



➤ AV7000
Linear Camera



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AV7000 Linear Camera Reference Manual

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REFERENCES

REFERENCE DOCUMENTATION

The documentation related to the AV7000 camera system management is listed below:

- DM3610 Reference Manual
- RangeFinder FRU Guide
- DS2 Instruction Manual
- PWR-480B Installation Manual

SUPPORT THROUGH THE WEBSITE

Datalogic provides several services as well as technical support through its website. Access www.datalogic.com and click on the **SUPPORT > UNATTENDED SCANNING SYSTEMS category** link. From this page you can select your country and the correct product model from the drop-down list which gives you access to:

Downloads including Data Sheets, Manuals, Software & Utilities, and Drawings: Repair Program for On-Line Return Material Authorizations (RMAs) plus Repair Center contact information Service Program containing details about Maintenance Agreements: Technical Support through email or phone.

PATENTS

See <http://www.patents.datalogic.com> for patent list.

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

Utility patents: EP0785452B1, EP0996284B1, EP1014292B1, EP2126781B1, EP2281264B1, EP2517148B1, EP2649555B1, FR2909442B1, GB2444409B, IT1403978, JP4129300B2, JP4571258B2, JP5154574B2, US6068189, US6616039, US6628445, US6856440, US7053954, US7385743, US7453614, US8004604, US8308070, US8888003, US8360318, US8915443, US9230142, US9247218, US9298959, USRE44005, ZL200680056899.2, ZL200980163411.X, ZL201280008935.3

CONVENTIONS



WARNING or CAUTION: 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 CAUTION: 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 observance of precautions to prevent Electrostatic Discharge (ESD) e.g., use of an ESD wrist strap. Circuit boards are most at risk. Please follow ESD procedures.



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.

COMPLIANCE

ELECTRICAL SAFETY

This product conforms to the applicable requirements contained in the European Standard for electrical safety EN 60950 at the date of manufacture.

LED SAFETY

These camera barcode readers include illuminations that use high-powered light emitting diodes (LEDs).

Red Light illuminations

RISK GROUP EXEMPT LED emission according to EN 62471.

Avoid staring at the LEDs as one would with any very strong light source, such as the sun. A safety device is included that switches the LED illumination to low power mode if the conveyor stops or the trigger cycles cease.

White Light Illuminations

RISK GROUP 2 LED emission according to EN 62471.

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

WARNING AND SERIAL LABELS



Figure 1: Warning and Device Class Label Location



WARNING: Disconnect the power supply when installing the device or during maintenance to avoid unintentional exposure to LED light.

Avoid staring at the LEDs as one would with any very strong light source, such as the sun.



WARNING: There are no user-serviceable parts inside the reader. Service should only be performed by Datalogic trained and certified technicians.

POWER SUPPLY

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

This product is intended to be supplied by a UL listed or CSA Certified Power unit.

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.



Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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.

GENERAL VIEW



Figure 2: AV7000 Camera Front View



Figure 3: AV7000 Camera Back View

FIELD PROCEDURE QUICK CROSS REFERENCE:

- **DM3610 Focusing/Calibration**, *see section 5.2.1*
- **RangeFinder Focusing/Calibration**, *see section 5.2.2*
- **DS2 Light Array Calibration**, *see section 5.2.3*
- **AS1 Area Sensor Alignment**, *see section 5.7*
- **Camera Calibration – Static**, *see section 5.3.2*
- **Camera Calibration – Dynamic**, *see section 5.3.3*
- **Protocol Index Setup**, *see section 4.5.5*
- **Final Acceptance Test**, *see section 5.4*

1 INTRODUCTION

1.1 PRODUCT DESCRIPTION

The AV7000 Camera is a high performance linear camera with an integrated image processing system dedicated to automatic code identification on moving parcels.

This chapter introduces a minimum set of concepts necessary for camera installation and setup.

1.2 READING STATION OVERVIEW

The AV7000 camera reading system consists of two pieces:

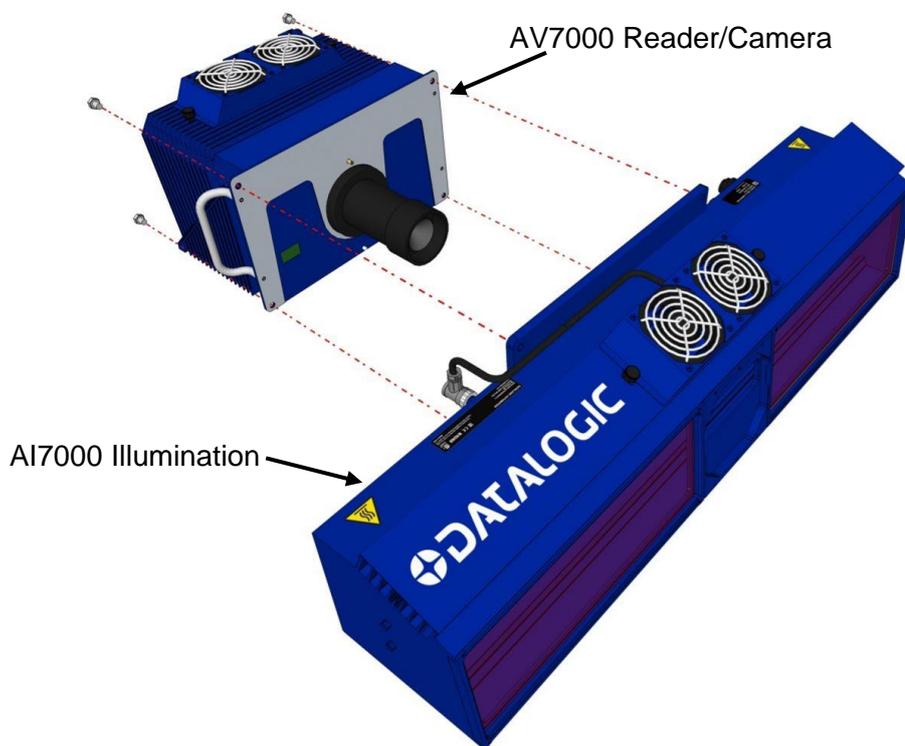


Figure 4: Camera and Illumination

1. A barcode reader/camera for acquiring the images, locating, and reading the codes on the target.
2. A lighting system for illuminating the target codes to be acquired.

Practical reading system applications often use a network of multiple cameras and are usually much more complex.

All linear cameras need to know the speed of the targets to be acquired, so the conveyor speed must be constantly measured. There are several ways to accomplish this.

- **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.
- **PGD100 Speed Detector:** Used with tilt-tray or cross-belt sorters. This detector uses a series of photoelectric sensors to determine the conveyor speed.

The position sensor (DM3610, RangeFinder, or light curtain (DS2)) is often used as a trigger source. When the height or left/right focus data measured by the sensor goes over a certain threshold, then 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" (AS1 or photoelectric sensor) input is used. An additional photoelectric sensor or conveyor controller signal is usually connected to this input.

When the codes are on more than one face of the parcel, more than one barcode reader-illuminator pair is necessary (multi-camera reading station). In this case, one of the barcode readers (the "Master") collects the information from all the sensors and distributes it to the other barcode readers using a dedicated ethernet connection.

A CBX connection box can be used to simplify the connection of the camera to the other system components (photoelectric sensors, encoders, height sensors, and etc.).

A typical reading station will also include:

- **Power Supply Systems:** The AV7000 requires a 24 Vdc power supply. Usually each barcode reader-illuminator pair has its own power supply system (i. e. PWR-480B).
- **Connection Boxes:** CBX100, CBX500, CBX510, or CBX800
- **Height/Side Position Sensor:** RangeFinder, DM3610, or light curtain
- **External Deflection 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 barcode reader.

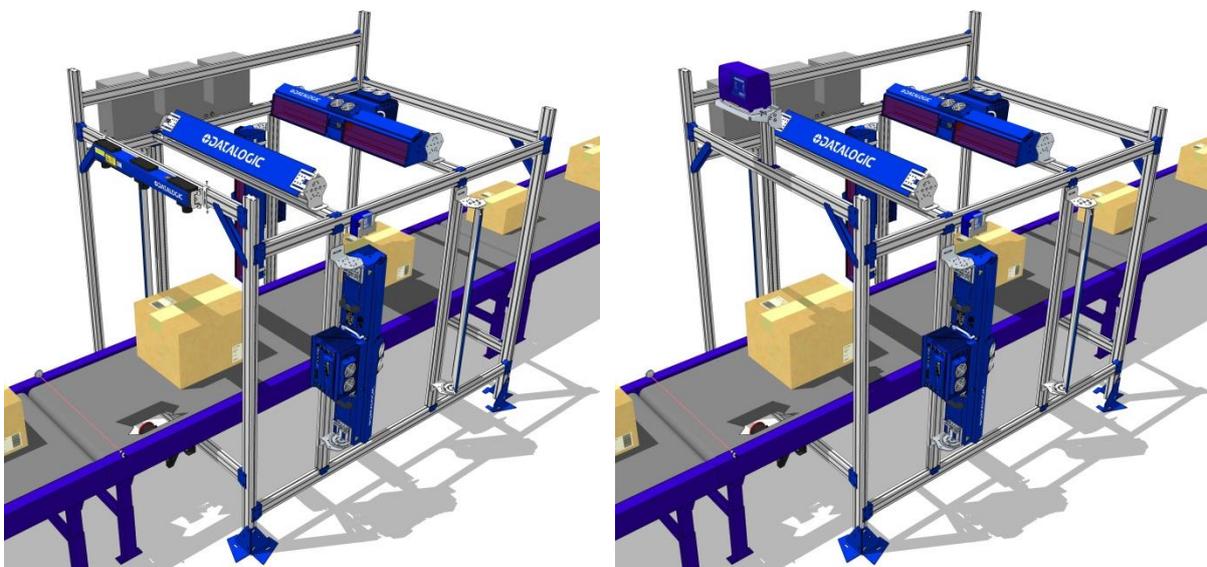


Figure 5: Typical Reading Station with RangeFinder (*left*) and DM3610 (*right*)

1.3 IMAGE ACQUISITION

Each barcode reader contains two distinct groups of devices:

- The acquisition device or "camera." This part of the AV7000 has to work in strict real time to acquire the best possible images.
- The decoding device or "decoder." This part of the AV7000 interprets the data received through the camera.

The Standard AV7000 barcode reader contains both the camera and the decoder.

As already mentioned, the camera needs three kinds of external sensors:

- **Speed Sensor:** At all times 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, an internal software tachometer, or a PDG100 Speed Detector when using a tilt-tray or cross-belt system.
- **Height/Side Position Sensor:** The focusing position is computed by the camera based on the position of the parcel measured by a height sensor. The Datalogic sensors may be a RangeFinder, DM3610 Dimensioner, or AREAScan™ DS2 Light Array (LCC-75xx Light Curtain Kit).
- **Trigger Source:** The camera needs to know when to acquire an object. 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 Master camera that interprets the information and distributes it to the Slave cameras.

The start and stop of an acquisition are triggered by a start/stop event generated by the trigger device (position sensor). 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 AV7000 mounting position, the unit tries to acquire one (reading angle $\alpha = 15^\circ$) or two faces of the parcel ($\alpha = \pm 45^\circ$).

1.4 PULSED ILLUMINATION

When building multi-camera stations with standard continuous light illuminators, the illumination areas must be accurately chosen to avoid the illuminator of one camera disturbing the acquisition of another camera. In particular the lobes of the side camera illuminators must not cross over the conveyor belt. This constraint leads to long multisided reading stations.

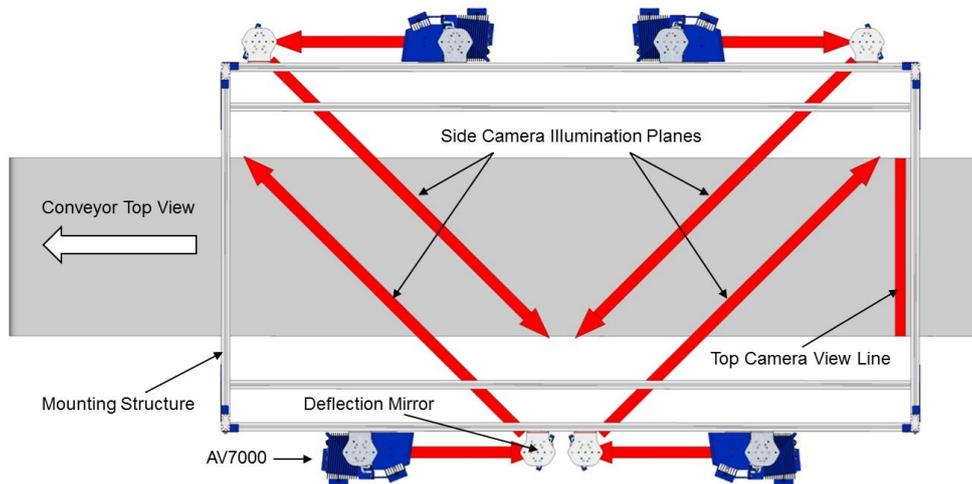


Figure 6: Multi-Camera Station with Standard Continuous Illumination

In **Pulsed Illumination** systems, an illuminator is switched on only during its camera's acquisition time. All the cameras are then synchronized so cameras with crossing illuminator lobes never acquire simultaneously. When a camera is not supposed to acquire, its electronic shutter is closed and the camera is completely blind. In this way, the illuminator of one camera does not disturb the acquisition of another camera, even if their illumination lobes cross in the camera field of view.

Using pulsed illumination, the side cameras' illumination lobes can cross on the conveyor and the reading station dimensions can be greatly reduced.

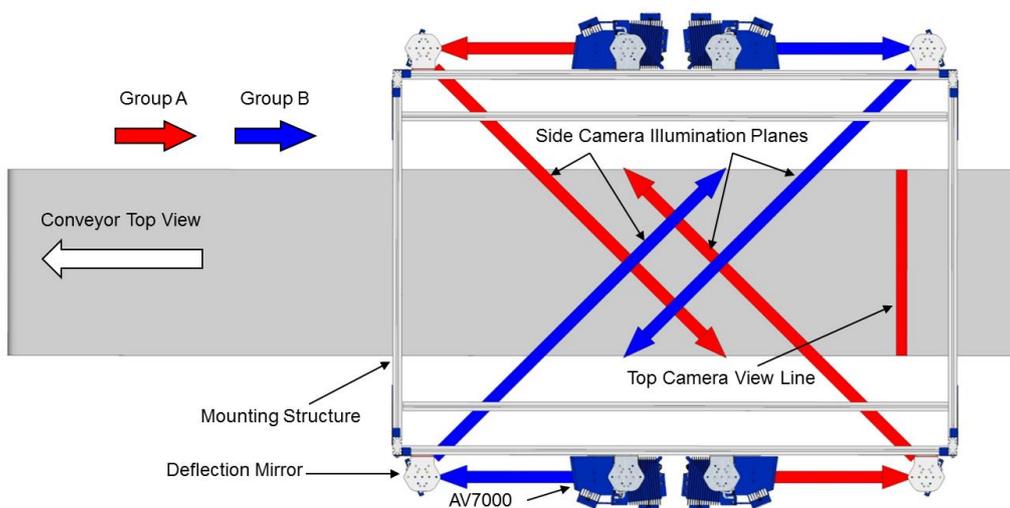


Figure 7: Multi-Camera Station with Pulsed Illumination

To enable and configure Pulsed Illumination, see [section 4.6.4](#). To adjust image gain when using Pulsed Illumination, see [section 4.6.2](#).

1.5 APPLICATIONS

The AV7000 cameras are specifically designed for industrial applications and for all cases requiring high reading performance such as:

- Reading low aspect ratio barcodes
- Reading of codes covered by plastic film
- Reading of codes with a large depth of field
- Reading codes within a wide field of view
- Reading of high resolution codes positioned at long distances from the barcode reader
- Code reading on fast moving objects

These barcode readers are designed for both single-reader layouts and multi-reader layouts.

1.6 MODEL DESCRIPTION

AV7000 cameras are available in versions that differ depending on the optical resolution (focus range), while the AI7000 illuminators differ depending on the illuminated reading width:

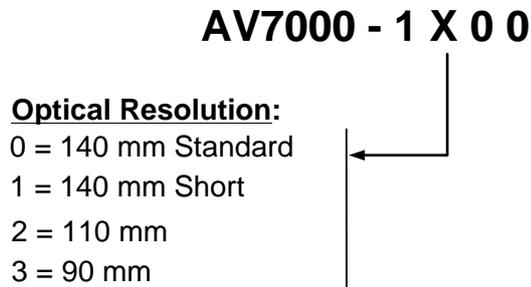


Figure 8: AV7000 Camera Model Description Key

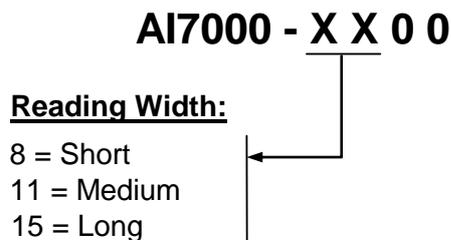


Figure 9: AI7000 Illumination Model Description Key

1.7 AV7000 AND AI7000 VERSIONS

Model	Description	Part Number
AV7000 BARCODE READER		
AV7000-1000	140mm f/5.6 STD	934001000
AV7000-1100	140mm f/5.6 SHORT RANGE	934001010
AV7000-1200	110mm f/8.0	934001020
AV7000-1300	90mm f/8	934001030
AI7000 ILLUMINATION		
AI7000-800	SHORT RED LIGHTING SYS	934001100
AI7000-1100	MEDIUM RED LIGHTING SYS	934001110
AI7000-1500	LONG RED LIGHTING SYS	934001120
AI7000-800W	SHORT WHITE LIGHTING SYS	934001200
AI7000-1100W	MEDIUM WHITE LIGHTING SYS	934001210
AI7000-1500W	LONG WHITE LIGHTING SYS	934001220

1.8 EXTERNAL FUNCTION BUTTONS (HMI – HUMAN MACHINE INTERFACE)

The AV7000 camera includes two external buttons that can be used to perform specific tasks without the need of connecting to **e-Genius** (*AV7000 browser-based user interface*). See *section 5.9* for functional description.



Figure 10: AV7000 External Function Buttons



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

1.9 ACCESSORIES

The following accessories are available on request for the AV7000 Camera Imaging System.

Description	Part Number
AV7000 CAMERA HEADS	
INDIVIDUAL HEADS	
AV7000-1000 140MM F/5.6	934001000
AV7000-1100 140MM F/5.6 SHORT RANGE	934001010
AV7000-1200 110MM F/8.0	934001020
AV7000-1300 90MM F/8	934001030
LIGHTING SYSTEMS	
AI7000-800 SHORT RED LIGHTING SYS	934001100
AI7000-1100 MEDIUM RED LIGHTING SYS	934001110
AI7000-1500 LONG RED LIGHTING SYS	934001120
AI7000-800W SHORT WHITE LIGHTING SYS	934001200
AI7000-1100W MEDIUM WHITE LIGHTING SYS	934001210
AI7000-1500W LONG WHITE LIGHTING SYS	934001220
AV7000 - ACCESSORIES	
EXTERNAL DEFLECTION MIRRORS	
EMK-NVS-800 EXT.MIRROR (800 MM)	93A201111
EMK-NVS-1100 EXT.MIRROR (1130 MM)	93A201110
EMK-NVS-1500 EXT.MIRROR (1460MM)	93A201109
RANGEFINDER FOCUSING	
RANGEFINDER,DLA,0.1IN	93ACC0156
RANGEFINDER,DLA,0.2IN/5MM/10MM	93ACC0157
RANGEFINDER,DLA,0.5IN/20MM	93ACC0159
CAB-GE01 M12-IP67 TO RJ45 1M	93A050034
CAB-GE03 M12-IP67 TO RJ45 3M	93A050035
CAB-GE05 M12-IP67 TO RJ45 5M	93A050036
CAB-GE10 M12-IP67 TO RJ45 10M	93A051389
POWER CORD, 125V, 10A, BLACK - 7 FT. - 6 IN.	0102414001
POWER CORD, 230V, 10A, EUROPEAN - 8 FT.	0102713001
LIGHT CURTAIN FOCUSING	
FOCUS CONTROL 5MT CABLE (M12-FREE WIRES)	93A201203
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
DM3610 DIMENSIONER FOCUSING	
DMS100-100 DIM SOLU 1HD STD NLFT	932702110
FOCUS CONTROL 5MT CABLE (M12-FREE WIRES)	93A201203
PHOTOELECTRIC SENSOR	
S60 PHOTOCELL KIT W/R3 REFL BRKT HDWR	93ACC1895
MEP-593 PHOTOCELL KIT PNP (PH-1) WITH FREE WIRES	93ACC1791
AS1 PHOTOEYE	
AS1-HD-SR-010-J D 3M RES 5MM H 100MM	958101030
CS-A1-03-G-03 M12-5 P 3M (RECEIVER)	95ACC2110
CS-A1-03-G-05 M12-5 P 5M (RECEIVER)	95ACC2120
CS-A1-03-G-10 M12-5 P 10M (RECEIVER)	95ACC2140
CS-A1-02-G-03 M12-4 P 3M (EMITTER)	95A251280

Description	Part Number
CS-A1-02-G-05 M12-4 P 5M (EMITTER)	95A251270
CS-A1-02-G-10 M12-4 P 10M (EMITTER)	95A251390
WIRE CONN,COMPACT,3COND,12-28AWG	890003099
TACHOMETER/ENCODER	
TACH,PROGR,W/20FT CAB,8-30VDC	1000019875
KIT,TACH BRKT GENERAL/EXTRUSION MTG	1000020567
ASSEMBLY,ANTI-STATIC BRUSH W/FERRITE	0102974001
OEK-2 OPTICAL ENCODER (CAB 10M+SPRING)	93ACC1770
OEK-3 ENCODER HI RES M139,6M CBL +SPRI (START/STOP ANTI ROLLBACK)	93ACC0104
CV-A1-22-B-03 SE 4PIN CABLE 3M	95ACC1480
CV-A1-22-B-05 SE 4PIN CABLE 5M	95ACC1490
CV-A1-22-B-10 SE 4PIN CABLE 10M	95ACC1500
CV-A1-22-B-15 SE 4PIN CABLE 15M	95ACC2070
CV-A1-22-B-25 SE 4PIN CABLE 25M	95ACC2090
POWER SUPPLY	
PG-600 PWR SUPPLY 600W	93A201205
PWR-480B POWER UNIT 110/230VAC 24V	93ACC0076
CBL,JKTED,300V,18AWG,BLK,RED,GRN,N=1FT	890003359
PWR CORD 18 AWG 3 COND 118" BLACK SJT	890002738
ETHERNET SWITCHES	
SINGLE GIG 8-PORT SWITCH ENCLOSURE	93ACC0160
DUAL GIG 8-PORT SWITCH ENCLOSURE	93ACC0131
SYNC CABLES	
CAB-GE03 M12M TO M12F 3M	93A050079
CAB-GE05 M12M TO M12F 5M	93A050080
CAB-GE10 M12M TO M12F 10M	93A050081
HOST AND IMAGE NETWORK CABLES	
CAB-9E05 RJ45-IP67 CABLE ETHERNET 5M	93A051364
CAB-9E10 RJ45-IP67 CABLE ETHERNET 10M	93A051365
AV7000 TO CBX CABLES	
CBL AV7-100 M16-IP67 CABLE TO CBX 3M	93A050072
CBL-AV7-101 M16-IP67 CABLE TO CBX 5M	93A050073
CBL-AV7-102 M16-IP67 CABLE TO CBX 10M	93A050074
CBX	
CBX100 CONNECTION BOX COMPACT	93A301067
CBX500 CONNECTION BOX MODULAR	93A301068
CBX510 CONNECTION BOX MODULAR	93A301087
CBX800 GATEWAY	93A301077
CBX ACCESSORIES	
BM300 PROFIBUS MODULE	93ACC1810
BM310 PROFIBUS IP65 MODULE	93ACC1811
BM400 DEVICENET IP65 MODULE	93ACC1814
BM500 ETHERNET/IP MODULE	93ACC1812
BM510 ETHERNET IP65 MODULE	93ACC1813
BM520 ETHERNET/IP IP54 MODULE	93ACC1840
BM600 CAN OPEN MODULE	93ACC1815
BM700 PROFINET MODULE	93ACC1816
BM1100 CC-LINK MODULE	93ACC1845
BM1200 MODBUS TCP MODULE	93ACC1848

Description	Part Number
BM1210 MODBUS TCP IP65 MODULE	93ACC1849
 NOTE: For AV7000 applications, the CBX Fieldbus modules listed above are only used in the CBX800 Gateway.	
BA100 DIN RAIL ADAPTERS	93ACC1821
BA900 TWO CABLE GLANDS PANEL	93ACC1847
BA300 M12 3P F. PANEL CONN. (SERVICE)	93ACC1877
BA400 M12 3P M. PANEL CONN. (EXT.POWER)	93ACC1853
BA500 M12 4P F. PANEL CONN. (TRIGGER)	93ACC1854
BA600 M12 5P F. PANEL CONN. (ID-NET OUT)	93ACC1855
BA700 M12 5P M. PANEL CONN. (ID-NET IN)	93ACC1856
DISPLAY	
KIT, VGA / USB INTERFACE PANEL	93A201204
KIT, MONITOR/KEYBRD/BRKT/USB HUB	93ACC0126
CBL,EXT,10FT,USB MOUSE/KEYBOARD	93ACC0108
CABLE,INTERFACE 10FT (MONITOR EXTENSION)	1000014572
CABLE,INTERFACE 25FT (MONITOR EXTENSION)	1000014574
MISCELLANEOUS	
AV7000 Controller Key	93A201206
FAN GUARD	93ACC0193

1.10 PHOTOELECTRIC SENSOR

The optional Datalogic Photoelectric Sensor is used in AV7000 camera systems to detect the presence of an item entering the scanning area.

The photoelectric sensor is used in singulated 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 AV7000 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. See *section 3.10.1 and 3.11.1 for wiring options*.



Figure 11: Photoelectric Sensors

Photoelectric Sensor

S60 PHOTOCELL KIT W/R3 REFL BRKT HDWR	93ACC1895
MEP-593 PHOTOCELL KIT PNP (PH-1) WITH FREE WIRES	93ACC1791

1.11 AREA SENSOR

The photoelectric light grids of the AS1 series are crossed-beam area sensors able to detect all objects, with even 0.2mm thickness, inside a 100mm height, over operating distances reaching 3m between emitter and receiver. 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. Versions with trimmer adjustment and optic synchronism between emitter and receiver unit are available. Area sensors also help avoid multiple triggers on irregular shaped packages. See section 3.10.2 and 3.11.2 for wiring options.



Figure 12: Area Sensors

Area Sensor and Cable (recommended)

AS1-HD-SR-010-J D 3m RES 5mm H 100mm	958101030
CS-A1-03-G-03 M12-5 p 3m (Receiver)	95ACC2110
CS-A1-03-G-05 M12-5 p 5m (Receiver)	95ACC2120
CS-A1-03-G-10 M12-5 p 10m (Receiver)	95ACC2140
CS-A1-02-G-03 M12-4 p 3m (Emitter)	95A251280
CS-A1-02-G-05 M12-4 p 5m (Emitter)	95A251270
CS-A1-02-G-10 M12-4 p 10m (Emitter)	95A251390

1.12 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. See section 3.10.3 and 3.11.3 for wiring options.



Figure 13: Encoder/Tachometer, Mounting Bracket, and Cable

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

1.13 PGD100 NON-CONTACT SPEED DETECTOR

The **PGD100** is a non-contact position measurement device, or **Speed Detector**, consisting of a Controller and Sensor Array(s). It is used in cases where a traditional contact encoder/tachometer will not work, as in a **Cross-Belt Sorters** or **Tilt-Tray** system where a continuous belt surface is not available. The speed detector is designed to function as an encoder/tachometer replacement in certified dimensioning and scanning applications.

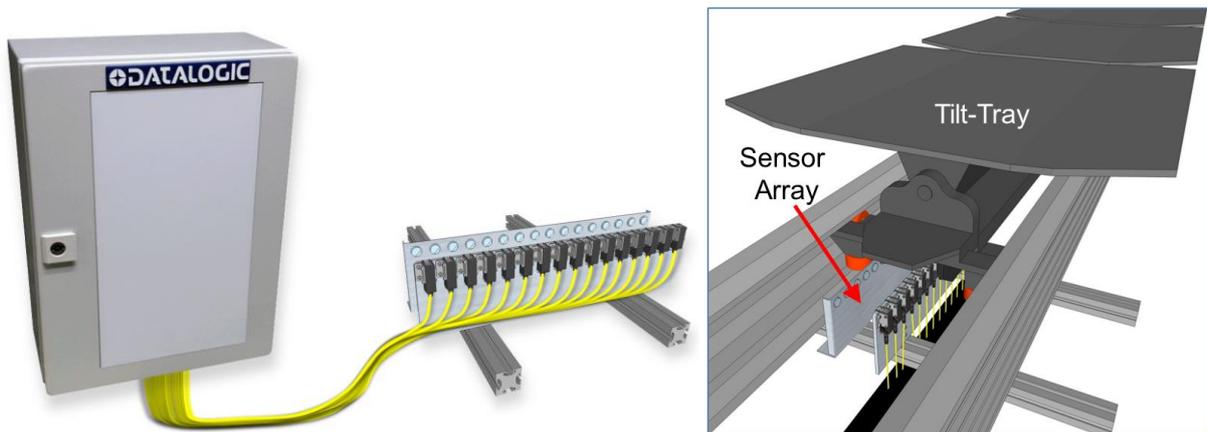


Figure 14: PGD100 Non-Contact Speed Detector

For information on installing and wiring the PGD100, see the **PGD100 Non-Contact Speed Detector Installation Manual** at www.datalogic.com.

1.14 CBX INDUSTRIAL CONNECTION BOX

CBX 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. See section 3.10 for wiring options.



Figure 15: CBX500, CBX800, and CBX100 Connection Boxes shown

CBX Connection Box	
CBX100 CONNECTION BOX COMPACT	93A301067
CBX500 CONNECTION BOX MODULAR	93A301068
CBX510 CONNECTION BOX MODULAR	93A301087
CBX800 GATEWAY	93A301077

1.15 LCC-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 as they enter the scanning area as well as report the package heights to the system Master. 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. Digital resolution is 12mm or 35mm while relative measurement precision is $\pm 6\text{mm}$ or $\pm 22.5\text{mm}$. See section 5.2.3 for information setting up the LCC-75xx kit with DS2 Light Array.



Figure 16: DS2 Light Array (part of LCC-75xx kit)

Light Curtain Focusing

FOCUS CONTROL 5MT CABLE (M12-FREE WIRES)	93A201203
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

1.16 RANGEFINDER

The RangeFinder 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. RangeFinders can also be used to provide rough dimensioning data. See *section 5.2.2* for information on installing and calibrating the RangeFinder.



Figure 17: RangeFinder

The RangeFinder module includes the following:

- RangeFinder Module
- RangeFinder Power Supply
- Mounting and adjustment brackets
- Power Supply

RangeFinder	
RANGEFINDER,DLA,0.1IN	93ACC0156
RANGEFINDER,DLA,0.2IN/5mm/10mm	93ACC0157
RANGEFINDER,DLA,0.5IN/20mm	93ACC0159

1.17 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. See *section 0* for information on setting up the DM3610.

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



Figure 18: DM3610 Dimensioner

The DM3610 Dimensioner requires the following:

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

2 MECHANICAL 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.



IMPORTANT: AV7000 cameras 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.

2.1 PREPARING FOR MECHANICAL INSTALLATION



IMPORTANT: 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.



NOTE: Refer to the *Chapter 3 Electrical Installation* and Reference Documentation for details on connecting your readers to other devices in the system.



NOTE: When installing several AV7000s, 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.

2.1.1 Tools Required

A 13mm wrench (combination ratcheting wrench recommended) and Philips Screwdriver (#1) are all the tools needed to assemble and install the AV7000/AI7000, deflection mirror, and brackets,

2.2 UNPACKING INSTRUCTIONS

Verify that the AV7000 Camera and all the parts supplied with the equipment are present and intact when opening the packaging; the list of parts includes:

CH-3 Autofocus Setting Chart 800x100mm

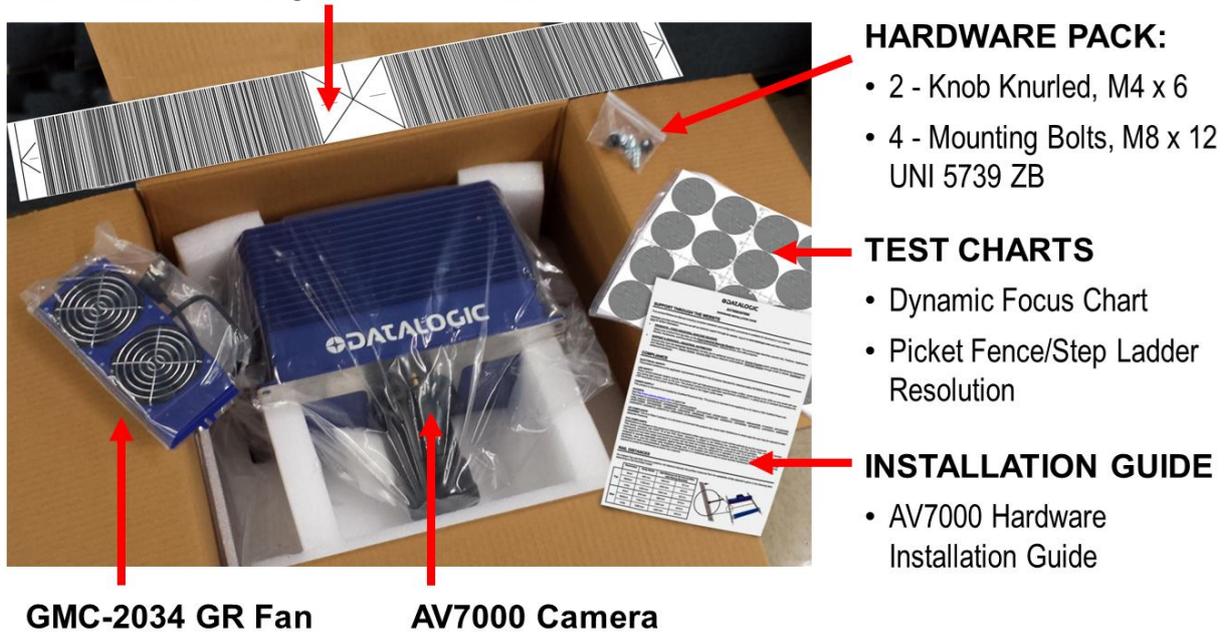
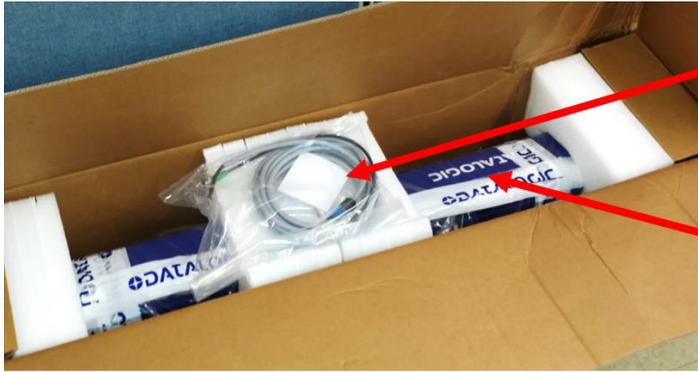


Figure 19: AV7000 Camera package contents



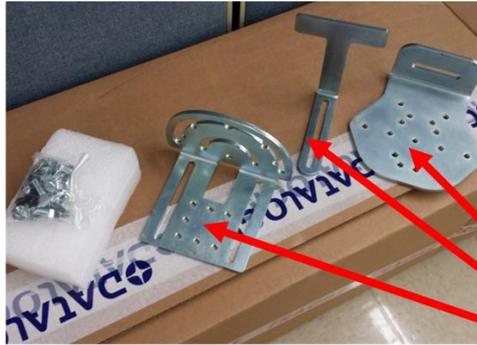
NOTE: The AV7000 Camera and accessory packaging is designed to protect the unit(s) during shipment. Do not throw it away. Save all packing material in case you need to transport your unit(s).

**CABLES:**

- CVL-2389 Cable, PS to AI7000, 6M
- CAB-503 9P01 M12-IP6 Cable 0.6M

AI7000 ILLUMINATOR**HARDWARE PACK:**

- 4 – Bolt M8x8 UNI 5739 ZB
- 18 – Bolt M8x12 UNI 5739 ZB
- 2 – Screw M4x8 UNI 7697 WZ
- 2 – Spacer H-5 D8 Cyl. Nickel Brass
- 4 – Stud, T-Slot, 5/16-18x3/4 Drop-in
- 4 – Locknut, Hex, 5/16-18x3/4, Serrated-Flange, STL
- 4 – Screw, M8x25 Hammer Head+INOX Nut

**BRACKETS:**

- 2 – ST-344 Rising Bracket
- 2 – ST-326 Support Bracket
- 2 – ST-325 Main Bracket

Figure 20: AI7000 Illumination package contents



Important: Be sure to retain shipping boxes and packing material for use if the unit needs to be returned to Datalogic for any reason.

2.3 INSTALLATION SEQUENCE



NOTE: Everything should be MECHANICALLY INSTALLED before performing any ELECTRICAL INSTALLATION.
See *Chapter 3, Electrical Installation* 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 brackets to the mounting structure
5. Mount the AI7000 Illuminator to its mounting brackets
6. Mount the fan assembly to the AV7000 Camera
7. Mount the AV7000 Camera to the Illuminator
8. Mount the brackets for the deflection mirror, if required.
9. Mount the deflection mirror to its brackets
10. Mount the height sensor (Light Curtain, RangeFinder, or DM3610 Dimensioner)
11. Mount the photoelectric sensor to the mounting structure (optional)
12. Mount the tachometer to the mounting structure
13. Mount the CBX connection box to the mounting structure
14. Complete electrical installation (**See Chapter 3**)
15. Align the AV7000 for proper operation
16. Align the height sensor for proper operation
17. Configure the AV7000 (**See Chapter 4**)
18. Calibrate the AV7000 (**See Section 5.3**)
19. Check AV7000 operations (**See Section 5.4**)

2.4 INSTALLATION

2.4.1 Dimensions and Clearances

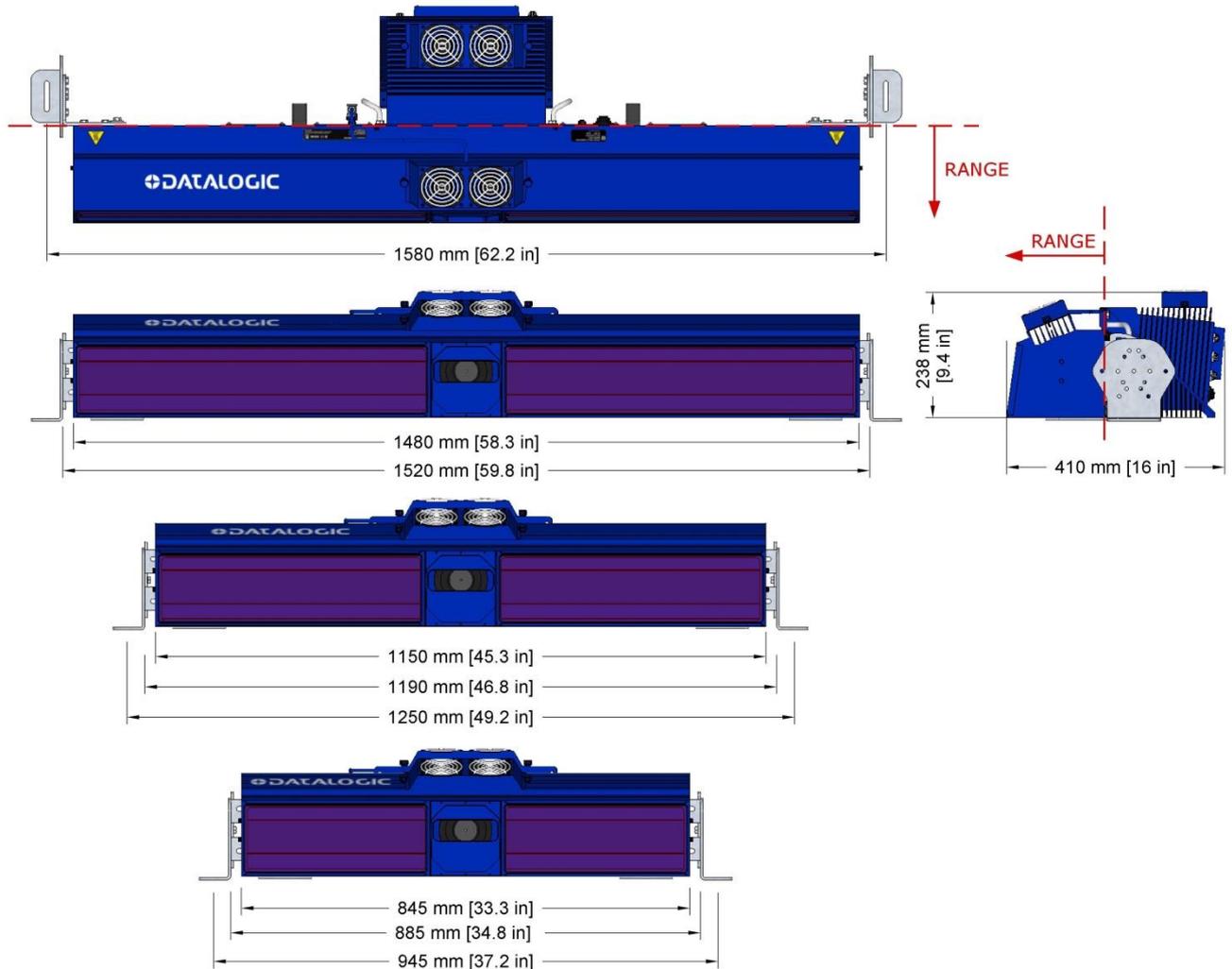


Figure 21: Mounting Dimensions



IMPORTANT: The AV7000 is a sealed, unventilated unit. Mounting the unit with 300 mm [12 in] of clearance (front, top, and sides) is recommended for cooling and ease of maintenance.



Note: The AV7000 datum is indicated by the dashed line. As indicated, the range to the target is measured from the camera/illumination interface plane.

2.4.2 Physical Support Requirements

For details on the weight of the barcode readers, see *Chapter 8, Technical Features*. Multiple-head systems may include further details on the physical support requirements with any application-specific documentation provided.

2.4.3 Vibration Limitations

See *Chapter 8, Technical Features*.

2.4.4 General Mounting 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 AV7000 camera imaging system application, be sure to 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.
- The first camera in the system must be installed at least 254 mm [10 in] upstream from the focus device (DM3610, RangeFinder, or light curtain) to work properly.
- 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).

2.4.5 Mounting Structure Considerations

Your first task is to mount your AV7000 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.

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 barcode reader 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.

- It provides approximately 300 mm [12 in] minimum clearance on all sides. This clearance is necessary to provide proper ventilation, allow access to all panels of the barcode reader, and allow room for proper servicing.

2.4.6 Scanning Station Frame/Mounting Structure Preparation and Positioning

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

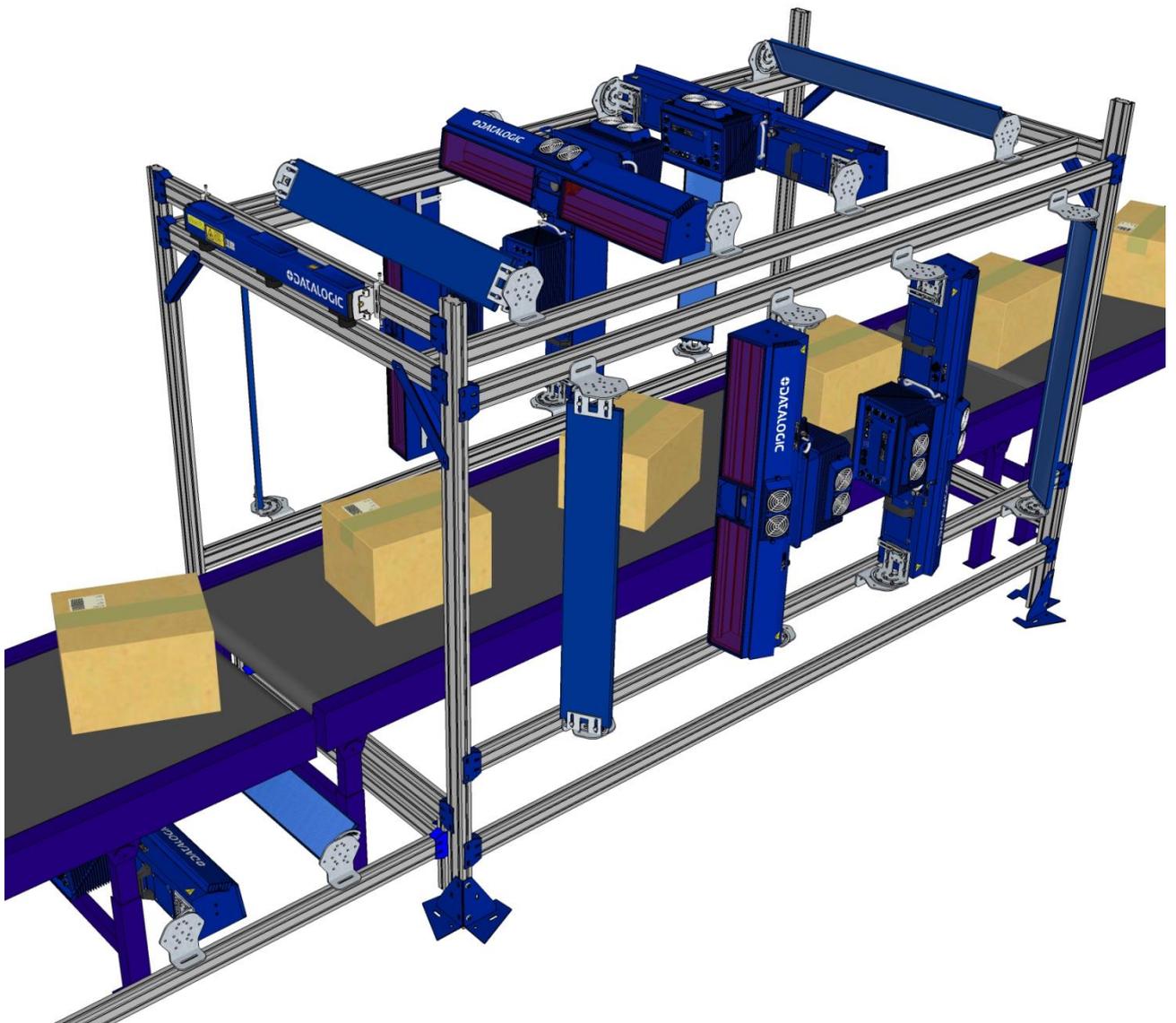


Figure 22: Example Station Frame Layout

2.4.7 Mounting Rails

The Camera/Illuminator and Deflection Mirror are mounted to mounting structure rails, as shown below. Typically, the rising brackets are mounted to the rails, but in some cases it may be necessary to mount the camera and deflection mirror between the mounting rails.

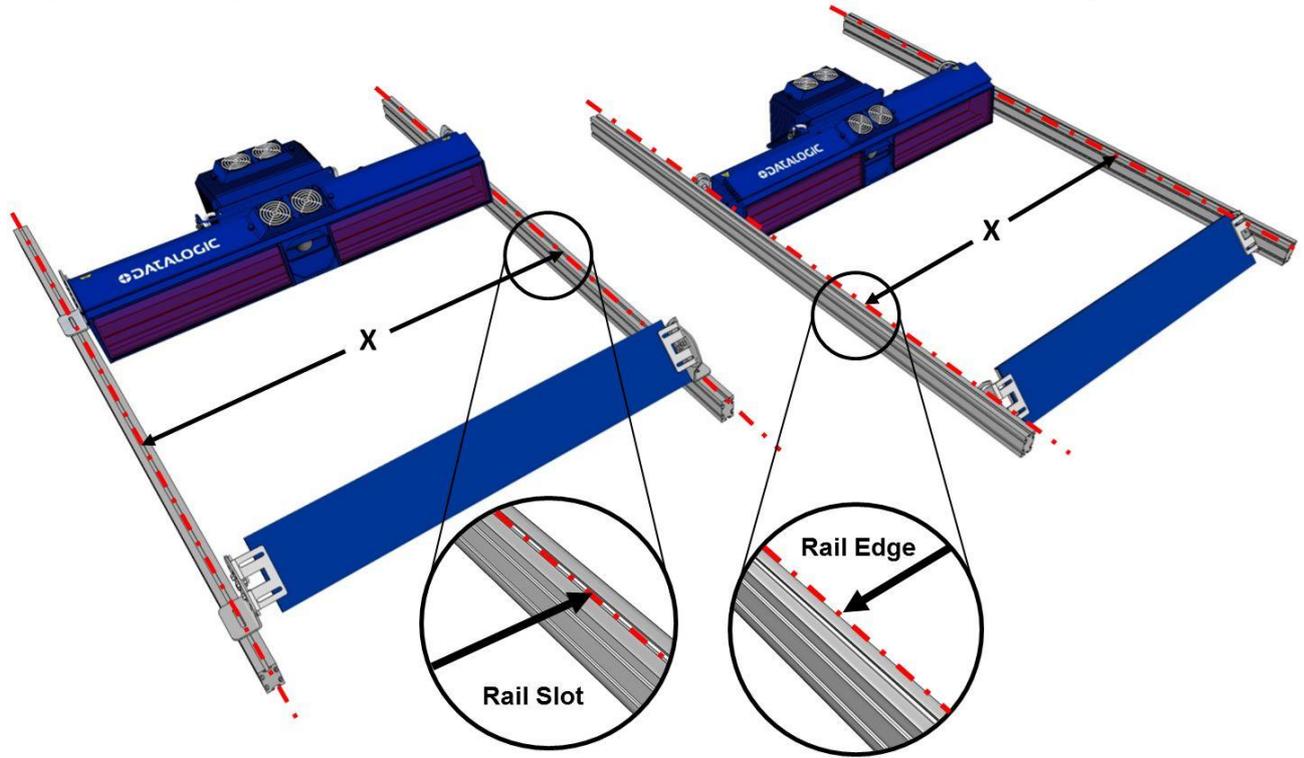


Figure 23: Mounting Rail positioning, above rail with rising bracket (typical) and between rails

For Rail configurations, the rails must be mounted so that the distance between the extrusion profiles (Bosch or 80/20) matches the illuminator model being used.

For Top Camera positions (both Direct and Indirect), the distance between the profiles measured from the internal sides is given in the following table depending on the illuminator model:

Illuminator	Body Width	x Distance Between Rail Slots with Rising Brackets		x Distance Between Rails without Rising Brackets	
Short	845 mm	945 mm	37.2 in	885 mm	34.8 in
Medium	1150 mm	1250 mm	49.2 in	1190 mm	46.8 in
Long	1480 mm	1580 mm	62.2 in	1520 mm	59.8 in

For Side Camera positions (either Direct or Indirect), the distance between the profiles measured from the internal sides is given in the following table depending on the illuminator model:

Illuminator	Body Width	x Distance Between Rail Slots with Rising Brackets		x Distance Between Rails without Rising Brackets	
Short	845 mm	955 mm	37.6 in	895 mm	35.24 in
Medium	1150 mm	1260 mm	49.6 in	1200 mm	47.24 in
Long	1480 mm	1590 mm	62.6 in	1530 mm	60.24 in

2.4.8 Illuminator Bracket Pre-Assembly and Mounting

The mounting brackets have been designed specifically to quicken, simplify and facilitate vision system mounting.

These brackets have universal mounting configurations and reference slots for all standard mounting angles allowing all of the standard Camera mounting positions to be made without the use of special tools.

The Illuminator Bracket kit included with the Camera contains:

- 2 ST-0325 universal main brackets
- 2 ST-0326 universal support brackets
- 2 ST-0344 universal rising brackets
- 4 M8x8 bolts (for support to main bracket assembly)
- 8 M8x12 bolts (for illuminator to main bracket assembly)
- 2 M4x8 screws + 2 H5 metal spacers (create illuminator locating pins on support bracket) (Not used for side mounted barcode readers)



IMPORTANT: Be sure to use the M8x8 (short) bolts when mounting the support brackets to the main bracket. Longer bolts will pass through the other side of the main bracket, interfering with the illuminator body.



Figure 24: Bolt Profiles

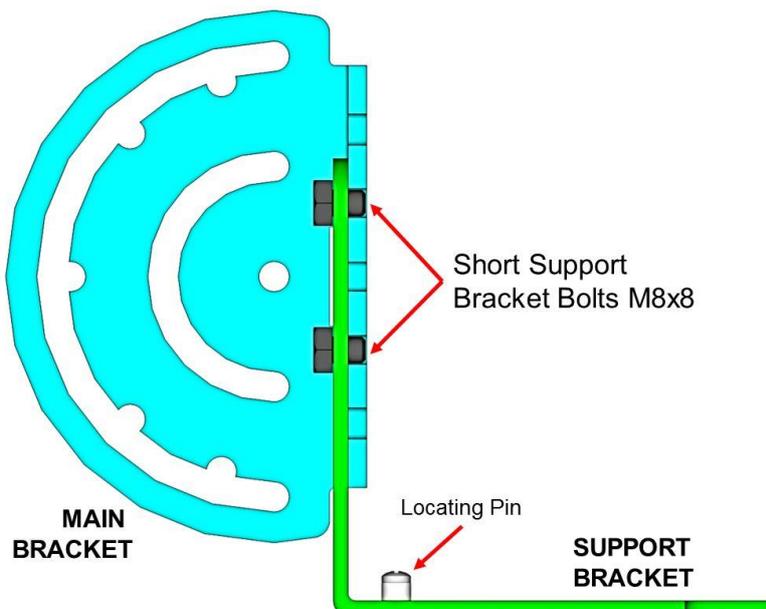


Figure 25: Mounting Support Bracket with short bolts

AV7000/AI7000 Top/Bottom Mounting Bracket Assembly and Mounting

Both Top and Bottom Camera positions require the same pre-assembly of the Illuminator Bracket.

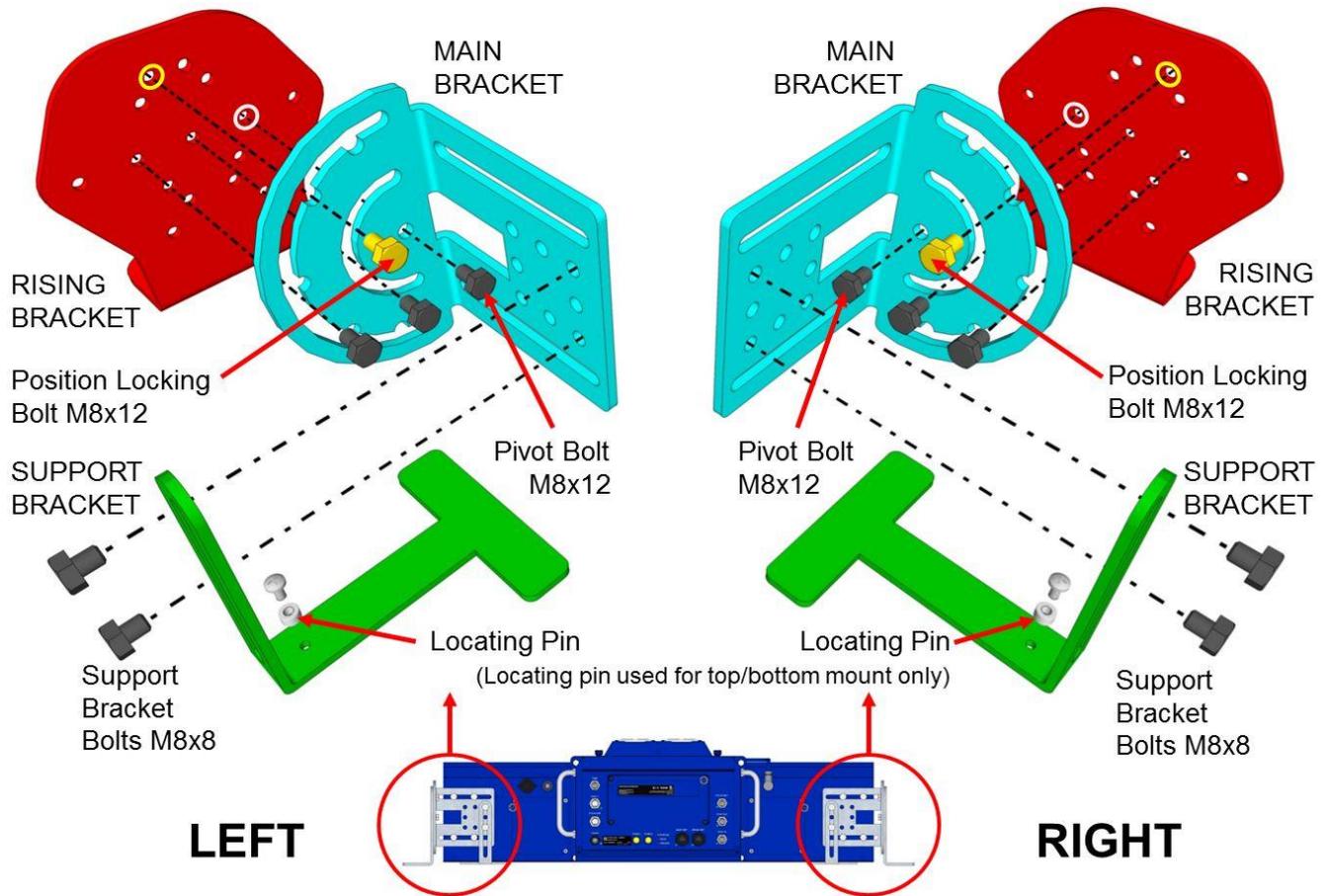


Figure 26: Bracket Assembly for Top and Bottom Mounted Cameras (Exploded View 90°)

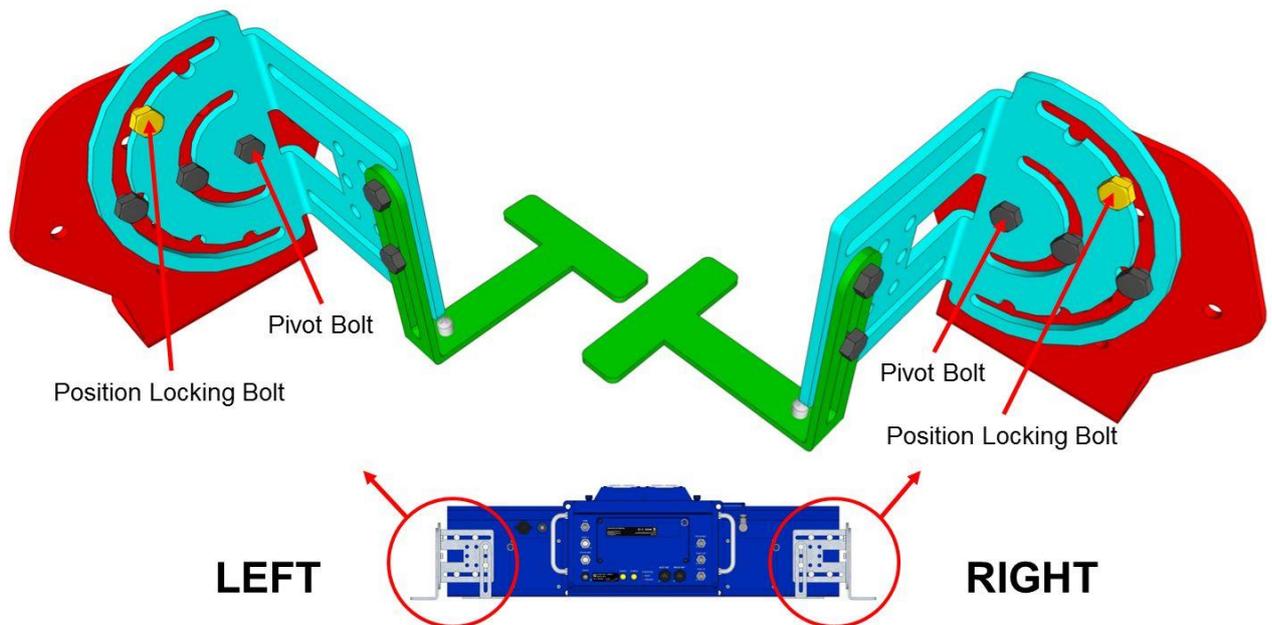


Figure 27: Bracket Assembly for Top and Bottom Mounted Cameras (Assembled 90°)

AV7000 Top/Bottom Mounting Sequence

Since the brackets are mounted directly to the body of the illuminator and the camera is mounted directly to the body of the illuminator, no matter what standard mounting position is used, (Top, Side, or Bottom), the basic sequence is the same:

1. Mount the cooling fan to the AV7000 camera (See section 2.4.11).
2. Pre-assemble the Illuminator brackets according to the application.
3. Mount the brackets to the mounting frame. Use two (2) T-bolts per bracket.
4. Set the Illuminator on top of the Support Brackets with the slots in the bottom of the illuminator positioned over the locating pins. See *Locating Pins in the illustration below*.
5. Mount the Illuminator to the bracket.
6. Mount the Camera to the illuminator.

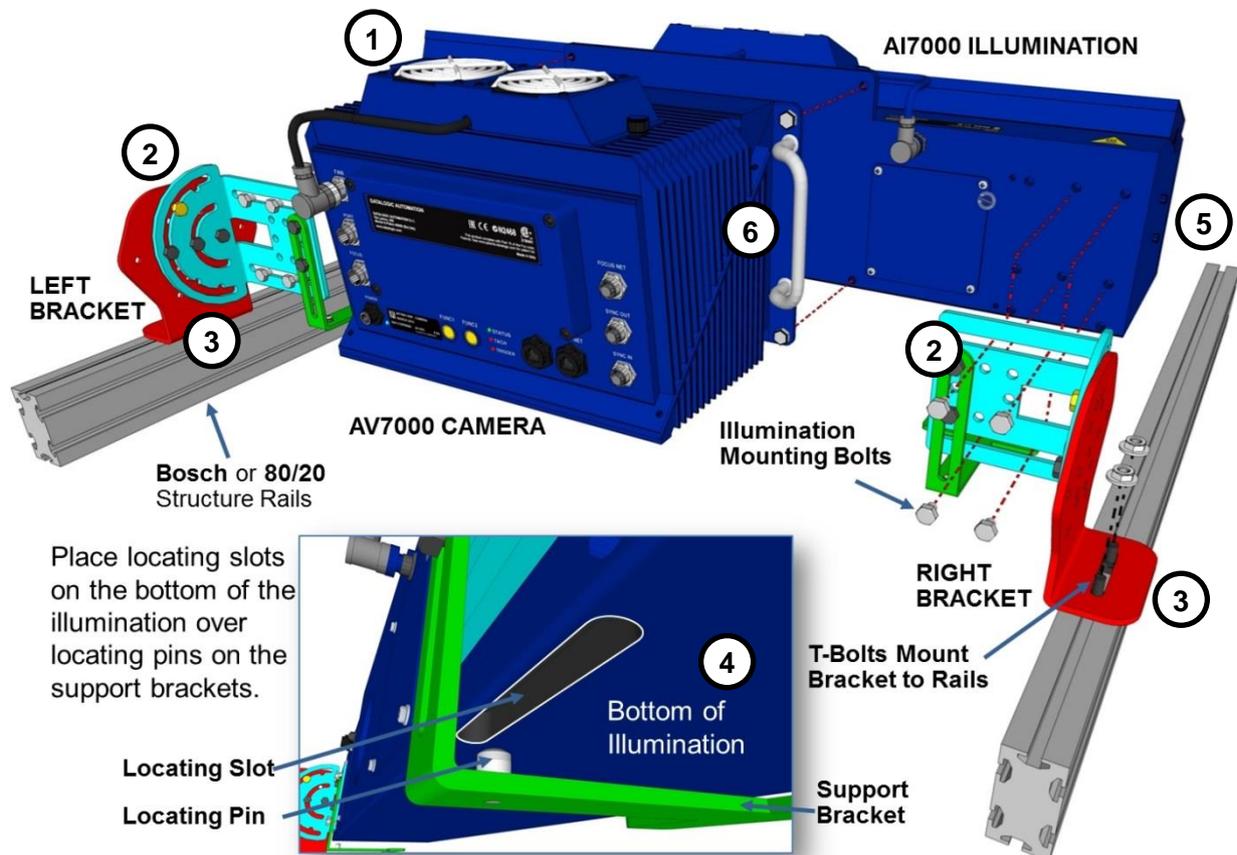


Figure 28: Mounting Sequence

AV7000/AI7000 Side Mounting Bracket Assembly and Mounting

The illustrations below show how the brackets are assembled, and how the AI7000 Illumination is then mounted to the brackets. Typically, the brackets are pre-assembled and attached to the mounting structure, and then the illumination is mounted to its brackets. The **Support Bracket** (green in the figure) passes through the **Main Bracket** (blue). Then the **Main Bracket** is bolted to the Rising Bracket, positioning the Pivot Bolt and Position Locking Bolt (yellow) as shown.

