AV500/AV900

PRODUCT REFERENCE GUIDE

2D CAMERAS

DATALOGIC

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Software version

This manual refers to software version 5.4 and later.

Patents

This product is covered by one or more of the following patents: Utility patents: EP1128315B1, EP1396811B1, EP1413971B1, EP2517148B1, EP2649555B1, FR2909442B1, GB2444409B, IT1404187, JP4435343B2, JP4571258B2, JP5947819B2, US6512218, US6616039, US6808114, US6997385, US7387246, US7433590, US8058600, US8360318, US8368000, US8888003, US8915443, US9230142, US9268982, US9349047, US9430689, US9589165, US9785817, US9798948, US9870498, US10229301, ZL200980163411.X, ZL201080071124.9, ZL201280010789.8
See www.patents.datalogic.com for patent lists.

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PREFACE

ABOUT THIS MANUAL

This Product Reference Guide (PRG) is provided for users seeking advanced technical information, including connection, programming, maintenance and specifications. The Quick Reference Guide (QRG) and other publications associated with this product can be downloaded free of charge from the website listed on the back cover of this manual.

Manual Conventions

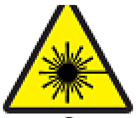
The following conventions are used in this document:

The symbols listed below are used in the manual to notify the reader of key issues or procedures that must be observed when using the camera.

NOTE: This symbol draws attention to details or procedures that may be useful in improving, maintaining, or enhancing the performance of the hardware or software being discussed.

WARNING: This symbol identifies a hazard or procedure that, if incorrectly performed, could cause personal injury or result in equipment damage. It is also used to bring the user's attention to details that are considered IMPORTANT.

HIGH VOLTAGE: This symbol alerts the user they are about to perform an action involving, either a dangerous level of voltage, or to warn against an action that could result in damage to devices or electrical shock.



LASER CAUTION: This symbol alerts the user they are about to perform an action involving possible exposure to laser light radiation.

ESD CAUTION: This symbol identifies a procedure that requires you take measures to prevent Electrostatic Discharge (ESD) e.g., use an ESD wrist strap. Circuit boards are most at risk. Please follow ESD procedures.

TECHNICAL SUPPORT

Support Through The Website

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For quick access, from the home page click on the search icon , and type in the name of the product you're looking for. This allows you access to download Data Sheets, Manuals, Software & Utilities, and Drawings.

Hover over the Support & Service menu for access to Services and Technical Support.

Reference Documentation

The documentation related to the AV500/AV900 camera system management is listed below:

- AS1 Series Instruction Manual
- CBX100 Reference Manual
- CBX510 Reference Manual
- CBX800 Reference Manual
- DK503 Installation Guide
- DM3610 Reference Manual
- LCC 75XX Light Curtain Instruction Manual
- PWR-480B Installation Manual

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Datalogic warrants that the Products shall be free from defects in materials and workmanship under normal and proper use during the Warranty Period. Products are sold on the basis of specifications applicable at the time of manufacture and Datalogic has no obligation to modify or update Products once sold. The Warranty Period shall be **two years** from the date of shipment by Datalogic, unless otherwise agreed in an applicable writing by Datalogic.

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All rights, duties, and obligations are subject to the courts of the country in which End User obtained the license. For licenses granted by Licensee who operates in the countries specified below, the following terms applies.

For Americas:

This Agreement is governed by the laws of the State of Oregon. This Agreement and the rights of the parties hereunder shall be governed by and construed in accordance with the laws of the State of Oregon U.S.A, without regard to the rules governing conflicts of law. The state or federal courts of the State of Oregon located in either Multnomah or Lane counties shall have exclusive jurisdiction over all matters regarding this Agreement, except that Datalogic shall have the right, at its absolute discretion, to initiate proceedings in the courts of any other state, country, or territory in which End User resides, or in which any of End User's assets are located. In the event an action is brought to enforce the terms and conditions of this Agreement, the prevailing party shall be entitled to reasonable attorneys' fees, both at trial and on appeal.

For Europe, Middle East and Africa:

This Agreement is governed by the laws of Italy. This Agreement and the rights of the parties hereunder shall be governed by and construed in accordance with the laws of Italy, without regard to the rules governing conflicts of law. Italian Court of Bologna shall have exclusive jurisdiction over all matters regarding this Agreement, except that Datalogic shall have the right, at its absolute discretion, to initiate proceedings in the courts of any other state, country, or territory in which End User resides, or in which any of End User's assets are located. In the event an action is brought to enforce the terms and conditions of this Agreement, the prevailing party shall be entitled to reasonable attorneys’ fees, both at trial and on appeal.

For Asia- Pacific Countries:

The validity, interpretation and construction of the Agreement shall be governed by and construed in accordance with Laws of the Republic of Singapore. Parties expressly disclaim the application of the United Nations Convention for AV500/AV900 International Sale of Goods.

Any dispute arising out of or in connection with this contract, including any question regarding its existence, validity or termination, shall be referred to and finally resolved by arbitration administered by the Singapore International Arbitration Centre (“SIAC”) in accordance with the Arbitration Rules of the Singapore International Arbitration Centre ("SIAC Rules") for the time being in force, which rules are deemed to be incorporated by reference in this clause. The seat of the arbitration shall be Singapore.

The number of arbitrators will be three, with each side to the dispute being entitled to appoint one arbitrator. The two arbitrators appointed by the parties will appoint a third arbitrator who will act as chairman of the proceedings. Vacancies in the post of chairman will be filled by the president of the SIAC. Other vacancies will be filled by the respective nominating party. Proceedings will continue from the stage they were at when the vacancy occurred. If one of the parties refuses or otherwise fails to appoint an arbitrator within 30 days of the date the other party appoints its, the first appointed arbitrator will be the sole arbitrator, provided that the arbitrator was validly and properly appointed. All proceedings will be conducted, including all documents presented in such proceedings, in the English language. The English language version of these terms and conditions prevails over any other language version.

12.4. Attorneys’ Fees. In the event an action is brought to enforce the terms and conditions of this Agreement, the prevailing party shall be entitled to reasonable attorneys' fees, both at trial and on appeal.

– END –

PATENTS

This product is covered by one or more of the following patents:

Utility patents: EP2212827, EP2517148B1, EP2649555B1, IT1404187, JP5947819B2, US10161742, US10229301, US10699091, US6808114, US7433590, US8360318, US8888003, US8915443, US9230142, US9349047, US9430689, US9589165, US9785817, US9798948, US9870498, ZL200980163411.X, ZL201080071124.9, ZL201280010789.8

AV7000

COMPLIANCE

Laser Safety

This product conforms to the applicable requirements of IEC60825-1 (Ed. 3). and complies with 21 CFR 10 except for deviations pursuant to laser notice N° 56, date January 19, 2018. This product is classified as a Class 2 laser product according to IEC 60825-1 regulations. The targeting lasers are pulsed 416Hz with a 400us on time which results in a 16.67% duty cycle with an angular subtense of 1.5mRad. Average power is less than 1.0mW.

Electrical Safety

This product conforms to the applicable requirements contained in the European Standard for electrical safety EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013 at the date of manufacture.

Caution

Use of controls or adjustments or performance of procedures other than those specified herein may result in exposure to hazardous visible laser light.

Disconnect the power supply when opening the device during maintenance or installation to avoid exposure to hazardous laser light. The laser beams are intended for initial alignment and positioning.

LED SAFETY

These camera bar code readers include illumination that use high powered light emitting diodes (LEDs). LED emission according to IEC 62471, Risk Group 0.

White Light Illuminations

RISK GROUP 0 LED emission according to IEC 62471.

Disconnect the power supply when opening the device during maintenance or installation to avoid exposure to LED light. The LED can be switched on or off through a software command.

Power Supply

This product is intended to be installed by **Qualified Personnel** only.

This product is intended to be supplied with a UL listed or CSA Certified LPS Power unit of 24 volt, 2 amp minimum (24 VDC Nominal, +/-20%).

CE Compliance

CE marking states the compliance of the product with essential requirements listed in the applicable European directive. Since the directives and applicable standards are subject to continuous updates, and since Datalogic promptly adopts these updates, therefore the EU declaration of conformity is a living document. The EU declaration of conformity is available for competent authorities and customers through Datalogic commercial reference contacts. Since April 20th, 2016 the main European directives applicable to Datalogic products require inclusion of an adequate analysis and assessment of the risk(s). This evaluation was carried out in relation to the applicable points of the standards listed in the Declaration of Conformity. Datalogic products are mainly designed for integration purposes into more complex systems. For this reason it is under the responsibility of the system integrator to do a new risk assessment regarding the final installation.

EAC Compliance

Customs Union:

The CU Conformity certification has been achieved; this allows the Product to bear the Eurasian Mark of conformity.

FCC Compliance

Modifications or changes to this equipment without the expressed written approval of Datalogic could void the authority to use the equipment.

This device complies with PART 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference which may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

UL Listing

Bureau Of Indian Standards (BIS)

Self Declaration – Conforming to IS 13252 (Part 1):2010, R-41009288

Laser Safety and Serial Labels

HANDLING

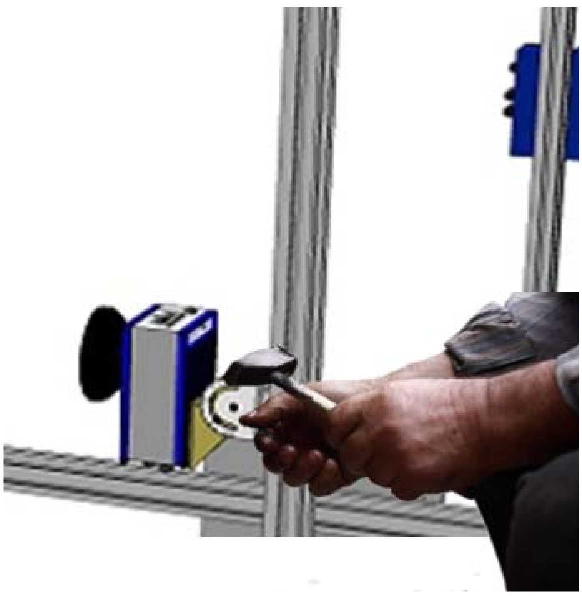
The AV500/AV900 is designed to be used in an industrial environment and is built to withstand vibration and shock when correctly installed. However, it is also a precision product and must be handled correctly before and during installation to avoid damage.

Do not drop the reader.

NO!

Do not fine tune positioning of the reader by striking it or its mounting bracket.

NO!



Do not weld the reader into position, which can cause electrostatic, heat or reading window damage.

NO!

Do not spray paint near the reader which can cause damage to the lens and illumination window.

NO!

CHAPTER 1
INTRODUCTION

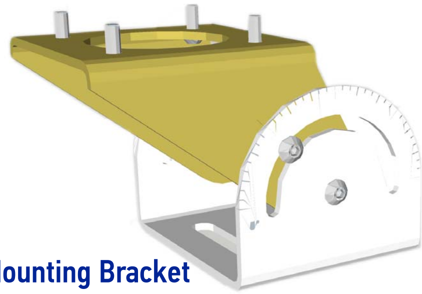
ABOUT THE CAMERA

The AV500/AV900 is a high performance camera with an integrated image processing system dedicated to automatic code identification on moving parcels. The AV500 uses a 5 mega pixel sensor and the AV900 a 9 mega pixel sensor.

The Sync-NET reader clustering permits extending the reading area for single-side and multi-side applications. Captured images are stored on-board and optionally transferred to external supports through the integrated Ethernet connectivity. Rugged metal construction, IP65 enclosure rate and operative temperature up to 50°C guarantee a long life cycle even in harsh industrial environments.

The AV500/AV900 camera can be used with WebSentinel PLUS Investigator which is a tool that provides no read classification and bar code grading for each barcode read during normal operations. No Read classification is a valuable tool. By post processing saved images of No Reads, WebSentinel PLUS Investigator sorts these items into categories and helps you determine No Read root causes. Bar code grading is another important feature that helps estimate trends in printing quality and determines decreasing quality before labels can become no reads.

A universal mounting bracket shown below comes with each AV500/AV900 and allows you to mount the unit in its required position with ease.



Mounting Bracket

AV500/AV900 has been developed for use in numerous applications:

- Manual Parcel Sorting
- Manual Presentation Scanning
- Loading and Unloading
- Airport Baggage Handling
- Automated Parcel Sorting

Quick, automatic focus, positioning, calibration and code setting of the image can be accomplished using the X-PRESS button and LEDs on top of the reader without the necessity of a PC.

DYNAMICFOCUS

Excellent Performance

- 5.0 or 9.0 M Pixels
- Adjustable focus through C-Mount lenses
- Powerful Illumination Lighting Systems
- Outstanding decoding capability on 1D, 2D, Stacked, Postal symbolizes
- Omni-directional reading
- Frame Rate up to 32 frames/sec
- Image Cropping for higher frame rate
- Up to 100 readable codes in a single frame

Ease of Setup

- e-Genius is a web browser based software to configure the reader parameters via PC Ethernet interface
- User-defined database of Image Acquisition Settings (parameter sets)

Ease of Use

- X-PRESS interface LEDs provide operational and performance feedback
- Green Spot for immediate Good Read feedback
- Different operating modes to suit various application requirements
- Multi Image Acquisition Settings for higher reader flexibility
- Image saving and storage with buffering capability
- Diagnostic software tools

Flexible Solution

- Complete set of Accessories like mirrors, connection boxes, cables and photocells
- Ethernet Connectivity with TCP/IP socket for reader parameter configuration, data and image transfer, FTP client, etc.
- Three Ethernet connections, Two serial ports
- General purpose opt-coupled I/Os

Industrial Strength

- Industrial compact 2D reader
- Rugged full metal construction
- Sealed circular connectors
- IP65 protection class
- 50 °C max operating temperature
- Supply voltage ranges 24 VDC Nominal, +/-20%

This chapter introduces the basic concepts necessary for camera installation and setup.

GENERAL VIEW

1 Serial Number and Warning Labels

2 Bracket Mounting Holes

3 Lens and Green Spot LED

4 Illumination

5 HMI X-Press Interface

6 Power On Connector and LED - stays blue when receiving power

7 Sync Out Connector and LED - flashes orange

8 Sync In Connector and LED - flashes orange

9 Host Net Connector and LED - lashes green and orange, orange if receiving data

10 Image Net Connector and LED - flashes green and orange, orange if receiving data

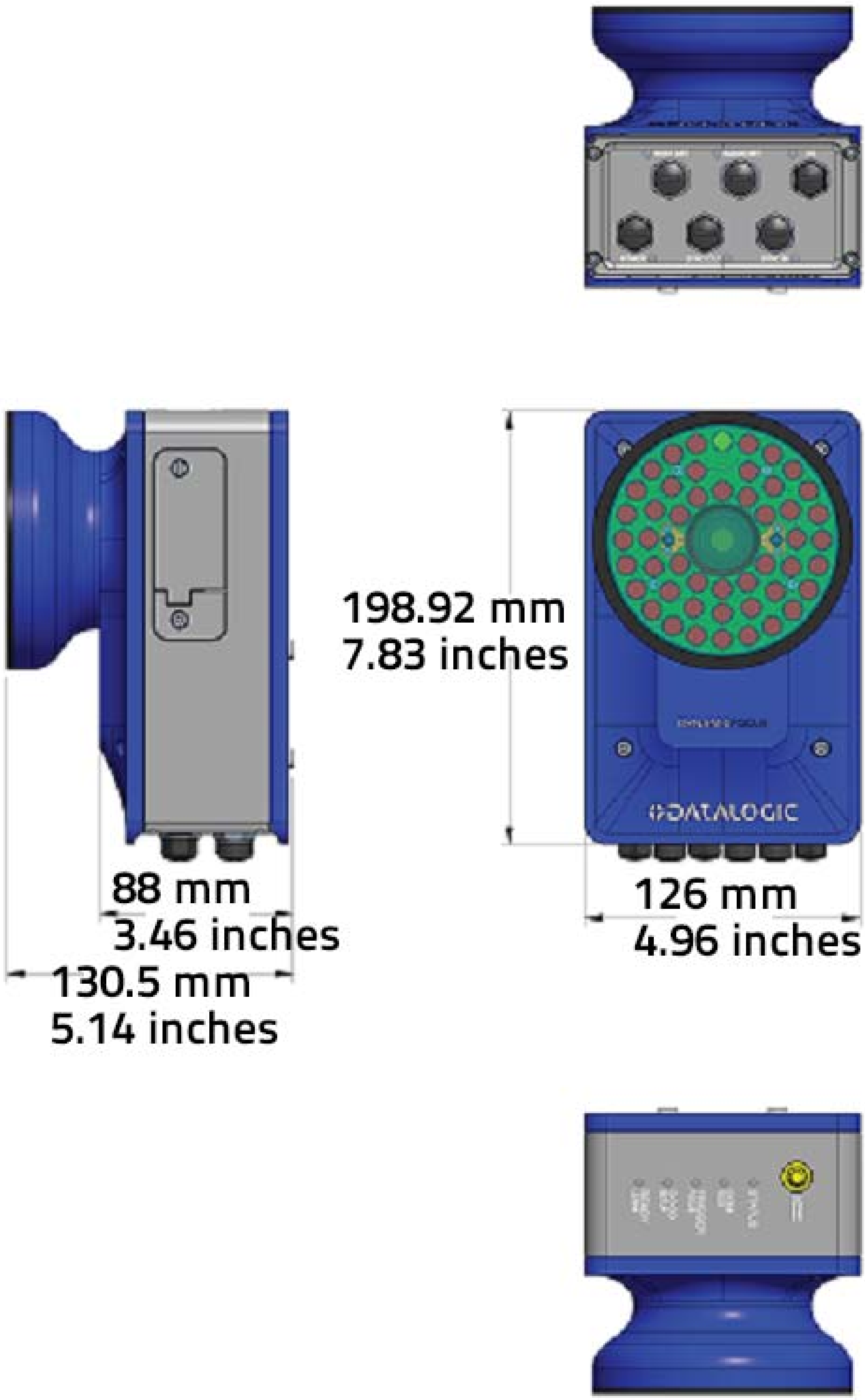
11 I/O Connector and LED - will light when connected to the CBX box

Power and Sync Out LEDs Lit

LED Indicators

#	LED	Description
1	POWER	Solid Blue – Power LED indicating all internal power supplies are at the correct voltage. Can be out if external power is supplied and an internal supply is out of range.
2	I/O	Solid Green – Indicates CBX box connected has the ID+ to GND jumper and this camera is the controller for the tunnel. The Tachometer/Encoder must be connected to this unit.
4	HOST NET	Green - Host Network Link at Gbit speed **Red** – Host Network Data activity **NOTE:** With a Gbit link, Green will always be on and Red will blink, looking like it alternates Green to amber. If connected to 100Mbit network, the LED will only blink Red with activity.
5	IMAGE NET	Green - Image Network Link at Gbit speed **Red** – Image Network Data activity **NOTE:** With a Gbit link, Green will always be on and Red will blink, looking like it alternates Green to amber. If connected to 100Mbit network, the LED will only blink Red with activity.
6	SYNC IN	Green - SyncNet Link at 100Mbit speed **Red** – SyncNet Data activity **NOTE:** With a 100Mbit link, Green will always be on and Red will blink, looking like it alternates Green to amber. If connected to 100Mbit network, the LED will only blink Red with activity.
9	SYNC OUT	Green - SyncNet Link at 100Mbit speed **Red** – SyncNet Data activity **NOTE:** With a 100Mbit link, Green will always be on and Red will blink, looking like it alternates Green to amber. If connected to 100Mbit network, the LED will only blink Red with activity.

AV500/AV900 DIMENSIONS



APPLICATIONS OVERVIEW

An AV500/AV900 reading system consists of a reader/camera for acquiring images and reading the codes on a target. Because of the reading area of the AV500/AV900 it is good choice for stationary presentation scanning systems, as well as systems over moving conveyor.

Applications

The AV500/AV900 cameras are specifically designed for industrial applications requiring high reading performance such as:

- Low aspect ratio barcodes
- Codes covered by plastic film
- Codes located within a large depth of field
- Codes within a wide field of view
- High resolution codes positioned at far distances from the barcode reader
- Fast moving objects

The AV500/AV900 is designed for multi-head arrays, single side or multi side tunnels and hybrid configurations. It can also be used as a stand alone unit.

Stand Alone Presentation Scanning

Manual Presentation Scanning

In Manual Material Handling or Parcel Scanning applications, manual presentation scanning is often the preferred method for item identification. Maximum productivity and **operational efficiency** is maintained, while the stationary overhead reader continuously scans the working area, the operator can easily and quickly handle objects of various dimensions and weights. Since no point-and-shot is required for scanning, no extra tools or infrastructure is necessary in the working area; no extra operations for part identification other than passing the object through the scanning zone. No training is required for users. The large coverage area and fast acquisition rate – by **AV500/AV900** – permits rapidly handling objects in sequence with great tolerance. **White illumination and continuous high power mode** enable top performance with the maximum comfort for operators.

A controller key is required!

Single or Multi-Unit Tunnels and Arrays

Many AV500/AV900 reading system applications will read over a moving conveyor and use a network of multiple devices.

- **Optical Encoder Wheel (Tachometer):** Used underneath a conventional conveyor. The encoder generates a pulse per specified distance (mm [in]) of conveyor travel.
- **Internal Tach:** This is a software-generated pulse mimicking an encoder/tachometer.

A position sensor (DM3610, light curtain or S85 Position Sensor) is often used as a trigger source. When the height or left/right focus data measured by the sensor goes over a certain threshold, a package is entering the image valid start, and when it goes under the threshold, the package is providing the image valid stop. Sometimes this sensor is not sufficiently precise and an additional Presence Sensor input is used. When the codes are located on more than one face of the parcel, more than one reader is necessary (multi-camera reading station). In this case, one of the bar code readers (the Controller) collects the information from all the sensors and distributes it to the other readers using a dedicated Ethernet connection. A CBX connection box is used to simplify the connection of the camera to the other system components.

Airport Baggage Handling

Baggage handling system airport arrays use multiple scanners and controllers as necessary to properly cover conveyors carrying passenger luggage through an airport baggage handling system. Several cameras, a CBX and an SC5000 Controller are required. Sometimes a Redundant System is required to provide duplicate controller and scanner stations for improved reliability and performance.

Automated Parcel Sorting

Easy installation, maintenance, superior performance, and longer life-cycle make AV500/AV900 a compelling solution for over-the-belt reading.

5.0/9.0 megapixel image captures where each single shot frames the entire area. One-reader-one-shot obtains maximum reading throughput. Image capture is associated with the data of each sorted item and for any reporting or analysis purposes. Additional devices can be used for scanning applications of large conveyors or multi-sided reading, through Ethernet clustering, multiple readers can be effectively combined to extend the scanning area.

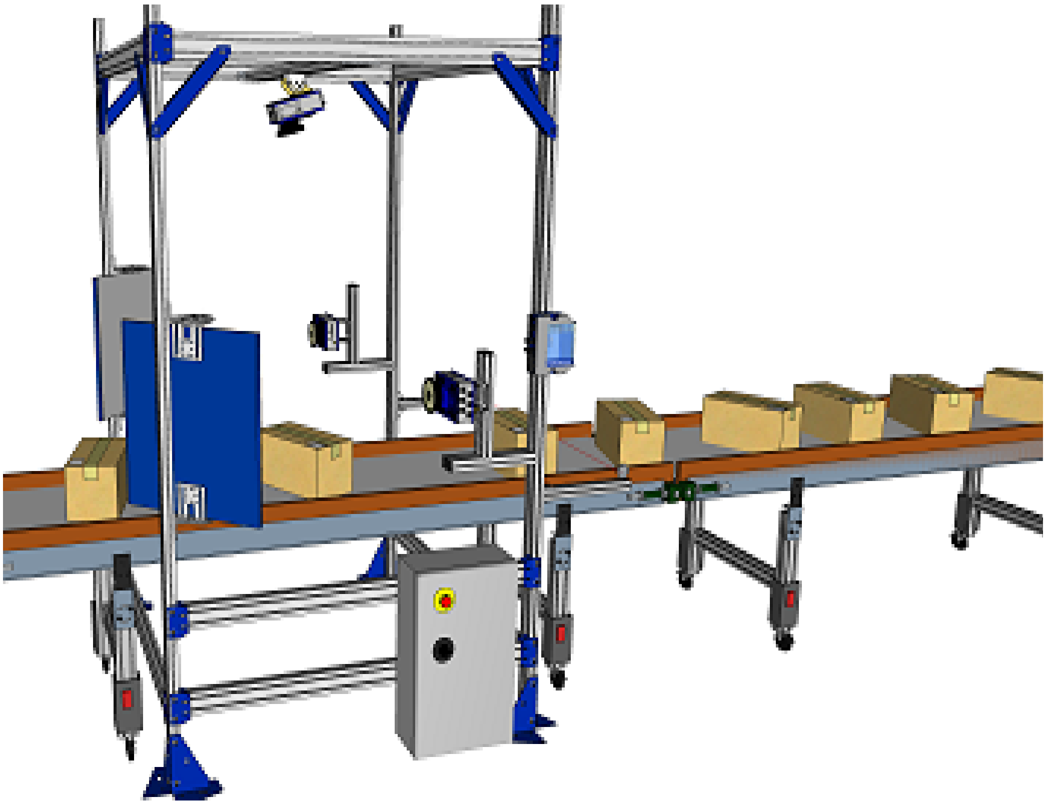


Image Acquisition

The AV500/AV900 contains both the acquisition device or “imager,” which works in strict real time to acquire the best possible images and the decoding device or “decoder” in one chassis. These parts of the AV500/AV900 interpret the data received.

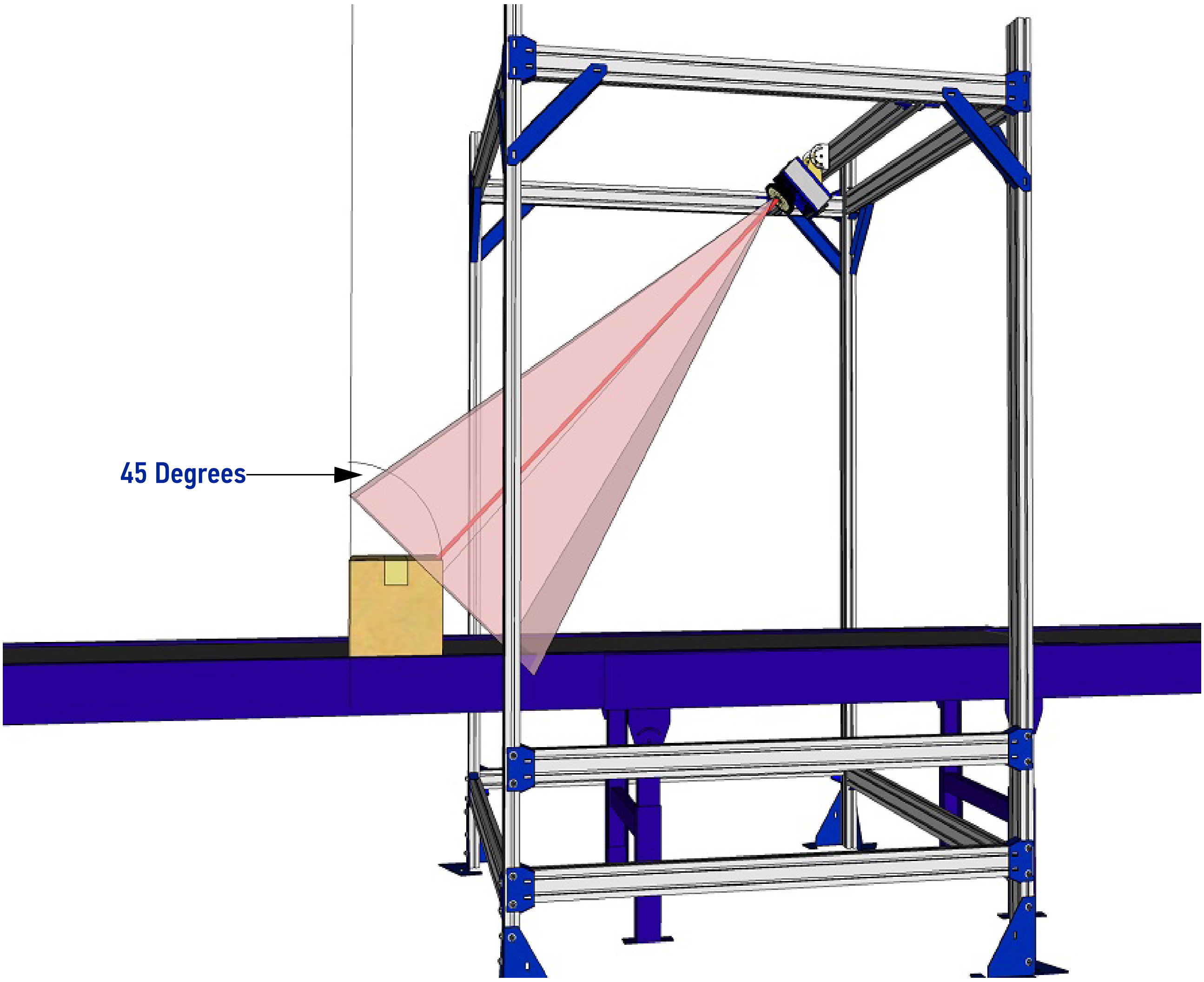
The camera can use several kinds of external sensors:

- **Speed Sensor:** If mounted over moving conveyor, the camera needs to know the speed of the objects to be acquired. The speed sensor is usually an encoder/ tachometer connected to the belt, or an internal software tachometer.
- **Height/Side Position Sensor:** The focusing position is computed by the camera based on the position of the parcel measured by a height sensor. Sensors may be a DM3610 Dimensioner, AREAscan™ DS2 Light Array or S85.
- **Trigger Source:** In multiple camera systems, each package has to be uniquely identified by all the cameras. For this reason, all of the cameras in a reading station share a unique trigger source.

All the sensors are connected to the Controller camera that interprets the information and distributes it to the Client cameras.The start and stop of an acquisition are triggered by a start/stop event generated by the trigger device (position sensor, photo sensor, read now signal). The acquisition of a package doesn’t start when the trigger source detects it, but with a certain delay depending on:

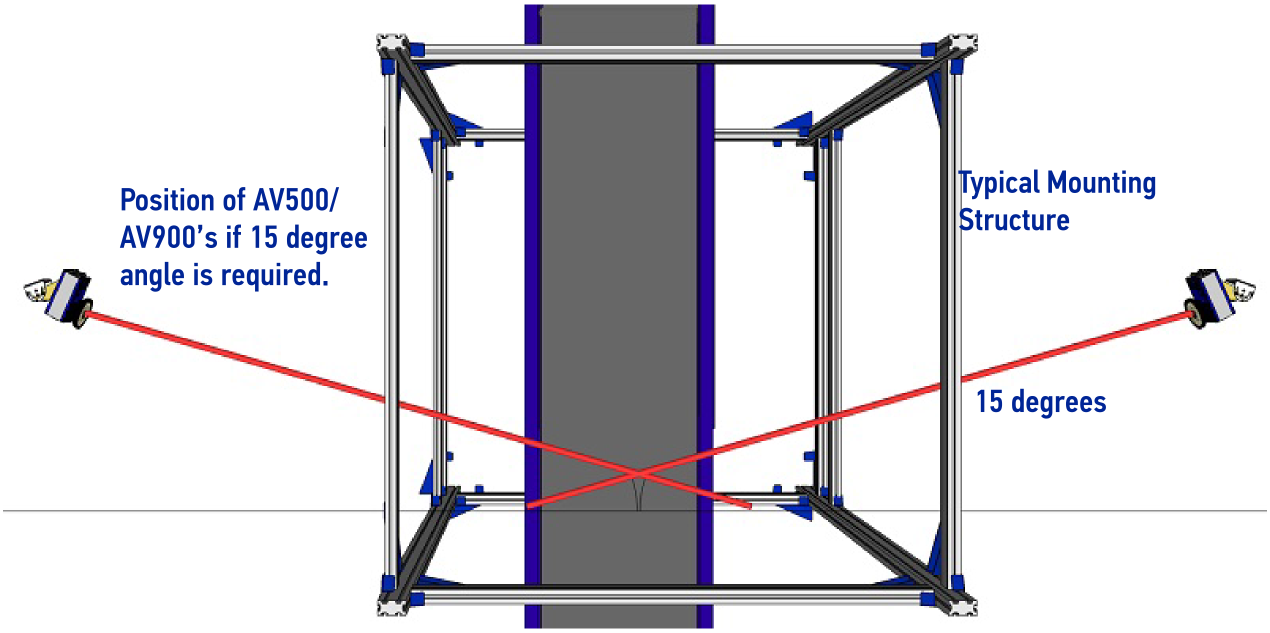
- the distance between the trigger device and the view line at belt level
- the view line angle (alpha) of the camera
- the speed of the object
- the height of the package

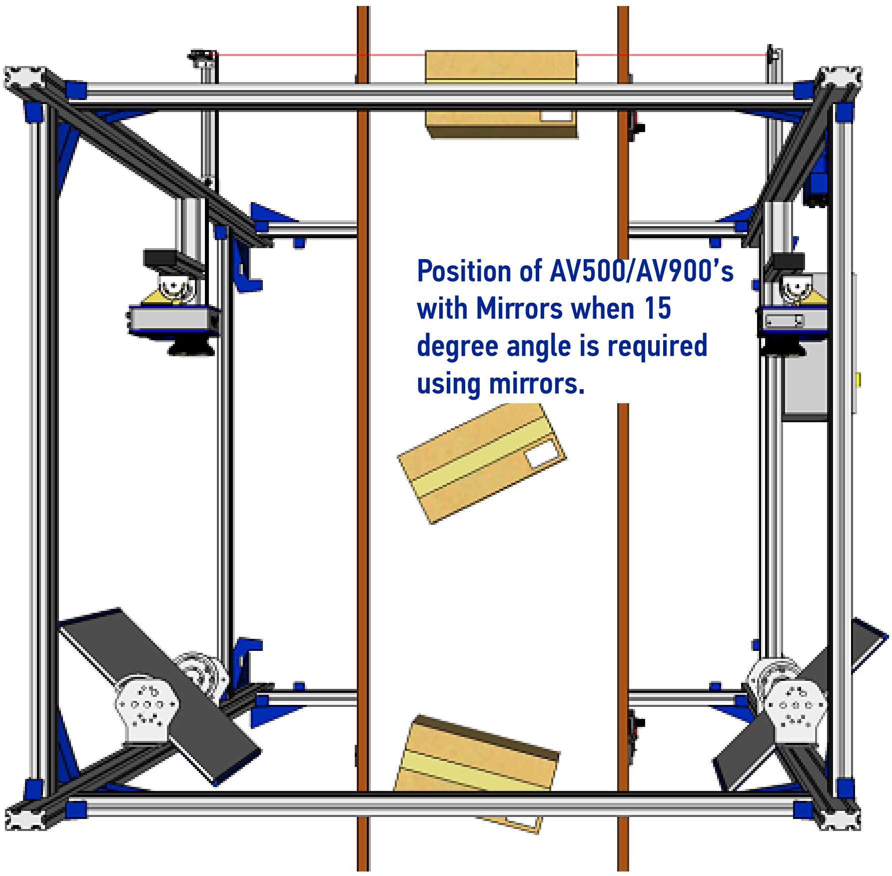
Based on the AV500/AV900 mounting position, the unit tries to acquire one (reading angle alpha = 15°) or two faces of the parcel (alpha = +/-45°).


45 Degrees

typical reading station may also include:

- **Power Supply Systems:** The AV500/AV900 requires a 24 Vdc power supply. Usually each camera has its own power supply system (i. e. PWR-480B).
- **External Mirrors:** To cover the requested reading field, the cameras must be positioned at a given distance from their targets. In order to create reading stations as small as possible, a deflection mirror is often inserted between the target and the camera. See examples below.





AV500/AV900 Versions

AV500/AV900 cameras are available in versions that differ depending on the optical resolution (focus range), F-stop and illumination color.

AV500 P/N	Focusing	Lens	F-stop	Illumination Color
938000007	Dynamic Focus	16 mm	F/6	White
938000017	Dynamic Focus	16 mm	F/6	Red
938000005	Dynamic Focus	25 mm	F/7	White
938000015	Dynamic Focus	25 mm	F/7	Red
938000006	Dynamic Focus	25 mm	F/8	White
938000016	Dynamic Focus	25 mm	F/8	Red
938000001	Dynamic Focus	35 mm	F/7	White
930000011	Dynamic Focus	35 mm	F/7	Red
938000002	Dynamic Focus	35 mm	F/8	White
938000012	Dynamic Focus	35 mm	F/8	Red

AV900 P/N	Focusing	Lens	F-stop	Illumination Color
938000105	Dynamic Focus	25 mm	F/7	White
938000115	Dynamic Focus	25 mm	F/7	Red (Coming Soon!)
938000102	Dynamic Focus	35 mm	F/8	White
938000112	Dynamic Focus	35 mm	F/8	Red (Coming Soon!)

HMI – HUMAN MACHINE INTERFACE

The AV500/AV900 camera includes one external button that can be used to perform specific tasks without the need of connecting to **e-Genius** *(AV500/AV900 browser-based user interface).*

Some of these functions may be performed using e-Genius. See Chapter 4.

LED Functionality

#	LED	Description
1	STATUS	Solid **Red** – active error exists
2	COMM	Solid **Yellow** when transmitting host message (serial or Ethernet)
3	TRIGGER	Lights **Yellow** when getting a trigger input from either the CBX or message on the Ethernet or serial interface. Always on in continuous mode.
4	GOOD	Lights **Green** with good read at time host message is transmitted.
5	READY	Solid **Green -** Good status when camera is running

The AV500/AV900 LED Boot Sequence

1. All LEDs will turn off after the FPGA is loaded
2. STATUS, COM, GOOD, and TRIGGER LEDs will turn ON after the RTP boots (READY will turn OFF)
3. STATUS LED will turn off after the controller camera status is determined
4. COM, GOOD, and TRIGGER LEDs will blink while the camera is waiting for the controller to start it's DHCP server
5. COM will turn off, GOOD and TRIGGER will turn ON, after the COMe boots
6. STATUS LED will turn ON if the camera is the active controller
7. TRIGGER will turn off after the RTP configures its network interface
8. GOOD LED will blink until the RTP gets an IP address from the controller camera
9. GOOD LED will turn ON after an IP address is obtained
10. GOOD LED will turn OFF after the handshake between the RTP and COMe completes
11. READY LED will turn ON after the RTP gets parameters from the COMe and the STATUS LED will indicate the cameras status and not the controller state.

The camera is ready for normal operation.

Green Spot

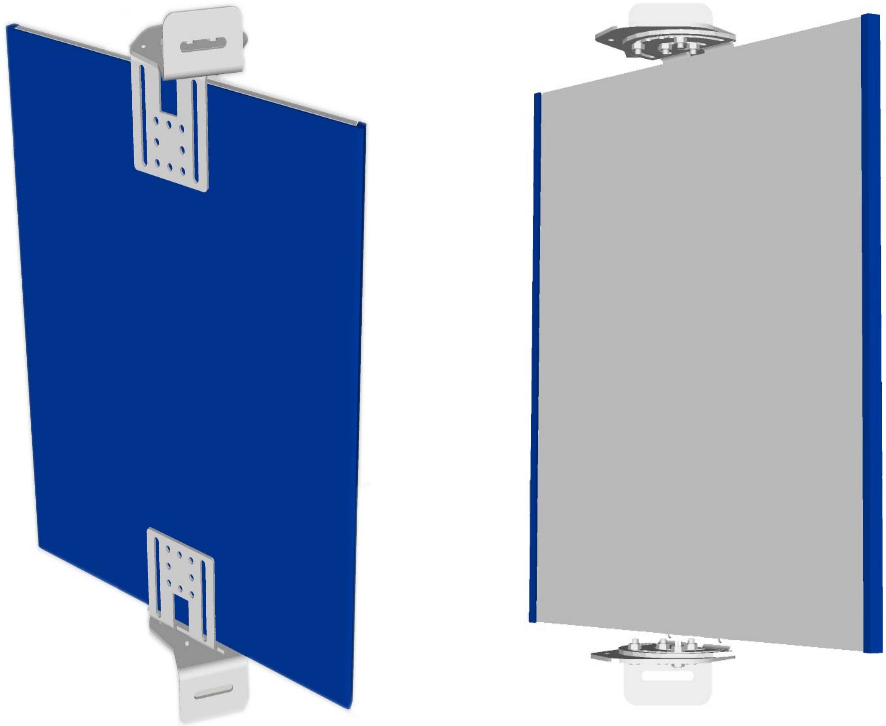
Green Spot' technology provides visual confirmation of a 'good read', improving the user's experience and increasing the speed of scanning operations, which is especially helpful when working in noisy environments. A green LED will illuminate the object when the camera successfully reads the barcode.

Accessories

The following accessories are available on request for the AV500/AV900 Camera Imaging System.

Reflecting Mirror

P/N 93ACC0086 (380mm) or 93ACC0116 (600mm)



The reflecting mirror is used to reduce the footprint of your system.

Ethernet Connection Cable (M12-IP67 to RJ45)

This cable may be connected to the Host or Image port.

P/N: 93A050034 (1m)

P/N: 93A050035 (3m)

P/N: 93A050036 (5m)

P/N: 93A051389 (10m)

Sync-net Connection Cable (M12 male to M12 female)

P/N 93A050133 (.75m)

P/N: 93A050079 (3m)

P/N: 93A050080 (5m)

P/N: 93A050081 (10m)

I/O Cable (M12-IP67 to CBX)

P/N: 93A050059 (3m)

P/N: 93A050060 (5m)

P/N: 93A051390 (10m)

Power Supply (Single Camera)

P/N: 93ACC0058 (US)

P/N: 93ACC0264 (PWR-240B)

P/N: 93ACC0076 (PWR-480B)

Four Port Power Supply (Multiple Cameras)

P/N 93ACC0141 (US)

P/N 93ACC0142 (EU)

Power Cable

P/N: 93ACC0149 (3m)

P/N: 93ACC0150 (5m)

PICTURE NOT AVAILABLE AT THIS TIME!

Controller Key

P/N: 93A200032

COMMUNICATION PORTS

The following communication ports are available on the AV500/AV900 camera.

Host Network

Image Network

Sync Net

Discrete I/O

The AV500/AV900 offers one Digital I/O, which stands for Digital Input and Output. This is available for connection to a CBX which provides multiple additional connections. Digital I/Os allow a micro-controller to detect and output logic states. Each digital I/O can recognize one of the following:

Inputs

Tach

Trigger

Dual Zone

Generic

Outputs

Complete Read

Partial Read

Trigger On

Trigger Off

Multiple Read

No Read

TRIGGER, FOCUS AND POSITION SENSOR DEVICES

There are several focusing device options available for the AV500/AV900 Camera, see Chapter Five for details.

Photoelectric Sensor

The Datalogic Photoelectric Sensor is used in AV500/AV900 camera systems to detect the presence of an item entering the scanning area.

The photoelectric sensor is used in singulated conveyor systems where the packages are separated by an open space between the trailing edge of one package and the leading edge of the next. In irregular package applications, the photoelectric sensor assists in maintaining the package footprint so that the AV500/AV900 camera will only scan and provide data for a specific package.

Depending on the application, these devices may need to be configured differently. While the photoelectric sensor and tachometer work well with belt conveyors, a special configuration is needed for tilt-tray and cross-belt sorter applications.

Photoelectric Sensor	
AS1-HD-HR-010-J D 3M RES 0.5MM H 100MM	958101020
AS1-HD-SR-010-J D 3M RES 5MM H 100MM	958101030

0LCC-75xx Kit with DS2 Light Array

The DS2 Light Array (Light Curtain), part of the LCC-75xx kit, is used to detect the presence of products in top mount applications as they enter the scanning area as well as report the focusing data to the top mounted AV500/AV900. The AREAscan™ family of the DS2 series covers controlled heights ranging from 150 to 2500mm, with 5m operating distances for high resolution versions, or 10m for low resolution versions.

Light Curtain Focusing	
LCC-7501 AV7 LIGHT CURTAIN 150MM+CAB 10M	93ACC0170
LCC-7506 AV7 LIGHT CURTAIN 600MM+CAB 10M	93ACC0171
LCC-7509 AV7 LIGHT CURTAIN 900MM+CAB 10M	93ACC0172
LCC-7512 AV7 LIGHT CURTAIN 1200MM+CAB 10M	93ACC0173

Position Sensor

The DK-503 Distance Kit is part of a vision system used to signal the focus range of packages to be imaged by the AV500/AV900 camera. It includes an S85 Class 2 visible red LASER sensor to measure direct proximity from .2 m to 5 m. It includes PNP or NPN, 4-20 mA analog output and RS 485 serial interface.

It comes with:

- Mounting bracket and non-reflective plate
- CVL 2811 Connection cable
- Installation Guide

Distance Sensor	
DK503 Distance Sensor Kit	93ACC0263

DM3610 Dimensioner

The DM3610 is used to detect the presence of products as they enter the scanning area as well as report the package positions/heights and sequence number to all cameras in the system. The DM3610 can also provide certified (Legal for Trade), side-by-side package detection, or volume measurements for the packages that pass below it.

For complete information about the features and capabilities of the DM3610 Dimensioner, see the dimensioner page on the Datalogic website: www.datalogic.com.

The DM3610 Dimensioner requires the following:

- DM3610
- Power Supply
- Universal Mounting Bracket
- Class 2 EU Adapter (optional)

DM3610	
DM3610-1000 STD NLFT	932702000
DM3610-1100 SING NTEP	932702020
DM3610-1200 SING OIML/MID	932702030
DM3610-1201 SING OIML/MID MOD D	932702031
DM3610-1300 SING MC	932702040

SPEED SENSORS

Encoder (Tachometer)

The encoder/tachometer delivers a continuous pulse to the system, which provides feedback on conveyor speed and transmit point, and can be used to help track the package position along the length of the conveyor.

Encoder (Tachometer)	
OEK-2 OPTICAL ENCODER (CAB 10m+SPRING)	93ACC1770
OEK-3 OPTICAL ENCODER HI RES,6M CBL+SPRI	93ACC0056
OEK-3 ENCODER HI RES M139,6M CBL +SPRI (START/STOP ANTI ROLLBACK)	93ACC0104

INDUSTRIAL CONTROLLERS

Industrial Connection Boxes

CBX510 Series are industrial connection boxes that can be used to connect the barcode readers to an encoder/tachometer, photoelectric sensor, serial devices, relays, or other peripherals.

CBX Connection Box	
CBX100 CONNECTION BOX COMPACT	93A301067
CBX510 CONNECTION BOX MODULAR	93A301087
CBX800 GATEWAY	93A301077

Only CBX510 should be used in a system, If additional I/O is needed CBX100 or 800 can be added to other camera systems.

SC5000

Used when multiple cameras are required, the SC5000 Controller offers all the necessary functions to make the phases of installation, setup, testing, and maintenance easy and quick.

The SC5000 Controller key functions are:

- Bus Controller: cluster management and Host interface of a multi-sided reading tunnel
- Automatic replacement procedure: automatic procedure for imager, reader, scanner and bus controller replacement;
- Diagnostic indications on the reading station status, simple to be detected without any PC needed. These indications, based on LEDs and display, provide the maintenance staff with all the necessary information;
- Single and Redundant System configurations;
- Integration with Dimensioners and Vision Systems; SC5000's efficiency in hybrid solutions represents a crucial competitive advantage for challenging application requirements.
- Three Inputs (Trigger, Encoder/Tachometer, IN3), three Outputs (OUT1, OUT2, OUT3), one configurable I/O Port (IN4/OUT4).

The SC5000 Controller is divided into two parts:

- The upper part (alloy case) contains the Controller’s digital section; here you can find the four Ethernet M12 connectors, the removable SD-Flash memory, the display, the keypad and the LEDs.
- The lower part (plastic case) contains the connection board, the place for the optional Fieldbus modules and the connector panel.

The simple and sturdy mechanical structure makes the SC5000 Controller the ideal solution for industrial environments.

The SC5000 Controller is fully compatible with DS8110 and DX8210 scanners.

The SC5000 Controller allows connection to the Trigger and Encoder/Tach. PNP inputs are available via M12 circular connectors, placed on the lower front panel.

This configuration covers a great part of all the possible user’s needs.

CHAPTER 2
MECHANICAL INSTALLATION

PREPARING FOR MECHANICAL INSTALLATION

WARNING: Application-specific drawings and documents provided by Datalogic supersede any contradictory content in this manual.

Before mounting any components, please do the following:

- Read all instructions before beginning your installation.
- Define and confirm the accuracy of your application's requirements and structure position, especially the height of the conveyor from the floor.
- Review all installation-specific drawings provided with your equipment.
- Review and plan the mechanical installation of all devices used in your application. Be sure to allow adequate clearance for maintenance.
- Review and plan the power requirements for your application.
- Check the contents of the shipping cartons against the packing list.
- Record all product serial numbers.

General Mounting Guidelines

WARNING: It is important that you follow these general precautions when installing, setting up, operating, maintaining, troubleshooting, or replacing any Datalogic products, parts or related equipment.

As you plan and install your AV500/AV900 camera imaging system, keep the following guidelines in mind:

- Follow application drawings for structural details and barcode reader placement.
- Determine the proper orientation and position of the barcode reader(s).
- Leave adequate clearances (approximately 300 mm [12 in]) for wiring.
- Route wires carefully to reduce or minimize electrical noise. When power and communication wiring must cross, make their intersection perpendicular. Avoiding sharp wire bends or loops, which can affect performance.
- Proper grounding limits the effects of noise due to Electromagnetic Interference (EMI).

Mounting Structure Considerations

Your first task is to mount your camera. You can provide your own mounting structure or Datalogic can design one for you. We recommend using a Datalogic mounting structure for standard applications.

NOTE: The AV500/AV900 cannot be mounted parallel to the conveyor belt. A 15 degree angle or more is required to avoid specular reflection.

WARNING: There must be at least 300 mm (12 in) clearance behind the unit for fan air intake!

Your mounting structure must provide the following capabilities:

- It is adjustable enough for you to move your unit to the optimum position for proper scanning.
- It allows a technician access to the camera while it is mounted.
- It must be as vibration free as possible so as not to affect the scanning accuracy.
- It is constructed of steel or aluminum.

NOTE: Refer to the Chapter 3 “Preparing for Electrical Installation” on page 42 and Reference Documentation for details on connecting your readers to other devices in the system.

When installing several cameras, take care to position them so that no laser beam or LED illumination enters the reading window of other barcode reading devices in the system. This condition could occur more frequently for side mounted applications. If these precautions are not followed, read rate could be negatively affected. To resolve this problem, it is sufficient to slightly change the inclination and/or position of one of the two devices involved.

Maintaining Thermal Performance

All electronic devices and circuitry generate excess heat and thus require thermal management to improve reliability and prevent premature failure. The AV500/AV900 is no exception, an internal fan is critical to maintaining AV500/AV900 performance. Also, proper clearance must be provided to the unit. There must be at least 300 mm (12 in) clearance behind the unit for fan air intake and you must use the mounting bracket provided with your unit to help maintain proper clearance and air flow.

The fan of the AV500/AV900 is a field replaceable part. Request spare part number: 8900006713. Instructions are included.

UNPACKING INSTRUCTIONS

Verify that the AV500/AV900 Camera and all the parts supplied with the equipment are present and intact when opening the packaging; the list of parts includes:

- Camera
- Installation Guide
- Test Chart
- Mounting Bracket and Hardware

WARNING: The AV500/AV900 Camera and accessory packaging is designed to protect the unit(s) during shipment. Do not throw it away. Save all packing material in case you need to transport your unit(s) to Datalogic for any reason.

2. Remove the foam layer to reveal the AV500/ AV900, its mounting bracket.and associated hardware.

3. Carefully remove the AV500/ AV900 and its mounting bracket. from the package.

4. Save the box and all of the packaging materials in case you need to ship the unit for service or repairs.

COMPLETE INSTALLATION SEQUENCE

NOTE: Everything should be MECHANICALLY INSTALLED before performing any ELECTRICAL INSTALLATION. See the Chapter 3 on “Electrical Installation” on page 42 for electrical installation details.

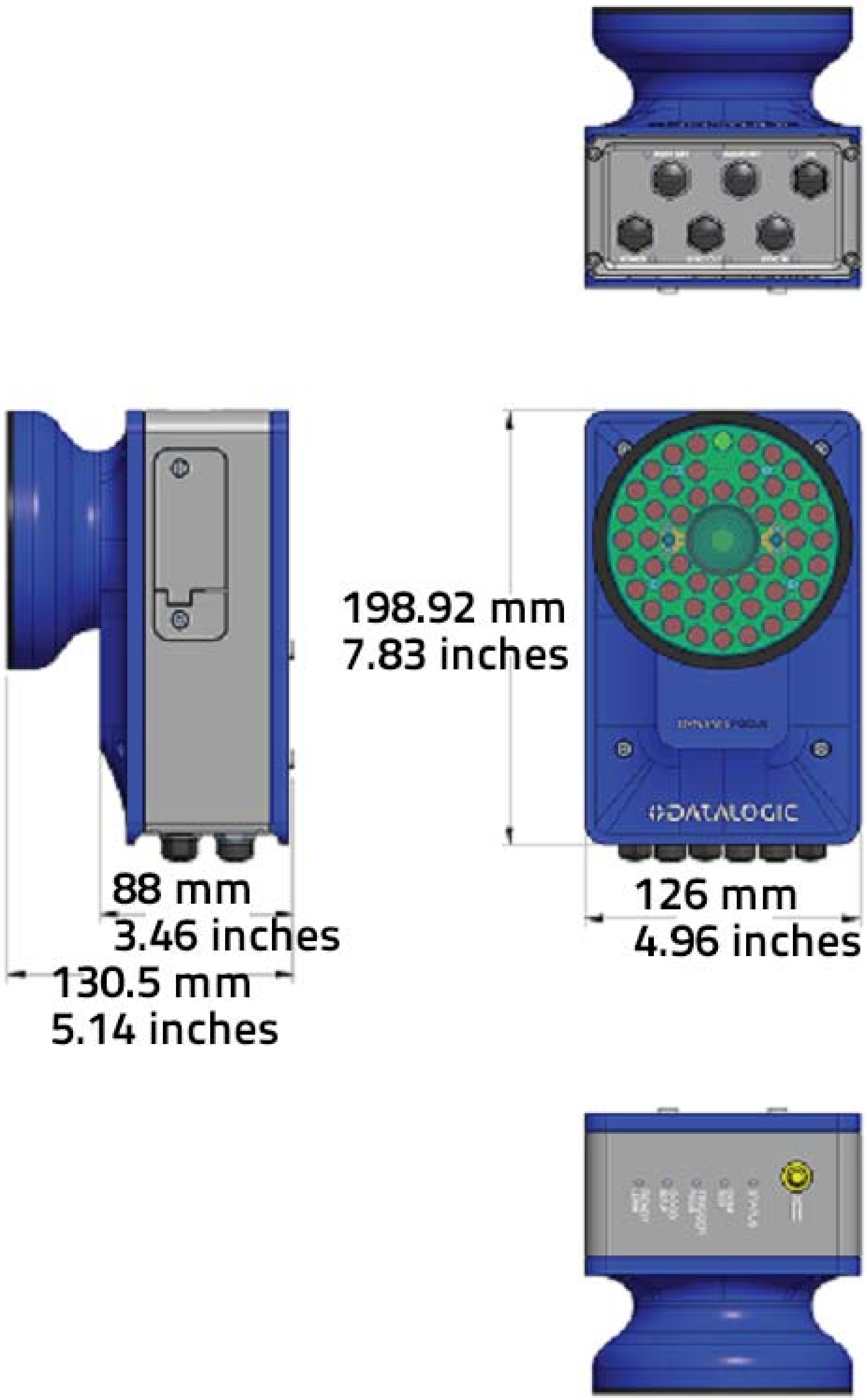
To complete mechanical installation and setup, you must:

1. Review the details of your application’s requirements
2. Erect mounting structure or other supporting structures
3. Determine and mark the Mounting Bracket locations
4. Mount the AV500/AV900 brackets to the mounting structure
5. Mount the AV500/AV900 to the bracket
6. Mount the brackets for the deflection mirror, if required
7. Mount the deflection mirror to its brackets
8. Mount the sensor(s) (Light Curtain, DM3610 Dimensioner, or S85)
9. Mount the photoelectric sensor to the mounting structure (optional)
10. Mount the tachometer to the mounting structure
11. Mount the CBX connection box to the mounting structure
12. Complete electrical installation (**See “Electrical Installation” on page 42**)
13. Align the AV500/AV900 for proper operation
14. Align the height sensor for proper operation, if used
15. Configure the AV500/AV900 (**See “E-Genius Basics” on page 80**)
16. Calibrate the AV500/AV900 **(See “Static Calibration” on page 345**)
17. Check AV500/AV900 operations

MOUNTING

Dimensions and Clearances

WARNING: The AV500/AV900 is a sealed, ventilated unit. Mounting the unit with 300 mm [12 in] of clearance (front, top, and sides) is recommended for cooling and ease of maintenance.



Physical Support Requirements

For details on the weight of the cameras, see “Technical Specifications” on page 380. Multiple-head systems may include further details on the physical support requirements with any application-specific documentation provided.

Vibration Limitations

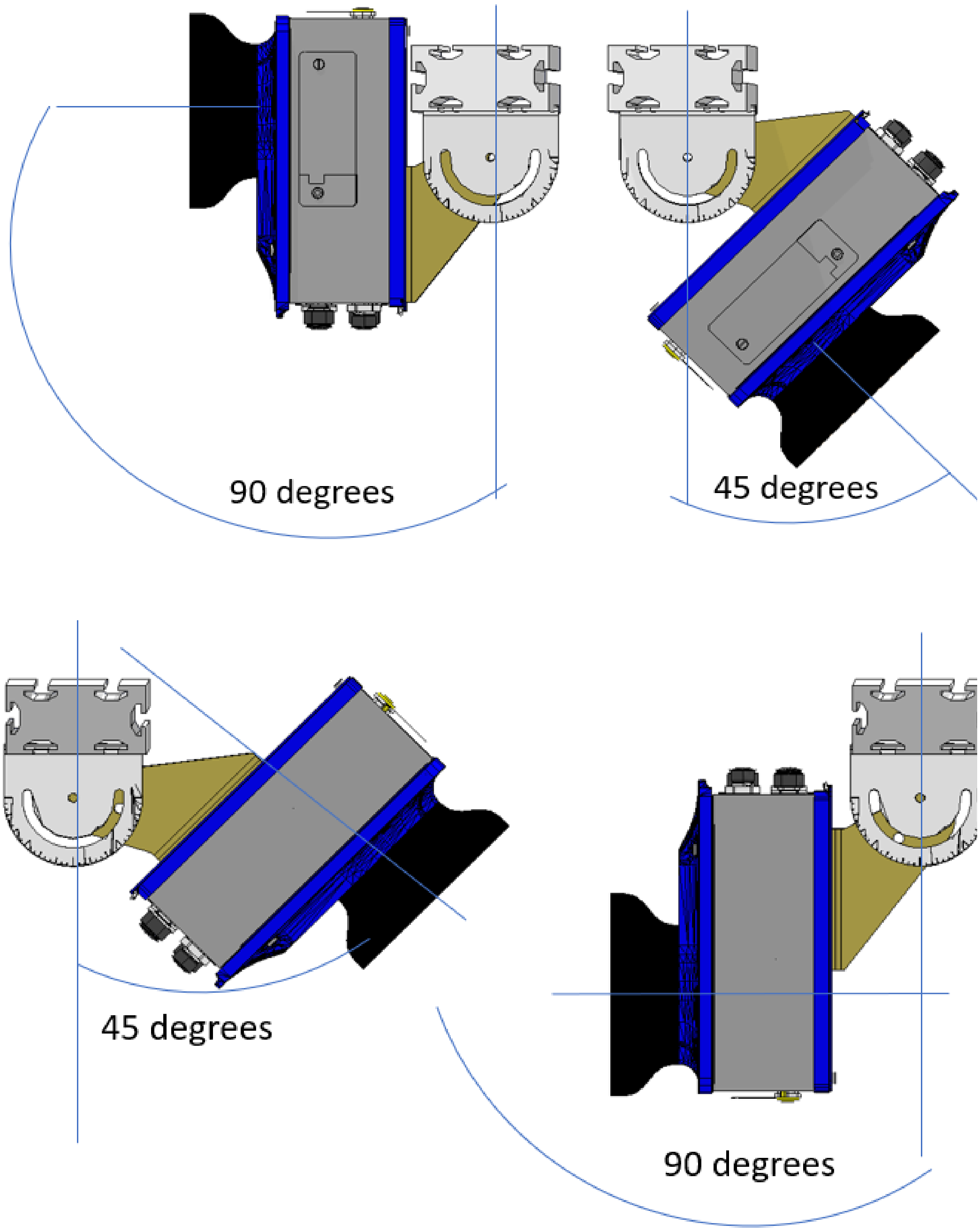
See “Technical Specifications” on page 380.

Mounting and Positioning

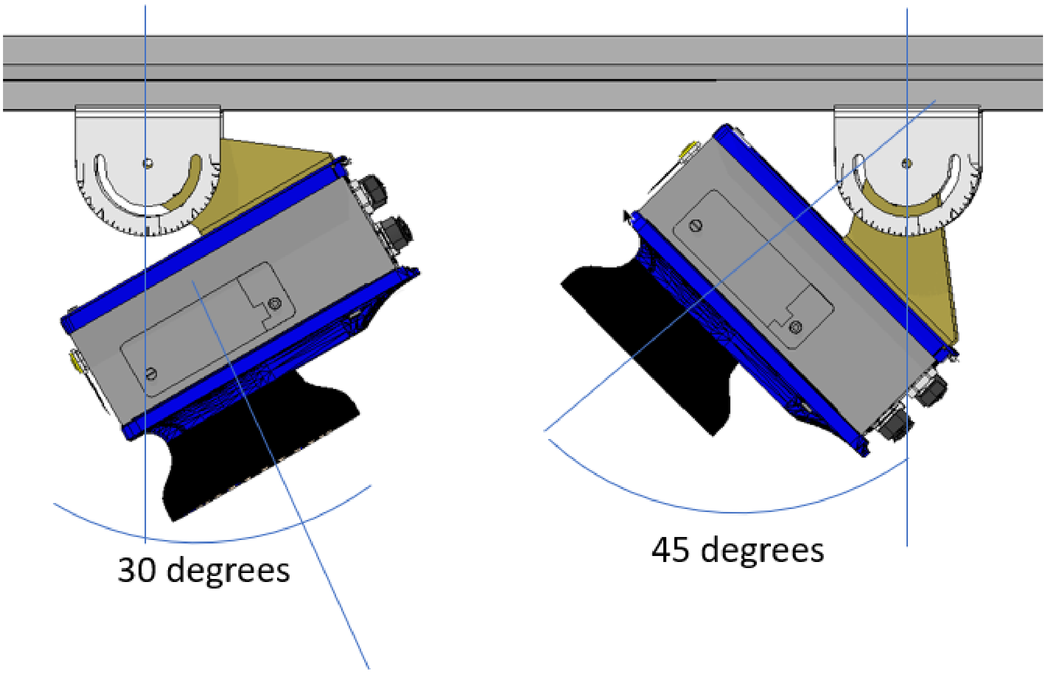
The AV500/AV900 system components and in particular the mounting bracket have been designed for installation onto standard Bosch and 80/20 frame profiles (extruded aluminum) and accessories. 60x60 mm profile is recommended for Bosch, although 45x45 mm profiles will work; and standard 1.5” x 3” for 80/20.

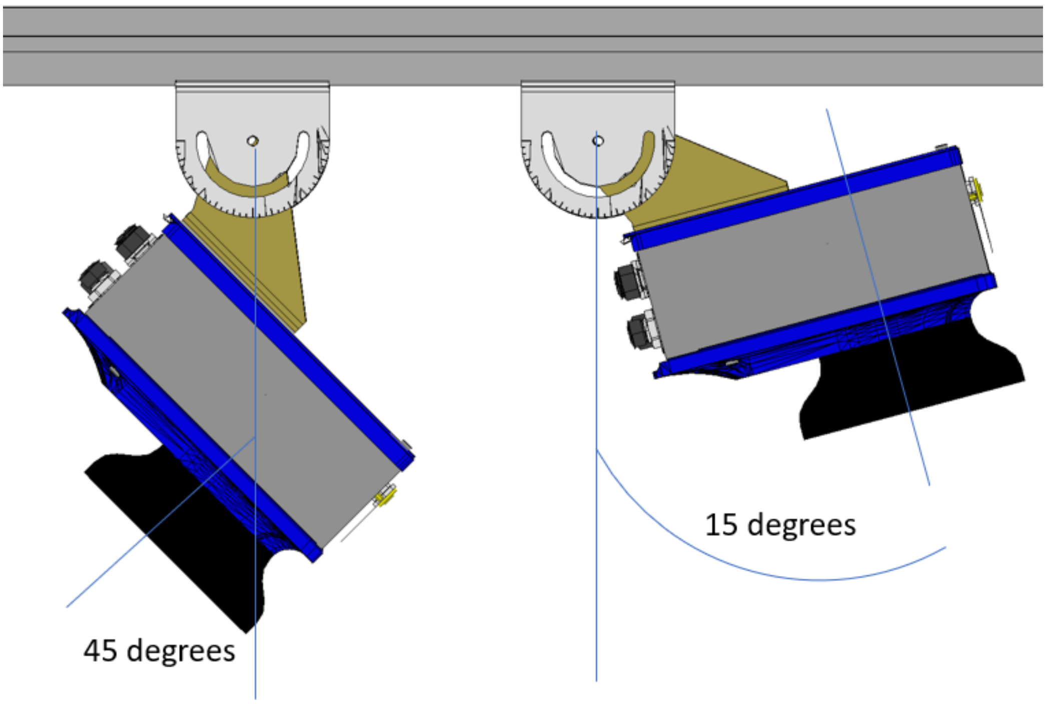
The following illustrations show the various typical mounting positions for the AV500/ AV900.

NOTE: It is important when mounting the camera that the connector panel is facing away from the conveyor so that the wiring does not interfere with product flow.



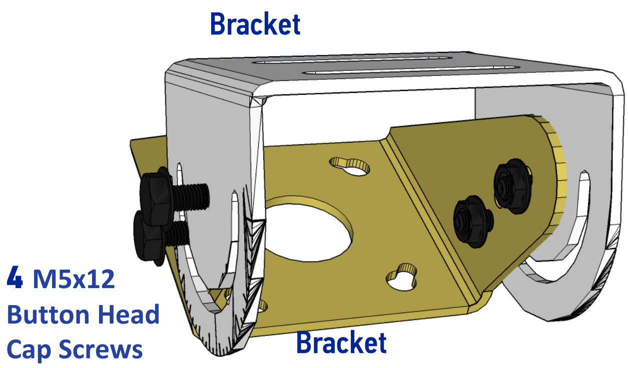
NOTE: Cameras will only be mounted at 90 degrees when used with a mirror.



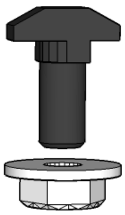


Mounting Sequence:

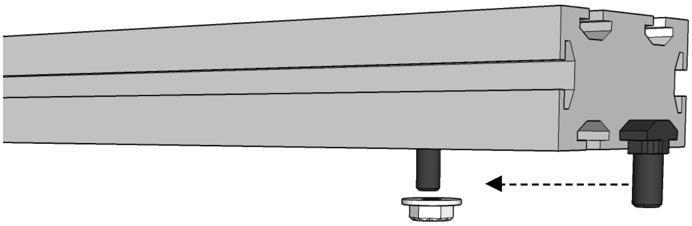
1. The AV500/AV900 mounting bracket has two parts and comes assembled. It is packaged with your camera.



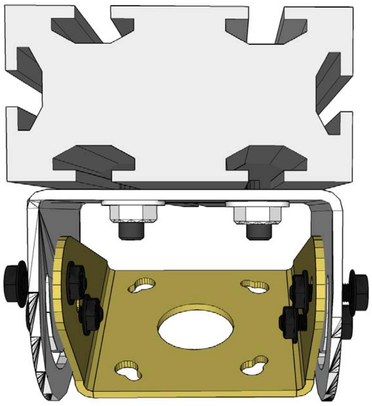
2. In your mounting kit are the required number of T-bolts and nuts used to attached the mounting bracket to the station frame.



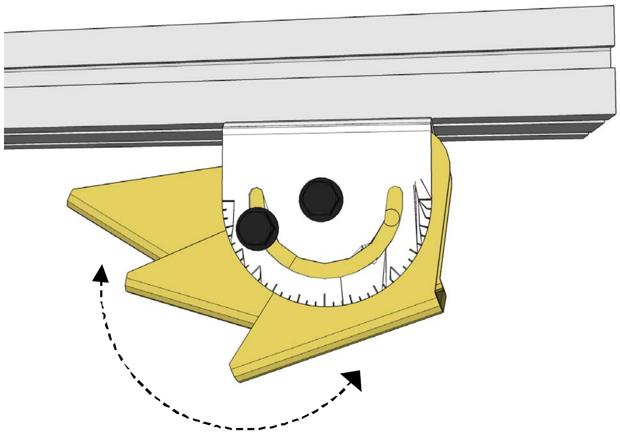
3. Determine where your AV500/AV900 will go on the structure (according to the measurements specified in your customer specific mounting diagram.) Slide the T-bolts into place.



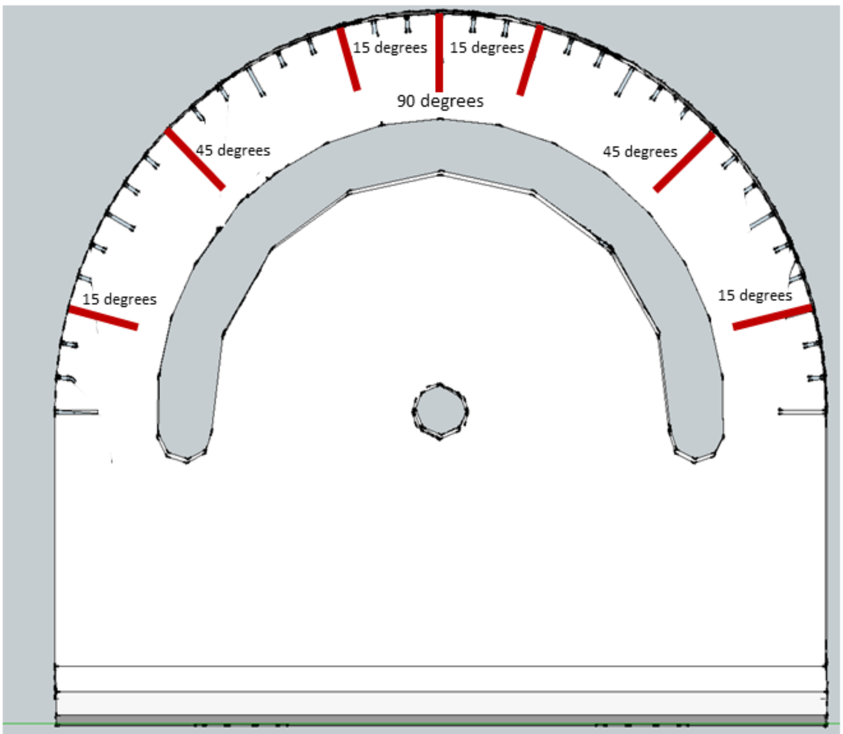
4. Set the AV500/AV900 mounting plate in the correct position and tighten the T-bolt nuts.

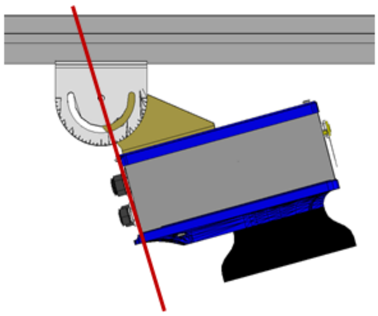


5. Make sure the bolts holding bracket parts together are loose enough to allow you to rotate the bracket.

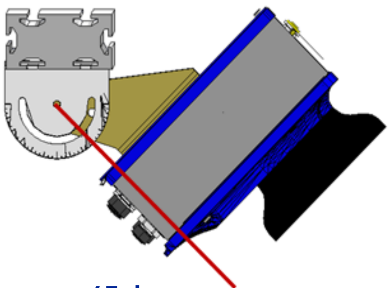


Once the brackets are in the correction position (15, 30, 45 or 90 degrees) tighten the bolts.



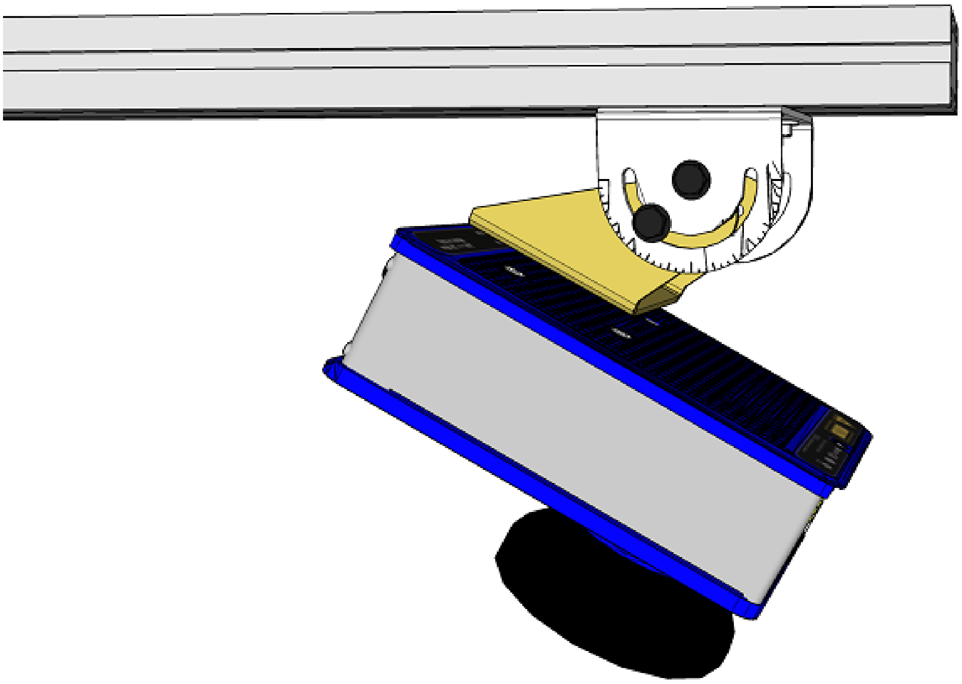


15 degrees



45 degrees

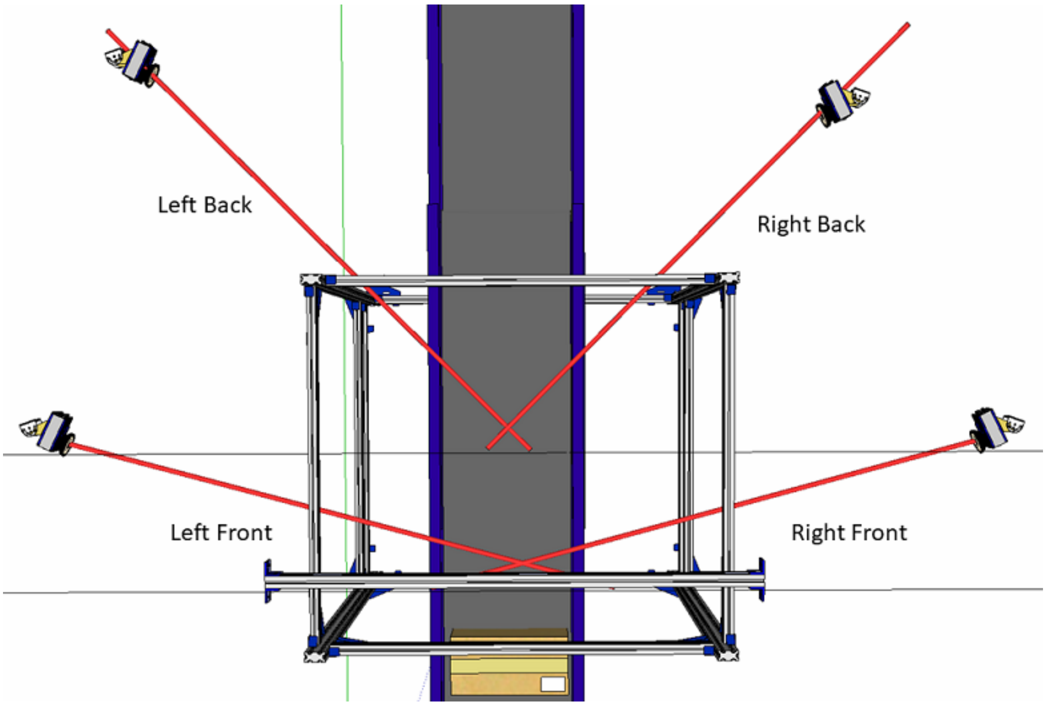
7. Attach the nuts to the back of the AV500/AV900.
8. Attach the camera via the four mounting holes by sliding it into place, then tighten the nuts.



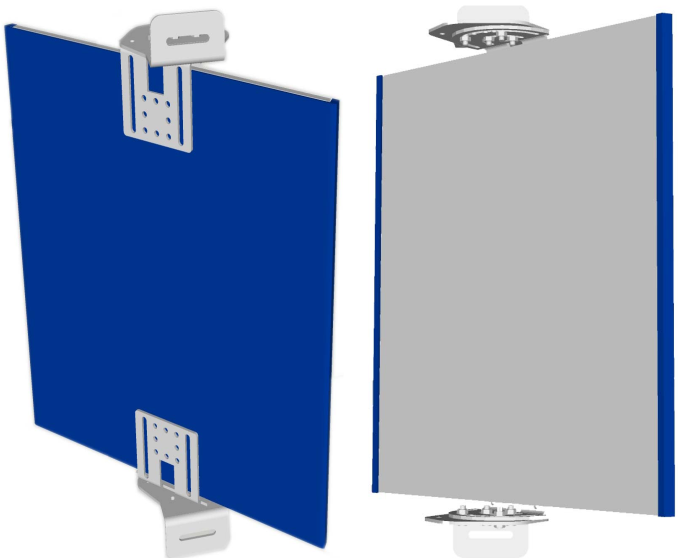
INSTALLING THE DEFLECTION MIRROR

EMK series External Deflection Mirrors are mounted in applications where it is not practical to mount the reader in a position to achieve the full DOF. In these cases a more compact reading station can be constructed using the mirror to fold the camera's view and is particularly useful in side reading applications.

NOTE: The diagram below is for illustration purposes to show how it is not always practical to mount the reader at the necessary distance to achieve the desired DOF and FOV. Refer to your application specific diagrams for more information.



NOTE: For all of the following mounting examples, the positioning distances are not given since they will depend upon the application specific diagrams. Refer to your application specific diagrams for more information.



Deflection Mirror Bracket Angles

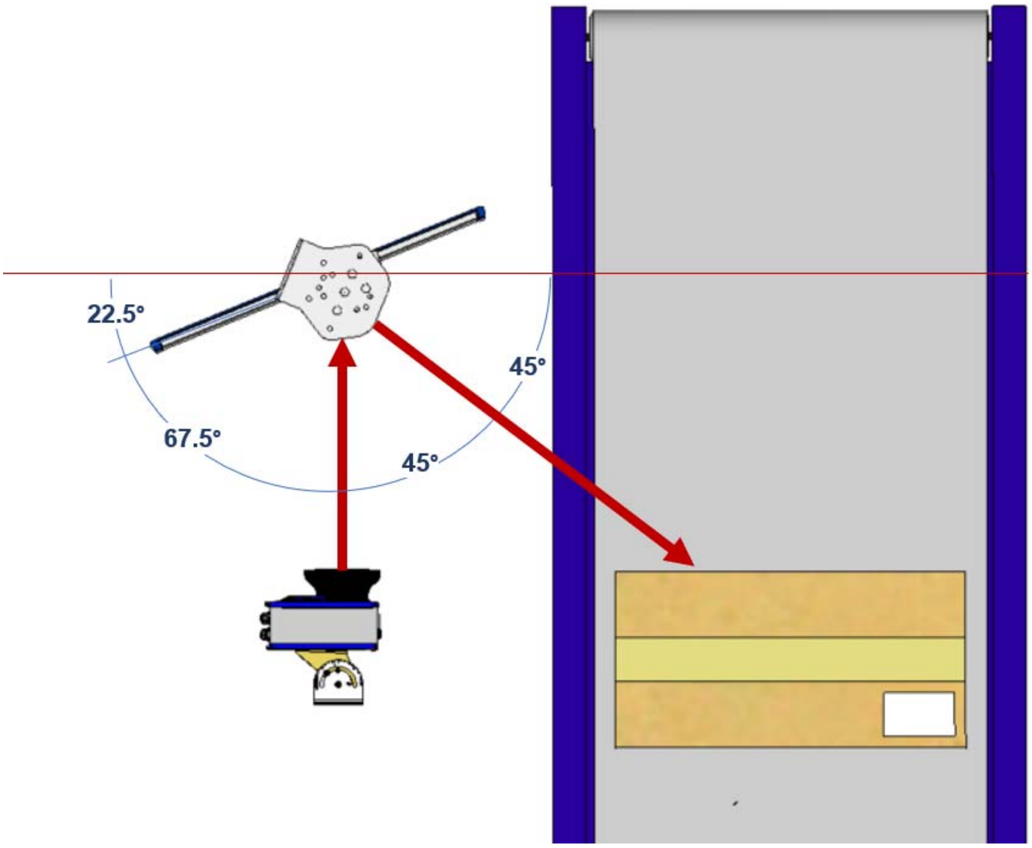
Standard deflection mirror bracket angles are show below. The bolt indicates the locking position between the Main Bracket (blue) and the Rising Bracket (red). The angles specified are reflective angles not the physical angle of the bracket or mirror.

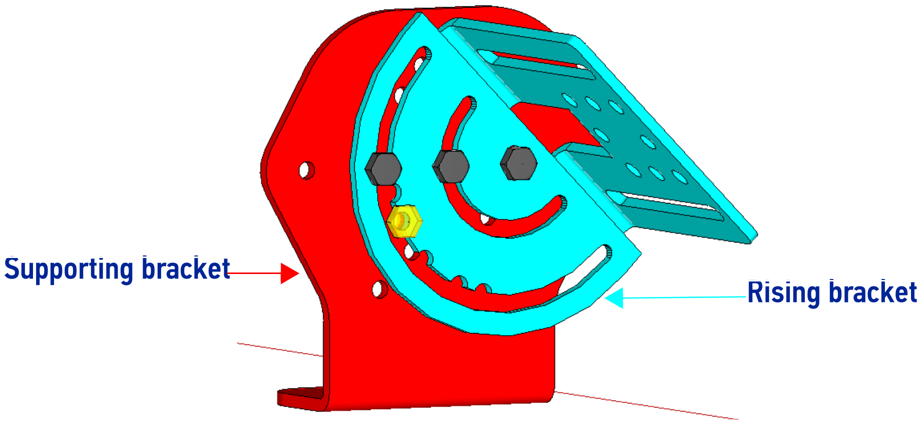
Left Back and Right Back (45 degrees)

WARNING: Do not mount the reader so far from the mirror that the reading area extends outside of the mirror surface.

It is critical that the brackets do not stress or flex the mirror, as this will cause focusing and calibration issues.

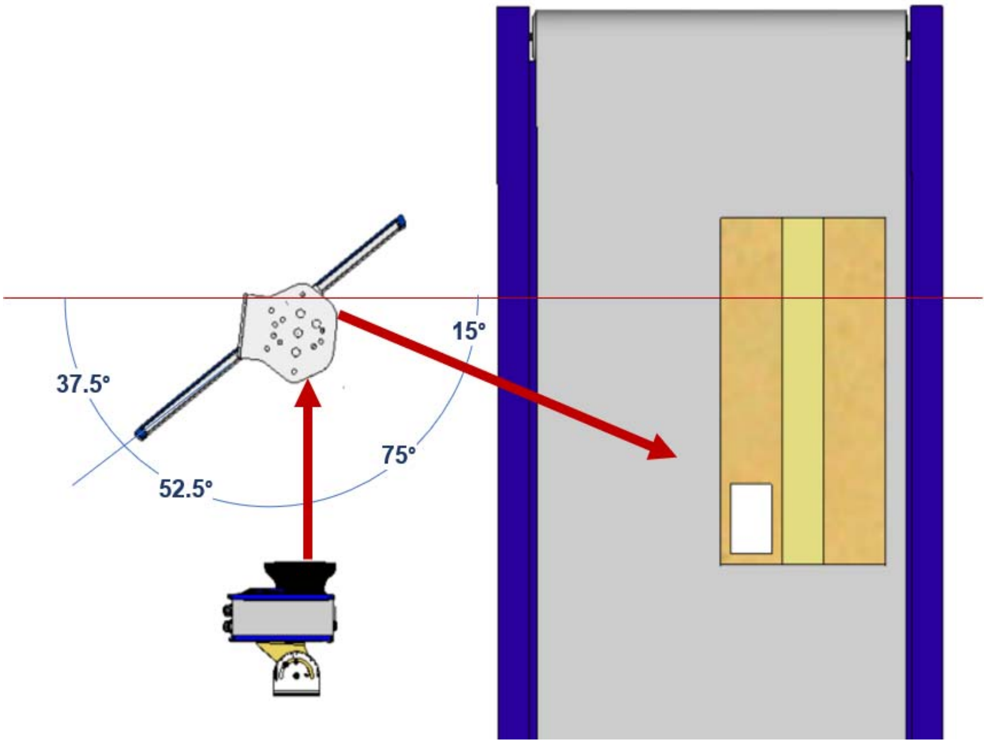
From the parallel position, rotate the mirror 22.5 degrees as shown.

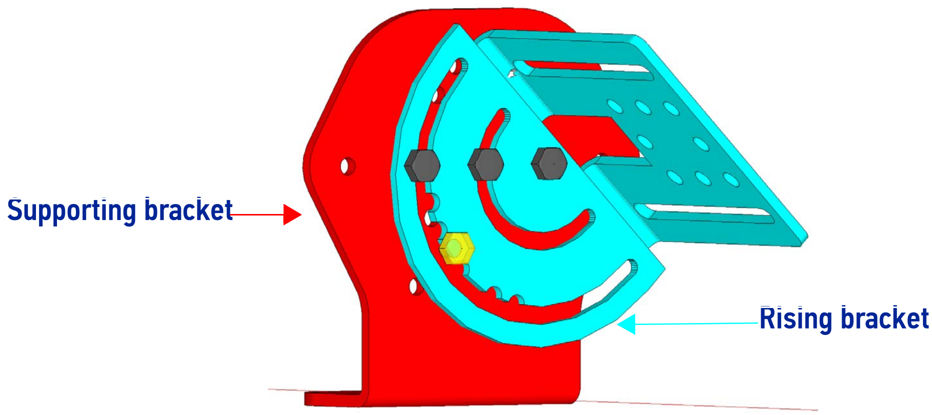




Left Front and Right Front (15 degrees)

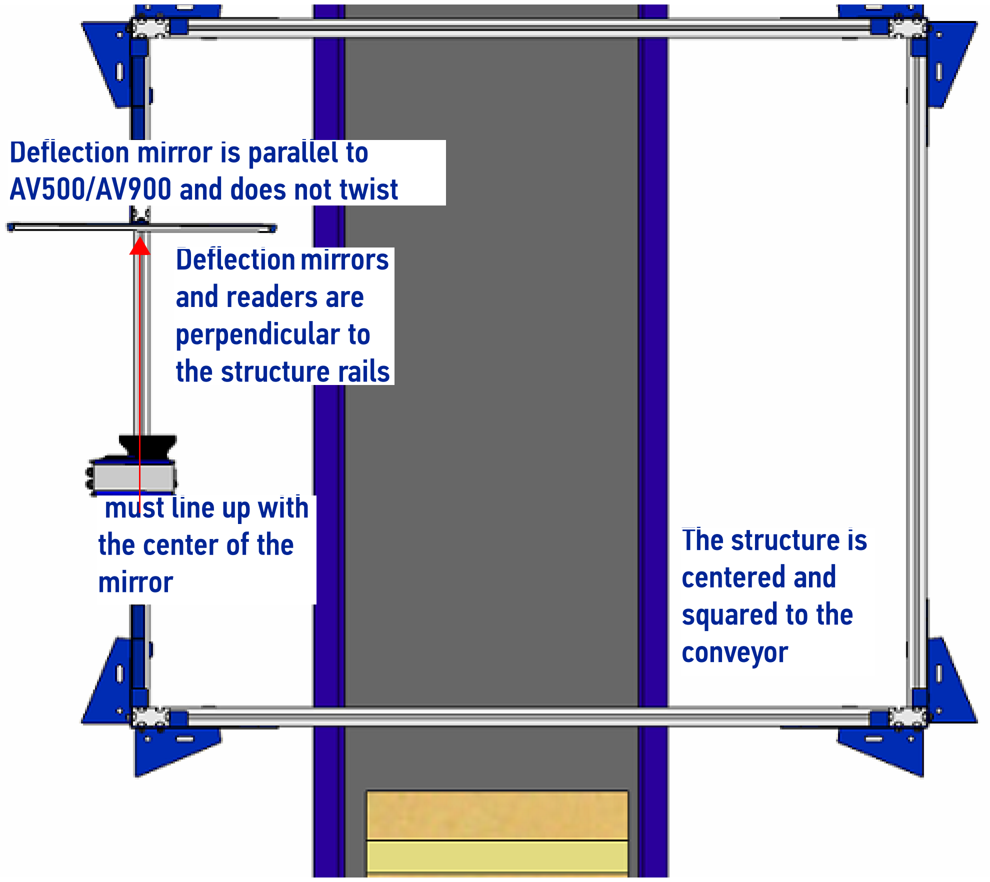
From the parallel position, rotate the mirror 37.5 degrees as shown.





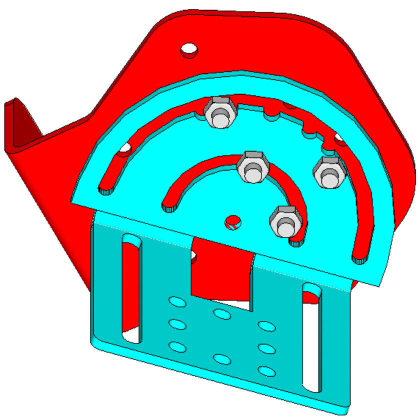
Aligning the AV500/AV900 with Deflection Mirrors

When using deflection mirrors with the AV500/AV900 reader, which is typical, the mirrors must be mounted parallel to the reader and at the correct distance to allow for proper focus and the highest read rate. Reference the system's application drawing for distances.

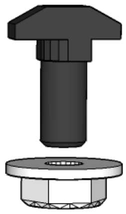


EMK-380 Mounting

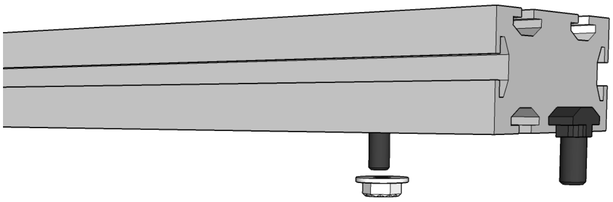
The EMK mirror mounting bracket has two parts and comes assembled, but not set to the proper angle. It is packaged with your EMK mirror. Whether mounting in a top or side position, mount the mirror as follows:



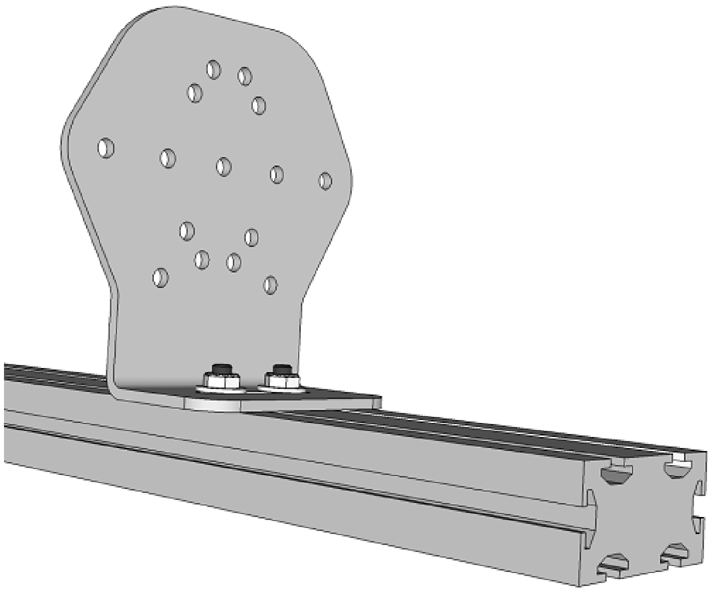
1. Included in your separate mounting kit are T-bolts and nuts. These will be used to attach the bracket to your mounting structure (typically Bosch or 80/20).



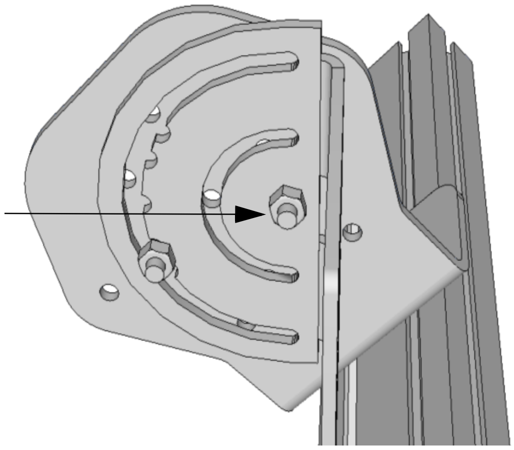
2. Determine where your mirror mounting bracket will go on the structure and slide the T-bolts into place. (2 or 4). Move the mirror assembly to the correct distance from the reader according to your application.



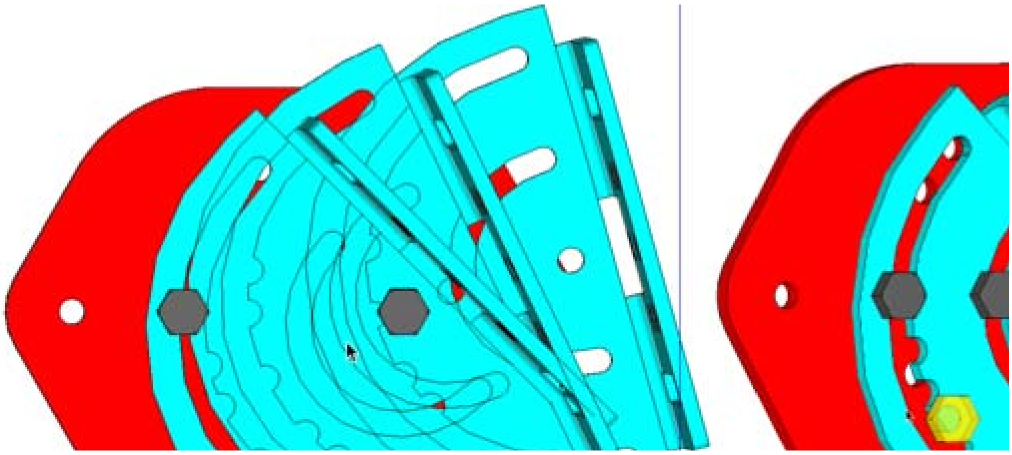
3. Once your bracket is in position, tighten nuts on T-bolts.



4. Mount the mirror rising bracket to the supporting bracket with one bolt in the center position and one bolt in the outer ring.



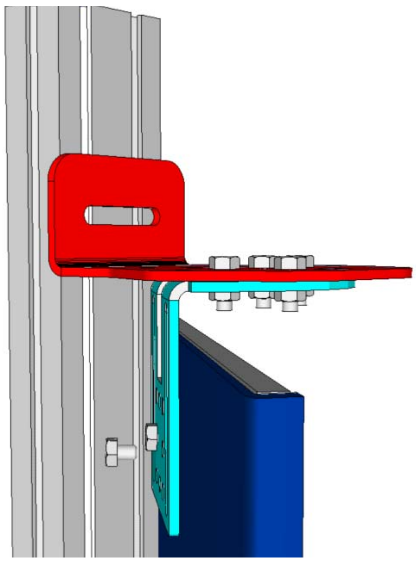
5. Rotate the mirror brackets so that the correct skew angle slot as shown on the bracket (15 or 45 degrees).



6. When in position, tighten center and outer ring nuts and attach two additional bolts and nuts in place and tighten as shown in previous diagrams.

To prevent mirror bowing or flexing, leave enough play with the rising bracket so if top and bottom (or left and right) brackets are not aligned you do not damage the mirror.

7. Now mount the mirror to the bracket.



TRIGGER AND FOCUSING DEVICE MOUNTING

When required, an external device can be used to measure the position of parcels as they enter the field of view of the AV500/AV900 Camera. This information can be used by the camera to determine the correct position for optimal focusing. Proper mounting of these devices is critical to accurately determining the parcel positions. The Datalogic focusing devices may be one of the following:

- AS1AreaScan
- DK503 - S-85 Position Sensor Kit
- DM3610 Dimensioner
- LCC 75XX Light Curtain
- S-60 Photocell

Follow the instructions for correct mounting and positioning of the focusing devices found in each devices reference manual.

Software setup of these devices is explained in “Trigger, Positioning and Focusing Device Setup” on page 325.

CHAPTER 3
ELECTRICAL INSTALLATION

WARNING: Electrical Installation must be performed by Qualified Service Technicians Only! Procedures may involve exposure to high-voltage. A trained and authorized technician must perform these procedures. Do not attempt to perform any electrical installation procedures unless you are a trained technician.

NOTE: The AV500/AV900 contain electronics that may be affected by electrostatic discharge (ESD). To prevent personal injury or damage to the unit, please follow the safety precautions and warnings found in the References section at the beginning of this manual. Failure to follow these precautions may void your warranty.

PREPARING FOR ELECTRICAL INSTALLATION

Before mounting any components, please do the following:

- Read all instructions before beginning your installation.
- Observe all electrical safety requirements discussed in the Introduction to this manual.
- Define and confirm the accuracy of your application's requirements.
- Review all installation-specific drawings.
- Review and plan the power requirements for your application.
- Review and plan the communications requirements for your application.

WARNING: The content of this manual may be superseded by any customer-specific documentation provided by Datalogic. Before proceeding with any installation procedures, be sure to review ALL documentation, especially content that contains details specific to your installation.

NOTE: Everything should be MECHANICALLY INSTALLED before performing any ELECTRICAL INSTALLATION. See Chapter 2 for mechanical installation details.

Most AV500/AV900 applications are shipped with the CBX connection box and all the necessary cabling required to electrically install the system. If your system requires custom-length cables or other special wiring, documentation specific to these requirements has been provided in your shipment. This special documentation supersedes any contradictory content in this manual.

To reduce the possibility of damage to the unit, check all cabling between the AV500/AV900 camera and other devices for accuracy.

CONNECTING AN AV500/AV900 CAMERA

To install a camera, follow this sequence:

1. Complete mechanical installation *(See "Mechanical Installation" on page 25.)*
2. Complete electrical installation.
3. Observe all electrical safety requirements outlined in this chapter.
4. Ground the mounting structure to protective earth (PE) ground.
5. If used, wire the photoelectric sensor (or other trigger).
6. Wire the tachometer to the CBX connection box, (*see "Encoder/Tachometer Wiring to CBX510" on page 54).*
7. Connect the M12 end of the Ethernet cable to the camera's HOST NET port.
8. Connect to Ethernet device.
9. Connect the AV500/AV900 to its power supply.

WARNING: To turn off your camera, use a power switch or box. Do not disconnect the 5 pin power connection from the unit.

If you attach the power supply to the AV500/AV900 and it is already attached to power, it may cause the AV500/AV900 to not boot correctly. Recycle power by unplugging the AC cord from the power supply and plugging it back in.

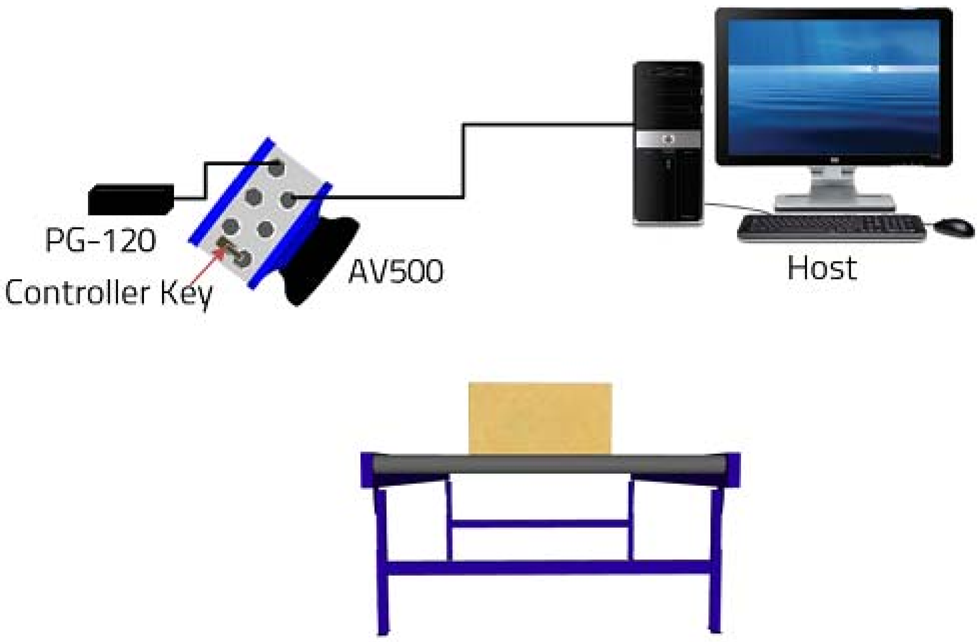
10. Connect the sync cables if multiple cameras are used.
11. Connect the power supply to the power source.
12. Setup / check camera operations *(See "Trigger, Positioning and Focusing Device Setup" on page 325.)*

WARNING: M12 connectors MUST be terminated with a cable or a protective cap in order to maintain IP65 standard

TYPICAL CONNECTION BLOCK DIAGRAMS

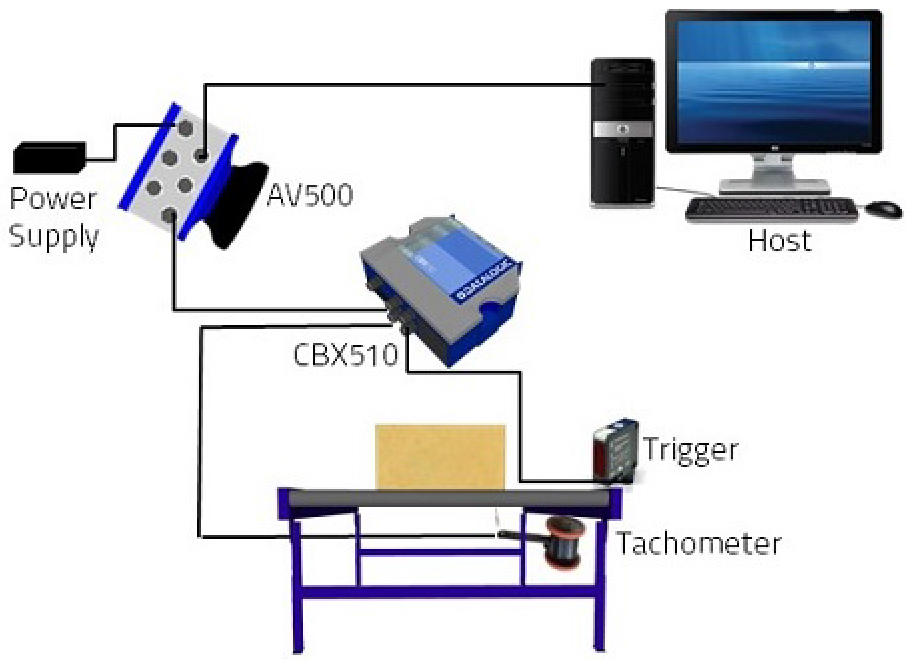
See “Standard Interconnection Diagrams” on page 417 for more details.

Single Head Stand Alone AV500/AV900



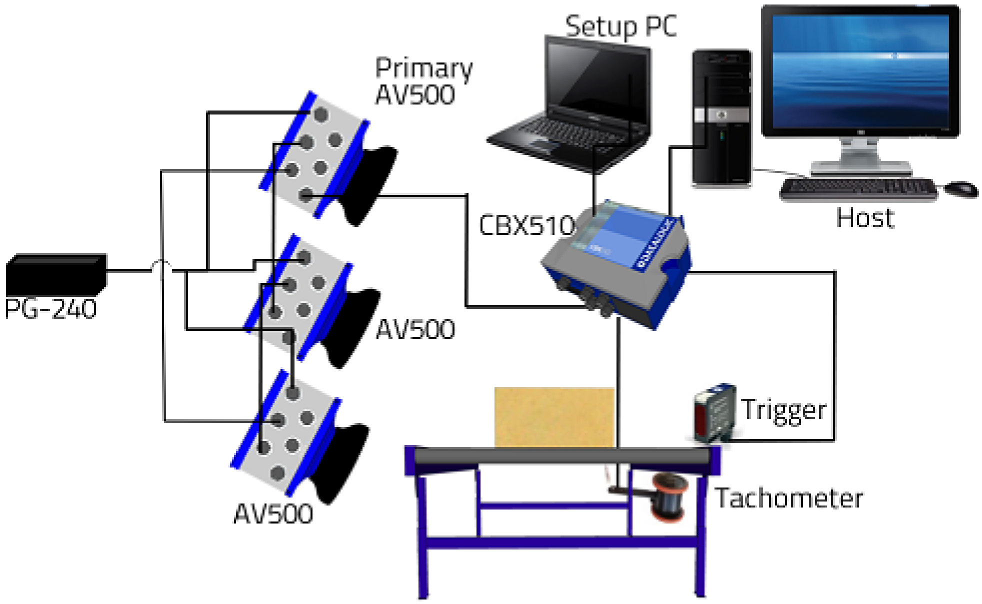
NOTE: A Controller Key must be connected to I/O port.

Single Head AV500/AV900 with Tachometer and Photoeye



Multiple Cameras Connected via SyncNet in Primary/Secondary Controller Configuration

NOTE: SyncNet is used in large tunnels where you must have a completed loop. Cables should be as short as possible for proper communication.



GENERAL ELECTRICAL INSTALLATION GUIDELINES

It is important that you follow these general precautions when installing, setting up, operating, maintaining, troubleshooting or replacing any Datalogic products, parts or related equipment.

As you plan and install your barcode reader(s), be sure to keep the following guidelines in mind:

- Determine the camera is in the proper location as outlined in Chapter 2.
- Leave adequate clearances (approximately 300mm [12 in]) for wiring.
- Route wires carefully to reduce or minimize electrical noise.
- When extraneous power and communication wiring must cross, make their intersection perpendicular. Avoid running power and data wiring parallel to each other. If possible, maintain one of the following separations between the power and data wiring:
- 300 mm [12 in] gap
- Use conduit and 25 mm [1 in] gap

WARNING: When planning your installation wiring, remember all power connections must be quick-disconnect. For PERMANENTLY CONNECTED EQUIPMENT a readily accessible disconnect device must be incorporated in the building installation wiring. For PLUGGABLE EQUIPMENT the socket-outlet must be installed near the equipment and must be easily accessible.

To assure no ESD damage will occur, be sure to observe the precautions outlined in the Introduction to this manual.

Ground the mounting structure to safety ground (protective earth ground (PE)). See section "Grounding" on page 74 for wiring recommendations for safety ground.

CONNECTOR PANEL

WARNING: M12 connectors MUST be terminated with a cable or a protective cap in order to maintain IP65 standard

After completing mechanical installation, use this section to properly wire your cameras for optimal performance in your application. AV500/AV900 wiring connections are made to the connector panel and through the CBX connection box (via the AV500/AV900 I/O port). In most applications, the cable connections to the barcode reader will include:

1. **HOST NET** – Barcode data to Host
2. **IMAGE NET** – Configuration, Remote Monitor application or image export
3. **POWER** – Power connected to AV500/AV900 power connector
4. **I/O** – Provides connection to CBX Connection Box
5. **SYNC OUT** – AV500/AV900 internal data, device network
6. **SYNC IN** – AV500/AV900 internal data, device network

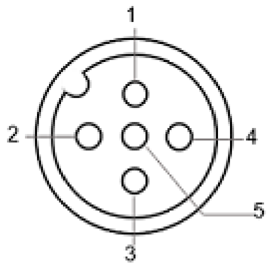
Route wiring from the barcode reader's connector panel through the wiring channels (if available) on the Datalogic mounting structure when interconnecting cables to other devices.

CONNECTING A PC TO THE AV500/AV900

During initial setup, a PC (laptop) may be connected to the AV500/AV900 with an RJ45 cable. Connect an Ethernet cable from the **HOST NET** or **IMAGE NET** port of the AV500/AV900 to the Ethernet port of your PC. For information on connecting to e-Genius, *see "E-Genius Basics" on page 80.*

POWER CONNECTOR PIN-OUT TABLE (CUSTOM POWER SUPPLY)

A recommended power supply and cabling is available for the AV500/AV900 Camera. However, if your installation requires custom power supply wiring, the pin-outs of the AV500/AV900 camera power connector are provided below.

<table>
<tr><td>24 - 2.5A MAX</td><td colspan="2">POWER INPUT</td></tr>
<tr><td>5 PIN M12 Type Male</td><td colspan="2">Unit Connector (shown)</td></tr>
<tr><td rowspan="7">
</td><td colspan="2">5 PIN M12 Type Male</td></tr>
<tr><td>Pin</td><td>Function</td></tr>
<tr><td>1</td><td>+24 VDC</td></tr>
<tr><td>2</td><td>+24 VDC</td></tr>
<tr><td>3</td><td>dc return</td></tr>
<tr><td>4</td><td>dc return</td></tr>
<tr><td>5</td><td>Protective Earth Chassis</td></tr>
</table>

NOTE: When using an AV500/AV900 camera, no power supply is required for the CBX510 connection box. All power and some communication options are fed to the CBX510 through the scanner's 17-pin I/O connector to the CBX510 25-pin connector using the cable provided.

In cases where the AS-I cabling is not used, the alternative CAB-LP-05 cable can be used to connect the power supply to the scanner. Connect the Brown/White pair to +24 Vdc and the Blue/Black pair to dc return.

SELECTING THE CORRECT CBX CONNECTION BOX FOR YOUR APPLICATION

As shown in section **"Standard Interconnection Diagrams" on page 417**, typical applications require a single CBX connection box to connect the trigger and encoder inputs to the master camera. The camera sources power to these devices. Other possible CBX connections are for digital outputs or a serial host.

- **CBX100** - used for slave cameras (and as an alternative for master cameras). It provides general access to digital input/output signals.
- **CBX510** - used for typical standalone or master cameras (cannot be used for slave cameras). It provides general access to digital input/output signals. It doesn't require special jumpers to set operation or power sourcing.
- **CBX800** - used for Fieldbus communication between standalone or master cameras and a Host. Various Fieldbus modules can be installed in the CBX800. The master camera communicates through its main serial interface to the CBX800 which must be programmed for the specific Fieldbus communication to the Host. It also provides general access to digital input/output signals.The table below indicates the available options for each recommended CBX Connection Box.

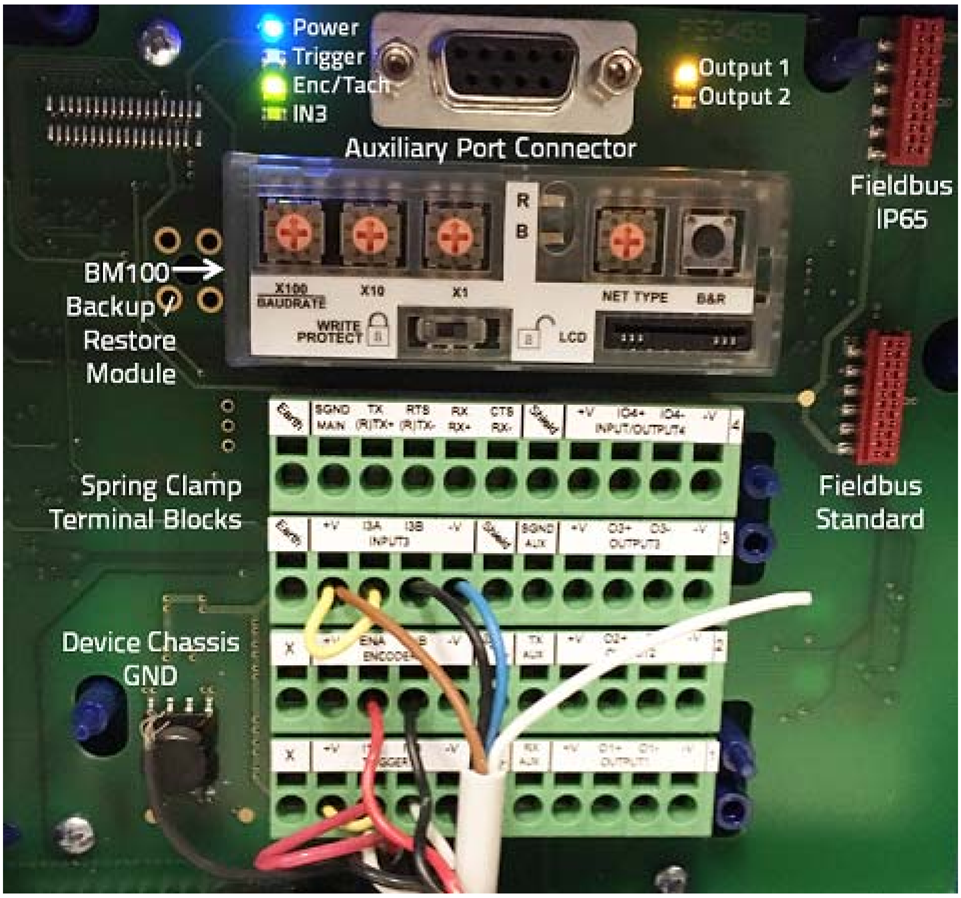
	OPTIONS						
DEVICE	Tach Input	Trigger Input	General Purpose Input	General Purpose Output 1	General Purpose Output 2	Works as Slave	Works as Master
CBX100	X	X		X	X	X *	w/ jumper (Ref to ID+)
CBX510	X	X	X	X	X		X
CBX800	X	X	X	X	X	X	w/ jumper (Ref to ID+)

* When working with a slave the jumper is not installed.

WARNING: Although multiple AV500/AV900 cameras can have a CBX box, only one of the CBX boxes in the system can have the Jumper to make it the Master.

CBX510 CONNECTION BOX

Complete installation information for the connection box is available in the ***CBX510 Installation Manual*** available at www.datalogic.com. The interior of the box is shown below.



WARNING: If you are terminating more than one wire in a single terminal, cut off any tinned ends and twist the wires together before inserting them into the terminal.

Sync In/Sync Out

If connecting several cameras together, they must be connected via the Sync In and Sync Out ports.

NOTE: Syncnet in large AV tunnels must have a completed loop. Sync cables must be kept as short as possible. Failure to follow these guidelines may cause tachometer errors in the tunnel.

Host Net/Image Net

During initial setup, a PC (laptop) may be connected to the AV500/AV900 with an M12 cable. Connect an Ethernet cable from the **HOST NET** or **IMAGE NET** port of the AV500/AV900 to the Ethernet port of your PC. For information on connecting to e-Genius, *see Chapter 4.*

NOTE: The default IP Address for Host Net and Image Net are as follows:

Host Net: 192.168.3.10

Image Net: 10.0.40.20

Photoelectric Sensor Connections to CBX510

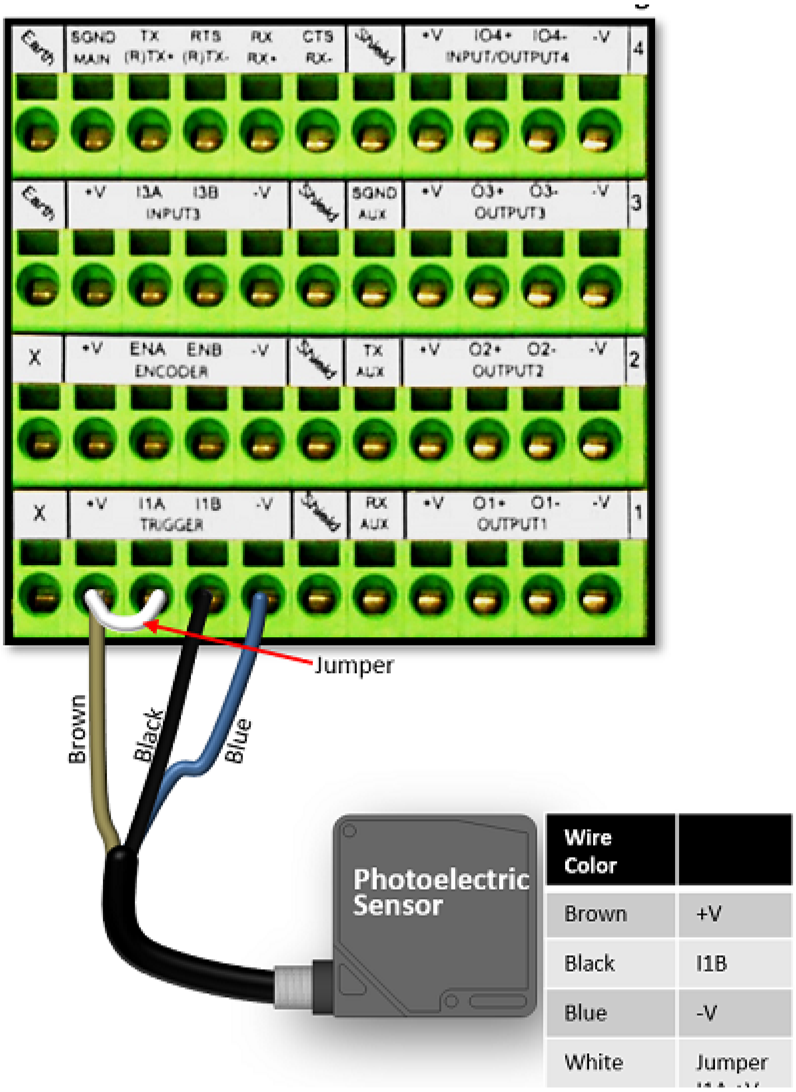
Barcode scanning applications may use a Datalogic photoelectric sensor as a trigger device. The photoelectric sensor is wired directly into the CBX510 terminal block.

If your application uses a trigger other than the one specified by Datalogic, follow the appropriate wiring diagram to assure proper wiring.

NOTE: To confirm the photoelectric sensor is functioning properly, watch the TRIGGER LED first in the CBX and then on the camera while the photoelectric sensor's beam is blocked. The Datalogic photoelectric sensor also includes a status LED.

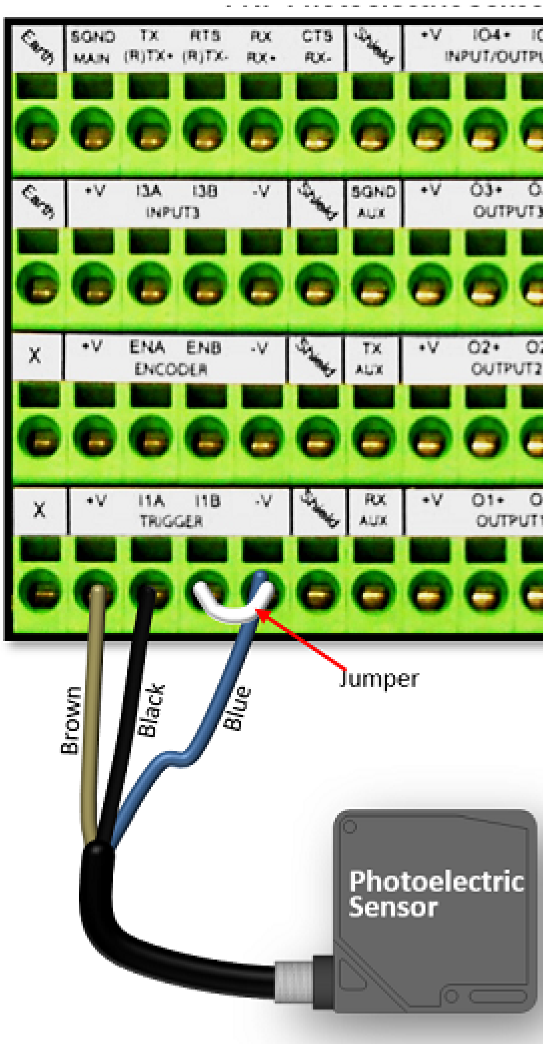
The following diagrams illustrate standard recommended wiring of the Photoelectric Sensor to the CBX510 terminal block.

Photoelectric Sensor to CBX510 (NPN)



Wire Color	
Brown	+V
Black	I1B
Blue	-V
White	Jumper

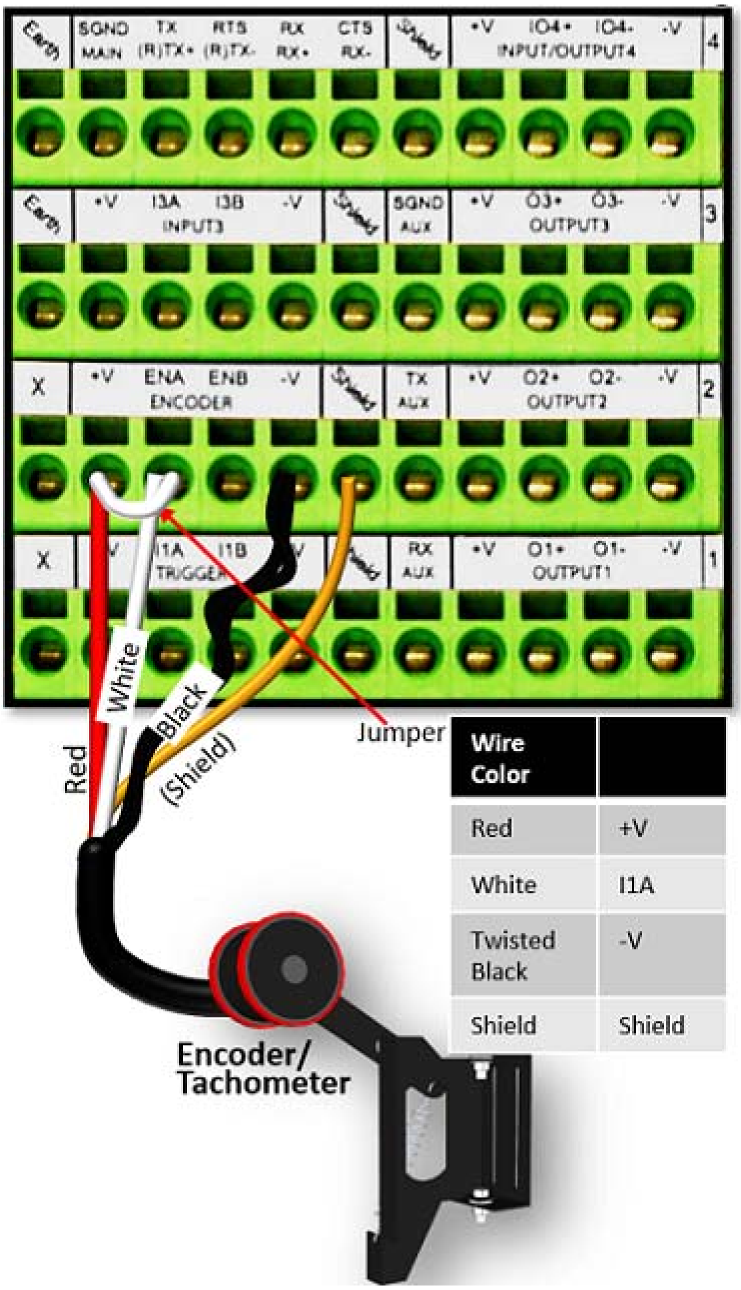
Photoelectric Sensor to CBX510 (PNP)



Wire Color	
Brown	+V
Black	I1A
Blue	-V
White	Jumper I1B -V

Encoder/Tachometer Wiring to CBX510

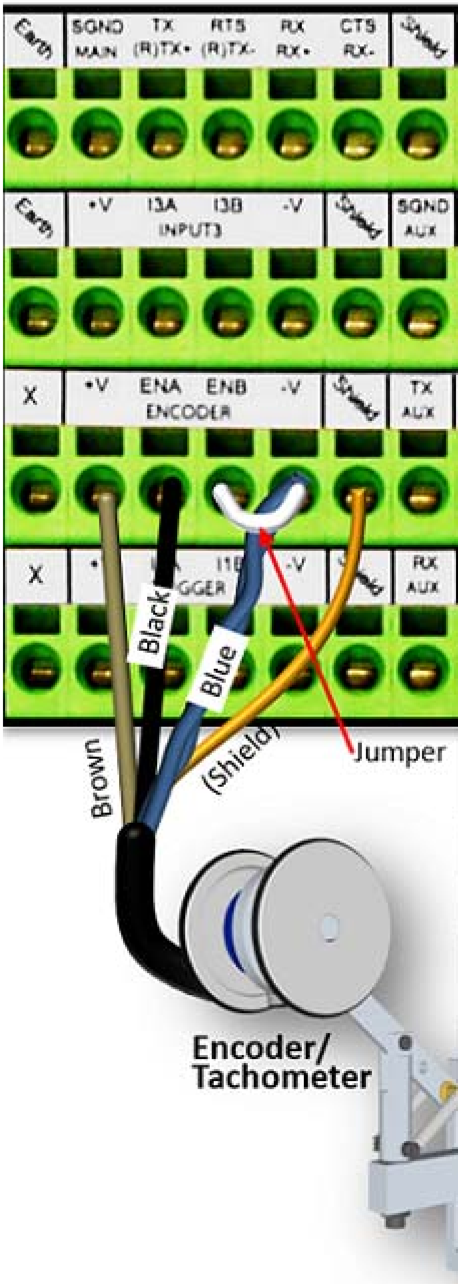
Encoder/Tachometer Wiring for NPN Output to CBX510



Wire Color	
Red	+V
White	I1A
Twisted Black	-V
Shield	Shield

DATALOGIC

Encoder/Tachometer Wiring for PNP Output to CBX510

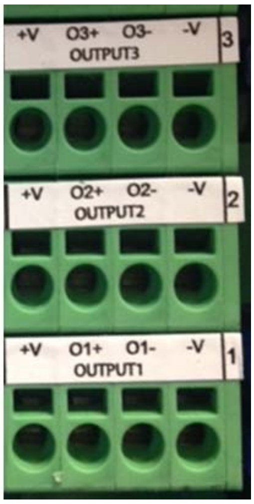


Wire Color	
Brown	+V
Black	I1A
Twisted Blue	I1B
Shield	Shield

Digital Output Configuration from CBX510

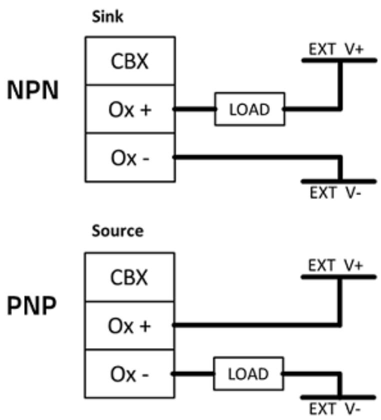
The CBX510 includes an OUTPUT block for wiring relays as needed for external accessories.

Outputs 1 – 3
Maximum Voltage 30V
Collector Current (pulse) 130 mA Max.
Collector Current (continuous) 40 mA Max.
Saturation Voltage (VCE) 1 V at 10 mA Max.
Max. Power Dissipation 90 mW at 50 degrees C
Ambient Temperature.



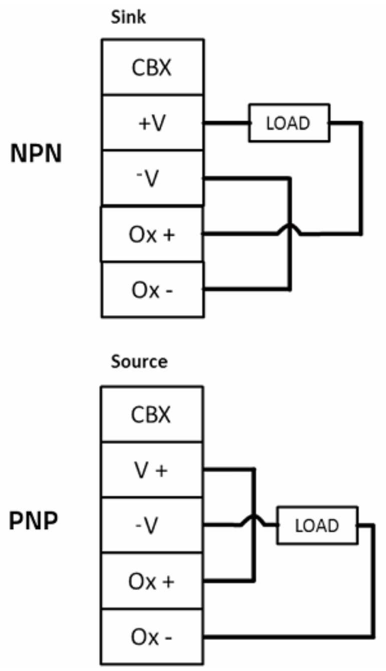
Schematics for Isolated and Non-Isolated digital outputs are provided below.

Unpowered Outputs



DATALOGIC

Powered Outputs



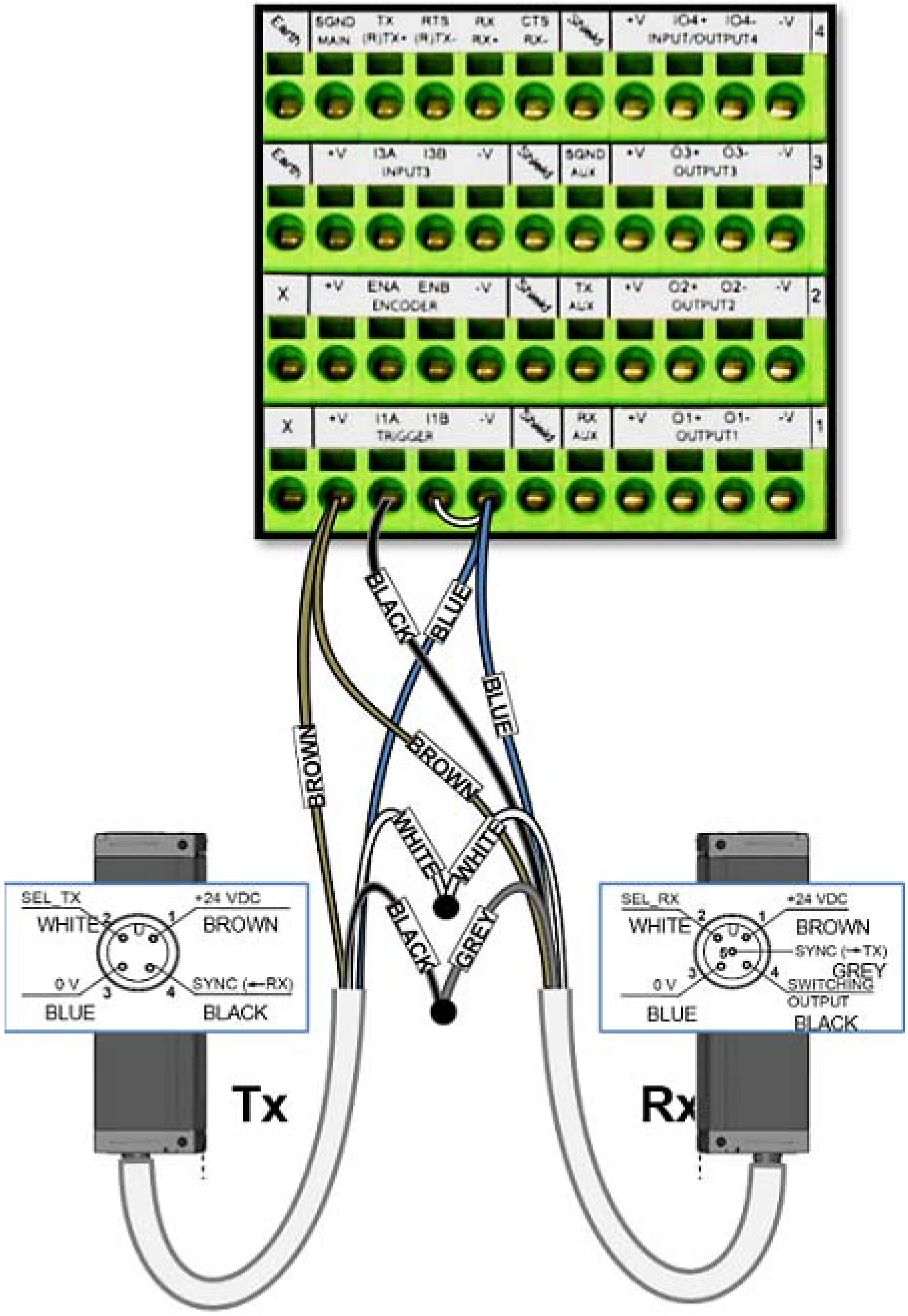
TRIGGER AND FOCUSING DEVICE WIRING

An external device can be used to measure the position of parcels as they enter the Field of view of the AV500/AV900 Camera. This information is used by the camera to determine the correct position for optimal focusing. The Datalogic focusing devices may be one of the following:

- AS1
- DK503 - S-85 Position Sensor Kit
- LCC 75XX Light Curtain
- DM3610 Dimensioner

ASI

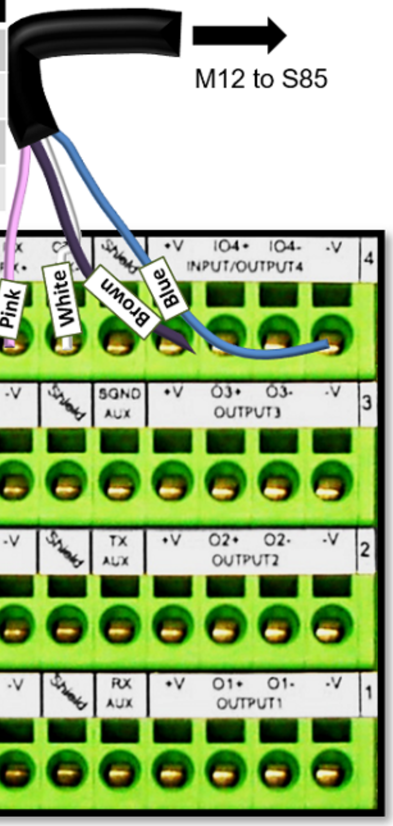
When using an AS1 for focusing, the AS1 must be wired to the CBX510 connected to the AV500/AV900 using a flying lead to M12 cable (FOCUS CONTROL 5MT CABLE (M12-FREE WIRES) 93A201203.)



DK503 - S-85 Position Sensor

When using the S-85 for focusing, it must be wired to the CBX510 connected to the AV500/AV900 using the cable included in the kit (95ACC1620).

Wire Color	
Brown	+V
Pink	RX+
Blue	-V
White	RX-

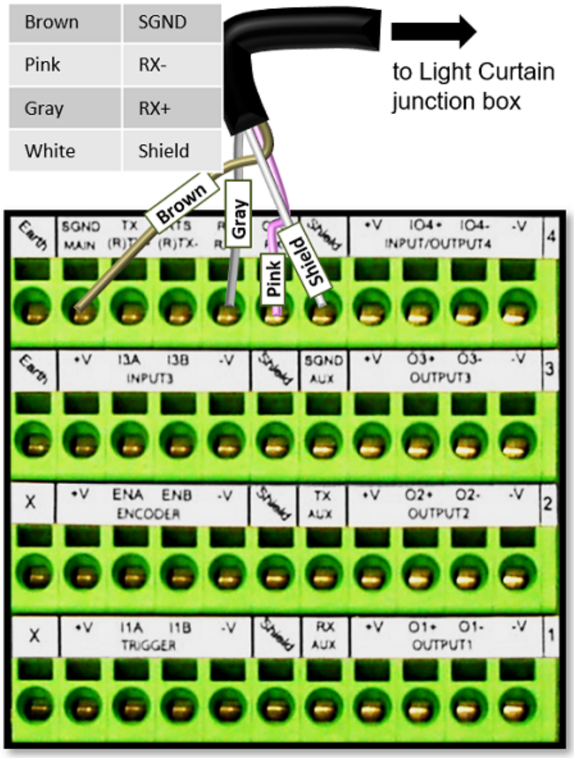


DATALOGIC

LCC 75XX Light Curtain

When using the Datalogic Light Curtain for focusing, it must be wired to the CBX510 connected to the AV500/AV900 using the M12 cable that is part of the cable assembly in the kit. (FOCUS CONTROL SMT CABLE) (93A201203). Cut off the M12 5-pin B-code connector and strip back the wires to go into the CBX box as follows:

Wire Color	
Brown	SGND
Pink	RX-
Gray	RX+
White	Shield



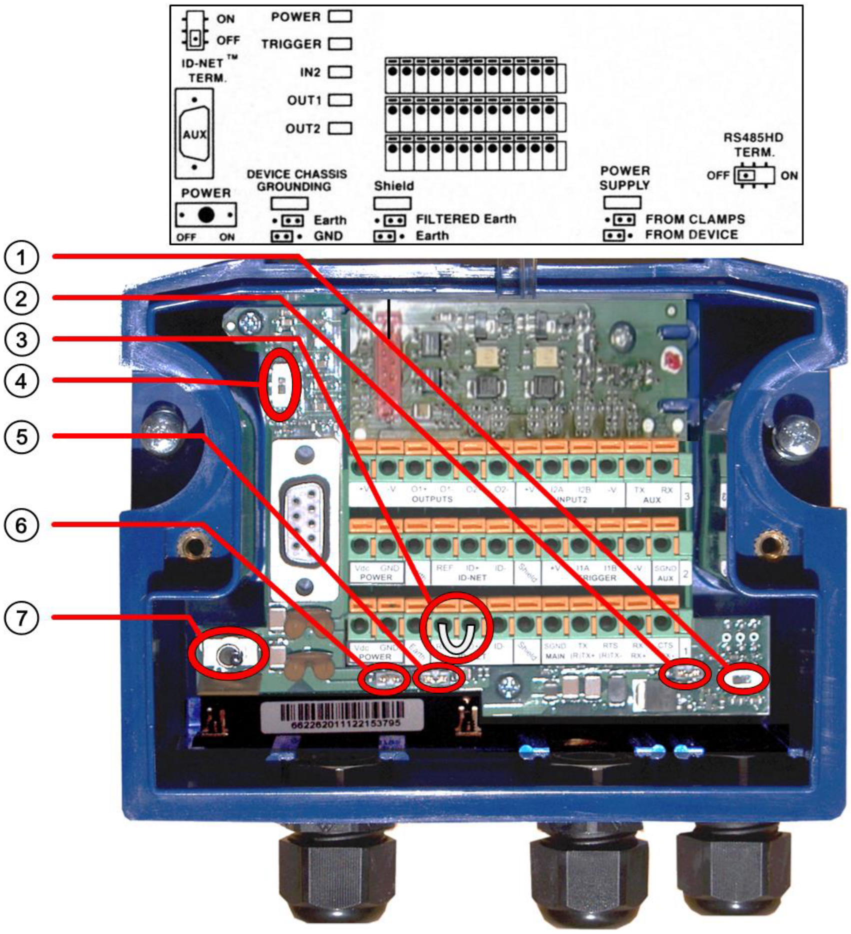
Wiring from DM3610 CBX to AV500/AV900 CBX

When using a DM3610 dimensioner for focusing, the DM3610's CBX box must be wired to the CBX box connected to the camera. Since each of the different CBX boxes may be used, we will just show the connections necessary as follows:

DM3610 CBX Serial Port	CBX Serial Port
TX+	TX+
TX-	TX-
RX+	RX+
RX-	RX-

CBX100

Please verify that the CBX100 connection box is configured for the AV500/AV900 application as follows:



Reference the image and diagram above:

1. Set RS422HD TERM switch to OFF.
2. Set POWER SUPPLY jumper to FROM DEVICE.
3. Insert jumper wire in pin block from REF to ID+ (one jumper in either block is sufficient).