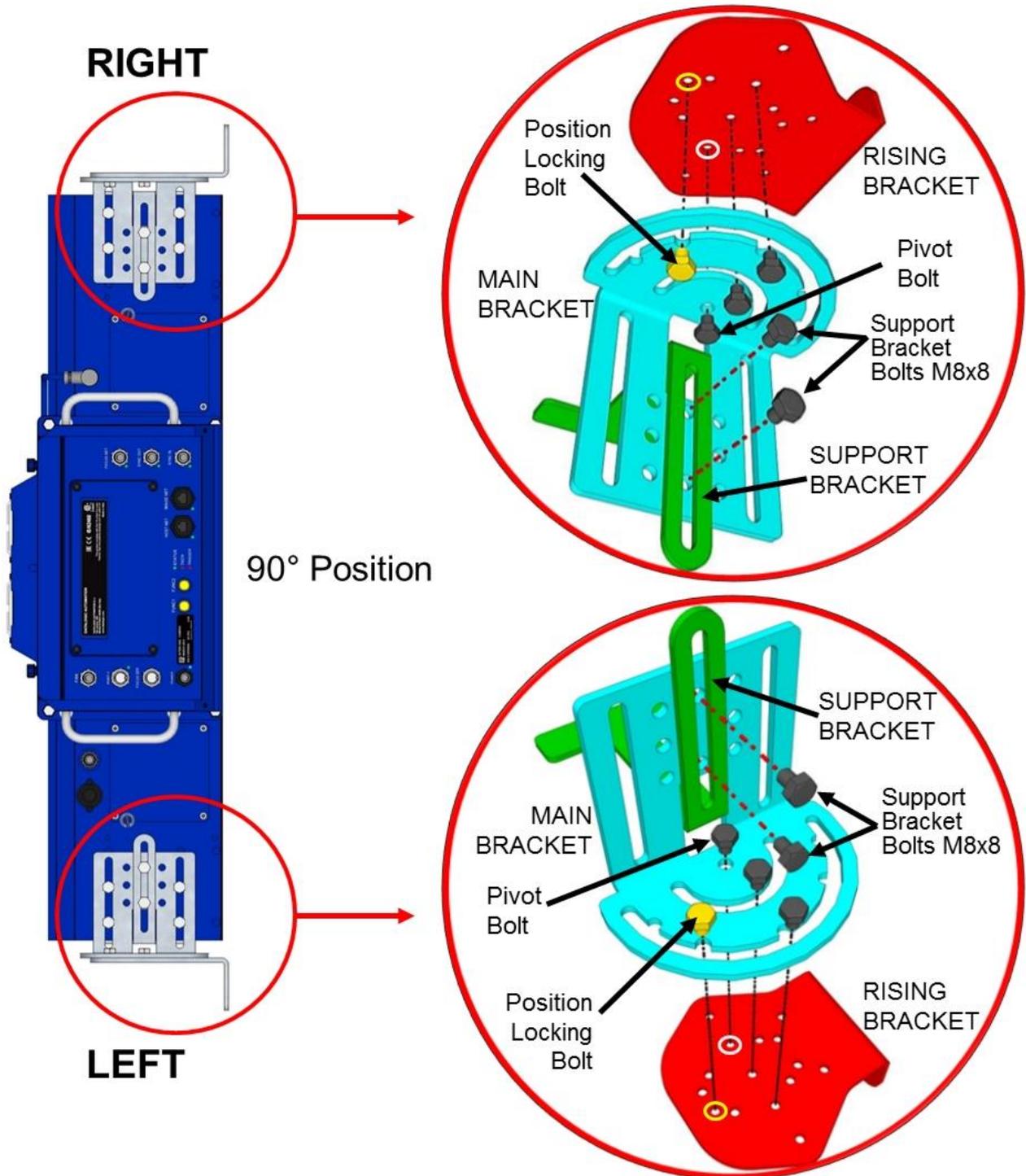


Figure 29: Side Bracket Assembly, Top=Right Mounting (90°)

Although both brackets will be mounted having 25 mm [1 in] between the **Support Bracket** (green) surface and the **Rising Bracket** (red) surface, for mounting purposes the "top" bracket should be pre-assembled so that this distance is 0 mm/in. This will provide clearance when placing the camera/illuminator between the mounted brackets.

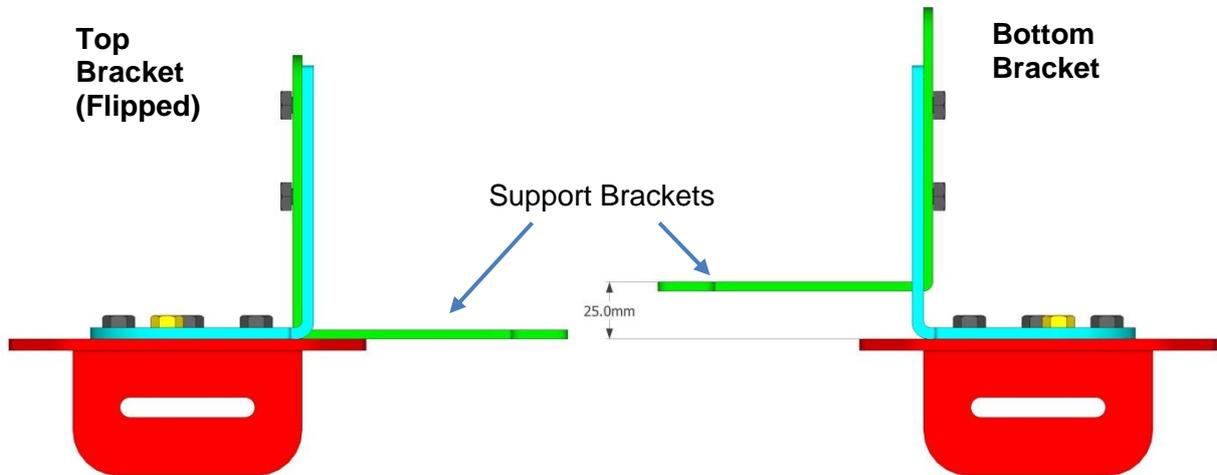


Figure 30: Side Bracket Assembly, Support Bracket position

AV7000 Side Mounting Sequence:

1. Mount the cooling fan to the AV7000 camera (See section 2.4.11).
2. Pre-assemble the Illuminator brackets according to the application.
3. Mount the bracket to the station frame.
4. Place the lower end of the illumination on the the bottom bracket, and then tilt the top end of the illumination in line with the top bracket.
5. Lower the top support bracket down to capture the locating pins in the end of the illumination. See *Locating Pins in the illustration below*.
6. Mount the Camera to the illuminator.

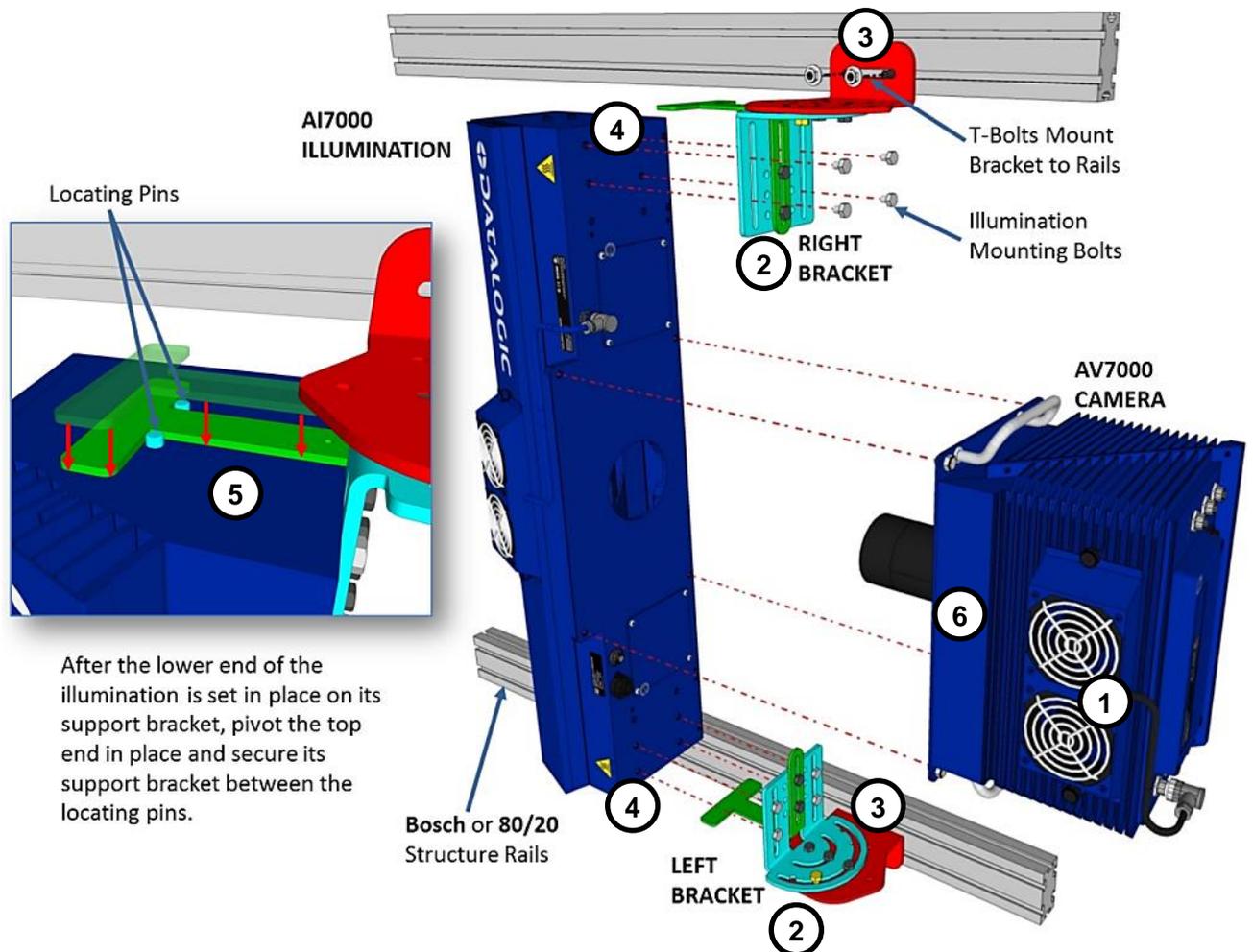


Figure 31: Mounting a SIDE AV7000 Camera

2.4.9 AV7000 Bracket Angles

Standard camera bracket angles are shown below. The **YELLOW** bolt indicates the locking position between the Main Bracket (blue) and Rising Bracket (red).



NOTE: In most applications, the viewing angle is created with a deflection mirror and its brackets, and the camera is mounted at 90-degrees.



NOTE: The “left” and “right” references shown below refer to the ends of the illumination, and not the AV7000’s position on the mounting structure.

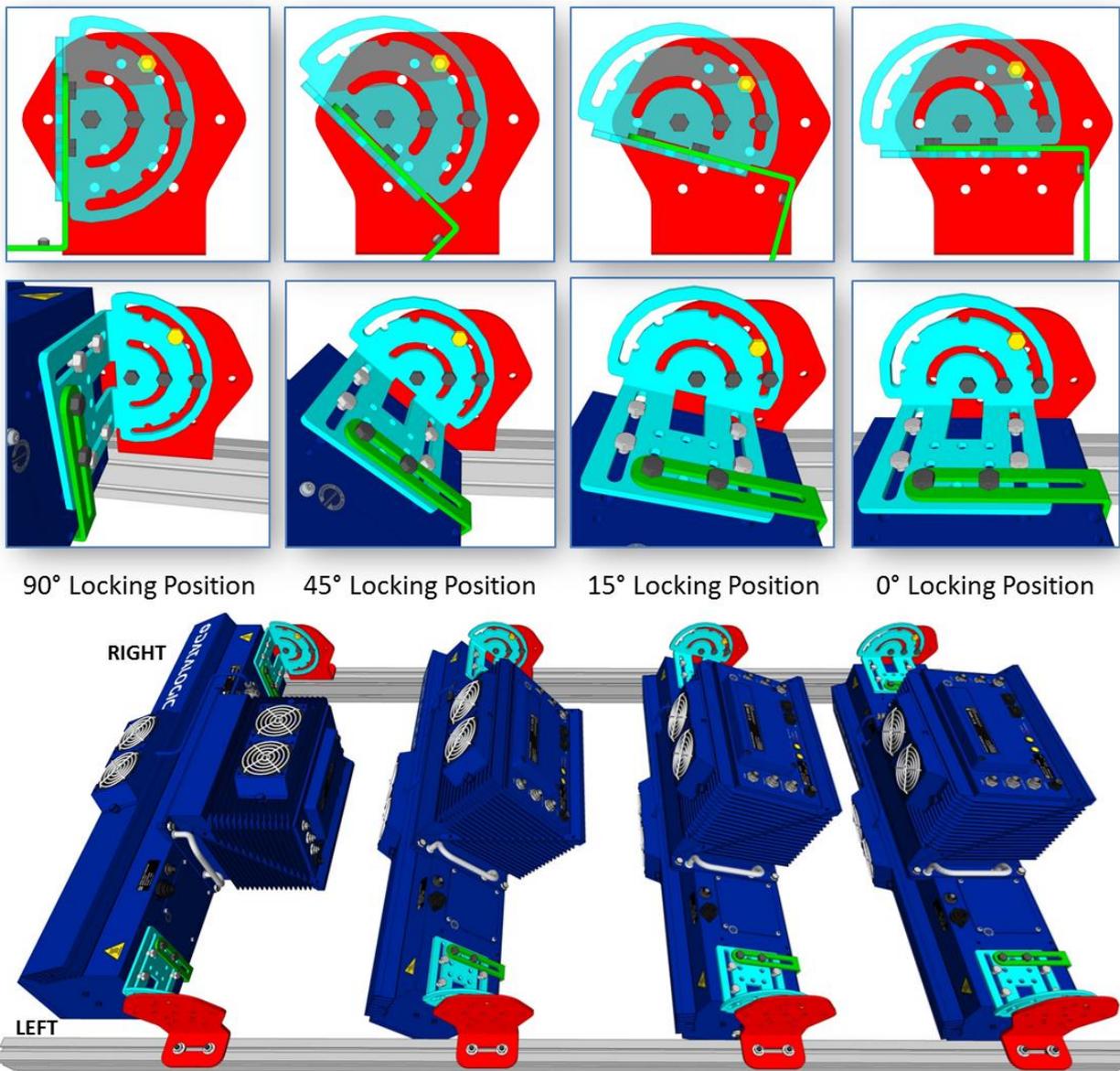


Figure 32: Standard TOP Mount AV7000 Bracket Angles (with locking bolt position)

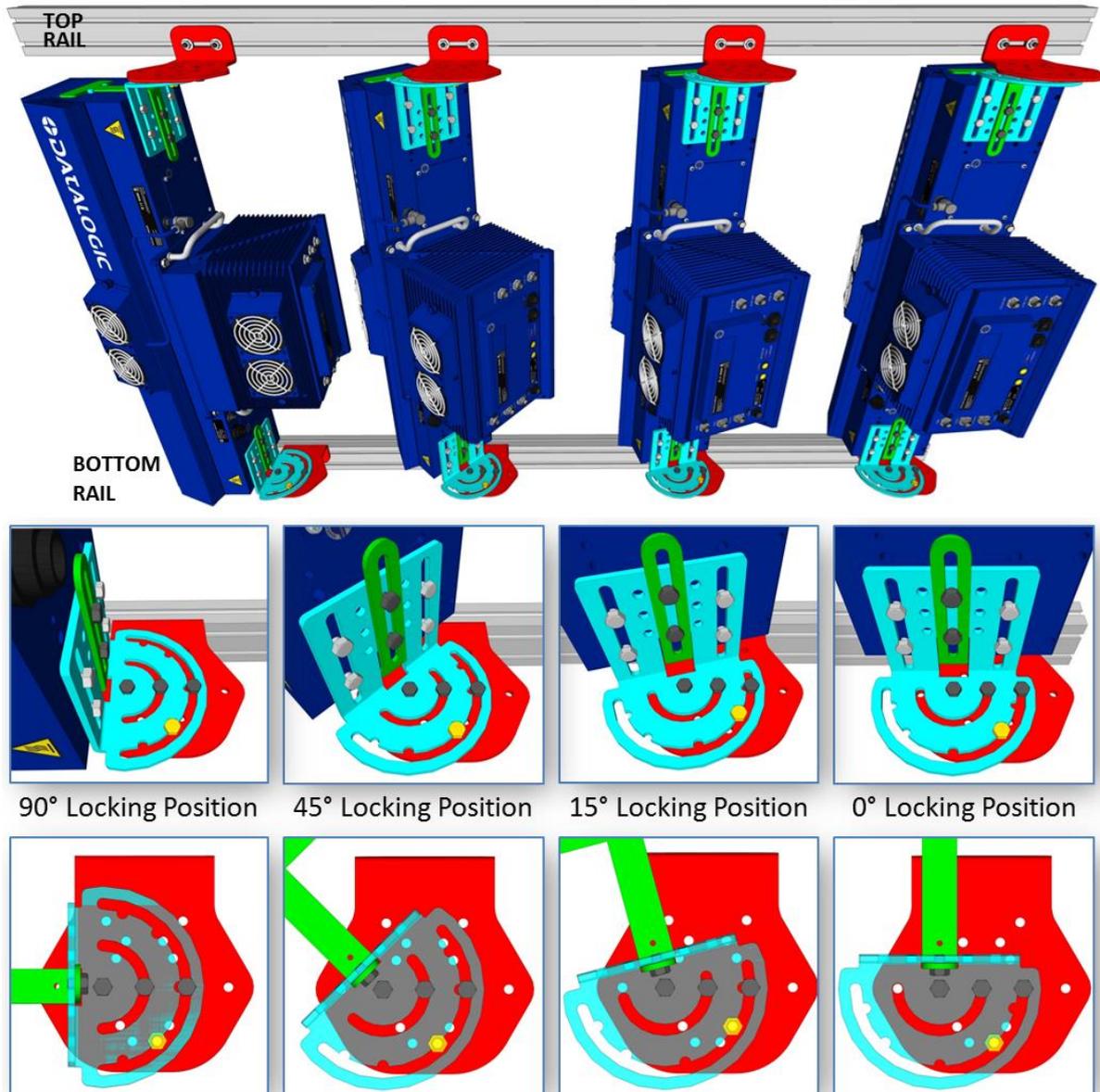


Figure 33: Standard SIDE Mount AV7000 Bracket Angles (with locking bolt position)

2.4.10 Alternative Camera Mounting Between Rails

In some cases when you need to save space, the AV7000 Camera (and deflection mirror) can be mounted directly between the rails, without the use of the Rising Bracket.

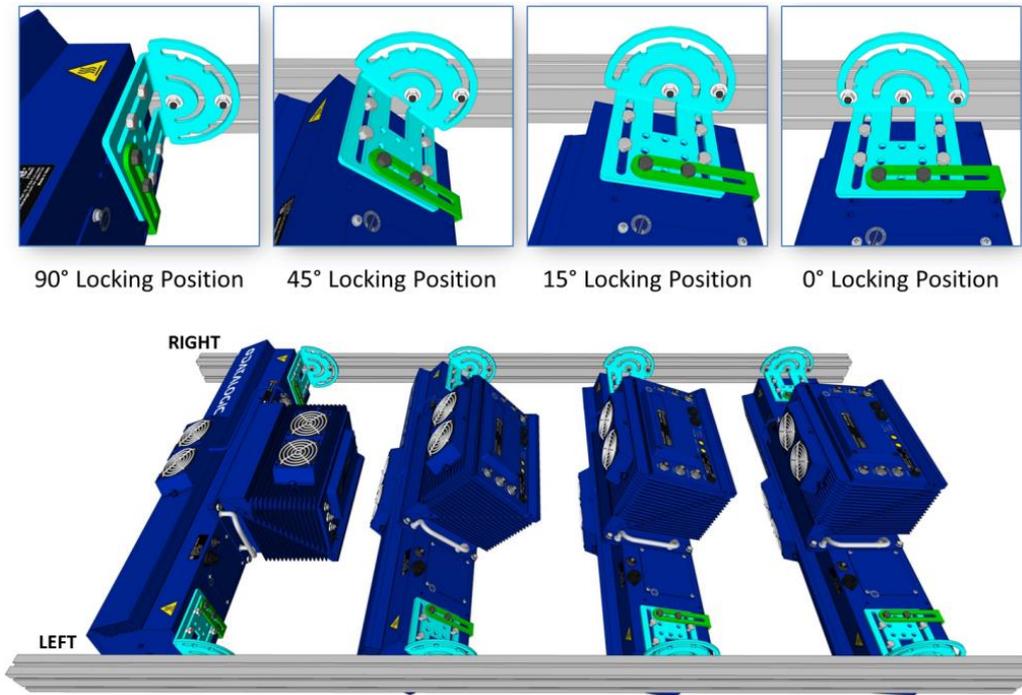


Figure 34: Alternative Mounting: TOP Camera Between Rails

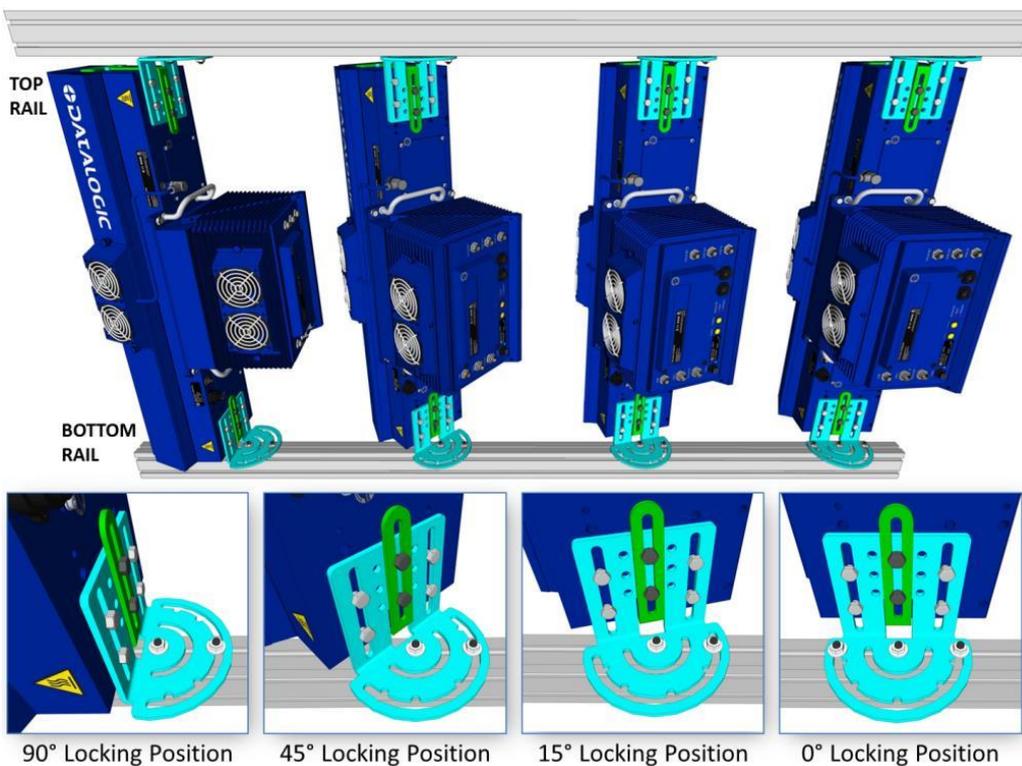


Figure 35: Alternative Mounting: SIDE Camera Between Rails

2.4.11 Mounting the AV7000 Camera to the AI7000 Illuminator

The AV7000 can be installed to operate in any position. *Figure 21: Mounting Dimensions* can be used for installation; refer to reading diagrams (See section 5.11) and any application drawings for correct positioning of the camera with respect to the reading zone and camera orientation. Typically, the illuminator is mounted to the system mounting structure, and then the camera is bolted to the illuminator.

Mounting the fan to the camera housing

The AV7000 Camera is shipped without the cooling fan attached to the top of the housing. Before mounting the camera to the illuminator, first mount the fan to the camera housing, as shown below.

To mount the cooling fan to the camera housing:

1. Position the fan over the housing and insert the knurled knobs (bolts).
2. The knurled knobs should be finger tight. Do not over-tighten.
3. Push the fan's power connector into the **FAN** connector on the back of the camera housing, and screw it in place.

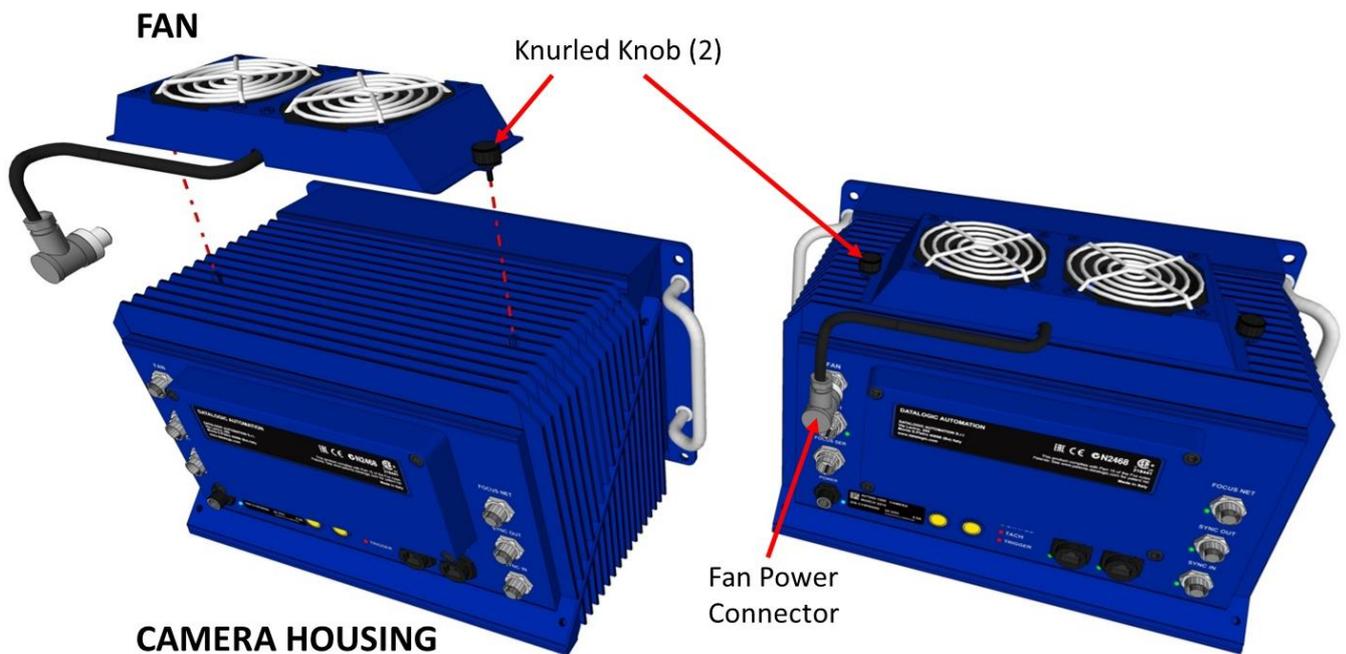


Figure 36: Mounting the cooling fan to the AV7000 Camera



NOTE: The cooling fan should be plugged into the camera's **FAN** port before the camera has been powered up. If the cooling fan is plugged into the camera after the camera has been powered up, the camera may not recognize and power the fan until the camera is rebooted.

Mounting the Camera to the Illuminator

After the cooling fan has been installed on the camera housing, the camera can be mounted to the illuminator as follows:

1. Make sure the illuminator is firmly mounted to the mounting structure.
2. Remove the dust cap from the lens access on the back of the illuminator.

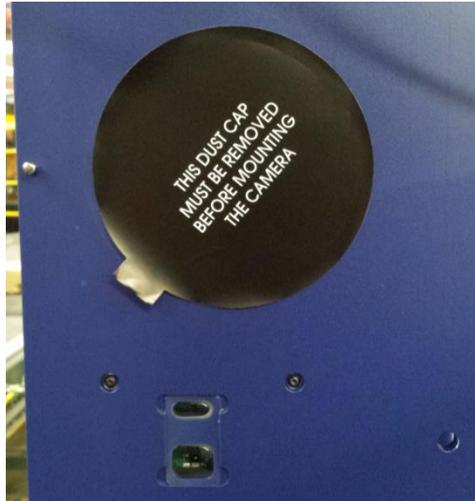


Figure 37: Illuminator Dust Cap

3. Lift the camera into place, inserting the lens through the lens hole and the Locator Pin into the Locator Pin Hole. See illustration below.

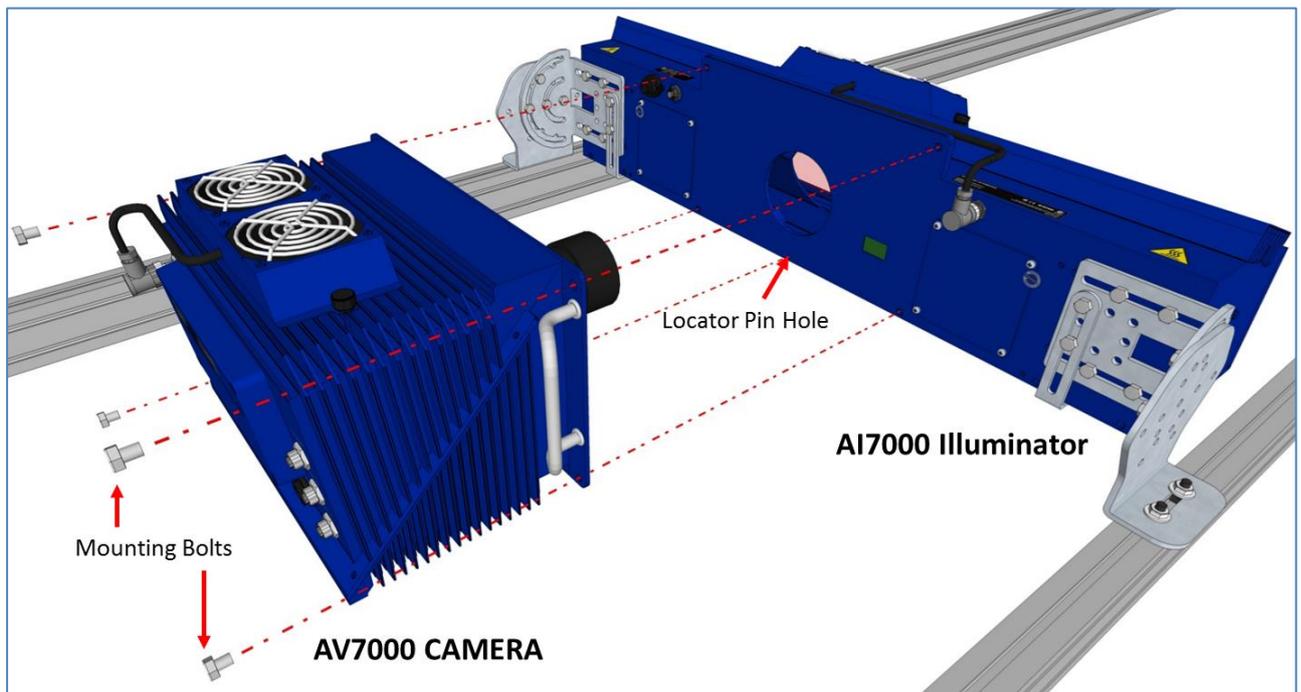


Figure 38: Mounting the Camera to the Illuminator (View A)

4. Push the camera in place against the back of the illumination and secure it by turning a mounting bolt through the camera housing and into one of the mounting holes in the illuminator. Finger-tighten the bolt for now to secure the camera and prevent it from slipping out of the illumination.



NOTE: The spring-loaded Focus Lock will push against the illuminator creating some resistance. As the bolts are tightened, the Focus Lock is pushed in to release the focusing mechanism.

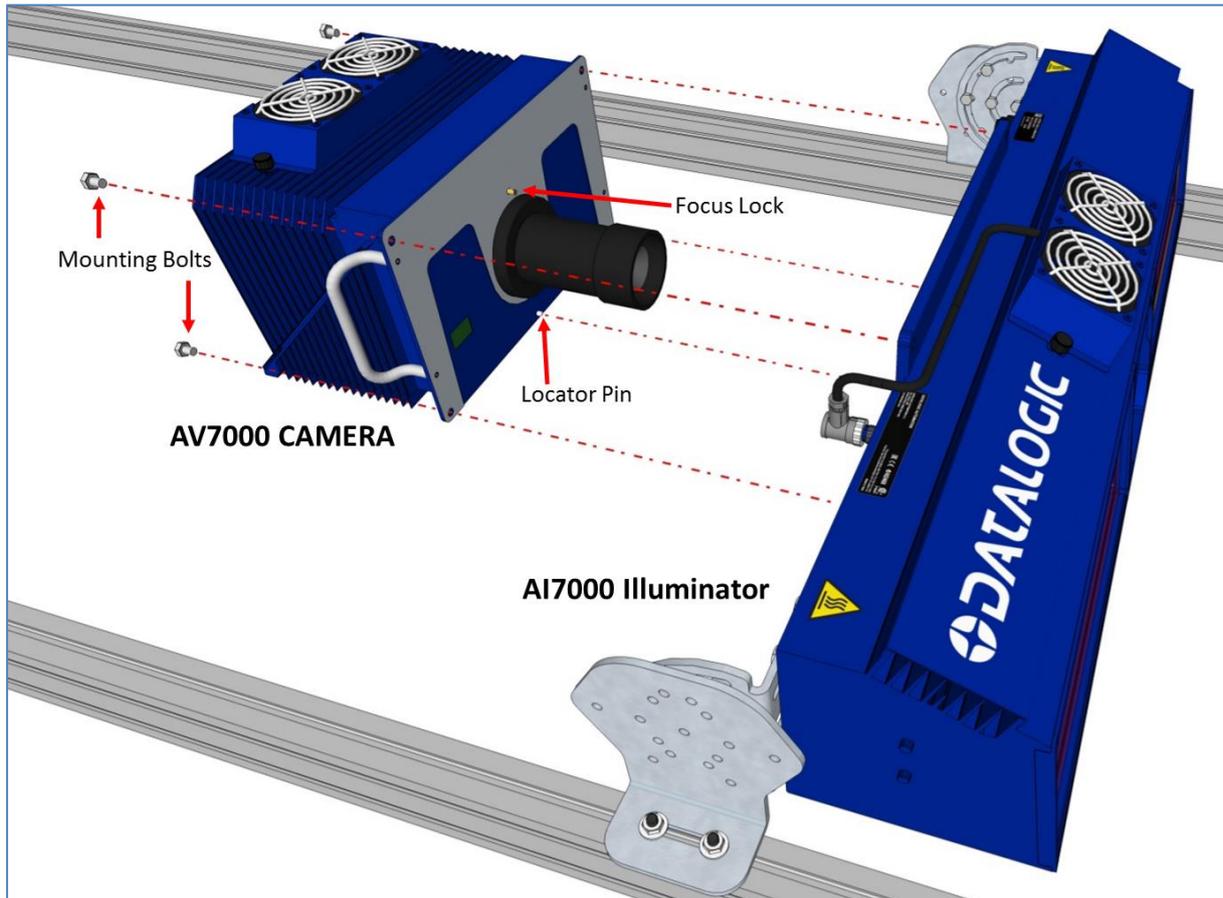


Figure 39: Mounting the Camera to the Illuminator (View B)

5. Add the remaining bolts, and securely fasten the camera to the illuminator.

2.5 INSTALLING THE DEFLECTION MIRROR

The external deflection mirror allows the AV7000 Camera to be mounted parallel to the conveyor, which can save space while allowing the light from the illuminator and image view to be angled for precise image capture.

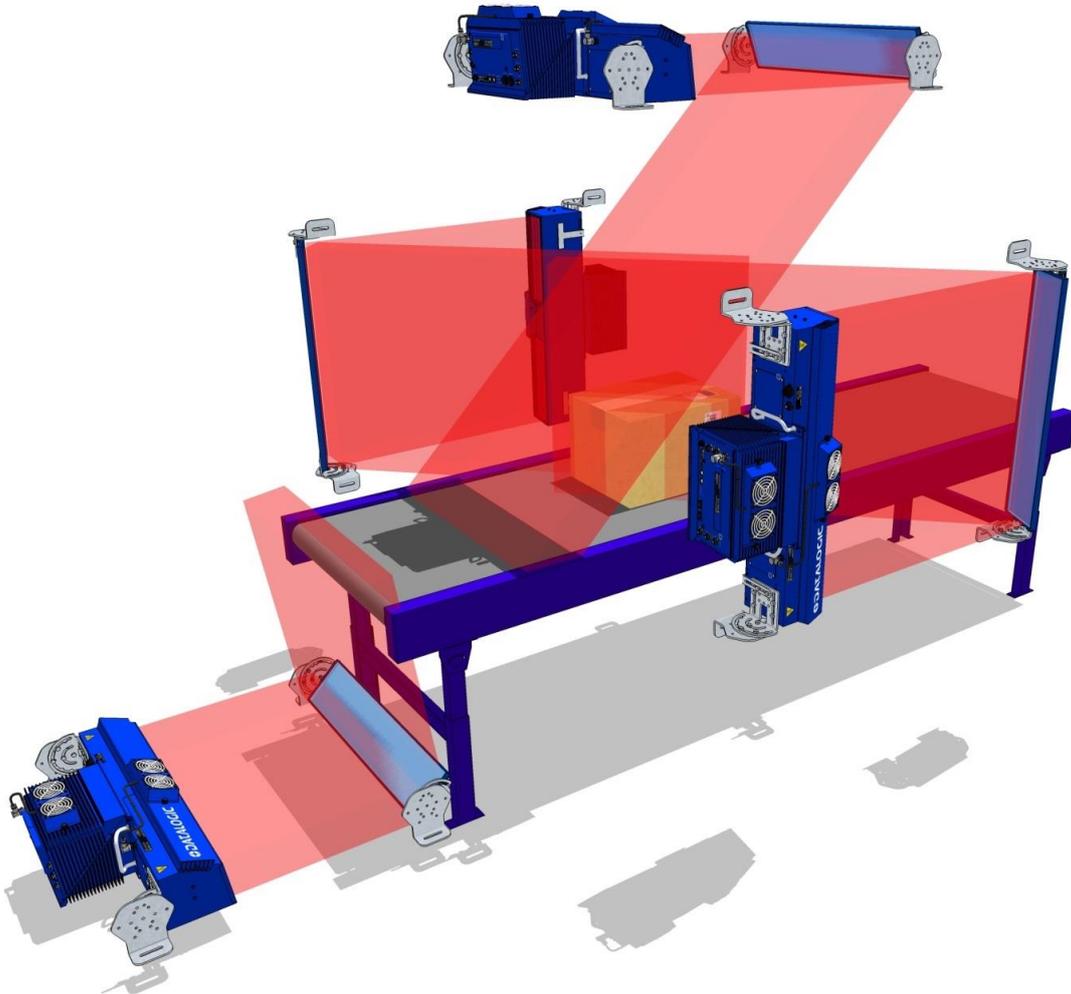


Figure 40: Deflection Mirror Examples

Deflection mirrors are mounted much like the illuminations, and use the same Rising Bracket, with a modified Main Bracket. The illustration below shows bracket assembly and mounting positions relative to the mounting structure. The illustration shows mirrors angled for 45-degree reflective angles, except for the bottom-read mirror, which is angled for an 8-degree reflective angle (off vertical).

2.5.1 Deflection Mirror Bracket Angles

Standard deflection mirror bracket angles are shown below. The **YELLOW** bolt indicates the locking position between the Main Bracket (blue) and Rising Bracket (red). The named angles are reflective view angles, and not the physical angle of the bracket, as shown in the illustration below.



NOTE: When mounting top mirrors to the brackets, start with the mirror brackets in the 0-degree position. Then you can set the mirror on the bracket without the fear of it sliding off before you can insert the mounting bolts. Once mounted, loosen the main bracket bolts, and angle the mirror as desired.

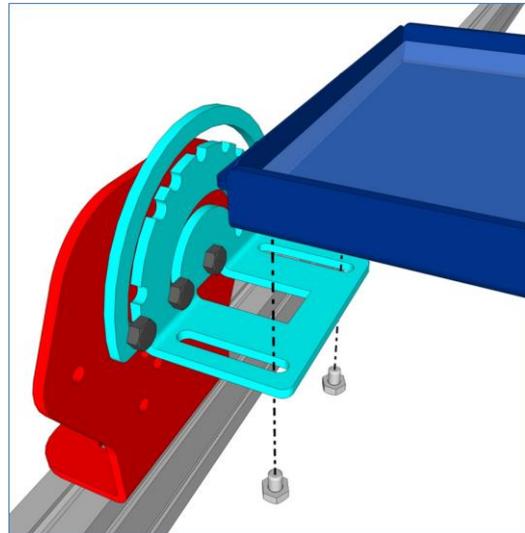


Figure 41: Top mirror mounting position



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

The left and right brackets must be parallel and square to each other.

To Do This:

1. Carefully install the mirror as usual, following application specifications.
2. Loosen all the bracket adjustment bolts on the bracket at one end of the mirror to relieve any stress on the mirror.
3. Retighten the bolts.

If the mirror still seems to be stressed, loosen and retighten the bolts of the opposite bracket. If that doesn't relieve any stress on the mirror, the mounting structure frame may not be square and will need to be adjusted.

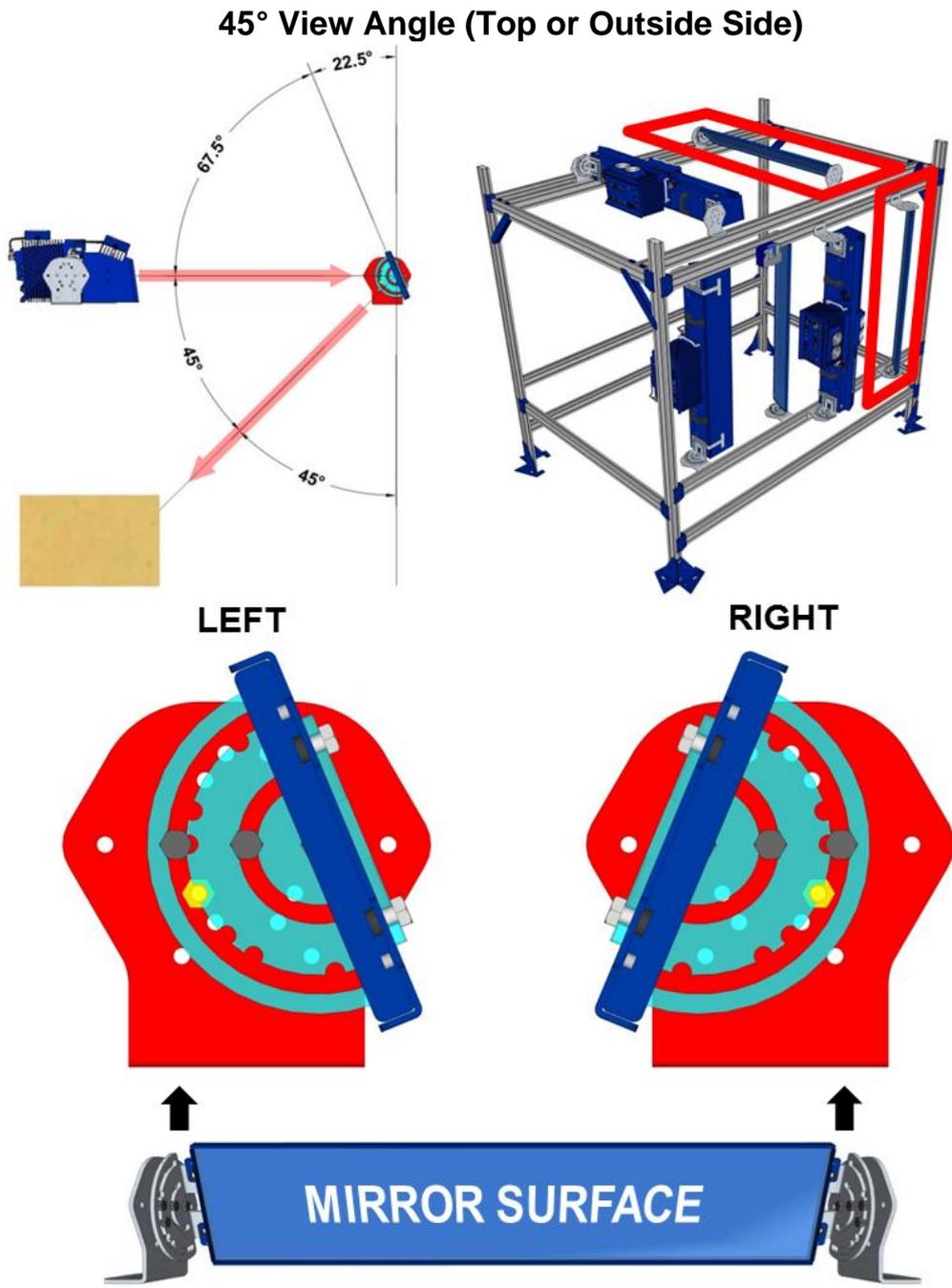


Figure 42: 45° View Angle Top or Side

15° View Angle (Top or Outside Side)

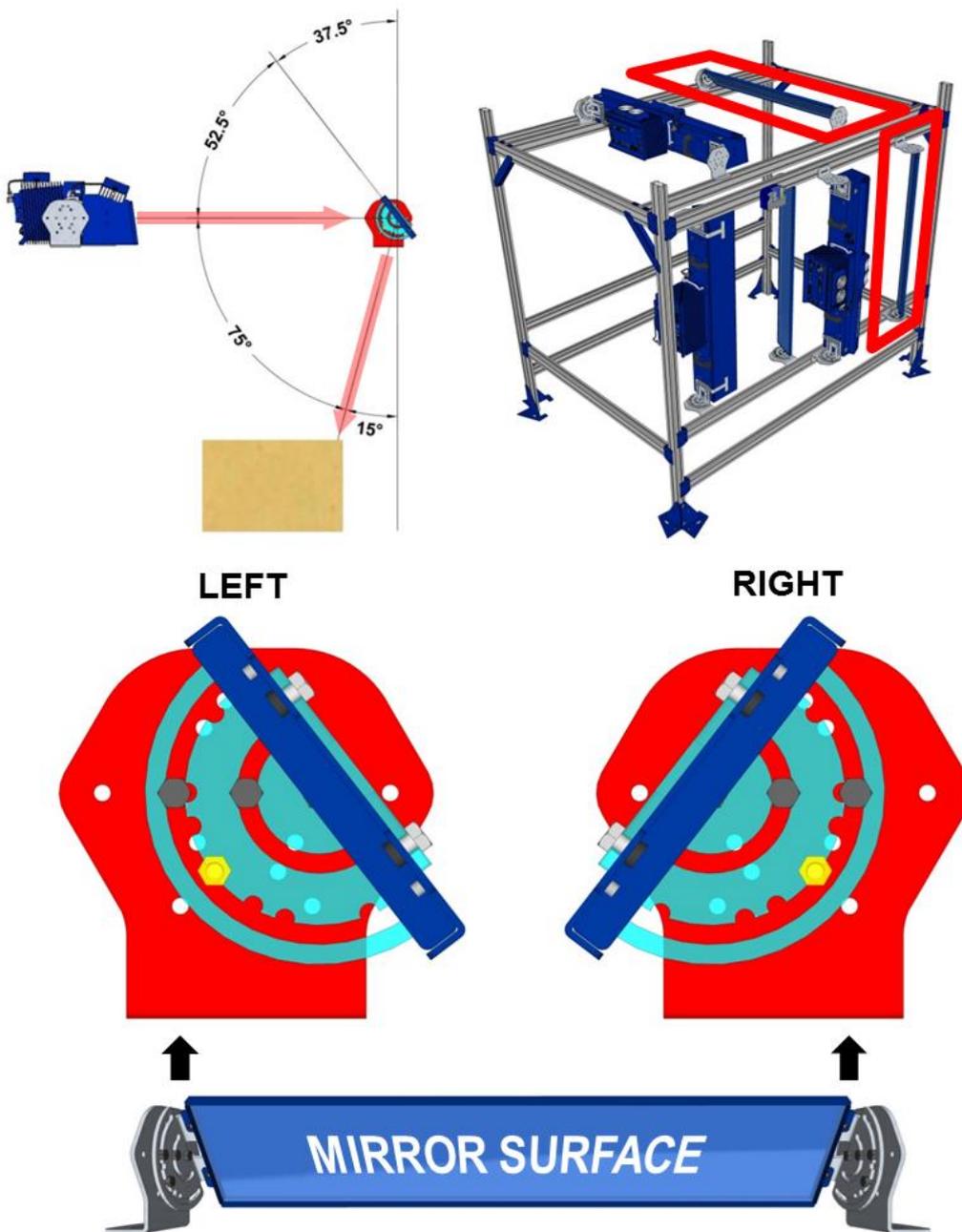


Figure 43: 15° View Angle Top or Side

In some cases, it may be necessary to install side mounted AV7000 Cameras and deflection mirrors on the inside of the mounting structure (closer to the conveyor), as shown below. Notice that to achieve a 15-degree locking angle, the mirror must be mounted on the outside of the main bracket.

45° View Angle (Inside Side)

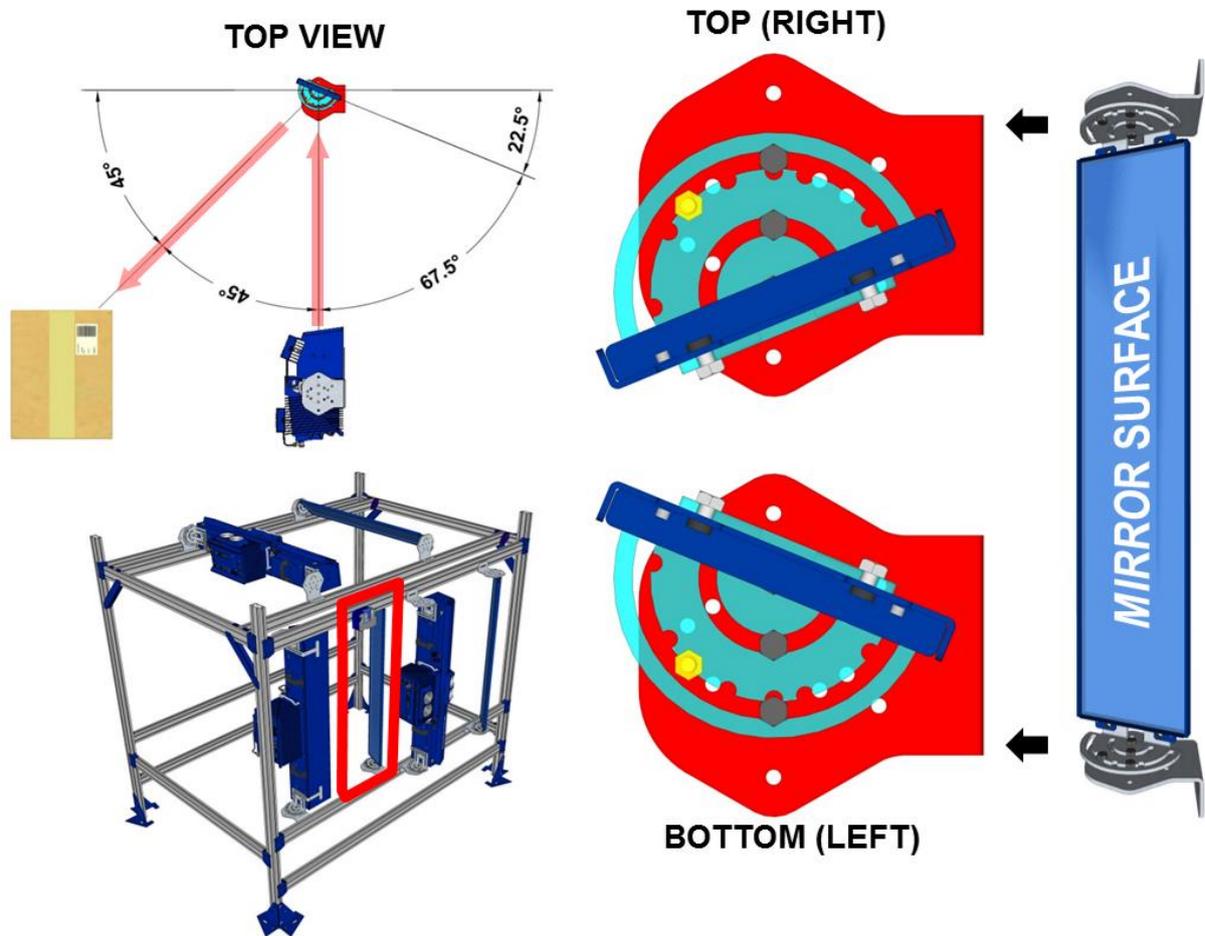


Figure 44: 45° View Angle Inside Side

15° View Angle (Inside Side)

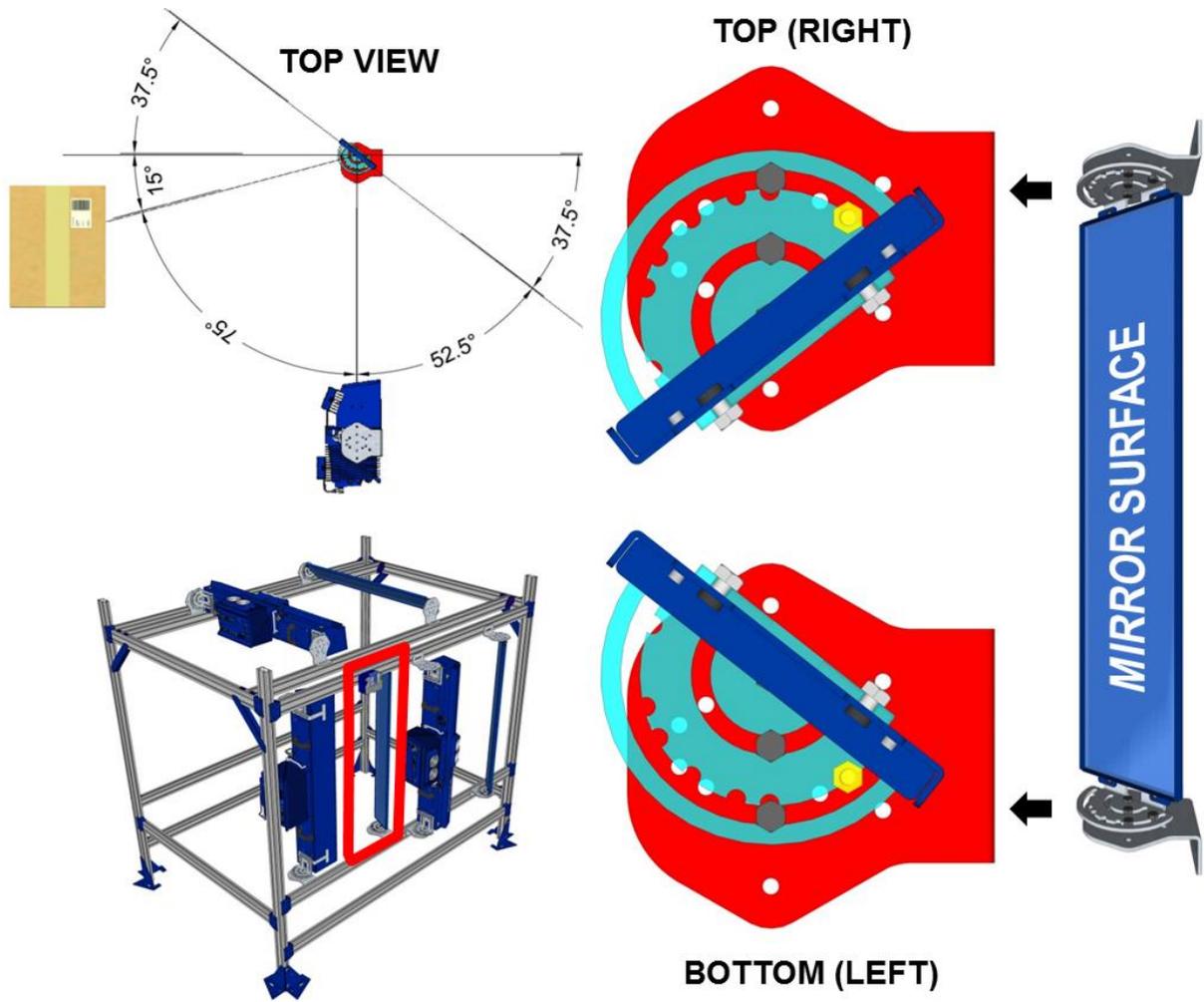


Figure 45: 15° View Angle Inside Side

15° View Angle with Old Bracket (Inside Side)

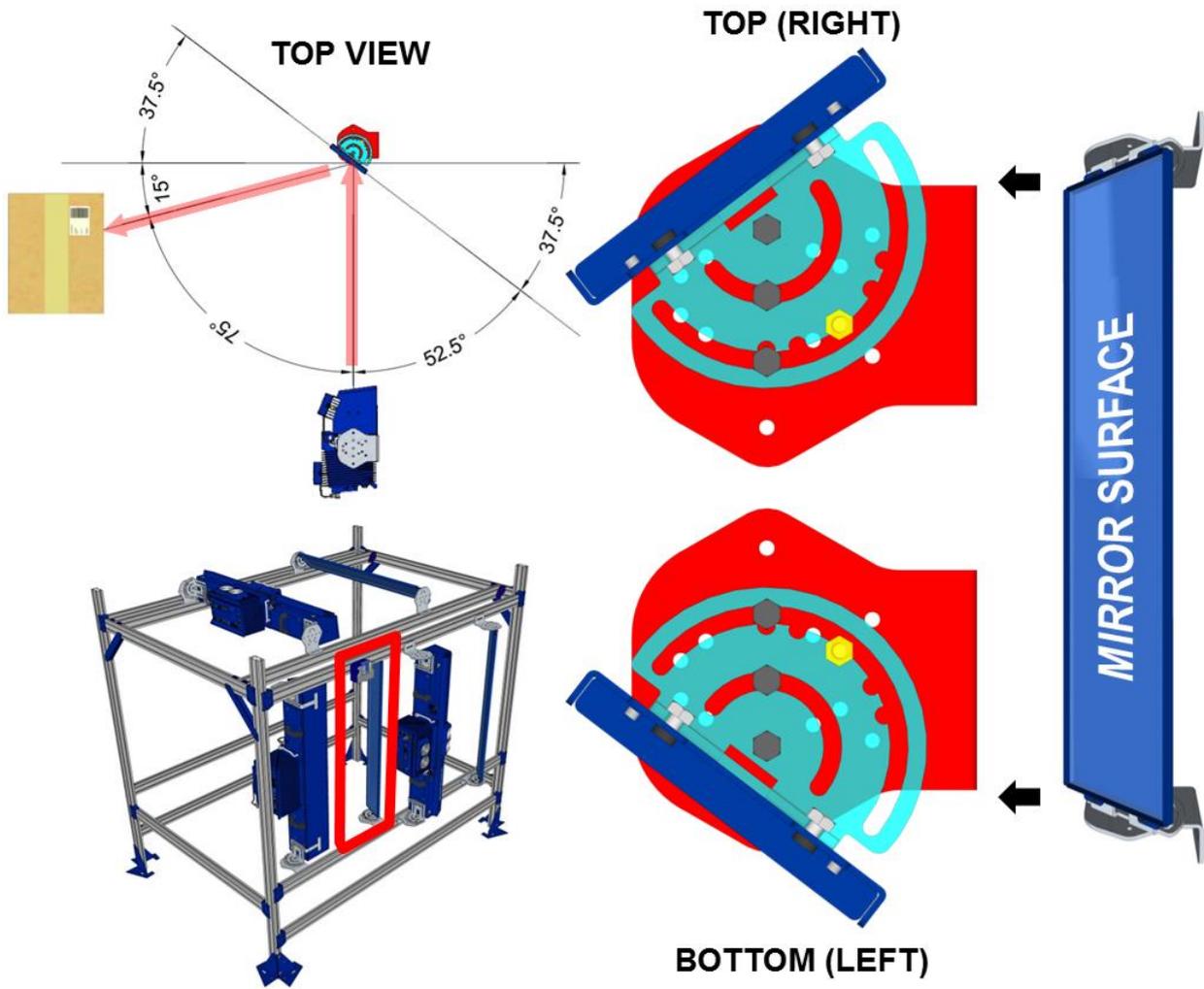


Figure 46: 15° View Angle with Old Bracket Inside Side

Deflection mirrors for bottom mounted AV7000 Cameras should be mounted to create an 8-degree view angle (from vertical). However, the angle must be set up manually because **there is no locking hole** in the bracket for this angle. Using an electronic angle finder, tilt the mirror 41-degrees off the horizontal, as shown below. Securely tighten the bracket bolts.

8° View Angle (Bottom Read)

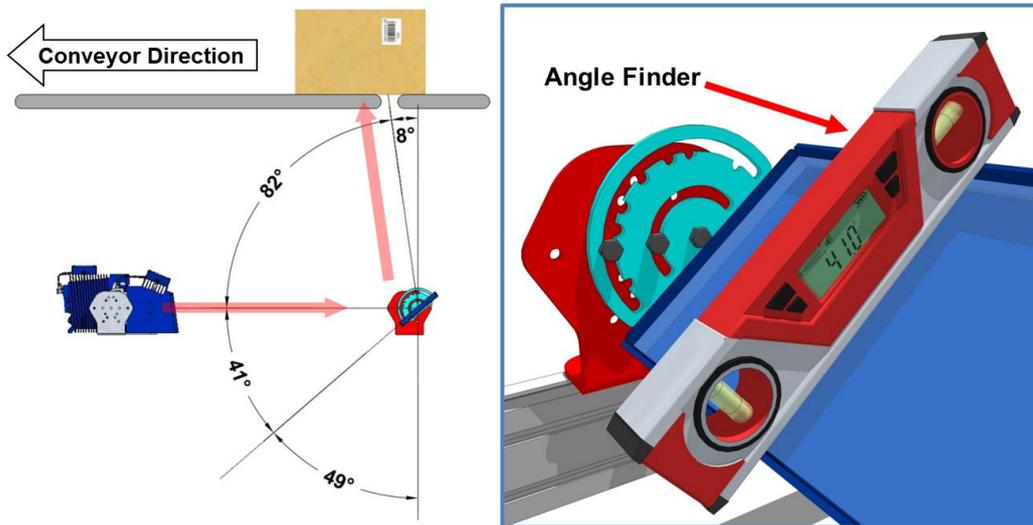


Figure 47: Bottom Mounted Deflection Mirror



NOTE: A bottom read mirror should be mounted upstream of the gap in the conveyor to minimize debris build up.

2.5.2 Alternative Deflection Mirror Mounting Between Rails

Like the AV7000 Camera, the deflection mirror can also be mounted between the mounting structure rails, as illustrated below.

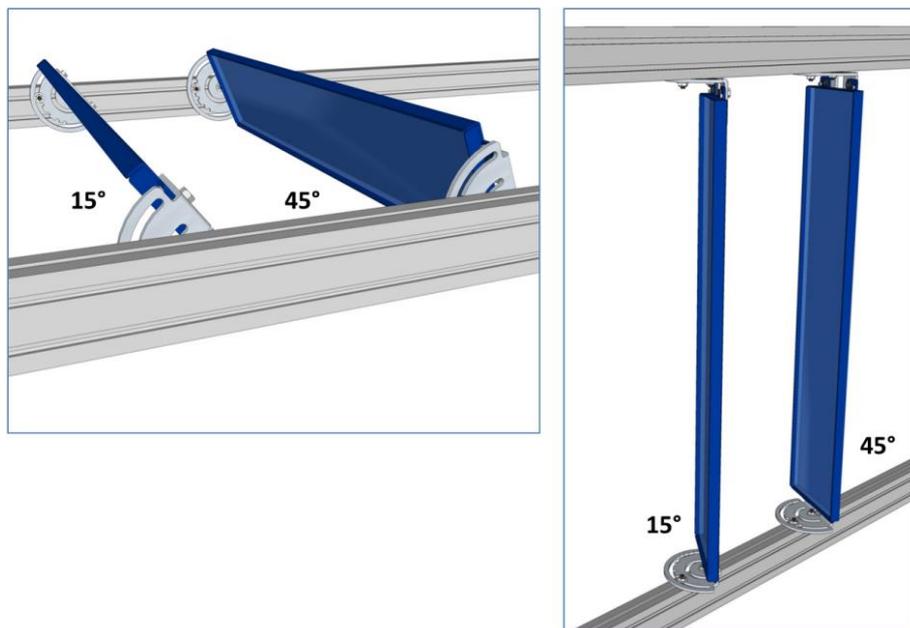


Figure 48: Alternative Deflection Mirror Mounting Between Rails

2.6 ALIGNING THE AV7000 WITH DEFLECTION MIRRORS

When using deflection mirrors with the AV7000 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 **A** and **B** shown in the illustration below. Distances **A** and **B** are measured to the edge of the Rising Bracket base, as shown.

When mounting the readers and mirrors, make sure:

- the structure is centered and squared to the conveyor
- deflection mirrors and readers are perpendicular to the structure rails
- deflection mirrors are parallel to their AV7000
- deflection mirror does not twist when mounted

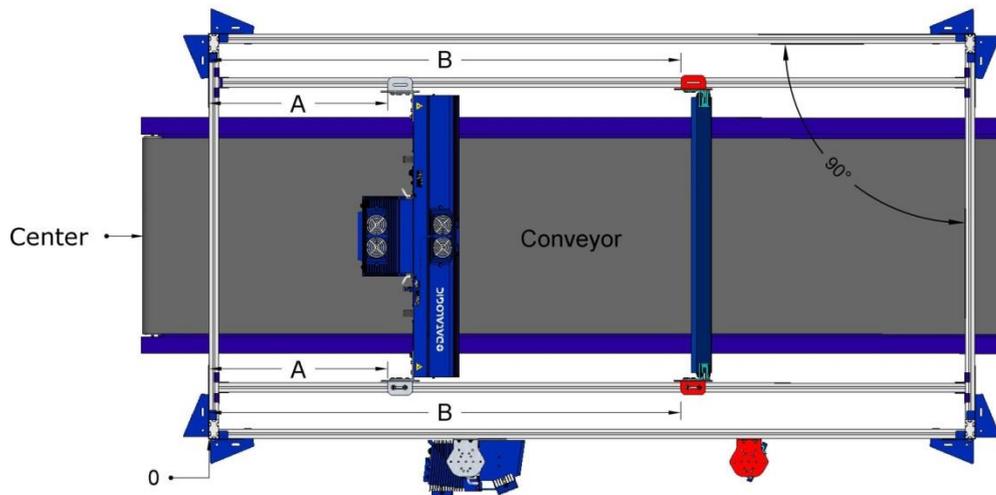


Figure 49: AV7000 with Deflection Mirror Mounting/Alignment (TOP VIEW)

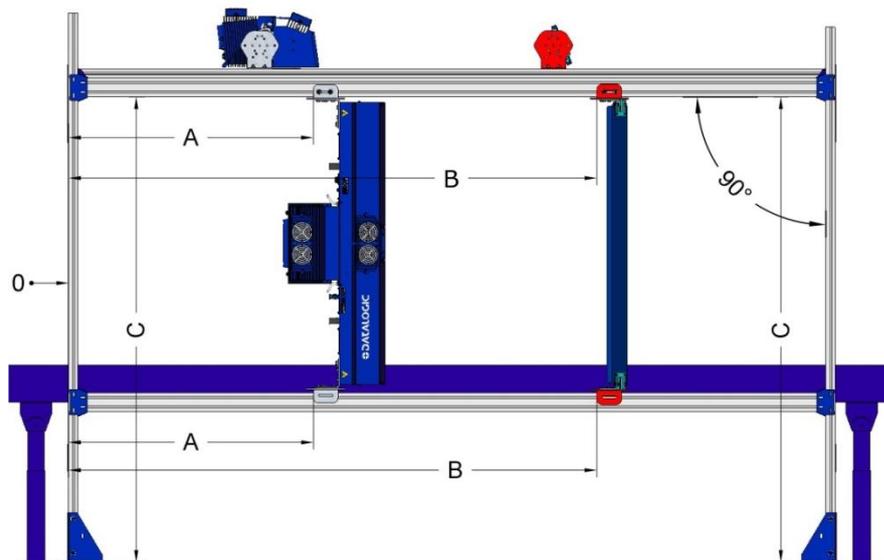


Figure 50: AV7000 with Deflection Mirror Mounting/Alignment (SIDE VIEW)

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.



IMPORTANT: The AV7000 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.

3.1 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.



IMPORTANT: 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 AV7000 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.



NOTE: To reduce the possibility of damage to the unit, check all cabling between the AV7000 camera and other devices for accuracy.

3.2 CONNECTING AN AV7000 CAMERA

To install an AV7000, follow this sequence:

1. Complete mechanical installation (*See Chapter 2.*)
2. Complete electrical installation (*See wiring illustrations provided in this chapter.*)
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) to the CBX connection box.
6. Wire the tachometer to the CBX connection box.
7. Wire serial ports to the CBX connection box if needed.
8. Connect the M12 end of the Ethernet cable to the barcode reader's HOST NET port and network switch as required by your application.
9. Wire the Remote Display to the CBX connection box (if used).
10. Connect the AV7000 to its power supply.
11. Connect the power supply to the power source.
12. Setup / check camera operations (*See Chapter **Error! Reference source not found..***)

3.3 TYPICAL CONNECTION BLOCK DIAGRAMS



NOTE: In each diagram below a Speed Detector may take the place of the encoder when a tilt-tray or cross-belt conveyance is used.



NOTE: A CBX510 Connection Box can be used in place of the CBX100 Connection Boxes shown in the following block diagrams.

3.3.1 Single Head AV7000 with DM3610

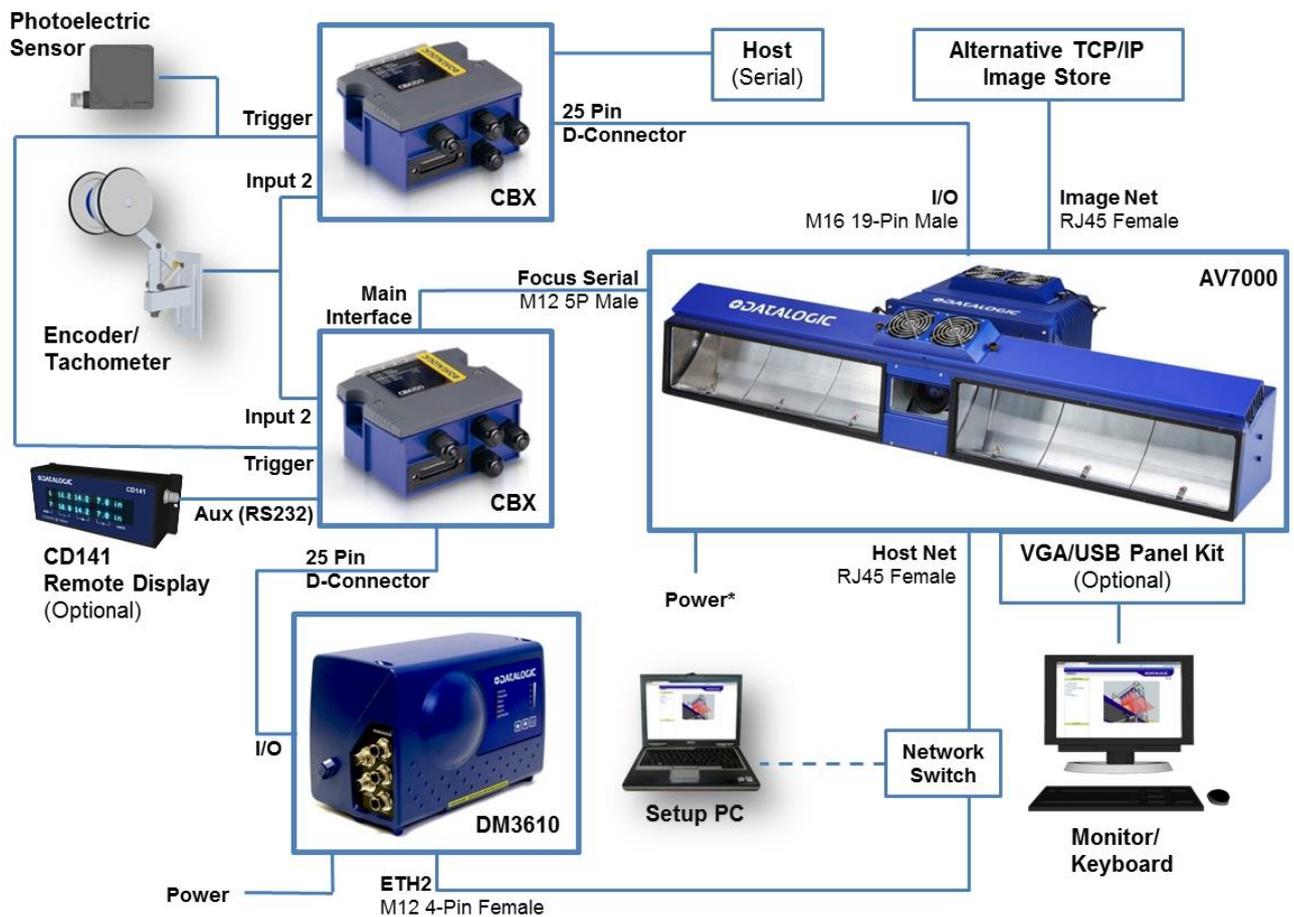


Figure 51: Single AV7000 with DM3610

* See section 3.8.1 for AV7000 power supply connections.

3.3.2 Single Head AV7000 with RangeFinder

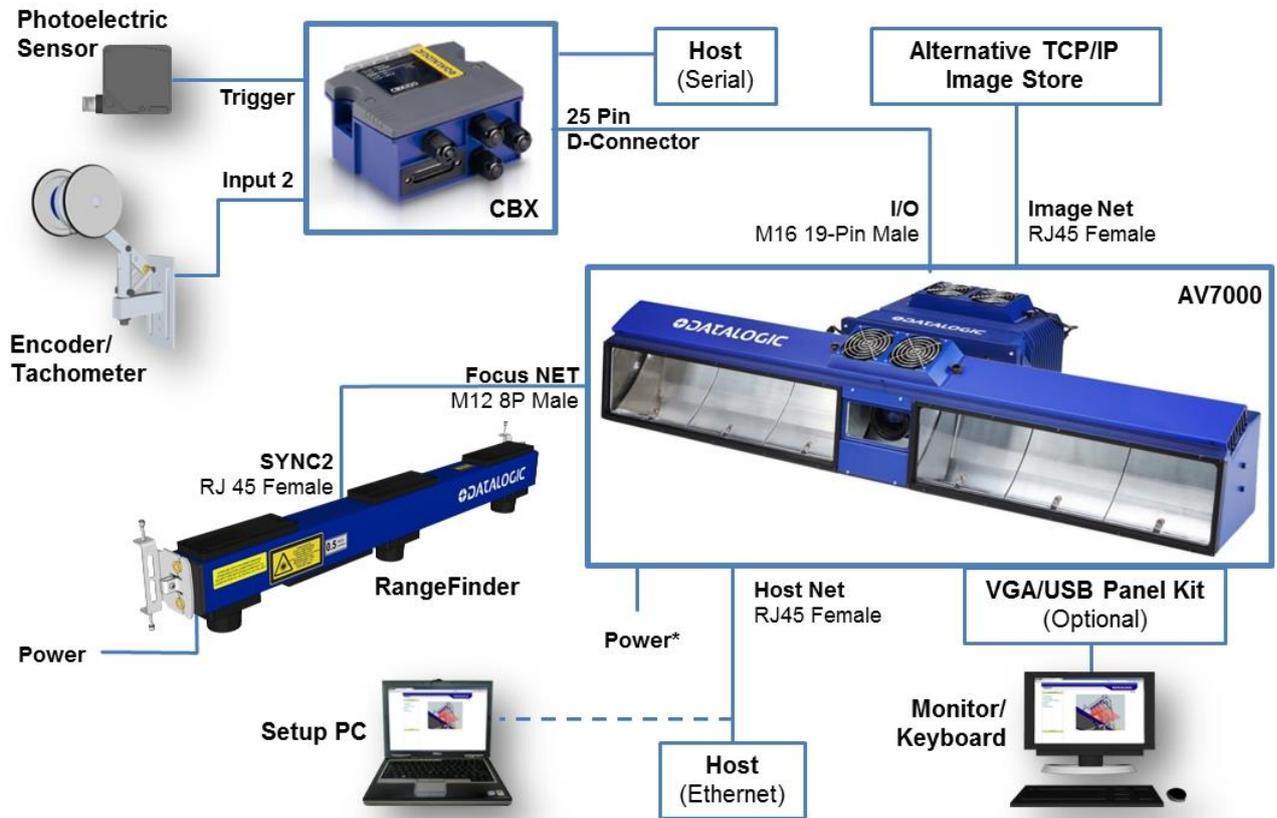


Figure 52: Single AV7000 with RangeFinder

* See section 3.8.1 for AV7000 power supply connections.

3.3.3 Single Head AV7000 with LCC-75xx Light Curtain Kit

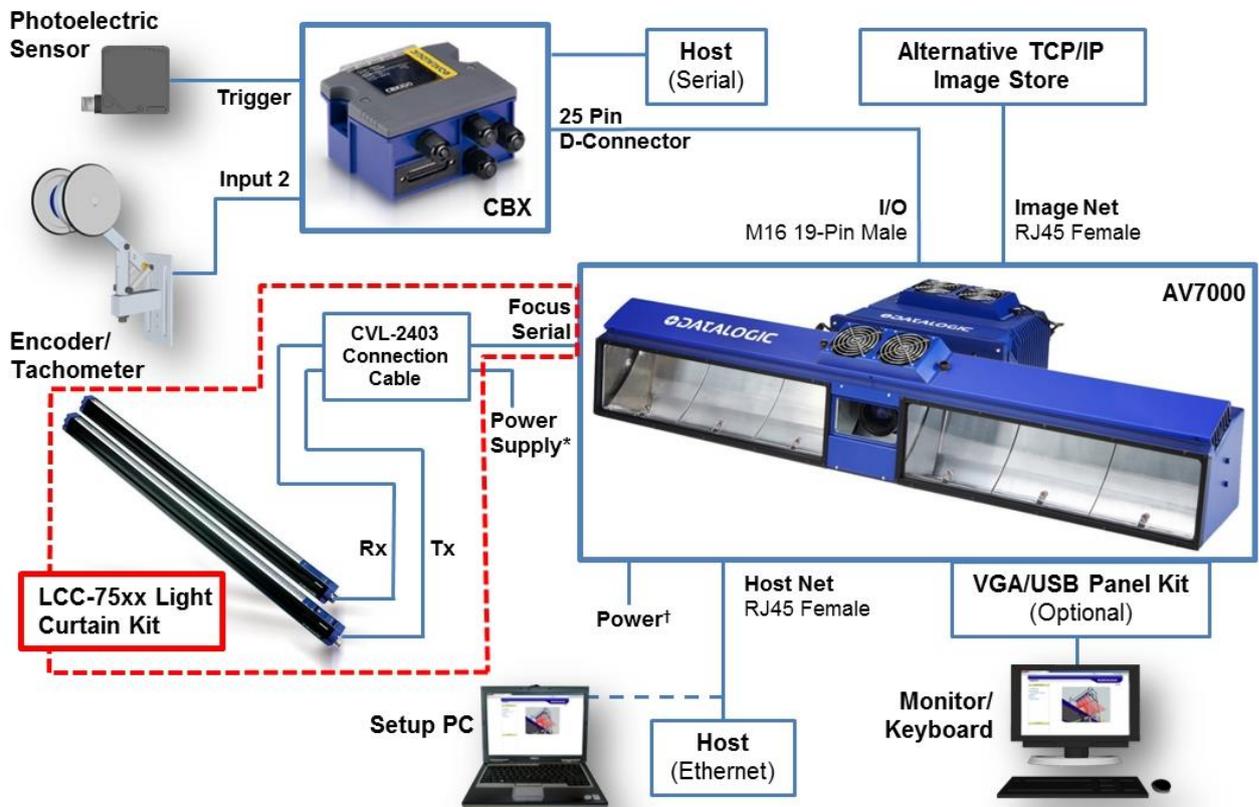


Figure 53: Single AV7000 with LCC-75xx Light Curtain Kit

* See section 5.2.3 for LCC-75xx power supply connections.

† See section 3.8.1 for AV7000 power supply connections.

3.3.4 Master/Slave Array with DM3610

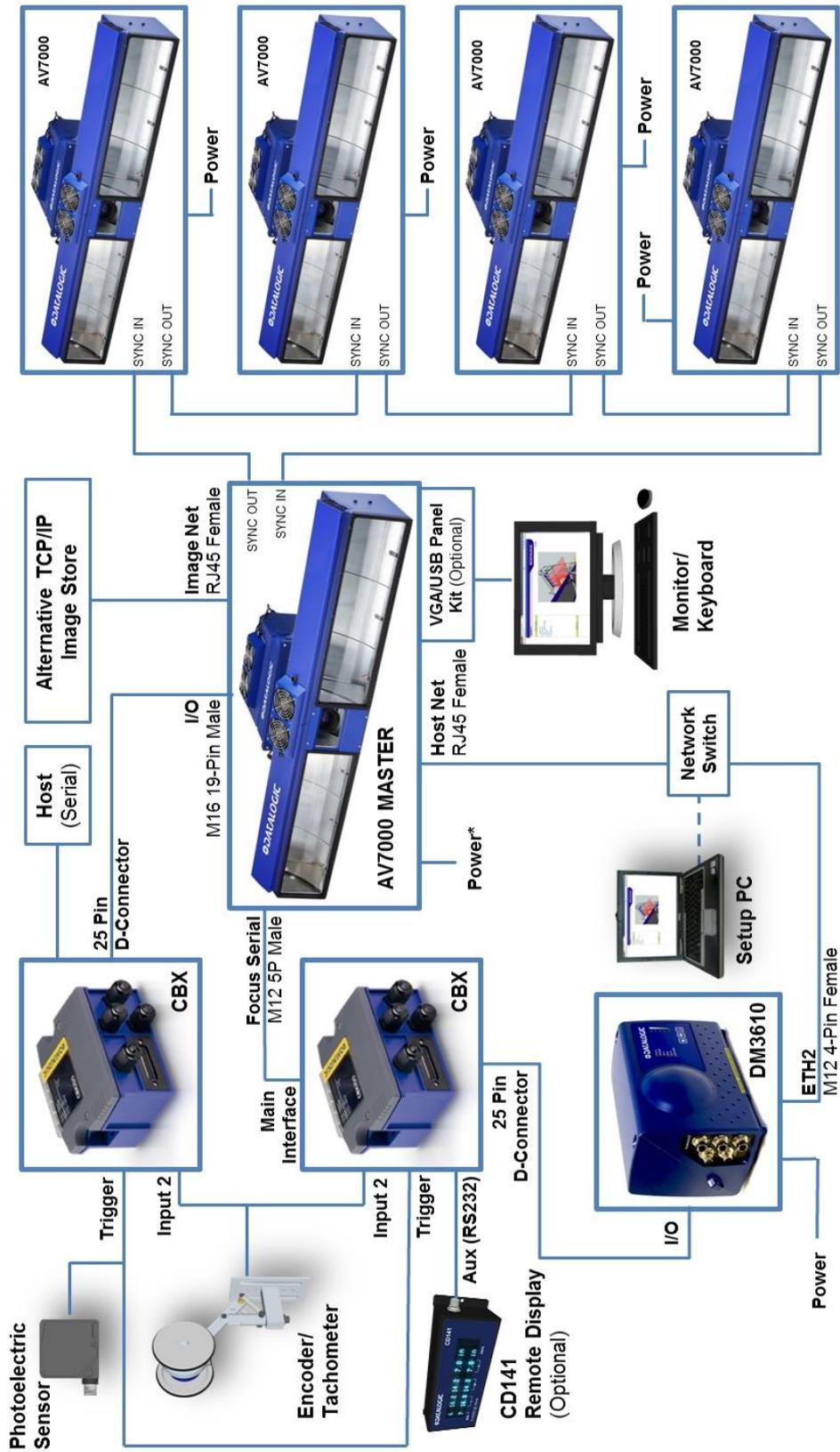


Figure 54: Master/Slave Array (Tunnel) with DM3610

* See section 3.8.1 for AV7000 power supply connections.

3.3.5 Master/Slave Array with RangeFinder

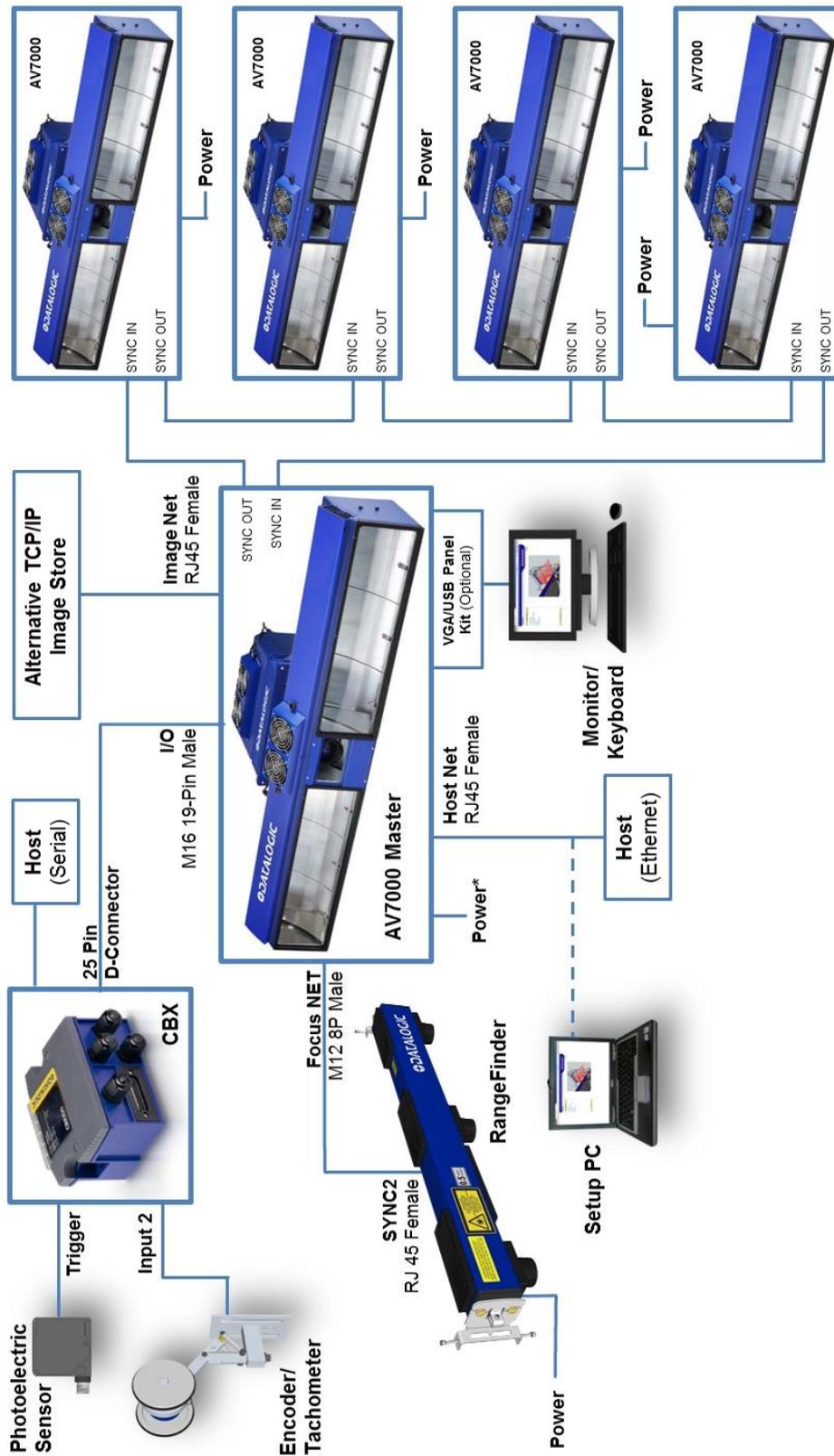


Figure 55: Master/Slave Array (Tunnel) with RangeFinder

* See section 3.8.1 for AV7000 power supply connections.

3.3.6 Master/Slave Array with LCC-75xx Light Curtain Kit

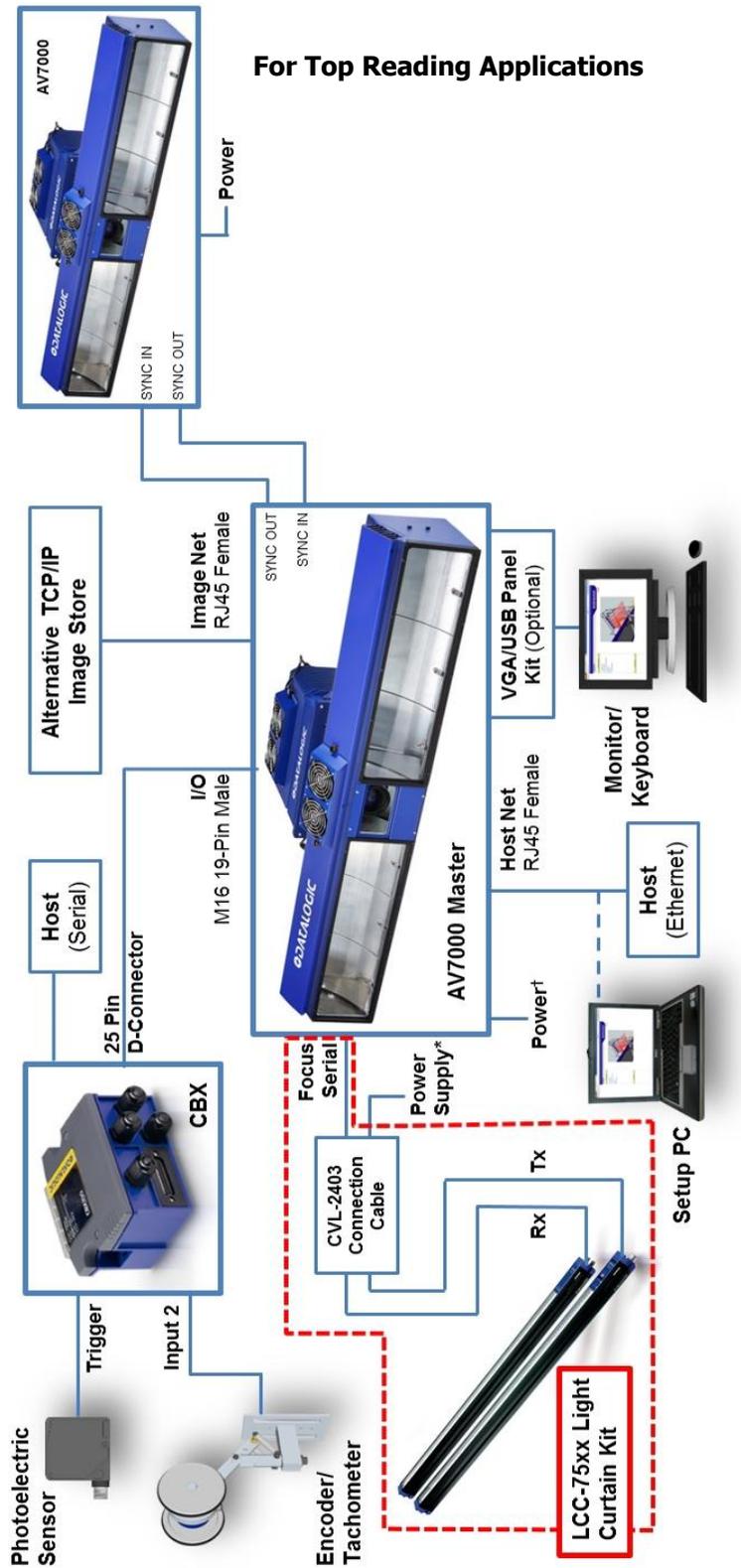


Figure 56: Master/Slave Array (Tunnel) with LCC-75xx Light Curtain Kit

* See section 5.2.3 for LCC-75xx power supply connections.

† See section 3.8.1 for AV7000 power supply connections.

3.4 GENERAL ELECTRICAL INSTALLATION GUIDELINES AND PRECAUTIONS

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 steel conduit and 25 mm [1 in] gap
 - 6.5 mm [0.25 in] of aluminum.



IMPORTANT: 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



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



IMPORTANT: Ground the mounting structure to safety ground (protective earth ground (PE)). See *section 3.12* for wiring recommendations for safety ground.

3.5 AV7000/AI7000 CONNECTOR PANELS

After completing mechanical installation, use this section to properly wire your cameras for optimal performance in your application. AV7000 wiring connections are made to the connector panel and through the CBX connection box (via the I/O port). In most applications, the cable connections to the barcode reader will include:

AI7000 Illumination

13. **POWER IN** – Main DC power connection for AV7000/AI7000 assembly
14. **POWER OUT** – Supplies DC power via cable to POWER connector on AV7000
15. **FANS** – Supplies DC power to AI7000 illumination fan units

AV7000 Camera

16. **FAN** – Supplies DC power to AV7000 fan unit
17. **I/O** – Provides connection to CBX Connection Box
18. **FOCUS SER** – Provides serial focus data to the camera (ex. light curtain)
19. **POWER** – Connector receiving power from AI7000 POWER OUT
20. **USB1** – OPTIONAL USB Keyboard and Mouse connection
21. **VGA** – OPTIONAL Monitor connector
22. **HOST NET** – Configuration and dimensioning data from the DM3610 if used
23. **IMAGE NET** – Configuration, Remote Monitor application, or image export
24. **SYNC IN** – AV7000 internal data, device network
25. **SYNC OUT** – AV7000 internal data, device network
26. **FOCUS NET** – Network focus data (RangeFinder)



Figure 57: AV7000/AI7000 Connector Panels



IMPORTANT: If a connector is not in use, it should always be covered with its protective cap.



Figure 58: Connector protective caps

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.



Figure 59: Wiring Channels

3.6 CONNECTING A PC TO THE AV7000

During initial setup, a PC (laptop) may be connected to the AV7000 with an RJ45 cable. Connect an Ethernet cable from the **HOST NET** or **IMAGE NET** port of the AV7000 to the Ethernet port of your PC. For information on connect to e-Genius, see *Chapter 4*.



NOTE: Parameters for tunnel are set up in the MASTER AV7000 only.

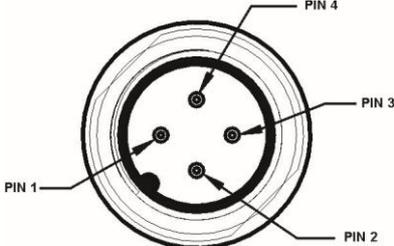


NOTE: IP Address for HOST NET and IMAGE NET are as follows:

- **HOST NET** – 192.168.3.10
- **IMAGE NET** – 10.0.40.20

3.7 POWER CONNECTOR PIN-OUT TABLE

A recommended power supply and cabling is available for the AI7000 Illumination, which then supplies the AV7000 Camera. However, if your installation requires custom power supply wiring, the pin-outs of the AV7000 camera power connector are provided below your convenience.

24V - - - 4A MAX		POWER Input		
		Unit Connector (shown)	Mating cable connector	
		4-PIN M12-TYPE MALE	4-PIN M12-TYPE FEMALE	
MALE 4-PIN M12-TYPE	Pin	Name	Function	
		1	GND	Input Power Ground
		2	+24 VDC	Input Power + 24Vdc
		3	+24 VDC	Input Power + 24Vdc
		4	GND	Input Power Ground



NOTE: When using an AI7000 Illumination and AV7000 Camera, no power supply is required for the CBX connection box. All power and some communication options are fed to the CBX through the AV7000's 19-pin I/O connector to the CBX 25-pin connector using the cable provided.

3.8 POWER CONNECTIONS



IMPORTANT: When planning your installation wiring, remember all power connections must be quick-disconnect.



CAUTION: While performing the following wiring connection procedures, be sure to follow all safety procedures regarding high-voltage as outlined in the Introduction to this manual. No power should be applied to any device until all wiring is completed and checked for accuracy.



IMPORTANT: The socket-outlet must be installed near the barcode reader. The outlet must be a readily accessible disconnect device.



GROUND: Ground the barcode reader to safety ground (protective earth ground (PE)). See *section 3.12* for wiring recommendations for safety ground.

The CBX connection boxes provide flexible connectivity to a range of I/O devices as well as serial hosting. The AV7000 connects to the CBX via its I/O port using a single 19-pin M16 to 25-pin D cable.

3.8.1 Power Supplies and Supply Capacity When Wiring to AI7000s

One **PG-600** is able to power:

- one AI7000 illuminator (including the AV7000 camera which is powered via this unit and one CBX510 with all the standard sensors)

The power supply unit is connected to the camera illuminator according to the following diagram (power supply side):

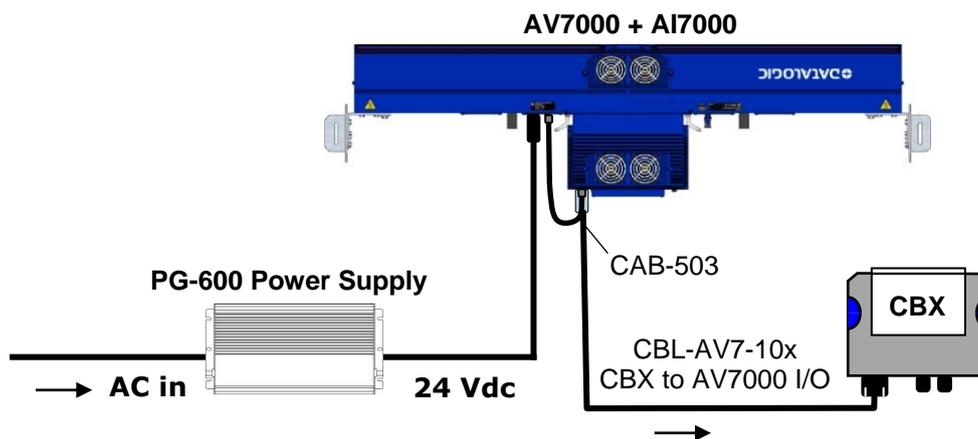


Figure 60 - Connecting PG-600 to AI7000 Illuminator



NOTE: If the PG-600 is mounted further than 1 M [3 ft] from the AV7000/AI7000, use the CVL-2389 power extension cable include in the illuminator package.

The CBX510 connection box receives power through the CBL-AV7-10x from the AV7000 IO connector.

One **PWR-480B** is able to power:

- one AI7000 illuminator (including the AV7000 camera which is powered via this unit and one CBX510 with all the standard sensors)

The power supply unit is connected to the camera illuminator according to the following diagram (power supply side):

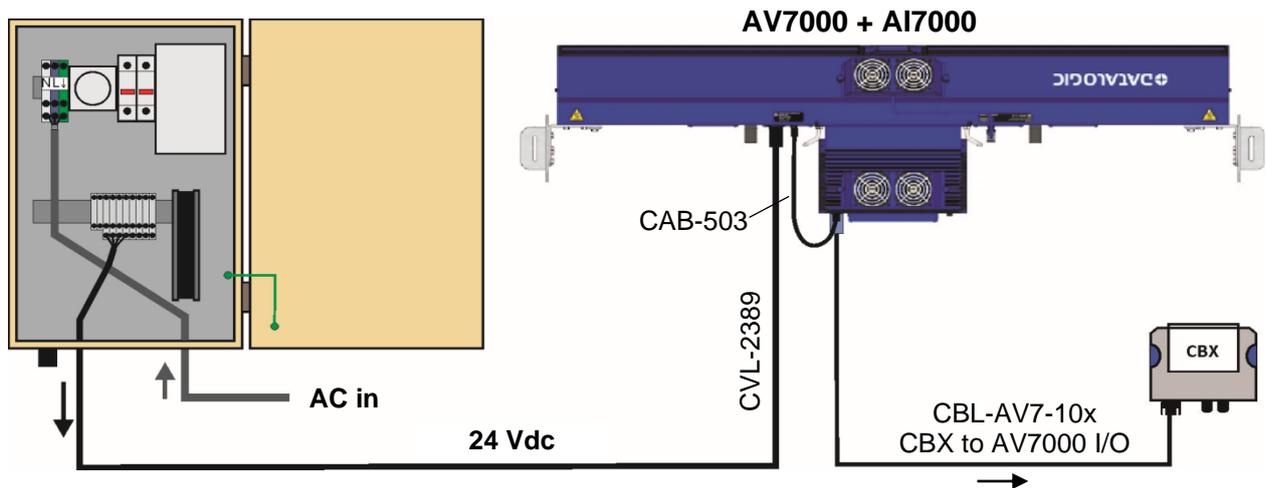


Figure 61 - Connecting PWR-480B to AI7000 Illuminator



NOTE: The AI7000 series illuminators are supplied with a CVL-2389 extension power cable. Use this cable to connect the PWR-480B power supply by cutting off the cable's male Amphenol connector and connecting the wires to the PWR-480B according to the table below:

CVL-2389 Wire Color or Number (Depending on Source)		Function
White	1	GND
Green	2	+ 24 Vdc
Red	3	+ 24 Vdc
Black	4	GND

The CBX510 connection box receives power through the CBL-AV7-10x from the AV7000 IO connector.

3.9 WIRING INTO THE CBX CONNECTION BOX



WARNING: DO NOT connect a separate power source to the CBX connection box. The CBX receives its power through its connection to the AV7000. Connecting a separate power source will be detrimental to the system operation.

As shown below, loose-lead cables must pass through the water-tight seals in the base of the CBX connection box (CBX100 shown). Insert the cables allowing enough slack for the individual wires to reach the appropriate pin block connectors. Securely tighten the water-tight seals after the cables have been inserted.

Insulation on individual wires should be removed to expose 13 mm [0.5 in] of bare metal before inserting into the pin block.

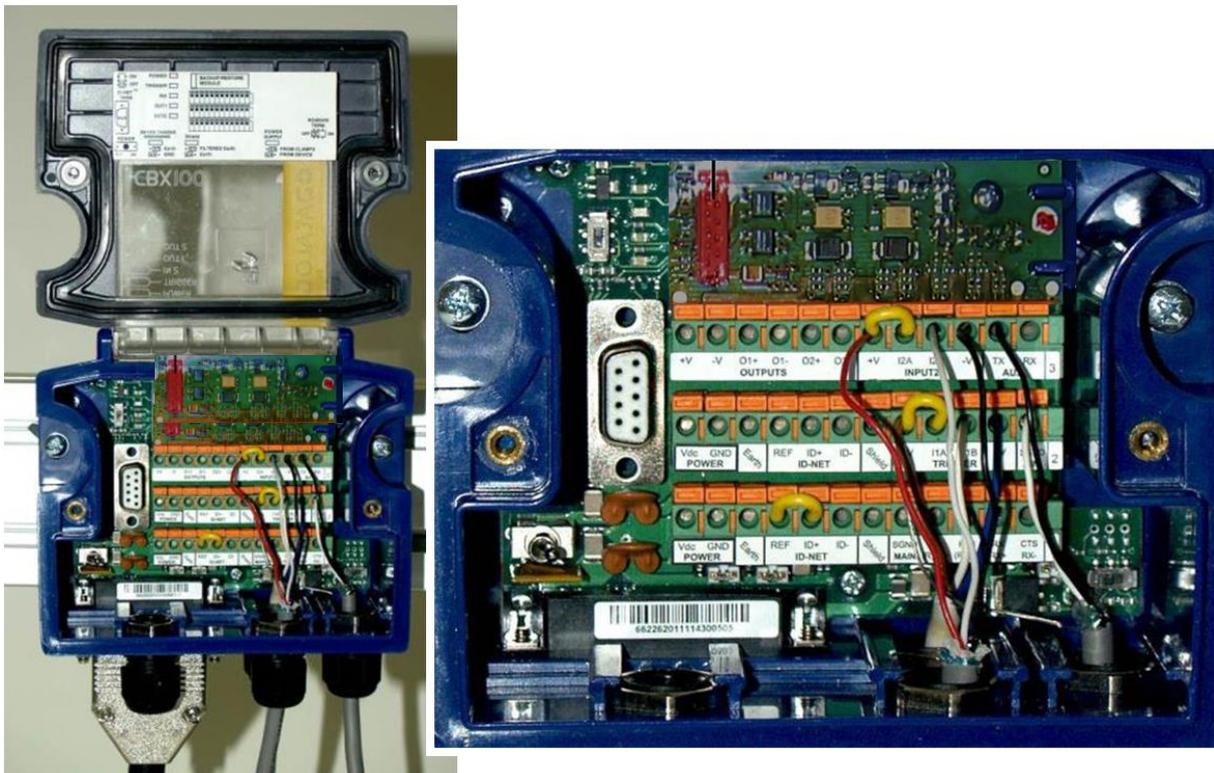


Figure 62: Securing wires with water-tight seals



IMPORTANT: 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.

3.9.1 Selecting the Correct CBX Connection Box for Your Application

As shown in *section 3.3*, 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/CBX500** - 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.

DEVICE	OPTIONS						
	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 D+)
CBX500	X	X	X	X	X	X	w/ jumper (Ref to D+)
CBX510	X	X	X	X	X		X
CBX800	X	X	X	X	X	X	w/ jumper (Ref to D+)



IMPORTANT: Although multiple AV7000 cameras can have a CBX box, only one of the CBX boxes in the system can have the Jumper to make it the Master.

3.10 CBX100/CBX500/CBX800 CONNECTION BOX INITIAL CONFIGURATION

Complete installation information on these connection boxes is available in the *CBX100*, *CBX500*, and *CBX800 Installation Manuals* available at www.datalogic.com.

CBX100

Please verify that the CBX100 connection box is configured for the AV7000 application as follows:

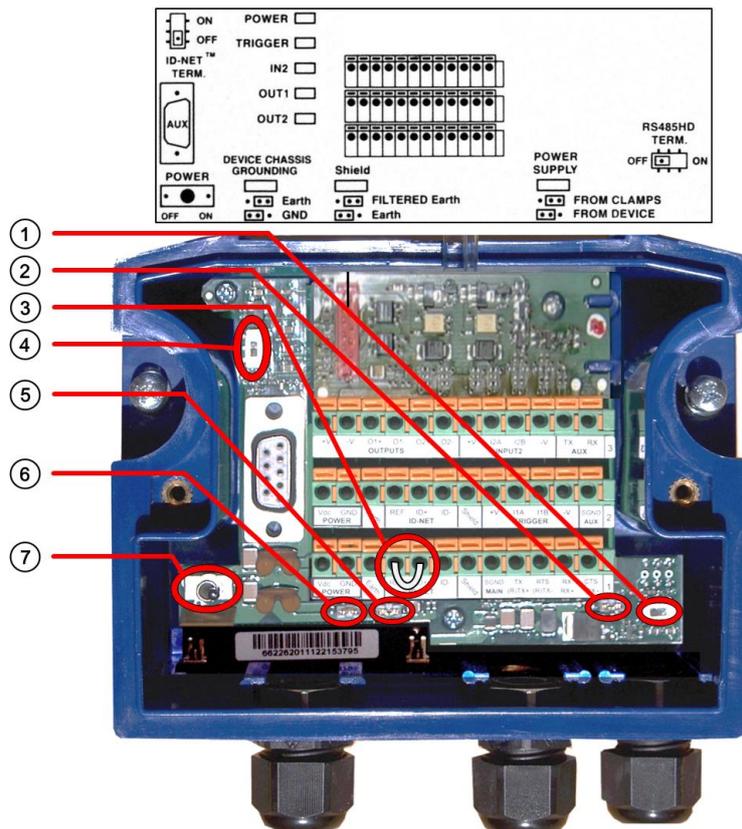


Figure 63: CBX100 Initial Setup

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 AV7000 to initialize properly, it must be connected to a CBX100. On power-up the AV7000 looks for the jumper (item number 3 in the image above) and will assume the responsibility of providing the SYNC Network IP addresses. Slave units in an array/tunnel will receive their SYNC Network IP addresses from the Master.



IMPORTANT: Although multiple AV7000 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.

CBX500

Please verify that the CBX500 connection box is configured for the AV7000 application as follows:

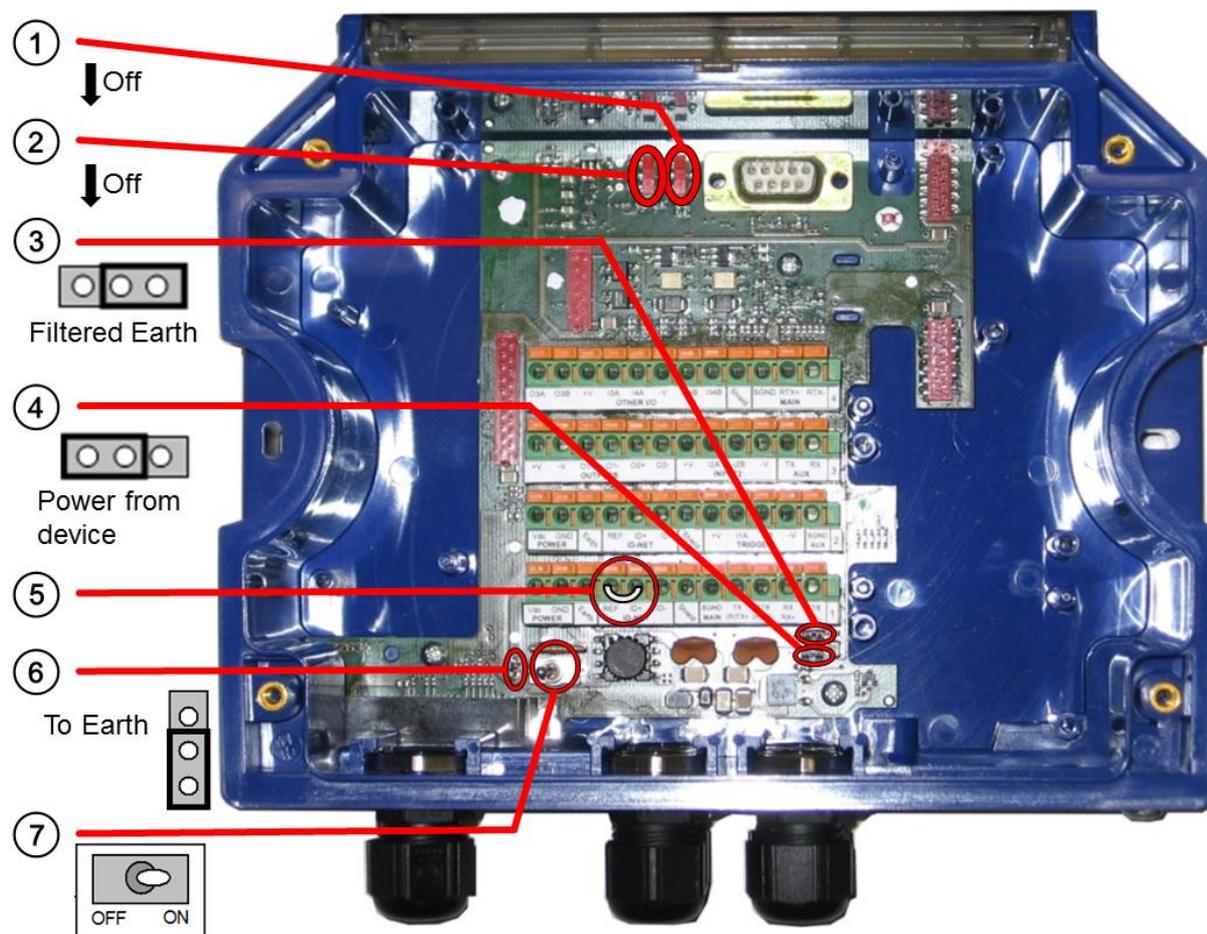


Figure 64: CBX500 Initial Setup

1. Set ID-NET TERM switch to OFF.
2. Set RS422HD TERM switch to OFF.
3. Set Shield jumper to FILTERED Earth.
4. Set Power Source Selector jumper to FROM DEVICE.
5. Insert jumper wire in pin block from REF to ID+ (one jumper in either block is sufficient).
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 AV7000 application as follows:

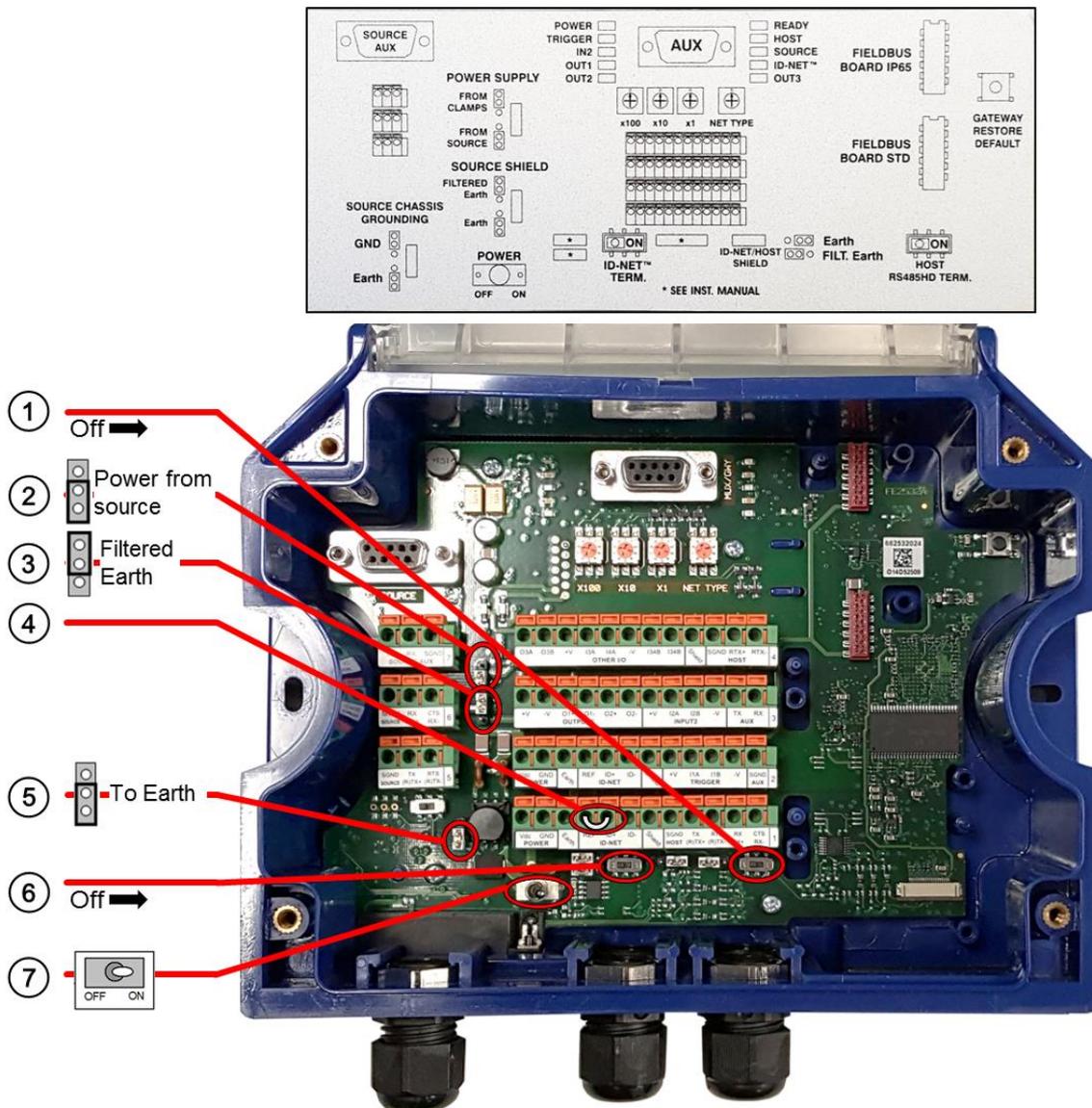


Figure 65: CBX800 Initial Setup

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 ID-NET TERM switch to OFF.
7. Set POWER switch to ON.



NOTE: Refer to the CBX800 Host Mode Programming Manual for programming instructions.

3.10.1 Photoelectric Sensor Connections to CBX100/CBX500/CBX800

A photoelectric sensor can be used as a trigger (phase) for an AV7000 system. The photoelectric sensor is wired directly into the CBX100/CBX500/CBX800.

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



IMPORTANT: You must use shielded interface cables with this product.



NOTE: To confirm the photoelectric sensor is functioning properly, watch the TRIG LED while the photoelectric sensor's beam is blocked. The Datalogic photoelectric sensor also includes a status LED.

Photoelectric Sensor (NPN Output)

The following diagram illustrates standard/recommended wiring of the Photoelectric Sensor in an AV7000 application.

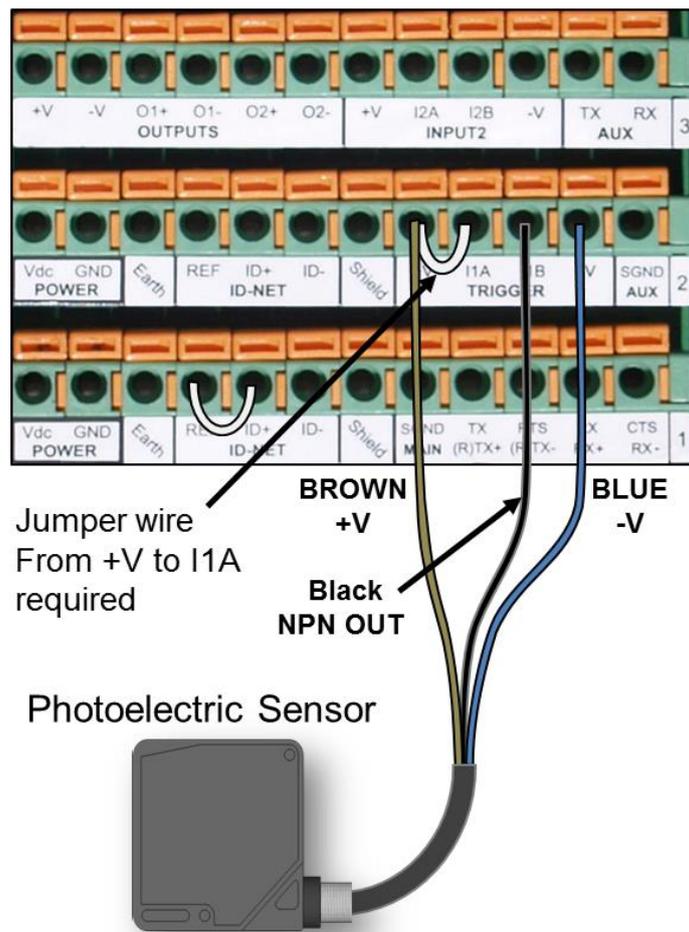


Figure 66: Photoelectric Sensor Wiring (NPN Output)

Photoelectric Sensor (PNP Output)

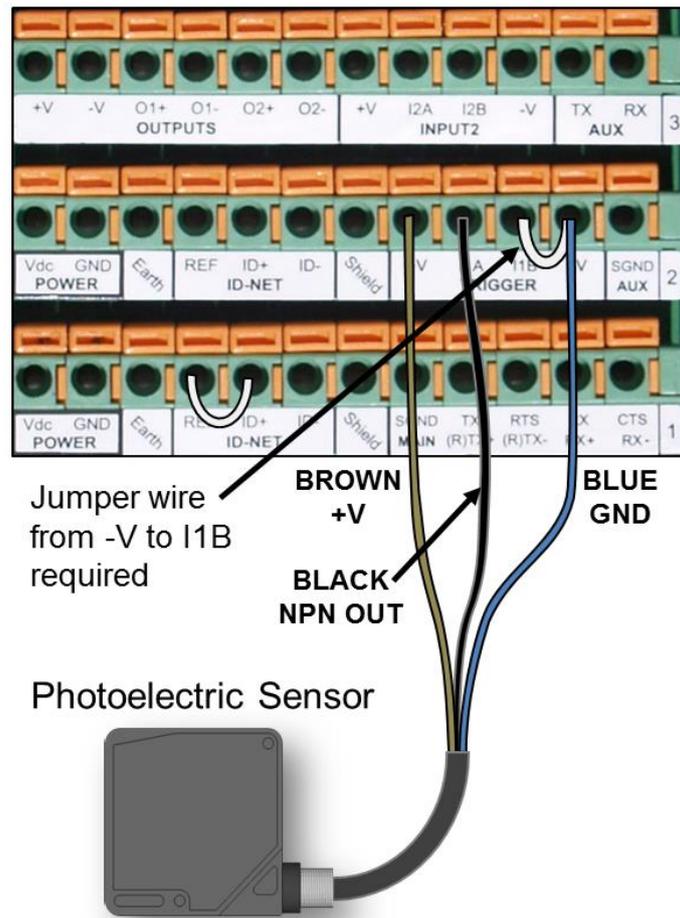


Figure 67: Photoelectric Sensor Wiring (PNP Output)

3.10.2 AS1 Area Sensor Connections to CBX100/CBX500/CBX800

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

AS1 Area Sensor (PNP Output)

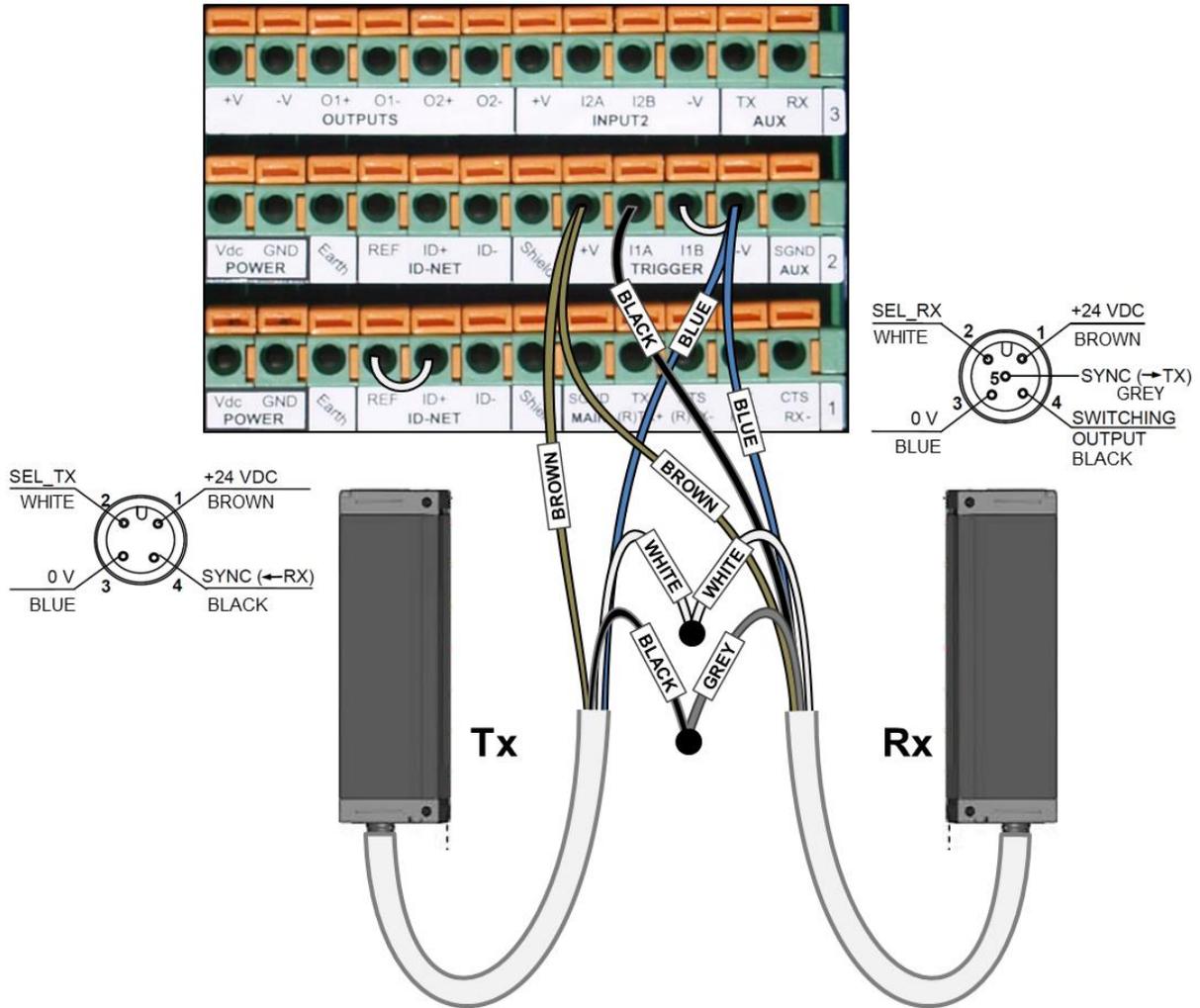


Figure 68: AS1 Area Sensor Connections (PNP Output)

3.10.3 Encoder/Tachometer Connections to CBX100/CBX500

AV7000 applications over a conveyor belt use an accessory tachometer and mounting kit. Use the cable provided with the tachometer to connect to the CBX100/CBX500 pin block as shown below.

Encoder/Tachometer Wiring for NPN Output

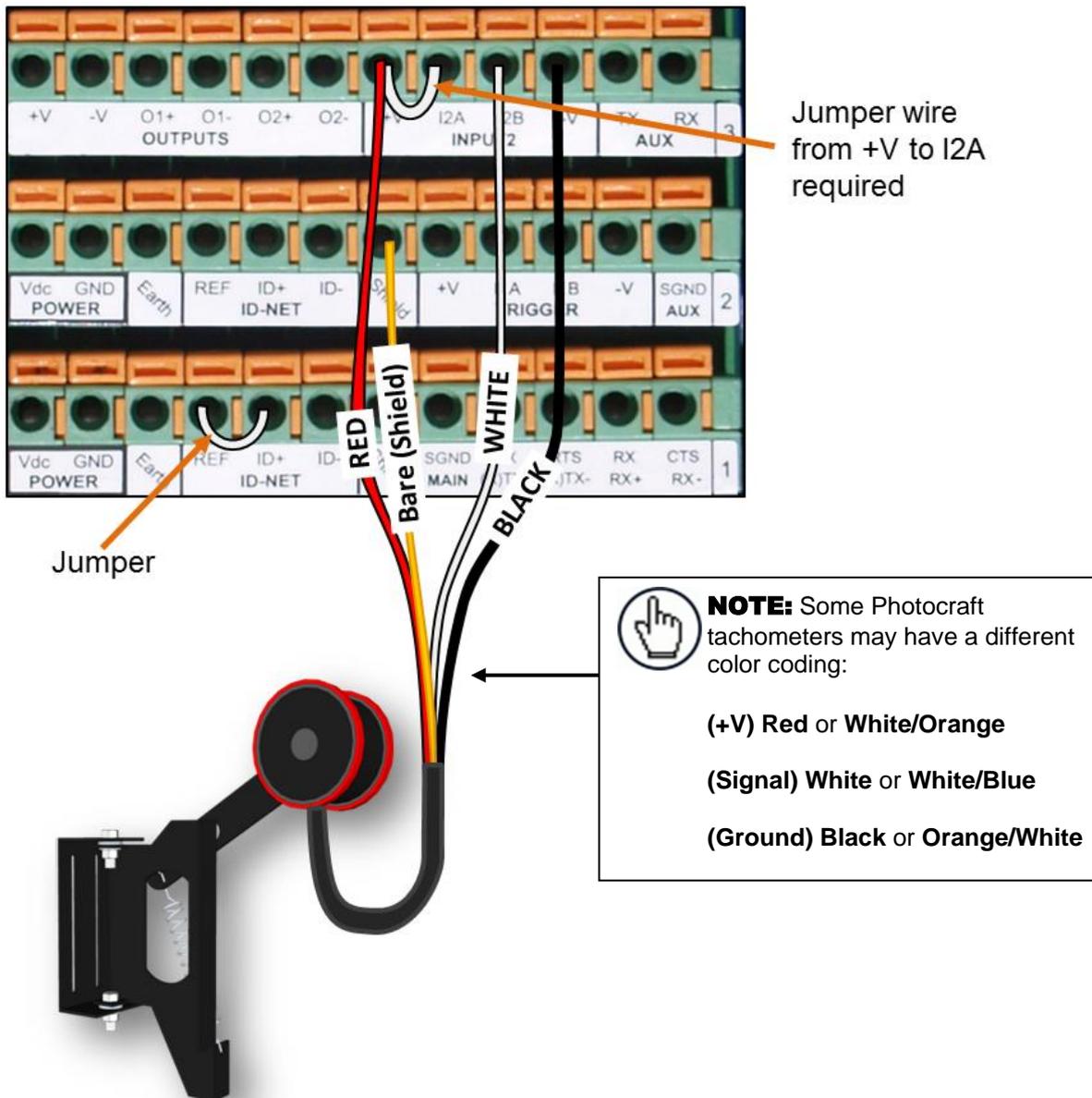


Figure 69: OEK-2 Encoder/Tachometer Wiring (NPN Output)

Encoder/Tachometer Wiring (PNP Output)

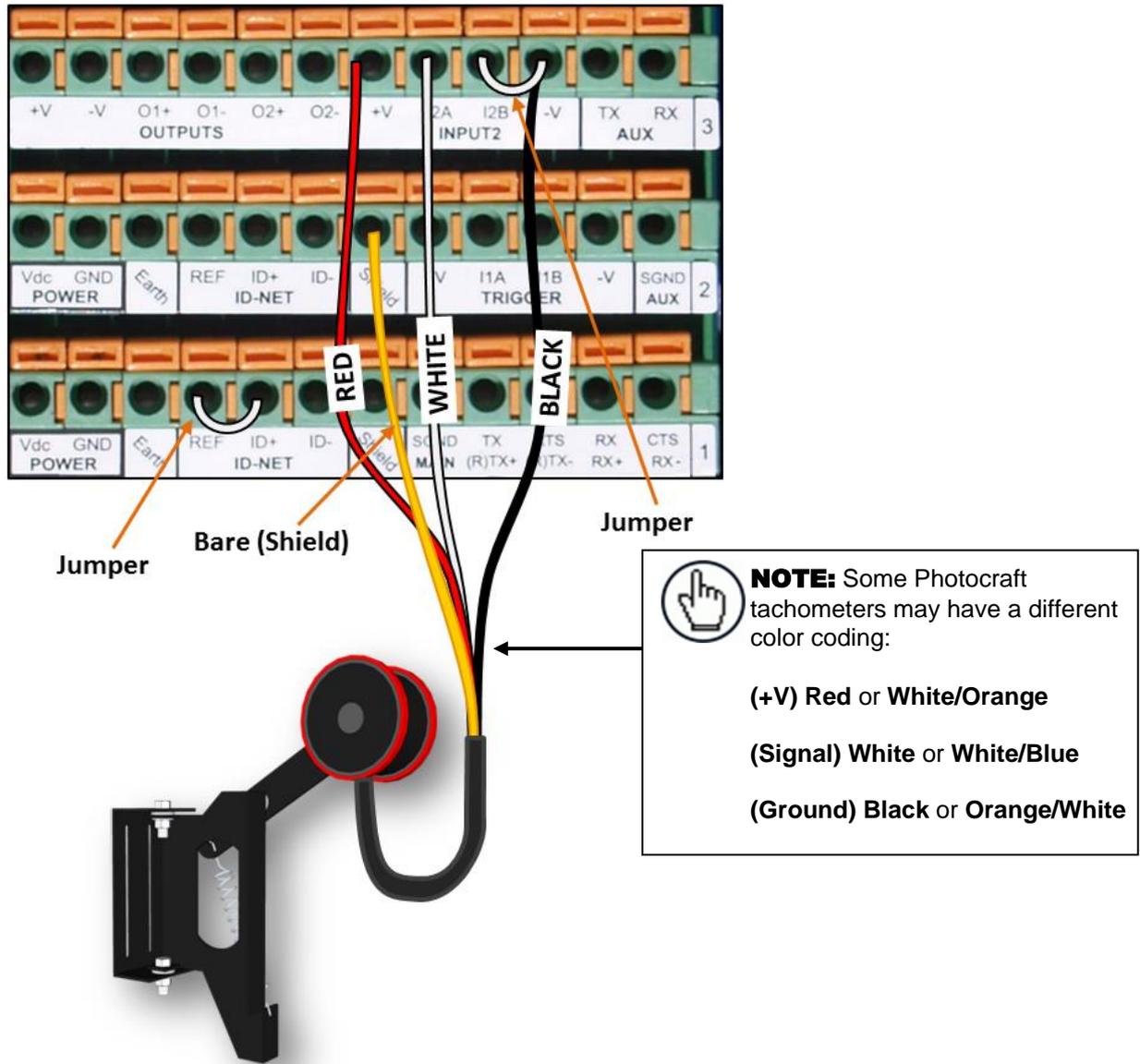


Figure 70: OEK-2 Encoder/Tachometer Wiring (PNP Output)

3.10.4 Wiring from DM3610 CBX100 to AV7000 FOCUS SER

When using a DM3610 dimensioner for focusing, the DM3610's CBX box must be wired to the focus serial (FOCUS SER) port of the master AV7000 using a flying lead to M12 cable (FOCUS CONTROL 5MT CABLE (M12-FREE WIRES) 93A201203.)