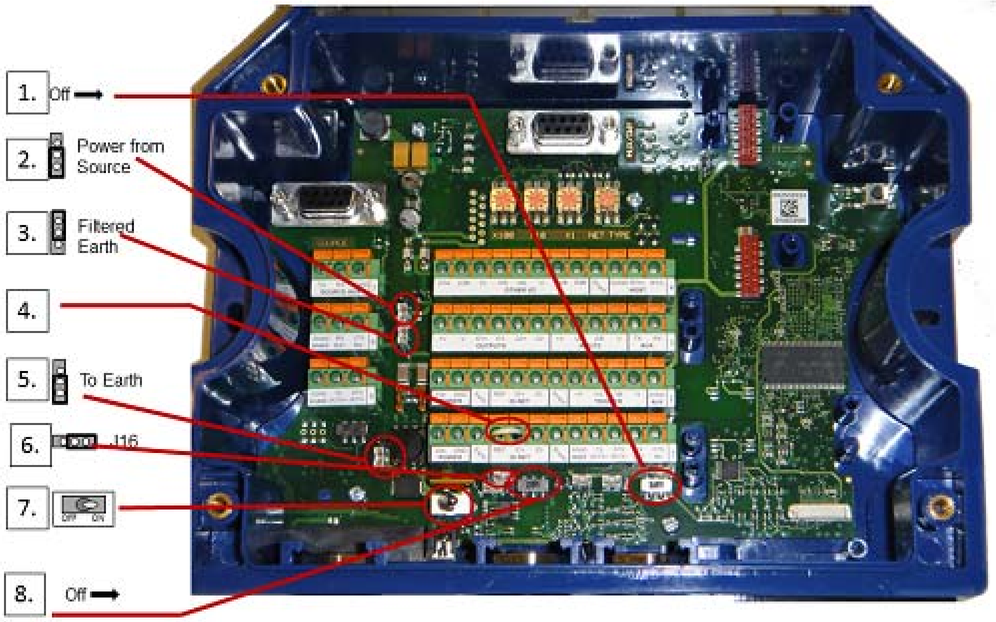
NOTE: In order for a standalone or Master AV500/AV900 to initialize properly, it must be connected to a CBX100. On power-up the AV500/AV900 looks for the jumper (item number 3 in the image above) and will assume the responsibility of the provided SYNC Network IP addresses. Slave units in an array/tunnel will receive their SYNC Network IP addresses from the Master.

WARNING: Although multiple AV500/AV900 cameras can have a CBX box, only one of the CBX boxes in a multi-camera system can have the jumper to make it the Master.

4. Set ID-NET TERM switch to OFF.
5. Set Shield jumper to FILTERED Earth.
6. Set DEVICE CHASSIS GROUNDING to Earth.
7. Set POWER Switch to ON.

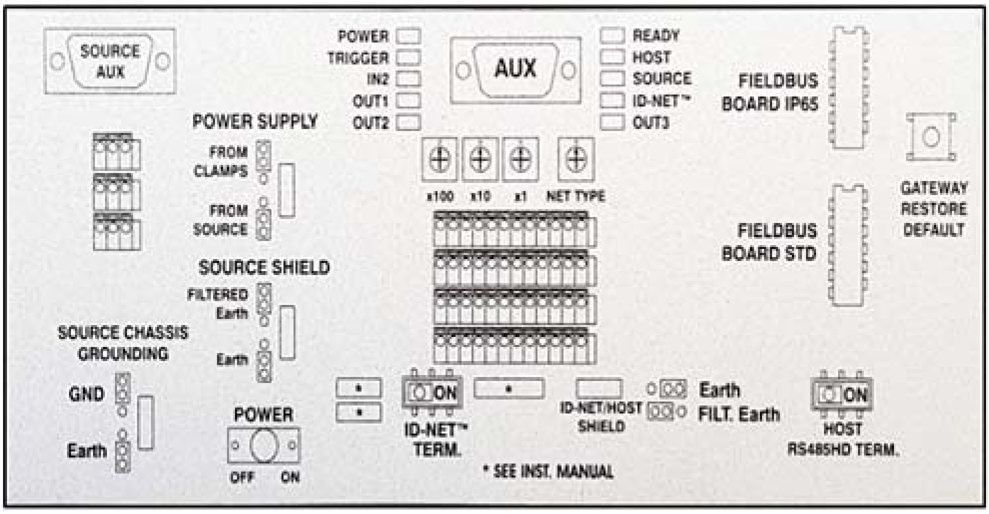
CBX800

Please verify that the CBX800 connection box is configured for the AV500/AV900 application as follows.



1. Set HOST RS485HD TERM switch to OFF.
2. Set Power Source Selector jumper to FROM SOURCE.
3. Set Shield jumper to FILTERED Earth.
4. Insert jumper wire in pin block from REF to ID+ (one jumper in either block is sufficient).
5. Set DEVICE CHASSIS GROUNDING to Earth.
6. Set J16 Jumper 16 to right position.
7. Set POWER switch to ON.
8. Set ID-NET TERM switch to OFF.

Box Interior Diagram



Photoelectric Sensor Connections to CBX100/800

Barcode scanning applications may use a Datalogic photoelectric sensor as a trigger device. The photoelectric sensor is wired directly into the CBX100/800 terminal block.

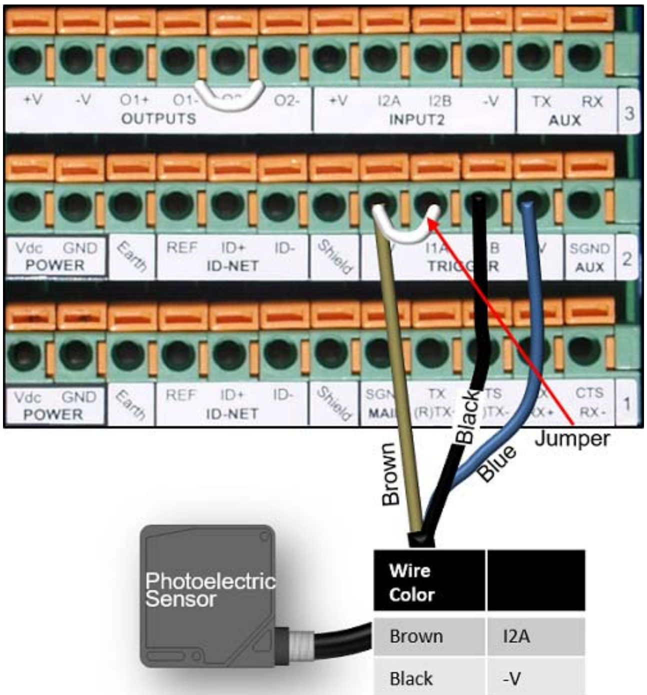
If your application uses a trigger other than the one specified by Datalogic, follow the appropriate wiring diagram to assure proper wiring.

WARNING: You must use shielded interface cables with this product. To maintain FCC compliance, the cable shield must make a 360-degree connection to the shielded mating connector.

NOTE: To confirm the photoelectric sensor is functioning properly, watch the TRIGGER LED first in the CBX and also on the camera while the photoelectric sensor's beam is blocked. The Datalogic photoelectric sensor also includes a status LED.

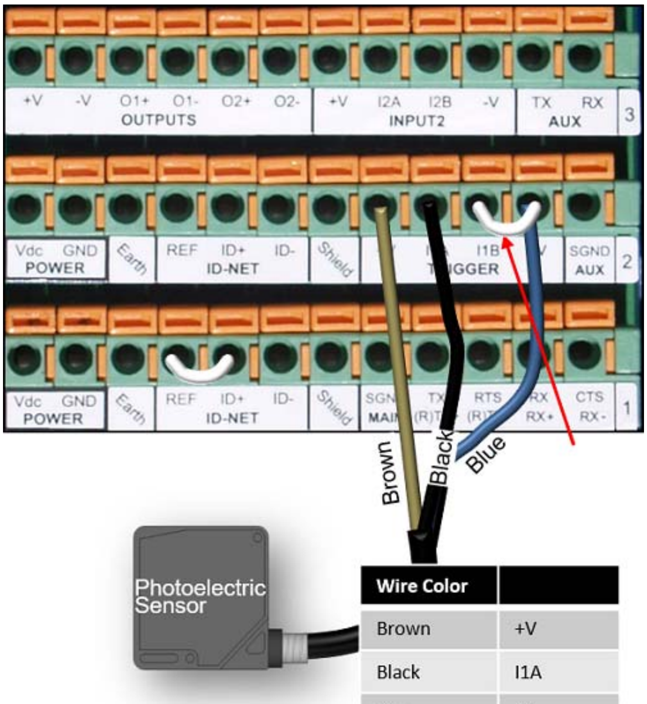
The following diagrams illustrate standard recommended wiring of the Photoelectric Sensor to the CBX100/800 terminal block.

Photoelectric Sensor to CBX100 and CBX800 (NPN)



Wire Color	
Brown	I2A
Black	-V
Blue	TX
White	Jumper I2A I2B

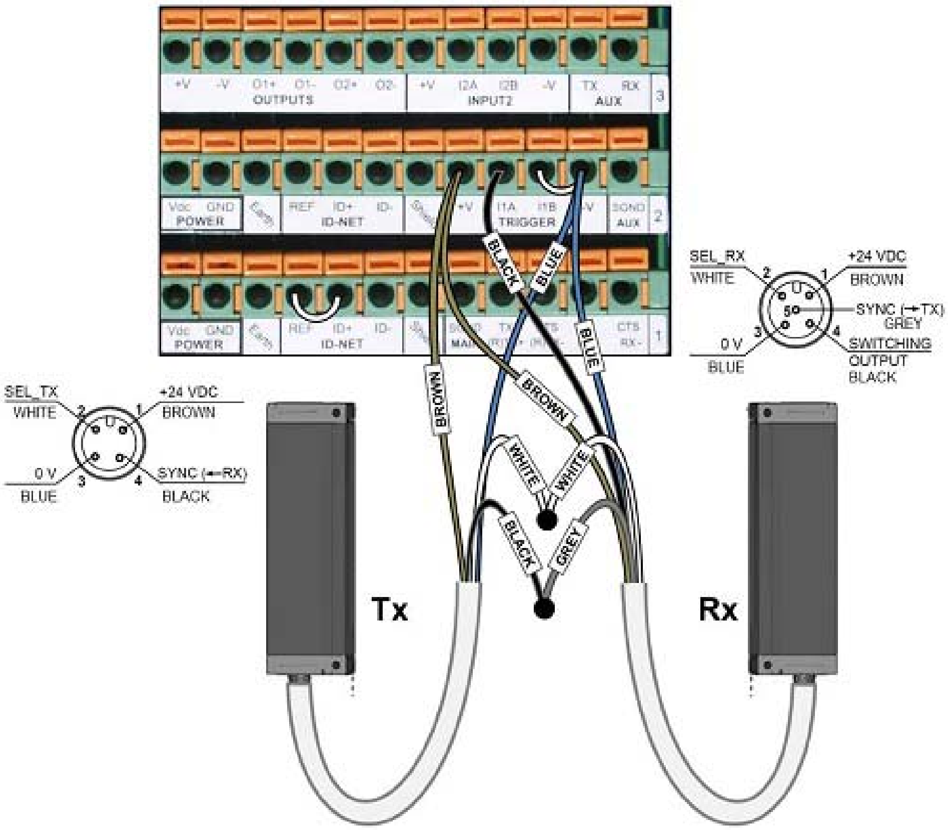
Photoelectric Sensor to CBX100/CBX800 (PNP)



Wire Color	
Brown	+V
Black	I1A
Blue	-V
White	Jumper TX AUX -V

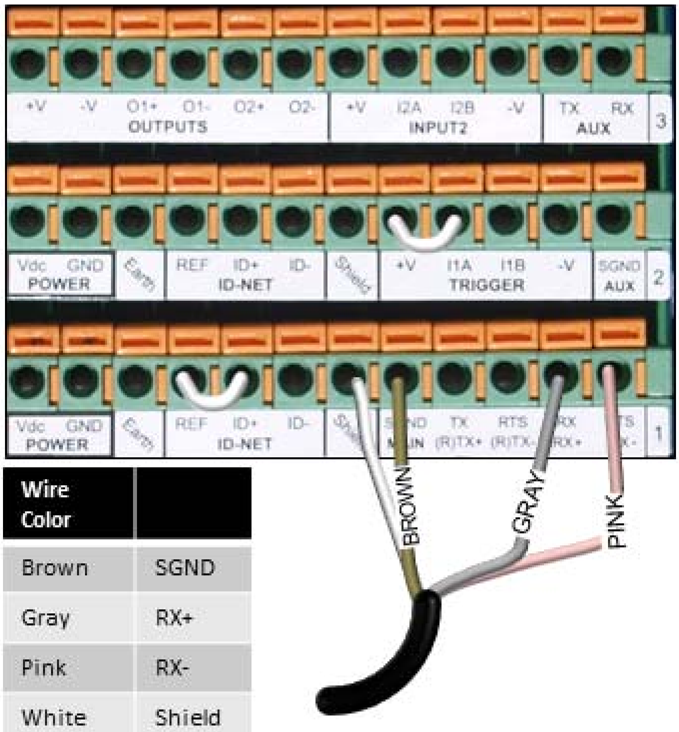
AS1 Area Sensor to CBX100/CBX800 Connections

The **AS1** area sensors can detect and provide trigger for very small or irregularly shaped objects. PNP Output.



Light Curtain to CBX100/CBX800 Connections

The Light Curtain may be connected to the CBX100/CX800 if there is more than one AV500/AV900.



Wire Color	
Brown	SGND
Gray	RX+
Pink	RX-
White	Shield

Encoder/Tachometer Wiring to CBX100/CBX800

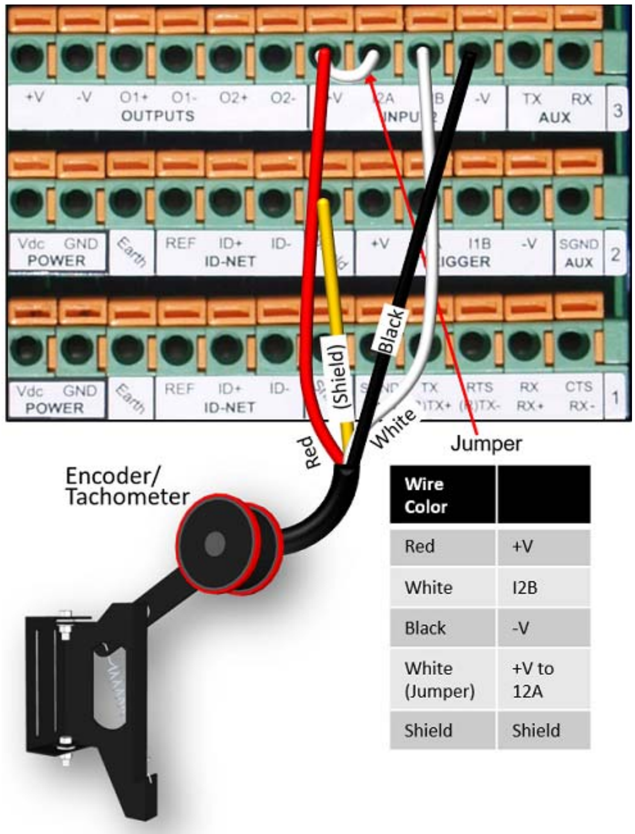
Encoder/Tachometer Wiring for NPN Output to CBX100/CBX800

NOTE: Some Photocraft tachometers may have a different color coding:

(+V) Red or White/Orange

(Signal) White or White/Blue

(Ground) Black or **Orange/White**



Wire Color	
Red	+V
White	I2B
Black	-V
White (Jumper)	+V to 12A
Shield	Shield

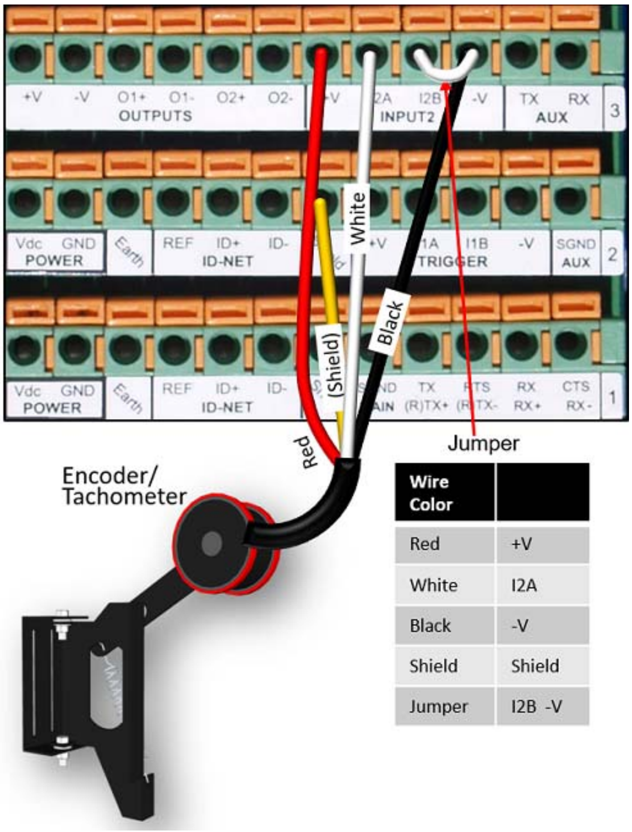
Encoder/Tachometer Wiring for PNP Output to CBX100/CBX800

Some Photocraft tachometers may have a different color coding:

(+V) Red or White/Orange

(Signal) White or White/Blue

(Ground) Black or **Orange/White**


+V -V O1+ O1- O2+ O2-
OUTPUTS
INPUT2
TX RX
AUX
3
Vdc GND
POWER
Earth
REF ID+ ID-
ID-NET
TRIGGER
SGND
AUX
2
White
Black
(Shield)
Vdc GND
POWER
Earth
REF ID+ ID-
ID-NET
TX RX CTS
RX+ RX-
1
Red
Jumper
Encoder/
Tachometer
Wire Color
Red +V
White I2A
Black -V
Shield Shield
Jumper I2B -V

Serial Communication Wiring to CBX100/CBX800

The AV500/AV900 provides serial RS232/RS422 communications to other devices through the CBX100/CBX800.

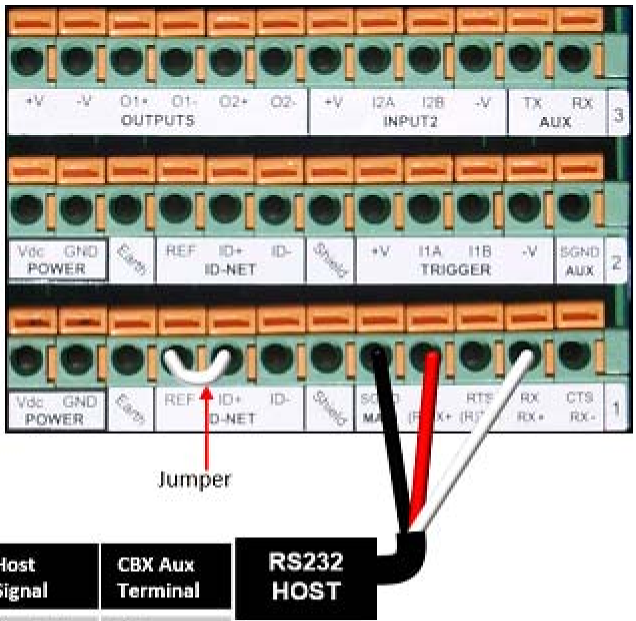
- RS232 provides point-to-point communications at distances up to 15 M [50 ft].
- RS422 provides point-to-point communications at distances up to 1200 M [3940 ft]

The following wiring diagrams illustrate the different types of serial communications available via the CBX100 pin block. It is very important that you make the proper pin connections.

RS232 with No Handshaking

Use RS232 for a direct connection to a controller, personal computer, or other device. RS232 provides point-to-point communications at distances up to 15 M [50 ft]. If longer cable lengths are needed, use RS422.

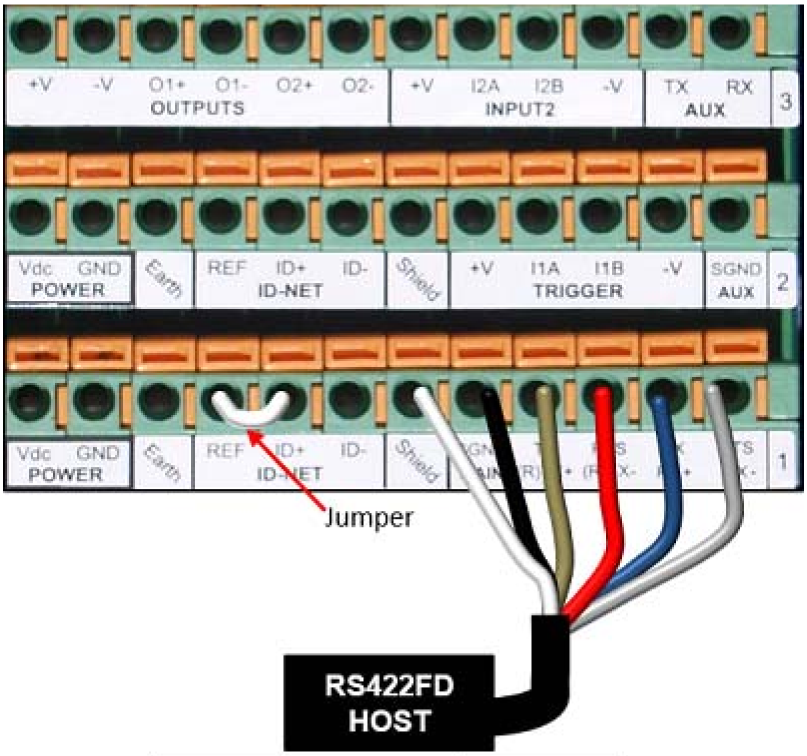
Use the following illustration as a guide when you want to connect your system to a device using RS232 communication with no handshaking.



Wire Color	Host Signal	CBX Aux Terminal
White	Host TX	RX
Red	Host RX	TX
Black	Signal GND	SGND
Jumper	NA	REF to ID+

RS422FD HOST (Full Duplex)

Use RS422 for a direct connection to a controller, personal computer, or other device. RS422 provides point-to-point communications at distances up to 1200 M [3940 ft]. Full duplex wiring supports a four wire, double twisted pair RxD/TxD. The Signal GND and shield cables are also required as shown.

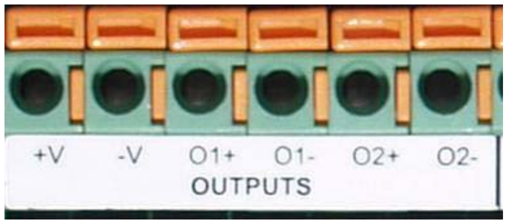


Wire Color	Host Signal	CBX Main Terminal
White	Cable Shield	Shield
Black	Signal GND	SGND
Brown	Host RX+	TX+
Red	Host RX-	TX-
Blue	Host TX+	RX+
Gray	Host TX-	RX-
Jumper	NA	REF to ID+

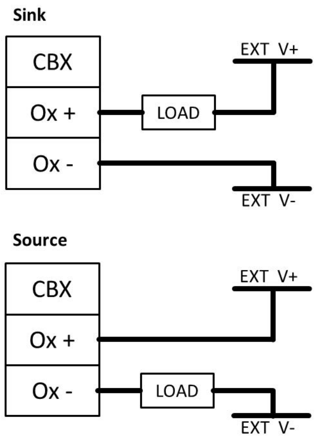
Relay Configuration for CBX100/800

The CBX100/CBX500 includes an OUTPUTS block for wiring relays as needed for external accessories. e-Genius Modify | Relays window includes options for outputs 1 and 2 including Life Light, Trigger Output, Error Light, Ready Light, Good Dim, and No Dim.

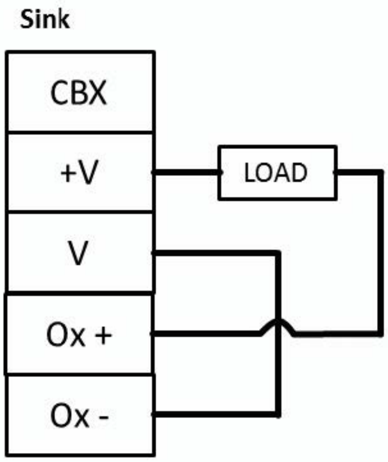
Schematics for Isolated and Non-Isolated relays are provided below.

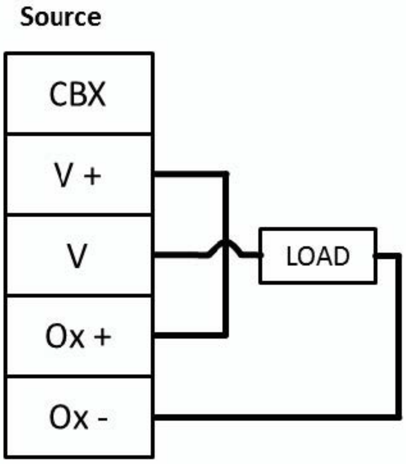
Outputs 1 and 2	
Maximum Voltage 30V	
Collector Current (pulse) 130 mA Max.	
Collector Current (continuous) 40 mA Max.	
Saturation Voltage (VCE) 1 V at 10 mA Max.	
Max Power Dissipation 90 mW at 50 degrees C (Ambient temperature)	

Unpowered Outputs



Powered Outputs





Grounding

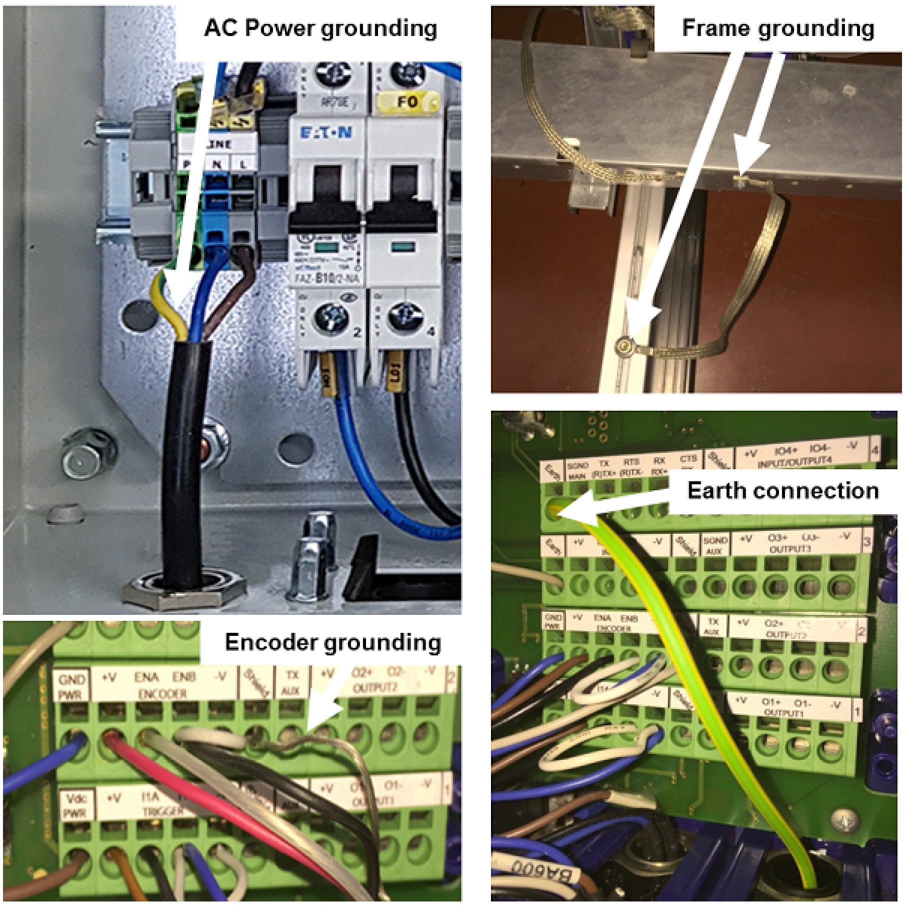
To avoid any problems with electrical noise that could negatively affect system function, make sure that:

1. The AC power cable coming into the PWR box is always provided with a Ground and connected to the proper connector (Protective Earth - PE).

2. The structure where the readers, controllers, encoders/tachometers, and photo-electric sensors are mounted is grounded to the conveyor or to the PE terminal inside the PWR.

3. The Shield wires from the Encoder/Tachometer and photoelectric sensor cables are connected to the proper *Shield* terminal in the CBX box.

4. Normally, steps 1 through 3 will guarantee proper function. In case of problems such as transmission of strange or wrong characters, devices stop working without any reason, or other unexpected behavior, try connecting the CBX or Controller Earth terminal to the PE terminal inside the PWR box.



Check AV500/AV900 Installation

After completing the installation, confirm that the AV500/AV900 reader(s) and CBX connection box have been properly installed mechanically and electrically. Use the Installation Sequence at the beginning of this chapter and your application specifications to check your installation.

CHAPTER 4
E-GENIUS

GETTING STARTED WITH THE AV FAMILY USER INTERFACE

Datalogic's AV Family camera imaging system provides fully automated, industrial quality barcode identification and imaging. The e-Genius web based application provides an easy-to-use series of configuration and diagnostics features that enable you to set up your imaging system.

e-Genius resides on each camera in your system. Use e-Genius to define operating parameters, construct output and input messages, view diagnostics and access utilities to configure, fine-tune and monitor your bar code reading operations.

NOTE: Please clear the PC's browser cache regularly or set up the browser to disable caching altogether. This is especially important after software upgrades to make sure updates in e-Genius are visible.

Prerequisites

Before setting up your camera(s), you will need the following:

Computer	Laptop
Browser	Internet Explorer 11 (or later)
	Firefox 30 (or later)
	Chrome 36 (or later)

WARNING: For proper e-Genius operation, make sure the web browser used is configured to allow pop-ups.

NOTE: Do not use auto-select/auto-fill in the web browser to fill in a parameter value.

Accessing e-Genius

To access e-Genius:

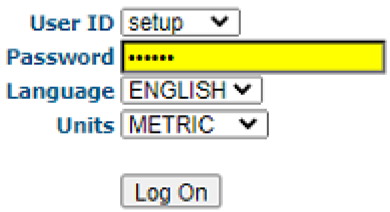
NOTE: Host and Image IP ports have static IP addresses, contact your IT department for the correct IP addresses if they are not the defaults specified here.

1. Connect your computer to the camera **HOST NET or IMAGE NET** port using an M12 to RJ45 Ethernet cable.

2. Turn on your laptop computer.

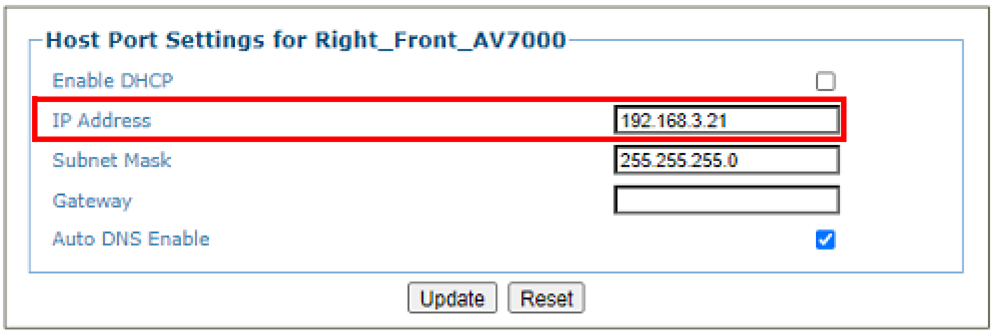
3. Configure your PC's IP Address to be in the same network as the port you are connected to. See **"Changing Your PC's IP Address:" on page 78**.

4. Open a web browser and enter the IP address for the unit. If the correct IP address is entered, the Log On window appears.



The default setup IP address for AV7000 cameras is: 192.168.3.10 (Host), and 10.0.40.20 (Image). The default setup IP address for all AV500/AV900 cameras is: 192.168.3.10 (Host), and 10.0.40.20 (Image). You may want to redefine your IP addresses.

For each device you can define specific IP addresses for your Host, Image and Focus Ports.



If you are operating a Redundant system, the controller IP is always 192.168.0.145 and the secondary controller IP is 192.168.0.146.

5. Enter the **User ID** (default is *setup*) and **Password** (default is *DLAset*) for your system in the fields provided. Your site administrator may have modified these defaults.

6. Select a language from the Language drop-down list.

7. Select **METRIC** or **IMPERIAL** from the Units drop-down list. All parameters which require units of measure will be in the option you select, unless otherwise specified.

8. Click **Log On.**

If the user name and password are valid, the application enables all functions available to the user and displays the System Info window.

If the password is not valid, the application displays a results box with the message, “Incorrect Password.” Click OK to return to the Log On window and enter the correct user name and password. If you don’t know the password, contact your system manager.

WARNING: The user ID and password shown above provide full setup rights to the user.

If a user only needs to view system information without saving changes, the User ID: monitor and Password: DLAmon should be used.

Changing Your PC’s IP Address:

1. From the desktop click the Windows or Start button, and enter **Control Panel**.
2. Select **Network and Sharing Center,** then click **Change adapter settings** or select the **Local Area Connection** you wish to change.
3. Right-click on the Local Area or Ethernet Connection you wish to change, and select **Properties.**

NOTE: Your PC may name the LAN port different than the Local Area Connection. For example, “Ethernet”.

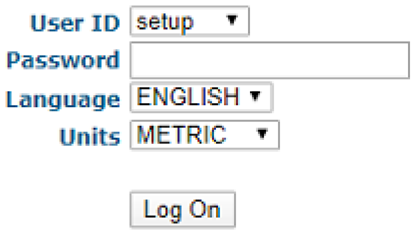
4. Select the Networking tab. Under **This connection uses the following items**, click **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.
5. Select **Use the following IP address**. In the IP address field, type the first 3 octets of the IP address of the unit.
6. For the last octet, type a number that differs from the last octet in the unit’s IP address. The actual number used is not important as long as it does not match that of the unit.

For Example: If the camera’s IP Address is 192.168.3.10, set your PC’s IP Address to 192.168.3.11.

7. In the Subnet mask field, type 255.255.255.0
8. Click **Okay** to save your changes.

Logging out of e-Genius:

Click at the upper right corner of the e-Genius window to Log Off. When logged out, the Log On window will appear.



E-GENIUS BASICS

e-Genius Menu Tree

The functions that you can select are displayed in a menu tree on the left–hand side of e-Genius. The function list is organized much like the hierarchy of a file system, where you can expand items that are preceded by a box ( ) to further sub–levels until you find a function of interest.

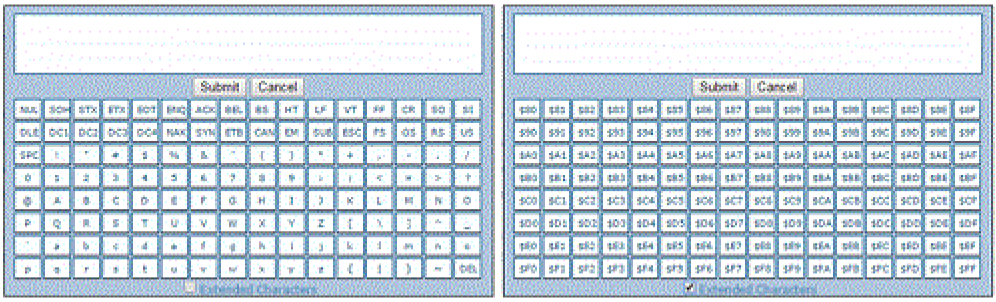
Sub–levels appear indented below the items from which they are expanded. Clicking the box again collapses that branch of the menu. You can expand no further when an item is not preceded by a box.

The e-Genius menu tree appears with no items expanded. Click the folders to display the active window for the setup function and/or expand the folders to view any additional setup features.

Enter Text with the Text Entry Tool

In cases where text needs to be entered to create message headers, trailer, custom messages, or for other reasons, the Text Entry Tool pencil icon will be displayed.

1. Click to open the Text Entry Tool.



NOTE: The Text Entry Tool is needed to enter unprintable characters or characters that cannot be typed. For example, <CR> is a single character presented as a string for easier reading. The character must be entered with the Text Entry Tool, if typed normally it will be recognized as a string and not as a single character.

2. You can enter text in the text field by typing, or click on the character buttons to create your message. Select the **Extended Characters** check box to reveal a new set of control characters.

3. Click **Submit** to save your text to the origin window text field, or click **Cancel** to return to origin window without transferring text.

Getting Help

e-Genius provides complete online help (this document).

To access the complete help system:

1. Select **Utilities | Help** in the **e-Genius** menu tree. The help **Welcome** window appears. The **Welcome** page provides important product information as well as two ways to find specific help information: **Contents** and **Search.**

To display contextual help for a current window:

1. Click the Help icon displayed at the top right of the screen. A help window appears, providing you with information for that specific page.

2. Click the link in the upper left corner of the help window to access Contents options.

AV Family Global Settings

In the online help Global Settings portion of the e-Genius User Interface the settings apply Globally to the entire system both the AV7000 and AV500/900 cameras. However, some parameters within these settings pages only apply to the AV7000 camera and others may only apply to the AV500/900 camera.

When this is the case it will be indicated as follows in the User Interface:

* AV7000 Only
** AV500/AV900 Only

When this is the case it will be indicated as follows in the online help:

AV7000 ONLY

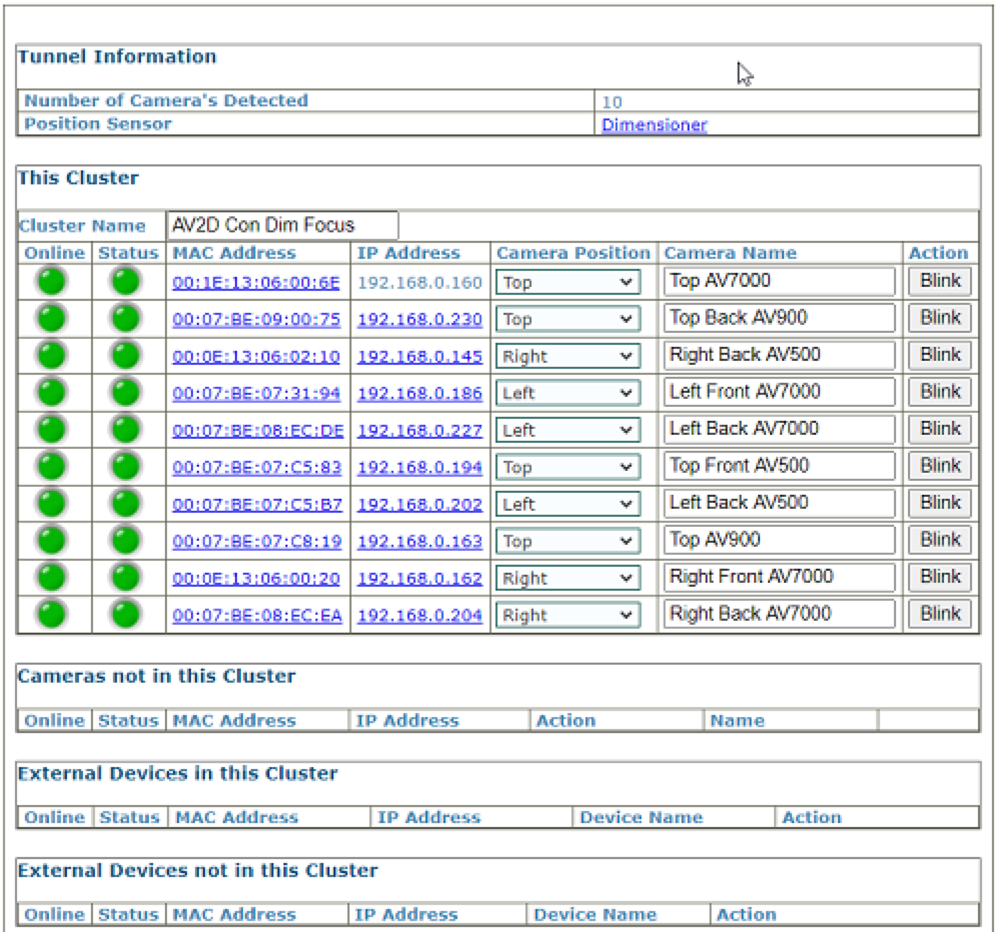
AV500/900 ONLY

SYSTEM INFO

System Info provides basic camera system data (whether your system includes one camera or an array). View cameras and bring new devices into a cluster (array of cameras and devices that work together). Critical information such as software version, MAC address, and camera position is also provided.

To view System Information:

1. In the menu tree under **Modify Settings**, click **System Info**. The **System Info** window opens.
2. The information in this form is auto-filled. The fields are described below.



Tunnel Information

Number of Camera's Detected	10
Position Sensor	Dimensioner

This Cluster

Cluster Name: AV2D Con Dim Focus

Online	Status	MAC Address	IP Address	Camera Position	Camera Name	Action
		00:1E:13:06:00:6E	192.168.0.160	Top	Top AV7000	Blink
		00:07:BE:09:00:75	192.168.0.230	Top	Top Back AV900	Blink
		00:0E:13:06:02:10	192.168.0.145	Right	Right Back AV500	Blink
		00:07:BE:07:31:94	192.168.0.186	Left	Left Front AV7000	Blink
		00:07:BE:08:EC:DE	192.168.0.227	Left	Left Back AV7000	Blink
		00:07:BE:07:C5:83	192.168.0.194	Top	Top Front AV500	Blink
		00:07:BE:07:C5:B7	192.168.0.202	Left	Left Back AV500	Blink
		00:07:BE:07:C8:19	192.168.0.163	Top	Top AV900	Blink
		00:0E:13:06:00:20	192.168.0.162	Right	Right Front AV7000	Blink
		00:07:BE:08:EC:EA	192.168.0.204	Right	Right Back AV7000	Blink

Cameras not in this Cluster

Online	Status	MAC Address	IP Address	Action	Name

External Devices in this Cluster

Online	Status	MAC Address	IP Address	Device Name	Action

External Devices not in this Cluster

Online	Status	MAC Address	IP Address	Device Name	Action

System Info

Tunnel Information

Number of Cameras Detected

Displays the number of cameras found in the system.

Position Sensor

Displays the type of Position sensor and indicates whether it is a Dimensioner, Light Curtain or S85.

This Cluster

Cluster Name

Name that identifies the cluster.

Online

Green = Online (connected and recognized in the cluster)

Gray = Unit not connected (unit not seen by master)

Yellow = Online, but not assigned to the cluster (shown under Cameras not in this Cluster)

Red = Offline

Status

Green = No errors and ready to read

Gray = Unit not connected

Yellow = Warning present, if you click on the MAC address, it will take you to the status viewer page for more info on the error

Red = Error, if you click on the MAC address, it will take you to the status viewer page for more info on the error

MAC Address

Displays the internal MAC Address (Media Access Control Address) Since all MAC addresses are unique, it is the information that the camera uses in the cluster to share data from camera to camera. Click the MAC Address link to view details about that specific device (See Device Details below).

IP Address

Displays the internal Sync Net IP address of the unit used for camera-to-camera communication.

Camera Position

Select Not Assigned, Top, Left, Right, or Bottom from the drop-down list.

Camera Name

Displays the camera's name assigned in Modify Settings | Device Settings | <device> | Device Info.

Action

Click **Blink**. This identifies the camera in the array. When clicked, the camera illumination turns on for around 10 seconds.

Click **Delete**. This will remove the camera from the cluster.

WARNING

Delete should never be selected in an already configured array.

Cameras not in this Cluster

Displays a list of discovered cameras not currently included in the cluster. This includes the same information listed above for each camera.

External Devices in this Cluster

Displays a list of external devices currently included in the cluster. These are Datalogic products that AV7000 and AV500/900 cameras can communicate with, but are not part of the SyncNet network. This includes the same information listed above for each device.

External Devices not in this cluster

Displays a list of external devices not currently included in the cluster. This includes the same information listed above for each device.

3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

Device Details

From the **System Info** window, click on a device's **MAC Address** to open a window displaying details about that device. The details include statistics, decoder, software, and processor information.

Camera Name: **Camera_1** Position: **Left**

Camera Statistics

Belt Speed(mm/s)	0
Encoder Frequency Hz	0
Statistic Elapsed Time	0-00:10:22
Total Packages	0
Valid Reads	0
No Reads	0
Multiple Reads	0
Read Rate	0.0%
Frame Rate (fps)	32.1
Total Barcodes	0
Barcodes Discarded	0
Barcodes In	0
Barcodes Out	0
Barcodes Uncertain	0
Solo Group Read	0
Total Group Read	0

Decoder Details

Online	Status	IP Address	MAC Address
		192.168.0.145	00:0E:13:06:02:2C

Software Type	STD_BETA
Software Version	0.0.0.92
PCIe Driver Version	2.0
Decoder Name	EVL 1.1.24.6 (VL VL5.12.17U.50331646.10)
Controller Mode	Active Controller
Host Port IP Address	192.168.1.100
Image Port IP Address	192.168.2.100
Configuration Update Count	541
Diagnostic Messages	Camera calibration has not been completed

Real-Time Processor Details

Online	Status	IP Address	MAC Address
		192.168.00.224	00:0E:13:06:02:4E

Software Type	STD_BETA
Software Version	0.0.0.90
FPGA Version	0.47.0
My Decoder's MAC	00:0E:13:06:02:2C
My Decoder's IP	192.168.0.145
Total Packages	0
Diagnostic Messages	SyncNetwork is not connected in a loop

Camera Statistics

Belt Speed

Displays the speed of the conveyor belt in millimeters per second or the internal clock for image acquisition.

Encoder Frequency

Displays the encoder frequency.

Statistics Elapsed Time

Displays the amount of time elapsed from the last reset or the last modification to the configuration of the system for which the unit has been collecting statistics. This is reset at startup and when the “Reset Counts” button is clicked.

Total Packages

The total number of packages detected by the presence sensor, including errors.

Valid Reads

Number of labels completely read by the system (**the same label may include more than one barcode**).

No Reads

The total number of unsuccessful code reads for the camera.

Multiple Reads

The total number of times the same bar code symbology has been read by the camera.

Partial Reads

Number of labels partially read by the system (only some of the barcodes set in the “Group Label” settings are read).

Read Rate

The number of good reads divided by the total number of reads.

Frame Rate (fps) frames per second AV500 Only

The total number of frames per second captured by the camera.

Total Barcodes

Indicates the number of barcodes read from all the cameras, including Multiple Reads.

Barcodes Discarded

Barcodes not programmed in “Code Definition” parameters group + “Barcodes Out” + “Encoder Errors”.

Barcode In

Total number of barcodes found on the packs detected by the single scanner. This is identified for the single camera’s MAC address selected, not a cluster. Only visible when Operating Mode is PackTrack.

Barcode Out

Total number of barcodes found outside the packs detected by the single camera. This is identified for the single camera’s MAC address selected, not a cluster. Only visible when Operating Mode is PackTrack.

Barcodes Uncertain

Total number of barcodes found that intersect more than one package, and are therefore ambiguous, detected by the single camera. This is only visible when Operating Mode is PackTrack.

Solo Group Read

The total number of times a single defined bar code group was read.

Total Group Read

The total number of times all defined bar code groups were read.

Decoder Details

Online Indicator

Green = Online (connected and recognized in the cluster)

Gray = Unit not connected (unit not seen by master)

Yellow = Online, but not assigned to the cluster (shown under Cameras not in this Cluster)

Red = Offline

Status Indicator

Green = No errors, read to read

Gray = Unit not connected

Yellow = Warning present, if you click on the MAC address you will access the Status Viewer page for more information

Red = Error, if you click on the MAC address you will access the Status Viewer page for more information

IP Address

This is the SYNC IP address provided from the DHCP controller camera in the cluster

MAC Address

A media access control address (MAC address) of a device is a unique identifier assigned to a network interface controller (NIC) for communications at the data link layer of a network segment.

Software Type

Describes the type of software on the device. Typically this will indicate STANDARD or a customer name if your software is custom.

Software Version

Identifies the version number of the software

PCIe Drive Version

Peripheral Component Interconnect Express, better known as PCI Express (and abbreviated

PCIe) is a computer expansion card standard used in motherboard-level connections and as an expansion card interface.

Decoder Name

Identifies the type of decoder. For example, BLR_VL5.10.56R_LNX or EVL 1.1.24.2 (VL VL5.11.00U.50331646.10)

Controller Mode

Displays the mode of the camera; Active Controller, Backup Controller or Client.

Host Port IP Address

The Internet Protocol address (IP address) of the host port.

Image Port IP Address

The Internet Protocol address (IP address) of the image port.

Configuration Update Count

The number of times the configuration file has been updated.

Diagnostic Messages

Displays any diagnostic messages that apply. Click on Diagnostics Messages to access the complete list of possible messages.

NOTE

Datalogic Technical Support will use these Diagnostic messages to properly diagnose and troubleshoot your cameras.

Real Time Processor (RTP) Details

Online Indicator

Green = Online (connected and recognized in the cluster)

Gray = Unit not connected (unit not seen by master)

Yellow = Online but not assigned to the cluster (shown under Cameras not in this Cluster)

Red = Offline

Status Indicator

Green = Online (connected and recognized in the cluster)

Gray = Unit not connected (unit not seen by master)

Yellow = Online but not assigned to the cluster (shown under Cameras not in this Cluster)

Red = Offline

IP Address

This is the SYNC IP address provided from the DHCP controller in the cluster.

MAC Address

A media access control address (MAC address) of a device is a unique identifier assigned to a network interface controller (NIC) for communications at the data link layer of a network segment.

Software Type

Describes the type of software on the device. Typically this will indicate STANDARD or a customer name if your software is custom.

Software Version

Identifies the version number of the software

FPGA Version

The version of the Datalogic field-programmable gate array (FPGA).

NOTE

Since the Real Time Processor is a sub-processor to the Decoder software, the My Decoder's MAC and the My Decoder IP identify the Decoder processor that they are related to.

My Decoder's MAC

A media access control address (MAC address) of a device is a unique identifier assigned to a network interface controller (NIC) for communications at the data link layer of a network segment.

My Decoder's IP

The Internet Protocol address (IP address) is a numerical label assigned to the device connected to a computer network that uses the Internet Protocol for communication.[1][2] An IP address serves two principal functions: host or network interface identification and location addressing.

Total Packages

The total number of packages that have been seen by the camera.

Diagnostic Messages

Displays any diagnostic messages that apply. “No active Errors or Warnings.” may display. Since the SyncNetwork is not connected in a loop, a message will appear when a camera is used as a single stand alone unit. This is not an error and no action is required.

NOTE

When message is in black, it is information only and no action is required.

MODIFY SETTINGS

Use the **Modify Settings** selections during initial setup to configure your camera system. If necessary, you can later make modifications to the configuration using the same menu selections, including:

"System Info" on page 82

"Global Settings" on page 89

"Operating Mode" on page 90

"Object Detection" on page 113

"Barcode Settings" on page 131

"Communications" on page 166

"Output Format" on page 185

"Image Saving" on page 201

"Time Synchronization" on page 212

GLOBAL SETTINGS

Use the **Global Settings** menu options to configure your camera system. Configure global settings for any camera and then distribute them to other cameras in the cluster. You can also make modifications to the global system settings, if necessary.

"Operating Mode" on page 90

"Object Detection" on page 113

"Barcode Settings" on page 131

"Communications" on page 166

"Output Format" on page 185

"Image Saving" on page 201

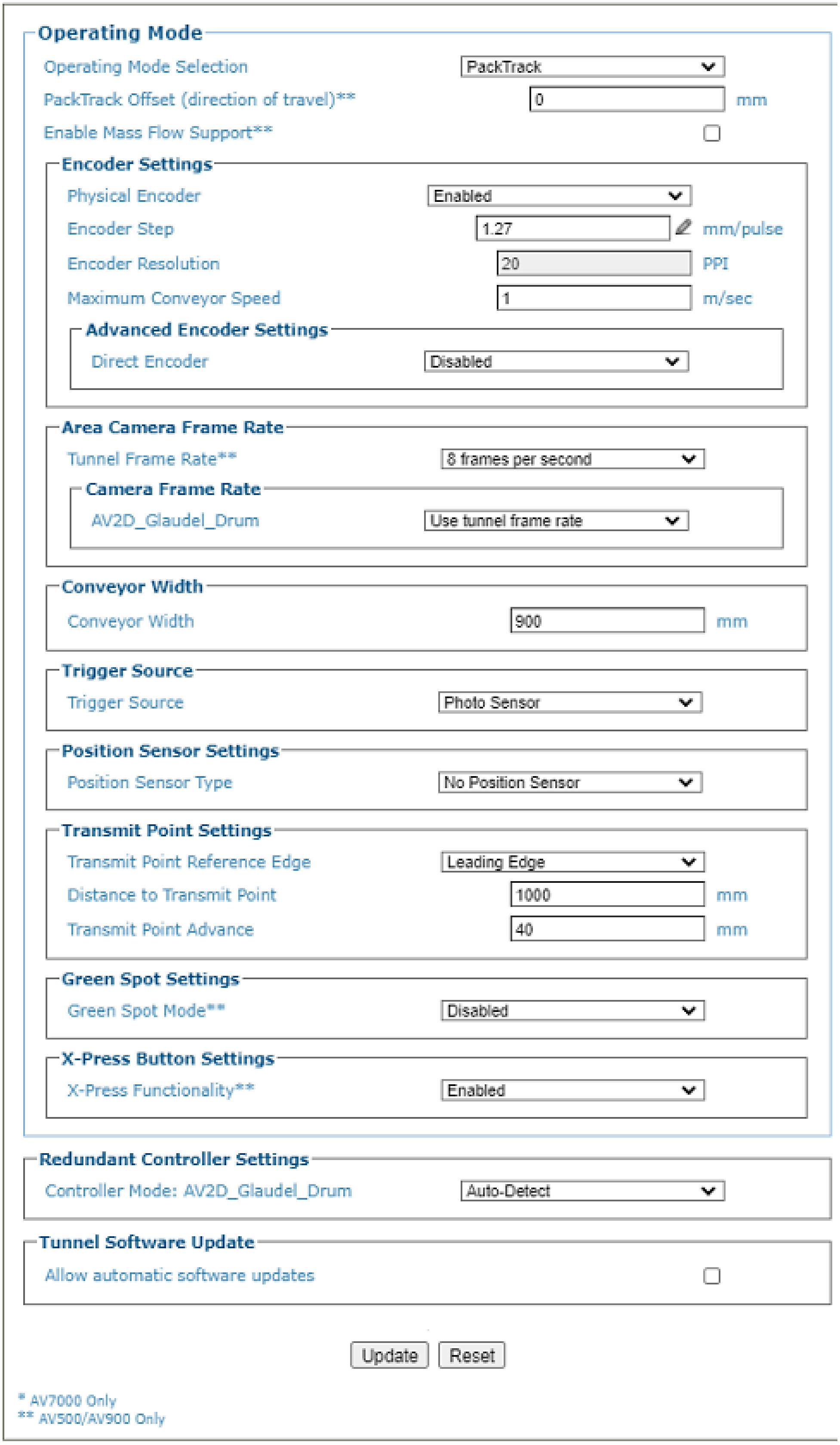
"Time Synchronization" on page 212

OPERATING MODE

Use **Operating Mode** to set up the physical parameters for your system including encoder, trigger, conveyor, and position sensor attributes. There are three major Operating Modes options that are selectable; **PackTrack, Online,** and **Continuous**.

To edit the system Operating Mode:

1. In the menu tree under **Modify Settings,** navigate to **Global Settings | Operating Mode.** The **Operating Mode** window opens.



2. Enter the appropriate information in the form as described below:

Operating Mode Selections

Select one of the following modes:

"Packtrack Mode" on page 93 is a patented operating mode for Datalogic devices used to read and correctly assign codes read on different parcels when placed in the camera reading area at the same time. The technology allows for smaller gaps between packages. It can also be used in bidirectional systems, in which you may want to read codes going forward or reverse.

"Online Mode" on page 104 in Online operating mode, the reading phase is defined as the time between a Phase ON and Phase OFF event. The Phase events can be signals coming from one or two external presence sensors connected to the camera inputs or a message start/stop strings sent from the host over the serial interface or Ethernet input.

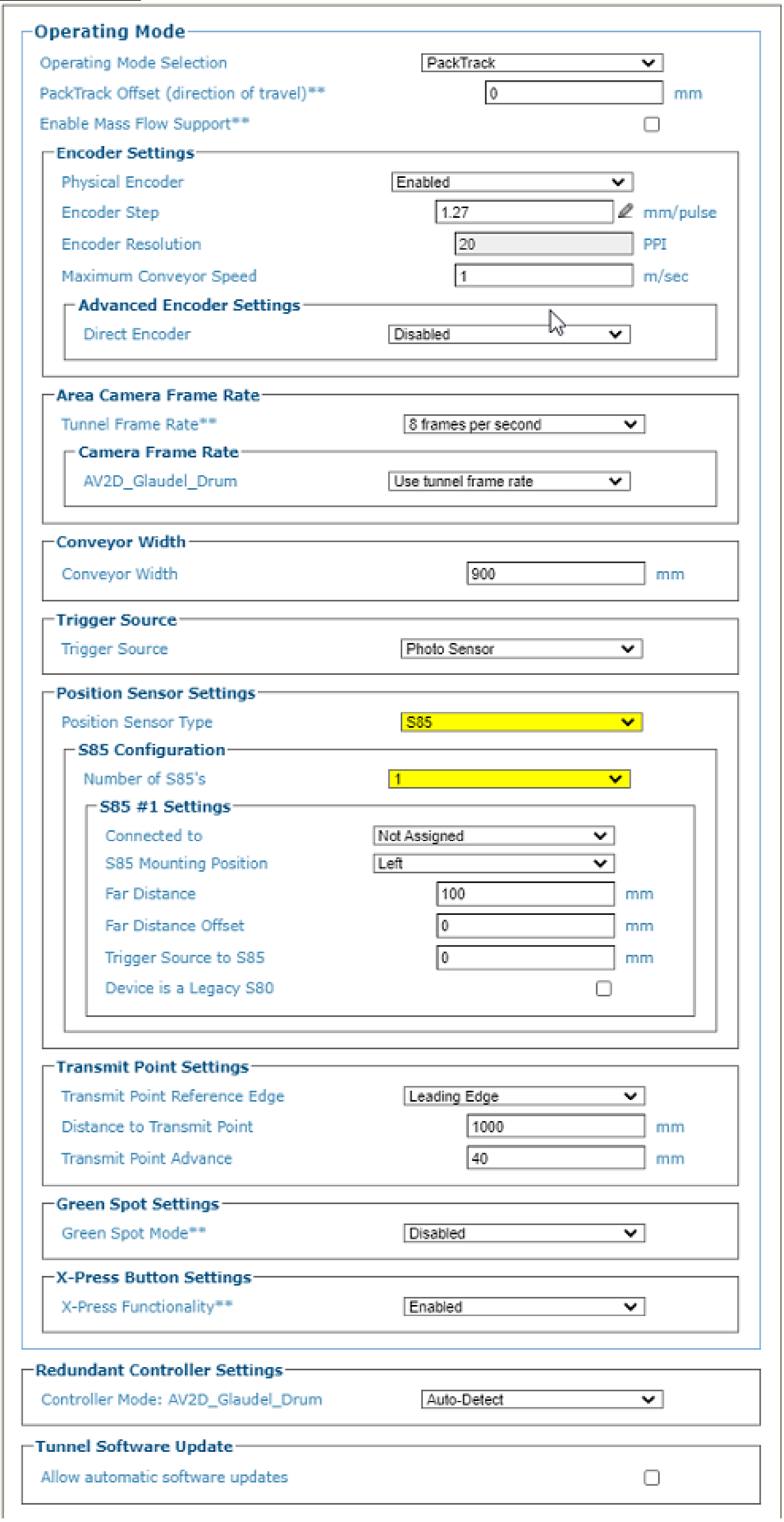
"Continuous Mode" on page 108 is continuous image / frame acquisition mode with immediate decode result processing and transmission. Frames are acquired at the rate selected. Suppression filters are available for eliminating duplicate decode results within a single frame and across multiple frames and can be configured either based on time or distance. When using a distance based suppression filter, distance can be based on a physical encoder where the clock time to timeout will be dependent on how fast the belt is running or where time will be based on an internal tach set to 1 meter per second. An option for code replication is also available where a decode result is replicated or not suppressed when the same code value is decoded but the code types are different.

NOTE: Image Saving does not work in Continuous Mode.

Enable Mass Flow Support

Click the check-box to enable Mass Flow Detection System features.

PackTrack Mode



PackTrack Offset (direction of travel) AV500 Only

Enter a value used when a value must be added for proper PackTracking. The PackTrack offset is used to fine tune the PackTrack calibration in the Y-direction (direction of travel). If after the static calibration is complete, the bar code is still not placed on the package correctly, the PackTrack offset parameter allows for a slight adjustment on the Y plane.

Enable Mass Flow Support AV500 Only

Click the check-box to enable Mass Flow Detection features.

Encoder Settings

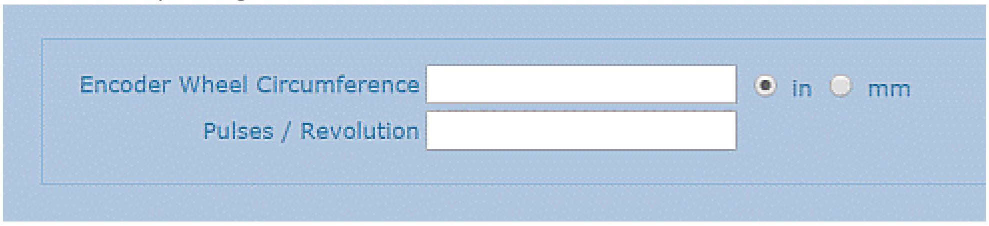
Physical Encoder

Select **Disable** or **Enable** from the drop-down list:

- **Disable:** External encoder is disabled, and internal encoder is active
- **Enable:** A physical encoder is connected to the Encoder input and is enabled

Encoder Step (mm/pulse)

Click to activate the **Encoder Step** input form. Enter the **Encoder Wheel Circumference** in the field provided and select the in or mm option. Enter the Pulses / Revolution in the field provided (See the table below for values). Click **Submit** to save the values, or click **Cancel** to return to the Operating Mode window.



Encoder Step Settings Table

Encoder Wheel Circumference	PPR (Pulses Per Revolution)	Encoder Step (mm)	Encoder Step (inch)	Encoder Model
304.8 mm [12 in]	192	1.5875	16	1000019875
304.8 mm [12 in]	240	1.27	20	1000019875
300 mm [11.81 in]	192	1.5625	16	OEK-2 93ACC1770
300 mm [11.81 in]	240	1.25	20	OEK-2 93ACC1770
304.8 mm [12 in]	2400	0.127	200	OEK-3 93ACC0104

Encoder Resolution

Displays the encoder/tachometer resolution in pulses per inch (PPI) based on the Encoder Step calculation. This field cannot be edited.

Conveyor Speed (max/constant) (m/sec)

When physical encoder is enabled, enter the maximum belt speed using the formula below.

Formula: Max conveyor speed x 1.05

This formula is for an external tach. If the unit is set for internal the exact speed of the conveyor must be entered.

When disabled there is no physical tach connected to the camera. When the unit is set for internal tack, the exact speed of the conveyor must be enabled. The Max Conveyor Speed option uses an internal clock that sets the tach to match the conveyor speed.

Advanced Encoder Settings

Direct Encoder

Select **Disable** or **Enable** from the drop-down list. Direct encoder is a high-resolution encoder/ tachometer (200 tachs per inch/.012700 mm/pulse) used in start/stop applications.

Frame Rate AV500 Only

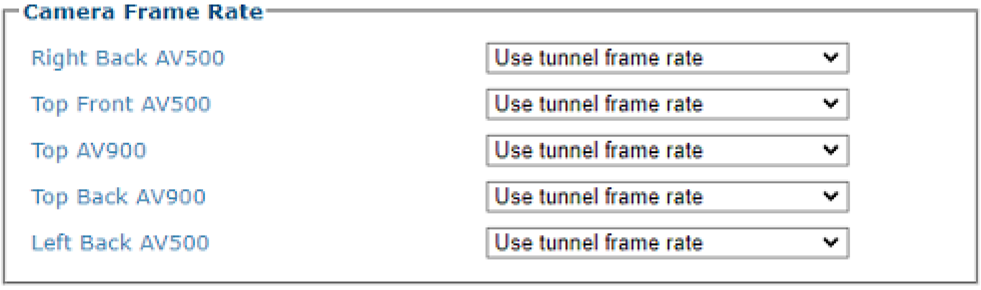
Tunnel Frame Rate

Select an appropriate Frame Rate from the drop-down list.

NOTE: This option is adjusted to best fit various applications. Contact Datalogic support to determine the correct setting.

- **8 frames per second**
- **16 frames per second**
- **24 frames per second**
- **32 frames per second**

If there are multiple AV500/900 cameras in a system, you can specify a tunnel frame rate for each specific camera. Use the options below to specify.



Select from the following:

- **Use tunnel frame rate**
- **8 frames per second**
- **16 frames per second**
- **24 frames per second**
- **32 frames per second**

Conveyor Width

Conveyor Width

Enter the width of the conveyor.

Trigger Source

Trigger Source

Select from the drop-down list.

- **Position Sensor:** triggers when selected position sensor senses a package.
- **Photo Sensor:** triggers when a photoelectric sensor is blocked.
- **Trigger Message:** triggers when a trigger message is received from an external device.
- **Ethernet/IP:** triggers when a trigger message is received from a PLC.

Trigger Controller

Select which camera in your system is controlling the trigger message. **This option is only available when the Trigger Source is set to Trigger Message.**

Position Sensor Settings

Position Sensor Type

Select **No Position Sensor, Light Curtain, Dimensioner, S85, or S85 with DL Light Curtain** from the drop-down list, depending on the specific position sensor used by the system. The following parameters will vary depending upon the Position Sensor selected.

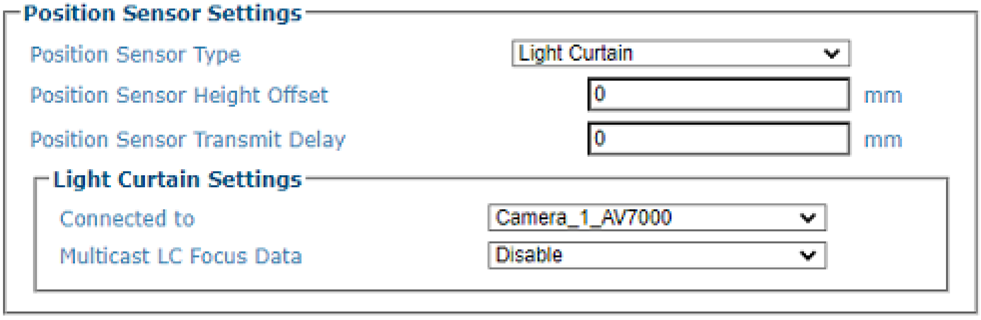
Position Sensor Height Offset

Enter the distance between the position sensor's zero height reference point and the conveyor's surface. This should be set to zero (0) for other, non-light curtain position sensors.

Position Sensor Transmit Delay

Enter the distance from the position sensor to the positions sensor's transmit point. The **Position Sensor Transmit Delay** is a delay in the time that the position sensor sends the focusing information to the camera. This delay time allows for the position sensor to provide stable focusing data to the camera. The Position Sensor Transmit Delay option allows the camera to receive the focusing data at the correct time.

Light Curtain Settings



Connected to

Select a camera in the system to which the light curtain is connected.

Multicast LC Focus Data

Select Disable or Enable. Selecting Enable allows the sending of Light Curtain focus data to ALL the cameras in the array.

Dimensioner Settings

When **Dimensioner** is selected as the **Position Sensor Type**, additional Trigger Source parameters are revealed. **These are AV7000 specific.**

Trigger Source to Position Sensor

Enter the distance from the trigger (PLC message or device) to the Position Sensor (in this case the dimensioner).

Crossbelt Sorter Mode AV7000 ONLY,

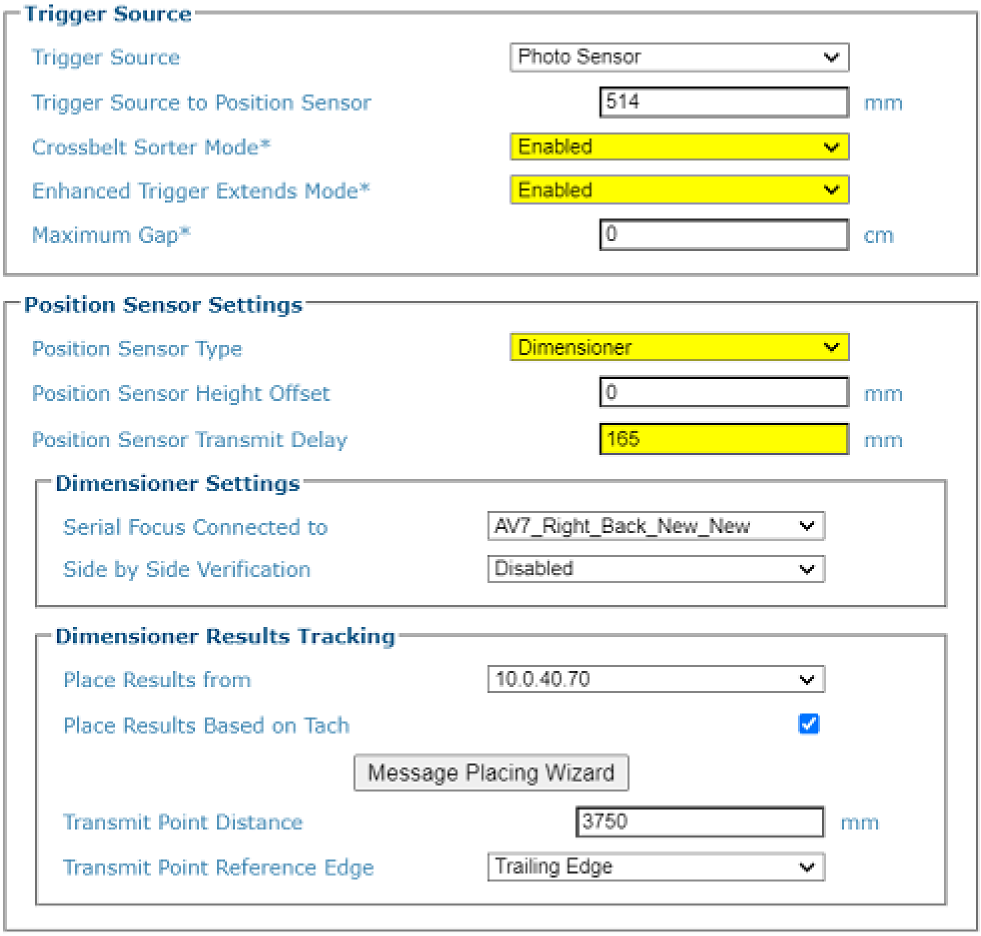
Click the drop-down to select **Enabled** or **Disabled.** This option enables features in Operating Mode and Device Imaging that can improve performance when your system is set up over a Crossbelt Sorter.

Enhanced Trigger Extends ModeAV7000 ONLY

Click the drop-down to enable or disable **Enhanced Trigger Extends Mode**. These options will become available in device imaging.

Maximum GapAV7000 ONLY

Enter a value for the greatest distance between crossbelt trays (in cm).



Serial Focus Connected to

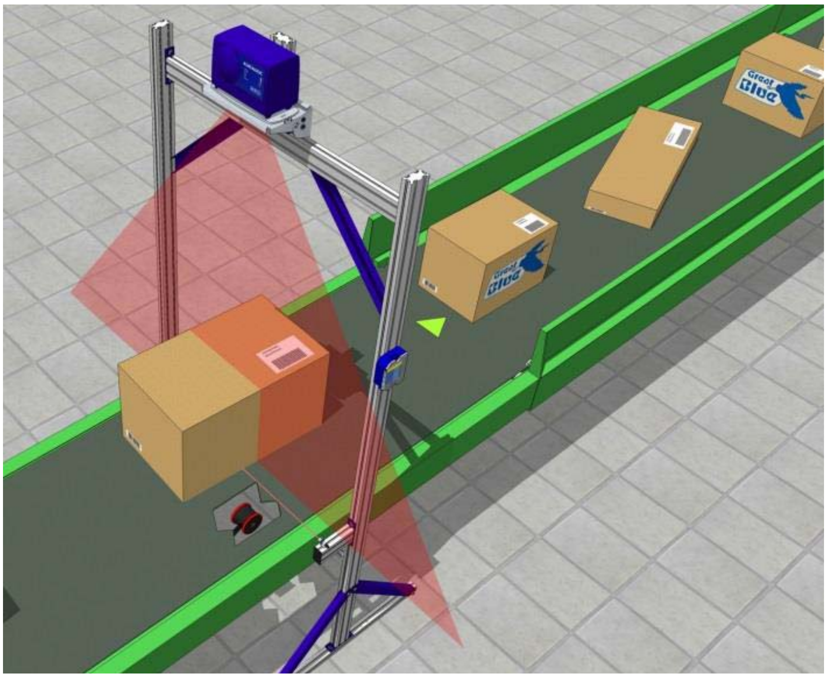
Will default to Active Controller. Active Controller indicates the Dimensioner must be connected to the Active Controller in the cluster. Click the drop-down to select the camera the Dimensioner is connected to. This will force the selected camera to accept Dimensioner data, all others will ignore incoming Dimensioner data. The Active Controller option will be used when there are multiple cameras in a array and one is selected as the Primary Controller and another is selected as Secondary Controller

Side by Side Verification

Select **Enabled** or **Disabled** from the drop-down list. Select Enabled if your system requires Side by Side Verification. This is only available for Dimensioners.

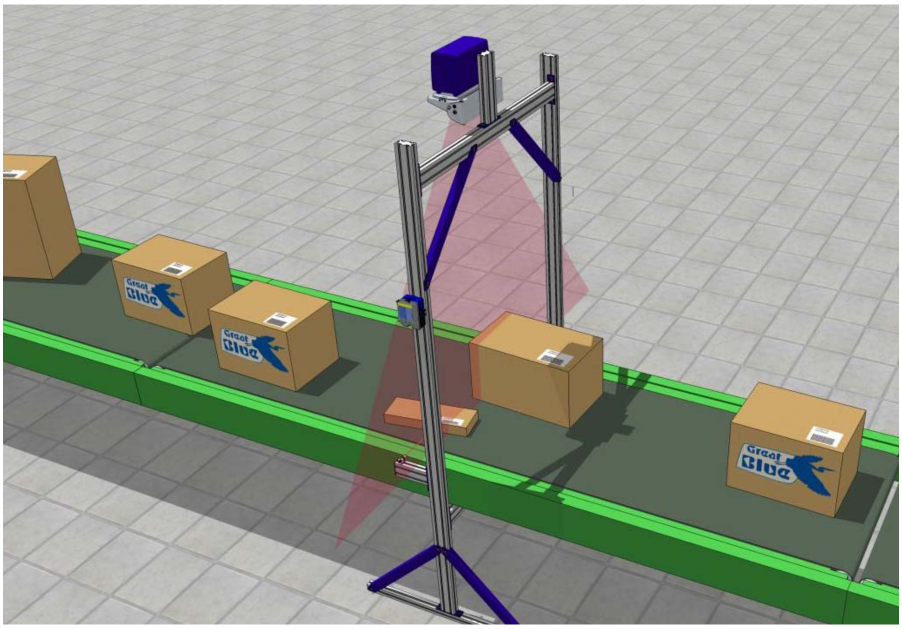
NOTE: In order to have the camera report a Side by Side condition, the DM3610 must be configured and also connected correctly. This connection is different then the connection that provides the focusing data.

In a “singulated” material handling system, parcels are separated by at least the minimum spacing distance along the direction of travel; there is at most one parcel across the conveyor at a time; therefore there is only one parcel present during a trigger cycle. A trigger is typically generated by a photoeye or a hardware signal from the sorter.

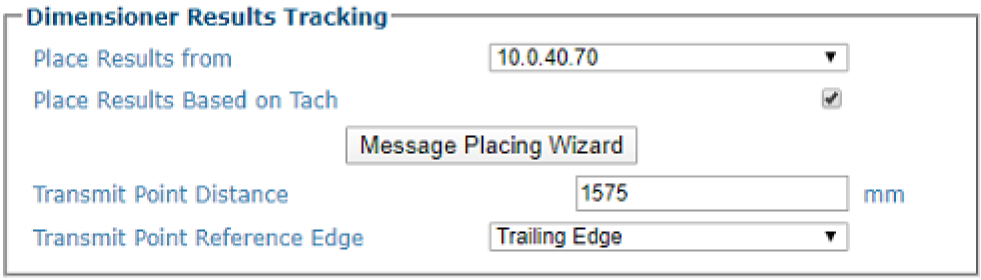


In a singulated system, a **Side-by-Side** (SBS) is an error condition in which these conditions are violated. The end-user wants to know when this happens (when their parcel flow has inadvertently become “non-singulated”), and Datalogic systems can tell them this by means of an SBS indicator in the Serial or Ethernet “host message.”

NOTE: If enabled, Object Detection parameters are revealed. See “Side by Side Verification Settings (Dimensioner only)” on page 114.



Dimensioner Results Tracking



Place Results from

If there is more than one dimensioner connected to your network, you can click the drop-down to select the IP Address of the dimensioner from which you wish to receive positioning data.

Place Results Based on Tach

Select the check-box to enable placement of the Dimensioning results based on the tachometer. This option works in conjunction with the DM3610 when the Datalogic Message is selected as it's transmit message format. the camera will receive the message at the defined Transmit Point Distance parameter.

Transmit Point Distance

Only appears when the Place Results Based on Tach check box is selected.

Enter the distance in the field provided. This is the distance at which the transmit point occurs and the camera is looking for the information from the DM3610/DC3000.

Message Placing Wizard

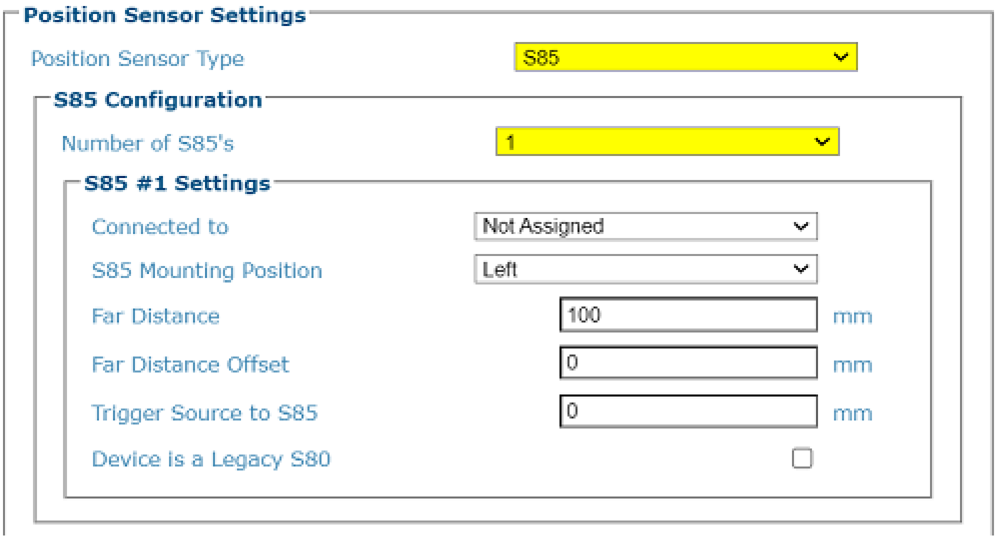
See “Diagnostics | Message Placing Wizard” on page 305

Transmit Point Reference Edge

This parameters deals with the transmit point of the DM3610 to the camera, not the transmit point of the camera to the host.

It will only appear when the **Place Results Based on Tach** check box is selected; however it is also terminology for the camera transmission to the host

S85 Configuration



Number of S85’s

Select None, 1 or 2 from the drop-down to specify the number of S85’s in your camera system.this number will change depending upon what is connected. The S85 is used to provide focusing data to a side read camera When a DM3610 is not used in the array, if the system is using a camera to read bar codes on the left and right side of the conveyor, then a second S85 will be used.

S85 #n Settings

Connected to

Select Not Assigned or a camera in the system to which the S85 is connected.

S85 Mounting Position

Click on the drop-down to select Top, Left or Right to specify the S85 position. This is in reference to the flow of product through the system not to which camera it will be providing the focus. A left mounted S85 provides focus for the right side camera.

Far Distance

Enter the S85 Far Distance. The Far Distance is the farther distance away from the camera that a label will be found. In most cases this is the far side of the conveyor, but there are some applications where the far side of the conveyor and the far working distance of the camera may be different. It is the Far Working Distance of the camera that the S85 is providing focus for.

Far Distance Offset

Enter the S85 Far Distance Offset. This value is used when the S85 is unable to be set to the correct distance due to some physical restriction. This value is added to the far of the S85 and counterbalances the focusing information. This value is subtracted from the far distance of the S85.

Trigger Source to S85

Enter the distance in inches from the trigger source to the S85.

Device is a Legacy S80

Click this check-box if your system uses the S80 Position Sensor(s).

Transmit Point Settings

Transmit Point Reference Edge

Select Leading Edge or Trailing Edge from the drop-down list to reference the leading or trailing edge of the package.

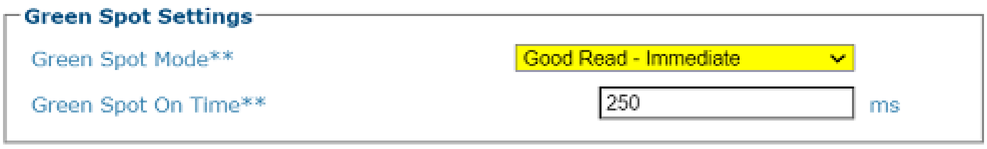
Distance to Transmit Point

Enter a delay distance from the edge of trigger that the camera will wait until it transmits the host message.

Transmit Point Advance

Enter the distance (amount of time) before (upstream) of the transmit point when the camera will stop decoding the image data to allow time to get the host message ready to transmit. This will help eliminate processing errors.

Green Spot Settings AV500 Only



Green Spot Mode

Select one of the following from the drop-down list:

- **Disabled**
- **Good Read - Immediate:** this option will light the green LED at the time of the bar code being decoded. In an array only the camera that read the bar code will light.
- **Good Read - Host Transmission:** this option will light the green LED when the package reaches the transmit point. In the on-line mode it will light when the trailing edge of the package leaves the trigger photo sensor. In the Packtrack mode it will light when the defined edge of the package, leading or trailing, arrives at the Distance To Transmit Point setting.

Green Spot On Time

Specify the amount of time in milliseconds that the Green Spot should remain on.

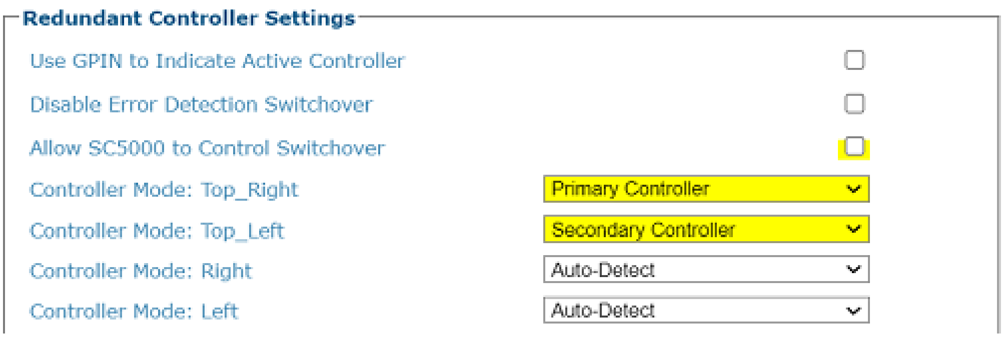
X-Press Button Settings AV500 Only)

X-Press Functionality

Select Enabled or Disabled from the drop-down.

Redundant Controller Settings

If your system requires redundant operation, these settings needs to be defined.



Use GPIN to Indicate Active Controller

Click the check-box to use GPIN to indicate the Active Controller. If this is selected, Input 3 of the primary and secondary controllers are set to indicate the active controller.

Disable Error Detection Switchover

Click this check-box to disable **Error Detection Switchover**. If checked the Switchover Parameters will not be available.

Allow SC5000 to Control Switchover

Click this check-box and the SC5000 controller will determine the switchover. The previous two parameters will not be available.

Controller Mode: Camera_1

Select the Controller Mode for the specific camera. This options appears for every AV family camera in the system.

- **Auto-Detect:** this option is used when multiple cameras are used in an array and there are two CBX's. All units in the array will check the status of the bit created by the IDNet jumper. The one that identifies the connection will become the controller. This option is used when the camera is in a redundant application. In this configuration there are two camera's that will be connected to a CBX510. When Auto-Detect is selected the camera that initializes first will become the DHCP controller and assume the 192.168.0.145 IP. The Secondary Controller will assume the 192.168.0.146 IP.

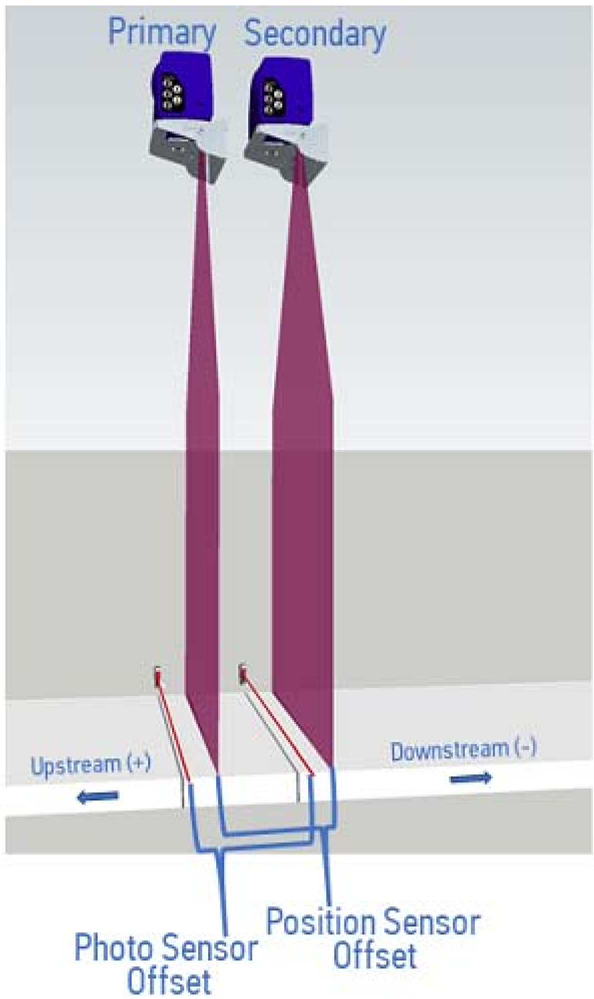
•**Primary Controller:** This option is used when a camera is in a redundant application. In this configuration there are two camera's that will be connected to a CBX510. You will identify which of the two camera's will always be the controller. Upon power up this camera will assume the DHCP responsibility and the Secondary will not come into play until the primary unit fails. When Auto-Detect is selected the camera that initializes first will become the DHCP controller and assume the 192.168.0.145 IP. The Secondary Controller will assume the 192.168.0.146 IP.

•**Secondary Controller:** This option is used when the camera is in a redundant application. In this configuration there are two camera's that will be connected to a CBX510. You identify which of the two camera's will always be Secondary. Upon power up this camera will assume the 146 IP address responsibility and will not come into play until the primary unit fails.

If one camera is designated as primary and another as secondary, these offsets will appear

Tracking Offsets Enable

Primary to Secondary Tracking Offsets (Upstream+, Downstream -)




Primary to Secondary Tracking Offsets (Upstream +,Downstream -)

Photo Sensor Offset	100
Position Sensor Offset	155

Photo Sensor Offset

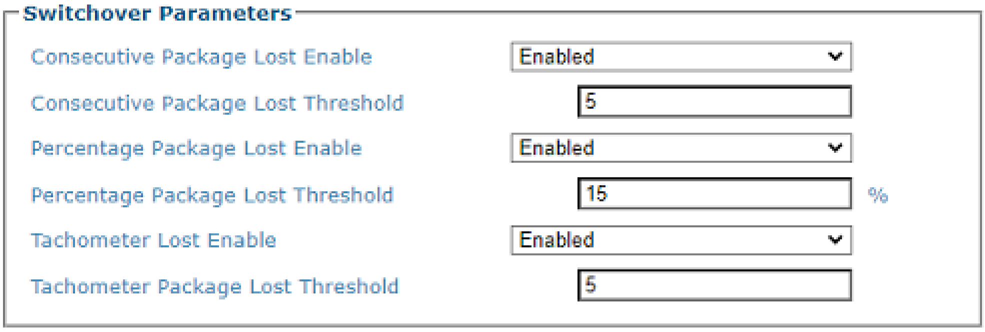
Enter the distance between the primary controller photo sensor and the secondary controller photo sensor.

Position Sensor Offset

Enter the distance between the primary controller position sensor and the secondary controller position sensor.

Switchover Parameters

If primary and secondary controllers are designated and Allow SC5000 to Control Switchover is not, the following Switchover options will appear.



Consecutive Package Lost Enable

Click the drop-down to select to enable or disable the Consecutive Package Lost Parameter.

Consecutive Package Lost Threshold

If enabled, enter the number of consecutive lost packages that occur before the system switches to the secondary controller.

Percentage Package Lost Enable

Click the drop-down to select to enable or disable the Percentage Package Lost Parameter.

Percentage Package Lost Threshold

If enabled, enter the percentage of consecutive lost packages that occur before the system switches to the secondary controller.

Tachometer Lost Enable

Click the drop-down to select to enable or disable the Tachometer Lost Parameter.

Tachometer Package Lost Threshold

If enabled, enter the number of consecutive Tachometers lost that occur before the system switches to the secondary controller.

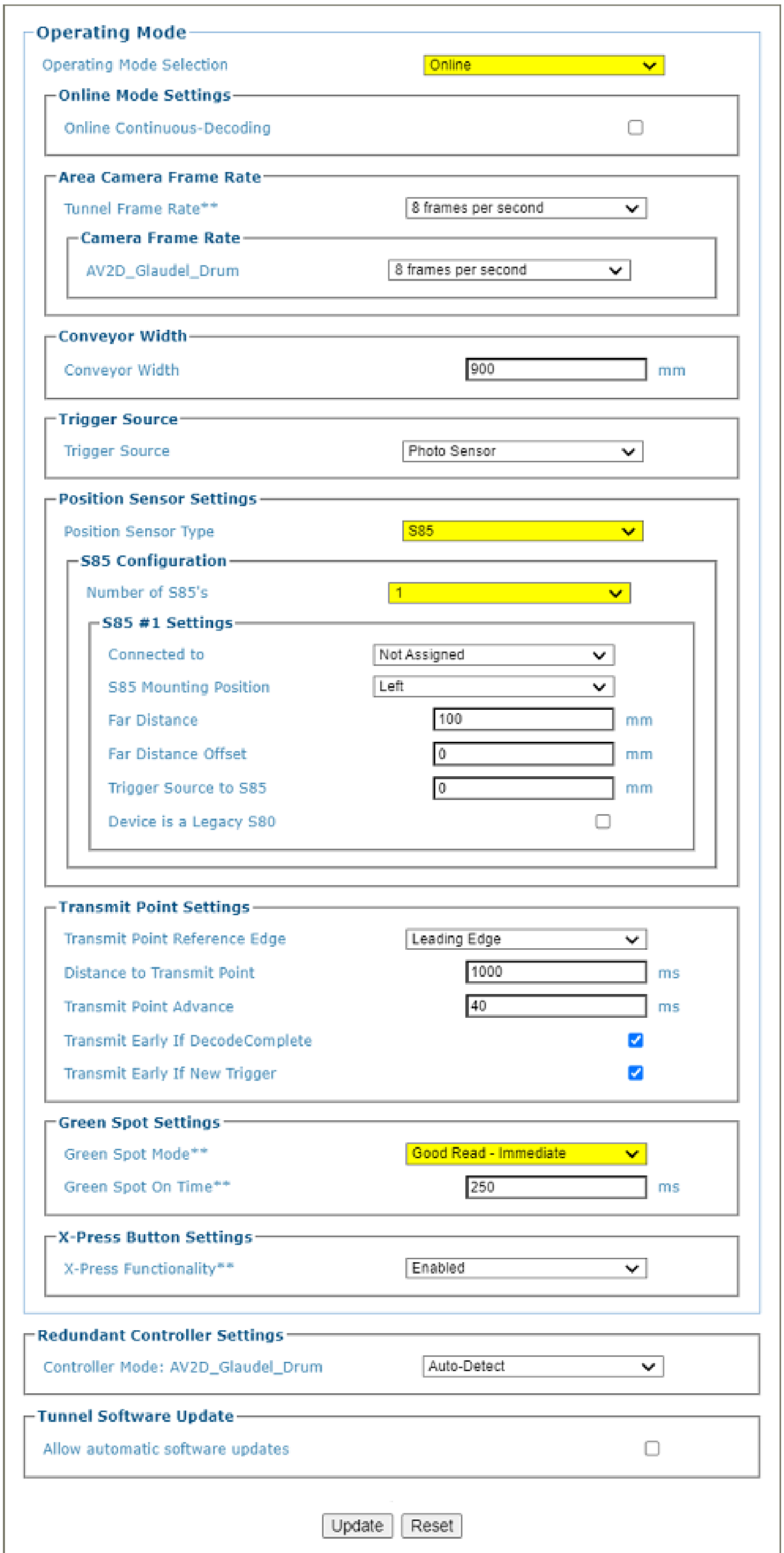
Allow automatic software updates

Select the check box to enable all cameras in the tunnel to automatically update when software is loaded to one of the cameras. This will not update software of different types on individual cameras, it is only intended to update the version of software currently on the camera.

When this item is selected, if a spare camera is connected to a tunnel, and it has a newer version of software, it will automatically upload it's software to the other 's in the tunnel.

This item should always be unselected unless otherwise instructed by Datalogic.

Online Mode



Online Mode Settings

Online Continuous-Decoding

Click the check-box to enable continuous decoding. When checked, the camera will try to decode an unlimited number of frames between an On and Off trigger, or until transmit point is reached. **Filter Incoming Duplicate Codes** under **Advanced Decode** is internally enabled to prevent the internal barcode buffer from filling up. Image Saving features are disabled. This feature is useful when a conveyor stops frequently. The same frame does not fill up the internal frame buffer, so when the conveyor starts again any frame afterwards is decoded.

Area Camera Frame Rate AV500 Only

Tunnel Frame Rate

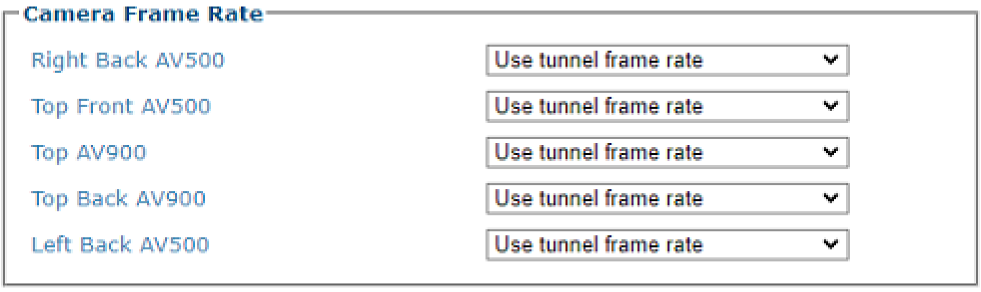
Select an appropriate Frame Rate from the drop-down list.

NOTE: This option is adjusted to best fit various applications. Contact Datalogic support to determine the correct setting.

- **8 frames per second**
- **16 frames per second**
- **24 frames per second**
- **32 frames per second**

Camera Frame Rate

If there are multiple AV500/900 cameras in a system, you can specify a tunnel frame rate for each specific camera. Use the options below to specify.



Select from the following:

- **Use tunnel frame rate**
- **8 frames per second**
- **16 frames per second**
- **24 frames per second**
- **32 frames per second**

Conveyor Width

Conveyor Width

Enter the conveyor width. The Conveyor Width is the area on the conveyor that a bar code can be read by the camera.

Trigger Source

Trigger Source

Select Position Sensor, Photo Sensor, or Trigger Message from the drop-down list.

•**Position Sensor:** triggers when selected position sensor senses a package.

•**Photo Sensor:** triggers when a photoelectric sensor is blocked. This can also be a contact closure or a 24VDC signal from a PLC.

•**Trigger Message:** triggers when a trigger message is received from an external device.

•**Ethernet / IP:** when a trigger message comes from PLC on Ethernet IP Connection

If you select Photo Sensor or Trigger Message as your Trigger Source, the following Trigger Source options are available.

Trigger Source to Position Sensor

Enter the distance in inches or millimeters from the Trigger Source to the Position Sensor if using a Photo Sensor, Trigger Message or Ethernet IP Trigger Source.

Trigger Controller

If Trigger Message is the Trigger Source, select which camera in your system is controlling the trigger message.

Position Sensor Settings (Primary Controller)

Position Sensor Type

Select No Position Sensor, Light Curtain, Dimensioner, S85, or S85 with Light Curtain from the drop-down list, depending on the specific position sensor used by the system.

Position Sensor Height Offset

Enter the distance between the light curtain's (light array's) zero height reference point and the conveyor's surface. This should be set to zero (0) for other, non-light curtain position sensors.

Position Sensor Transmit Delay

Enter the distance from the position sensor to the transmit point in the field provided.

DL Light Curtain Settings

Connected to

Select a camera in the system to which the light curtain is connected.

Multicast LC Focus Data

Select Disable or Enable from drop-down. Enable if you have a Light Curtain and there are multiple camera's that should use the Light Curtain signal for focusing.

Dimensioner Settings

Serial Focus Connected to

Click the drop-down to select from the available devices to specify which device is receiving the serial focus data.

Side by Side Verification

Select Enabled or Disabled from the drop-down list if your system requires Side by Side Verification. This is only available for Dimensioners.

Dimensioner Results Tracking

Place Results from

Click the drop-down to select; Single DM System Connected, or the IP address of the dimensioner results to use for Tracking.

Place Results Based on Tach

Select the check-box to enable placement of the Dimensioning results based on the tachometer. This option works in conjunction with the DM3610 when the Datalogic Message is selected as it's transmit message format. The camera will receive the message at the defined Transmit Point Distance parameter.

See “Diagnostics | Message Placing Wizard” on page 305

Transmit Point Distance

Enter the distance in the field provided.This is the distance at which the camera is looking for the information from the DM3610/DC3000 Transmit Point Reference Edge. This option is in reference to the DM3610 message to the camera.

This option is different than the "Distance To Transmit Point" which is the point where the camera transmits the host message

Transmit Point Reference Edge

Select Leading Edge or Trailing Edge from the drop-down list to reference the leading or trailing edge of the package.This option is in reference to the DM3610 message to the camera.

It is different than the Transmit Point Reference Edge which is the which is the package edge for the camera transmits the host.

S85 Configuration

Number of S85's

Select none, 1, or potentially 2 depending on the number of S85's needed for the application.

The 1 or 2 options will not appear unless the S85 is connected to the camera.

S85#n Settings

Connected to

Select Not Assigned or a camera in the system to which the S85 is connected.

S85 Mounting Position

Select Top, Left or Right to specify the S85 position. This is in reference to the flow of product through the system not which camera it will be providing the focus to.

Far Distance

Enter the S85 Far Distance. The Far Distance is the Far Working Distance of the camera that the S85 is providing focus for. In most cases this is the far side of the conveyor, but there are some applications where the far side of the conveyor and the far working distance of the camera can be different.

Far Distance Offset

Enter the S85 Far Distance Offset. This value is used when the S85 is unable to be set to the correct distance due to some restriction. This value is subtracted from the far Distance of the S85 and compensates the focusing information.

Trigger Source to S85

Enter the distance from the trigger source to the light curtain.

Device is a Legacy S80

Click this check-box if your system uses the S80 Position Sensor(s)

Transmit Point Settings

Transmit Point Reference Edge

Select Leading Edge or Trailing Edge from the drop-down list to reference the leading or trailing edge of the package.

Distance to Transmit Point

Enter the distance from the location of the trigger source to the host transmit point.

Transmit Point Advance

Enter the distance. This is the distance upstream of the transmit point when the camera will stop decoding the image data. This will help eliminate processing errors.

Transmit Early If Decode Complete

Click the check box to transmit when decode is completed.

Transmit Early if New Trigger

Click the check box to transmit when new trigger is received. This will keep the camera from misapplying the bar code data.

Green Spot Settings AV500 Only

Green Spot Mode

Select one of the following from the drop-down list:

•**Disabled**

•**Good Read** - Immediate: this option will light the green LED at the time of the bar code being decode. In an array only the camera that read the bar code will light

•**Good Read - Host Transmission:** this option will light the green LED when the package reaches the transmit point. In the on-line mode it will light when the trailing edge of the package leaves the trigger photo sensor. In the Packtrack mode it will light when the defined edge of the package, leading or trailing, arrives at the Distance To Transmit Point setting.

Green Spot On Time

Specify the amount of time is milliseconds that the Green Spot should remain on.

Redundant Controller Settings (Only appear if operating a Redundant System)

Controller Mode: Camera_1

Select one of the following from the drop-down list:

•**Auto-Detect:** This option is used when multiple cameras and CBX's are used and both can be controllers. This is considered a redundant application. In this configuration there are two camera's that will be connected to a CBX510. When Auto-Detect is selected the camera that initializes first will become the DHCP controller and assume the 192.168.0.145 IP. The Secondary Controller will assume the 192.168.0.146 IP. Both units can be DHCP Servers, however the .145 will assume responsibility for providing all cameras a Sync IP address. The secondary unit will assume .146 and the controller unit will see it as another camera.

•**Primary Controller:** This option is used when the camera is in a redundant application. In this configuration there are two camera's that will be connected to a CBX510. In this configuration you will identify which of the two cameras will assume DHCP responsibility. The secondary unit will not come into play until the primary unit fails.

•**Secondary Controller**: This option is used when the camera is in a redundant application. In this configuration there are two camera's that will be connected to a CBX510. When Primary Controller is selected the camera selected as the Primary Controller will become the DHCP controller and assume the 192.168.0.145 IP. The Secondary Controller will assume the 192.168.0.146 IP.

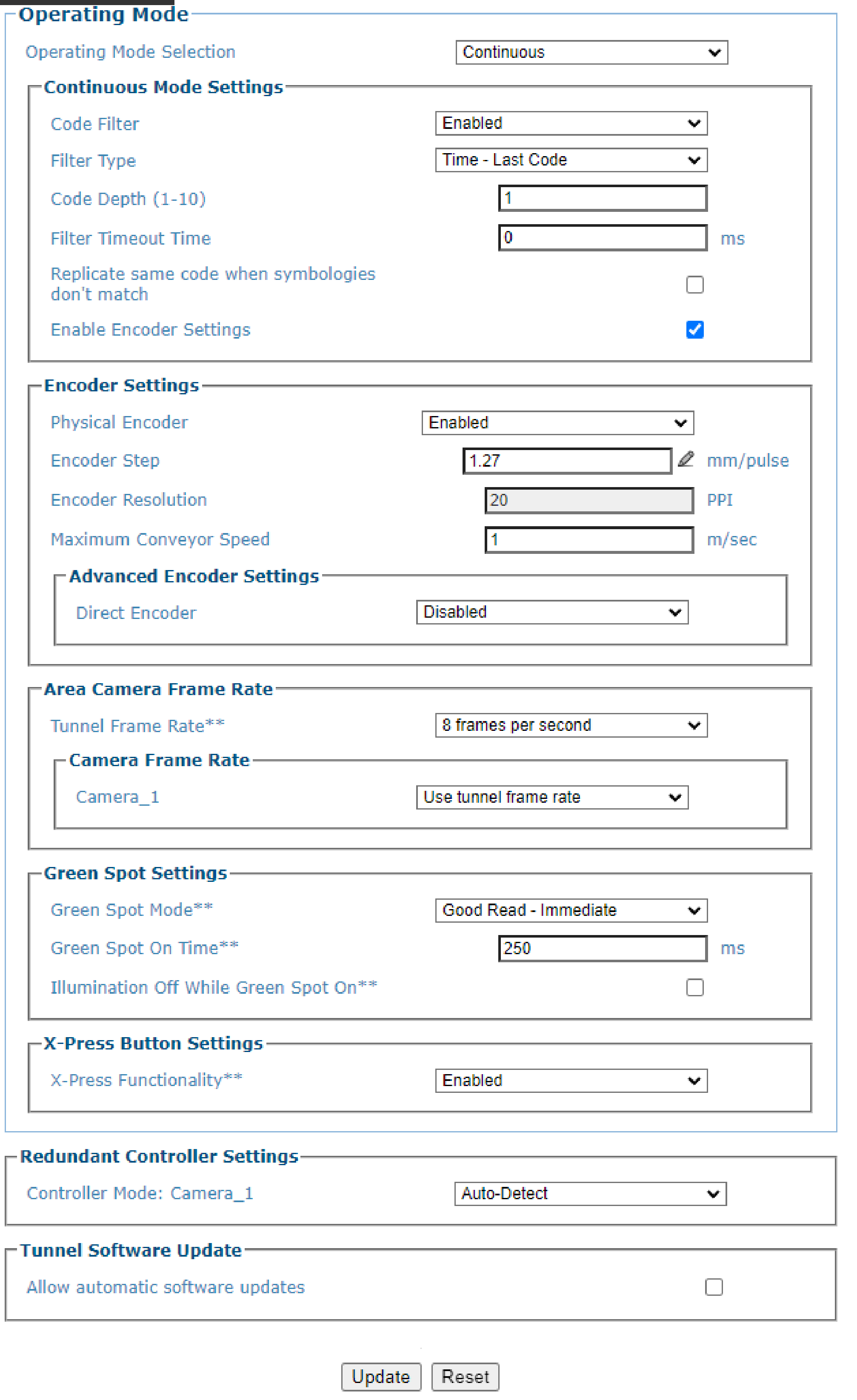
Tunnel Software Update

Allow automatic software updates

Select the check box to enable all cameras in the tunnel to automatically update when software is loaded to one of the cameras. When this item is selected, if a spare AV500 is connected to a tunnel, and it has a newer version of software, it will automatically upload it's software to the other camera's in the tunnel.

This item should always be unselected unless otherwise instructed by Datalogic

CONTINUOUS MODE



Continuous Mode Settings

Code Filter

Select Enabled or Disabled from the drop-down. If enabled code filter options become available. The camera offers several different conditions associated to the Continuous Mode Settings. These different options allows the user to configure the camera to accommodate Such conditions as reading unique bar code data, restrict reading the same bar code by time (ms), or by distance (mm).

Filter Type

Select one of the following from the drop-down:

- **None:** when None is selected the camera will continue to transmit the bar code data as long as the bar code is held under the camera.
- **New Unique Code:** When selected will read new unique bar codes. The camera stores the data in a memory location and transmits this data to the host. It will then continue to look for bar code data. If the bar code data read by the camera matches the data that is stored in memory, the cameras will not transmit it a second time to the host. If the bar code data is different, the camera will add the new bar code data to the memory location and transmit the new data to the host. When the memory if full, the oldest bar code is overwritten by a new unique code.
- **Time - First Code/Last Code:** First Code/Last Code: Since the camera is an area camera it will acquire images up to 32 frames per second. The first and last option is in respect to the bar code images found. When the First option is selected the camera will use the first image with a decoded bar code to start the timer. If the last code is selected, the camera will use the last decoded image to start the timer. The camera will read a bar code and place the data into a memory location. It will then start an internal timer. When the camera reads another bar code it will check the new bar code data with the previous data stored in memory. If the new bar code data matches any previous data the camera will check the timer. If the time appointed has not been exceeded, and the data exists in memory, the camera will not transmit the data to the host. if the data matches and the timer times out, the camera will transmit the data to the host.If the new bar code data is different than any of the bar codes in memory the camera will add the new bar code data in memory and transmit the new bar code data to the host. When the memory if full, the oldest code is overwritten by a new unique code, regardless whether the oldest code has expired.
- **Distance - First Code/Last Code:** First Code/Last Code: operates the same as time, but the tachometer is used to measure distance. the camera will not transmit that bar code data again until it has not been decoded or the conveyor has traveled the specified distance as defined here. When the memory if full, the oldest code is overwritten by a new unique code, regardless whether the oldest code has expired.

Code Depth

Specify the number of unique codes to be saved in memory and checked against incoming codes.

Filter Timeout Time

When the Filter Type is selected the Filter Timeout Time option is made available. this option allows the user to set the time before the camera will transmit the same bar code data as the previous decode. Enter time in milliseconds.

Replicate same code when symbologies don’t match

Click the check-box to transmit the same bar codes when contain the same data but they are not the same symbology.

Enable Encoder Settings

Click the Check-box to enable encoder settings. The Enable Encoder Settings is used when the bar code data is compared by distance rather then time.When this option is enabled the Distance - First Code and Distance - Last Code filter types are made available.

Encoder Settings

Physical Encoder

Select Disable or Enable from the drop-down list:

- **Disable:** External encoder is disabled, and internal encoder is active
- **Enable:** A physical encoder is connected to the Encoder input and is enabled

Encoder Step (mm/pulse)

Click to activate the Encoder Step input form. Enter the Encoder Wheel Circumference in the field provided and select the in or mm option. Enter the Pulses / Revolution in the field provided (See the table below for values). Click Submit to save the values, or click Cancel to return to the Operating Mode window.

Encoder Resolution

Displays the encoder/tachometer resolution in pulses per inch (PPI) based on the Encoder Step calculation. This field cannot be edited.

Maximum Conveyor Speed (m/sec)

When Physical Encoder is Disabled, enter the conveyor speed in meters per second in the field provided (see formula below).

When Physical Encoder is Enabled, enter the maximum belt speed using the formula below. Setting the belt speed too high will affect image quality; setting it too low will give you an exceeded maximum line rate error when the belt exceeds this setting.

Formula: Max conveyor speed x 1.05

Advanced Encoder Settings

The settings are available when Physical Encoder is set to Enabled above.

Direct Encoder

Select Disable or Enable from the drop-down list. Direct encoder is a high-resolution encoder/ tachometer used in start/stop applications.

Area Camera Frame Rate AV500 ONLY

Tunnel Frame Rate

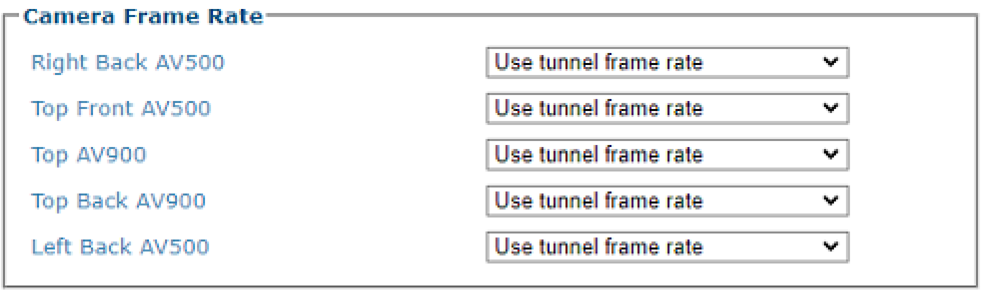
Select an appropriate Frame Rate from the drop-down list.

NOTE: This option is adjusted to best fit various applications. Contact Datalogic support to determine the correct setting.

- **8 frames per second**
- **16 frames per second**
- **24 frames per second**
- **32 frames per second**

Camera Frame Rate

If there are multiple AV500/900 cameras in a system, you can specify a tunnel frame rate for each specific camera. Use the options below to specify.



Select from the following:

- **Use tunnel frame rate**
- **8 frames per second**
- **16 frames per second**
- **24 frames per second**
- **32 frames per second**

Green Spot Settings AV500 Only

Green Spot Mode

Select one of the following from the drop-down lists:

- **Disabled**
- **Good Read - Immediate:** this option will light the green LED at the time of the bar code being decode. In an array only the camera that read the bar code will light
- **Good Read - Host Transmission:** this option will light the green LED when the package reaches the transmit point. In the on-line mode it will light when the trailing edge of the package leaves the trigger photo sensor. In the Packtrack mode it will light when the defined edge of the package, leading or trailing, arrives at the Distance To Transmit Point setting.

Green Spot On Time

Specify the amount of time is milliseconds that the Green Spot should remain on.

Illumination Off While Green Spot On

Click the check-box to turn of Illumination while Green Spot is on. This may help you use Green Spot to line up the camera.

X-Press Functionality

Select Enabled or Disabled from the drop-down.

Redundant Controller Settings

Controller Mode: Camera_1

Select one of the following from the drop-down list:

- **Auto-Detect:** This option is used when the camera is in a redundant application. In this configuration there are two camera's that will be connected to a CBX510. When Auto-Detect is selected the camera that initializes first will become the DHCP controller and assume the 192.168.0.145 IP. The Secondary Controller will assume the 192.168.0.146 IP.
- **Primary Controller:** This option is used when the camera is in a redundant application. In this configuration there are two camera's that will be connected to a CBX510. When Primary Controller is selected the camera selected as the Primary Controller will become the DHCP controller and assume the 192.168.0.145 IP. The Secondary Controller will assume the 192.168.0.146 IP.
- **Secondary Controller**: This option is used when the camera is in a redundant application. In this configuration there are two camera's that will be connected to a CBX510. When Primary Controller is selected the camera selected as the Primary Controller will become the DHCP controller and assume the 192.168.0.145 IP. The Secondary Controller will assume the 192.168.0.146 IP.

Tunnel Software Update

Allow automatic software updates

Select the check box to enable all cameras in the tunnel to automatically update when software is loaded to one of the cameras.

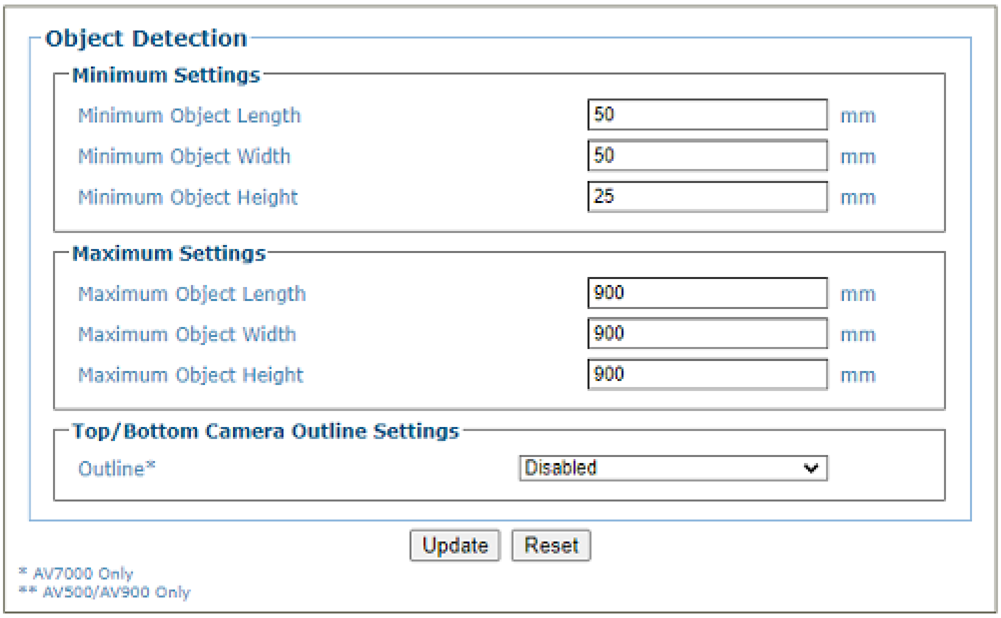
3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

OBJECT DETECTION

Use **Object Detection** to set the minimum and maximum size parameters for objects (packages) in your system.

To edit the system Object Detection:

1. In the menu tree under **Modify Settings**, navigate to **Global Settings | Object Detection**. The **Object Detection** window opens.



2. Enter the appropriate information in the form as described below:

PACKTRACK MODE

If **PackTrack Mode** has been selected as the Operating Mode the following parameters will be available.

Minimum Settings

Enter the minimum detection size settings for object length, width and height in the fields provided.

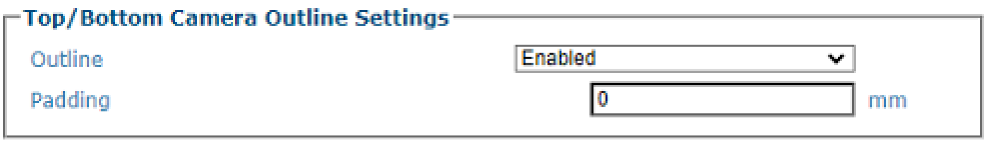
NOTE: The maximum box height setting will effect the number of leading or trailing images the camera will collect. Since the camera doesn't measure the distance the package is from the camera, it will take the maximum box height entered here and collect images accordingly.

Maximum Settings

Enter the maximum detection size settings for object length, width and height in the fields provided.

Top/Bottom Camera Outline Settings AV7000 ONLY

Click the drop-down to select **Enable** or **Disable**. Enable the Top/Bottom Camera Outline Settings and a Padding option appears.



Outline

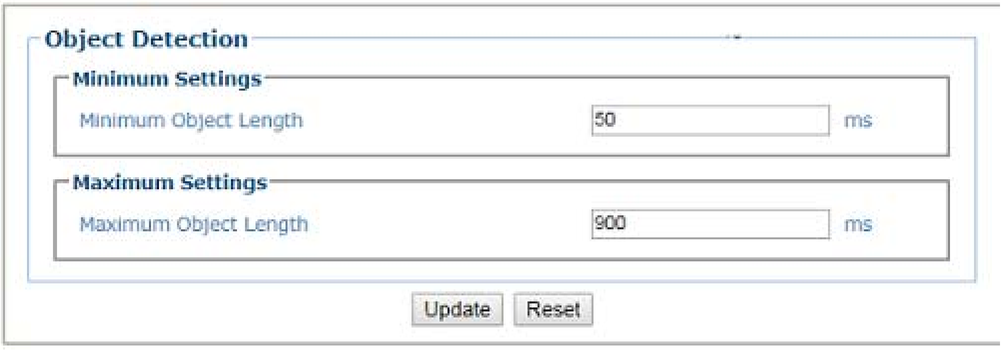
Click the drop-down to **Enable** or **Disable** the Outline setting.

Padding

Enter a value to use for padding between the outline and the image.

Online and Continuous Mode

If **Online or Continuous Mode** has been selected as the Operating Mode, the following parameters will be available.



Minimum Settings

Enter the minimum detection size setting for the object length.

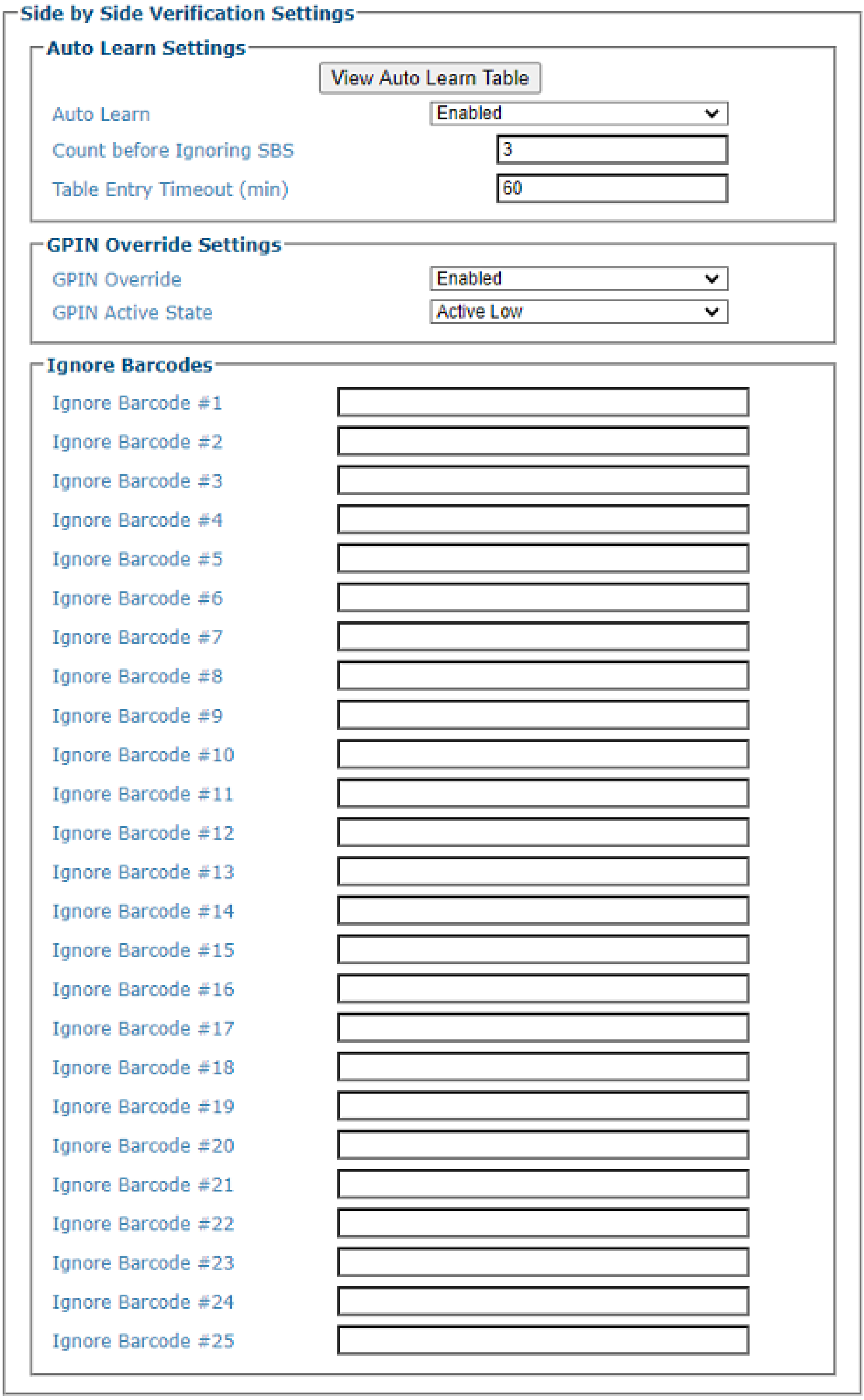
Maximum Settings

Enter the maximum detection size setting for the object length.

Side by Side Verification Settings (Dimensioner only)

If **Side by Side Verification have been enabled in Operating Mode,** several parameters are revealed.

The Dimensioner has the ability to indicate when packages are too close to one another on the belt. This is called a **Side By Side Condition**. However some parcels like cases of water can cause a false identification by the Dimensioner. The Side by Side Verification Settings options allow the AV500/900 to use the bar code data to ignore the SBS message from the dimensioner.



Auto Learn Settings

Auto Learn

Click on the drop-down to select **Disable** or **Enable**. When Auto Learn is enabled Count Before Ignoring SBS, and Table Entry Timeout parameters are revealed.

Auto Learn sets the camera to keep track of the bar codes read and identifies those with an SBS message associated. If the barcode does have the SBS message, the camera starts a counter. If it receives consecutive SBS messages for that bar code within the "**Count Before Ignoring SBS**" value, the camera ignores the SBS condition sent by the dimensioner for the amount of time entered in the "**Table Entry Timeout value**".

View Auto Learn Table

Click the **View Auto Learn Table** button and the following table is revealed.

Barcode Data	Match Count	Filtered Count	Active Time (min)

Count before Ignoring SBS

Enter the Count Before Ignoring SBS value. If SBS is enabled, this value tells the camera that when the Dimensioner identifies a package as SBS, it must also consider the package an SBS until the it receives the number of SBS identified packages entered here.

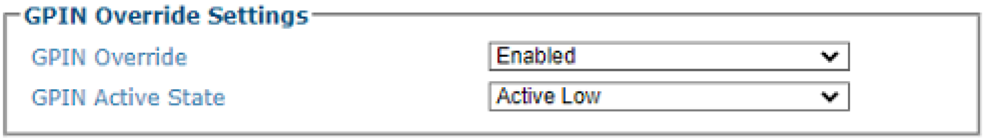
Table Entry Timeout (min)

Enter the amount of time the SBS Condition will be ignored for.

GPIN Override Settings

GPIN Override

Select **Enabled** or **Disabled** from the drop-down. If Enabled, the GPIN Override allows for a relay input, which when activated, overrides the camera option to filter bar codes for determining SBS conditions.



GPIN Active State

Select **Active Low** or **Active High** from the drop-down. This defines which state will activate the relay.

Ignore Barcodes

Manually enter barcodes that you would like to ignore SBS conditions for.

Ignore Barcode #N

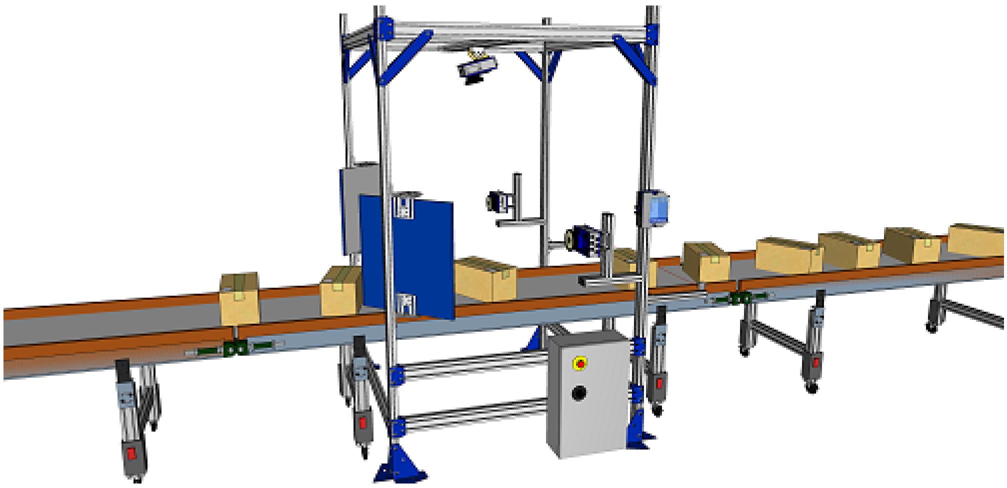
Enter the barcodes to ignore. You can enter up to 25.

3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

AV500 TIMING AND DISTANCE DIAGRAMS

It is important to identify the distance/timing between the critical devices in an AV500/ AV900 camera system. These include:

- Distance from trigger source to position sensor
- Distance from position sensor to AV500
- DM3610/Dual Headed scan line to DM3610 focus data transmit point



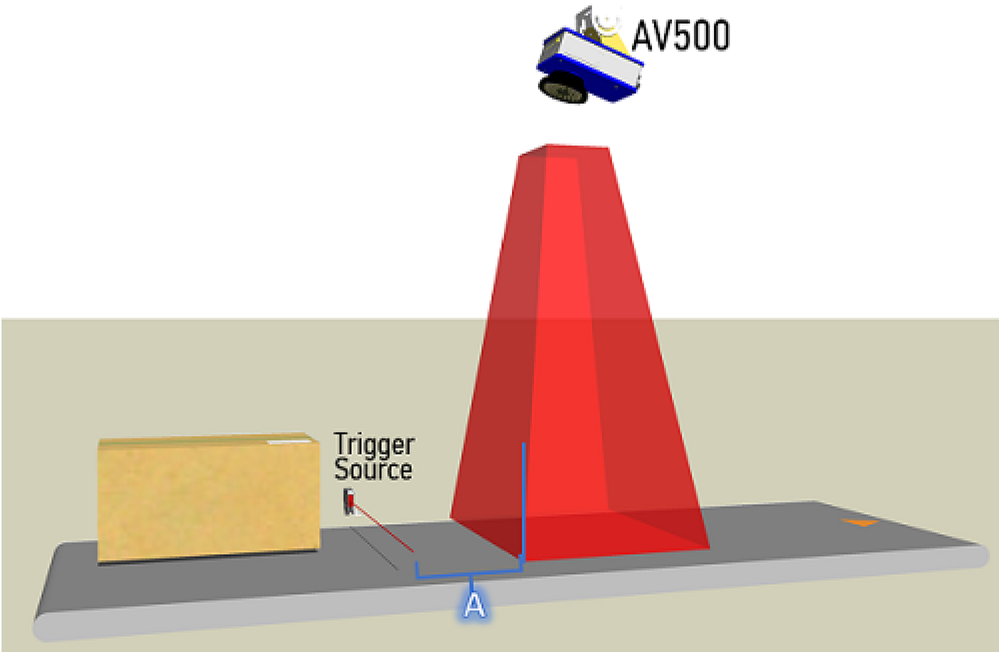
Three AV500s and a Single S85 Configuration

All configurations use a photo sensor as the trigger source. The position sensors identified in the document include:

- "Fixed Focus Single Trigger Source" on page 118
- "Focusing with a Light Curtain" on page 119
- "Focusing with a Light Curtain and S85" on page 120
- "Focusing with S85's" on page 121
- "Focusing with a Single DM3610" on page 122
- "Focusing with a Dual DM3610 System" on page 123

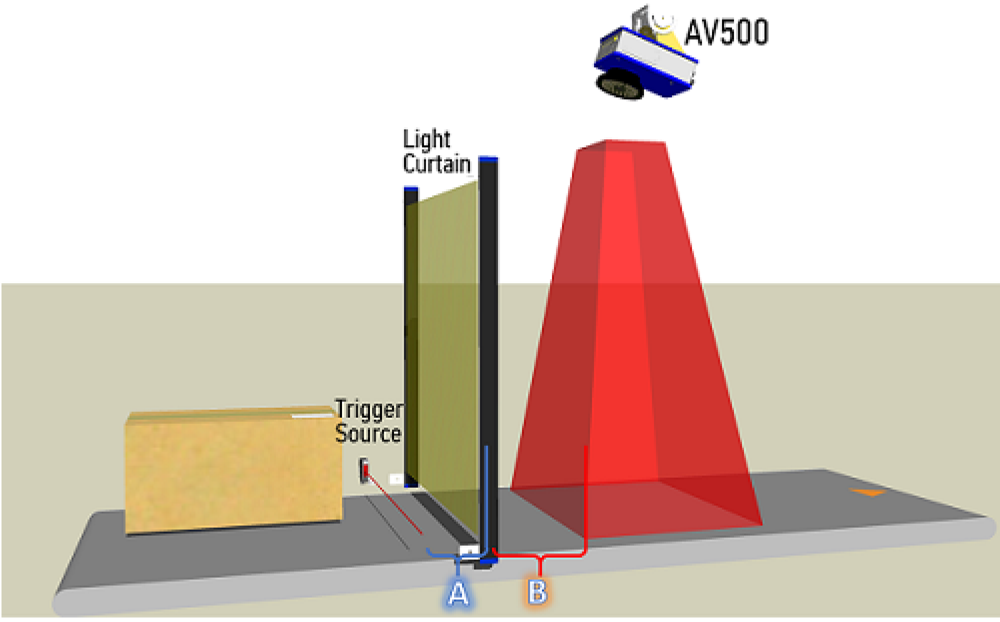
Fixed Focus Single Trigger Source

Identifier	Item 1	Item 2	Distance	
			Standard (in.)	Metric
A	Trigger Source	AV500	5 or 10	127 or 254



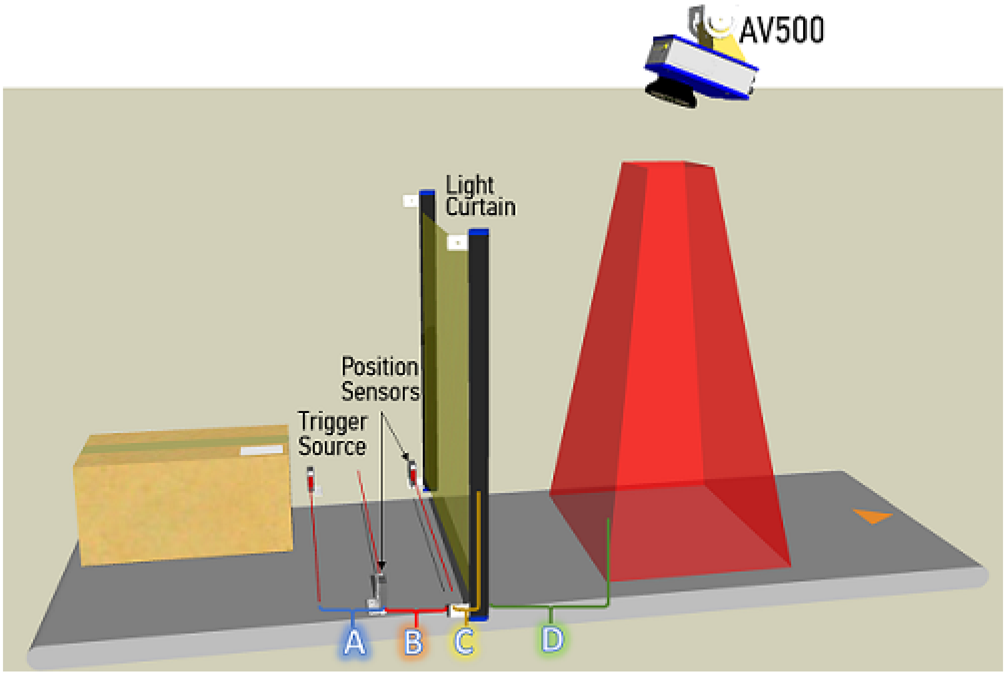
Focusing with a Light Curtain

Identifier	Item 1	Item 2	Distance	
			Standard (in.)	Metric
A	Trigger Source	Light Curtain	5	127
B	Light Curtain	AV500	12	305



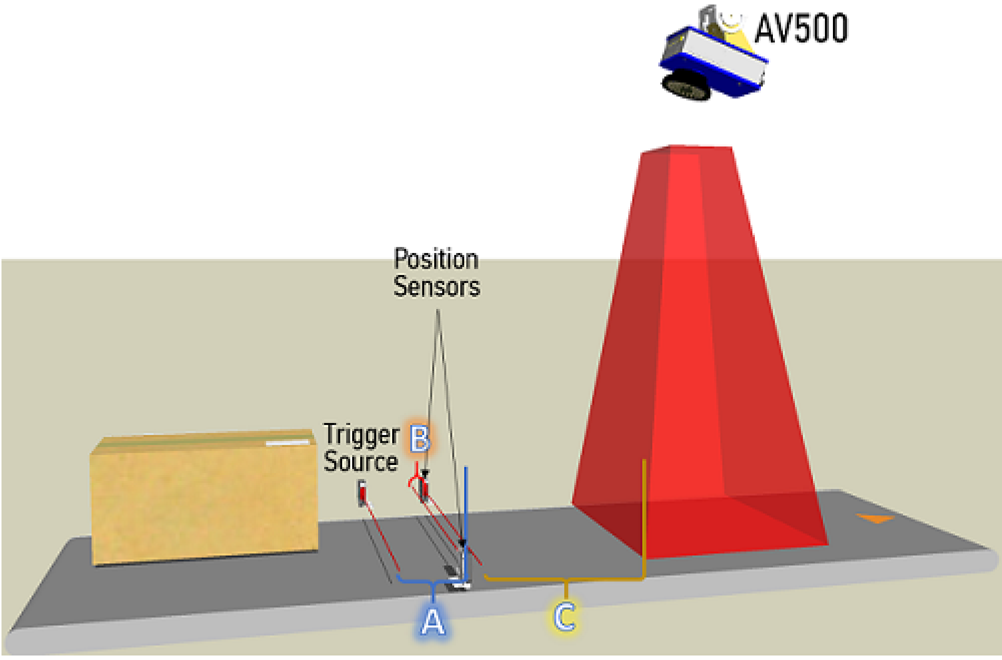
Focusing with a Light Curtain and S85

Identifier	Item 1	Item 2	Distance	
			Standard (in.)	Metric
A	Trigger Source	S85 #1	5	127
B	S85 #1	S85 #2	5	127
C	S85 #2	Light Curtain	No distance required	
D	Light Curtain	AV500	12	305
Position Sensor Delay				127



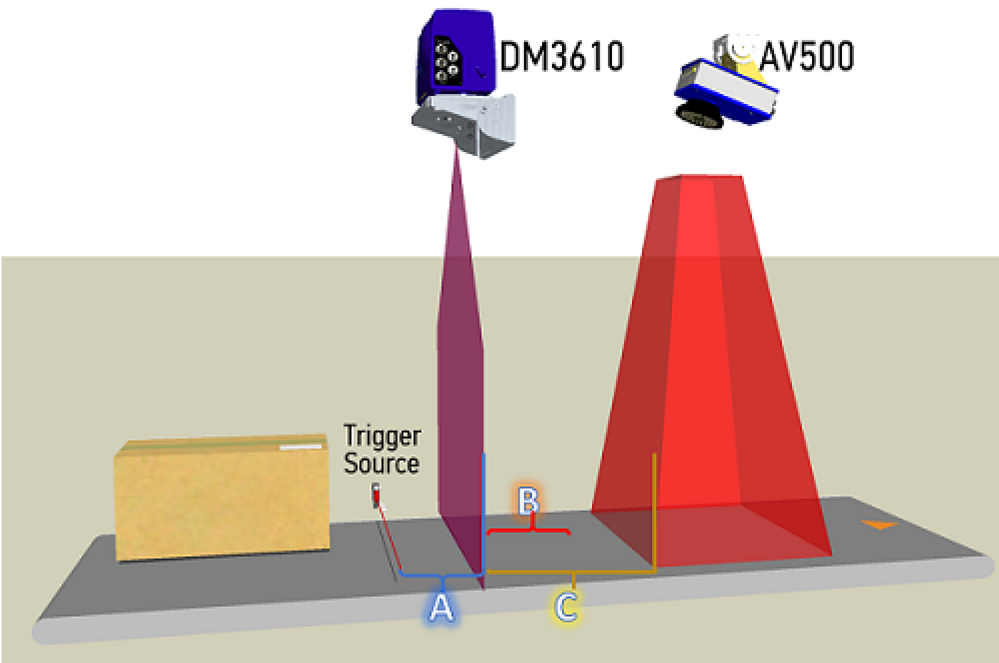
Focusing with S85's

Identifier	Item 1	Item 2	Distance	
			Standard (in.)	Metric
A	Trigger Source	S85 #1	5	127
B	S85 #1	S85 #2	1	25.4
C	S85 #2	AV500	12	305



Focusing with a Single DM3610

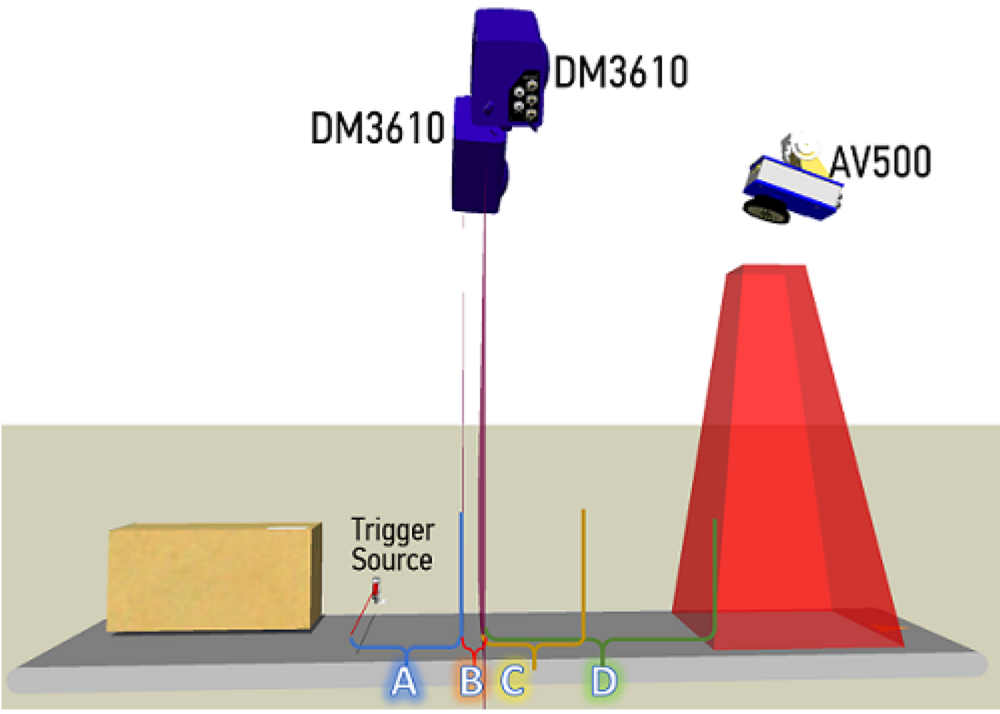
Identifier	Item 1	Item 2	Minimum Distance	
			[in]	[mm]
A	Trigger Source	DM3610	5	127
B	DM3610 Scanline	Focus Xmit Point	5	127
B note:	The "B" distance number is inserted into the **Focus Transmit Point** in the DM3600 and the **Position Sensor Transmit Delay** in the AV7000			
C	DM3610 Scanline	AV500		
		Speed [ft/min]	Minimum Distance	
			[in]	[mm]
		300	15.4	391
		400	17.7	450
		500	20.0	508
		600	22.3	566



Focusing with a Dual DM3610 System

Identifier	Item 1	Item 2	Minimum Distance	
			[in]	[mm]
A	Trigger Source	DM3610 #1	5	127
B	DM3610 Scanline #1	DM3610 #2	1.5 to 10	38 to 254
C	DM3610 Scanline #1	Focus Xmit Point	B + 10	B + 254
C note:	The “C” distance number is inserted into the **Focus Transmit Point** in the DM3600 and the **Position Sensor Transmit Delay** in the AV7000			
D	DM3610 Scanline #2	AV500		

	Speed [ft/min]	Minimum Distance	
		[in]	[mm]
	300	20.4	518
	400	22.7	577
	500	25.0	635
	600	27.3	693



DETERMINING THE DISTANCE TO TRANSMIT POINT FOR AV500/900 APPLICATIONS

A critical parameter to consider when identifying the transmit point for an AV500/900 camera system is the length of time the decode engine takes to process each image. This is referred to in this document as processing time. There are several parameters that will help you determine what this processing time should be for your system.