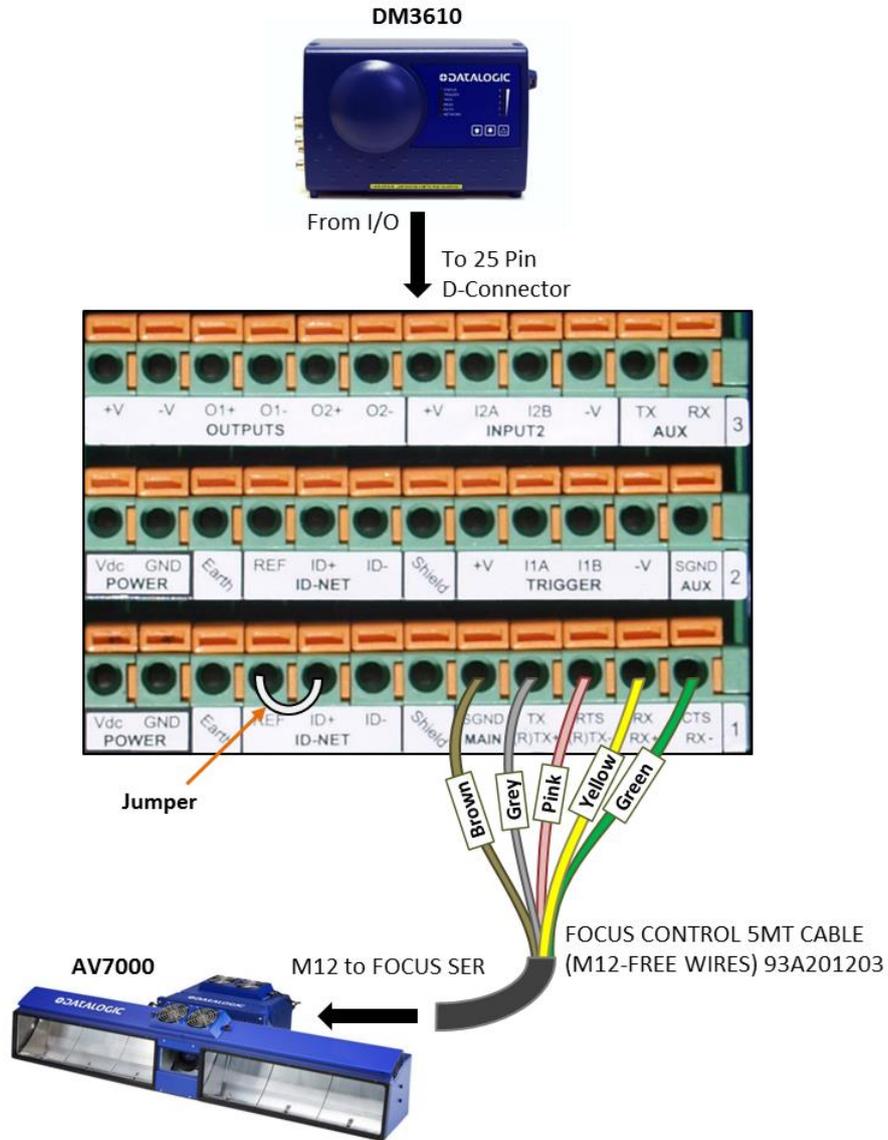


Figure 71: DM3610 CBX100 to AV7000 FOCUS SER

3.10.5 Serial Communication Wiring to CBX100/CBX500

The AV7000 provides serial RS232/422 communications to other devices through the CBX100.

- 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.

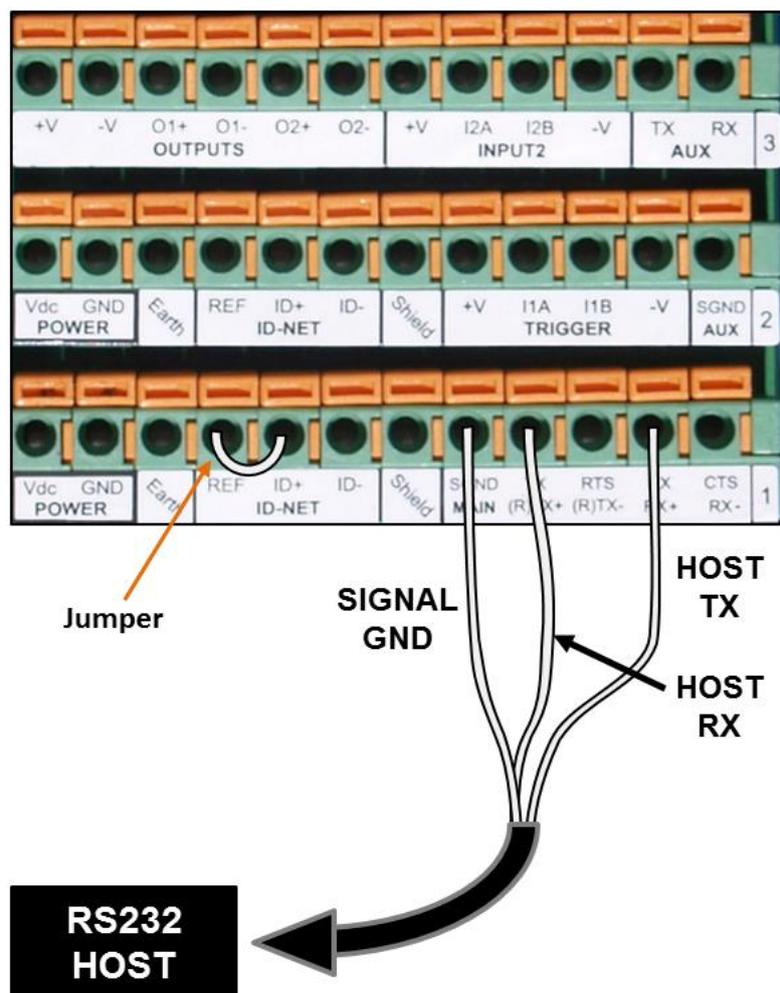


Figure 72: RS232 HOST (No Handshaking)

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.

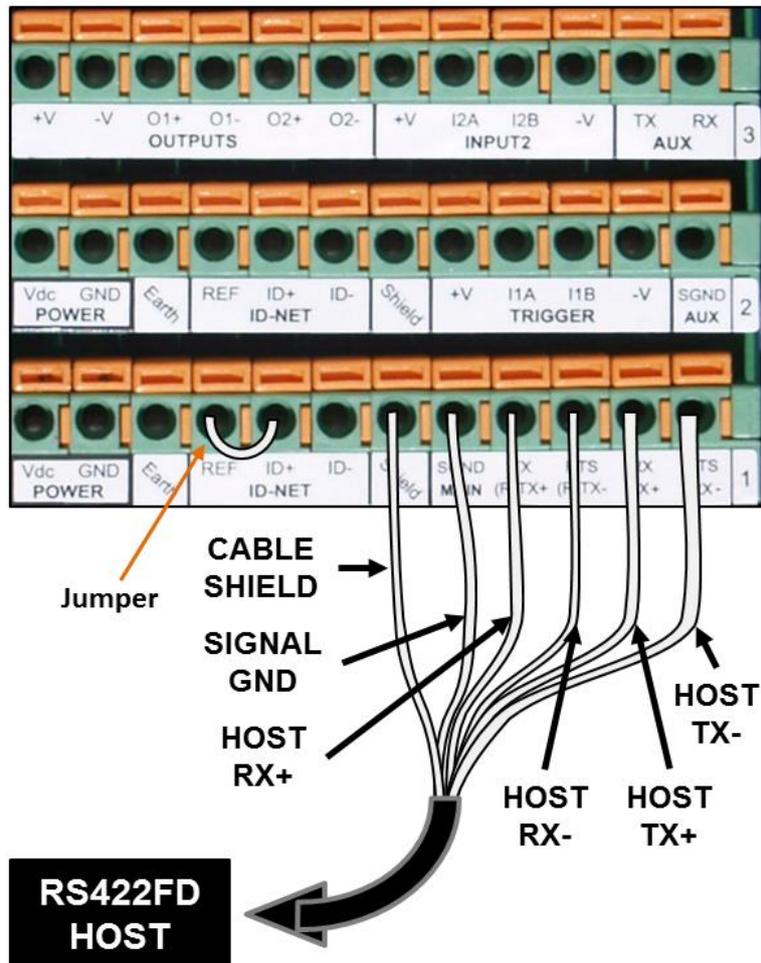


Figure 73: RS422FD HOST (Full Duplex)

3.10.6 Relay Configuration from CBX100/CBX500

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 30 V

Collector Current (pulse) 130 mA Max.

Collector Current (continuous) 40 mA Max.

Saturation Voltage (VCE) 1 V at 10 mA Max.

Maximum Power Dissipation 90 mW at 50°C
(Ambient temperature)

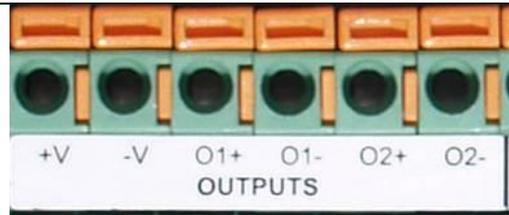


Figure 74: OUTPUTS Block

Unpowered Outputs

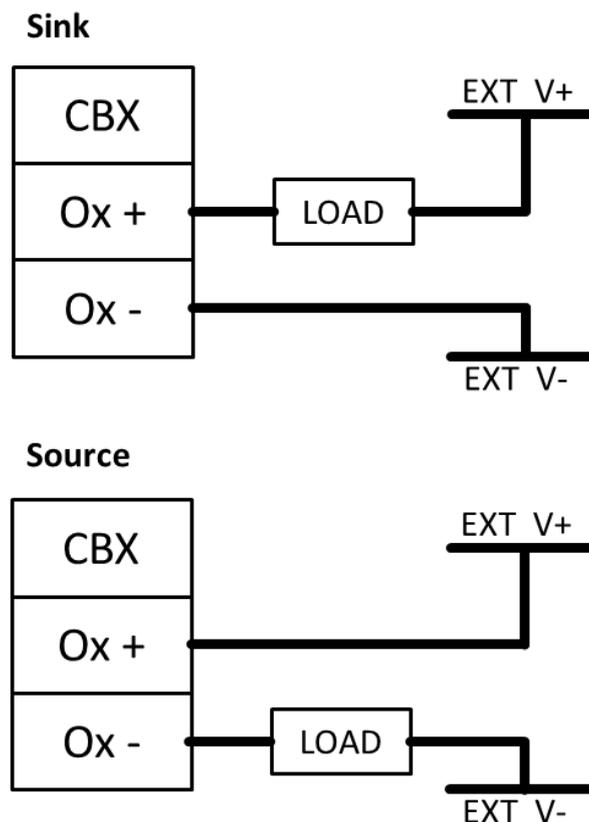


Figure 75: Unpowered Output Connections

Powered Outputs

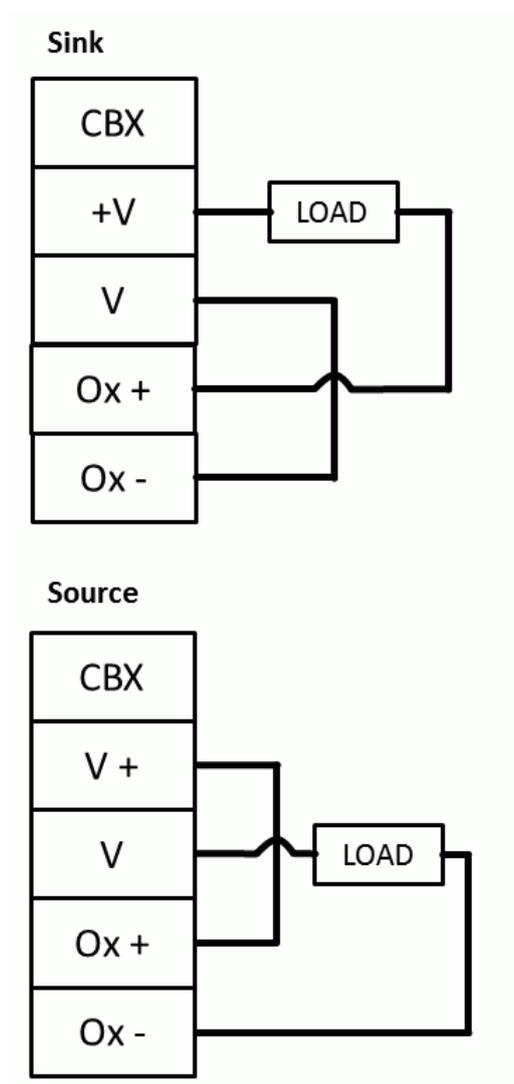


Figure 76: Powered Output Connections

3.11 CBX510 CONNECTION BOX

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

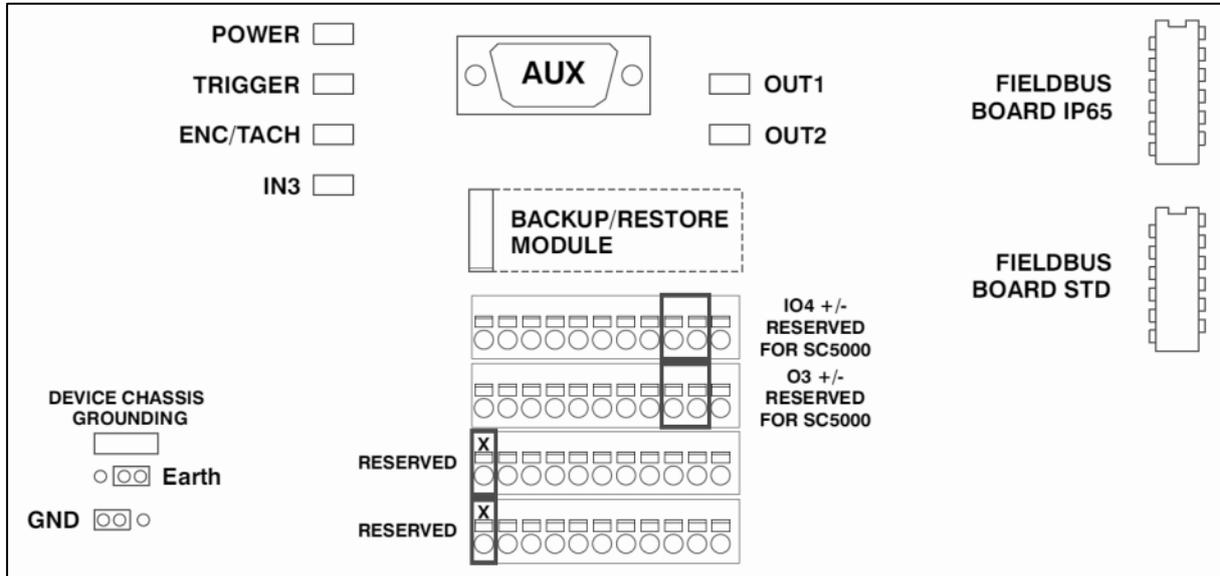


Figure 77: CBX510 Interior



IMPORTANT: 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.

3.11.1 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.



IMPORTANT: 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 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)

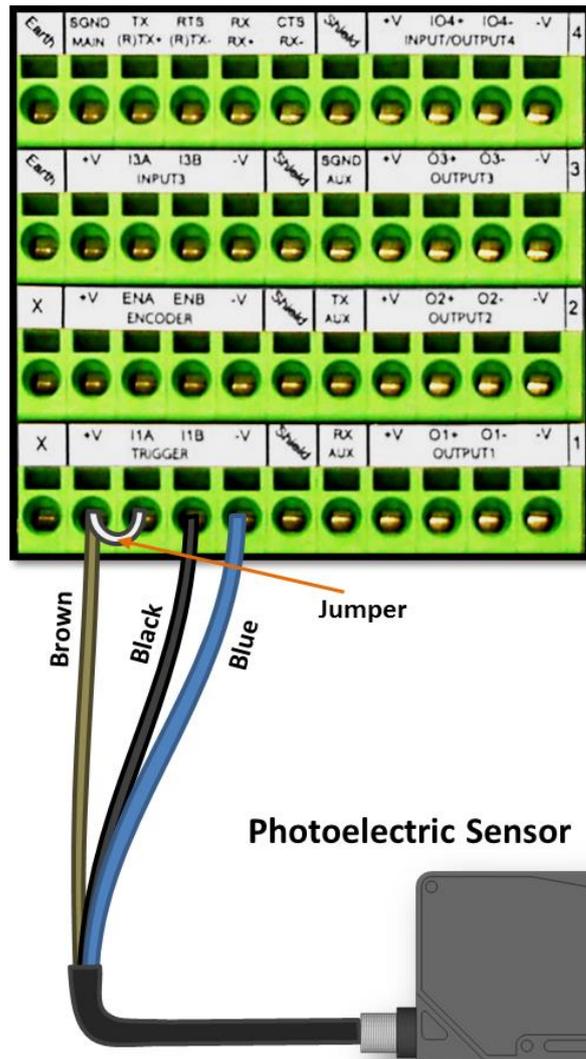


Figure 78: Photoelectric Sensor Wiring (NPN Output)

Photoelectric Sensor to CBX510 (PNP)

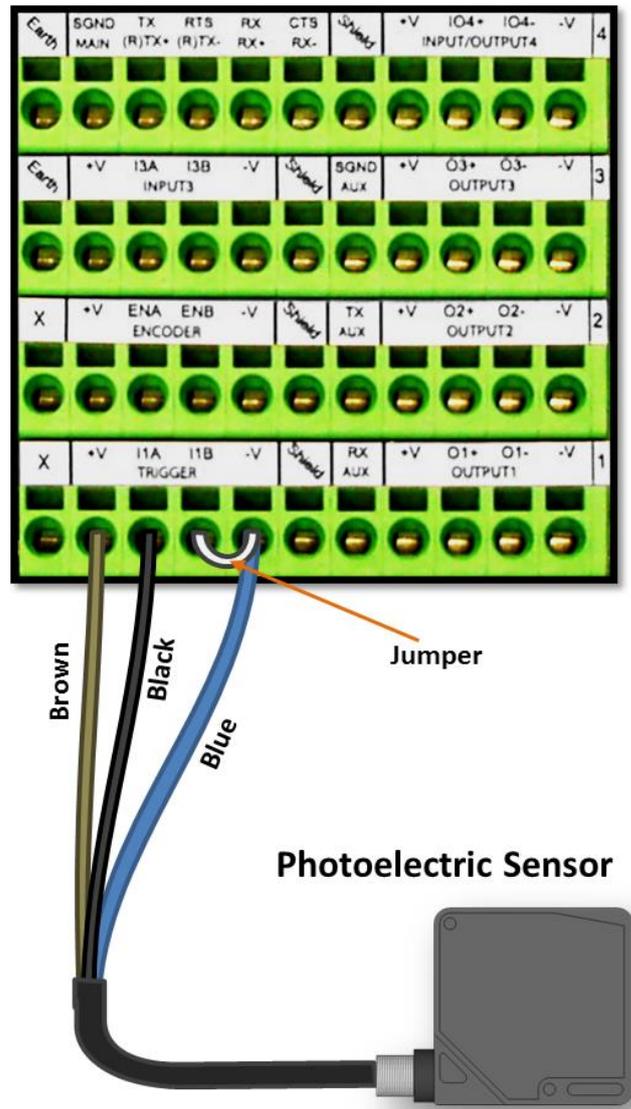


Figure 79: Photoelectric Sensor Wiring (PNP Output)

3.11.2 AS1 Area Sensor to CBX510 Connections

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

AS1 Area Sensor (PNP Output)

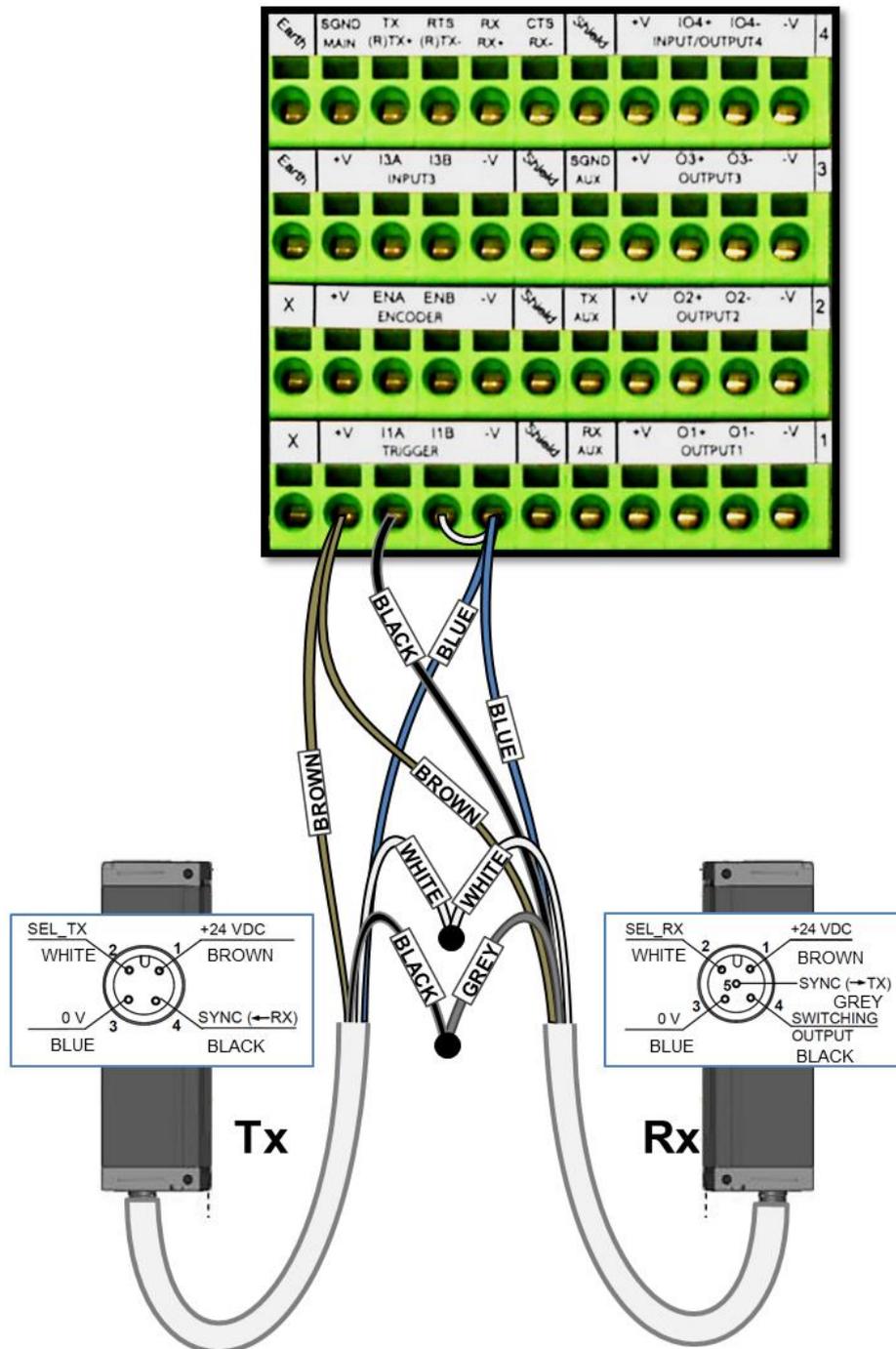


Figure 80: AS1 Area Sensor Wiring (PNP Output)

3.11.3 Encoder/Tachometer Wiring to CBX510

Encoder/Tachometer Wiring for NPN Output to CBX510

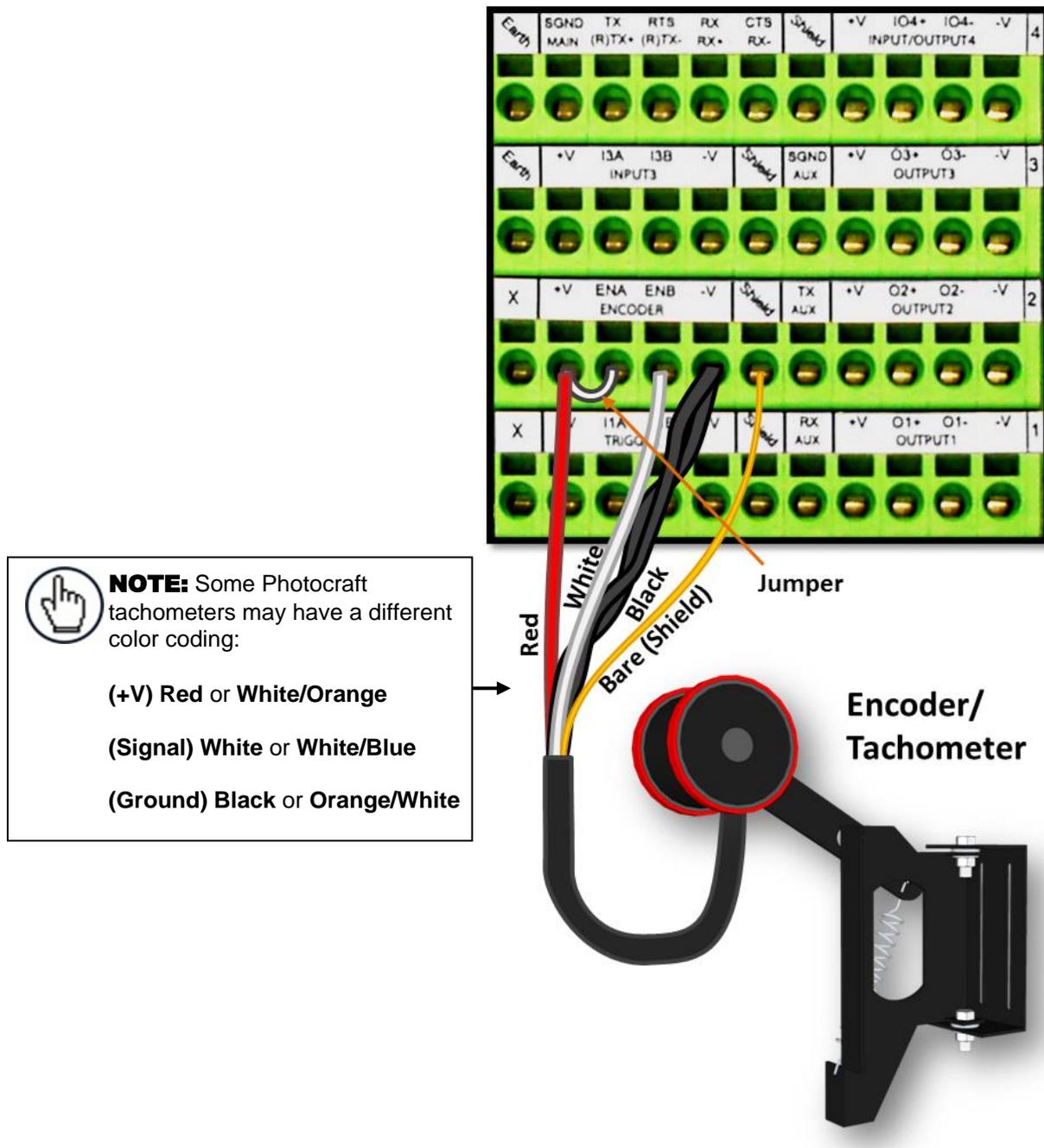


Figure 81: OEK-2 Encoder/Tachometer Wiring (NPN Output)

Encoder/Tachometer Wiring for PNP Output to CBX510

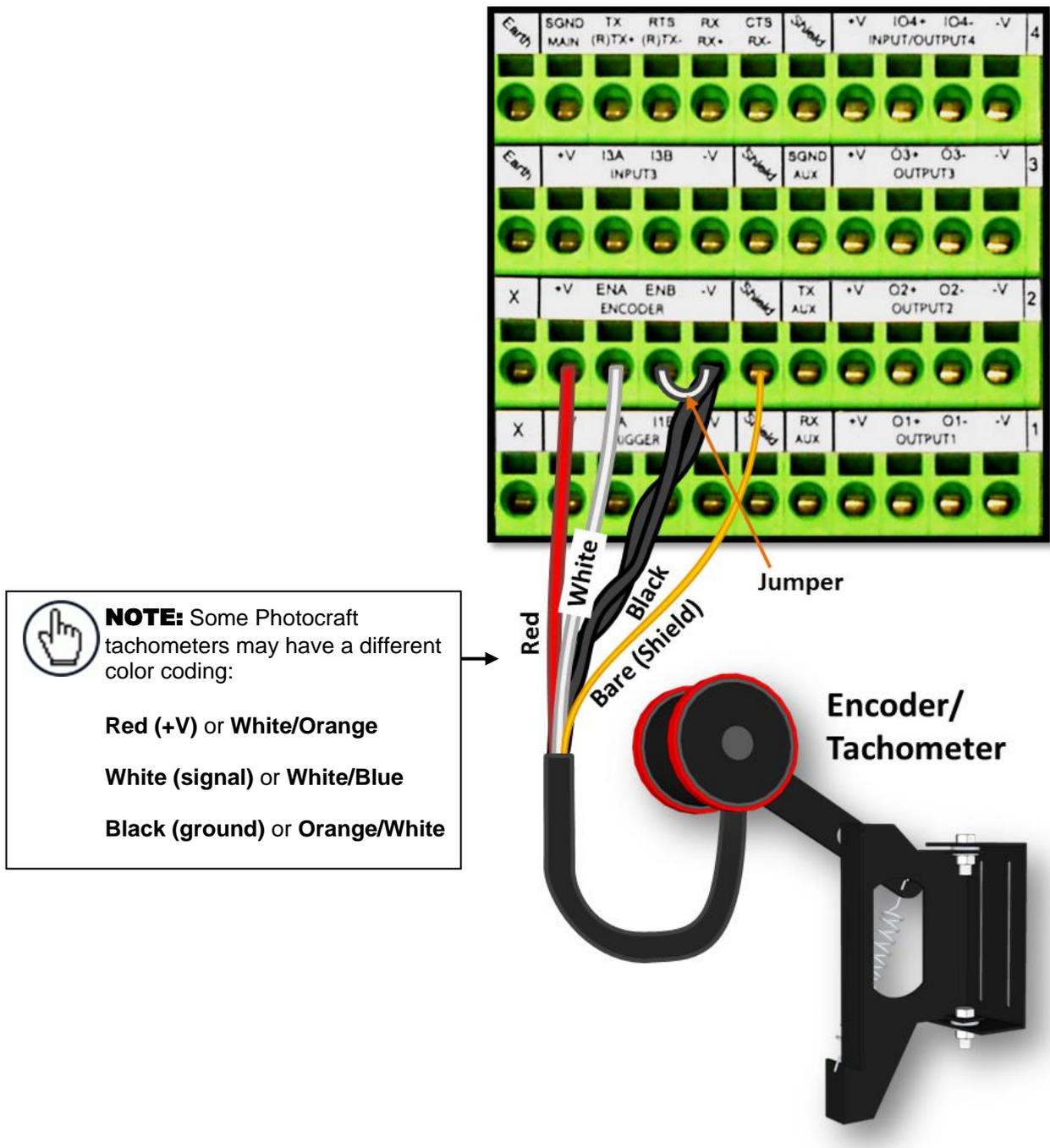


Figure 82: OEK-2 (93ACC1770) Encoder/Tachometer Wiring (PNP Output)

3.11.4 Wiring from DM3610 CBX510 to AV7000 FOCUS SER

When using a DM3610 dimensioner for focusing, the DM3610's CBX box must be wired to the focus serial (FOCUS SER) port of the master AV7000 using a flying lead to M12 cable (FOCUS CONTROL 5MT CABLE (M12-FREE WIRES) 93A201203.)

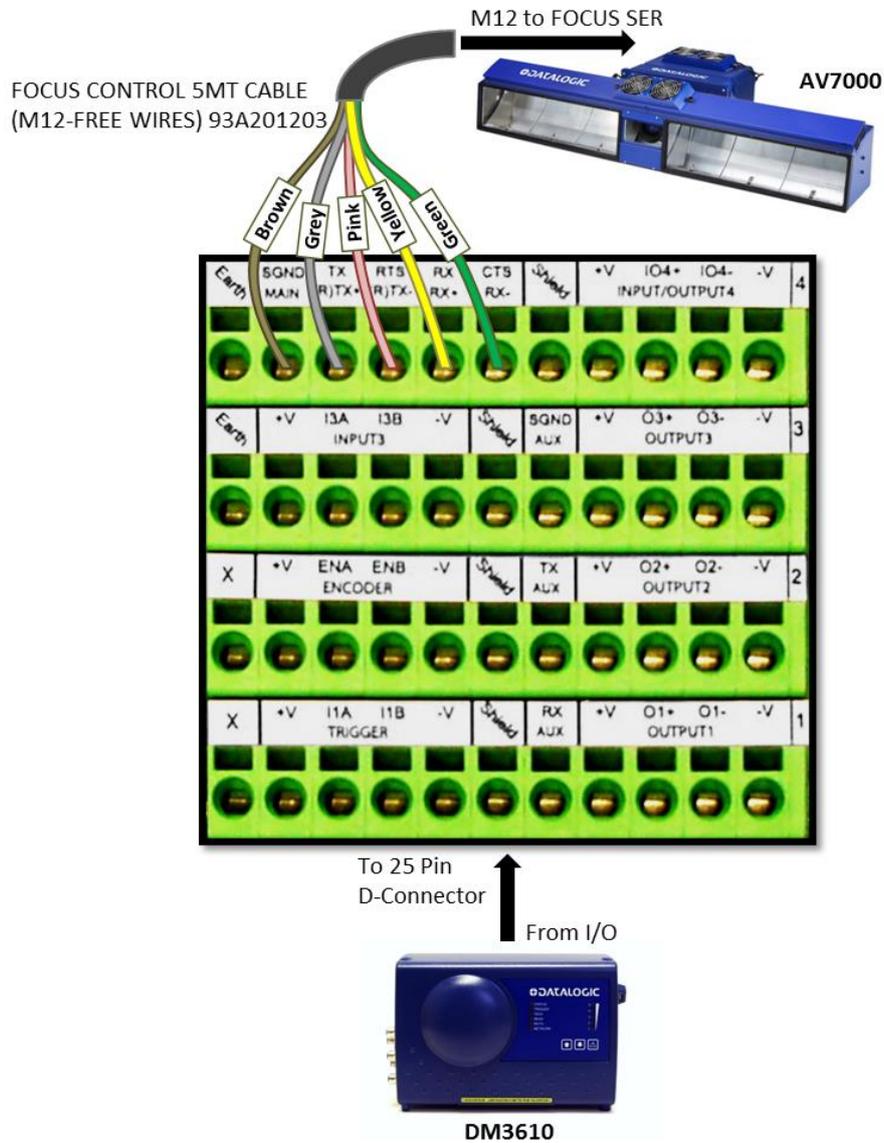


Figure 83: DM3610 CBX510 to AV7000 FOCUS SER

3.11.5 Digital Output Configuration from CBX510

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

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

Outputs 1 - 3

Maximum Voltage 30 Vdc

Collector Current (pulse) 130 mA Max.

Collector Current (continuous) 40 mA Max.

Saturation Voltage (VCE) 1 V at 10 mA Max.

Maximum Power Dissipation 90 mW at 50°C
(Ambient temperature)

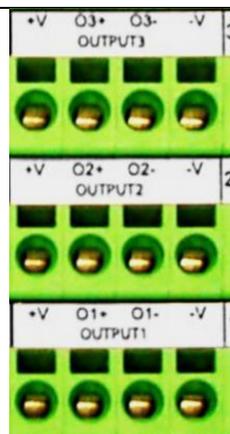


Figure 84: OUTPUTS Block

3.11.6 Unpowered Outputs

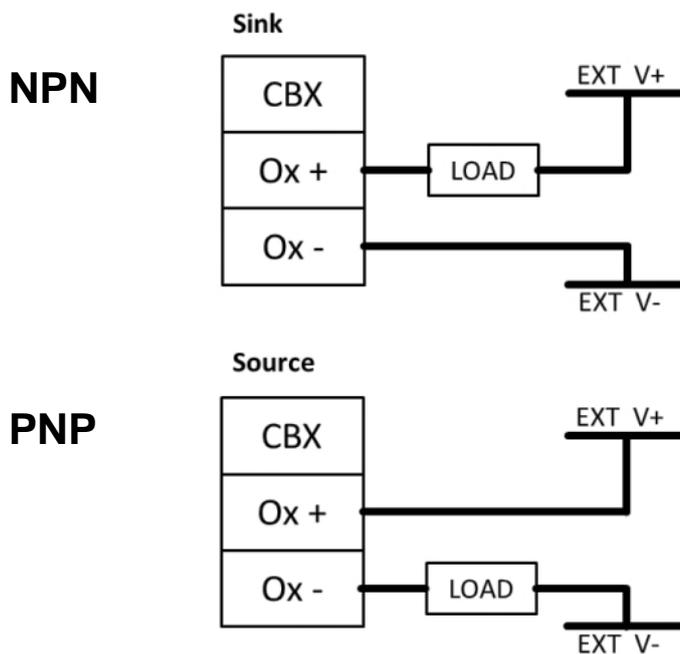


Figure 85: Unpowered Outputs

3.11.7 Powered Outputs

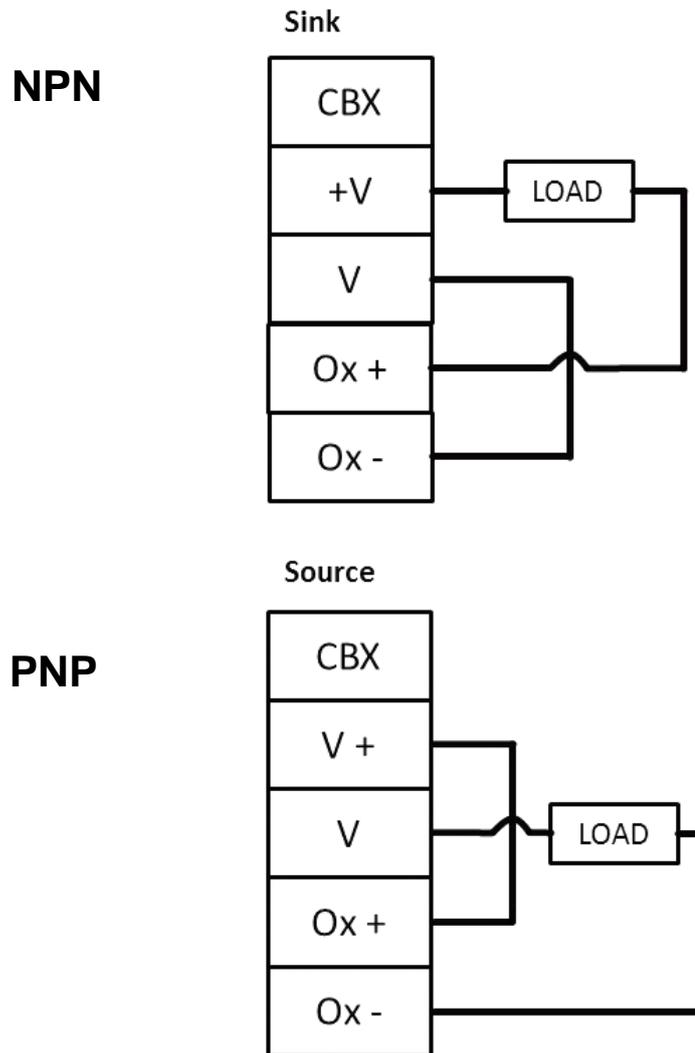


Figure 86: Powered Outputs

3.12 GROUNDING

In order 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 photoelectric 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.

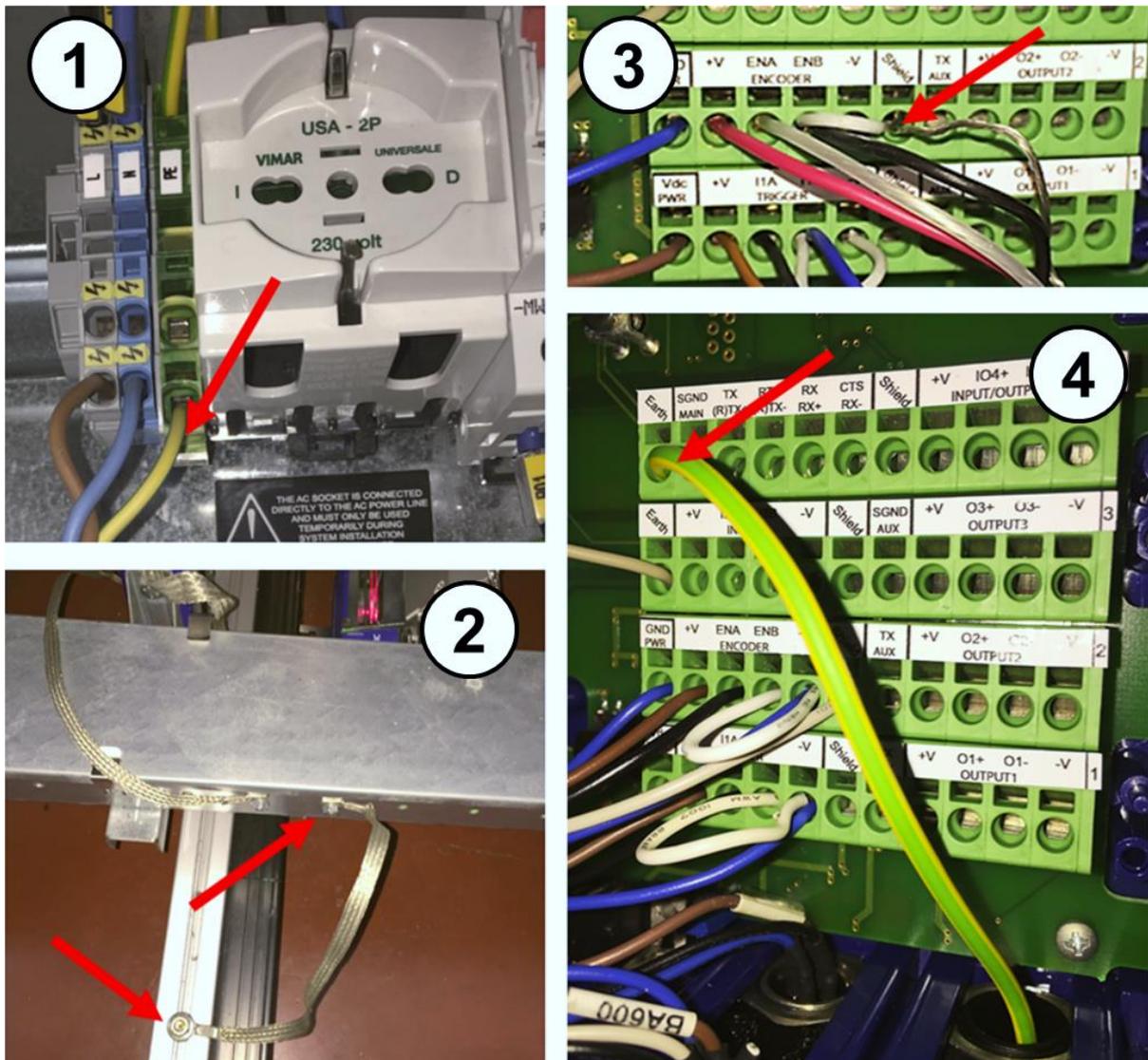


Figure 87: Grounding Examples

3.13 INSTALLING THE OPTIONAL VGA / USB INTERFACE PANEL KIT

An optional **VGA / USB Interface Panel Kit** (93A201204) replacement panel accessory can be used to attach a monitor, keyboard and mouse to an installed AV7000 camera. In this way, system status and statistics can be monitored local to a scan point or tunnel, and the monitor, keyboard and mouse can be used to change parameters without the need of an external computer.



Figure 88: VGA / USB Interface Panel Kit external connectors and internal cables



ESD CAUTION: 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.

To install the optional VGA / USB Interface Panel Kit:

1. Disconnect the power source from the AV7000 camera.
2. Remove the camera's rear access panel by loosening the four screws at its corners.



Figure 89: Rear access panel screw locations

3. Locate the USB and VGA connectors inside the camera.

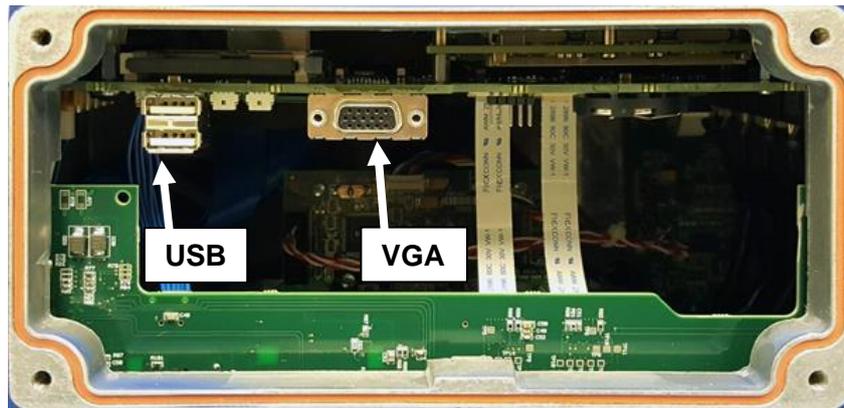


Figure 90: USB and VGA Connectors inside camera

4. Connect the VGA cable on the back of the VGA / USB Interface Panel Kit to the VGA connector inside the back of the camera.



Figure 91: Connecting VGA Cable

5. Connect the USB cable on the back of the VGA / USB Interface Panel Kit to one of the USB connectors inside the back of the camera.

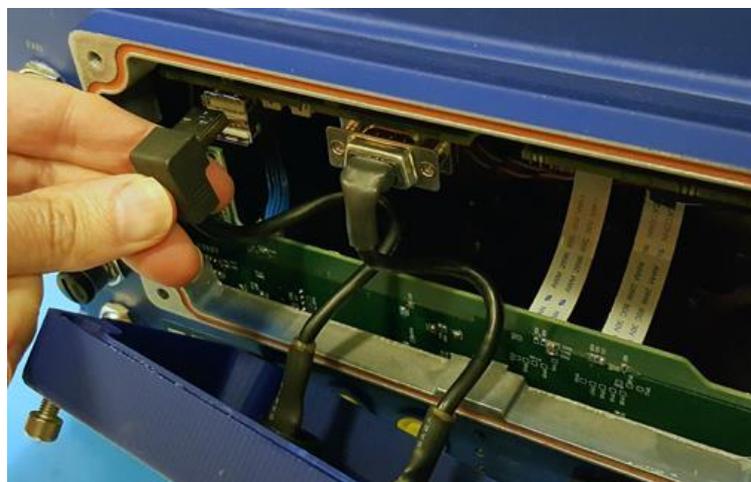


Figure 92: Connecting USB Cable

6. Carefully push the USB and VGA cables into the camera housing above the circuit board as shown below.

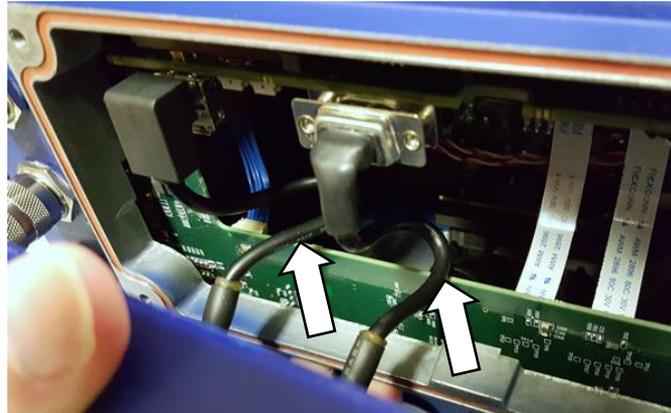


Figure 93: Carefully positioning the USB and VGA cables

7. Carefully position the VGA / USB Interface Panel Kit cover and tighten the four screws at its corners.
8. Attach the monitor to the VGA port and the combination keyboard/mouse to the USB port (MONITOR/KEYBRD/BRKT/USB HUB KIT, 93ACC0126).
9. Reapply power to the AV7000 Camera.



NOTE: When the camera is powered on, the monitor will come on after several seconds and display an image of the AV7000 camera system.

To access a browser (Firefox), right click with the mouse on the monitor window. A drop-down list appears. Select **Firefox** to open the browser to the e-Genius **Log On** window (see 4.1.2).



Figure 94: Right click for browser drop-down

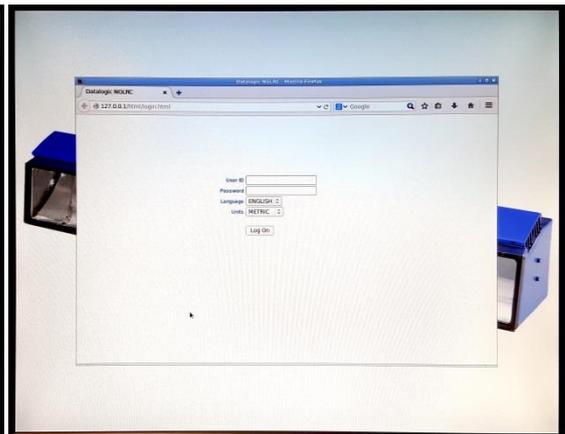


Figure 95: Log On window

3.14 CHECK AV7000 INSTALLATION

After completing the installation, confirm that the AV7000 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.

4 E-GENIUS

The AV7000 camera imaging system provides fully automated, industrial quality barcode identification and imaging. The user interface provides an easy-to-use series of configuration and diagnostics features that enable you to set up your Scanning System.

4.1 GETTING STARTED

The AV7000 reader uses a familiar browser-based user interface (e-Genius), which resides on each camera. It is the tool you will use to define operating parameters, construct output messages, and view diagnostics for the system. The e-Genius enables you to configure, fine-tune, and monitor your scanning system operations.



IMPORTANT: 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.

4.1.1 Prerequisites

Before setting up your AV7000 or multi-head barcode reader system, you will need the following:

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



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



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

4.1.2 Accessing e-Genius

To access e-Genius:



NOTE: Before starting up or testing the AV7000, it must be connected to a **CBX Connection Box** depending on the system configuration.

1. Connect your computer to the AV7000 **HOST NET** or **IMAGE NET** port using an RJ45 Ethernet cable.
2. Turn on your laptop computer.
3. Configure your PC's IP Address to be in the same network as the **HOST NET** or **IMAGE NET** port.

To change your PC's IP Address:

- a. From the desktop (Windows 7 or Windows 8), click the **Start** button, and then select **Control Panel**.
 - b. Type **adapter** in the search box, and then from the results, under **Network and Sharing Center**, click **View network connections**.
 - c. Right-click **Local Area Connection**, and then select **Properties**.
 - d. Select the **Networking** tab. Under **This connection uses the following items**, click **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.
 - e. Select **Use the following IP address**.
 - f. In the **IP address** field, type the first 3 octets of the IP address of the unit.
 - g. For the last octet, type a number that differs from the last octet in the AV7000's IP address. The actual number used is not important as long as it does not match that of the AV7000.

Example: If the camera's IP Address is 192.168.0.145, set your PC's IP Address to 192.168.0.146.
 - h. In the Subnet mask field, type 255.255.255.0
 - i. Click **Okay**.
4. Open a web browser and enter the IP address for the unit. If the correct IP address is entered, the Log On window will appear.

User ID	<input type="text"/>
Password	<input type="password"/>
Language	ENGLISH ▾
Units	METRIC ▾
<input type="button" value="Log On"/>	

The default setup IP address for all **AV7000** cameras is: 192.168.0.145 (setup/sync controller), 192.168.3.10 (Host), and 10.0.40.20 (Image).

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.
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.



IMPORTANT: 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.

To log out of the e-Genius:

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

4.2 E-GENIUS BASICS

4.2.1 e-Genius Menu Tree

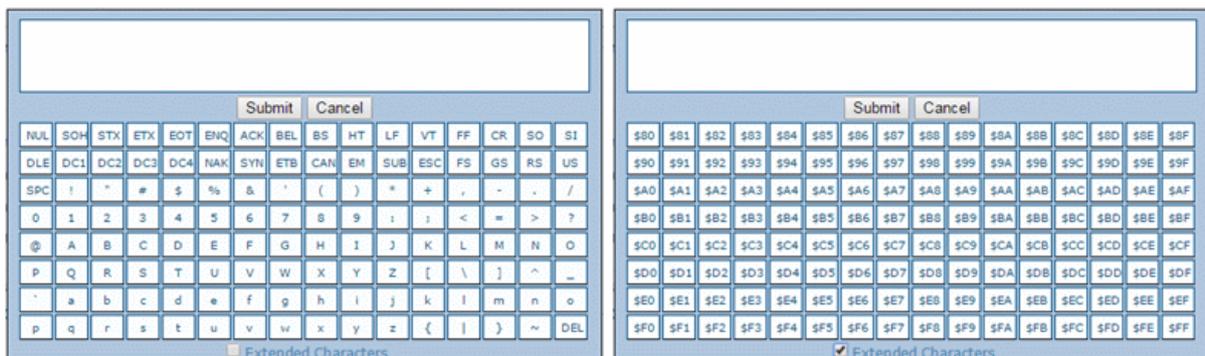
The functions that you can select are displayed in a menu tree on the left-hand side of **e-Genius**. The function list is organized much like the hierarchy of a file system, where you can expand items that are preceded by a box (☐) to further sub-levels until you find a function of interest.

Sub-levels appear indented below the items from which they are expanded. Clicking the box again will collapse 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.

4.2.2 Entering Text Using 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. 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 more easily reading. The character must be entered with the tool, if typed normally it will be recognized as a string and not as a single character.

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.

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

4.2.3 Getting Help

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

To access the complete help system:

Select **Utilities | Help** in the **e-Genius** menu tree. The help **Welcome** window appears. The **Welcome** page provides important product information as well as three ways to find specific help information: **Contents**, **Index**, 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 **Show** link in the upper left corner of the help window to access Contents, Index, and Search options.



Click Show to access Contents, Index and Search options.

[Home](#) > [Modify Settings](#) > System Info

Modify Settings | System Info

Use **System Info** to identify and name the scanning system (whether it includes one scanner or an array), indicate Master or Standalone systems, discover the scanners included in the system, and distribute software from the Master scanner to Slave scanners in the system.

To view and edit system information:

1. In the tree menu under **Modify Settings**, click **System Info**. The [System Info](#) window opens.
2. Enter the appropriate information in the form as described below:

Field Name	Action/Definition						
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 Detected. They type will display and is hyper-linked to the corresponding device setup software. For example: Click Rangefinder and the following displays:						
<table border="1" style="margin-left: 40px;"> <thead> <tr> <th colspan="2">RangeFinder</th> </tr> </thead> <tbody> <tr> <td>Belt Speed(fpm)</td> <td style="text-align: center;">0</td> </tr> <tr> <td>Total Packages</td> <td style="text-align: center;">0</td> </tr> </tbody> </table>		RangeFinder		Belt Speed(fpm)	0	Total Packages	0
RangeFinder							
Belt Speed(fpm)	0						
Total Packages	0						

Contents | **Index** | **Search**

- ? Welcome
- ? Getting Started
- ? e-Genius Basics
- Modify Settings
 - ? **System Info**
 - ? Camera Statistics
 - Global Settings
 - Device Settings
- Diagnostics
- Utilities

Modify Settings | System Info

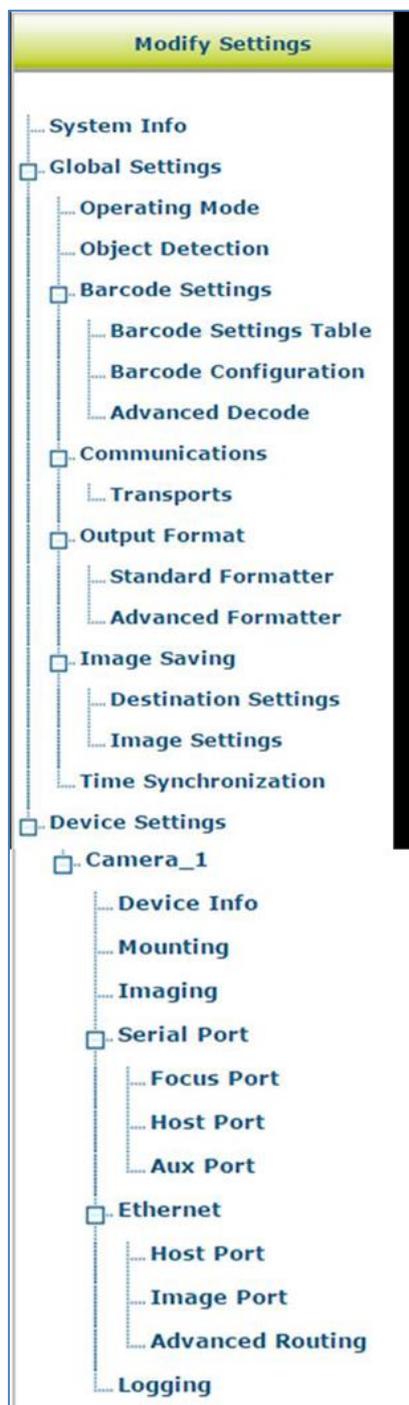
Use **System Info** to identify and name the scanner or an array), indicate Master or Standalone systems, discover the scanners included in the system, and distribute software from the Master scanner to Slave scanners in the system.

To view and edit system information:

1. In the tree menu under **Modify Settings**, click **System Info**. The [System Info](#) window opens.
2. Enter the appropriate information in the form as described below:

4.3 MODIFY SETTINGS

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



4.4 MODIFY SETTINGS | SYSTEM INFO

Use **System Info** to identify and name the scanning system (whether it includes one AV7000 barcode reader or an array), indicate Master or Standalone systems, discover the cameras included in the system, and distribute software from the Master AV7000 to Slave AV7000s in the system.

To view system information:

1. In the menu tree under **Modify Settings**, click **System Info**. The **System Info** window opens.

Tunnel Information						
Number of Camera's Detected				6		
Position Sensor				Dimensioner		
This Cluster						
Online	Status	MAC Address	IP Address	Camera Position	Camera Name	Action
		00:0E:13:06:00:2C	192.168.0.145	Right	Right_Front	Blink
		00:0E:13:06:00:3E	192.168.0.205	Bottom	Bottom	Blink
		00:0E:13:06:00:20	192.168.0.206	Top	Top	Blink
		00:0E:13:06:00:36	192.168.0.207	Right	Right_Back	Blink
		00:0E:13:06:00:24	192.168.0.209	Left	Left_Back	Blink
		00:0E:13:06:00:26	192.168.0.218	Left	Left_Front	Blink
Cameras not in this Cluster						
Online	Status	MAC Address	IP Address	Action	Name	
<input type="button" value="Update"/> <input type="button" value="Reset"/>						

2. The information in this form is auto-filled. The fields are described below:

Field Name	Action/Definition
System Info	
Tunnel Information	
Number of Cameras Detected	Displays the number of cameras found in the system.
Position Sensor Detected	Displays the type of Position sensor. Indicates whether it is a RangeFinder or a Dimensioner that is Detected. Rangefinder or Dimensioner will display and be hyperlinked to the corresponding device setup software.

For example: Click Rangefinder and the following displays:

RangeFinder			
Belt Speed(fpm)		262	
Total Packages		0	
RangeFinder Details			
Online	Status	IP Address	MAC Address
		192.168.00.40	00:0E:13:01:01:6D
Software Name		RangeFinder	
Software Version		9.0 / MetSig 1.1	
Diagnostic Messages		No active Errors or Warnings	

This Cluster	
Online	<p>Green = Online (connected and recognized in the cluster)</p> <p>Gray = Unit not connected (unit not seen by master)</p> <p>Yellow = Online, but not assigned to the cluster (shown under Cameras not in this Cluster)</p> <p>Red = Offline</p>
Status	<p>Green = No errors and ready to read</p> <p>Gray = Unit not connected (unit not seen by master)</p> <p>Yellow = Warning present</p> <p>Red = Error. If you click on the MAC address, it will take you to the status viewer page for more info on the error</p>
MAC Address	<p>Displays the internal MAC Address (Media Access Control Address) the device used for camera-to-camera communications.</p> <p>Click the MAC Address link to view details about that specific device (See Device Details below).</p>
IP Address	Displays the internal 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.
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. See <i>section 4.4</i> for information on moving AV7000 cameras into the Cluster.

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

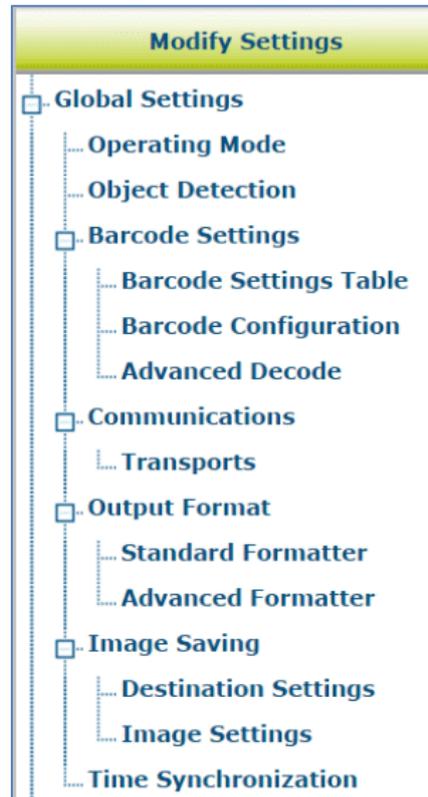
4.4.1 Device Details

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: Top		Position: Top	
Camera Statistics			
Belt Speed(mm/s)	2432		
Total Packages	1849		
Valid Reads	1		
No Reads	8		
Multiple Reads	1840		
Read Rate	99.6%		
Decoder Details			
Online	Status	IP Address	MAC Address
		192.168.0.145	00:0E:13:06:00:28
Software Type	STANDARD		
Software Version	0.25.0.5		
Decoder Name	BLR_VL5.07.21D_LNX		
Host Port IP Address	10.27.155.247		
Image Port IP Address	192.169.3.4		
Configuration Update Count	218		
Diagnostic Messages	Decoder load warning		
Real-Time Processor Details			
Online	Status	IP Address	MAC Address
		192.168.00.196	00:0E:13:06:00:C1
Software Version	0.25.0.5		
FPGA Version	1.12.0		
My Decoder's MAC	00:0E:13:06:00:28		
My Decoder's IP	192.168.0.145		
Total Packages	0		
Diagnostic Messages	No active Errors or Warnings		

4.5 GLOBAL SETTINGS

Use the Global Settings menu tree selections during initial setup to configure your camera system. Global settings are applied to the system Master, and then distributed by the Master AV7000 to the Slave devices. If necessary, you can later make modifications to the global system settings using the following menu selections:



4.5.1 Modify Settings | Global Settings | Operating Mode

Use **Operating Mode** to set up the physical parameters for your system including encoder, trigger, conveyor, and position sensor attributes.

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.

The screenshot displays the 'Operating Mode' configuration window, which is organized into several sections:

- Encoder Settings:** Includes a dropdown for 'Physical Encoder' (set to 'Enabled'), a text input for 'Encoder Step' (1.27 mm/pulse), a text input for 'Encoder Resolution' (20 PPI), and a text input for 'Conveyor Speed' (1 m/sec). Below this is an 'Advanced Encoder Settings' section with a dropdown for 'Direct Encoder' (set to 'Disabled').
- Tunnel Software Update:** A checkbox labeled 'Allow automatic software updates' is checked.
- Conveyor Width:** A text input for 'Conveyor Width' is set to 35.4 in.
- Trigger Source:** A dropdown menu for 'Trigger Source' is set to 'Position Sensor'.
- Position Sensor Settings (Primary Controller):** Includes a dropdown for 'Position Sensor Type' (RangeFinder), a text input for 'Position Sensor Height Offset' (0 in), and a text input for 'Position Sensor Transmit Delay' (0 in). Below this is a 'RangeFinder Settings' section with a 'Mounting Calibration Wizard' button and several text inputs: 'Left/Right Offset' (0 in), 'Mounting Height' (76 in), 'Left Ignore Limit (-)' (20 in), 'Right Ignore Limit (+)' (20 in), 'Offset to RangeFinder Gain Setting' (0), 'Delay Distance (for Object Filtering)' (5 in), 'Package Detection Debounce' (1.1 in), and 'Yaw' (0). There are also three unchecked checkboxes for 'Enable Rough Dimensioning', 'Offset Front Focus for Skewed Box', and 'Offset Back Focus for Skewed Box'.
- Transmit Point Settings:** Includes a dropdown for 'Transmit Point Reference Edge' (Leading Edge), a text input for 'Distance to Transmit Point' (157.5 in), and a text input for 'Transmit Point Advance' (1.6 in).

At the bottom of the window, there are two buttons: 'Update' and 'Reset'.

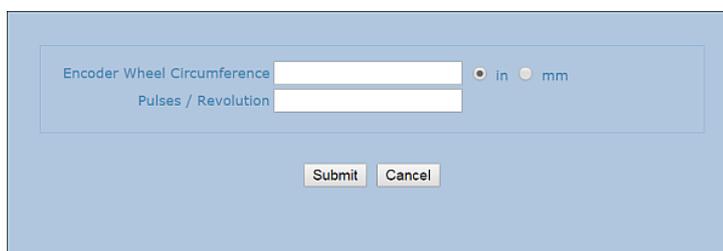
2. Enter the appropriate information in the form as described below:

Field Name	Action/Definition
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 (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.

Field Name	Action/Definition
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.



NOTE: 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.

Conveyor Width	
Conveyor Width	Enter width of the scanning area in the field provided. This could be the physical width of the conveyor bed, but could be smaller depending on the application. In an application with opposing side read cameras, it is the distance from the left side camera's Far Working Distance point to the right side camera's Far Working Distance point measuring across the conveyor.

Enter width of the scanning area in the field provided. This could be the physical width of the conveyor bed, but could be smaller depending on the application. In an application with opposing side read cameras, it is the distance from the left side camera's **Far Working Distance** point to the right side camera's **Far Working Distance** point measuring across the conveyor.

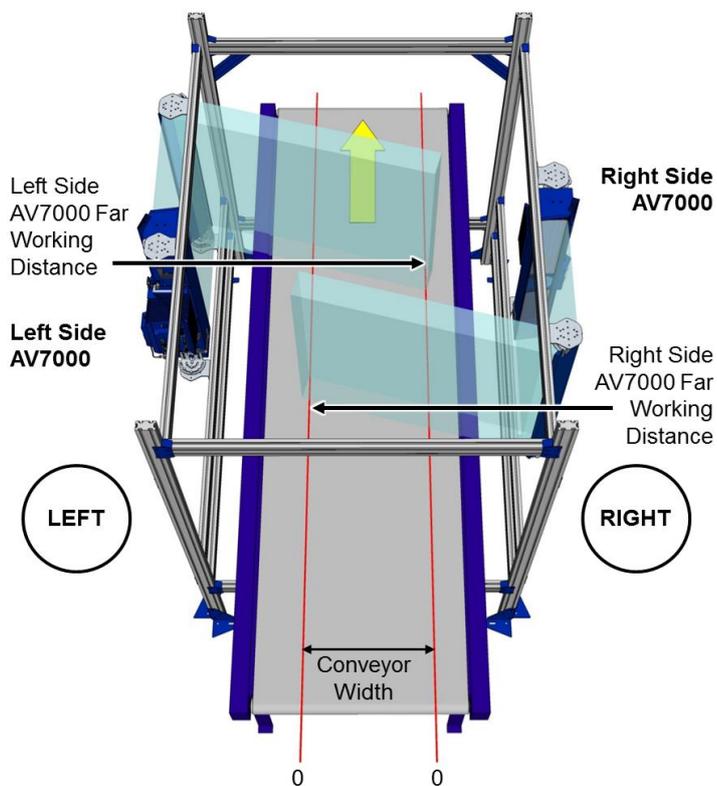


Figure 96: Conveyor Width



NOTE: Conveyor width must match what is set in the position sensor (RangeFinder or DM3610).

Trigger Source	
Trigger Source	Select Position Sensor , Photo Sensor , or Photo Sensor and Upstream Bottom from the drop-down list.

Select **Position Sensor**, **Photo Sensor**, or **Photo Sensor and Upstream Bottom** from the drop-down list.

- **Position Sensor:** triggers when selected position sensor senses a package.
- **Photo Sensor:** triggers when a photoelectric sensor is blocked. Use when there is NOT a bottom camera defined in the tunnel.
- **Photo Sensor and Bottom:** triggers when a photoelectric sensor is blocked and there IS a bottom camera defined in the tunnel.

Field Name	Action/Definition
Trigger Source to Position Sensor	Enter the physical distance from the trigger to the positions sensor.
Trigger Active State	Select Active High or Active Low from the drop-down list. This depends on the active state of the selected photoelectric sensor. Selections: <ul style="list-style-type: none"> • Active High: Object is detected when current is flowing through the trigger input pins. • Active Low: Object is detected when there is NO current is flowing through the trigger input pins.
Trigger Debounce	Enter the Trigger Debounce distance in the field provided. This distance must be a positive value and is the minimum distance the photo detector should be blocked for the system to consider an object to scan, reducing false triggers. A typical value is 25mm or 1 inch. This value must be significantly less than the distance from the trigger to read line.
Extend Leading Edge of Photo Sensor	Enter a distance to extend the leading edge of the photo sensor by.
Extend Trailing Edge of Photo Sensor	Enter a distance to extend the trailing edge of the photo sensor by.
Crossbelt Sorter Mode	Select Enabled or Disabled from the drop-down list if your system requires crossbelt sorter mode.

Position Sensor Settings

Position Sensor Type	Select No Position Sensor , RangeFinder , STI Light Curtain , DL Light Curtain , Dimensioner (Legacy) , or Dimensioner (Corner Detection) 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.

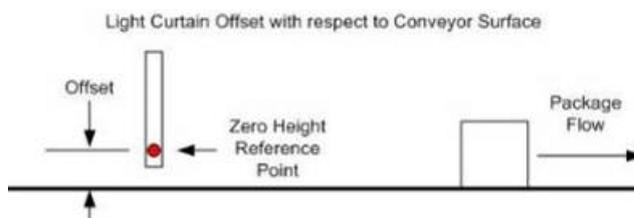


Figure 97: Position Sensor Height Offset

Position Sensor Transmit Delay	Enter the distance from the position sensor to the transmit point in the field provided.
Minimum Object Height for Corner Detection	Enter a height in the field provided. When using a dimensioner for focusing, this is usually set to the minimum package height but can be set higher. Corner detection will not be attempted on any package with a height less than this parameter value. This is only visible when Dimensioner (Corner Detection) is selected for the Position Sensor Type .

Field Name	Action/Definition
RangeFinder Settings	
These values are entered by the Wizard.	
<i>For information RangeFinder installation and calibration, see section 5.2.2</i>	
Left/Right Offset	Enter the offset on the X axis (across the conveyor) of the RangeFinder. This parameter compensates for the RangeFinder not being centered above the scanning surface.
Mounting Height	Enter the height that the RangeFinder is mounted above the scanning surface (Z axis)
Left Ignore Limit (-)	Enter the usable area on left side of the RangeFinder. This is referenced from the center of the RangeFinder. Any codewords that are beyond the dimension set in this field will be ignored.
Right Ignore Limit (+)	Enter the usable area on right side of the RangeFinder. This is referenced from the center of the RangeFinder. Any codewords that are beyond the dimension set in this field will be ignored.
Offset to RangeFinder Gain Setting	This parameter adjusts the gain value used by the Rangefinder. This is an offset that is applied to the "Factory Gain Setting". This value can be positive or negative. See Setting the RangeFinder Gain in section 5.2.2.
Delay Distance (for Object Filtering)	This specifies the "delay" in transmitting the Rangefinder focus data. The size of this delay helps with the 'bounding' of boxes to smooth the data for the sides. Essentially the range used in the 'bounding' is about 25 mm [1 in] less than twice this number (in other words, if left at 70 mm [3 in], bounding is performed over approximately 127 mm [5 in]). This value cannot be smaller than the minimum box size (minimum box size will be used in that case). It cannot be larger than 200 mm [8 in].
Package Detection Debounce	This specifies the "Distance without height data" that must be observed before the package detection algorithm terminates a box. Be careful making this value much larger, as that will increase the sensitivity of the rangefinder to "belt noise".
Enable Rough Dimensioning	Select the check box to allow the RangeFinder to return rough package dimensions.
Photo Sensor Indicates Package is Present	Select the check box to allow the RangeFinder to indicate package is present.
Yaw	Select 0 or 180 from the drop-down list. This identifies the RangeFinder mount as Standard or Non-Standard. The Yaw should either be 0 or 180, 0 being the standard mount where the two indicator laser dots are upstream from the RangeFinder scan line. When set to 180-degrees, the two indicator laser dots are downstream from the RangeFinder scan line
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 in the field provided.

Field Name	Action/Definition
Transmit Point Advance	Enter the distance in the field provided. This is the distance upstream of the transmit point when the camera will stop decoding the image data. This will help eliminate processing errors.

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

4.5.2 Modify Settings | Global Settings | 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:

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

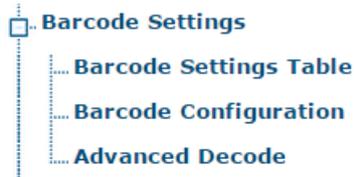


NOTE: Default values are shown in the screen capture above.

- Enter the minimum and maximum detection size settings for object length (mm [in]), width, and height in the fields provided.
- When you have finished making changes, click **Update** to save or click **Reset** to revert to the previously saved values.

4.5.3 Modify Settings | Global Settings | Barcode Settings

Use Barcode Settings options to define the barcodes to be read by the system. Make modifications to the system barcode settings using the menu selections, including (click on the menu item to access that help window):



Modify Settings | Global Settings | Barcode Settings | Barcode Settings Table

Use **Barcode Settings Table** to select and configure barcodes to be read in your application. Each barcode type

To edit the Barcode Settings Table Settings:

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

Barcode List

Idx	Type	Minimum Length	Maximum Length
<input checked="" type="radio"/> 1	Interleaved 2 of 5	1	60
<input type="radio"/> 2	Code 39	1	60
<input type="radio"/> 3	Interleaved 2 of 5	1	60
<input type="radio"/> 4	Disabled		

Code 1 Definition

Enable

Code Symbology

Minimum Length

Maximum Length

Match String Rule

Options

Use Check Digit

Transmit Check Digit

Short Margin

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

Field Name	Action/Definition
Top Panel	Displays a list of barcodes that have been added to the system with the following columns:

Field Name	Action/Definition
Idx	Select an option button for the row/barcode you wish to edit. <ul style="list-style-type: none"> If a barcode type is displayed in the selected row, its configuration can then be edited. If a row displaying disabled is selected, a barcode type can be selected and configured 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. Deselect 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 digit Add On from the Add On drop-down list. Selecting 2 digit Add On or 5 digit Add On adds that many digits as a supplement to the barcode. 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. <ul style="list-style-type: none"> 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 activate the Text Entry Tool 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 <i>Regular Expression Syntax</i> .

Field Name	Action/Definition
------------	-------------------

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.

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:

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

- Match String = 123.*
- Example Code = 123aC53

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

- Match String = .*123
- Example Code = 41pO123

3. Match a code having 123 string in any position:

- 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

Field Name	Action/Definition
	Check Digit is transmitted, it must be considered in the match conditions.
	 NOTE: Input fields will vary depending on the selected symbology.
Options	
Transmit Start / Stop Char(s)	Select the check box to enable transmission of start and stop characters. Available for Code 128 and Code GS1-128.
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.
Transmit Function Char(s)	Select the check box to enable transmission of functional characters. Available for Code 128.
Use Check Digit	<p>Select the check box to include the Check Digit in the code transmitted.</p> <p>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.</p> <p>It is advised to enable the check digit whenever correct code identification is difficult.</p>
Transmit Check Digit	Select the check box to enable transmission of the Check Digit.
Full ASCII	Select the check box to enable full ASCII. This pertains to Code 39 only.
Quiet Zone	<p>Specify the quiet zone in the field provided.</p> <p>This defines the minimum quiet zone (white margins) measured in narrowest module width. This option may be symbology dependent.</p>
UPCE Expand	Select the check box to enable conversion of a full-length UPC (UPC-A) UPC-E. Excess zeroes will be suppressed.
Type	<p>Select Omnidirectional, Expanded, Limited, Expanded Stacked, or Stacked from the drop-down list.</p> <p>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.</p>
Transmit Start Char	<p>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:</p> <ul style="list-style-type: none"> • 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 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

Field Name	Action/Definition																																																																								
	<p>transmitting the code stop character:</p> <ul style="list-style-type: none"> • Disabled: The character is not selected; • Lower Case: The character is transmitted in lower case; • Upper Case: The character is transmitted in upper case. 																																																																								
Data Matrix Fast Improve	Select the check box to enable the Data Matrix options available via the table shown below.																																																																								
Data Matrix Options	<p>The following options are available for Data Matrix codes:</p> <p>Select the Data Matrix Fast Improve check box and the check box next to the Data Matrix type codes required from the provided table.</p> <div style="border: 1px solid black; padding: 5px;"> <p>Options</p> <p>Data Matrix Fast Improve <input type="checkbox"/></p> <p>Code Module Size <input type="text" value="500"/></p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th colspan="8">Select Data Matrix Types</th> </tr> </thead> <tbody> <tr> <td><input checked="" type="checkbox"/></td> <td>10x10</td> <td><input type="checkbox"/></td> <td>12x12</td> <td><input type="checkbox"/></td> <td>14x14</td> <td><input type="checkbox"/></td> <td>16x16</td> </tr> <tr> <td><input type="checkbox"/></td> <td>18x18</td> <td><input type="checkbox"/></td> <td>8x18</td> <td><input type="checkbox"/></td> <td>20x20</td> <td><input type="checkbox"/></td> <td>22x22</td> </tr> <tr> <td><input type="checkbox"/></td> <td>24x24</td> <td><input type="checkbox"/></td> <td>26x26</td> <td><input type="checkbox"/></td> <td>12x26</td> <td><input type="checkbox"/></td> <td>32x32</td> </tr> <tr> <td><input type="checkbox"/></td> <td>8x32</td> <td><input type="checkbox"/></td> <td>12x36</td> <td><input type="checkbox"/></td> <td>16x36</td> <td><input type="checkbox"/></td> <td>16x48</td> </tr> <tr> <td><input type="checkbox"/></td> <td>36x36</td> <td><input type="checkbox"/></td> <td>40x40</td> <td><input type="checkbox"/></td> <td>44x44</td> <td><input type="checkbox"/></td> <td>48x48</td> </tr> <tr> <td><input type="checkbox"/></td> <td>52x52</td> <td><input type="checkbox"/></td> <td>64x64</td> <td><input type="checkbox"/></td> <td>72x72</td> <td><input type="checkbox"/></td> <td>80x80</td> </tr> <tr> <td><input type="checkbox"/></td> <td>88x88</td> <td><input type="checkbox"/></td> <td>96x96</td> <td><input type="checkbox"/></td> <td>104x104</td> <td><input type="checkbox"/></td> <td>120x120</td> </tr> <tr> <td><input type="checkbox"/></td> <td>132x132</td> <td><input type="checkbox"/></td> <td>144x144</td> <td colspan="4"></td> </tr> </tbody> </table> <p style="text-align: center;"> <input type="button" value="All"/> <input type="button" value="All Square"/> <input type="button" value="All Rectangle"/> <input type="button" value="Clear"/> </p> </div> <p>Select All to select all of the Data Matrix codes listed.</p> <p>Select All Square to select all of the Data Matrix square codes.</p> <p>Select All Rectangle to select all of the Data Matrix rectangular codes.</p> <p>Select Clear to clear the table of any selections.</p>	Select Data Matrix Types								<input checked="" type="checkbox"/>	10x10	<input type="checkbox"/>	12x12	<input type="checkbox"/>	14x14	<input type="checkbox"/>	16x16	<input type="checkbox"/>	18x18	<input type="checkbox"/>	8x18	<input type="checkbox"/>	20x20	<input type="checkbox"/>	22x22	<input type="checkbox"/>	24x24	<input type="checkbox"/>	26x26	<input type="checkbox"/>	12x26	<input type="checkbox"/>	32x32	<input type="checkbox"/>	8x32	<input type="checkbox"/>	12x36	<input type="checkbox"/>	16x36	<input type="checkbox"/>	16x48	<input type="checkbox"/>	36x36	<input type="checkbox"/>	40x40	<input type="checkbox"/>	44x44	<input type="checkbox"/>	48x48	<input type="checkbox"/>	52x52	<input type="checkbox"/>	64x64	<input type="checkbox"/>	72x72	<input type="checkbox"/>	80x80	<input type="checkbox"/>	88x88	<input type="checkbox"/>	96x96	<input type="checkbox"/>	104x104	<input type="checkbox"/>	120x120	<input type="checkbox"/>	132x132	<input type="checkbox"/>	144x144				
Select Data Matrix Types																																																																									
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<input type="checkbox"/>	132x132	<input type="checkbox"/>	144x144																																																																						
Postal Symbologies	<p>Select a symbology from the drop-down list, and then define its parameters including:</p> <ul style="list-style-type: none"> • Postal Direction: Select Omnidirectional, Horizontal, Vertical, or Horizontal/ Vertical from the drop-down list. • Postal Bar Distance: Enter the bar distance in the field provided. • Postal Max Bar Count: Enter the maximum number of bars in the field provided. • Postal Min Bar Count: Enter the minimum number of bars in the field provided. 																																																																								
Code Module Size	Enter number of code modules in the field provided.																																																																								
Maxicode Enable n	Select the check box corresponding to the Maxicode(s) to enable.																																																																								

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

Modify Settings | Global Settings | Barcode Settings | Barcode Configuration

Barcode Configuration is used to define the relationship of barcodes and how they are grouped together for transmitting to the host. It also defines the formatting of no read, multiple reads, partial reads 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:

Field Name	Action/Definition
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 AV7000 will read. The minimum height is 6 mm [.25 in].
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: Barcode Configuration Single Label , Barcode Configuration Standard Multi Label , Barcode Configuration Logical Combination , Barcode Configuration Code Collection <ul style="list-style-type: none"> • Single Label: 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 code is read.

Field Name	Action/Definition
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If the code is not read during the reading phase, the No Read message is produced.



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.

- **Standard Multi Label:** 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, a **Global No Read** message will be produced, unless it is disabled, in which case a **Local No Read** will be produced.



NOTE: In case of 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.

- **Logical Combination:** In Logical Combination mode the codes of the groups defined by the **Logical Combination Rule** are read in the same reading phase.
- **Code Collection:** 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.

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

Barcode Configuration | 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:

Field Name	Action/Definition
Minimum 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. <ul style="list-style-type: none"> • 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 activate the Text Entry Tool and create a string to be displayed when Global No Read Message is selected from the No Read Message drop-down list.

Field Name	Action/Definition
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 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 activate the Text Entry Tool and enter specific characters to be stripped from the code. Click Submit to save your text to the origin window text field, or click Cancel to return to origin window without transferring text.
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 activate the Text Entry Tool 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.

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

Barcode Configuration | 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.

Barcode Configuration

Minimum 1D Code Height mm

Code Combination

No Read Message

No Read String (max. 128 chars) 

Multiple Read Message

Multiple Read String (max. 128 chars) 

Partial Read Is Treated As

Multi-Filter Settings

Strip Filter

Strip Filter Settings

Strip All Non Printable Chars

Char(s) to be Stripped 

Strip Filter Collapse

Replacement Char 



NOTE: In case of 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.

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

Field Name	Action/Definition
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	<p>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.</p> <ul style="list-style-type: none"> • 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. <p>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.</p>
No Read String (max. 128 chars)	Click  to activate the Text Entry Tool and create a string to be displayed when Global No Read Message is selected from the No Read Message drop-down list. Click Submit to save your text to the origin window text field, or click Cancel to return to origin window without transferring text.
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)	<p>Click  to activate the Text Entry Tool and create a string to be displayed in case of Multiple Read Message. Click Submit to save your text to the origin window text field, or click Cancel to return to origin window without transferring text.</p> <p>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.</p>
Partial Read Is Treated As	<p>Select No Read, Good Read, or Partial Read from the drop-down list.</p> <p>A Partial Read is a condition when multiple barcodes are enabled, but not all barcodes are read during a trigger cycle.</p>
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).

Field Name	Action/Definition
Char(s) to be Stripped	Click  to activate the Text Entry Tool and enter specific characters to be stripped from the code. Click Submit to save your text to the origin window text field, or click Cancel to return to origin window without transferring text.
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 activate the Text Entry Tool 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.

Barcode Configuration | Logical Combination

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



NOTE: The **Logical Combination** option is only available when more than one code is enabled in the **Barcode Settings Table**.

Barcode Configuration

Minimum 1D Code Height mm

Code Combination

Logical Combination Rule

No Read Message

No Read String (max. 128 chars)

Multiple Read Message

Multiple Read String (max. 128 chars)

Partial Read Is Treated As

Multi-Filter Settings

Strip Filter

Strip Filter Settings

Strip All Non Printable Chars

Char(s) to be Stripped

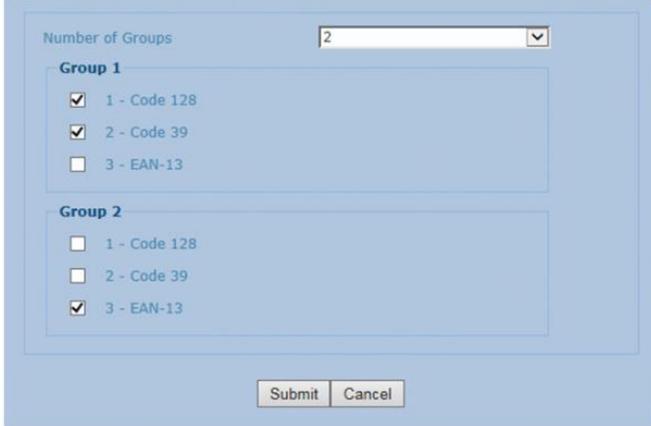
Strip Filter Collapse

Replacement Char

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

Field Name	Action/Definition
Minimum 1D Code Height	Enter the minimum code height in the field provided (mm [in])
Code Combination	Logical Combination has been selected.

Field Name	Action/Definition
------------	-------------------

Logical Combination Rule	<p>Click  to activate the Code Group selection dialog box.</p>  <p>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.</p> <p>Groups and their order define the output message format, while each group identifies an expected code.</p> <p>When editing the logical combination rule, proceed as follows:</p> <ol style="list-style-type: none"> 1. Define the Barcode Settings indicating the type of expected code labels. It is possible to define up to 10 different code types; 2. 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. <p>The maximum number of groups to be defined for each rule string is 15.</p> <p>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.</p> <p>Example</p> <p>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:</p> <pre><STX>12345678xxx,12345678xxx,noread <CR><LF></pre>
---------------------------------	--

1. Define the **Barcode Settings** indicating the type of expected code labels. It is possible to define up to 10 different code types;
2. 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>
```

Field Name	Action/Definition
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. <ul style="list-style-type: none"> • 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 activate the Text Entry Tool and create a string to be displayed when Global No Read Message is selected from the No Read Message drop-down list. Click Submit to save your text to the origin window text field, or click Cancel to return to origin window without transferring text.
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. Click Submit to save your text to the origin window text field, or click Cancel to return to origin window without transferring text.
Multiple Read String (max. 128 chars)	Click  to activate the Text Entry Tool and create a string to be displayed in case of Multiple Read Message . Click Submit to save your text to the origin window text field, or click Cancel to return to origin window without transferring text. <p>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.</p>
Partial Read Is Treated As	Select No Read , Good Read , or Partial Read from the drop-down list. <p>A Partial Read is a condition when multiple barcodes are enabled but not all barcodes are read during a trigger cycle.</p>
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 (000-020 and 127).
Char(s) to be Stripped	Click  to activate the Text Entry Tool and enter specific characters to be stripped from the code. Click Submit to save your text to the origin window text field, or click Cancel to return to origin window without transferring text.
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 activate the Text Entry Tool 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.

Barcode Configuration | Logical Combination Rule

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.

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 #1	Label	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>

The screenshot shows a configuration window with a blue header. At the top, 'Number of Groups' is set to 2. Below this, there are two sections labeled 'Group 1' and 'Group 2'. Each section contains a checked checkbox followed by the text '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 codes are 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>

Number of Groups 1 ▾

Group 1

- 1 - Code 39
- 2 - Code 128

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 data><DPS><Code 39 data><DPS><First decoded code/Multiple Read Message string><Terminator>

Number of Groups

Group 1

1 - Code 39
 2 - Code 128

Group 2

1 - Code 39
 2 - Code 128

Group 3

1 - Code 39
 2 - Code 128

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

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

Barcode Configuration | Code Collection

When **Code Collection** 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:

Field Name	Action/Definition
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	<p>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.</p> <ul style="list-style-type: none"> • 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 allows the user to define a specific no read message for each enabled symbology. 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. <p>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.</p>
No Read String (max. 128 chars)	Click  to activate the Text Entry Tool and create a string to be displayed when Global No Read Message is selected from the No Read Message drop-down list.

Field Name	Action/Definition
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 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 activate the Text Entry Tool and enter specific characters to be stripped from the code. Click Submit to save your text to the origin window text field, or click Cancel to return to origin window without transferring text.
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 activate the Text Entry Tool 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.

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

Modify Settings | Global Settings | Barcode Settings | Advanced Decode

Use **Advanced Decode** to set up and enable advanced code settings.

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.

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

Field Name	Action/Definition
Enable Low Profile 1D Codes	Select the check box to enable reading of low profile 1D barcodes.
Enable Low Contrast Improvements	Select the check box to enable automatic contrast improvements.
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.
Advanced Localizer Settings	
Enable Advanced Localizer	Select the check box to enable the advanced localizer options. DO NOT change this parameter unless directed by Datalogic Support.
ROI Usage (Region of Interest)	Select a code profile from the drop-down list to match the type of barcodes read by the system. Do not change this parameter unless directed by Datalogic Support.
ROI Threshold	The ROI Threshold factor in the field provided. To improve decode time, this allows for the restriction of the decoding region of interest. The default value is 60. Do not change this parameter unless directed by Datalogic Support.

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

4.5.4 Modify Settings | Global Settings | Communications

Use Communications options to enable and setup the following communication outlets:



Communications | Transports

Use the Transports window to setup, edit, and configure numbered user sockets or serial ports for your scanning system. User sockets are another interface available for the Ethernet communication.

The Transports parameters are used to setup the serial or Ethernet configuration to match the transmit/receive parameters of the 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:

Field Name	Action/Definition
------------	-------------------

Transport List	Select an option button in the list at the top of this window to create a new item, or to edit an existing one.
-----------------------	---

Serial: Transport n Settings

Field Name	Action/Definition
Use Global Configuration	Select the check box to reveal the global configuration options. When Global Configuration is selected any of the AV7000's in the tunnel will use this transport. When not selected, a drop-down allows you to select a particular AV7000. This is only available for transport 1, the only serial transport option.
Enable	Select the check box to reveal the related configuration options.
Device Select	Select a listed named device from the drop-down list.
Data Output Protocol	Select from the drop-down list. Once selected, the input options for that selection are revealed. Current options for Data Output Protocol are: <ul style="list-style-type: none"> • Standard • Advanced • Crisplant • Beumer • Custom 1-4 • WebSentinel • Video Coding (PV v1.11) • SC5000

Protocol Specialized Settings

Advanced	Advanced Formatter Index	Select and index number from the drop-down list. This selection is available when Data Output Protocol > Advanced is selected.
Crisplant	Crisplant Protocol Type	Select P10 , CSC , or CMC from the drop-down list. <ul style="list-style-type: none"> P10 The Protocol Index message syntax is fixed according to the Crisplant P10 message specifications. CSC The Protocol Index message syntax is fixed according to the Crisplant CSC message specifications. CMC The Protocol Index message syntax is fixed according to the Crisplant CMC message specifications.
	Scanner ID	Select Datalogic NVS9000/AV7000, 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 heartbeat messages.
	Heartbeat Timeout	Enter a time value in seconds to define the amount of time between two message transmissions. If the input timeout expires and no transmission has occurred, the Heartbeat message will be transmitted.
	Read Mask Enable	Select the check box to enable.
	Code Type Enable	Select the check box to enable.

Field Name	Action/Definition
Beumer	<p>Heartbeat Timeout Enter a time value in seconds to define the amount of time between two message transmissions. If the input timeout expires and no transmission has occurred, the Heartbeat message will be transmitted.</p>
	<p>Scan Data Max Length Enter a maximum length value in the field provided.</p>
	<p>Filler Click  to activate the Text Entry Tool and create a filler character(s).</p>
	<p>Profibus Terminator Click  to activate the Text Entry Tool and create a filler character(s) to terminate a Profibus message.</p>
WebSentinel	
	<p>Image Saving Index Number Select a number from the drop-down list. These numbered selections are defined in Image Savings Images Settings.</p>
Monitor Settings	
	<p>Conveyor Speed Check Type Select Percentage or Absolute from the drop-down list to determine how the conveyor speed is evaluated.</p> <p>This parameter allows selecting if the speed check error will be calculated as percentage change or absolute value change between two consecutive time intervals.</p>
	<p>Max Conveyor Speed Percent Error (%) In the text field provided, enter the percentage of discrepancy allowed in the conveyor speed before an error is sent to WebSentinel. This option is available when Percentage is selected from the Conveyor Speed Check Type drop-down list.</p>
	<p>Max Conveyor Speed Absolute Error (mm/s) In the text field provided, enter the milliseconds of discrepancy allowed in the conveyor speed before an error is sent to WebSentinel. This option is available when Absolute is selected from the Conveyor Speed Check Type drop-down list.</p>
Video Coding	<p>Tunnel Identifier Enter a character string used to identify the AV7000 Tunnel/Array; usually a number.</p>
	<p>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.</p> <ul style="list-style-type: none"> • 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

Field Name	Action/Definition
	Index communication channel. See section 4.5.5 for Example Protocol Index configuration.
	<p>Max Transmit Distance from System Ref Point (mm [in]) Enter the maximum distance in the field provided.</p> <p>The AV7000 System sends information 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.</p>
	<p>Image Saving Index Number Select a number from the drop-down list. These numbered selections are defined in Image Savings Images Settings.</p>
	<p>Include Dimension Data Select this check box to include packages dimension data with your image.</p>
	<p>Include Parcel Surface Coordinates Select this check box to include package surface coordinates with your image.</p>
SC5000	<p>Heartbeat Timeout Enter a time value in seconds to define the amount of time between two message transmissions. If the input timeout expires and no transmission has occurred, the Heartbeat message will be transmitted.</p>
	<p>SM Start Position When the SC5000 is used as a multiplexor, this identifies which camera the barcode data is being received from.</p>
	<p>Image Saving Index Number Select a number from the drop-down list. These numbered selections are defined in Image Savings Images Settings.</p>
Heartbeat Enable	<p>Select Disable, Unconditioned, or Conditioned from the drop-down list. This parameter is available when Disable, Standard, Advanced, or Custom is selected from the Data Output Protocol drop-down list. It enables/disables the transmission of the Heartbeat message signaling that the device is still active.</p> <ul style="list-style-type: none"> • Disable: The Heartbeat message is not transmitted • Unconditioned: The Heartbeat message is always transmitted, even if communication is still active • Conditioned: The Heartbeat message is transmitted only when there is no communication
Heartbeat Settings	

Field Name	Action/Definition												
Timeout	Enter a time value in seconds to define the amount of time between two message transmissions. If the input timeout expires and no transmission has occurred, the Heartbeat message will be transmitted.												
Header	Click  to activate the Text Entry Tool 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 activate the Text Entry Tool 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. Selections: <table border="0"> <tr> <td>Disable</td> <td>No counter field in the Heartbeat message</td> </tr> <tr> <td>10</td> <td>Counts cyclically from 0 to 9</td> </tr> <tr> <td>100</td> <td>Counts cyclically from 0 to 99</td> </tr> <tr> <td>1000</td> <td>Counts cyclically from 0 to 999</td> </tr> <tr> <td>10000</td> <td>Counts cyclically from 0 to 9999</td> </tr> <tr> <td>Custom</td> <td>Allows defining a custom counter start/stop range from 0 to 10000.</td> </tr> </table>	Disable	No counter field in the Heartbeat message	10	Counts cyclically from 0 to 9	100	Counts 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.
Disable	No counter field in the Heartbeat message												
10	Counts cyclically from 0 to 9												
100	Counts 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 activate the Text Entry Tool and create a separator character(s) to set the Diagnostic Message apart from the heartbeat message.												

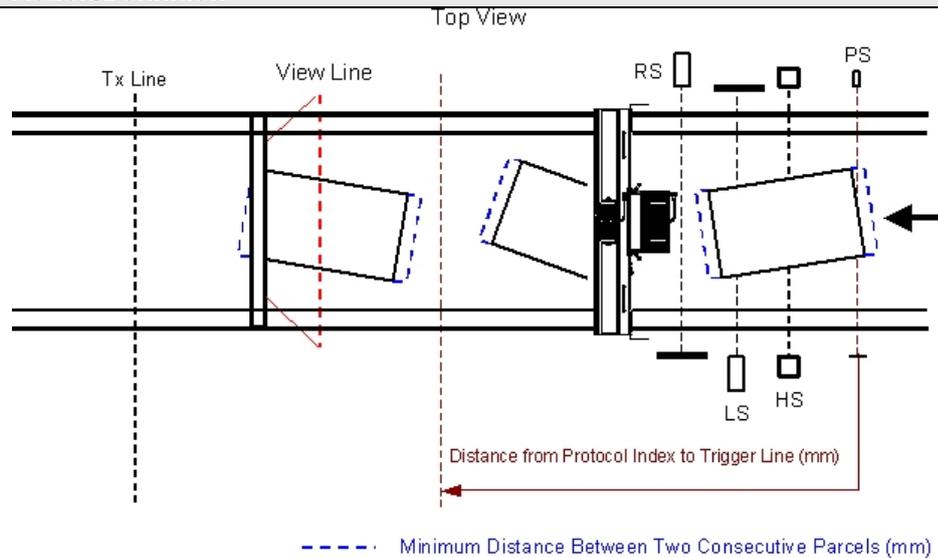
Protocol Index Settings

See section 4.5.5 for Example Protocol Index configuration.

Enable	Select Disable , Without Request Message , or With Request Message from the drop-down list.
Header	Click  to activate the Text Entry Tool 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). Click Submit to save your changes, or click Cancel to return to previous window.

Field Name	Action/Definition
Terminator	<p>Click  to activate the Text Entry Tool 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).</p> <p>Click Submit to save your changes, or click Cancel to return to previous window.</p>
Length Type	<p>Select Variable Length, Length in Message, or Fixed Length from the drop-down list.</p> <p>Selections:</p> <ul style="list-style-type: none"> • Variable Length: The length of the Protocol Index string sent by the Host is variable. • Length in Message: The first byte of the barcode reader 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	<p>Click  to activate the Text Entry Tool and create a No Index String. Click Submit to save your changes, or click Cancel to return to previous window.</p> <p>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.</p>
Request Message	<p>Click  to activate the Text Entry Tool and create a Request Message. Click Submit to save your changes, or click Cancel to return to previous window.</p> <p>This parameter defines the request message which will be sent to the Host by the decoder when the presence of a package is detected.</p>
Delay Request Message	<p>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.</p>
Reference Edge	<p>Select Leading or Trailing from the drop-down list.</p>
Distance to Trigger Line	<p>Enter the distance from the receiving point of the Protocol Index to the trigger line in the field provided.</p> <p>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. It is used together with the Minimum Distance Between Two Consecutive Objects (below) parameter to assign the Protocol Index information to the correct package.</p>

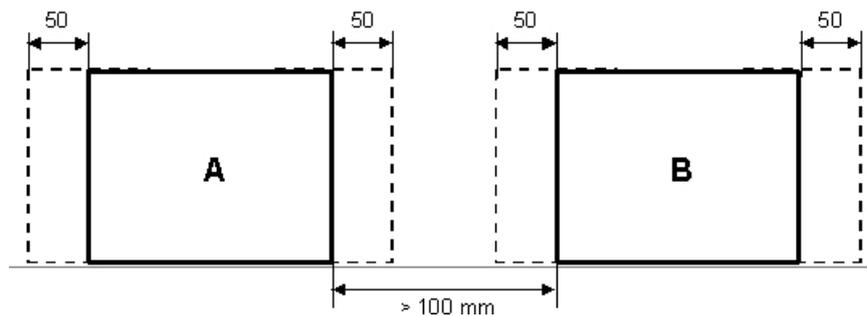
Field Name	Action/Definition
------------	-------------------



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 expect receiving point of the Protocol Index, measured in mm. It is used together with the Minimum Distance Between Two Consecutive Objects (below) parameter to assign the Protocol Index information to the correct package.
---------------------------------------	--

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) 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, a Protocol Index assignment error will occur.
---	---

Example: Minimum Distance Between Two Consecutive Parcels = 100 mm



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.
-----------------	--

Socket: Transport n Settings

Enable	Select the check box to enable User Sockets and reveal the related configuration options.
---------------	--

Type	Socket selected from the drop-down list.
-------------	---

Field Name	Action/Definition
Socket Settings	<p>Socket Type Select TCP Server, TCP Client, UPD, or UDP Multicast from the drop-down list.</p> <p> NOTE: When using the UDP protocol:</p> <ul style="list-style-type: none"> • The User Socket Client Port is bound to the Server Port. • The maximum size for maintaining a whole datagram is 1436 bytes, messages exceeding this value will be fragmented.
TCP Server	
Server Port	Enter the server port number in the field provided. This option is available when TCP Server is selected from the Socket Type drop-down list.
Max Clients	Enter the maximum number of clients in the field provided. This option is available when TCP Server is selected from the Socket Type drop-down list.
TCP Client / UDP/ UDP Multicast	
Device Select	Select a listed named device from the drop-down list.
Enable Client	Select the check box to enable the client and reveal Client Settings options.
Remote Server IP Address	Enter the IP address in the field provided. IP Address provided by the user's system administrator.
Remote Server Port	Enter the remote server port number in the field provided. Port number provided by the user's system administrator.
Data Output Protocol	<p>Select Disable, Standard, Advanced, Crisplant, Beumer, or Custom from the drop-down list. Once selected, the input options for that selection are revealed.</p> <p>See <i>Protocol Specialized Settings</i> above.</p>
Heartbeat Enable	<p>Select Disable, Enable Unconditioned, or Enable Conditioned from the drop-down list. This parameter is available when the Data TX parameter is checked. It enables/disables the transmission of the Heartbeat message signaling that the device is still active.</p> <ul style="list-style-type: none"> • Disable: The Heartbeat message is not transmitted • Enable Unconditioned: The Heartbeat message is always transmitted, even if communication is still active • Enable Conditioned: The Heartbeat message is transmitted only when there is no communication <p>See <i>Heartbeat Settings</i> above.</p>
Protocol Index Settings	See <i>Protocol Index Settings</i> above. Also see section 4.5.5 for Example Protocol Index configuration.

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

4.5.5 Protocol Index Setup Example

Protocol 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.

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 **outgoing** Host message. In this example, transport number **2** is selected.

The screenshot shows the 'Transport List' and 'Transport 2 Settings' configuration interface. The 'Transport List' table has the following data:

Idx	Type
1	Serial
2	Socket
3	Socket
4	Disabled

The 'Transport 2 Settings' section includes the following fields:

- Enable:
- Socket Settings:
 - Socket Type: TCP Server
 - Server Port: 3003
 - Max Clients: 1
- Data Output Protocol: Advanced
- Advanced Formatter Index: 1
- Heartbeat Enable: Disable
- Protocol Index Settings:
 - Enable: Disable

3. Make sure **TCP Server** is selected from the **Socket Type** drop-down list.
4. Enter a viable server port number for your system in the **Server Port** text field.
5. Select **Advanced** from the **Data Output Protocol** drop-down list.
6. Select **1** from the **Advanced Formatter Index**.

7. Select a transport **Idx #** for the *incoming* scale message. In this example, transport number **7** is selected.

The screenshot shows a configuration window titled "Transport List" and "Transport 7 Settings".

Transport List: A table with columns "Idx" and "Type".

Idx	Type
5	Disabled
6	Disabled
7	Socket
8	Disabled

Transport 7 Settings:

- Enable:**
- Socket Settings:**
 - Socket Type: TCP Server
 - Server Port: 3001
 - Max Clients: 1
- Data Output Protocol:** Disabled
- Heartbeat Enable:** Disabled
- Protocol Index Settings:**
 - Enable: Without Request Message
 - Header: <STX>
 - Terminator: <ETX>
 - Length Type: Variable Length
 - No Index String: NoScale
 - Reference Edge: Leading
 - Distance to Trigger Line: 320 mm
 - Min Distance Between Two Consecutive Objects: 25 mm
 - Log Type: Advanced

Buttons: Update, Reset

8. Make sure **TCP Server** is selected from the **Socket Type** drop-down list.
9. Enter a viable server port number for the scale in your system in the **Server Port** text field.
10. Make sure **Disabled** is selected from the **Data Output Protocol** drop-down list.
11. Under the **Protocol Index Settings** section of the screen, select **Without Request Message** from the **Enable** drop-down list. Associated parameters appear.
12. Enter a **Header** and **Terminator** for the incoming message from the scale in the fields provided. Use the Text Entry Tool  to create the Header and Terminator, in this example <STX> and <ETX>.
13. Select a length for the message from the **Length Type** drop-down list. In this example **Variable Length** is selected.

14. Select **NoScale** from the **No Index String** drop-down list. This means “NoScale” will be attached to the outgoing host message if nothing was received from the scale.
15. Select **Leading** from the **Reference Edge** drop-down list. This indicates the front/leading edge of the box is the reference point.
16. In the **Distance to Trigger Line**, enter the measured distance from the trigger to the expected scale transmission location on the conveyor belt. The transmission point from the scale 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.

17. 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.

18. Select **Advanced** from the **Log Type** drop-down list.

Next, navigate to Modify Settings | Global Settings | Output Format | Advanced Formatter. The Advanced Formatter window opens.

Advanced Formatter Definition

Select an Advanced Formatter to Modify: 1

Advanced Formatter 1

[Message Builder](#)

Global Alignment: None

Header: <STX>

Terminator: <CR><LF>

Global No Read Type: Only No Read

Multiple Label Separator: ,

Multiple Code Item Separator: ,

Multiple Global Item Separator: ,

Global Scale Type: Metric

Code Identifier: Disabled

Update Reset

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.

Message Builder

Advanced Formatter 1 - Item List

Idx	Type	Qualifier
<input type="radio"/> 1	Code	Group 1
<input type="radio"/> 2	String	/
<input checked="" type="radio"/> 3	Protocol Index	Transport 7

Advanced Formatter 1 - Item 3 definition

Item Type:

Global Items:

Item Alignment:

Item Format Type:

Scale Type:

Transport Number:

3. Set up a Code (system barcode), and a delimiter to fall between the barcode data and protocol index data from the scale. See **Advanced Formatter Message Building Examples in section 4.5.6**.
4. To add in the scale message (Protocol Index), click **Add**.
5. Select Global from the Item Type drop-down list.
6. Select Protocol Index from the Global Items drop-down list.
7. Select 7 (in this example) from the Transports drop-down list. This was selected as the **Idx #** in **Global Settings | Communications | Transports** (see above).

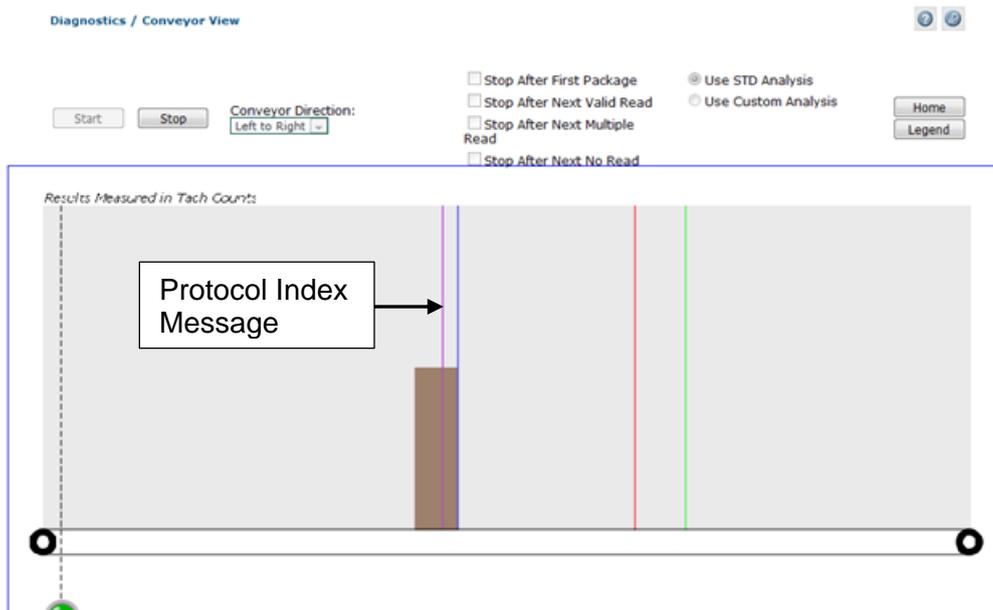
Finally, test the Protocol Index Output

1. Navigate to **Diagnostics | Conveyor View**. The **Conveyor View** window opens.



NOTE: Refer to section 4.7.14 for parameters that must be set to properly use Conveyor View.

2. Run a small package through the system and view the results on the **Conveyor View**.



3. Click **Legend** to determine the line color for the Protocol Index. The color depends on the transport selected to bring in the Protocol Index Message. The line representing the Protocol Index (Scale Message) should fall on the small test package. If it doesn't, adjust the **Distance to Trigger Line** value in the **Transports** window for transport 7.
4. In e-Genius, navigate to **Diagnostics | Device Tracking**. The **Device Tracking** window opens.
5. Again, run the small package through the system. Look at the **Event** Information for transports 2 (in this example) and verify that the information returned is what you expect: <STX>(barcode data)/(Protocol Index Data)<CR><LF> or <STX>94IYEGA52MCHTEST/012.07<CR><LF> in the example below.

Diagnostics / Device Tracking

Start Stop

Event Type	Seq Number	Tach Count	Event Information
TRANSMIT POINT	2	11693	
TX MSG	2	Transport2	<STX>94IYEGA52MCHTEST/012.07<CR><LF>
UNUSED DECODE	2	0	012.07
DECODE RESULT	2	0	94IYEGA52MCHTEST
END TRIGGER	2	11007	Left=0 Right=0 Height=0
START TRIGGER	2	10812	

4.5.6 Modify Settings | Global Settings | Output Format

Use Output Format to format messages:



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 **Global Settings | Output Format | Standard Formatter**. The **Standard Formatter** window opens.

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

Field Name	Action/Definition
Header	Click to activate the Text Entry Tool 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 activate the Text Entry Tool 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 activate the Text Entry Tool 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.

Field Type Select **Variable Length** or **Fixed Length** from the drop-down list. The code field length can be (in number of characters/digits) can be specified in order to be accepted for decoding:

Selections:

- **Variable Length:** All possible code field lengths (in number of characters/digits) allowed for the code selected are accepted.
- **Fixed Length:** Only the length defined by the Code Field Length parameter is accepted.

Field Length Enter a length value in the field provided.

Fill Direction Select **Left** or **Right** from the drop-down list.

Fill Character Click  to activate the **Text Entry Tool** 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.

Selections:

- **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.



NOTE: When Custom is selected, the AIM's industry standard strings are displayed with each code type. These can then be modified.

In each code string option, click  to activate the Text Entry Tool 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 activate the **Text Entry Tool** and create a **Code Identifier** characters.

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.

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.

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

Field Name	Action/Definition
Select an Advanced Formatter to Modify	Select a numeric Advanced Formatter item to modify from the drop-down list.
Message Builder	Click on this link to open the Message Builder 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 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	Enter a length in the field provided. This defines the number of characters added to the leading (Left) or trailing (Right) sides of the message.
Align Filler Char	Click  to activate the Text Entry Tool and create a filler character. These are the characters used leading (Left) or trailing (Right) the message.

Field Name	Action/Definition
Header	Click  to activate the Text Entry Tool 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 activate the Text Entry Tool 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 Code Item Separator	Click  to activate the Text Entry Tool 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 activate the Text Entry Tool 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. Selections: <ul style="list-style-type: none"> • Metric: Metric length units are used • Imperial: Imperial length units are used
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. Selections: <ul style="list-style-type: none"> • 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. <p>In each code string option, click  to activate the Text Entry Tool and create a character string.</p>
List of Code Types	This list appears when Custom is selected from the Code Identifier drop-down list. For each code type, click  to activate the Text Entry Tool and create Code Identifier characters.

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

Message Builder

Use the **Message Builder** window to configure **Standard** or **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.

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:

Field Name	Action/Definition
Advanced Formatter Index	The number displayed represents the Advanced Formatter <i>n</i> Item that was being modified in the Advanced Formatter Definition window.
Message <i>n</i> Item List	
The Items in this list are the fields in the message being transmitted.	
Idx	Displays the index number of the messages.

Field Name	Action/Definition
Item 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 <i>n</i> Definition section of the window (see below).
Add before	Click to add a new message item above the currently selected message.
Add after	Click to add a new message item below the currently selected message.
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.

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 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 tracking mode - 32-bit mask indicating which barcode reader in the network has read the code (when character <1> is present in the related position). In On Line mode - 32-bit mask indicating the lowest unit number barcode reader in the network that read the code (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.
- **Read Count (by device):** Indicates the number of times the code has been read by one specific barcode reader present in the network during the reading phase (selectable among those present).
- **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
- **Code Direction:** Indicates if the code has been read either from either the start character or the stop character.
- **Code Distance:** Indicates the distance from the scan head to the code that was read.
- **Decode Mode:** Indicates if the barcode reader is configured for Linear or Reconstruction (ACR) reading mode.
- **Decode Scans Number:** Indicates the minimum number of decoded scans referred to the single characters in a code when the device is reading in Reconstruction mode. This Item can be used as Code Quality Index

Field Name	Action/Definition
------------	-------------------

- **Average Code Position:** Average position of the code in the scan line (Average of Minimum and Maximum Code Position)
- **Minimum Code Position:** Minimum position of the code in the scan line (closest to the left side/connector side of the barcode reader)
- **Maximum Code Position:** Maximum position of the code in the scan line (farthest from the left side/connector side of the barcode reader)
- **Ink Spread:** Indicates the calculated Ink Spread value. This indicates the sharp or blurry quality of the code
- **Encoder Value:** Indicates the encoder/tachometer pulse value from trigger to the code being read
- **Reading Persistence:** Indicates how many times the laser beam has crossed the complete code during the reading phase



NOTE: Code Direction, Code Distance, Decode Mode, Decode Scans Number, Ink Spread, Laser Number, and Reading Persistence are available only when the associated code is read by the Master device.

Global Item	Select a package related 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
- **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
- **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
- **Image Filename:** Includes the filename of the image

Code Definition Number	Select a Code Definition Number from those available in the drop-down list. This option is available when Item Type > Code Related has been selected.
-------------------------------	--

Text String: Options

Field Name	Action/Definition
Link to Code	Select Disabled , Previous Code , or Next Code from the drop-down list. Selections include: <ul style="list-style-type: none"> • 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
Code Related Item or Package Related Item: Options	
Item Alignment	Select None , Left , or Right from the drop-down list.
Item Alignment Length	Enter an Item Alignment Length in the field provided.
Item Alignment Filler	Click  to activate the Text Entry Tool and create filler text. Click Submit to save your text to the origin window text field, or click Cancel to return to origin window without transferring text.
Code Cutting	Select None , Simple or Pattern from the drop-down list.
	If Simple is selected:
Number of Leading Chars to Cut	Enter the number of characters to cut from the leading edge of the barcode.
Number of Trailing Chars to Cut	Enter the number of characters to cut from the trailing edge of the barcode.
	If Pattern is selected:
Pattern Delimiting Chars to Cut	Enter a character after which, or before which the code will be cut.
Pattern Mode	Select Keep Before , Keep After and Keep Middle to specify which portion of the code will be cut.
Item Data Format	Select Decimal (ASCII) , Hexadecimal (ASCII) , Bitmap (ASCII) , or Numeric (Binary) from the drop-down list.

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

Advanced Formatter Message Building Examples

As an example, here are two messages that could be created:

Message #1 will be an ethernet message on port number 4004.