"Enable and Determine the Strict Process Time Limit" on page 124

"DM3610 or Dual Headed DM3610/DC3000 Application" on page 127

"Disable Strict Process Time Limit" on page 130

Enable and Determine the Strict Process Time Limit

In most cases you will want to select **Enable Strict Process Time Limit**. This setting limits the amount of time the camera should spend processing each image and prevents the camera from getting hung up on a single image for too long.

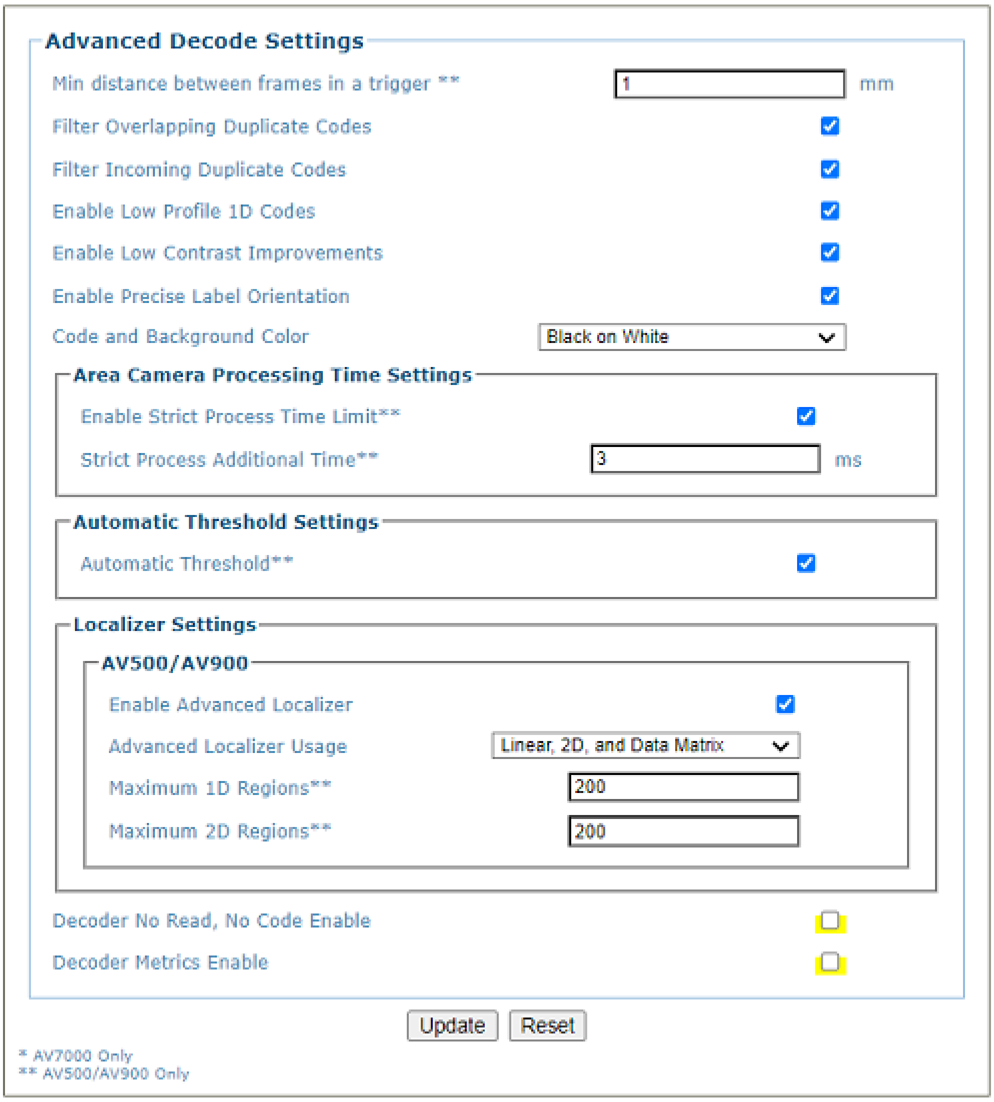
AV500 1.2.0.12 Version Software or older

To edit the Enable Strict Process Time Limit | Advanced Decode Settings:

1. In the menu tree under **Modify Settings,** navigate to **Global Settings | Advanced Decode.** The **Advanced Decode** window opens.

2. Select the check-box for **Enable Strict Process Time Limit**.

3. Enter a **Strict Process Time Limit**. Default is 35.



NOTE: The strict process time limit should be changed according to the Frames Per Second (FPS) settings. Use this table as a guide.

Frame Rate (FPS)	Processing Time (ms)
8	125
16	63
32	42
64	32

4. Click **Update** to save your changes.

AV Family 5.0 Version Software

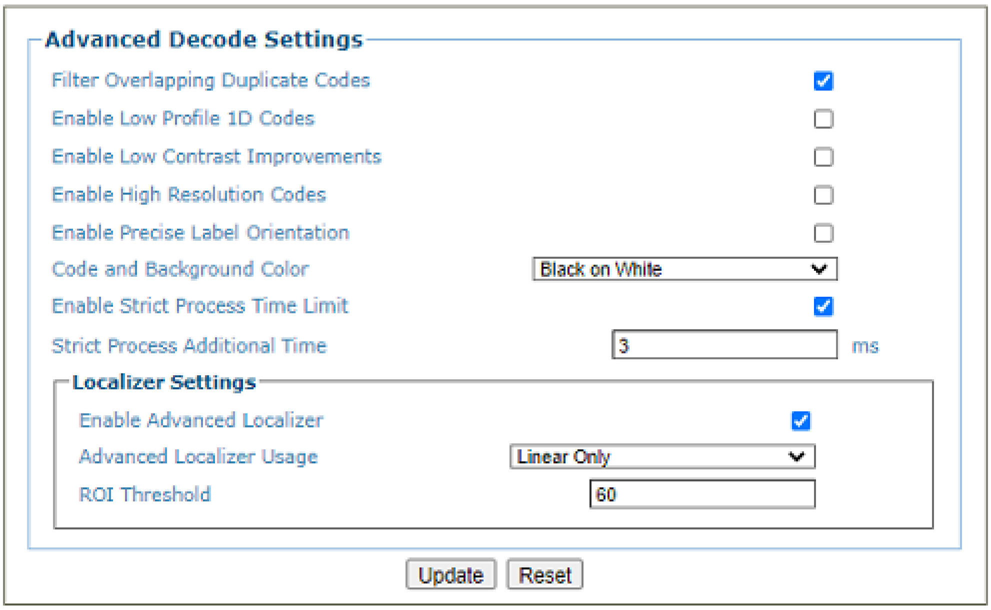
To edit the Enable Strict Process Time Limit | Advanced Decode Settings:

1. In the menu tree under **Modify Settings,** navigate to **Global Settings | Advanced Decode.** The **Advanced Decode** window opens.
2. Select the check-box for **Enable Strict Process Time Limit**. The default is 3. This process time limit is based upon what Frame Rate you choose.

NOTE: The strict process time limit should be changed according to the Frames Per Second (FPS) settings. Use this table as a guide. These numbers are hard coded in the software and are not visible to the user. They are presented here to use in the formulas.

Frame Rate (FPS)	Processing Time (ms)
8	125
16	63
32	42
64	32

3. You can also set **Strict Process Additional Time** if required.



4. Click **Update** to save your changes.

Record the Strict Process Time Limit

AV500 1.2.0.12 Version Software or older

Whatever amount of time you entered.

AV Family 5.0 Version Software

The Time listed based upon the camera frame rate defined in **Operating Mod**e plus any additional time you defined.

DM3610 or Dual Headed DM3610/DC3000 Application

When working with a DM3610 or Dual Head DM3610 tunnel the **Transmit Point** is measured from the Trigger Source, whether a photo eye or a read now signal from a PLC, to the last scan point.

Processing time may need to be added to allow for the decode engine to complete decoding all of the barcodes. To accommodate this you can calculate a Distance to Transmit Point that provides for this processing time.

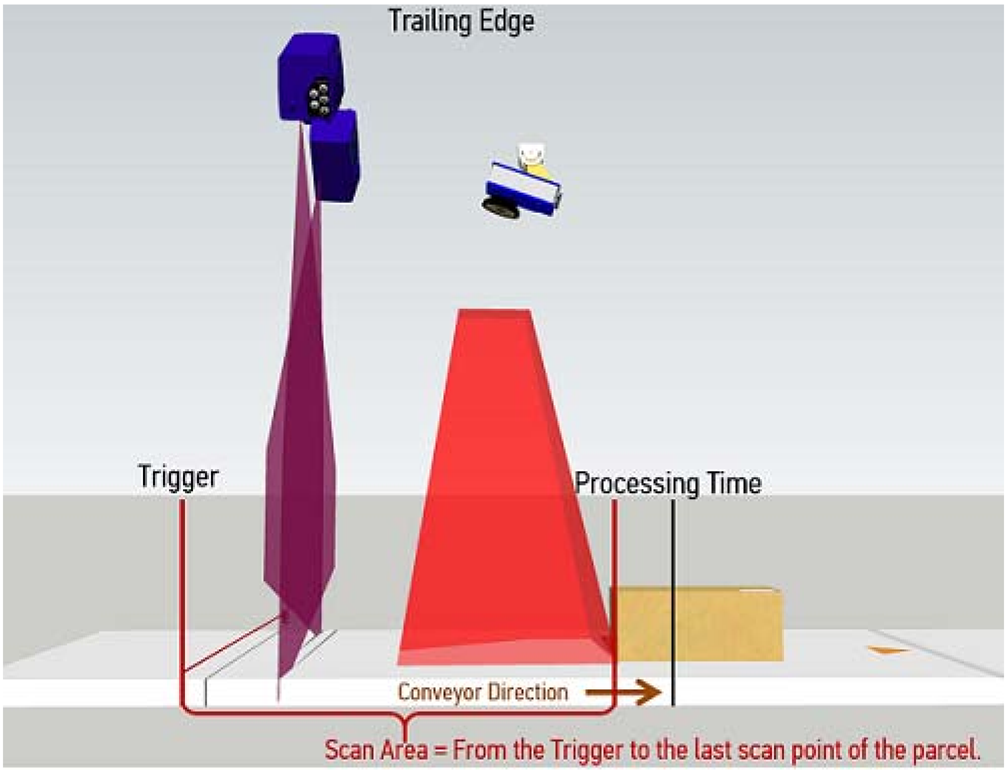
Obtain the Conveyor Speed

In the menu tree under **Modify Settings,** navigate to **Diagnostics | System Status.** The **System Status** window opens. **Belt Speed** is indicated in the **System Status** screen as Belt Speed. **When the belt is running the Belt Speed will be indicated.**

Belt Speed(mm/s)	0
Belt Speed(fpm)	0
Encoder Frequency Hz	0

Trailing Edge

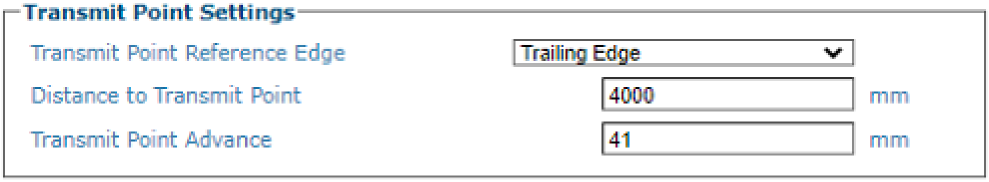
If the transmit point is from the **Trailing Edge** of the package, the Trailing Edge of the package must pass the last camera scan line in the tunnel before the message is transmitted. The processing time must be set to allow for the decode engine to complete the decoding of the bar codes.



Measure from the Trigger Source to the Last Scan Point and record your measurement as the **Scan Area**.

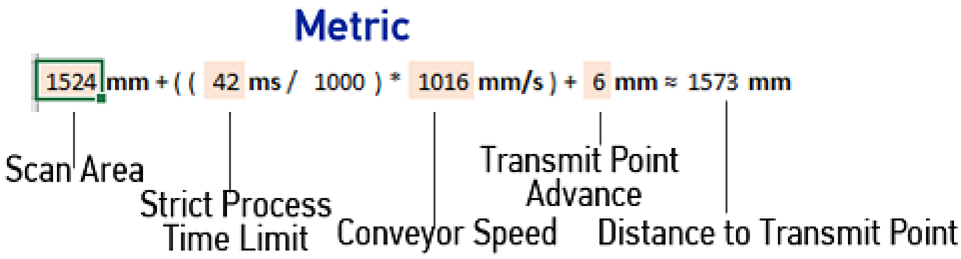
Calculate the Distance to Transmit Point using the following formula:

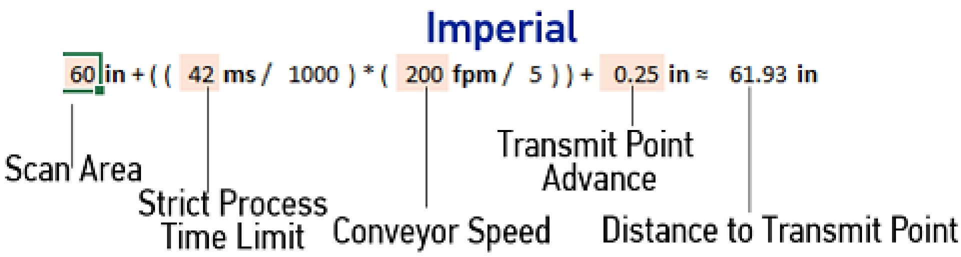
Scan Area + (Strict Process Time Limit * Conveyor Speed) + Transmit Point Advance = Distance to Transmit Point



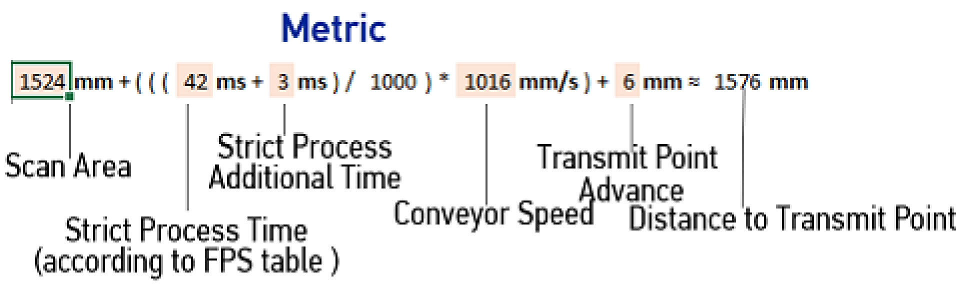
Enter your calculation as the **Distance to Transmit Point.**

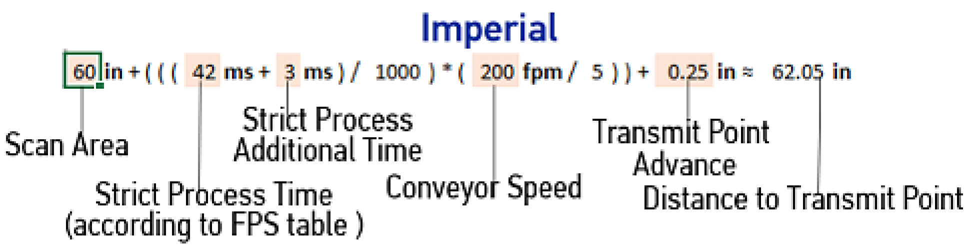
Example Calculation 1.2.0.12 Version Software or older:





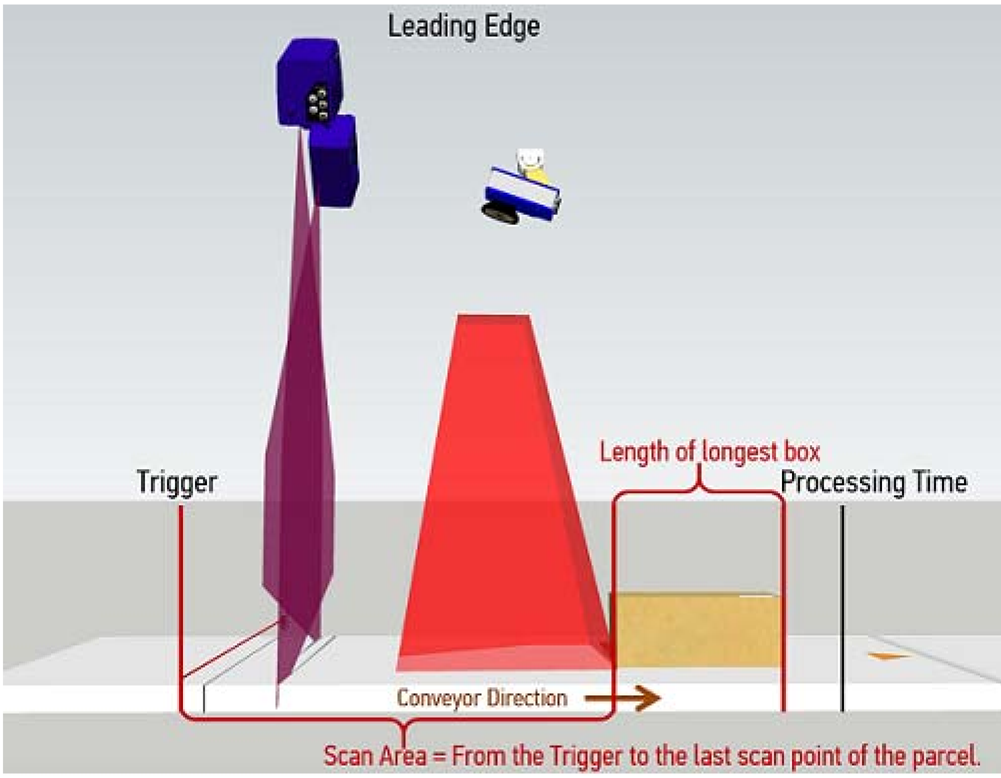
Example Calculation 5.0 Version Software:





Leading Edge

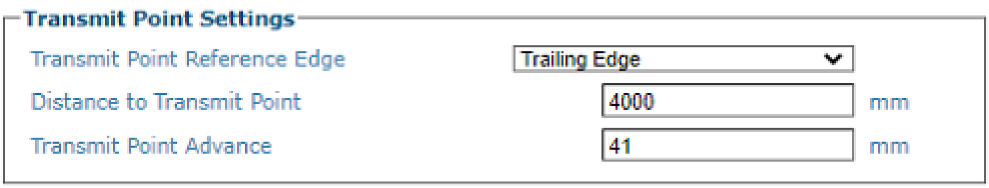
If the transmit point is from the **Leading Edge** of the package, the Leading Edge of the package must pass the last camera scan line in the tunnel before the message is transmitted. Because it is the Leading Edge or front end of the box, more processing time is required, so we also add the length of the longest box in the system.



Measure from the Trigger Source to the Last Scan Point and record your measurement as the **Scan Area**.

Calculate the Distance to Transmit Point using the following formula:

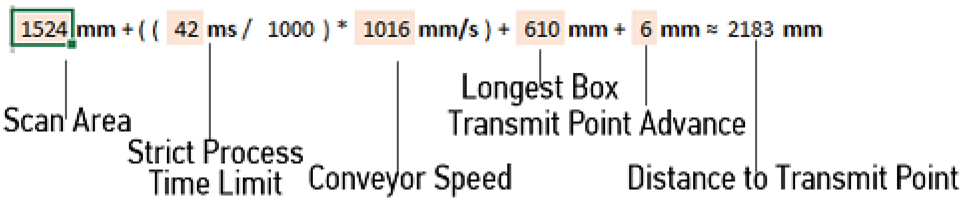
Scan Area + (Strict Processing Time * Conveyor Speed) + Longest Box Length + Transmit Point Advance = Distance to Transmit Point



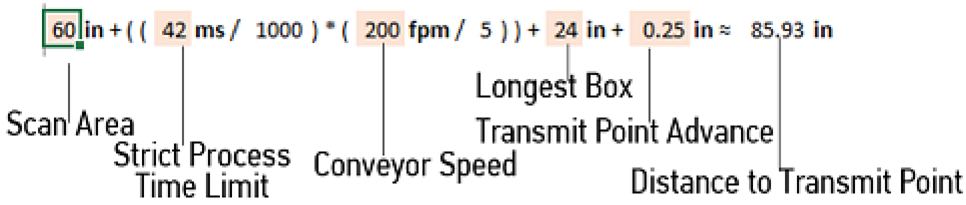
Enter your calculation as the **Distance to Transmit Point.**

Example Calculation 1.2.0.12 Version Software or older:

Metric

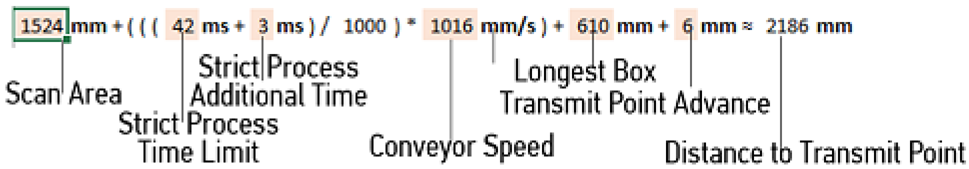


Imperial

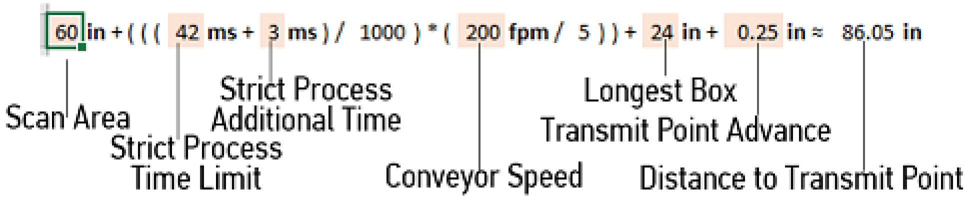


Example Calculation 5.0 Version Software:

Metric



Imperial



Disable Strict Process Time Limit

If you have chosen to disable the Strict Process Time Limit or not select the check-box, use the following formula:

Trailing Edge:

Scan Area + (150 ms * Conveyor Speed) + Transmit Point Advance = Distance to Transmit Point

Leading Edge:

Scan Area + (150 ms * Conveyor Speed) + Longest Box Length + Transmit Point Advance = Distance to Transmit Point

Enter the calculation as your **Distance to Transmit Point**.

BARCODE SETTINGS

Use Barcode Settings options to define the barcodes to be read, as well as no read, multiple read and other message characteristics. Make modifications to the system barcode settings using the menu selections:

"Barcode Settings Table" on page 132

"Barcode Configuration" on page 142

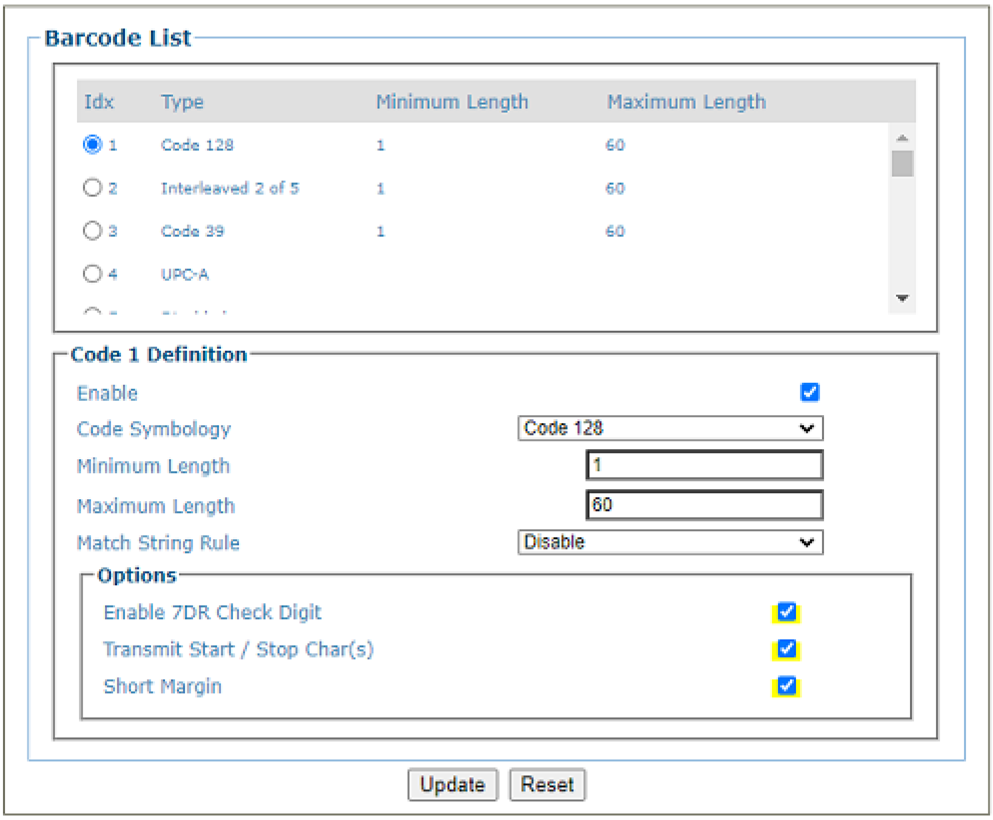
"Advanced Decode" on page 161

Barcode Settings Table

Use the **Barcode Settings Table** to select and configure barcodes to be read by your application. Different configuration options are available based on the barcode type selected.

To edit the Barcode Settings Table:

1. In the menu tree under **Modify Settings**, navigate to **Global Settings | Barcode Settings | Barcode Settings Table**. The **Barcode Settings Table** window opens.



2. Enter the appropriate information in the form as described below:

Top Panel

Displays a list of barcodes that have been added to the system with the following columns:

Idx (Index)

Select an option button for the row/barcode you wish to edit.

- If a barcode type is displayed in the selected row, its configuration can be edited.
- If a row displays disabled, enable it and select a barcode type to configure for that row.

Type

Displays the name of the barcode symbology for that index. If no symbology has been added for a row, disabled is displayed.

Minimum Length

Displays the minimum barcode character length for that row's symbology.

Maximum Length

Displays the maximum barcode character length for that row's symbology.

Code n Definition

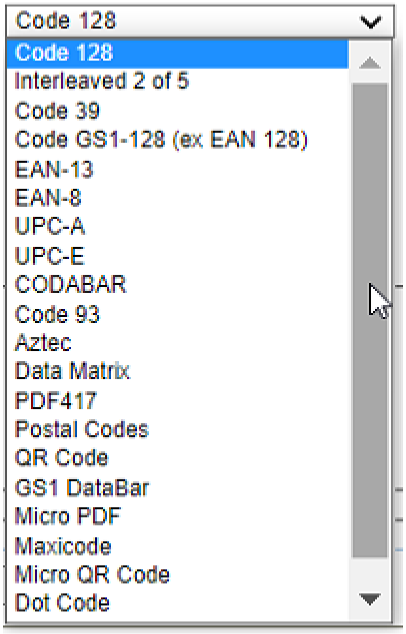
NOTE: Input fields will vary depending on the selected symbology

Enable

Select the Enable check box to activate the selected barcode. De-select the Enable check box to disable the selected barcode. When the check box has been selected, configuration and code type options are displayed.

Code Symbology

Select a barcode symbology from those available in the Code Symbology drop-down list.



Add On (EAN and UPC Codes only)

Select No Add On, 2 digits Add On, or 5 digits Add On from the Add On drop-down list.

No Add On

2 digits Add On: Adds this many digits as a supplement to the barcode

5 digits Add On: Adds this many digits as a supplement to the barcode

NOTE: EAN is the acronym for International Article Number, previously known as European Article Number.

Minimum Length (Not shown on EAN and UPC)

Enter the minimum character length for the selected barcode.

Maximum Length (Not shown on EAN and UPC)

Enter the maximum character length for the selected barcode.

Match String Rule

Select Disable, Match, or Do Not Match from the drop-down list. This parameter defines the matching rule, according to which a code can be transmitted.

- **Match:** All codes matching the Pattern Match String will be transmitted
- **Do Not Match:** All codes not matching the Pattern Match String will be transmitted

Pattern Match String (max. 200 chars)

Click to **"Enter Text with the Text Entry Tool" on page 80** and create a pattern match string.

A Pattern Match String allows the user to check for a sequence of characters in a group of barcodes. The string can be made up of a sequence of alpha numeric characters combined with Regular Expression Syntax.

The regular expression algorithms allow checking for conditional barcode information based on specific expression functions (see below). A pattern matching string is programmable for each barcode used in the system, and if the barcodes read do not match the defined string, a No Read Event will be returned. A no read is sent depending on the Match/Do Not Match selection.

It is possible to define the matching string by inserting Regular Expressions, including but not limited to the following:

. (dot) Matches any character

*(asterisk) Matches 0 or more of the preceding character.

+(plus) Matches 1 or more of the preceding character.

\d - Matches any single digit

\w - Matches any word character (alphanumeric & underscore).

[XYZ] - Matches any single character from the character class.

[XYZ]+ - Matches one or more of any of the characters in the set.

$ - Matches the end of the string.

[^a-z] - When inside of a character class, the ^ means NOT; in this case, match anything that is NOT a lowercase letter.

Examples:

Match a code starting with 123 string and followed by any string of characters:

Match String = 123.*

Example Code = 123aC53

Not Matched = 2231c53

Match a code ending with 123 string preceded by any string of characters:

Match String = .*123

Example Code = 41pO123

Match a code having 123 string in any position: 0)

Match String = .*123.*

Example Code = 41pO123253

NOTE: For Codabar codes the start/stop characters must be considered in the match conditions. For all codes which use check digits, if the Check Digit is transmitted, it must be considered in the match conditions. Input fields will vary depending on the selected symbology.

OPTIONS

Code 128

Enable 7DR Check Digit

Select the check box to enable 7DR Check Digit.

NOTE: The 7DR Check Digit is not use with all code symbologies.

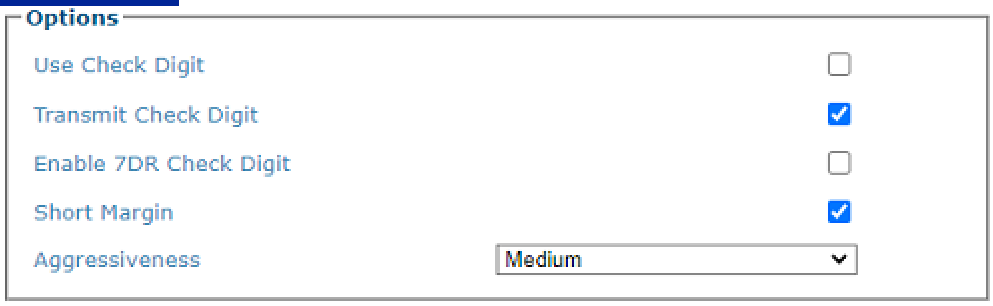
Transmit Start / Stop Char(s)

Select the check box to enable transmission of start and stop characters.

Short Margin

Select the check box to enable. Available for Code 128, Code GS1-128, Interleaved 2 of 5, Code 39, Code GS1-128, EAN, UPC, CODABAR, and Code 39. This options allows the bar code to have an illegal quiet zone on one side of the bar code. If selected this could increase the processing time.

Interleaved 2 of 5



Use Check Digit

Select the check box to include the Check Digit in the code transmitted. Check digits can improve decoding safety: it is generally the last digit aligned to the right of the code and verifies the validity of the preceding digits. The calculation technique and number of check digits depend on the code selected.

It is advised to enable the check digit whenever correct code identification is difficult.

Transmit Check Digit

Select the check box to enable transmission of the Check Digit.

NOTE: For all codes which use check digits, if the Check Digit is transmitted, it must be considered in the match conditions.

A check digit is a character that is transmitted at the end of the data. It is the remainder of an equation that uses all data in the bar code. The same algorithm is used at the host and to ensure that the data from the camera is completed.

Enable 7DR Check Digit

Select the check box to enable 7DR Check Digit.

NOTE: The 7DR Check Digit is not use with all code symbologies.

Short Margin

Select the check box to enable. Available for Code 128, Code GS1-128, Interleaved 2 of 5, Code 39, Code GS1-128, EAN, UPC, CODABAR, and Code 39. This options allows the bar code to have an illegal quiet zone on one side of the bar code. If selected this could increase the processing time.

Aggressiveness

Click the drop-down to select the level of I 2 of 5 aggressiveness appropriate for your system. The default setting is Medium. Set to Low to reduce the number of mis-decodes in situations where damaged codes are present. The options are:

- **Very Low**
- **Low**
- **Medium**
- **High**
- **Very High**

Code 39 and 32

Use Check Digit

Select the check box to include the Check Digit in the code transmitted.

Transmit Check Digit

Select the check box to enable transmission of the Check Digit.

NOTE: For all codes which use check digits, if the Check Digit is transmitted, it must be considered in the match conditions.

A check digit is a character that is transmitted at the end of the data. It is the remainder of an equation that uses all data in the bar code. The same algorithm is used at the host and to ensure that the data from the camera is completed.

Enable 7DR Check Digit

Select the check box to enable 7DR Check Digit.

NOTE:The 7DR Check Digit is not use with all code symbologies.

Short Margin

Select the check box to enable. Available for Code 128, Code GS1-128, Interleaved 2 of 5, Code 39, Code GS1-128, EAN, UPC, CODABAR, and Code 39. This options allows the bar code to have an illegal quiet zone on one side of the bar code. If selected this could increase the processing time.

Full ASCII

Select the check box to enable full ASCII. This pertains to Code 39 only.

Code GS1-128 (ex EAN 128)

Enable 7DR Check Digit

Select the check box to enable 7DR Check Digit.

NOTE: The 7DR Check Digit is not use with all code symbologies.

Transmit Start/Stop Char

Select Disabled, Lower Case, or Upper Case from the drop-down list. This parameter is available only for Codabar code symbologies. It allows transmitting the code start character:

- **Disabled:** The character is not selected;
- **Lower Case:** The character is transmitted in lower case;
- **Upper Case:** The character is transmitted in upper case.

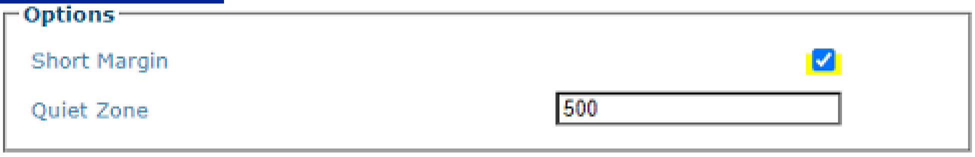
Transmit Function Char(s)

Select the check box to enable transmission of functional characters. A functional character is a non-printable character that is found in the GS1 bar code.

Short Margin

Select the check box to enable. Available for Code 128, Code GS1-128, Interleaved 2 of 5, Code 39, Code GS1-128, EAN, UPC, CODABAR, and Code 39. This options allows the bar code to have an illegal quiet zone on one side of the bar code. If selected this could increase the processing time.

EAN-13, EAN-8, UPC-A



Short Margin

Select the check box to enable. Available for Code 128, Code GS1-128, Interleaved 2 of 5, Code 39, Code GS1-128, EAN, UPC, CODABAR, and Code 39. This options allows the bar code to have an illegal quiet zone on one side of the bar code. If selected this could increase the processing time.

Quiet Zone

Specify the quiet zone in the field provided. This defines the minimum quiet zone (white margins) measured in narrowest module width. This option may be symbology dependent. The quiet zone is expressed as a percentage of module, 500 = 500% of the module = 5 times the module.

UPC-E

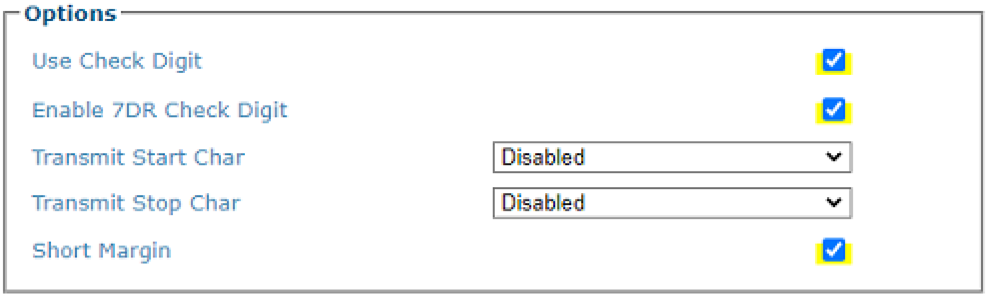
Quiet Zone

Specify the quiet zone in the field provided. This defines the minimum quiet zone (white margins) measured in narrowest module width. This option may be symbology dependent. The quiet zone is expressed as a percentage of module, 500 = 500% of the module = 5 times the module.

UPCE Expand

Select the check box to enable conversion of a full-length UPC (UPC-A) UPC-E. Excess zeros will be suppressed.

CODABAR



Use Check Digit

Select the check box to include the Check Digit in the code transmitted

Enable 7DR Check Digit

Select the check box to enable 7DR Check Digit.

NOTE: The 7DR Check Digit is not use with all code symbologies.

Transmit Start/Stop Char

Select the check box to allow Start/Stop Characters. This parameter is available only for Codabar code symbologies.

Short Margin

Select the check box to enable. Available for Code 128, Code GS1-128, Interleaved 2 of 5, Code 39, Code GS1-128, EAN, UPC, CODABAR, and Code 39. This options allows the bar code to have an illegal quiet zone on one side of the bar code. If selected this could increase the processing time.

NOTE: For Codabar codes the start/stop characters must be considered in the match conditions.

Code 93

Enable 7DR Check Digit

Select the check box to enable 7DR Check Digit.

NOTE: The 7DR Check Digit is not use with all code symbologies.

Short Margin

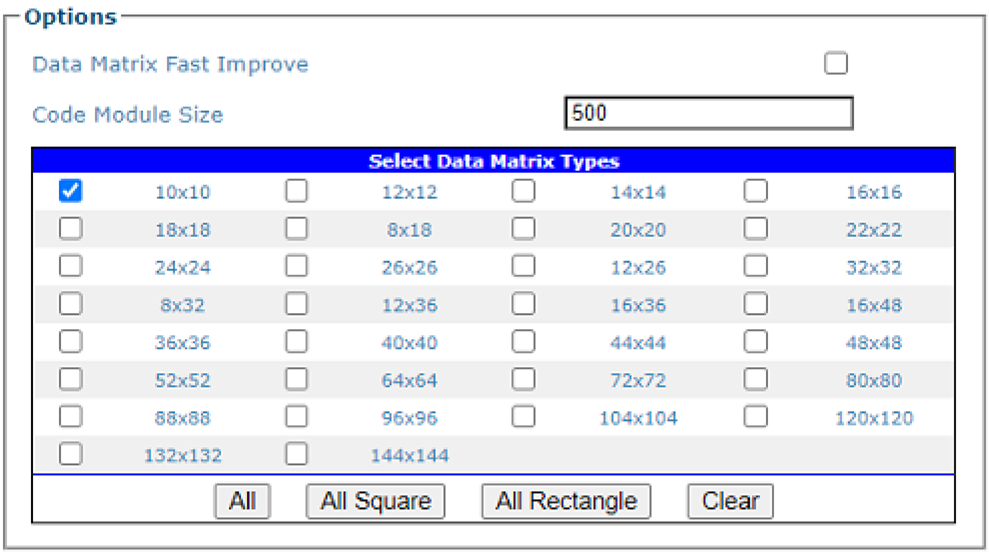
Select the check box to enable. Available for Code 128, Code GS1-128, Interleaved 2 of 5, Code 39, Code GS1-128, EAN, UPC, CODABAR, and Code 39. This options allows the bar code to have an illegal quiet zone on one side of the bar code. If selected this could increase the processing time.

Data Matrix Options

Select the check box to enable the Data Matrix options available via the table shown below.

Data Matrix Fast Improve

Select the Data Matrix Fast Improve check box and the check box next to the Data Matrix type codes required from the provided table. DataMatrix Fast Improve should only be used when high quality Data Matrix symbols are present. Otherwise it will reduce performance.



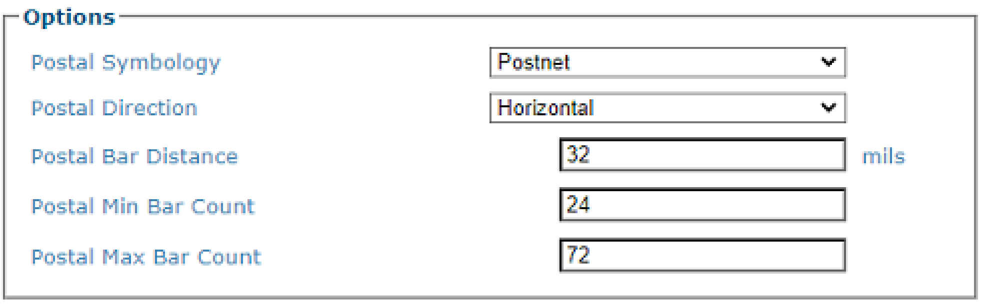
- Select **All** to select all of the Data Matrix codes listed. Code Module Size. Datamatrix module size is expressed in micrometer (500 micrometer = 0.5 mm)
- Select **All Square** to select all of the Data Matrix square codes.
- Select **All Rectangle** to select all of the Data Matrix rectangular codes.
- Select **Clear** to clear the table of any selections.

Code Module Size

Enter the number of code modules in the field provided. This field defines the size in micrometers of a single module or element in a 2D code. There must be at least three pixels per module, therefore the minimum module size depends on the camera's resolution and the application. Use the following formula to calculate your module size.

$$\frac{3 * 25400}{DPI}$$

Postal Codes



Select a symbology from the drop-down list, and then define its parameters including:

Postal Direction

Select in which direction the label is oriented:

- 0: Code in every direction
- 1: Code positioned horizontally only
- 2: Code positioned vertically only
- 3: Code positioned both vertically and horizontally

Postal Bar Distance (MILS):

Enter the distance between bars of the label in inch/1000. It is used to discriminate between expected postal labels and noise, it is the postal label resolution.

Postal Min/Max Bar Count:

Enter the minimum number of bars in the label. It is used for localization purposes (min bars) and for final validation of the label (max bars).

QR Code

Code Module Size

Enter number of code modules in the field provided. Module size is expressed in micrometer (500 micrometer = 0.5 mm)

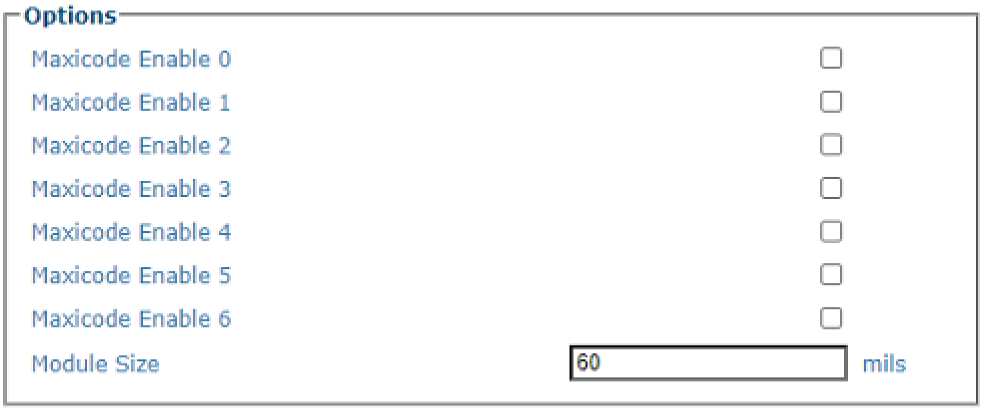
GS1 DataBar

Type

Select Omnidirectional, Expanded, Limited, Expanded Stacked, or Stacked from the drop-down list.

These options are available when reading GS1 DataBar stacked type barcodes, this parameter can be enabled to apply a fixed safety margin to the decoding process in terms of decoding time (number of scans). This parameter is particularly useful in applications that read tall stacked type codes or on slow moving conveyors.

Maxicode



Maxicode Enable n

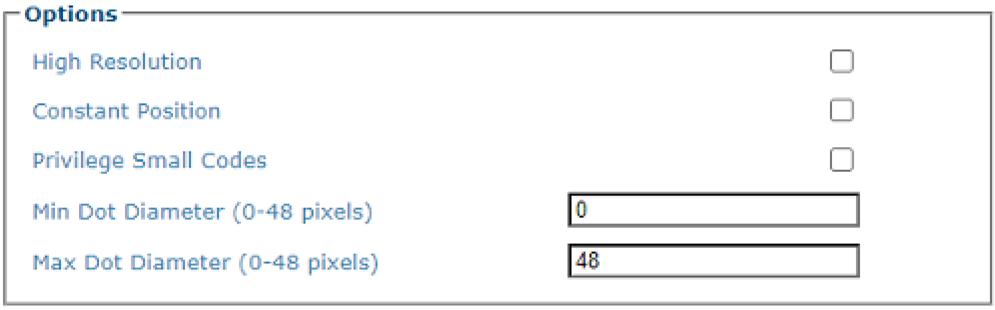
Select the check box corresponding to the Maxicode(s) to enable.

MaxiCode barcodes have different modes of operation. IDAutomation MaxiCode products support the following modes:

- 2 = US Carrier with postal codes up to 9 digits in length. Approximately 93 characters may be encoded in this mode.
- 3 = International Carrier with alpha-numeric postal codes up to 6 digits in length. Approximately 93 characters may be encoded in this mode.
- 4 = Standard Symbol encodes general information for purposes other than the shipping industry. Approximately 90 characters may be encoded in this mode.
- 5 = Secure Symbol encodes general information with more error correction. Approximately 74 characters may be encoded in this mode.
- 6 = Reader Program allows scanner manufacturers to program barcode readers.

UPS labels use Mode 2 or Mode 3 MaxiCodes.

Dot Code



High Resolution

Click to enable High Resolution.

Constant Position

Click to enable Constant Position

Privilege Small Codes

Click to enable **Privilege Small Codes**. This will allow the system to look for small codes before larger codes.

Min Dot Diameter (0-48 pixels)

Enter the Minimum Dot Diameter for the code in pixels.

Max Dot Diameter (0-48 pixels)

Enter the Maximum Dot Diameter for the code in pixels.

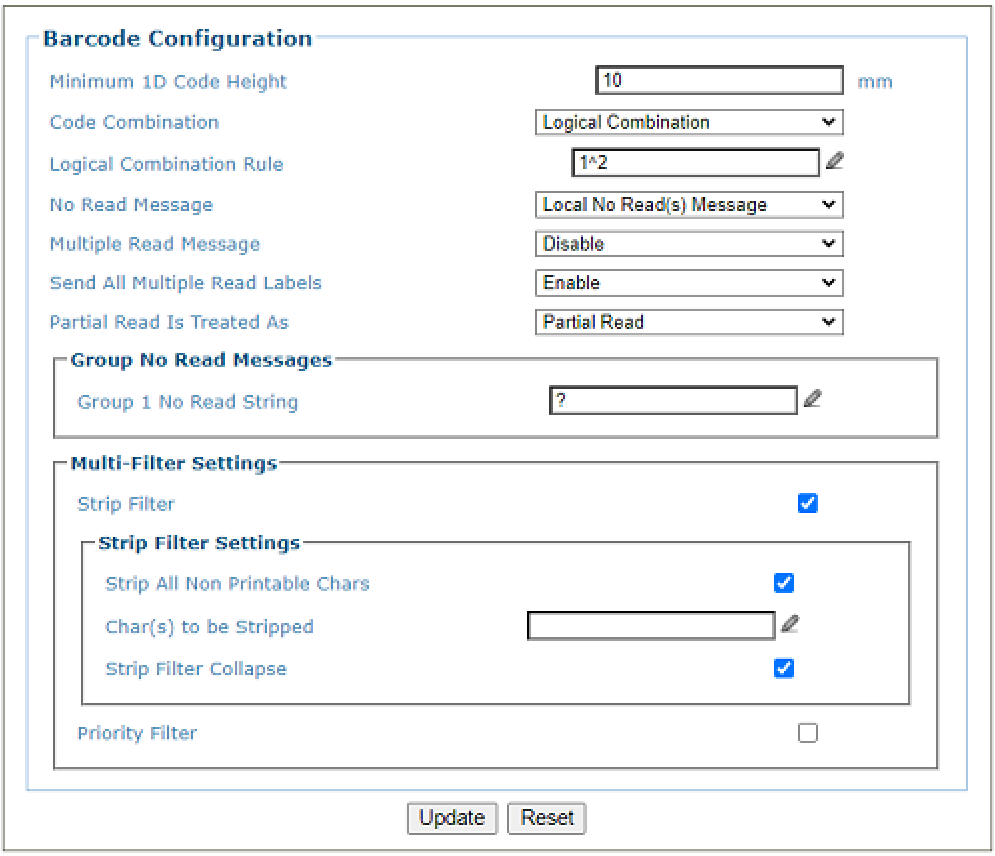
3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

Barcode Configuration

Barcode Configuration is used to define the relationship between the barcodes read and processed by your camera and how they are grouped together for transmitting to the host. For example, which ones must be read, which ones are optional and what is the priority. It also defines the formatting of no read, multiple read, partial read and duplicate messages.

To edit the Barcode Configuration:

1. In the menu tree under **Modify Settings,** navigate to Global Settings | **Barcode Settings** | **Barcode Configuration**. The **Barcode Configuration** window opens.



2. Enter the appropriate information in the form as described below:

Minimum 1D Code Height

Enter the minimum height of codes the system is expected to read. This parameter defines the minimum height of the barcode the camera will read. The minimum height is 6 mm [.25 in].

NOTE: The smaller the Minimum 1D code height the more processing time is needed to complete the decode. If the application is having difficulty providing a decoded bar code, and the minimum bar height is greater then 6mm (.25 in) the parameter may be increased to assist in the decoding.

Code Combination

Select **Single Label, Standard Multi Label, Logical Combination**, or **Code Collection** from the drop-down list. The Code Combination parameter selects the decoding mode for the barcode reader. Follow these links for each type of Code Combination to view its specific inputs:

- **See "Single Label" on page 144:** In Single Label mode only one barcode can be read in each reading phase; however it can be determined automatically from up to 10 enabled codes. The barcode reader stops decoding as soon as a single code is read.

NOTE: If there are multiple barcodes within the barcode readers read area during a trigger cycle, the first barcode decoded will be the data transmitted to the host.

- **See "Standard Multi-Label" on page 146:** In Multi Label mode the barcodes selected (up to 10), will all be read in the same reading phase. If the reading phase terminates before all the codes are read, and a No Read message is enabled, Local or Global, a no read message is produced.

NOTE: In case of Standard Multi Label, the codes will be distinguished EITHER by their symbology, OR by their contents. If two (or more) codes share the same symbology and content, the barcode reader will perceive them as a unique code.

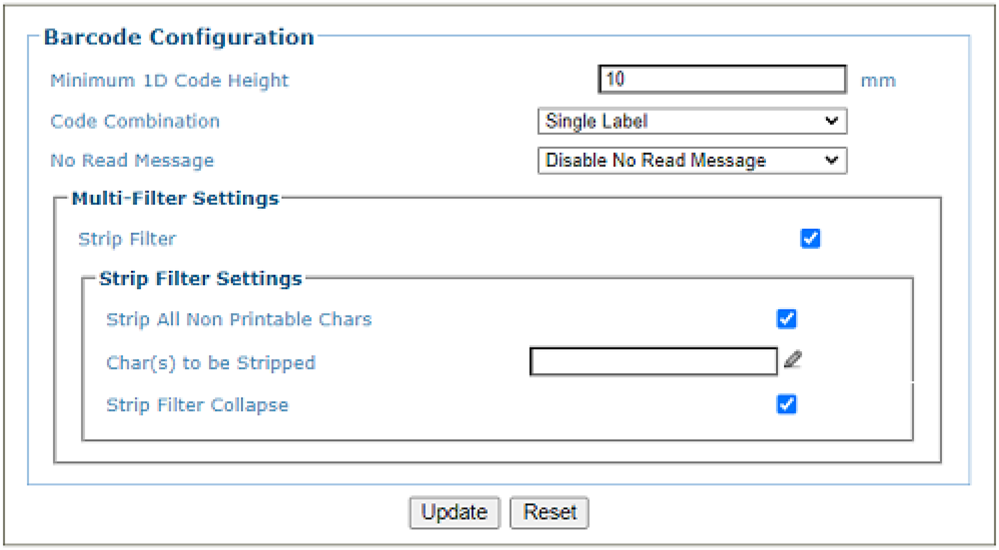
- **See "Logical Combination" on page 149:** Logical Combination allows for grouping bar codes together. You can create an AND or Xor condition. For example: if three codes are enabled each bar code can be put into separate groups creating an AND condition or you can place two of the bar codes in one group and a third bar code in a separate group. Group 1 (code 1 or code 2) Group 2 (code 3). You can have either code 1 OR code 2 read and it's data will be place in Group's 1 field. In Logical Combination mode the codes of the groups defined by the Logical Combination Rule are read in the same reading phase.
- **See "Code Collection" on page 159**: In Code Collection mode expected codes are collected within a single reading phase in the order in which they are read. The No Read message is produced only if none of the codes are read. Up to 50 codes can be collected.

Based on your code combination selection, different fields will become available. See the following sections for the details of your code combination.

3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

Single Label

When **Single Label** has been selected from the **Code Combination** drop-down list, the **Barcode Configuration** window reveals related input fields.



1. Enter the appropriate information in the form as described below:

Minimum 1D Code Height

Enter the **Minimum Code Height** in the field provided (mm [in]).

Code Combination

Single Label has been selected.

No Read Message

Select **Disable No Read Message, Global No Read Message,** or **Local No Read(s) Message** from the drop-down list. The **No Read** condition occurs whenever a code cannot be read or decoded.

Disable No Read Message: The No Read Message is not transmitted.

Global No Read Message: The No Read String will be sent if the barcode reader is unable to decode one or more barcodes in the reading phase. When multiple codes are enabled in the **Barcode Settings Table**, and not all of the codes are read within a trigger cycle, a single **Global No Read** message is transmitted to the host.

Local No Read(s) Message: This option is used when **Standard Multi Label** or **Code Collection** is selected. A **Local No Read** message is a configurable **No Read** message associated with each individual code enabled in the Barcode Settings Table.

No Read String (max. 128 chars)

Click to **"Enter Text with the Text Entry Tool" on page 80** and create a string to be displayed when **Global No Read Message** is selected from the **No Read Message** drop-down list.

Multi-Filter Settings

Strip Filter

Select the check box to display the **Strip Filter** options. This filter, when enabled, allows the elimination of characters not managed by the host.

Strip All Non Printable Chars

Select the check box to remove all non- printable ASCII characters from the code (000-020 and 127).

Char(s) to be Stripped

Click to **"Enter Text with the Text Entry Tool" on page 80** and enter specific characters to be stripped from the code.

Strip Filter Collapse

Select the check box to remove the stripped characters from the code and, therefore, reduce the code length (collapsed).

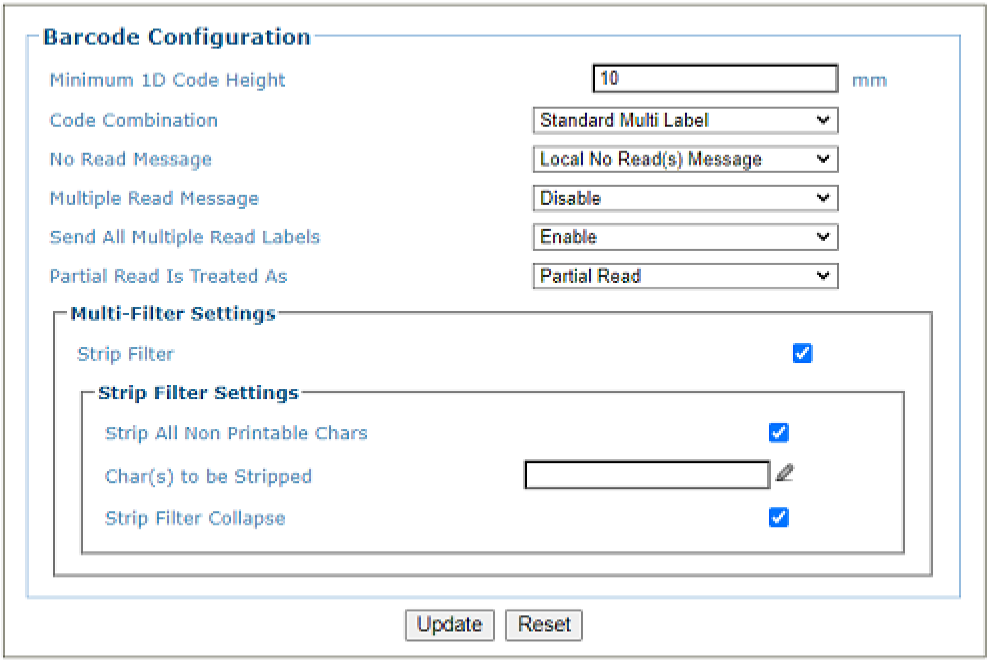
Replacement Char

Click to **"Enter Text with the Text Entry Tool" on page 80** and enter the substitution character to replace all the stripped ones. It can even be null.

2. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

Standard Multi-Label

When **Standard Multi Label** has been selected from the **Code Combination** drop-down list, the **Barcode Configuration** window reveals related input fields.



1. Enter the appropriate information in the form as described below:

Minimum 1D Code Height

Enter the minimum code height in the field provided (mm [in])

Code Combination

Standard Multi Label has been selected.

No Read Message

Select **Disable No Read Message, Global No Read Message,** or **Local No Read(s) Message** from the drop-down list. The No Read condition occurs whenever a code cannot be read or decoded.

Disable No Read Message: The No Read Message is not transmitted.

Global No Read Message: The No Read String will be sent if the barcode reader is unable to decode one or more barcodes in the reading phase.

Local No Read(s) Message: This option is useful when one or more codes are not read in the reading phase or when more codes than the expected number set by the configuration parameters are read.

If working in **Standard Multi Label** mode, this option activates the **Code Label Local No Read String** and the **Code Label Local Multiple Read String** parameters which allow setting a **Local No Read String** and a **Local Multiple string** for each defined code symbology.

No Read String (max. 128 chars)

Click to **"Enter Text with the Text Entry Tool" on page 80** and create a string to be displayed when **Global No Read Message** is selected from the **No Read Message** drop-down list.

Multiple Read Message

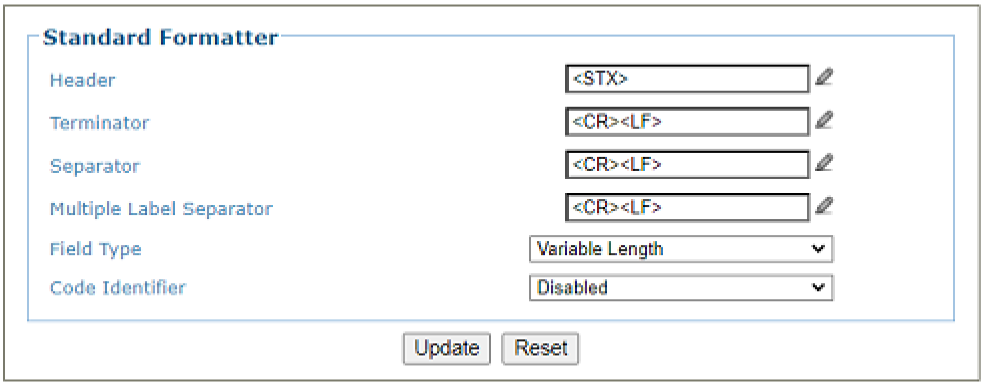
Select **Enable, Disable** from the drop-down list.

Send All Multiple Read Labels

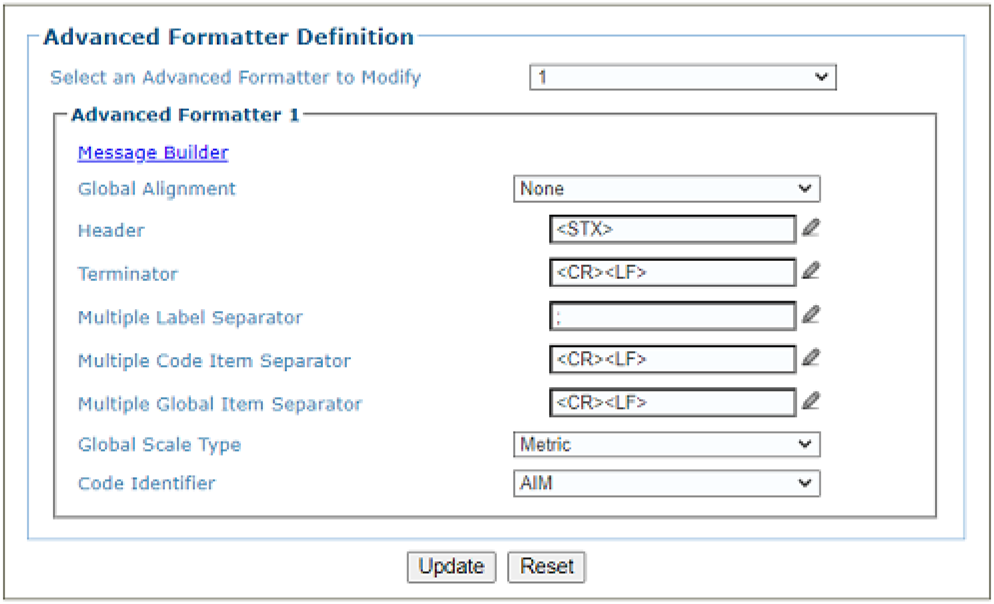
Select Enable, Disable from the drop-down list. Available with Standard Multi Read, Logical Combination and Code Collection. When set to Disable, if there are two or more codes during the read cycle, the camera will transmit the first decoded bar code and ignore all other bar codes with matching parameters. When enabled the camera will read all bar codes having the same symbology and number of characters.

First, **Enable Send All Multiple Read Labels:**

Next, define a **Multiple Label Separator** (Standard Formatter):



Next, define a **Multiple Label Separator** (Advanced Formatter), if Advanced Formatter is used:



Partial Read Is Treated As

When an application is set to read two or more bar codes in a trigger cycle, there are certain decisions that the application software needs to make. In an example where two bar codes are enabled and only one of the two codes are read the customer can choose to:

Send only the single bar code that was read to the host

Only send bar code data if both bar codes are read.

This defines a Partial read condition. If only one of the two bar codes are read the following option can be selected:

- **No Read** – if only one of the two codes are read transmit a No Read
- **Good Read** – if only one of the two codes are read transmit that read data
- **Partial Read** - A Partial Read is a condition when multiple barcodes are enabled, but not all barcodes are read during a trigger cycle.

Multi-Filter Settings

Strip Filter

Select the check box to display the **Strip Filter Settings** options. This is a second level filter that when enabled allows eliminating characters not managed by the host.

Strip All Non Printable Chars

Select the check box to remove all non- printable ASCII characters from the code (000-020 and 127).

Char(s) to be Stripped

Click to **"Enter Text with the Text Entry Tool" on page 80** and enter specific characters to be stripped from the code.

Strip Filter Collapse

Select the check box to remove the stripped characters from the code and, therefore, reduce the code length (collapsed). It can even be null.

Replacement Char

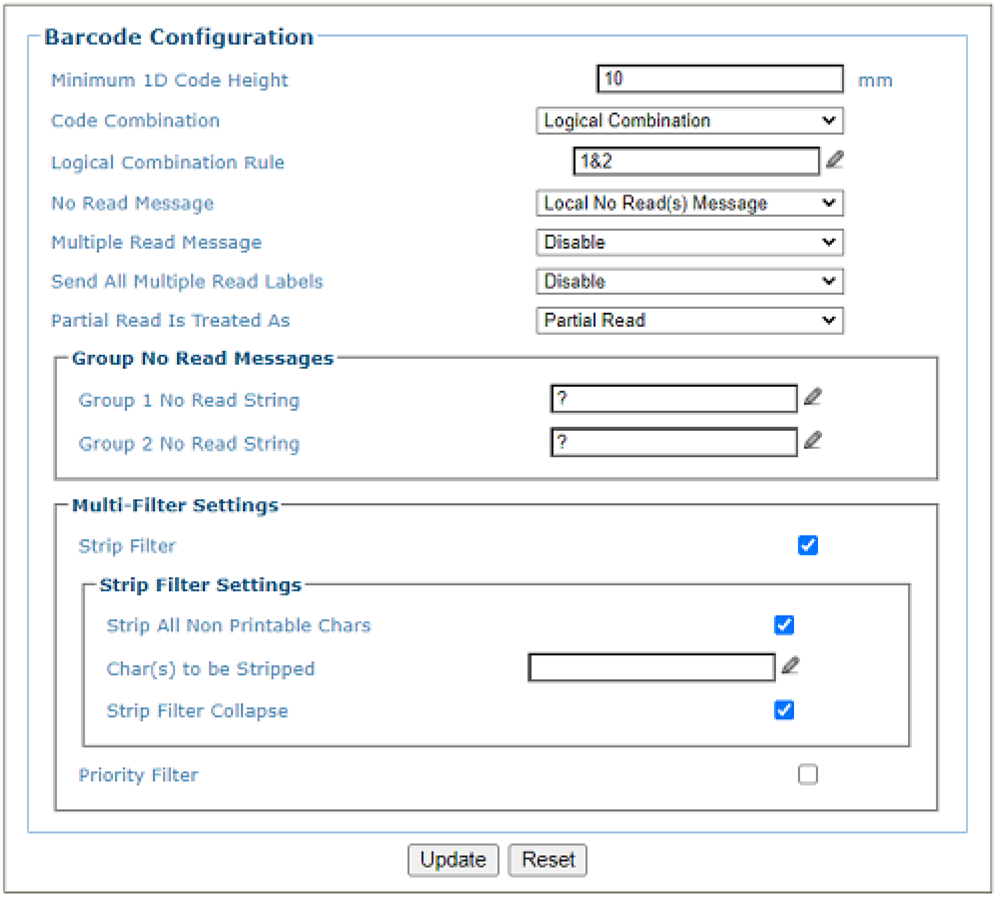
Click to **"Enter Text with the Text Entry Tool" on page 80** and enter the substitution character to replace all the stripped ones. Click **Submit** to save your text to the origin window text field, or click **Cancel** to return to origin window without transferring text.

2. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

Logical Combination

When **Logical Combination** has been selected from the Code Combination drop-down list, the Barcode Configuration window reveals related input fields. In Logical Combination, you can define groups of codes from the codes set in the Barcode Setting Table which can be read within a trigger cycle. You can define up to 15 groups.

NOTE: The Logical Combination option is only available when two or more codes are enabled in the Barcode Settings Table.



1. Enter the appropriate information in the form as described below:

Minimum 1D Code Height

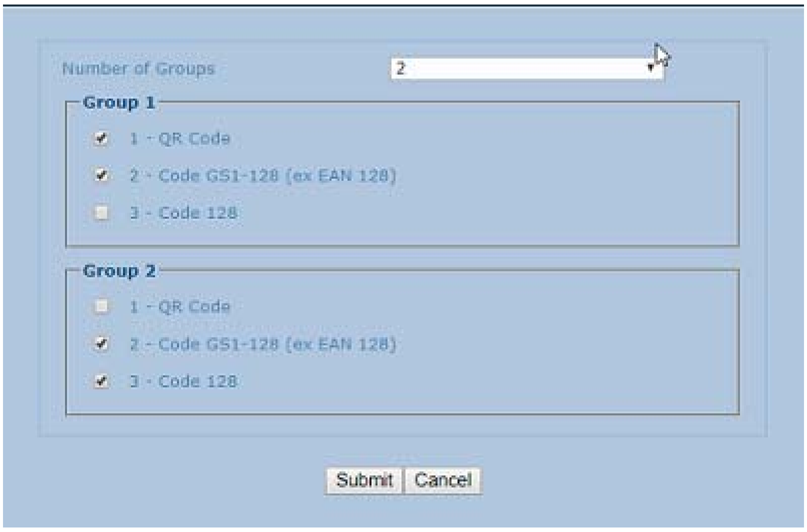
Enter the minimum code height in the field provided (mm [in]).

Code Combination

Logical Combination has been selected.

Logical Combination Rule

Click to activate the Code Group selection dialog box.



Select the number of groups you wish to use from the Number of Groups drop-down list. Then select the check box next to the Group/Code you wish to define. Click **Submit** to save your text to the origin window text field, or click **Cancel** to return to origin window without transferring text.

Groups and their order define the output message format, while each group identifies an expected code or group of codes. When placing one bar code within a group, the camera will fill that group location in the host message with only the code selected.

If you define the Logical Combination Rule to include Group 1 and Group 2 and Group 3 and Group 4. The Logical Combination Rule parameter will appear as follows:

For the1&2&3&4 rule, when two or more codes are selected within the same group the camera will fill this groups field with the first decoded bar codes listed in that group.

If you define the Logical Combination Rule to include two groups, one with Code 1 or 2 and the second with Code 3 or 4 the Logical Combination Rule will appear as follows.

When editing the logical combination rule, proceed as follows:

- **Define the Barcode Settings** indicating the type of expected code labels. It is possible to define up to 10 different code types;
- **Define how many code types** (groups) are expected by editing the combination rule through the following logical operators. Each group may include one or more selected code types.

The maximum number of groups to be defined for each rule string is 15.

If Local No Read Message is selected from the No Read Message drop-down list, the Group No Read Messages parameter group is displayed requiring the definition of a Local No Read String for each group.

Example

If three barcodes are enabled and barcode 1 and 2 are read successfully but barcode 3 is a no read, the message could look like this:

<STX>12345678xxx,12345678xxx,noread <CR><LF>

No Read Message

Select Disable No Read Message, Global No Read Message, or Local No Read(s) Message from the drop-down list. The No Read condition occurs whenever a code cannot be read or decoded.

Disable No Read Message: The No Read Message is not transmitted.

Global No Read Message: The No Read String will be sent if the barcode reader is unable to decode one or more barcodes in the reading phase.

Local No Read(s) Message: This option is useful when one or more codes are not read in the reading phase or when more codes than the expected number set by the configuration parameters are read.

No Read String (max. 128 chars)

Click ✎ to **"Enter Text with the Text Entry Tool" on page 80** and create a string to be displayed when Global No Read Message is selected from the No Read Message drop-down list.

Multiple Read Message

Select **Disable** or **Enable** from the drop-down list. This string will be sent if, during the reading phase, the barcode reader reads more than the number of the expected barcodes set by the configuration parameters.

Multiple Read String (max. 128 chars)

Click ✎ to **"Enter Text with the Text Entry Tool" on page 80** and create a string to be displayed in case of Multiple Read Message.

This parameter is only available when Multiple Read Message is enabled and the No Read Message selection is different from Local No Read(s) String. It is possible to select either the ASCII or HEX value. If disabled, the barcode reader transmits the first code read.

Send All Multiple Read Labels

Select **Enable**, **Disable** from the drop-down list. Available with Standard Multi Read, Logical Combination and Code Collection. When set to Disable, if there are two or more codes during the read cycle, the camera will transmit the first decoded bar code and ignore all other bar codes with matching parameters. When enabled the camera will read all bar codes having the same symbology and number of characters.

Partial Read Is Treated As

Select **No Read**, **Good Read,** or **Partial Read** from the drop-down list.

A Partial Read is a condition when multiple barcodes are enabled, but not all barcodes are read during a trigger cycle.

Multi-Filter Settings

Strip Filter

Select the check box to display the Strip Filter Settings options. This filter, when enable, allows eliminating characters not managed by the host.

Strip All Non Printable Chars

Select the check box to remove all non- printable ASCII characters from the code.

Char(s) to be Stripped

Click ✎ to **"Enter Text with the Text Entry Tool" on page 80** and enter specific characters to be stripped from the code.

Strip Filter Collapse

Select the check box to remove the stripped characters from the code and, therefore, reduce the code length (collapsed). It can even be null.

Replacement Char

Click ✎ to **"Enter Text with the Text Entry Tool" on page 80** and enter the substitution character to replace all the stripped ones.

Priority Filter Settings

Select the check box to display the Priority Filter options. This function allows the user to prioritize groups.

NOTE: Priority Filter only applies to Logical Combination Bar code configuration.

Example:

3 groups, each group has a single bar code. If you enter 2,3,1 then if Group 1(code 1) and group 2 (code 2) are read, code 2 is transmitted. If group 3 and 1 are read, then group 3 is transmitted.

Group List

Enter the Group List in the field provided. This field defines the specific Logical Combination groups to which the Priority Filter will apply. The groups are numbered according to the order in which they are listed (from left to right) in the Logical Combination Rule parameter.

Format: Group Number(s) separated by the comma character

Filter Type

Select **Normal** or **Advanced** from the drop-down list.

Normal

When the Priority Filter Type is set to Normal, the operators used in the Logical Combination Rule string have the following meaning:

& = AND operator which separates a group from the previous/following one;

^ = The priority is given to the code label indicated to the left of the operator. If this code is read, the group is in Good Read independent from any other code in the same group.

Example:

Logical Combination Rule = 1^2&5^3^4&6^7 (3 groups)

Results Without Priority Filter:

Group 1 - read either code 1 or 2 = Good Read; read both code 1 and 2 = Multiple Read

Group 2 - read either code 5 or 3 or 4 = Good Read; read any combination = Multiple Read

Group 3 - read either code 6 or 7 = Good Read; read both code 6 and 7 = Multiple Read

Results With Priority Filter:

Filter Enabled on Groups = 1,2

Group 1 - read code 1 = Good Read independent from reading code 2

Group 2 - read code 5 = Good Read independent from reading code 3 or 4; read code 3 = Good Read independent from reading code 4

Group 3 - read either code 6 or 7 = Good Read; read both code 6 and 7 = Multiple Read

Advanced

Uses the Priority Filter Advanced String to define the priority. Advanced type allows the priority filter to essentially take "priority" over the Logical Combination Rule string.

When the Priority Filter Type is set to Advanced, the Priority Filter Advanced String applies to the Logical Combination Groups. This string must correspond to the order of the groups defined in the Logical Combination Rule string.

The following operators can be used:

& = Code group separator. This operator separates a group from the previous/following one;

^ = The priority is given to the code label indicated to the left of this operator. If this code is read, the group is in Good Read independent from any other code in the same group.

| = Equal priority operator (vertical line). Codes separated by this operator have the same priority and if both codes are read a Multiple Read will result.

The only difference from the implicit pattern string of the Normal (default) case when the Logical Combination Rule string is used, is the Equal Priority operator.

Example:

Logical Combination Rule = 1^2&5^3^4&8^6^7 (3 groups)

Results Without Priority Filter:

Group 1 - read either code 1 or 2 = Good Read; read both code 1 and 2 = Multiple Read

Group 2 - read either code 5 or 3 or 4 = Good Read; read any combination = Multiple Read

Group 3 - read either code 8 or 6 or 7 = Good Read; read any combination = Multiple Read

Results With Priority Filter:

Filter Enabled on Groups = 1,3

Filter Type =Custom

Custom Filter Pattern String = 1^2&8^6|7 (2 groups)

Group 1 - read code 1 = Good Read independent from reading code 2

Group 2 - read either code 5 or 3 or 4 = Good Read; read any combination = Multiple Read

Group 3 - read code 8 = Good Read independent from reading code 6 or 7; no read on code 8 and read either code 6 or 7 = Good Read; no read on code 8 and read both code 6 and 7 = Multiple Read

Advanced Filter String

Enter the character string (see above).

2. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values. 0)

Logical Combination Rules

The following are examples of rules used with Logical Combination selection in Barcode Configuration. For all the following examples the No Read Message parameter is set to Global No Read Message.

NOTE: In all of the examples, Partial must be set to “treat as no read.

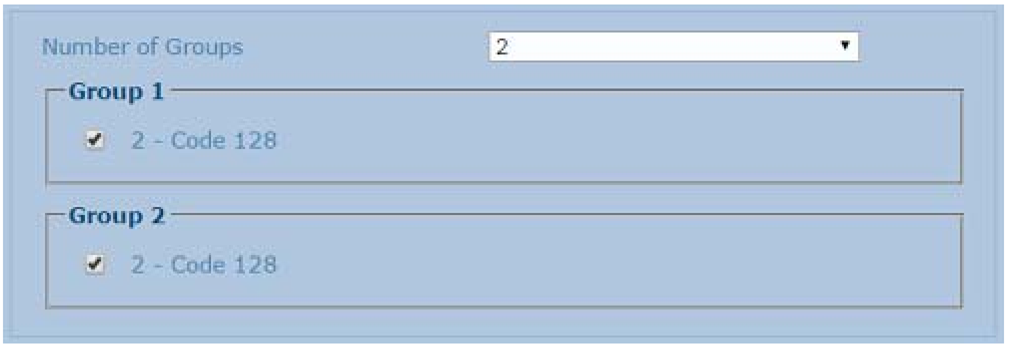
Example 1

Code label setting#1 = Code 128

Logical Combination Rule = 1&1

Defines 2 groups, each of them expecting a **Code 128** label.

Decoded Code Symbology		Output Message
First Label #1	Second Label #1	
---	---	<Header><Global No Read Message><Terminator>
X	---	<Header><Global No Read Message><Terminator>
---	X	<Header><Global No Read Message><Terminator>
X	X	<Header><Code 128 data><Data Packet Separator><Code 128 data><Terminator>


Number of Groups
2
Group 1
2 - Code 128
Group 2
2 - Code 128

NOTE: If Multiple Read Message is enabled and a third label belonging to the Code 128 symbology is decoded, the Multiple Read string will be transmitted instead. If the Multiple Read Message is disabled, the third code label is ignored and only the first two bar codes in the order that they are decoded will be transmitted.

For advanced formatting, if the Send All Multiple Read Labels parameter is enabled, then all three labels are sent in the output message; the multiple read label is separated by its own Multiple Read Label Separator String which should be different from the Data Packet Separator (DPS).

Example 2

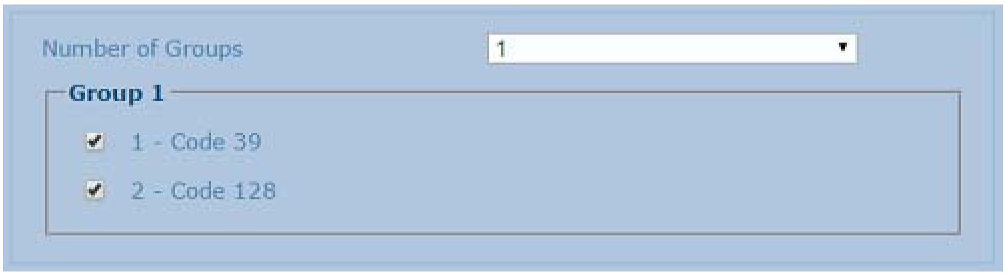
Code label setting#1 = Code 39

Code label setting#2 = Code 128

Logical Combination Rule = 1^2

Defines a single group expecting a **Code 39** label OR a **Code 128** label.

Decoded Code Symbology		Output Message
Label #1	Label #2	
---	---	<Header><Global No Read Message><Terminator>
X	---	<Header><Code 39 data><Terminator>
---	X	<Header><Code 128 data><Terminator>
X	X	<Header><First decoded code/Multiple Read Message string ><Terminator>



Example 3

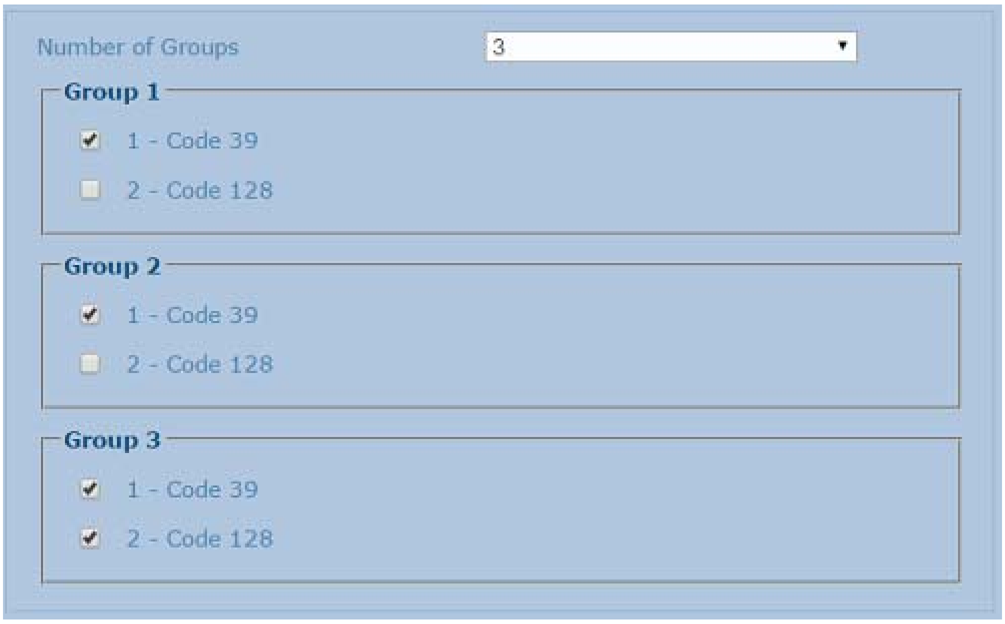
Code label setting#1 = Code 39

Code label setting#2 = Code 128

Logical Combination Rule = 1&1&1^2

Defines three different groups. The first two groups expect a **Code 39** label while the third one expects a **Code 39** label OR a **Code 128** label.

Decoded Code Symbology				Output Message
First Label #1	Second Label #1	Third Label #1	Label #2	
---	---	---	---	<Header><Global No Read Message><Terminator>
X	---	---	---	<Header><Global No Read Message><Terminator>
---	X	---	---	<Header><Global No Read Message><Terminator>
---	---	X	---	<Header><Global No Read Message><Terminator>
---	---	---	X	<Header><Global No Read Message><Terminator>
X	X	X	---	<Header><Code 39 data><DPS>< Code 39 data><DPS>< Code 39 data><Terminator>
X	X	---	X	<Header><Code 39 data><DPS><Code 39 data><DPS><Code 128><Terminator>
X	X	X	X	<Header><Code 39 AV500/AV900 data><DPS><Code 39 AV500/AV900 data><DPS><First decoded code/Multiple Read Message string><Terminator>



Example 4

Code label setting#1 = Interleaved 2/5

Code label setting#2 = Code 128

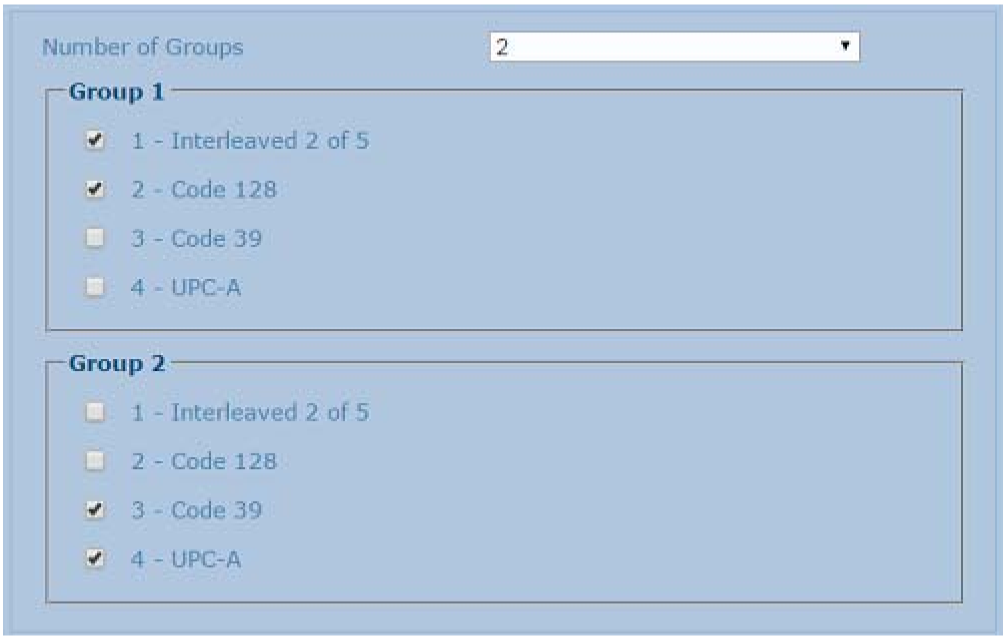
Code label setting#3 = Code 39

Code label setting#4 = UPC-A

Logical Combination Rule = 1^2&3^4

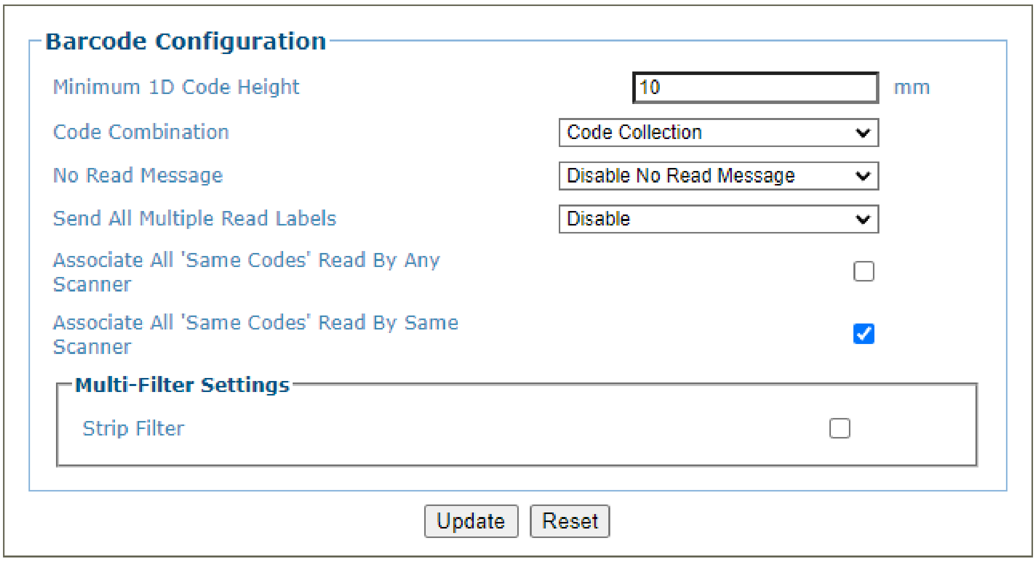
Defines 2 groups, each of them expecting one of the defined code types. The first group may expect an **Interleaved 2 of 5** label or a **Code 128** label. The second group may expect a **Code 39** label or a **UPC-A** label.

Decoded Code Symbology				Output Message
Label #1	Label #2	Label #3	Label #4	
---	---	---	---	<Header><Global No Read Message><Terminator>
X	---	---	---	<Header><Global No Read Message><Terminator>
---	X	---	---	<Header><Global No Read Message><Terminator>
---	---	X	---	<Header><Global No Read Message><Terminator>
---	---	---	X	<Header><Global No Read Message><Terminator>
X	X	---	---	<Header><Global No Read Message><Terminator>
X	---	X	X	<Header><Code93><DPS>< First decoded code/Multiple Read Message string><Terminator>
X	X	X	---	<Header><First decoded code/Multiple Read Message string><DPS><EAN 8 data><Terminator>
---	X	X	X	<Header>< Interleaved 2/5 data><DPS>< First decoded code/Multiple Read Message string ><Terminator>
X	---	X	---	<Header><Code 93 data><DPS><EAN 8 data><Terminator>
X	---	---	X	<Header><Code 93 data><DPS><UPC-A data><Terminator>
---	X	X	---	<Header><Interleaved 2/5 data><DPS><EAN 8 data><Terminator>
---	X	---	X	<Header><Interleaved 2/5 data><DPS><UPC-A data><Terminator>
X	X	X	X	<Header><First decoded code/Multiple Read Message string><DPS>< First decoded code/Multiple Read Message string ><Terminator>


Number of Groups
2
Group 1
1 - Interleaved 2 of 5
2 - Code 128
3 - Code 39
4 - UPC-A
Group 2
1 - Interleaved 2 of 5
2 - Code 128
3 - Code 39
4 - UPC-A

Code Collection

1. When **Code Collection** has been selected from the **Code Combination** drop-down list, the **Barcode Configuration** window reveals related input fields.



2. Enter the appropriate information in the form as described below:

Minimum 1D Code Height

Enter the minimum code height in the field provided (mm [in]).

Code Combination

Code Collection has been selected.

No Read Message

Select Disable No Read Message, Global No Read Message, or Local No Read(s) Message from the drop-down list. The No Read condition occurs when no barcodes are read during the trigger cycle.

- **Disable No Read Message:** A No Read Message is not transmitted.
- **Global No Read Message:** A No Read String will be sent if the barcode reader is unable to decode one or more barcodes in the reading phase.

Send All Multiple Read Labels

Select Enable, Disable from the drop-down list. Available with Standard Multi Read, Logical Combination and Code Collection. When set to Disable, if there are two or more codes during the read cycle, the camera will transmit the first decoded bar code and ignore all other bar codes with matching parameters. When enabled the camera will read all bar codes having the same symbology and number of characters.

Associate All'Same Codes"Read By Any Scanner

Checked by default, indicates that barcodes of the same content and symbology are transmitted only once regardless of how many devices read them. If unchecked, codes are sent for each device that reads them.

Associate All "Same Codes" Read By Same Scanner (only available if above is unchecked)

Click the check-box to enable. When enabled (the default), the previous behavior is used - duplicate barcodes decoded on the same node are merged. When the option is disabled, duplicates from the same node are not merged.

No Read String (max. 128 chars)

Click to **"Enter Text with the Text Entry Tool" on page 80** and create a string to be displayed when Global No Read Message is selected from the No Read Message drop-down list.

Multi-Filter Settings

Strip Filter

Select the check box to display the Strip Filter options. This filter, when enabled, allows eliminating characters not managed by the host.

Strip Filter Settings

Strip All Non Printable Chars

Select the check box to remove non- printable ASCII characters from the code (000-020 and 127).

Char(s) to be Stripped

Click to **"Enter Text with the Text Entry Tool" on page 80** and enter specific characters to be stripped from the code.

Strip Filter Collapse

Select the check box to remove the stripped characters from the code and, therefore, reduce the code length (collapsed). It can even be null.

Replacement Char

If strip filter is not enabled, click to **"Enter Text with the Text Entry Tool" on page 80** and enter the substitution character to replace all the stripped ones.

3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

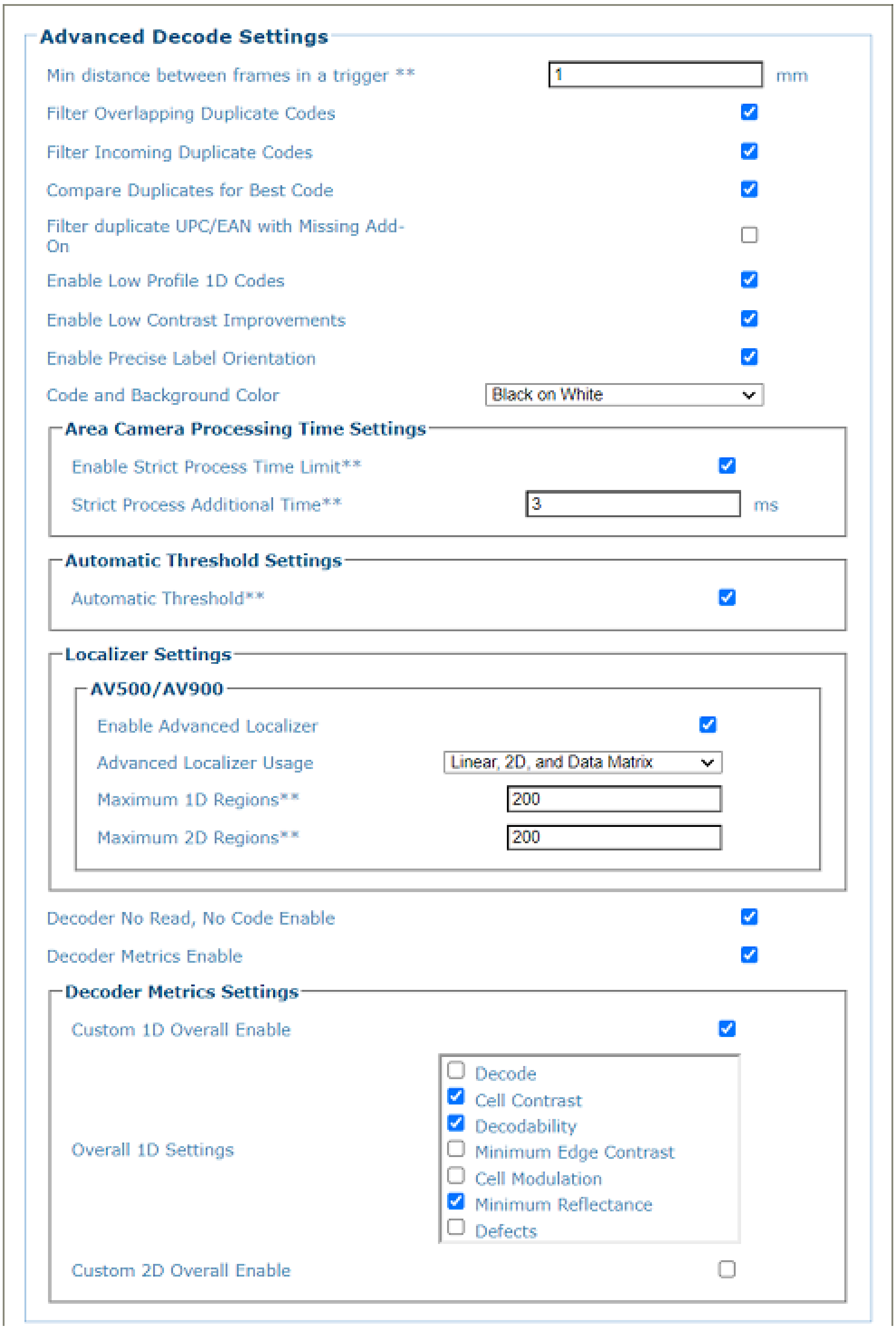
Advanced Decode

Advanced Decode provides ways to improve read rate, by setting filters or more precise parameters, however these settings often affect processing time. When you set Advanced Decode parameters there is a fine balance between reading performance and processing time. Use **Advanced Decode** options with caution.

To edit the Advanced Decode Settings:

1. In the menu tree under **Modify Settings,** navigate to **Global Settings | Advanced Decode.** The **Advanced Decode** window opens.

NOTE: It is best to use Advanced Decode only when necessary and under the guidance of Datalogic Tech Support.



2. Enter the appropriate information in the form as described below:

Min distance between frames in a trigger (For PackTrack only) AV500 Only

Enter the minimum distance between frames required per trigger cycle.

Filter Overlapping Duplicate Codes

Select the Check box to enable the camera to filter out duplicates where the bounding boxes overlap. The bounding box is the area that a bar code is found in by the decode engine.

Filter Incoming Duplicate Codes

Select the check-box to enable. When enabled it will help to prevent the internal barcode buffer from filling up. Image Saving features are disabled. This feature is useful for when conveyor stops frequently, the same frame does not fill up the internal frame buffer, so when conveyor starts again any frame afterwards is decoded.

Compare Duplicates for Best Code

This option is only visible if 'Decode Metrics is Enable' AND either 'FIlter Overlapping Duplicate Codes' or 'Filter Incoming Duplicate Codes' are enabled. When enabled, the metrics of all duplicates are compared and the one with the best grading information is kept, while the others are discarded. When disabled, first-come-first-keep remains.

Filter duplicate UPC/EAN with Missing Add-On

When enabled, the camera filters for 2 decode results of the same 'base' type (UPCA, UPCE, EAN8, EAN13) where one result has an addon, the other does not, and the 'base' barcode text is the same. When this situation is detected, the barcode without the addon is dropped.

This option is only available if either 'Filter incoming duplicates' or 'filter overlapping duplicates' is enabled, barcode configured with AN/UPC "base" type (UPCA, UPCE, EAN8, EAN13) and no add-on and another barcode is configured with same EAN/UPC base type and either 2- or 5-digit addon is enabled.

Enable Low Profile 1D Codes

Select the check box to enable reading of low profile 1D barcodes. This option is used when the bar height of the 1D is small (1/4 inch (6.4mm). It causes the decode engine to spend more time looking at the bar code in the image.

NOTE: This option may increase processing time which may create no reads

Enable Low Contrast Improvements

Select the check box to enable automatic contrast improvements.

Enable High Resolution Codes AV7000 Only

Select the check box to enable High Resolution Codes.

Enable Precise Label Orientation

Select the check box to enable precise label orientation. This option tells the decode engine to spend more processing time locating the center point and bounding box around the barcode symbol.

NOTE: This option may increase processing time which may create no reads

Code and Background Color

Select Black on White, White on Black, or Both from the drop-down list to match the kind of barcodes read by the system.

Enable Strict Process Time Limit AV500 Only

Select the check box to enable a processing time to be set. Specify the maximum amount of time the decoder can spend processing a single image. This may be used to prevent the decoder from spending too much time on a noisy image

Strict Process Additional Time AV500 Only

Enter an amount of time in ms to add your camera’s strict processing time.

Automatic Threshold Settings AV500 Only

Automatic Threshold

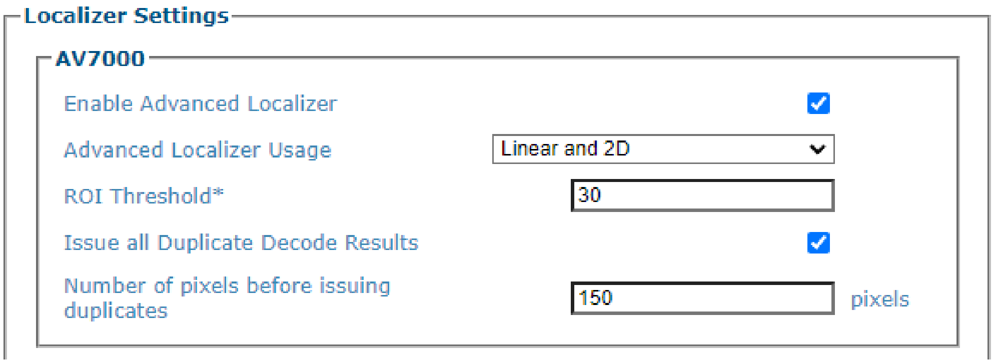
Select the check-box to enable automatic threshold. If this is enabled the decode engine automatically determines the contrast between white and black in the bar codes.

Minimum 2D Contrast

If Automatic Threshold is not enabled, you must enter a value that specifies the minimum difference between what is considered a black bar and what is considered a white space.

For example, if your white level is 158, and your black is 58, subtract the difference, which equals 100 and add another 10% for error. This gives you a value of 90 as your Minimum 2D contrast.

Localizer Settings
AV7000



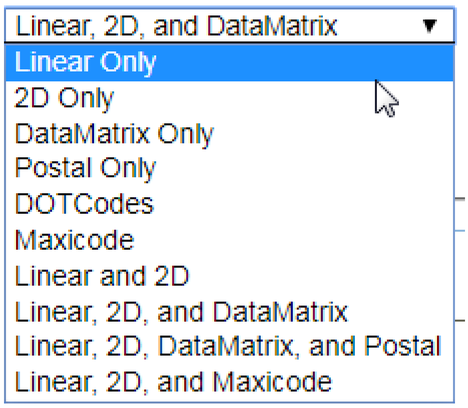
Enable Advanced Localizer

Select the check box to enable the advanced localizer options.

WARNING: DO NOT change this parameter unless directed by Datalogic Support.

Advanced Localizer Usage

The camera employs hardware acceleration to locate possible bar codes. This option specifies for which symbologies the hardware acceleration should be used



The following parameters allow you to define an ROI or Region of Interest for the decoder. This is a region where you will find the bar code. You may want to define a different Max 1D region than the Max 2D region because you may want one to be larger than the other. The parameters below allow you define these individually.

ROI Threshold AV7000 only

Enter ROI Threshold

NOTE: If selecting the following parameters, you should disable Filter Overlapping Duplicate Codes and Filter Incoming Duplicate Codes.

Issue all Duplicate Decode Results

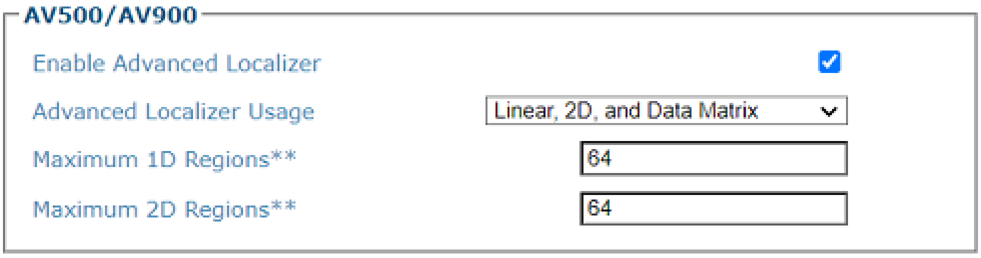
Click the check-box to enable. If enabled, a second new option becomes visible. This must be enabled in order for the AV7000 to generate decode results for duplicate barcodes.

Number of pixels before issuing duplicates

WARNNG: DO NOT change this parameter unless directed by Datalogic Support. More information to come.

LOCALIZER SETTINGS

AV500/AV900



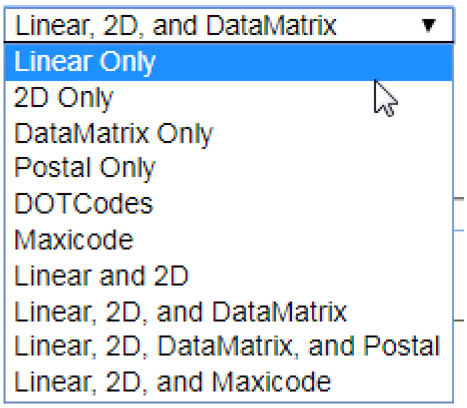
Enable Advanced Localizer

Select the check box to enable the advanced localizer options.

WARNNG: DO NOT change this parameter unless directed by Datalogic Support.

Advanced Localizer Usage

The camera employs hardware acceleration to locate possible bar codes. This option specifies for which symbologies the hardware acceleration should be used



The following parameters allow you to define an ROI or Region of Interest for the decoder. This is a region where you will find the bar code. You may want to define a different Max 1D region than the Max 2D region because you may want one to be larger than the other. The parameters below allow you define these individually.

Maximum 1D Regions

Enter the necessary 1D Region.

Maximum 2D Regions

Enter the necessary 2D Region.

Decoder No Read, No Code Enable

Click the check-box to enable this option which will cause the following changes:

- The Image Viewing pages will update their legend to include a red dot labeled as "Barcodes Not Decodable."
- Image viewers will show a red dot over areas of the image that trigger a no read / no code.
- Image metadata will contain "ImageAnalysis" data on the no read / no code entries.

Decoder Metrics Enabled

Click this check-box to enable special decoder metrics.

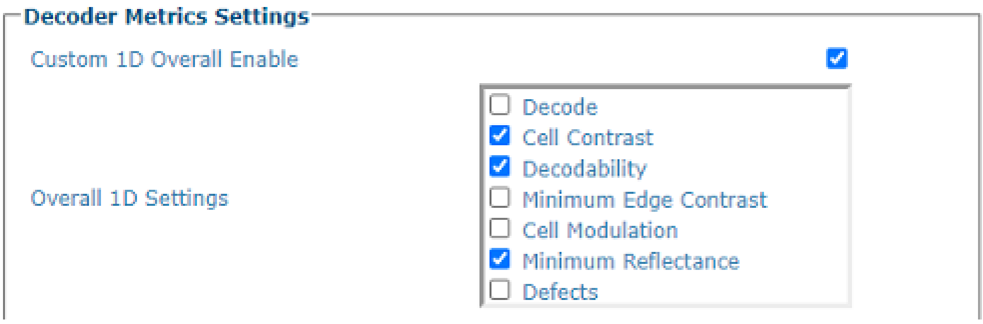
Decoder Metrics Settings

Custom 1D Overall Enable

Click the check-box to reveal a list of overall metrics settings to choose from to define your system's Overall Metric. Click the check-box for the metrics you wish to use. The options you select are combined to provide bar code grading for each barcode read during normal operations. **See "BarCode Grading References" on page 436.** Options are:

- Decode
- Cell Contrast
- Decodability
- Minimum Edge Contrast
- Cell Modulation
- Minimum Reflectance
- Defects

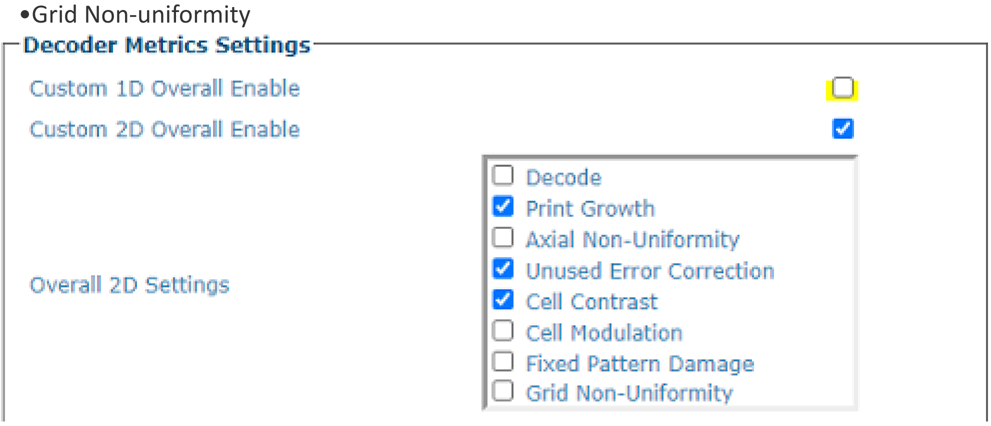
These metrics are used to provide bar code grading for each barcode read during normal operations.



Custom 2D Overall Enable

Click the check-box to reveal a list of overall metrics settings to choose from to define your system's Overall Metric. Click the check-box for the metrics you wish to use. The options you select are combined to provide bar code grading for each barcode read during normal operations. **See "BarCode Grading References" on page 436.** Options are:

- Decode
- Print Growth
- Axial Non-Uniformity
- Unused Error Correction
- Cell Contrast
- Cell Modulation
- Fixed PatternDamage
- Grid Non-uniformity



3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

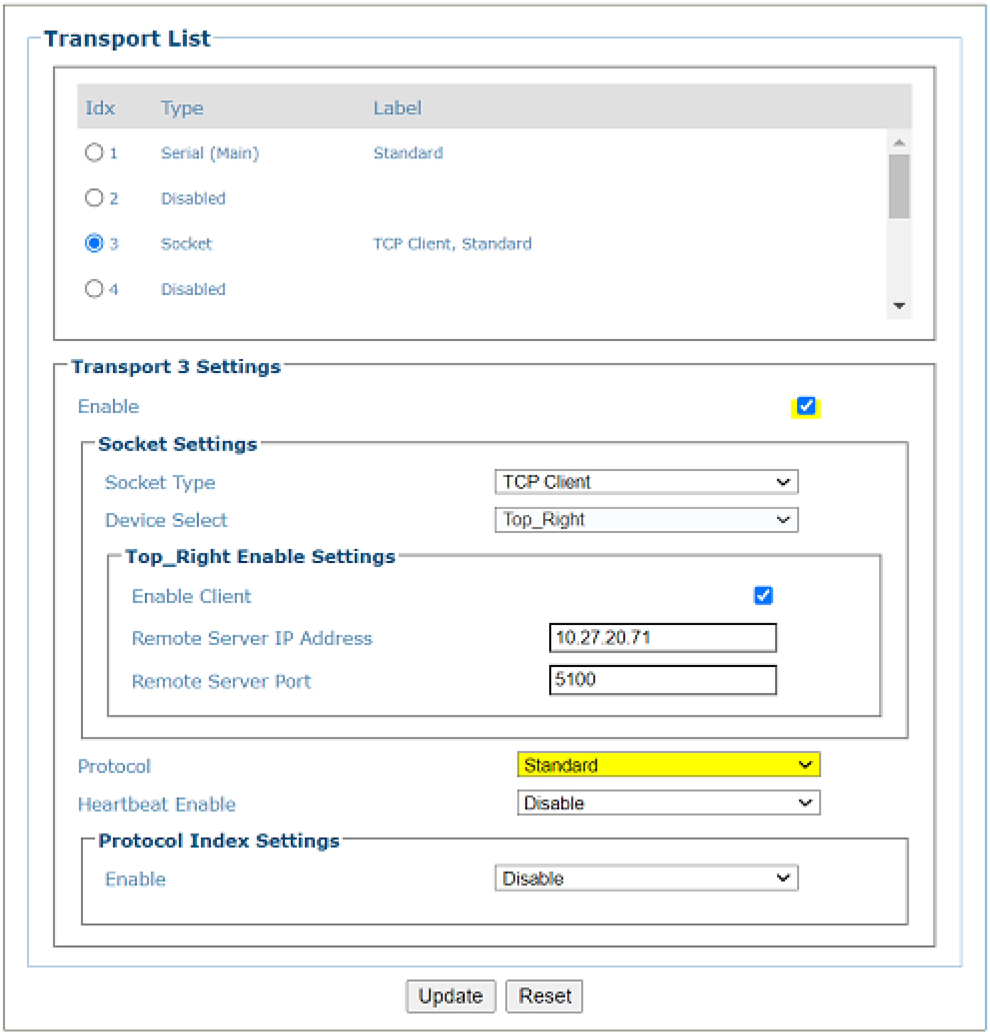
COMMUNICATIONS

Use the **Communications Transports** window to setup, edit, and configure the serial port or numbered user sockets for your scanning system. User sockets are another interface available for Ethernet communication. There are nine available.

Transport parameters are used to setup the serial or Ethernet configuration to match the transmit/receive parameters of an external interface.

To edit the Transports settings:

1. In the menu tree under **Modify Settings,** navigate to **Global Settings | Communications | Transports.** The **Transports** window opens.



2. Enter the appropriate information in the form as described below:

TRANSPORT LIST

NOTE: Transport # 1 is the only setting that allows for a Serial communication connection. If setting Transport #1 skip to Protocol Index Settings.

Select an Idx option button in the list at the top of this window to create a new transport setting item, or to edit an existing one.

Idx

Number identifying the transport item.

Type

The type of transport item. Options are **Serial (Main)**, **Socket** or **Disable.**

Label

The type of communications setup for the transport.

TRANSPORT N SETTINGS

Enable

Select the check-box to enable and reveal configuration options.

Transport Type

Click the drop-down to select Serial (Aux) or Socket.

Device Select

Select the device from the drop-down for which you are setting a transport. The Device Select option is only available when the "**Use Global Configuration**" option is NOT selected and will list all of the available devices in the system.

Use Global Configuration (only Transport 1)

Select the check-box to make this transport setting global. When **Global Configuration** is selected, any of the camera's in the tunnel will use this transport. When Global Configuration is not selected a **Device Select** drop-down is presented which allows for the selection of the devices in the array to transmit the data.

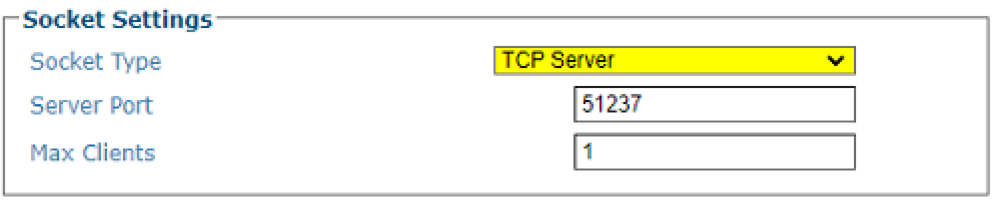
Socket Settings

Socket Type

Select the **Socket Type** from the drop-down. Specific configuration options will appear based on the Socket Type you select.

- **TCP Server**
- **TCP Client**
- **UDP**
- **UDP Multicast**
- **Ethernet/IP**
- **HTTPS**

TCP Server



Server Port

Enter the port number of the server.

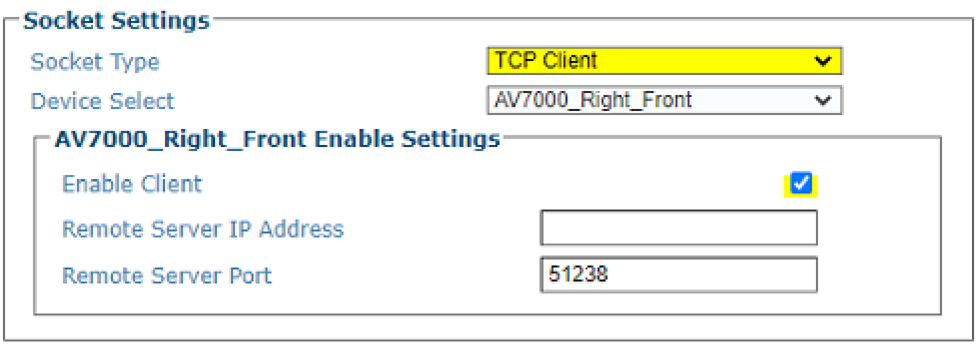
Max Clients

Enter the maximum number of simultaneous clients on the network at one point in time.

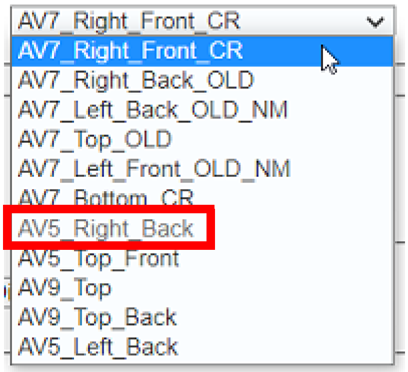
TCP Client, UDP, UDP Multicast

Device Select

Select the device from the drop-down for which you are setting a transport.



Under Transmit 1, the device selection box shows all of the available devices. Any devices that cannot be selected will be grayed out and not able to be selected.



Enable Client

Click the check-box to enable the device as a client

Remote Server IP Address

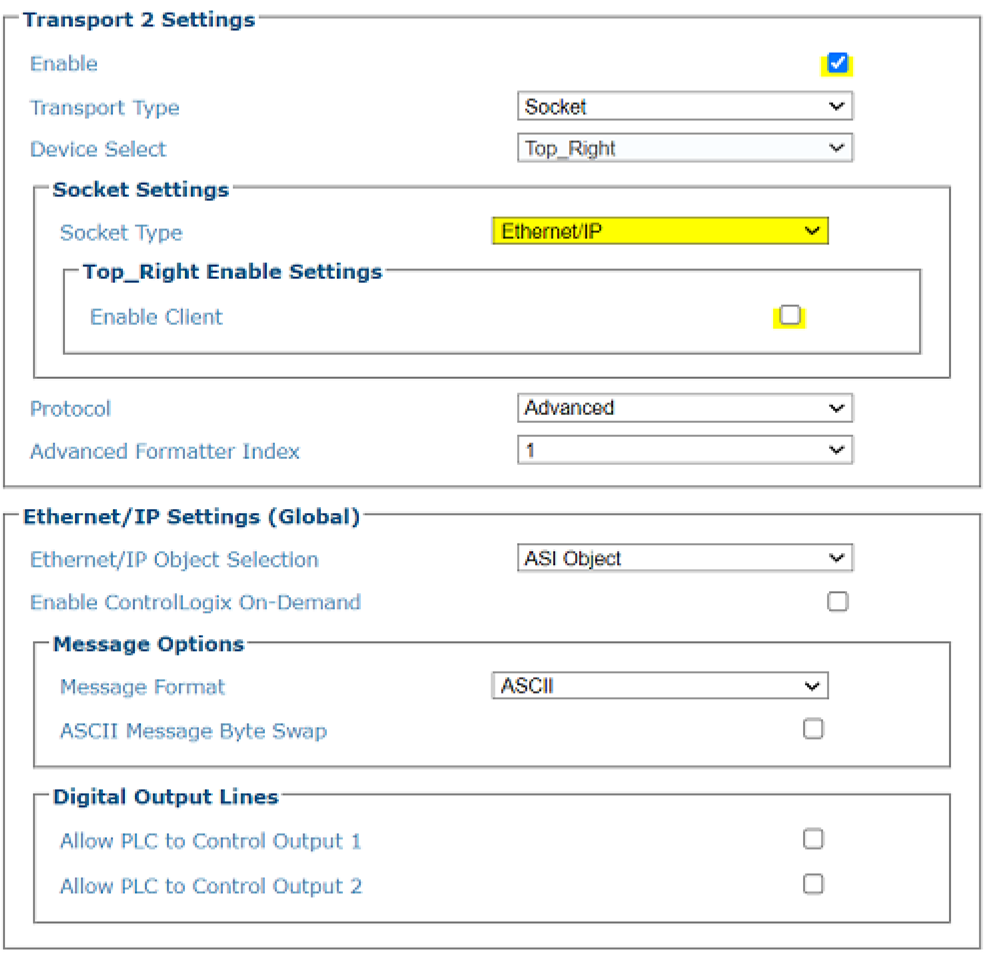
Enter the IP address of the remote server.

Remote Server Port

Enter the port number of the remote server.

Ethernet IP Settings

NOTE: Ethernet IP can only be enabled on one Transport.



Enable Client

Click the check-box to enable the device as a client

Protocol

Select one of the following from the drop-down. Specific Protocol Index Settings will display based on your selection.

- **Disable**
- **Standard**
- **Advanced**
- **Crisplant**
- **Beumer**
- **Custom 1-5**
- **Web Sentinel**
- **Video Coding (PV v2.4)**
- **SC5000**
- **Trigger Message**

Ethernet /IP Object Selection

Click the drop-down to select **ASI Object**. Currently it is the only object available.

Enable ControlLogix On-Demand

Click the check-box to enable **ControlLogix On-Demand**. If selected, the following three On-Demand Options are revealed.

PLC IP Address

Enter the IP address of the PLC.

Tag Name

Enter the Name of the Tag that contains the bar code data.

PLC Slot Number

Enter the slot number of the PLC.

Message Options

Message Format

Select ASCII or Binary from the drop-down list.

- **ASCII** - Select to transmit an ASCII barcode message (as defined by the Message Type). The only difference is that the Header and Trailer are omitted from the barcode messages transmitted using EtherNet/IP. When ASCII messages are in use, the Byte Swap ASCII Data selection will swap the high and low byte of data within each 16 bit word. This is useful for processing data on some Programmable Controllers.
- **Binary** - Select to convert barcode data to a “numeric value” and transferred as a 32 bit word. The user can specify the byte ordering of this word. If any non-numeric (not ASCII ‘0’ to ‘9’ or leading or trailing space) characters are contained in the barcode, the numeric value is zero.

ASCII Message Byte Swap

Select the check box to enable the function. Available when Binary is selected from the Message Format drop-down list. When ASCII messages are in use, the ASCII Message Byte Swap selection will swap the high and low byte of data within each 16 bit word. This is useful for processing data on some Programmable Controllers.

Binary Message Byte Order

If you have selected a Binary Message Format, you will need to click this drop-down and select the Little Endian or Bif Endian for the correct Byte Order.

- Little Endian: little-endian system stores the least-significant byte at the smallest address.
- Big Endian: big-endian system stores the most significant byte of a word at the smallest memory address and the least significant byte at the largest.

Digital Output Lines

NOTE: If Digital Output Lines are set to Ethernet IP and the poll rate for the PLC is set to less than 20 ms, message may get missed. Make sure your PLC polling rate is not less than 20 ms.

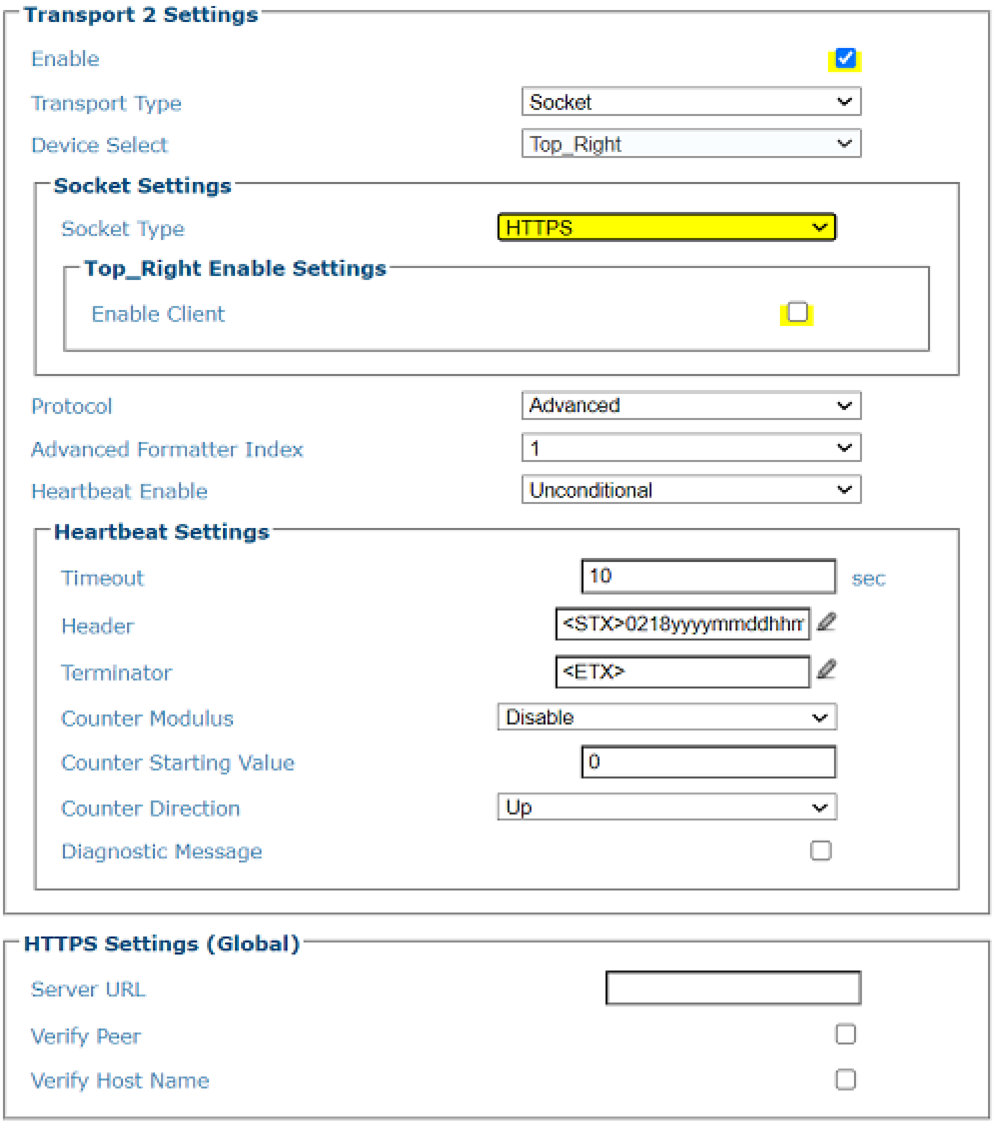
Allow PLC to Control Output 1

Click to allow PLC to control Output 1.

Allow PLC to Control Output 2

Click to allow PLC to control Output 2.

HTTPS Settings



Enable Client

Click the check-box to enable the device as a client.

Protocol

Select one of the following from the drop-down. Specific Protocol Index Settings will display based on your selection.

- **Standard**
- **Advanced**

Heartbeat Enable. See “Heartbeat Settings (If Heartbeat has been enabled)” on page 178

Select one of the following from the Heartbeat Enable drop-down.

- **Disable:** The Heartbeat message is not transmitted
- **Unconditional:** The Heartbeat message is always transmitted, even if communication is still active.
- **Conditional:** The Heartbeat message is transmitted only when there is no communication.

HTTPS Settings (Global)

The HTTPS socket type can be used to transmit messages to a HTTP/HTTPS server. Messages are sent by the camera to the server as an HTTP POST request.

For secure end-to-end communication, the ‘Server URL’ must use HTTPS, and both ‘Verify Peer’ and ‘Verify Host’ must be enabled. **See “Understanding HTTPS Security for AV Family Products” on page 182.**

Server URL

Enter the complete URL of the HTTPS server. Specify the URL to the HTTPS server, in standard URI format **<protocol>://<host>[:<port>]/[<path>]**. Protocol must be either http or https. If using HTTP, the data sent over the network is unencrypted. If using HTTPS, the data sent over the network is encrypted.

See **“Example Server and Destination Directory Settings” on page 183**

Verify Peer - See “Understanding Verify Peer and Verify Host Options” on page 183

Click the Verify Peer check-box. This option only applies when using the HTTPS protocol. Otherwise it is ignored. If enabled, the camera will attempt to authenticate the SSL certificate, as provided by the HTTPS server. If authentication fails, the host message will not be sent.

If disabled, the camera will not attempt authentication of the SSL certificate. HTTPS traffic will still be encrypted, but the authenticity of the server will not be verified. This option is required if using an unsigned / self-signed SSL certificate.This will enable the server to verify the certificate is valid.

Verify Host Name - See “Understanding Verify Peer and Verify Host Options” on page 183

This option only applies when using the HTTPS protocol and ‘Verify Peer’ is enabled. Otherwise it is ignored. If enabled, the camera will attempt to verify the authenticity of the server providing the SSL certificate. If verification fails, the host message will not be sent.

If disabled, the camera will not attempt to authenticate the server.

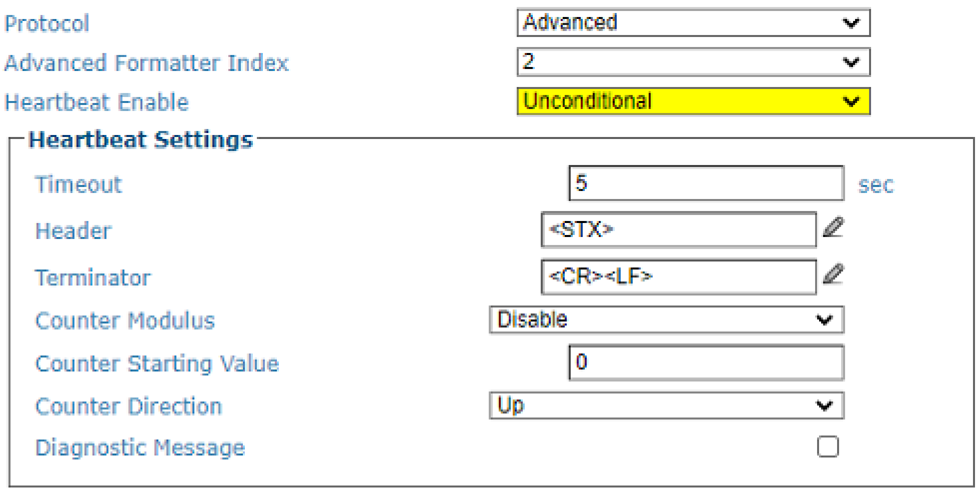
Protocol Selection Options

Protocol

Select one of the following from the drop-down. Specific Protocol Index Settings will display based on your selection.

- **Disable**
- **Standard**
- **Advanced**
- **Crisplant**
- **Beumer**
- **Custom 1-5**
- **Web Sentinel**
- **Video Coding (PV v2.4)**
- **SC5000**
- **Trigger Message**

Standard and Advanced Protocol Index Settings



Advanced Formatter Index (Advanced ONLY)

Select 1 - 5 from the drop-down. When the **Advance Option** is selected the cameras will use the configuration defined in the Output Format>Advanced Formatter page (See **"Output Format | Advanced Formatter" on page 192**). There are up to 5 configurations that can be constructed.

Heartbeat Enable

See **"Heartbeat Settings (If Heartbeat has been enabled)" on page 178**

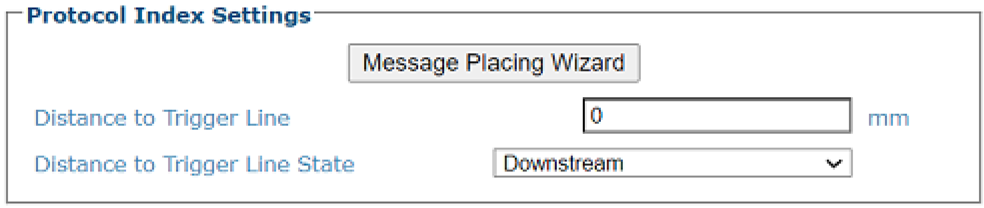
Select one of the following from the Heartbeat Enable drop-down.

Disable: The Heartbeat message is not transmitted

Unconditional: The Heartbeat message is always transmitted, even if communication is still active.

Conditional: The Heartbeat message is transmitted only when there is no communication.

Crisplant Protocol Index Settings



See"Diagnostics | Message Placing Wizard" on page 305

Distance to Trigger Line

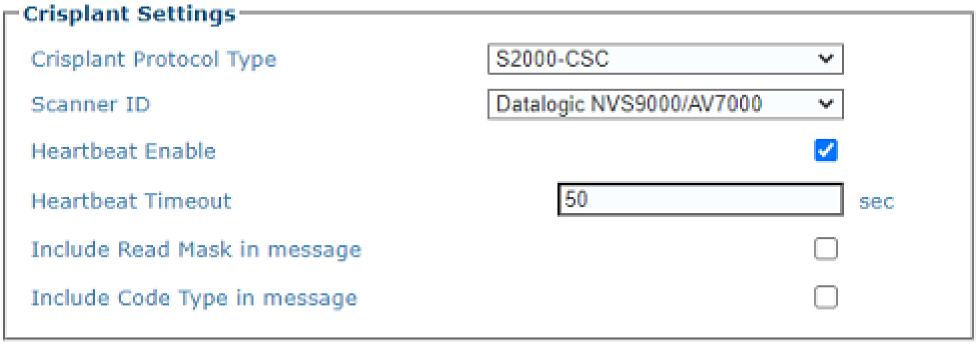
Enter the distance from the trigger line to the point where the camera will receive the protocol index message.

This parameter specifies the distance from the physical Trigger Line (i.e. Trigger Source) to the expected receiving point of the Protocol Index, measured in mm or inches. It is used together with the Minimum Distance Between Two Consecutive Objects (below) parameter to assign the Protocol Index information to the correct package.

Distance to Trigger Line State

Select Upstream or Downstream. This parameter specifies if the distance from the physical Trigger Line is required Upstream or Downstream (i.e. Trigger Source) to the expected receiving point of the Protocol Index, measured in mm or inches. It is used together with the Minimum Distance Between Two Consecutive Objects (below) parameter to assign the Protocol Index information to the correct package. This option allows the camera to recognize a protocol index message even if it occurs upstream such as a message from a scale.

Crisplant Settings



Crisplant Protocol Type

Select one of the three Crisplant protocols: P10, CSC, or CMC from the drop-down list.

- **SORTERCMC.P10:** The Protocol Index message syntax is fixed according to the Crisplant P10 message specifications.
- **S2000-CSC:** The Protocol Index message syntax is fixed according to the Crisplant CSC message specifications.
- **S2000-CMC:** The Protocol Index message syntax is fixed according to the Crisplant CMC message specifications.
- **SORTERCMC.P10A:** The Protocol Index message syntax is fixed according to the Crisplant CMC P10A message specifications.
- **CSC-918:** The Protocol Index message syntax is fixed according to the Crisplant 918 message specifications.

Scanner ID

Select Datalogic, NVS9000/, Accu-Sort 4800, Accu-Sort 55/70, Accu-Sort Quad-X. Available if Crisplant has been selected.

Heartbeat Enable

Select the check box to enable Crisplant heartbeat messages. When Crisplant message is selected there is a separate field for the Crisplant heartbeat message.

Heartbeat Timeout

Enter a time value in seconds to define the amount of time between two heartbeat message transmissions. The timeout timer determines the period from one message to the next. In the Conditional setting the timer is reset when either a host message or a heartbeat is sent. In an unconditional condition the heartbeat message timer is only associated with the heartbeat message, not the host message.

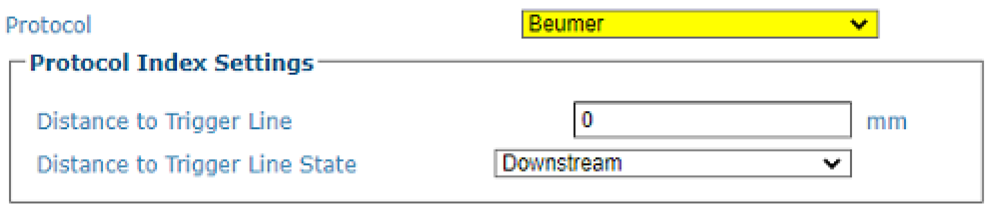
Include Read Mask in message

Select the check-box to add a Read Mask (indicating what was read and what was not read) to the host message.

Include Code Type in message

Select the check box to add the AIM code identifier to the host message.

Beumer Protocol Index Settings



Distance to Trigger Line

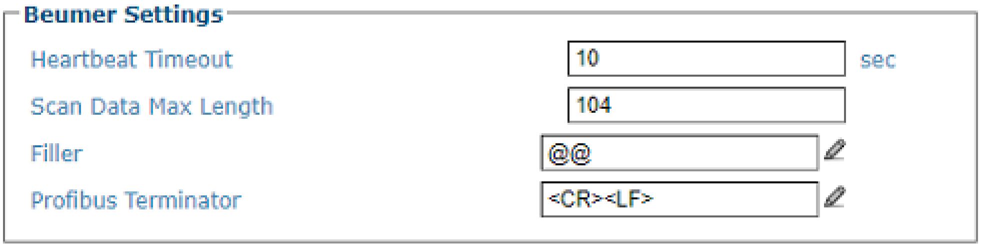
Enter the distance from the trigger line to the point where the camera will receive the protocol index message.

This parameter specifies the distance from the physical Trigger Line (i.e. Trigger Source) to the expected receiving point of the Protocol Index, measured in mm or inches. It is used together with the Minimum Distance Between Two Consecutive Objects (below) parameter to assign the Protocol Index information to the correct package.

Distance to Trigger Line State

Select Upstream or Downstream. This parameter specifies if the distance from the physical Trigger Line is required Upstream or Downstream (i.e. Trigger Source) to the expected receiving point of the Protocol Index, measured in mm or inches. It is used together with the Minimum Distance Between Two Consecutive Objects (below) parameter to assign the Protocol Index information to the correct package. This option allows the camera to recognize a protocol index message even if it occurs upstream such as a message from a scale.

Beumer Settings



Heartbeat Timeout

Enter a time value in seconds to define the amount of time between two heartbeat message transmissions. The timeout timer determines the period from one message to the next. In the Conditional setting the timer is reset when either a host message or a heartbeat is sent. In an unconditional condition the heartbeat message timer is only associated with the heartbeat message, not the host message.

Scan Data Max Length

Enter a maximum length value in the field provided. This field defines the number of characters that will be expected by the Beumer host PLC.

Filler

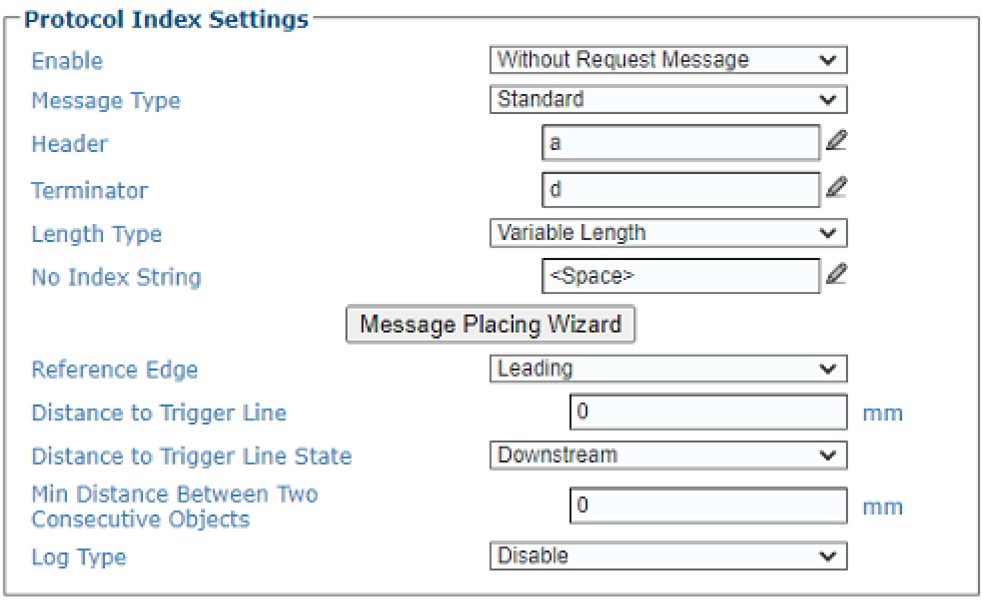
Click to **"Enter Text with the Text Entry Tool" on page 80** and create a filler character(s).

Profibus Terminator

Click to **"Enter Text with the Text Entry Tool" on page 80** and create a filler character(s) to terminate a Profibus message.

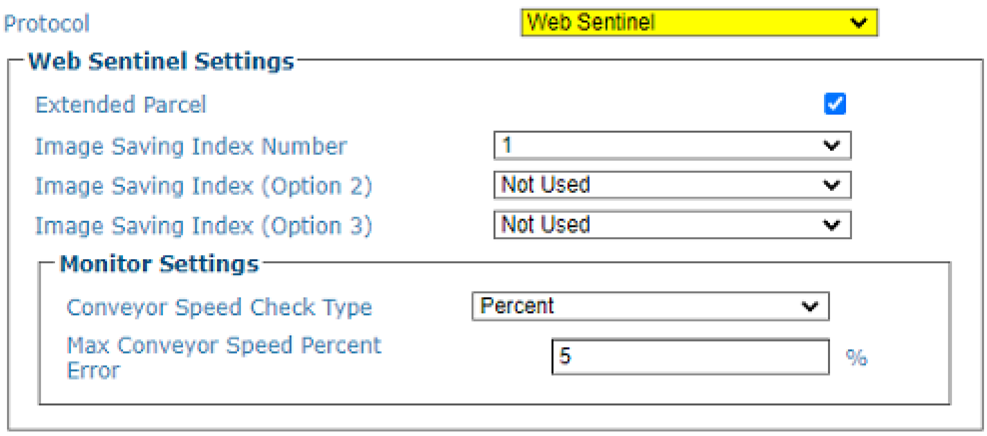
Custom 1-5 Protocol Index Settings

See **"Protocol Index Example" on page 186**



WebSentinel Settings

WARNING: You must select Frame ID or Index for your Image names, if you are sending images to a WebSentinel PLUS Server. This creates unique filenames for each frame, which is necessary for capturing frames and saving them with WebSentinel PLUS.



Extended Parcel

Click the check-box to enable Extended Parcel. This check-box should be selected if you wish to receive image and dimension information.

Image Saving Index Number

Select from the drop-down one of the available index numbers.

Image Saving Index (Option 2)

Select from the next available number to allow additional index numbers.

Image Saving Index (Option 3)

Select from the next available number to allow additional index numbers.

Monitor Settings

Conveyor Speed Check Type

Select Percentage or Absolute from the drop-down list to determine how the conveyor speed is evaluated. This parameter allows selecting if the speed check error will be calculated as percentage change or absolute value change between two consecutive time intervals

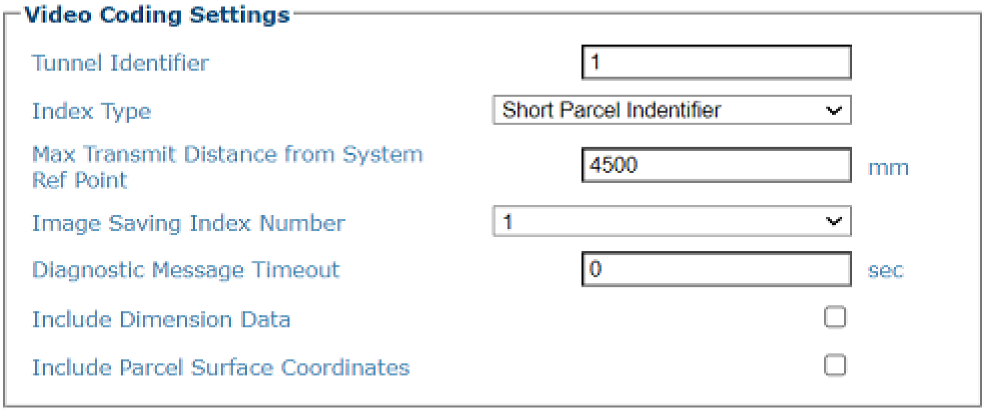
Max Conveyor Speed Percent Error

In the text field provide, enter the percentage of discrepancy allowed in the conveyor speed before an error is sent to the WebSentinel. This option is available when Percentage is selected from the Conveyor Speed Check Type drop-down list.

Max Conveyor Speed Absolute Error

In the text field provide, enter the amount in mm/sec of discrepancy allowed in the conveyor speed before an error is sent to the WebSentinel. This option is available when Absolute is selected from the Conveyor Speed Check Type drop-down list.

Video Coding Settings



Tunnel Identifier

Enter at character string used to identify the AV7000 Tunnel/Array; usually a number.

Index Type

Select Short Parcel Identifier, Extended Parcel Identifier, or Parcel Protocol Index from the drop-down list, to indicate the type of identifier used to tag a package in communication between the AV7000 System, Video Coding System and Host. •Short Parcel Identifier: A string representing the package reference number n n n (max 3 digits from 0 to 255) •Extended Parcel Identifier: A string representing the package reference number (max 3 digits from 0 to 255) appended to the Timestamp: Y Y M M D D H H M M S S M M M n n n Parcel Protocol Index: The Protocol Index string received from the Host through the enabled Protocol Index communication channel. See section for Example Protocol Index configuration.

Max Transmit Distance from System Ref Point

regarding a parcel to the Video Coding System as soon as it is available. This information for each image includes the address where it has been saved, and the value and position of each decoded label found on that image. If images become available at different times (typically on multisided AV7000 Systems) more than one message is sent to the Video Coding System. The last one is explicitly flagged. If this Max Distance from the Trigger is reached for a parcel before all the expected images are saved, the last message is sent to force the closure of the parcel transaction.

Image Saving Index Number

Select a number from the drop-down list. These numbered selections are defined in Image Savings | Images Settings.

Diagnostic Message Timeout

Enter an amount of seconds. It defines the time between Diagnostic Messages. If set to 0 it disables Diagnostic Messages.

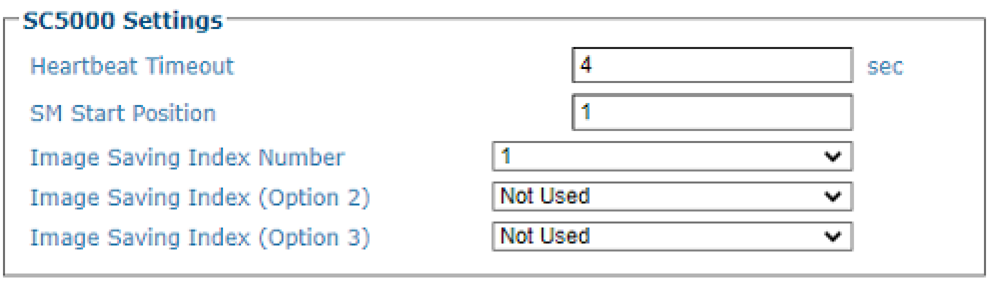
Include Dimension Data

Select this check box to include packages dimension data with your image.

Include Parcel Surface Coordinates

Select this check box to include package surface coordinates with your image.

SC5000



Heartbeat Timeout

Enter a time value in seconds to define the amount of time between two heartbeat message transmissions. The timeout timer determines the period from one message to the next. In the Conditional setting the timer is reset when either a host message or a heartbeat is sent. In an unconditional condition the heartbeat message timer is only associated with the heartbeat message, not the host message

SM Start Position

When the SC5000 is used as a multiplexor, this identifies which camera the barcode data is being received from.

Image Saving Index Number

Select a number from the drop-down list. These number selections are defined in Image Savings | Images Settings.

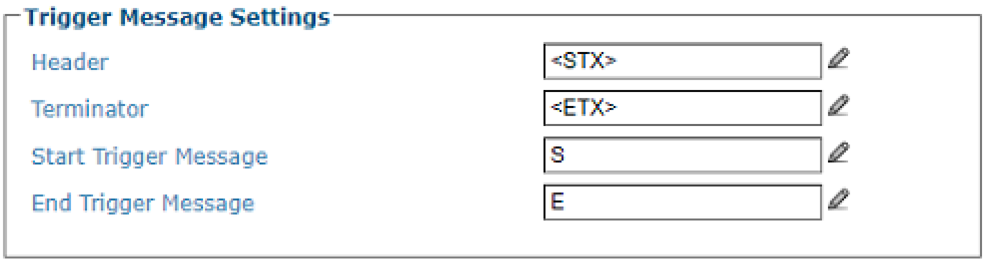
Image Saving Index (Option 2)

Select from the next available number to allow additional index numbers.

Image Saving Index (Option 3)

Select from the next available number to allow additional index numbers.

Trigger Message Settings



Header

Click to **"Enter Text with the Text Entry Tool" on page 80** and create a Header (up to 128 bytes) to be defined and transmitted as a block preceding the Trigger message. Use characters from NUL (00H) to ~ (7EH).

Terminator

Click to **"Enter Text with the Text Entry Tool" on page 80** and create a Terminator (up to 128 bytes) to be defined and transmitted as a block ending the Trigger message. Use characters from NUL (00H) to ~ (7EH).

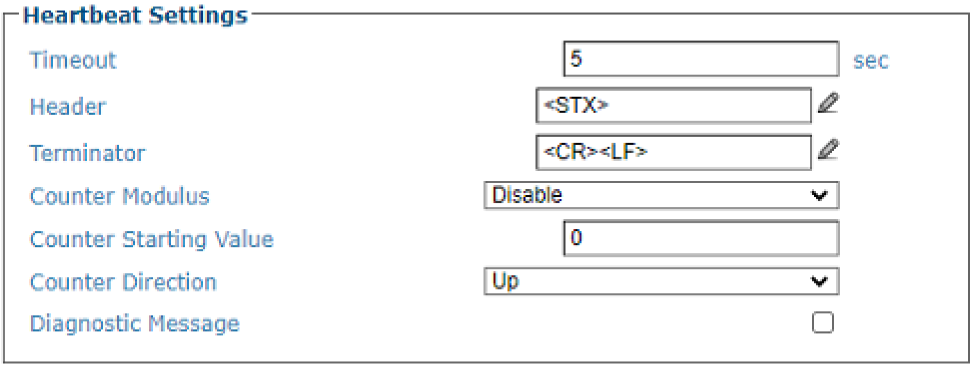
Start Trigger Message

Click to **"Enter Text with the Text Entry Tool" on page 80** and create a Start Trigger Message (up to 128 bytes) to be defined and transmitted as the Start Trigger message. Use characters from NUL (00H) to ~ (7EH).

End Trigger Message

Click to **"Enter Text with the Text Entry Tool" on page 80** and create an End Trigger Message (up to 128 bytes) to be defined and transmitted as the End Trigger message. Use characters from NUL (00H) to ~ (7EH).

Heartbeat Settings (If Heartbeat has been enabled)



Heartbeat Settings

Timeout

Enter a time value in seconds to define the amount of time between two heartbeat message transmissions. The timeout timer determines the period from one message to the next. In the Conditional setting the timer is reset when either a host message or a heartbeat is sent. In an unconditional condition the heartbeat message timer is only associated with the heartbeat message, not the host message.

Header

Click to **"Enter Text with the Text Entry Tool" on page 80** and create heartbeat header text to signal the beginning of the heartbeat message. Characters from NUL (00H) to ~ (7EH) can be used.

Terminator

Click to **"Enter Text with the Text Entry Tool" on page 80** and create Terminator text to signal the end of the heartbeat message. Characters from NUL (00H) to ~ (7EH) can be used.

Counter Modulus

Select Disable, 10, 100, 1000, 10000 or Custom from the drop-down list.

This parameter enables a counter to track the number of Heartbeat messages.

- **Disable** No counter field in the Heartbeat message
- **10** Counts cyclically from 0 to 9
- **100 C**ounts cyclically from 0 to 99
- **1000** Counts cyclically from 0 to 999
- **10000** Counts cyclically from 0 to 9999
- **Custom** Allows defining a custom counter start/stop range from 0 to 10000.

Counter Starting Value

Enter a counter start value in the field provided.

For the Custom Counter Module this parameter selects the starting counter value.

Selections: a number from 0 to 9999

Counter Direction

Select Up or Down from the drop-down list to set the counter direction.

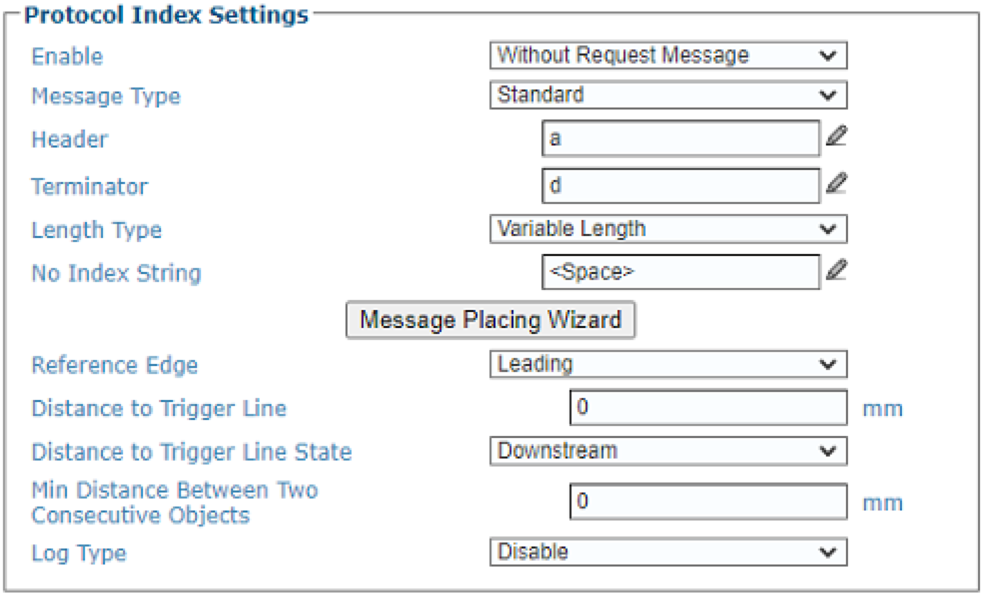
Diagnostic Message

Select the check box to include a diagnostic field in the heartbeat message.

Separator

Click to **"Enter Text with the Text Entry Tool" on page 80** and create a Separater to text to signal the end of one part of the message and the beginning of another.

Protocol Index Settings (If Protocol Index is enabled)



Message Type

NOTE: The Header and Terminator need to match the external component.

Click the drop-down to select the appropriate message type. Options are Standard or AIM+Barcode.

- **Standard:** Regular protocol index messages without additional processing.
- **AIM + Barcode:** Protocol Indes Messages in the format of a 3-digit AIM code followed by the barcode data (e.g]xxABCDEFGHIJKL) will be processed as a decode and matched to a package.

Header

Click to **"Enter Text with the Text Entry Tool" on page 80** and create a Header (up to 128 bytes) to be defined and transmitted as a block preceding the Protocol Index string sent by the Host. Use characters from NUL (00H) to ~ (7EH).

Terminator

Click to **"Enter Text with the Text Entry Tool" on page 80** and create a Terminator to be defined and transmitted as a block following the Protocol Index string sent by the Host. Use characters from NUL (00H) to ~ (7EH).

Click Submit to save your changes, or click Cancel to return to the previous window.

Length Type

Select Variable Length, Length in Message, or Fixed Length from the drop-down list.

- **Variable Length:** The length of the Protocol Index string sent by the Host is variable.
- **Length in Message:** The first byte of the output message indicates the length of the Protocol Index string sent by the Host.
- **Fixed Length:** The Protocol Index string has a fixed length from 3 to 12 characters.

No Index String

Click to **"Enter Text with the Text Entry Tool" on page 80** and create a No Index String. Click Submit to save your changes, or click Cancel to return to the previous window.

This parameter defines the string to be transmitted instead of the Protocol Index within the output message when no Protocol Index string has been associated to the package.

Request Message

The Request Message is the message that the camera sends to the external component, requesting the component to send the protocol message. Only available when "With Request Message is enabled."

Delay Request Message

When unchecked, the request message gets sent at start of trigger. Select this check box and the request message will be delayed by the Reference Edge and Distance to Trigger Line specified here.

Message Placing Wizard

See **"Diagnostics | Message Placing Wizard" on page 305**

Reference Edge

Select Leading or Trailing from the drop-down list. This is the edge of the package when the external component will send the message.

Distance to Trigger Line

Enter the distance from the trigger line to the point where the camera will receive the protocol index message. This parameter specifies the distance from the physical Trigger Line (i.e. Trigger Source) to the expected receiving point of the Protocol Index, measured in mm or inches. It is used together with the Minimum Distance Between Two Consecutive Objects (below) parameter to assign the Protocol Index information to the correct package.

Distance to Trigger Line State

Select Upstream or Downstream. This parameter specifies if the distance from the physical Trigger Line is required Upstream or Downstream (i.e. Trigger Source) to the expected receiving point of the Protocol Index, measured in mm or inches. It is used together with the Minimum Distance Between Two Consecutive Objects (below) parameter to assign the Protocol Index information to the correct package. This option allows the camera to recognize a protocol index message even if it occurs upstream such as a message from a scale.

Min Distance Between Two Consecutive Objects

Enter the smallest possible distance between system packages in the field provided. This specifies the minimum distance (in mm or inches) between two consecutive packages. It is used to compensate for imprecision in the Distance from Protocol Index to Trigger Line parameter by virtually lengthening the package. This parameter implies that if two consecutive packs are placed on the conveyor at a distance less than the minimum, Protocol Index assignment error will occur and the camera will not assign the message to either package.

Log Type

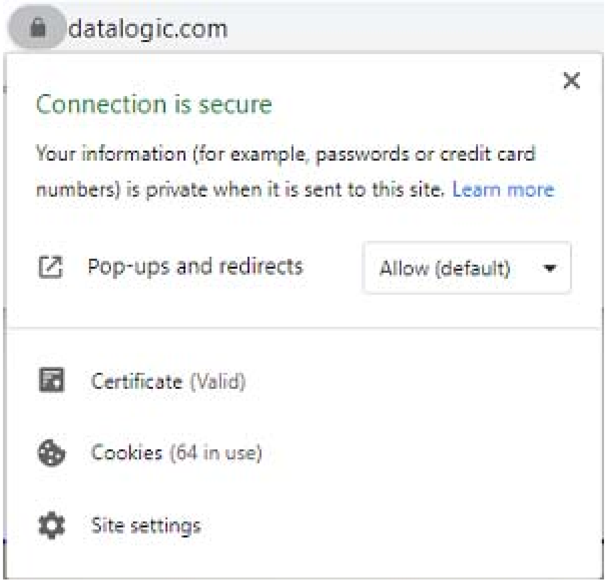
Select **Disable, Standard,** or **Advanced** from the drop-down list. Advanced Logging is used during calibration or troubleshooting to confirm that the protocol index message is solidly found on the correct box.

3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

UNDERSTANDING HTTPS SECURITY FOR AV FAMILY PRODUCTS

HTTPS Overview (Server Side Certificates)

HTTPS (Hyper Text Transfer Protocol Secure) appears in a URL when a website is secured by an SSL certificate. The details of the certificate, including the issuing authority and the corporate name of the website owner, can be viewed by clicking on the lock symbol on the browser bar.



SSL stands for Secure Sockets Layer and, in short, it's the standard technology for keeping an Internet connection secure and safeguarding any sensitive data that is being sent between two systems, preventing criminals from reading and modifying any information transferred, including potential personal details. The two systems can be a server and a client (for example, a shopping website and browser) or server to server (for example, an application with personal identifiable information or with payroll information).

SSL does this by making sure that any data transferred between users and sites, or between two systems remain impossible to read. It uses encryption algorithms to scramble data in transit, preventing hackers from reading it as it is sent over the connection. This information could be anything sensitive or personal which can include credit card numbers and other financial information, names and addresses.

TLS (Transport Layer Security) is just an updated, more secure, version of SSL. We still refer to our security certificates as SSL because it is a more commonly used term.

Understanding Verify Peer and Verify Host Options

Part of this security verifies Peer and/or Host Name. These options are explained below.

This will authenticate the HTTPS connection:

Verify peer – verify the certificate is valid.

Verify host – verify the certificate matches the target host

Analogy

If this certification were a drivers license, Verify Peer makes sure the license is valid. Verify Host checks that the name/photo on the license matches the person presenting it. Ideally, users would always leave both options enabled. But often for testing and sometimes for internal services, it’s useful to use self-signed certificates. Self-signed certs allow TLS/SSL encryption, but they are not signed by any certificate authority and will fail the “verify peer” check. Depending on the network setup, users may also need to disable “verify host”.

For the URL format, we allow standard http and https formats, with or without the port numbers specified. The URL should also contain the path to the specific endpoint that the message is to be sent.

If using HTTP there is no TLS/SSL cert, causing the verify peer/host options to be ignored.

For the Transport configuration, we support a single URL containing both the hostname and path to the endpoint for sending data **(https://myhost.com:8443/path/to/data).**

For Image Saving, we create separate “Server Path” and “Destination Directory” fields; at runtime they are concatenated together to form the final URL. Users may choose to split the server+port from the path **(https://myhost.com:8443 and “/path/to/data”)** or enter the full URL in just the “Server Path” field **(https://myhost.com:443/path/to/data).**

Example Server and Destination Directory Settings

Server = http://myhost.com (uses default http port 80)

Destination Directory = path/to/endpoint

Server path used by camera = http://myhost.com/path/to/endpoint/

Server = http://myhost.com:8080/path/to/endpoint/ (uses HTTP over port 8080)

Destination Directory = (left Blank)

Server path used by device = http://myhost.com:8080/path/to/endpoint/

Server = https://myhost.com/path/to/endpoint/ (uses default https port 443)

Destination Directory = (left Blank)

Server path used by device = https://myhost.com/path/to/endpoint/

Server = https://myhost.com:8443 (uses HTTPS over port 8443)

Destination Directory = path/to/endpoint

Server Path used by device = https://myhost.com:8443/path/to/endpoint/

Support for HTTPS Client Certificates

The AV Family cameras can act as an HTTPS clients, communicating with a remote HTTPS server. The HTTPS connection is encrypted, so both client and server can be assured that the data being sent is what the sender intended, and that no one is able to eavesdrop.

Client Certificates come into play when you need to validate that the device at the other end of the connection really is the device that it claims to be. Typically in HTTPS whenever there's a reference to a signed SSL/TLS certificate, it is almost always a reference to the signed cert on the HTTPS server. When your web browser (client) visits a website such as amazon.com (server) there is a key exchange between the client and server that lets the browser verify the remote server really is amazon.com, and that's what triggers the browser to display the secure padlock. The user authenticity is then handled through other means, such as logging into amazon with a username and password.

Client certificates allow the HTTPS server to verify the connection is from a real AV camera. The camera is still the HTTPS client, but it has a private certificate that it uses in the HTTPS handshake with the remote HTTPS server. The server can then verify that the client is 'valid' and not a random actor attempting to connect. This is supported in HTTPS, but used less often then the server-side cert.

When using certs there are two different encryption keys: one private, one public. As the names imply, the public can be shared with anyone. The private key should be kept secret, as the entire trust chain is based on ONLY the real owner of the cert having access to that private key. If anyone else gets a hold of the private key, it could be impersonated.

OUTPUT FORMAT

Use Output Format to format messages. The following options are available:

"Output Format | Standard Formatter" on page 189
"Output Format | Advanced Formatter" on page 192
"Advanced Formatter | Message Builder" on page 196

Protocol Index Example

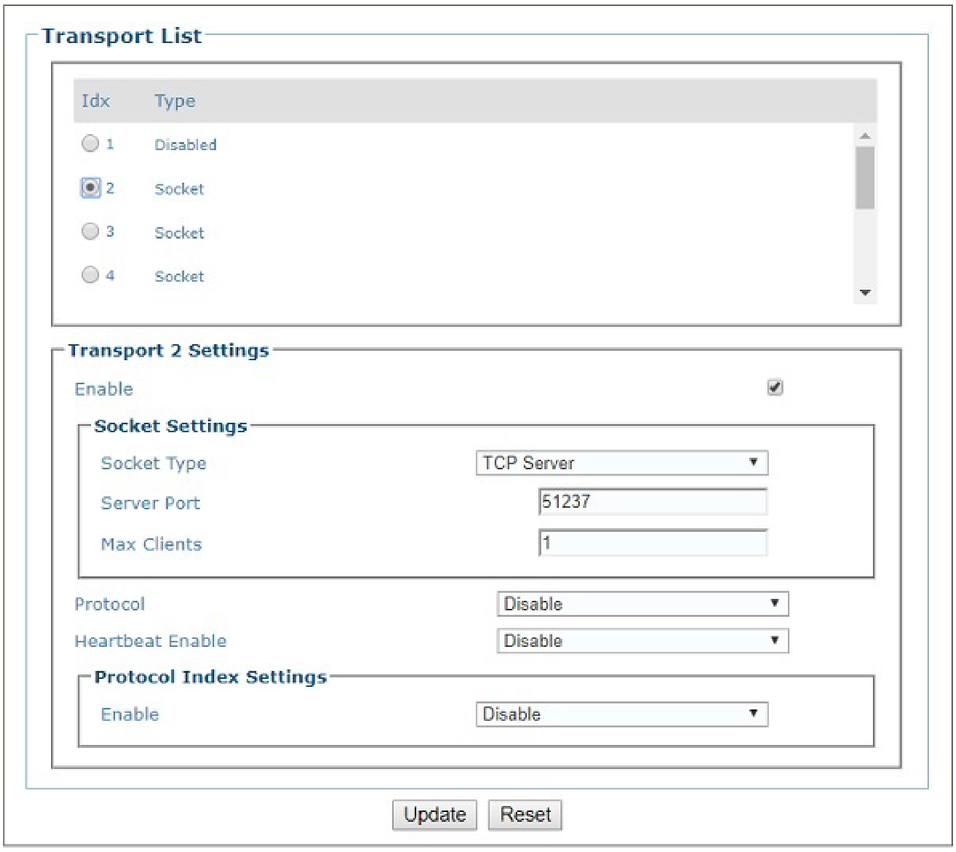
The Protocol Index is used to get a message from third party equipment such as a scale or sorter. The message can then be attached to the barcode message output from the system. In the following example, a message from a third party scale needs to be attached to a barcode relating to a package.

NOTE: Use the "Diagnostics | Message Placing Wizard" on page 305 to properly set up your Protocol Index messages.

Protocol Index Setup Example:

First, configure the transport connections in **Global Settings | Communications | Transports**.

1. Navigate to **Global Settings | Communications | Transports.**
2. Select a transport for the incoming data message from the scale. In this example, **transport number 2** is selected.
3. Click the **Enable** checkbox. Socket settings parameters appear.



4. Make sure appropriate Socket Type is selected from the Socket Type drop-down list.
5. Enter the shared Server port # of the unit generating the protocol index information and specify Max Clients.
6. Under the **Protocol Index Settings - Enable** section of the screen, select **Without Request Message** from the drop-down list. Associated parameters appear.

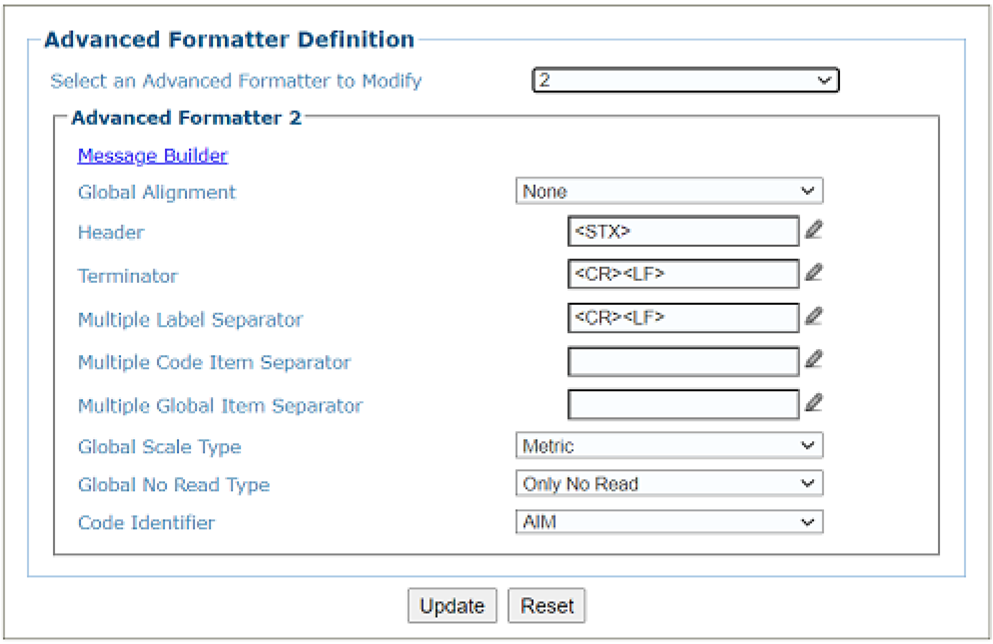
7. Enter a **Header** and **Terminator** for the incoming message from the scale in the fields provided. Use the to **"Enter Text with the Text Entry Tool" on page 80** to create the Header and Terminator, in this example <STX> and <ETX>.

NOTE: The header and terminator must match the Protocol Index source, in this case, the scale structures.

8. Select a length for the message from the **Length Type** drop-down list. In this example **Variable Length** is selected.
9. Enter **NoScale** for the **No Index String**. This means "NoScale" will be attached to the outgoing host message if nothing is received from the scale.
10. Select **Trailing** from the **Reference Edge** drop-down list. This indicates the back/ trailing edge of the box is the reference point. Trailing is the normal setting for a message from scale.
11. In the **Distance to Trigger Line,** enter the measured distance from the trigger to the expected scale transmission location on the conveyor belt. This distance will have been set up in the scale configuration. This parameter specifies the distance from the Trigger Line (Trigger Source) to the expected receiving point of the Protocol Index. It is used together with the Minimum Distance between Two Consecutive Parcels parameter to assign the Protocol Index information to the correct pack.
12. Select **Upstream** or **Downstream** from the **Distance to Trigger Line State**.
13. Enter a distance in the **Min Distance between Two Consecutive Objects** text field. This specifies the minimum distance (in mm) between two consecutive packages. It is used to compensate for imprecision in the Distance from Protocol Index to Trigger Line parameter by virtually lengthening the package.

Configuration Host Message with Protocol Index

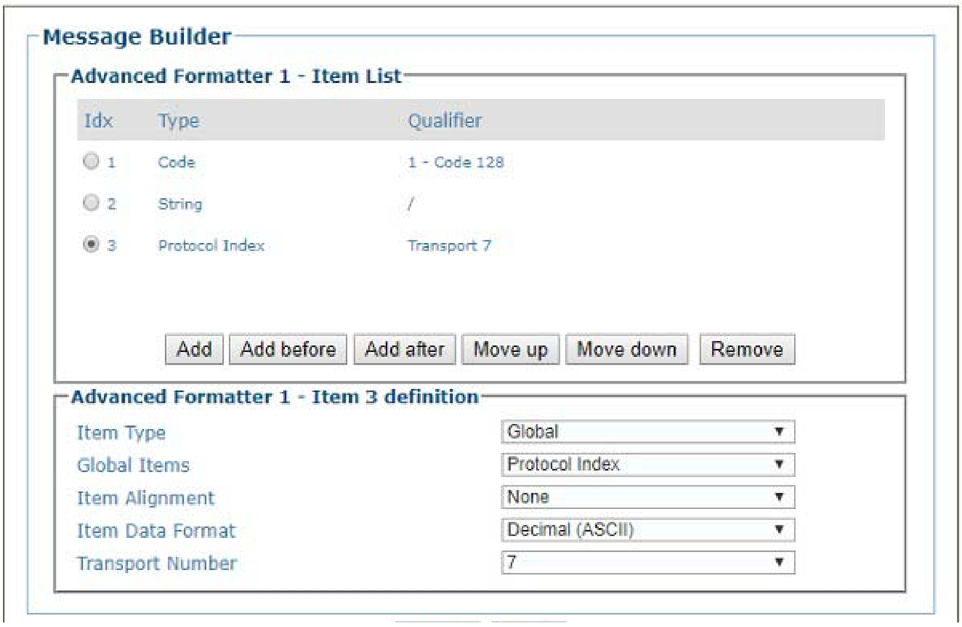
Navigate to **Modify Settings | Global Settings | Output Format | Advanced Formatter**. the Advanced formatter window opens



1. From the **Advanced Formatter** window, select 1 from the Select an Advanced Formatter to Modify drop-down list. This is the outgoing host message that will combine the barcode data and scale (protocol index) message.

2. Click on the **Message Builder** link. The Message Builder window opens.

3. Set up a Code (system barcode), and a delimitter to fall between the barcode data and protocol index data from the scale. See **"Advanced Formatter | Message Builder" on page 196**.



4. Click **Add** and select **Code Related** for the item type, to define the barcode as the first part of the message.

5. Select **Code** from the **Code Related Items** drop-down.

6. Click **Add** and select **String** for the item type, to add a string to separate the code and the scale data.

7. Select **Disabled, Previous Code or Next Code** for the Link to Code drop-down.

8. Use the to **"Enter Text with the Text Entry Tool" on page 80** to create the string.

9. Click **Add,** to add in the scale message (Protocol Index).

10. Select **Global** from the Item Type drop-down list.

11. Select **Protocol Index** from the Global Items drop-down list.

12. Select **None** from the Item Alignment drop-down.

13. Select **Decimal (ASCII)** from the Item Data Format drop-down.

14. Select 2 (in this example) from the Transports drop-down list. This was selected as the **Idx # in Global Settings | Communications | Transports**.

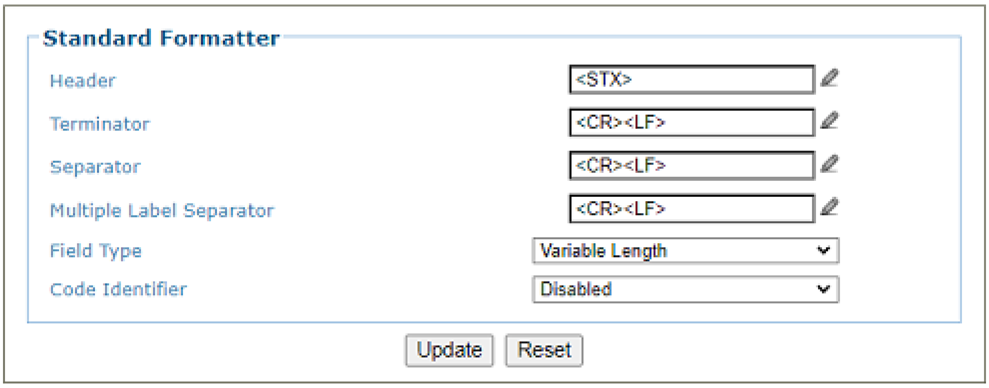
Output Format | Standard Formatter

Use the **Standard Formatter** to set up standard code parameters for output messages.

To edit the Standard Formatter settings:

1. In the menu tree under **Modify Settings,** navigate to G**lobal Settings | Output Format | Standard Formatter**. The **Standard Formatter** window opens.

2. Enter the appropriate information in the form as described below:



Header

Click to **"Enter Text with the Text Entry Tool" on page 80** and create a header string. Headers (up to 128 bytes) can be defined and transmitted as a block preceding the barcode(s). Characters from NUL (00H) to ~ (7EH) can be used.

Terminator

Click to **"Enter Text with the Text Entry Tool" on page 80** and create a terminator string. Terminators (up to 128 bytes) can be defined and transmitted as a block following the barcode(s). Characters from NUL (00H) to ~ (7EH) can be used.

Separator

Click to **"Enter Text with the Text Entry Tool" on page 80** and create a separator string. Separators (up to 128 bytes) can be defined. Characters from NUL (00H) to ~ (7EH) can be used.

The Data Packet Separators (up to 128 bytes) are used to separate barcodes in the reading phase. For this reason, it is very useful when the Multi Label parameter has been enabled. If selected, they occur within the Code Field and are transmitted after each decoded code.

Multiple Label Separator

When Standard Multi Label or Logical Combination is selected in the Barcode Configuration page, the Multiple Label Separator option appears. This allows for the configuration of a character that will be transmitted between multiple bar codes.

Field Type

Select **Variable Length or Fixed Length** from the drop-down list. The code field length can be (in number of characters/digits) specified in order to be accepted for decoding:

- **Variable Length:** All possible code field lengths (in number of characters/digits) allowed for the code selected are accepted. When the Variable Length option is selected the following options appear: Field Length, Fill Direction, and Fill Character
- **Fixed Length:** Only the length defined by the Code Field Length parameter is transmitted.

Field Length

Enter a length value in the field provided. Only for fixed length format.

Fill Direction

Select Left or Right from the drop-down list. Only for fixed length format.

Fill Character

For fixed length, click to **"Enter Text with the Text Entry Tool" on page 80** and create a fill character.

Code Identifier

Select **Disabled, AIM**, or **Custom** from the drop-down list. This parameter allows enabling/disabling the transmission of the code ID in the output data format.

- **Disabled:** No code identifier is included in the output message
- **AIM:** The AIM standard identifier is included in the output message
- **Custom:** This selection activates a list of Custom Code ID strings, allowing the user to define an identifier string for each code symbology. The string will be included in the output message.

In each code string option, click to **"Enter Text with the Text Entry Tool" on page 80** and create a character string.

List of Code Types

This list appears when Custom is selected from the Code Identifier drop-down list. For each code type, click to **"Enter Text with the Text Entry Tool" on page 80** and create Code Identifier characters.

Custom Code Identifiers

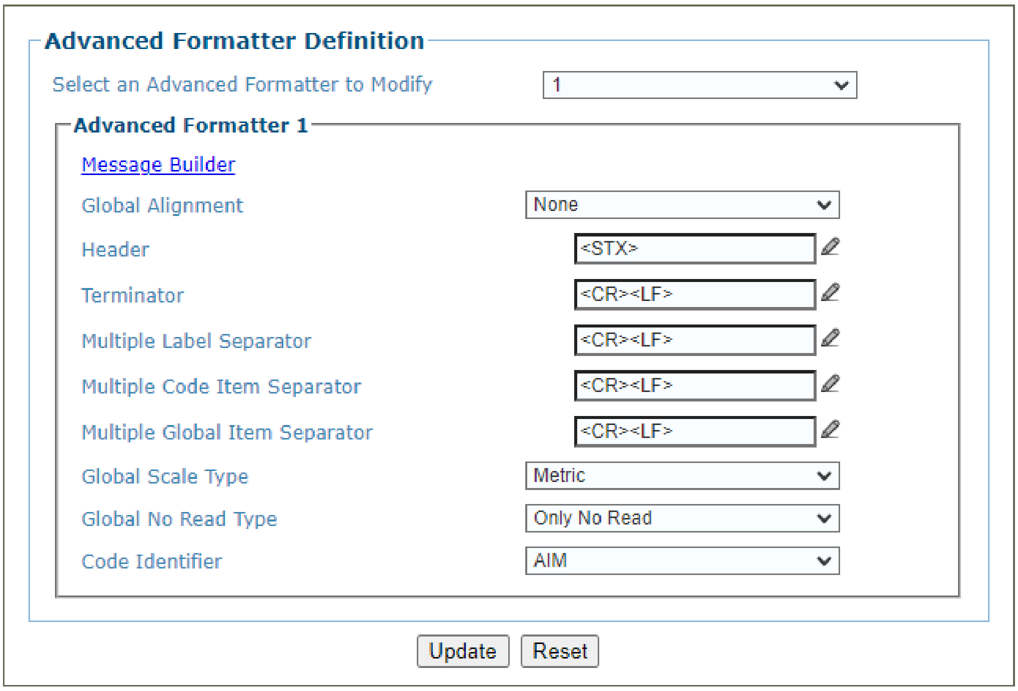
3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

Output Format | Advanced Formatter

Use the **Advanced Formatter** to set up a selection of advanced code parameters for output messages. This is useful when you need to create more complex messages to the Host. There are five unique message formats that can be constructed. Once the format is defined the format is assigned to a port in the **Communication>Transports** menu option by selecting the Advanced option in the Data Output Protocol drop down. Then select the Advanced Formatter item in the Advanced Formatter Index number.

To edit the Advanced Formatter settings:

1. In the menu tree under **Modify Settings,** navigate to **Global Settings | Output Format | Advanced Formatter.** The Advanced Formatter window opens.



Select an Advanced Formatter to Modify

Select a numeric Advanced Formatter item to modify from the drop-down list. There are five host messages that can be constructed.

Advanced formatter N

Message Builder

Click on this link to open the Message Builder "Advanced Formatter | Message Builder" on page 196 window.

Global Alignment

Select None, Left, or Right from the drop-down list.

When you activate Global Alignment you are choosing to add characters (padding) to the leading and/or trailing edge of the transmitted message. Left refers to the leading part of the message, and Right refers to the trailing part of the message.

Align Length

If Left or Right alignment is selected, enter the number of characters to align by.

Align Filler Char

If Left or Right alignment is selected, enter the character to fill the align length with.

Header

Click to **"Enter Text with the Text Entry Tool" on page 80** and create a header string. Headers (up to 128 bytes) can be defined and transmitted as a block preceding the barcode(s). Characters from NUL (00H) to ~ (7EH) can be used.

Terminator

Click to **"Enter Text with the Text Entry Tool" on page 80** and create a terminator string. Terminators (up to 128 bytes) can be defined and transmitted as a block following the barcode(s). Characters from NUL (00H) to ~ (7EH) can be used.

Multiple Label Separator

Click to **"Enter Text with the Text Entry Tool" on page 80** and create a separator string. Separators (up to 128 bytes) can be defined. Characters from NUL (00H) to ~ (7EH) can be used. This is only available if your configuration is Multi-Label, Logical Combination or Code Collection.

Multiple Code Item Separator

Click to **"Enter Text with the Text Entry Tool" on page 80** and create a separator string. Separators (up to 128 bytes) can be defined. Characters from NUL (00H) to ~ (7EH) can be used.

Multiple Global Item Separator

Click to **"Enter Text with the Text Entry Tool" on page 80** and create a separator string. Separators (up to 128 bytes) can be defined. Characters from NUL (00H) to ~ (7EH) can be used.

Global Scale Type

Select Metric, Imperial, Encoder Units, or Normalized (0-255) from the drop-down list.

- **Metric:** Metric length units are used
- **Imperial:** Imperial length units are used

Global No Read Type

Click the drop-down to select from **Only No Read, Leading,** or **Trailing.**

ADVANCED FORMATTER GLOBAL NO READ TYPE EXAMPLES:

Assume the Global No Read message is defined as NOPE and Two Protocol Index Messages are being sent to the Camera as additional Fields in the Advanced formatter.

Example 1 - Single Label

Bar code is not read.

Global No Read Type selected is Only No read.

Host message = Global No Read Defined under barcode configuration

NOPE

Global No Read Type selected is Leading.

Host message = Global No Read_PI1_PI2

NOPE_PI1_HI1!_0004_PI2_Hi2!_0004

Global No Read Type selected is Trailing.

No Read: Host message = _PI1_PI2<Global No Read>

_PI1_HI1!_0006_PI2_Hi2!_0006**NOPE**

Example 2 - Multiple Label

Two Codes enabled. Barcode Configuration set to Global No Read

Global No Read Type selected is Only No read.

Barcode 1 No read Barcode 2 Read or Barcode 1 Read Barcode 2 No Read or Both codes not read

Host message = Global No Read Defined under barcode configuration

NOPE

Global No Read Type = Leading

Barcode 1 No read Barcode 2 Read

Host message = Global No Read_PI1_PI2

NOPE_PI1_HI1!_0013_PI2_Hi2!_0013

Barcode 1 Read Barcode 2 No Read

Host message = Global No Read_PI1_PI2

NOPE_PI1_HI1!_0014_PI2_Hi2!_0014

Both codes are a No Read

Host message = Global No Read_PI1_PI2

NOPE_PI1_HI1!_0015_PI2_Hi2!_0015

Global No Read Type = Trailing

Barcode 1 No read Barcode 2 Read

Host message = _PI1_PI2 Global No Read

-_PI1_HI1!_0019_PI2_Hi2!_0019**NOPE**

Barcode 1 Read Barcode 2 No Read

Host message = _PI1_PI2Global No Read

-_PI1_HI1!_0020_PI2_Hi2!_0020**NOPE**

Both code No Read

Host message = _PI1_PI2Global No Read

-_PI1_HI1!_0021_PI2_Hi2!_0021**NOPE**

Example 3 - Logical Combination

Global No Read Type = No Read Only

Barcode 1 No read Barcode 2 Read or Barcode 1 Read Barcode 2 No Read or Both codes No Read

Host message = Global No Read Defined under barcode configuration

NOPE

Host message = Global No Read Defined under barcode configuration

NOPE

Global No Read Type = Leading

Barcode 1 No read Barcode 2 Read

Host message = <Global No Read>_PI1_PI2

NOPE-_PI1_HI1!_0027_PI2_Hi2!_0027

Barcode 1 Read Barcode 2 No Read

Host message = <Global No Read>_PI1_PI2

NOPE-_PI1_HI1!_0028_PI2_Hi2!_0028

Both codes No Read

Host message = <Global No Read>_PI1_PI2

NOPE-_PI1_HI1!_0029_PI2_Hi2!_0029

Global No Read Type = Trailing

Barcode 1 No read Barcode 2 Read

Host message = _PI1_PI2Global No Read

-_PI1_HI1!_0031_PI2_Hi2!_0031**NOPE**

Barcode 1 Read Barcode 2 No Read

Host message = _PI1_PI2Global No Read

-_PI1_HI1!_0032_PI2_Hi2!_0032**NOPE**

Both code No Read

Host message = _PI1_PI2Global No Read

-_PI1_HI1!_0033_PI2_Hi2!_0033**NOPE**

Code Identifier

Select Disabled, AIM, or Custom from the drop-down list. This parameter allows enabling/ disabling the transmission of the code ID in the output data format.

- **Disable:** No code identifier is included in the output message
- **AIM:** The AIM standard identifier is included in the output message
- **Custom:** This selection activates a list of Custom Code ID strings, allowing the user to define an identifier string for each code symbology. The string will be included in the output message.

In each code string option, click to **"Enter Text with the Text Entry Tool" on page 80** and create a character string.

List of Code Types

A list of codes appears when Custom is selected from the Code Identifier drop-down list. For each code type, click to **"Enter Text with the Text Entry Tool" on page 80** and create Code Identifier characters.

2. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

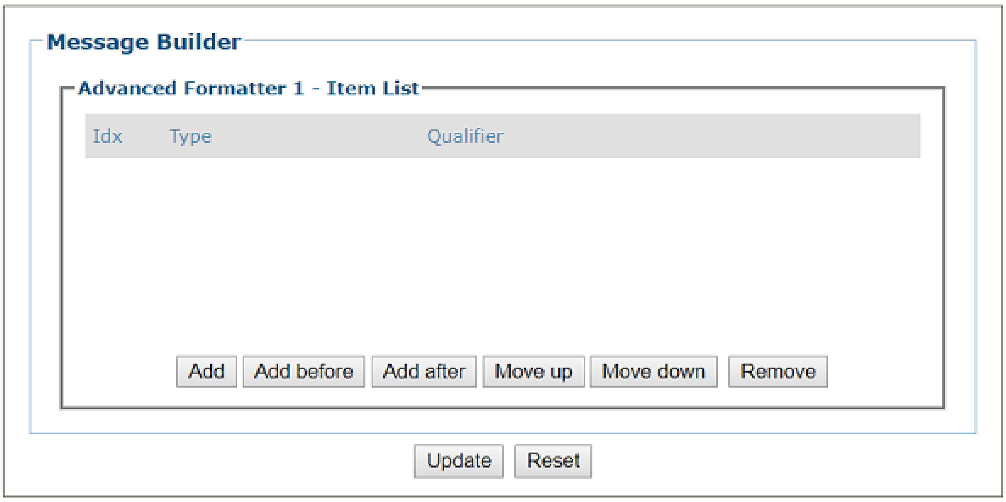
Advanced Formatter | Message Builder

Use the **Message Builder** window to configure **Advanced** system messages.

This option allows for the defining of each field in the host message. When Message Builder is activated, Its settings apply to the Advanced Formatter *n* Item that was being modified in the Advanced Formatter Definition window. There are five host messages which can be constructed.

To Use the Message Builder:

1. Click on the **Message Builder** link in the **Advanced Formatter** window. The **Message Builder** window opens.



2. Enter the appropriate information in the form as described below:

Advanced Formatter n - Item List

The number displayed represents the Advanced Formatter n Item being modified in the Advanced Formatter Definition window.

The Items in this list are the fields in the message being transmitted.

Idx

Displays the index number of the messages. The idx field identifies the order that the information will be sent to the host.

Type

Displays the message type including various Code Related Item, String, or Global Item messages.

Qualifier

Displays relevant qualifiers for the message item if needed.

Advanced Formatter n - Item List Buttons

Add

Click to add a new message item to the bottom of the list. The type of message added is based on the Item Type selected in the Item n Definition section of the window (see below).

Add before

Click to add a new message item above the currently selected idx number.

Add after

Click to add a new message item below the currently selected idx number.

Move up

Click to move the selected message item up one level in the list.

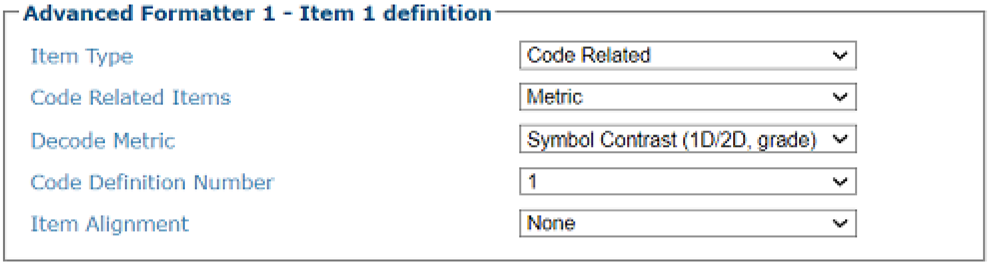
Move down

Click to move the selected message item down one level in the list.

Remove

Click to remove the selected message item.

If you click Add, Add before, or Add After the following window opens:



Item n Definition

Item Type

Select String, Code Related, or Global from the drop-down list. Each selection reveals a unique set of options. Code Related and Global item types will reveal a unique set of options. The String option is a free flowing text box.

CODE RELATED ITEMS:

Select a code related item from those available in the drop-down list. This option is available when Item Type > Code Related has been selected. The Code Related items can be associated to a specific programmed code or group label depending on the Code Combination selection. Selections Include:

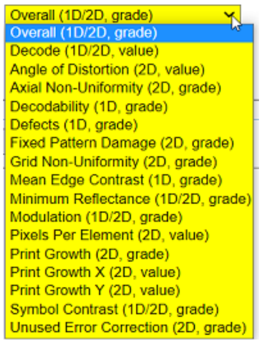
- **Code:** Barcode data
- **Length:** Number of characters in code
- **Read Mask:** In PackTrack mode - 32-bit mask indicating which camera read a given code in the bar code menu (when character <1> is present in the related position).
- **Total Read Count:** Indicates how many times the code has been read by all barcode readers present in the network during the same reading phase.

NOTE: The following parameters depend on the "Center Coordinates" option selected, Image Related or Space Related. If Image Related: the values will be in pixels, If Space Related: the values will be in millimeters.

- **X Position:** X coordinate for the code that was read
- **Y Position:** Y coordinate for the code that was read
- **Z Position:** Z coordinate for the code that was read
- **Code Identifier:** Indicates type of code that was read
- **Encoder Value:** Encoder Value identifies the tachometer count that the bar code was found at.
- **Code Orientation Angle:** Click the drop-down to choose None, Left or Right. This defines the angle of the code within the image. It is not related to belt travel or parcels.
- **Metric:** Click the drop-down to choose from a set of barcode metric related options.

Decode Metric

Click the drop-down to select one of the Decoder Metrics options. These Decode Metrics will be used by WebSentinel PLUS Investigator.



NOTE: More information about these metrics is found in the WebSentinel PLUS Investigator Installation and Configuration documentation.

Code Definition Number

Click the drop-down to select from 1 to 5.

Item Alignment

Click the drop-down to select, None, Left or Right.

tem Alignment Length

Enter the number of characters to fill with the Align Filler Character.

Align Length is the number of characters to fill if the counter value if less than the maximum number. Its main purpose is to make the field length consistent no matter what the counter value.

For example:

Counter Max Number (Counter Module) = 10000

Counter Current Value = 500

Align Filler Char = X

Counter shown in Image Name = XX500 (Left Alignment) or 500XX (Right Alignment)

Item Alignment Filler

Enter a filler character to use with Align Length.

GLOBAL ITEMS:

NOTE: More information about these metrics is found in the WebSentinel PLUS Investigator Installation and Configuration documentation.

Select a global item from those available in the drop-down list. This option is available when Item Type > Global has been selected. Selections Include:

- **Total Read Mask:** Indicates the complete reading mask related to all codes read during the reading phase or which camera read any code
- **Total Read Count:** Indicates the sum of all Code-related Total Reading Counts of each code read during the reading phase
- **Sequence Number:** Indicates the sequential number assigned to the package
- **Hours:** Indicates hour the code was scanned
- **Minute:** Indicates minute the code was scanned
- **Seconds:** Indicates second the code was scanned
- **Day:** Indicates day of the month the code was scanned
- **Month:** Indicates month the code was scanned
- **Year:** Indicates year the code was scanned

- **Protocol Index:** Indicates the programmed protocol index string data

NOTE: Length, Width, Height, and Volume are only used if there is a DM3610 in your system.

- **Parcel Length:** Indicates the approximate length of the package
- **Parcel Width:** Indicates the approximate width of the package
- **Parcel Height:** Indicates the approximate height of the package
- **Parcel Volume:** Indicates the approximate volume of the package
- **Parcel Orientation Angle:** Indicates the angle of the package
- **Parcel Isolated:** indicates it is not a side-by-side condition as detected by the Dimensioning system.
- **Image Filename:** Includes the filename of the image

Code Definition Number

Click the drop-down to select from 1 to 5.

Item Alignment

Click the drop-down to select, None, Left or Right.

Item Alignment Length

Enter the number of characters to fill with the Align Filler Character.

Align Length is the number of characters to fill if the counter value if less than the maximum number. Its main purpose is to make the field length consistent no matter what the counter value.

For example:

Counter Max Number (Counter Module) = 10000

Counter Current Value = 500

Align Filler Char = X

Counter shown in Image Name = XX500 (Left Alignment) or 500XX (Right Alignment)

Item Alignment Filler

Enter a filler character to use with Align Length.

Item Data Format

Click the drop-down to select, Decimal, Hexidecimal, Numeric, Bitmap

STRING ITEMS:

Item Alignment Length

Enter the number of characters to fill with the Align Filler Character.

Align Length is the number of characters to fill if the counter value if less than the maximum number. Its main purpose is to make the field length consistent no matter what the counter value.

For example:

Counter Max Number (Counter Module) = 10000

Counter Current Value = 500

Align Filler Char = X

Counter shown in Image Name = XX500 (Left Alignment) or 500XX (Right Alignment)

Item Alignment Filler

Enter a filler character to use with Align Length.

Link to Code

Select Disabled, Previous Code, or Next Code from the drop-down list.

- **Disabled:** A code will not be linked to this text string
- **Previous Code:** The text string will be linked to the previous generated code
- **Next Code:** The text string will be linked to the next generated code

Miscellaneous String

Click ✎ to **"Enter Text with the Text Entry Tool" on page 80** and enter a code related string.

3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values

IMAGE SAVING

Use Image Saving options to configure how and where images are saved:

"Destination Settings" on page 201

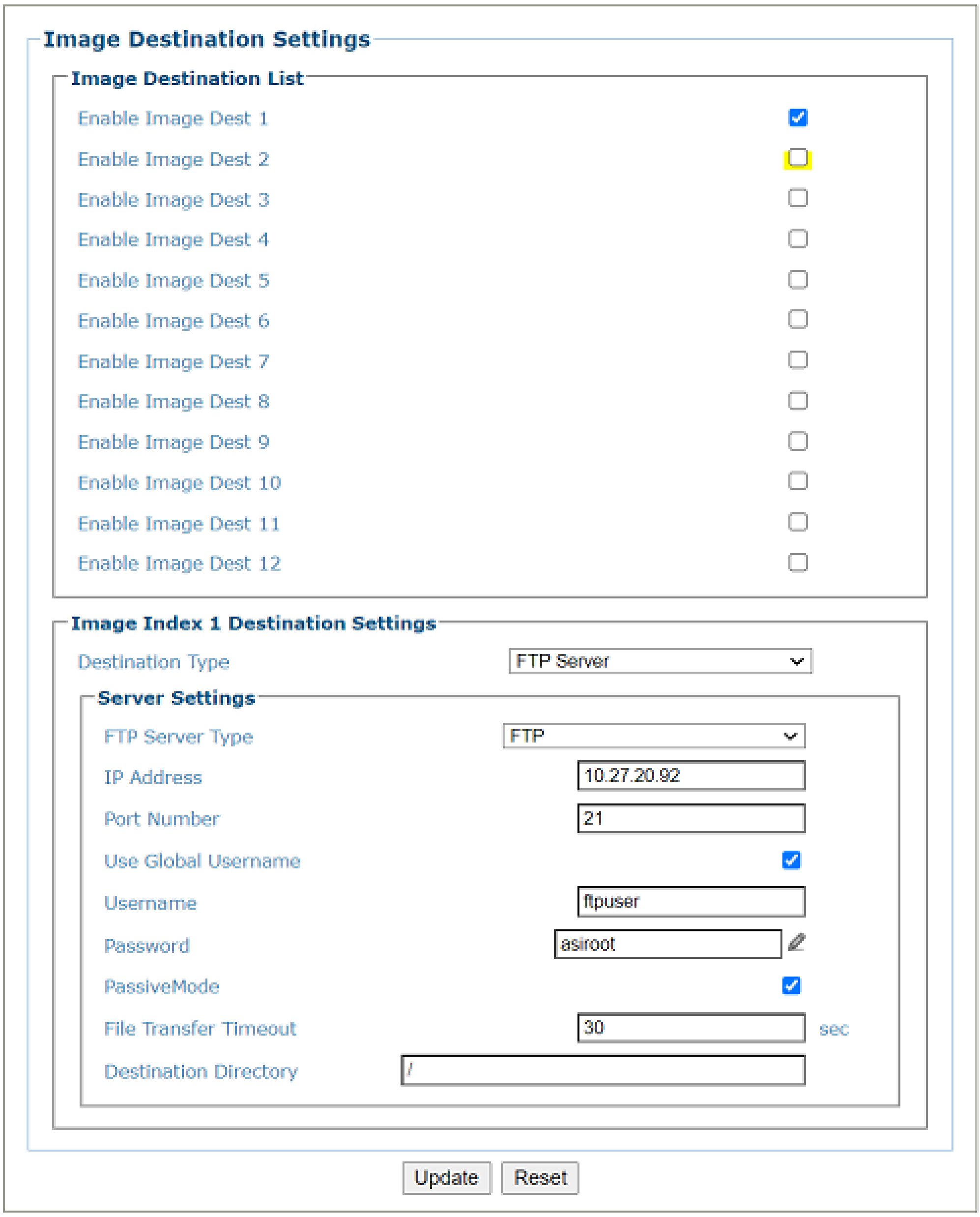
"Image Settings" on page 206

Destination Settings

Use **Destination Settings** to configure how and where system images are saved. There are twelve configurable image destinations available.

To edit the Destination Settings:

1. In the menu tree under **Modify Settings**, navigate to **Global Settings | Image Saving | Destination Settings.** The **Destination Settings** window opens.



2. Enter the appropriate information in the form as described below:

Image Destination List

Select the check box(es) corresponding to the numbered image destination to enable setup. Image Index n Destination Settings inputs will appear for the image destinations selected.

Image Index n Destination Settings

Destination Type

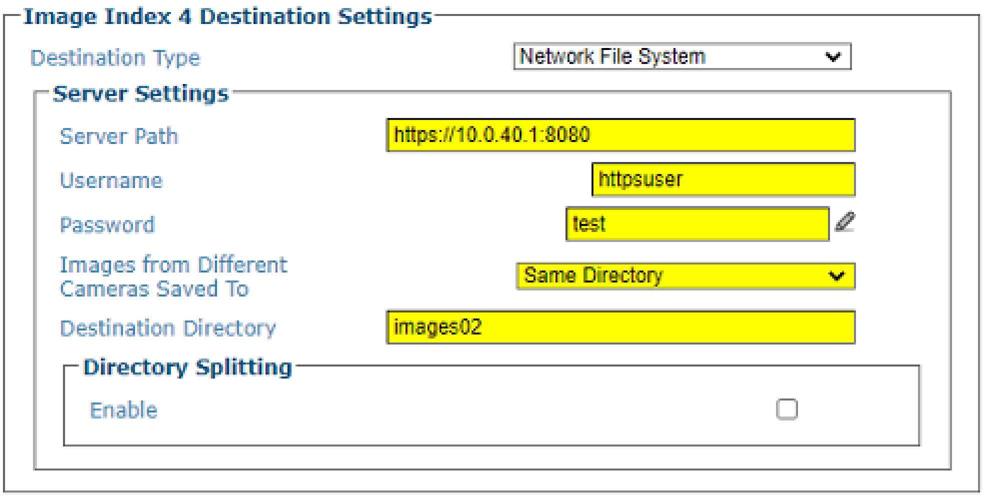
Select File System, FTP Server, External Viewer, On Camera, or HTTPS from the drop-down list to save to a remote file system server.

- **Network Files System:** Reveals options for saving to an external file system folder. You determine where on your system the images files will be saved. Your IT department will provide the Server Path, Username, and password. They will also determine how the images will be saved on their server and determine whether each cameras images will be saved in Different Directories or all cameras images will be saved to the same location. Your IT department will also provide the Destination Directory on their server where the images will be saved. The Directory Splitting options Use the explanation below.
- **FTP Server:** Reveals options for save to an FTP server IP Address/Port Number - the IP address and Port Number where the FTP Server is located will be provided by your IT department
- **External Viewer:** Provides a field for the Destination IP Address of the viewer. The External Viewer is only used as a diagnostic and calibration tool
- **On Camera:** Provides options to store images on the camera to be retrieved by your system. These files can be accessed either through e-Genius under Diagnostics - “Viewing Camera Images” on page 274 or by connecting to the camera’s on board FTP server. The Host or Image Ethernet connection can be used to connect to the FTP server.

  Username: dluser

  Password: plop
- **HTTPS Server:** Provides options for saving images to a secure server using HTTPS protocols.

Server Settings Network File System



Server Path

Enter the complete path of the server.

Username

Enter a valid username.

Password

Click to **“Enter Text with the Text Entry Tool” on page 80** and enter the password required to access the server.

Images from Different Cameras Saved To

Select Different Directories or Same Directory from the drop-down.

Different Directories: images are saved in different directories

Same Directory: images are saved in the same directory

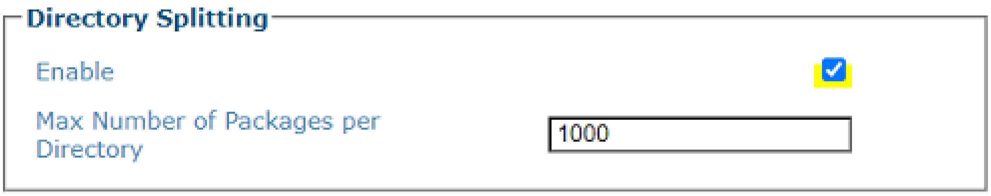
Destination Directory

Enter the complete path of the destination directory.

Directory Splitting

Enable

Select the check box to enable directory splitting. Enabling this parameter causes the destination directory to be split into subdirectories containing a number of images not greater than the defined Split Destination Max File Number (see below). The subdirectories of the Saving Path are numbered consecutively: 1, 2, 3, etc.



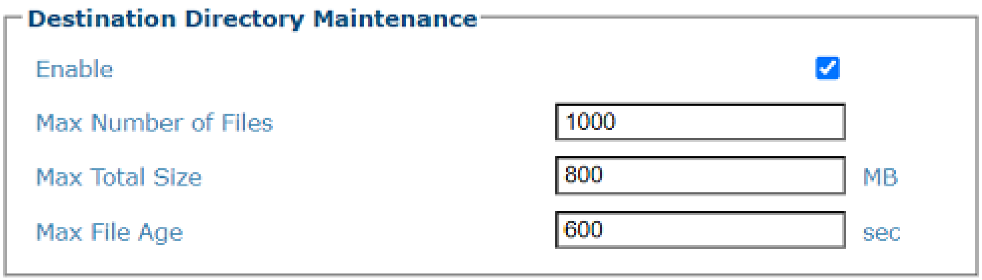
Max Number of Packages per Directory

Enter the maximum number of packages allowed in each subdirectory.

Destination Directory Maintenance

Enable

Select the check box to enable Directory Maintenance.



Max Number of Files

Enter the number of packages allowed in each subdirectory.

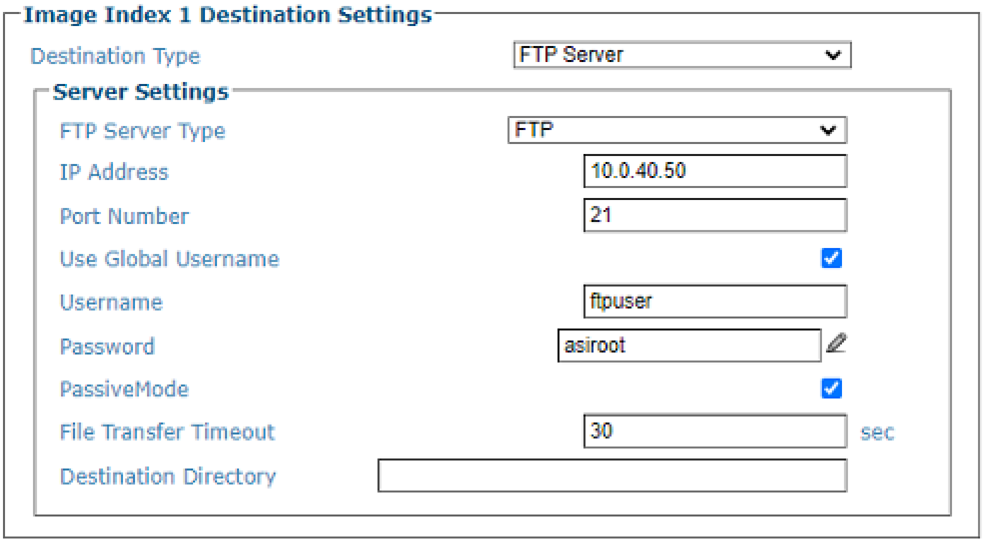
Max Total Size

Enter a number specifying the total size of the destination directory MB.

Max File Age

Enter the time in seconds a file will be maintained in the destination directory.

Server Settings FTP Server



FTP Server Type

Click to select SFTP or FTP from the drop-down.

IP Address

Enter the IP Address for the FTP Server.

Port Number

Enter the Port Number where you would like your images to go.

Use Global Username

Enter a Global username if applicable

Username

Enter a valid username.

Password

Click to **"Enter Text with the Text Entry Tool" on page 80** and enter the password required to access the server.

Passive Mode

Click the checkbox to enable Passive Mode.

File Transfer Timeout

Enter an amount of time in seconds within which the transfer of the image will timeout.

Destination Directory

Enter the complete path of the destination directory.

Server Settings External Viewer

Destination IP Address

Enter the IP Address of the External Viewer destination

Server Settings On Camera

Port Number

Port number of on Board FTP Server. Cannot be 22 which is SFTP Server.

Directory Splitting

Enable

Select the check box to enable directory splitting. Enabling this parameter causes the destination directory to be split into subdirectories containing a number of images not greater than the defined Split Destination Max File Number (see below). The subdirectories of the Saving Path are numbered consecutively: 1, 2, 3, etc.

Max Number of Files per Directory

Enter the number of files allowed in each subdirectory.

Destination Directory Maintenance

Click the check box to enable directory maintenance. The following parameters are revealed

Max Number of Files

Enter the maximum number of image files to maintain on the camera.

Max Total Size (Max value = 1000)

Enter the size in mega bytes to allow for on camera image storage.

Max File Age

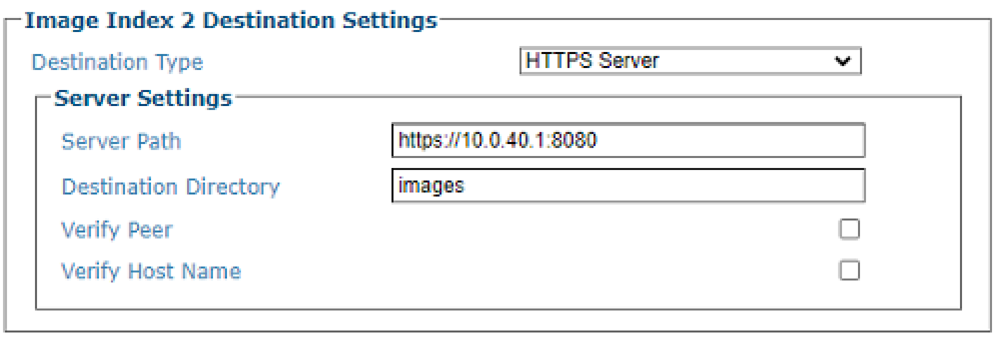
Enter the age in seconds of images to save.

HTTPS Server

Destination Type

Click to select **HTTPS Server** from the drop-down. The HTTPS destination type can be used to upload images to a server over HTTP/HTTPS. Images are sent by the camera to the server using an HTTP PUT request. For secure end-to-end communication, the 'Server Path' must use HTTPS, and both 'Verify Peer' and 'Verify Host' must be enabled.

See "Understanding HTTPS Security for AV Family Products" on page 182.



Server Path

Specify the URL to the HTTPS server, in standard URI format `<protocol>://<host>[:<port>]/[<path>]`. Protocol must be either http or https. If using HTTP, the data sent over the network is unencrypted. If using HTTPS, the data sent over the network is encrypted.

The `<path>` can also be specified through the "Destination Directory" setting.

Destination Directory

Enter the complete path of the destination directory. Optional URL endpoint, that is appended to the Server Path creating the full URL to be used when posting images.

Verify Peer

This option only applies when using the HTTPS protocol. Otherwise it is ignored. If enabled, the camera will attempt to authenticate the SSL certificate, as provided by the HTTPS server. If authentication fails, the host message will not be sent.

If disabled, the camera will not attempt authentication of the SSL certificate. HTTPS traffic will still be encrypted, but the authenticity of the server will not be verified. This option is required if using an unsigned / self-signed SSL certificate

Verify Host Name

Click the Verify Host Name check-box. This option only applies when using the HTTPS protocol and 'Verify Peer' is enabled. Otherwise it is ignored. If enabled, the camera will attempt to verify the authenticity of the server providing the SSL certificate. If verification fails, the host message will not be sent.

If disabled, the camera will not attempt to authenticate the server.

3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

Image Settings

Use the **Image Settings** window to configure where and how images are saved.

To edit the Image Settings:

1. In the menu tree under **Modify Settings,** navigate to **Global Settings | Image Saving | Image Settings.** The **Image Settings** window opens.

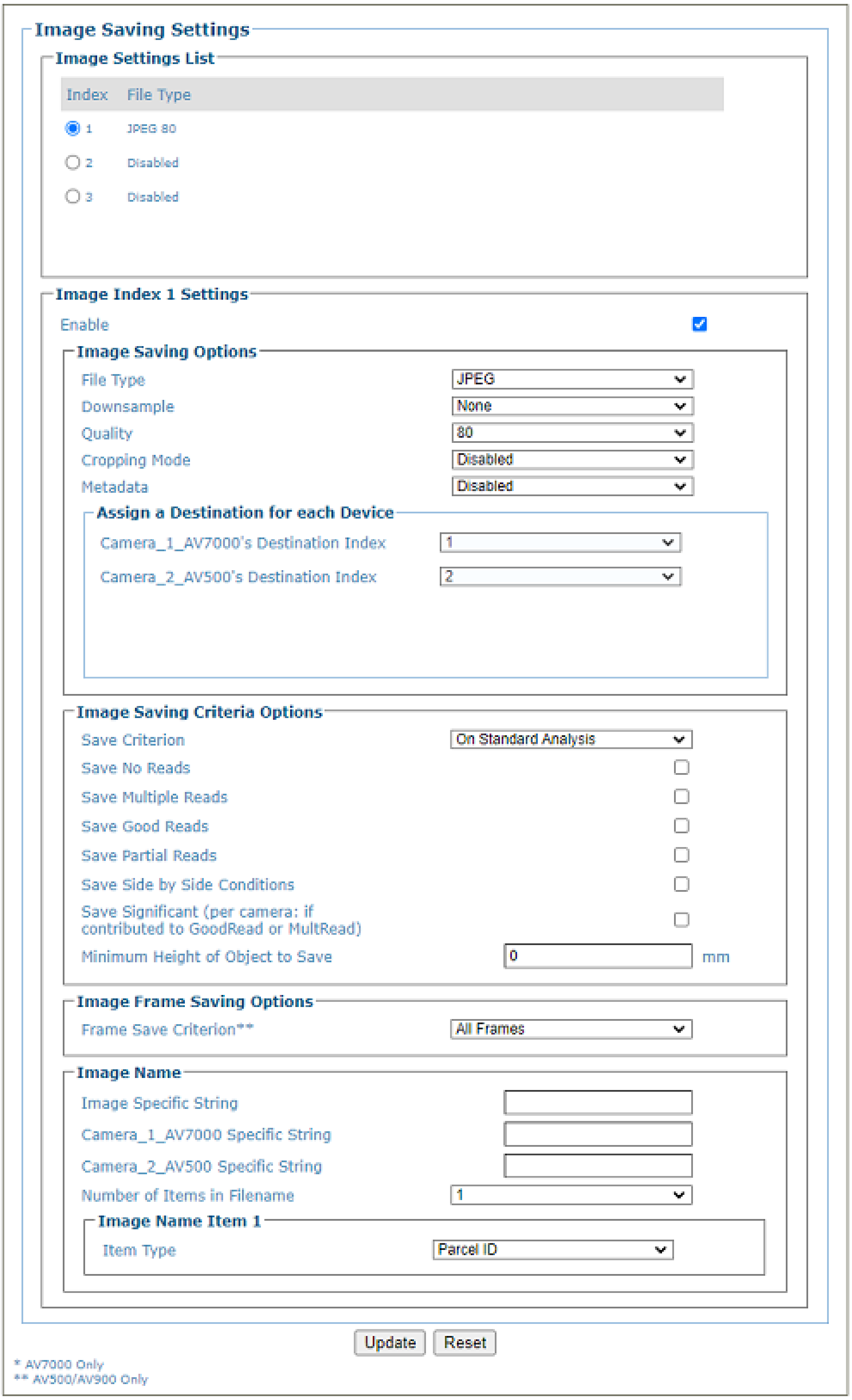


Image Settings List

Select the option button adjacent to the item you wish to create or modify.

Image Index n Settings

Enable

Select the check box to reveal the image settings options.

Image Saving Options

File Type

Select JPEG, Bitmap, or TIFF from the drop-down list. Specifies the type of image to save as.

Downsample

Select None, 2, 4, 8, or 16 from the drop-down list.

Quality

Only available when TIFF or JPEG is selected. Select a quality percentage from the drop-down list.

Quality defines the compression, by the Hoffman algorithm, in JPG images: 100 means maximum quality and minimum compression, lower values mean lower quality but higher compression. Valid values are in the range from 15 to 100.

Cropping Mode

Select **Disabled**, **Crop to Object**, **User Defined**, or **Imaging Subregion** from the drop-down list.

Crop to Object: This option provides cropping on the start and stop edges of the parcel image. The Crop to Object option is used for full cropping: not only on the start and stop edge of the parcel, but also on both parcel sides. This is possible only when the distance sensors are available.

User Defined: This option provides the user with the ability to crop each side of the image independently. You can assign different cropping regions for each camera. The available parameters are:

- **Camera_1's Left:** Enter the numbers of pixel by which the image should be cropped
- **Camera_1's Right:** Enter the numbers of pixel by which the image should be cropped
- **Camera_1's Top:** Enter the numbers of pixel by which the image should be cropped
- **Camera_1's Bottom:** Enter the numbers of pixel by which the image should be cropped

Imaging Subregion: Image cropped to the subregion specified in the Subregion Wizard

Margin

Enter the numbers of pixel to use for a margin around the object, if cropping mode is enabled.

Metadata

Select **Disabled**, **Embedded**, or **External File** from the drop-down list.

- **Disabled:** Metadata not used
- **Embedded:** Metadata is embedded with the image
- **External File:** Metadata is saved to an external file

Include Hardware Acceleration (Not available for User Defined)

Click the check-box to include Hardware Acceleration.

Assign a Destination for Each Device

Camera n's Destination Index

Select **Disabled** or a destination index number from the drop-down list. The destination index number refers to the Image Destination List in **Modify Settings | Global Settings | Image Saving | Destination Settings**.

Image Saving Criteria Options

Save Criterion

Select All or On Standard Analysis from the drop-down list.

- **All:** Sends out all images.
- **On Standard Analysis:** Allows you select the image criterion from the options below.

No Reads, Multiple Reads, Good Reads and Partial Reads are all based on the results of what is read by the entire cluster of cameras.

Save No Reads

Select the check box to save no read images.

Save Multiple Reads

Select the check box to save multiple read images.

Save Good Reads

Select the check box to save good read images.

Save Partial Reads

Select the check box to save partially read images.

If this camera contributed to a Good Read or Mult Read, the condition will be evaluated as true for this camera. Each camera evaluates a parcel based on what it read only (not what the entire cluster read).

Save Significant (per camera: if contributed to GoodRead or MultRead)

Select the check box to save an image only if it has contributed to a GOOD-READ or MULTI-READ result. This helps cut down on the amount of storage used.

Example: If the parcel is GOOD-READ or MULTI-READ, at least one barcode must have been decoded in an image for it to be considered "significant."

Minimum Height of Object to Save

Enter a minimum package height from which images will be saved. This is used to avoid saving images of various objects or debris caused by false triggers.

Image Frame Saving Options

Frame Save Criterion AV500 Only

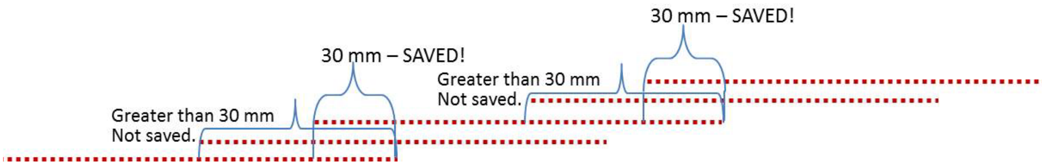
Since the camera is an area camera there may be a large number of images during each trigger cycle. It may be necessary to limit the number of images saved. The Frame Save Criterion allow for the limiting of the number of frames saved. Select one of the following from the drop-down:

- **All Frames**
- **Frames with Decode Results**
- **Frames with Minimum Overlap:** Specify an amount in mm that frames must overlap to be saved. In the example below a 30 mm overlap has been defined

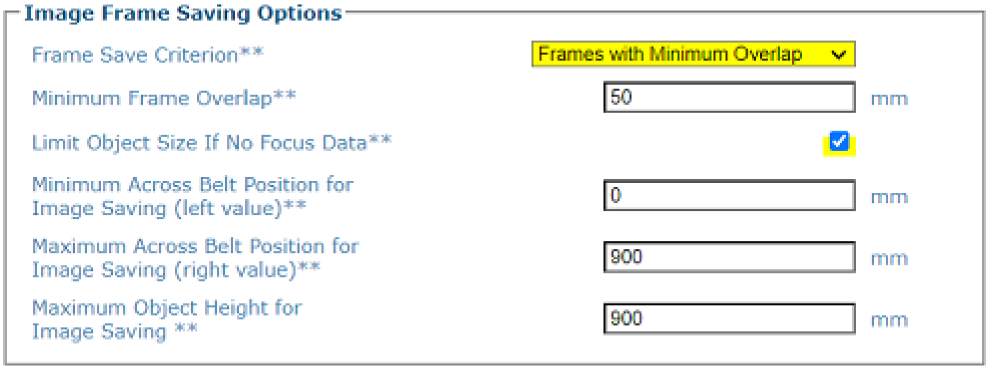
When a position sensor is connected and you are using PackTrack Mode, if Minimum Frame Overlap is selected it also reveals additional image saving options.

It only starts saving images when a parcel's leading edge is a specified distance away before exiting the frame, and stops saving images when a parcel's trailing edge is a specified distance after entering the frame.

If the entire parcel is visible in one frame, only that one frame is saved. Extra frames are saved to make sure no part of a parcel's top surface is missed.



- **Every Nth Frame:** Specify which frame of the 32 frames per second to save.



Limit object Size If No Focus Data

Click check-box to reveal more parameters, which limit possible parcel sizes if Focus Data is NOT available.

Minimum Across Belt Position for Image Saving (left value)
Maximum Across Belt Position for Image Saving (right value)

Normally, for a side read camera, parcels are assumed to be in the range from the 'right side' of the conveyor (maximum conveyor width) to the left side (0 position). These parameters allow a tighter range to be specified. For a right side camera, perhaps the minimum package width is actually 6 inches, then the "Minimum position" can be changed to 6" (152mm), instead of 0". Likewise, the "Maximum position" can be used to adjust the right side limit used for image saving.

Maximum Object Height for Image Saving

Parcels are assumed to have a height of specified value.

Image Name

These options relate to the image file naming conventions.

NOTE: Any characters in the image file name that are not allowed in Linux or Windows will be replaced with an underscore (_). Characters that can be considered safe for both operating systems include alphanumeric values, dash (-), period (.), and underscore (_).

Image Specific String

Enter a string to be assigned to all camera image file names.

Camera n Specific String

Enter a string to be included identifying the specific camera name (example: top).

Number of Items in Filename

This identifies how many fields are used for the file name

Select a number from 1 to 16 from the drop-down list. With an area camera there may be a large number of images during each trigger cycle. It may be necessary to limit the number of images saved. The Frame Save Criterion allow for the limiting of number of frames saved.

Image Name Item n

Item Type

Select an Image Name item type from the drop-down list, including:

- **Parcel ID:** Uses the parcel ID as the Image Name
- **Image Specific String:** Uses the image string entered above
- **Date:** Uses the current date (yymmdd)
- **Time:** Uses the image scan time (hhmmss)
- **Analysis Result:** Adds read analysis code to the image naming convention
- **Protocol Index:** Uses the protocol index data, as defined in the following options. the Protocol Index allows for the selection of the transport (communication port) that the Protocol Index is received on.
- **String** this is a free form box allowing for text characters to be entered.
- **Camera Specific String** the Camera Specific String is the name applied to the camera in the above Image Name>Specific String field
- **Code** Uses the barcode as the image name
- **Counter** Uses the counter value as the image name

WARNING: You must select Frame ID or Index if you are sending images to a WebSentinel PLUS Server. This creates unique filenames for each frame, which is necessary for capturing frames and saving them with WebSentinel PLUS.

- **Frame ID**
- **Frame Index**

If String is selected

IString uses the character string entered below

Item String (Max 16 Chars.)

Select a transport number from the drop-down list

Camera Specific String appends the specified string to the image file name.

If Code is selected

Code Group Index

Logical combination group number as specified in Barcode Settings | Barcode configuration

Cutting Mode

Select **Disabled** or **Simple** from the drop-down list. When Simple is selected from the options below are revealed.

Number of Leading Characters to Cut

Enter a number indicating the number of characters to cut from the leading part of the message.

Number of Trailing Characters to Cut

Enter a number indicating the number of characters to cut from the trailing part of the message.

If Counter is selected

Counter: Uses a counter as described below

Counter Module

Enter the number maximum for the counter before it turns over to start at 1 again.

Alignment

Select **None**, **Left,** or **Right** from the drop-down list. When Left or Right is selected the options below are revealed.

Align Length, If Left or Right is selected

Enter the number of characters to fill with the Align Filler Character.

Align Length is the number of characters to fill if the counter value if less than the maximum number. Its main purpose is to make the field length consistent no matter what the counter value.

Example:

Counter Max Number (Counter Module) = 10000

Counter Current Value = 500

Align Filler Char = X

Counter shown in Image Name = XX500 (Left Alignment) or 500XX (Right Alignment)

Align Filler Char

Enter a filler character to use with Align Length.

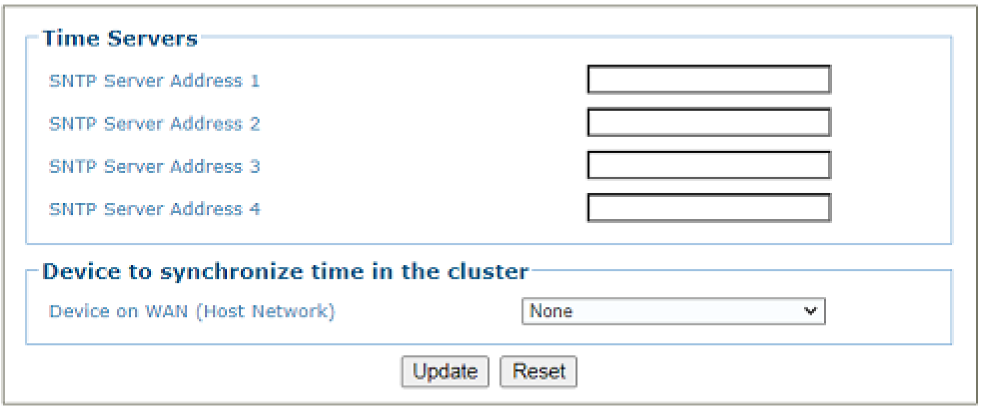
2. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

TIME SYNCHRONIZATION

Use **Time Synchronization** to synchronize system time between the system devices. Time must be synchronized for accurate tracking and logging. This feature allows all units within an organization to have the same time stamp. For example, product located on the west coast can have the message stamped with east coast time. It synchronizes equipment with a company's central PC.

To view and edit Time Synchronization settings:

1. In the menu tree under **Modify Settings,** navigate to **Global Settings | Time Synchronization.** The **Time Synchronization** window opens.



2. Enter the appropriate information in the form as described below:

Time Servers

Simple Network Time Protocol (SNTP) Server Address N

Enter the IP address for the servers you wish to synchronize.

Device on WAN (Host Network)

Select None or the camera name from the drop-down list of the camera whose host network is connected to the network with the time server. All the devices in the system will synchronize to this selected device.

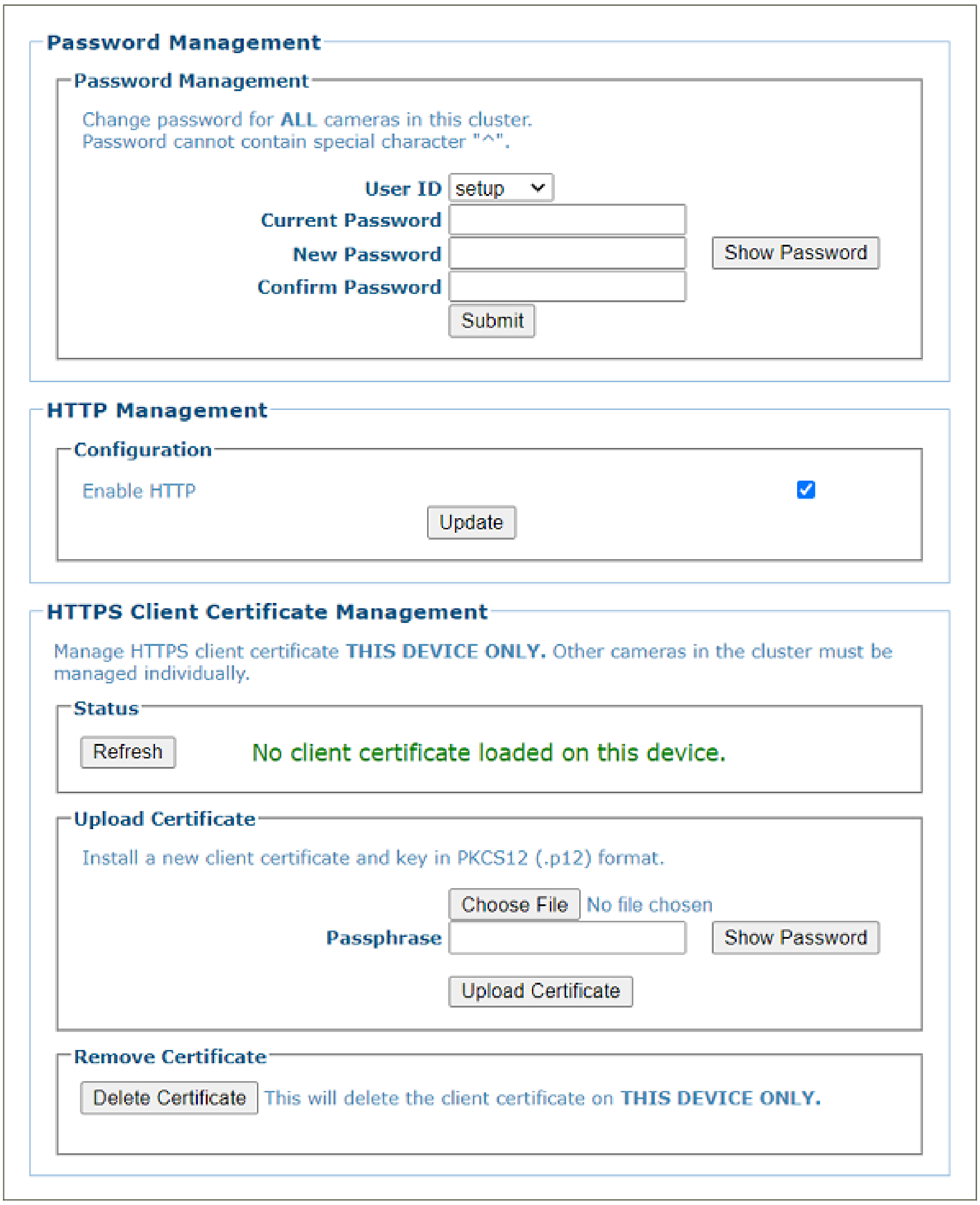
3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

SECURITY

Use **Security** to manage passwords and HTTP Certificates.

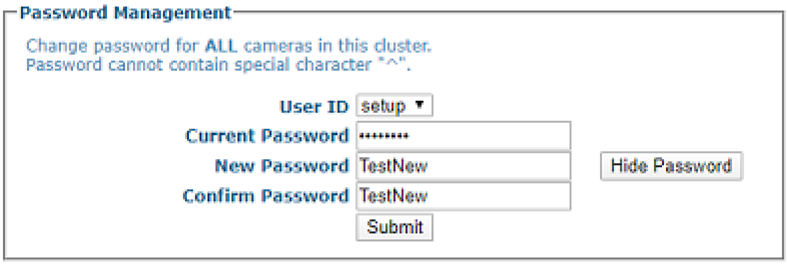
To view and edit Security settings:

1. In the menu tree under **Modify Settings,** navigate to **Global Settings | Security** The **Security** window opens.

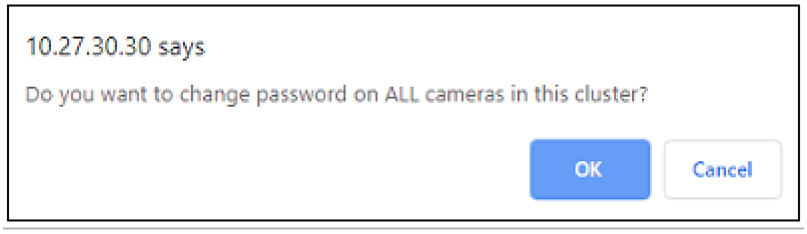


To use Password Management function:

1. Select the User ID from the drop-down. Choose from dluser, setup and monitor
2. Enter the valid current password. You can click **Show Password** to reveal what the password is that you are entering. Click **Hide Password** to hide it again.
3. Enter the new password and confirm the new password.

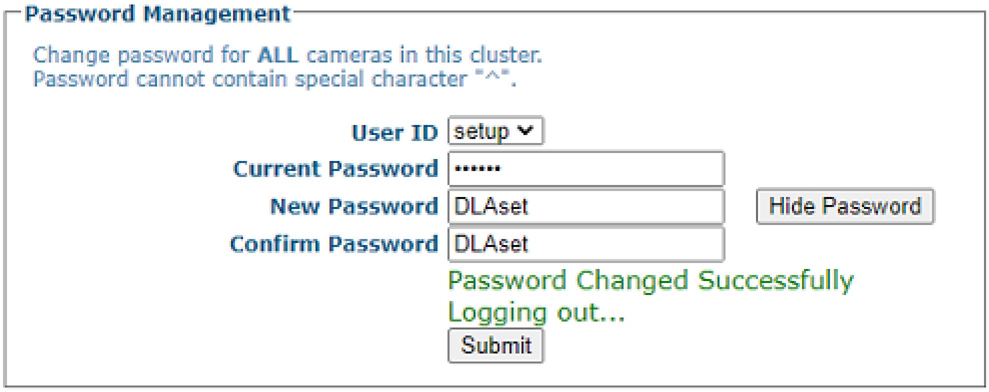


4. Click **Submit** to save the new password. The following confirmation message appears.



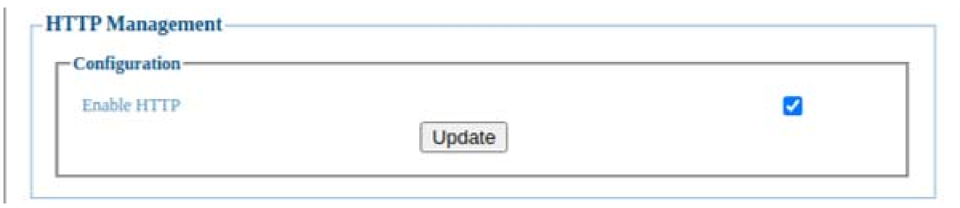
5. Click **OK** to reset the password for ALL cameras in this cluster or **Cancel.**

When the password has been successfully reset, the following message appears.



HTTP Management

Enable HTTP



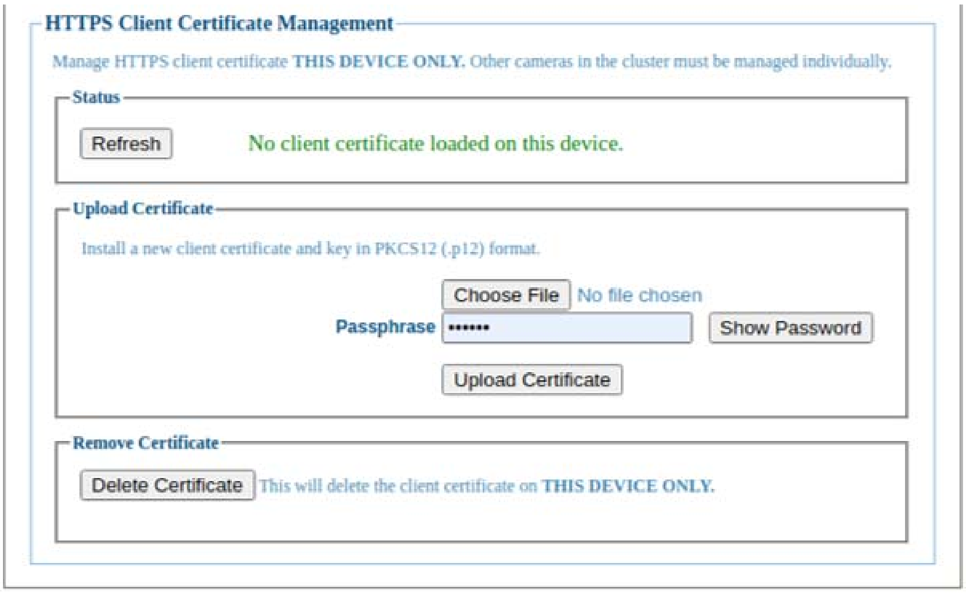
Click the check-box to enable or disable HTTP. This option controls whether the Web User Interface is accessible over HTTP. When not enabled any attempts to connect via http:// will be redirected to https:// to ensure the Web User Interface is encrypted. HTTPS cannot be disabled. Click the **Update** button to make this change immediately.

Client Certificate Management

See “Support for HTTPS Client Certificates” on page 184.

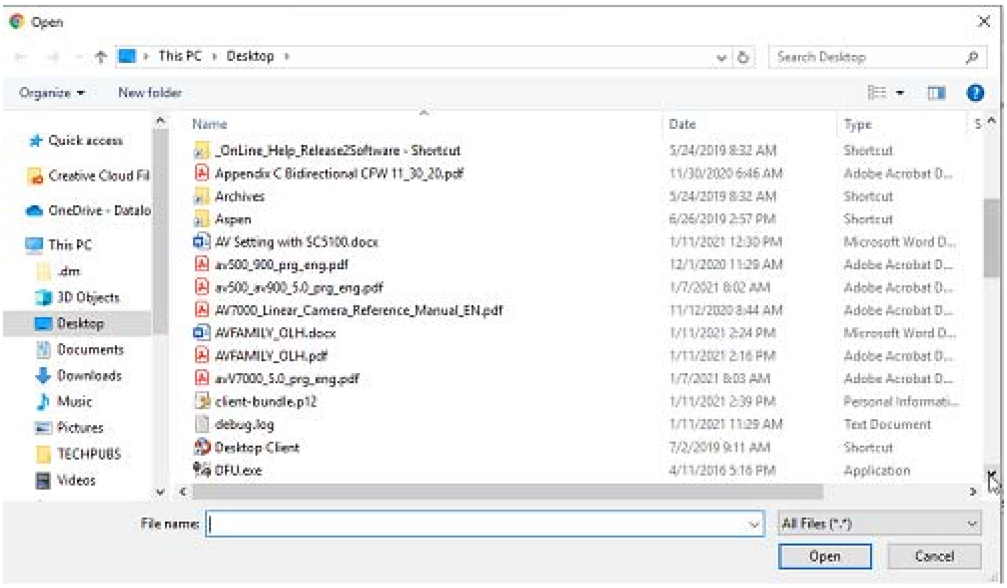
As you can see in the example screen shot, no client certificate is loaded for this camera.

NOTE: You will need to perform these actions for each device.

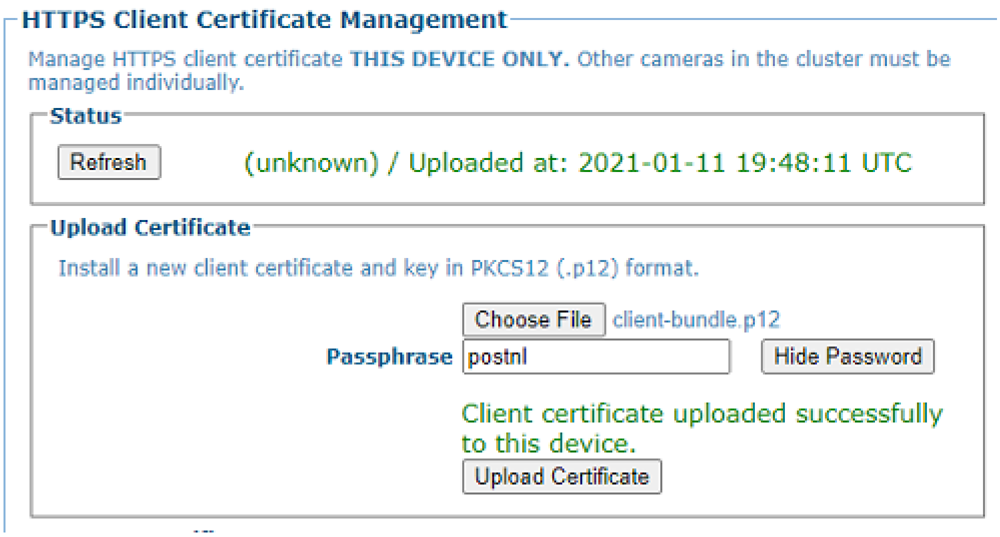


To load a valid cert, follow these steps:

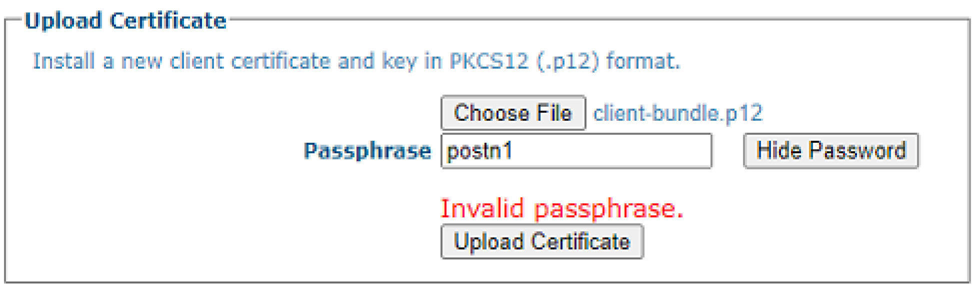
1. Click the **Choose File** button.
2. Browse to the location of a valid Cert.



3. Select a valid cert and click **Open.**
4. Enter the valid **Passphrase**: postnl
5. Click the **Upload Certificate** button.
6. If the Certificate is uploaded successfully, the screen will display the following information.

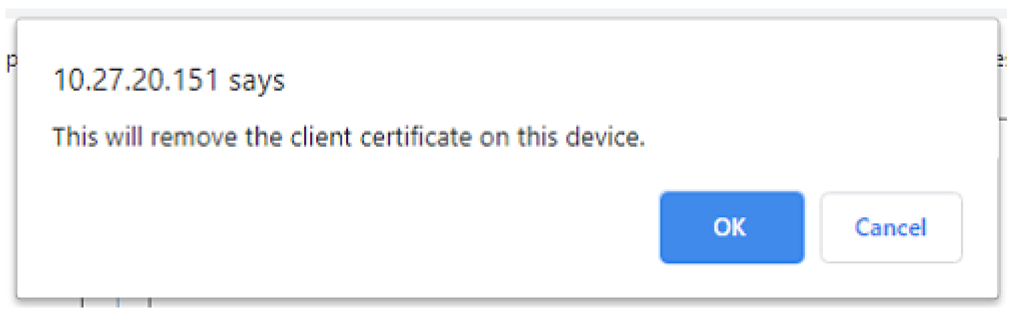


If the certificate or the Passphrase is not valid, the screen will display the following information.



To delete a certificate, follow these steps:

1. Click **Delete Certificate** button, the following confirmation message displays.



2. Click **OK** to delete the certificate, or Cancel.

AV500 DEVICE SETTINGS

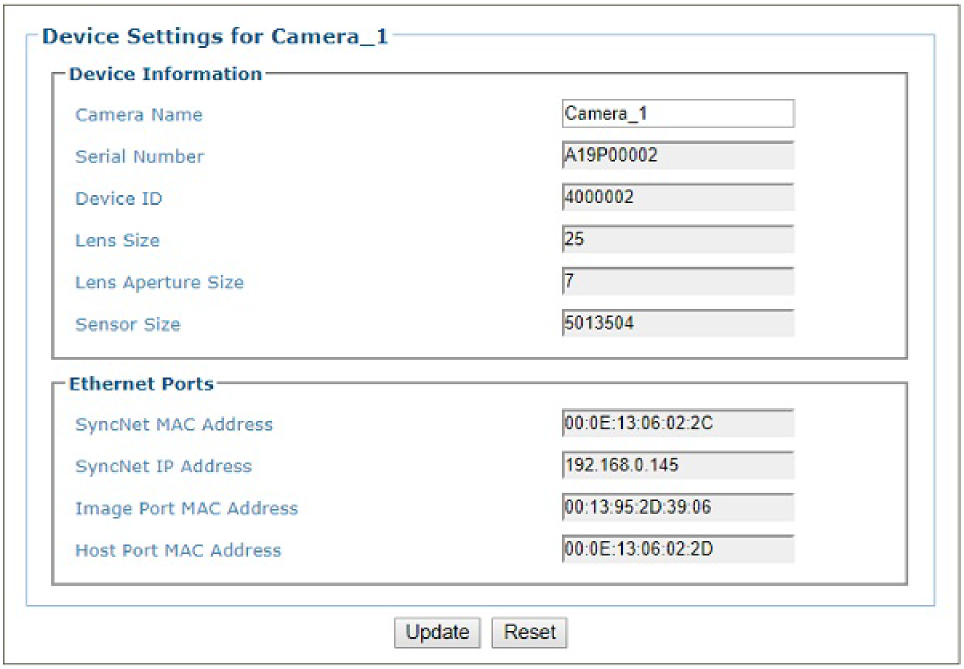
Use the **Device Settings** menu during initial setup to configure device specific settings. If necessary, you can later make modifications to the device settings using the same menu selections, including:

Device Information | Camera #n

Use the **Device Settings** window to view device information, including a description, serial number and address.

To view the Device Settings window:

1. In the menu tree under **Modify Settings**, navigate to **Device Settings | <Camera Name> (if applicable) | Device Info**. The **Device Info** window opens.



2. View the information in the form as described below:

Camera Name

Enter a unique name for the camera. **This is the only editable field.**

Once changed, this name will appear in the System Info page and the Device Settings menu tree.

NOTE: The following characters may NOT be used in the camera name: # % & { } \ > * ? / (space) $! ' " : @ + ` | =.

The rest of the parameters are automatically filled.

Serial Number

Displays the serial number sent by the device.

Device ID

Displays the device ID as programmed in the factory and defines what kind of device this camera is. Some examples are: AV900, AV7000.

Lens Size

Displays the size of the lens; Is it a 16, 25 or 35 mm lens.

Lens Aperture Size

Displays the Lens Aperture Size; 6, 7, 8 or 9.

Sensor Size

Displays the Sensor Size.

Ethernet Ports

SyncNet MAC Address

Displays the **MAC (media access control) address** of the cameras SYNC Ethernet port.

SyncNet IP Address

Displays the camera's **SYNC IP address.**

Image Port MAC Address

Displays the MAC Address of the **camera's Image Ethernet Port**.

Host Port MAC Address

Displays the MAC Address of the **camera's Host Ethernet port.**

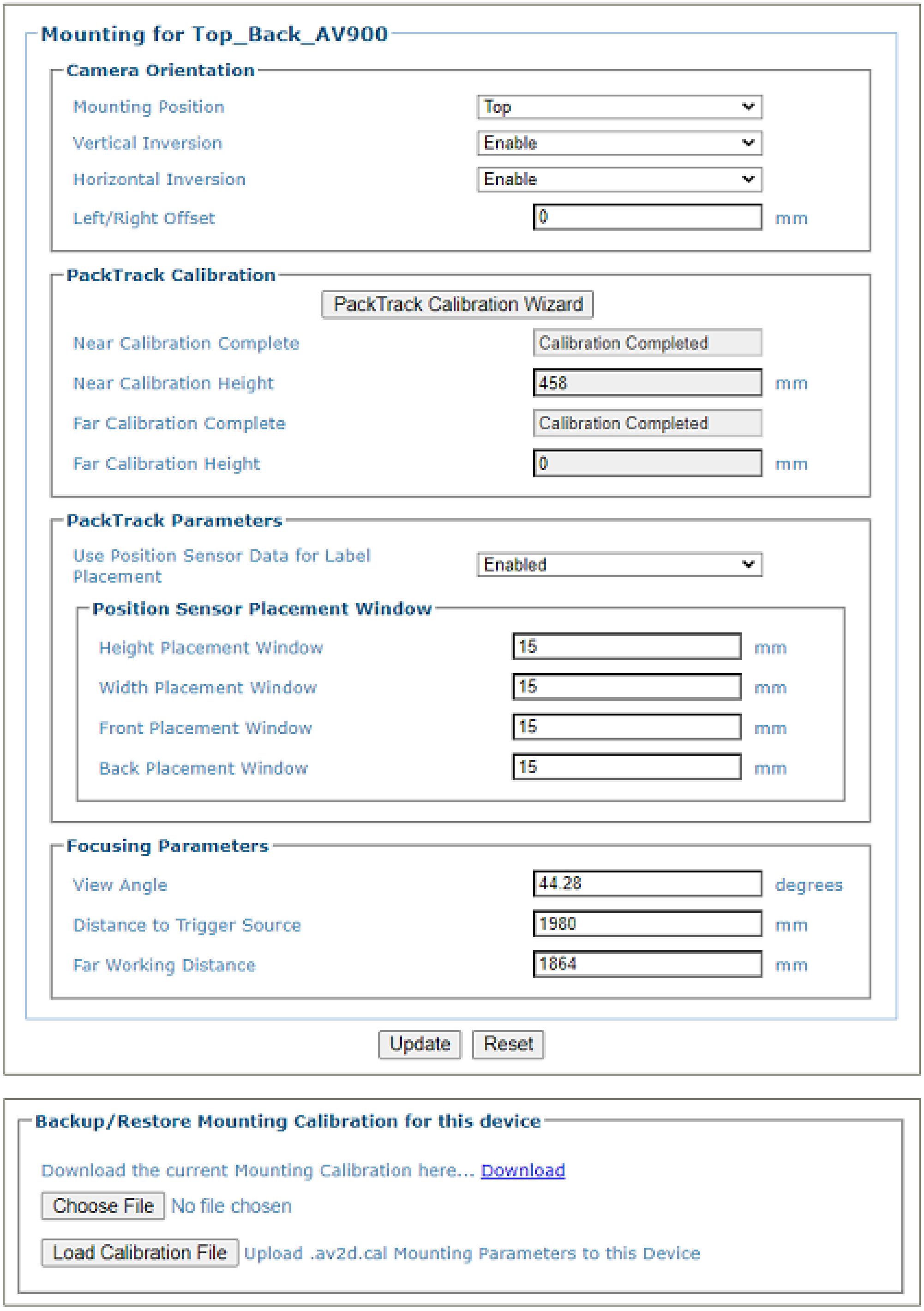
3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

Device Settings | Camera #n | Mounting

Use the **Mounting window** when installing and calibrating the camera.

To view the Mounting window:

1. In the menu tree under **Modify Settings**, navigate to **Device Settings | <Camera Name> | Mounting.** The **Mounting window** opens.



2. Enter the appropriate information in the form as described below:

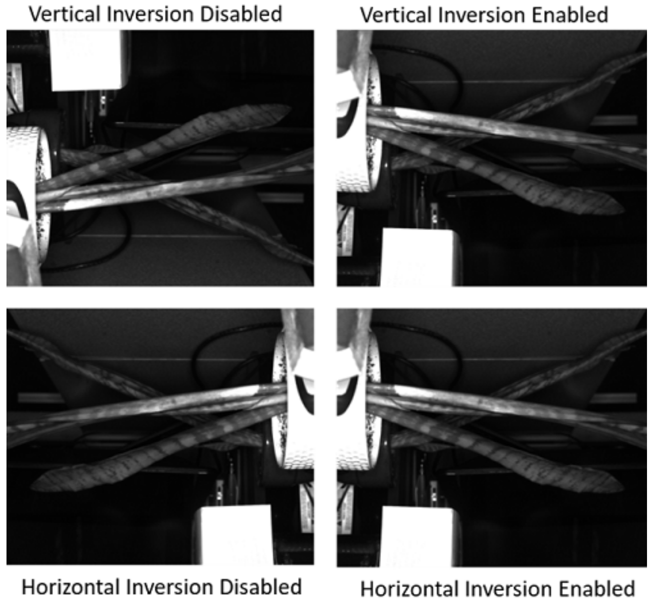
Camera Orientation

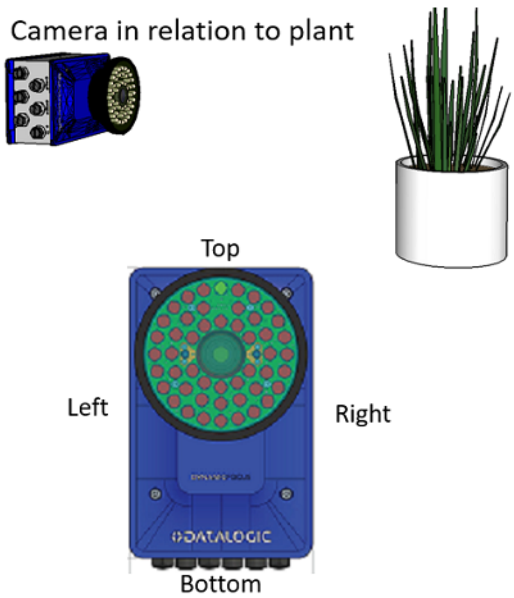
Mounting Position

Select **Top, Left, Right,** or **Bottom** from the drop-down list depending on where the camera is mounted.

This parameter allows defining the installation position of the camera in multi-camera tunnel installations according to the code reading on the conveyor: Top, Right, Left, etc. This parameter acts on the software reading algorithms and on the position and height sensors configuration.

Vertical Inversion





Select **Disable** or **Enable** from the drop-down list.

This parameter (when enabled) allows inverting or mirroring the image sent by the camera. This function is used to set the object movement with respect to the camera mounting position (i.e. camera position = Top Back). It is used to change a reversed (mirrored) image to proper orientation for OCR applications or video coding.

Horizontal Inversion

Select **Disable** or **Enable** from the drop-down list.

This parameter (when enabled) allows inverting or mirroring the image sent by the camera. This function is used to set the object movement with respect to the camera mounting position (i.e. camera position = Top Back). It is used to change a reversed (mirrored) image to proper orientation for OCR applications or video coding.

Left/Right Offset (Y)

Enter the camera offset from the Y-axis (across the conveyor). 0 = centered on Y. This defines the center of the cropped image.

PackTrack Calibration

PackTrack Calibration Wizard

Click to open the **PackTrack Calibration Wizard** (see “PackTrack Calibration Wizard” on page 225). This is used during initial calibration only.

Calibration Parameters (these are automatically completed when the PackTrack Calibration Wizard has been run). These parameters are not editable.

Near/Far Calibration Complete

Indicates whether the Mounting Wizard was successfully executed to learn the PackTrack Calibration.

Near/Far Calibration Height

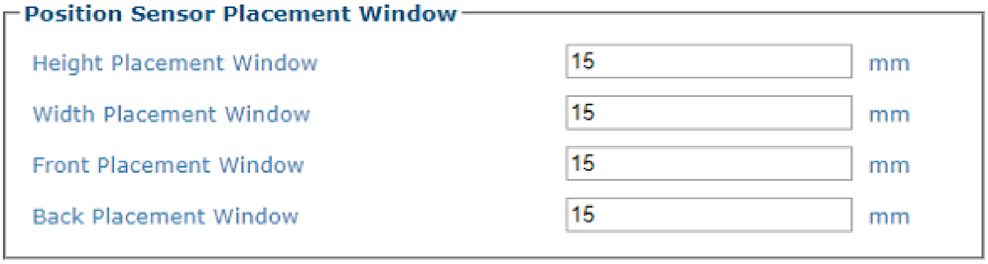
Indicates the height (or offset from the far working distance) where the Mounting Wizard learned the PackTrack Calibration.

PackTrack Parameters

Use Position Sensor Data for Label Placement

Click the drop-down to select, **Enabled** to use of Position Sensor Data for PackTrack Label Placement and several parameters are revealed, or **Disabled**.

Normally the camera uses max box size in Object Detection to help determine label placement. You can reduce package spacing by enabling the Use Position Sensor Data for Label Placement feature to help the system locate the label.



NOTE: This option is only available if a position sensor has been selected in Operating Mode.

When “**Use Position Sensor Data for Label Placement”** is Enabled, you define an “extra window” around the box dimensions for PackTrack label assignment.

Height / Width Placement Window

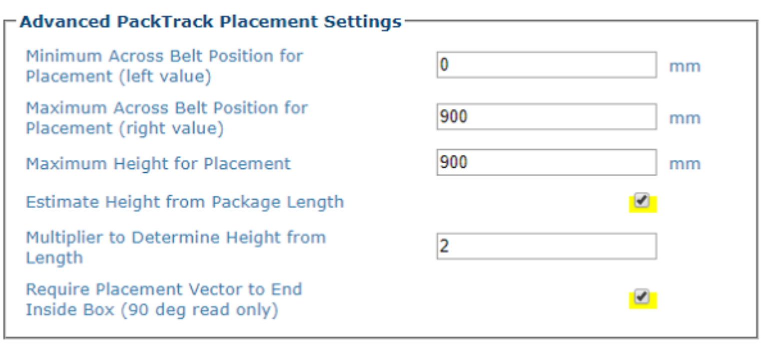
Enter an amount of mm or inches that define the extra window around box dimensions for PackTrack label assignment.

Front / Back Placement WIndow

Enter an amount of mm or inches that define the extra window applied at the front and back of the package for PackTrack label assignment. These are similar to the “extends” that can be applied when not using Position Sensor Data.

If Use Position Sensor Data for Label Placement is Disabled you can instead select, Use Advanced Label Placement Settings

Click the check-box to enable **Advanced Label Placement Settings** and several other parameters are revealed.



Minimum Across Belt Position for Placement (left value) / Maximum Across Belt Position for Placement (right value)

Normally, for a side read camera, labels are assumed to be in the range from the 'right side' of the conveyer (maximum conveyer width) to the left side (0 position). This allows a tighter range to be specified. **For example,** for a right side camera, perhaps the minimum package width is actually 6 inches, then the "Minimum position" can be changed to 6", instead of 0". Likewise, the "Maximum position" can be used to adjust the right side limit used for placement.

Maximum Height for Placement

Enter inches or mm to adjust the 'maximum height' for label placement.

Estimate Height from Package Length

If **Maximum Height for Placement** is selected, this option estimates a package height to use for label placement, based on the package length.

Multiplier to Determine Height from Length

The "multiplier" is multiplied by the length to get the height.

Require Placement Vector to End Inside Box (90 deg read only)

The vector defining where the barcode could be located, must end within the box. This eliminates cases the vector would extend from the front or back of the box. In practice this should ONLY be used for top-read cameras mounted looking straight down (not at 45 deg).

Extend Label Placement

Front Window

Enter a value with which to extend the front of the barcode placement window.

Back Window

Enter a value with which to extend the back of the barcode placement window.

Focusing Parameters

View Angle

View angle is determined by PackTrack calibration. This value represents the view angle of the camera. This value should not be changed after it is set by PackTrack calibration.

This parameter allows defining the reading angle of the camera. For standard installations this angle should be set to match the mechanical mounting: +15 or -15 degrees (single side object reading), +45 degrees for a side/back read or -45 degrees for a side/front read (double side object reading) depending on the type of installation. This parameter may be up to two degrees different then the 15/45 degree after the completed calibration.

For top read single side, +15 degrees is facing downstream, and -15 degrees is facing upstream. For top read multi-side, +45 degrees for top/back and -45 degrees for top/front.

Positive angles correspond to the package front or leading side with respect to the package movement and negative angles correspond to the package back or trailing side.

This field is automatically filled in during the static calibration of the unit (Calibration Wizard).

The possible values are from -50° to +50°. The default setting is 15°.

Distance to Trigger Source (X)

Defines the distance from the camera scan line to the trigger source (typically a Photo Sensor, Position Sensor, Light Curtain or DM3610 Dimensioner).

This field is automatically filled in during the static calibration of the unit (Calibration Wizard).

Far Working Distance (Z)

Defines the distance from the camera to the furthest scanning point.

This field is automatically filled in during the static calibration of the unit (Calibration Wizard).

Backup/Restore Mounting Calibration for this device

Once you have determined and defined mounting parameters, you may want to save a backup copy.

Download the current Mounting Calibration here ....Download

PTCalib_0.cal

Click **Download** and a calibration file for the device is automatically downloaded. You can save the file to your desired location.

Choose File

Click the **Choose File** button to select a calibration file do load.

Load Calibration File

Click **Load Calibration File** to upload the file you have selected.

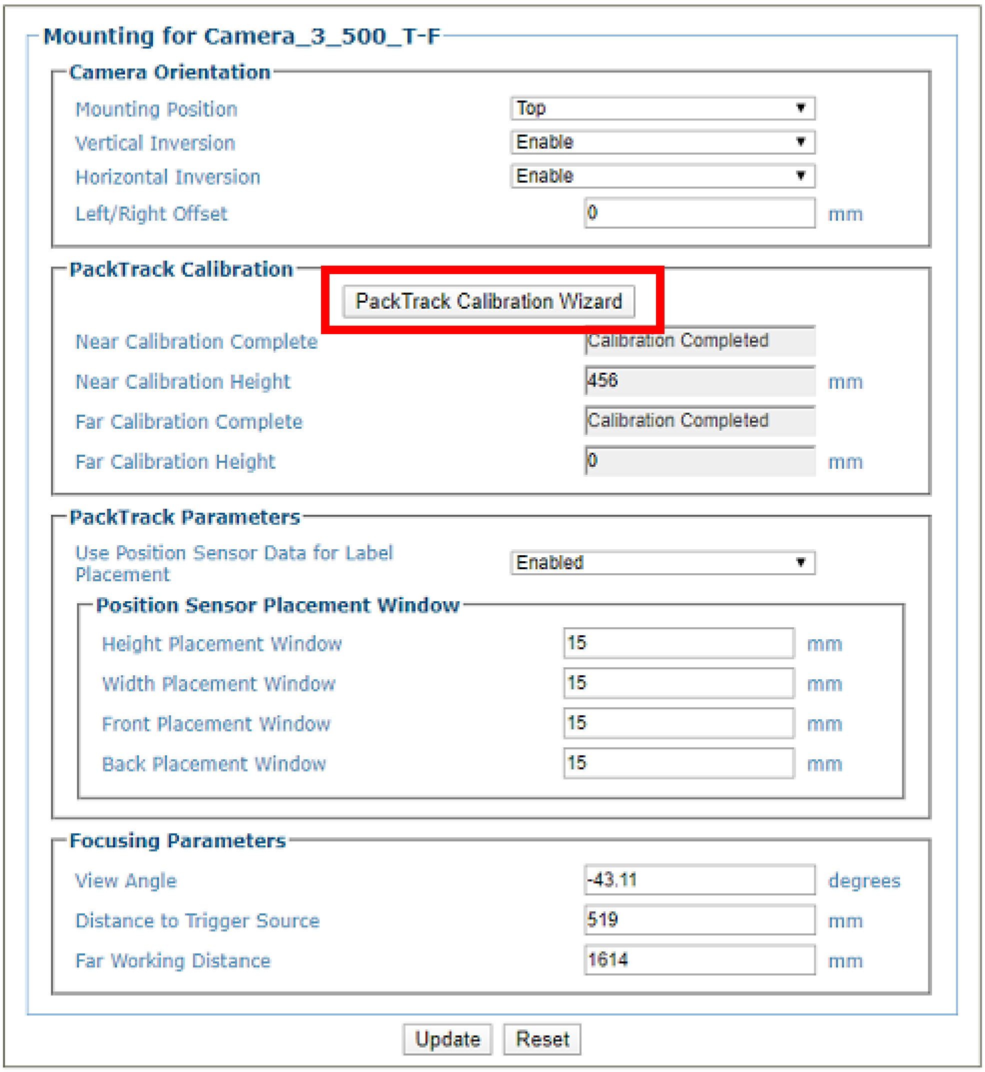
3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

PackTrack Calibration Wizard

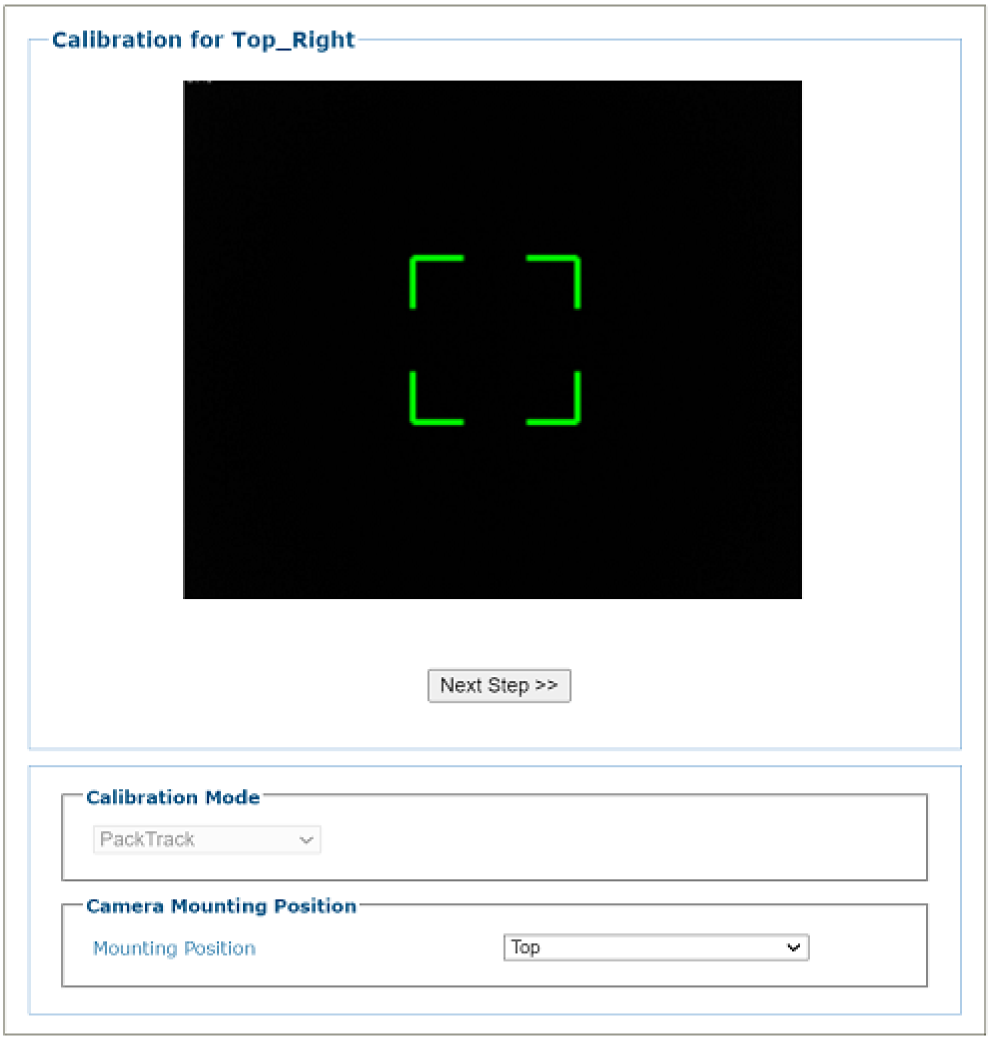
Use the **PackTrack Calibration Wizard** to automatically calibrate mounting dimensions and settings.

To access the PackTrack Calibration Wizard:

1. In the menu tree under **Modify Settings**, navigate to **Device Settings | <Camera Name> | Mounting**. The **Mounting** window opens.



2. Click the **PackTrack Calibration Wizard** button and the following appears.



3. Click the drop-down to select the appropriate Calibration Mode.

4. Click the drop-down to select the correct mounting position for the camera you are calibrating. Options are:

- Top
- Left
- Right
- Bottom

5. Place a **Calibration Target** at the maximum distance from the camera. Make sure the checker board grid is centered in the green alignment area and the 'Conveyor Direction' arrow is pointing in the direction the conveyor travels. Leave the target under the camera and press '**Next Step**'.

Step 2/5: Mounting Calibration Measurements at the Far Distance

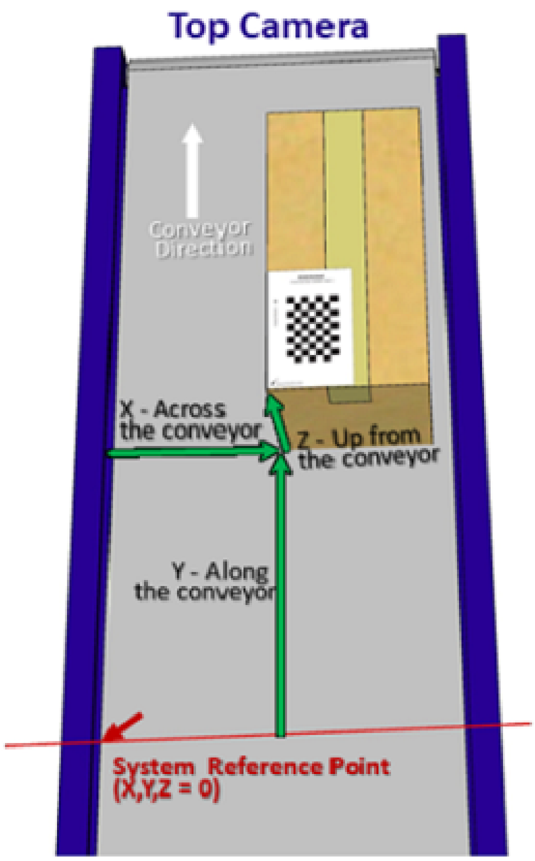
FAR Measurements

X ____ mm

Y ____ mm

Z ____ mm

Measure the X, Y and Z references in relation to the 'Measure from this Corner' arrow on the Calibration Target.
- System Reference Point is either the Photo Sensor or Position Sensor, which ever is closer to the camera.
- X is the distance from the left side of the belt.
- Y is the distance from the Photo Sensor or Position Sensor, which ever is closer to the camera.
- Z is the distance from the conveyor surface to the Calibration Target.