```
<STX>(2 character sequence #)xx-(code128 barcode)-(code39 barcode)-(parcel length mm)xxxx<CR><LF>
```

Example message: 01-123456789000-450

Message #2 will be a serial message.

<STX>(string of six Xs [xxxxxx] followed by last 4 digits of the barcode),hh:mm:ss<ETX>

Example message: xxxxxx8900,12:59:59



NOTE: In this example the **Barcode Settings Table** is set up to read code 1 as a **code128 4-40** characters barcode, code 2 is set up as a **code39 10** character barcode, and the **Code Combination** selection is set for **Logical Combination**. The **Logical Combination** rule equals **1&2**. **Local No Read(s) Message** is selected for the **No Read Message**.

Start by setting up serial and ethernet connections for three messages:

1. Navigate to **Modify Settings | Global Settings | Communications | Transports**. The **Transports** window opens.

Idx	Type
1	Serial
2	Socket
3	Socket
4	Disabled

Transport 1 Settings

Enable

Use Global Configuration

Data Output Protocol: Advanced

Advanced Formatter Index: 2

Heartbeat Enable: Disable

Protocol Index Settings

Enable: Disable

Update Reset

2. Select the **Serial** option button #1.
3. Select the **Enable** check box.
4. Select **Advanced** from the **Data Output Protocol** drop-down list.
5. Select an index number from the **Advanced Formatter Index**. In this example 2 is selected.
6. Select the **Socket** option button #2 at the top of the **Transports** window.

Transport List

Idx	Type
1	Serial
2	Socket
3	Disabled
4	Disabled

Transport 2 Settings

Enable

Socket Settings

Socket Type: TCP Server

Server Port: 4004

Max Clients: 1

Data Output Protocol: Advanced

Advanced Formatter Index: 1

Heartbeat Enable: Disable

Protocol Index Settings

Enable: Disable

Update Reset

7. Select the **Enable** check box.
8. Select **TCP Server** from the **Socket Type** drop-down list.
9. Enter a **Server Port** in the field provided (4004 in this example).
10. Enter **Max Clients** or the number of devices this Transport will be communicating to 92 in this example).
11. Select **Advanced** from the **Data Output Protocol** drop-down list.
12. Select an index number from the **Advanced Formatter Index**. In this example 1 is selected.
13. Click **Update** to save the changes.

Create Message #1 (<STX>(2 character sequence #)xx-(code128 barcode)-(code39 barcode)-(parcel length mm)xxxx<CR><LF>):

1. Navigate to **Modify Settings | Global Settings | Output Format | Advanced Formatter**. The Advanced Formatter window opens.

Advanced Formatter Definition

Select an Advanced Formatter to Modify: 1

Advanced Formatter 1

[Message Builder](#)

Global Alignment: None

Header: <STX>

Terminator: <CR><LF>

Global No Read Type: Only No Read

Multiple Label Separator: ,

Multiple Code Item Separator: ,

Multiple Global Item Separator: ,

Global Scale Type: Metric

Code Identifier: Disabled

Update Reset

2. Select **1** (to build **Message #1**) from the **Select an Advanced Formatter to Modify** drop-down list. This was set in the **Transports** window **Advanced Formatter Index** selection in the previous steps.
3. For the **Header**, click to activate the **Text Entry Tool** and select **STX** (Start of Text), and click **Submit**.

<STX>

Submit Cancel

NUL	SOH	STX	ETX	EOT	ENQ	ACK	BEL	BS	HT	LF	VT	FF	CR	SO	SI
DLE	DC1	DC2	DC3	DC4	NAK	SYN	ETB	CAN	EM	SUB	ESC	FS	GS	RS	US
SPC	!	"	#	\$	%	&	'	()	*	+	,	-	.	/
0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
P	Q	R	S	T	U	V	W	X	Y	Z	[\]	^	_
`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
p	q	r	s	t	u	v	w	x	y	z	{		}	~	DEL

Extended Characters

4. For the **Terminator** (Trailer), click to activate the **Text Entry Tool** and select **CR** and **LF**, and click **Submit**.
5. Click **Message Builder**. The **Message Builder** window opens.

6. Click **Add**.

7. Select **Global** from the **Item Type** drop-down list.

8. Select **Sequence Number** from the **Global** Item drop-down list.

9. Select **Right** from the **Item Alignment** drop-down list.

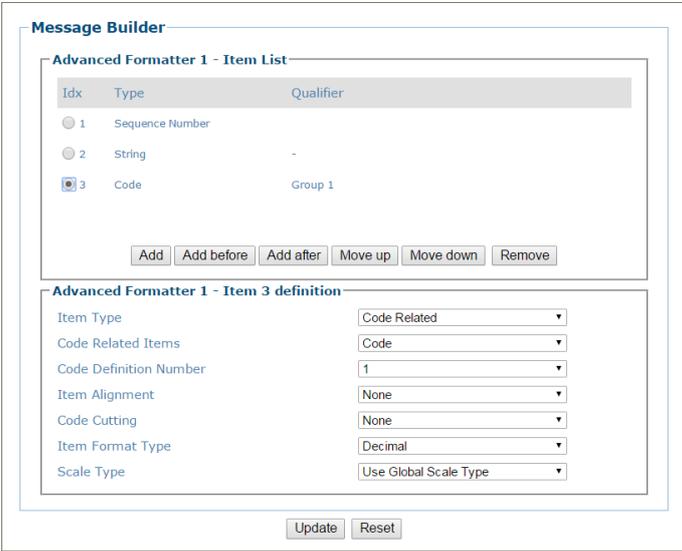
10. Enter 2 in the **Item Alignment Length** text field.

11. Click **Add**.

12. Select **String** from the **Item Type** drop-down list.

13. To create a hyphen separator, click  to activate the **Text Entry Tool**, select the hyphen (-), and click **Submit**.

14. Click **Add**.



The screenshot shows the 'Message Builder' interface. It is divided into two main sections: 'Advanced Formatter 1 - Item List' and 'Advanced Formatter 1 - Item 3 definition'.

Advanced Formatter 1 - Item List: This section contains a table with three columns: 'Idx', 'Type', and 'Qualifier'. The table has three rows:

Idx	Type	Qualifier
1	Sequence Number	
2	String	-
3	Code	Group 1

 Below the table are buttons for 'Add', 'Add before', 'Add after', 'Move up', 'Move down', and 'Remove'.

Advanced Formatter 1 - Item 3 definition: This section contains several configuration options:

- Item Type: Code Related
- Code Related Items: Code
- Code Definition Number: 1
- Item Alignment: None
- Code Cutting: None
- Item Format Type: Decimal
- Scale Type: Use Global Scale Type

 At the bottom of this section are 'Update' and 'Reset' buttons.

15. Select **Code Related** from the **Item Type** drop-down list.

16. Select **Code** from the **Code Related** Item drop-down list.

17. Select **1** from the **Code Definition Number** drop-down list (in this example representing code128).

18. Click **Add**.

19. Select **String** from the **Item Type** drop-down list.

20. To create a hyphen separator, click  to activate the **Text Entry Tool**, select the hyphen (-), and click **Submit**.

21. Click **Add**.

22. Select **Code Related** from the **Item Type** drop-down list.

23. Select **Code** from the **Code Related Item** drop-down list.

24. Select **2** from the **Code Definition Number** drop-down list (in this example representing code39).

25. Click **Add**.

26. Select **String** from the **Item Type** drop-down list.

27. To create a hyphen separator, click  to activate the **Text Entry Tool**, select the hyphen (-), and click **Submit**.

28. Click **Add**.

The screenshot shows the 'Message Builder' window. It has two main sections:

- Advanced Formatter 1 - Item List:** A table with columns 'Idx', 'Type', and 'Qualifier'. It contains four rows:

Idx	Type	Qualifier
4	String	-
5	Code	Group 2
6	String	-
7	Parcel Length	-

 Below the table are buttons: 'Add', 'Add before', 'Add after', 'Move up', 'Move down', and 'Remove'.
- Advanced Formatter 1 - Item 7 definition:** A configuration area for the selected item. It includes:
 - Item Type: Global (highlighted in yellow)
 - Global Items: Parcel Length (highlighted in yellow)
 - Item Alignment: None
 - Item Format Type: Decimal
 - Scale Type: Metric (highlighted in yellow)

At the bottom of the window are 'Update' and 'Reset' buttons.

29. Select **Global** from the **Item Type** drop-down list.

30. Select **Parcel Length** from the **Global Item** drop-down list.

31. Select **Metric** from the **Scale Type** drop-down list.

The resulting Item List should look like this:

The screenshot shows the 'Advanced Formatter 1 - Item List' table with the following data:

Idx	Type	Qualifier
1	Sequence Number	-
2	String	-
3	Code	Group 1
4	String	-
5	Code	Group 2
6	String	-
7	Parcel Length	-

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

Create Message #2 (<STX>(string of six Xs [xxxxxx] followed by last 4 digits of the barcode),hh:mm:ss<ETX>):

1. Navigate to **Modify Settings | Global Settings | Output Format | Advanced Formatter**. The Advanced Formatter window opens.

Advanced Formatter Definition

Select an Advanced Formatter to Modify: 2

Advanced Formatter 2

[Message Builder](#)

Global Alignment: None

Header: <STX>

Terminator: <ETX>

Global No Read Type: Only No Read

Multiple Label Separator: ,

Multiple Code Item Separator: ,

Multiple Global Item Separator: ,

Global Scale Type: Metric

Code Identifier: Disabled

Update Reset

2. Select **2** (to build **Message #2**) from the **Select an Advanced Formatter to Modify** drop-down list. This was set in the **Transports** window **Advanced Formatter Index** selection in the previous steps.
3. For the **Header**, click to activate the **Text Entry Tool** and select **STX** (Start of Text), and click **Submit**.
4. For the **Trailer**, click to activate the **Text Entry Tool** and select **ETX** (End of Text), and click **Submit**.
5. Click **Message Builder**. The **Message Builder** window opens.

Message Builder

Advanced Formatter 1 - Item List

Idx	Type	Qualifier
-----	------	-----------

Add Add before Add after Move up Move down Remove

Update Reset

6. Click **Add**.
7. Select **String** from the **Item Type** drop-down list.
8. In the **Miscellaneous String** field, click to activate the **Text Entry Tool** and enter 6 Xs (xxxxxx).
9. Click **Submit**.
10. Click **Add**.

11. Select **Code Related** from the **Item Type** drop-down list.
12. Select **2** from the **Code Definition Number** drop-down list.
13. Select **Simple** from the **Code Cutting** drop-down list.
14. Enter 6 in the **Number of Leading Chars to Cut** text field.
15. Click **Add**.
16. Select **String** from the **Item Type** drop-down list.
17. To create a comma separator, click  to activate the **Text Entry Tool**, select the comma (,) and click **Submit**.
18. Click **Add**.
19. Select **Global** from the **Item Type** drop-down list.
20. Select **Hours** from the **Global Item** drop-down list.
21. Enter **2** in the **Item Length (Number of Characters)** field.
22. Click **Add**.
23. Select **String** from the **Item Type** drop-down list.
24. To create a colon separator, click  to activate the **Text Entry Tool**, select the colon (:) and click **Submit**.
25. Repeat steps 18-24 two more times substituting **Minutes** and **Seconds** for Hours to create hh:mm:ss (do not add a colon after the seconds).

The resulting Item List should look like this:



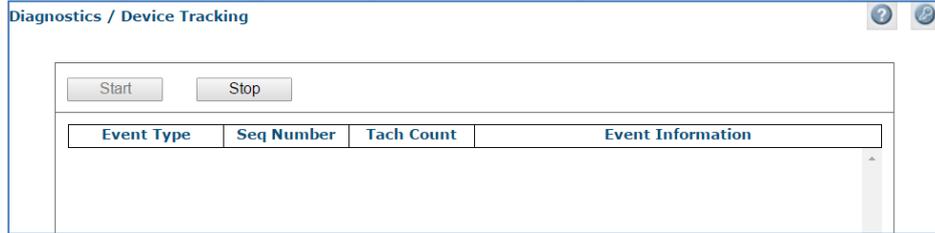
Idx	Type	Qualifier
1	String	xxxxxx
2	Code	Group 2
3	String	,
4	Hours	
5	String	:
6	Minutes	
7	String	:
8	Seconds	

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

Verify Message Format

1. Prepare a box with barcodes matching those to be read by the system. In this example the system is set up to read two barcodes, code 1 as a **Code 128** 4-40 character barcode, and code 2 is set up as a **Code 39** 10 character barcode.

2. In e-Genius, navigate to **Diagnostics | Device Tracking**. The **Device Tracking** window opens.



3. Run the box through the system. Look at the Event Information for transports 1, 2, and 3, and verify that the information returned is what you intended.

Event Type	Seq Number	Tach Count	Event Information
TRANSMIT POINT	1	920	
TX MSG	1	Transport3	<STX>XXXXXX4519,11:10:18<ETX>
TX MSG	1	Transport2	<STX>01-OELC83YH492-0123874519-0387<CR><LF>
TX MSG	1	Transport1	<STX>XXXXXX4519,11:10:18<ETX>
DECODE RESULT	1	0	0123874519
DECODE RESULT	1	0	OELC83YH492
END TRIGGER	1	228	Left=0 Right=0 Height=0
START TRIGGER	1	39	

4.5.7 Modify Settings | Global Settings | Image Saving

Use Image Saving options to configure how images are saved:



Image Saving | Destination Settings

Use **Destination Settings** to configure how and where system images are saved. There are three 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.

Image Destination Settings

Image Destination List

Destination Name	Enabled
Enable Image Dest 1	<input checked="" type="checkbox"/>
Enable Image Dest 2	<input checked="" type="checkbox"/>
Enable Image Dest 3	<input type="checkbox"/>
Enable Image Dest 11	<input type="checkbox"/>
Enable Image Dest 12	<input type="checkbox"/>

Image Index 1 Destination Settings

Destination Type: FTP Server

Server Settings

IP Address: 192.168.3.1

Port Number: 21

Use Global Username:

Username: datalogic

Password: support

PassiveMode:

File Transfer Timeout: 900 sec

Destination Directory: upload

Image Index 2 Destination Settings

Destination Type: FTP Server

Server Settings

IP Address: 192.168.3.110

Port Number: 21

Use Global Username:

Username: mx80

Password: mx80

PassiveMode:

File Transfer Timeout: 900 sec

Destination Directory:

Update Reset

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

Field Name	Action/Definition
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.
Destination Type	Select File System , FTP Server , or External Viewer from the drop-down list to save to a remote file system server. Selections: <ul style="list-style-type: none"> • Network Files System: Reveals options for saving to an external file system folder • File System: Reveals options to save to an existing file system folder • FTP Server: Reveals options to save to an FTP server • 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
File System Options	
Server Path	Enter the file path for an existing destination directory folder. Example: \\mymachine\dirname
Username	Enter a user name for the server.
Password	Enter a password for the server.
Images from Different Cameras Saved to:	Select Same Directory or Different Directory. <ul style="list-style-type: none"> • Same Directory: All cameras will copy images into the same folder. • Different Directory: Each camera will create a sub-folder using its camera name as its sub folder name.
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.
FTP Server Settings	
IP Address	Enter the address of the FTP server.
Port Number	Enter the port number of the FTP server.
Use Global Username	Select the check box to enable an FTP username field, or deselect the check box to enable the individual camera user name.
Username	The User Name for logon to the FTP server. Default = anonymous.

Field Name	Action/Definition
Camera N Username	When Use Global Username is NOT checked, enter a username for the numbered camera.
Password	The Password for logon to the FTP server. Default = anonymous.
Passive Mode	Select the check box to enter passive mode.
File Transfer Timeout	Enter a time out value in seconds. This sets the polling cycle in seconds for sending the keepalive signal to the Server so that the connection is maintained even if no data is sent.
Destination Directory	Enter the path of the FTP server directory as follows: \datalogic\images, without indicating any volume, because the FTP connection already points to the correct volume (for example: D:\).
External Viewer	
Destination IP Address	Enter the IP address of the external PC on which the image viewer is installed, in the field provided.
On Camera	
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	
Enable	Select the check box to enable maintenance of the saving folder based on the options presented.
Max Number of Files	Enter the maximum number of files allowed in the saving folder. When this number is exceeded, the older files are deleted.
Max Total Size	Enter the maximum amount of disk space allowed in the saving folder. When this number is exceeded the older files are deleted. Set the parameter to 0 to disable.
Max File Age	Enter the maximum age of a file allowed. When this number is exceeded the older files will be deleted. Set the parameter to 0 to disable.

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

Image Saving | 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.

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

Field Name	Action/Definition
Image Settings List	Select the option button adjacent to the item you wish to create or modify.
Image Index <i>n</i> Settings	
Enable	Select the check box 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.

Field Name	Action/Definition
Downsample	Select None , 2 , or 4 from the drop-down list.
JPEG Quality	<p>Only available when JPEG is selected. Select a quality percentage from the drop-down list.</p> <p>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 1 to 100.</p>
Cropping Mode	<p>Select Disabled or Crop to Object from the drop-down list.</p> <p>The standard option provides cropping on the start and stop edges of the parcel image. The Crop to Object option is used to have a 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.</p>
Left and Right Margin	Specify the left and right margins in pixels.
Metadata	<p>Select Disabled, Embedded, or External File from the drop-down list.</p> <p>Selections:</p> <ul style="list-style-type: none"> • Disabled: Metadata not used • Embedded: Metadata is embedded with the image • External File: Metadata is saved to an external file.
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	<p>Select On Standard Analysis, All, or On Custom Analysis from the drop-down list.</p> <p>Selections:</p> <ul style="list-style-type: none"> • On Standard Analysis: Allows you select the image criterion from the options below. • All: Sends out all images. • On Custom Analysis: Allows you select the image criterion from the options below as well as defining the transport through which it is sent.
 NOTE: This is only available when custom software is being used and custom analysis may be required.	
Custom Analysis Host Transport	Select a host transport number from the drop-down list. These are the configured transport options created in Modify Settings Global Settings Communications Transports .

Field Name	Action/Definition
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 partial read images.
Save Significant	Select the check box to save an image only if it has contributed to the 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 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 <i>n</i> Specific String	Enter a string to be included identifying the specific camera name (example: top).
Number of Items in Filename	Select a number from 1 to 16 from the drop-down list.

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 (yyyymmdd)
- **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.

Transport Number	Select a transport number from the drop-down list
Cutting Mode	Select Disabled or Simple from the drop-down list. When Simple is selected from the options below are revealed.

Field Name	Action/Definition
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.



NOTE: See section 4.5.5 for Example Protocol Index configuration.

- **String:** 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.

- **Code:**

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.

- **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.

Field Name	Action/Definition
Align Length	<p>Enter the number of characters to fill with the Align Filler Character.</p> <p>Align Length is the number of characters to fill if the counter value is less than the maximum number. Its main purpose is to make the field length consistent no matter what the counter value.</p> <p>Example:</p> <p>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)</p>
Align Filler Char	Enter a filler character to use with Align Length .

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

4.5.8 Modify Settings | Global Settings | 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 PC server located on the east coast.

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:

Field Name	Action/Definition
Time Servers	
SNTP Server Address N	Enter the IP address for the servers you wish to synchronize.
Device to synchronize time in the cluster	
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 the selected device.

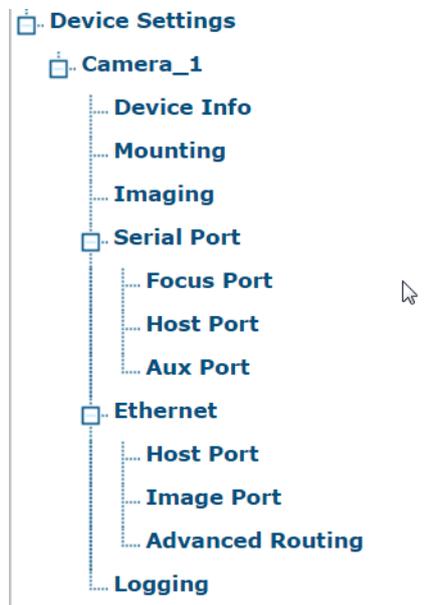


NOTE: All time references (timestamps, logging, etc.) are in UTC time.

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

4.6 MODIFY SETTINGS | DEVICE SETTINGS

Use the Device Settings menu tree selections 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:



4.6.1 Modify Settings | Device Settings | <Camera Name> | Device Info

Use the **Device Info** window to view information about each device in the system including description, serial number, and address.

To view the Device Info window:

1. In the menu tree under Modify Settings, navigate to Device Settings | <Camera Name> (if applicable) | Device Info. The **Device Info** window opens.

A screenshot of the 'Device Settings for Camera 1' window. The window is titled 'Device Settings for Camera 1' and contains two main sections: 'Device Information' and 'Ethernet Ports'. The 'Device Information' section has two rows: 'Conventional Name' with the value 'Camera 1' and 'Serial Number' with the value 'A14A00011'. The 'Ethernet Ports' section has four rows: 'SyncNet MAC Address' with '00:0E:13:06:00:28', 'SyncNet IP Address' with '192.168.0.145', 'Image Port MAC Address' with '00:13:95:10:34:0B', and 'Host Port MAC Address' with '00:0E:13:06:00:27'. At the bottom of the window are two buttons: 'Update' and 'Reset'.

2. View the following camera information:

Field Name	Definition
Camera Name	Enter a unique name for the camera. 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) \$! ' " : @ + ` =
Serial Number	Displays the serial number sent by the device.
Ethernet Ports (These fields are not editable)	
SyncNet MAC Address	Displays the MAC (media access control) address of the device.
SyncNet IP Address	Displays the IP address sent by the device.
Image Port MAC Address	Displays the Image Port MAC Address sent by the device.
Host Port MAC Address	Displays the Host Port MAC Address sent by the device.

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

4.6.2 Modify Settings | Device Settings | <Camera Name> | 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. View the following barcode reader information:

Field Name	Definition
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.
Mirroring	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. 0 = centered on Y. This defines the center of the cropped image.
Automatic Calibration Parameters	

Field Name	Definition
Mounting Calibration Wizard	Click to open the Mounting Calibration Wizard (see section 4.6.3). This is used during initial static calibration only.
View Angle	Enter an angle (degrees) in the field provided. 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), but may be changed during dynamic calibration. 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 RangeFinder or DM3610 Dimensioner). This field is automatically filled in during the static calibration of the unit (Calibration Wizard), but may be changed during dynamic calibration.
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), but may be changed during dynamic calibration.
Global Gain with Continuous Illumination	Enter the gain value. A typical value would be 1.0. This parameter sets the gain in the image to create the contrast between the dark and light elements in the image. This field is automatically filled in during the static calibration of the unit (Calibration Wizard), but may be changed during dynamic calibration.
Global Gain with Pulsed Illumination	Enter the gain value. This parameter is only used when Pulsed Illumination Enable is selected in Modify Settings Device settings Camera x Imaging . This parameter sets the gain in the image to create the contrast between the dark and light elements in the image. This field is automatically filled in during the static calibration of the unit (Calibration Wizard), but may be changed during dynamic calibration.

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

4.6.3 Mounting | Mounting Calibration Wizard

For complete information on using the **Mounting Calibration Wizard**, see *section 5.3*.

4.6.4 Modify Settings | Device Settings | <Camera name> | Imaging

Use the **Imaging** window to configure how images are handled by the selected camera.

To view the Imaging window:

1. In the menu tree under **Modify Settings**, navigate to **Device Settings | <Camera name> | Imaging**. The **Imaging** window opens.

Imaging for Camera_1

Illumination Settings

Illumination Pre-Power Enable

Illumination Stay-On Time sec

Pulsed Illumination Enable

Pulsed Acq Delay ns

Optics

DPI

LPI

Focusing

Focus Mode

Focus Settings

Use Focus Data to Detect Spacing Violations

Trigger Extends

Leading Edge mm

Trailing Edge mm

Hold Last Focus, Gain, Zoom Point mm

Gain

Gain Mode

Gain Settings

Tracking Offset mm

Horizontal (Scanline) Digital Zoom

Horizontal Digital Zoom Enable

Data Masking

Data Masking Enable

2. View the following barcode reader information:

Field Name	Definition
Illumination Settings	
Illumination Pre-Power Enable	Select the check box to enable. This puts the illumination in a power saving mode that allows it to power up to full mode faster.
Illumination Stay-On Time	Enter a value in seconds. This determines how long the illumination will stay on after the end of the trigger cycle.
 NOTE: If Direct Encoder is enabled in Modify Settings Global Settings Operating Mode (see section 4.5.1), the Illumination Stay-On Time needs to be greater than the amount of time the conveyor will be stopped in a start/stop configuration.	
Pulsed Illumination Enable	Select the check box to enable pulsed illumination and reveal the related option.
Pulsed Acq Delay	Enter the Pulsed Acq (Acquisition) Delay in nanoseconds in the field provided. The default value is zero.
<p>This option is used to synchronize the illumination in an application where there are multiple cameras in a tunnel and the illuminator lobes cross over the conveyor, possibly causing interference (See 1.4). This allows the mounting structure to be reduced in size.</p> <p>If a bright glare spot appears in the AV7000 Live Image Viewer when an image is acquired, this may indicate interference of crossing illuminator lobes. Increase the Pulsed Acq Delay value incrementally until the bright spot disappears.</p>	
Optics	
 CAUTION: After running the Calibration Wizard, changes should ONLY be made to the DPI/LPI as directed by Datalogic Support. Changing DPI/LPI may have a negative effect on the quality of the image which may result in no reads.	
DPI	Enter the minimum allowable DPI (Dots Per Inch) in the field provided.
<p>This parameter expresses the minimum resolution (in the X direction) in Dots Per Inch (DPI), supported by the camera. The minimum resolution is typically defined at the maximum reading distance.</p> <p>This field is automatically filled in during the static calibration of the unit but may be changed during the dynamic calibration step</p>	
LPI	Enter the minimum allowable LPI (Lines Per Inch) in the field provided.
<p>The LPI should match the DPI at the far scanning point. This matching of the DPI to the LPI assures the pixels are not out of square, which can cause a no read.</p>	
Focusing	
Focus Mode	Select Profile or Fixed from the drop-down list.
<p>When Profile is selected, the light curtain, RangeFinder, or DM3610 will provide the profile of the package.</p>	

Field Name	Definition
Use Focus Data to Detect Spacing Violations	When Profile mode is selected, select this check box to use focusing data and not photoeye, to identify whether there is a spacing violation.
Fixed Focus Value	<p>When Fixed mode is selected, enter the fixed focus value in the field provided.</p> <p>This parameter indicates the fixed focus position used when the position sensor related to the camera is not used. The possible values are from 0 to 32767 mm where 0 is the farthest valid station reading distance from the camera. The default setting is 0.</p> <p>0 (zero) is referenced from the camera sensor.</p> <p>This distance must be greater than the Far Working Distance (Z) set in the Device settings>camera>mounting>automatic calibration parameters.</p>
Trigger Extends	
Leading Edge	Enter the distance to extend the trigger phase beyond the leading edge of the package.
Trailing Edge	Enter the distance to extend the trigger phase beyond the trailing edge of the package.
Hold Last Focus, Gain, Zoom Point	Enter the distance to hold the latest focus, gain, and zoom.
Gain	
Gain Mode	Select Profile or Fixed from the drop-down list.
Tracking Offset	<p>When Profile mode is selected, enter the tracking offset in the field provided.</p> <p>The Height sensor can be positioned either above or below the 0 focus height as shown in the figures. However it should not be positioned above the level of the tray/box. In this case the tray/box would never be detected so the Tracking Offset must be set to compensate. This Offset then is added to the Percentage of Tray Depth to Set AF therefore degrading the focus precision.</p>
Fixed Exposure Value	This sets a fixed exposure time to optimize the quality of the acquired image
Fixed Gain Value	This option is only used for testing. It should be set to Normal for regular operation.
Horizontal (Scanline) Digital Zoom	
Horizontal Digital Zoom Enable	Select the check box to enable.
Data Masking	
Data Masking Enable	Select the check box to enable the Data Masking options. This enables options for Line Length , Line Start , and Line End that allows you to isolate a portion of scanning area.

Field Name	Definition
Line Start	Enter a value in pixels in the field provided.
Line End	Enter a value in pixels in the field provided.

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

4.6.5 Modify Settings | Device Settings | <Camera Name> | Serial Port

Use the Serial Port menu tree selections to set up communications through the serial Port. If necessary, you can later make modifications to the device settings using the same menu selections, including:



Serial Port | Focus Port

Use the **Focus Port** window to configure communication between the barcode reader and the focusing device. The focus port is only used to match the focus device's communication configuration (light curtain, RangeFinder, DM3610).

To edit the Focus Port settings:

1. In the menu tree under Modify Settings, navigate to **Modify Settings | Device Settings | Camera N | Serial Ports | Focus Port**. The **Focus Port** window opens.

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

Field Name	Action/Definition
Use Global Configuration	Select the check box when using a serial focus device for one or more cameras.
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.

Field Name	Action/Definition
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.

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

Serial Port | Host Port

Use the **Host Port** window to configure communication between the barcode reader and the Host, or, in a multi-sided layout, between the Master and a Host.

To edit the **Host Port** settings:

- In the menu tree under Modify Settings, navigate to **Modify Settings | Device Settings | Camera N | Serial Ports | Host Port**. The **Host Port** window opens.

- Enter the appropriate information in the form as described below:

Field Name	Action/Definition
Use Global Configuration	Select the check box to use the same "Global" configuration for all of the cameras in an array/tunnel. If not selected, the settings will be used for the currently selected camera.
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.

Field Name	Action/Definition
Serial Communication Type	Select RS422 Full Duplex or RS232 from the drop-down list.

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

Serial Port | Aux Port

Use the **Aux Port** window to configure communication between the barcode reader and the Host, or, in a multi-sided layout, between the Master and a Host.

To edit the **Aux Port** settings:

- In the menu tree under Modify Settings, navigate to **Modify Settings | Device Settings | Camera N | Serial Ports | Aux Port**. The **Aux Port** window opens.

- Enter the appropriate information in the form as described below:

Field Name	Action/Definition
Use Global Configuration	Select the check box to use the same "Global" configuration for all of the cameras in an array/tunnel. If not selected, the settings will be used for the currently selected camera.
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.

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

4.6.6 Modify Settings | Device Settings | <Camera Name> | Ethernet

Use the Ethernet menu tree 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

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.

Host Port Settings for Camera 1

Enable DHCP

IP Address

Subnet Mask

Gateway

Auto DNS Enable

DNS Address



NOTE: In a multi-headed system each AV7000 will have its own host option.

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

Field Name	Action/Definition
Enable DHCP	Select the check box to use addresses assigned by a DHCP server. When 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).

Field Name	Action/Definition
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.

- 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:

- In the menu tree under Modify Settings, navigate to **Modify Settings | Device Settings | Camera N | Ethernet | Image Port**. The **Image Port** window opens.

- Enter the appropriate information in the form as described below:

Field Name	Action/Definition
Enable DHCP	Select the check box to use addresses assigned by a DHCP server. When 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.

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

4.6.7 Ethernet | Advanced Routing

Use the **Advanced Routing** window to make a string command to route to your network.

To edit the Image Port settings:

- In the menu tree under Modify Settings, navigate to **Modify Settings | Device Settings | Camera N | Ethernet | Advanced Routing**. The **Advanced Routing** window opens.

Add a Route for RIGHT_BACK

Network IP: 155.110.128.68
Network Mask: 255.255.255.255
Interface: Any (automatic)
Gateway (optional): 172.16.173.129

Advanced Route Settings

-net 155.110.128.68 netmask 255.255.255.255 gw 172.16.173.129	Remove
	Remove

Click Add Route To create the to route as shown below.

Update Reset

- Click **Update** to save or **Reset** to revert to previously saved fields.

4.6.8 Modify Settings | Device Settings | <Camera Name> | Logging

Use the **Logging** configuration window to configure how and what information is logged (saved).

To view the **Logging** configuration window:

3. In the menu tree under Modify Settings, navigate to **Device Settings | Camera # (if applicable) | Logging**. The **Logging** window opens.

4. View the following camera information:

Field Name	Action/Definition
Advanced Logging	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.

5. When you have finished making changes, click **Update** to save or click **Reset** to revert to the 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 use during troubleshooting.

Enabling Advanced Logging may fill the event buffer with unimportant information and overwrite important information.

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:

Field Name	Action/Definition
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	<p>Advanced Logging allows the user to modify logging parameters in several categories, including:</p> <ul style="list-style-type: none"> • Everyone • Process Manager

Field Name	Action/Definition
	<ul style="list-style-type: none">• Status Monitor• Log Manager• Config Manager• Package Collector• FPGA• Decode Engine• Host• Web Manager• Communication• Image Saving Master• Image Saving• RT Manager• Protocol Index• SimRangeFinder• RF Manager• Web Sentinel• DM Manager• Image Processing

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

4.7 DIAGNOSTICS

Use the **Diagnostics Menu Tree** selections to monitor system performance and identify maintenance or device degradation issues. You can continually monitor system performance using the following selections:



4.7.1 Diagnostics | System Status

Use the 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.

The screenshot displays the System Status window. It is divided into two main sections. The top section, labeled 'Global Status', shows overall system metrics. The bottom section, labeled 'Status for Specific Devices', shows a table of device-specific performance data. Below the table are navigation buttons and a detailed view of the current sequence number and trigger/volumetric data.

Belt Speed(mm/s)	2403
Belt Speed(fpm)	473
Total Packages	1836
Good Reads	1
No Reads	8
Multiple Reads	1827
Read Rate	99.56%
Reset Counts	

Online	Status	Device Name	Good Reads	Multiple Reads	No Reads	Read Rate
●	●	Top	1	1827	8	99.56%
●	●	Right Back	0	0	1836	0.00%
●	●	Left Front	0	1	1835	0.05%
●	●	Right Front	0	0	1836	0.00%
●	●	Left Back	0	0	1836	0.00%
●	●	Bottom	0	362	1474	19.72%

|< || >|

Sequence Number 1837

Trigger:
TachStart..... 15185269
TachEnd..... 15186220
TachLength.... 951

Volumetric:
LeftPosition.... -20000
RightPosition... 18321
DimReady..... false
LegalForTrade... false
Length..... 0
Width..... 0
Height..... 0
Volume..... 0
Angle..... 0

2. From the System Status window, the following information is available:

Tunnel/Array Statistics

Belt Speed(mm/s) Shown in millimeters per second.

Belt Speed(fpm) Shown in feet per minute.

Total Packages Package count since last reset.

Good Reads Number of good packages read since last reset.

Tunnel/Array Statistics

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.

Reset Counts (button) Click to reset the counts to zero.

Camera Statistics **Statistics for each system camera are shown in rows with the following columns:**

Online **Green** indicates the camera is connected to the cluster.
Red indicates the camera is not connected to the cluster.

Status **Green** indicates the camera is functioning correctly.
Red indicates the camera has posted an error.

Camera Name Displays the camera/device name.

Click the device name to view details about that specific device:

Camera Name:	Top	Position:	Top
Camera Statistics			
Belt Speed(mm/s)	2432		
Total Packages	1849		
Valid Reads	1		
No Reads	8		
Multiple Reads	1840		
Read Rate	99.6%		
Decoder Details			
Online	Status	IP Address	MAC Address
		192.168.0.164	00:0E:13:06:00:20
Software Name	UPS		
Software Version	0.14.0.0		
Decoder Name	BLR_VLS.07.20D_LNX		
Configuration Update Count	4556		
Diagnostic Messages	Decoder load warning		
Real-Time Processor Details			
Online	Status	IP Address	MAC Address
		192.168.00.188	00:0E:13:06:00:C9
Software Version	0.14.0.0		
FPGA Version	1.4.0		
My Decoder's MAC	00:0E:13:06:00:20		
My Decoder's IP	192.168.0.164		
Total Packages	1849		
Diagnostic Messages	No active Errors or Warnings		

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.

Tunnel/Array Statistics

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
 - **Volumetric:** general package size/position
 - **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:** General message data
 - **Decode Results:** Posts the barcode data and indicates the camera that read the code
 - **Decoding Status:** Displays barcodes and which camera(s) read them
 - **Image Saving:** Image links are provided for each named camera in the system
 - **Sequence Number:** Identifies the total number of packages with history stored in the camera
-

4.7.2 Diagnostics | System Health

Use the **System Health** to get specific functional details on each device in the system.



WARNING: Accessing the **System Health** window during operation can cause lost package data.

To access the **System Health** window:

1. In the menu tree under **Diagnostics**, click **System Health**. The **System Health** window opens.

Camera_1	
Date and Time	Fri Dec 16 14:54:47 UTC 2016
Motherboard	
Board Name	BQ77
Board Sub Name	TS77
Manufacturer Name	OEM
Manufacturer Code	13
Manufacturer Date	2013.06.28
Serial Number	000001324569
Part Number	046504
EAN	04250186191863
Product Rev	A.0 (0x4130)
System BIOS Rev	510
BIOS Interface Rev	100
BIOS Interface Build Rev	001
Boot Counter	950
Running Time	20612 hours
Temperature Sensors	
Current Board Temperature	42 degrees C
Current Environment Temperature	44 degrees C
Current CPU Temperature	48 degrees C
Voltage Sensors	
Current Core A Voltage	0.914 V
Current 3.3V Standby Voltage	3.300 V
Current 5V Standby Voltage	5.26 V
Current Battery Voltage	3.184 V
Current 12V Supply Voltage	12.187 V
System Configuration	
Serial Number	A14P00003
CCD Length	8192 pixels
Pixel Size	7 microns
Lens Focal Length	140.25 mm
Lens Focal Length Offset	31.92 mm
Minimum Range	1550 mm
Maximum Range	4650 mm
Focus Table Num Coefficients	7
Focus Table Coefficient #1	36819
Focus Table Coefficient #2	-36.2642
Focus Table Coefficient #3	0.0142535
Focus Table Coefficient #4	-2.13544E-06
Focus Table Coefficient #5	-1.22028E-10
Focus Table Coefficient #6	7.02702E-14
Focus Table Coefficient #7	-5.63496E-18
Temperature Compensation Num Coefficients	4
Temperature Compensation Coefficient #1	-0.54088
Temperature Compensation Coefficient #2	-0.0055341
Temperature Compensation Coefficient #3	1.8421E-06
Temperature Compensation Coefficient #4	-1.7526E-10
Focus Mechanism	
Hardware Version	-1
Software Version	-1
Number of Cycles	319
Temperature	30.0 degrees C
Sensor Board	
Model	BL_CM_08K07A_50_R
Microcode	03-081-20301-02
CCI	03-110-20296-01
FPGA	03-056-20469-01
Serial #	14015691
BiST:	Good
DefaultSet	1
Ext Trig	On
Meas L.R.	9 [Hz]
Meas CC1.	0 [Hz]
Max L.R.	38387 [Hz]
Exp. Mode	TriggerWidth
Meas E.T.[0]	25050 [ns]
Max E.T.	3000000 [ns]
Test Pat.	0:Off
Flat Field	Off
Offset	1
System Gain	1.30
Mirror	Off
CL Speed	66MHz
Illumination	
Model Number	
Serial Number	
Software Version	
On Time	1 Hours
Total Run Time	261 Hours
Number of Processors	0

2. 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.

4.7.3 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.

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	Tach	Trigger	GPIO	Output 1	Output 2
Right_Front	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Toggle	<input checked="" type="checkbox"/> Toggle
Bottom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Toggle	<input type="checkbox"/> Toggle
Top	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Toggle	<input checked="" type="checkbox"/> Toggle
Right_Back	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Toggle	<input type="checkbox"/> Toggle
Left_Back	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Toggle	<input type="checkbox"/> Toggle
Left_Front	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Toggle	<input type="checkbox"/> Toggle

2. Click Toggle next to the correct camera I/O to send data from the I/O to the PLC.

4.7.4 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. Displays serial messages received.

Camera Name	Serial Port	Incoming Data (last 16 decimal bytes)
Right_Front	Focus	003 255 000 000 000 000 000 000 000 000 000 000 000 000 000 000
	Host	
Bottom	Focus	
	Host	
Top	Focus	
	Host	
Right_Back	Focus	
	Host	
Left_Back	Focus	
	Host	
Left_Front	Focus	
	Host	

4.7.5 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**, and 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
END TRIGGER	1912	15687800	Left=-20000 Right=20000 Height=0
START TRIGGER	1912	15686869	
TRANSMIT POINT	1911	15683077	
TX MSG	1911	Transport1	<STX><CAN><CR><LF><CAN><CR><LF>...
DECODE RESULT	1911	0	[]><RS>01<GS>96280780000<GS>840<GS>000
DECODE RESULT	1911	0	1Z1693210340308436
DECODE RESULT	1911	0	42028078
END TRIGGER	1911	15679140	Left=-20000 Right=20000 Height=0
START TRIGGER	1911	15678289	
TRANSMIT POINT	1910	15676802	
TX MSG	1910	Transport2	192.168.3.13,SCANNER,,,SCAN_DATA2,000001910
TX MSG	1910	Transport1	<STX><CAN><CR><LF><CAN><CR><LF>...
DECODE RESULT	1910	0	[]><RS>01<GS>96280780000<GS>840<GS>000
DECODE RESULT	1910	0	42028078
DECODE RESULT	1910	0	1Z1693210342481610
END TRIGGER	1910	15672865	Left=-20000 Right=20000 Height=0
START TRIGGER	1910	15671949	
TRANSMIT POINT	1908	15665587	
TX MSG	1908	Transport1	<STX><CAN><CR><LF><CAN><CR><LF>...
DECODE RESULT	1908	0	42028078
DECODE RESULT	1908	0	1Z1693210340730229
DECODE RESULT	1908	0	[]><RS>01<GS>96280780000<GS>840<GS>000
END TRIGGER	1909	15664690	Left=-20000 Right=20000 Height=0
START TRIGGER	1909	15663789	
END TRIGGER	1908	15661650	Left=-20000 Right=20000 Height=0
START TRIGGER	1908	15660714	
TRANSMIT POINT	1907	15656942	
TX MSG	1907	Transport1	<STX><CAN><CR><LF><CAN><CR><LF>...
DECODE RESULT	1907	0	[]><RS>01<GS>96280780000<GS>840<GS>000
DECODE RESULT	1907	0	1Z1693210340308436

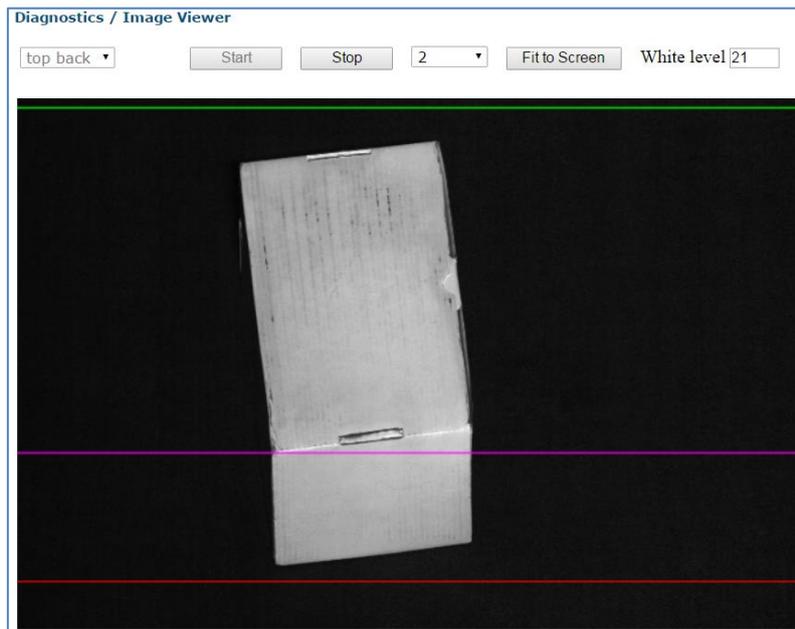
2. Click Start for a continuous feed of Event Type, Seq(ue)nce Number, Tach(ometer) Count, and Event Information data.
3. Click Stop to pause the feed.
4. Click on a **TRANSMIT POINT** link to view specific transaction data and image of last package.

4.7.6 Diagnostics | Image Viewer

Use the **Image Viewer** window to view encoder/tachometer and trigger event information. See *section 5.3* for information on using Image Viewer during AV7000 calibration.

To access the Image Viewer window:

1. In the menu tree under **Diagnostics**, click **Image Viewer**. The **Image Viewer** window opens.



The following colored lines indicate where the device sees certain parts of the package.

Green: Indicates Start of Trigger

Purple: Indicates where the focus source perceives the transition corner of the box.

Red: Indicates End of Trigger

2. Select a device (named camera) from the drop-down list.
3. Click **Start** to view live captured images.

When the **Image Viewer** captures an image of the box, it displays a purple line in the image to indicate the **Focusing Data Transition Point**, which should align with the leading edge of the corner of the box.

The **White Level** is displayed based on where the cursor is positioned.

4. 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.



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.

5. Click **Stop** to cease capturing images.
6. Click **Fit to Screen** to zoom the image to fill the view window.

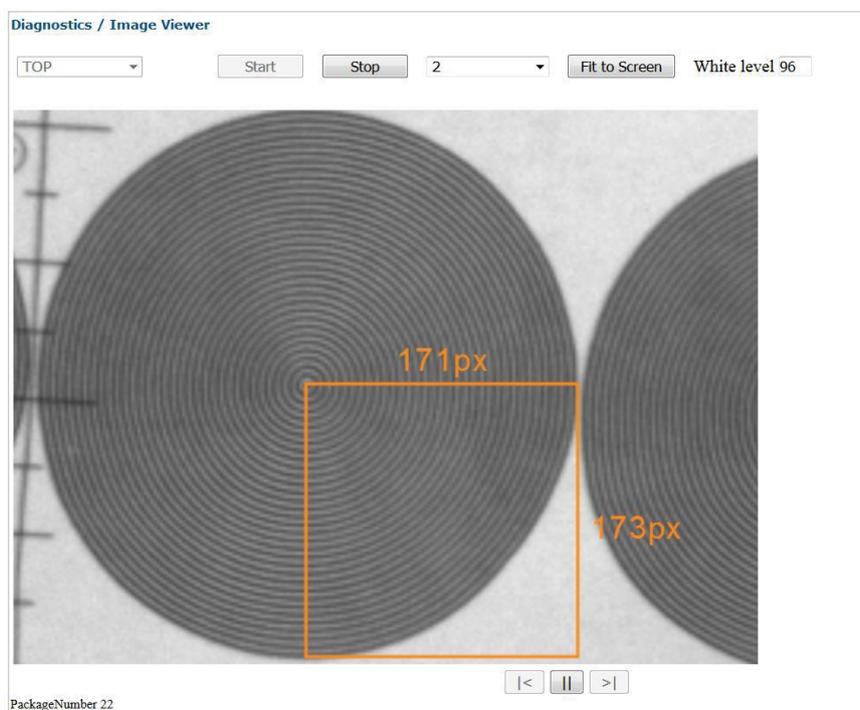
Controls:

- 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.

LPI/DPI Tool

The Image Viewer can also be used to check the **Lines per Inch (LPI)** and **Dots per Inch (DPI)** of an image. For information on when this tool is used, see *section 5.3*.

1. Prepare a test box with the **Dynamic Focus Target** that is included with each AV7000 camera.
2. With the Image Viewer open, click Start, and run the box through the system.
3. Zoom in to the captured image of the **Dynamic Focus Target** so one of its circles fills the screen.
4. With the mouse cursor, click and drag a graphic box from the middle of the center dot to the outer edges of the outer circle as shown below. The graphic displays the LPI and DPI of the box. Adjustments can then be made in **Modify Settings | Device Setting | <Camera name> | Imaging** to square the image (see *section 4.6.4*), but **ONLY as directed by Datalogic Support**.

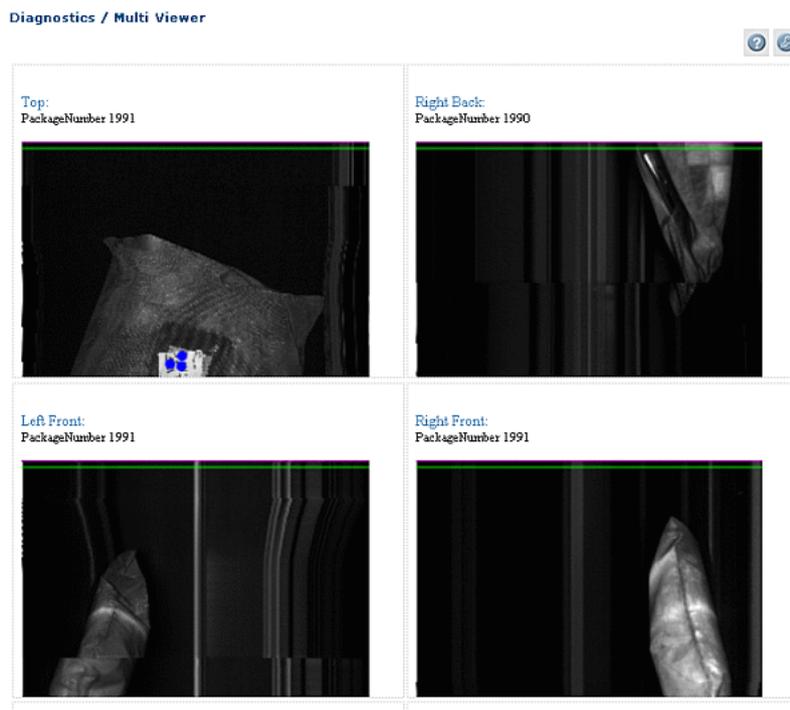


4.7.7 Multiple Camera Viewer (Multi Viewer)

The **Multiple Camera Viewer** allows you to view low resolution images from all system AV7000s at the same time during a trigger cycle. The number of images shown depends on the number of AV7000 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.



Controls:

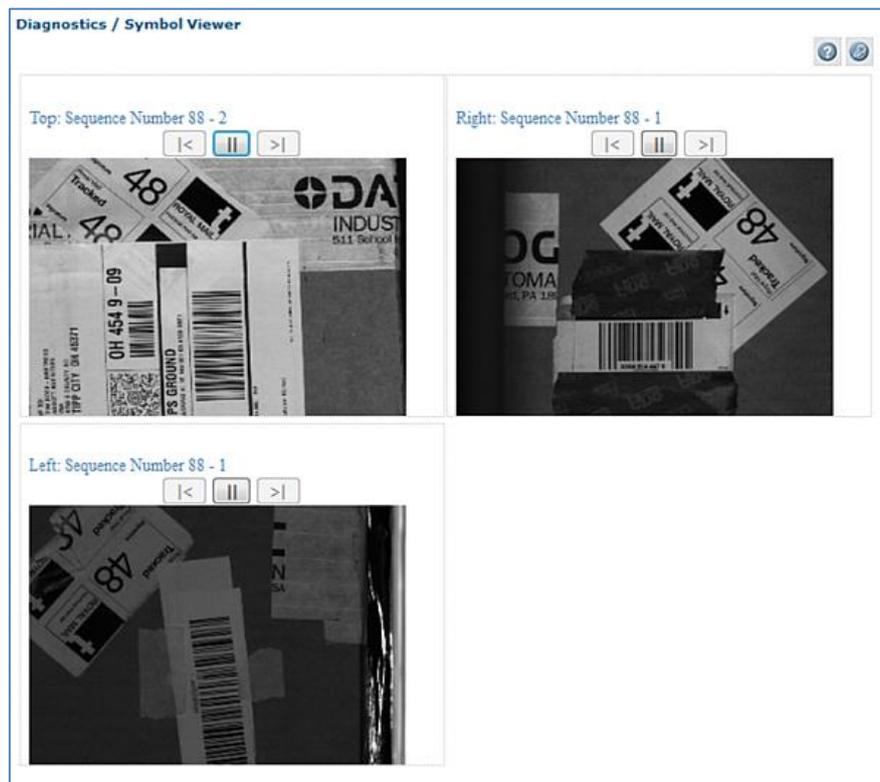
- Click an image multiple times to zoom in.
- Hold **<SHIFT>** and click an image multiple times to zoom out.
- Roll the mouse wheel to zoom in or out.
- Click, hold, and slide to pan an image.

4.7.8 Multiple Symbol Viewer

The **Multiple Symbol Viewer** allows you to view high resolution images of all the barcodes read on each box during a trigger cycle. The number of images shown depends on the number of AV7000 cameras that read barcodes on a particular package. Only cameras that read a barcode will return an image. For a barcode to be read, it must be configured in **Modify Settings | Global Settings | Barcode Settings | Barcode Settings Table** (See section 4.5.3).

To access the Multiple Symbol Viewer:

In the menu tree under **Diagnostics**, navigate to **Multiple Symbol Viewer**. The **Multiple Symbol Viewer** window opens.



Controls:

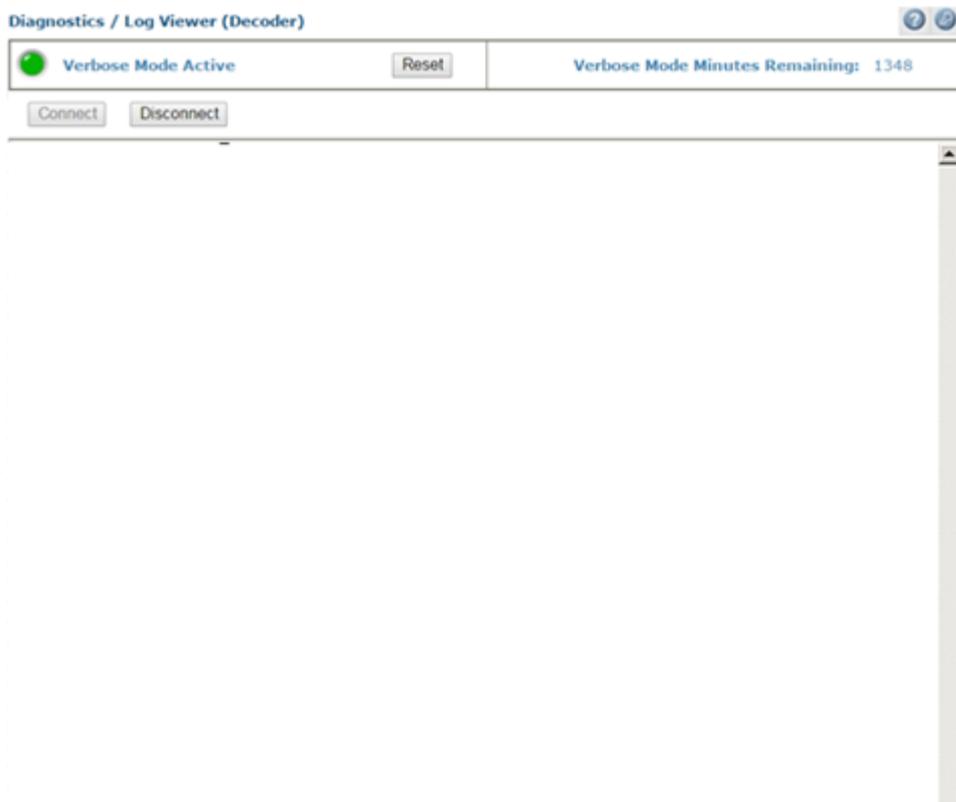
- Click **||** to pause the images from a particular camera.
- Click **>** to continue viewing new images from a particular camera.
- Click **|<** to view a barcode from the previous package, or click **>|** to view a barcode from the next package.
- Click an image multiple times to zoom in.
- Hold **<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.

4.7.9 Diagnostics | Log Viewer (Decoder)

Use the **Log Viewer (Decoder)** window to view encoder/tachometer and trigger event information.

To access the **Log Viewer (Decoder)** window:

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.
3. Click **Disconnect** to pause the data stream.

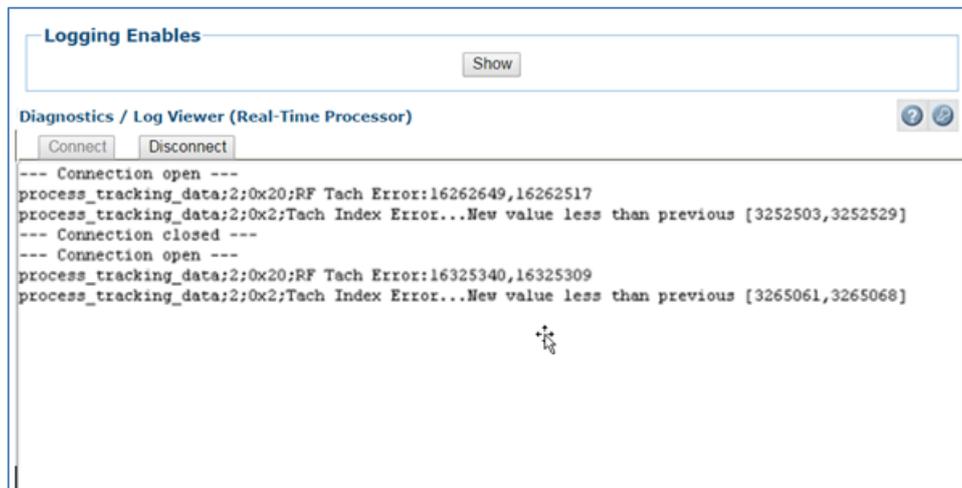


NOTE: Click **Reset** to re-enable **Verbose Mode** logging.

4.7.10 Diagnostics | Log Viewer (Real-Time Process)

Use the **Log Viewer (RT)** window to view encoder/tachometer and trigger event information. To access the **Log Viewer (RT)** window:

1. In the menu tree under **Diagnostics**, click **Log Viewer (RT)**. The **Log Viewer (RT)** window opens.



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.

4.7.11 Diagnostics | Scope (Calibration Check)

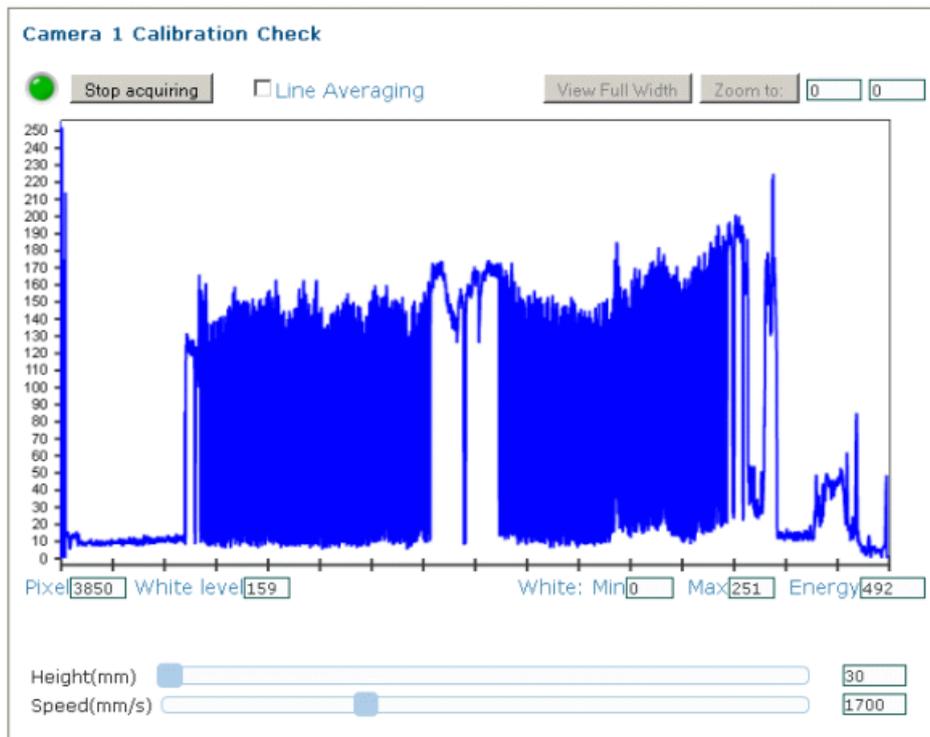
Use the **Scope (Calibration Check)** window to view a software oscilloscope of the camera/illumination performance.



NOTE: Scope functionality will enable **Calibration Mode** and disable normal camera functionality.

For practical use of the Scope for verifying the function of the focusing mechanism, see *section 7.2*.

Diagnostics / Scope



To access the Scope (Calibration Check) window:

1. In the menu tree under Diagnostics, click Scope (Calibration Check). The **Scope (Calibration Check)** window opens.
2. To zoom, click on the right and left sides of the area to be zoomed, and then click Zoom to.
3. Use the sliders at the bottom of the screen to adjust Height (Focus) and Speed (Amplitude).
4. Click **Stop Acquiring** to freeze the scope.

4.7.12 Diagnostics | Scope (Advanced)

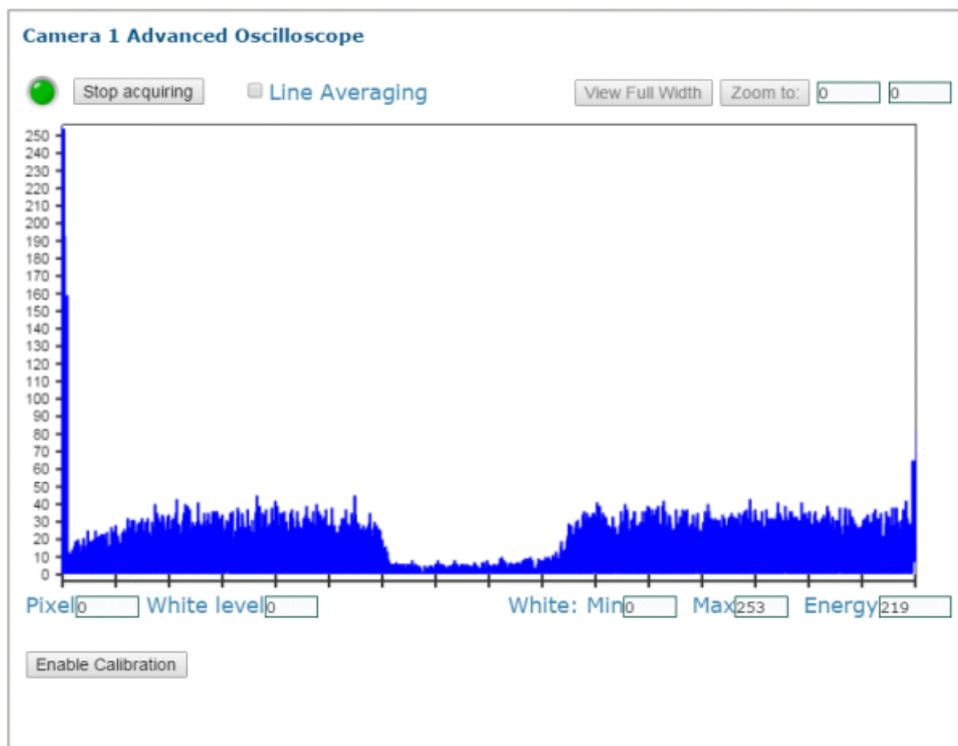
Use the **Scope (Advanced)** window to view a software oscilloscope of the camera/illumination performance.



NOTE: Scope functionality will enable **Calibration Mode** and disable normal camera functionality.

To access the **Scope (Calibration Check)** window:

1. In the menu tree under **Diagnostics**, click **Scope (Calibration Check)**. The **Scope (Advanced)** window opens.



2. Click **Stop Acquiring** to freeze the scope.
3. Click **Enable Calibration** to reveal the calibration sliders.



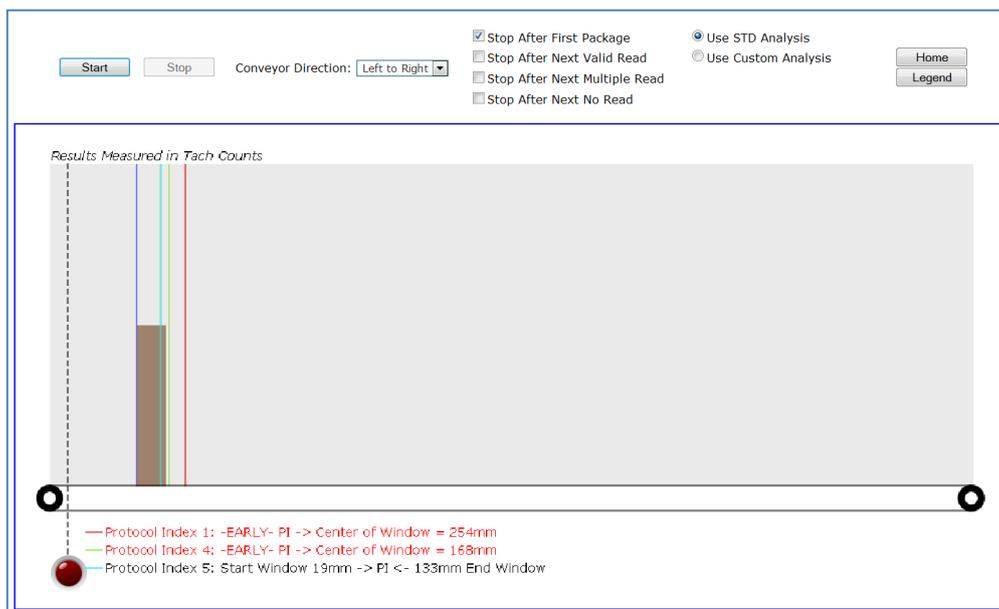
4. Select the **Illumination Correction Enable** to modify illumination settings.
5. Click and move the sliders to make adjustments to the imaging settings.

4.7.13 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:

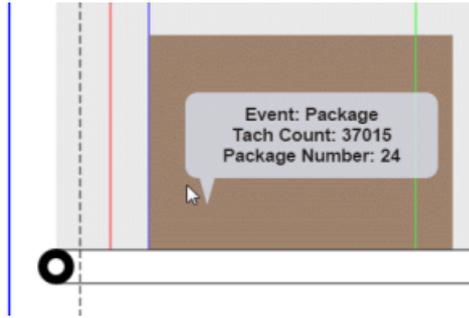
1. In the menu tree under **Diagnostics**, click **Conveyor View**. The **Conveyor View** window opens.



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.



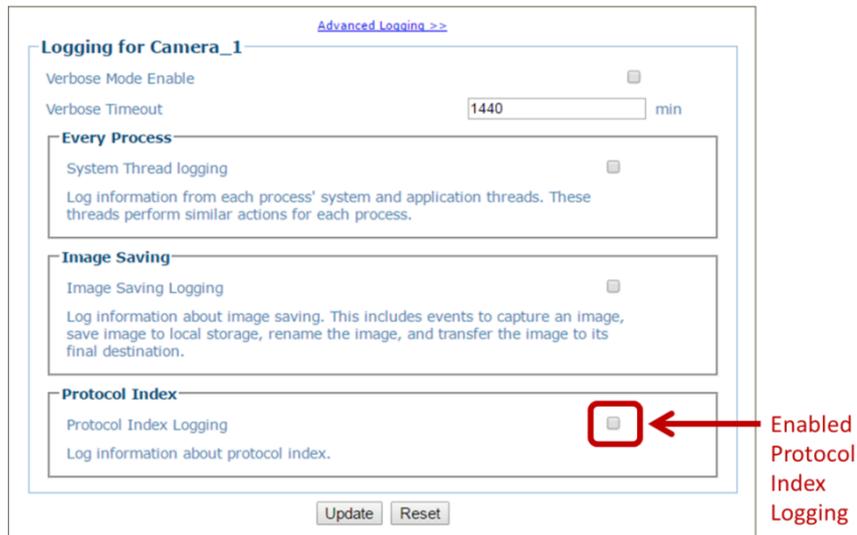
6. Click **Legend** to view a color key for the **Conveyor View** animation. Click **Home** to return to **Modify Settings | System Info**.

Solid Lines		Packages	
Color	Description	Color	Description
	Start Trigger		No Read
	End Trigger		Valid Read
	Transmit Point		Multiple Read
	Protocol Index Transport 1		
	Protocol Index Transport 2		
	Protocol Index Transport 3		
	Protocol Index Transport 4		
	Protocol Index Transport 5		
	Protocol Index Transport 6		
	Protocol Index Transport 7		
	Protocol Index Transport 8		
	Protocol Index Transport 9		

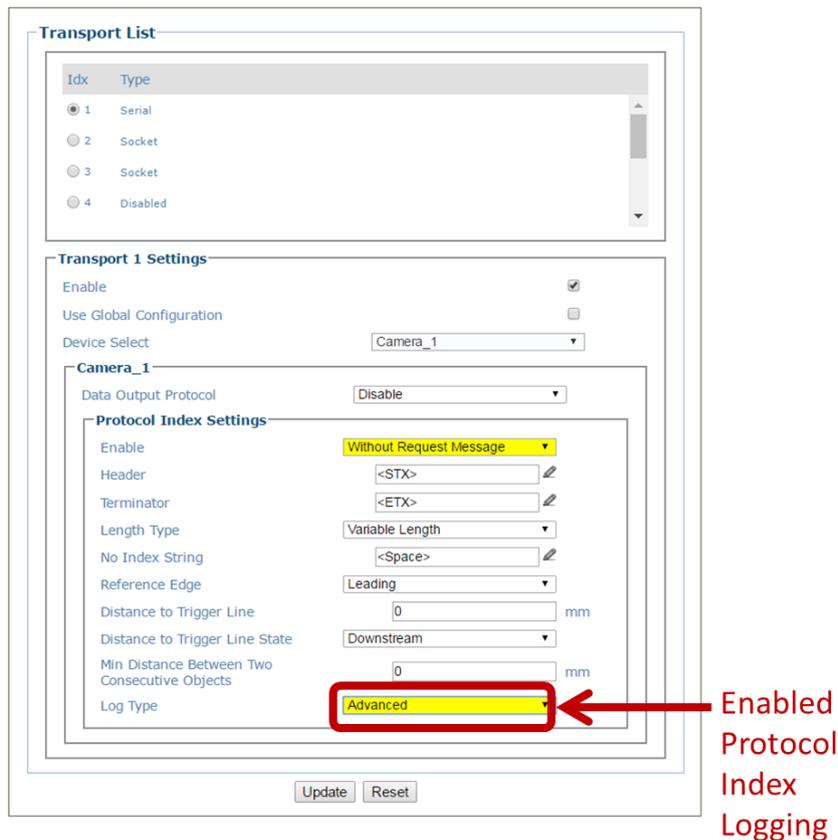
4.7.14 Enabling Diagnostics | Conveyor View

Two settings must be enabled in order for the **Conveyor View** to be available.

1. Access **Device Settings | Camera_1 | Logging** and the logging window will open.
2. Select the checkbox to enable **Protocol Index Logging**.



3. Click **Update** to save your changes.
4. Access **Global Settings | Communications | Transports** and the Transport List window opens.
5. From the Log Type drop-down select **Advanced**.



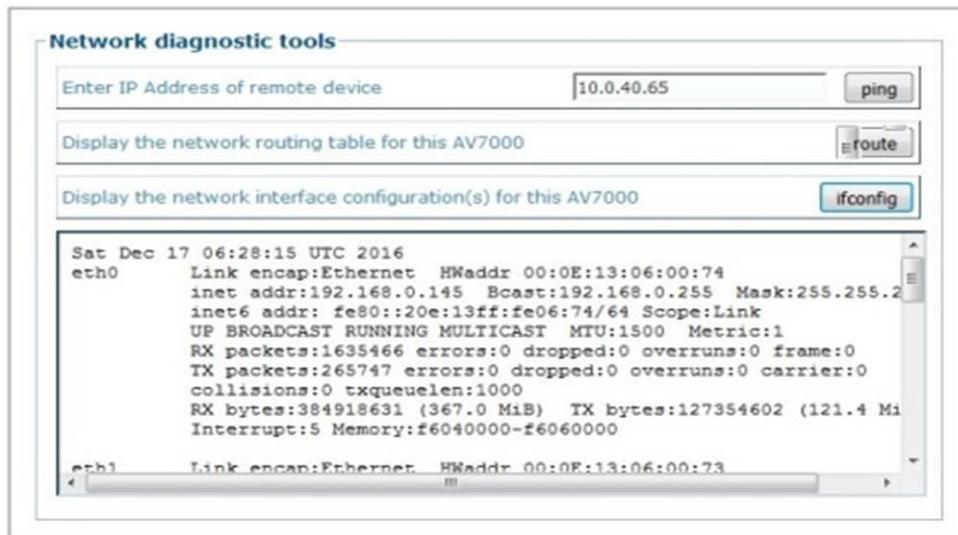
6. Click **Update** to save your changes.

4.7.15 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.

4.7.16 Diagnostics | Error Codes

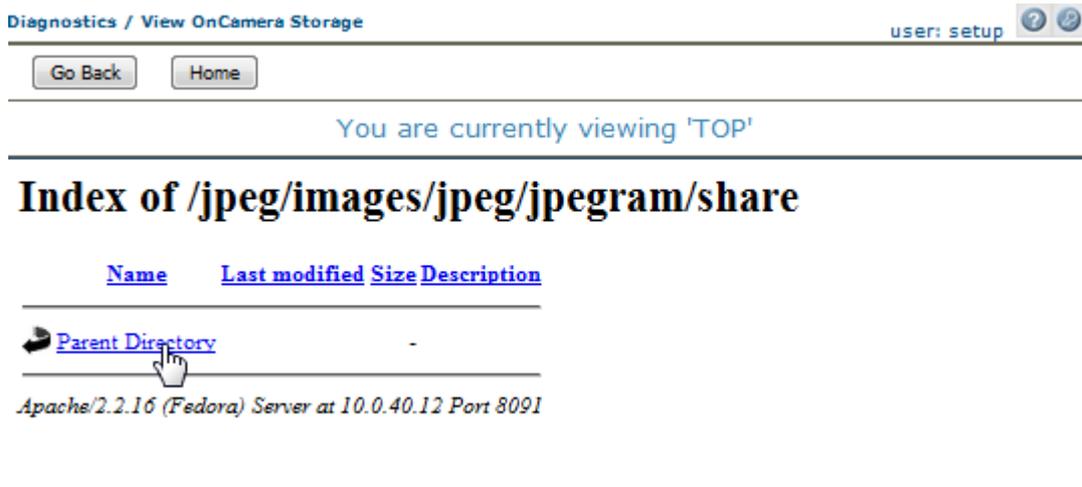
See *Chapter 7, Troubleshooting* for a list of error codes, descriptions, possible causes, and possible resolutions.

4.7.17 Diagnostics | View OnCamera Storage

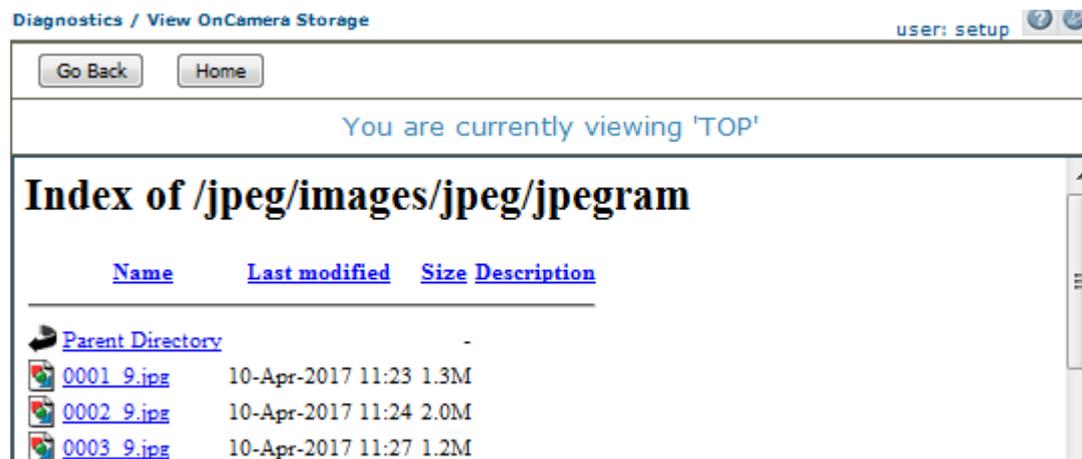
Use the **View OnCamera Storage** window to view stored images on a particular camera within your system.

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 on **Parent Directory**.



- All of the images stored in that directory will display, along with date and time.



- Click on the image name "0001.9.jpg" to view that particular image.



4.8 UTILITIES

Use the **Utilities Menu Tree** selections to backup and restore system parameters, upgrade system software, or download system log information using the following selections:



4.8.1 Advanced Cluster Configuration

Use **Advanced Cluster Configuration** to reorganize the cameras in a Tunnel/Array.



WARNING: 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	Name	Select for Action
0	<input checked="" type="checkbox"/>	00:0E:13:06:00:2C	Right	RightFront	<input type="checkbox"/>
1	<input checked="" type="checkbox"/>	00:0E:13:06:00:26	Left	LeftFront	<input type="checkbox"/>
2	<input checked="" type="checkbox"/>	00:0E:13:06:00:24	Left	LeftBack	<input type="checkbox"/>
3	<input checked="" type="checkbox"/>	00:0E:13:06:00:20	Top	Top	<input type="checkbox"/>
4	<input checked="" type="checkbox"/>	00:0E:13:06:00:36	Right	RightBack	<input type="checkbox"/>
5	<input checked="" type="checkbox"/>	00:0E:13:06:00:3E	Top	Bottom	<input type="checkbox"/>
6	<input type="checkbox"/>		Top	Camera 7	<input type="checkbox"/>
7	<input type="checkbox"/>		Top	Camera 8	<input type="checkbox"/>
8	<input type="checkbox"/>		Top	Camera 9	<input type="checkbox"/>
9	<input type="checkbox"/>		Top	Camera 10	<input type="checkbox"/>
10	<input type="checkbox"/>		Top	Camera 11	<input type="checkbox"/>

Actions for Selected Camera(s)

The enabled columns (not greyed out) show the AV7000 cameras currently online in the system. If a camera is not online (greyed out) you can still select it for action.

To Swap Two Cameras in the same tunnel:

2. Select the check boxes in the **Select for Action** column corresponding to the cameras you want to swap.
3. Click **Swap Cameras**. The selected cameras swap MAC addresses.

Advanced Cluster Configuration					
Index	Enabled	MAC Address	Camera Position	Name	Select for Action
0	<input checked="" type="checkbox"/>	00:0E:13:06:00:2C	Right	RightFront	<input checked="" type="checkbox"/>
1	<input checked="" type="checkbox"/>	00:0E:13:06:00:26	Left	LeftFront	<input type="checkbox"/>
2	<input checked="" type="checkbox"/>	00:0E:13:06:00:24	Left	LeftBack	<input type="checkbox"/>
3	<input checked="" type="checkbox"/>	00:0E:13:06:00:20	Top	Top	<input type="checkbox"/>
4	<input checked="" type="checkbox"/>	00:0E:13:06:00:36	Right	RightBack	<input checked="" type="checkbox"/>
5	<input checked="" type="checkbox"/>	00:0E:13:06:00:3E	Top	Bottom	<input type="checkbox"/>
6	<input type="checkbox"/>		Top	Camera 7	<input type="checkbox"/>
7	<input type="checkbox"/>		Top	Camera 8	<input type="checkbox"/>
8	<input type="checkbox"/>		Top	Camera 9	<input type="checkbox"/>
9	<input type="checkbox"/>		Top	Camera 10	<input type="checkbox"/>
10	<input type="checkbox"/>		Top	Camera 11	<input type="checkbox"/>

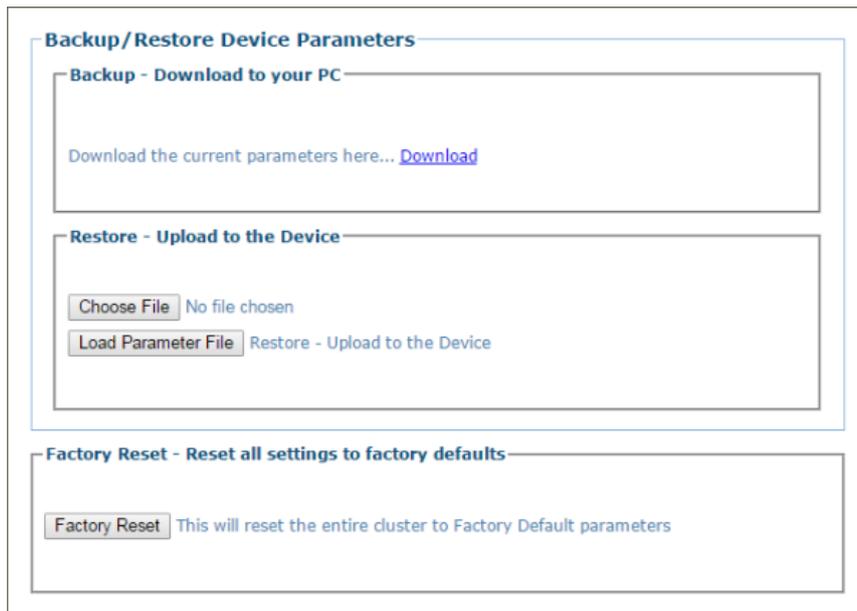
Actions for Selected Camera(s)

4.8.2 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** Info. The **Backup/Restore Parameters** window opens.



The screenshot shows a web interface for 'Backup/Restore Device Parameters'. It is divided into three main sections:

- Backup - Download to your PC:** Contains the text 'Download the current parameters here...' followed by a blue 'Download' link.
- Restore - Upload to the Device:** Contains a 'Choose File' button with the text 'No file chosen' next to it, and a 'Load Parameter File' button with the text 'Restore - Upload to the Device' next to it.
- Factory Reset - Reset all settings to factory defaults:** Contains a 'Factory Reset' button with the text 'This will reset the entire cluster to Factory Default parameters' next to it.

2. From the **Backup - Download to your PC** section of the window, click **Download**. The parameter file is downloaded by the browser to the 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.



IMPORTANT: 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 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.

4.8.3 Utilities | Software Upgrade

Use **Software Upgrade** window to load new versions of the camera system software.



IMPORTANT: 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** Info. 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 with the latest software downloaded.
6. Click **Application Installation History** to view historical software revision information about the application.

App Base R2 Apr 4,2016