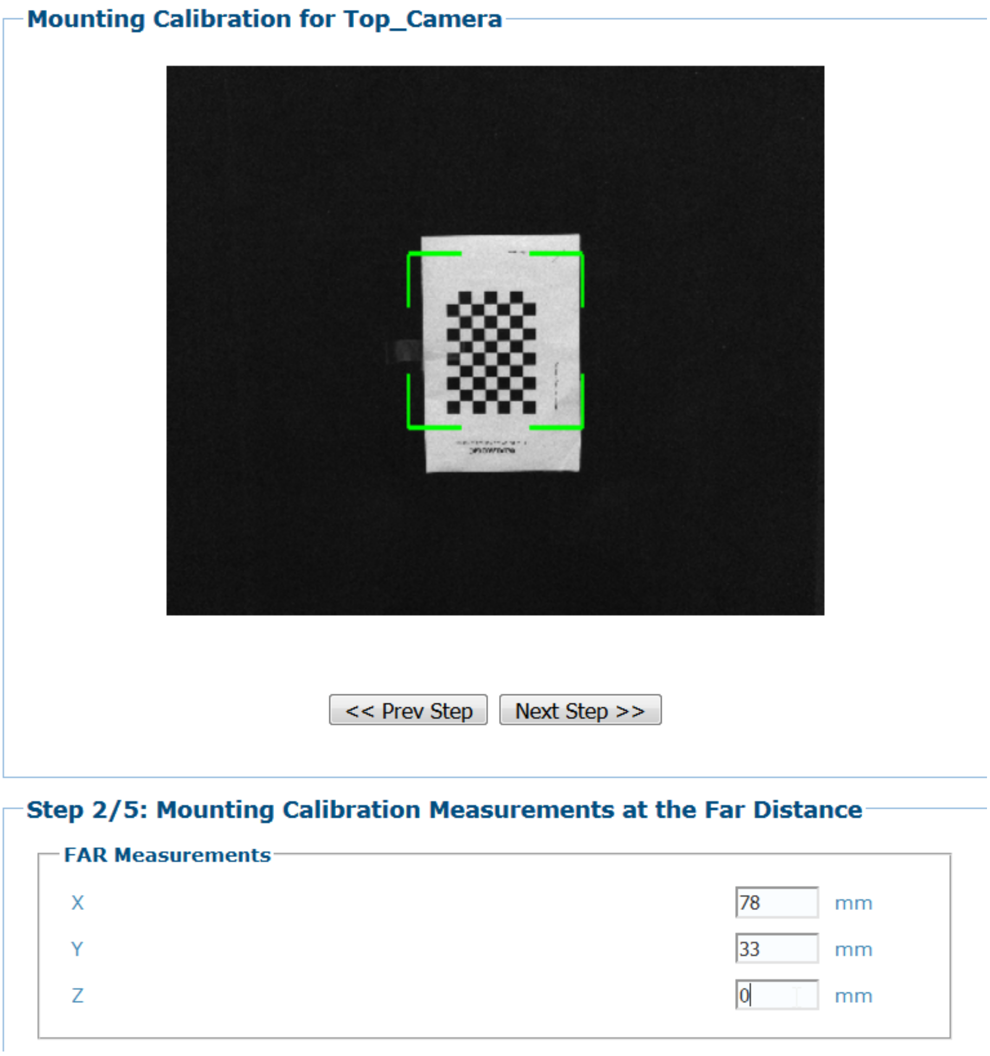


6. At the **Far Distance,** measure along conveyor travel, the distance from the trigger source to the target.

7. At the **Far Distance,** measure across the conveyor the distance from the target to the edge of the scanning area or the side of the conveyor belt.

8. At the **Far Distance**, measure up from the conveyor surface to the target, if the target is on the surface of the conveyor, this measurement will be 0.

9. Enter the measurements.



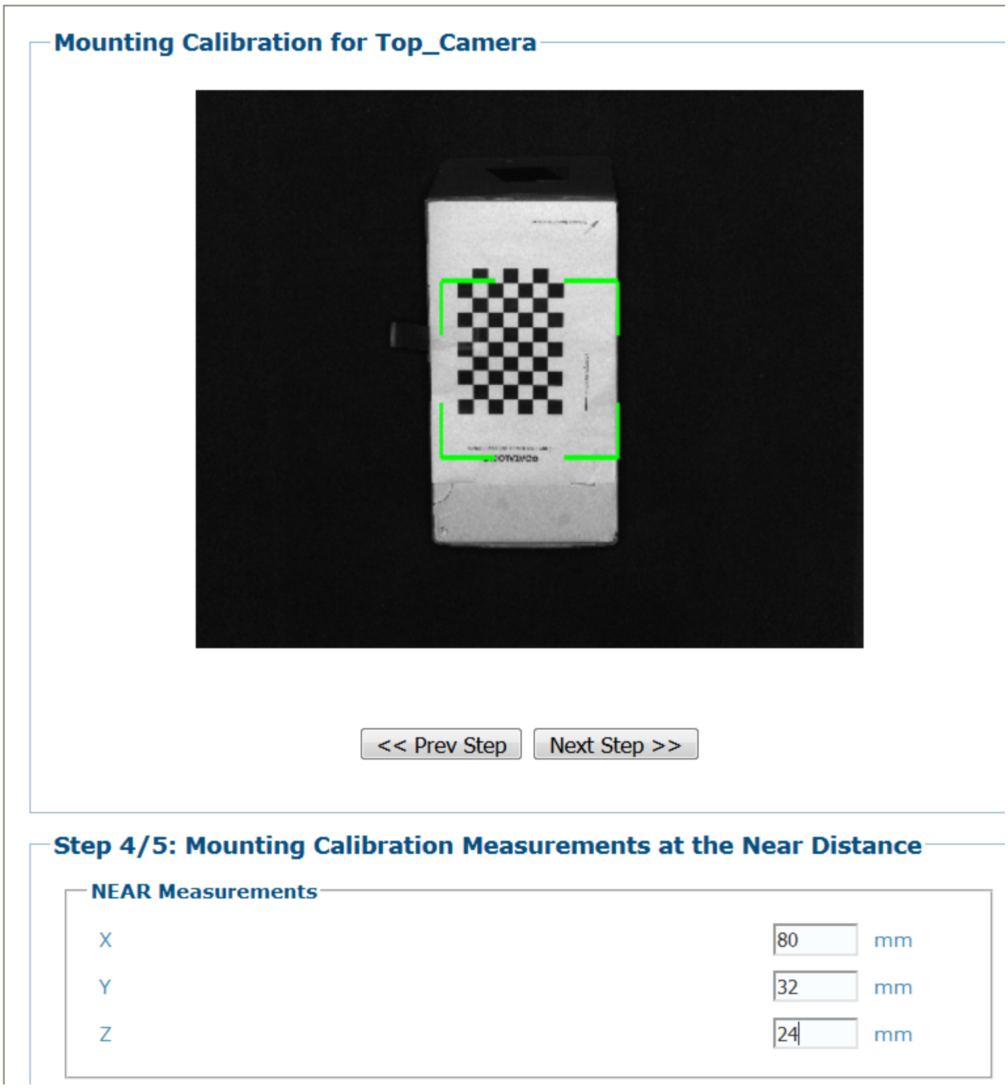
10. Place a Calibration Target at the **minimum distance** from the camera. Make sure the checker board grid is centered in the green alignment area and the 'Conveyor Direction' arrow is pointing in the direction the conveyor travels. Leave the target under the camera and press '**Next Step**'.

11. At the **Near Distance**, measure along conveyor travel, the distance from the trigger source to the target.

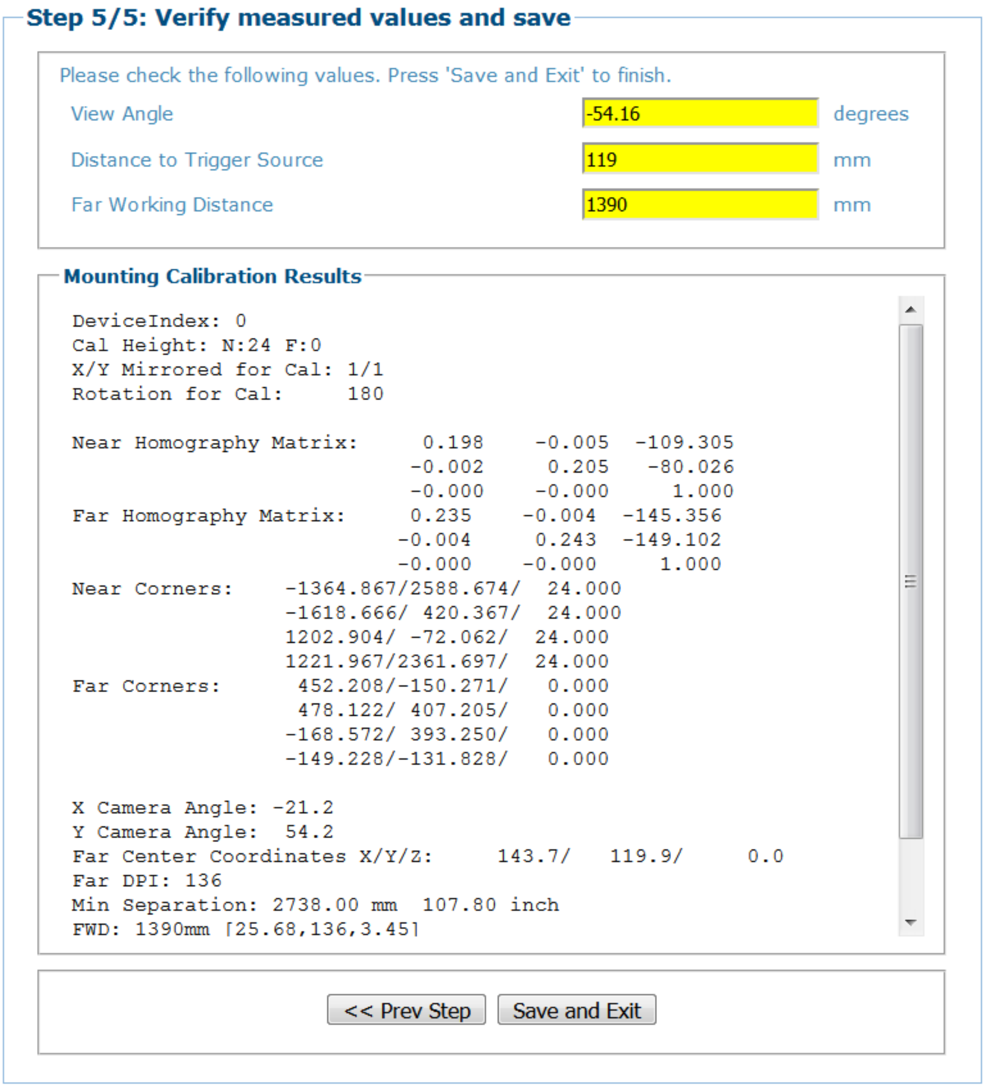
12. At the **Near Distance,** measure across the conveyor the distance from the target to the edge of the scanning area or the side of the conveyor belt.

13. At the **Near Distance,** measure up from the conveyor surface to the target, if the target is on the surface of the conveyor, this measurement will be 0.

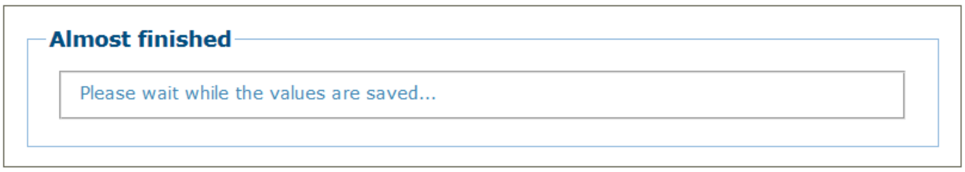
14. Enter the measurements.



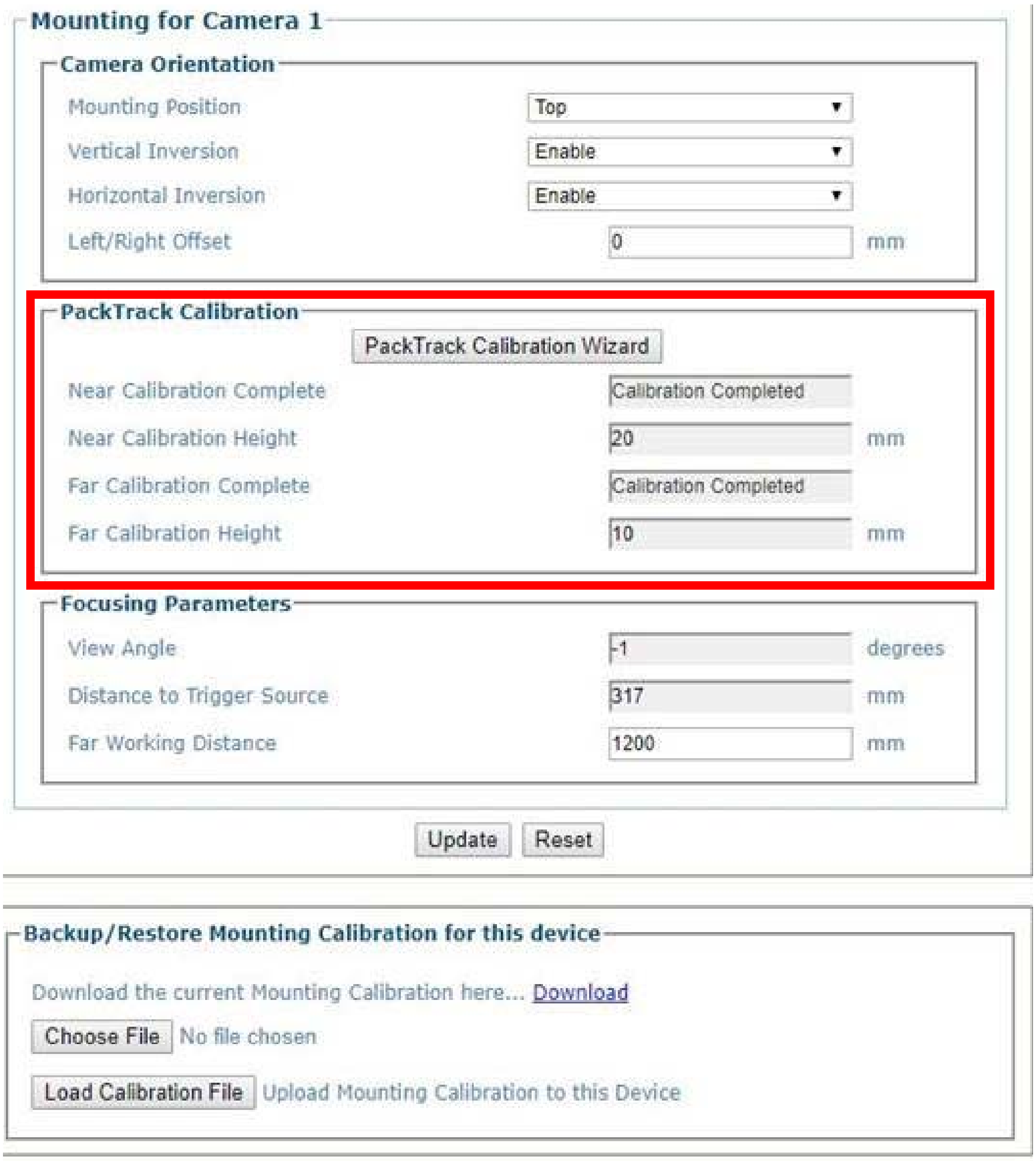
15. Click **Next Step** and the following screen appears.



16. Click **Save and Exit** and the following message appears while the values are being saved.



17. When the values have been saved e-Genius will return to the Mounting screen for that camera with the information learned from the **Calibration Wizard** in the appropriate fields.

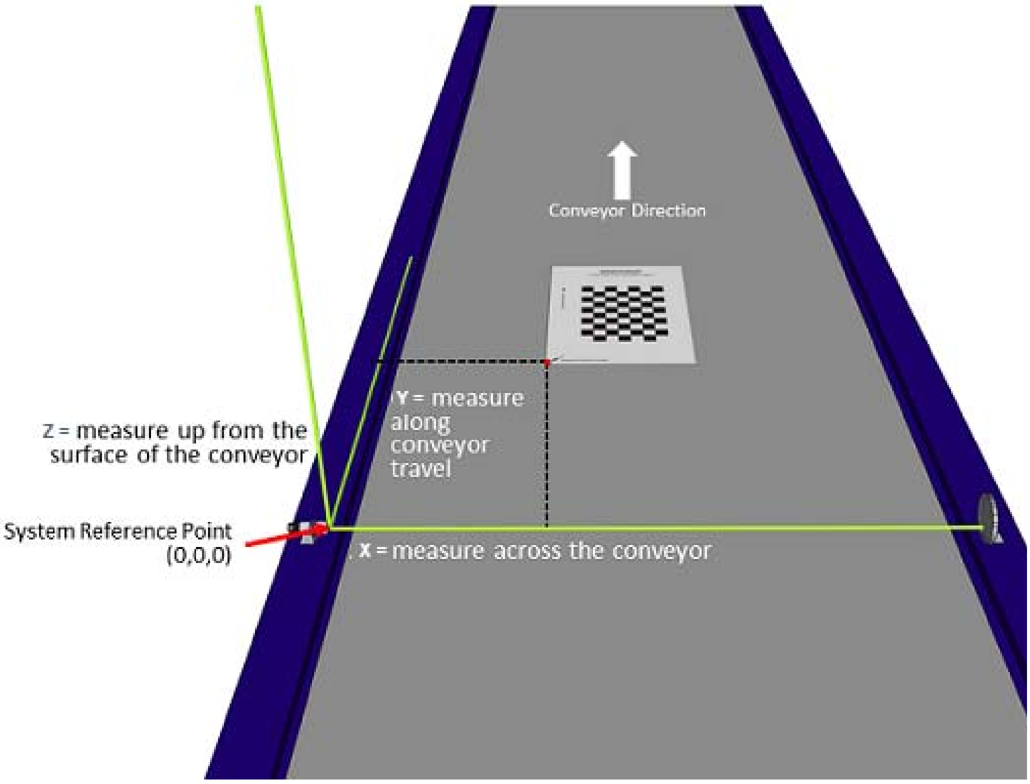

Mounting for Camera 1
Camera Orientation
Mounting Position
Top
Vertical Inversion
Enable
Horizontal Inversion
Enable
Left/Right Offset
0
mm
PackTrack Calibration
PackTrack Calibration Wizard
Near Calibration Complete
Calibration Completed
Near Calibration Height
20
mm
Far Calibration Complete
Calibration Completed
Far Calibration Height
10
mm
Focusing Parameters
View Angle
-1
degrees
Distance to Trigger Source
317
mm
Far Working Distance
1200
mm
Update
Reset
Backup/Restore Mounting Calibration for this device
Download the current Mounting Calibration here... Download
Choose File
No file chosen
Load Calibration File
Upload Mounting Calibration to this Device

Understanding PackTrack

PackTrack is a patented operating mode for Datalogic products used to read and correctly assign codes on different parcels when read at the same time. If the codes of two or more consecutive parcels are found at the same time in the camera reading area, the condition occurs where, the code of the second pack is read first, just before the code of the previous pack. A system without PackTrack would assign the code of the second pack to the first pack and vice versa, thus causing a gross error in sortation.

NOTE: Tracking starts 10 cm before and stops 10 cm after the Reading Area in order to ensure the bar code is assigned to the correct package.

PackTrack uses a right-handed reference system where the **X** axis coincides with the Photoelectric Sensor line, the **Z** axis is oriented upwards from the conveyor (see figure below) and the **Y** axis coincides with the conveyor direction. The arrows point in the positive direction. The coordinate point of origin (0,0,0) is on the left edge of the conveyor as illustrated.



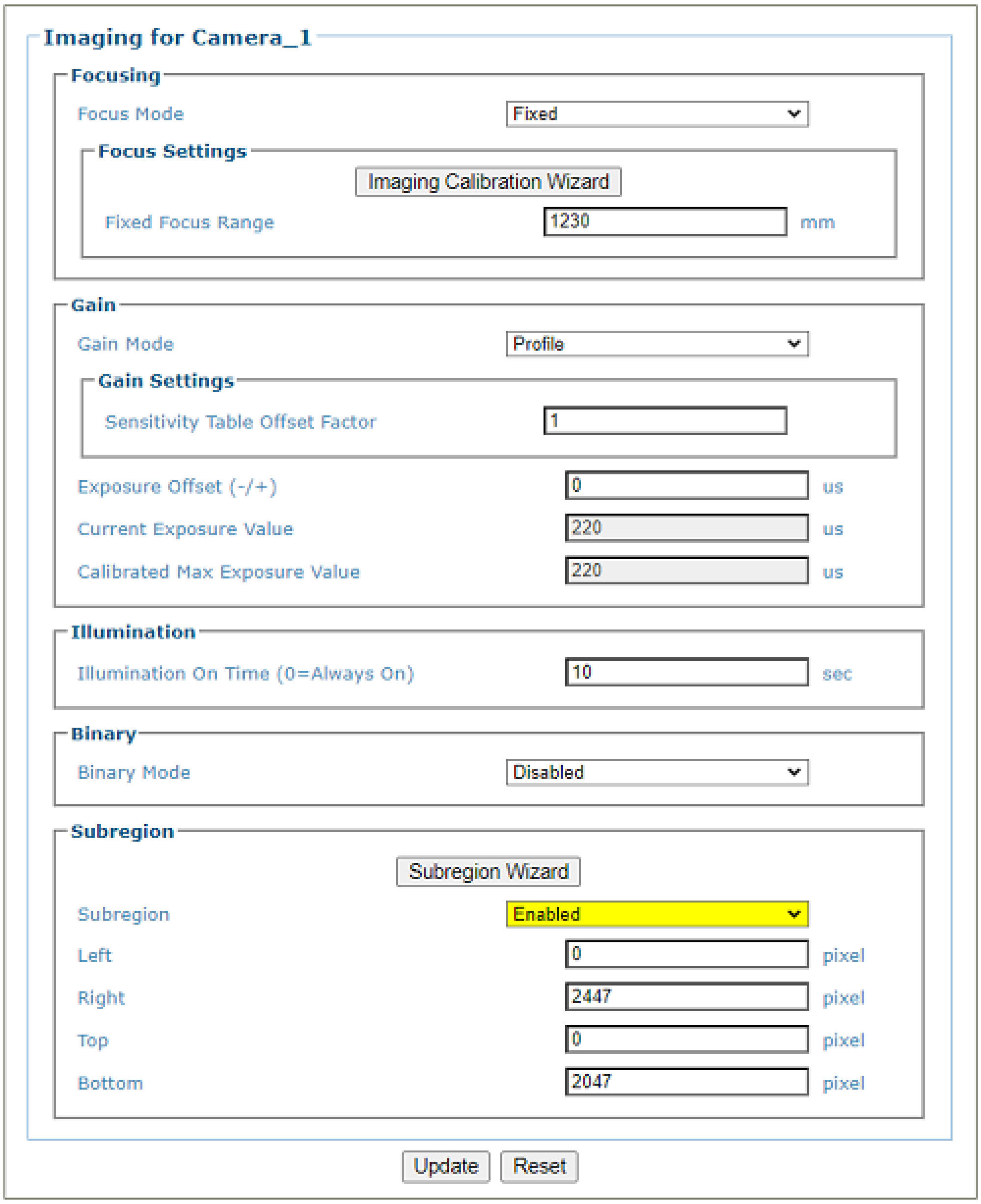
X, Y and Z are absolute for the reading station, i.e. valid for all the cameras independently from their position or orientation with respect to the conveyor. For this reason, after the PackTrack configuration (and calibration) has been correctly performed, when a barcode is under the beam to be read by the cameras, its position is defined by the coordinates of its central point, independently from which camera is reading it.

Device Settings | Camera #n | Imaging

Use the **Imaging window** to configure how the selected camera focuses on images.

To view the Imaging window:

1. In the menu tree under **Modify Settings**, navigate to **Device Settings | <Camera name> | Imaging.** The **Imaging** window opens.



2. Enter the appropriate information in the form as described below:

NOTE: The furthest distance is measured from the back of the camera.

Imaging for Camera_1

FOCUSING

Focus Mode

Select **Fixed, Dynamic, Dual Zone**, or **Sequential** from the drop-down.

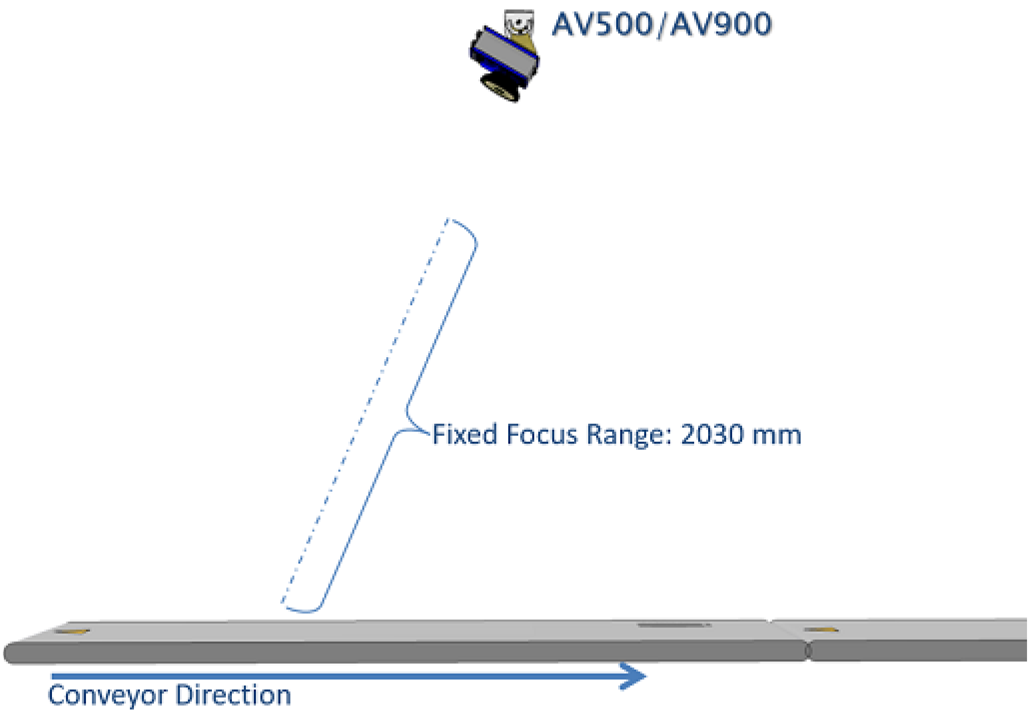
Focus Settings

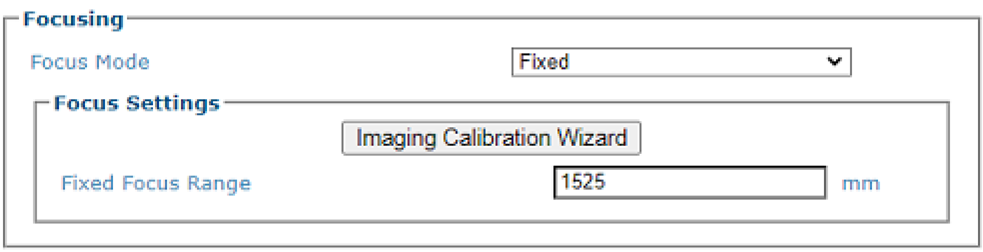
Imaging Calibration Wizard (Not available for Dynamic Focusing)

Click on the **Imaging Calibration Wizard** button to calibrate Focus and Sensitivity. See “Imaging Calibration Wizard” on page 241.

FIXED FOCUS MODE

When **Fixed Focus** mode is selected, enter the fixed focus range in the field provided. This parameter indicates the fixed focus range used when a position sensor is not used. The possible values are from the minimum to the far range.





NOTE: The Depth Of Field (DOF) is dependent on the x dimension of the bar code (the narrowest part of a barcode's symbology). The camera focus should be set to the middle of the application's DOF.

Fixed Focus Range

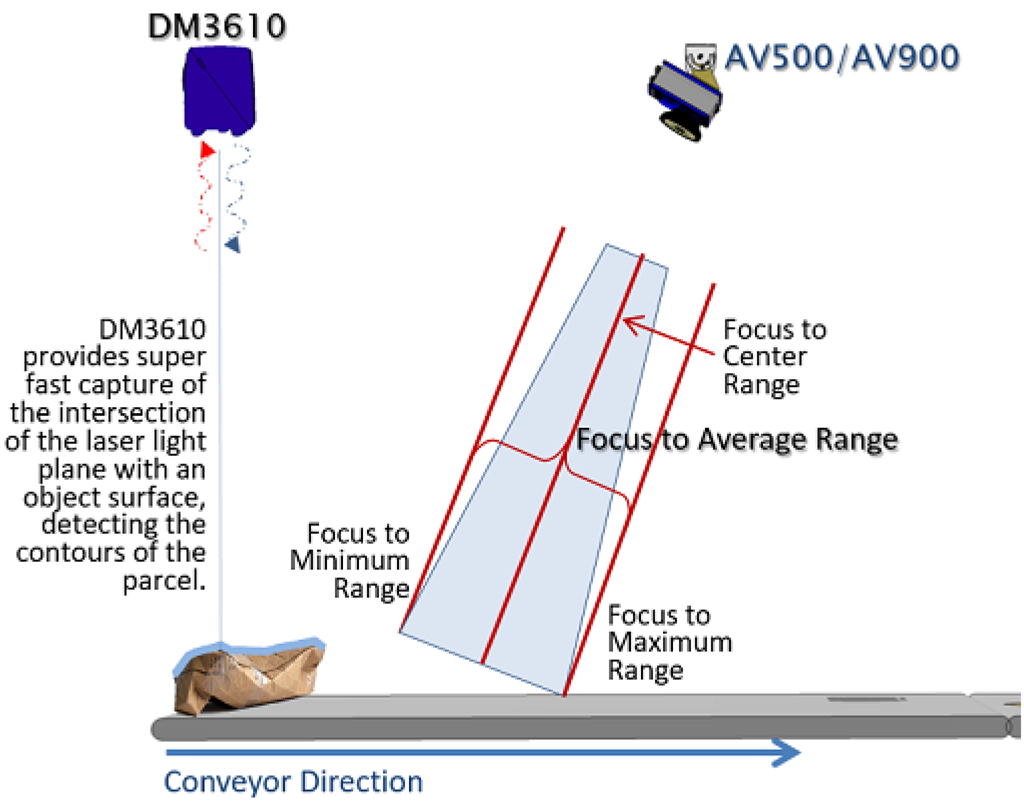
This distance must be less than the Far Working Distance set in the **Device settings > Mounting > Mounting Calibration Wizard**.

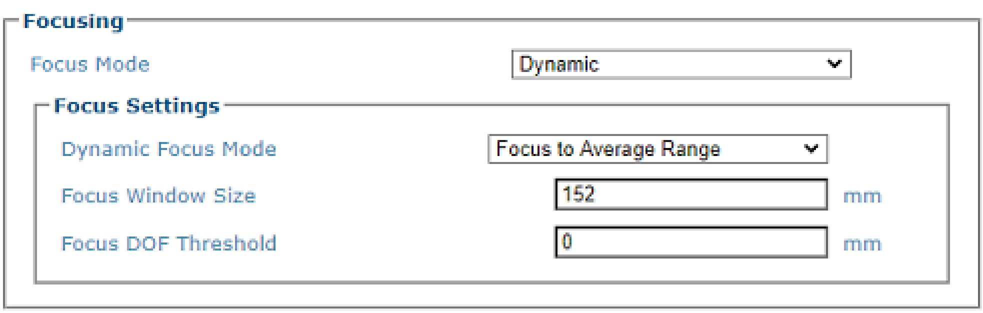
Dynamic Focus Mode

Dynamic Focus Mode (Imaging Calibration Wizard is not available)

Allows the camera to change focus per frame based on data received from a positioning sensor, usually a DM3610. To determine where to focus the AV500/AV900 dynamically, select one of the following from the drop-down:

- **Focus to Center Range:** Focuses the camera to the center of the range provided by the positioning sensor.
- **Focus to Average Range:** Focuses the camera to the average of the range provided by the positioning sensor.
- **Focus to Min Range (Near):** Focuses the camera to the minimum of the range provided by the positioning sensor.
- **Focus to Max Range (Far):** Focuses the camera to the maximum of the range provided by the positioning sensor.





Focus Window Size

Enter the value of the Size of the **Focus Window**. Not available for Center Range.

Focus DOF Threshold

Enter the value of the **Depth of Field Threshold**. This threshold determines when the camera will change its position. Once the camera identifies its focus point generated by the position sensor, it will hold its position until data from the position sensor exceeds this threshold.

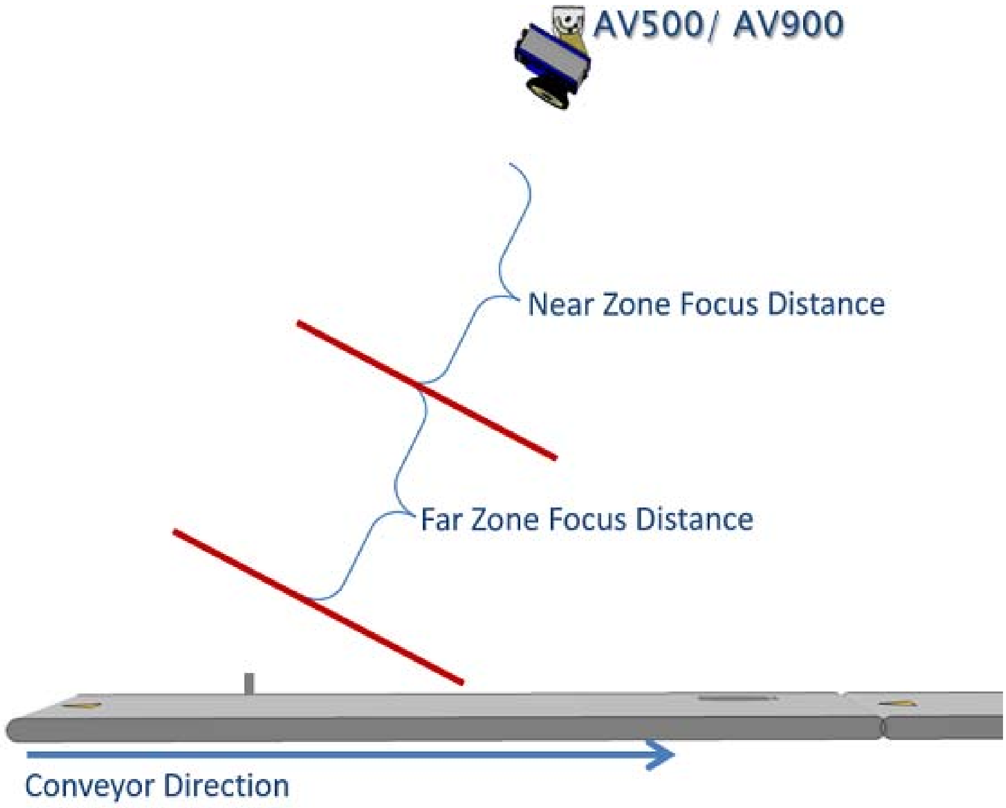
Use Focus for Label Placement

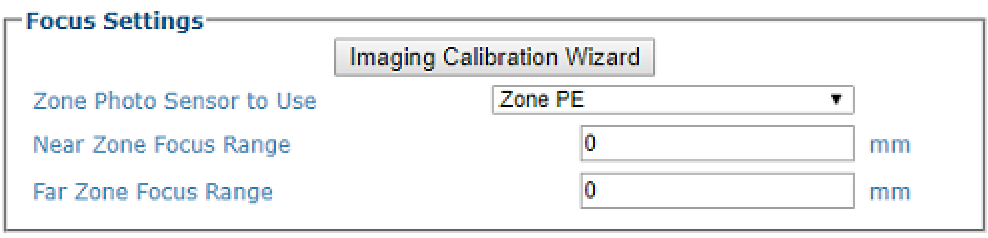
Select **Enabled** or **Disabled.** If enabled, the PackTrack algorithm can use "focus data" from the

Position Sensor to more accurately determine if a decoded symbol can be placed on a parcel.

DUAL ZONE

When Dual Zone focus is selected it allows you to define two zones to which a photo sensor will focus the camera.





Zone Photo Sensor to Use

Select from the drop-down to Identify which relay input is used to provide the change of focus zone.

Near Zone Focus Distance

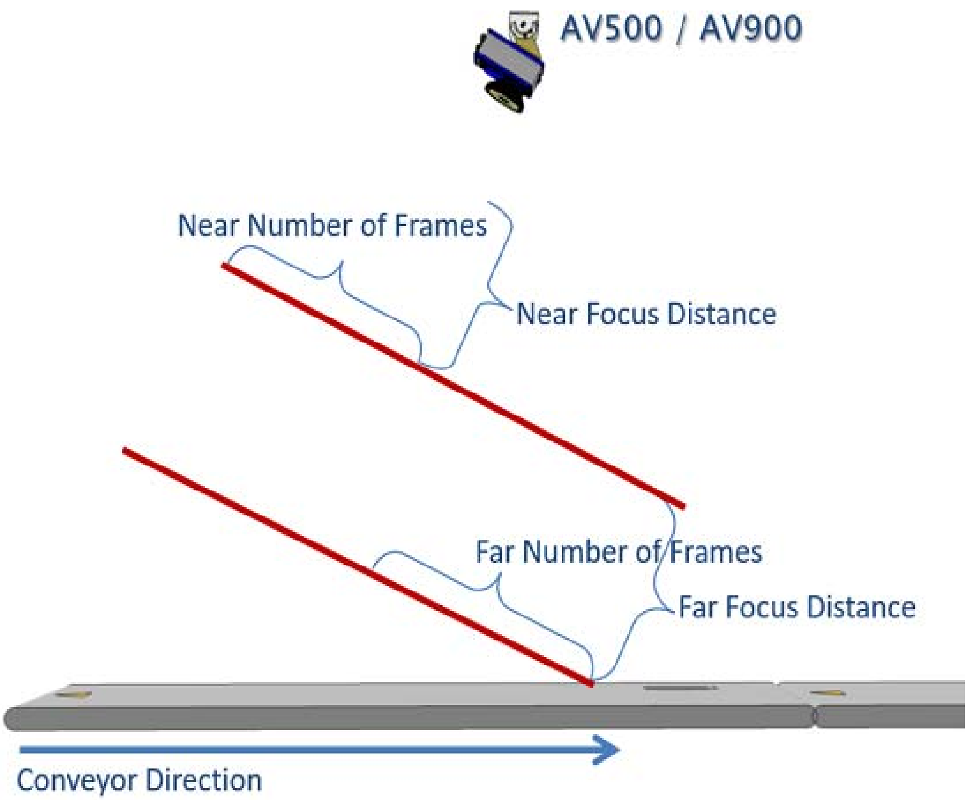
Enter the distance from the back of the camera to the mid range of the near zone.

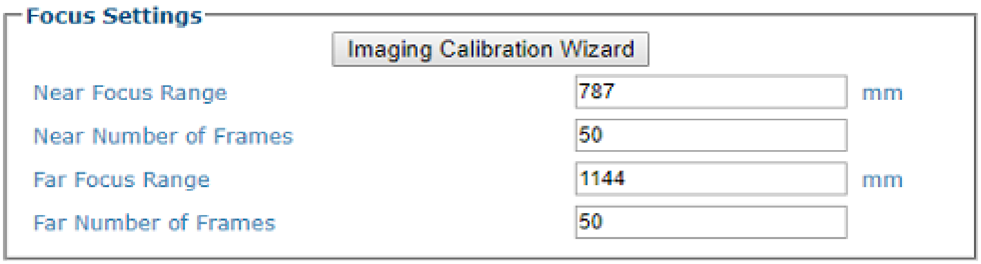
Far Zone Focus Distance

Enter the distance from the back of the camera to the Mid range of the far read zone.

SEQUENTIAL

When sequential is selected it allows for the AV500/AV900 to read bar codes in two separate zones without the need of a photo sensor. the AV500/AV900 will set two separate focus zones and control the number of frames it keeps the focus for each zone





Near Focus Distance

Enter the Near Zone Focus Distance is the distance from the back of the scanner to the Mid range of the near read zone.

Near Number of Frames

Enter the Near Number of Frames determines the number of frames the AV500/AV900 will remain in the near zone until it changes its focus to the far zone.

Far Focus Distance

Enter the Far Zone Focus Distance is the distance from the back of the scanner to the Mid range of the far read zone.

Far Number of Frames

Enter the Far Number of Frames determines the number of frames the AV500/AV900 will remain in the far zone until it changes its focus to the near zone.

Gain

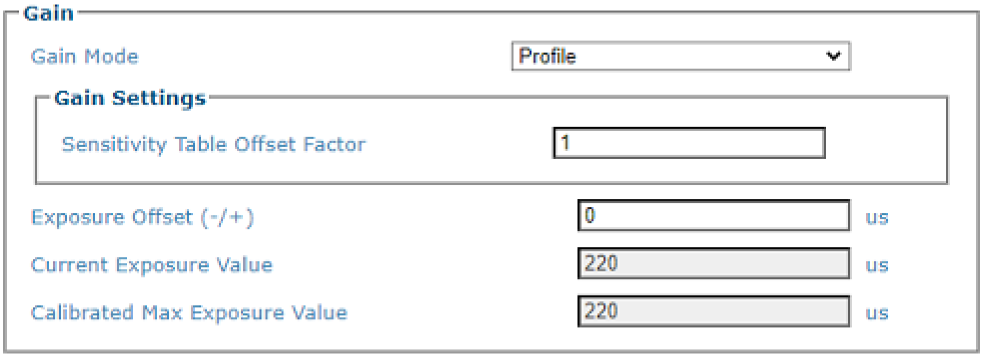
Gain Mode

Select **Profile** or **Fixed** from the drop-down list.

When profile is selected the AV500/AV900 will adjust the image Sensitivity according to the identified distance from the camera. The closer the package is to the AV500/AV900 the lower the sensitivity. The farther the distance, the greater the Sensitivity adjustment.

Gain Settings

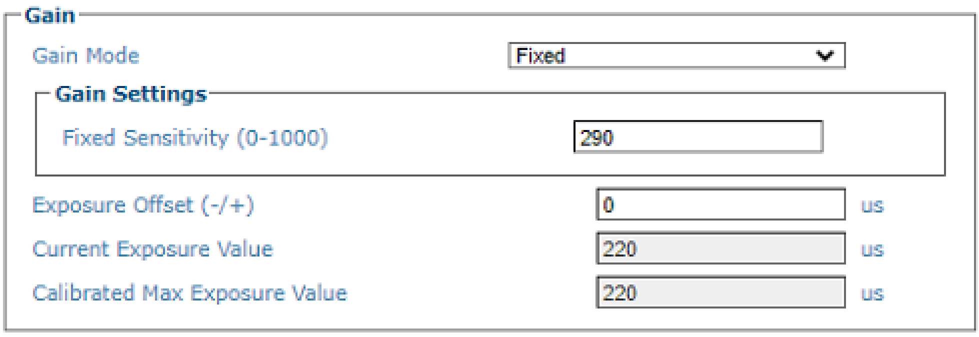
If **Profile** is selected, a Sensitivity Table offset Factor will adjust the gain according to the focus mode selected. This option is used when position sensor is enabled.



Sensitivity Table Offset Factor

Sensitivity Table Offset Factor, when used with the Dual Zone Focus Mode option will adjust the gain in the near zone.

If **Fixed** is selected, the Sensitivity is adjusted to optimize the image intensity and is maintained through the DOF.



Fixed Sensitivity (1-1000)

Enter a value (between 1-1000) In the Fixed Sensitivity configuration the Sensitivity is adjusted to optimize the image intensity and is maintained through the DOF.

Exposure Offset (-/+)

Enter the offset to be applied to the value in “Calibrated Maximum Exposure”. The result of “Calibrated Maximum Exposure” +/- “Maximum Exposure Offset” cannot be lower than 20 or greater than the value in “Calibrated Maximum Exposure”

Current Exposure Value

The result of “Calibrated Maximum Exposure” +/- “Maximum Exposure Offset”. This is the maximum amount of exposure the camera will use. Lower values will reduce motion blur at higher belt speeds.

Calibrated Max Exposure Value

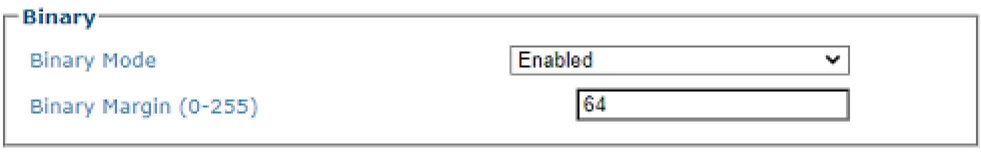
The maximum exposure value calibrated in the factory. The “Current Maximum Exposure Value” cannot not exceed this value

Illumination

Illumination On Time

Enter the number of seconds the illumination should remain on. **0 = Always on.**

Binary



Binary Mode

Select **Enable** or **Disable** from the drop-down. Binary Mode enabled will use the least significant bit of each pixel to create a binary image.

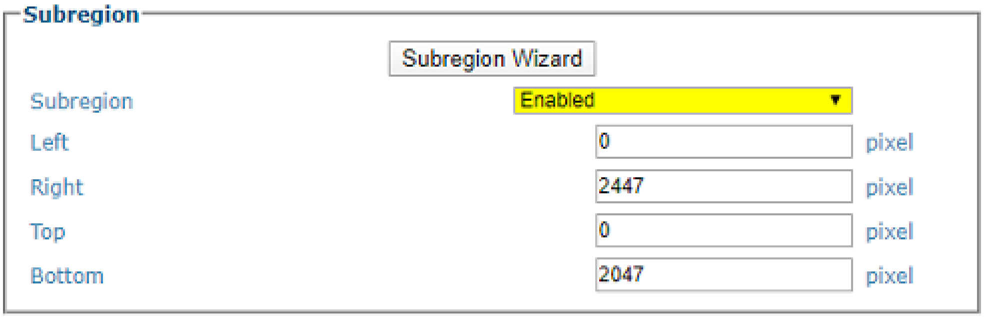
Binary Margin (0-255)

If **Binary Mode** is enabled, enter the Binary Margin. **Binary Margin** is used to determine whether a pixel should be a 1 or a 0. Higher margin values will result in less noise (more white values) but less detail. Lower margin values will produce more detail but also more noise

Subregion

Subregion Wizard

Click the Subregion Wizard button (See "Subregion Wizard" on page 248) to access a tool where you draw a green rectangle around a region of the pattern specifying an Imaging Subregion used to determine what part of the frame will be used (PackTrack). See left/right/top/bottom PackTrack functions.



Subregion

Select **Enable** or **Disable** from the drop-down. When you enable, the following parameters appear:

These will be automatically filled in by the wizard. You can adjust the numbers if necessary.

Left

Enter a number of pixels

Right

Enter a number of pixels

Top

Enter a number of pixels

Bottom

Enter a number of pixels

See **"Subregion Wizard" on page 248.**

3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

Imaging Calibration Wizard

Use the **Imaging Calibration Wizard** to automatically calibrate focus and sensitivity for the **Fixed, Dual** and **Sequential** focus modes.

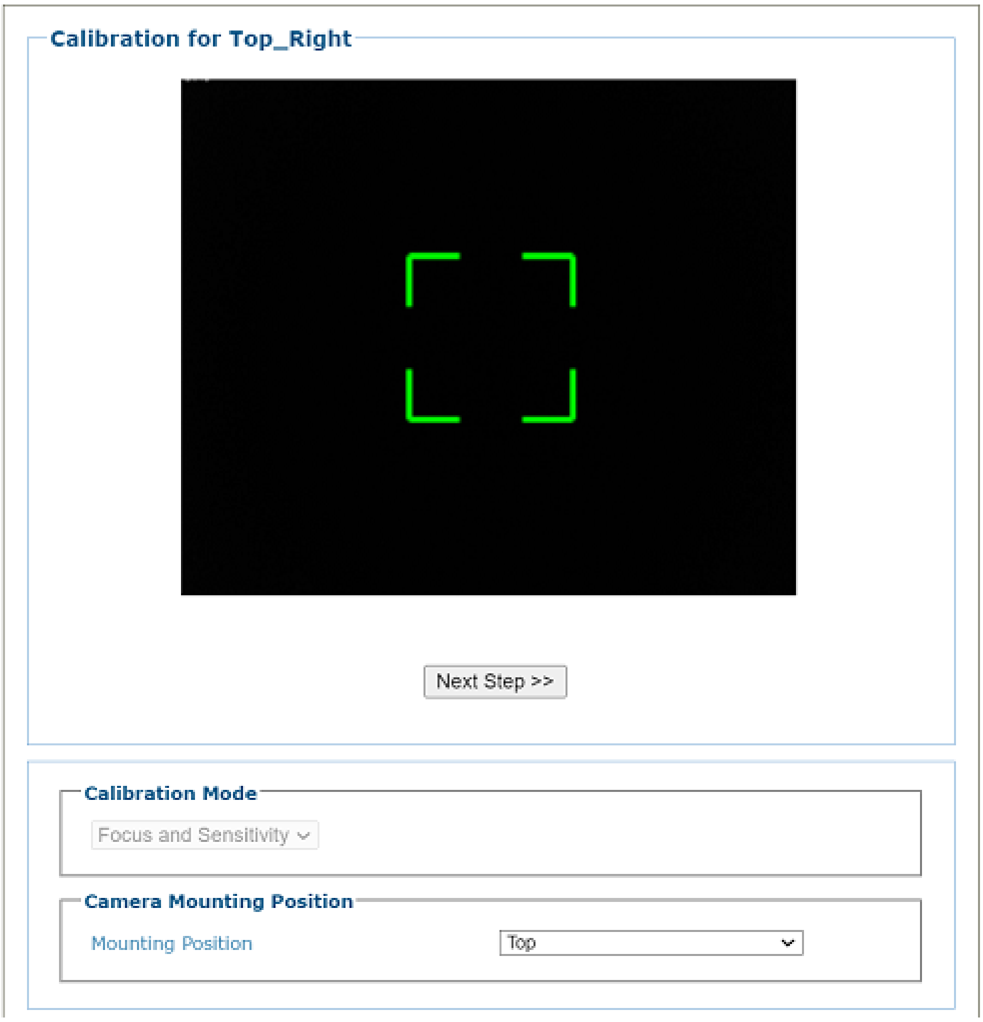
To access the Imaging Calibration Wizard:

In the menu tree under **Modify Settings**, navigate to **Device Settings | <Camera Name> | Imaging**. The **Imaging window** opens. Click the **Imaging Calibration Wizard** button.

The steps for this wizard are different based upon the focusing method you chose.

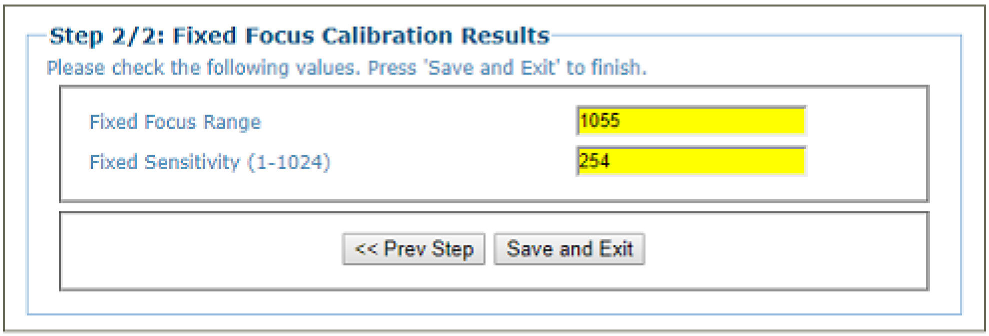
Fixed Focus Calibration

1. When you click the Imaging Calibration Wizard this is the first screen you will see. Click **Next Step>>**.

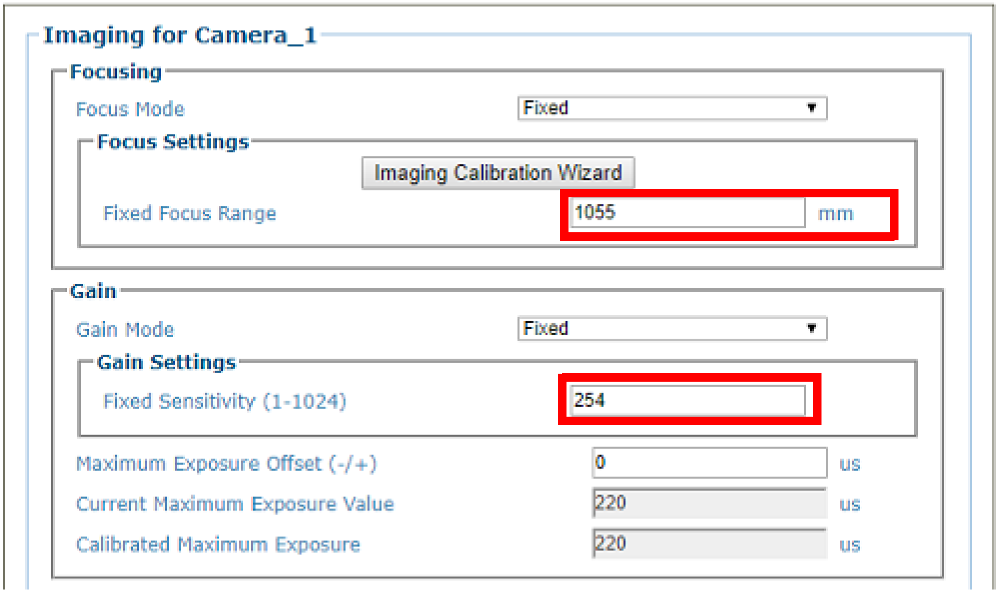


2. Place a **Calibration Target**, or clean barcode, in the middle of the desired working range. Make sure the checker board grid, or a clean barcode, is centered in the green alignment area. Leave the target under the camera and press **Next Step>>**.

3. You will hear the focusing mechanism as it moves into the optimal focusing position for the specific camera.

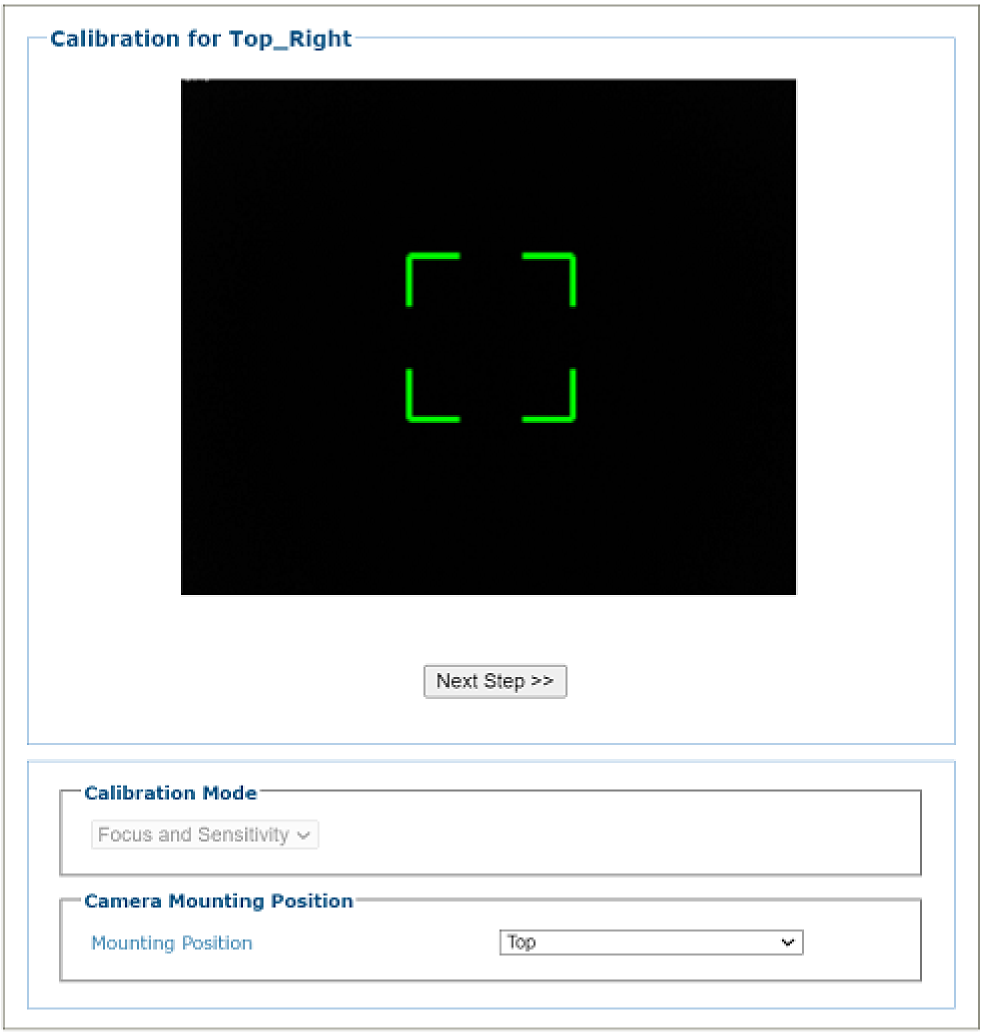


4. Click **Save and Exit** and the Fixed Focus Range and Sensitivity values are entered into the Imaging parameters based upon the wizard determinations.

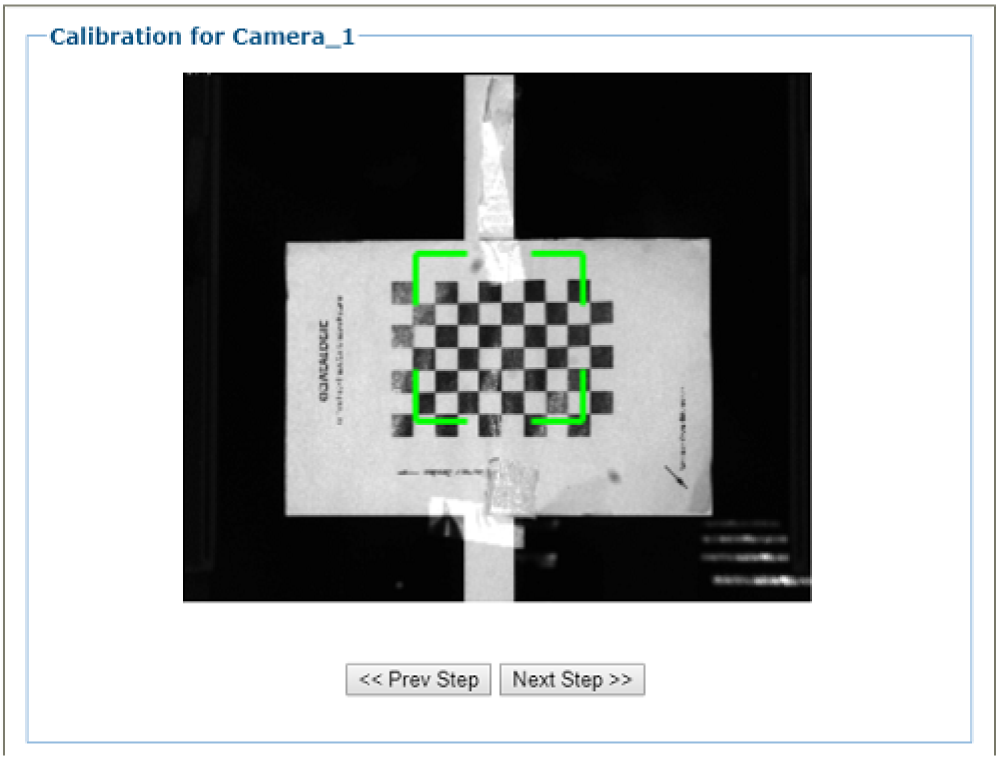


Dual Zone Calibration

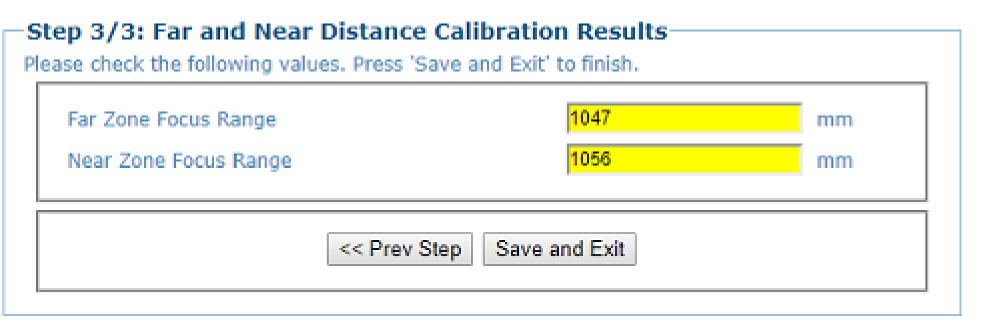
1. If you have selected **Dual Zone** focusing, and you click the **Imaging Calibration Wizard** this is the first screen you will see. Click **Next Step>>**.



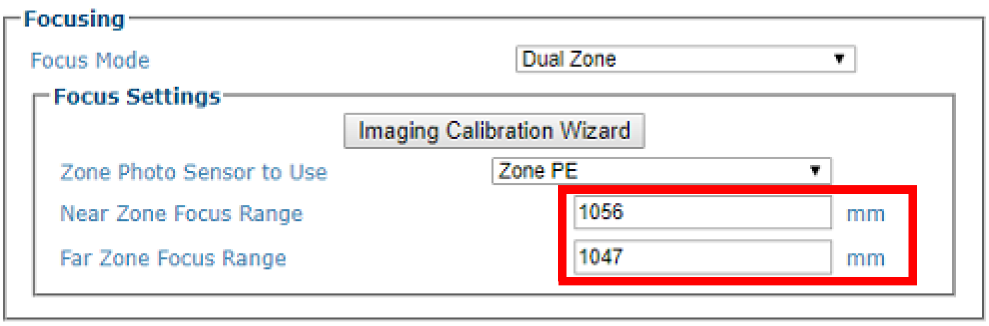
2. Place a Calibration Target, or clean barcode, in the center of the **far working range**. Make sure the checker board grid, or a clean barcode, is centered in the green alignment area. Leave the target under the camera and press **Next Step>>**.



3. Place a Calibration Target, or clean barcode, in the center of the **near working range**. Make sure the checker board grid, or a clean barcode, is centered in the green alignment area. Leave the target under the camera and press **Next Step>>**.

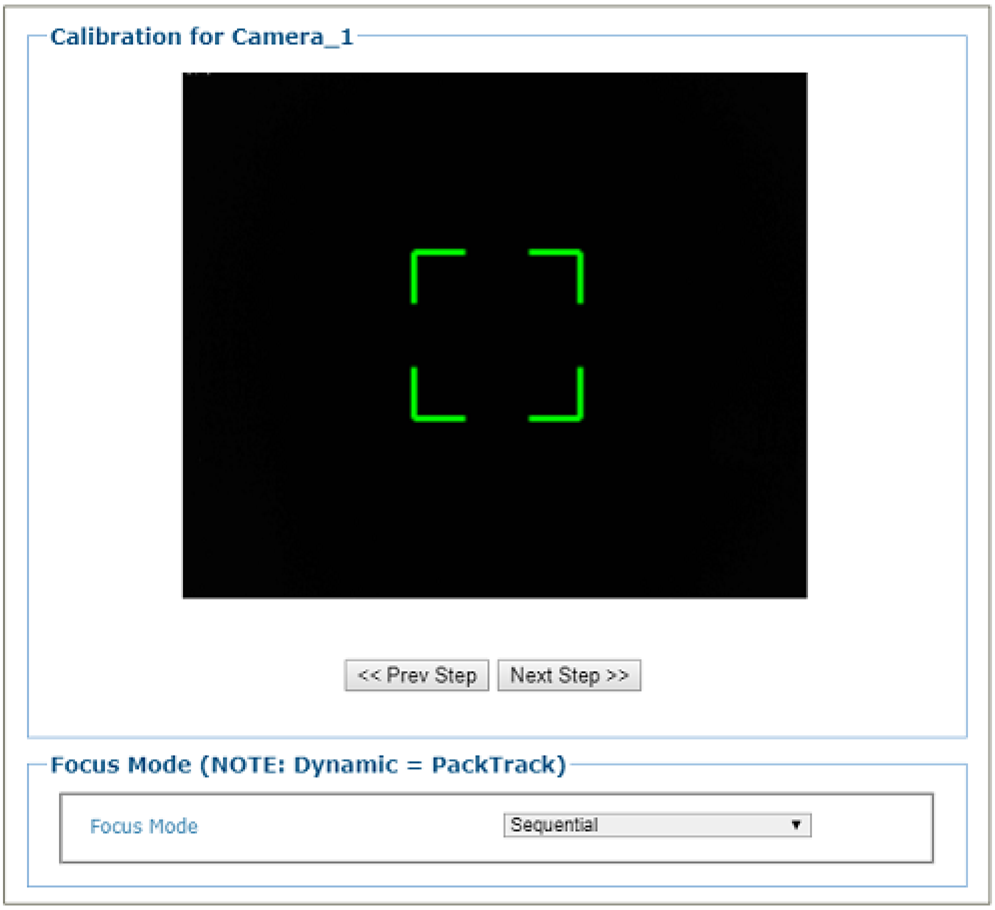


4. Click **Save and Exit** and the Near and Far Zone Focus Ranges are entered into the Imaging parameters based upon the wizard determinations



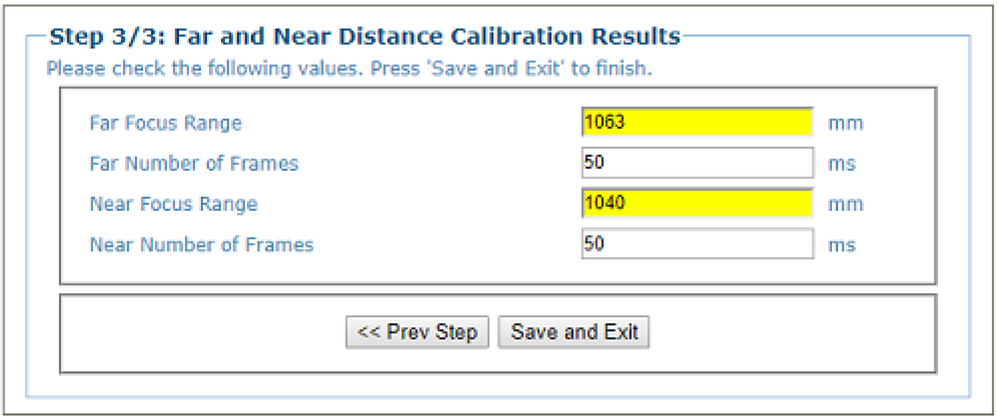
Sequential Calibration

1. If you have selected **Sequential focusing**, and you click the **Imaging Calibration Wizard** click **Next Step>>**



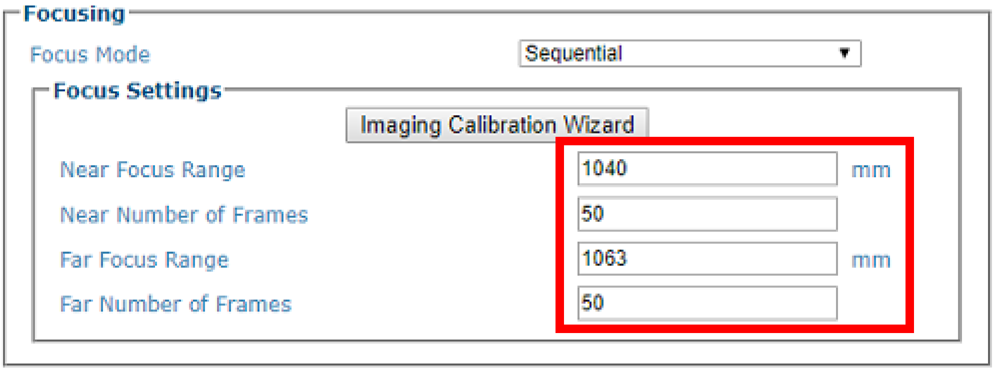
2. Place a Calibration Target, or clean barcode, in the center of the **far working range**. Make sure the checker board grid, or a clean barcode, is centered in the green alignment area. Leave the target under the camera and press '**Next Step**'

3. Place a Calibration Target, or clean barcode, in the center of the **near working range**. Make sure the checker board grid, or a clean barcode, is centered in the green alignment area. Leave the target under the camera and press '**Next Step**'



4. Click **Save and Exit** and the **Far and Near Focus Ranges** are entered into the Image parameters based upon the wizard determinations.

5. You can enter the number of frames as desired.


Focusing
Focus Mode
Sequential
Focus Settings
Imaging Calibration Wizard
Near Focus Range
1040
mm
Near Number of Frames
50
Far Focus Range
1063
mm
Far Number of Frames
50

Subregion Wizard

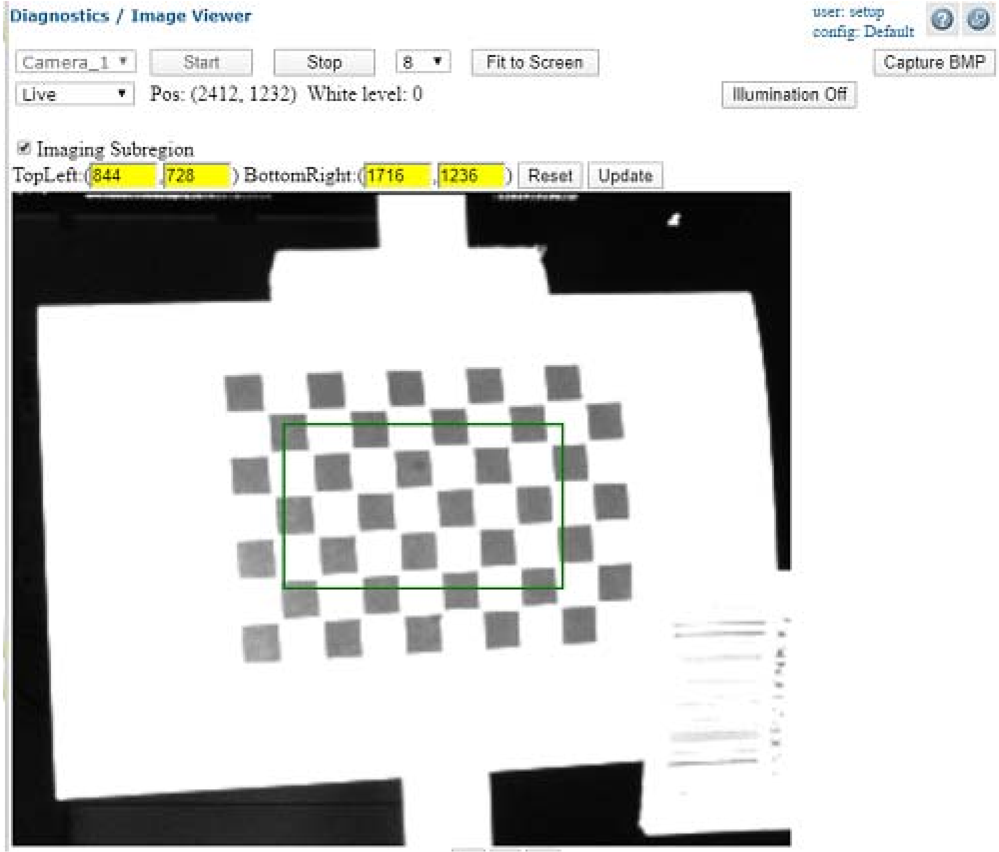
Use the **Subregion Wizard** to automatically create a green rectangle around a region of the pattern specifying the Imaging Subregion. The Imaging Subregion (if enabled) is used to determine what frames intersect a package (PackTrack).

To access the Subregion Wizard:

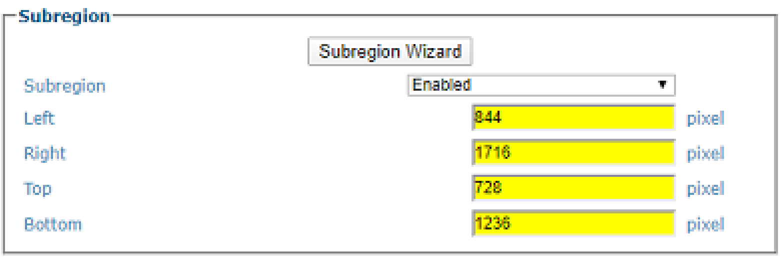
1. In the menu tree under **Modify Settings**, navigate to **Device Settings | <Camera Name> | Imaging**. The **Imaging window** opens. Click the **Subregion Wizard** button.

2. Place a **Calibration Target** at the maximum distance from the camera. Make sure the checker board grid is centered in the green alignment area and the '**Conveyor Direction' arrow** is pointing in the direction the conveyor travels. Leave the target under the camera.

3. Drag your mouse to select the “**Subregion area**” you desire.



4. You can click "**Update"** on the Image Viewer page to transfer the subregion values back to the Imaging page, where you can submit them.



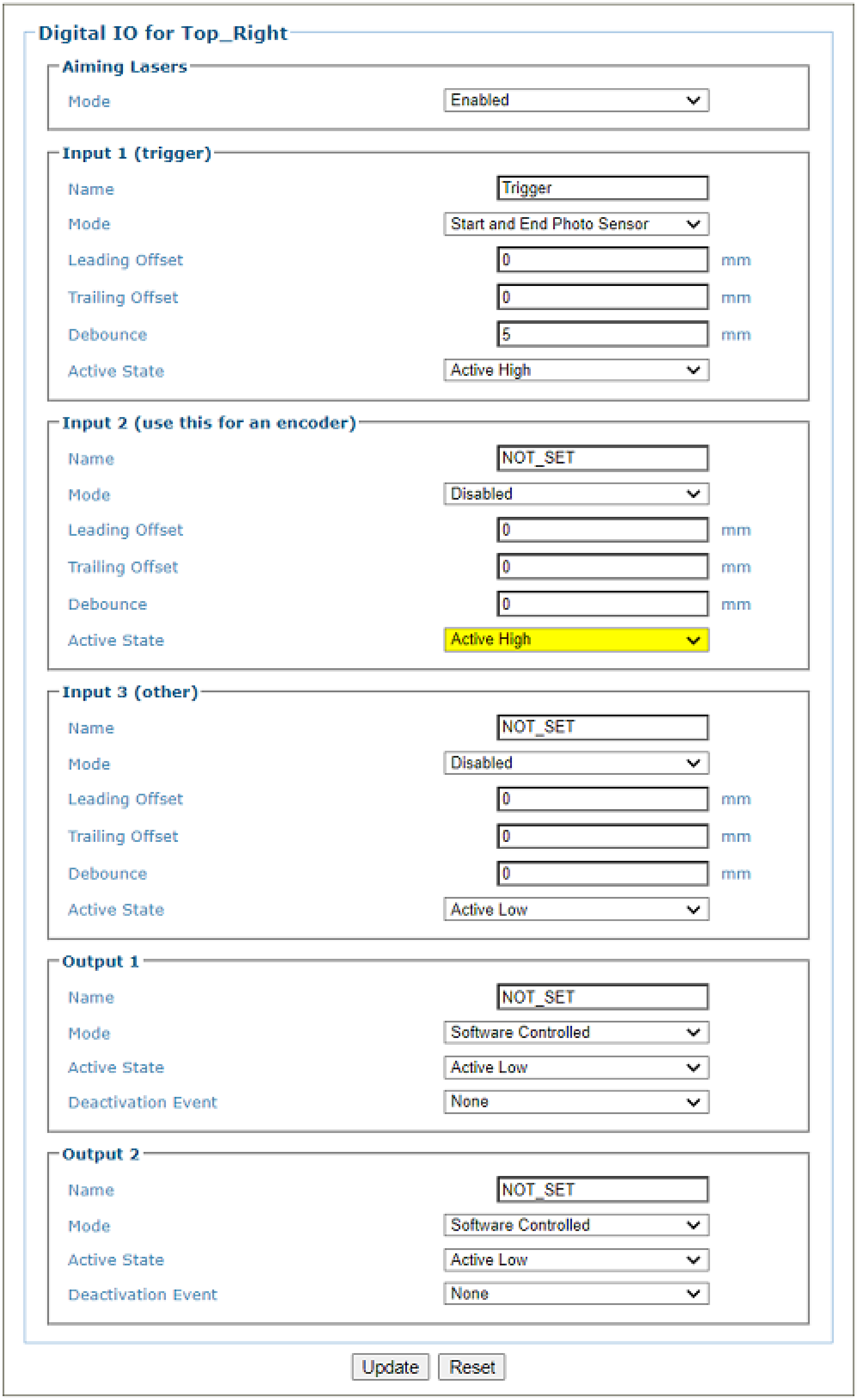
5. Click **Update** to save the new values as your Subregion.

Device Settings | Camera #n | Digital IO

Use the **Digital IO** window to configure the inputs and outputs for the selected camera.

To view the Digital IO window:

1. In the menu tree under **Modify Settings,** navigate to **Device Settings | <Camera name> | Digital IO**. The **Digital IO** window opens.



2. Enter the appropriate information in the form as described below:

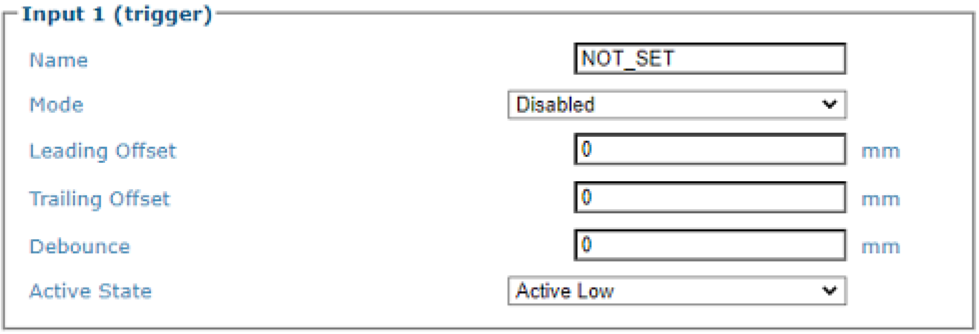
AIMING LASERS

Mode

Select **Disabled** or **Enabled** from the drop-down. When Enabled the AV500/AV900 will project two red LED's. This is to be used during installation to confirm the center of the AV500/AV900 image on the scanning surface. It can also be used for presentation applications where the unit is set in the **Continuous Focus Mode** to identify the best position for presenting the bar code to the scanner.

INPUTS

Input 1 (Trigger)



Name

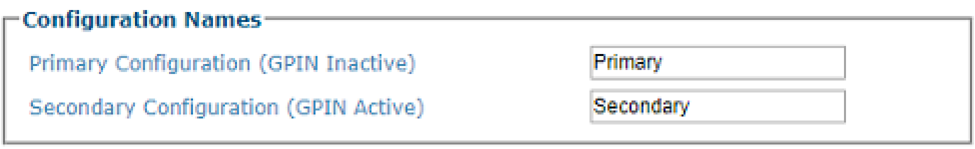
A text field that will allow the user to identify the purpose or function of the I/O option. An example of this may be Trigger, Zone 1 PE, etc.

Mode

Select one of the following from the drop-down.

- **Disabled**
- **Start and End Photo Sensor:** The Start and End Photo Sensor option is use in the Online mode when the bar code on the package can be seen by the camera while the trigger signal from the PE is high. It is also used in a PackTrack mode where the package needs to be track through the system and the single PE is used for the starting point of tracking.
- **Dual Start Photo Sensor/Dual End Photo Sensor:** The Dual Start identifies the beginning of the trigger signal and the Dual End identifies the end of the trigger cycle
- **Zone Photo Sensor:** The Zone Photo Sensor is used to identify a near/far focusing area. The AV500/AV900 can accommodate multiple zones. When the Zone Photo Sensor is active the AV500/AV900 will adjust the focusing to accommodate the nearest zone. When the zone PS is not blocked the camera will set it's focus to the far.
- **Indicate Active Controller (Input 3):** With some applications there can be two AV500/AV900 scanners that have the ability to be the array controller. The customer will supply an input to the controller they want to be the active controller. Upon a reboot of the array the unit with the "Indicate Active Configuration" set by the customer will assume the controller responsibility.
- **Indicate Active Configuration:** When selected there will be two menu options under the Configuration Names field; Primary Configuration Name and Secondary Configuration Name. This options allows for the AV500/AV900 to be used in an application where the conveyor can be run in either direction. When the bit goes high the AV500/AV900 will use a separate configuration file to accommodate the change in the conveyance direction.

If Indicate Active Configuration is selected, the following options become available. Indicate the correct **Active** configuration.



- **Custom**

Leading Offset

Enter the offset distance in mm prior to the trigger.

Trailing Offset

Enter the offset distance in mm after the trigger.

Debounce

Enter the distance in mm the trigger should be blocked to be considered a valid trigger.

Active State

Select one of the following from the drop-down:

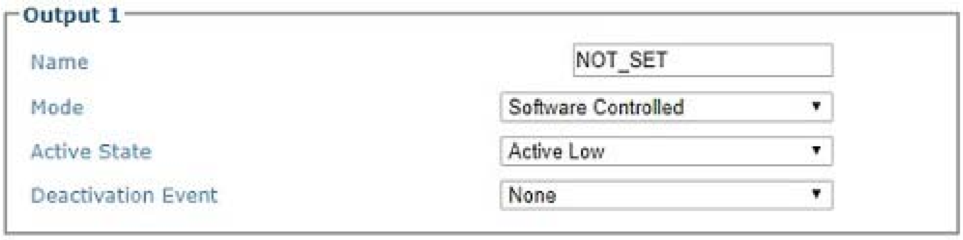
Active Low/Active High: The Active State allows the AV500/AV900 to accommodate the state of the input signal. Since there are a variety of photo sensors the AV500/900 menu options allows for the camera to change the input state to match the cameras triggering logic.

NOTE: Input 1 through 3 have the same parameter options. Use Input 2 for an encoder.

Distance from Trigger Source (only available if Zone Photo Sensor is selected)

Defines the distance from the camera scan line to the trigger source (typically a Photo Sensor, Position Sensor, Light Curtain or DM3610 Dimensioner).

OUTPUTS



Name

Enter a name to identify the output.

Mode

Select one of the following from the drop-down. These are events that trigger the output except "External Illumination". External Illumination mode allows an illumination to be controlled by the AV500/AV900 such that it will be synchronized with the internal illumination.

- **Software Controlled:** Custom
- **External Illumination:** Allows an additional illumination to be controlled by the camera and synchronized with internal illumination. If selected External Illumination Settings appear at the end of the page.
- **Good Read**
- **Partial Read**
- **No Read**
- **Multiple Read**
- **Camera Error**
- **Trigger**
- **Ethernet/IP Out1:** output controlled by PLC using Ethernet/IP communications
- **Ethernet/IP Out2:** output controlled by PLC using Ethernet/IP communications

Active State

Select one of the following from the drop-down:

Active Low: Sets the bit open

Active High: Sets the bit closed

Deactivation Event

Select **None, Timeout, or Distance** from the drop-down.

Timeout: If Timeout is selected enter a timeout period in ms

Distance: If Distance is selected enter a deactivation distance in mm

Deactivation Timeout

Enter an amount of time in milliseconds within which the I/O will deactivate.

Deactivation Distance

Enter a distance within which the I/O will deactivate

3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

Device Settings | Camera #n | Serial Port

Use the **Serial Port** menu selections to set up communications through the Serial Ports. If necessary, you can later make modifications to the device settings using the same menu selections, including:

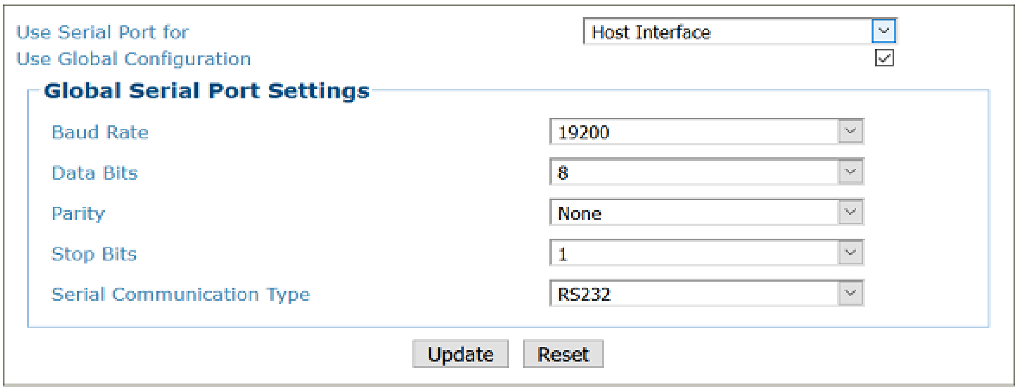
- “Focus | Host Port Settings” on page 254
- “Aux Port Settings” on page 255

Focus | Host Port Settings

Use the **Focus Port** window to configure communication between the camera and the focusing device. The focus port is only used to match the focus device’s communication configuration (light curtain, DM3610).

To edit the Focus Port settings:

1. In the menu tree under **Modify Settings,** navigate to **Modify Settings | Device Settings | Camera N | Serial | Focus/Host Port**. The **Focus/Host Port Settings** window opens.



2. Enter the appropriate information in the form as described below:

Use Serial Port for

Select one of the following from the drop-down:

Host Interface: The Host Interface is used to communicate with the customers serial interface. The AV500/AV900 can either communicate RS232 or RS422.

Focus Input: The Focus Input is used to communicate with the focus device.

Use Global Configuration

Select the check box when using a serial focus device for one or more cameras. When the Use Global Configuration is selected all camera's in the array can identify the Serial message from the Host/Aux input. This is only available on the camera connected to the CBX Controller.

When it is not selected the menu will give the option of selecting a single AV500/AV900 in the array.

Baud Rate

Select a value from 1200 to 115200 from the drop-down list. Baud Rate is the transmission speed in a communication line.

Data Bits

Select 7 or 8 from the drop-down list. Data Bits is a parameter indicating the number of bits composing the data packet of the communication protocol frame.

Parity

Select None, Odd, or Even from the drop-down list. Parity is a parameter indicating the presence of a control bit in the communication protocol frame.

Stop Bits

Select 1 or 2 from the drop-down list. Stop Bits is a parameter indicating the number of stop bits in the data packet of the communication protocol frame.

Serial Communication Type

Select RS422 Full Duplex or RS232 from the drop-down list.

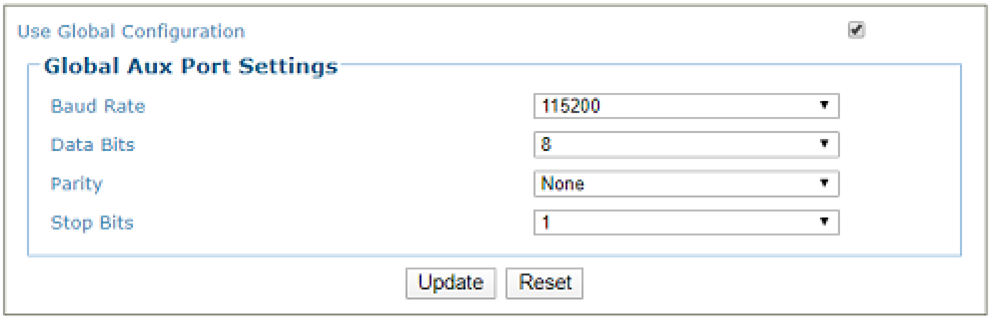
3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

Aux Port Settings

Use the **Aux Port** window to configure communication between the camera and an Auxiliary Port device. This port is only used to match the device's communication configuration.

To edit the Aux Port settings:

1. In the menu tree under **Modify Settings,** navigate to **Modify Settings | Device Settings | Camera N | Serial Port | Aux Port Settings**. The **Aux Port Settings** window opens.



2. Enter the appropriate information in the form as described below:

Use Global Configuration

Select the check box when using a serial focus device for one or more cameras. When the Use Global Configuration is selected all camera's in the array can identify the Serial message from the Host/Focus input.

When it is not selected the menu will give the option of selecting a single AV500/AV900 in the array.

Baud Rate

Select a value from 1200 to 115200 from the drop-down list. Baud Rate is the transmission speed in a communication line.

Data Bits

Select 7 or 8 from the drop-down list. Data Bits is a parameter indicating the number of bits composing the data packet of the communication protocol frame.

Parity

Select None, Odd, or Even from the drop-down list. Parity is a parameter indicating the presence of a control bit in the communication protocol frame.

Stop Bits

Select 1 or 2 from the drop-down list. Stop Bits is a parameter indicating the number of stop bits in the data packet of the communication protocol frame.

3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

Device Settings | Camera #n | Ethernet

Use the **Ethernet** menu selections to set up communications through Ethernet. If necessary, you can later make modifications to the device settings using the same menu selections, including (click on the menu item to access that help window):

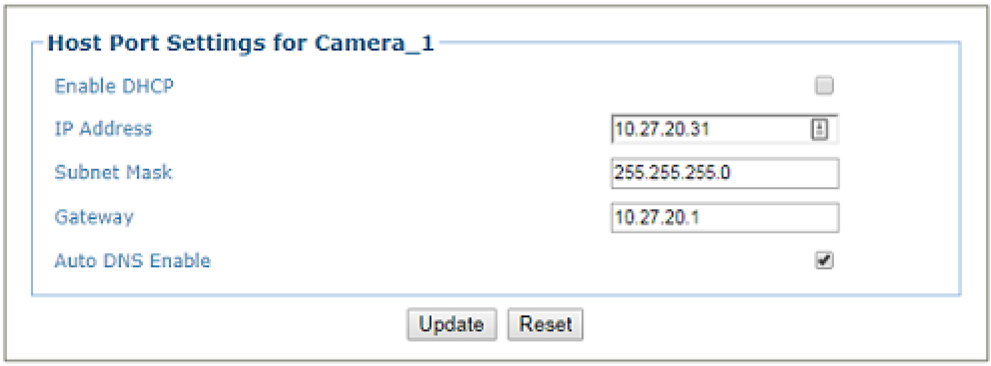
- "Ethernet | Host Port" on page 256
- "Ethernet | Image Port" on page 257
- "Ethernet | Advanced Routing" on page 257

Ethernet | Host Port

Use the **Host Port** window to set up network communications to the Host.

To edit the Host Port settings:

1. In the menu tree under **Modify Settings,** navigate to **Modify Settings | Device Settings | Camera N | Ethernet | Host Port.** The **Host Port** window opens.



2. Enter the appropriate information in the form as described below:

Enable DHCP

Select the check box to use addresses assigned by a DHCP server. **When this option is not selected, the static IP options are made available.**

IP Address

Enter the device Internet Protocol (IP) network address in the field provided. Consult your network administrator to obtain a new address. Available only in static IP mode (when DHCP is not selected).

Subnet Mask

Enter the device subnet mask address in the field provided. Consult your network administrator to obtain a new address. Available only in static IP mode (when DHCP is not selected).

Gateway

Enter the device gateway address in the field provided. Consult your network administrator to obtain a new address. Available only in static IP mode (when DHCP is not selected).

Auto DNS Enable

Select the check box to automatically assign a DNS address. When not selected, the DNS Address field is revealed. Available only in static IP mode (when DHCP is not selected).

DNS Address

Enter the address of the Secondary Domain Name System (DNS) in the field provided.

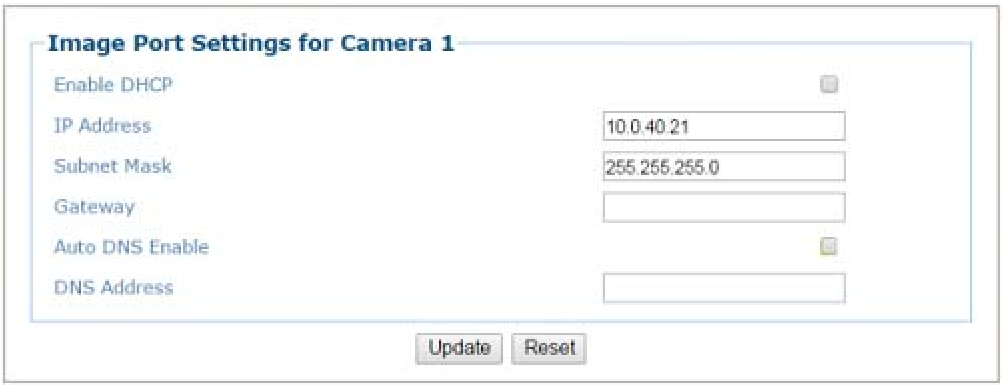
3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

Ethernet | Image Port

Use the **Image Port** window to set up network communications from the Image Port to a server.

To edit the Image Port settings:

1. In the menu tree under **Modify Settings**, navigate to **Modify Settings | Device Settings | Camera N | Ethernet | Image Port**. The **Image Port** window opens.



2. Enter the appropriate information in the form as described below:

Enable DHCP

Select the check box to use addresses assigned by a DHCP server. **When this option is not selected, the static IP options are made available.**

IP Address

Enter the device Internet Protocol (IP) network address in the field provided. Consult your network administrator to obtain a new address. Available only in static IP mode (when DHCP is not selected).

Subnet Mask

Enter the device subnet mask address in the field provided. Consult your network administrator to obtain a new address. Available only in static IP mode (when DHCP is not selected).

Gateway

Enter the device gateway address in the field provided. Consult your network administrator to obtain a new address. Available only in static IP mode (when DHCP is not selected).

Auto DNS Enable

Select the check box to automatically assign a DNS address. When not selected, the DNS Address field is revealed. Available only in static IP mode (when DHCP is not selected).

DNS Address

Enter the address of the Secondary Domain Name System (DNS) in the field provided.

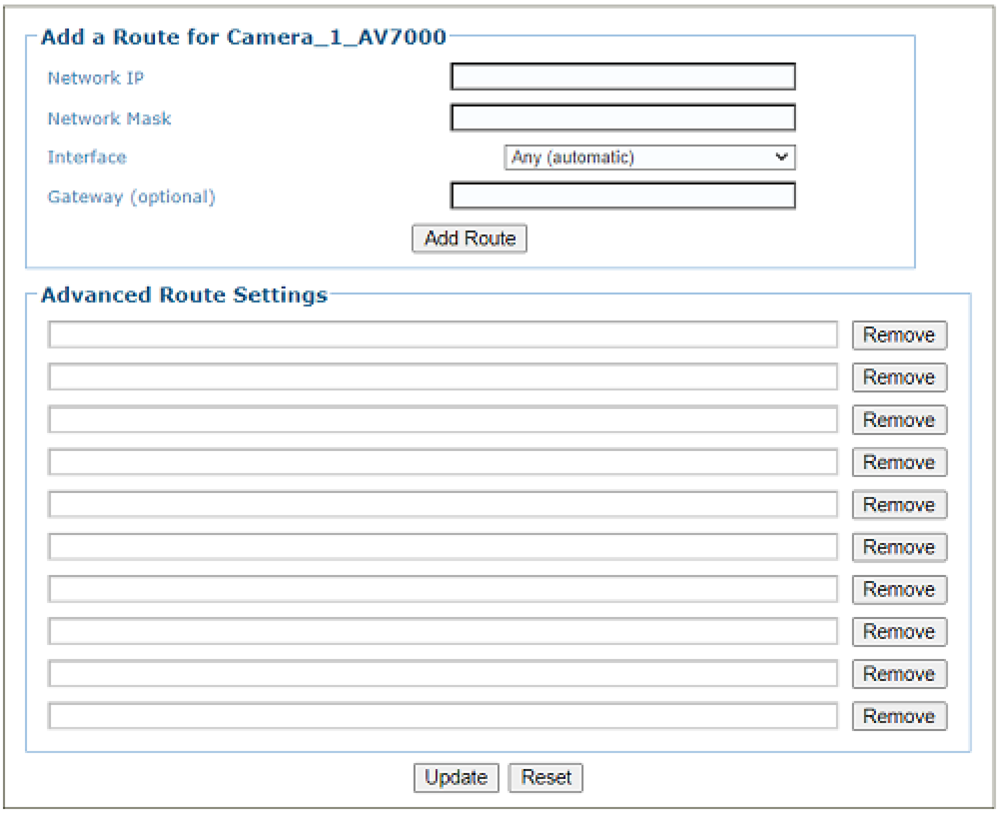
3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

Ethernet | Advanced Routing

Use the **Advanced Routing** window to make a string command to route to your network.

To edit the Advanced Routing settings:

1. In the menu tree under Modify Settings, navigate to **Modify Settings | Device Settings | Camera N | Ethernet | Advanced Routing.** The **Advanced Routing** window opens.



2. Enter the appropriate information in the form as described below:

Add a Route for Camera_1

Network IP

Enter the Internet Protocol (IP) address of the network in the field provided. Consult your network administrator to obtain a new address. Available only in static IP mode.

Network Mask

Enter the device network mask address in the field provided. Consult your network administrator to obtain a new address. Available only in static IP mode (when DHCP is not selected).

Interface

Select from the drop-down.

Gateway

Enter the device gateway address in the field provided. Consult your network administrator to obtain a new address. Available only static. IP mode (when DHCP is not selected).

Advanced Route Settings

Displays the linux command created from the entries into the above fields.

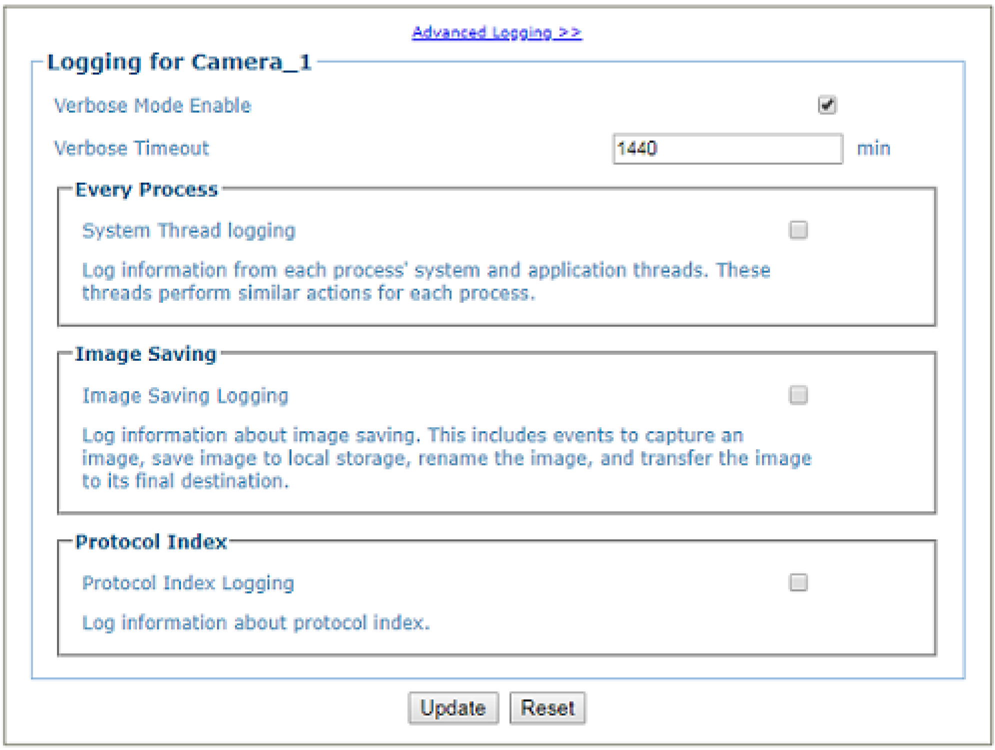
3. When you have finished making changes, click **Update** to save or click **Reset** to revert to previously saved fields.

Device Settings | Camera #n | Logging

Use the **Logging** window to configure how and what information is logged (saved). Once enabled, the logging information will be posted to the Diagnostics Log Viewer (decoder).

To view the Logging window:

1. In the menu tree under **Modify Settings**, navigate to **Device Settings | Camera # (if applicable) | Logging**. The **Logging window** opens.



2. View the following camera information:

“Advanced Logging” on page 260

Click the link to go to the **Advanced Logging** window. The main Logging options will typically be all that is needed for standard systems. Advanced logging options are available for problem solving on cameras not connected with the standard decoder. Enabling them may fill the event buffer with unimportant information and therefore overwrite important information.

Verbose Mode Enable

Select the check box to verbose logging. When disabled, the debug log will provide data for Critical, Errors, Warnings, and Info in the log text.

Verbose Timeout

Enter the number of minutes before Verbose Mode will be automatically disabled.

Every Process

Select the check box to log information from each process' system and application threads. These threads perform similar actions for each process.

Image Saving

Select the check box to log information about image saving. This includes events to capture an image, save image to local storage, rename the image, and transfer the image to its final destination.

Protocol Index

Select the check box to Log information about protocol index.

3. When you have finished making changes, click **Update** to save or click **Reset** to revert to previously saved values.

Advanced Logging

Use the **Advanced Logging** window to configure how and what information is logged (saved). The main Logging options have been identified to cover most logging needs, however, Advanced Logging can provide advanced data collection for troubleshooting purposes.

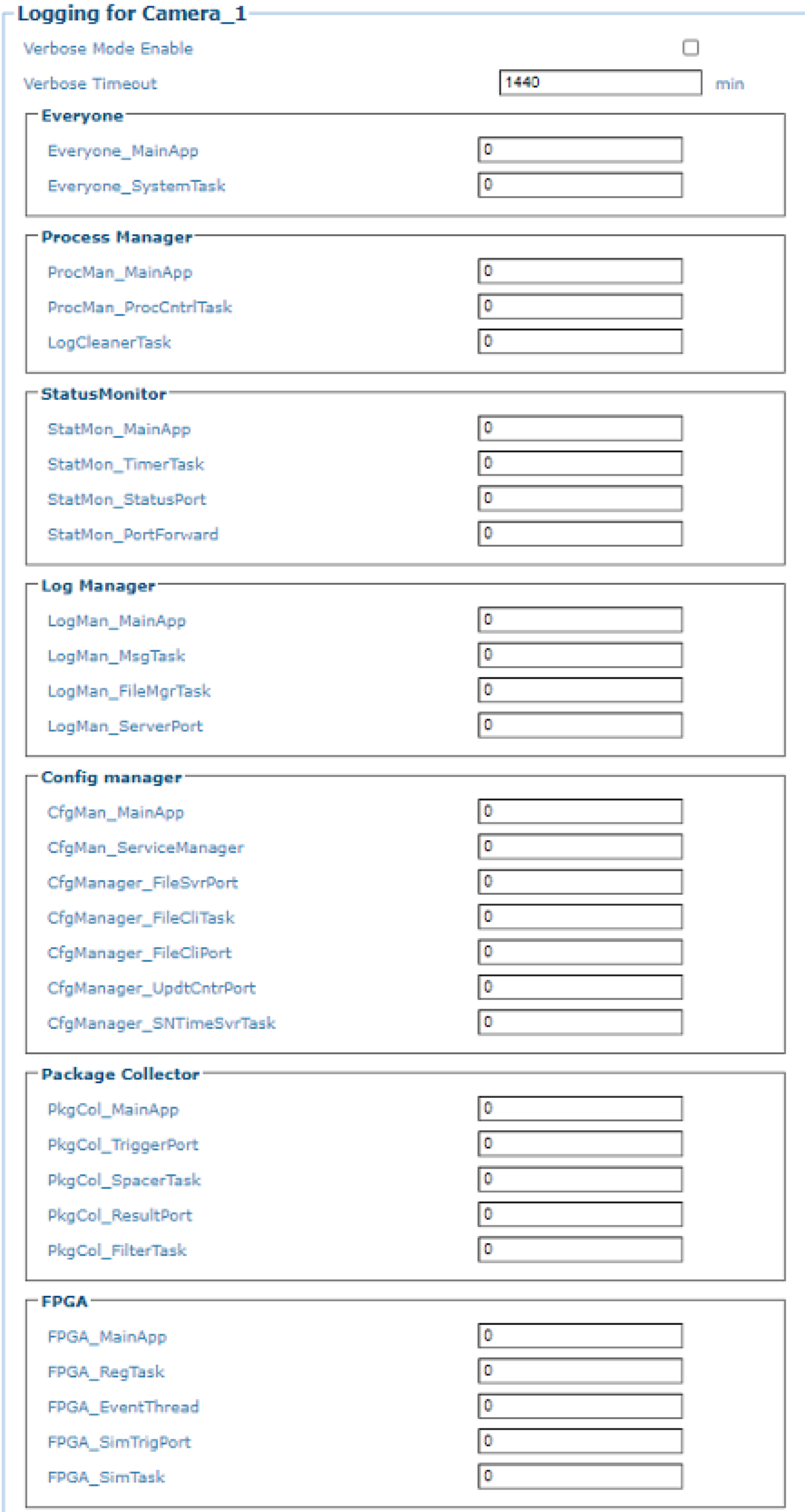
WARNING: Enabling Advanced Logging options during operations may have an adverse effect on the system performance. Advanced Logging should only be used during troubleshooting.

Enabling Advanced Logging may fill the event buffer with unimportant information and overwrite important information.

NOTE; Contact Datalogic Technical Support for proper use of the Advanced Logging options.

To view the Advanced Logging window:

1. From the **Logging window**, click **Advanced Logging.** The **Advanced Logging** window opens.



2. View the following camera information.

Basic Logging

Click the link to return to the basic Logging window.

Verbose Mode Enable

Select the check box to verbose logging. When disabled, the debug log will provide data for Critical, Errors, Warnings, and Info in the log text. When enabled, further diagnostic log data is provided in the debug log.

Verbose Timeout

Enter the number of minutes before Verbose Mode will be automatically disabled.

Advanced Logging Parameters

Advanced Logging allows the user to modify logging parameters in several categories, including:

- Everyone
- Process Manager
- Status Monitor
- Log Manager
- Status Monitor
- Log Manager
- Config Manager
- Package Collector
- FPGA
- Decode Engine
- Host
- Web Manager
- Communication
- Image Saving Master
- Image Saving
- RT Manager
- Protocol Index
- Sim RangeFinder
- RF Manager
- WebSentinel
- DM Manaer
- Image Processing

3. When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

DIAGNOSTICS

Use the **Diagnostics** Menu selections to monitor system performance and identify maintenance or device degradation issues. You can continually monitor system performance using the following selections:

Diagnostics | System Status

Use **System Status** to get an overview of how your system is running.

To access the System Status window:

1. In the menu tree under **Diagnostics**, click **System Status**. The **System Status** window opens.

Conveyor Speed(mm/s)	0
Conveyor Speed(fpm)	0
Encoder Frequency Hz	0
Statistic Elapsed Time	30-03:38:20
Total Packages	4107
Good Reads	431
No Reads	3676
Multiple Reads	0
Partial Reads	0
Read Rate	10.49%
Average Pack Size	460mm (18.09in)
Average Pack Distance	11668mm (459.38in)
Total Barcodes	37956
Barcodes Discarded	23835
Barcodes In	33413
Barcodes Out	4248
Barcodes Uncertain	295

Reset Counts | Show Group Label Statistics

Online	Status	Camera Name	Good Reads	Multiple Reads	No Reads	Read Rate
		Top_Right	48	197	3862	5.97%
		Top_Left	19	162	3930	4.40%
		Right	88	162	3866	6.07%
		Left	112	44	3957	3.79%
		SC5100	428	0	3679	10.42%

Sequence Number 787

Sequence Number 787

Trigger:
```
Package Time.. 2021-09-17 14:19:32.199
TachStart..... 39651143
TachEnd....... 39651447
Length........ 386mm (15.20in)
Spacing....... 140mm (5.51in)
```

Volumetric:
```
LeftPosition..... 0
RightPosition.... 0
DimReady......... false
LegalForTrade.... false
Length........... 0
Width............ 0
Height........... 0
Volume........... 0
Angle............ 0
IsIsolated....... true
NoDimReason...... ""
```

Shadowing:
```
Camera: Top_Right
   Spacing.... 0mm (0.00in)
   Shadowed... No
Camera: Top_Left
   Spacing.... 0mm (0.00in)
   Shadowed... No
Camera: Right
   Spacing.... 0mm (0.00in)
   Shadowed... No
Camera: Left
   Spacing.... 0mm (0.00in)
   Shadowed... No
```

Protocol Index:
Not Enabled

Transmit Messages:
Not Enabled

Image Saving:
Stored Images:
Top_Right's Images
Top_Left's Images
Right's Images

2. From the **System Status** window, the following information is available:

NOTE; Statistics have been added to the camera to provide for a future interface with DL-Stat.

Tunnel/Array Statistics

Conveyor Speed(mm/s)

Belt speed shown in millimeters per second.

Conveyor Speed(fpm)

Belt speed shown in feet per minute.

Encoder frequency Hz

The current encoder frequency computed from the current Belt Speed and the Encoder Resolution.

Statistic Elapsed Time

Time elapsed from the last reset or the last modification to the configuration of the system. This is reset at startup and when Reset Counts is clicked.

Total Packages

Package count since last reset.

Good Reads

Number of good packages read since last reset.

No Reads

Number of packages not read since last reset.

Multiple Reads

Number of packages read multiple times since last reset.

Partial Reads

Number of partially read packages since last reset.

Read Rate

Number of packages read out of total number of packages since last reset.

Average Pack Size

The average size of packages since last reset.

Average Pack Distance

The average distance between packages read since last reset.

Total Barcodes

The total number of barcodes read since last reset.

Barcodes Discarded

The total number of barcodes discarded since last reset.

Barcodes In

Total number of barcodes found on the packs detected by the system.

Barcodes Out

Total number of barcodes found outside the packs detected by the system.

Barcodes Uncertain

Total number of barcodes found that intersect more than one pack, and are therefore ambiguous. A barcode was read but couldn’t be assigned to a package.

Possible reasons:

- Package spacing is too small and the code can be placed on more than one package.
- Verify Package Detection Settings
- Adjust advanced Packtrack settings
- Re-PackTrack camera

•Poor Triggering Creating packages that are smaller than the actually are. Fix trigger or use package extends

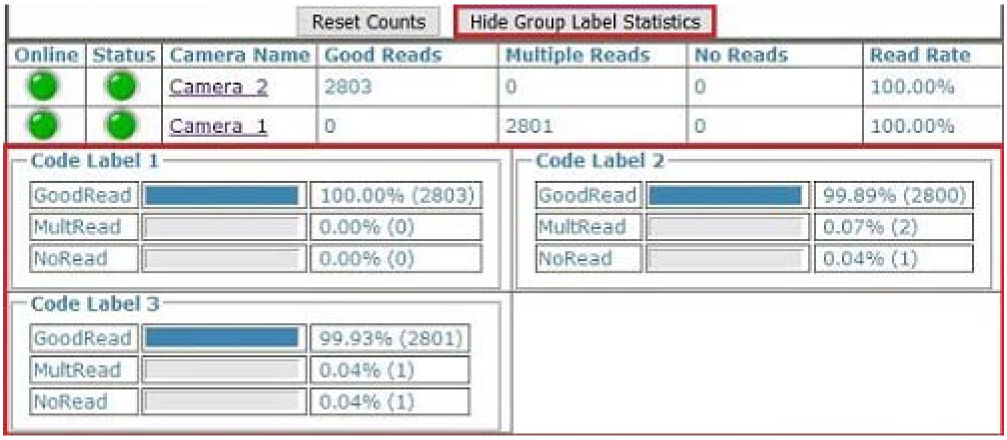
Reset Counts (button)

Click to reset the counts to zero.

NOTE: These statistics are exposed by clicking the "Show Group Label Statistics" button, which will then change to "Hide Group Label Statistics." This button is disabled until there is something to show, e.g. it will be disabled if you have Reset Counts and not inducted any packages yet. The legend changes from "Code Label X" to "Group Label X" when using "Logical Combination" as the "Code Combination" setting.

Show Group Label Statistics

Click **Show Group Label Statistics** to expose these statistics.



Click **Hide Group Label Statistics** to hide this information.

Package Information

Online

Green indicates the camera is connected to the cluster.
Red indicates the camera is not connected to the cluster.

Yellow = Online, but not assigned to the cluster (shown under Cameras not in this Cluster)

Status

Green indicates the camera is functioning correctly.
Red indicates the camera has posted an error.

Yellow = Online, but not assigned to the cluster (shown under Cameras not in this Cluster)

Camera Name

Displays the camera/device name.

Good Reads

Number of good barcode reads on that device since last reset.

Multiple Reads

Number of times a "Mult" condition has been met since last reset for the selected camera.

No Reads

Number of packages not read on that device since last reset for the selected camera.

Read Rate

The average number of packages successfully read on that device since last reset.

Sequence Number

The Sequence Number is the camera's internal package counter. It will be reset when the camera is rebooted.

Back, Pause, Forward

Click the Back |<, Pause ||, and Forward >| buttons to navigate through recent statistics of previous trigger cycles.

Package Information

The following information is displayed:

Trigger: Tachometer information for each phase. The 'Trigger field provides the following information:

Package Time: Date and time that the camera saw the package

PE Tach Start: Tach count when the PE went active

PE Tach End: Tach count when the PE went inactive

TachStart: the internal tachometer count seen at the start of the trigger

Tach End: The tachometer count at the end of the trigger signal

Length: Length of the package in millimeters and inches

Spacing: the space between the current and previous package. This is posted in millimeters and inches. When the camera is mounted to read multiple surfaces of the package (ie side and back) this parameter specifies a condition where one package, because of illegal spacing, blocks part of the surface of another package. The camera is able to detect this condition and will post pertinent information.

Volumetric: The Volumetric information is valid when the camera is connected to a DM3610. The camera will take the data it receives for the package from the DM3610 and fill the appropriate fields general package size/position

Shadowing: Indicates camera spacing and whether there is shadowing

DM3610 Msg Tracking: When the DM3610 transmit message is set to Camera Message, the camera will receive the data without the need for any other configuration such as Protocol Index. When this is set and the message is not received within the correct package tach stamp, it will post the Msg Missed Window in this field.

Protocol Index: Protocol data if enabled. Identifies when the Protocol Index window opens and closes and the position of the parcel in tach/encoder pulses.

Transmit Messages: The Transmit Message field will identify the enabled communication Transport and the message that is transmitted out of that port.

Image Saving: Stored Images are displayed for each camera. Click on the link to access a view of that camera's images. Camera N's Images. see **"Viewing Camera Images" on page 274**, view of the cameras image for the select sequence number.

Decoding Status: Identifies the decoding status of each camera in the array and the processing load (how hard the processor has to work to decode the bar code). The higher the number the more processing time it took to identify the bar code data.

Image Analysis: NOT USED, FOR FUTURE RELEASE!

Decode Results: Posts the barcode data and indicates the camera that read the code

End of Sequence Number: Identifies the total number of packages with history stored in the camera

Camera Statistics

Statistics for each system camera are shown in rows with the following columns:

Camera Name

Displays the camera/device name. Click the device name to view details about that specific device:

Camera Name:	Camera_1	Position:	Left

Camera Statistics

Belt Speed(mm/s)	0
Encoder Frequency Hz	0
Statistic Elapsed Time	0-01:35:43
Total Packages	0
Valid Reads	0
No Reads	0
Multiple Reads	0
Read Rate	0.0%
Frame Rate (fps)	32.1
Total Barcodes	0
Barcodes Discarded	0
Barcodes In	0
Barcodes Out	0
Barcodes Uncertain	0
Solo Group Read	0
Total Group Read	0

Decoder Details

Online	Status	IP Address	MAC Address
		192.168.0.145	00:0E:13:06:02:2C

Software Type	STD_BETA
Software Version	0.0.0.86
PCIe Driver Version	2.0
Decoder Name	EVL 1.1.24.2 (VL VL5.11.00U.50331646.10)
Controller Mode	Active Controller
Host Port IP Address	192.168.1.100
Image Port IP Address	192.168.2.100
Configuration Update Count	540
Diagnostic Messages	No active Errors or Warnings

Real-Time Processor Details

Online	Status	IP Address	MAC Address
		192.168.00.224	00:0E:13:06:02:4E

Software Type	STD_BETA
Software Version	0.0.0.84
FPGA Version	0.41.0
My Decoder's MAC	00:0E:13:06:02:2C
My Decoder's IP	192.168.0.145
Total Packages	2
Diagnostic Messages	No active Errors or Warnings

Belt Speed(mm/s)

Shown in millimeters per second.

Encoder frequency Hz

The current encoder frequency computed from the current Belt Speed and the Encoder Resolution.

Statistic Elapsed Time

Time elapsed from the last reset or the last modification to the configuration of the system. This is reset at startup and when Reset Counts is clicked.

Total Packages

Package count since last reset.

Valid Reads

Number of good packages read since last reset.

No Reads

Number of packages not read since last reset.

Multiple Reads

Number of times a “Mult” condition has been met since last reset.

Read Rate

The average number of packages successfully read since last reset.

Frame Rate (fps) AV500 Only

The number of frames per second.

Total Barcodes

Indicates the number of barcodes read from all the scanners, including Multiple Reads.

Barcodes Discarded

Barcodes that did not match an entry in the Barcode Settings Table.

Barcodes In

Total number of barcodes found on the packs detected by the system.

Barcodes Out

Total number of barcodes found outside the packs detected by the system.

Barcodes Uncertain

Total number of barcodes found that intersect more than one pack, and are therefore ambiguous.

Solo Group Read

Click to reset the counts to zero. Number of Group Labels read only by the single scanner.

Total Group Read

Click to reset the counts to zero. Total number of Group Labels read by the single scanner.

Decoder Details

Displays the following information about the Decoder.

Software Type
Software Version
PCIe Driver Version
Decoder Name
Controller Mode
Host Port IP Address
Image Port IP Address
Configuration Update Count
Diagnostic Messages

Real-Time Processor Details

Displays the following information about the RTP.

Software Type
Software Version
FPGA Version
My Decoder's MAC
My Decoder's IP
Total Package
Diagnostic Messages

Click on **Diagnostic Messages** and a **Diagnostic Messages** window opens.

Camera_1		Position: Top
Count	Severity	Description
0	Critical	FPGA_RFU1
0	Error	Failed to set space notification
0	Critical	IV Monitor failed to get an image buffer
0	Error	LogManager can't open a log file
0	Error	LogManager can't write to the log file
0	Error	PROCMAN_RFU1
0	Information	Application in startup list does not exist
0	Critical	Application failed to start
0	Information	Application failed to shutdown
0	Critical	Maximum Application restarts
0	Critical	Maximum system resets in one day
0	Information	Decoder load warning
0	Information	Decoder overload error
0	Error	Bad scanline data detected
0	Information	FPGA_RFU1
0	Information	FPGA_RFU2
0	Information	Driver returned an error
0	Error	Configuration not synchronized with cluster
0	Warning	Decoder CPU over temperature
0	Warning	Decoder board over temperature
0	Warning	Decoder rfu1 over temperature
0	Warning	Decoder rfu2 over temperature
0	Warning	Decoder Configuation read/write failure
0	Warning	Decoder version reade failure
0	Warning	Decode frame(s) discarded
0	Warning	Start/End Trigger out-of-sync
0	Warning	Start/End Trigger too short
0	Critical	Controller Camera is Offline
0	Error	Camera status not understood
1	**Error**	**Expected Camera is Offline**
0	Warning	Unexpected Camera is Online
0	Error	Unable to read Decoder IP address
0	Error	Unable to read Decoder MAC address
0	Error	RangeFinder is not Online
0	Warning	RangeFinder is not Expected
0	Warning	RangeFinder is not OK
0	Error	RangeFinder status not understood
0	Critical	Real-Time Processor is not Online
3	**Error**	**Real-Time Processor has Errors**
0	Error	Real-Time Processor status not understood
0	Error	Dimensioner Beacon not understood
0	Error	Far Working Distance Out of Range
0	Error	Fixed Focus Value Out of Range
0	Error	Error Configuring the Decode Engine
0	Warning	Real-time Processor has Warnings
0	Warning	Bottom Camera Distance to Scanline too Small
0	Warning	Distance to Scanline too small
0	Error	Image Saving Queue is Full. Check Connection Speed
0	Error	Not Saving BMP Image. Request Too Late
0	Error	Failed to Write Image to File System
0	Error	Failed to Login to FTP Server
0	Error	Failed to Write Image to FTP Server
0	Error	Failed to Write Image to Offline Viewer
0	Error	Image Transfer Falling Behind. Check Connection Speed
0	Error	Failed to Read Image from Ramdisk
0	Error	Failed to Allocate Memory for Image Transfer
0	Error	No ACK from Rangefinder after Parameter Update
0	Error	Could Not Save JPEG - Queue is Full
0	Error	Could Not Save JPEG - Compression Failed
0	Error	Could Not Save JPEG - Job Queue is Full
0	Error	Could Not Save JPEG - Waiting for FPGA
0	Warning	Could Not Save JPEG - Image Too Small
0	Warning	Could Not Save JPEG - Image Too Large
0	Warning	IV State Not Sent - Pkg Not Found
0	Warning	Software upgrade in progress
0	Error	Software upgrade failed
0	Warning	Unable to mount SMB/CIFS file share for image saving
0	Error	Camera with different SW version detected
0	Warning	Trigger tach is out of range. No transmit point
0	Error	Factory Reset Performed. Power Cycle Required
0	Information	Dimensioner is not Online
0	Information	Dimensioner IP address not valid for Sync Network
0	Error	More than one camera setup to multicast LC data
0	Error	Expected External Device is Offline
0	Warning	Unexpected External Device is Online
0	Error	Frame Acqusition is not running

Diagnostics | System Health

Use the System Health to get specific functional details on each camera in the array.

NOTE: This information will be used by Datalogic support in order to do more in-depth troubleshooting if necessary.

To access the System Health window:

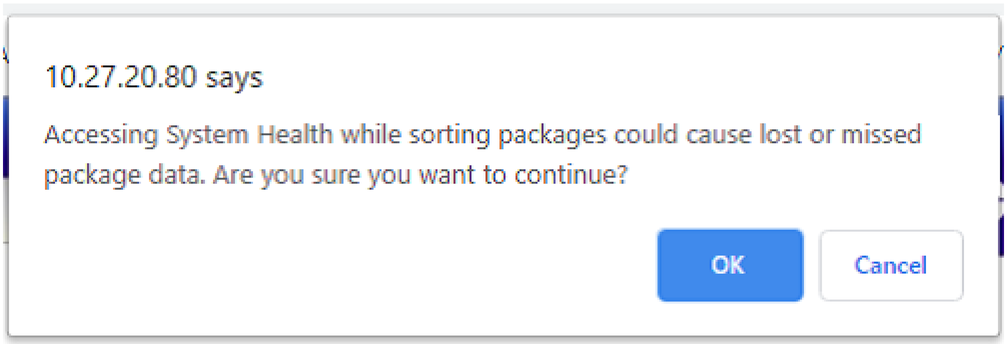
1. In the menu tree under **Diagnostics**, click **System Health**. The **System Health** window opens.

2. If multiple cameras in an array, click the drop-down to select the camera, for which you wish to view system health information.

Camera_1

Date and Time	Thu Mar 7 08:54:24 EST 2019
Motherboard	
Board Name	MA50
Board Sub Name	MA50
Manufacturer Name	OEM
Manufacturer Code	13
Manufacturer Date	2018.01.26
Serial Number	000003702197
Part Number	048020
EAN	04250186188092
Product Rev	A.1 (0x4131)
System BIOS Rev	907
BIOS Interface Rev	100
BIOS Interface Build Rev	001
Boot Counter	9080
Running Time	3927 hours
Temperature Sensors	
Current CPU Temperature	40 degrees C
Current Board Temperature	44 degrees C
Voltage Sensors	
Current 5V Standby Voltage	0.0 V
Current DC Voltage	12.6 V
System Configuration	
Serial Number	A14A00099
CCD Length	2448 pixels
Pixel Size	3 microns
Lens Focal Length	35.00 mm
Lens Focal Length Offset	0.00 mm
Minimum Range	835 mm
Maximum Range	2525 mm
Focus Table Num Coefficients	7
Focus Table Coefficient #1	2323.77
Focus Table Coefficient #2	18.5258
Focus Table Coefficient #3	-0.0446155
Focus Table Coefficient #4	4.14025E-05
Focus Table Coefficient #5	-1.94229E-08
Focus Table Coefficient #6	4.60406E-12
Focus Table Coefficient #7	-4.397E-16
Temperature Compensation Num Coefficients	0
Combo Board	
Software Version	3
DFM Degrees Moved	411767
Illumination On Time	699541 seconds
Aiming Laser On Time	668329 seconds
PIC Temperature	0.0 degrees C
LED Temperature	32 degrees C
Angle Sensor Temperature	36 degrees C

NOTE: Reviewing the System Health may have an adverse effect on the camera's ability to decode bar codes. When the System health is enabled there will be a pop-up identifying this concern.



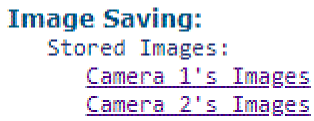
3. Select a device from the drop down list to view its **Motherboard, Temperature Sensor, Voltage Sensor, System Configuration, Focus Mechanism, Sensor Board and Illumination data.**

Viewing Camera Images

Use the **System Status** to view a specific camera's images.

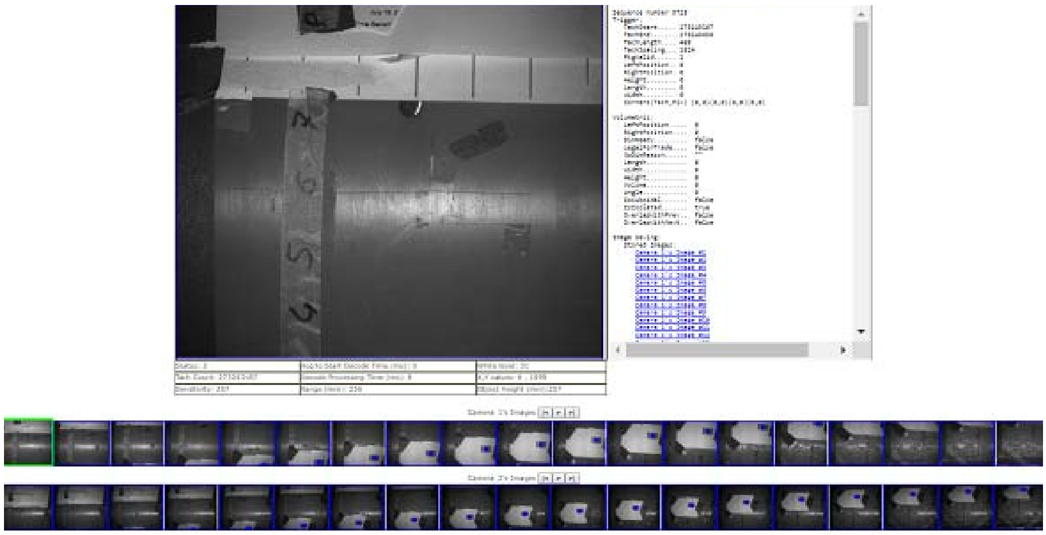
To access the System Status window:

1. In the menu tree under **Diagnostics**, click **System Status.** The **System Status** window opens.

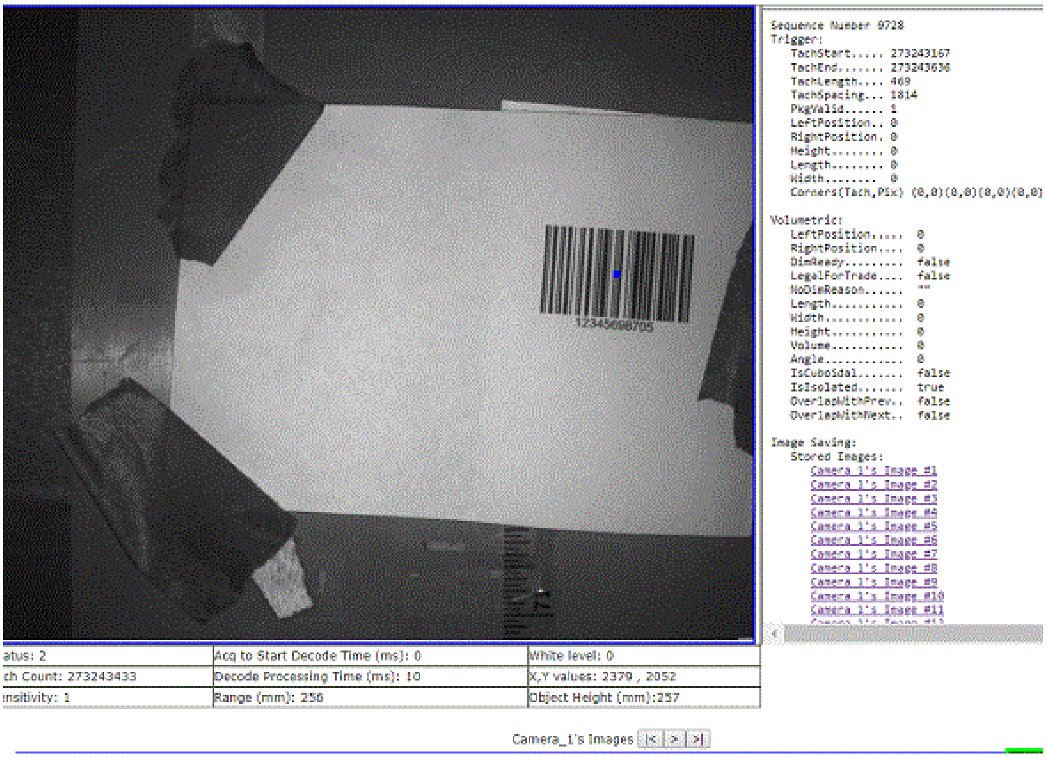


2. Look for image saving information in System Status data as shown below.

3. Click on a **Camera N's Images** and a window opens displaying a variety of image information.



All the frames associated with the trigger cycle are displayed. The following play buttons are available to proceed through the frames. Hover over a location in the image and the White level and X, Y values will display.



4. Click roll the wheel on your mouse forward to zoom, click and roll the wheel backward to reverse the zoom.

5. Click **|<** to move backwards through the available images, **>|** to move forwards through the available images, or click **>** to proceed through the images in play mode.

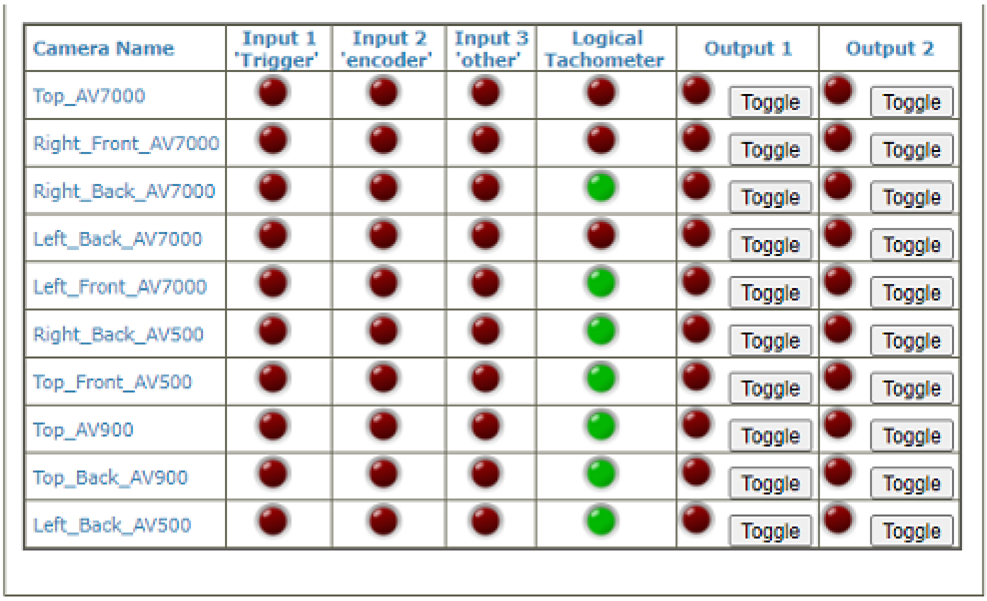
6. Click on any image to select it for the image viewer.

Diagnostics | Input/Output Status

Use the **Input/Output Status** window to view whether the PLC is seeing the data coming from the camera I/O. The Input 1, Input 2, and Input 3 indicator descriptions vary depending on the **Device Setting>Digital IO** selections. The Logical Tachometer is an internal clock. It is present whether the camera is set to Packtrack or Online mode

To access the Input/Output Status window:

1. In the menu tree under **Diagnostics**, click **Input/Output Status**. The **Input/Output Status** window opens.



Camera Name	Input 1 'Trigger'	Input 2 'encoder'	Input 3 'other'	Logical Tachometer	Output 1	Output 2
Top_AV7000					Toggle	Toggle
Right_Front_AV7000					Toggle	Toggle
Right_Back_AV7000					Toggle	Toggle
Left_Back_AV7000					Toggle	Toggle
Left_Front_AV7000					Toggle	Toggle
Right_Back_AV500					Toggle	Toggle
Top_Front_AV500					Toggle	Toggle
Top_AV900					Toggle	Toggle
Top_Back_AV900					Toggle	Toggle
Left_Back_AV500					Toggle	Toggle

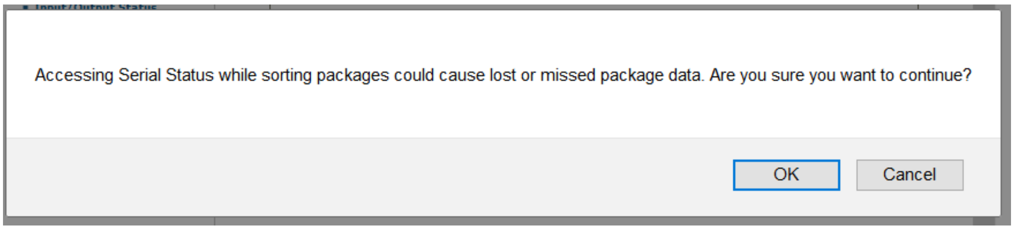
2. Output 1 and Output 2 columns allow the testing of the output bit by clicking the camera "Toggle" button. The Input 1, Input 2, and Input 3 indicators descriptions will vary depending on the **Device Settings > Digital IO** selections.

Diagnostics | Serial Comm Status

Use the **Serial Comm Status** window to view serial data from the camera.

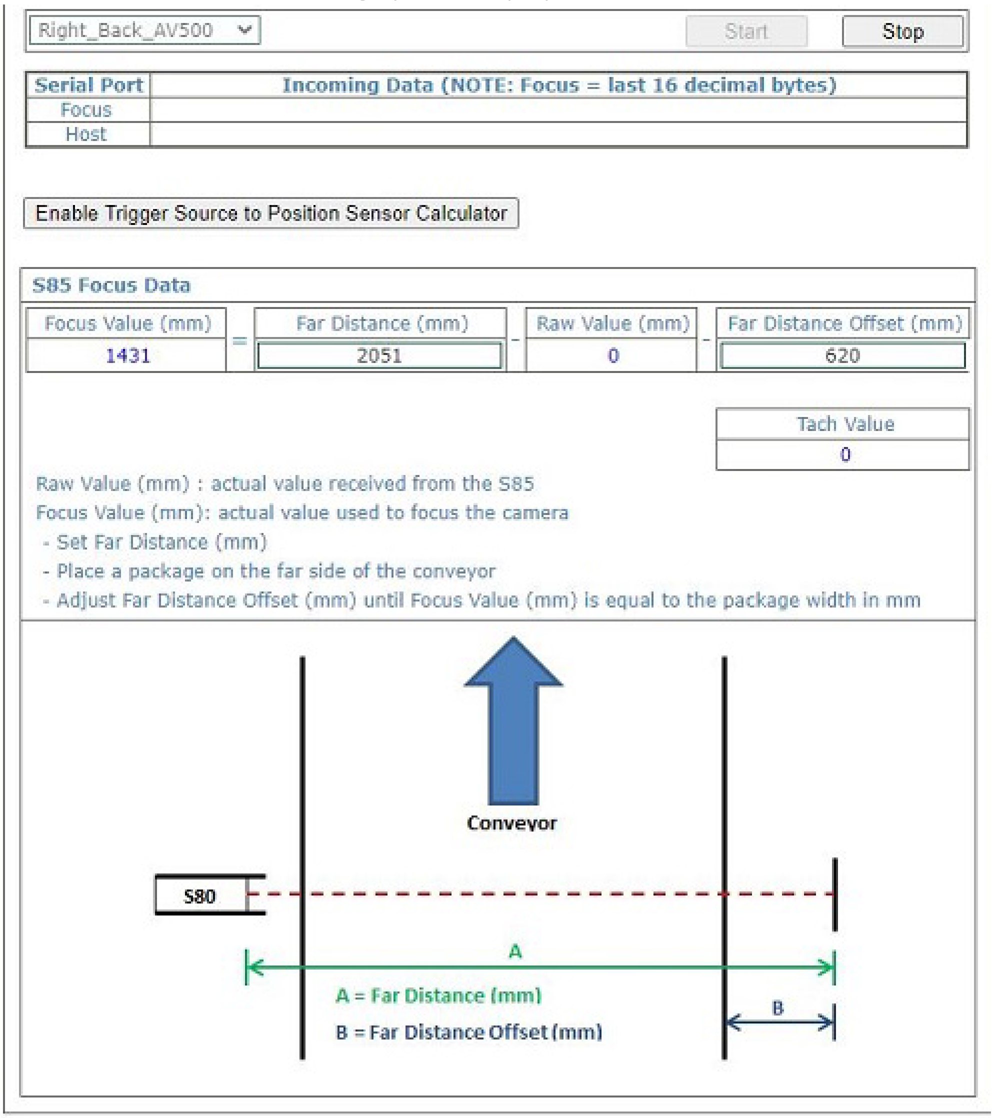
To access the Serial Comm Status window:

1. In the menu tree under **Diagnostics**, click **Serial Comm Status**. The **Serial Comm Status** window opens and displays serial messages received.

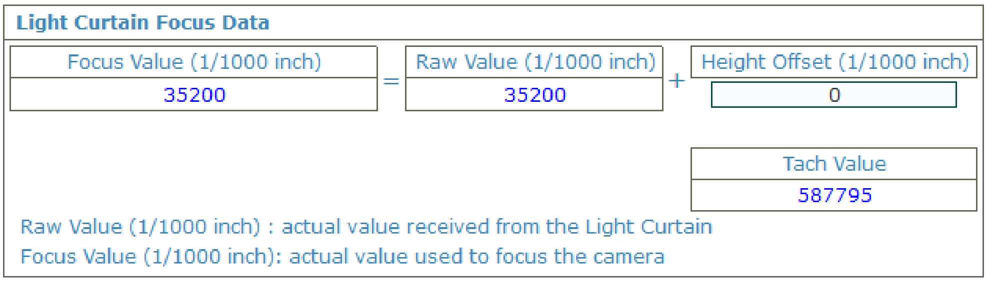


NOTE: This information is only available if a position sensor is enabled. Do not use this function while your sortation system is running.

2. Click **Start** and the following options display:



3. Click **Enable Trigger Source to Position Sensor Calculator**. If your Position Sensor is a light curtain, the following view of the Serial Comm Status page appears.



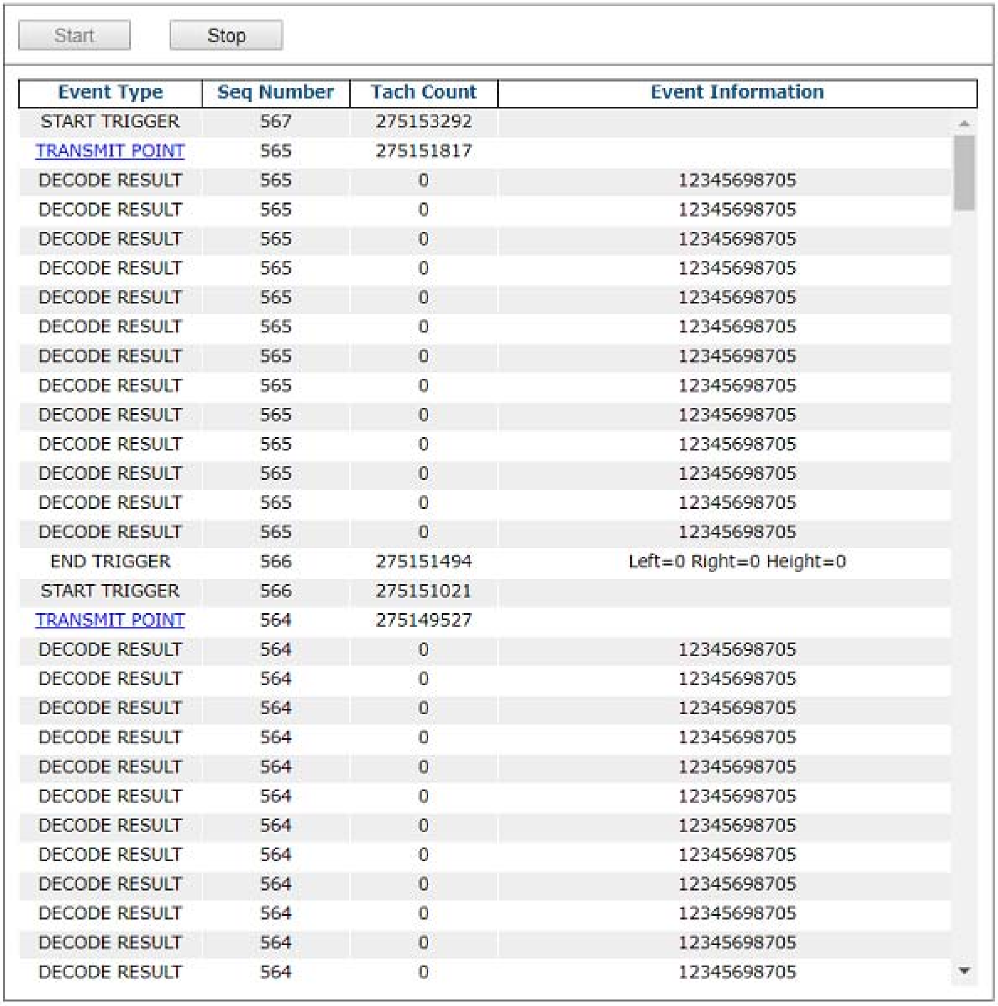
4. Run a single package through the camera tunnel and the calculated Trigger Source to Position Sensor distance is displayed in red. This ability to learn the distance from the Trigger Source to the Position Sensor is useful when the camera is in Packtrack and connected to a tilt belt/cross belt system.

Diagnostics | Device Tracking

Use the **Device Tracking** window to view encoder/tachometer and trigger event information. This will provide information such as start and end trigger, transmit point data, transmit message, sequence number, etc.

To access the Device Tracking window:

1. In the menu tree under **Diagnostics**, click **Device Tracking**. The **Device Tracking** window opens.

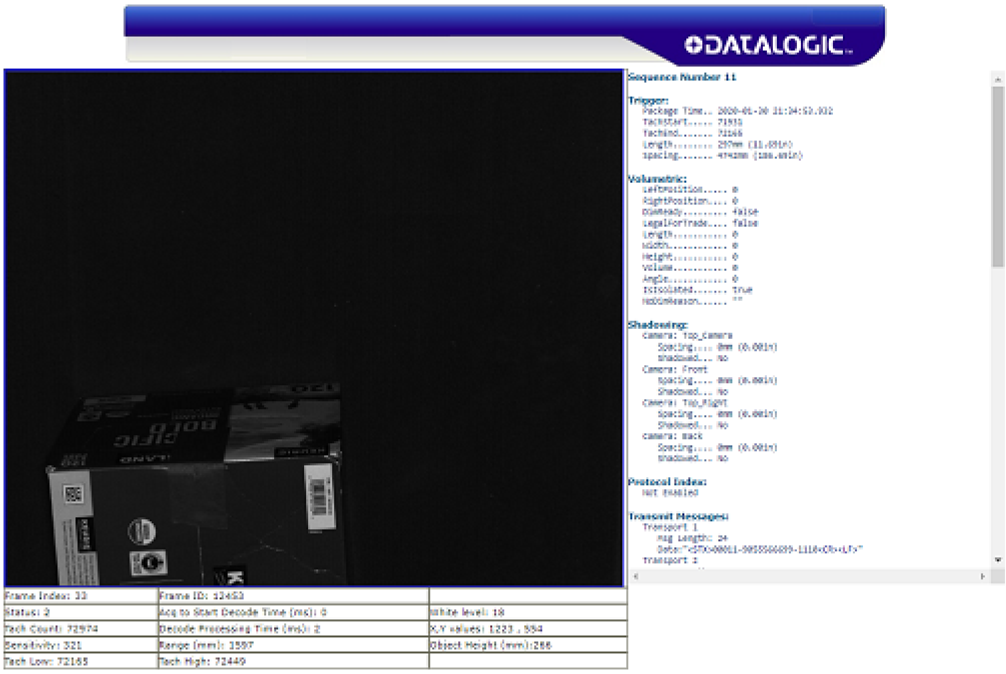


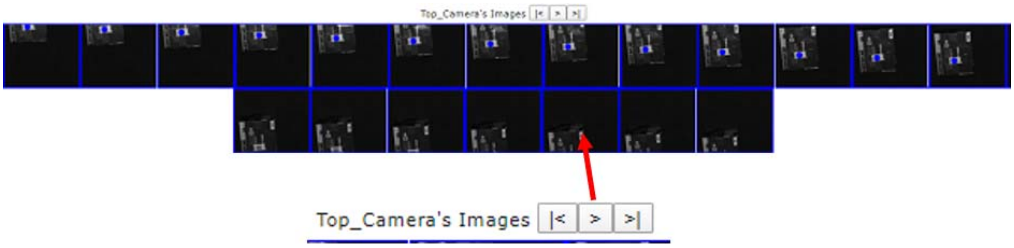
Event Type	Seq Number	Tach Count	Event Information
START TRIGGER	567	275153292	
TRANSMIT POINT	565	275151817	
DECODE RESULT	565	0	12345698705
DECODE RESULT	565	0	12345698705
DECODE RESULT	565	0	12345698705
DECODE RESULT	565	0	12345698705
DECODE RESULT	565	0	12345698705
DECODE RESULT	565	0	12345698705
DECODE RESULT	565	0	12345698705
DECODE RESULT	565	0	12345698705
DECODE RESULT	565	0	12345698705
DECODE RESULT	565	0	12345698705
DECODE RESULT	565	0	12345698705
DECODE RESULT	565	0	12345698705
DECODE RESULT	565	0	12345698705
END TRIGGER	566	275151494	Left=0 Right=0 Height=0
START TRIGGER	566	275151021	
TRANSMIT POINT	564	275149527	
DECODE RESULT	564	0	12345698705
DECODE RESULT	564	0	12345698705
DECODE RESULT	564	0	12345698705
DECODE RESULT	564	0	12345698705
DECODE RESULT	564	0	12345698705
DECODE RESULT	564	0	12345698705
DECODE RESULT	564	0	12345698705
DECODE RESULT	564	0	12345698705
DECODE RESULT	564	0	12345698705
DECODE RESULT	564	0	12345698705
DECODE RESULT	564	0	12345698705
DECODE RESULT	564	0	12345698705

2. Click **Start** for a continuous feed of **Event Type**, **Seq(uence) Number**, **Tach(ometer) Count**, and **Event Information** data.

3. Click **Stop** to pause the feed.

4. Click on a **TRANSMIT POINT** link to view specific transaction data and an image of last package.





Click **|<** to go to the previous frame.

Click **>** to proceed through the frames

Click **>|** to go to the next frame.

Diagnostics | Image Viewer

Use the **Image Viewer** window to view and assess image quality and verify the Pack-Track calibration.

To access the Image Viewer window:

1. In the menu tree under **Diagnostics,** click **Image Viewer**. The **Image Viewer** window opens.

2. Select a **device** (named camera) from the drop-down list.

3. Select whether to view:
   •**Live**
   •**Processed:** Used to view live product flow
   •**Verify:** Used to test the PackTrack calibration. Place a code on the conveyor within the camera read area. The camera will post what it perceives as the XYZ position.

4. Select **Live** and click **Start** to view live captured images. The Image Viewer captures an image of the box. The White Level is displayed based on where the cursor is positioned. Toggle the **Illumination On/Off**.

5. Each package is labeled with its sequence number and read status:

● Barcodes In ✕ Barcodes Out ? Barcodes Uncertain ● Barcodes Not Decodable

Barcodes In means a decode is placed on a package.

Barcodes Out means a decode is not placed on any package.

Barcodes Uncertain means it is uncertain which package the decode belongs to (e.g. two packages are too close). Total number of barcodes found that intersect more than one pack, and are therefore ambiguous. A barcode was read but couldn’t be assigned to a package.

Possible reasons:

- Package spacing is too small and the code can be placed on more than one package.
- Verify Package Detection Settings
- Adjust advanced Packtrack settings
- Re-PackTrack camera
- Poor Triggering Creating packages that are smaller than the actually are. Fix trigger or use package extends

Barcodes Not Decodable means the barcode could not be decoded.

6. Select a **down sampling number** from the drop-down list. Choose a lower number to see a fuller resolution of the image. Choose a higher number to view an image during operation.

WARNING: Contact Datalogic Tech Support before making any calibration adjustments.

NOTE: The White Level field displays the image white level based on where the cursor is positioned. The X,Y values field displays the cursor coordinates.

WARNING: Do not use down-sampling numbers lower than 16 when viewing images during live sort. It will increase the processing time of the camera and could cause no reads.

7. Click **Stop** to cease capturing images.

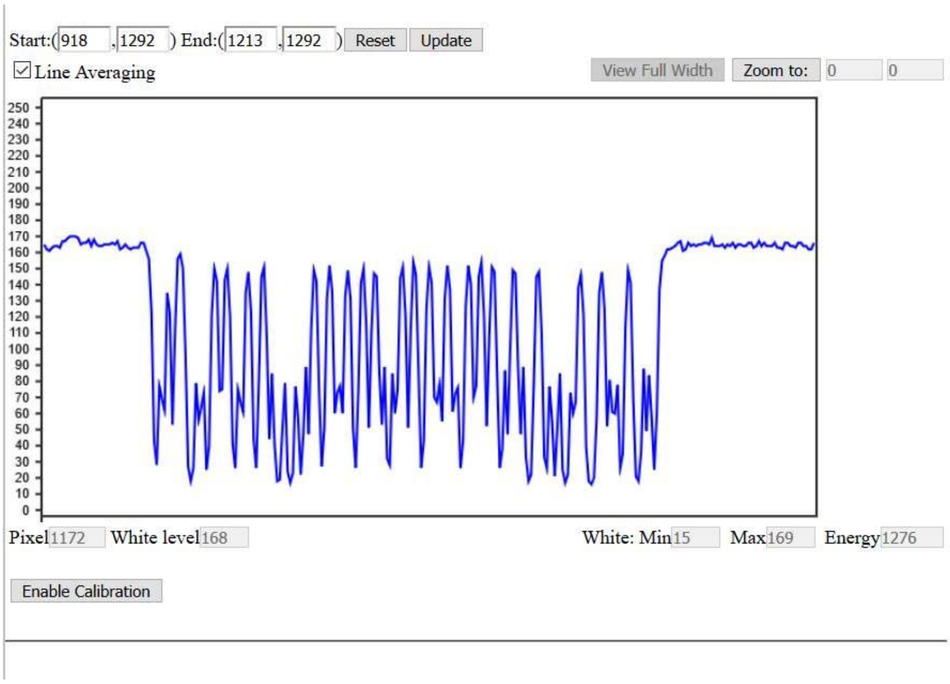
8. Click **Fit to Screen** to zoom the image to fill the view window.

9. Controls:

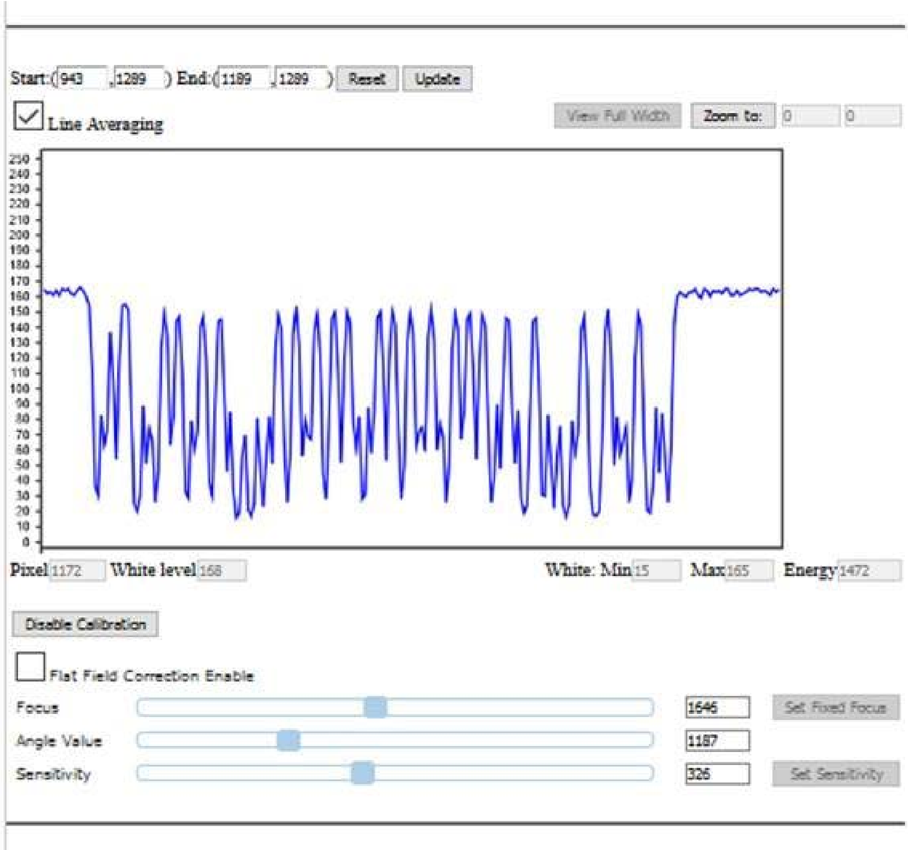
- Click an image multiple times to zoom in.
- Hold **<SHIFT>** and click an image multiple times to zoom out.
- Roll the mouse wheel to zoom in or out.
- Click, hold and slide to pan an image.

10. Click <**ALT**> and drag the mouse across the image.

11. The following view of your image light appears.

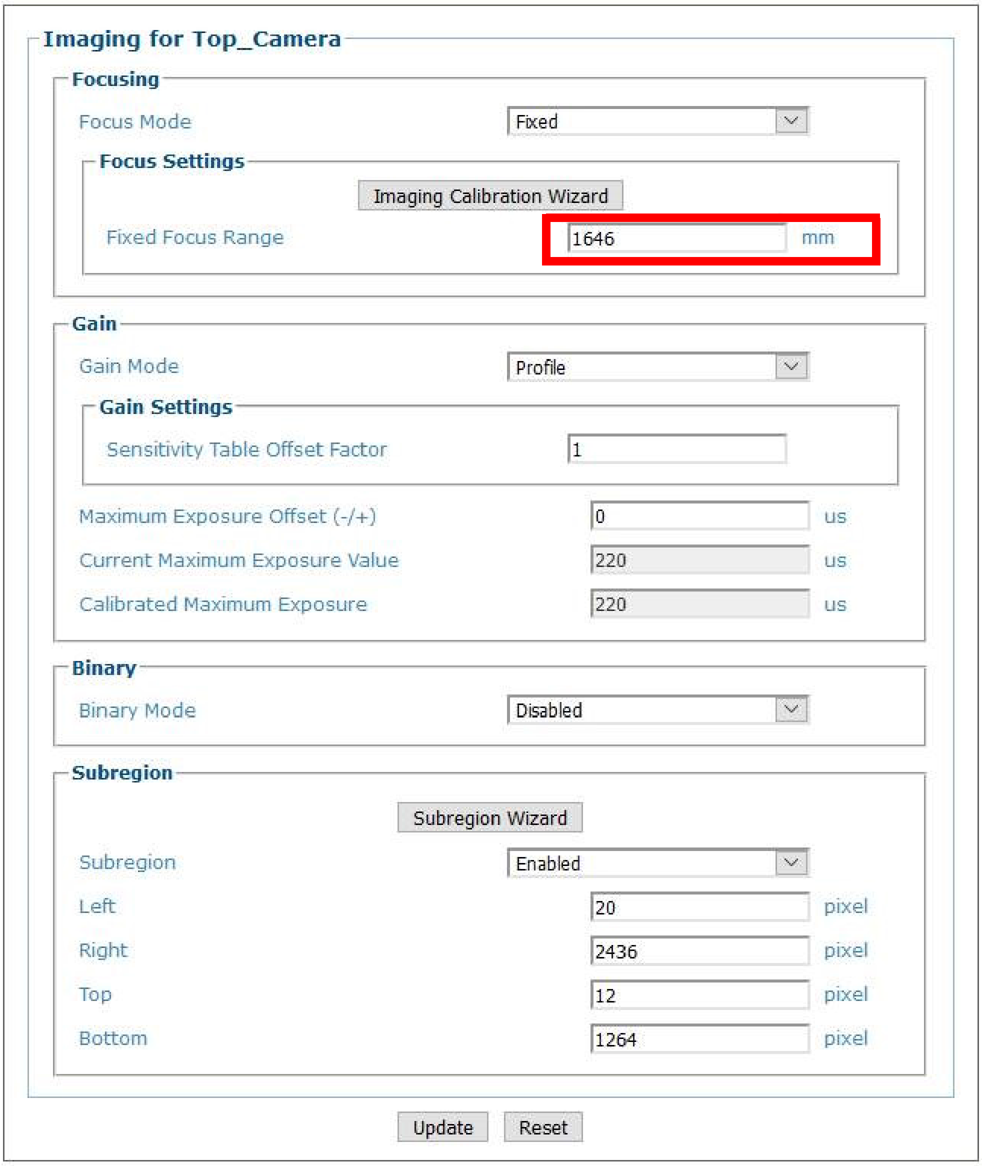


12. Click the **Enable Calibration** button to reveal sliders which allow you to adjust the Focus, Angle Value and Sensitivity.



13. If your image is not in focus, click on the focus slider to adjust until the image appears in focus.

14. When you have found the correct values, click **Set Fixed Focus** button and/or **Set Sensitivity**. The Fixed Focus Range parameter in the Device Imaging menu is updated with the value you defined in the Image Viewer.


Imaging for Top_Camera
Focusing
Focus Mode
Fixed
Focus Settings
Imaging Calibration Wizard
Fixed Focus Range
1646
mm
Gain
Gain Mode
Profile
Gain Settings
Sensitivity Table Offset Factor
1
Maximum Exposure Offset (-/+)
0
us
Current Maximum Exposure Value
220
us
Calibrated Maximum Exposure
220
us
Binary
Binary Mode
Disabled
Subregion
Subregion Wizard
Subregion
Enabled
Left
20
pixel
Right
2436
pixel
Top
12
pixel
Bottom
1264
pixel
Update
Reset

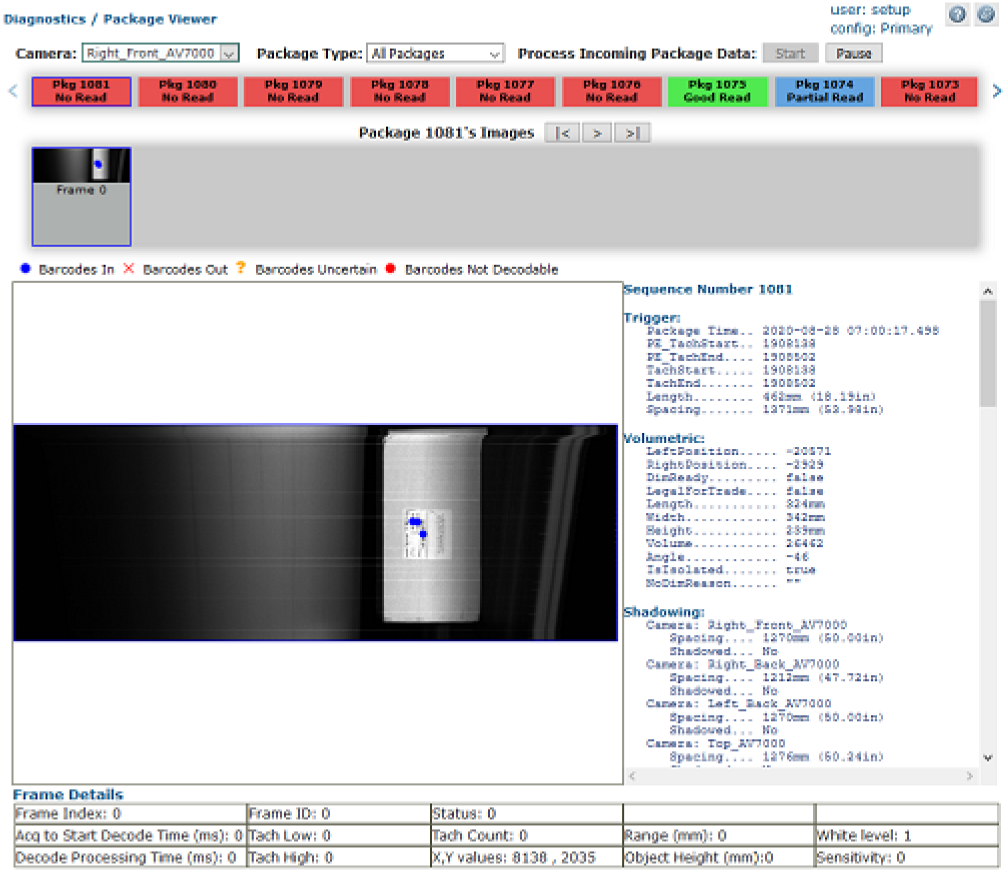
Diagnostics | Package Viewer

Use the **Package Viewer** window to view and assess package image quality and verify the PackTrack calibration.

To access the Package Viewer window:

1. In the menu tree under **Diagnostics,** click **Package Viewer**. The **Package Viewer** window opens.

2. Select a **Camera** (named camera) from the drop-down list.



3. Select **Package Type**, choose from; All Packages or No Reads.

4. Click **Start** to begin processing incoming package data, or click **Pause** to stop processing incoming package data to review.

5. Controls:

- Click an image multiple times to zoom in.
- Hold **<SHIFT>** and click an image multiple times to zoom out.
- Roll the mouse wheel to zoom in or out.
- Click, hold and slide to pan an image.

6. Click <**ALT**> and drag the mouse across the image.

Package Details

Package Details displays a sequence of packages with the leftmost one being the latest package processed. Each package is labeled with its sequence number and read status:

● Barcodes In ✕ Barcodes Out ? Barcodes Uncertain ● Barcodes Not Decodable

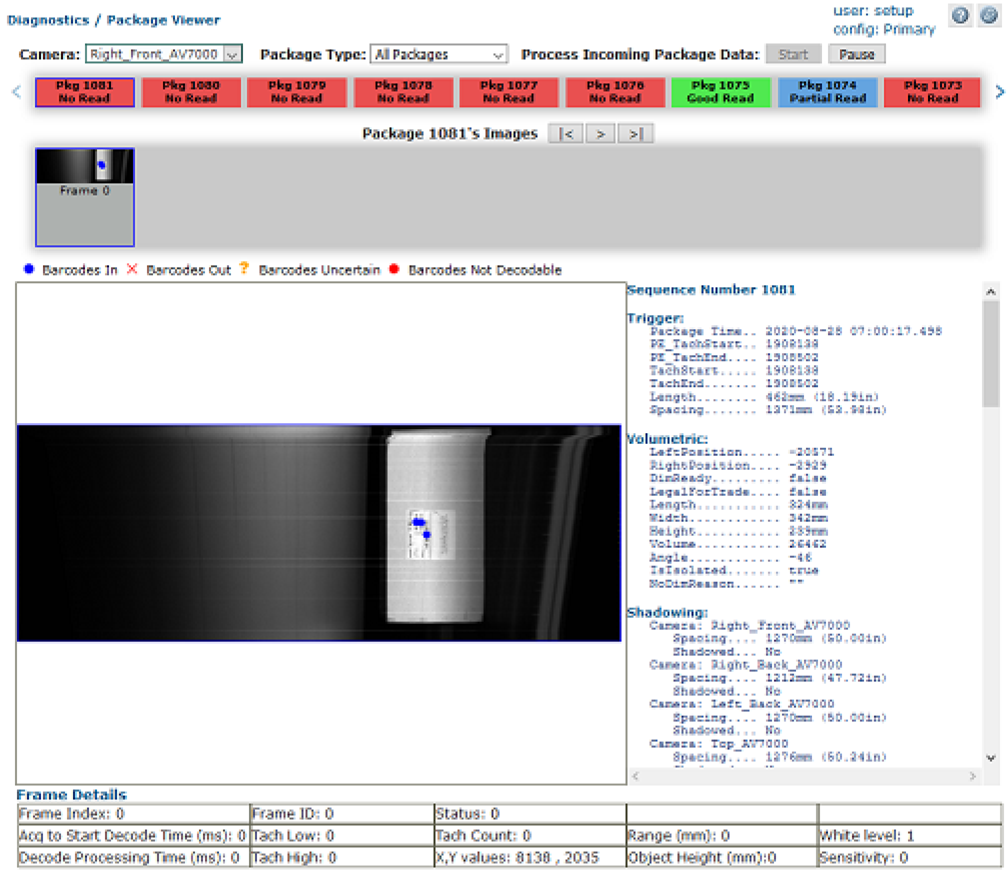
Barcodes In means a decode is placed on a package.

Barcodes Out means a decode is not placed on any package.

Barcodes Uncertain means it is uncertain which package the decode belongs to (e.g. two packages are too close).

Barcodes Not Decodable means barcodes are not decoded

Click a package item and a blue box is shown to indicate that an item is clicked. Detail information and images of selected package are displayed below package carousel.



Click **|<** to go to the previous frame.

Click **>** to proceed through the frames.

Click **>|** to go to the next frame.

The “Canvas” displays a magnified image of a frame. Use the mouse wheel to zoom in/ out on the image.

Frame Details

Frame Details displays all image frames of a package. When a frame item is clicked a magnified image of the frame is displayed in “Canvas” below it, detailed information about this frame is displayed in the “Frame Details” section.

Frame Details

Frame Index: 0	Frame ID: 0	Status: 0		
Acq to Start Decode Time (ms): 0	Tach Low: 0	Tach Count: 0	Range (mm): 0	White level: 1
Decode Processing Time (ms): 0	Tach High: 0	X,Y values: 8138 , 2035	Object Height (mm):0	Sensitivity: 0

Diagnostics | Multiple Camera Viewer

The **Multiple Camera Viewer** allows you to view low resolution images from all system cameras at the same time during a trigger cycle. The number of images shown depends on the number of cameras in the tunnel/array.

To access the Multiple Camera Viewer:

1. In the menu tree under **Diagnostics,** navigate to **Multiple Camera Viewer.** The **Multiple Camera Viewer** window opens.

2. Controls:

- Click an image multiple times to zoom in.
- Hold **<SHIFT>** and click an image multiple times to zoom out.
- Roll the mouse wheel to zoom in or out.
- Click, hold, and slide to pan an image.
- Click **|<** to go to the previous frame.
- Click **>** to proceed through the frames
- Click **>|** to go to the next frame.

3. Each package is labeled with its read status:

Barcodes In means a decode is placed on a package.

Barcodes Out means a decode is not placed on any package.

Barcodes Uncertain means it is uncertain which package the decode belongs to (e.g. two packages are too close).

Barcodes Not Decodable means barcodes are not decoded

Diagnostics | Log Viewer

Use the **Log Viewer (Decoder)** window to view encoder/tachometer and trigger event information.

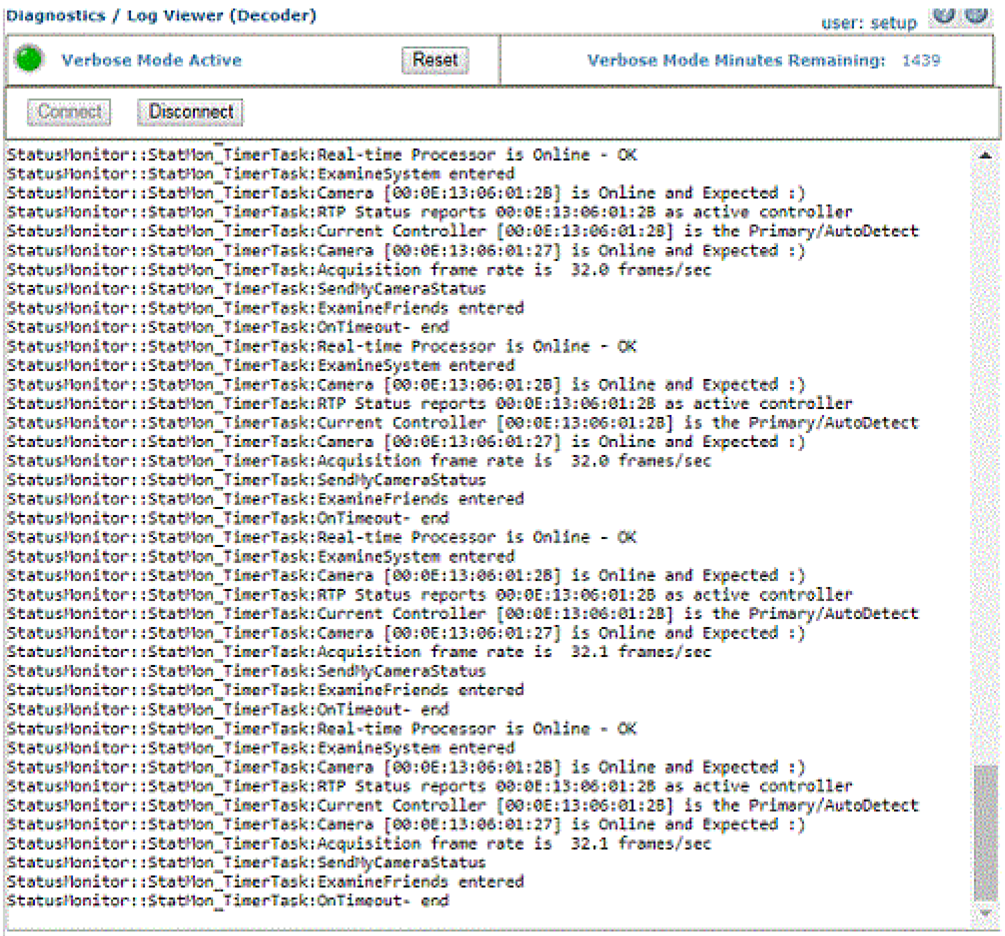
To access the Log Viewer (Decoder) window:

NOTE: The log view data will only post the data associated with the camera that the GUI interface is connected to. It does not post data from other camera's in the tunnel.

WARNING: Contact Datalogic Tech Support to review diagnostic information.

1. In the menu tree under **Diagnostics**, click **Log Viewer (Decoder).** The **Log Viewer (Decoder)** window opens.
2. Click **Connect** to view logged data from the decoder, the information posted on the Log Viewer window.
3. Click **Disconnect** to pause the data stream.

NOTE: Click Reset to re-enable Verbose Mode logging.

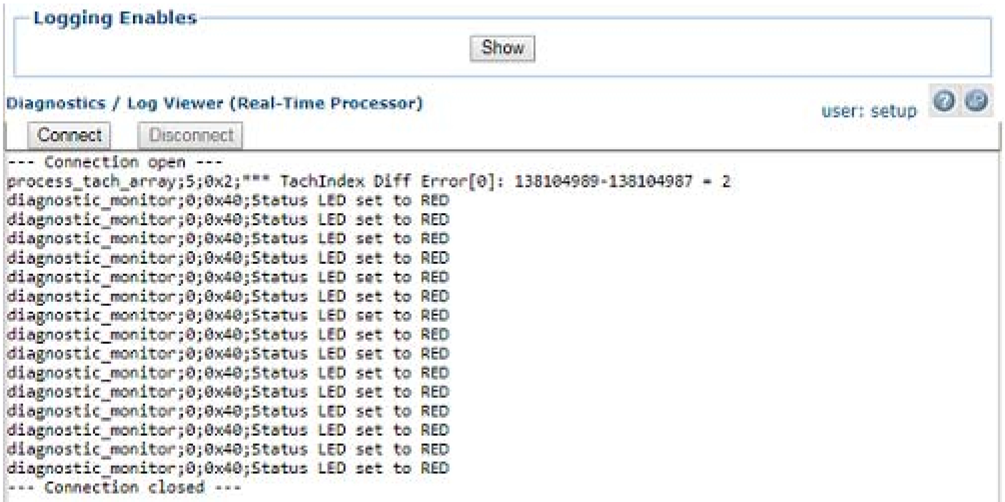


Diagnostics | Log Viewer (RTP)

Use the **Log Viewer (RTP)** window to view encoder/tachometer, trigger and focusing event information.

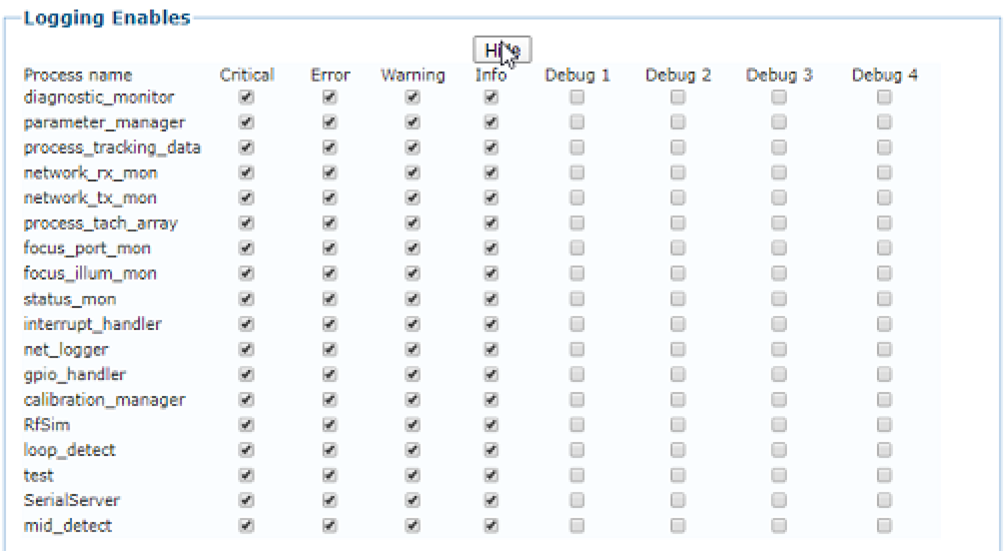
To access the Log Viewer (RTP) window:

1. In the menu tree under **Diagnostics**, click **Log Viewer (RTP)**. The **Log Viewer (RTP)** window opens.



NOTE: The RTP Log Viewer tool is used by Datalogic support to assist in diagnosing issues experienced by the camera. If a log option is selected, it will remain enabled until it is unselected or power is cycled to the unit.

2. Click **Show** at the top of the window to view a **Logging Enables** table of processes.



3. Select the check boxes related to the named processes to display Logged Information pertaining to Critical, Error, Warning, Info, or Debug conditions.

4. Click **Connect** to view logged data from the real-time processes.

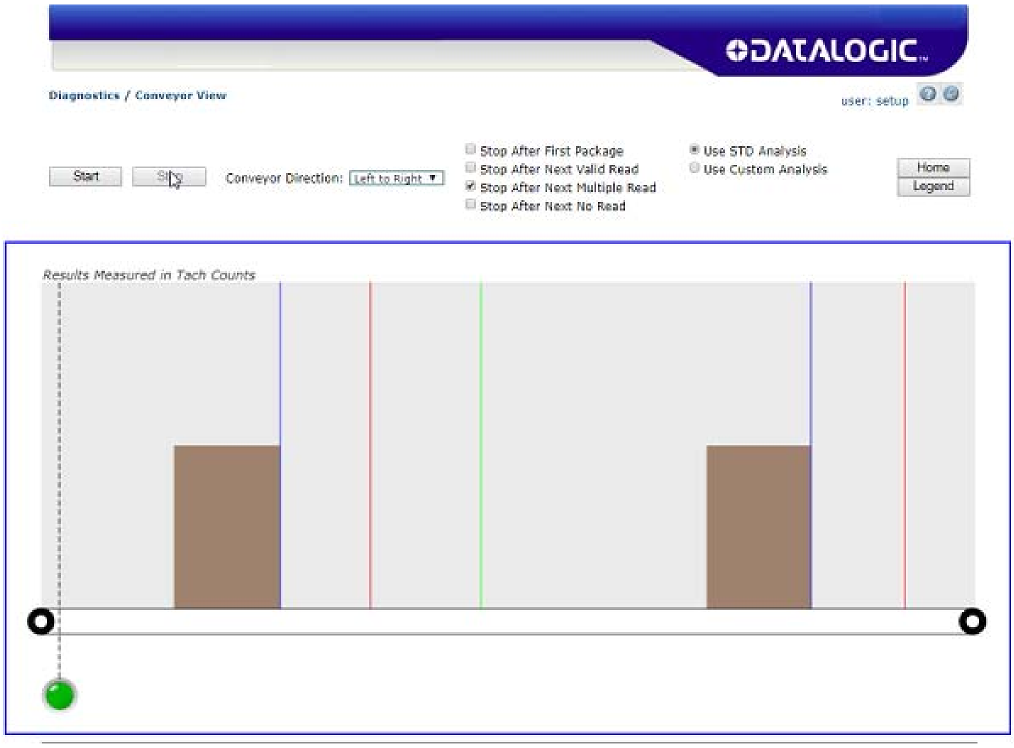
5. Click **Disconnect** to pause the data stream.

Diagnostics | Conveyor View

Use the **Conveyor View** window to view a representation of the packages currently on the conveyor.

To access the Conveyor View window:

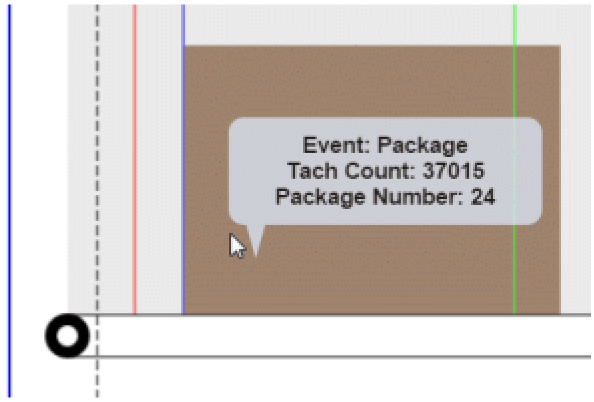
1. In the menu tree under **Diagnostics,** click **Conveyor View**. The **Conveyor View** window opens.



NOTE: The Protocol Index information will not be posted unless the option is enabled on the Transport and Logging pages.

2. Select the check box(es) by the option(s) you want to use.
   •Stop After First Package
   •Stop After Next Valid Read
   •Stop After Next Multiple Read
   •Stop After Next No Read
3. Select **Left to Right** or **Right to Left** from the Conveyor Direction drop-down list to shift the orientation.
4. Select the **Use STD (standard) Analysis** or **Use Custom Analysis** option button. If the Use Custom Analysis option is selected, you can then select a numbered Transport from the drop-down list that appears.
5. Click **Start** to view a representation of packages moving along the conveyor, or click **Stop** to freeze the window.

NOTE: Hold the cursor of the package shown on the conveyor animation to view package information, including Event, Tach Count, and Package Number information.



6. Click **Legend** to view a color key for the **Conveyor View** animation. Click **Home** to return to **Modify Settings | System Info.**

Solid Lines	
Color	Description
Green	Start Trigger
Red	End Trigger
Blue	Transmit Point
Red	Protocol Index Transport 1
Orange	Protocol Index Transport 2
Yellow	Protocol Index Transport 3
Light green	Protocol Index Transport 4
Cyan	Protocol Index Transport 5
Indigo	Protocol Index Transport 6
Purple	Protocol Index Transport 7
Crimson	Protocol Index Transport 8
Black	Protocol Index Transport 9

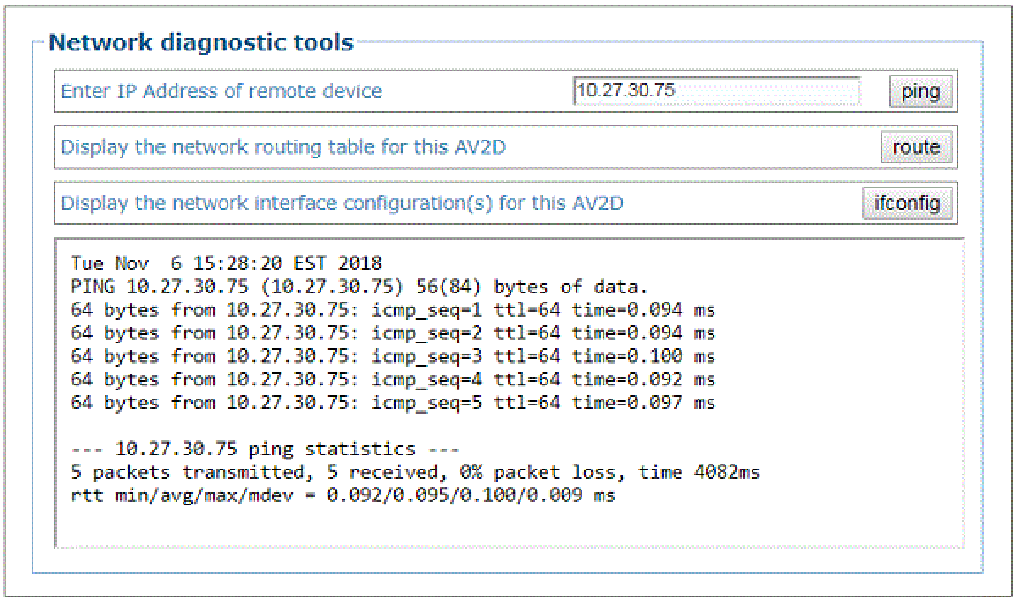
Packages	
Color	Description
Red	No Read
Green	Valid Read
Yellow	Multiple Read

Diagnostics | Network Diagnostics

Use **Network Diagnostics** to diagnose network issues.

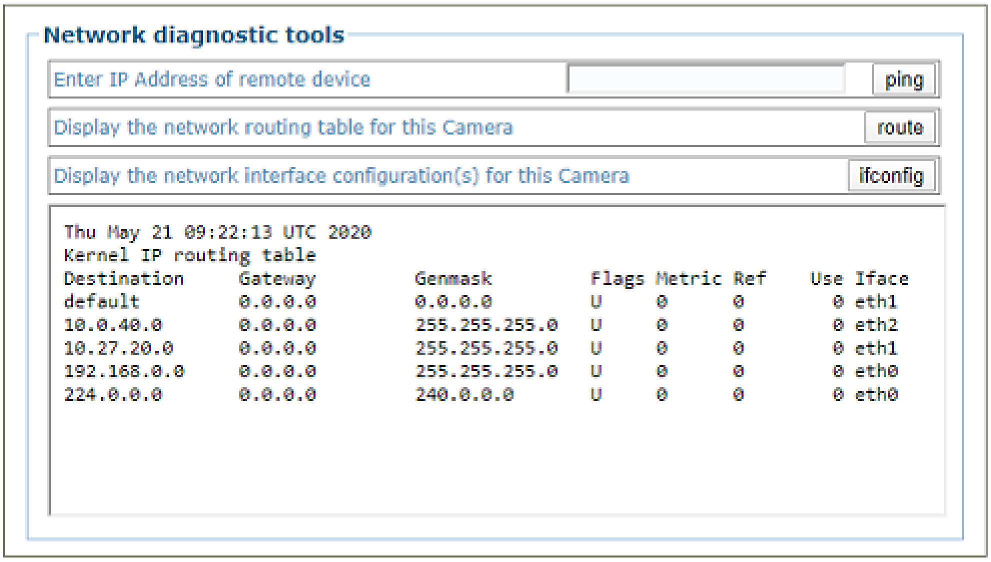
To access the Network Diagnostics window:

1. In the menu tree under **Diagnostics,** click **Network Diagnostics.** The **Network Diagnostics** window opens.

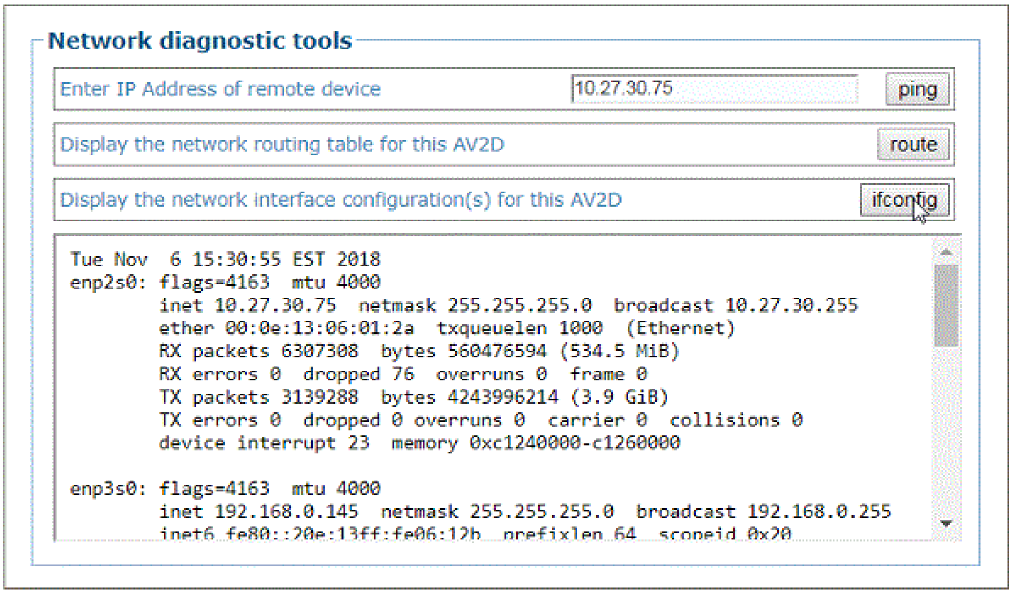


2. Enter the **IP Address** of the remote device you want to communicate with and click the **ping** button to send a message to that device.

3. Click **route** button to view Network routing table.



4. Select **ifconfig** button to view configuration information.

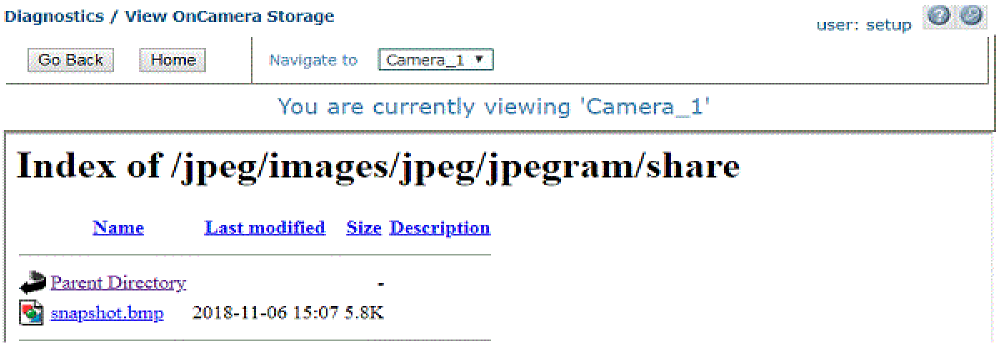

Network diagnostic tools
Enter IP Address of remote device
10.27.30.75
ping
Display the network routing table for this AV2D
route
Display the network interface configuration(s) for this AV2D
ifconfig
Tue Nov 6 15:30:55 EST 2018
enp2s0: flags=4163 mtu 4000
inet 10.27.30.75 netmask 255.255.255.0 broadcast 10.27.30.255
ether 00:0e:13:06:01:2a txqueuelen 1000 (Ethernet)
RX packets 6307308 bytes 560476594 (534.5 MiB)
RX errors 0 dropped 76 overruns 0 frame 0
TX packets 3139288 bytes 4243996214 (3.9 GiB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
device interrupt 23 memory 0xc1240000-c1260000
enp3s0: flags=4163 mtu 4000
inet 192.168.0.145 netmask 255.255.255.0 broadcast 192.168.0.255

Diagnostics | View OnCamera Storage

Use the **View OnCamera Storage** window to view stored images on a particular camera within your system.

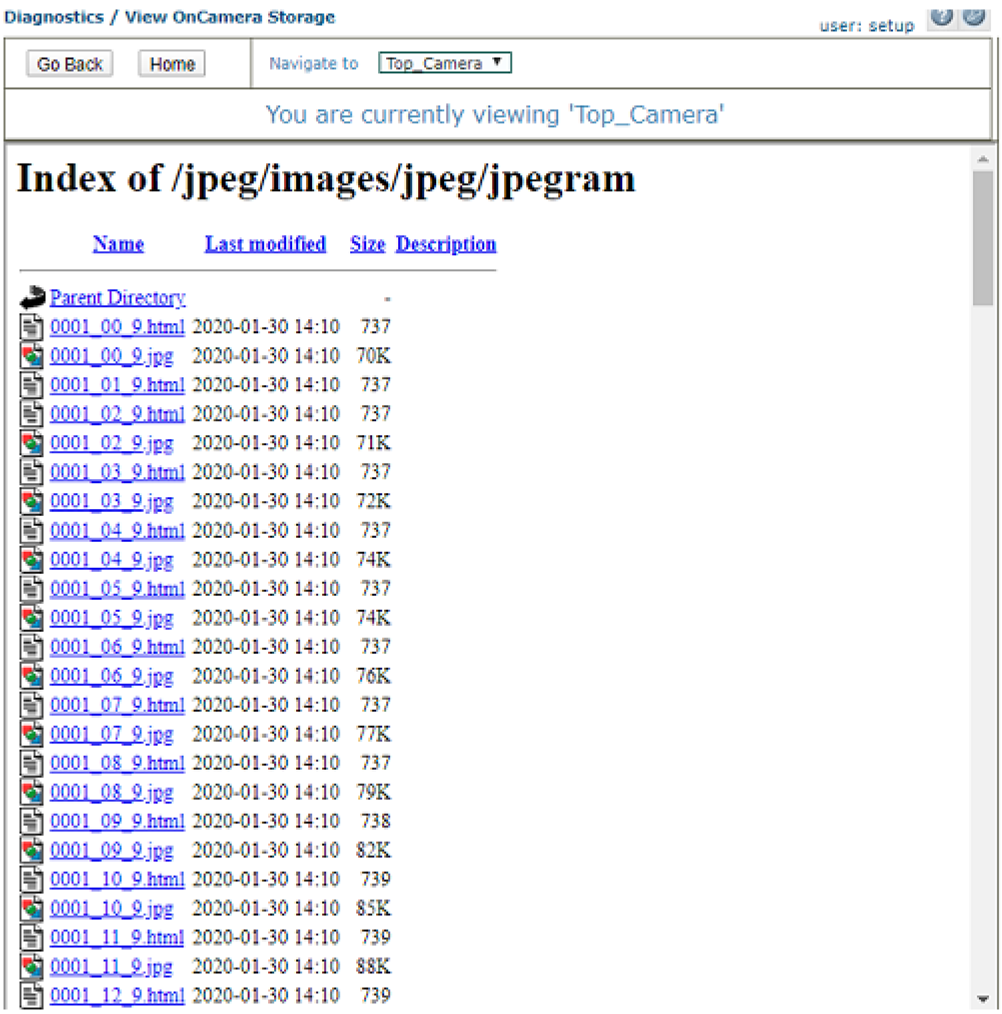
To access the View OnCamera Storage window:

1. In the menu tree under **Diagnostics**, click View **OnCamera Storage**. The **View OnCamera Storage** window opens.



2. Click the **Navigate to** drop-down to select the camera for which you wish to view images.

3. Click on **Parent Directory**, and a list of available saved images displays.



4. Click on an **image** in the list to view it.

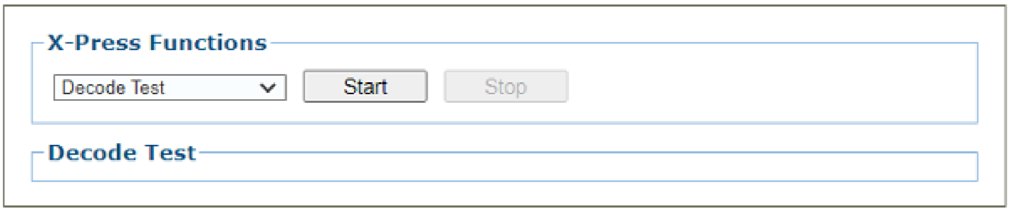

Diagnostics / View OnCamera Storage
user: setup
Go Back
Home
Navigate to
Top_Camera
You are currently viewing 'Top_Camera'

Diagnostics | X-Press Functions

Use the **Xpress Functions** window to access functions available for easier setup.

To access the Xpress Functions window:

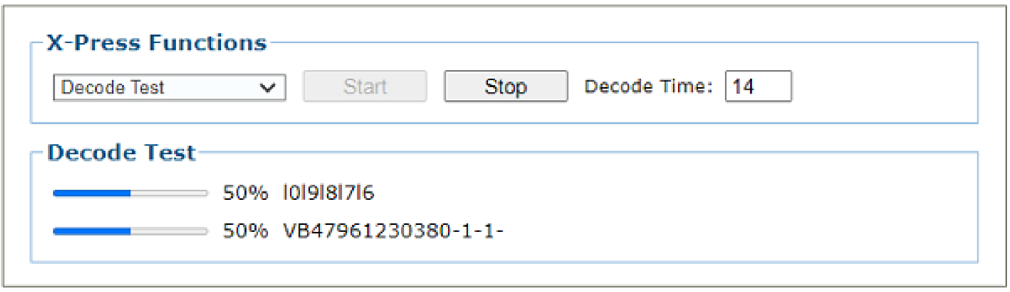
1. In the menu tree under **Diagnostics**, click **X-Press Functions**. The **X-Press Functions** window opens.



2. Click the drop-down to select from one of the following functions:
   - **Decode Test:**
   - **Focus**
   - **Setup**
   - **Auto Learn**

Decode Test

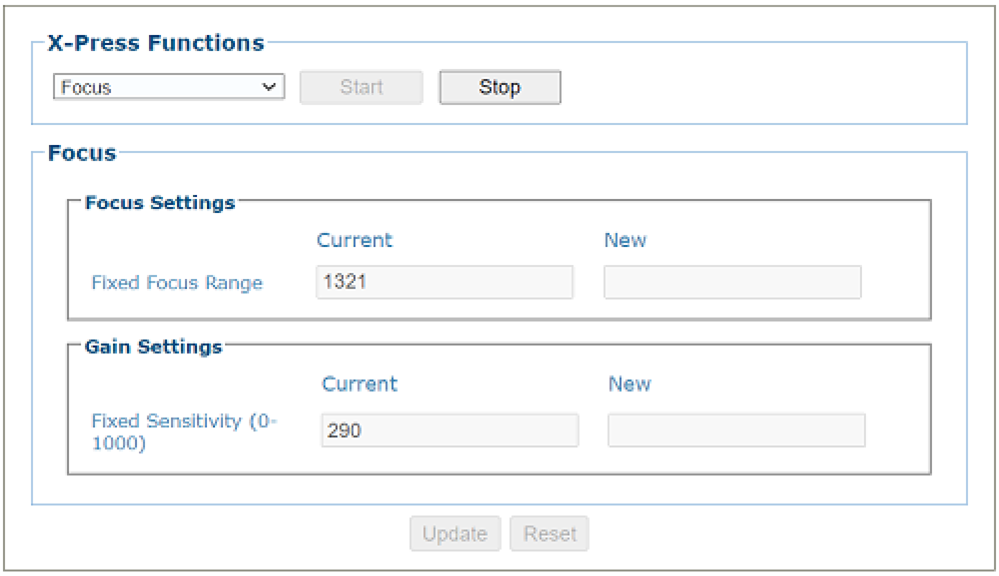
1. Click **Decode Test** (the default) and click **Start**, as codes are decoded, they display and the decode time appears. The percent of images decoded also appears.



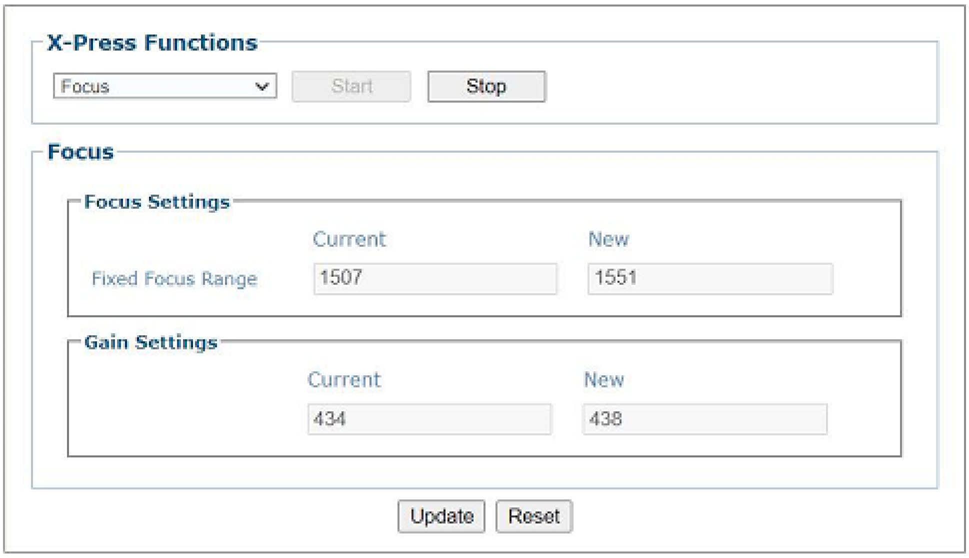
2. Click **Stop** and the Decode Test function stops.

Focus

1. Click **Focus** and the following window appears.



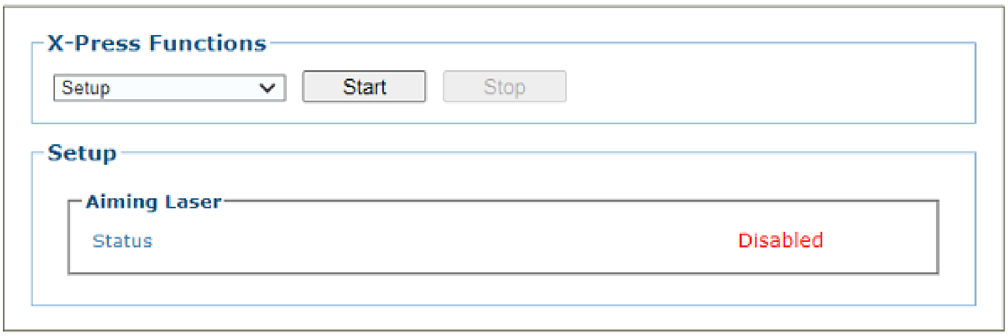
2. Click **Start** and Focus and Gain Settings are gathered. New setting data displays. If you wish to use the new data, click **Update** to apply it.



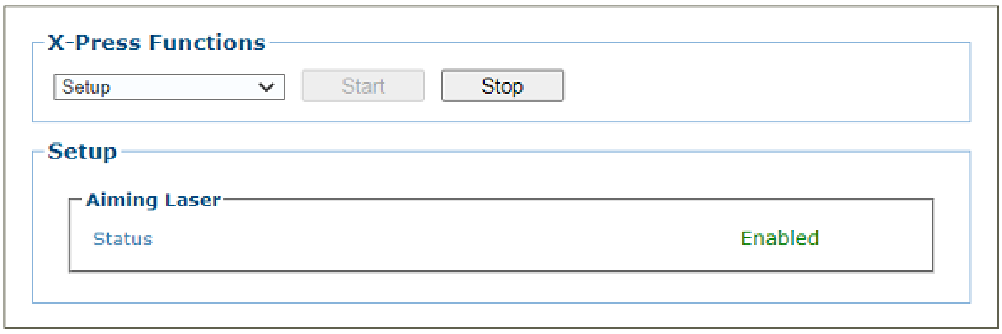
3. Click **Stop** and the Focus function stops.

Setup

1. Click **Setup** and the following window appears.



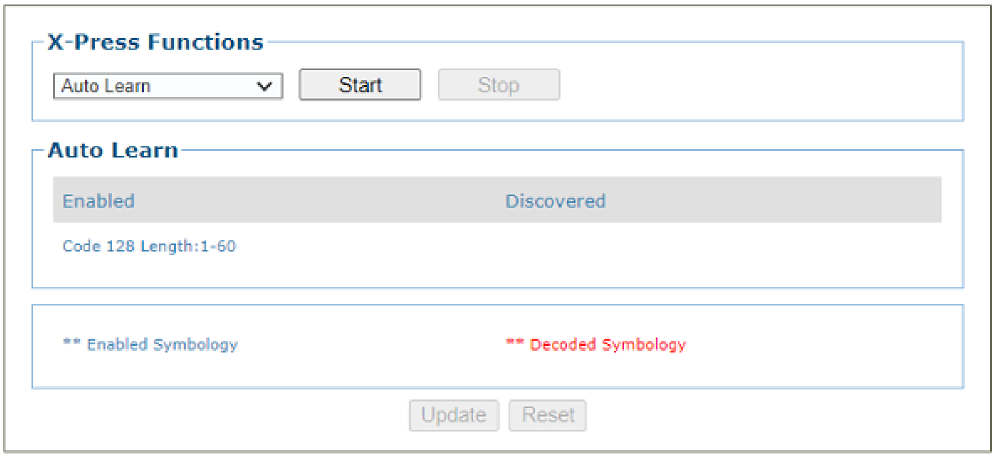
2. Click **Start** and the Aiming Laser is enabled.



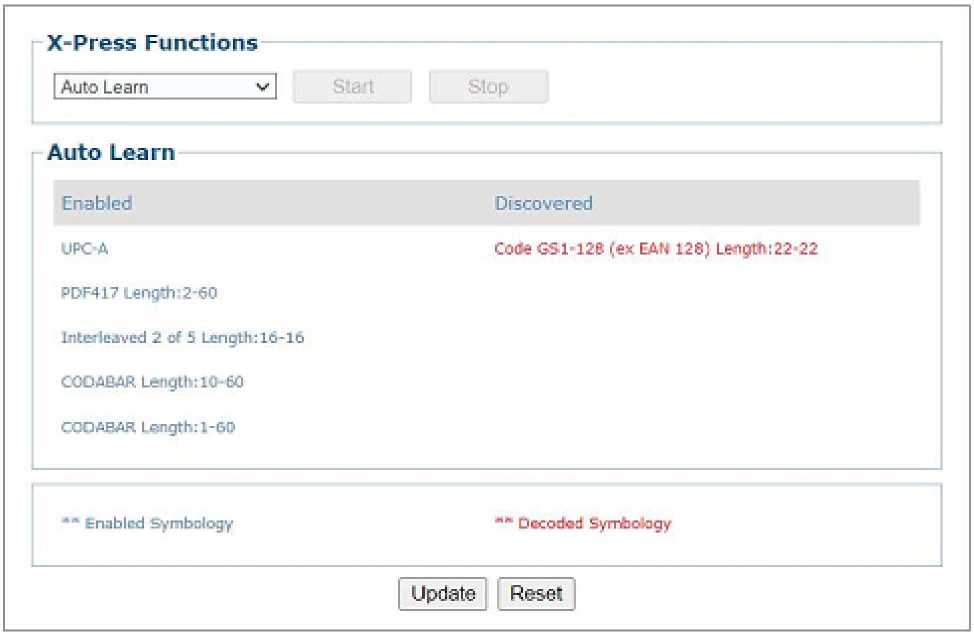
3. Click **Stop** and the Aiming Laser is Disabled again.

AutoLearn

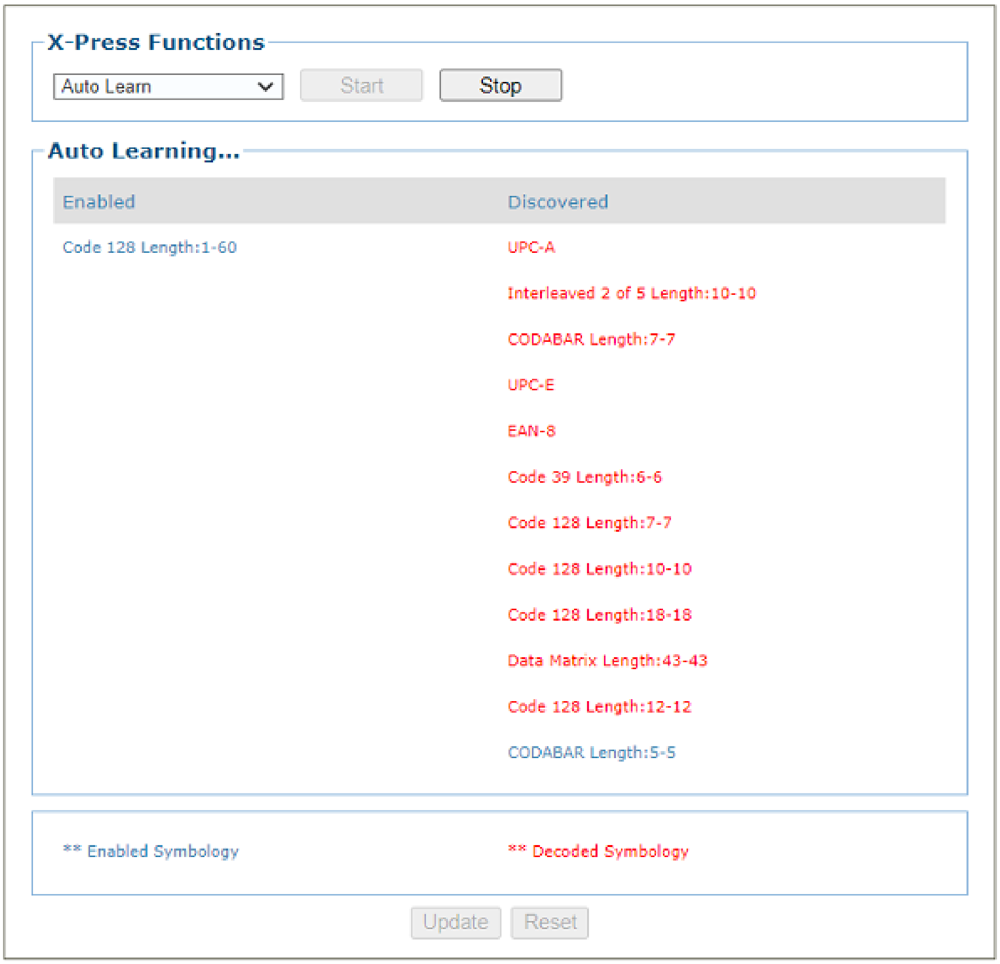
1. Click **AutoLearn** and the following window appears.



2. Click Start and as new barcodes are learned, they are displayed.



3. Click **Start** and the camera auto learns various bar codes.



4. Click **Stop** to stop Auto Learn.
5. Click **Update** to update the Barcode Settings with any new bar codes learned.

X-PRESS SINGLE PUSH BUTTON FUNCTIONALITY

Many of the same functionalities available via Xpress Functions in e-Genius are also available via the single push button found on the camera.

X-PRESS is the intuitive Human Machine Interface designed to improve ease of installation and maintenance. Status information is clearly presented by means of the five colored LEDs, and a single push button gives immediate access to the following relevant functions:

- Test with bar graph visualization to check static reading performance
- Focus/Locate the Focus LED will blink
- Setup to perform Exposure Time and sensitivity calibration
- Turn on aiming diodes
- Learn to self-detect and auto-configure for reading unknown codes

1 – **Press** the button (the Status LED will give a visual feedback).

2 – **Hold** the button until the specific function LED is on (Test, Focus, Setup or Learn).

3 – **Release** the button to enter the specific function.

Once in a mode, if you press and hold the button again, it will exit that mode and continue the scrolling sequence to select a mode.

Once button is pressed, the cycle of LEDs activation is as follows:

If the Xpress web interface is active, the LEDs will flash four times indicating it is disabling the active interface. The hardware interface returns to its initial state for regular access.

Test Mode

Once entered, the Bar Graph on the five LEDs is activated and if the camera starts reading codes the Bar-Graph shows the Good Read Rate. The Bar Graph has the following meaning:

In case of a NO READ, only the Status LED is on and it is blinking. To exit the Test Mode, press the X-PRESS push button once.

Test Mode will timeout in 4.5 minutes after the last barcode is decoded and revert back to Operating Mode.

Focus/Locate

By default, the Test mode exits automatically 60 seconds after the last bar code is decoded.

This function causes the camera to automatically learn the fixed focus distance and sensitivity. The Focus LED blinks to indicate this state. To exit the Focus/Locate Mode, press the X-PRESS button once.

The focus procedure is as follows:

1. Place a package with barcode at the desired fixed focus distance in the center of the camera's view.
2. Enter the focus function. The Focus LED will blink.
3. Wait until the Focus LED is steady. This indicates the camera has determined the fixed focus distance and sensitivity.
4. To commit the settings and exit, press the XPress button once.
5. This procedure ends when the values are committed or after a timeout of 60 seconds. If it times out the data is not saved.

Setup

Once entered, the camera aiming laser is enabled. The SETUP LED blinks to indicate the aiming laser is enabled. Use the aiming laser to aim the camera properly during mounting.

To exit Setup Mode, press the X-PRESS push button once.

Setup Mode will timeout after about 5 minutes.

AutoLearn

Once entered, the reader starts a procedure to automatically detect and recognize barcode types. The LEARN LED blinks to indicate the Learn mode is enabled.

The AutoLearn procedure is as follows:

1. Place one or more barcode types in the camera view. Hold the Xpress button until LEARN LED lights.
2. Wait until the LEARN LED stays steady (indicating the reader has detected the barcode.
3. To commit the learned barcode type(s) and exit, press the X-PRESS push button twice.
4. AutoLearn will timeout 60 seconds after the last barcode type is decoded and no learned barcode type(s) will be committed.

AutoLearn will only add new barcode type(s) to the configuration. The function will not drop or modify existing barcode type(s) enabled in the configuration. AutoLearn will only enable a learned barcode type if the barcode type does not already exist in the configuration.

If you do not want to accept the learned barcode, let it go and AV500/AV900 will time out. The learned barcode will not be committed.

Default Parameters

The user shall be able to default the parameters with the express button on power up, **This procedure is as follows:**

1. Press and hold Xpress button and apply power to the unit.
2. The unit will recognize the button press within 15 seconds and blink all five LEDs three times (once per second)
3. Release the Xpress button once the LED's start blinking

If the Xpress button is still pressed after the blink sequence ends, the default request will be ignored.

4. All 5 LEDs will turn off after 3 blinks
5. Press and release the Xpress button again within 5 seconds (all LEDs will turn on)

Failure to press the Xpress button within 5 seconds will result in the default request being ignored.

6. All 5 LEDs will blink 3 more times to confirm parameter defaulting will take place
7. Normal LED boot sequence will take place
8. All 5 LEDs will start blinking after the boot sequence finishes. Blinking will continue until the parameters are defaulted
9. If you are connected to e-Genius you will notice that the RTP will report the following "critical" message to the web interface until the default sequence is completed: "*Waiting for Xpress Parameter Default to Complete*"
10. The following error will be reported if the RTP requests an Xpress default but the COMe does not know about it "*Xpress parameter default requested but ignored*"

Diagnostics | Message Placing Wizard

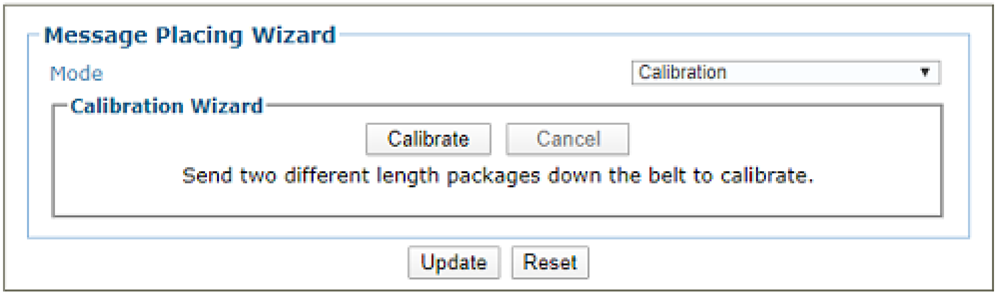
Use the **Message Placing Wizard** to help place incoming messages (either Protocol Index or Dimensioner messages) onto a package. There are two different modes:

- “Calibration” on page 305
- “Verification Wizard” on page 307

NOTE: A DM3610 must be setup via the Operating Mode and you must enable Protocol Indexes and/or Dimensioner results. Only enabled messages will show up on the Message Placing Wizard. Also, adjust Device > Logging to Verbose Mode Enabled, and Turn on Protocol Index.

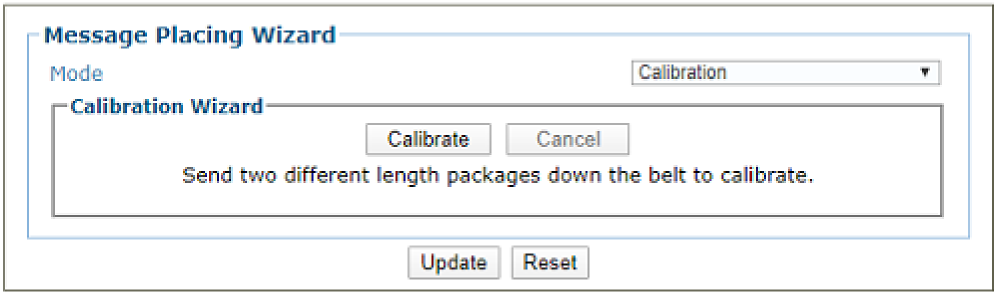
To access the Message Placing Wizard:

1. In the menu tree under **Diagnostics**, click **Message Placing Wizard** and the following window opens.



Calibration

The Calibration option allows you to easily find the distance to trigger line value without any calculations. The reference edge and the distance to trigger line state (not for Dimensioner messages) are also found.



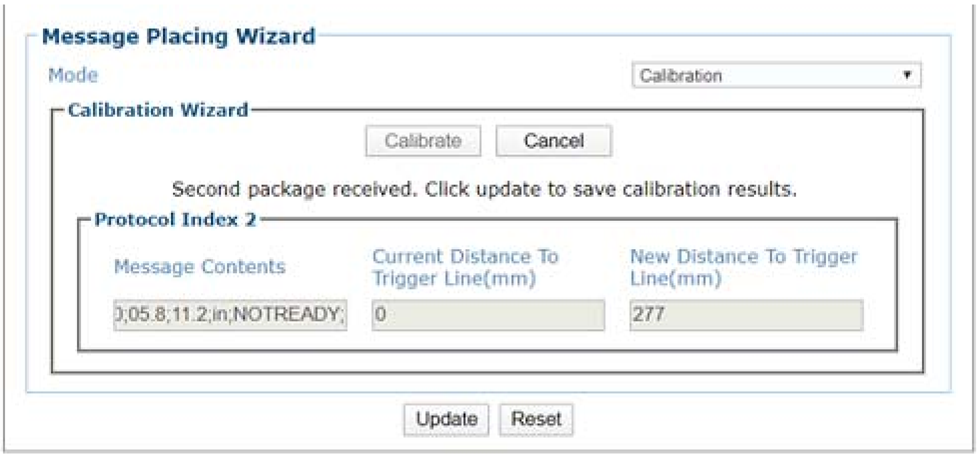
NOTE: Enable your Protocol Indexes and/or Dimensioner results. Only enabled messages will show up on the Message Placing Wizard.

Follow these steps to calibrate your incoming messages:

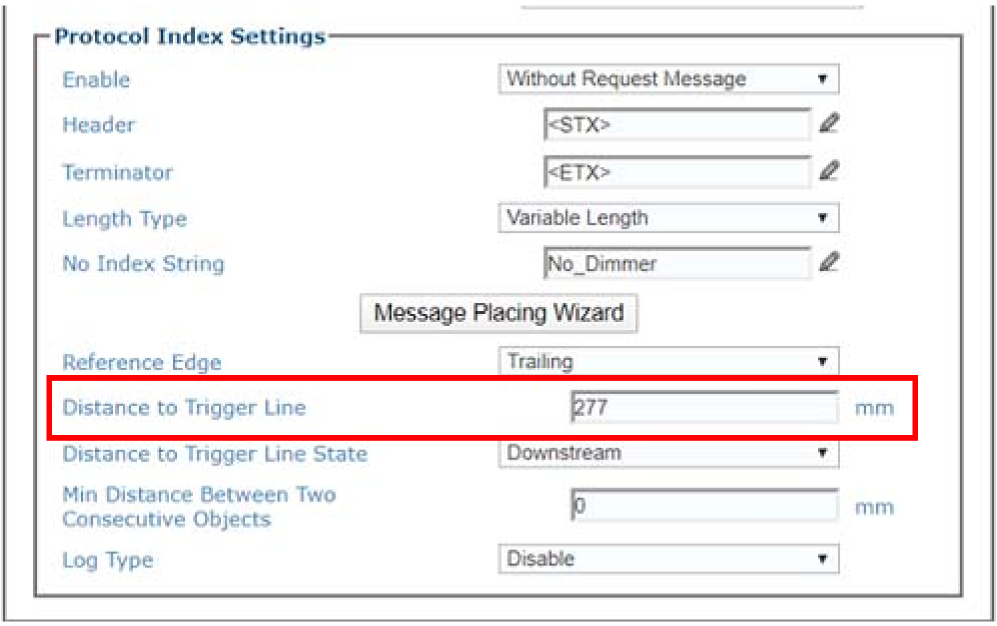
2. Click the **Calibrate** button.

3. Send a package down the conveyor. The message contents should be filled with the first boxes message for each enabled message received. If no message is received, the message Contents will say “**No message Received**.”

4. Send a second, different sized package down the conveyor. The message contents will update with the new messages, and “**New Distance To Trigger Line**” field is now filled. A negative number means upstream and a positive number means downstream. A negative value is not allowed for a Dimensioner, and a warning message is shown.



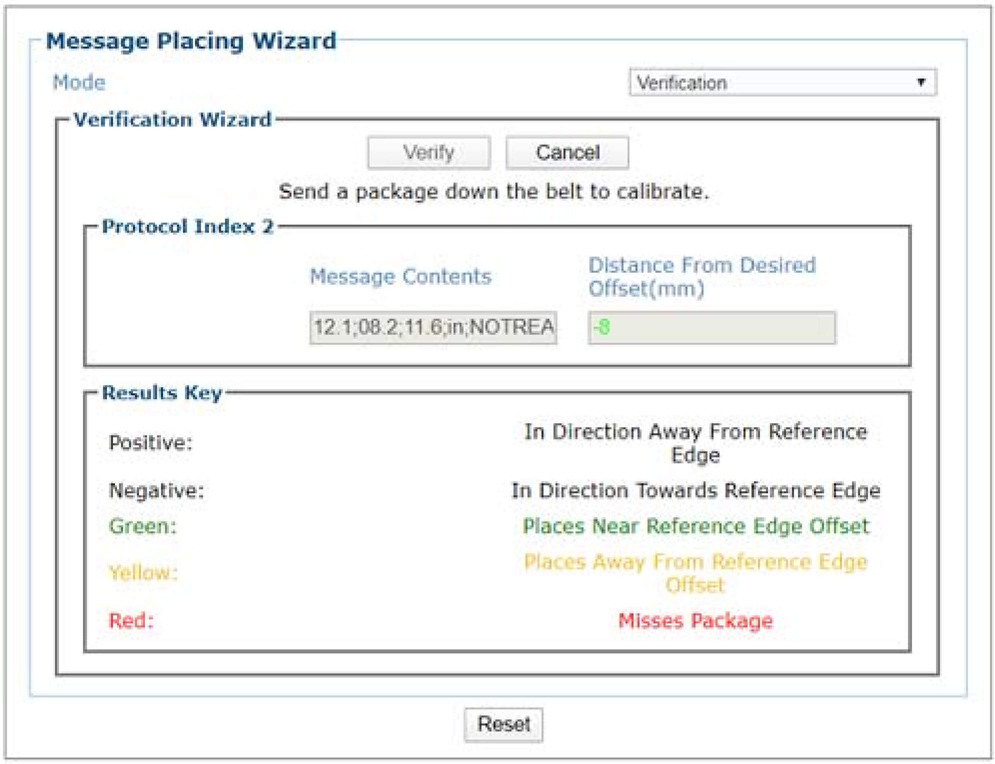
5. Click **Update** if you are satisfied with the results. You can now view the DM3610 operating mode and/or transports Protocol Index page and see the updated values. If successful this information can be viewed on the **Diagnostics > Systems Status** page too.



Verification Wizard

Use the verification page to check the messages placed on a package. No changes are made via this page.

1. Click the **Verify** button and send a package down the conveyor. The results display.



2. The message contents appear in the Message Contents box. In the verification page, as well as the calibration page, if a character is not utf-8 then it will be replaced with a period '.' character.

3. The **Distance from Desired Offset** refers to the 3-inch buffer from the leading/trailing edge that we want to place the Protocol Index in. We should not place it much closer or further from this offset.

4. If the resulting value is **red,** the message missed the box entirely (the message came in either before start trigger or after end trigger).

5. If the resulting value is **green**, we placed on the package within an acceptable range of the offset. The acceptable range is set to .75*Offset or from .75->5.25inches from the reference edge of the package.

6. If the resulting value is **yellow,** we placed on the package, but not in the "acceptable" range.

7. If you click **Reset** the values will be cleared and you will need to begin the Calibration process over again.

UTILITIES

Use the **Utilities** Menu selections to backup and restore system parameters, upgrade system software, or download system log information using the following selections:

"Utilities | Advanced Cluster Configuration" on page 309

"Utilities | Backup/Restore Parameters" on page 311

"Utilities | Software Upgrade" on page 313

"Utilities | Download Logs" on page 315

"Utilities | Download Tools" on page 316

"Utilities | Camera Reboot" on page 322

"Utilities | Help and Logout" on page 323

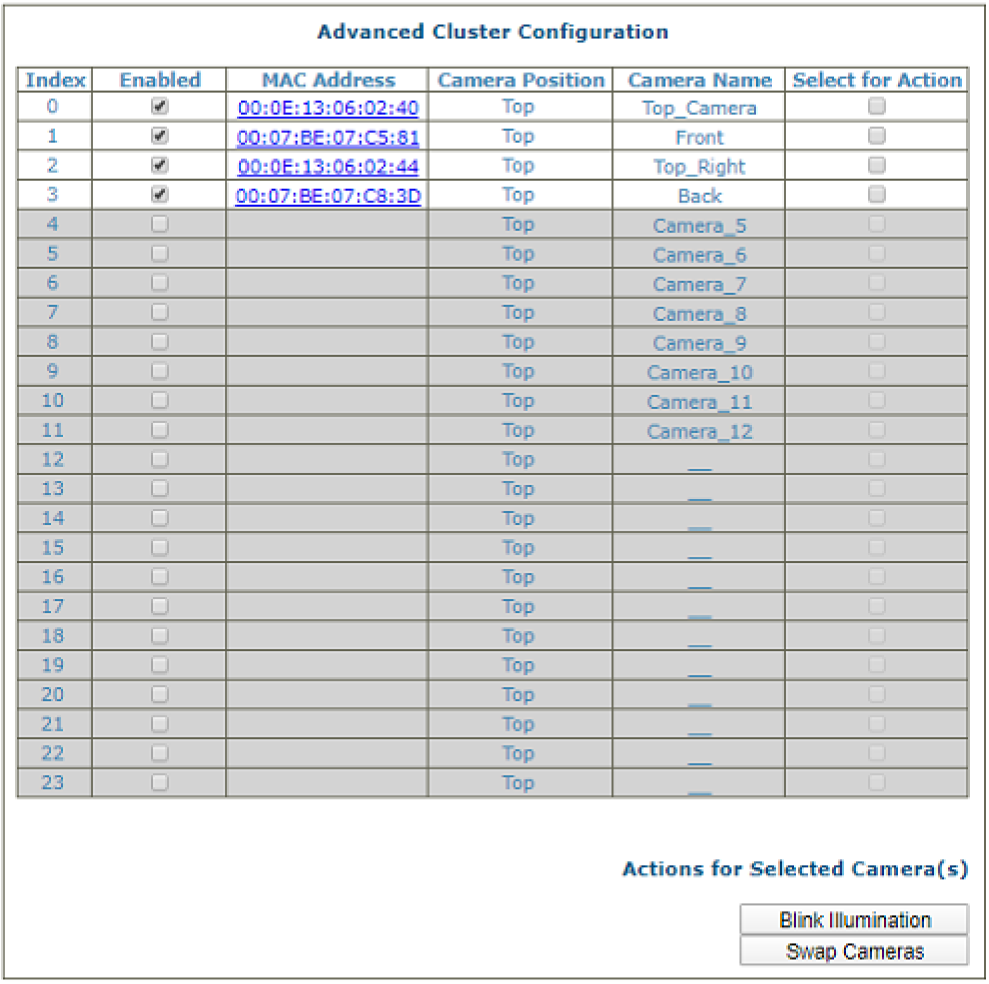
Utilities | Advanced Cluster Configuration

Use **Advanced Cluster Configuration** to reorganize the cameras in a Tunnel/Array. Due to the configuration of the Sync Network of the camera, it is not possible to simply replace a failed camera with another camera in the same cluster (Sync Network). You need to use the Advanced Cluster option. For example, when putting a bottom camera in the Top mounting location. If the bottom camera is mounted in the top location it will still use the bottom parameters. The Advance Cluster option allows for the repositioning of the camera.

NOTE: DO NOT use Advanced Cluster Configuration unless authorized by Datalogic Support. Using this function without Datalogic Support can harm system operation.

To access the Advanced Cluster Configuration window:

1. In the menu tree under **Utilities**, click **Advanced Cluster Configuration**. The **Advanced Cluster Configuration** window opens.



Advanced Cluster Configuration

Index	Enabled	MAC Address	Camera Position	Camera Name	Select for Action
0	☑	00:0E:13:06:02:40	Top	Top_Camera	☐
1	☑	00:07:BE:07:C5:81	Top	Front	☐
2	☑	00:0E:13:06:02:44	Top	Top_Right	☐
3	☑	00:07:BE:07:C8:3D	Top	Back	☐
4	☐		Top	Camera_5	☐
5	☐		Top	Camera_6	☐
6	☐		Top	Camera_7	☐
7	☐		Top	Camera_8	☐
8	☐		Top	Camera_9	☐
9	☐		Top	Camera_10	☐
10	☐		Top	Camera_11	☐
11	☐		Top	Camera_12	☐
12	☐		Top	__	☐
13	☐		Top	__	☐
14	☐		Top	__	☐
15	☐		Top	__	☐
16	☐		Top	__	☐
17	☐		Top	__	☐
18	☐		Top	__	☐
19	☐		Top	__	☐
20	☐		Top	__	☐
21	☐		Top	__	☐
22	☐		Top	__	☐
23	☐		Top	__	☐

Actions for Selected Camera(s)

Blink Illumination

Swap Cameras

The enabled columns (not grayed out) show the cameras currently online in the system. If a camera is not online (grayed out) you can still select it for action.

To Swap Two Cameras in the same tunnel:

1. Select the check boxes in the **Select for Action** column corresponding to the cameras you want to swap.

2. Click **Swap Cameras.** The selected camera’s swap MAC addresses. When the Swap Cameras is selected the system will assume the parameters associated to the other camera. It will then change the XML (parameter) file by placing it's MAC address in the new location and send the updated XML file to the other cameras in the cluster.

3. At this point, in our example, the previous bottom camera will assume the parameters of the top camera.

Advanced Cluster Configuration

Index	Enabled	MAC Address	Camera Position	Camera Name	Select for Action
0	☑	00:0E:13:06:02:40	Top	Top_Camera	☑
1	☑	00:07:BE:07:C5:81	Top	Front	☐
2	☑	00:0E:13:06:02:44	Top	Top_Right	☑
3	☑	00:07:BE:07:C8:3D	Top	Back	☐
4	☐		Top	Camera_5	☐
5	☐		Top	Camera_6	☐
6	☐		Top	Camera_7	☐
7	☐		Top	Camera_8	☐
8	☐		Top	Camera_9	☐
9	☐		Top	Camera_10	☐
10	☐		Top	Camera_11	☐
11	☐		Top	Camera_12	☐
12	☐		Top	__	☐
13	☐		Top	__	☐
14	☐		Top	__	☐
15	☐		Top	__	☐
16	☐		Top	__	☐
17	☐		Top	__	☐
18	☐		Top	__	☐
19	☐		Top	__	☐
20	☐		Top	__	☐
21	☐		Top	__	☐
22	☐		Top	__	☐
23	☐		Top	__	☐

Actions for Selected Camera(s)

Blink Illumination

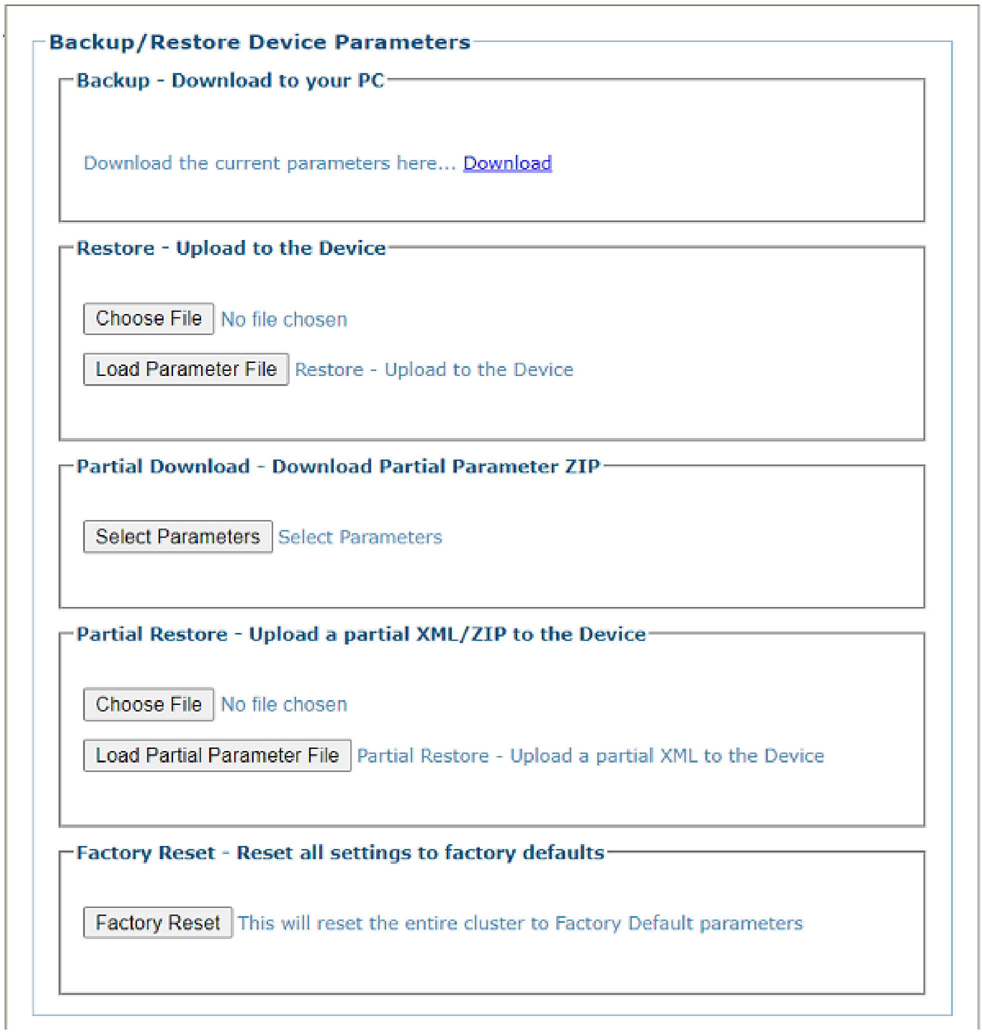
Swap Cameras

Utilities | Backup/Restore Parameters

Use **Backup/Restore Parameters** window to download system parameters to a camera or save them to a file.

To use the Backup/Restore Parameters functions:

1. In the menu tree under **Utilities**, click **Backup/Restore Parameters**. The **Backup/ Restore Parameters window** opens.



2. From the **Backup - Download to your PC** section of the window, click Download. The parameter file is downloaded by the browser to your PC.

NOTE: Various browsers will handle file saving in different ways.

3. From the **Restore - Upload to the Device** section of the window, click **Browse (or Choose File in Chrome)**. From the file window that opens, navigate to and select a previously saved parameter file.

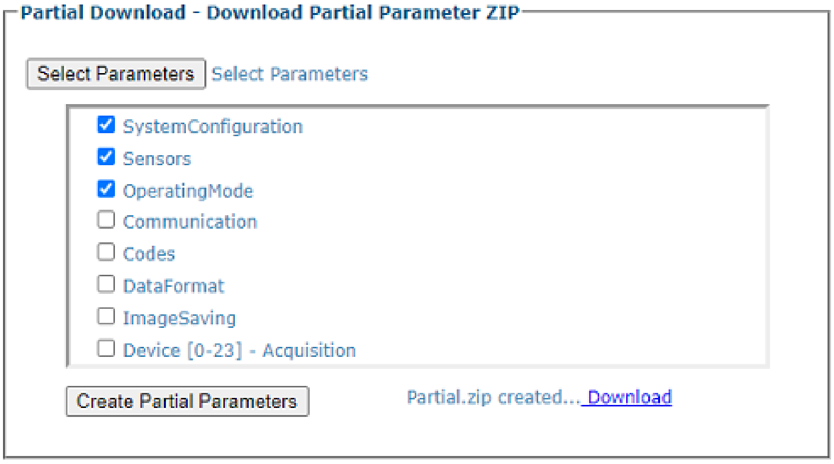
NOTE: You must only restore a system with a restore file originally created from that system. DO NOT use a restore file from a different system. NEVER use on a configured system.

4. Click **Load Parameter File** to upload the file to the system device(s).

To Download a Partial Parameter file:

1. Click **Partial Download** to download a partial parameter file.

2. Click the check-boxes for the parameters you wish to include in the file.



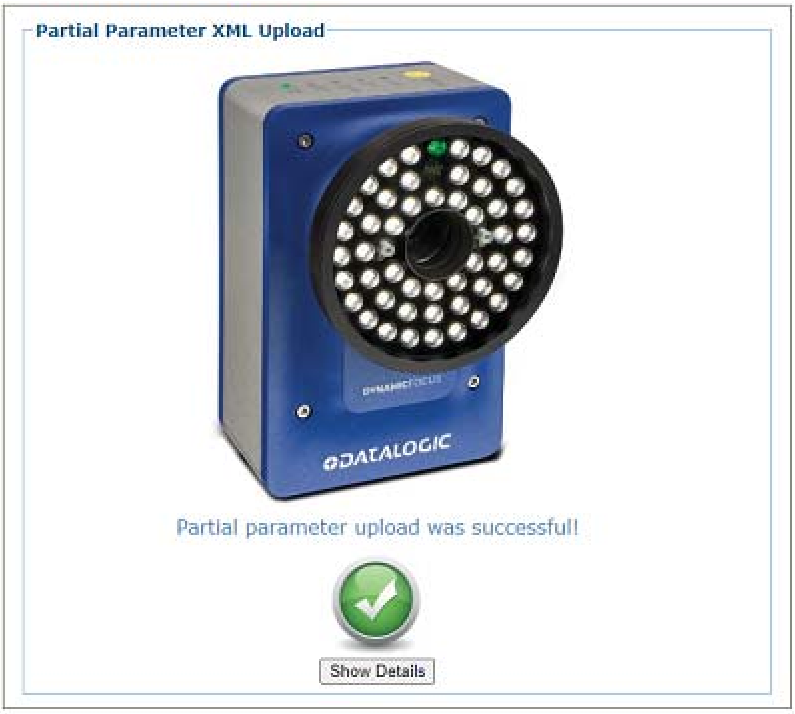
3. Click **Create Partial Parameters** button and the file will be created.

4. Click **Download** to download the file.

To Partially Restore Parameters:

1. Click **Choose File** and select a XML/Zip file to upload to the camera.

2. Click **Load Partial Parameter file** to load.



To use the Factory Reset function:

1. Click **Factory Reset.** A confirmation box appears stating "**This will reset the entire cluster to Factory Default parameters.**"

2. Click **OK** to reset to the factory default, or click **Cancel** to return to the Backup/ Restore Parameters window.

WARNING: Do not use this Factory Reset option on a calibrated tunnel array. This option is only used during the initial configuration or under extreme measures. If it is applied the array will have to be re-calibrated.

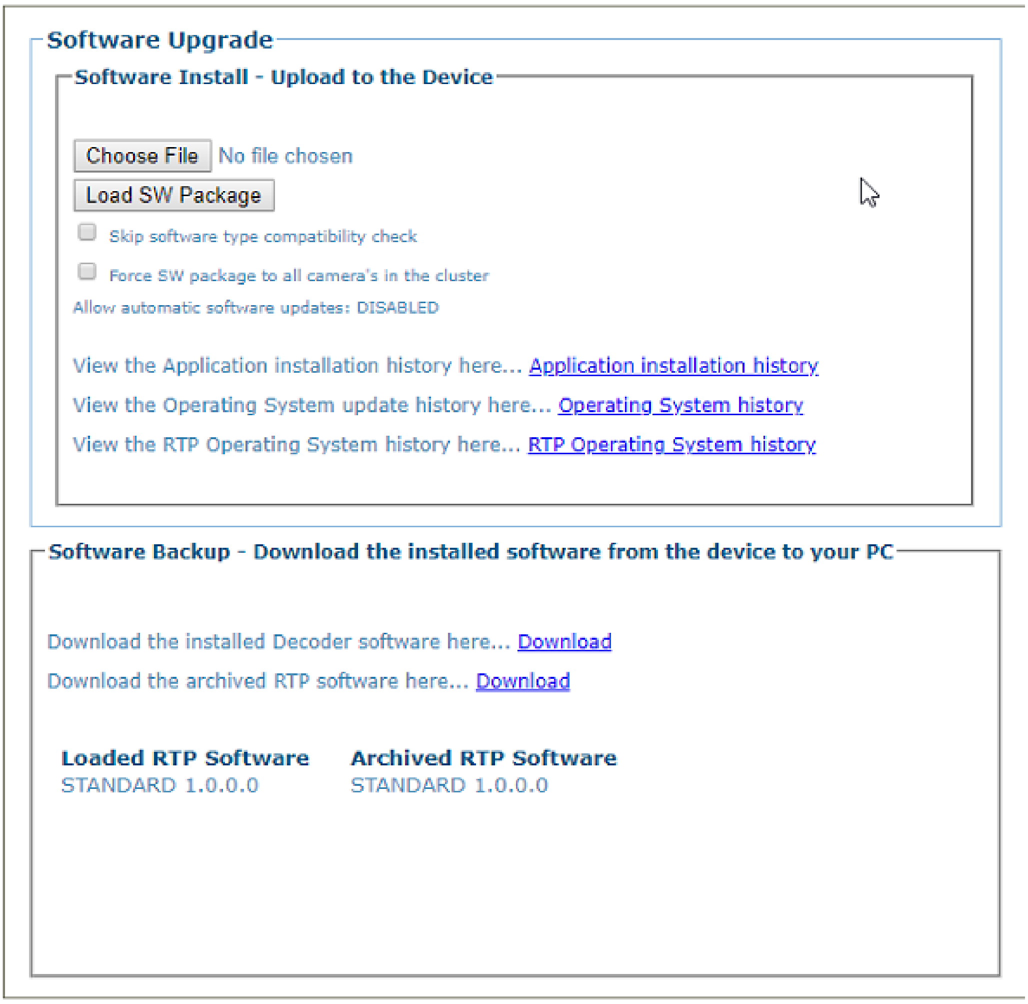
Utilities | Software Upgrade

Use the **Software Upgrade** window to load new versions of the camera system software.

NOTE: Please clear the PC's browser cache regularly or set up the browser to disable caching altogether. This is especially important after software upgrades to make sure updates in e-Genius are visible.

To use the Software Upgrade functions:

1. In the menu tree under **Utilities**, click **Software Upgrade.** The **Software Upgrade** window opens.



2. Click **Choose File**. From the file window that opens, navigate to and select the software upgrade file.

3. Click **Load SW Package** to upload the software upgrade to the device.

4. Select the **Skip software type compatibility check**, check box if you are certain the software is newer than that currently installed on the system.

5. Select **Force SW package to all camera's in the cluster** to update all of the cameras in the cluster with the latest software downloaded.

6. Click **Application Installation History** to view historical software revision information about the application.

```
Mon Sep 9 13:32:30 UTC 2019 : Installing AV2D_VERSION STD_AV2D 0_0_0_94
Mon Oct 14 12:17:19 UTC 2019 : Installing AV2D_VERSION STD_AV2D 0_0_0_98
Thu Oct 17 13:23:25 UTC 2019 : Installing AV2D_VERSION STD_BETA 0_0_0_100
Fri Nov 1 14:42:33 UTC 2019 : Installing AV2D_VERSION STD_BETA 0_0_0_102
Wed Nov 20 15:37:10 UTC 2019 : Installing AV2D_VERSION STANDARD 1_0_0_0
```

7. Click **Operating System History** to view historical software patch information about the operating system.

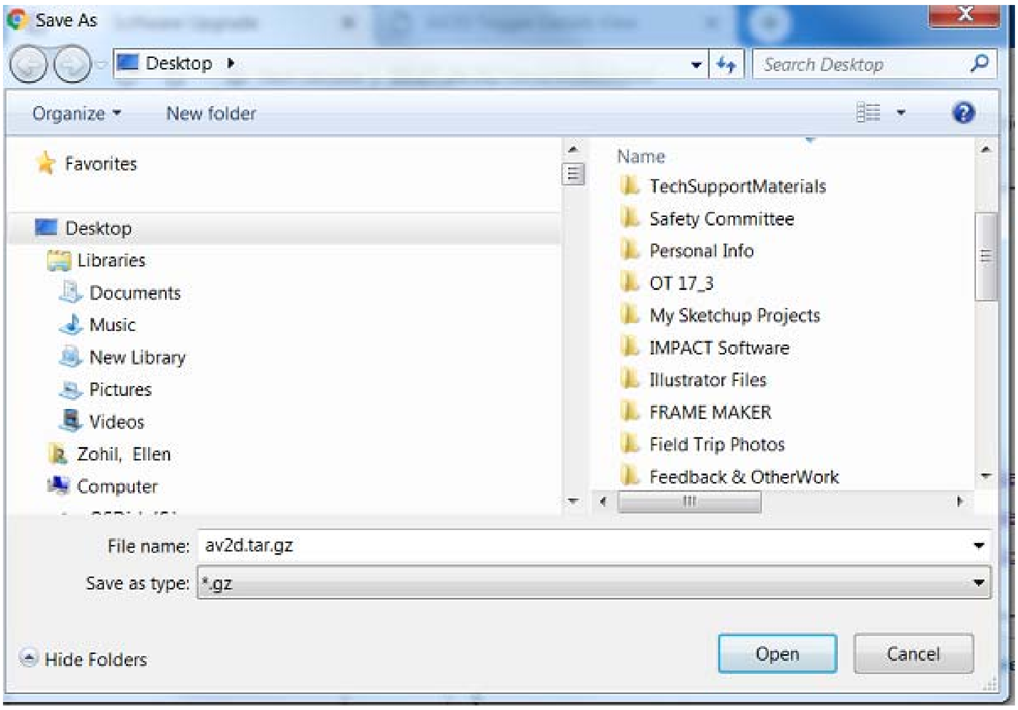
```
OS BASE 0_0_1_2 Feb 15, 2019

Mon Mar 11 15:18:12 UTC 2019 : Installing Patch -  av2d_InstallLibSSH2.tar.gz
Wed Jun 5 17:00:11 UTC 2019 : Installing Patch -  av2d_UpdatePCIeDriver_2.0.tar.gz
```

8. Click **RTP Operating System history** to view RTP (Real Time Processing) software revision historical information about the Real Time Processing OS.

```
Installing RTP STD_BETA 0_0_0_30
Installing RTP STD_BETA 0_0_0_37
Installing RTP STD_BETA 0_0_0_42
Installing RTP STD_BETA 0_0_0_50
Installing RTP STD_BETA 0_0_0_54
Installing RTP STD_BETA 0_0_0_62
Installing RTP STD_BETA 0_0_0_69
Installing RTP STD_BETA 0_0_0_82
Installing RTP STD_BETA 0_0_0_84
Installing RTP STD_BETA 0_0_0_90
Installing RTP STD_BETA 0_0_0_98
Installing RTP STD_BETA 0_0_0_102
Installing RTP STANDARD 1_0_0_0
```

9. Click **Download** to save a copy of the installed software to your PC.



Utilities | Download Logs

Use **Download Logs** window to download system information logs to your PC.

To use the Download Logs function:

1. In the menu tree under **Utilities,** click **Download Logs**. The **Download Logs** window opens.

Device Name	SyncNet IP	Status
Camera_1	192.168.0.145	getting file
Camera_1	192.168.0.145	Success
Camera_2	192.168.0.240	getting file
Camera_2	192.168.0.240	Success
All Devices		Click here to download debug logs

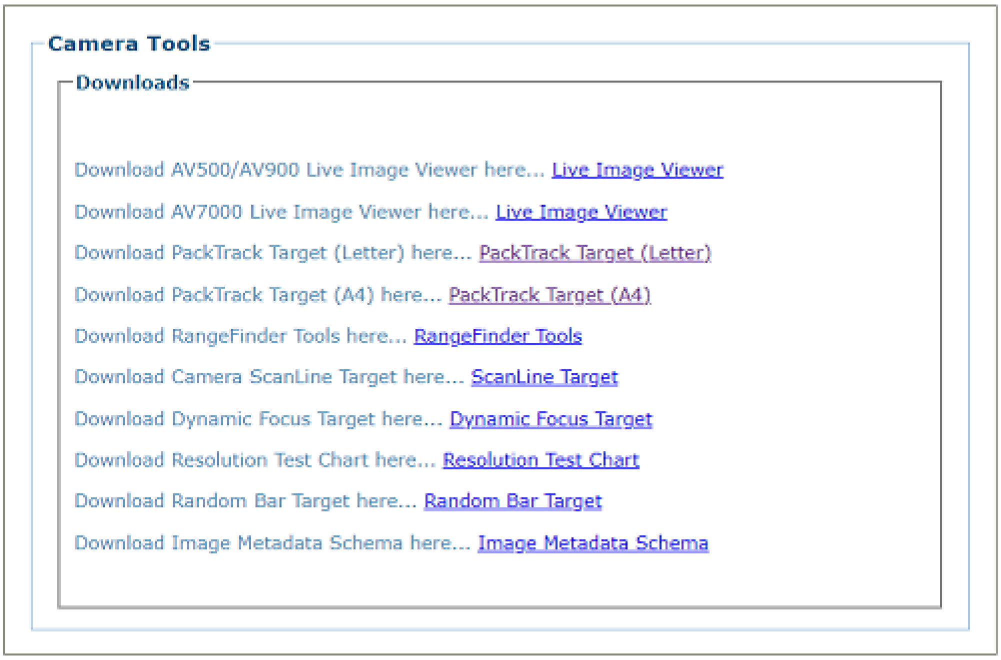
2. Click the link **Click here to download debug logs** to download the AllDebugLogs.tar.gz file to your PC.

Utilities | Download Tools

The **Download Tools** window provides links to tools stored on the camera that can be used for calibrating and testing the camera system. These include printable calibration targets and other helpful items. The items available may change depending on the camera version.

To view the available tool links:

1. In the menu tree under **Utilities**, click **Download Tools**. The **Download Tools** window opens.

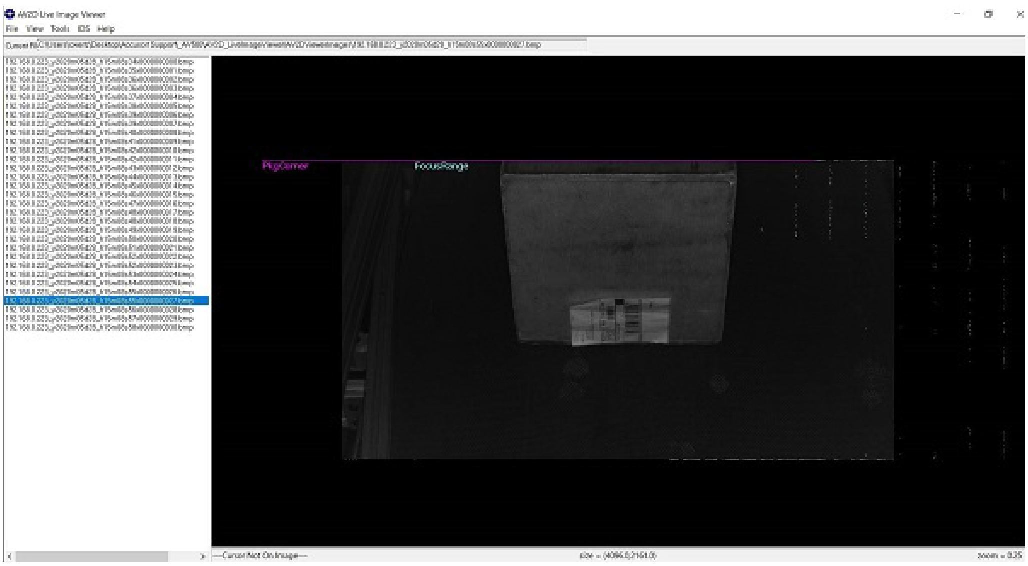


2. Click on a link to download the indicated tool to your computer.

Live Image Viewer

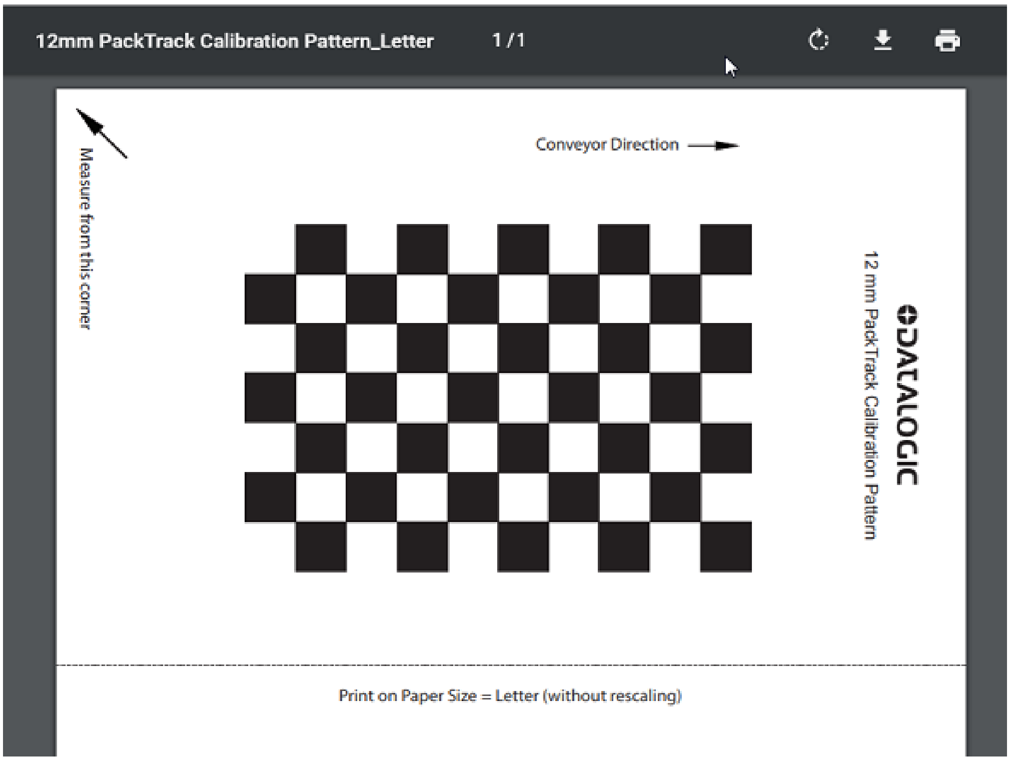
1. Click **Live Image Viewer** to download the tool. There is one for the AV7000 and a different one for the AV500/AV900. Extract the desired tool to your desired location.

2. Click on the exe to open. The following window opens.



PackTrack Target (Letter) and (A4)

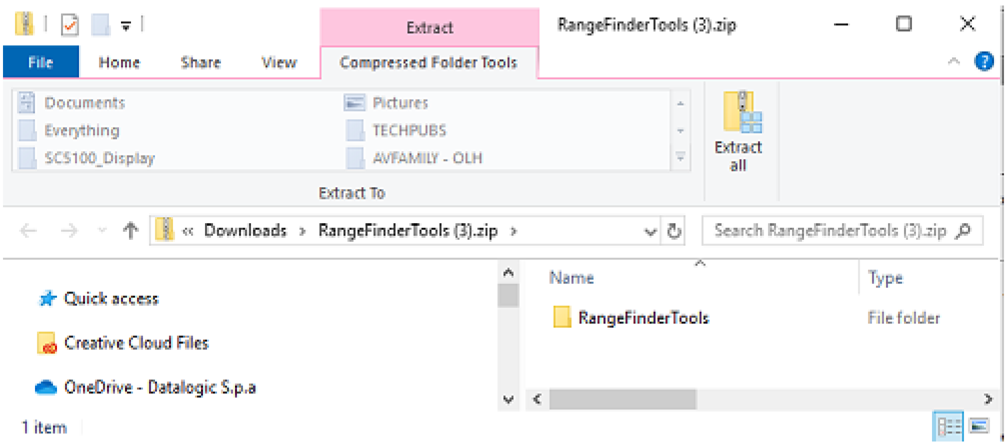
1. Click **PackTrack Target Letter or A4** size paper and the following target will display.



2. Click the printer icon to print the target to be used for AV500 PackTrack calibration purposes.

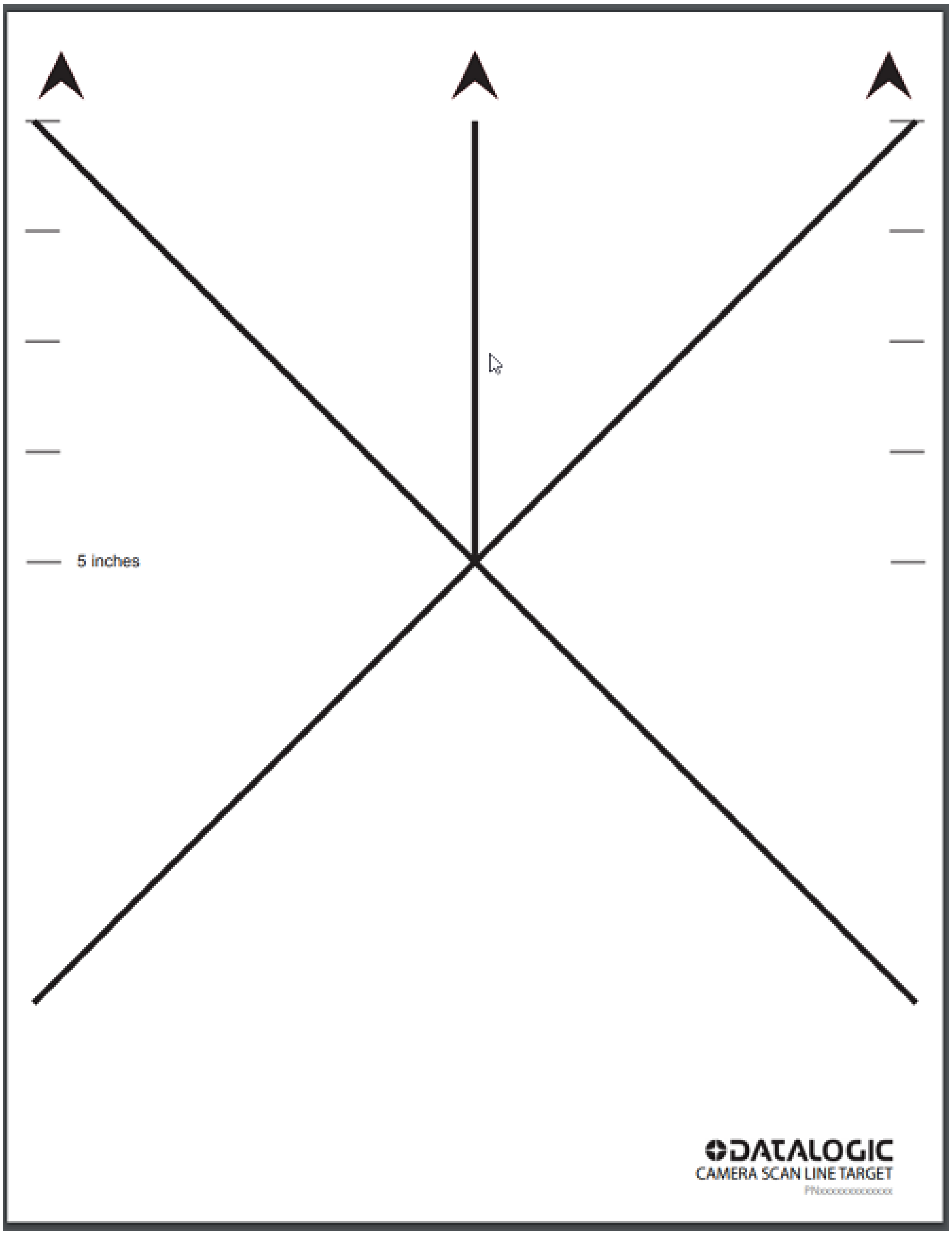
RangeFinder Tools

Click on **RangeFinder Tools** to download a zipped folder of tools to help you setup your RangeFinder.



ScanLine Target

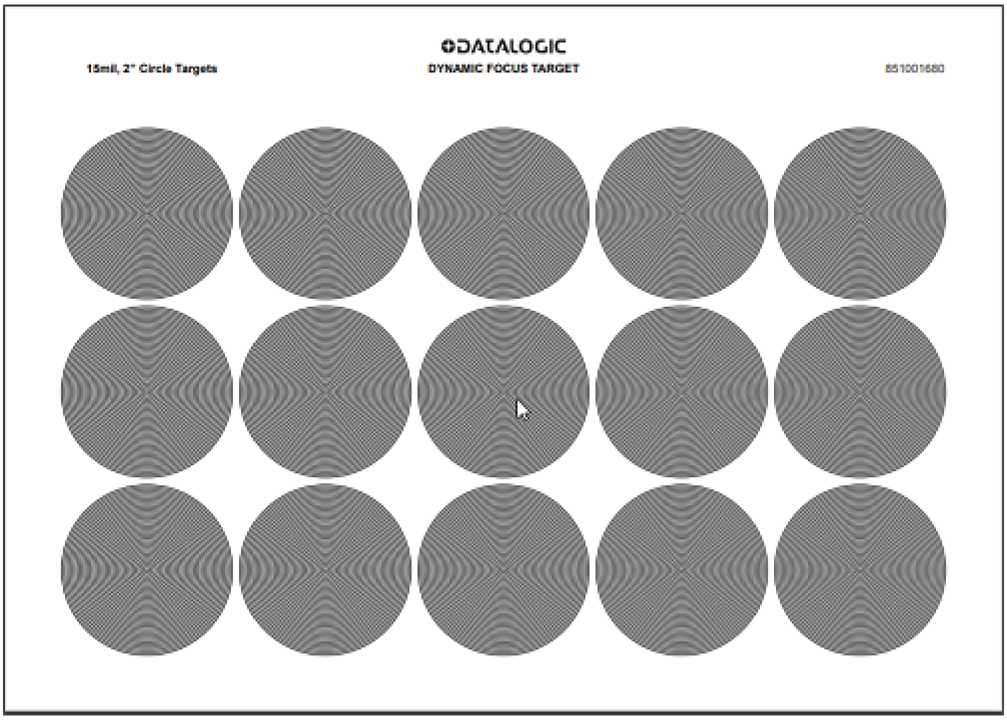
1. Click **ScanLine Target** and the following target will display.



2. Click the printer icon to print the target for AV7000 calibration purposes.

Dynamic Focus Target

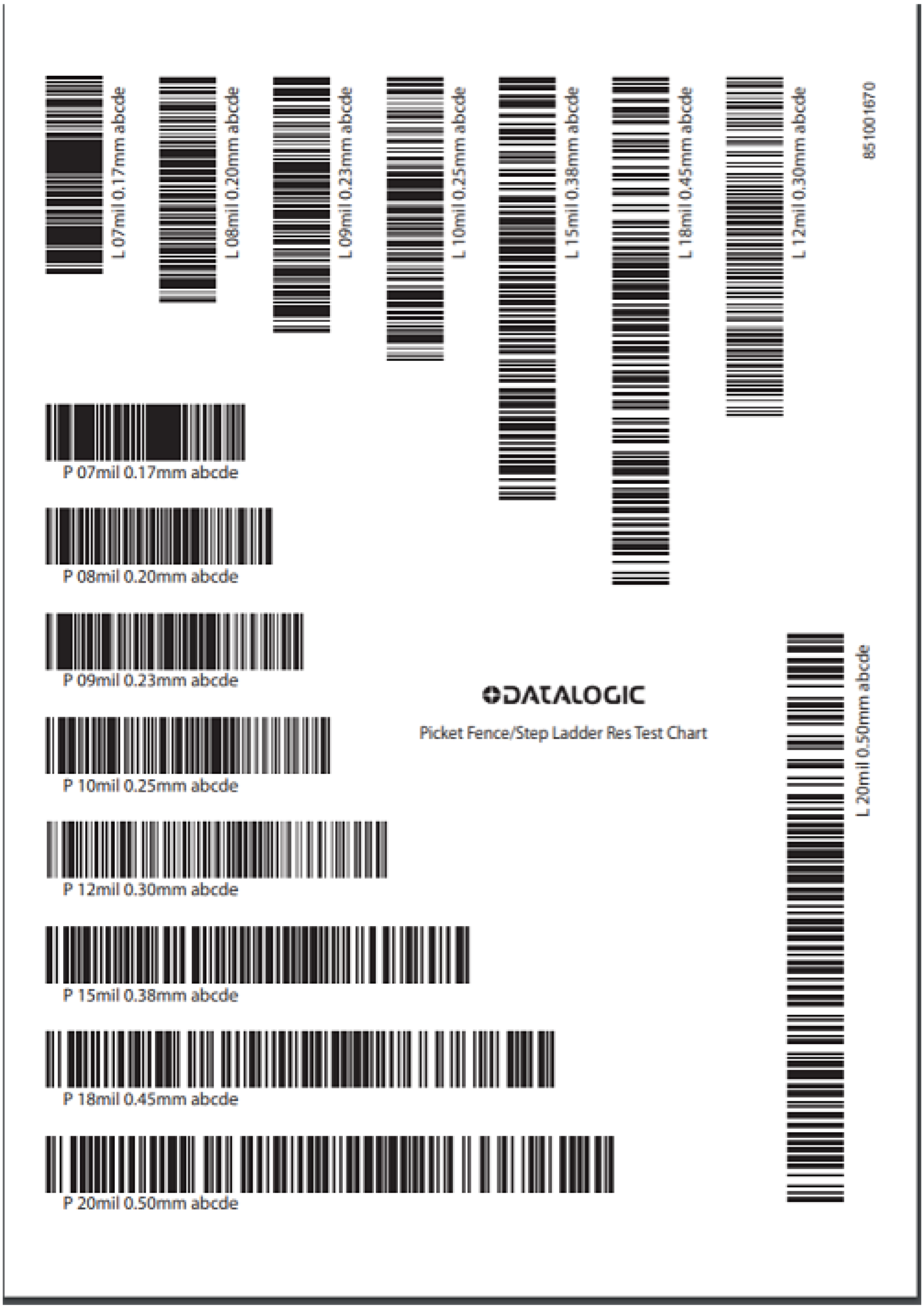
1. Click **Dynamic Focus Target** and the following target will display



2. Click the printer icon to print the target for AV7000 calibration purposes.

Resolution Test Chart

1. Click **Resolution Test Chart** and the following test chart will display.



2. Click the printer icon to print the test chart for AV7000 AV500/AV900 calibration purposes.

Random Bar Target

1. Click **Random Bar Target** and the following target will display

2. Click the printer icon to print the AV7000 Calibration Target.

Image Metadata Schema

Click **Image Metadata Schema** and an *.xsd file can be saved to your desired location. The XML Schema Definition (XSD) describes the structure of the image “metadata” XML file. “Metadata” can be saved along with images, and this is enabled/configured on the “Image Settings” page in the “Image Saving Options” section.

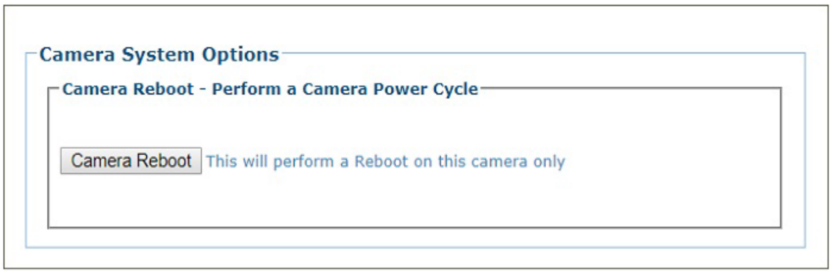
Utilities | Camera Reboot

The Camera Reboot window allows you to reset a specific camera.

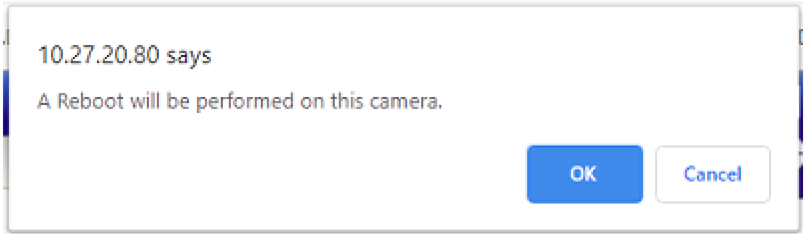
NOTE: In a tunnel configuration this option will only reboot the camera you are connected to.

To reboot the camera:

1. In the menu tree under **Utilities,** click **Camera Reboot.** The **Camera System Options** window opens.



2. Click **Camera Reboot** and the following confirmation message appears**.**



3. Click **OK** to continue the camera reset or **Cancel** to discontinue this process.

Utilities | Help and Logout

Utilities | Help

Use the **Help** selection to access the online help system.

In the menu tree under **Utilities**, click **Help**. The online help **Welcome** page opens in a new browser window.

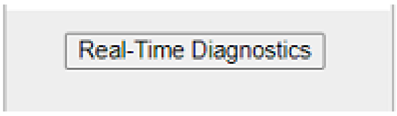
Utilities | Logout

Click **Utilities | Logout** to exit e-Genius.

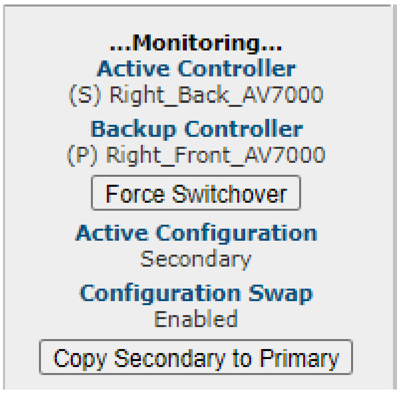
Utilities | Real-Time Diagnostics

Use the **Real-Time Diagnostics** selection to view **Active Controller/Active Configuration** status.

Below the menu tree, click the Real-Time Diagnostics button.

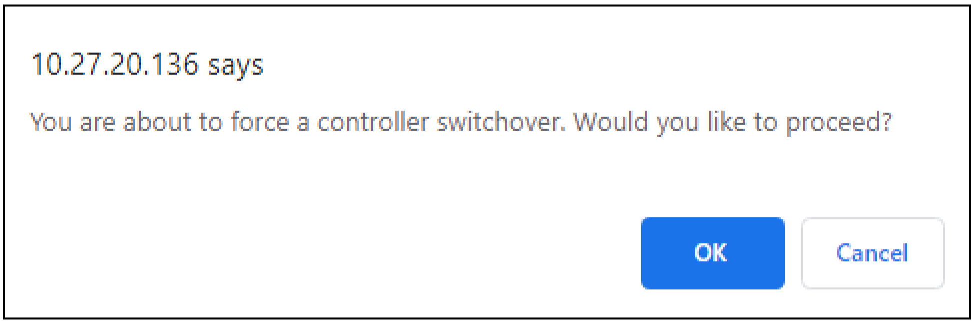


The following information appears.



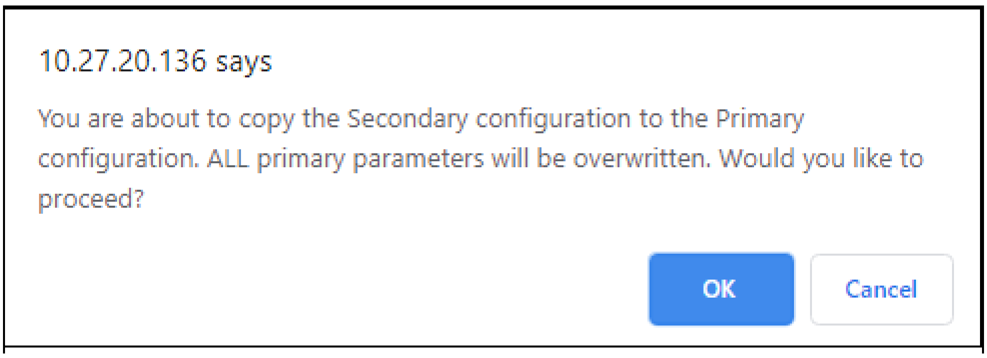
Click **Force Switchover** to switch to the Backup Controller in a redundant system.

The following confirmation window appears.



Click **OK** to complete the process.

Click **Copy Secondary to Primary** to copy the Secondary configuration to the primary configuration.



Click **OK** to complete the process.

CHAPTER 5

TRIGGER, POSITIONING AND FOCUSING DEVICE SETUP

The AV500/AV900 trigger and focusing position is computed by the camera based on the position of the package measured by a trigger and/or focusing device. These Datalogic devices may be one or more of the following:

- S-60 Photocell
- AS1
- AREAscan™
- DLA Light Curtain
- DM3610 Dimensioner
- (LCC-75xx AV7 Light Curtain)
- STI Light Curtain
- S-85 Positioning Sensor

This section provides detailed procedures on setup and calibration of your AV500/AV900 Camera and the necessary focusing devices installed for your system.

WARNING: The procedures outlined in this chapter should only be performed by a Datalogic trained technician. For further information on training, contact us through the Datalogic website at www.datalogic.com.

WHAT YOU WILL NEED

Items listed below are not required for every focusing option.

- Application Drawing (for structure, camera, mirror, sensor and focusing device positioning, and *Far Working Distance* for focusing)
- Application Specifications
- Laptop PC
- Tape Measure
- Sync Ethernet Cable Adapter
- Installation Kit (Test Boxes) (included with camera)
- CH-3 Autofocus Test Chart (included with camera)

- Dynamic Focus Target (included with camera)
- Picket Fence/Step Ladder Test Chart
- Inventory All Equipment and Structure Parts

FIRST-TIME STARTUP

On initial power-up, the AV500/AV900 performs a series of self-diagnostic and LED tests. When the **STATUS** LED turns a steady green the power-up sequence is complete, and the camera is operational.

The AV500/AV900 cameras are shipped from the factory with these defaults:

- **Default User ID:** setup (case sensitive)
- **Default Password:** DLAset (case sensitive)
- Control Panel Buttons Enabled
- IP address - **192.168.0.145 (setup/sync controller),** 192.168.3.10 (Host), and 10.0.40.20 (Image)

UNDERSTANDING DATALOGIC FOCUSING OPTIONS

There are several Datalogic focusing options available for the AV500/AV900. Each option serves a different purpose in AV500/AV900 systems. They can be used alone or in combination with one another. Below is a list of the available options and an explanation of their purpose. The following sections detail how to focus each device when used in an AV500/AV900 system.

S-60 Photocell

The standard S-60 Photoelectric sensor is used in AV500/AV900 Camera Fixed Focus systems to detect the presence of an item entering the scanning area. This device works best in systems where packages are separated by an open space between the trailing edge of one package and the leading edge of the next.

AS1 AREAscan™

The **AS1** area sensors represent the ideal solution for the detection of very small objects, even when passing in different positions inside the controlled height and width. They can also help avoid multiple triggers on irregular shaped packages.

DL Light Curtain (LCC-75xx AV7 Light Curtain)

This device is used to detect the presence of objects as they enter the scanning area, as well as report the package heights ranging from 150 to 2500mm to the camera.

S-85 Positioning Sensor

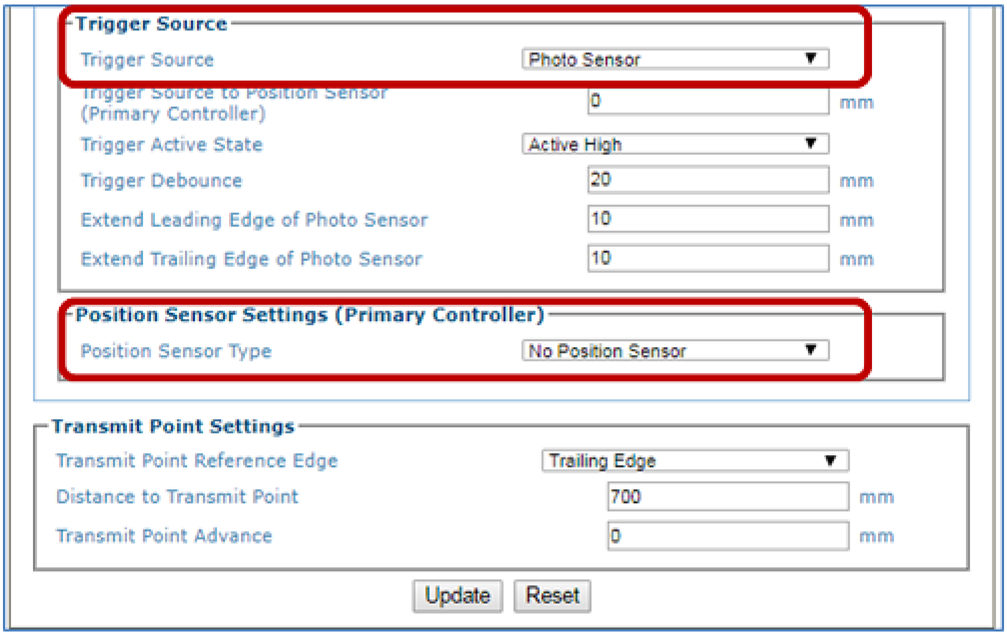
The S85 distance sensor with laser emission provides time of flight measurement between the S85 and an object located between the S85 and the calibrated far distance.