```
Tue Oct 18 16:42:43 UTC 2016 : Installing AV7000_VERSION STANDARD 1_12_0_0
Thu Dec 1 16:17:16 UTC 2016 : Installing AV7000_VERSION STD_BETA 1_16_0_8
Thu Jan 19 14:16:04 UTC 2017 : Installing AV7000_VERSION STANDARD 2_0_0_0
```

- Click **Operating System History** to view historical software patch information about the operating system.

OS Base 2_0_0_0 Sept 12, 2016 PCIe4, Partition fix, Clean OS

Mon Sep 12 19:05:29 UTC 2016 : CleanOS patch

Mon Sep 12 19:23:15 UTC 2016 : CleanOS patch

- Click **RTP Operating System history** to view RTP (Real Time Processing) software revision historical information about the Real Time Processing OS.

Installing RTP STANDARD 1_8_0_0

Installing RTP BETA 1_16_0_2

Installing RTP STANDARD 2_0_0_0

- Click **Download** to save a copy of the installed software to your PC.



4.8.4 Utilities | Download Logs

Use **Download Logs** window to download system information logs to your PC.
To use the **Download Logs** function:

- 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	192.168.0.183	getting file
Camera 2	192.168.0.183	Success
All Devices		Click here to download debug logs

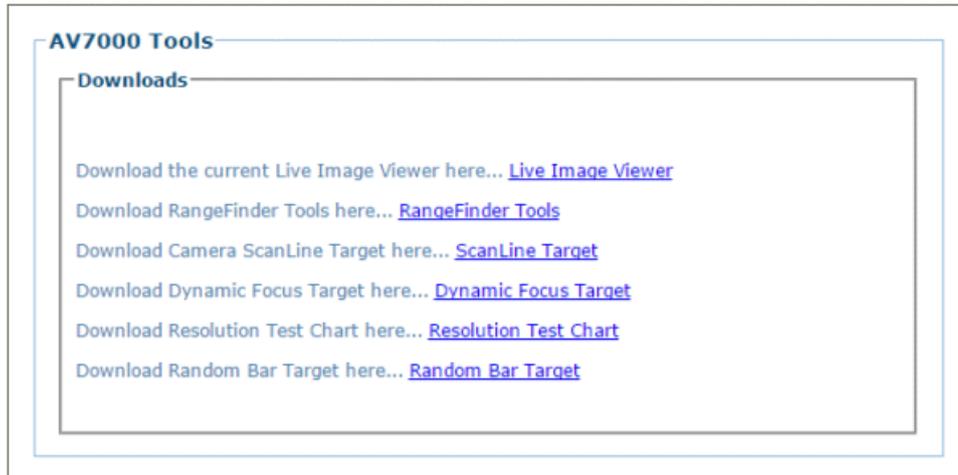
- Click the link **Click here to download debug logs** to download the AllDebugLogs.tar.gz file to your PC.

4.8.5 Utilities | Download Tools

The Download Tools window provides links to tools stored on the AV7000 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.



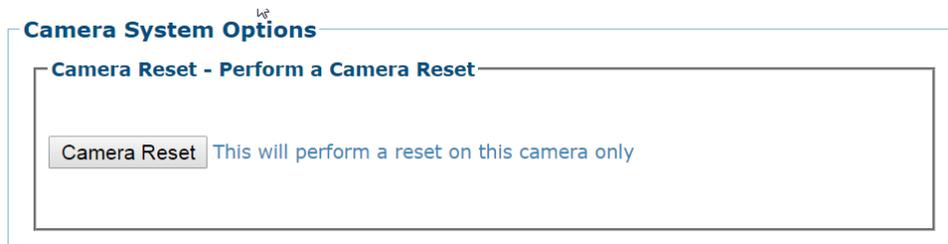
2. Click on a link to download the indicated tool to your computer.

4.8.6 Utilities | Camera Reset

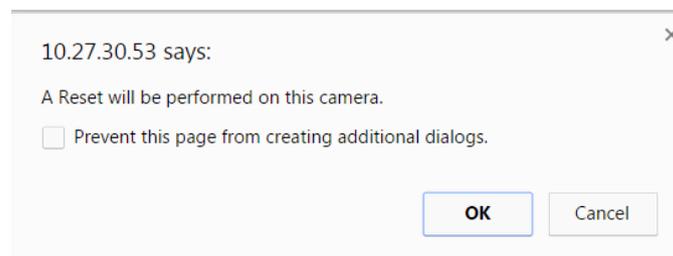
The Camera Reset window allows you to reset a specific camera.

To reset the camera:

1. In the menu tree under Utilities, click **Camera Reset**. The **Camera System Options** window opens.



2. Click **Camera Reset** and the following confirmation message appears.



3. Click **OK** to continue the camera reset or **Cancel** to discontinue this process.

4.8.7 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.

4.8.8 Utilities | Logout

Click **Utilities | Logout** to exit e-Genius.

5 IMAGING FEATURES

This chapter provides detailed procedures on AV7000 setup and calibration, and on how the AV7000 Camera System functions during normal operation. It also helps familiarize the user with status indicator LEDs, and how the camera can be easily and quickly replaced with a new unit if necessary.



IMPORTANT: 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.

5.1 FIRST-TIME STARTUP

On initial power-up, the AV7000 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.

5.1.1 Default Parameters

The AV7000 cameras are shipped from the factory with these defaults:

- **Default User ID:** setup (case sensitive)
- **Default Password:** DLAsset (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)

Perform the following setup procedure using these defaults or configure your Barcode reader with your application's parameters using **e-Genius**.

5.2 FOCUS DEVICE SETUP

The AV7000 focusing position is computed by the camera based on the position of the package measured by a height sensor. The Datalogic sensors may be a DM3610 Dimensioner (see *section 0*), RangeFinder (see *section 5.2.2*), or AREAscan™ DS2 Light Array (LCC-75xx Kit) (see *section 5.2.3*). Focus device setup is explained in this section.



IMPORTANT: Though it is unlikely to happen, a DM3610 and RangeFinder cannot be installed and configured for focusing on the same system. This will cause system problems.

5.2.1 Setting up AV7000 Focus Using a DM3610 Dimensioner

Refer to the DM3610 Dimensioner Reference Manual for complete information on installation and calibration. The manual is available for download from www.datalogic.com.



IMPORTANT: The DM3610 must be running software version 1_7_47 or greater, and must be installed at least 500 mm [20 in] from the nearest camera scan line.

DM3610 offset calculations are based on ¼ in. [6.35 mm] increments. Each whole number value in the **Focus Setup** window equals ¼ in, i.e.: a value of 4 equals 1 in. [25.4 mm]. The goal in setting up the DM3610 is to identify the zero value positions for focusing; i.e. the height to the conveyor belt or tray surface (for tilt-tray systems) and read area across the belt (right and left edges).

Set DM3610 parameters to the following configuration for the calibration process.



NOTE: For complete information on connecting to the DM3610 User Interface, see the **DM3610 Dimensioner Reference Manual**.



NOTE: Remember to reset these parameters to the application specifications after the calibration is complete.

System Orientation

Before setting focus offsets, it is wise to become familiar with the orientation of the systems DM3610 and AV7000 Cameras when looking downstream or in the direction of package flow. Notice how the **Far Working Distance** of the right side AV7000 camera coincides with the **DM3610 Left Focus Offset**, and the **Far Working Distance** of the left side AV7000 camera coincides with the **DM3610 Right Focus Offset**. These lines on the left and right are considered the 0 (zero) position. The distance between the left and right focus offsets is considered the “Conveyor Width” and must be entered in the **Conveyor Width** field in **Global Settings | Operating Mode**.

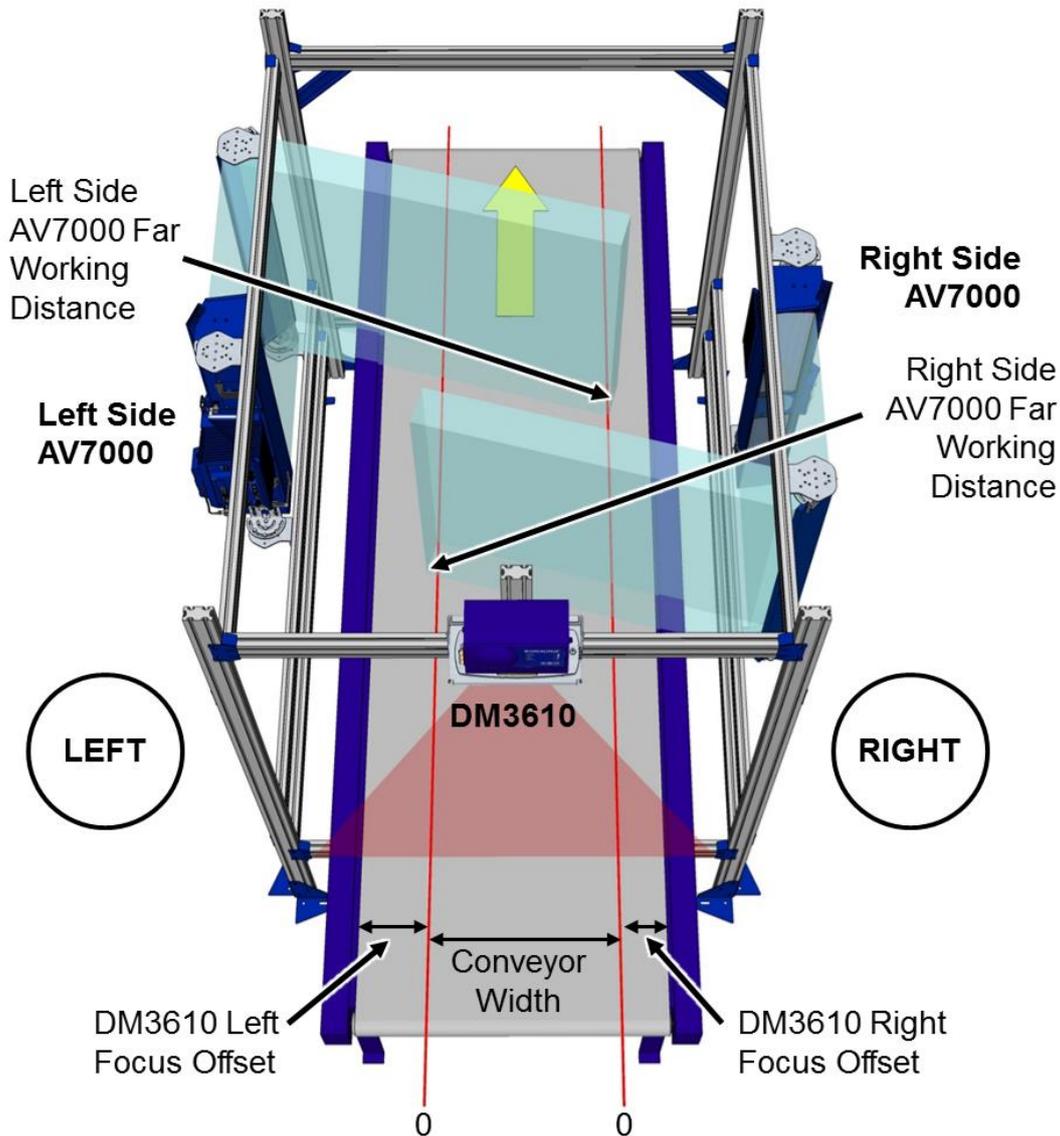


Figure 98: System Orientation

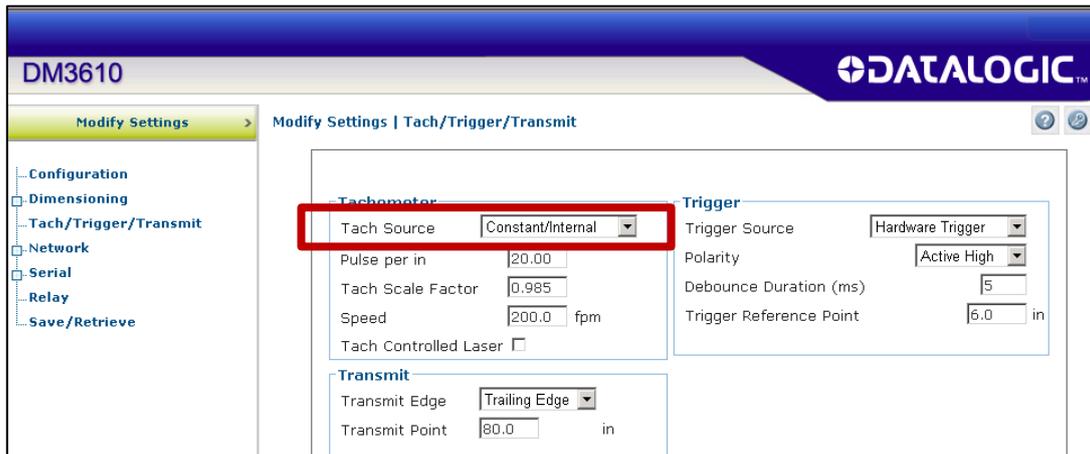


NOTE: The DM3610 Left and Right Offsets will not necessarily be the same, but are based on the **Far Working Distance** of the side AV7000 cameras. Reference the system application drawings for the prescribed Far Working Distance of each camera.

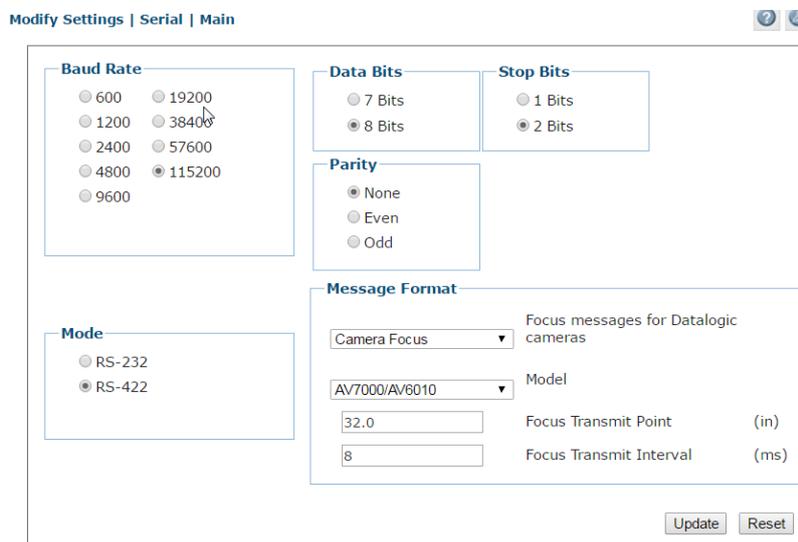
Preparation:

Before programming the Focus Offset, a few preliminary settings are required.

1. In the **DM3610 User Interface** under **Modify Settings**, navigate to **Tach/Trigger/Transmit**. The **Tach/Trigger/Transmit** window opens.



2. Under **Tachometer**, select **Constant/Internal** from the **Tach Source** drop-down list.
3. Click **Update**.
4. Next, under **Modify Settings**, navigate to **Serial | Main** or **Aux** depending on the port wired to the AV7000 (typically **Main**). The port window opens.



5. Make sure the selected **Baud Rate** matches that of the AV7000 (AV7000 uses the main port, RS485 (RS422), at 115200).
6. Select **Camera Focus** from the **Focus messages for Datalogic cameras** drop-down list.
7. Click **Update**.

8. Navigate to **Diagnostics | Focus Setup**. The **Focus Setup** window opens.

DM3610 Focus Setup

Tachometer Connector Position

Left Offset Right Offset

Height Offset

9. Select **Constant** from the **Tachometer** drop-down list.
10. Select **Left** or **Right** from the **Connector Position** drop-down list depending on which side the DM3610 connectors are on when looking down stream.



Figure 99: Connector Position

11. Enter a value of 0 (zero) in the **Left Offset**, **Right Offset**, and **Height Offset** fields.
12. Click **Update**.

Adjusting DM3610 Left Focus Offset

1. Place a box/spacer in the beam of the DM3610 with the **LEFT** side of the box aligned with the **Far Working Distance** of the **RIGHT** camera based on the application drawing. You must know the width of the box/spacer, and in this example, a 3 in [76.2 mm] spacer is used.

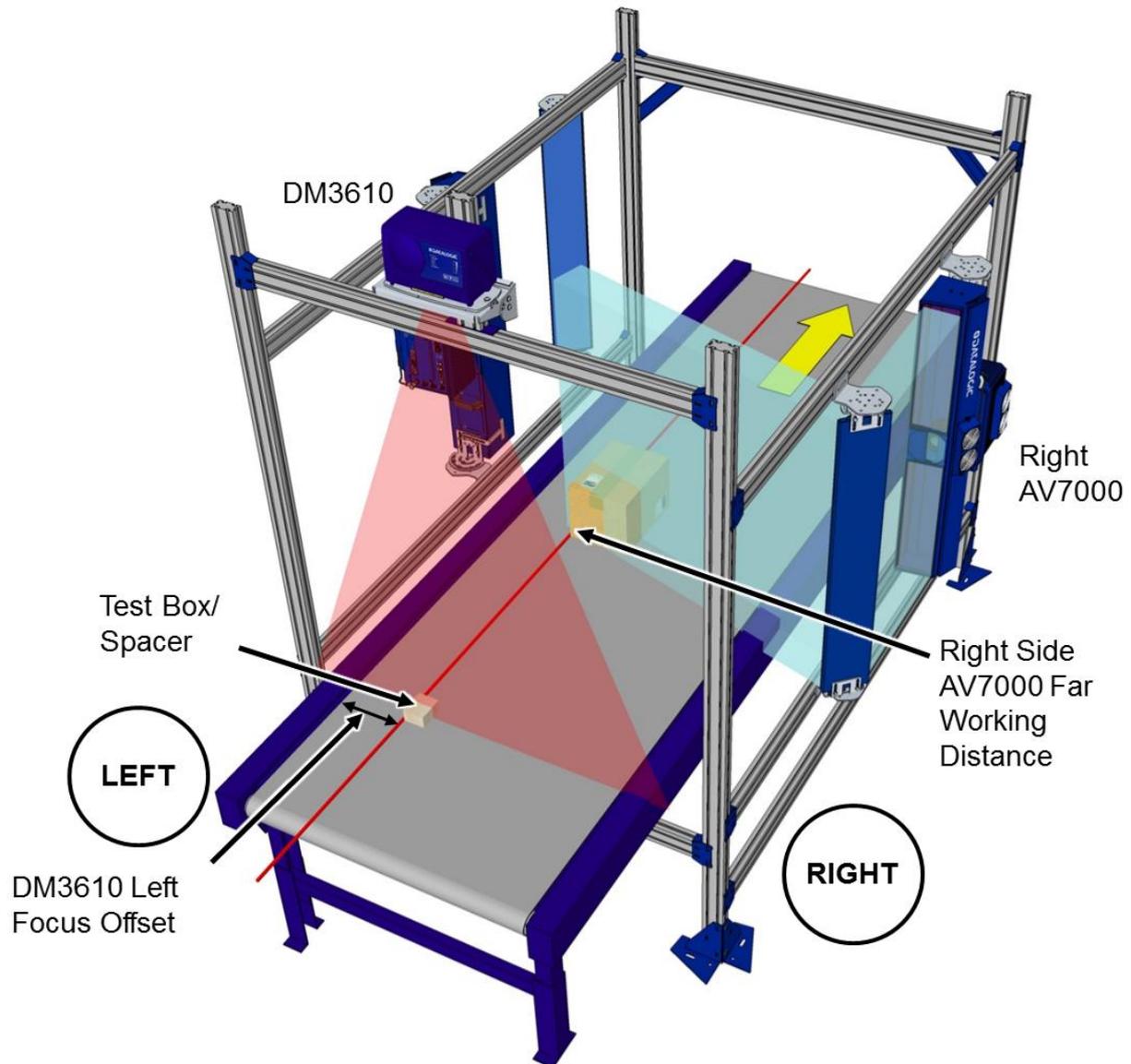


Figure 100: Left Focus Offset

2. Measure from the **LEFT** edge of the conveyor to the **LEFT** edge of the box/spacer. This measurement becomes the **Left Offset**.
3. Enter that distance in negative $\frac{1}{4}$ inch [6.35 mm] increments into the **Left Offset** field. In this example the distance is 9 inches [228.6 mm]. 9×4 ($\frac{1}{4}$ in. increments) = 36, so -36 is entered.

- Click **Focus Data**. The focus setup window displays the measurement results from the DM3610 equaling width of the 3 in. box/spacer ($3 \times 4 \text{ (}\frac{1}{4}\text{ in. increments)} = 12$). This distance is displayed as **Right=xxx** in the **DM3610 Focus Setup**.

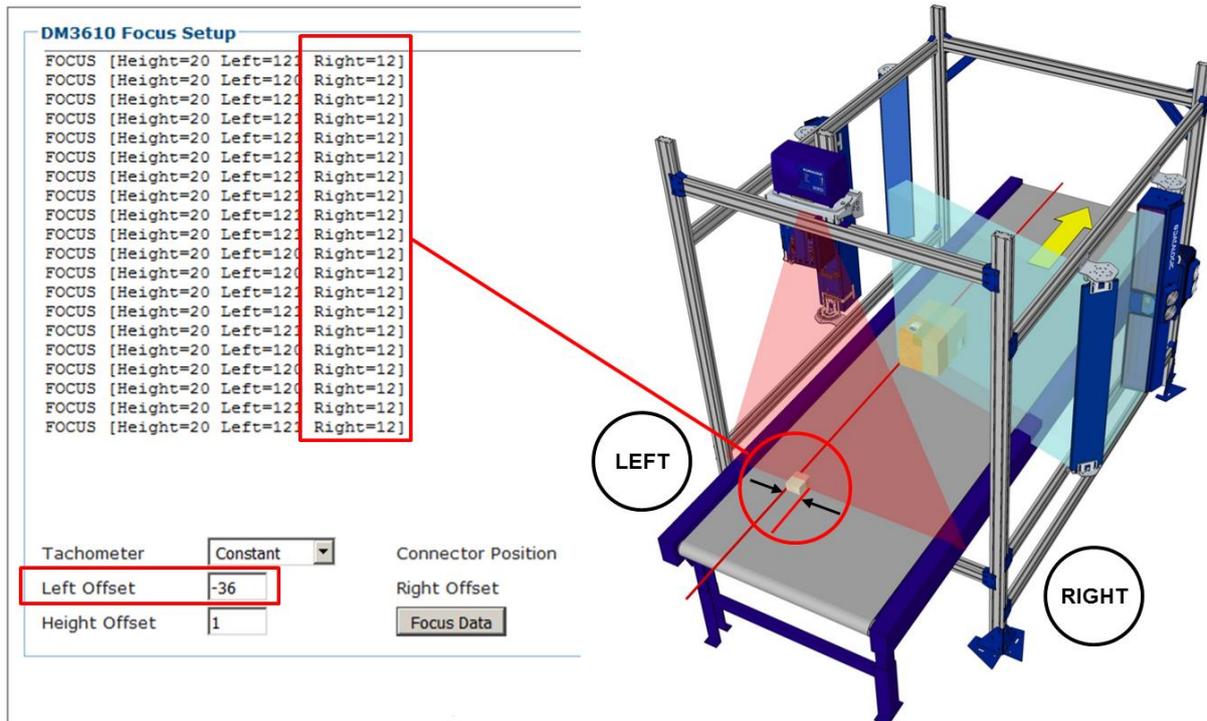


Figure 101: Left Side Box/Spacer Width Calculation

- If the measurement displayed doesn't equal the actual distance measured, adjust the **Left Offset** incrementally by whole numbers (negative) until the DM3610's displayed **RIGHT** measurement equals the physical width measurement (in $\frac{1}{4}$ in [6.35 mm] increments).
- Click **Update**.

Adjusting DM3610 Height Offset

- Measure the height of the box/spacer.
- Click **Focus Data**. The **Height** measurement displayed will show the height of the box/spacer measured by the DM3610 in $\frac{1}{4}$ in [6.35 mm] increments.

If the measurement displayed doesn't equal the actual box height measured, adjust the **Height Offset** incrementally by whole numbers (negative or positive) until the DM3610's displayed **Height** measurement equals the physical height of the box/spacer.

- Click **Update**.

Adjusting DM3610 Right Focus Offset

1. Place a box/spacer in the beam of the DM3610 with the **RIGHT** side of the box aligned with the **Far Working Distance** of the **LEFT** camera based on the application drawing. You must know the width of the box/spacer, and in this example, a 3 in [76.2 mm] spacer is used.

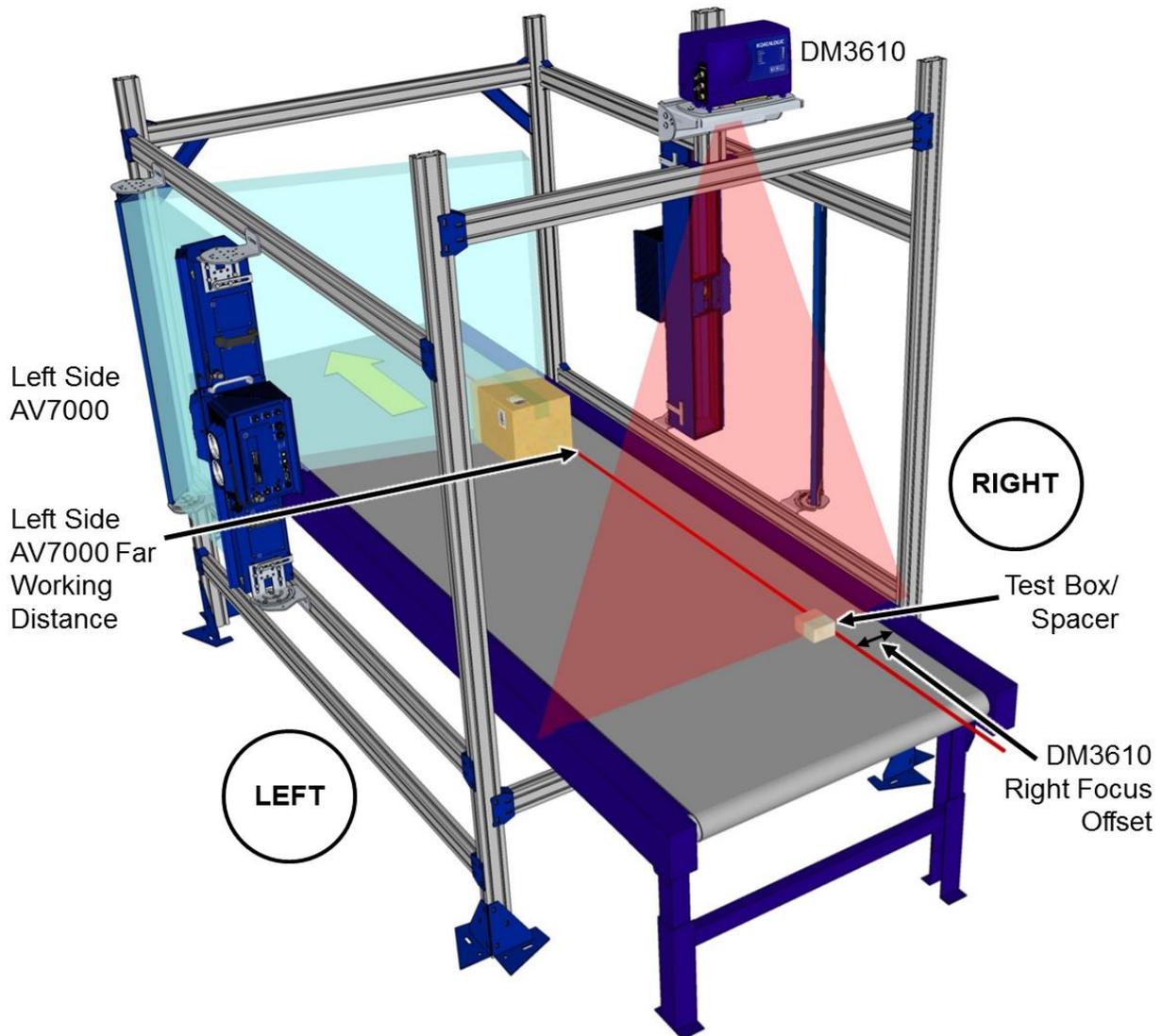


Figure 102: Right Focus Offset

2. Measure from the **RIGHT** edge of the conveyor to the **RIGHT** edge of the box/spacer. This measurement becomes the **Right Offset**.
3. Enter that distance in negative $\frac{1}{4}$ inch [6.35 mm] increments into the **Right Offset** field. In this example the distance is 6 inches [152.4 mm]. 6×4 ($\frac{1}{4}$ in. increments) = 24, so -24 is entered.

- Click **Focus Data**. The focus setup window displays the measurement results from the DM3610 equaling width of the 3 in. box/spacer ($3 \times 4 \frac{1}{4}$ in. increments) = 12). This distance is displayed as **Left=xxx** in the **DM3610 Focus Setup**.

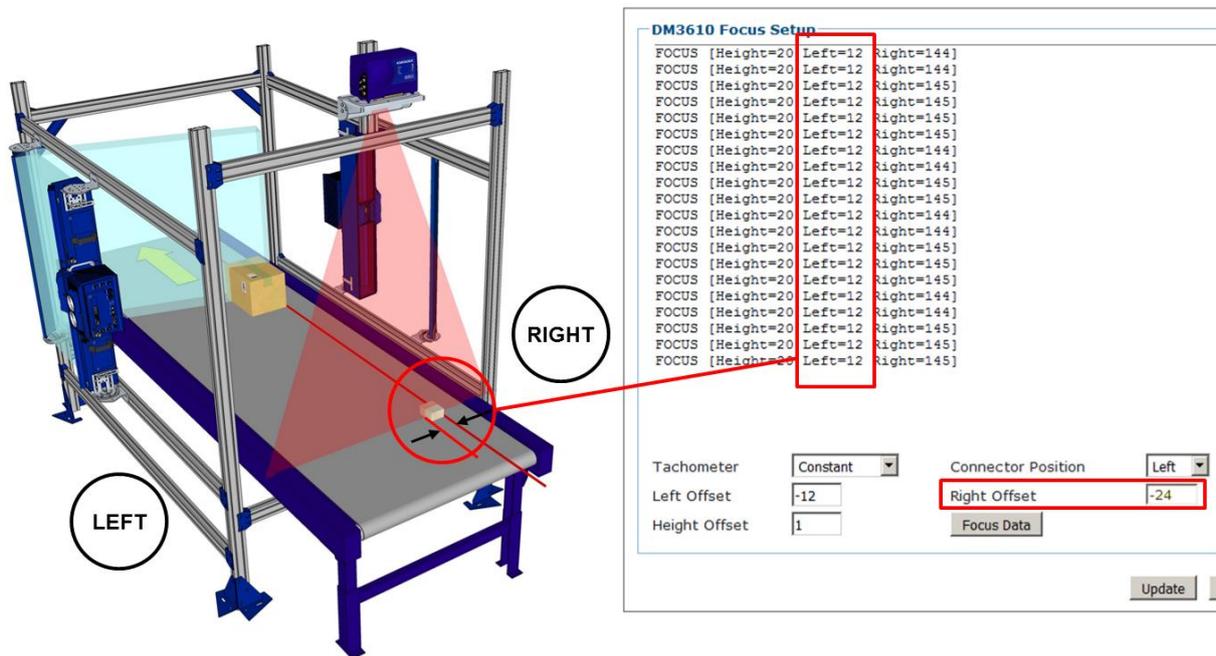


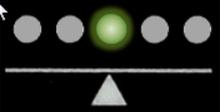
Figure 103: Right Side Box/Spacer Width Calculation

- If the measurement displayed doesn't equal the actual width of the box/spacer, adjust the **Right Offset** incrementally by whole numbers (negative) until the DM3610's displayed **LEFT** measurement equals the physical width measurement (in $\frac{1}{4}$ in [6.35 mm] increments) of the box/spacer.
- Click **Update**.
- When the focus offsets have been input, navigate to **Tach/Trigger/Transmit** in the **DM3610 User Interface**. The **Tach/Trigger/Transmit** window opens.
- Under **Tachometer**, select **Hardware/External** from the **Tach Source** drop-down list.
- Click **Update**.

5.2.2 Installing and Calibrating a RangeFinder for Focusing in an AV7000 System

The RangeFinder 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. RangeFinders 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].

RangeFinder LED Indicators

Indicator	Description
	<p>System Ok (Green LED solid 'ON')</p> <p>System Standby* (Green LED blinking)</p> <p>*Standby condition indicates the conveyor has stopped or there is no encoder/tachometer input.</p>
	<p>Warning (Red LED blinking = recoverable fault)</p> <p>Error (Red LED solid 'ON = non-recoverable fault)</p>
	<p>During installation (with no encoder/tachometer input) these LEDs function as a leveling indicator.</p> <p>During normal operation (encoder/tachometer input with conveyor running), these LEDs will ALL illuminate when a package is present under the RangeFinder.</p>

Tools/applications needed:

- Socket driver (13mm)
- **RangerOscope** Program: Download from **e-Genius, Utilities | Download Tools** window. Click **RangeFinder Tools**
- **CodeWord Viewer**: Download from **e-Genius, Utilities | Download Tools** window. Click **RangeFinder Tools**
- Sync port adapter cable, RangeFinder to PC
- White printer paper (enough to cover the width of the conveyor, 3 pages thick)

RangeFinder Mechanical Installation

Install the RangeFinder according to the AV7000 application drawing. The RangeFinder is typically installed 1924 mm [75.75 in] above the conveyor.

1. Attach mounting brackets to both sides of RangeFinder (if not already installed). Place each bracket over its mounting post(s) and tighten the retaining screws.

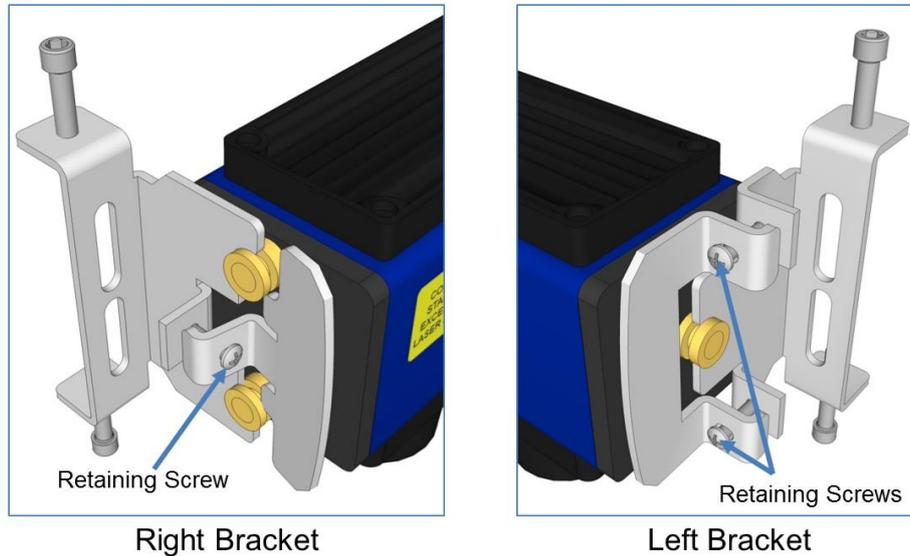


Figure 104: Attaching the RangeFinder Brackets

2. Lift RangeFinder into position as marked on the mounting structure or as specified in the application drawing. Make sure the RangeFinder is positioned facing in the correct direction.
3. Attach the RangeFinder to the mounting structure with T-bolts (only finger tighten before leveling).

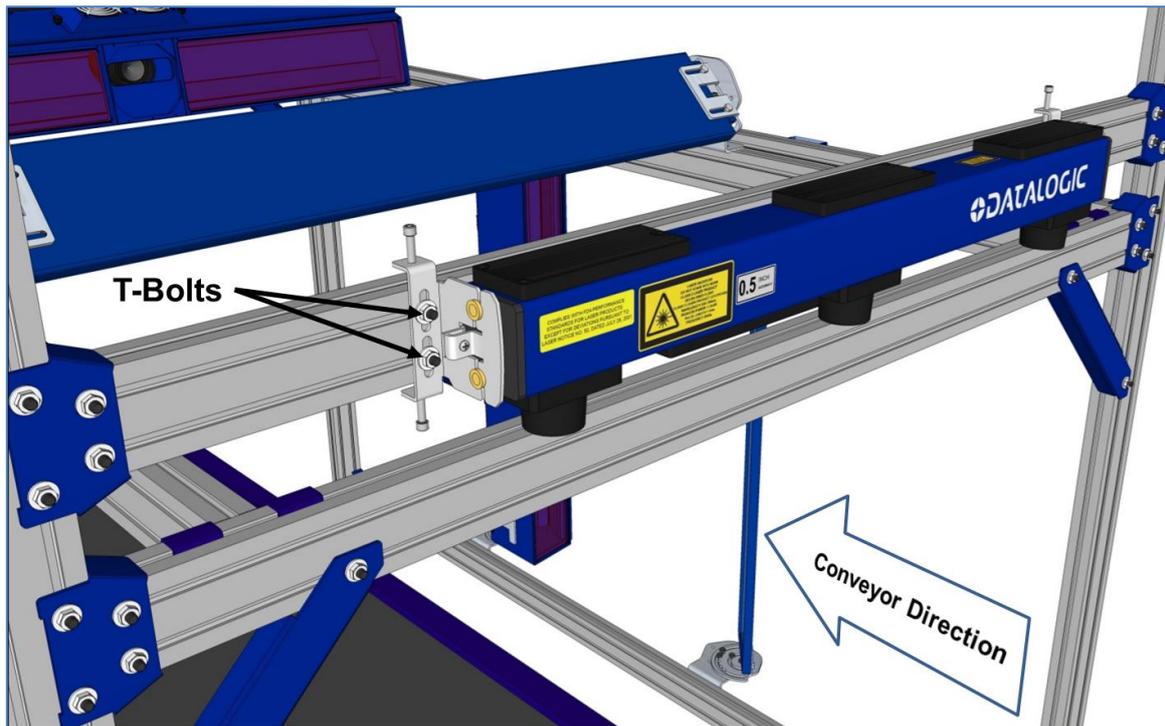


Figure 105: Attaching the RangeFinder to the Mounting Structure



NOTE: There must be 300 mm [12 in] between the RangeFinder's code words on the belt to the beginning read area of the nearest camera.

4. Measure from Left and Right laser housing to the belt, making sure the RangeFinder 1924 mm [75.75 in] above the conveyor at those points.

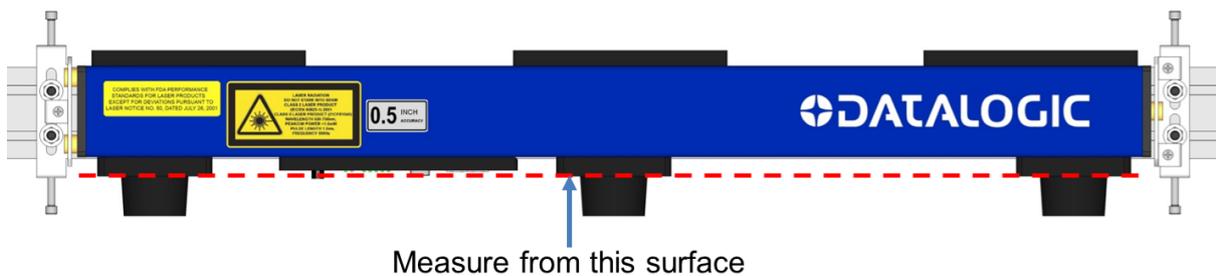


Figure 106: Height Reference

5. Tie-wrap the power supply to the structure, making sure the power cable can be connected.

Leveling the RangeFinder

Before beginning normal operations, the RangeFinder must be level with the conveyor surface. This is especially important to dimensioning applications.



WARNING: The RangeFinder uses visible red lasers and is rated as a Class 2 Laser Product. Do not look directly into the beam.

Prerequisites:

- RangeFinder software revision 9.0 (or greater)
- RangeFinder power must be **ON** during this procedure.
- Confirm correct mounting location based on application drawings

Tools Required:

- Socket Driver (13mm)

To level the RangeFinder:

1. Make sure the T-bolts holding the RangeFinder Brackets to the mounting structure are only finger-tight (4 places).

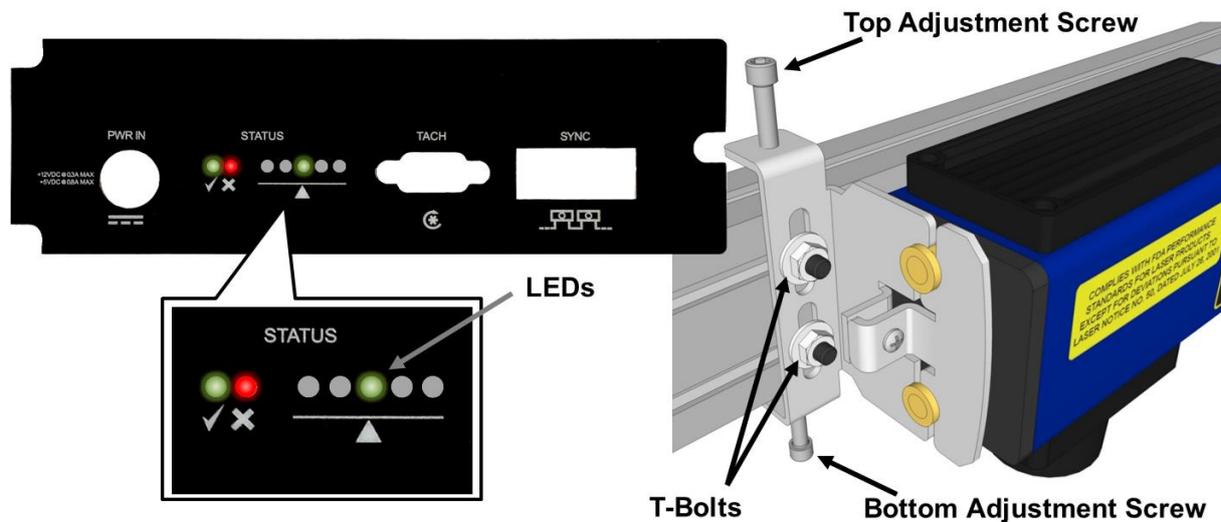


Figure 107: RangeFinder Leveling

2. Check the five leveling LEDs on the bottom panel of the RangeFinder. The lit LED is like the bubble on a standard level. If the center LED is lit, no adjustment is needed.
3. If one of the LEDs is lit to the left or right of center, make adjustments to the top and bottom adjustment screws on both sides of the RangeFinder until the center LED is lit.



NOTE: The leveling screws can be finger adjusted, and don't require an Allen wrench. Once the RangeFinder is leveled, the mounting bolts hold it in place.

4. Once level, tighten the mounting hardware (T-bolts).

Beam Blockers: Blocking RangeFinder Codewords on Narrow Belts

It is necessary to block the RangeFinder laser pattern (also called codewords) that is projected beyond the edges of the conveyor (read area).



WARNING: The RangeFinder uses visible red lasers and is rated as a Class 2 Laser Product. Do not look directly into the beam.

Prerequisites:

- Know the package flow (i.e., justified, non-justified) and usable belt width (i.e., width of conveyor in which packages appear in the scanning area)
- The RangeFinder cannot measure any further left and right than where the codewords end. Allow at least one inch (25.4 mm) of additional codewords to extend beyond the usable belt width and beyond the tallest package at the far left/right of the reading area.
- RangeFinder power must be **ON** to see the laser pattern on the belt.
- RangeFinder must be level.

Tools Required:

- Beam Blocker Kit (ships with RangeFinder)
- Socket Driver (13mm)

Install and adjust the beam blockers:

1. Mount the beam blockers to the structure.
2. Attach loosely with the hardware provided. Do not tighten.

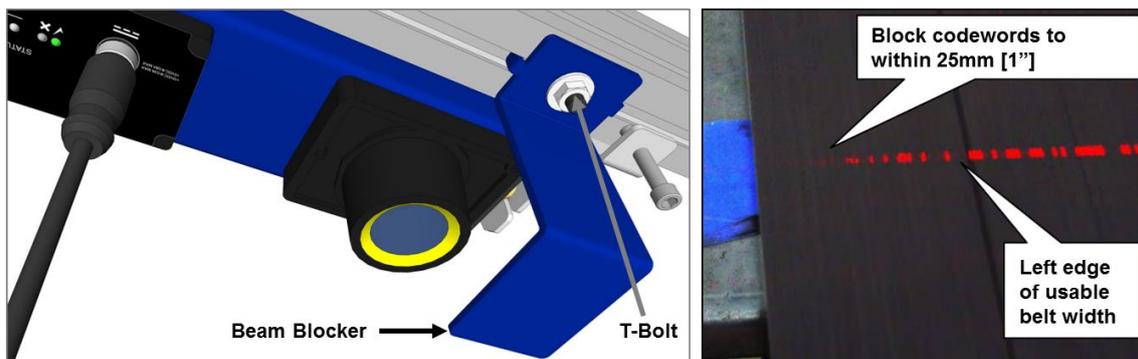


Figure 108: Installing Beam Blockers (LEFT) and Close-up of the RangeFinder's scan line pattern along edge of conveyor (RIGHT)

3. While viewing the codewords on the belt, adjust the beam blockers to within one inch (25.4 mm) of the usable belt width on both sides by sliding them in the structure channel.
4. Once the correct amount of codewords are blocked, tighten hardware.

RangeFinder Pre-Calibration Steps:

1. Make sure the RangeFinder is mounted at the correct height (typically 1924 mm [75.75 in] from the left and right laser housings to the conveyor belt. See *Figure 106: Height Reference*.)
2. Attach an RJ45 cable from your PC to the **SYNC** port of the RangeFinder.
3. From a command prompt enter: (start>run>cmd)
 - telnet 192.168.0.40
 - Free Scale login: **root**
 - Password: **root**
 - **set_gain** (this command will return with the current gain setting)



NOTE: The **RangerOScope** and **CodeWord Viewer** allows for turning on/off the display for each laser. The image below identifies the right and left laser positions on the RangeFinder:

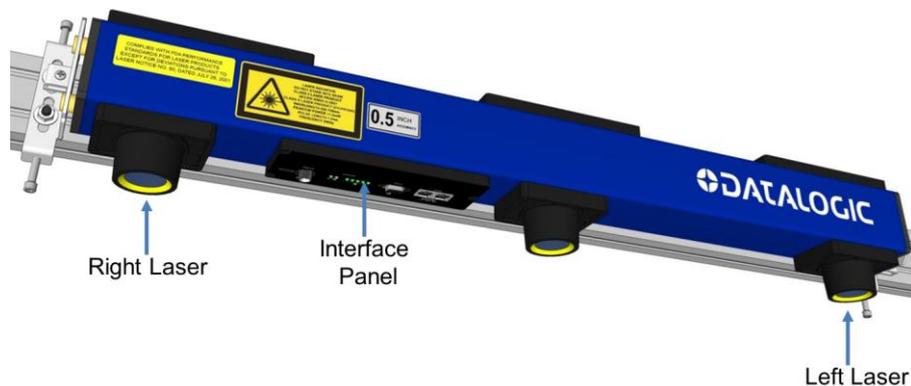


Figure 109: Right/Left laser identification

Setting the RangeFinder Gain

1. Place white printer paper across the conveyor under the RangeFinder.

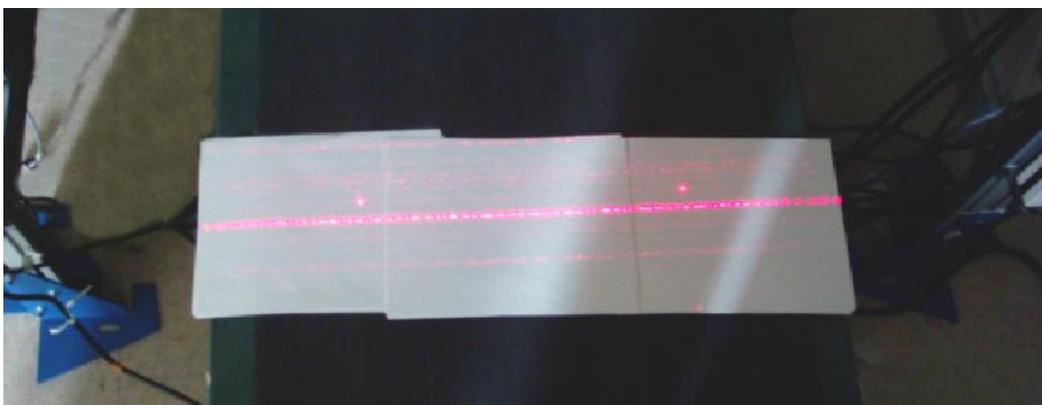
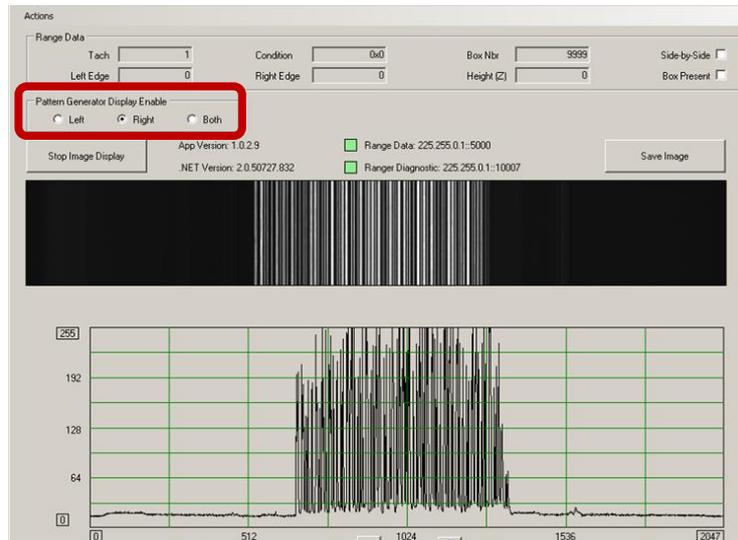


Figure 110: White paper positioned on conveyor under RangeFinder

2. Open the **RangerOScope** application to view the signal.

3. Select the left pattern generator and compare its signal to the right pattern generator. Both signals should be symmetrical.



4. In **e-Genius** under **Modify Settings**, navigate to **Global Settings / Operating Mode**. The **Operating Mode** window opens.
5. Under **RangeFinder Settings**, adjust the signal gain value in the **Offset to RangeFinder Gain Setting** text field until the right and left pattern generator signals are symmetrical in the **RangerOScope** application and gain pattern matches the sample in the image above.

Position Sensor Settings (Primary Controller)

Position Sensor Type: RangeFinder

Position Sensor Height Offset: 0 in

Position Sensor Transmit Delay: 0 in

RangeFinder Settings

Mounting Calibration Wizard

Left/Right Offset: 0 in

Mounting Height: 1930 in

Left Ignore Limit (-): 508 in

Right Ignore Limit (+): 508 in

Offset to RangeFinder Gain Setting: 0

Delay Distance (for Object Filtering): 127 in

Package Detection Debounce: 28 in

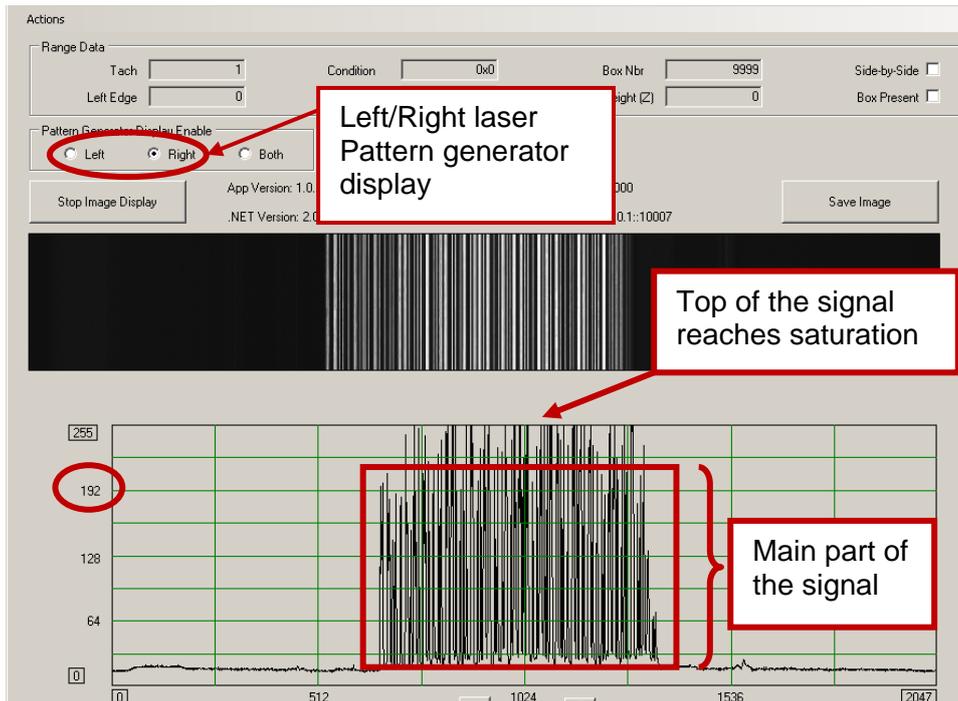
Enable Rough Dimensioning:

Offset Front Focus for Skewed Box:

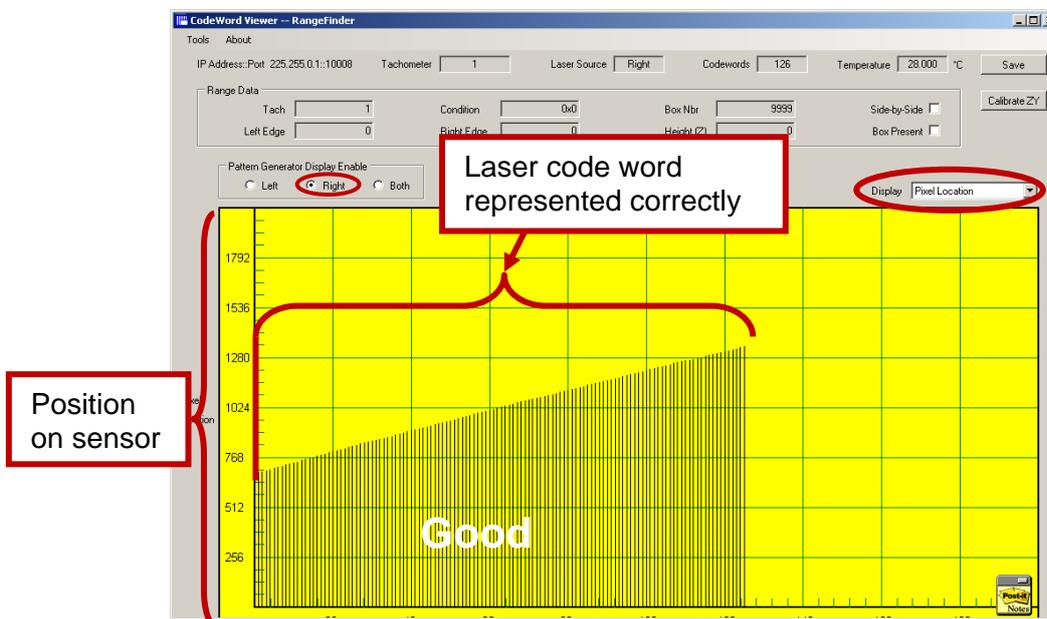
Offset Back Focus for Skewed Box:

Yaw: 0

6. Make sure the main part of the signal reaches inside line 192 in the **RangerOScope** application program.



7. Open the **CodeWord Viewer** application and view the signal.

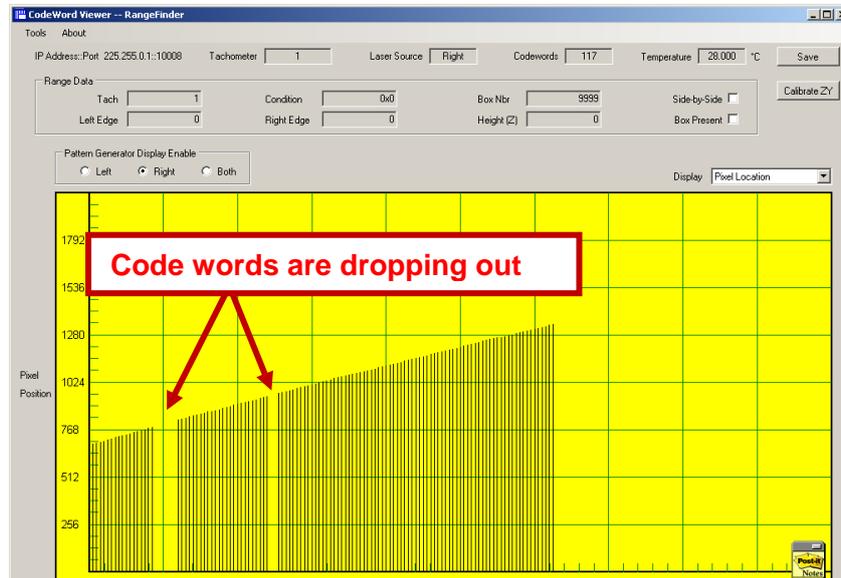


8. Select the **Left** generator display button under **Pattern Generator Display Enable**.
9. Select **Pixel Location** from the **Display** drop-down list.
10. Watch the CodeWord Viewer screen for a few moments, and make sure the code word signal remains solid, and none of the code words drop in and out.

11. Select the **Right** option button under **Pattern Generator Display Enable**, and make sure the code word signal remains stable.



NOTE: If the gain is set too high or too low some of the code words along the scan line will drop in and out as shown below. Adjust the gain to eliminate the drop-outs.



12. Next, place the white paper on some tall system boxes in the near of the depth of field (DOF) as shown below.

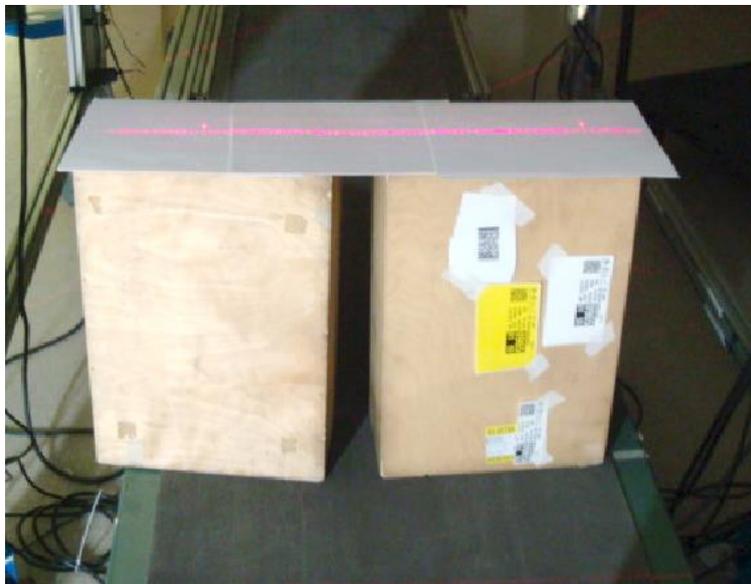


Figure 111: White paper positioned on tall boxes

13. Repeat steps 7-11 above.

Other Possible RangeFinder Signal Degradation Factors

Two other factors that can negatively affect the RangeFinder signal are **Laser Power** and **Ambient Light**.

Laser Power Test

If the Left (or Right) laser signal looks good, but the opposite side laser code words periodically drop out:

1. Select left side signal and note its signal amplitude.



NOTE: The gain may have to be reduced in order to have a good representation of the signal.

2. Select right side laser and confirm that the signal amplitude is relatively equal to the left side signal amplitude.

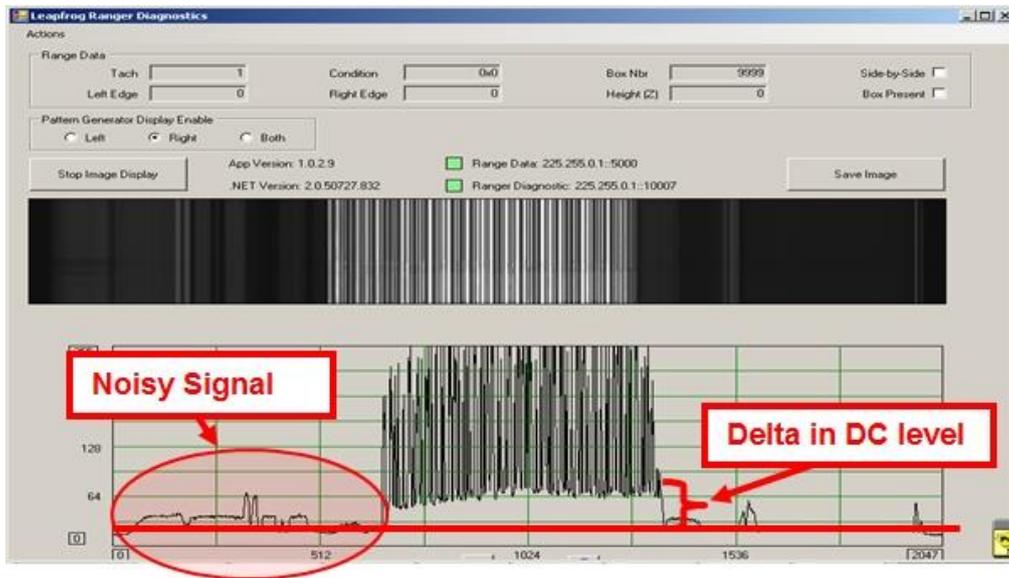


A noticeable discrepancy could indicate a potential problem with the laser diode, and the unit could report erroneous height data.

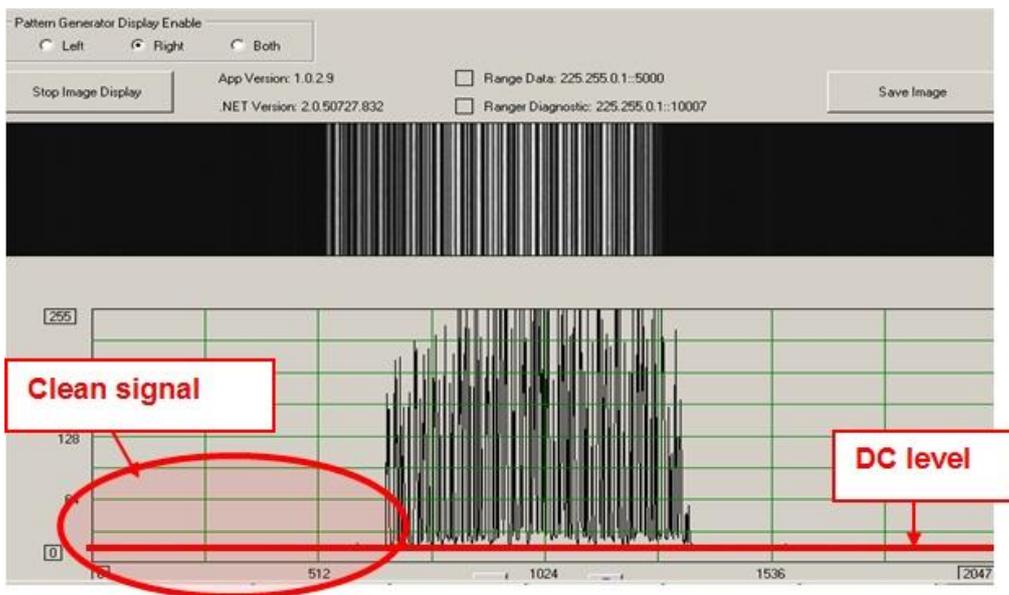
Since there are no field repairable items on the RangeFinder the unit should be replaced.

Ambient Light

Ambient light can influence the signal DC level:



Good Read:



RangeFinder Static Calibration

If not already connected, connect a PC to the RangeFinder and run Codeword Viewer:

- Local PC IP address
- 192.168.0.1
- Connect PC to sync port of the RangeFinder (RF IP: 192.168.0.40)
- Run Codeword Viewer

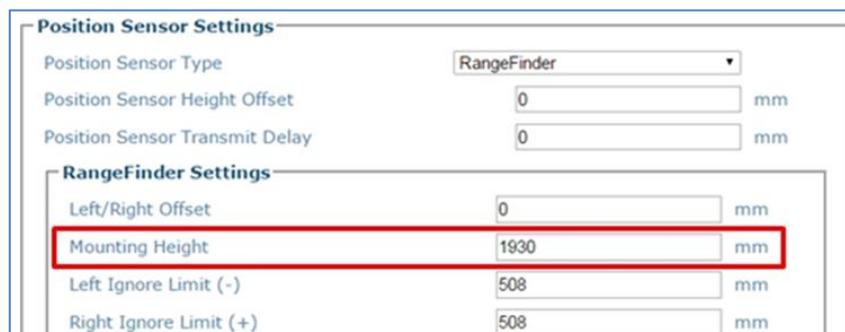
To Perform RangeFinder Static Calibration:

1. Place a box of known height in the center of the conveyor under the RangeFinder scan line. This box in this example is 3 inches tall.



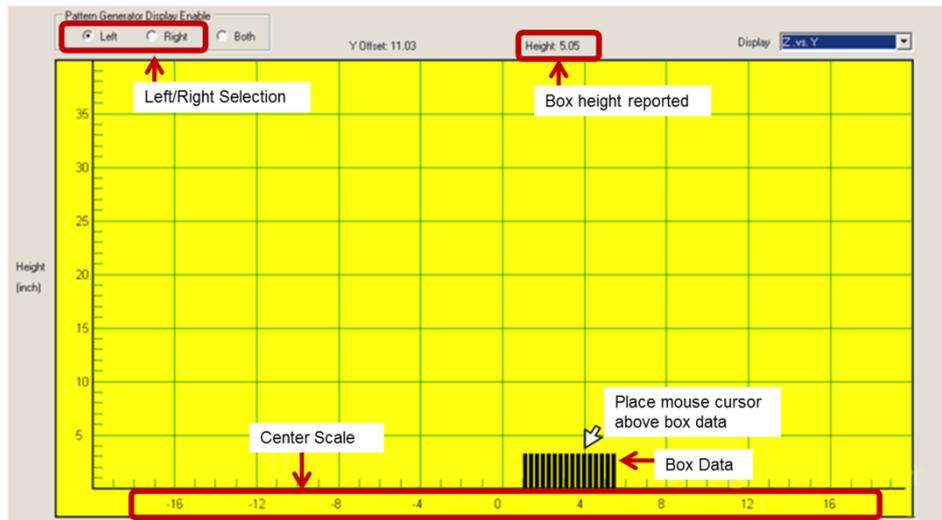
Figure 112: Box of known height placed in RangeFinder scan line

2. Select the Left or Right Pattern Generator Display Enable option button (It doesn't matter which one).
3. Place the mouse cursor over top of the box image. The box height that the RF measure's is displayed on the top of the yellow window.
4. The offset from center is displayed on the scale at the bottom of the window.
5. In the **e-Genius** change the mounting height until the correct box height is recorded in the Code Word Viewer screen.



6. Identify where on the bottom scale the box is located (this scale is in inches).

7. Measure the conveyor width (the distance from the left side camera's far working distance point to the right side camera's far working distance point measuring across the conveyor) and add that value into **e-Genius**. See **section 4.5.1 Modify Settings | Global Settings | Operating Mode**.
8. Identify how many inches the Box Data is found from the center 0 found in the Center Scale of the CodeWord Viewer.



Example:

- With a 28 inch wide conveyor, if the box is located exactly at the 0 (zero) line in the Code Word Viewer Center Scale, a **Left Ignore Limit** of 14 and a **Right Ignore Limit** of 15 is entered into the AV7000 e-Genius RangeFinder parameters (See **4.5.1**).

In the example above the box is found on the one inch increment mark of the Center Scale line. Since the box is on the positive side of the 0 reference then the following values will be added into the left/right field if the RangeFinder mounting parameters:

Left: -15

Right: +13

5.2.3 Setting up an AV7000 System Using an LCC-75XX KIT with DS2 Light Array

The DS2 AREAscan™ Light Array is a multibeam optoelectronic devices that can be used to detect objects, including small and transparent targets as well as for measurement detection. Reference the **DS2 Instruction Manual** available at www.datalogic.com.

The device consists of emitter and receiver units, which generate infrared beams that detect any object positioned in the light grid's detection field.

The command and control functions are inside the two units; the connections are made through M12 connectors located in the lower side of the profiles. The synchronisation between the emitter and the receiver takes place via cable through direct connection

between the two units. The operator obtains information relative to the light grid status and error conditions through LEDs located on the device and/or through the control interface of a remote PC.

Mounting the DS2 Light Array