DM3610 Dimensioner

The DM3610 can be used to detect the presence of products as they enter the scanning area as well as report the package positions/heights and sequence number to all cameras in the system used in dimensioning are calibrated to have an accuracy of 2.5 mm [0.1 in], 5 mm [0.2 in] or 13 mm [0.5 in].

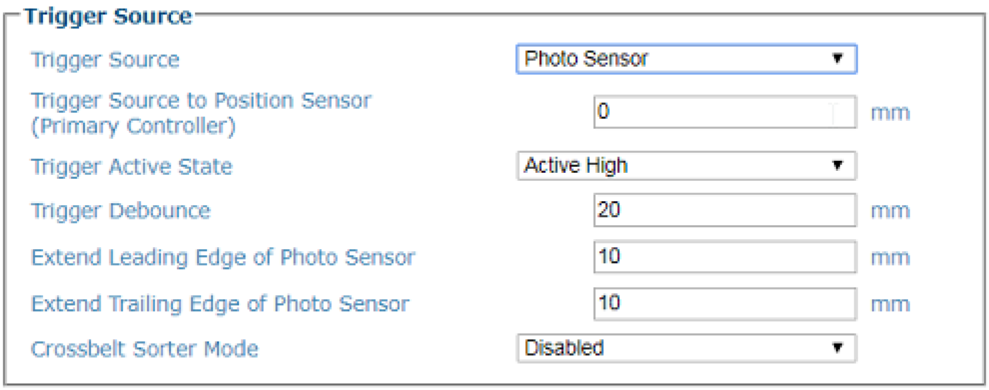
SETTING UP THE S-60 PHOTOCELL

Reference the **S-60 Installation Guide** (included with your S-60 kit) for complete information on connecting and aligning the Photocell. Make the following selections in the AV500/AV900 e-Genius application Operating Mode.



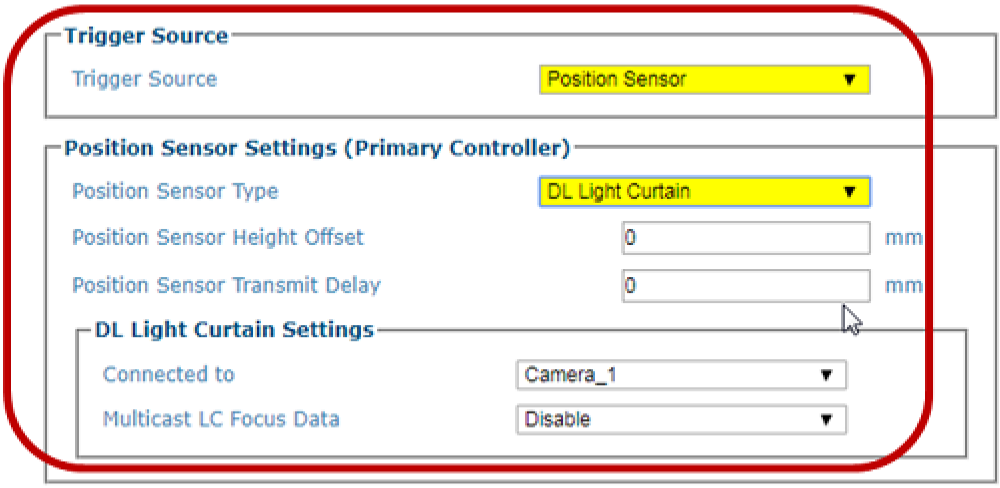
SETTING UP THE AS1 AREASCAN

Reference the **AS1 Series Instruction Manual** (included with your AS1 kit) for complete information on connecting and aligning the ASl. Make the following selections in the AV500/AV900 e-Genius application Operating Mode.



SETTING UP THE DS2 LIGHT CURTAIN

Reference the DS2 Instruction Manual available at www.datalogic.com for complete information on connecting and aligning the Light Curtain. Make the following selections in the AV500/AV900 e-Genius application Operating Mode.



NOTE: Make sure to connect the correct Light Curtain is connected to the correct camera.

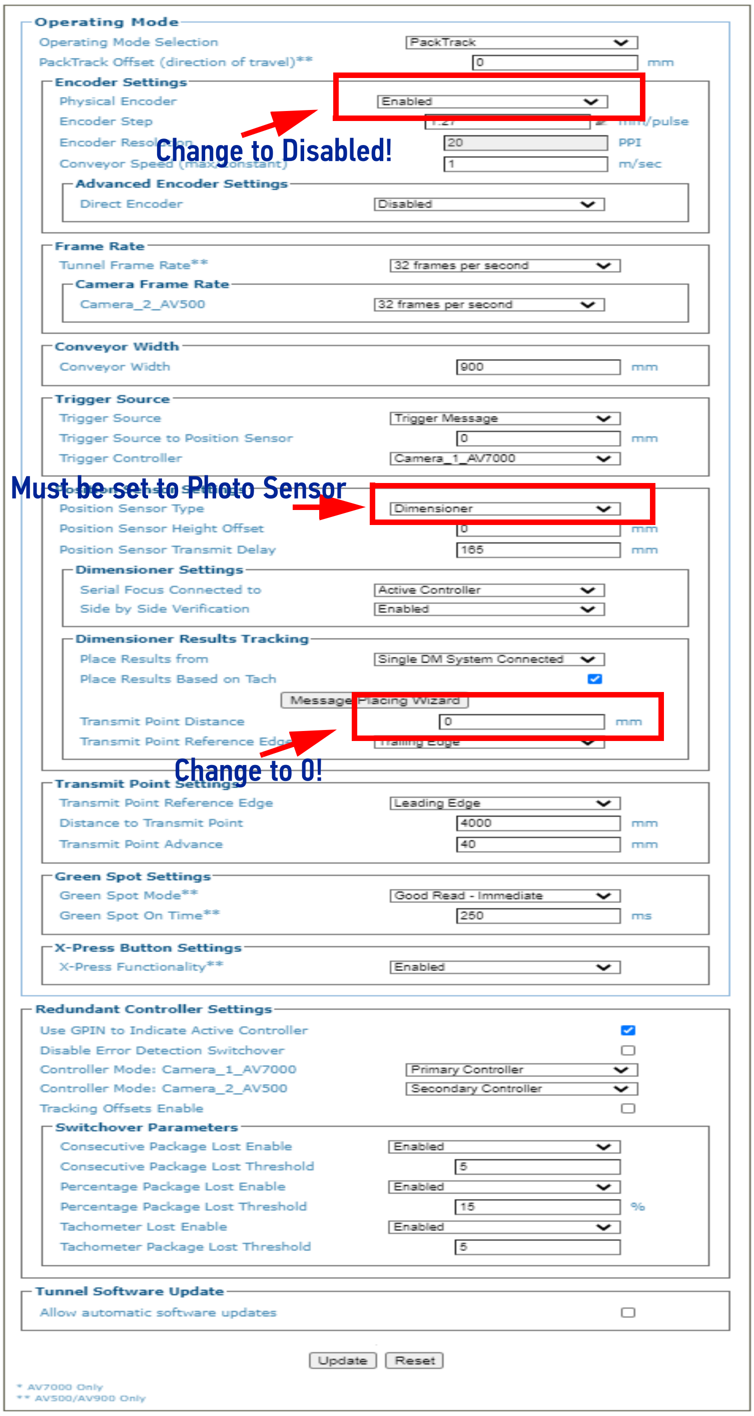
SETTING UP THE S85 PHOTOSENSOR

Reference the DK503 Instruction Manual available at www.datalogic.com for complete information on connecting and aligning the S85 Position Sensor. There may be more than one S85 used in the system. Normally for a side read camera two S85's may be used, one for each side read camera. Make the following selections in the AV500/AV900 e-Genius application Operating Mode.

You must first temporarily change the camera connected to the S85 to internal tach mode. This allows you to see the S85 input coming into the serial port of the camera when the conveyor belt is not moving.

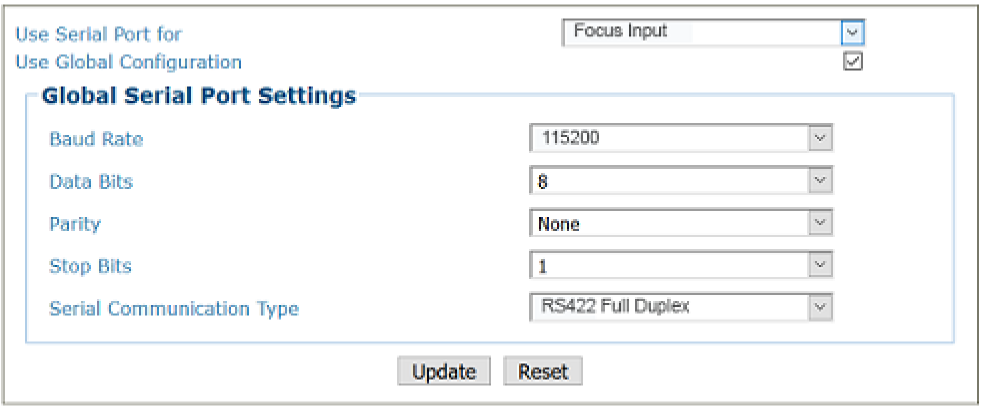
To do this follow these steps:

1. In the menu tree under **Modify Settings**, click **Operating Mode**. The **Operating Mode** window opens.
2. Under **Encoder Settings**, click **Disabled** at the **Physical Encoder** drop-down.



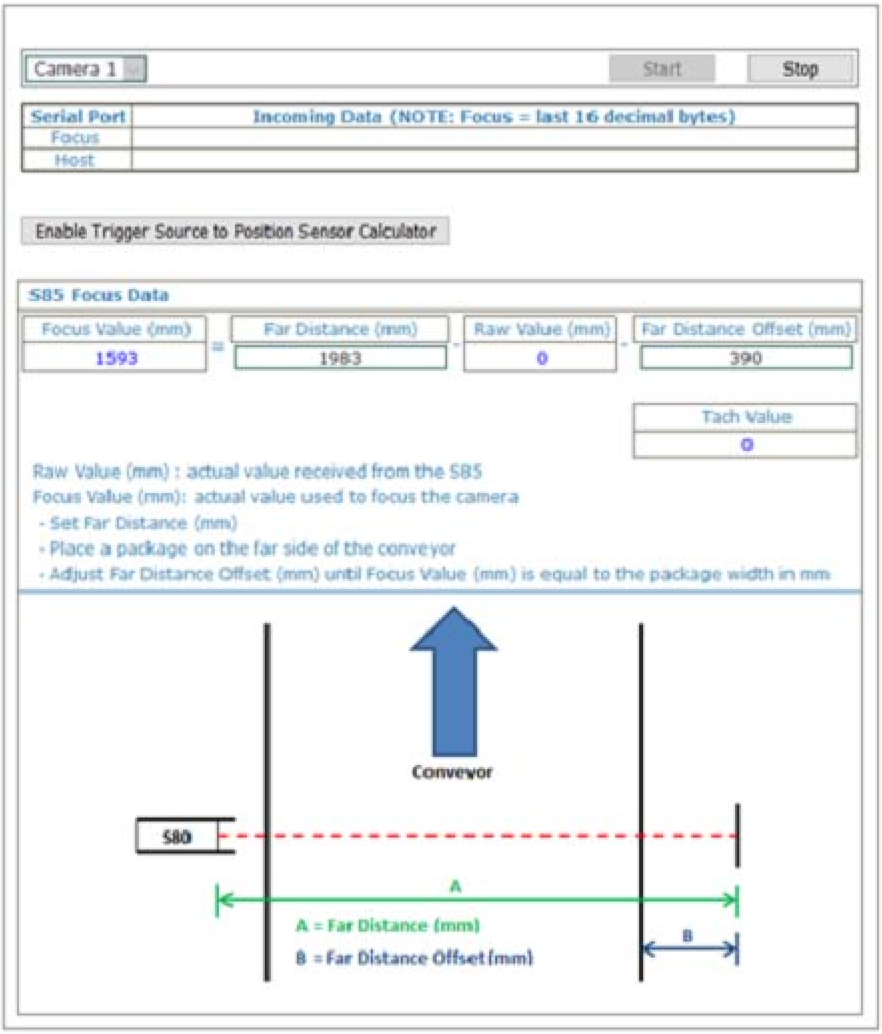
3. In the menu tree under **Device Settings**, click **Serial > Focus/Host Port**. The **Focus/ Host Port** window opens.

4. Set the **Focus/Host Port** parameters as shown below:. This will need to be done for each camera an S85 is connected to.



5. Click **Update** to save your changes.

6. In the menu tree under **Diagnostics**, click **Serial Comm Status**. The **Serial Communications Status** window opens. Follow the steps described below.



7. Once you have determined the appropriate **Far Distance Offset**, go back to the **Operating Mode** window and enter it.

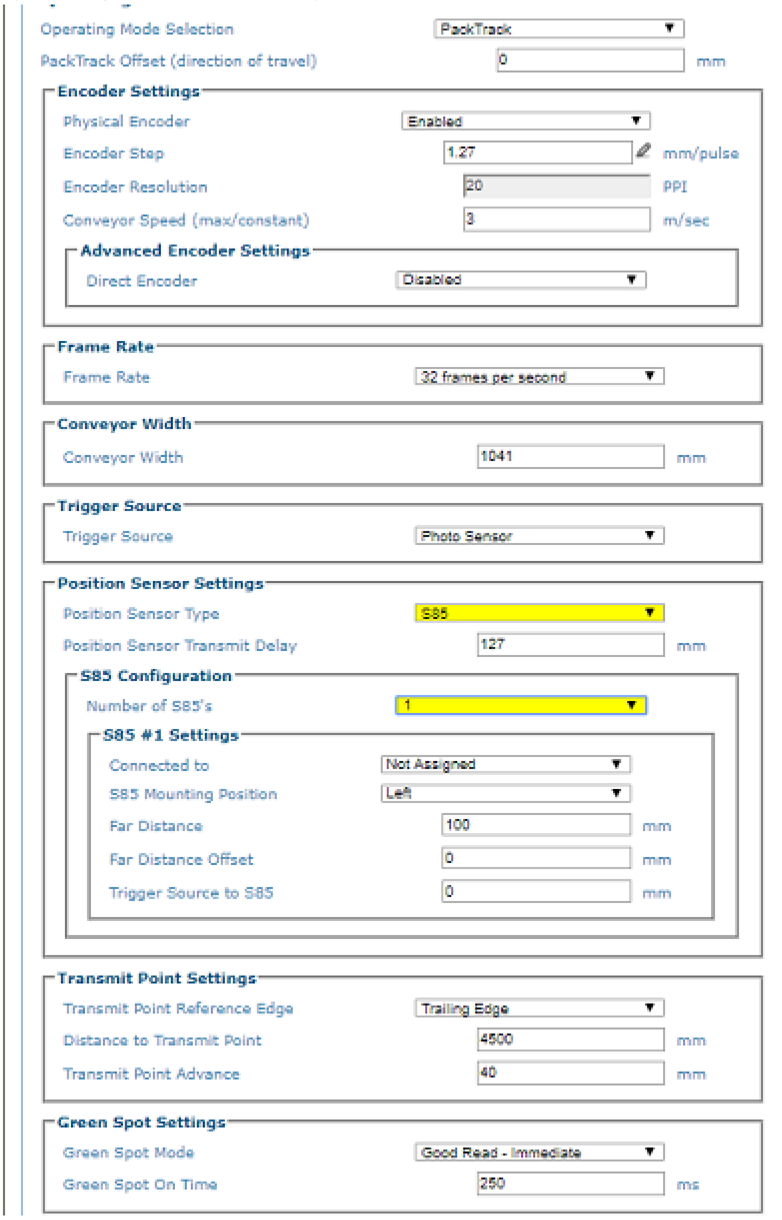
8. Re-enable your S85 and Click **Update** to save your changes.

Setup and Calibration

NOTE: Make sure to connect the correct S85 to the correct camera.

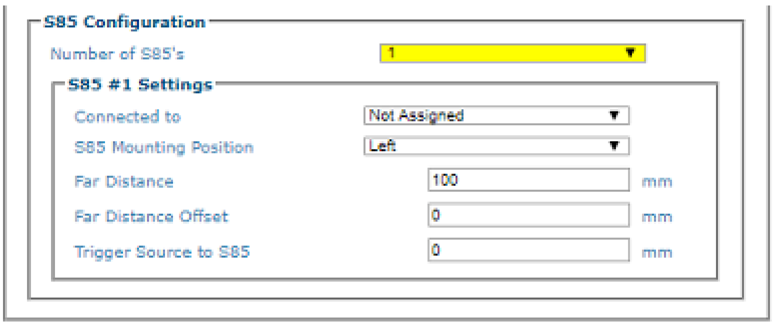
To calibrate the S85 Distance Sensors, follow these steps:

1. In e-Genius under Modify Settings, navigate to **Global Settings / Operating Mode.** The Operating Mode window opens.



2. Select the **Photo Sensor** as **Trigger Source** from the drop-down.

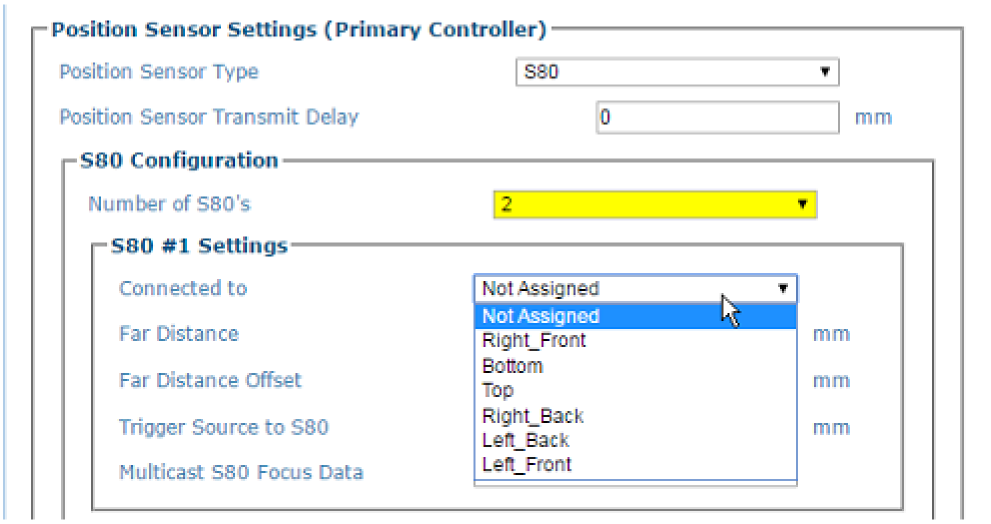
3. Select the **Position Sensor Type** from the drop-down. Select S85 or S85 with DL Light Curtain.



4. Enter the **Position Sensor Transmit Delay** as 127mm. This is required because the tach controller camera (with or without an S85 connected) tracks the connected S85's and DL light curtain to a point that is 127mm past the S85/LC that's located the furthest downstream from the PE (and closet to the first camera scanline).

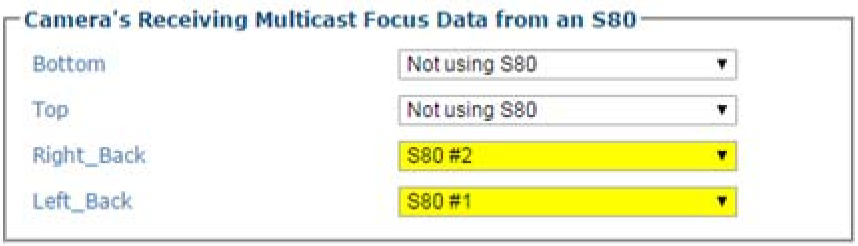
5. Select None or 1 from the **Number of S85's** drop-down.

6. For each S85 used, select the correct camera from the **Connected to** drop-down.



7. If the S85 is required to share its focus information with other cameras on the same side of the conveyor, select **Enable** from the **Multicast S85 Focus Data** drop-down.

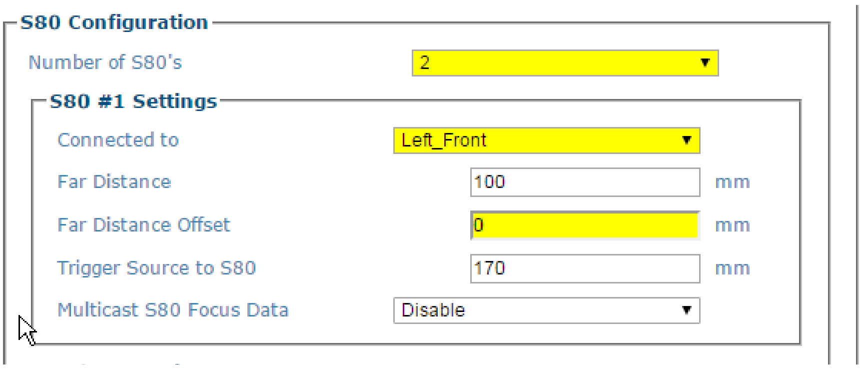
8. Once Multicast is enabled, **Camera's Receiving Multicast Focus Data from an S85** options appear.



9. Select from the Multicast Focus Data drop-downs which cameras will use data from which S85.

10. Measure the distance from the trigger source to the first S85.

11. Enter this value into the **Trigger Source to S85** field. In this example 170 has been entered.

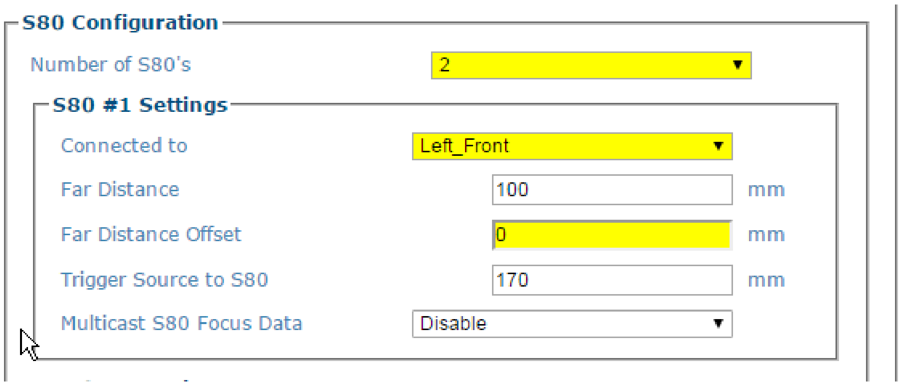


12. Click **Update** to save your changes.

13. In **e-Genius** under Diagnostics, navigate to **Serial Comm Status**. The Serial Communications Status window opens.

14. Determine the Far Distance (A).

15. Enter the displayed distance in the **Operating Mode > Far Distance** field. Click U**pdate** to save your changes.



16. Remove all objects from the conveyor belt and click the **Start** button.

17. Place an object of known width on the far edge of the conveyor and adjust the Far Distance Offset (B) until the focus value equals the object width.

18. To adjust the distance, press enter each time you make an adjustment.

19. Enter this displayed value in the **Operating Mode > Far Distance Offset** field.

20. Click **Update** to save your changes.

SETTING UP THE DM3610 DIMENSIONER

This focus setup is used to calibrate Dimensioner system focus data for AV500/AV900 Camera systems. DM3610 Dimensioners provide focus data for Datalogic cameras, including the camera, NVS9000, and AV6010.

Refer to the DM3610 Dimensioner Reference Manual (or Two-Head Dimensioner Reference Manual) for complete information on installation and calibration of the DM3610. It is available for download from www.datalogic.com.

NOTE: For single Dimensioner applications, the DM3610 must be running software version 1.8.11 or greater. For multi-head applications, the DM3610's must be running 1.8.1 and the DC3000 must be version 1.3.60 or greater.

The Dimensioner scan line must be installed at least 500 mm [20 in] upstream from the nearest camera scan line.

The examples used in this guide use Imperial units i.e. inches. AV500/AV900 If the system is configured for metric, the unit of measure will be in mm.

Remember to reset these parameters to the application specifications after the calibration is complete.

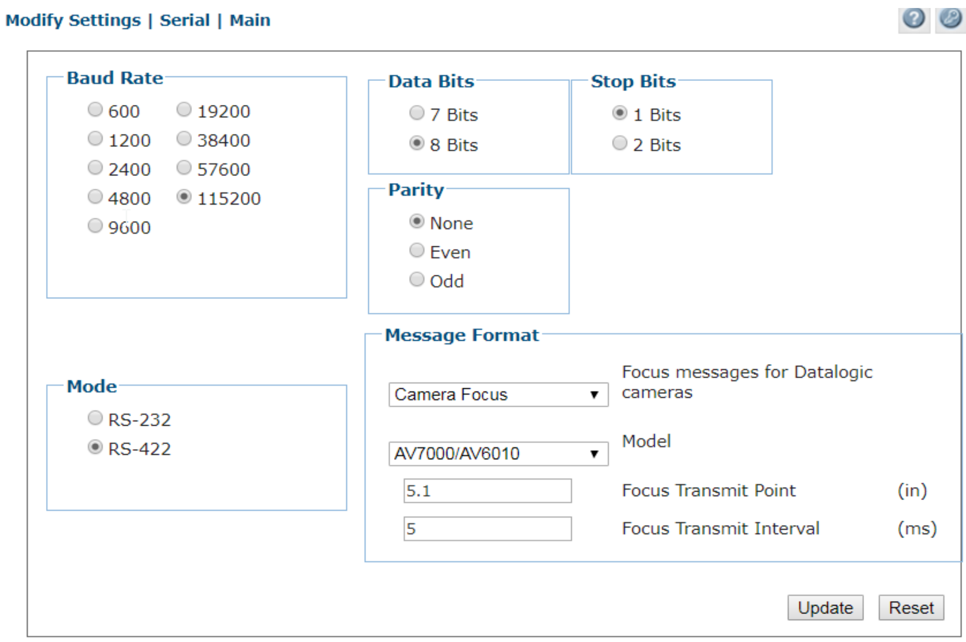
Also see “Determining the Distance to Transmit point for AV500/900 applications” on page 124.

Preparation

Before beginning the DM3610 focusing process, a few preliminary settings are required.

NOTE: When working with a multi-head Dimensioning system, the focus setup steps apply to the unit designated as the “Tach Master” by the DC3000.

1. In the DM3610 e-Genius under **Modify Settings**, navigate to **Serial | Main** or **Aux** depending on the port wired to the AV500/AV900 (typically **Main,** consult your application interconnect diagrams for details). The **Serial | Main** window opens.



2. Make sure the selected **Baud Rate** matches that of the AV500/AV900 (uses the main port, RS485 (RS422), at 115200).

3. Under **Message Format**, select **Camera Focus** from the **Focus messages for Datalogic cameras** drop-down list.

4. Select the **Model** of camera for which you are focusing.

5. Enter the **Focus Transmit Point**. This is the distance the DM3610 waits until after the AV500/AV900 scan line has read, to transmit the message. This value correlates to a value in the AV500/AV900 settings. Default is 8 inches.

6. **Leave at the default unless otherwise instructed!** Enter the **Focus Transmit Interval**. This is the amount of milliseconds between data transmissions. It defines the frequency of the data transmissions from the DM3610(s).

7. Click **Update** to save the changes.

8. The distance between the far working distances of the cameras is considered the “Conveyor Width” and must also be entered in the **Conveyor Width** field in AV500/AV900 **Global Settings | Operating Mode.**

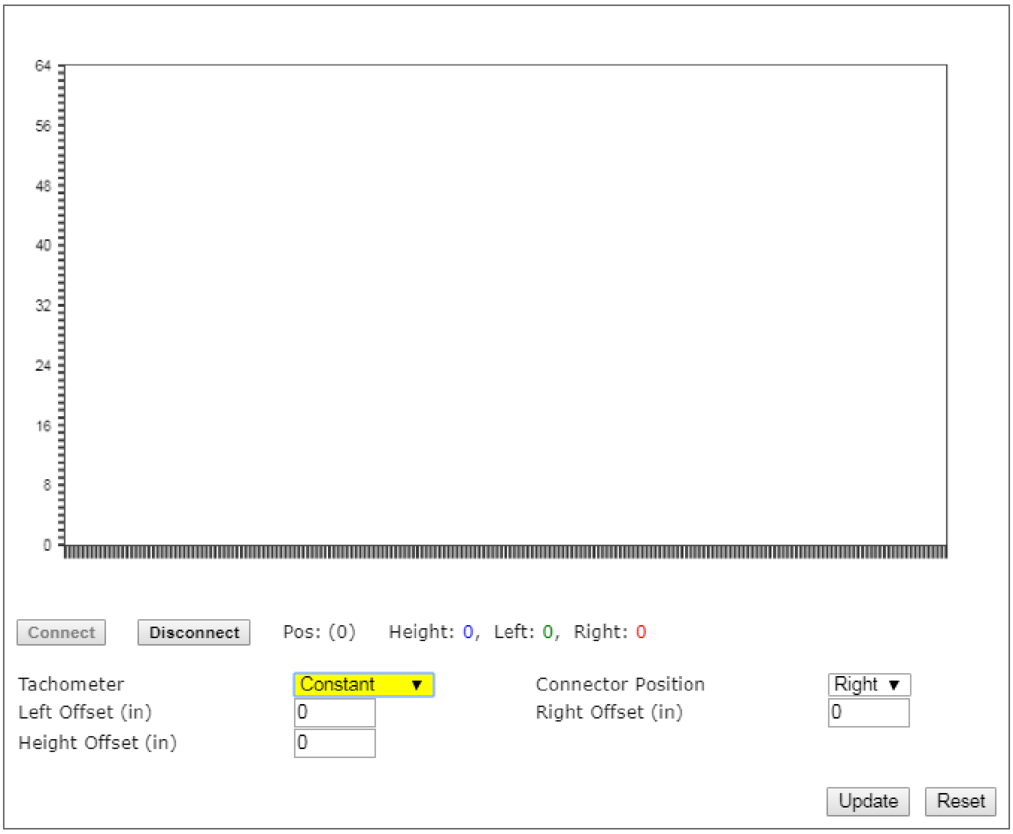
Understanding DM3610 Focusing and AV500/AV900 System Orientation

The goal of this focusing process is to correlate the DM3610 zero reference points to the far working distances of the cameras.

The DM3610 Left and Right Offsets will focus the DM3610 at the **Far Working Distances (Left and Right)** of the side AV500/AV900 cameras. These values are not necessarily the same. AV500/AV900 Reference the system application drawings for the exact prescribed Far Working Distances of each camera.

1. Navigate to **Diagnostics | Focus Setup**. The **Focus Setup** window opens,

NOTE: If you navigate away from the Focus Setup page, the Constant Tach setting will automatically reset to Hardware Tach. AV500/AV900 Reset it, to continue the focus setup process.



2. From the **Tachometer** drop-down list, select **Constant**.
3. Verify that the values displayed for **Left Offset, Right Offset,** and **Height Offset** are all set to 0.
4. Referencing the direction of conveyor travel, view the Dimensioner from an upstream position. Determine if the connectors located on the side of the unit face left or right, see the image below.

5. From the **Connector Position** drop-down, select **Left** or **Right**.

6. Click **Update** to save the changes.

WARNING: When working with a DC3000 multi-head system, you must select a focus data source on the DC3000 Tach/Trigger/Transmit page. In applications involving side read cameras, select Head 1 and Head 2. For top read only applications, selecting a single head will suffice.

Adjusting DM3610 Left Focus Offset

1. Position a test box with a known width in the dimensioner line(s) so the side of the box is at the RIGHT side AV500/AV900 far working distance as specified by the application’s installation drawing. In this example we will be using a box with a 3” width.

WARNING: When working with a DC3000 multi-head system, the text box must intercept all dimensioning lines

NOTE: When working with a DC3000 based Dimensioning system, please allow time for the constant tach signal to synchronize between the Master and Slave units.

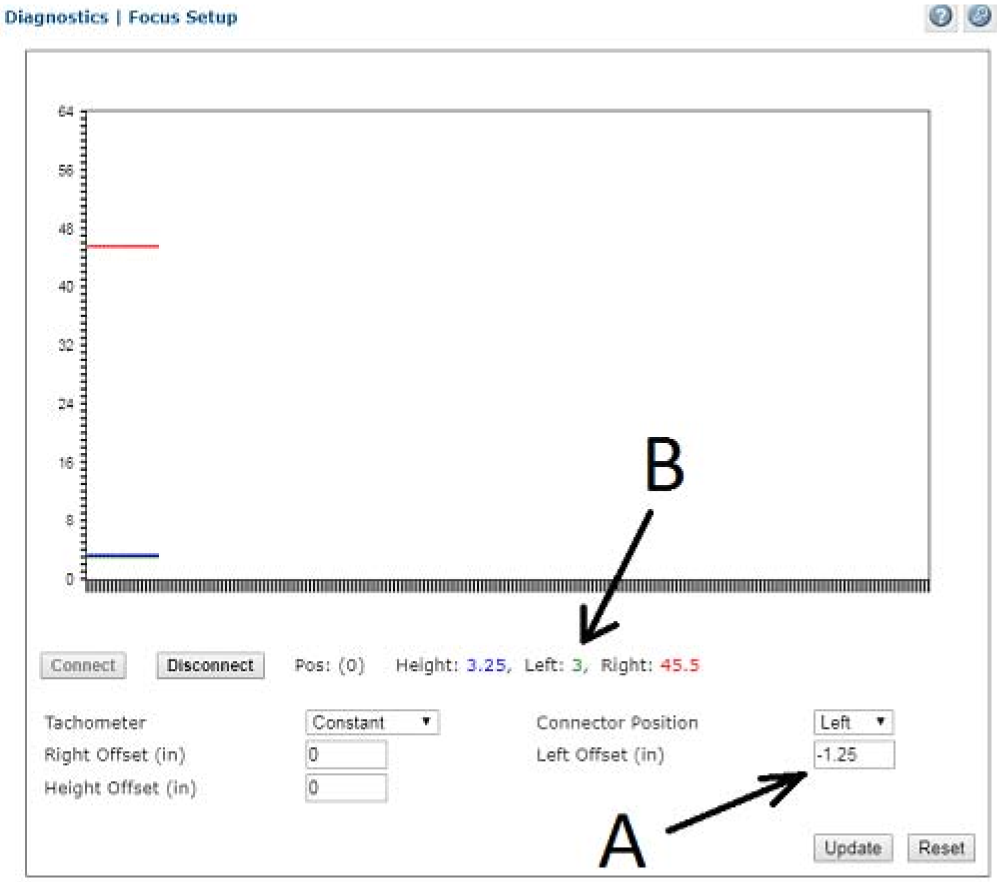
2. In the menu tree under **Diagnostics**, click **Focus Setup**. The **Focus Setup** Windows opens.

3. View the displayed data and determine what the left value is. In the displayed example above, the value is 4.25".

4. Subtract the width of the test box, in our example it is 3", from the value displayed for Left.

$$4.25 - 3 = 1.25$$

5. Enter the result as a NEGATIVE value in the Left Offset field. In this case you will enter -1.25.



6. The position value displayed for the Left is now 3.

7. Click **Update** to save your changes.

Adjusting Right Focus Offset

NOTE: When working with a DC3000 multi-head based Dimensioning system, the text box must intercept all dimensioning lines.

1. Position the test box with a known width in the dimensioning line so the LEFT side of the box is at the RIGHT far working distance as specified by the application installation drawing.

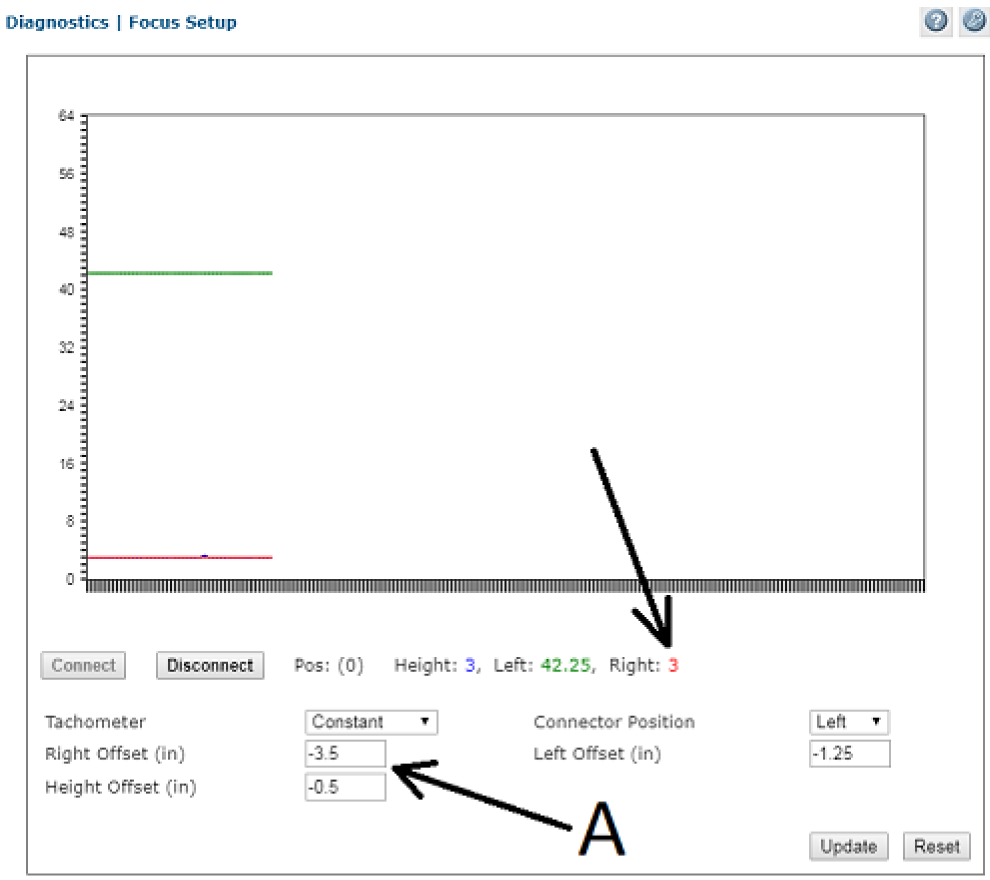
2. View the displayed data and determine what the **RIGHT** value is. In our example the value is 6.5”.

3. Subtract the width of the test box from the value displayed for RIGHT.

   6.5 – 3 = 3.5

4. Enter the result into the RIGHT OFFSET field as a negative value, in our example it is -3.5.

5. Note the position value displayed for RIGHT is now 3.



6. Click **Update** to save the changes.
7. Test the system by inducting a series of application objects and bar codes. Use the AV500/AV900 imaging utility to verify that the cameras are focusing properly over the width and height of the conveyor.
8. Under **Tachometer**, select **Hardware/External** from the **Tach Source** drop-down list.
9. Click **Update**.

Adjusting Height Offset

NOTE: When working with a DC3000 multi-head based Dimensioning system, the text box must intercept all dimensioning lines.

1. Place the same test box in the center of the dimensioning line so the known distance side is facing up.
2. Determine the Height value as displayed by the DM3610. In the image below the 3” test box displays a height of 3.5.

CHAPTER 6
CALIBRATION

The AV500/AV900 Camera can be set up as a single unit or with multiple units in a scanning array (tunnel). The AV500/AV900 camera system is a high-precision imaging system, and requires careful and accurate setup and calibration to function at its full potential.

REVIEW MOUNTING DRAWING AND APPLICATION SPECIFICATIONS

Make sure all equipment is mounted correctly based on the application drawings and specifications.

- **Deflection Mirror Alignment** - Reference the application drawing and section for deflection mirror placement and mounting.
- **Photoelectric Sensor, Trigger (if applicable)** - Mount the photoelectric sensor according to the application drawing, and with the following recommendations:
- Make sure the Photoelectric Sensor (PS) is square to the conveyor
- Make sure the PS is high enough off of the conveyor surface that it will not get false triggers from any part of the conveyor
- Make sure the PS is aligned properly to the reflector. (In a sender receiver application, make sure the two components are aligned correctly)
- Make sure the PS is positioned correctly upstream from the scan line (if applicable). See .
- If using any one of the additional focusing devices, see“Trigger, Positioning and Focusing Device Setup” on page 325 .

SOFTWARE UPDATE

If necessary, a Datalogic technician will update the AV500/AV900 CPU with the latest software. This must only be done by, or under the guidance of, a trained Datalogic technician.

NOTE: DO NOT use a parameter file from any previous AV500/AV900 installations.

You will need to connect a laptop to the AV500/AV900 in order to perform static and dynamic calibration, You may use any of the three Ethernet ports; Image, Host or Sync:

- Sync IP: 192.168.0.145
- Host default IP: 192.168.3.10
- Image default IP: 10.0.40.20
- Sync Controller IP (the sync adapter cable must be used):

NOTE: Your PC's IP address needs to match the camera system's IP Address range, "Changing Your PC's IP Address:" on page 78 for information on connecting a laptop to the system. The Host and Image port IP addresses may have been changed for your application. Contact your system administrator for changes.

e-Genius Calibration Presets

Before physical calibration is begun, a few settings need to be confirmed or modified in e-Genius. Your PC's IP address needs to match the camera system's IP Address range, *see* for information on connecting a laptop to the cameras.

System Info: Bring Each Camera into the Network

When power is applied to the cameras for the first time each camera will need to be brought into the sync network using e-Genius.

1. From the menu tree, navigate to the **Modify Settings | System Info**. The **System Info** Page opens.
2. From the **Action** drop-down list, select the **Add to Cluster as new.**
3. Click **Update** to add the camera to the **This Cluster** table.
4. Once each AV500/AV900 has been added under **This Cluster**, its mounting positions will need to be identified. Click **Blink** in a camera's row in the table. That camera's illumination will light.
5. Once the camera has been identified, select its mounting position from the **Camera** Position drop-down list.
6. Click **Update** to save the configuration.

PackTrack Calibration

The following procedure is for PackTrack Mode.

Operating Mode

In the menu tree under Modify Settings, navigate to Global Settings | Operating Mode. The Operating Mode window opens. See *section* for an explanation of the Operating Mode options.

The following parameters must be set to match the application:

1. Encoder Settings - **Encoder Step Settings: Modify Settings | Global Settings | Operating Mode** > **Encoder Step. Conveyor speed:** Enter the conveyor speed (Formula: Max conveyor speed x 1.05). This is needed so the AV500/AV900 sets the exposure time parameter during calibration.

2. **Trigger Source:** Make sure the Trigger Active State is set correctly, To test this, navigate to **Diagnostics | Device Tracking**. Run two boxes through the system. Confirm that the start and end trigger corresponds to the correct **Seq Number.**

3. Transmit Point Settings

4. Other Important Application Dependent Parameters:

- **Modify Settings | Global Settings | Object Detection**
- **Modify Settings | Global Settings | Barcode Settings**
- **Modify Settings | Global Settings | Communications**
- **Modify Settings | Global Settings | Output Format**
- **Modify Settings | Global Settings | Image Saving**

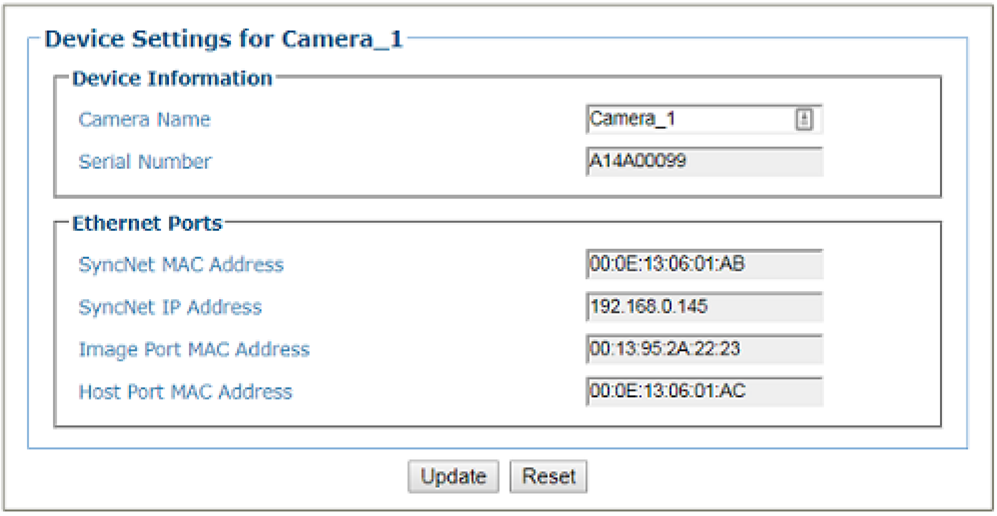
Device Settings

In the menu tree under Modify Settings, navigate to Device Settings. Since each camera is mounted separately, each AV500/AV900 camera in a system must be calibrated separately.

There will be a different Device Settings branch in the menu tree for each camera in an array. *See section* for an explanation of the Device Settings options.

1. In the menu tree, navigate to **Modify Settings | Device Settings | Camera *N* | Device Info**. The **Device Info** window opens.

2. Enter a unique name for the camera; such as top left, front right, etc. The new name will appear in the **Name** column on the **System Info** window, and also in the menu tree under **Device Settings**.



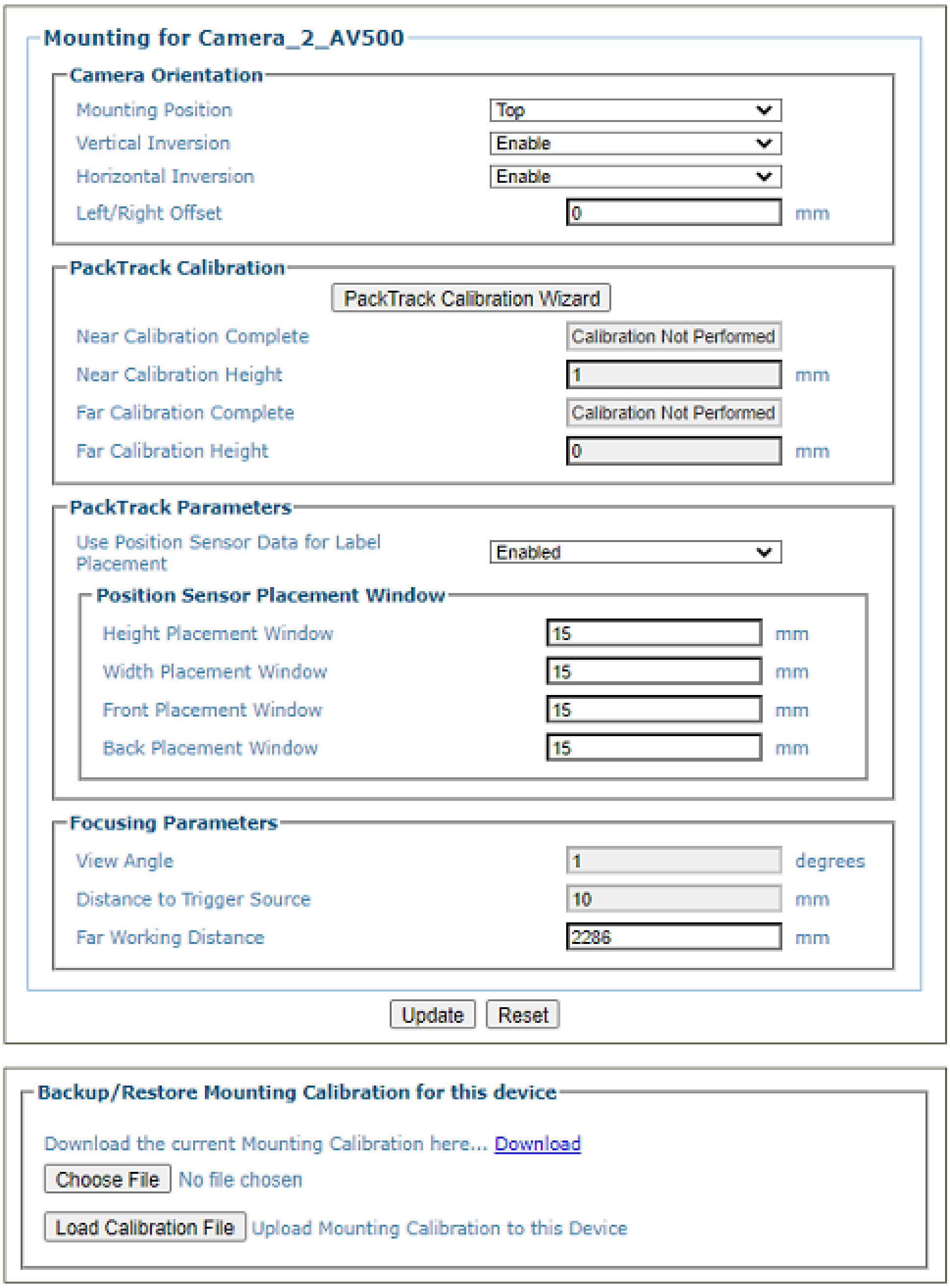
3. Click **Update** to save the new name. Repeat this for each camera in the system.

NOTE: If there are several cameras in your array, you may want to label them appropriately.

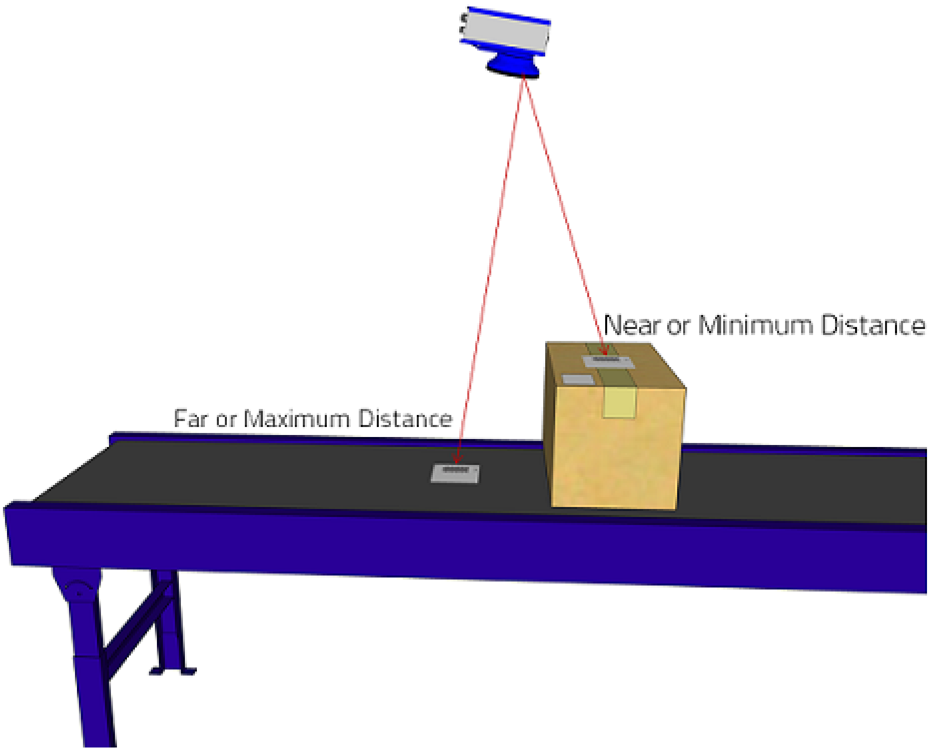
Static Calibration

Static calibration is used to set up and calibrate the camera while the conveyor is sitting still.

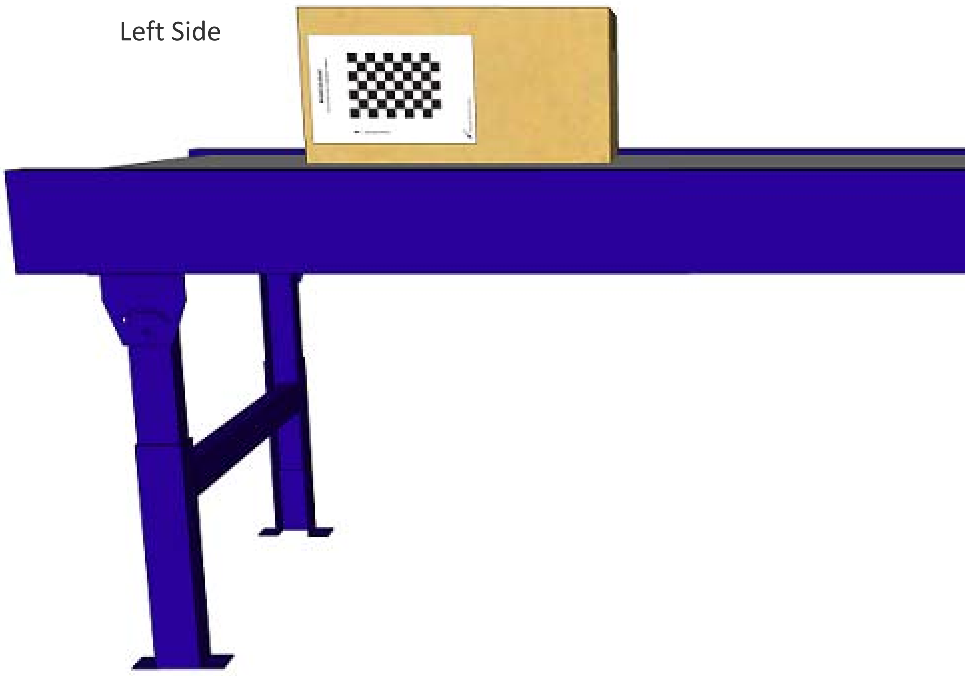
1. Navigate to **Modify Settings | Device Settings | Camera N | Mounting**. The **Mounting** window opens.

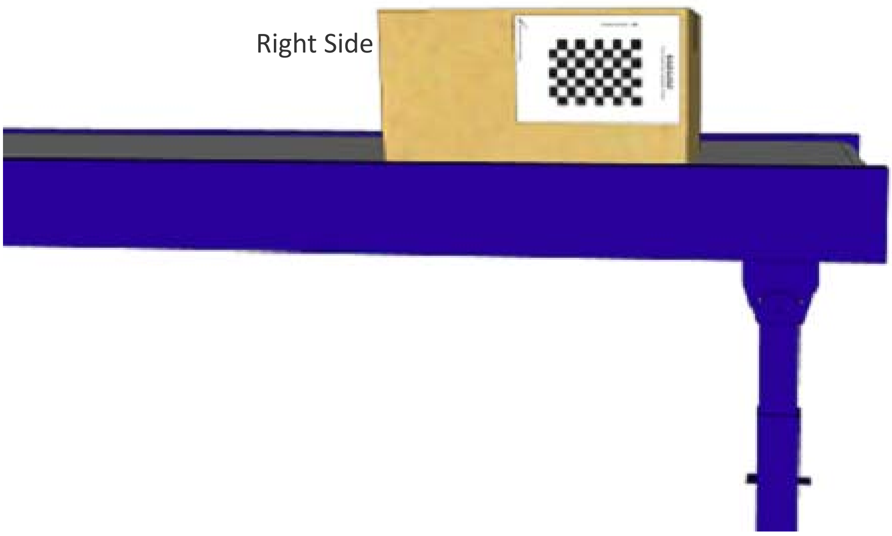


2. Click **PackTrack Calibration Wizard** button and Mounting Calibration for Camera n and **Step 1/5: Far Distance Calibration Target Alignment** appears.



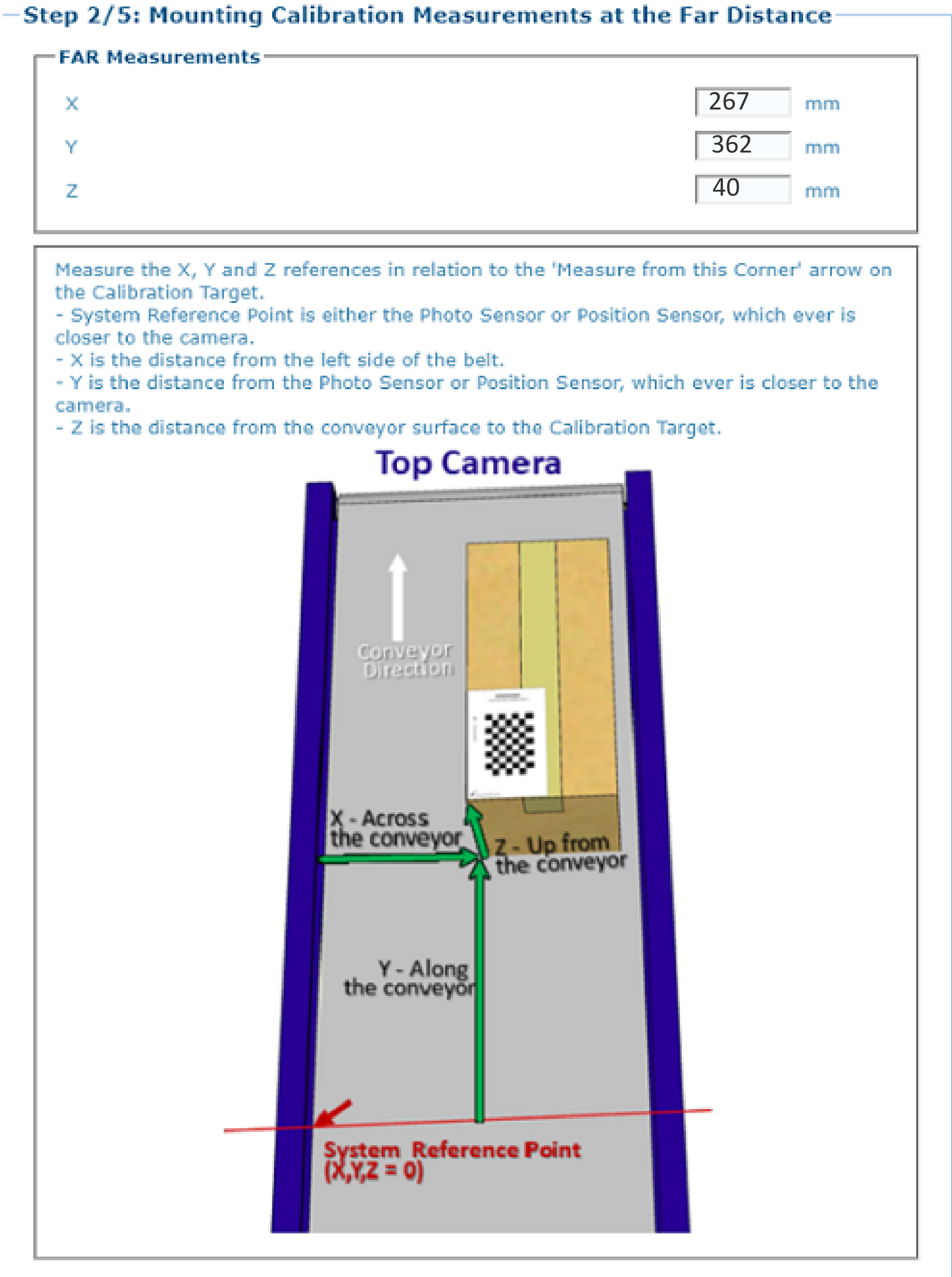
If you are calibrating side read cameras place your calibration target as show in the diagrams below.





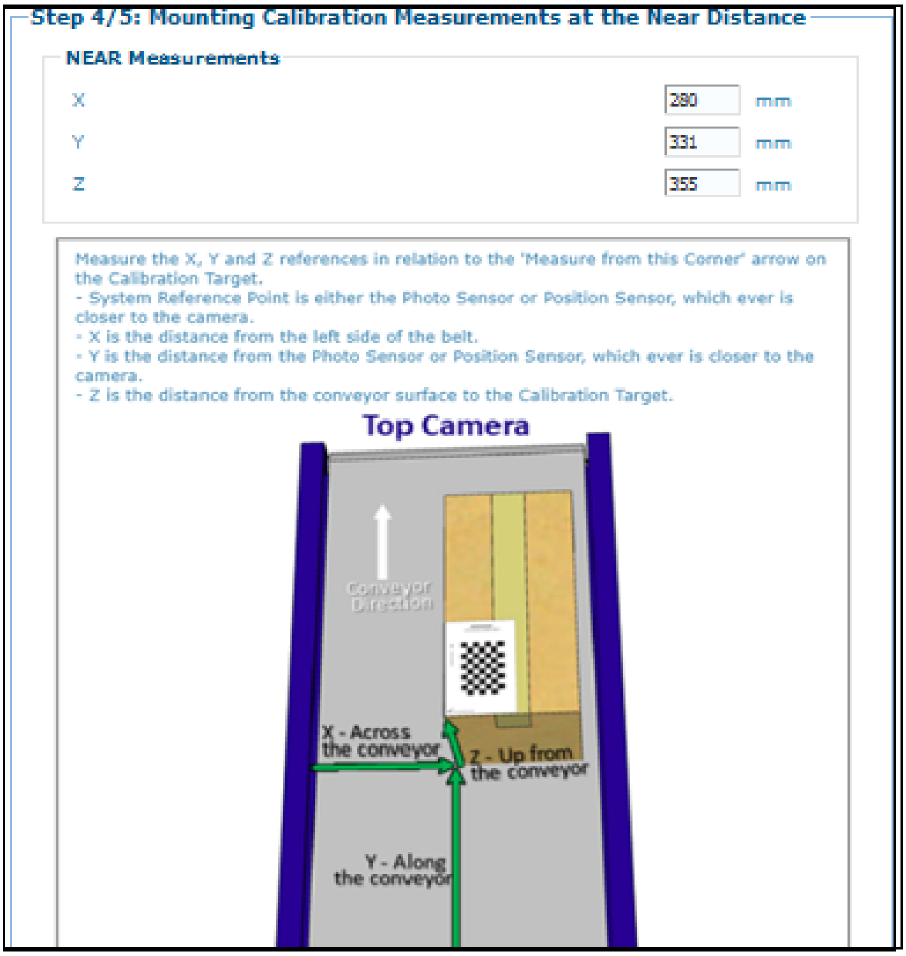
3. Place a calibration target at the maximum distance from the camera. Make sure the checker board grid is centered within the green alignment area. Make sure the Conveyor Direction arrow is pointing in the direction in which the conveyor is traveling. Leave the target under the camera and press **Next Step >>**.

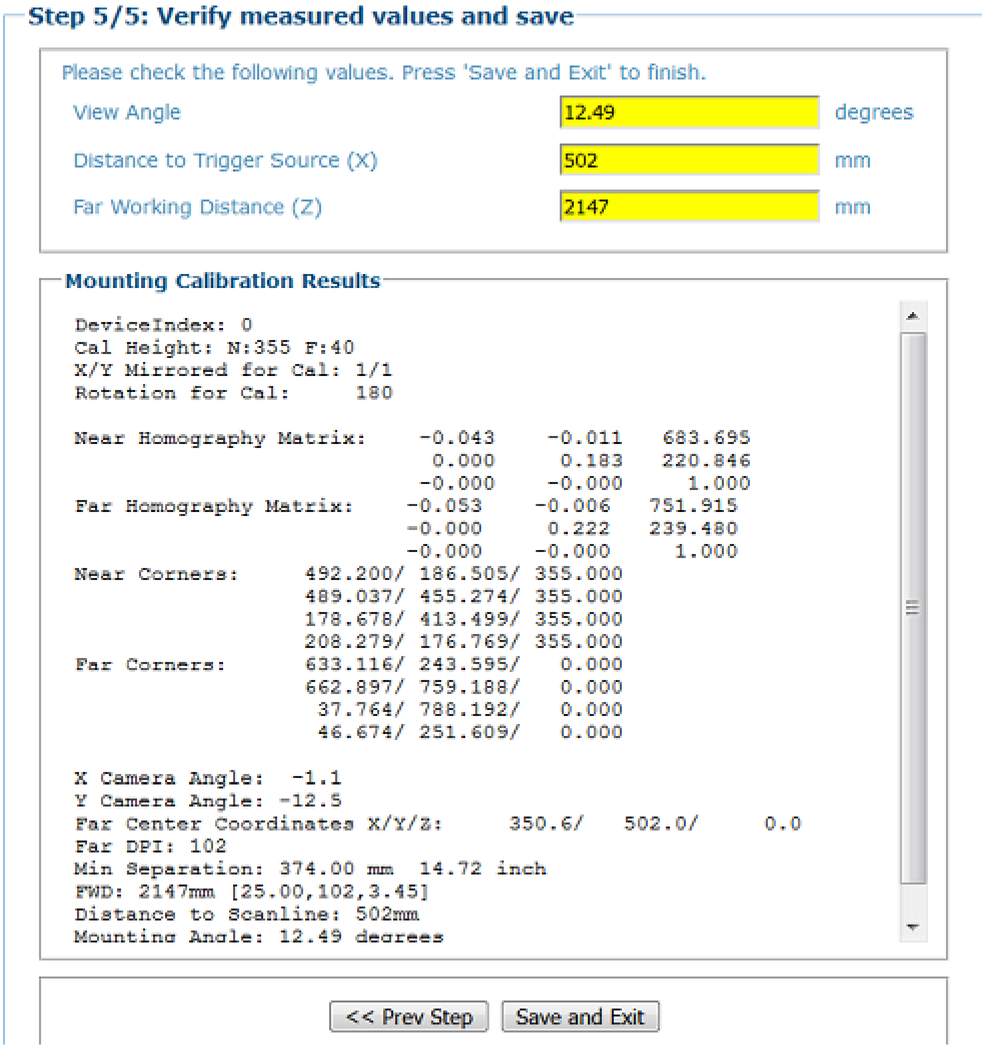
4. Step 2/5: **Mounting Calibration Measurements at the Far Distance** appears:



5. Measure the distance from the side of the belt to the Calibration Target.
6. Measure the distance from the Photo Sensor or Position Sensor, whichever is closer to the camera, to the Calibration Target.
7. Measure the distance from the conveyor surface to the Calibration Target. Z=0
8. Enter those measurements into the Far Measurements fields.
9. Click **Next Steps >>.**
10. Step 3/5: Near Distance Calibration Target Alignment appears:

11. Place a target at the minimum distance and measure X, Y, and Z references
    •X is the distance from the side of the belt to the Calibration Target.
    •Y is the distance from the Photo Sensor or Position Sensor, which ever is closer to the camera, to the Calibration Target.
    •Z is the distance from the conveyor surface to the Calibration Target.
12. Enter those measurements into the Near Measurements fields.
13. Click **Next Steps >>.**


Step 4/5: Mounting Calibration Measurements at the Near Distance
NEAR Measurements
X 280 mm
Y 331 mm
Z 355 mm
Measure the X, Y and Z references in relation to the 'Measure from this Corner' arrow on the Calibration Target.
- System Reference Point is either the Photo Sensor or Position Sensor, which ever is closer to the camera.
- X is the distance from the left side of the belt.
- Y is the distance from the Photo Sensor or Position Sensor, which ever is closer to the camera.
- Z is the distance from the conveyor surface to the Calibration Target.
Top Camera
Conveyor Direction
X - Across the conveyor
Z - Up from the conveyor
Y - Along the conveyor



14. Check the values for far distance and near distance.

15. Click **Save** and **Exit** button.

16. Verify!

Online Calibration

The following procedure is for Online Mode.

Operating Mode

In the menu tree under Modify Settings, navigate to Global Settings | Operating Mode. The Operating Mode window opens. See *section* for an explanation of the Operating Mode options.

The following parameters must be set to match the application:

1. **Set to Online Mode in Modify Settings | Global Settings | Operating Mode**

2. Trigger Source: Make sure the Trigger Source and Transmit Point Settings are correct.

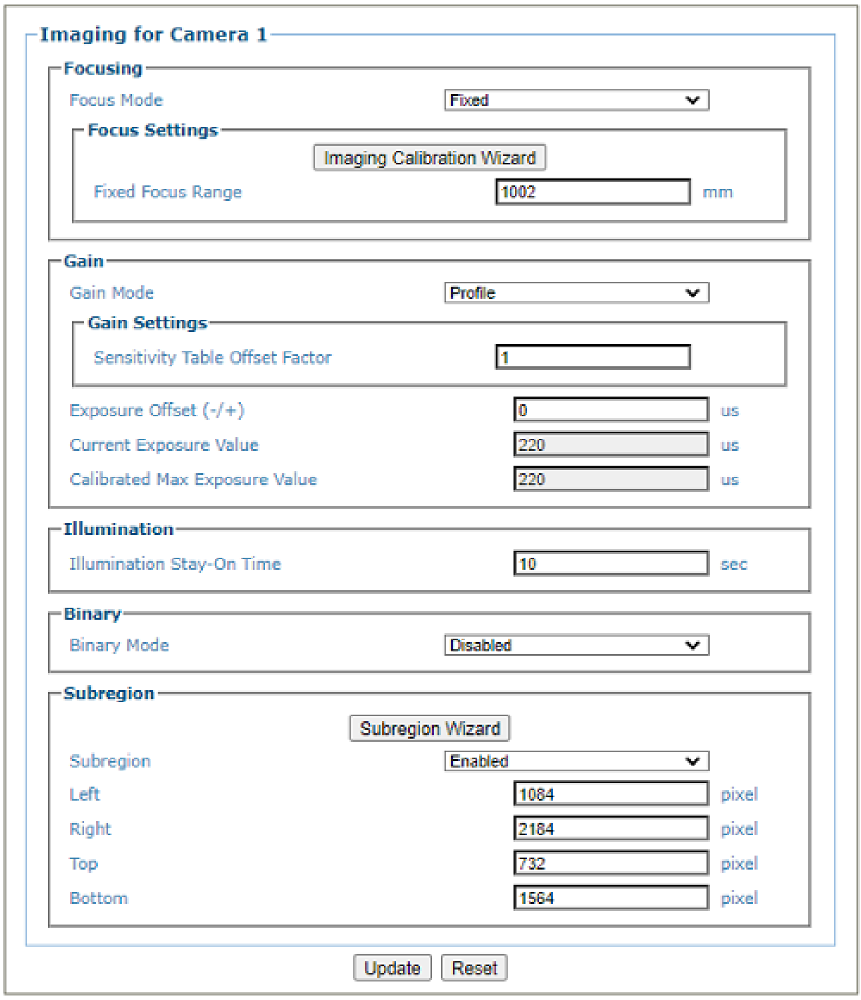
3. Check other Important Application Dependent Parameters:
- **Modify Settings | Global Settings | Object Detection**
- **Modify Settings | Global Settings | Barcode Settings**
- **Modify Settings | Global Settings | Communications**
- **Modify Settings | Global Settings | Output Format**
- **Modify Settings | Global Settings | Image Saving**

Set Camera Focusing

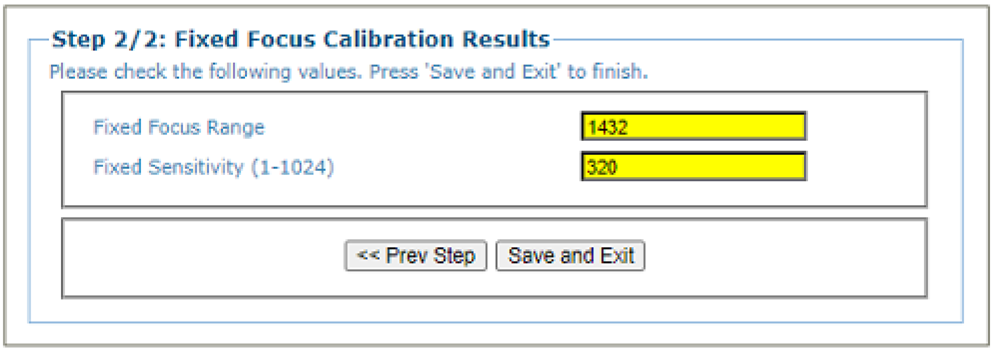
Set the camera focusing parameters to match the application:

1. **Go to Device Settings | Camera n Imaging** and Select Fixed, Dynamic, Dual or Sequential focusing.

2. Than click **Imaging Calibration Wizard** and follow the instructions.

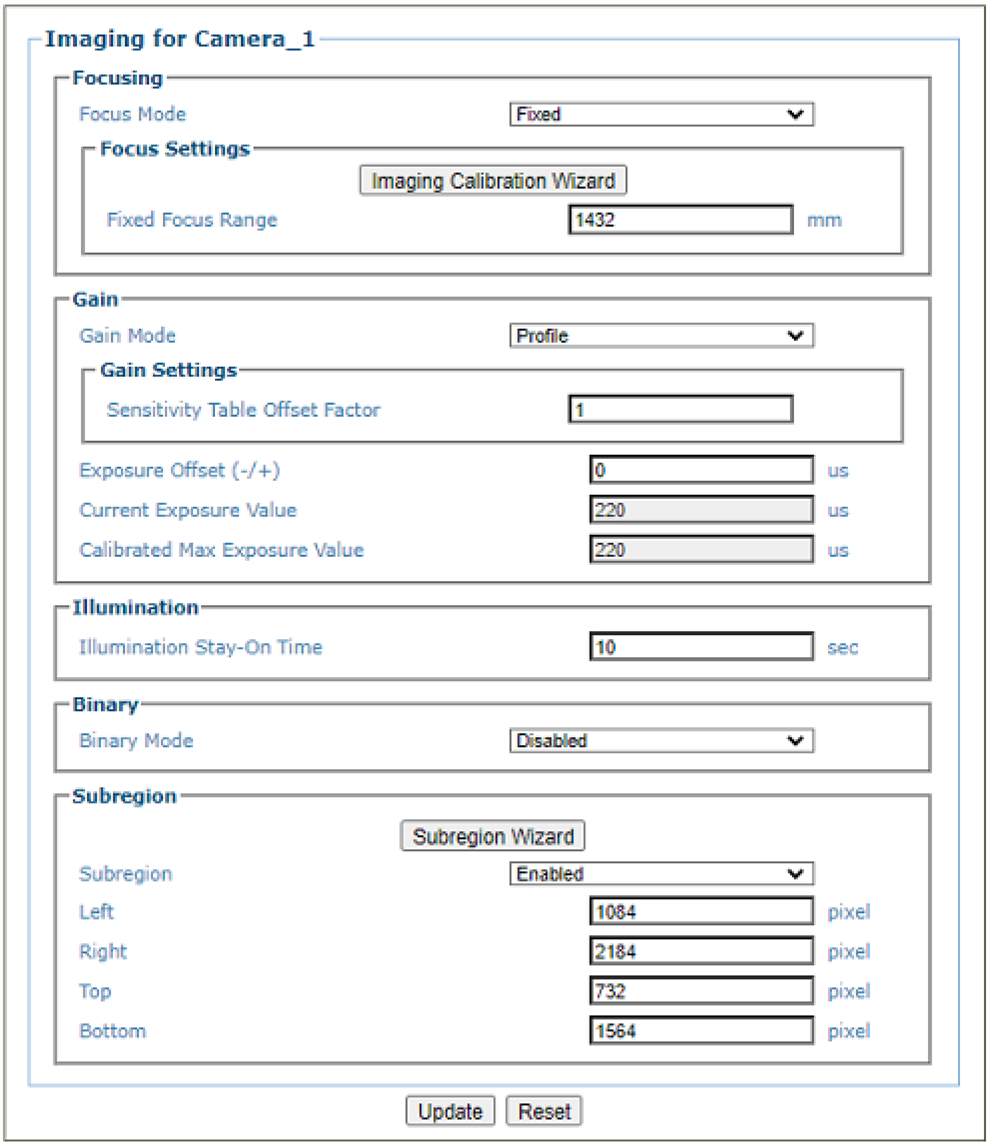


3. Place a target at the desired focusing distance and click **>>Next Step**. The camera will begin to find the correct focusing distance as shown below.



4. When the camera has completed this step it will show the Fixed Focus Range and Fixed Sensitivity values.

5. Click **Save and Exit** to complete the calibration process and the values will be transferred to the Imaging window.



6. Click **Update** to complete the process.

Other Camera Checks

Perform these additional camera checks:

1. Confirm communication with host.
- **Serial** (if applicable)
- **Ethernet** (if applicable)
- **Confirm Protocol Index** (if applicable)

2. Observe the System in Action.

3. Confirm that all cameras are reading the barcode correctly and that the scan point is communicating to the host.

SETTING THE AV500/AV900 TO COMMUNICATE WITH WEBSENTINEL PLUS

Follow the steps below to set up your camera to communicate with WebSentinel PLUS:

1. Set-up your Image Destination
2. Set-up the Image Saving Options
3. Define Transport Settings

NOTE: Set the parameters for you camera in the order specified here!

Set Up Your Image Destination

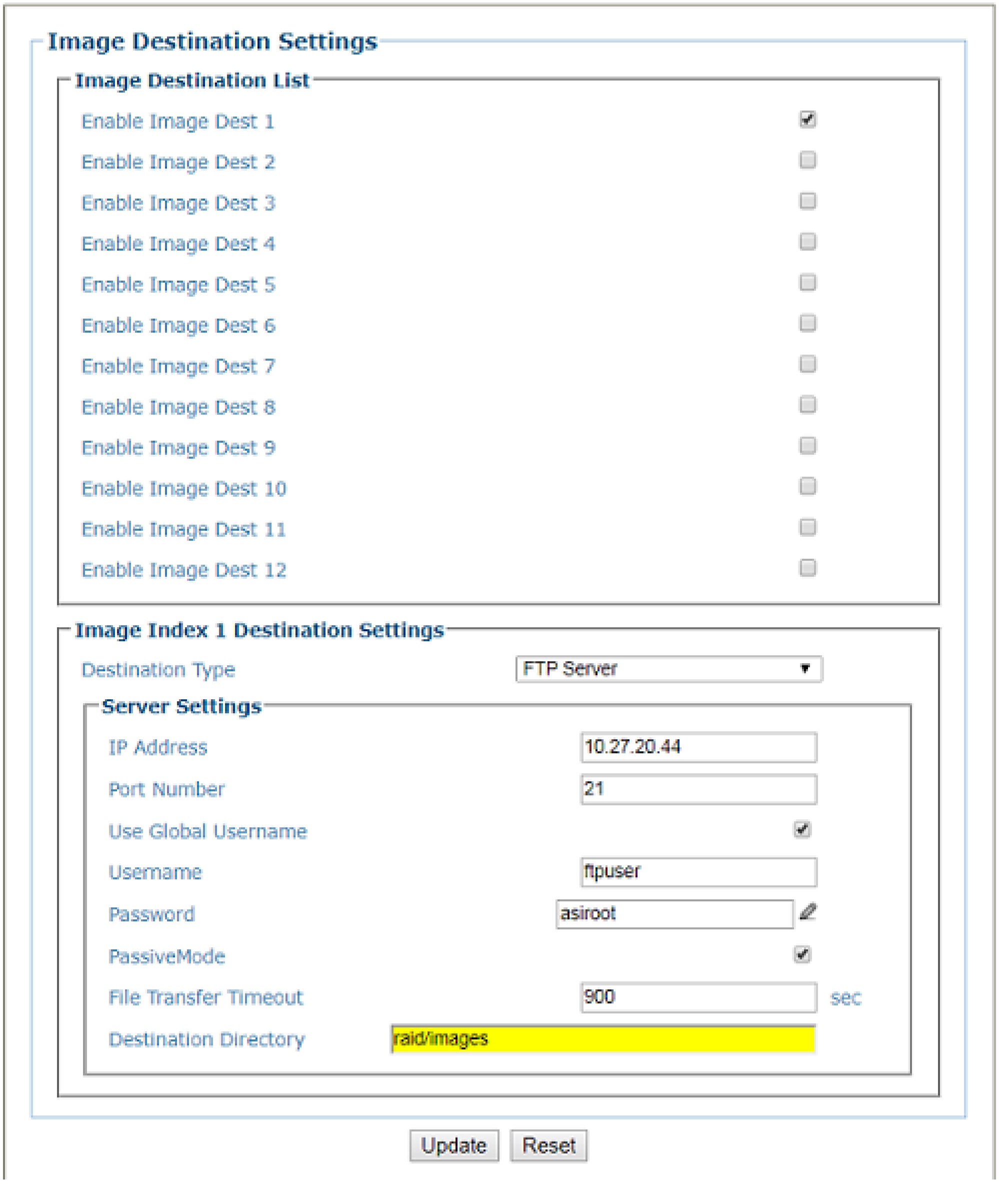
The camera saves image files to an FTP Server, CIFS network file share, or in volatile on-board storage inside the camera. The preferred network for transferring images is the Image network interface FTP. The Image network interface supports a 1 Gb connection speed for the operation of the AV500/AV900.

This process explains how to save images to the FTP Server. If you wish to save images to CIFS network file share or in volatile on-board storage.

NOTE: These settings pertain to connecting to the Datalogic WebSentinel PLUS server. The Destination Directory - raid/images is the file location used by the Datalogic Web-Sentinal server. If the WebSentinal software is mounted on a customers server the destination directory may be different.

One of the greatest advantages of using WebSentinel PLUS with the AV500 is the ability to save all of your camera images.

1. In the e-Genius menu under **Modify Settings**, select **Global Settings >Image Saving > Destination Settings,** the **Image Destination Settings** window opens.



2. Enable Image Destination 1 or the next available.

3. Select the destination type **FTP Server** from the drop-down.

4. Enter the **IP Address. Port Number, Username, Password and File Transfer Time-out** as indicated above.

5. Enter your Destination Directory as **raidimages**.

6. Click **Update** to save the changes.

Set Up the Image Saving Options

1. In the menu tree under **Modify Settings**, select **Global Settings >Image Saving > Image Settings**. The **Image Saving Settings** window opens.

2. Set the **Image Saving** options as shown below.

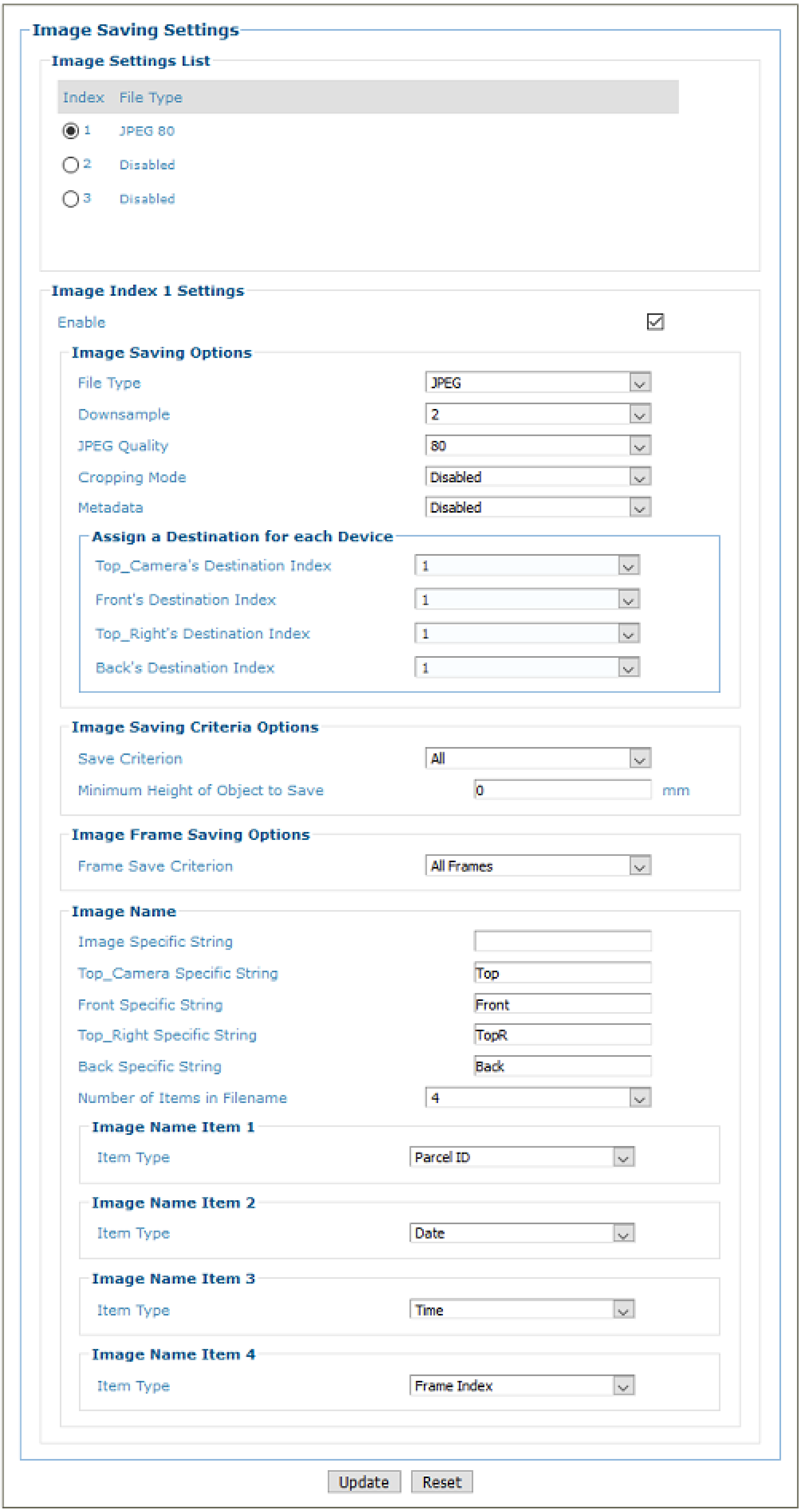
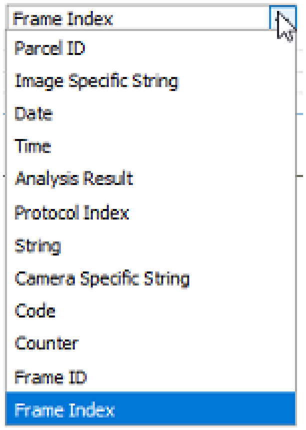


Image Saving Settings
Image Settings List
Index File Type
1 JPEG 80
2 Disabled
3 Disabled
Image Index 1 Settings
Enable
Image Saving Options
File Type JPEG
Downsample 2
JPEG Quality 80
Cropping Mode Disabled
Metadata Disabled
Assign a Destination for each Device
Top_Camera's Destination Index 1
Front's Destination Index 1
Top_Right's Destination Index 1
Back's Destination Index 1
Image Saving Criteria Options
Save Criterion All
Minimum Height of Object to Save 0 mm
Image Frame Saving Options
Frame Save Criterion All Frames
Image Name
Image Specific String
Top_Camera Specific String Top
Front Specific String Front
Top_Right Specific String TopR
Back Specific String Back
Number of Items in Filename 4
Image Name Item 1
Item Type Parcel ID
Image Name Item 2
Item Type Date
Image Name Item 3
Item Type Time
Image Name Item 4
Item Type Frame Index
Update
Reset

NOTE: This information is an example only. Your application may require different parameters.

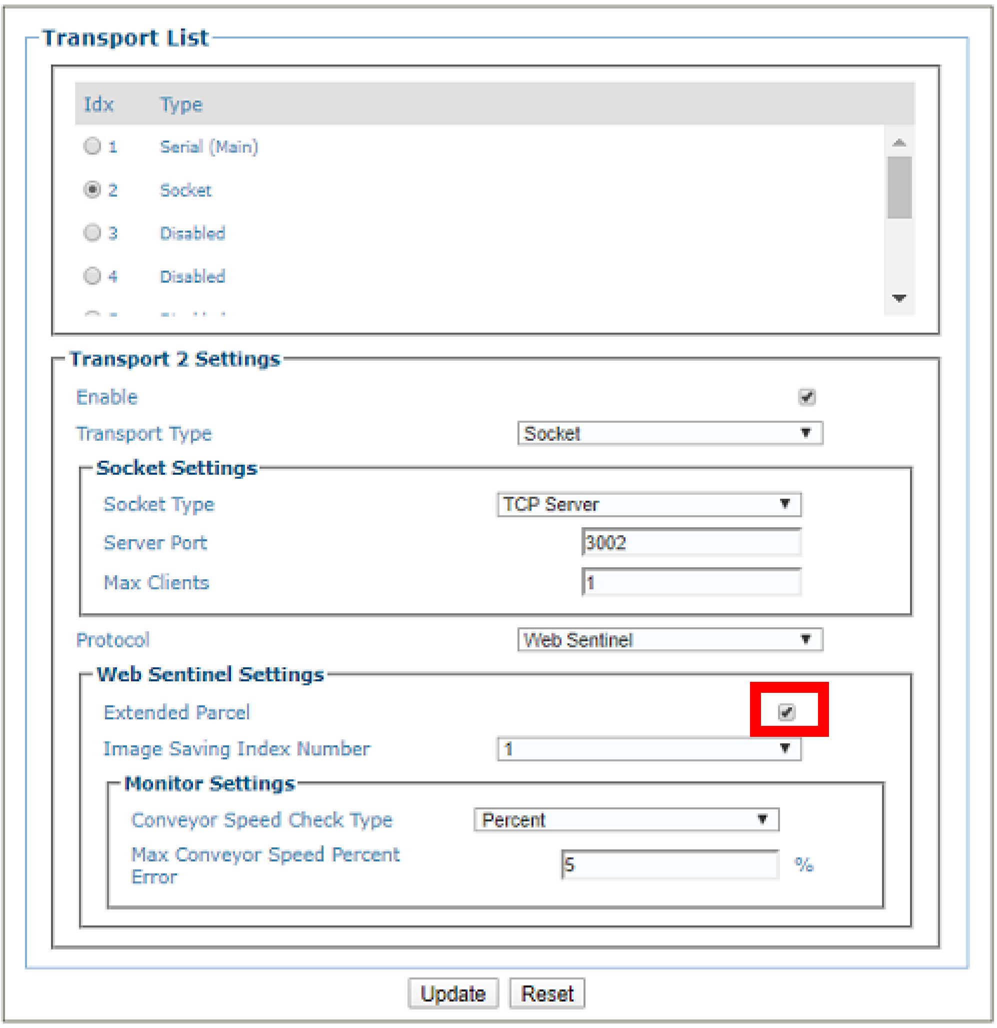
One of your Image Name Item > Item Types must be set to Frame Index as show above. This is required so that each frame is saved as a unique image with a unique filename, therefore assuring that frames are not saved over-top of one another.



3. Click **Update** to save the changes.

Define Transport Settings

1. In the menu tree under **Modify Settings**, select **Global Settings > Communications > Transports.** The **Transport List Settings** window opens.
2. Set the **Transport List** options as shown below.
3. **The Extended Parcel check-box must be selected**, if you are to receive image and dimension information.



4. Click **Update** to save the changes.

CHAPTER 7
MAINTENANCE

OVERVIEW

This chapter provides instructions for maintaining optimum performance and life for your AV500/AV900 cameras. It provides specific information on:

- Maintenance Procedures
- Exterior Cleaning
- Mounting Hardware Checks
- Wiring Connection Checks

Item	Description
Soft-bristle brush	For cleaning the unit's exterior
Clean, soft cloths	For cleaning the unit's exterior
Cleaning solutions	Mild detergent solution for cleaning the unit's exterior. 70% denatured alcohol, 30% de-ionized water solution for cleaning exit window
Soft cotton swabs or	Use to clean illumination exit window

WARNING: Due to the complex and application-specific nature of these installations, AV500/ AV900 camera systems must be setup and serviced by authorized technicians trained by Datalogic.

Maintenance procedures in this chapter may be performed by an end user technician. Training is recommended if the end user intends to do more than the maintenance procedures provided in this chapter.

DO NOT OPEN THE UNIT. OPENING THE AV500/AV900 MAY VOID ITS WARRANTY.

CAUTION: Proceeding with any setup, calibration, or service procedures without proper training may void the warranty.

For further information on training, contact us through our website at www.datalogic.com.

RECOMMENDED MAINTENANCE FREQUENCY

The AV500/AV900 Camera System is designed for industrial environments. The recommended frequency for performing these maintenance tasks will depend on the application's environment. In general, these procedures are recommended only if it is noticed that the environment is dirty enough that deposits are appearing on the equipment or when performance is degraded by accumulation of dust or dirt on the exit windows or deflection mirrors. By monitoring normal operations and performing weekly visual checks, you can establish a maintenance schedule that fits your application.

MAINTENANCE TASKS

Perform the maintenance tasks on an "as needed" basis to assure proper operation of the camera.

Task schedule frequency depends upon the application environment conditions. Harsh environments that expose the equipment to more heat, dust, and dirt will require these procedures be performed more frequently.

It only requires a few minutes to complete each maintenance task.

Exterior Cleaning

WARNING: Do not use any chemical on the camera that is unsafe for plastics, such as benzene, acetone, or similar products. Before performing this maintenance task, be sure to shut down the unit.

The exterior cleaning procedure may be performed without removing the camera from the mounting structure.

1. Switch off the conveyor.
2. Switch off the camera system by disconnecting the power source.
3. Clean the exterior (except the windows) with a clean, soft-bristle brush. Be sure not to brush any dust, dirt, or debris onto the windows.
4. Carefully remove any dirt or debris in or around the connector panel.
5. Wipe the exterior with a clean, soft cloth dampened slightly with a mild detergent solution.

Cleaning the Illumination / Camera Window

WARNING: Shut down the camera system before performing this maintenance task. Do not stare into the camera's window at the LED light. Avoid direct eye exposure. The LED light level does not constitute a health hazard, however staring at the LED light for prolonged periods could result in eye damage.

Never apply cleaning solution directly to the camera window. Always apply the solution to a cloth, and then the cloth to the window. Do not use any chemical on the camera that is unsafe for plastics, such as benzene, acetone, or similar products.

This procedure is recommended only if it is noticed that the environment is dirty enough that deposits are appearing on the deflection mirrors. The window cleaning procedure should be performed without removing the camera from the mounting structure.

1. Switch off the conveyor.
2. Switch off the camera system.
3. Follow the exterior cleaning procedure before cleaning the window.
4. Check the window surface for any dust, dirt, or smudges. If the window needs to be cleaned, proceed to Step 5.
5. Make a solution of seven parts denatured alcohol and three parts water. (Many over-the-counter solutions will leave deposits/smudges that can affect performance.)
6. Apply the cleaning solution to a lint-free cotton cloth.
7. Apply the cloth with cleaning solution to the camera and illumination window.
8. Remove any streaks or remaining moisture from the window with a dry, soft, lint-free cloth or lens paper.
9. Verify camera operation.

Cleaning the Deflection Mirror

WARNING: Shut down the camera system before performing this maintenance task. Do not stare into the camera's window at the LED light. Avoid direct eye exposure. The LED light level does not constitute a health hazard, however staring at the LED light for prolonged periods could result in eye damage.

Use care when cleaning the deflection mirror to assure that the alignment with the camera is not altered. Never apply cleaning solution directly to the mirror. Always apply the solution to a cloth, and then the cloth to the mirror. It is a good habit to pre-mark the mirror position, so if it does move it can be returned to the original position.

This procedure is recommended only if it is noticed that the environment is dirty enough that HEAVY deposits are appearing on the deflection mirrors. The cleaning procedure should be performed without removing the mirror from the mounting structure.

1. Switch off the conveyor.
2. Switch off the camera system.
3. Review the exterior cleaning procedure before cleaning the deflection mirror.
4. Check the deflection mirror for any dust, dirt, or smudges. If the deflection mirror needs to be cleaned, proceed to ***Step 5***.
5. Use a dry, soft, lint-free cloth to remove accumulated dust.
6. If the deflection mirror is particularly dirty or smudged, make a solution of seven parts denatured alcohol and three parts water. (Many over-the-counter solutions will leave deposits/smudges that can affect performance.)

7. Apply the cleaning solution to a lint-free cloth.
8. Apply the cloth with the cleaning solution to the mirror.
9. Remove any streaks or remaining moisture from the mirror with a dry, soft, lint-free cloth or lens paper.
10. Verify camera operation.

Cleaning the Photoelectric Sensor

If your application uses the photoelectric sensor option as a hardware trigger, be sure to clean the photoelectric sensor periodically as outlined below.

1. Switch off the conveyor.
2. Switch off the camera system.
3. Clean the photoelectric sensor's lens using the denatured alcohol solution and a cotton swab or lens paper.
4. Clean the reflector using the denatured alcohol solution and a cotton swab or lens paper.
5. Verify photoelectric sensor operation.

Cleaning the Tachometer

If your application uses the tachometer option for tracking purposes, be sure to clean the tachometer wheels periodically as outlined below.

1. Turn off the product transport.
2. Turn off the barcode reader by disconnecting the power source.
3. Using a clean, soft cloth, wipe the wheels of the tachometer clean using a mild detergent solution.
4. Before restarting the system, be sure the tachometer is making good contact with the product transport.
5. Verify tachometer operation.

Tighten Mounting Hardware

1. Check all cameras, Deflection Mirrors, CBX connection boxes, and power supply mounting hardware as applicable. Tighten as necessary. Do not over-tighten. Be sure not to disturb the equipment's alignment as it relates to the product transport.
2. Check the mounting hardware of the Photoelectric Sensor (if this option is being used). Tighten as necessary. Do not over-tighten.
3. Check the mounting hardware of the tachometer (if this option is being used). Tighten as necessary. Do not over-tighten.

Checking Camera System Connections

This is a safety check recommended for harsh environments where vibration may be a problem. *(See "Electrical Installation" on page 42)*

1. Check all wiring connections to the camera and illumination connector panels. Tighten any loose connections as necessary. Do not over-tighten.
2. Check all wiring connections to the CBX connection box. Tighten any loose connections as necessary. Do not over-tighten.
3. Check all cabling/conduit for signs of wear/damage. Repair/replace any damaged cable connections as necessary.

Verify Camera Operation

If after performing maintenance, the imaging system continues to perform below the normal operations experienced with the system under normal daily conditions, contact Datalogic through our website at www.datalogic.com.

Verify Photoelectric Sensor Operation

1. Block the Photoelectric Sensor emitter beam to confirm it is aligned properly with the reflector.
2. Verify that the TRIGGER LED on camera lights when photoelectric sensor beam is blocked.
3. If the photoelectric sensor's LED does not change status, adjust the photoelectric sensor so that it is properly aligned with the reflector.
4. If the TRIGGER LED on the barcode reader does not light when the photoelectric sensor's beam is blocked, check the cabling between the photoelectric sensor and CBX connection box for damage.

Verify Tachometer Operation

1. Rotate the tachometer wheel slowly.
2. The **TACH** LED on camera’s connector panel should flash indicating the tachometer is operational.

Replacing the Fan

The fan of the AV500/AV900 is a field replaceable part. Request spare part number: 8900006713. Instructions are included.

CHAPTER 8
TROUBLESHOOTING

WARNING: Due to the complex and application-specific nature of these installations, operational deficiencies of the barcode reader must be diagnosed and serviced by a trained and authorized Datalogic technician.

There are no user serviceable components or field replaceable units (FRUs) inside the barcode reader.

For further information on training, contact us through the Datalogic website at www.datalogic.com.

When contacting Datalogic for help with an AV500/AV900 camera, please be ready to share the unit serial number with the Datalogic technician. The unit's serial number tag is located on the bottom of the device, as shown below. Help desk contact information is available at [www.datalogic.com.](http://www.datalogic.com)

Serial Number

ERROR CODES AND RESOLUTIONS

Decoder Errors

Alphabetical by type: Information / Error / Warning.

Description	Type	Explanation	Possible Cause(s)	Solution
Application failed to shutdown	Info	The application was in a state were it could not shut down properly.	If software was recently loaded, an error occurred during the load.	Power cycle the unit. If software was recently loaded, try to reload the new software. If the error persists, contact Datalogic Support.
Decoder load warning	Info	Decode engine CPU usage is high	Background is noisy. Multiple 2D codes are enabled. Camera gain is too low or too high or the camera is out of focus.	Make sure gain and focus are set properly. Otherwise this error will not cause any problems
Decoder overload error	Info	Decode engine is being killed before the package is complete	Background is noisy. Multiple 2D codes are enabled. Camera gain is too low or too high or the camera is out of focus. Transmit point distance is too close	Make sure gain and focus are set properly. Increase the transmit point distance if possible.
Driver returned an error	Info	PCIe driver returned an error	HW issue with the PCIe bus or the FPGA	Contact Datalogic Support if this error persists
Configuration not synchronized with cluster	Info	XML does not match the XML in other cameras.	XML from a custom version of software was loaded into a camera running STD software.	Default the camera and reboot, which will force the camera to load the appropriate XML.
Decoder load exceeds 200%	Info			
Decoder load exceeds 80%	Info	PCIe driver returned an error.	HW issue with the PCIe bus or the FPGA.	Contact Datalogic Support if this error persists.
Dimensioner IP address not valid for Sync Network	Info	In some applications the Dimmer will connect directly to the AV. In that situation the AV will identify the dimmer is connected and process the data accordingly. If the application doesn't require the Dimmer to be connected directly to the AV, the AV will still monitor the connection and post this message.	Dimmer is not connected directly to the AV.	This is just an Information message and requires no action
Dimensioner is not Online	Info	Once the Dimmer is connected the AV will monitor the connection and post this message if the dimmer connection is missing	This will only be an issue if the Dimmer is intended to be connected. Dimmer is disconnected or failed.	Check to see that the Dimmer is still connected and functioning.

Description	Type	Explanation	Possible Cause	Solution
Bad scanline data detected	Error	Raw data from the image buffer is corrupt.	RAM is corrupt or bad.	Contact Datalogic Support.
Camera status not understood	Error	Received camera status was not understood.	Make sure all of the cameras in the tunnel contain the same software.	Load the same software into all of the cameras in the tunnel.
Camera with different SW version detected	Error	The camera will compare it's version of software to the other cameras in the Cluster. This message is posted when there is a conflict	Often this is caused when a spare camera is installed, but does not have the same software as the other cameras in the cluster.	Install the correct software version
Configuration not synchronized with cluster	Error	XML does not match the XML in other cameras	XML from a custom version of software was loaded into a camera running STD software.	Default the camera and reboot. That will force the camera to load the appropriate XML
Could Not Save JPEG - Compression Failed	Error	JPEG compression failed.	Image was too big or too small. Compression was interrupted.	Contact Datalogic Support if this error persists.
Could Not Save JPEG - Job Queue is Full	Error	Internal JPEG queue is full.	JPEG compression is taking too long.	Contact Datalogic Support if this error persists.
Could Not Save JPEG - Queue is Full	Error	Internal JPEG queue is full.	JPEG compression is taking too long.	Contact Datalogic Support if this error persists.
Could Not Save JPEG - Waiting for FPGA	Error	Attempt to compress a JPEG while another compression is taking place.	JPEG compression is taking too long.	Contact Datalogic Support if this error persists.
Decoder CPU over temperature	Error	The AV camera will monitor the internal temperature. If the temperature goes above a preset value this error will appear.	Internal Fan failure Faulty CPU processor	Replace Camera
Dimensioner Beacon not understood	Error	Status received from the Dimensioner was not understood.	The dimensioner is not running a version of software that is compatible with the camera.	Load the correct software into the dimensioner.
Error Configuring the Decode Engine	Error	Parameter settings used to configure the decode engine were rejected	A decode engine parameter is out of range	Make sure all decode engine settings are correct. Contact Datalogic Support
Expected Camera is Offline	Error	A camera in the tunnel configuration is not online.	The offline camera has lost power or restarted. The offline camera failed to start properly. The SyncNet cables are not connected properly to the camera listed offline.	Verify the offline camera has power. Verify the SyncNet cables are connected properly between the offline camera and the next camera. Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.

Expected External Device is Offline	Error	All AV cameras communicate through the Sync network. When one of the cameras stops communicating the other cameras in the system will post this message.	Camera failure	Replace failed camera
Factory Reset Performed. Power Cycle Required	Error	If the cameras are set to factory default they must be power cycled in order for all the internal applications to run correctly.	Cameras were factory defaulted	Reboot the cameras
Failed to set space notification	Error	Camera could not set a delayed encoder/ tachometer event.	Encoder/tachometer resolution is set too high.	Check the encoder/tachometer resolution. Contact Datalogic Support, if the encoder/ tachometer resolution is set properly.
Failed to Allocate Memory for Image Transfer	Error	Requested image could not be loaded into memory.	RAM is bad or corrupt .	Contact Datalogic Support.
Failed to Login to FTP Server	Error	The camera was unable to log into the specified FTP server to save images.	The log in credentials are incorrect. The external FTP server is offline. The camera Image port is not connected to the network to get to the FTP server.	Verify the login credentials are correct. Verify the external FTP server is up and running. Verify the camera image port is correctly connected to the appropriate network.
Failed to Read Image from Ramdisk	Error	Requested Image no longer available in Ramdisk.	Parameter updated performed while sorting packages. Image transfer taking too long.	Check the network connection speed.
Failed to Write Image to File System	Error	The camera was unable to save the image file to the specified File System Location.	The file system location is incorrect or full.	Verify that the Image saving settings for the file system are correct. Verify the location is not full or set up the file maintenance to remove old files automatically.
Failed to Write Image to FTP Server	Error	The camera was unable to write the image to the FTP server.	The external FTP server is offline. The camera Image port is not connected to the network to get to the FTP server.	Verify the external FTP server is up and running. Verify the camera image port is connected to the appropriate network correctly.
Failed to Write Image to Offline Viewer	Error	The camera was unable to send an image to the external viewer.	External viewer is not running or it's not a version meant for the Parameters required to send images to the external viewer are not set properly.	Make sure the external viewer is running. Make sure the external viewer was downloaded from the camera. Make sure the external viewer network parameters on the Modify Settings | Global Settings | Image Saving Destination Settings window are properly set
Far Working Distance Out of Range	Error	The far working distance is set to a distance beyond the focus range of the camera.	The far working distance is set incorrectly. The camera being used is incorrect for the application.	Verify the camera model is correct for the application. Re-run the calibration wizard on this camera.
Fixed Focus Value Out of Range	Error	The fixed focus setting is set to a distance beyond the focus range of the camera.	The fixed focus value is set incorrectly. The camera being used is incorrect for the application.	Verify the fixed focus value is correct. Verify the camera model is correct for the application.

Image Transfer Falling Behind. Check Connection Speed	Error	The volume of images to be saved is exceeding the hardware capabilities of the Image port connection.	The ethernet hardware connected to the camera Image port (cables, switches, etc.) is not Gigabit capable.	Verify the switches are Gigabit capable and the cables are at least Cat5e. Verify the LED's of the camera Image port is indicating a Gigabit connection. Verify the ethernet cables are not routed with AC wiring and are not excessively long.
Image Saving Queue is Full. Check Connection Speed	Error	Requested package is no longer available to save.	Image transfer is taking too long, resulting in lost packages.	Check the network connection speed.
IV Monitor failed to get an image buffer	Error	Camera could find the raw image buffer	RAM is corrupt or bad.	Contact Datalogic Support
LogManager can't open a log file	Error	Log Manager was unable to open the log file on the media device.	Log file media device is unavailable or full.	Verify logging options.
LogManager can't write to the log file	Error	Log Manager was unable to write to the log file on the media device.	Log file media device is unavailable or full.	Verify logging options.
Maximum Application restarts	Error	An application was restarted multiple times due to an error	If software was recently loaded, an error occurred during the load. An internal hardware failure exists.	Power cycle the unit. If software was recently loaded, try to reload the new software. If the error persists, contact Datalogic Support.
Maximum system resets in one day	Error	The system became unresponsive multiple times within a 24 hour period and was reset.	If software was recently loaded, an error occurred during the load. An internal hardware failure exists.	Power cycle the unit. If software was recently loaded, try to reload the new software. If the error persists, replace the camera and/or contact Datalogic Support.
More than one camera setup to multicast LC data	Error	There should only be one camera transmitting the focusing data from the Light Curtain.	Camera is not configured correctly.	Change configuration
No ACK from Rangefinder after Parameter Update	Error	RangeFinder did not Ack the last parameter update.	Communication with the RangeFinder is compromised.	Check the Ethernet connection with the RangeFinder.
Not Saving Image. Request Too Late	Error	Requested package is no longer available to save.	Image transfer is taking too long, resulting in lost packages.	Check the network connection speed.
Primary Controller Photo Sensor Issue Detected	Error	The cameras can be set in a redundant configuration. When configured as such, there is a Primary and Secondary controller. This message is posted by the Secondary controller and indicates that there is a problem with the Primary's Photo Sensors signal.	Photo Sensor malfunction Primary unit failure	Determine if the problem is associated with either the Photo Sensor or the Primary unit

Primary Controller Tachometer Issue Detected	Error	The cameras can be set in a redundant configuration. When configured as such there is a Primary and Secondary controller. This message is posted by the Secondary controller and indicates that there is a problem with the Primary's Tachometer's signal.	Tachometer malfunction Primary unit failure	Determine if the problem is associated with either the Tachometer or the Primary unit
RangeFinder is not Online	Error	The RangeFinder is selected as the position sensor but is not detected as being online.	The RangeFinder is powered off or not connected. The Rangefinder is not the position sensor being used.	If the RangeFinder is not the position sensor being used, select the appropriate position sensor. Verify the RangeFinder has power. Verify the network port of the RangeFinder is connected to the Focus Eth port of one of the cameras. Power cycle the RangeFinder. If the error persists, replace the RangeFinder and/or contact Datalogic Support.
RangeFinder status not understood	Error	The status message received from the RangeFinder was not understood by the camera	The RangeFinder software is too old	Load the appropriate SW into the RangeFinder
Real-Time Processor has Errors	Error	The Real-Time Processor is reporting an error.	Check the Real-Time Processor section of the System Info > Device Details window for detailed error information.	Check the Real-Time Processor section of the status page for detailed error information. Refer to the Real-Time Processor error list for more information.
Real-Time Processor is not Online	Error	The Real-Time Processor is unable to communicate with the Decoder.	Real-Time Processor has stopped functioning. Internal hardware failure.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Real-Time Processor status not understood	Error	Status received from the Real-Time Processor was not understood.	Make sure the Real-Time Processor software version is compatible with the Application software.	Load a compatible version of Real-Time Processor software.
Reboot Required to finish configuring redundancy	Error	In the redundant configuration the units need to be rebooted in order to complete the configuration	Redundant configuration has been completed and units need to be rebooted	Reboot units
Secondary Controller PhotoSensor Issue Detected	Error	The cameras can be set in a redundant configuration. When configured as such there is a Primary and Secondary controller. This message is posted by the Secondary controller and indicates that there is a problem with the Primary's Photo Sensor's signal	Photo Sensor malfunction Primary unit failure	Determine if the problem is associated with either the Photo Sensor or the Primary unit

Secondary Controller Tachometer Issue Detected	Error	The cameras can be set in a redundant configuration. When configured as such there is a Primary and Secondary controller. This message is posted by the Secondary controller and indicates that there is a problem with the Primary's Tachometer's signal	Tachometer malfunction Primary unit failure	Determine if the problem is associated with either the Tachometer or the Primary unit
Software upgrade failed	Error	An attempt to load upgraded software failed.	There is a type mismatch with the existing software and the new software being loaded. An error occurred while loading software.	Verify the software type being loaded matches that of the existing software. If you are intentionally changing the software type, check the box to skip software type compatibility check when loading the new software file. Cycle the unit's power, and re-attempt to load software.
Application failed to start	Error	One of the applications failed to properly start and is not functioning.	The application was unable to initialize its interfaces properly and failed. If software was recently loaded, an error occurred during the load.	Cycle the unit's power. If software was recently loaded, try to reload the new software. If the error persists, contact Datalogic Support.

Description	Type	Explanation	Possible Cause	Solution
Bottom Camera Distance to Scanline too Small	Warning	The distance from the position sensor scan line to the bottom camera scan line is too small.	The position sensor is mounted incorrectly, too close to the camera. The bottom camera is mounted incorrectly.	Verify and move the position sensor further upstream if needed. Verify and move the camera further downstream if needed.
Could Not Save JPEG - Image Too Large	Warning	Requested image is too large to compress	Photo sensor or Position sensor obstructed or a package jam resulting in an extremely long package	Eliminate package jams. Make sure the photo sensor and/or position sensor are not obstructed
Could Not Save JPEG - Image Too Small	Warning	Requested image is too small to compress	Junk on the conveyor	Check for junk on the conveyor resulting in extremely small packages
Decoder board over temperature	Warning	The Decoder board exceeding the maximum temperature	Ambient temperature has exceeded the maximum 50 degrees C operating temperature. There is a fan failure or airflow blockage.	Verify the ambient temperature is less than or equal to 50 C. Check the fan operation and for any airflow obstructions. Replace fans if necessary.
Decoder CPU over temperature	Warning	The Decoder CPU exceeding the maximum temperature	Ambient temperature has exceeded the maximum 50 degrees C operating temperature. There is a fan failure or airflow blockage.	Verify the ambient temperature is less than or equal to 50 C. Check the fan operation and for any airflow obstructions. Replace fans if necessary.
Distance to Scanline too small	Warning	The distance from the position sensor scan line to the closest point of the camera line of sight is too small.	The position sensor is mounted incorrectly, too close to the camera. The camera is mounted incorrectly or the angle is wrong.	Verify and move the position sensor further upstream if needed. Verify and move the camera further downstream if needed. Verify and correct the camera angle if needed.
IV State Not Sent - Pkg Not Found	Warning	A trigger message for a package was received but the package was never found in the image data	This can occur during boot up if packages are running through the tunnel or if a package is completely shadowed	Contact Datalogic Support if this error persists
RangeFinder is not Expected	Warning	A RangeFinder is detected in the system but is not selected as the position sensor.	Wrong position sensor is selected in the configuration.	Select the RangeFinder as the position sensor in the configuration.
RangeFinder is not OK	Warning	The RangeFinder is online but reporting an error.	Check the RangeFinder GUI page for error details.	Check the RangeFinder GUI page for error details. Refer the RangeFinder error list for more information.
Real-time Processor has Warnings	Warning	The Real-Time Processor is reporting at least one warning.	Check the Real-Time Processor section of the status page for detailed warning information.	Check the Real-Time Processor section of the status page for detailed warning information. Refer to the Real-Time Processor warning list for more information.

Software upgrade in progress	Warning	The camera is in the process of updating software.	A software update was loaded on this camera or one of the cameras in the tunnel and auto-update is enabled.	Wait for the update to complete.
Bottom Camera Distance to Scanline too Small	Warning	The distance from the position sensor scan line to the bottom camera scan line is too small.	The position sensor is mounted incorrectly, too close to the camera. The bottom camera is mounted incorrectly.	Verify and move the position sensor further upstream if needed. Verify and move the camera further downstream if needed.
Camera calibration has not been completed	Warning			
Could Not Save JPEG - Image Too Large	Warning	Requested image is too large to compress.	Photo sensor or Position sensor obstructed or a package jam resulting in an extremely long package.	Eliminate package jams. Make sure the photo sensor and/or position sensor are not obstructed.
Could Not Save JPEG - Image Too Small	Warning	Requested image is too small to compress.	Debris on the conveyor.	Check for junk on the conveyor resulting in extremely small packages.
Decoder frame(s) discarded	Warning			
Decoder board over temperature	Warning	The Decoder board has exceeded the maximum temperature.	Ambient temperature has exceeded the maximum 50 degrees C operating temperature. There is a fan failure or airflow blockage.	Verify the ambient temperature is less than or equal to 50 C. Check the fan operation and for any airflow obstructions. Replace fans if necessary.
Distance to Scanline too small	Warning	The distance from the position sensor scan line to the closest point of the camera line of sight is too small.	The position sensor is mounted incorrectly, too close to the camera. The camera is mounted incorrectly or the angle is wrong.	Verify and move the position sensor further upstream if needed. Verify and move the camera further downstream if needed. Verify and correct the camera angle if needed.
IV State Not Sent - Pkg Not Found	Warning	A trigger message for a package was received but the package was never found in the image data.	This can occur during boot up if packages are running through the tunnel or if a package is completely shadowed.	Contact Datalogic Support if this error persists.
RangeFinder is not Expected	Warning	A RangeFinder is detected in the system but is not selected as the position sensor.	A different Position Sensors is selected in the Operationg Mode other then the RangeFinder	Select the RangeFinder as the position sensor in the configuration.
RangeFinder is not OK	Warning	A RangeFinder is selected but has an error	A component within the RangeFinder has failed	Replace RangeFinder
Real-time Processor has Warnings	Warning	The Real-Time Processor is reporting at least one warning.	Check the Real-Time Processor section of the Modify Settings | System Info > Device Details window for detailed warning information (See section	
Software upgrade in progress	Warning	The AV is in the process of upgrading the software.	The AV camera is ith the process of upgrading it's software. It will inform the user and not do any other activity until this process is complete	Wait until the software upgrade is complete. The AV will reboot itself once this process is complete.

Unable to mount SMB/ CIFS file share for image saving	Warning	The camera was unable to mount the SMB/CIFS file share on the external device	File System parameters on the Destination Settings page are not correct. External device is not available. The Server Path is set to a path local to the camera	Make sure the File System parameters on the Destination Settings page are setting properly. Make sure the Server Path is not local to the camera
Unexpected Camera is Online	Warning	A camera is detected in the tunnel that was not part of the tunnel configuration.	A new camera was added to the tunnel or an existing camera was replaced.	Add the camera to the configuration and proceed with the set up if it is a new camera. If an existing camera was replaced, there should be an offline camera. From the Modify Settings | System Info, replace the offline camera with one listed outside the cluster
Unexpected External Device is Online	Warning	The AV will identify any device that is set for DHCP. The controller camera will give the device an IP address. It the device is not an AV camera it will post this message.	Another device set to DHCP is connected to the AV Sync network	Disconnect the device.
Controller Camera is Offline		This message is posted by the Clients in the cluster. Since the Controller Camera provides the tach and trigger to the other cameras the cluster will not trigger	Controller camera failed	Determine that the camera is in fact not working and there are no other conditions as a cable unplugged. If the issue is a failed camera then replace the Controller camera

BYPASSING AN AV500/AV900 IN AN ARRAY (TUNNEL)

If for any reason, an AV500/AV900 needs to be removed from an array (tunnel), it can be bypassed to allow the array to continue functioning in a redundant loop, minimizing down time. To bypass a non-working , Disconnect the Sync In and Sync Out cables of the non-working unit and connect them to one another.

OTHER CAMERA CHECKS

Confirm communication with host

- Serial (if applicable)
- Ethernet (if applicable)
- Confirm Protocol Index (if applicable)

Observe the System in Action

Confirm that all cameras are reading the barcode correctly and that the scan point is communicating to the host.

REPLACING AN AV500/AV900 CAMERA

Use the following procedures to replace an AV500/AV900 Camera, either a stand-alone unit, a Master in a tunnel/array, or a Slave unit in a tunnel/array.

ESD WARNING: Observe precautions to prevent Electrostatic Discharge (ESD). Use an ESD grounding wrist strap and avoid direct contact with circuit boards, which could be damaged by ESD.

1. Disconnect the power source from the camera.
2. Locate the memory card inside the camera and remove it. See.
3. Insert the memory card firmly into the card slot in the replacement camera.
4. Reattach the back access panels and secure it with the retaining screws.
5. Screw the mounting bolts in place to secure the camera
6. Reattach the cables to the camera in their original locations.
7. Apply power to the AV500/AV900 Camera.
8. Connect the Controller Key (tach dongle) to the I/O port of the camera.
9. With the unit powered up, hold down buttons 1 and 2 at the same time. The STATUS LED (located to the right of button #2) will blink GREEN and then RED to indicate that the unit has been defaulted.
10. Disconnect the power connection from the camera assembly.
11. Remove the CONTROLLER KEY from the I/O port of the camera.
12. Re-attach all of the cables to the camera in their original locations.
13. Apply power to the AV500/AV900 Camera.

14. Connect the browser to any AV500/AV900 in the tunnel EXCEPT the unit being replaced.
15. Navigate to the System Info page.
16. In the “This Cluster” section of the page the failed camera will show up with the “Delete” option in the Action column. Note the MAC address of this camera.
17. The replacement AV500/AV900 will be found in the “Cameras not in the Cluster” portion of the page.
18. Under the “Action” section select Replace (The MAC address of the failed camera).

RECOMMENDED AV500/AV900 SETUP SEQUENCE

Confirm Tunnel is Ready for Calibration Process

1. Confirm that equipment is mounted according to the application mounting drawing and app specs – Reference section 2 of the AV500/AV900 manual for devices used in the application.
2. Confirm that all electrical equipment is installed properly – Reference section 3 of AV500/AV900 manual for the devices in conjunction with the interconnect drawing for application.
3. Confirm that the AV500/AV900 mirrors are aligned – Reference section 2 of the AV500/AV900 manual.
4. Verify that the mirror and camera brackets are assembled per the manual Section 2.
5. Verify that the Photoeye (if used) is mounted and aligned.

“Static Calibration” on page 345

Establish a connection, login to the system, and verify software version installed.

1. Connect to SYNC network using the Datalogic Sync In and Sync Out cables and connections.

2. Establish a connection.
3. Use the Ignore connecting through Host Net or Image Net as we are using the Sync net for this process.
4. Navigate to the **Diagnostics|System Status** screen and follow “Diagnostics | System Status” on page 264 of the AV500/AV900 manual to determine the software version of each camera.
5. If the correct software is already loaded in the cameras (based on application specs), skip over the next step and proceed to System Configuration.

Load Software

1. Before putting all the cameras into the network, click on each IP Address and open in a separate tab.
2. Reference “Utilities | Software Upgrade” on page 313
3. Software Loading order:
- Patches
- RTP software
- Application software
4. Prepare each camera to load the software, but don’t execute until ALL cameras are prepared, this will assure that all the cameras will complete the upgrade about the same time and that the software gets distributed without any interruption.
5. Load the software in the clients first until they are completed, next load the software in the controller last.
6. Default each AV500/AV900 after software load.

NOTE: Please do not use a parameter file from any previous installations.

NAME AND CLUSTER CONFIGURATION

1. Assign system name and positions of each camera in the system cluster.
2. Only bring one camera into the cluster at a time.

CHAPTER 9
TECHNICAL FEATURES

This chapter provides detailed specifications for the AV500/AV900 Camera Systems. It provides specific information on:

- Electrical Features
- Optical Features
- Reading Features
- Human Machine Interface
- Software Features
- Environmental Features
- Physical Features

TECHNICAL SPECIFICATIONS

OPTICAL FEATURES	
Frame Rate	Up to 32 frames/sec
Sensor Type	CMOS, 5.0 or 9.0 M Pixels
Optical Lens	16mm, 25mm, 35mm C-Mount Lens
Focus	Fixed, adjustable, dual zone and dynamic
Illumination	Integrated Red or White
SCAN ENGINE	
	2D Ultra slim area imager (supports 1D/2D codes): Datalogic's Green Spot for good-read feedback
Depth of Field:	8.5 to 50 cm / 3.3 to 19.7 in. depending on bar code density and type
Resolution:	5 Mp - 2448 x 2048 pixels 9 Mp - 4096 x 2160 pixels
Field of View:	Three FOV's for the 5 Mp and two FOV's for the 9 Mp
DECODING CAPABILITY	
1D and Stacked Codes	Code 128 (GS1-128); Code 39 (Standard and Full ASCII); Code 32 · MSI; Standard 2 of 5; Matrix 2 of 5; Interleaved 2 of 5; Codabar; Code 93 · Pharmacode; EAN-8/13 - UPC-A/E (including Addon 2 and Addon 5); GS1 DataBar Family; PDF417 (Standard and Micro PDF417)
2D Codes	Data Matrix ECC 200 (Standard,GS1 and Direct Marking); QR Code (Standard and Direct Marking); MicroQR Code; Maxicode
Postal Codes	Aztec Code Postal; Australia Post; Royal Mail 4 State Customer; Kix Code; Japan Post; PLANET; POSTNET; POSTNET (+BB); Intelligent Mail; Swedish Post
SYSTEM	
Memory	System RAM: 8 GB; eMMC Flash; 32 GB
Microprocessor	Intel Pentium Quad-core
Operating System	Linux
Real-time clock	Time and date stamping under software control or can be synchronized with time server
COMMUNICATIONS INTERFACE	
Communication Interfaces	2 Ethernet TCP/IP, 2 serial communication interfaces
Internal Communication System	SyncNet Technology
Connectivity Modes	Master/Slave, Ethernet Point to Point
Programming Method	e-GENIUS multi-language browser-based, on board HTML web server interface
ELECTRICAL FEATURES	

Supply Voltage	24 VDC +/- 20%
Power Consumption	2A
PHYSICAL CHARACTERISTICS	
Dimensions	20.0 x 12.6 x 13.0 cm / 7.8 x 4.9 x 5.1 in
Weight	2,900 g / 6.4 pounds
Chassis Material	A380 Die Cast Aluminum
ENVIRONMENTAL FEATURES	
Humidity	95% non condensing
Protection Class	IP65
Vibration Resistance	SINE vibration as per EN60068-2-6 10-50 Hz: 0.4mm / 50-500 Hz: 2g 2h on all axis
Shock Resistance	As per EN60068-2-27, 15g / 11ms / 3 times up and 3 times down on the primary axis.
Fan Life	L10 @ 40°C : 50000h
Temperature	Operating: 0° to 50° C [32° to 122° F] Storage: -20° to 70° C [-4° to 158° F]
HUMAN MACHINE INTERFACE	
Keypad	Single button, Test, Focus, Setup and Learn
LED Indicators	Status, Com, Trigger, Good, Ready
SAFETY & REGULATORY	
Agency Approvals	The product meets necessary safety and regulatory approvals for its intended use.
Environmental Compliance	Complies to EU RoHS
Regulatory	EN55032 Emissions for Class A digital device; EN61000-6-2 Electromagnetic Compatibility; FCC part 15 for Class A digital device; cULus listed product for Canada and U.S.; CE
Laser Safety	Class 2 laser product as per IEC60825-1:2014 Complies with 21 CFR 1040
LED Safety	LED Safety (Risk Group 0) as per IEC62471
WARRANTY	
Warranty	2-Year Factory Warranty

AV500 READING FEATURES

FOV Calculation

Use the data in the following tables to calculate the FOV for your application. AV500 Range is measured from the back of the unit. AV500 FOV = 2*[(D-X)*tan(a/2)]

NOTE: Range is measured from the back of the unit 15 degree angle, 16mm., 1.1 PPM

All measurements in table are in millimeters.

16 MM	0.2MM, 8 MIL		0.25MM, 10 MIL		0.3MM, 12 MIL		0.33MM, 13 MIL		0.38MM, 15 MIL		0.5MM, 20 MIL	
	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)
Far	932	204	1142	261	1350	317	1476	350	1686	405	2000	489
Near	525	91	525	91	525	91	525	91	525	91	525	91

16 MM	0.2MM, 8 MIL		0.25MM, 10 MIL		0.3MM, 12 MIL		0.33MM, 13 MIL		0.38MM, 15 MIL		0.5MM, 20 MIL	
	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)
Near	525		525		525		525		525		525	
Near FOV	182		182		182		182		182		182	
Far	932		1142		1350		1476		1686		2000	
Far FOV	408		522		634		700		810		978	

25 MM	0.2MM, 8 MIL		0.25MM, 10 MIL		0.3MM, 12 MIL		0.33MM, 13 MIL		0.38MM, 15 MIL		0.5MM, 20 MIL	
	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)
Far	1402	214	1730	268	2056	322	2252	354	2580	408	2600	411
Near	660	92	660	92	660	92	660	92	660	92	660	92

25 MM	0.2MM, 8 MIL		0.25MM, 10 MIL		0.3MM, 12 MIL		0.33MM, 13 MIL		0.38MM, 15 MIL		0.5MM, 20 MIL	
	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)
Near	660		660		660		660		660		660	
Near FOV	184		184		184		184		184		184	
Far	1402		1730		2056		2252		2580		2600	
Far FOV	428		536		644		708		816		822	

35 MM	0.2MM, 8 MIL		0.25MM, 10 MIL		0.3MM, 12 MIL		0.33MM, 13 MIL		0.38MM, 15 MIL		0.5MM, 20 MIL	
	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)
Near	900		900		900		900		900		900	
Near FOV	182		182		182		182		182		182	
Far	1956		2416		2600							
Far FOV	430		536		580							

35 MM	0.2MM, 8 MIL		0.25MM, 10 MIL		0.3MM, 12 MIL		0.33MM, 13 MIL		0.38MM, 15 MIL		0.5MM, 20 MIL	
	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)	Range (x)	FOV (Y)
Far	1956	215	2416	268	2600	290	0	0	0	0	0	0
Near	900	91	900	91	900	91	900	91	900	91	900	91

(AV500) 5 MEGAPIXEL READING DIAGRAMS

The following reading diagrams are to be considered as references and are given for typical performance at 25°C using high quality grade A symbols: Code 128 (1D code) and-Data Matrix ECC 200 (2D code) from the Test Charts provided with the reader.

- Testing should be performed with the actual AV500/AV900 using application codes in order to evaluate whether maximizing application performance requires adjustments to the HW/SW configuration with respect to the Reference Conditions given under each diagram.
- The focus distance and reading distance ranges are measured from the surface of the mounting screws on the back of the unit.
- When defining a HW/SW configuration for the AV500/AV900 for conditions different from those of the reference diagrams, it is suggested to keep in mind the following rules:

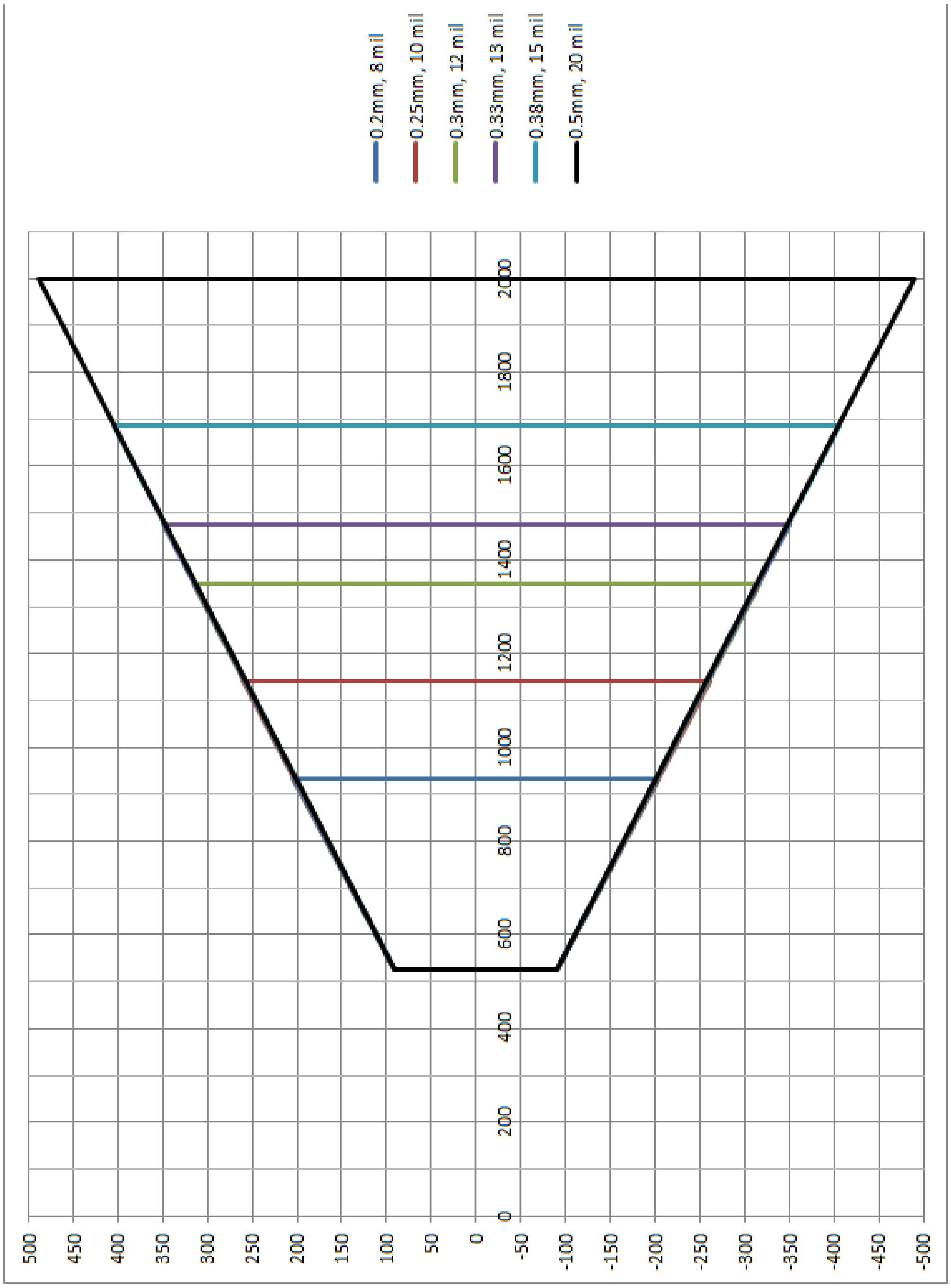
Changes in the diaphragm aperture influence the depth of field (reading distance range) and the luminosity of the image. Increasing the diaphragm aperture by one stop (i.e. from F/8 to F/5.6 or from F/11 to F/8) doubles the luminosity of the image, but can cause significant reduction in the reading distance range.

Changes in *Exposure Time* act directly proportional to the luminosity of the image and inversely proportional to the maximum code reading movement speed. Consequently, reducing the *Exposure Time* by half, reduces the luminosity of the image by half but doubles the theoretical code reading movement speed.

Changes in *Gain* act directly proportional to the luminosity of the image. Increasing the *Gain* value however, can reduce the quality of the acquired image. For example, for the purpose of only changing the luminosity of the image, the following three adjustments are equivalent: increase the diaphragm aperture by one stop; double the *Exposure Time*; double the *Gain*.

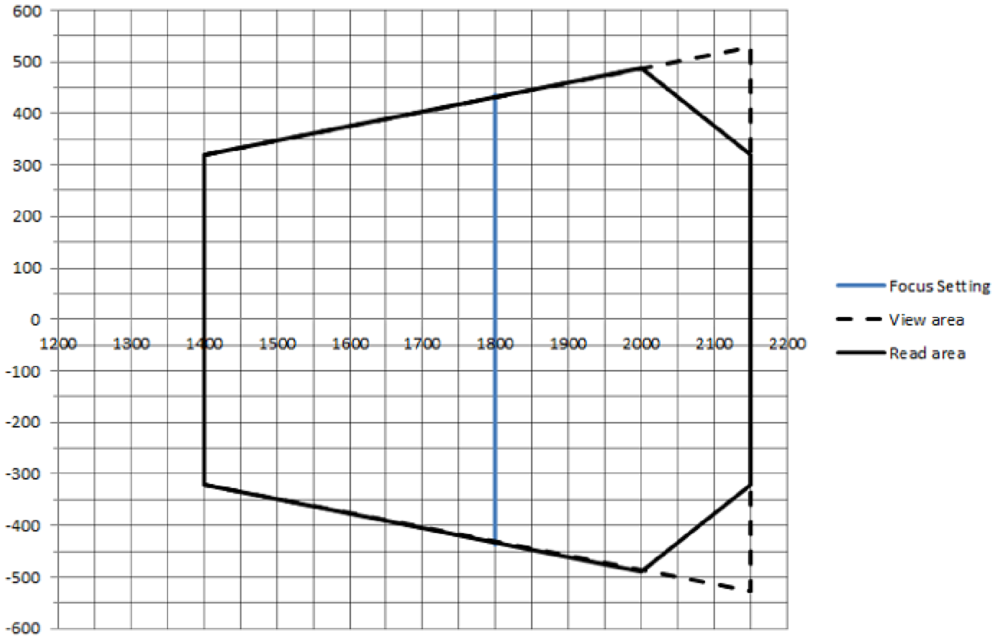
White Illumination 16 mm

Range is measured from the back of the unit
Camera mounted at a 15 degree angle
Read area is for 1D codes at a minimum 1.1 Pixel per element



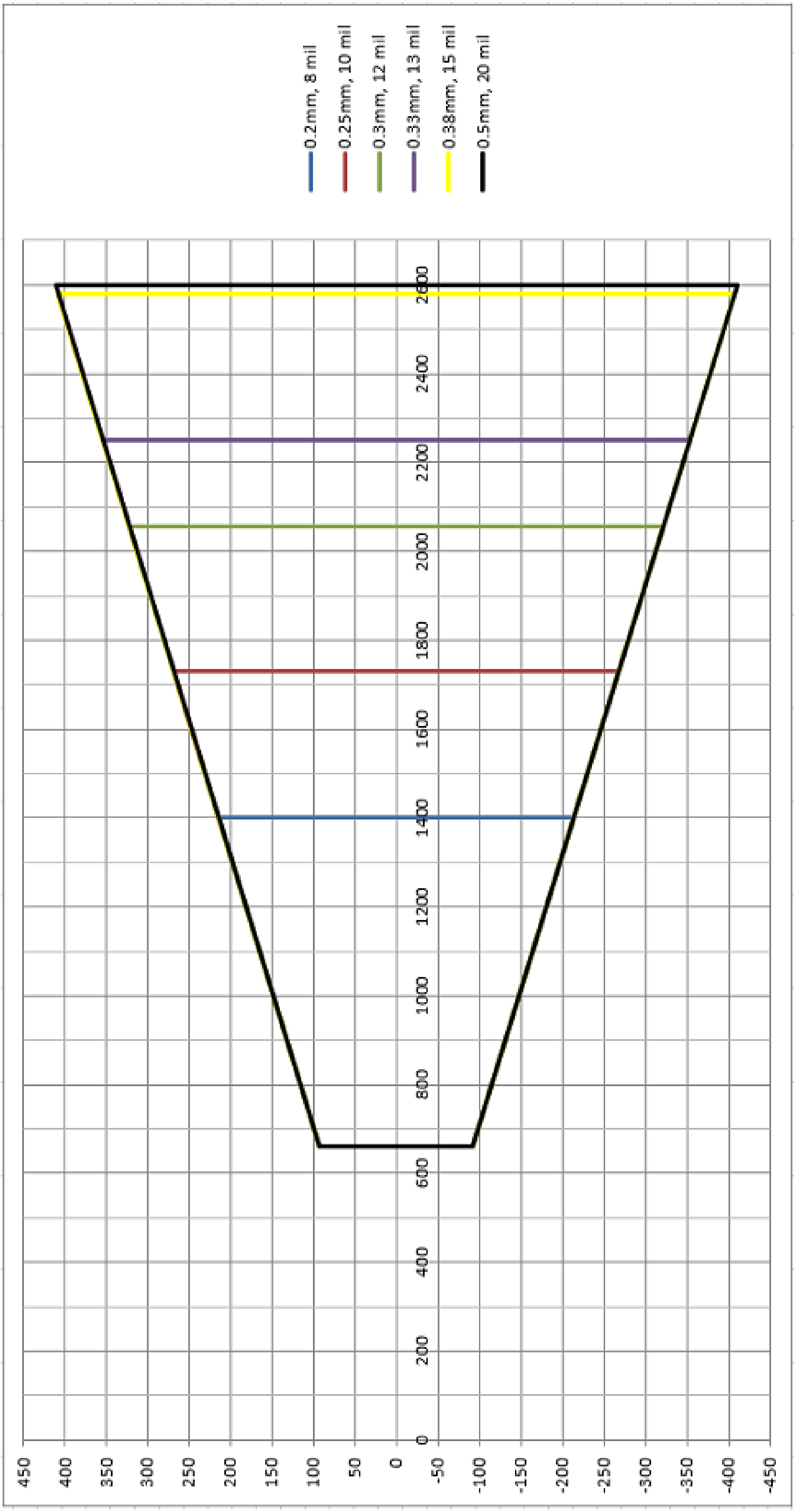
16mm F6 Application Example

20 mill code 128
640mm FOV
750mm DOF
Focus set to 1800mm
Belt speed 1 m/s



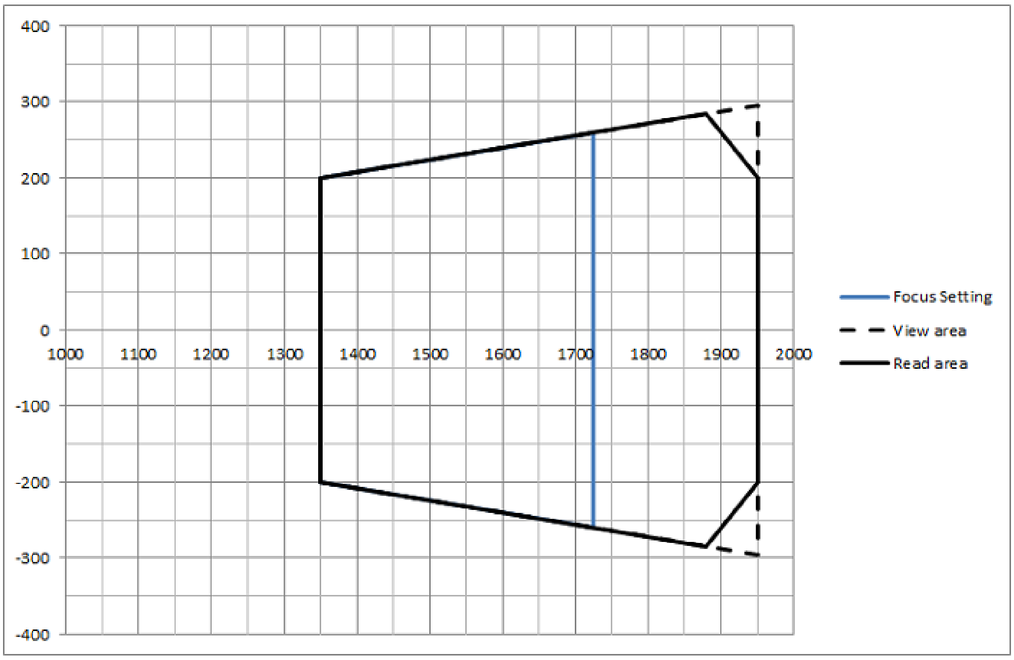
White Illumination 25 mm

Range is measured from the back of the unit
Camera mounted at a 15 degree angle
Read area is for 1D codes at a minimum 1.1 Pixel per element



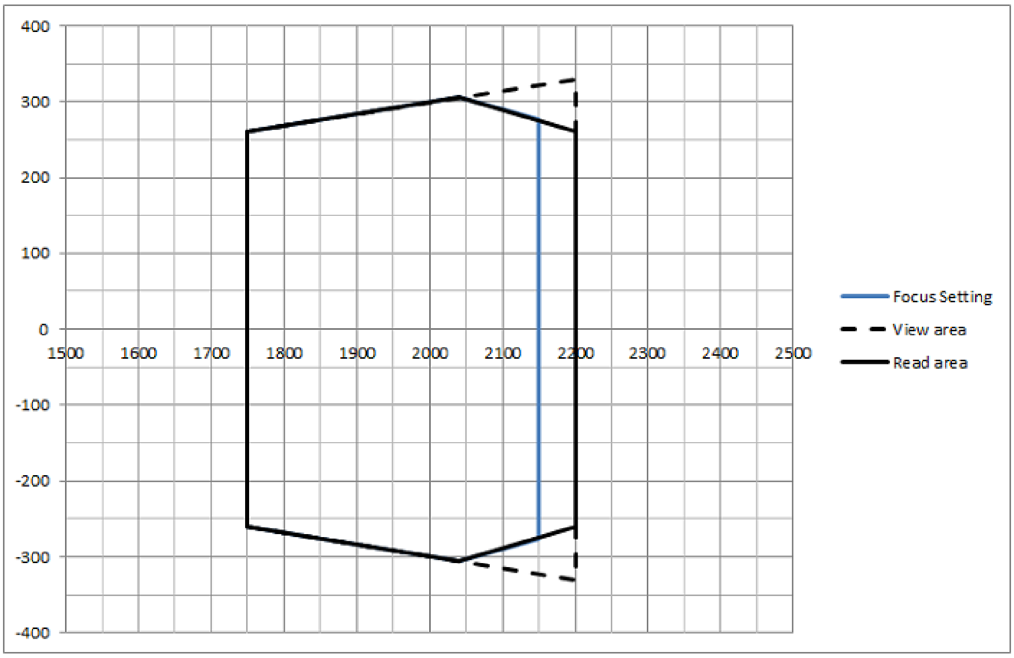
25mm F8 Application Example

12 mill code 128
400mm FOV
600mm DOF
Focus set to
1725mm
Belt speed 1 m/s



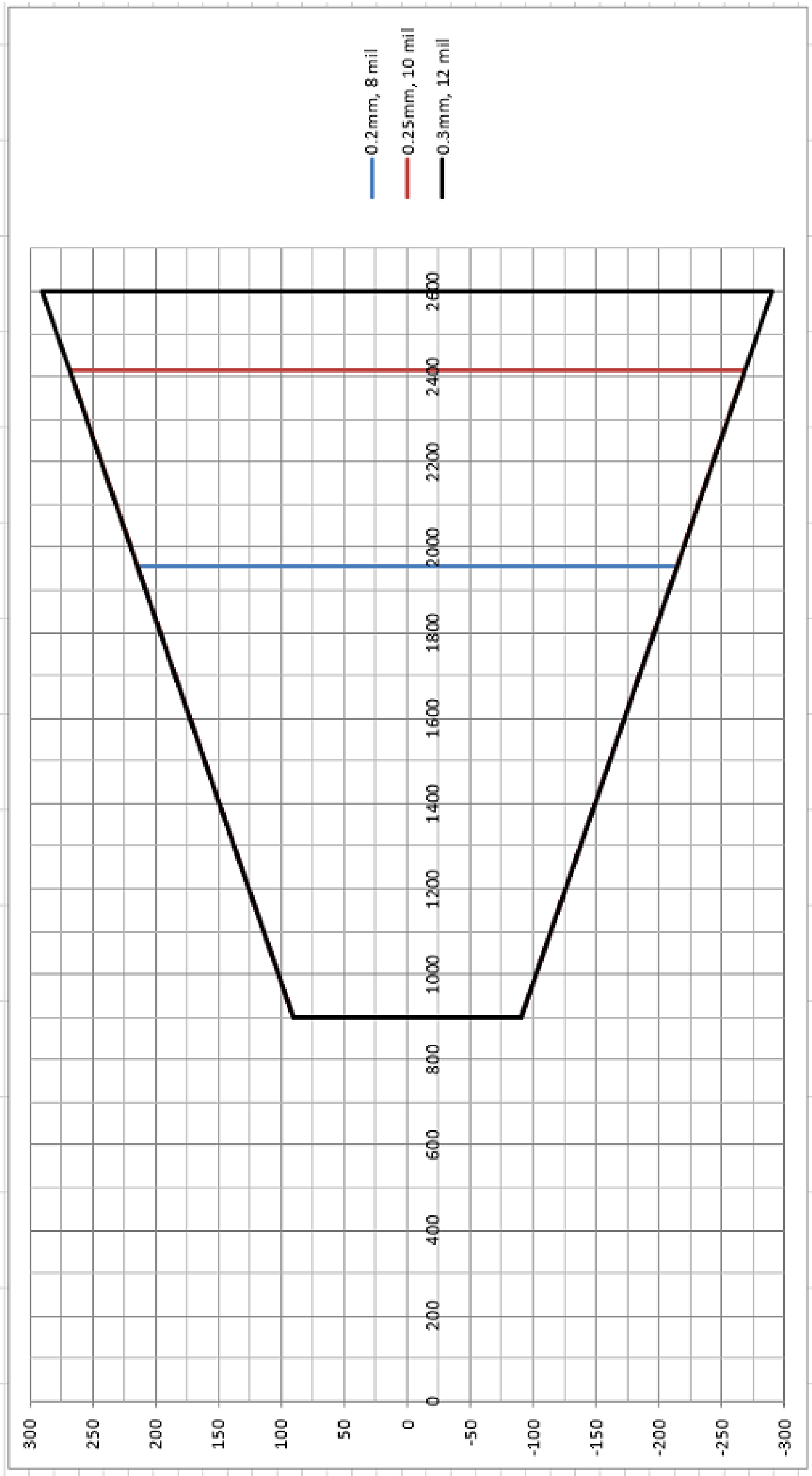
25mm F7 Application Example

13 mill code 128
520mm FOV
450mm DOF
Focus set to 2150mm
Exposure offset -
140us
Belt speed 2.5 m/s



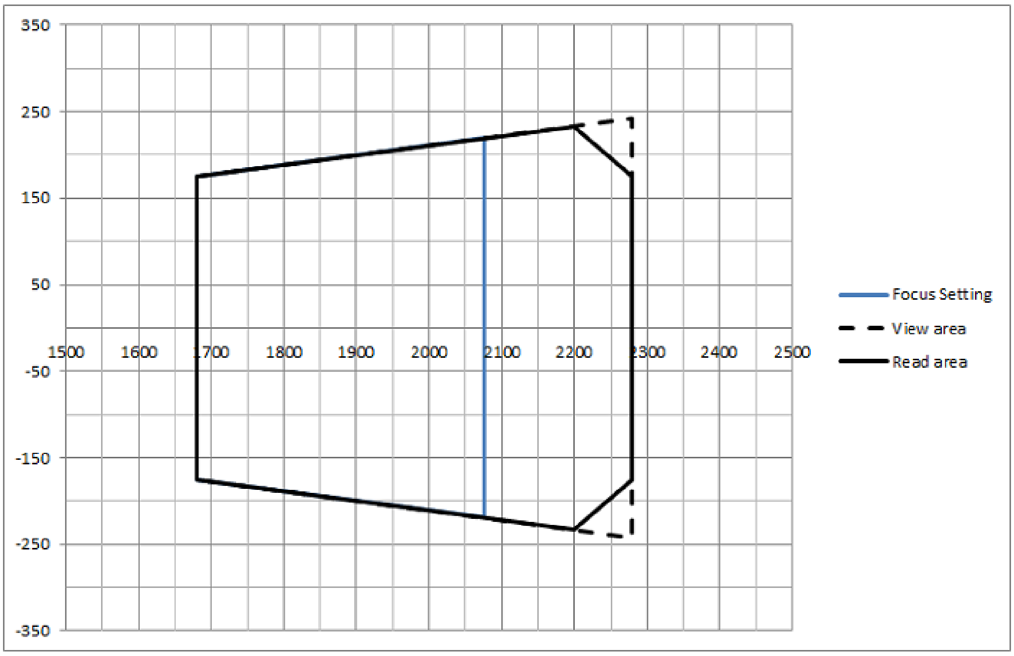
White Illumination 35 mm

Range is measured from the back of the unit
Camera mounted at a 15 degree angle
Read area is for 1D codes at a minimum 1.1 Pixel per element



35mm F8 Application Example

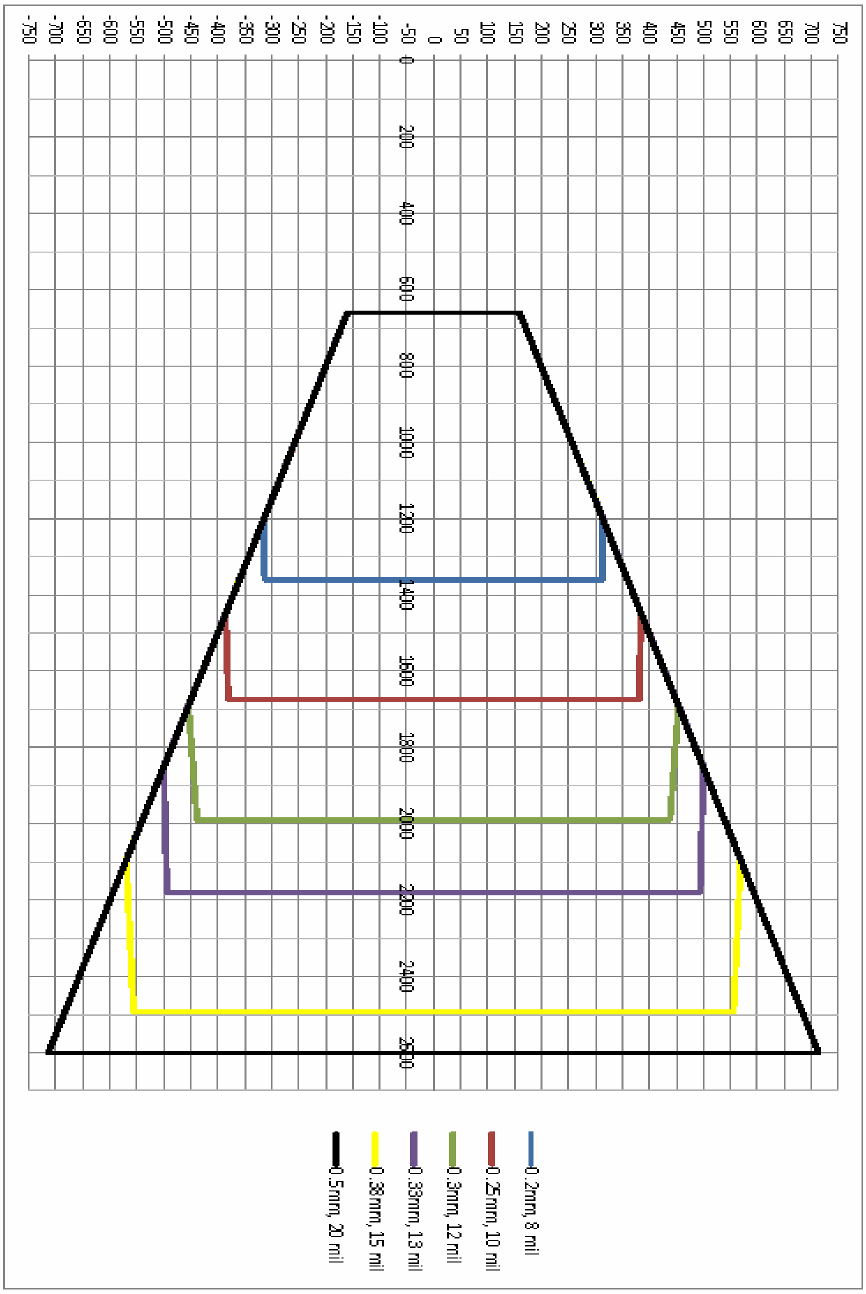
10 mill code 128
350mm FOV
600mm DOF
Focus set to 2075mm
Belt speed 1 m/s



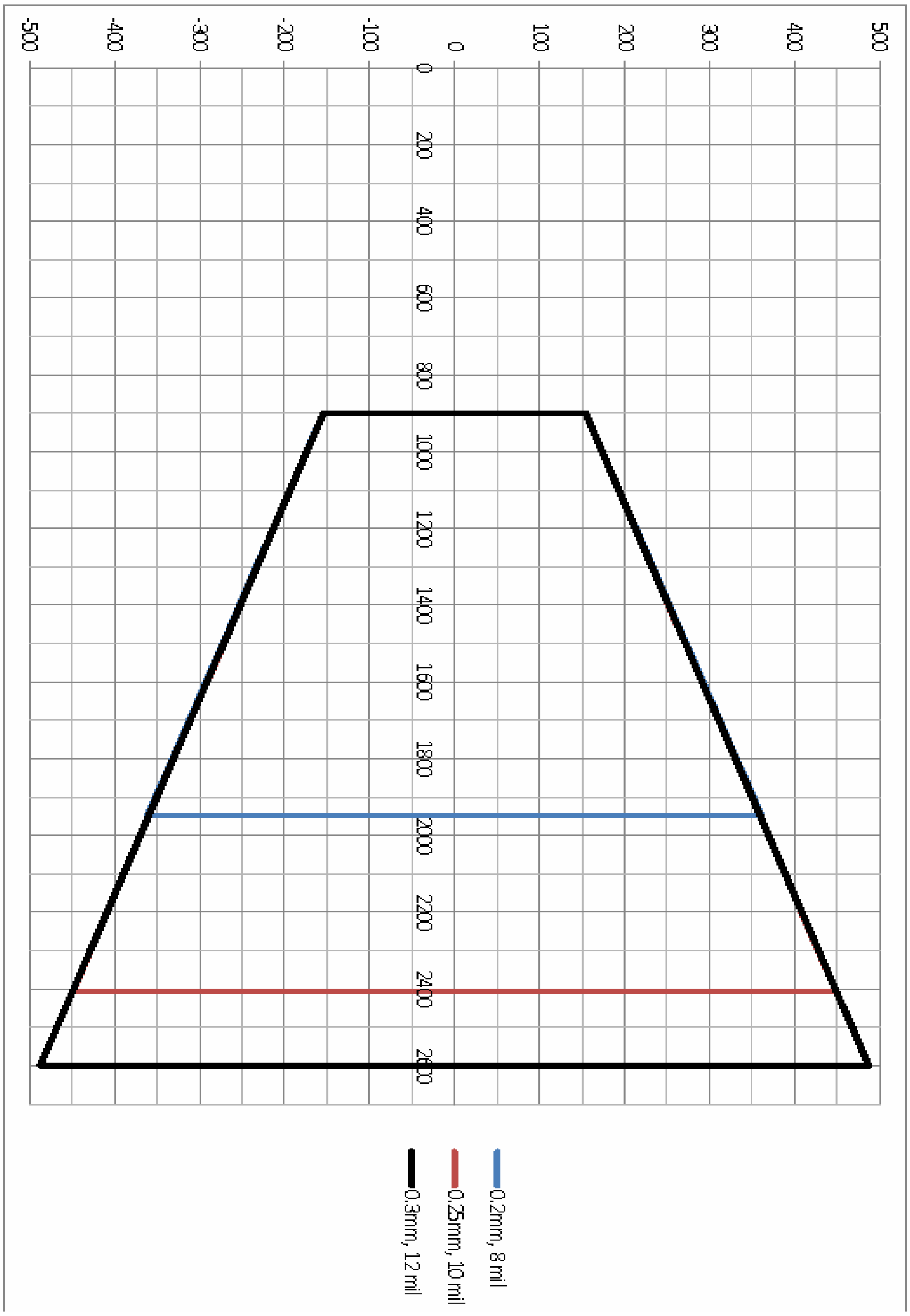
AV900 9 MEGA PIXEL READ CHARTS

Range is measured from the back of the unit, horizontal view
Camera mounted at a 15 degree angle
Read area is for 1D codes at a minimum 1.1 Pixel per element
Objects are conveyed

25 mm 1.1 PPE

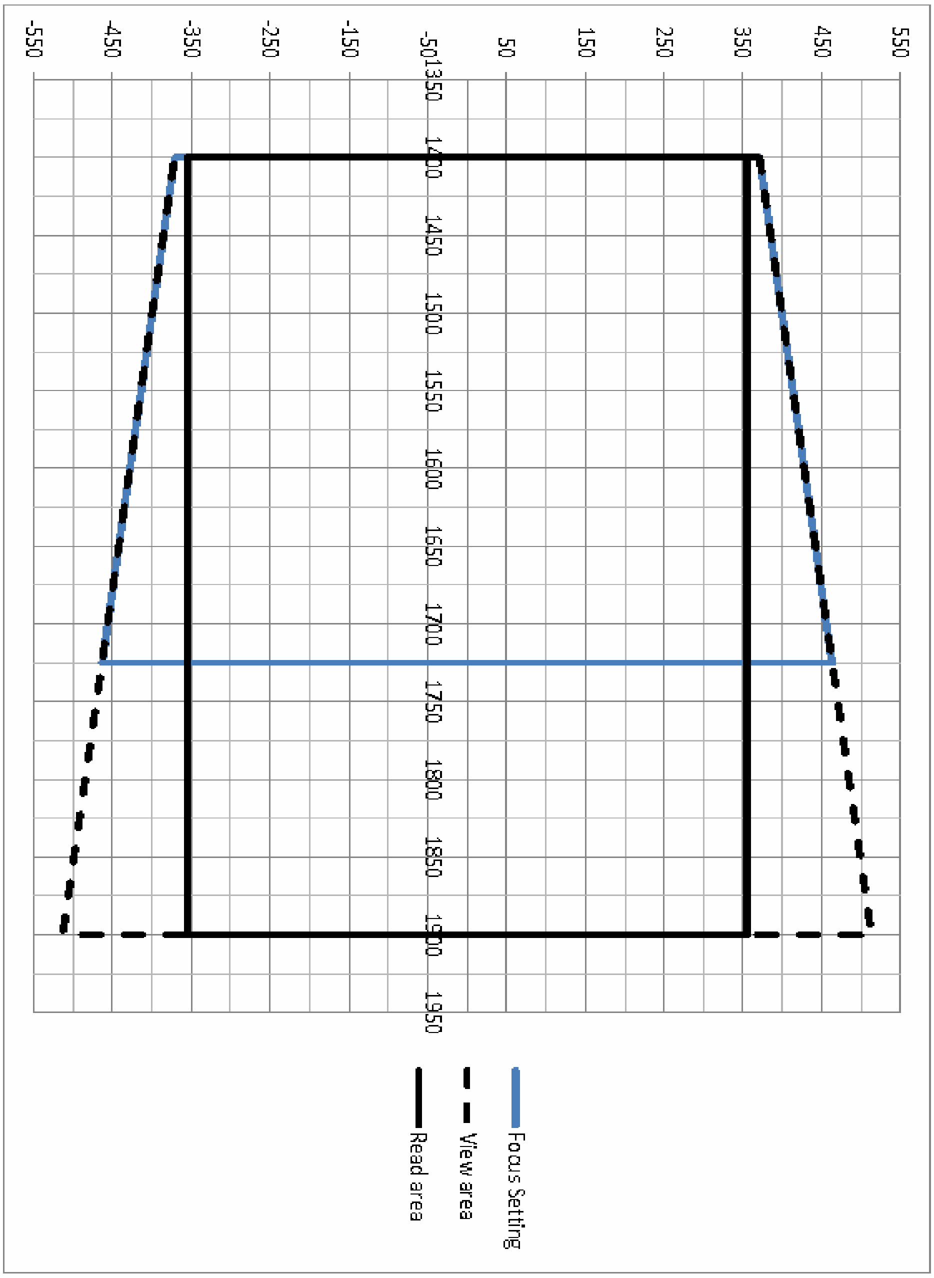


35 mm 1.1 PPE

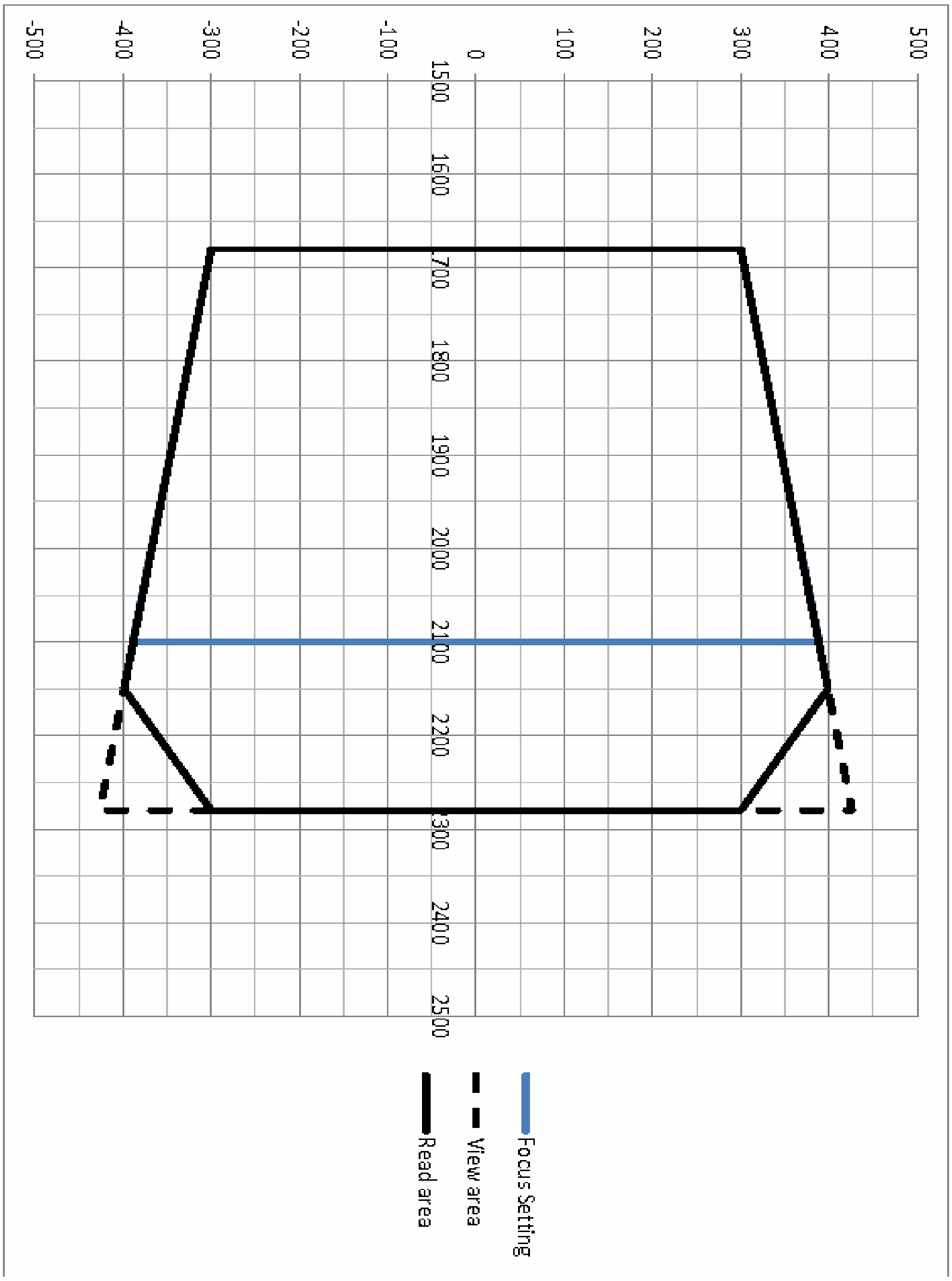


-500
-400
-300
-200
-100
0
100
200
300
400
500
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
0.2mm, 8 mil
0.25mm, 10 mil
0.3mm, 12 mil

25 mm App Example1



35 mm App Example1



APPENDIX A
ETHERNET IP

ETHERNET IP INTRODUCTION

The AV500/900 camera supports the EtherNet/IP™ Industrial Networking protocol which we will refer to as EIP. EIP simplifies the communication of barcode and Input/Output data with other EIP enabled devices, such as a programmable logic controller (PLC).

Software release 1.4.0.0 and higher for the AV500/900 product line supports the legacy ASI EtherNet/IP™ Object. This mode allows the installation of AV500/900 cameras in systems using PLC programs developed for Axiom, Axiom X, and AL5010 scanners and can also be useful if ControlLogix On-Demand Messaging is desired for an application.

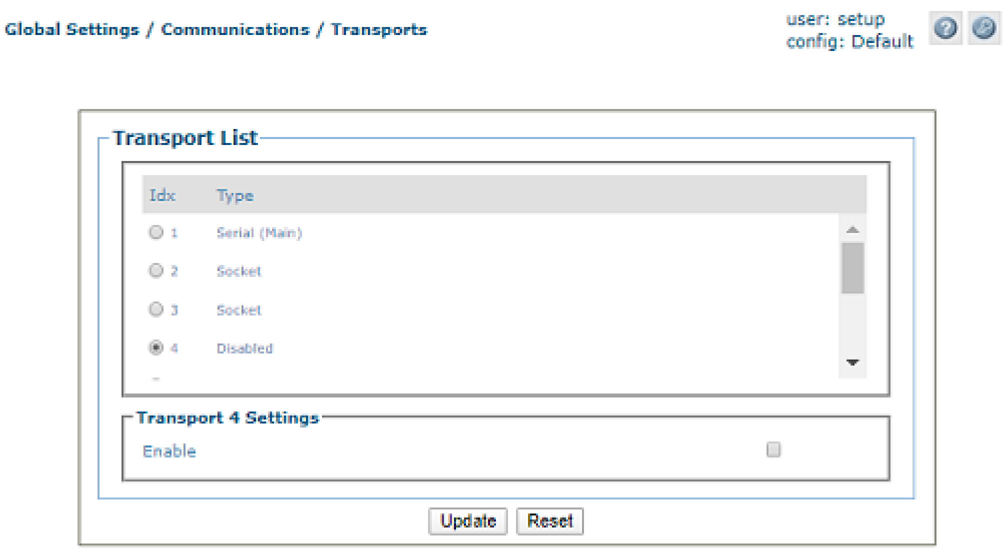
The ASI Object supports all configuration options available on the Axiom, Axiom X, and AL5010 with the exception of the 8 Reader Outputs.

ETHERNET/IP CONFIGURATION IN READER

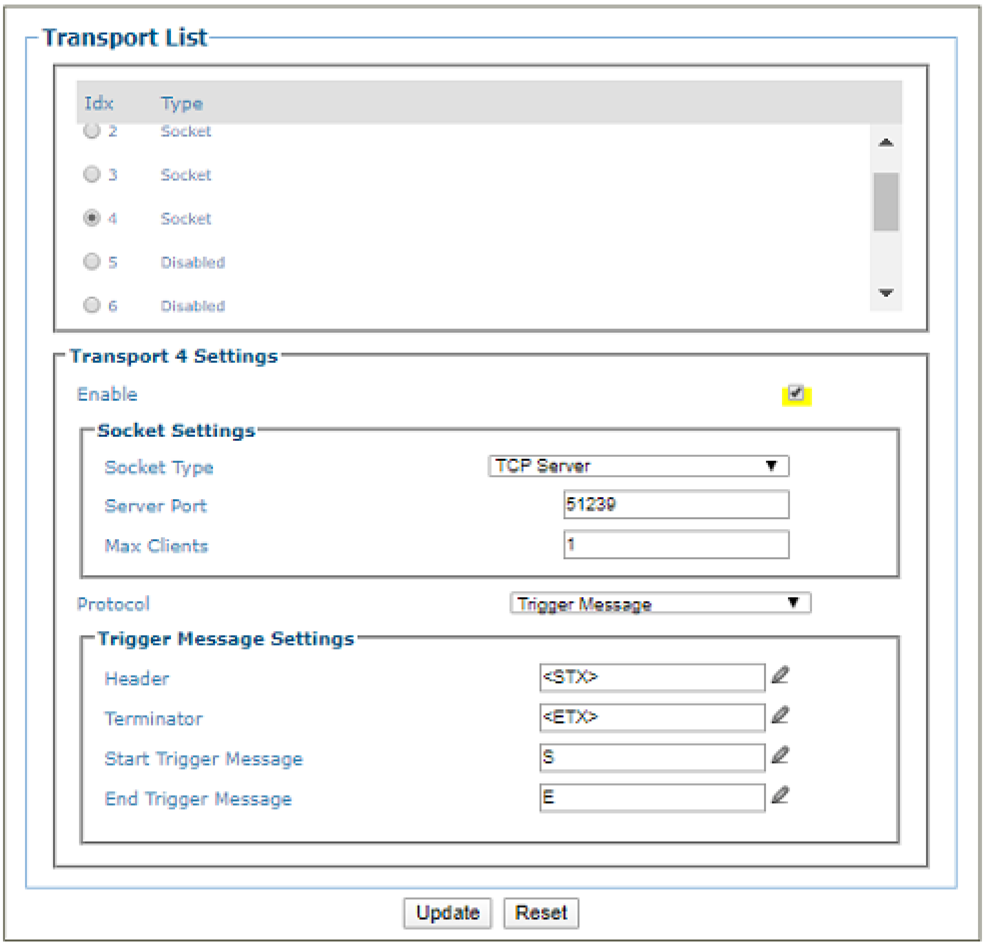
EIP is not enabled by default in the camera.

To enable Ethernet IP follow these steps:

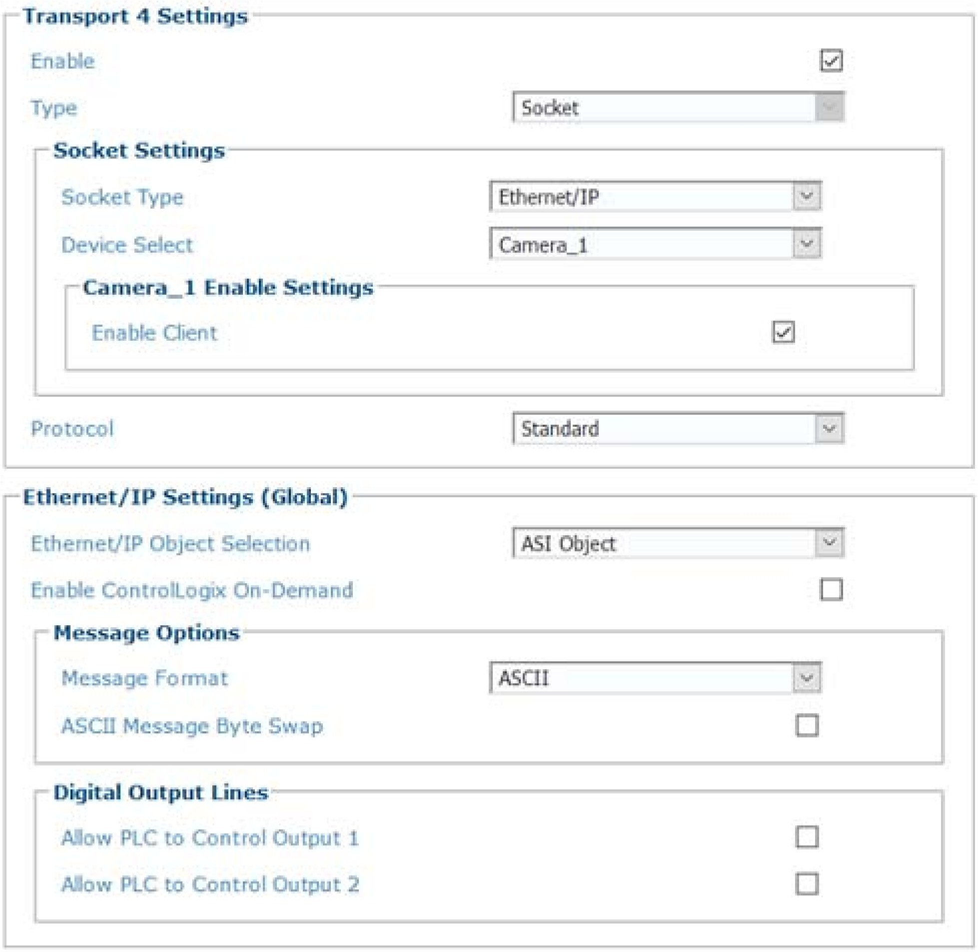
1. In the menu under **Modify Settings / Global Settings / Communications,** click **Transports.** The Transports List window opens.



2. Select the socket for which to **Enable Ethernet/IP**.

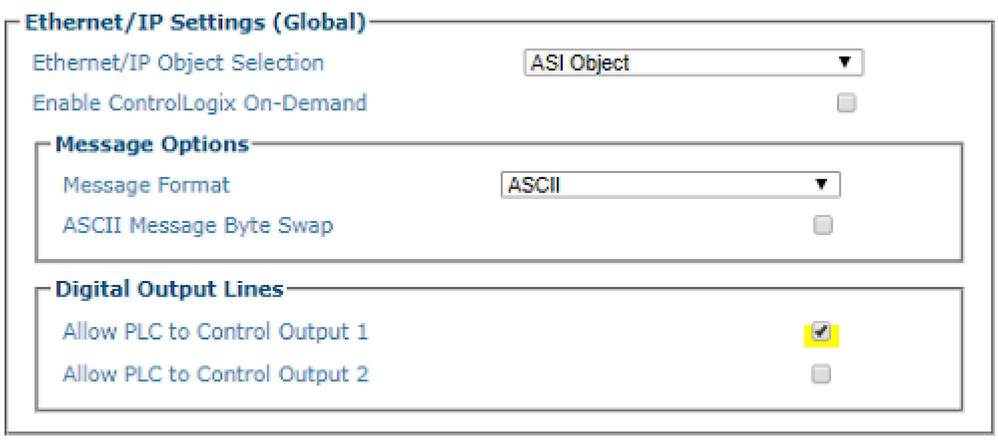


3. Click the **Socket Type** drop-down and select **Ethernet/IP**, various Ethernet options will appear.

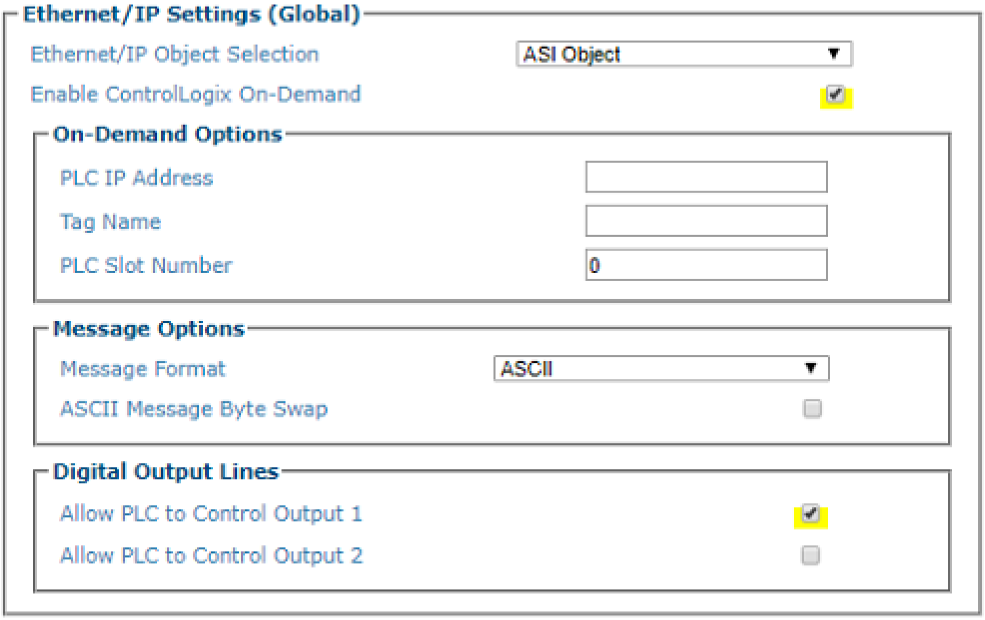


4. Click the check-box to **Enable Client.** Once enabled, EIP allows the camera to communicate with other Ethernet/IP enabled devices. This can be done using **Explicit Messaging, I/O Messaging** and a special protocol for ControlLogix Controllers called **On-Demand Messaging**. The EIP, ASI Object definitions follow.

I/O messaging can be used to monitor and set the cameras I/O bits, and to obtain bar code data from the camera. The disadvantage is that the I/O messages are always sent at a scheduled interval creating a lot of network traffic.



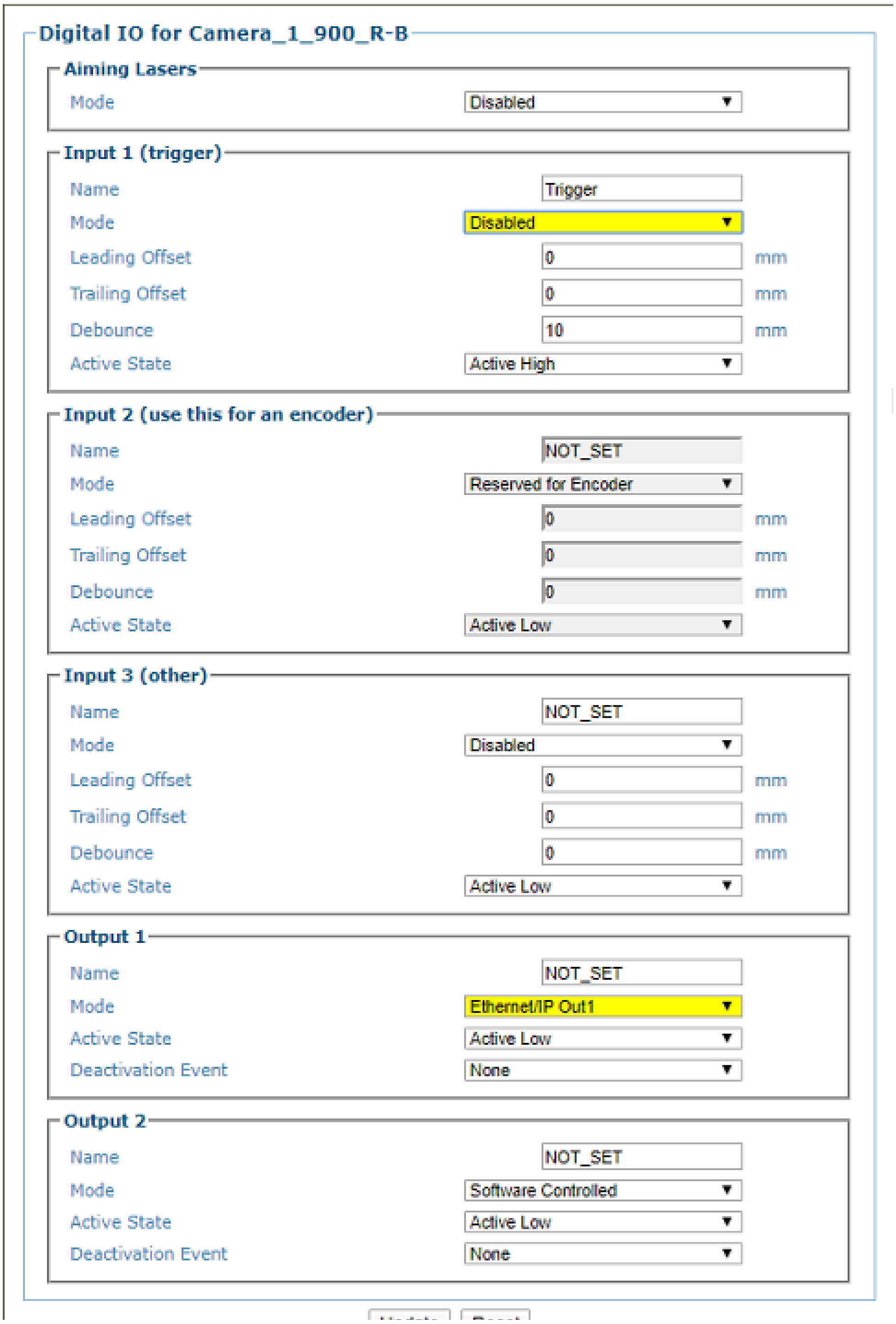
By contrast, **On-Demand Messaging** (which only works with a ControlLogix Controller) allows bar code data to be sent to the Controller only when a bar code is read.



Select the check-box **Enable ControlLogix On-Demand**. This is described in more detail later in this document.

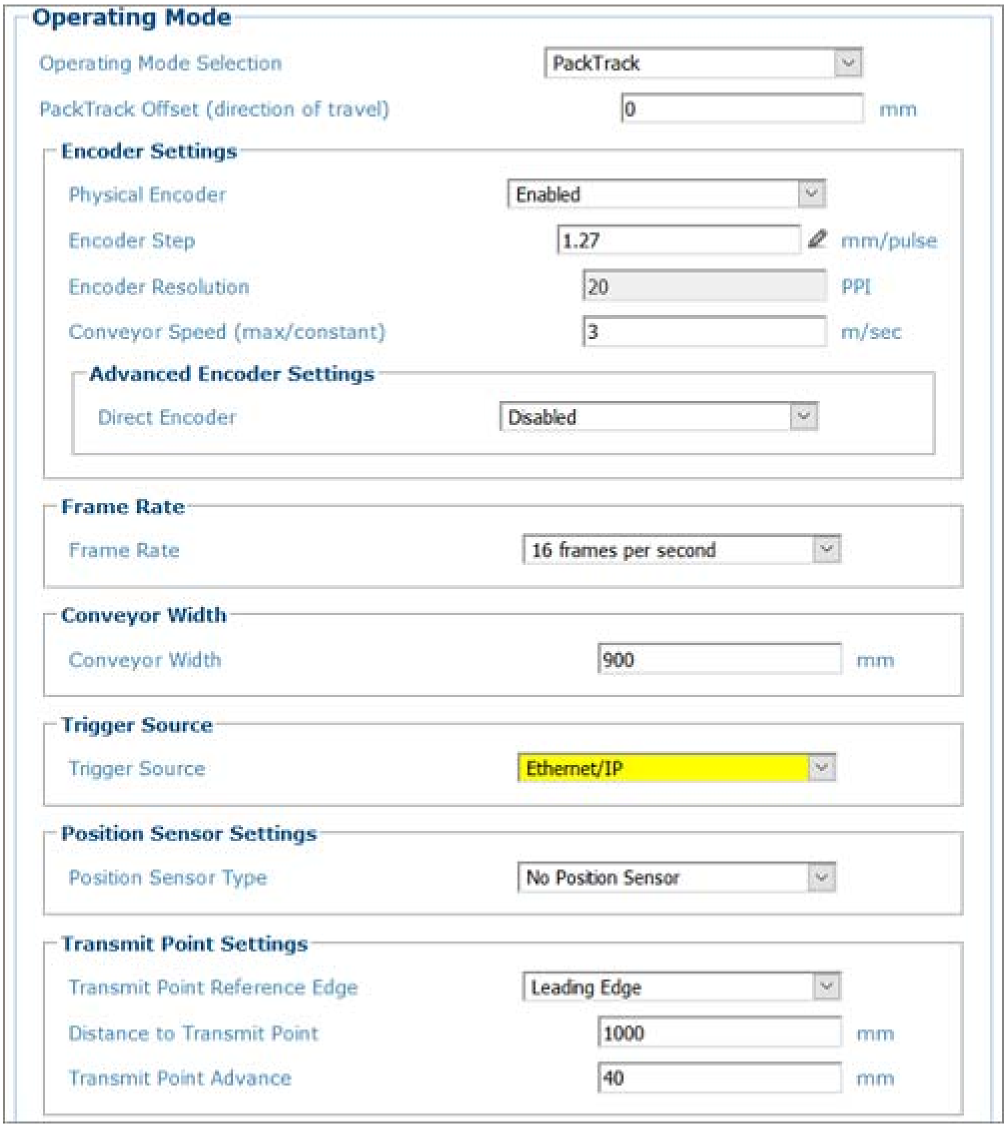
The **Message Format** parameters allow you to manipulate the format of the bar code data. Most notable if your barcodes only contain numeric digits, you can configure the reader to convert the bar codes to a numeric value instead of transmitting them as ASCII text.

The **Digital Output Lines** parameter can be used to relinquish control of the internal relays (2 relays for AV500/900). When this has been done, these relays are controlled by bits within the Output Word.



Lastly, When EIP is enabled, the option **Start Input From Bus** becomes available on the Operating Mode page of e-Genius.

When this is enabled, the camera trigger input is ignored and the reader will be triggered solely by manipulating the Trigger Bit in the Output Word (contained in the reader Assembly and Output Objects).



I/O CONTROLLOGIX MESSAGING EXAMPLE

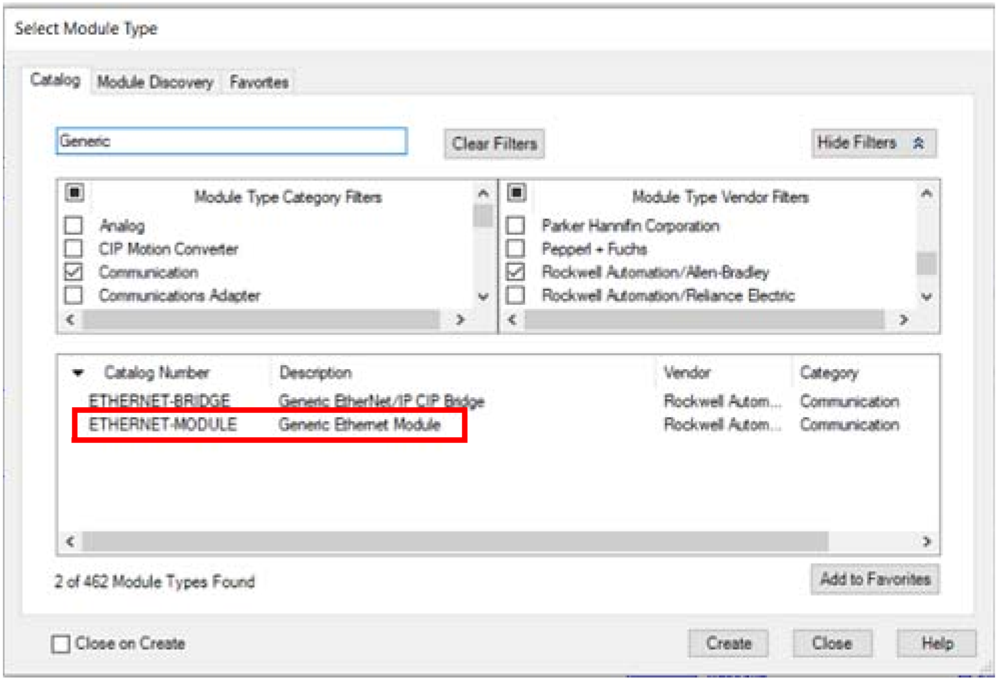
The following example illustrates how a camera can be configured to communicate with a ControlLogix processor using I/O messaging. Using this information along with the Reader Object definitions later in this document, it should be possible to adapt these directions for other EtherNet/IP network master devices.

When EtherNet/IP is enabled on the camera, EIP I/O Messaging is automatically enabled. No further configuration on the Datalogic device is needed to setup I/O messaging. Since the ControlLogix processor now treats the camera as an I/O device, to setup an EIP I/O message transfer between a camera and a ControlLogix processor, you need to configure your camera as a **Generic Ethernet Module** in the ControlLogix I/O tree.

Follow these steps to add a module:

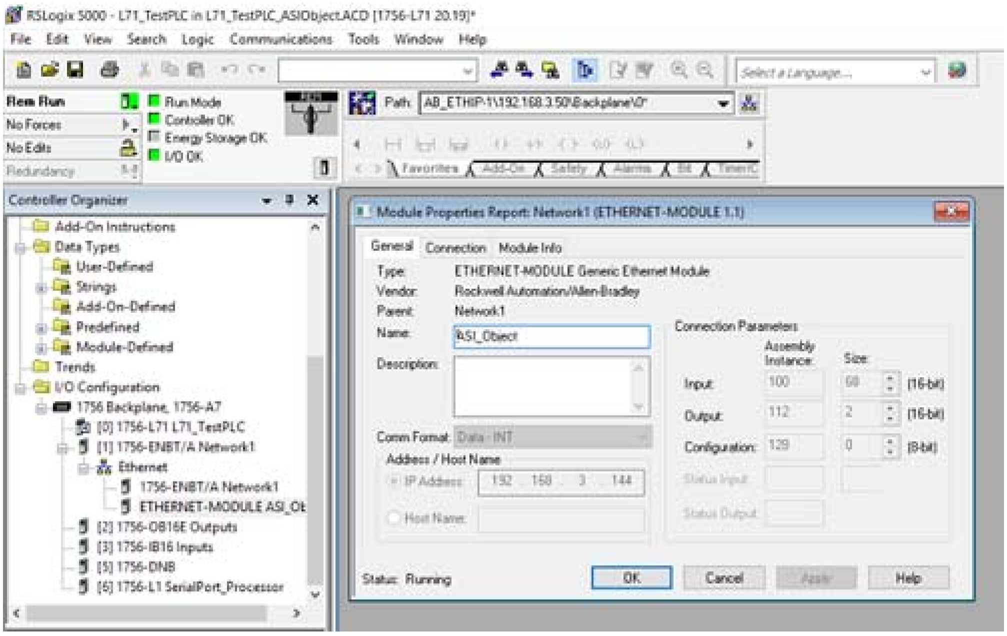
Right click and select **New Module** on the entry for your Ethernet module under the I/O Configuration Tree. A list of options similar to what is shown below will appear.

1. From this list select **ETHERNET-MODULE** for the Generic Ethernet Module.



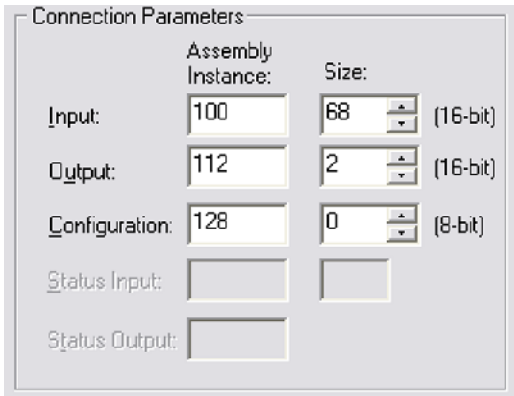
2. Click **OK.**

3. Specify the Properties for your camera. First set the Comm Format to Data-INT. **This must be done first as it cannot be changed later.**

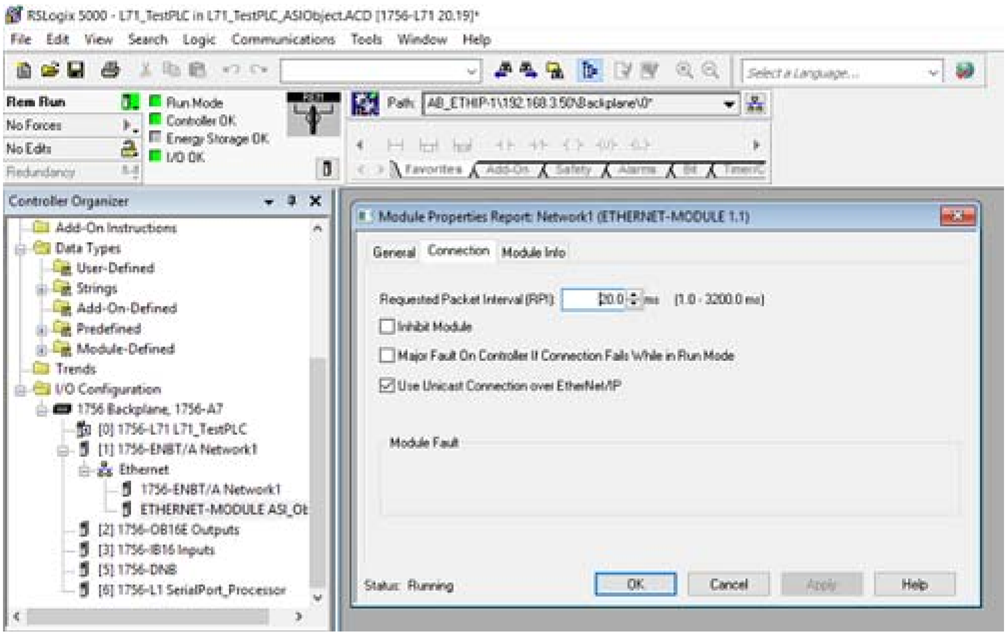


4. Specify the Name, Description and IP address of the camera.

5. Next enter the **Connection Parameters**.



6. You can only “schedule” I/O message transfers to the camera at a fixed interval. Click the **Connection Tab** and specify this interval. The camera will handle intervals down to 20 milliseconds.



7. Click **OK**.

8. After the module definition for the camerar has been completed, tags will be created in the controller based on the name you specified on the properties page for the module. These tags will consist of the name followed either by the letter **"Reader:C Configuration Data" on page 404** the **"Reader:O Output Data" on page 405** or the **"Reader:I Input Data" on page 404**. These tags are based on the reader assembly objects.

Reader:C Configuration Data

This data is not used.

Reader:I Input Data

Tag Name	Value	Description
Reader:I.Data[0]	Discrete Input Word	See bit definitions.
Reader:I.Data[1]	Bar Code Sequence Number	This field is updated every time the bar code data is updated. However, the bar code data will only be updated when the "Last Bar Code Sequence Number" (see Output Data) is set equal to this value.
Reader:I.Data[2]	Bar Code Status	Not currently used.
Reader:I.Data[3]	Bar Code Size (words)	Number of words which contain the barcode data
Reader:I.Data[4-67]	Bar Code Data	

Discrete Input Word

Bit	
0	Unused
1	Unused
2	Unused
3	Unused
4	Unused
5	Unused
6	Unused
7	Unused
8-15	Unused

Reader:O Output Data

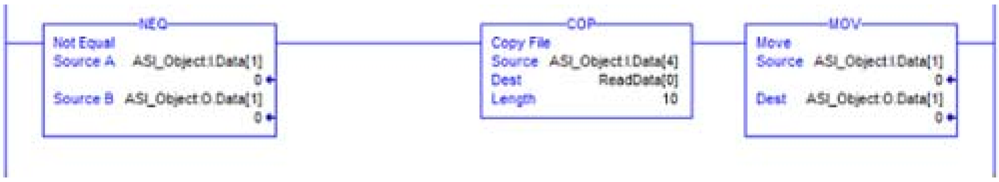
Tag Name	Value	Description
Reader:O.Data[0]	Discrete Output Word	See bit definitions.
Reader:O.Data[1]	Last Barcode Sequence Number Received	This field must be updated to match the Bar Code Sequence Number each time the bar code data has been processed.

Discrete Output Word

Bit	Bit = 0	Bit = 1
0*	Trigger Off	Trigger On
1 – 7	Unused	Unused
8*	Reader Relay #1 Off	Reader Relay #1 On
9*	Reader Relay #2 Off	Reader Relay #2 On
10*	Reader Relay #3 Off	Reader Relay #3 On
11*	Reader Relay #4 Off	Reader Relay #4 On
12-15	Unused	Unused

I/O MESSAGING LADDER LOGIC EXAMPLE

The rung of ladder logic below shows an example of how to update the Output data register "Last Barcode Sequence Number Received" after new barcode data is present.



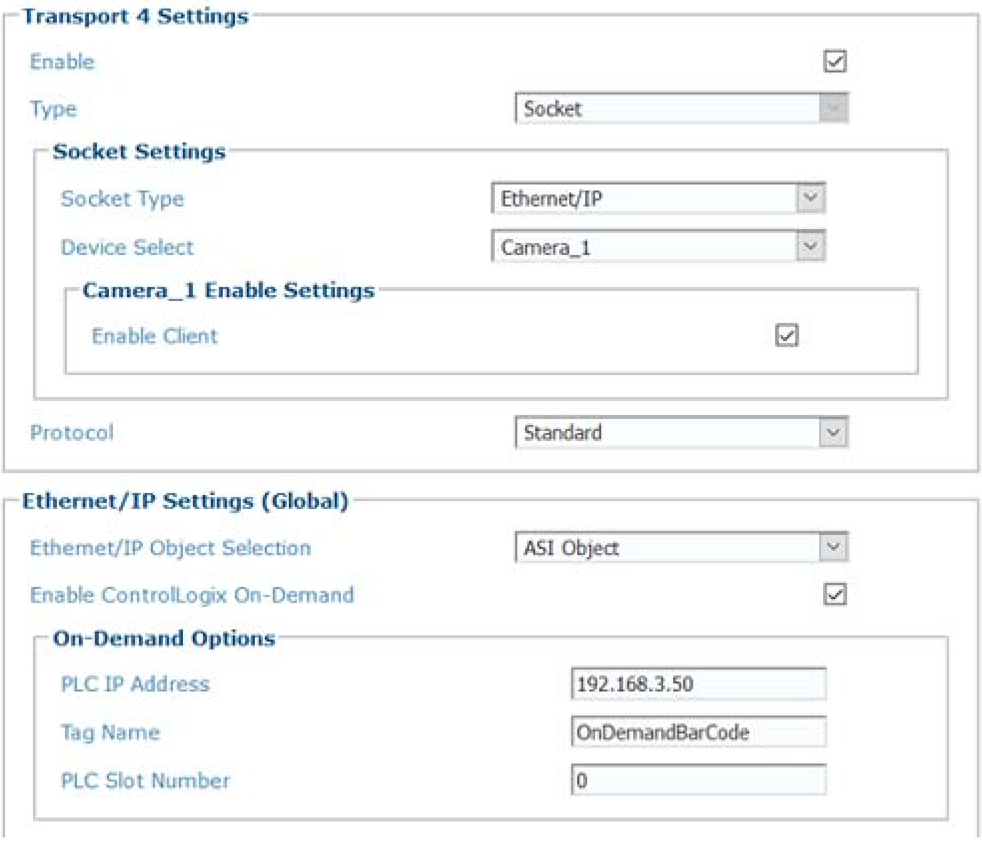
If this logic is not implemented correctly the Input data registers "Bar Code Data" will contain the data from the first read cycle after the reader boots. The **Not Equal To** instruction check for new data to bar code data must be available. When new data is available (output register is not equal to input) the rung is executed.

The **Copy File** instruction copies the bar code data to a program tag. Note that in this example the instruction moves a fixed 10 registers (10 registers will contain 20 ASCII characters).

The **Move** instruction moves the sequence number from the input registers to the output register. This lets the reader know the PLC is ready for the data from the next read cycle.

ON-DEMAND MESSAGING (CONTROLLOGIX)

On-Demand messaging provides another option for transferring bar code data to your ControlLogix processor. With on-demand messaging, the data transfer occurs as soon as the bar code data is available, not as the result of constant messaging at a scheduled interval.



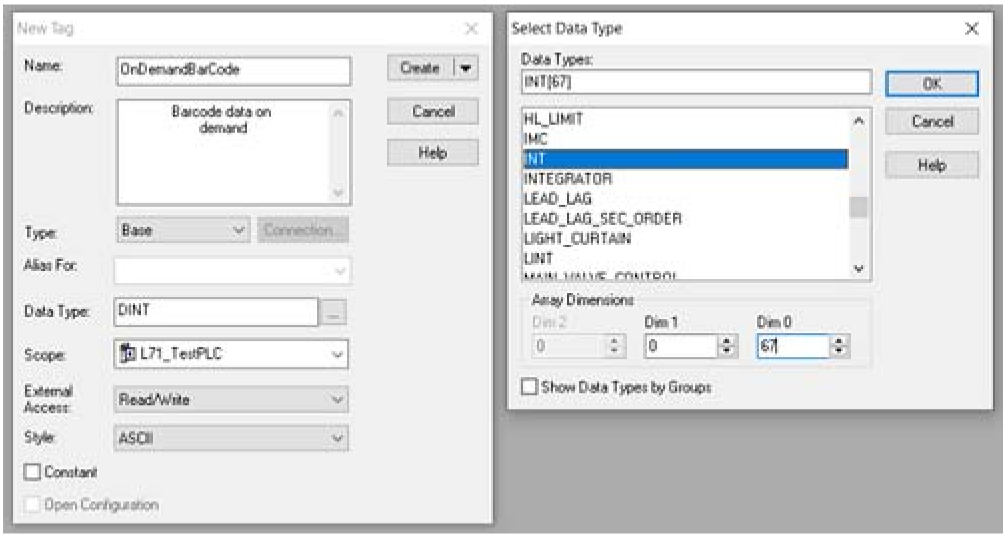
For On-Demand messaging follow these steps:

1. To enable the camera, select the check-box **Enable ControlLogix On-Demand Messaging** from the Ethernet/IP page within e-Genius.

2. Specify the IP address and slot for the ControlLogix processor.

3. Name of the Tag to contain the bar code data.

Once this is complete, you need to define a new Tag in the ControlLogix processor. The new tag must have a type of INT and a dimension of 67 words. The name must match the name specified in the camera Tag Name.



Once this has been completed, these tags will be updated every time a bar code is read.

On-Demand Tag

Tag Name	Value	Description
ReaderTag.Data[0]	Bar Code Sequence Number	This field is incremented every time the bar code data is updated.
ReaderTag.Data[1]	Bar Code Status	Not currently used.
ReaderTag.Data[2]	Bar Code Size (words)	Number of words which contain the barcode data
ReaderTag.Data[3-66]	Bar Code Data	

ETHERNET/IP OBJECT MODELS

This is a description of the different data types that are used in the documentation of the object model. These are standard definitions of the Open DeviceNet Vendor Association (ODVA).

Summary of Objects

The following standard objects are supported. More details can be found in the EtherNet/IP™ Specification available from the Open DeviceNet Vendors Association (ODVA).

Identity Object (01_{HEX})

Message Router Object (02_{HEX})

Assembly Object (04_{HEX})

Connection Manager Object (06_{HEX})

TCP Object ($F5_{HEX}$)

Ethernet Link Object ($F6_{HEX}$)

The following Vendor Specific Objects have been defined to support the Reader Bar Code Reader:

- Barcode Data Object (70_{HEX})
- Discrete Input Data Object (71_{HEX})
- Discrete Output Data Object (72_{HEX})

Definitions

The following table has a description of all of the data types used.

USINT	Unsigned Short Integer (8-bit)
UINT	Unsigned Integer (16-bit)
UDINT	Unsigned Double Integer (32-bit)
STRING	Character String (1 byte per character)
BYTE	Bit String (8-bits)
WORD	Bit String (16-bits)
DWORD	Bit String (32-bits)

STANDARD OBJECTS

Identity Object (01HEX - 1 Instance)

Class Attributes

Attribute ID	Name	Data Type	Data Value	Access Rule
1	Revision	UINT	1	Get

Instance Attributes

Attribute ID	Name	Data Type	Data Value	Access Rule
1	Vendor Number	UINT	25DEC	Get
2	Device Type 0x00 – Generic	UINT	00HEX	Get
3	Product Code Number	UINT	01	Get
4	Product Major Revision Product Minor Revision	USINT USINT	03 01	Get
5	Status Word (see below for definition)	WORD	See Below	Get
6	Product Serial Number	UDINT	Unique 32 Bit Value	Get
7	Product Name Structure of: Product Name Size Product Name String	UINT USINT[0-32]	15 "Bar Code Reader"	Get

Status Word

Bit	Bit = 0	Bit = 1
0	No I/O Connection	I/O Connection Allocated
1 – 15	Unused	Unused

Common Services

Service Code	Implemented for Class Level	Instance Level	Service Name
0EHEX	Yes	Yes	Get_Attribute_Single
05HEX	No	Yes	Reset

Reset Service Code

Service Code	Class	Instance	Attribute	Description
05HEX	1	1	0	Force software reset
05HEX	1	1	1	Reload factory settings and reset

Message Router Object (02HEX)

This object has no supported attributes.

ASSEMBLY OBJECT (04HEX – 4 INSTANCES)

Class Attributes

Attribute ID	Name	Data Type	Data Value	Access Rule
1	Revision	UINT	1	Get
2	Max Instance	UINT	81	Get

Instance 0x64 Attributes (Input Instance 1)

Attribute ID	Name	Data Type	Default Data Value	Access Rule
3	Input Data Structure of: Discrete Input Word (see below) Barcode Sequence Number Barcode Status (reserved) Barcode Size Word Barcode Data [UINT]	UINT UINT UINT UINT UINT [ ] varies (up to 64)	0 0 0 0 0	Get

Discrete Input Word

Bit	
0	Reader Programmable Output #1
1	Reader Programmable Output #2
2	Reader Programmable Output #3
3	Reader Programmable Output #4
4	Reader Programmable Output #5
5	Reader Programmable Output #6
6	Reader Programmable Output #7
7	Reader Programmable Output #8
8-15	Unused

Instance 0x70 Attributes (Output Instance 1)

Attribute ID	Name	Data Type	Default Data Value	Access Rule
3	Output Data Structure of: Discrete Output Word (see below) Last Barcode Seq. Num Received	UINT UINT	0 0	Get / Set

Discrete Output Word

Bit	Bit = 0	Bit = 1
0*	Trigger Off	Trigger On
1 – 7	Unused	Unused
8*	Reader Relay #1 Off	Reader Relay #1 On
9*	Reader Relay #2 Off	Reader Relay #2 On
10*	Reader Relay #3 Off	Reader Relay #3 On
11*	Reader Relay #4 Off	Reader Relay #4 On
12-15	Unused	Unused

Instance 0x80 Attributes (Configuration Instance)

Most I/O clients include a Configuration path when opening an I/O connection to a server. There is no Configuration data needed.

Instance 0x81 Attributes (Heartbeat Instance – Input Only)

This instance allows clients to monitor input data without providing output data.

Common Services

Service Code	Implemented for		Service Name
	Class Level	Instance Level	
0EHEX	Yes	Yes	Get_Attribute_Single
10HEX	No	Yes	Set_Attribute_Single

Connection Manager Object (06 $_{HEX}$)

This object has no attributes.

TCP Object (F5HEX - 1 Instance)

Class Attributes

Attribute ID	Name	Data Type	Data Value	Access Rule
1	Revision	UINT	1	Get

Instance Attributes

Attribute ID	Name	Data Type	Default Data Value	Access Rule
1	Status	DWORD	1	Get
2	Configuration Capability	DWORD	0	Get
3	Configuration Control	DWORD	0	Get
4	Physical Link Object Structure of: Path Size Path	UINT Array Of WORD	2 0x20F6 0x2401	Get
5	Interface Configuration Structure of: IP Address Network Mask Gateway Address Name Server Name Server 2 Domain Name Size Domain Name	UDINT UDINT UDINT UDINT UDINT UINT STRING	0 0 0 0 0 0 0	Get
6	Host Name Structure of: Host Name Size Host Name	UINT STRING	0 0	Get

Common Services

Service Code	Implemented for		Service Name
	Class Level	Instance Level	
0EHEX	Yes	Yes	Get_Attribute_Sin-gle

Ethernet Link Object (F6 HEX – 1 Instance)

Class Attributes

Attribute ID	Name	Data Type	Data Value	Access Rule
1	Revision	UINT	1	Get

Instance Attributes

Attribute ID	Name	Data Type	Default Data Value	Access Rule
1	Interface Speed	UDINT	100	Get
2	Interface Flags	DWORD	3	Get
3	Physical Address	USINT Array[6]	0	Get

Common Services

Service Code	Implemented for		Service Name
	Class Level	Instance Level	
0EHEX	Yes	Yes	Get_Attribute_Single

VENDOR SPECIFIC OBJECTS

Barcode Data Object (70 HEX - 1 Instance)

Class Attributes

Attribute ID	Name	Data Type	Default Data Value	Access Rule
1	Revision	UINT	1	Get

Instance Attributes

Attribute ID	Name	Data Type	Default Data Value	Access Rule
1	Barcode Sequence Number	UINT	0	Get
2	Barcode Status (reserved)	UINT	0	Get
3	Barcode Data Size	UINT	0	Get
4	Barcode Data	UINT[ ] varies (up to 64)	0	Get
5	Last Barcode Seq. Num Received	UINT	0	Get / Set

Common Services

Service Code		Implemented for	Service Name
	Class Level	Instance Level	
0EHEX	Yes	Yes	Get Attribute Single
10HEX	No	Yes	Set Attribute Single

Discrete Input Data Object (71 HEX - 1 Instance)

Class Attributes

Attribute ID	Name	Data Type	Default Data Value	Access Rule
1	Revision	UINT	1	Get

Instance Attributes

Attribute ID	Name	Data Type	Default Data Value	Access Rule
3	Discrete Input Word	UINT	0	Get

Discrete Input Word

Bit	
0	Reader Programmable Output #1
1	Reader Programmable Output #2
2	Reader Programmable Output #3
3	Reader Programmable Output #4
4	Reader Programmable Output #5
5	Reader Programmable Output #6
6	Reader Programmable Output #7
7	Reader Programmable Output #8
8-15	Unused

Common Services

Service Code		Implemented for	Service Name
	Class Level	Instance Level	
0EHEX	Yes	Yes	Get Attribute Single

Discrete Output Data Object (72 $_{HEX}$– 1 Instance)

Class Attributes

Attribute ID	Name	Data Type	Data Value	Access Rule
1	Revision	UINT	1	Get

Instance Attributes

Attribute ID	Name	Data Type	Default Data Value	Access Rule
3	Discrete Output Data	UINT	0	Get / Set

Discrete Output Word

Bit	Bit = 0	Bit = 1
0*	Trigger Off	Trigger On
1 – 7	Unused	Unused
8*	Reader Relay #1 Off	Reader Relay #1 On
9*	Reader Relay #2 Off	Reader Relay #2 On
10*	Reader Relay #3 Off	Reader Relay #3 On
11*	Reader Relay #4 Off	Reader Relay #4 On
12-15	Unused	Unused

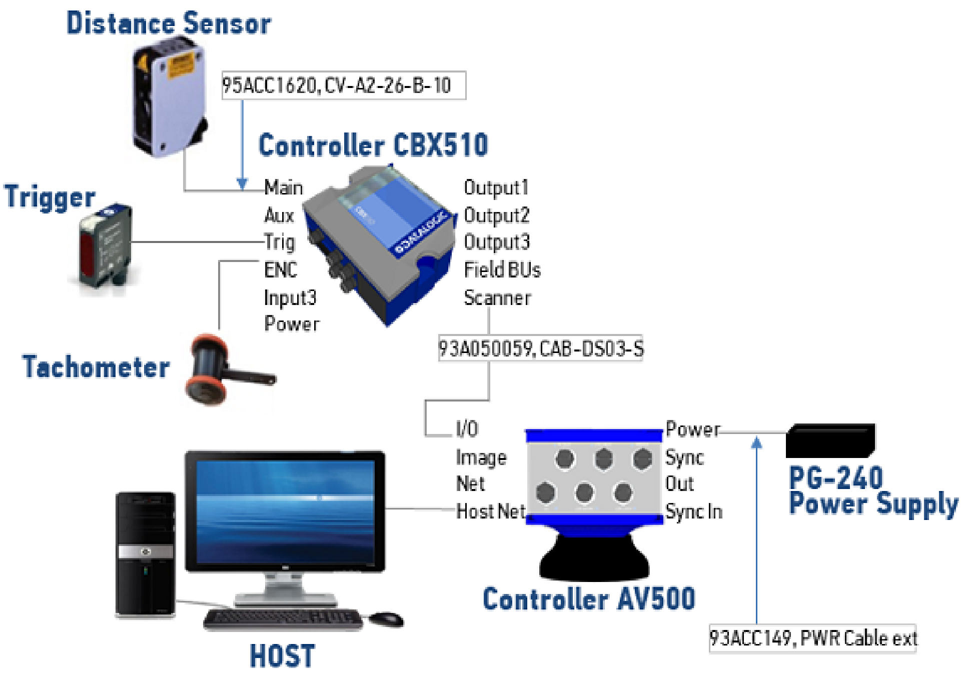
Common Services

Service Code	Implemented for		Service Name
Class Level		Instance Level	
0EHEX	Yes	Yes	Get_Attribute_Single
10HEX	No	Yes	Set_Attribute_Single

APPENDIX B
STANDARD INTERCONNECTION DIAGRAMS

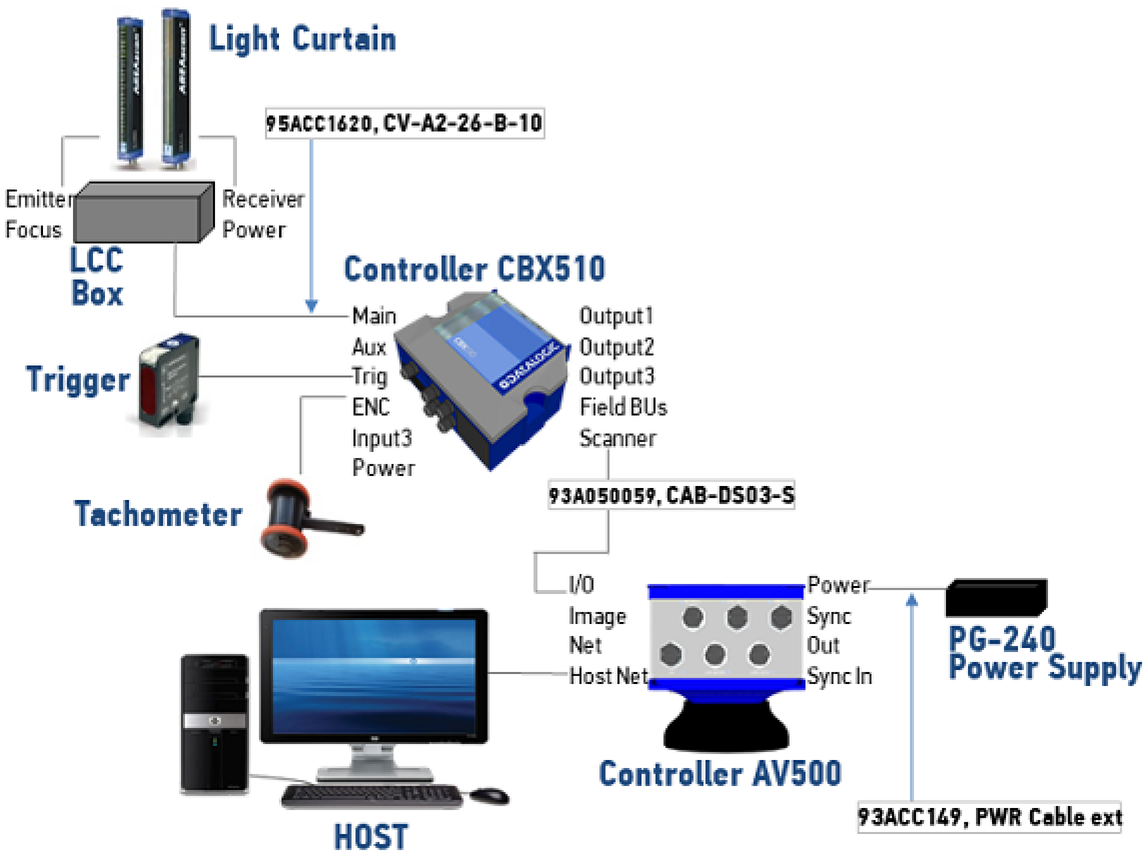
The AV500/900 supports innumerable configurations. Illustrated here are eight typical examples.

AV500, Distance Sensor, CBX510, Trigger and Tachometer



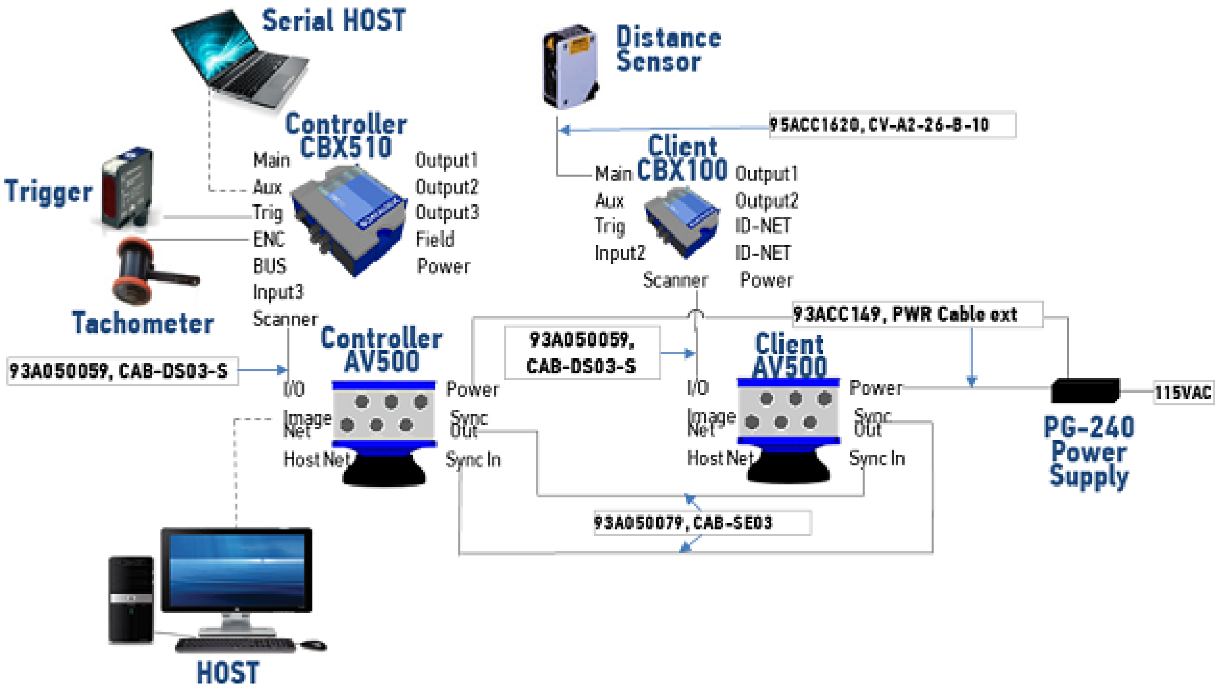
NOTE: AV500/900 cameras cannot accommodate fieldbus, however a CBX800 can be used for fieldbus applications.

AV500, Light Curtain, CBX510, Trigger and Tachometer



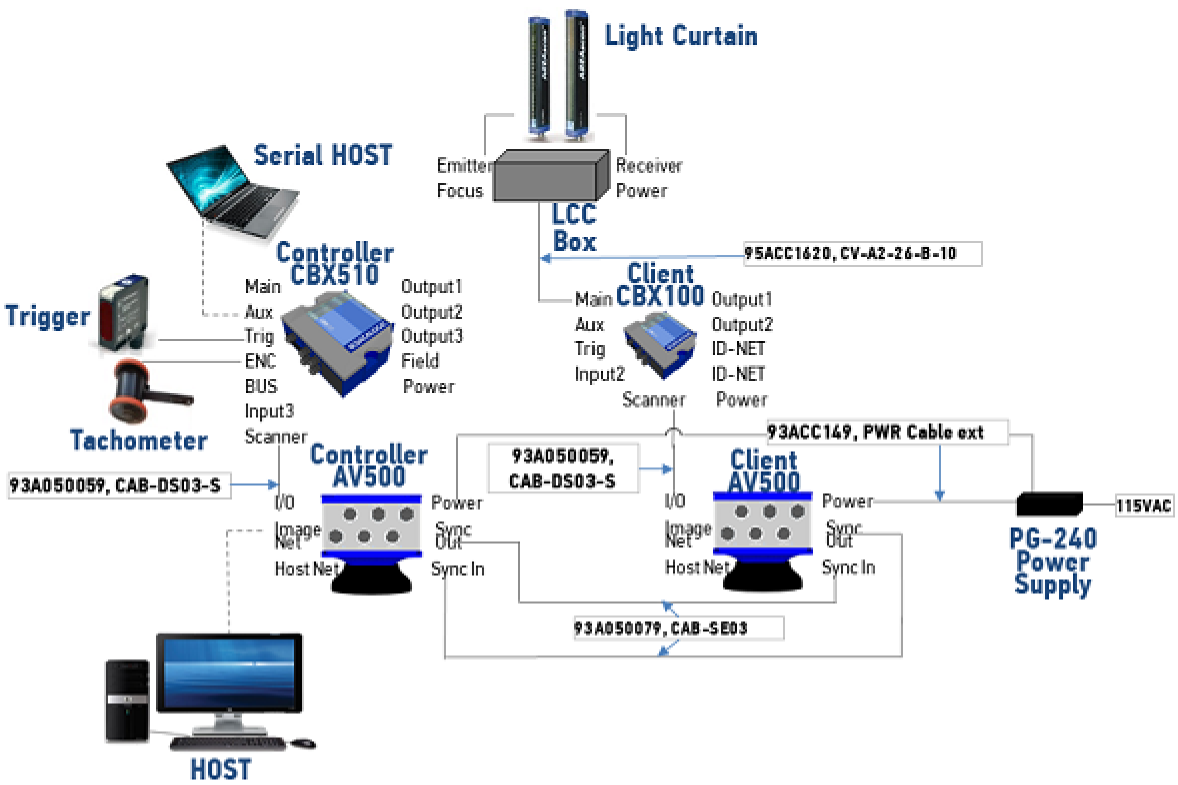
NOTE: AV500/900 cameras cannot accommodate fieldbus, however a CBX800 can be used for fieldbus applications.

Two AV500, Distance Sensor, CBX510 and CBX100, Trigger and Tachometer



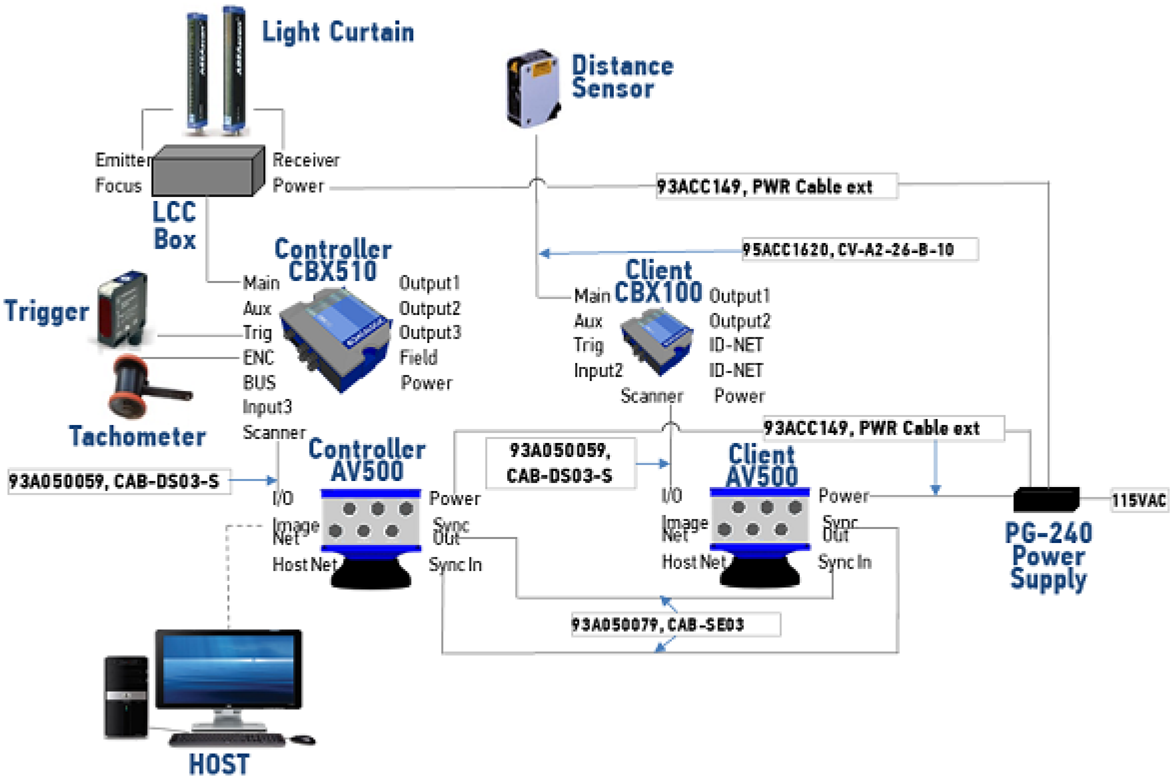
NOTE: AV500/900 cameras cannot accommodate fieldbus, however a CBX800 can be used for fieldbus applications.

Two AV500, Light Curtain, CBX510 and CBX100, Trigger and Tachometer



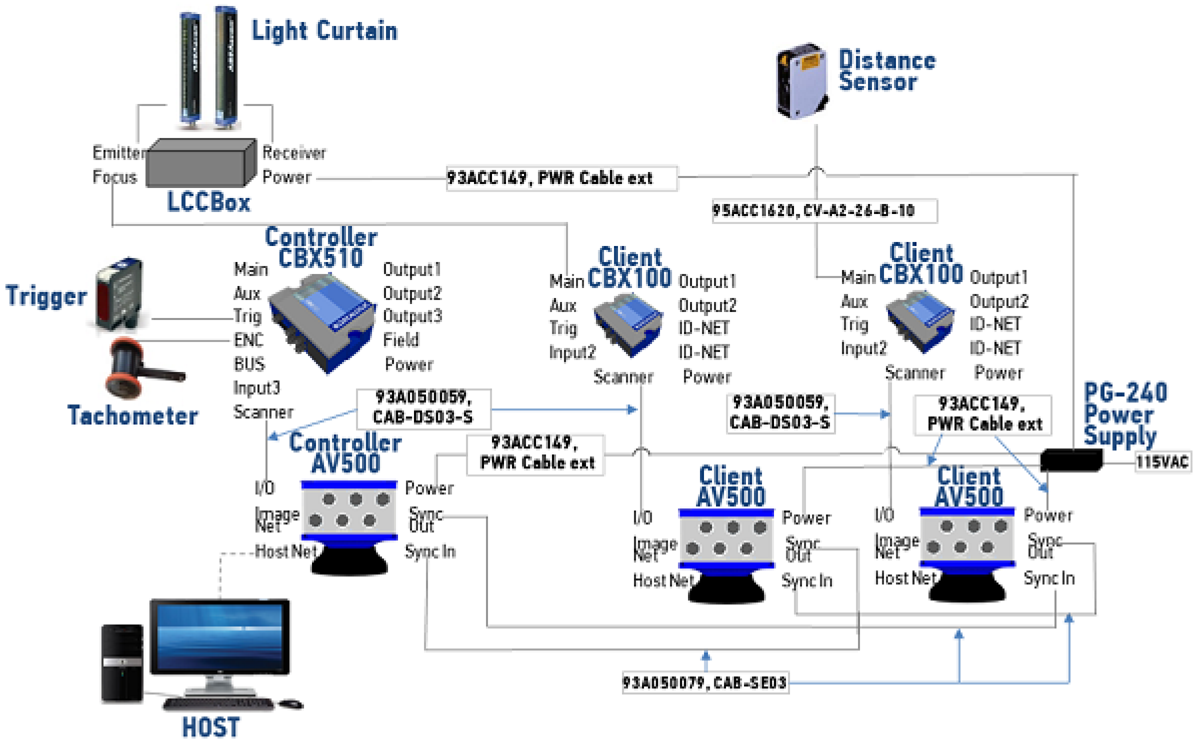
NOTE: AV500/900 cameras cannot accommodate fieldbus, however a CBX800 can be used for fieldbus applications.

Two AV500, Light Curtain, Distance Sensor CBX510 and CBX100, Trigger and Tachometer



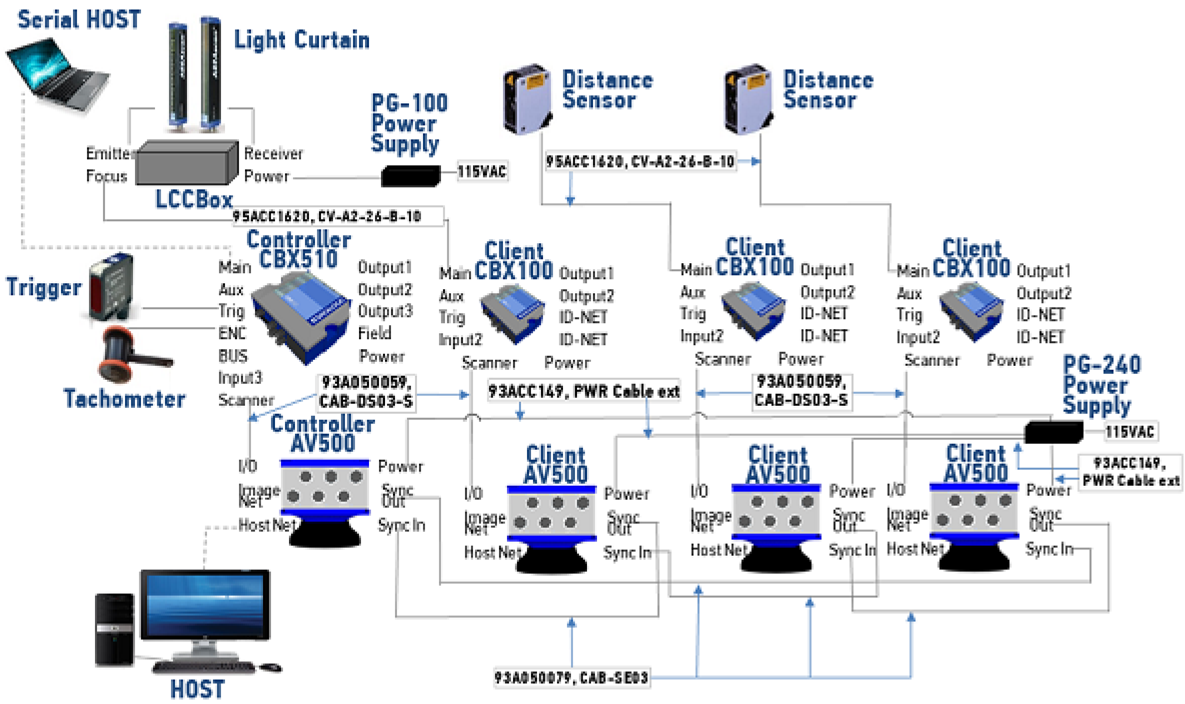
NOTE: AV500/900 cameras cannot accommodate fieldbus, however a CBX800 can be used for fieldbus applications.

Three AV500's, Light Curtain, Distance Sensor CBX510 and CBX100, Trigger and Tachometer



NOTE: AV500/900 cameras cannot accommodate fieldbus, however a CBX800 can be used for fieldbus applications.

Four AV500's, Light Curtain, Two Distance Sensors CBX510 and CBX100, Trigger and Tachometer



NOTE: AV500/900 cameras cannot accommodate fieldbus, however a CBX800 can be used for fieldbus applications.

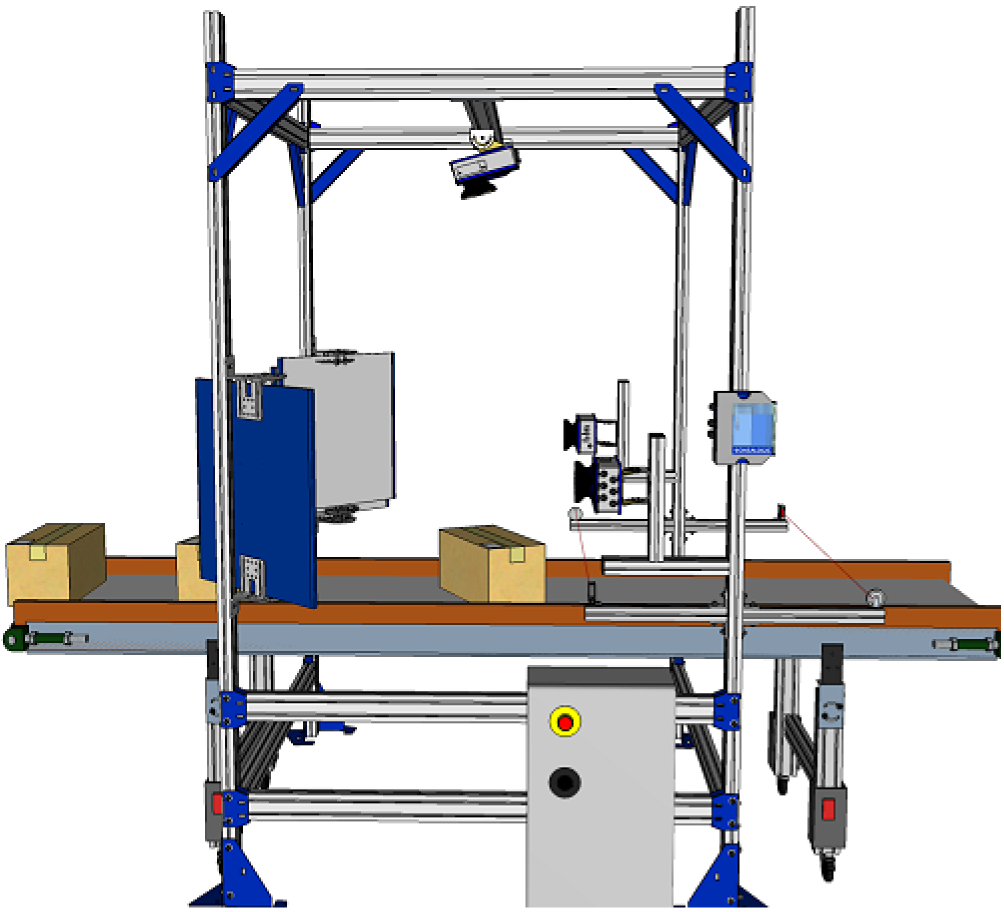
APPENDIX C
BIDIRECTIONAL SETUP

BIDIRECTIONAL SETUP INTRODUCTION

The AV500/AV900 supports bi-directional conveyor travel. A Datalogic Bidirectional system accommodates an application where the customer can change the direction of the conveyor. To accommodate a Bidirectional system, an additional photocell is required, as well as other special equipment:

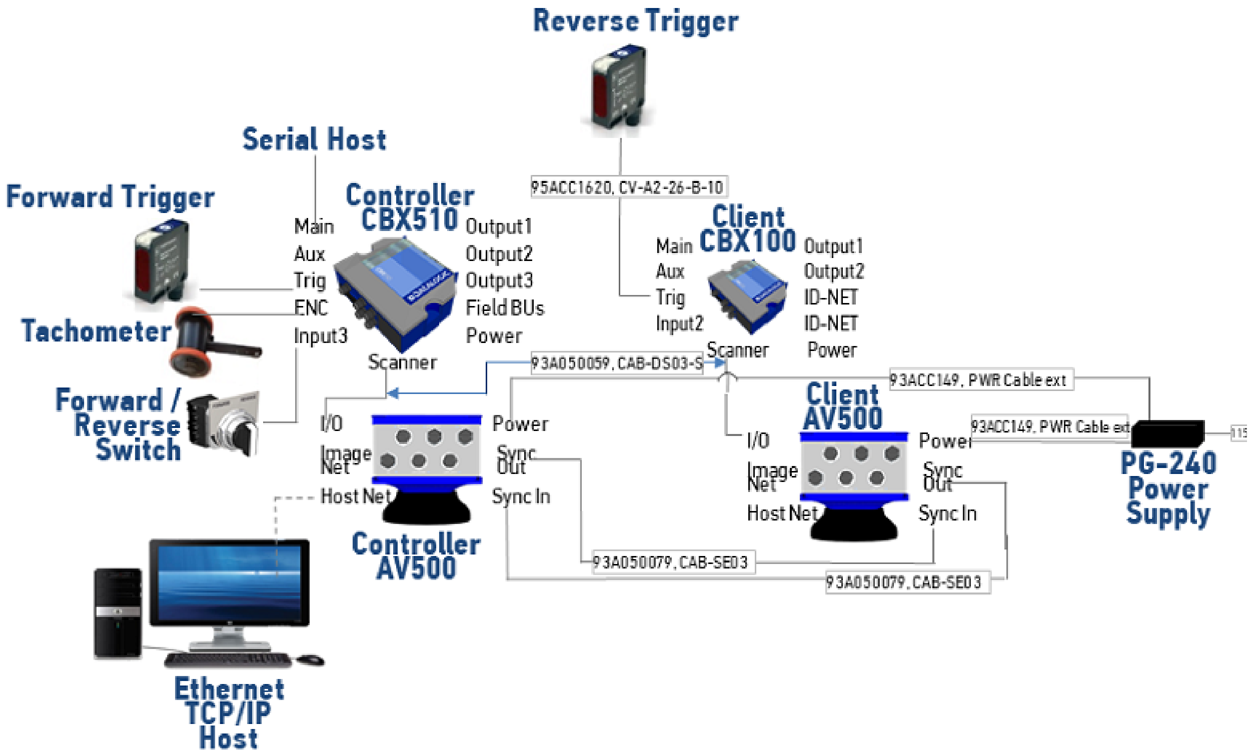
- Special tachometer bracket to more securely fasten the tachometer to the conveyor
- An additional photocell to signal in the reverse direction
- A customer supplied switch (relay) to indicate to the system in which direction the conveyor is going

Bidirectional functionality is made up of two configurations; one is used in the "forward" direction and the other is used in the "reverse" direction.



Bidirectional System Wiring

Connect your system components as show in the diagram below.



Prerequisites/Considerations

- Unless a single AV500/AV900 is setup in **Continuous** Operating Mode, two AV500/AV900 units are required to provide the necessary I/O support.
- Dynamic Focus is not supported.
- The tachometer input to the Controller is shared by all units.
- The Active Configuration bit must be input to the Controller's I/O box
- A bi-directional system behaves like two unique AV500/AV900 arrays. The functionality is enabled by setting an Input Mode, on the "Digital IO" page, to "Indicate Active Configuration" to "Active Low".

Once this parameter is set, the AV500/AV900 RTP reads the active state of the configured input and sends a message to the COMe to enable the *Primary* or *Secondary* configuration. Each configuration has its own unique XML file. It is advisable that for any given application, the state of the Direction bit is provided by the customer. This must be kept in mind during the application development and installation phases of the project.

Inactive state (high) on the selected "Input" will force "Primary Configuration"

Active state (low) on the selected "Input" will force "Secondary Configuration"

Configuration of Bidirectional System

Follow these steps to configure a bi-directional system.

1. Configure the "forward" direction
2. Enable "Indicate Active Configuration" which allows a digital input to determine the direction in use.
3. Configure the "reverse" direction

Tunnels generally require a single Tach Controller. The tach controller camera is connected to a CBX with the tach jumper installed, and the Tachometer, Photo Sensor, and/or Position Sensor used in the "Forward" direction are connected.

For a bidirectional system an additional CBX, without the tach jumper, is connected to another camera in the tunnel. A Tachometer, Photo Sensor and/or Position Sensor are also connected to this CBX/Camera and setup to be used in the "Reverse" direction.

The tach controller CBX must be wired to receive an input on "Input 3". This input is used to indicate the active controller.

- Inactive state on "Input 3" = Forward Direction (CBX Input 3 light off)
- Active Stats on "Input 3" = Reverse Direction (CBX Input 3 light on)

4. Physically wire all cameras in a loop via the Sync Network.
5. Make sure the Tach Controller, and only the Tach Controller, has the Tach jumper installed in its CBX box . The green LED, next to the cameras IO connector, is illuminated when the CBX/Tach Jumper is installed. This camera is the primary controller (IP address 192.168.0.145).
6. See "Assign Cameras To a Cluster" on page 3.
7. Perform a default on all of the cameras in the tunnel if redundancy or forward/reverse has been enabled in the past. When "Indicate Active Configuration" is enabled, the old configuration files are loaded and this **WILL** create confusion!

8. Complete the “Configure Digital Inputs and Outputs” on page 6 for the “forward” configuration.

NOTE: Do not set any of the inputs to “Indicate Active Configuration”. That will be done later in this procedure

9. Complete the “Configure Operating Mode” on page 10 for the “forward” configuration
10. Complete “Automated Mounting Calibration” on page 23 for the “forward” configuration. Repeat for each camera in the cluster.
11. Configure any Barcode Settings, Communications, Output Format, and Image Saving parameters.
12. Make sure the tach controller CBX is wired to receive an input on “Input 3”.
13. Make sure “Input 3” of the controller CBX is inactive (Input 3 LED off).
14. In the menu tree under Modify Settings, navigate to Device Settings | Camera Name | Digital IO. The Digital IO window opens.
15. Set the Input 3 Mode (other)” to Indicate Active Configuration.
16. Enter an name for Input 3 (other).
17. When you select **Indicate Active Configuration** a Configuration Name option appears at the top of the IO window.
- Enter Forward as the Primary Configuration name and Reverse as the Secondary Configuration name.
18. Click **Update** to save your changes.
19. Initially the config name is set to Primary. You need to change the state of Input 3 on the controller if Secondary is displayed instead of Primary.
20. Click **Real-Time Diagnostics** on the menu. If it’s not already connected and monitoring, Configuration Swap is Enabled and the Active Configuration is Forward (the config is still Primary)
21. Click **Copy Primary to Secondary** to copy all of the Primary (Forward) settings to the Secondary (Reverse) configuration.
22. Change the state of Input 3 in the tach controller CBX to Active – Input 3 LED On

NOTE: The “Force Configuration Swap” in Real-Time Diagnostics can be used to switch to the “Reverse” configuration. Doing so will get “Input 3” out of sync with the current configuration. You will need to set “Input 3” inactive and then active to get back in sync.

23. The **Active Configuration** in **Real-Time Diagnostics** should switch to Reverse.
24. Reload your webpage.
25. The config should be set to Reverse.
26. Configure Digital IO for the reverse configuration.
27. NOTE: You will get a warning after clicking Update to save Digital IO settings. This is OK. The warning is displayed because the Forward configuration settings were the starting point for the Reverse configuration.

28. Configure Operating Mode for the reverse configuration.
29. Complete Field Calibration for the reverse configuration. Repeat for each camera in the cluster.
30. Configure any Barcode Settings, Communications, Output Format, and Image Saving parameters that need to be different from the Forward configuration.
31. Forward/Reverse (Bidirectional) configuration is complete.

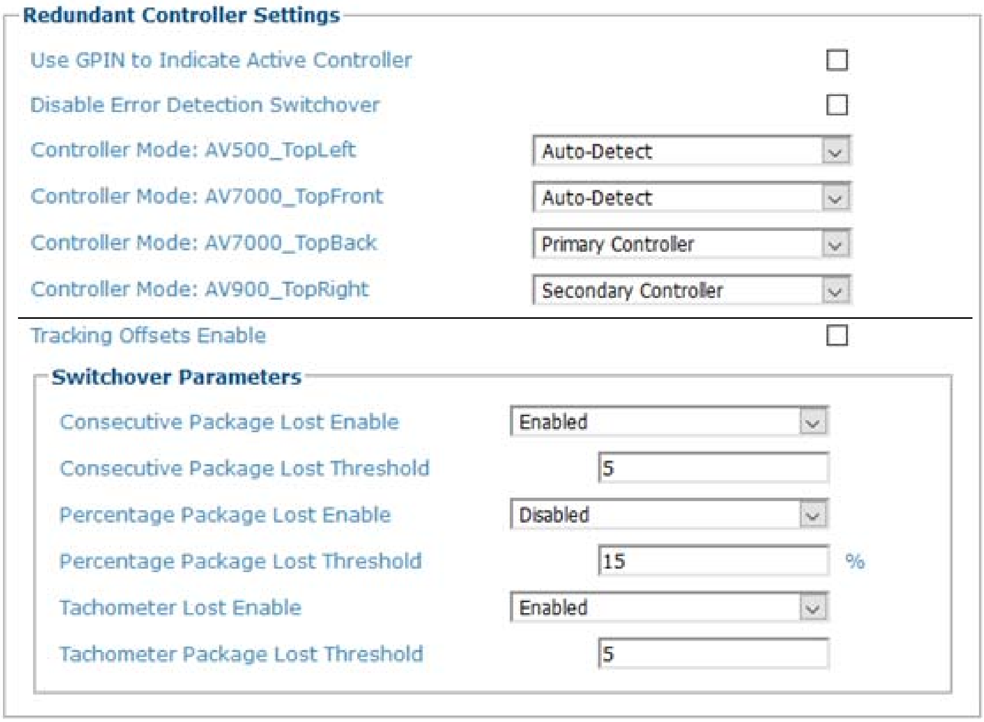
NOTE: Toggling the GPIN continuously could get the Input 3 state and active configuration out of sync. The cameras will recover on their own after ~2 minutes. The RTP will report an error ("Active Configuration is Out of Sync. Please wait...") for ~2 minutes before forcing the camera to synchronize with the current Input 3 state

APPENDIX D
REDUNDANT SETUP

REDUNDANT SETUP OVERVIEW

A Redundant System provides duplicate controller and scanner camera stations for improved reliability and performance.

1. Mount and wire all cameras in your redundant system.
2. Since a redundant configuration requires a Primary and Secondary Controller, determine which cameras in the cluster are your Primary and Secondary Controllers.
3. A CBX with tach jumper installed must be connected to the Primary Controller. The green LED, next to the cameras IO connector, is illuminated when the CBX/Tach Jumper is installed. This camera is the primary controller (IP address 192.168.0.145). Connect another CBX to the Secondary Controller.
4. Apply power to all the cameras in the cluster.
5. Bring the primary and secondary cameras into the cluster.
6. Perform a default on all of the cameras in the tunnel, if redundancy or bidirectionality (forward/reverse) have been enabled in the past. The old configuration files will be loaded if they exist, which **WILL** cause confusion.
7. In Operating Mode | Redundant Controller Settings assign Primary and Secondary Controllers.



8. Do you want to switch between the Primary and Secondary controllers using a GPIN? Under Redundant Controller Settings check the box next to **Use GPIN to Indicate Active Controller.**
9. Click **Update** to save your changes.
10. The new Primary and Secondary controllers display an error indicating all cameras in the tunnel need to be rebooted in order to finish configuring redundancy.
11. **Reboot** the cameras in the cluster.

Important Information

- The **Primary Controller** always boots with static IP Address **192.168.0.145**. Regardless of its tach controller state.
- The **Secondary Controller** always boots with static IP Address **192.168.0.146.** Regardless of its tach controller state.
- Default the entire cluster if redundancy was previously enabled

Boot-up without Use GPIN to Indicate Active Controller enabled:

On boot-up the **Primary Controller** always becomes the **Active Controller** if it's available. The **Secondary Controller** only boots as the **Active Controller** if the P**rimary Controller** is not available.

Boot-up with Use GPIN to Indicate Active Controller enabled:

Input 3 is used to determine the primary and secondary tach controller on boot-up when the **Primary Controller** and **Secondary Controller** are both available.

This is how the cameras boot based on the **Input 3** state of the Primary and Secondary controllers:

Input 3 Primary Controller	Input 3 Secondary Controller	Active Controller	Backup Controller
Active	Active	Primary	Secondary
Inactive	Inactive	Primary	Secondary
Active	Inactive	Primary	Secondary
Inactive	Active	Secondary	Primary

- Input 3 must be used for Active Controller detection
- Input 3 on the Digital IO page automatically sets to **Indicate Active Controlle**r after enabling
- Use GPIN to Indicate Active Controller. Primary and Secondary controller cameras only
- Input 3 will not allow Debounce, Active State, Leading Offset or Trailing Offset to be configured when Mode is set to Indicate Active Controller
- Rising edge on Input 3 forces the secondary controller to become the Active Controller
- The Backup Controller will ignore all tracking inputs (Start/End PS, Start PS, End Trigger PS, and Zone PS)

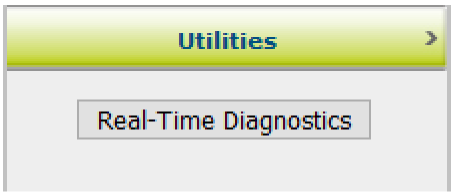
Primary Configuration is the Primary Controller and the connected components (CBX, Tachometer, Photo Sensor, Position Sensor, etc.)

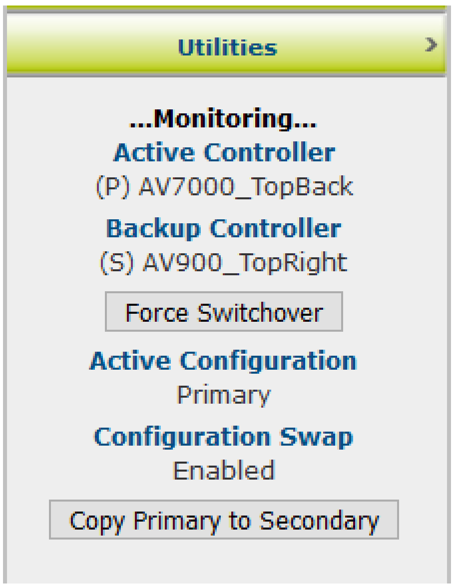
Secondary Configuration is the Secondary Controller and the connected components (CBX, Tachometer, Photo Sensor, Position Sensor, etc.).

---

12. Access e-Genius via one of the cameras in the cluster.

13. Access **Utilities | Real-Time Diagnostics**. Real-time diagnostics, related to redundancy and the current configuration display.





14. **Real-Time Diagnostic** allows you to monitor the Active Controller, Backup Controller and Active Configuration information.
- (P) indicates Primary Controller
- (S) indicates Secondary Controller
- Primary under Active Configuration should match the config: type displayed in the top right corner of the web page.

NOTE: Refresh the web page, if the Active Configuration and config, do not match.

15. In the menu tree under **Modify Settings |Operating Mode**. Tach, Trigger, and Communication errors on the active controller force a failover to the backup controller.

If you do not want this to happen, rely solely on Input 3 or the external controller (SC5000 or SC5100) to force the switchover.

16. Click the Disable Error Detection Switchover check-box and click Update to save your changes.

If you want to force a switchover if the backup controller detects packages that are not detected by the active controller, which would indicate a potential photo sensor failure?

17. Enable **Consecutive Package Lost Enable**.

18. For **Consecutive Package Lost Threshold** enter the number of consecutive packages lost before the switchover occurs.

Do you want to force a switchover, if the number of packages detected by the backup controller is X percent greater than the packages detected by the active controller? This would indicate a potential photo sensor failure.

19. Enable **Percentage Package Lost Enable**.

20. For **Percentage Package Lost Threshold** enter a percentage difference required to force a switchover.

Do you want to force a switchover if a tachometer issue is detected on the active controller?

21. Enable **Tachometer Lost Enable**.

22. For **Tachometer Package Lost Threshold** enter the number of consecutive packages detected by the backup controller, without a tachometer being detected by the active controller, before a switchover occurs.

If using an S80 or S85 to provide focus, skip to Step 26>>>

If using a Photo Sensor or Position Sensor in one configuration, but not the other, skip to Step 26>>>

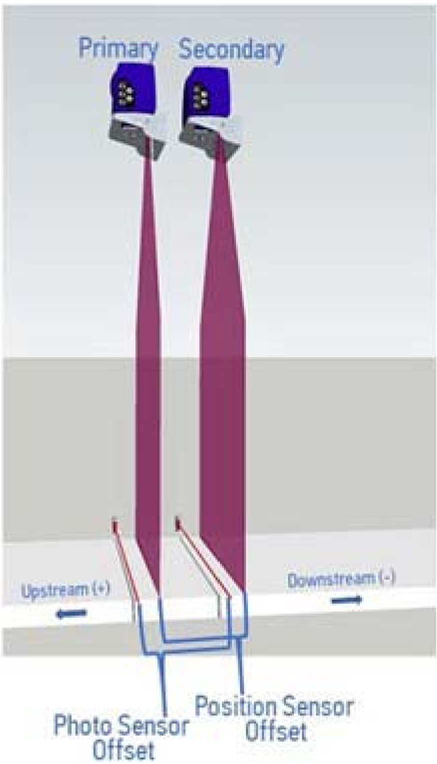
NOTE: The "Tracking Offsets Enable" parameter cannot be used with an S80/S85. The "Tracking Offsets Enable" parameter cannot be used if a Photo Sensor or Position Sensor is enabled in one configuration and not the other. It needs to be enabled in both configurations or not enabled at all

23. Enabling **Tracking Offsets Enable** allows you to calibrate your cameras one time (primary configuration) and set the offsets within Primary to Secondary Tracking Offsets for secondary configuration. Enable Tracking Offsets.

If you do not want to enable Tracking Offsets, skip to Step 26>>>

24. Measure the distance from the primary Photo Sensor to the secondary Photo Sensor. Enter this value for the **Photo Sensor Offset =** The value is positive if the secondary Photo Sensor is upstream of the primary Photo Sensor and negative if the secondary Photo Sensor is downstream of the primary Photo Sensor. Enter 0 if the same Photo Sensor is being used (not recommended in a redundant configuration).

25. Measure the distance from the primary Position Sensor to the secondary Position Sensor. Enter this value for the **Position Sensor Offset =** The value is positive if the secondary Photo Sensor is upstream of the primary Photo Sensor and negative if the secondary Photo Sensor is downstream of the primary Photo Sensor. Enter 0 if the same Photo Sensor is being used (not recommended in a redundant configuration).



26. Click **Update** to save your parameter settings.

Complete Configuration for the Primary Controller

1. Configure Digital IO for the primary configuration. Make sure the photo sensor input (if available) is enabled for both the primary and secondary controller, in both the primary and secondary configurations.

2. Configure **Operating Mode** for the primary configuration.

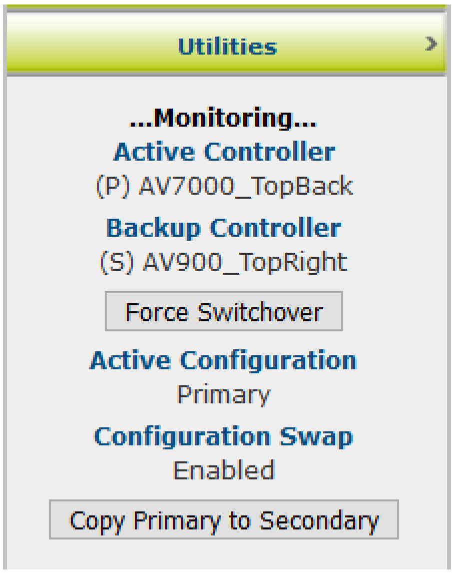
3. Complete the **Field Calibration** for the primary configuration. Make sure to calibrate each camera in the cluster.

4. Configure **Barcode Settings, Communications, Output Format, and Image Saving** parameters.

5. Click th**e Real-Time Diagnostics** button. If it's not already connected and monitoring.

6. Click the Copy Primary to Secondary button to force the current primary configuration to the secondary configuration. Now both configurations are the same.

NOTE: This is the only time the Primary configuration needs to be copied to the Secondary configuration. The goal is to make both configurations the same and only change the secondary parameters that are different.



7. Click **OK** when asked if you're sure you want to copy the primary configuration to the secondary configuration.

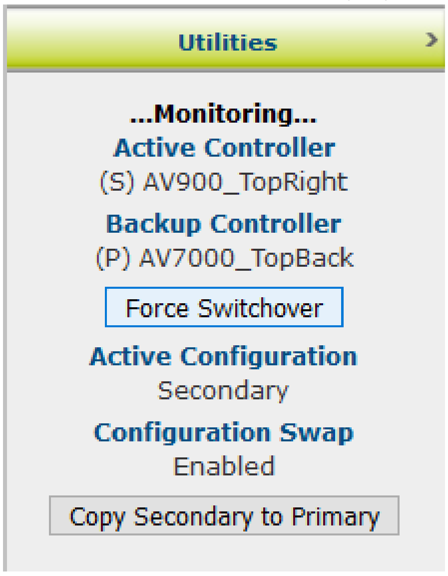
Force Cameras to Load Secondary Configuration

1. Use Input 3 to force a switchover if **Use GPIN to Indicate Active Controller** is enabled, or Use the Force Switchover button in Real-Time Diagnostics to force a switchover.

2. Access e-Genius to view the secondary configuration.
   •**config: Secondary** in the top right of the web page displays
   •**Active Configuration Secondary** under Real-Time Diagnostics displays

   •Active Controller (S) YOUR CAMERA NAME displays

•Backup Controller (P) YOUR CAMERA NAME displays



3. Configure **Digital IO** settings for the secondary configuration.
4. Configure **Operating Mode** for the secondary configuration Is **Tracking Offset Enable** enabled on the **Operating Mode** page.
5. Complete the Field Calibration for the secondary configuration. Repeat for each camera in the cluster.
6. Configure any **Barcode Settings, Communications, Output Format**, and **Image Saving** parameters that need to be different from the primary configuration.

Redundancy configuration is complete.

APPENDIX E
BARCODE GRADING REFERENCES

BARCODE GRADING

Symbol Verification Versus Code Grading

Symbol Verification involves completely testing the adherence of 2D and 1D codes to the parameters defined in specific International Standards in order to guarantee their reliability and therefore ability to be correctly decoded. In Symbol Verification the (Overall) Symbol Grade is only meaningful if it is expressed in conjunction with the measurement wavelength and aperture used. It should be shown in the format:

Grade / Aperture / Wavelength [/ Angle]

Where:

“Grade” is the overall symbol grade (i.e. the arithmetic mean of the individual Scan Grades for a number of tested images of the symbol).

“Aperture” is the aperture reference number or the diameter in thousandths of an inch (to the nearest thousandth) of the synthetized aperture.

“Wavelength” is the peak light wavelength in nanometers.

“Angle” is the angle of incidence of the illumination relative to the plane of the symbol of the illumination (if 45° it is omitted).

Code Grading for the Datalogic readers is a feature used to evaluate the quality of a code within a specific application based only on the Scan Grade parameters defined in certain International Standards. **It does not take into consideration the external environmental lighting parameters such as Aperture, Wavelength and Illumination Angle which can in any case affect the Scan Grade.**

The Overall Code Grade is determined by the lowest resulting Scan Grade within the evaluated set of individual Scan Grade parameters.

NOTES: Overall Code Grading cannot be equated with and should not be confused with Symbol Verification.

INTERNATIONAL STANDARDS APPLIED TO CODE GRADING

Datalogic readers can be used to evaluate printed or marked symbols according to the ISO/IEC 16022, 18004, AIM DPM, and ISO/IEC 15416 standards.

ISO-IEC 16022

(Data Matrix - International Symbology Specification)

The ISO-IEC 16022 Standard specifies general requirements (data character encoding, error correction rules, decoding algorithm, etc.) for Data Matrix symbology.

ISO-IEC 18004

(QR Code - International Symbology Specification)

The ISO-IEC 18004 Standard specifies general requirements (data character encoding, error correction rules, decoding algorithm, etc.) for QR Code symbology.

ISO-IEC TR 29158 (AIM DPM 2006)

(Direct Part Mark Quality Guideline)

The AIM DPM Quality Guideline is applicable to the symbol quality assessment of direct parts marking performed in using two-dimensional bar code symbols. It defines modifications to the measurement and grading of several symbol quality parameters.

The marking processes covered by this guideline are as follows: Dot Peening, Ink Jet, Laser Etching and Electro-Chemical Etching.

ISO-IEC 15415

(Two-Dimensional Symbols - Print Quality Test Specification)

The ISO-IEC 15415 Standard specifies the methodologies for the measurement of specific attributes of two-dimensional bar code symbols, and methods for evaluating and grading these measurements and deriving an overall assessment of symbol quality.

ISO-IEC 15416

(Linear Symbols - Print Quality Test Specification)

The ISO-IEC 15416 Standard specifies the methodologies for the measurement of specific attributes of linear bar code symbols, and methods for evaluating and grading these measurements and deriving an overall assessment of symbol quality.

Parameters Overview

Standards / Parameters	ISO/IEC 16022	ISO/IEC 18004	ISO/IEC TR 29158	ISO/IEC 15415	ISO/IEC 154156
	Data Matrix	QR	2D DPM	2D	1D
Print Growth	X	X	Non Graded	X	Non Graded
Axial Non Uniformity	X	X	X	X	
Unused Error Correction	X	X	X	X	
Symbol Contrast	X	X		X	X
Cell Contrast			X		
Cell Modulation			X		
Decode			X	X	X
Fixed Pattern Damage			X	X	
Grid Non Uniformity			X	X	
Minimum Reflectance			X		X
Minimum Edge Contrast					X
Decodability					X
Modulation				X	X
Defects					X
Reflectance Margin					X

You can enable Code Grading by selecting the International Code Quality (CQ) Standard from the Advanced Setup General Settings menu.

ISO/IEC 16022 AND ISO/EIC 18004 STANDARDS

The ISO-IEC 16022 and ISO-IEC 18004 Standards specify the methodologies for the measurement of specific attributes respectively for Data Matrix and QR code symbols, and methods for evaluating and grading these measurements and deriving an overall assessment of symbol quality.

Each quality parameter shall be measured and a grade on a descending scale of integers from 4 to 0 shall be allocated to it. The grade 4 represents the highest quality, while the grade 0 represents failure.

Code Quality Scan Grade Parameters

The following scan grade parameters can be evaluated for the ISO-IEC 16022 and ISO-IEC 18004 Standards:

Print Growth

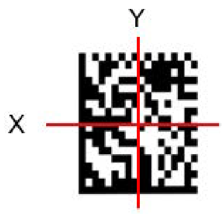
Measures the deviation of actual element dimension from the expected element dimension due to the printing problems (i.e. overprint or underprint).

Overprinting

Underprinting

Axial Non-Uniformity (ANU)

Measures and grades the squareness of all modules in the direction of each of the symbol's major axes (X-axis and Y-axis) by applying the decode algorithm to the binarized image.



Unused Error Correction (UEC)

This parameter tests and grade the extent to which regional or spot damage in the symbol has eroded the information redundancy margin that error correction provides. 100% Unused Error Correction Capacity is the ideal condition.

Symbol Contrast (SC)

Symbol Contrast tests that the two reflective states in the symbol, namely Light and Dark, are sufficiently distinct within the symbol.

The Overall Code Grade is determined by the lowest resulting Scan Grade within the evaluated set of individual Scan Grade parameters.

ISO/IEC TR 29158 (AIM DPM 2006) QUALITY GUIDELINE

The AIM DPM Quality Guideline is applicable to the symbol quality assessment of direct parts marking performed in using two-dimensional bar code symbols. It defines modifications to the measurement and grading of several symbol quality parameters.

The marking processes covered by this guideline are as follows: Dot Peening, Ink Jet, Laser Etching and Electro-Chemical Etching.

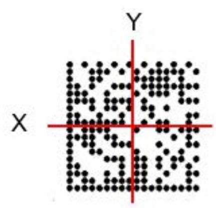
Each quality parameter shall be measured and a grade on a descending scale of integers from 4 to 0 shall be allocated to it. The grade 4 represents the highest quality, while the grade 0 represents failure.

Code Quality Scan Grade Parameters

The following scan grade parameters can be evaluated for the AIM DPM Standard:

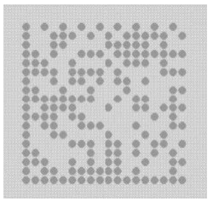
Axial Non-Uniformity (ANU)

Measures and grades the squareness of all modules in the direction of each of the symbol’s major axes (X-axis and Y-axis) by applying the decode algorithm to the binarized image.



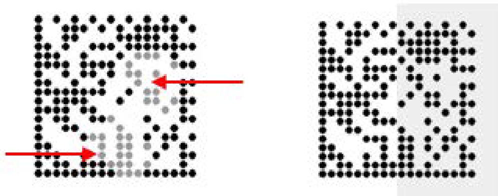
Cell Contrast (CC)

Measures and grades the difference between the means of brightest and darkest values of the symbol (instead of determining differences between the brightest and darkest values).



Cell Modulation (CM)

Cell modulation analyzes the grid center points within the data region to determine the reflectance uniformity of light and dark elements after considering the amount of error correction available in the code.



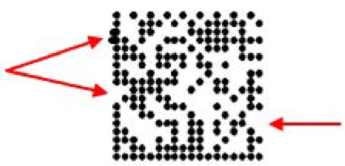
Decode

The Decode parameter tests, on a Pass/Fail basis, whether the symbol has all its features sufficiently correct to be readable. If the image cannot be decoded using the symbology reference decode algorithm, then it shall receive the failing grade 0. Otherwise, it shall receive the grade 4.

This parameter then will always produce Grade A for good reads. If the code cannot be decoded, then a No Read result will be produced by the reader so you will never have a Grade F result for this parameter.

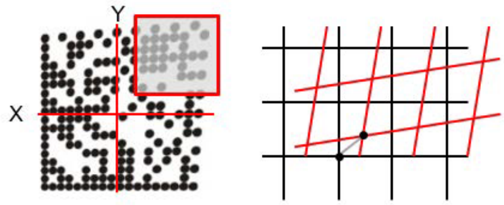
Fixed Pattern Damage (FPD)

This metric is similar to Cell Modulation, but it analyzes the finder pattern and clock pattern as well as the quiet zone around the code instead of the data region.



Grid Non-Uniformity (GNU)

Measures and grades the largest vector deviation of the grid intersections, determined by the reference decode algorithm from the binarized image of a given symbol, from their “ideal” theoretical position. Assuming a grid on which the ideal angle of intersection is 90°, any angle deviation from 90° constitutes Grid Non-Uniformity.



Minimum Reflectance (MR)

The image brightness is adjusted on a reference part, after which this calibrated value is compared with the reflectance of that part. Minimum Reflectance is the ratio of the parts reflectance to the calibrated reflectance.

Unused Error Correction (UEC)

This parameter tests and grade the extent to which regional or spot damage in the symbol has eroded the information redundancy margin that error correction provides. 100% Unused Error Correction Capacity is the ideal condition.

Non Graded Parameters

Print Growth

Measures the deviation of actual elements dimension from the expected element dimension due to printing problems (i.e. overprint or underprint).

Overprinting

Underprinting

ISO/IEC 15415 STANDARD

The ISO-IEC 15415 Standard specifies the methodologies for the measurement of specific attributes two-dimensional bar code symbols, and methods for evaluating and grading these measurements and deriving an overall assessment of symbol quality.

Each quality parameter shall be measured and a grade on a descending scale of integers from 4 to 0 shall be allocated to it. The grade 4 represents the highest quality, while the grade 0 represents failure.

Code Quality Scan Grade Parameters

The following scan grade parameters can be evaluated for the ISO-IEC 15415 Standard:

Print Growth

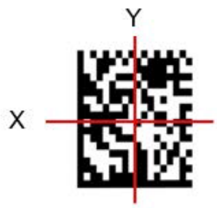
Measures the deviation of actual elements dimension from the expected element dimension due to printing problems (i.e. overprint or underprint).

Overprinting

Underprinting

Axial Non-Uniformity (ANU)

Measures and grades the squareness of all modules in the direction of each of the symbol's major axes (X-axis and Y-axis) by applying the decode algorithm to the binarized image.



Unused Error Correction (UEC)

This parameter tests and grade the extent to which regional or spot damage in the symbol has eroded the information redundancy margin that error correction provides. 100% Unused Error Correction Capacity is the ideal condition.

Symbol Contrast (SC)

Symbol Contrast tests that the two reflective states in the symbol, namely Light and Dark, are sufficiently distinct within the symbol.

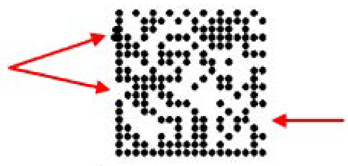
Decode

The Decode parameter tests, on a Pass/Fail basis, whether the symbol has all its features sufficiently correct to be readable. If the image cannot be decoded using the symbology reference decode algorithm, then it shall receive the failing grade 0. Otherwise, it shall receive the grade 4.

This parameter then will always produce Grade A for good reads. If the code cannot be decoded, then a No Read result will be produced by the reader so you will never have a Grade F result for this parameter.

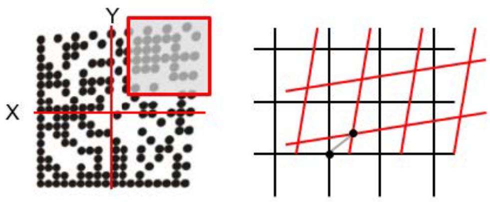
Fixed Pattern Damage (FPD)

This metric is similar to Cell Modulation, but it analyzes the finder pattern and clock pattern as well as the quiet zone around the code instead of the data region.



Grid Non-Uniformity (GNU)

Measures and grades the largest vector deviation of the grid intersections, determined by the reference decode algorithm from the binarized image of a given symbol, from their "ideal" theoretical position. Assuming a grid on which the ideal angle of intersection is 90°, any angle deviation from 90° constitutes Grid Non-Uniformity.



Modulation (MOD)

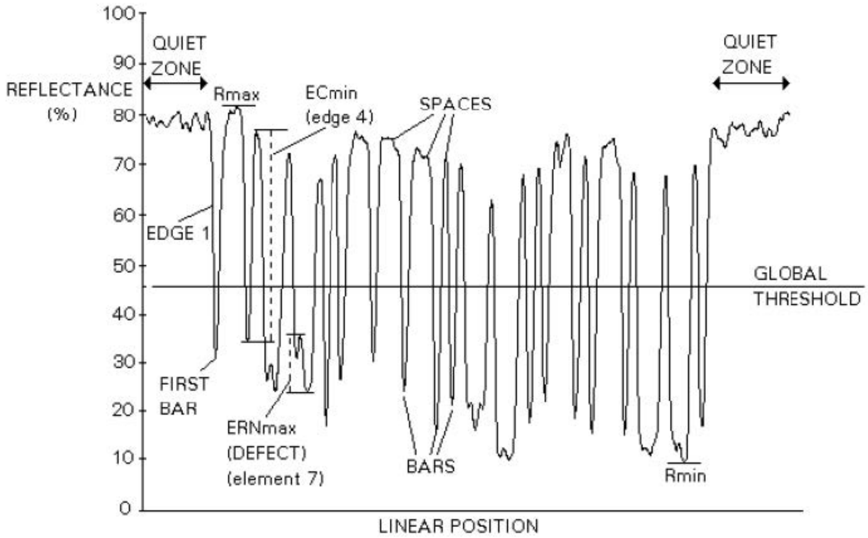
Modulation is the ratio of the minimum edge contrast to Symbol Contrast. It can be considered as the quality of the Analog signal related to the printing contrast.

The Overall Code Grade is determined by the lowest resulting Scan Grade within the evaluated set of individual Scan Grade parameters.166 DL.CODE

ISO/IEC 15416 1D STANDARD

The ISO/IEC 15416 Standard specifies the methodologies for the measurement of specific attributes of linear bar code symbols, and methods for evaluating and grading these measurements and deriving an overall assessment of symbol quality.

Bar code symbol quality assessment shall be based on an analysis of the Scan Reflectance profiles. The scan reflectance profile is a record of the Reflectance values measured on a single line across the entire width of the barcode.



Scan Reflectance Profile

Symbol Quality grading shall be used to derive a relative measure of symbol quality under the measurement conditions used. Each scan reflectance profile shall be analyzed and a grade on a descending scale of integers from 4 to 0 shall be allocated to each of the parameters evaluated.

Code Quality Scan Grade Parameters

The following scan grade parameters can be evaluated for the ISO-IEC 15416 Standard:

Decode

The symbology reference decode algorithm shall be used to decode the symbol using the element edges determined on the Scan Reflectance profile. This algorithm may be found in the symbology specification.

Decodability

The decodability of a bar code symbol is a measure of the accuracy of its production in relation to the appropriate reference decode algorithm.

Defects

Defects are irregularities found within elements and quiet zones, and are measured in terms of element reflectance non-uniformity.

Element reflectance non-uniformity within an individual element or quiet zone is the difference between the reflectance of the highest peak and the reflectance of the lowest valley.ISO/IEC 15416 1D Standard User's Manual 167

Defect measurement is expressed as the ratio of the maximum element Reflectance Non-Uniformity (ERNmax) to Symbol Contrast.

Minimum Edge Contrast (EC)

Edge contrast is the difference between the Rs (Space Reflectance) and Rb (Bar Reflectance) of adjoining elements including quiet zones.

The lowest value of edge contrast found in the scan reflectance profile is the minimum edge contrast, ECmin.

Minimum Reflectance (Rmin)

Rmin is the lowest reflectance value in the scan reflectance profile. Rmin shall not be higher than 0,5 x Rmax. This parameter is intended to ensure that Rmin shall not be too high, especially when the value of Rmax is high.

Modulation (MOD)

Modulation is the ratio of the minimum edge contrast to Symbol Contrast. It can be considered as the quality of the Analog signal related to the printing contrast.

Symbol Contrast (SC)

Symbol contrast is the difference between the highest and lowest reflectance values in a scan reflectance profile.

Reflectance Margin

Reflectance margin measures how close the reflectance value of the darkest space or palest bar is to the global threshold, expressed in terms of the symbol contrast. When this value is less than 5% it is likely that the barcode is close to failing on decode.

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821006480 (Rev D) February 2022