The emitter and receiver units have to be mounted with the relevant sensitive surfaces facing each other. The connectors must be positioned on the same side and with the operating distance of the model used (see *DS2 Instruction Manual* available at www.datalogic.com). Reference system application drawings for proper placement.

The two units must be aligned and parallel as much as possible. To mount the device, insert the threaded pins supplied (shown below) in the slots present on the two units.

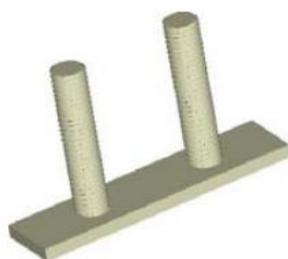


Figure 113: Threaded pins

Depending on the particular application and/or type of support, the operator can use the fixing pins or the rigid fixing brackets supplied to mount the two units as shown below.



Figure 114: Threaded pins

LCC-75xx Kit with DS2 Light Array Electrical Connection and Setup

The DS2 AREAscan™ Light Array for the AV7000 is part of the LCC-75XX Light Curtain kit. The LCC-75XX Light Curtain consists of:

- DS2 AREAscan™ Light Array (Receiver & Emitter)
- CVL-2403 Connection Cable
- Mounting Brackets

The CVL-2403 Connection Cable is provided to attach the DS2 AREAscan™ Light Array emitter and receiver to the AV7000 and a power source.

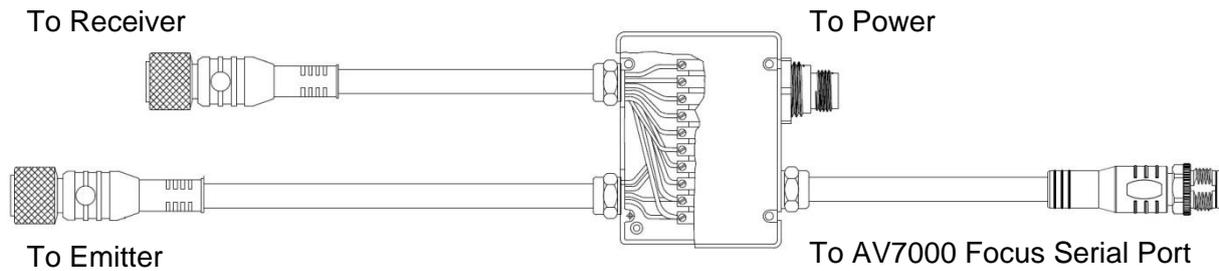


Figure 115: CVL-2403 Connection Cable

Power Options:

External Power Supplies:

PG-100-K01 POWER SUPPLY 60W KIT (EU)	93ACC0059
PG-100-K02 POWER SUPPLY 60W KIT (UK)	93ACC0060
PG-100-K03 POWER SUPPLY 60W KIT (US)	93ACC0058

Power from CBX box using cable 95ACC2110:

95ACC2110 Cable wire	CBX box terminal
Brown and White twisted together	Power Vdc
Blue and Black twisted together	Power GND
Grey	Earth

Verify the following:

Receiver DIP Switches:

- 1 = OFF (down)
- 2-8 = ON (up)

Emitter Trimmer is set fully clockwise (maximum gain)

5.3 AV7000 CAMERA SETUP AND CALIBRATION

The AV7000 Camera can be set up as a single unit or with multiple AV7000s in a scanning array (tunnel). The AV7000 camera system is a high-precision imaging system, and requires careful and accurate setup and calibration to function at its full potential.

Prerequisites

To successfully install, set up, and calibrate you camera system, the following is required:

- 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)
- CH-3 Autofocus Test Chart
- Dynamic Focus Target
- Picket Fence/Step Ladder Test Chart
- RangerOScope (software): Download from **e-Genius, Utilities | Download Tools** window. Click **RangeFinder Tools** (Only when using RangeFinder for focusing).
- CodeWord Viewer: Download from **e-Genius, Utilities | Download Tools** window. Click **RangeFinder Tools** (Only when using RangeFinder for focusing).
- Inventory All Equipment and Structure Parts

Review Mounting Drawing and Application Specifications

Make sure all equipment is mounted correctly based on the application drawings and specifications.

- **DM3610 (if applicable)**

If the system uses a DM3610 Dimensioner for camera focus, review the DM3610 Dimensioner Reference Manual for installation and calibration of the DM3610. Install the DM3610 as specified in the application drawing. *See section 0.*

- **RangeFinder (if applicable)**

If the system uses a RangeFinder for camera focus, install and calibrate the RangeFinder according to application drawings and *section 5.2.2.*

- **LCC-75xx Kit with DS2 Light Array**

If the system uses a DS2 Light Array (Light Curtain) for camera focus, install the LCC-75xx Kit according to application drawings and *section 5.2.3.*

- **AV7000 Deflection Mirror Alignment**

Reference the application drawing and *section 2.5* 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 PS is square to the conveyor
- Make sure the PS is high enough off 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 155 mm [6 in] or greater upstream from the RangeFinder scan line (if applicable).
- If using the **AS1 Area Sensor** as trigger, see *section 0* for information on installation and alignment.

AV7000 Software Update

If necessary, a Datalogic technician will update the AV7000 CPU with the latest software. This must only be done by, or under the guidance of, a trained Datalogic technician.



IMPORTANT: DO NOT use a parameter file from any previous AV7000 installations.

Connect a Laptop to the AV7000

The static and dynamic calibration can be accomplished using any of the three Ethernet ports; Image, Host or Sync:

- Host default IP: 192.168.3.10
- Image default IP: 10.0.40.20
- Sync Controller IP (the sync adapter cable must be used): 192.168.0.145



NOTE: Your PC's IP address needs to match the camera system's IP Address range, see *section 4.1.2* for information on connecting a laptop to the system.



NOTE: The Host and Image port IP addresses may have been changed for your application. Contact your system administrator for changes.

Open a browser and enter camera's IP address into the browser's address field. When **e-Genius** opens, enter the case sensitive user name (setup) and password (DLAset).

5.3.1 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 *section 4.1.2* for information on connecting a laptop to the AV7000.

System Info: Bring Each Camera into the Network

When power is applied to the AV7000 scan tunnel for the first time each camera will need to be brought into the sync network using the **e-Genius**.

1. From the menu tree, navigate to the **Modify Settings | System Info**. The **System Info** Page opens.

Tunnel Information	
Number of Camera's Detected	2
RangeFinder Detected	NO

This Cluster						
Online	Status	MAC Address	IP Address	Camera Position	Name	Action

Cameras not in this Cluster						
Online	Status	MAC Address	IP Address	Action	Name	
		00:0E:13:06:00:6A	192.168.0.145	Ignore this camera	Unknown	Blink
		00:0E:13:06:00:52	192.168.0.164	Ignore this camera Ignore this camera Add to Cluster as new	Unknown	Blink

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 AV7000 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.

Tunnel Information	
Number of Camera's Detected	2
RangeFinder Detected	NO

This Cluster						
Online	Status	MAC Address	IP Address	Camera Position	Name	Action
		00:0E:13:06:00:6A	192.168.0.145	Top	Camera 1	Blink
		00:0E:13:06:00:52	192.168.0.164	Top	Camera 2	Blink

Cameras not in this Cluster						
Online	Status	MAC Address	IP Address	Action	Name	

6. Click **Update** to save the configuration.

This Cluster						
Online	Status	MAC Address	IP Address	Camera Position	Name	Action
		00:0E:13:06:00:6A	192.168.0.145	Top	Camera 1	Blink
		00:0E:13:06:00:52	192.168.0.164	Right	Camera 2	Blink

Cameras not in this Cluster						
Online	Status	MAC Address	IP Address	Action	Name	

Operating Mode

In the menu tree under **Modify Settings**, navigate to **Global Settings | Operating Mode**. The **Operating Mode** window opens. See *section 4.5.1* for an explanation of the **Operating Mode** options.

The following parameters are important to be set to match the application:

1. Encoder Settings

Encoder Step Settings: See *section 4.5.1 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 AV7000 sets the exposure time parameter during calibration

2. **Conveyor width:** Enter the width of the conveyor (the distance between left and right focus offsets; See *section 0*)

3. **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**.

4. Transmit Point Settings

5. Other Important Application Dependent Parameters:

- **Modify Settings | Global Settings | Object Detection** (See *section 4.5.2*)
- **Modify Settings | Global Settings | Barcode Settings** (See *section 4.5.3*)
- **Modify Settings | Global Settings | Communications** (See *section 4.5.4*)
- **Modify Settings | Global Settings | Output Format** (See *section 4.5.6*)
- **Modify Settings | Global Settings | Image Saving** (See *section 4.5.7*)

Device Settings

In the menu tree under **Modify Settings**, navigate to **Device Settings**. Due to the mounting differences among the AV7000 cameras in the system, each camera will be calibrated separately.

There will be a different **Device Settings** branch in the menu tree for each camera in the array. See *section 4.6* for an explanation of the **Device Settings** options.

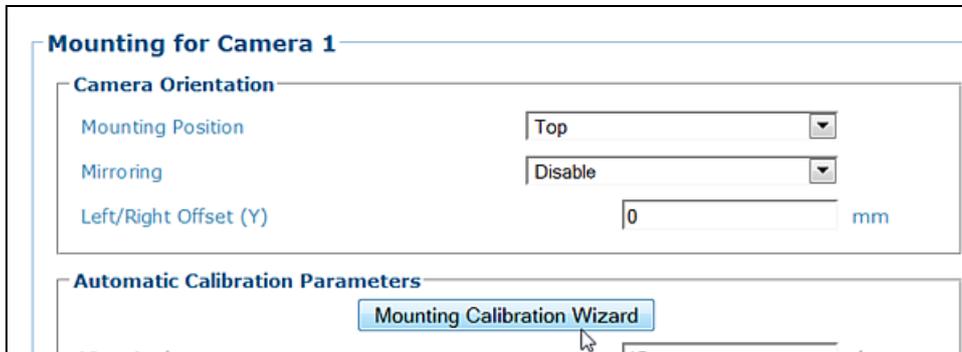
1. In the menu tree, navigate to **Modify Settings | Device Settings | Camera N | Device Info**. The **Device Info** window opens.
2. Enter a unique name for the camera. The new name will appear in the **Name** column on the **System Info** window, and also in the menu tree under **Device Settings**.

Device Settings for Camera 1	
Device Information	
Conventional Name	Top
Serial Number	A14P00004
Ethernet Ports	
SyncNet MAC Address	00:0E:13:06:00:6A
SyncNet IP Address	192.168.0.145
Image Port MAC Address	00:13:95:16:83:52
Host Port MAC Address	00:0E:13:06:00:69
<input type="button" value="Update"/> <input type="button" value="Reset"/>	

3. Click **Update** to save the new name. Repeat this for each camera in the system.

5.3.2 Calibrating AV7000: Static Calibration

1. Navigate to **Modify Settings | Device Settings | Camera N | Mounting**. The **Mounting** window opens.



2. Place the **CH-3 Autofocus Test Chart** on the conveyor within the imaging area for the selected camera.

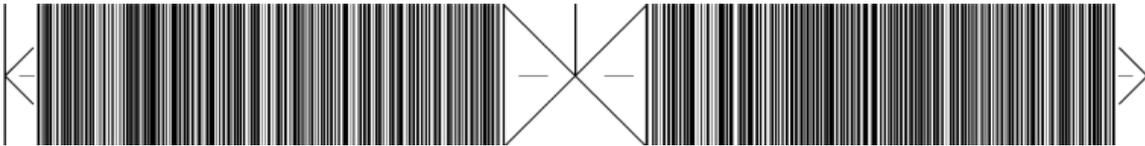
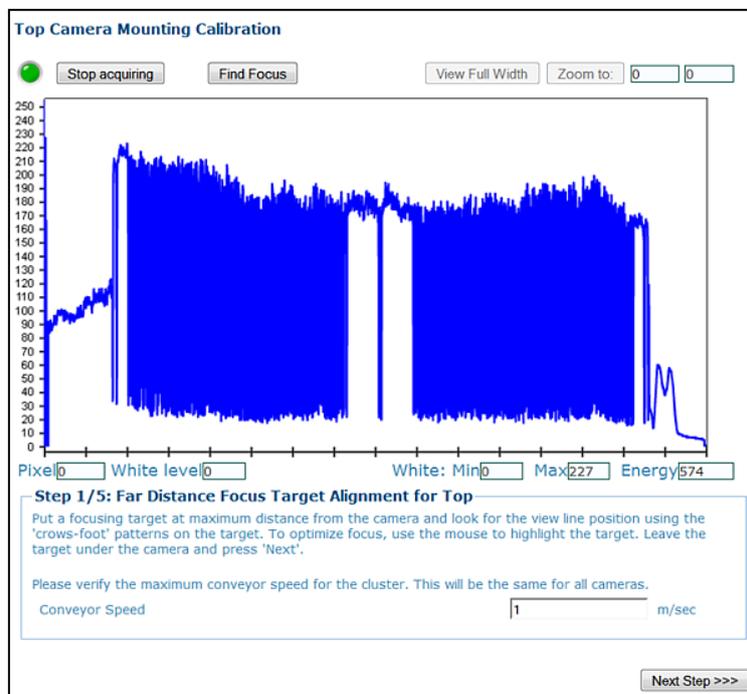


Figure 116: CH-3 Autofocus Test Chart

3. Click **Mounting Calibration Wizard**. The AV7000 camera launches the **Step 1/5** calibration wizard window, and attempts to focus on the calibration test target.



NOTE: If the image does not come into focus as shown above, click **Find Focus**. This should find and focus on the target.

4. Confirm that the application's correct MAX conveyor speed (Formula: Max conveyor speed x 1.05) is in the **Conveyor Speed** field. This is used by the AV7000 to set the image exposure time.
5. Place the **CH-3 Autofocus Test Chart** at the **FARTHEST** distance from the AV7000 (far working distance).
6. Adjust the target position until the center pattern is represented by only a single line.

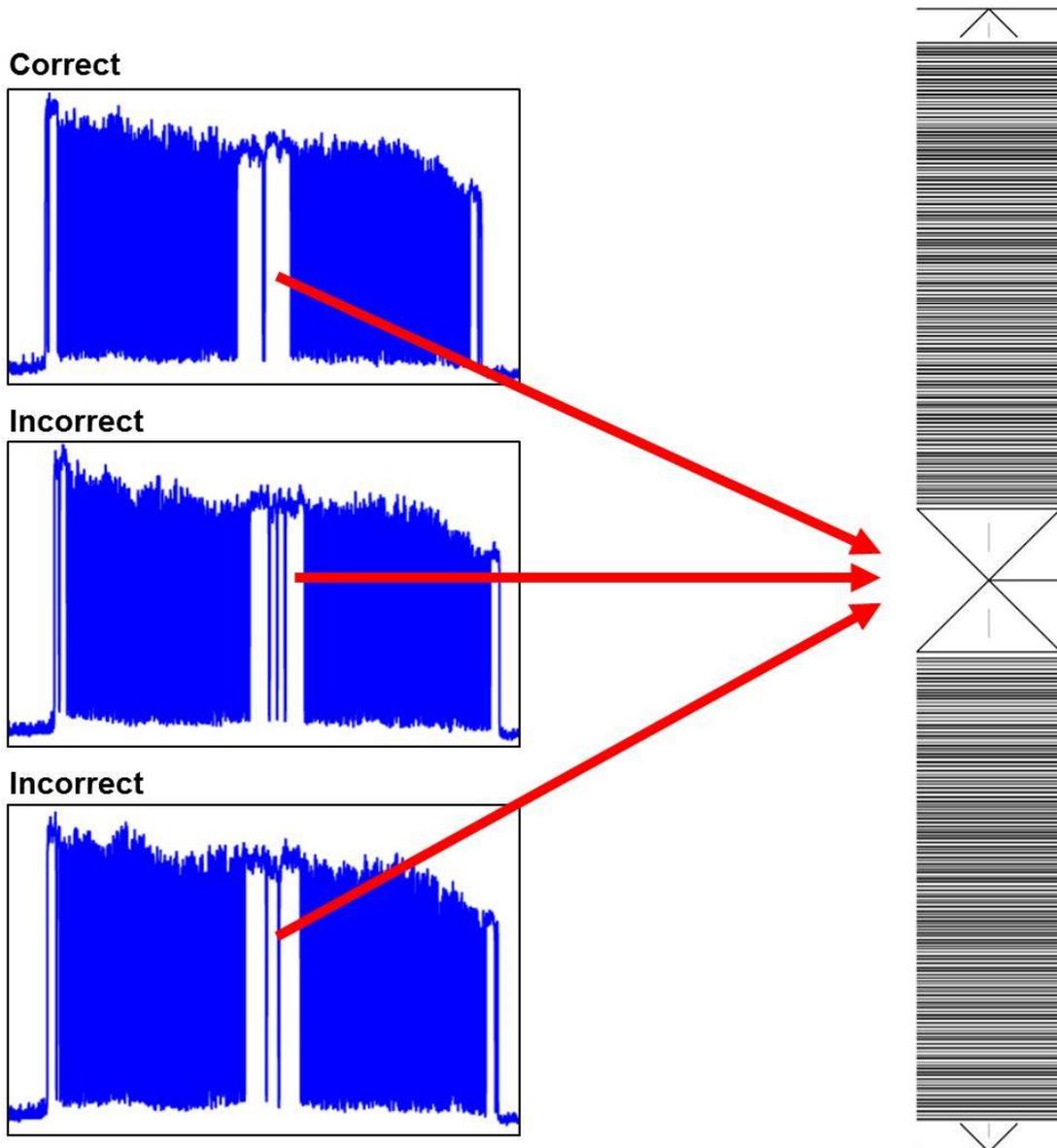
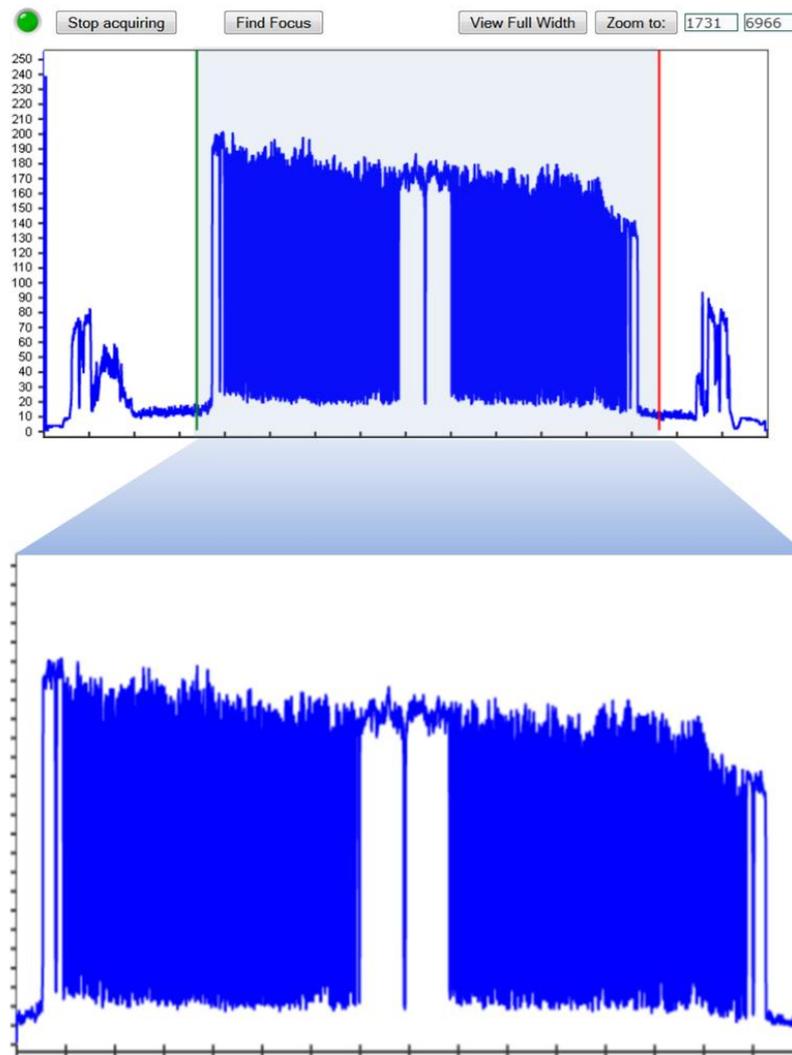


Figure 117: Focus Target Position

7. Zoom into the focused area with the mouse by left clicking and holding the cursor on the left side of the image and then dragging the cursor to the right. Release the mouse button past the second focused area. This minimizes the amount of data the AV7000 has to process during this calibration step.

- Click **Zoom to** and the image is zoomed to the selected area.



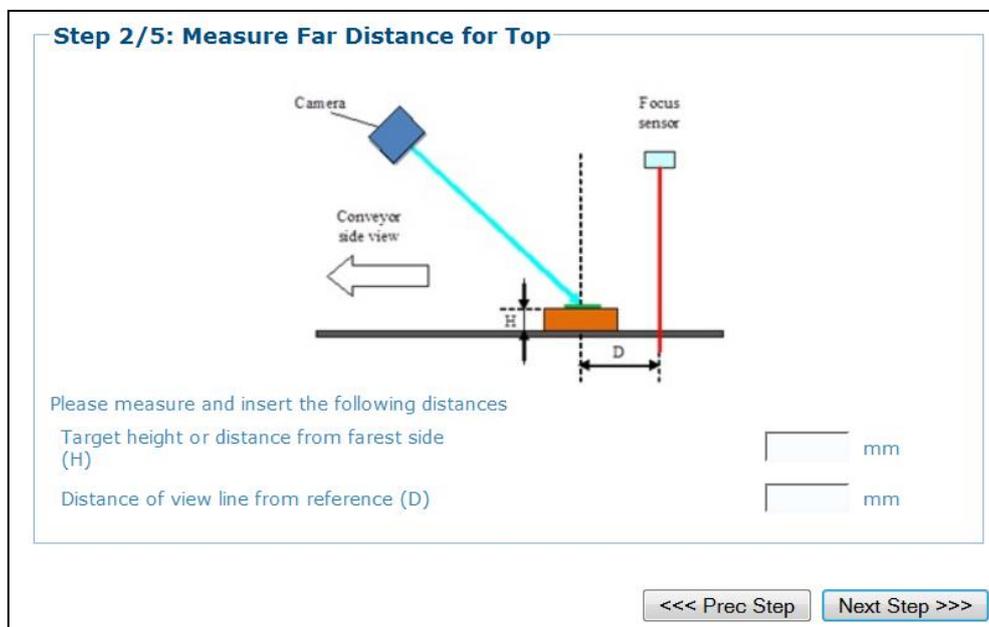
- Click **Next Step >>>**. The **Step 2/5 Mounting Calibration Window** opens. The AV7000 uses the image and determine the optimal far working distance for the camera. This step takes a while and the “Please Wait” message will blink during this time.

Step 1/5: Far Distance Focus Target Alignment for Top

Please wait while the camera determines the optimal far working distance.
Do not move the target during this time.

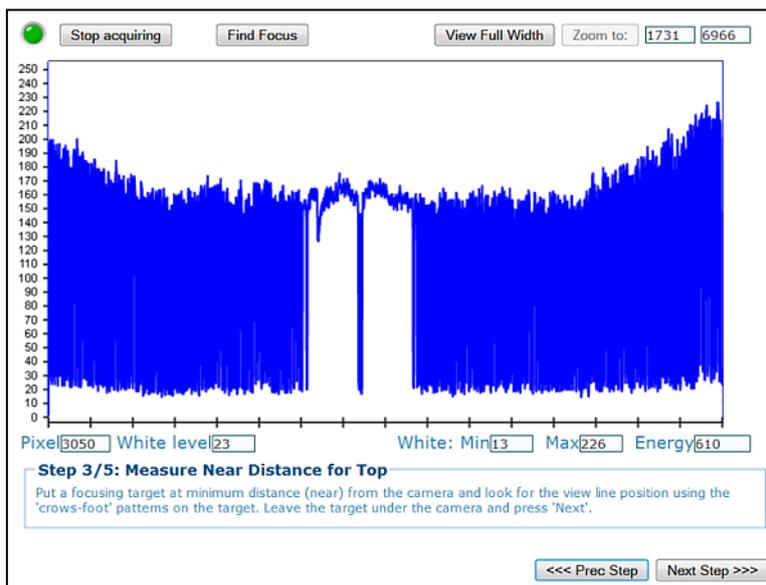
10. Enter the **Target height** (Top mount) or **distance from the farthest side** (Side Mount) (**H**).

- For **Top Read**, with the target on the conveyor this value is **0**.
- For **Side Read**, the target can be placed on a box. Set the box at the farthest distance from the AV7000 and the **H** value is the width of the box.



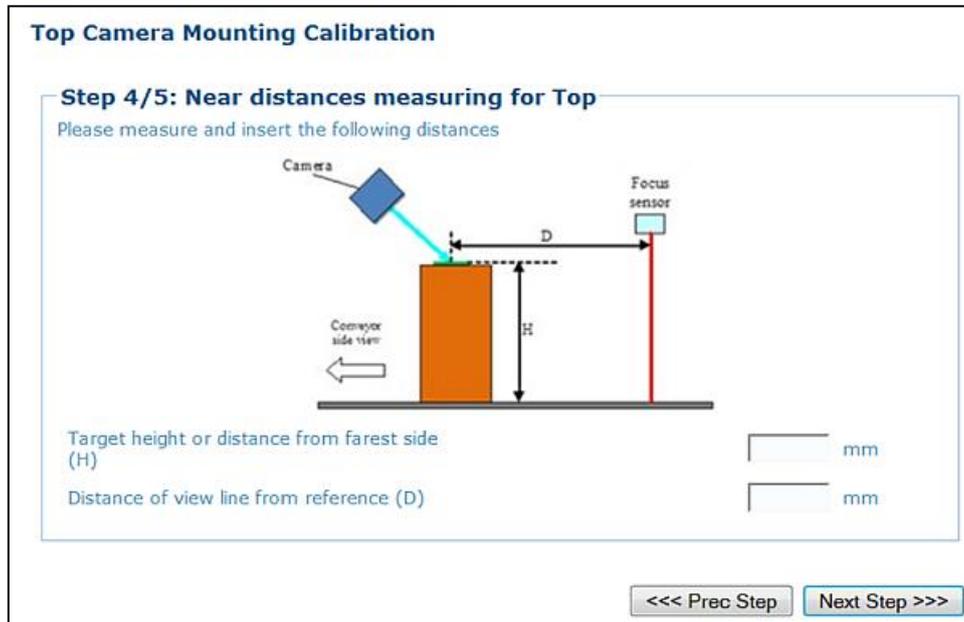
11. Measure the distance from the center of the **CH-3 Autofocus Test Chart** (center of X) to the focus source (DM3610, RangeFinder, or Light Curtain). Enter the distance in the **Distance of view line from reference (D)**.

12. Click **Next Step >>>**. The **Step 3/5 Mounting Calibration Window** opens.

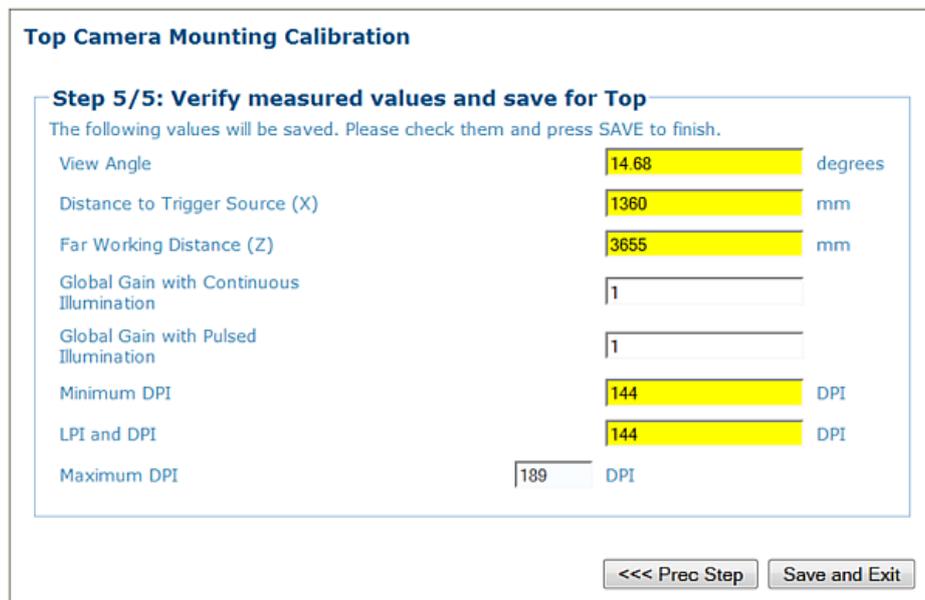


NOTE: If the image does not come into focus as shown above, click **Find Focus**. This should find and focus on the target.

13. Place the **CH-3 Autofocus Test Chart** at the near distance. Position the target so the center X has only one leg (center of X) represented.
14. Zoom into the target area as described in the steps above.
15. Click **Next Step >>>**. The **Step 4/5 Mounting Calibration Window** opens.



16. Enter the **Target height** (top mount AV7000) **or distance from farthest side** (side mounted AV7000) (**H**).
17. Enter **Distance of view line to reference (D)**. This is the distance from DM3610, RangeFinder, or Light Curtain to the view line.
18. Select **Next >>>**. The **Step 5/5 Mounting Calibration Window** opens.



19. The **Mounting Calibration Wizard** displays the results of the static calibration. The yellow highlight indicates which fields will be changed in the XML file. These new parameters will automatically be used by the AV7000.
20. Click **Save and Exit**.

5.3.3 Calibrating AV7000: Dynamic Calibration

Dynamic calibration is used to set up and calibrate a system in motion.

Configuring e-Genius for Running Dynamic Calibration

1. The test target used for dynamic calibration uses 20 character Code 128 barcodes, so e-Genius must be configured to accept those codes.

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

Barcode List

Idx	Type	Minimum Label Length	Maximum Label Length
1	Code 128	10	60
2	Disabled		
3	Disabled		
4	Disabled		

Code 1 Definition

Enable

Code Symbology

Disable reading on device (bit mask)

Minimum Label Length

Maximum Label Length

Match String Rule

Options

Start / Stop Char Tx

Code128 Function Tx

Short Margin

2. Set the barcode menu to read the **Picket Fence/Step Ladder Res Test Chart** (code 128 barcodes).



NOTE: This barcode setting must be removed if it is not the customers expected barcode.

Preparing the Dynamic Calibration Test Box

1. Tape the **Dynamic Focus Target** and **Picket Fence/Step Ladder Res Test Chart** on the 460x300x150 mm [18x12x6 in] box.



Figure 118: Dynamic Focus Target and Picket Fence/Step Ladder Res Test Chart

2. Turn on the conveyor.
3. In e-Genius, navigate to **Diagnostics | System Status** and confirm that the belt speed is correct.

Diagnostics / System Status

Belt Speed(mm/s)	1508
Belt Speed(fpm)	296
Total Packages	48
Good Reads	6
No Reads	25
Multiple Reads	17
Read Rate	47.92%
<input type="button" value="Reset Counts"/>	

Calibrating Distance to Trigger Source (X)

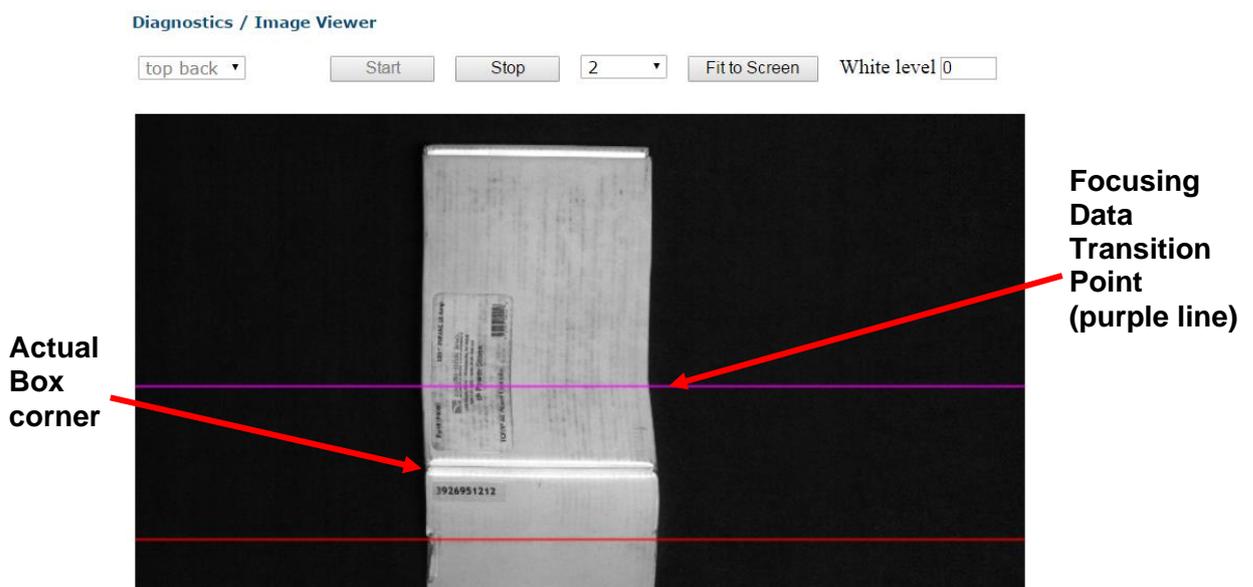
1. In e-Genius, navigate to **Diagnostics | Image Viewer**. The **Image Viewer** window opens.



2. Select the camera to be calibrated from the first drop-down box.
3. Click **Start**.
4. Send a small box through the system (belt surface for top mount, and farthest distance from camera for side mount).

The **Image Viewer** captures an image of the box. The purple line in the image indicates the **Focusing Data Transition Point**, which should align with the corner of the box.

5. If the **Focusing Data Transition Point** (purple line) does not align with the leading corner of the box, the **Distance to Trigger Source (x)** must be modified to align the purple **Focusing Data Transition Point** line with the corner of the box.



6. In the menu tree, navigate to **Modify Settings | Device Setting | Camera n (unit being calibrated) | Mounting**. The **Mounting** window opens.

Mounting for Top

Camera Orientation

Mounting Position: Top

Mirroring: Disable

Left/Right Offset (Y): 0 mm

Automatic Calibration Parameters

Mounting Calibration Wizard

View Angle: 14.68 degrees

Distance to Trigger Source (X): 1336 mm

Far Working Distance (Z): 3655 mm

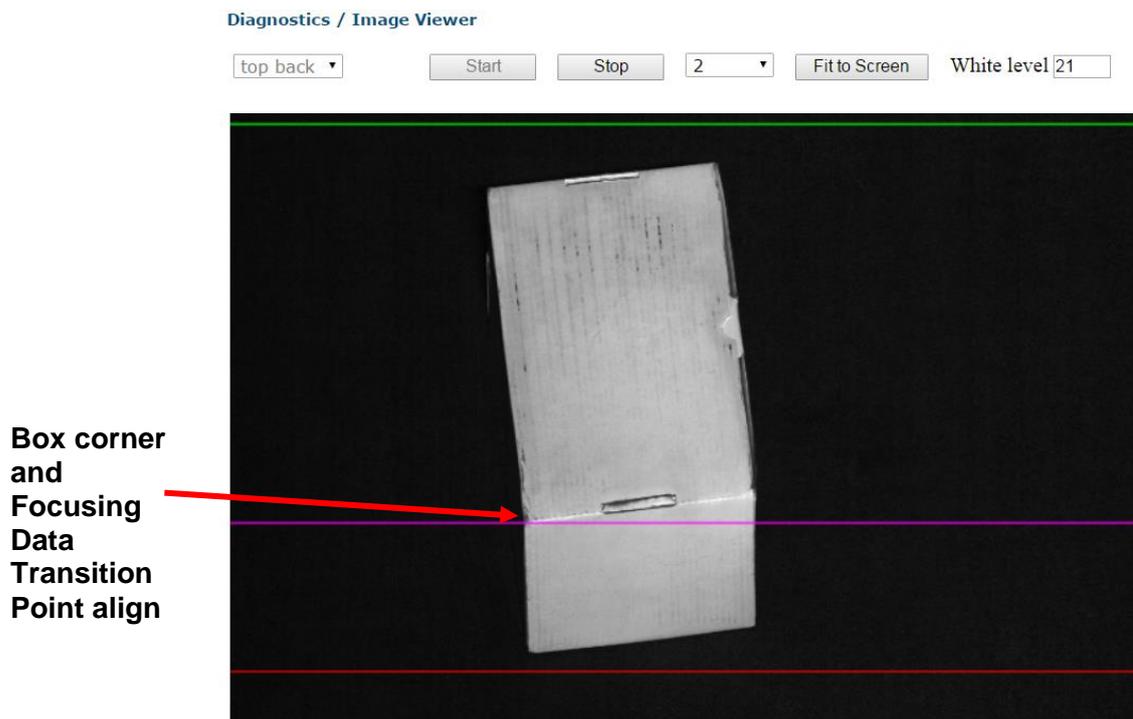
Global Gain with Continuous Illumination: 1

Global Gain with Pulsed Illumination: 1

Update Reset

- Incrementally modify **Distance to Trigger Source (X)** to move the **Focusing Data Transition Point** (purple line) to the actual corner of the box.

To do this, re-run the **SMALL** box and adjust the **Distance to Trigger Source (X)** until the **Focusing Data Transition Point** aligns with the leading corner of the box.



NOTE: The leading corner of the box should align with the purple **Focusing Data Transition Point** line.

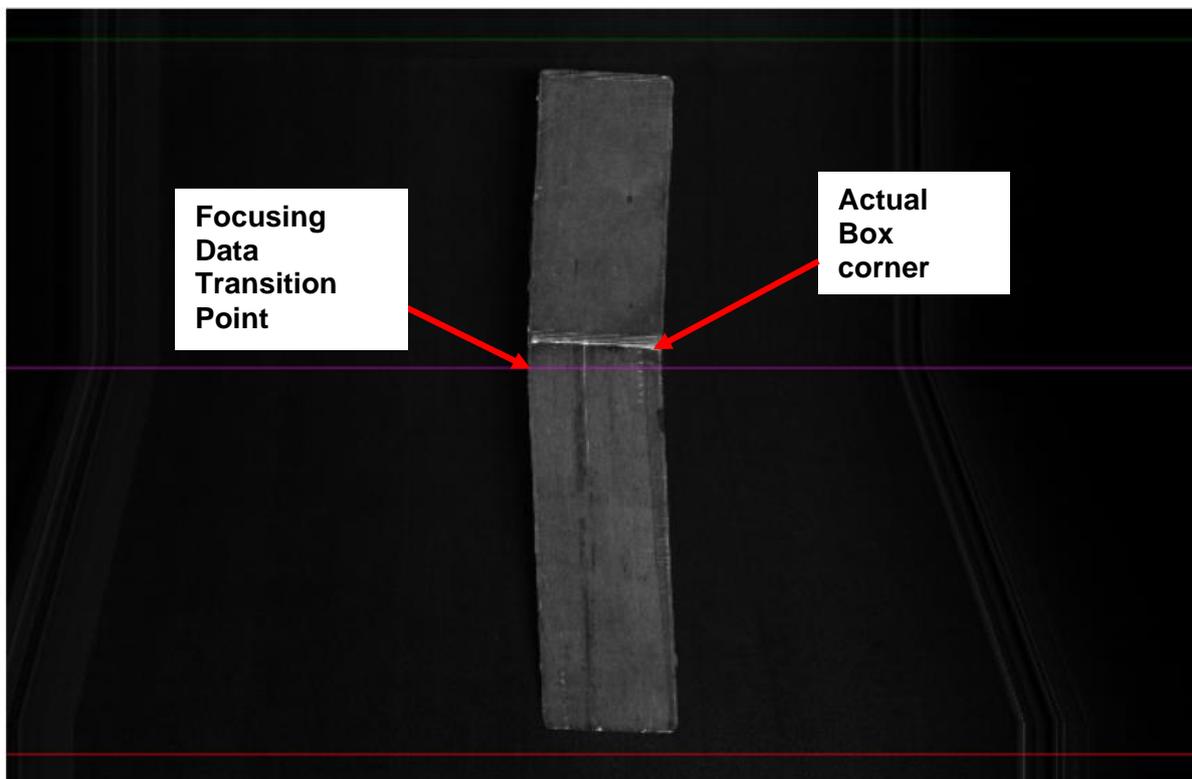
Calibrating Camera View Angle

After the **Distance to Trigger Source (X)** is set correctly, set the camera view angle.

1. From the menu tree, navigate to **Diagnostic | Image Viewer**. The **Image Viewer** window opens.
2. Run a box (TALL box for a top read, and NEAR box for a side read), through the system and identify the position of the **Focusing Data Transition Point** (purple line) in regards to the corner of the box.

Diagnostics / Image Viewer

top back ▾ Start Stop 2 ▾ Fit to Screen White level 0



3. In the menu tree, navigate to **Modify Settings | Device Setting | Camera n (unit being calibrated) | Mounting**. The **Mounting** window opens.

Mounting for Top

Camera Orientation

Mounting Position:

Mirroring:

Left/Right Offset (Y): mm

Automatic Calibration Parameters

View Angle: degrees

Distance to Trigger Source (X): mm

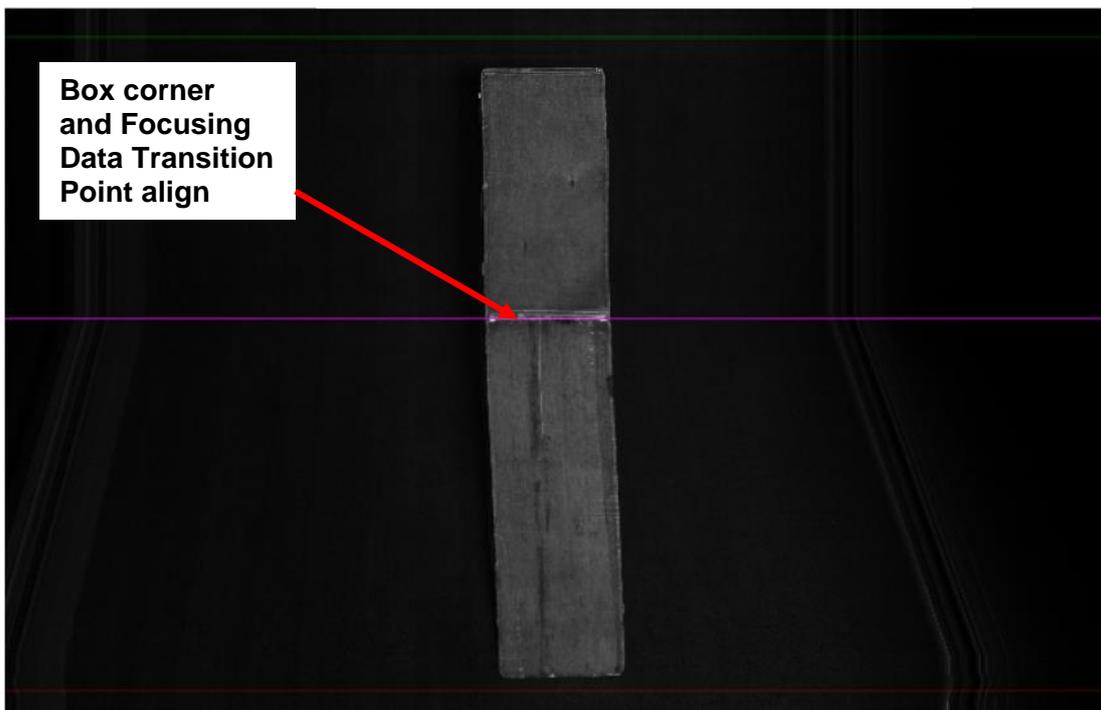
Far Working Distance (Z): mm

Global Gain with Continuous Illumination:

Global Gain with Pulsed Illumination:

4. Incrementally modify the View Angle until the **Focusing Data Transition Point** aligns with the corner of the box.

Diagnostics / Image Viewer



5. Re-run the small box and confirm the **Distance to Trigger Source (X)** setting. Make adjustments as needed.
6. Re-run the tall box and confirm the **View Angle** setting. Repeat process until both the tall (or near distance for side read) and small (farthest distance for side read) boxes have the same **Focusing Data Transition Point** at the corner of the box.

Image Gain

The image gain affects the camera's ability to decode the barcodes by modifying the image exposure. Increased gain increases the brightness and clarity of an image at a given exposure.

1. From the menu tree, navigate to **Diagnostic | Image Viewer**. The **Image Viewer** window opens.
2. Again run the text box through the system with the targets facing the camera.
3. In the **Image Viewer**, hold the mouse pointer over any white area of the target.

Diagnostics / Image Viewer

top back ▾ Start Stop 2 ▾ Fit to Screen White level 172



PackageNumber 528

4. The gain value (White level) should fall between 180 and 200.
5. In the menu tree, navigate to **Modify Settings | Device Setting | Camera *n* (unit being calibrated) | Mounting**. The Mounting window opens.

Mounting for Top 3

Camera Orientation

Mounting Position: mm

Mirroring:

Left/Right Offset (Y): mm

Automatic Calibration Parameters

View Angle: degrees

Distance to Trigger Source (X): mm

Far Working Distance (Z): mm

Global Gain with Continuous Illumination:

Global Gain with Pulsed Illumination:



NOTE: If pulsed illumination is enabled in **Device Settings | Camera n** (unit being calibrated) | **Imaging, Global Gain with Pulsed Illumination** should be adjusted. If pulsed illumination is not enabled, make adjustments to **Global Gain with Continuous Illumination**.

6. Adjust the gain until the white level shown in the **Image Viewer** is between 180 and 200.

Diagnostics / Image Viewer



PackageNumber 550

LPI/DPI Calibration

Lines Per Inch (LPI) and **Dots Per Inch (DPI)** values read by the AV7000 must be within 5% of each other. The goal is for the AV7000 to capture square pixels. This is especially important with certain barcodes and in cases where Optical Character Recognition (OCR) is required.

1. From the menu tree, navigate to **Diagnostic | Image Viewer**. The **Image Viewer** window opens.
2. Run the prepared test box through the system.
3. Click to zoom into the captured image of the **Dynamic Focus Target** so one circle fills the screen.

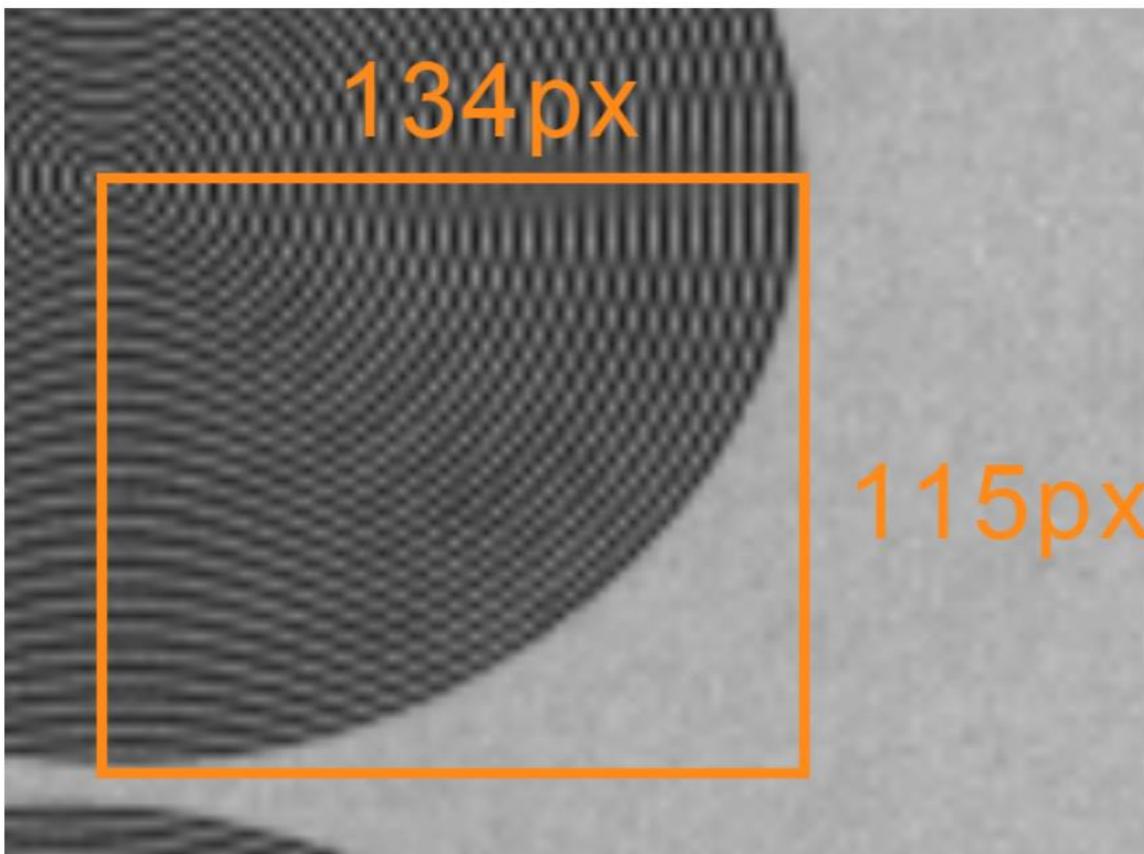


NOTE: If necessary, hold the Shift key and click to zoom back out. Alternatively, rotate the mouse wheel to zoom in or out.

4. While holding down the **CTRL** key, click and drag a box from the middle of the center dot to the outer edges of the outer circle as shown below. This image is obviously elongated, and corrections must be made.

Diagnostics / Image Viewer

top back ▾ Start Stop 2 ▾ Fit to Screen White level 181

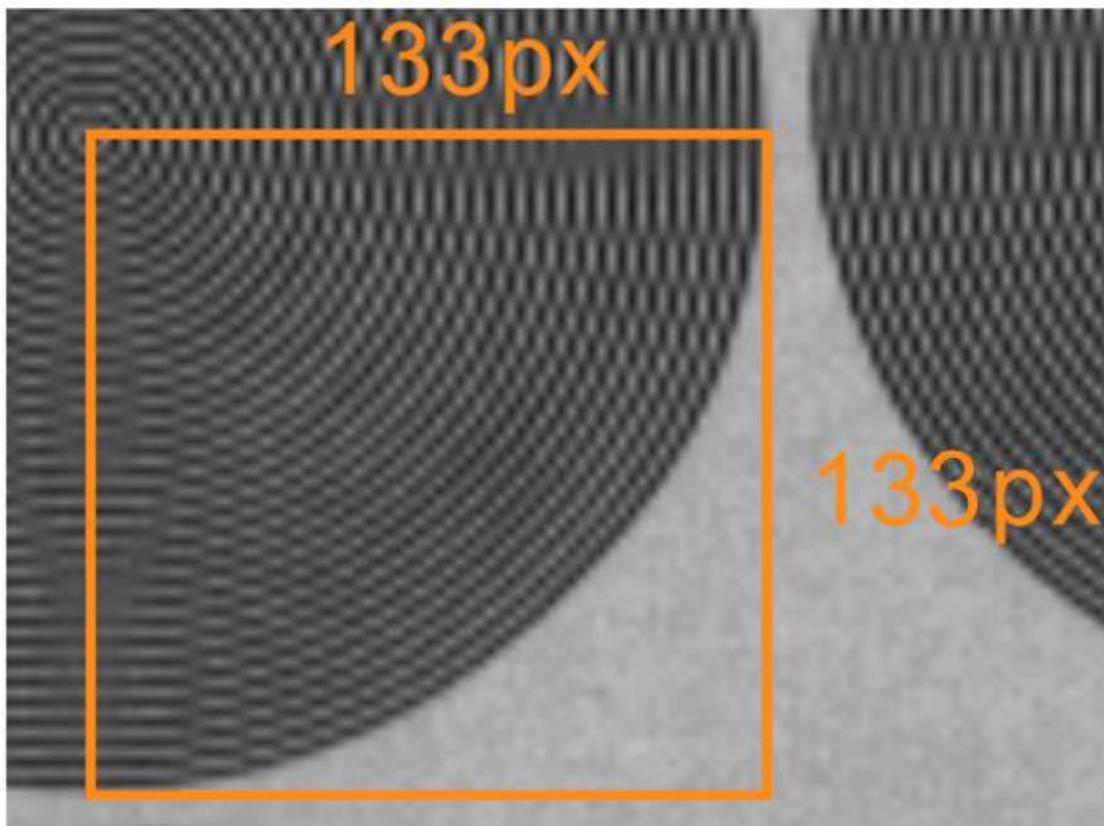


PackageNumber 552

5. If the LPI/DPI are not within 5% then a parameter is likely incorrect. Run the install wizard again to correct the problem. If that doesn't correct the problem, consult Datalogic Support for possible solutions.

Diagnostics / Image Viewer

top back ▾ Start Stop 2 ▾ Fit to Screen White level 172



PackageNumber 550

Adjusting the Focus (Far Working Distance (Z))

The Far Working Distance must be adjusted to read an equal number of step ladder and picket fence barcodes on the **Picket Fence/Step Ladder Test Chart**.

1. Place the **Picket Fence/Step Ladder Test Chart** on the test box. The first part of the data of the barcode indicates the mil/mm size of the narrow element.



Figure 119: Picket Fence/Step Ladder Res Test Chart barcode example

2. Run a box with the **Picket Fence/Step Ladder Test Chart** through the system. The goal is to have the same number of picket fence and ladder barcodes decoded. In the following example, there are more barcodes decoded in one orientation than the other. This indicates that the camera is not focused correctly.

Diagnostics / Image Viewer

top back ▾ Start Stop 2 ▾ Fit to Screen White level 87



PackageNumber 558

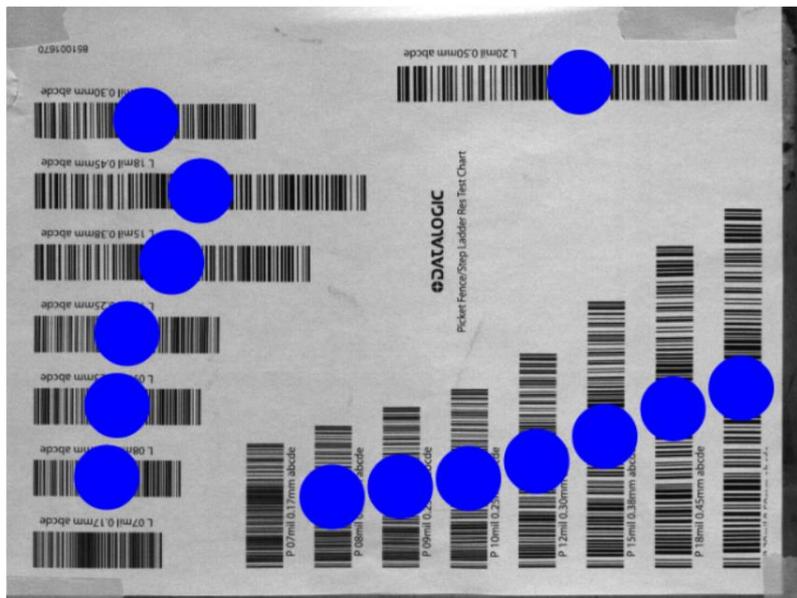
- In the menu tree, navigate to **Modify Settings | Device Setting | Camera *n* (unit being calibrated) | Mounting**. The **Mounting** window opens.

- Adjust the **Far Working Distance (Z)** parameter incrementally and run the box through the system again.

The image below is an optimized focus example with the same number of barcodes decoded in ladder and picket fence orientation. However, there may be times when one orientation will have one more barcode decoded than the other.

Diagnostics / Image Viewer

top back Start Stop 2 Fit to Screen White level 200



PackageNumber 563

- Continue running the box and making adjustments until the barcodes are in focus. Make sure that barcodes from both columns have been read.



NOTE: Remove the test barcode from the symbologies menu when completed.

5.4 FINAL ACCEPTANCE TEST

5.4.1 Dynamic Read Test

Use smallest, medium, and largest-sized system boxes for the dynamic read test.

- System smallest box: Used to test the far read distance from the camera
- System medium box: Used to test the center of the read area
- System tallest box: Used to test the near read distance from the camera

Code Placement

Obtain system code samples of various density and contrast.

Position the barcode on the surface of the box in the following manner (sample)



Figure 120: Test barcode placement



NOTE: For a front or back read the top surface of the box should have labels placed in the same pattern to accommodate testing both surfaces at the same time.

Repeat the following procedure for each AV7000 Camera in the tunnel or array.

1. Place bar codes on the surface of the box facing the AV7000 mounting location.
2. Using the smallest box with the barcodes on the top surface, run the box on the left, center, and right portions of the Field of View. **All bar codes should be read.**

3. Using the medium box with the barcodes on the top surface, run the box on the left, center, and right portions of the Field of View. **All barcodes should be read.**
4. Using the largest box with the barcodes on the top surface, run the box on the left, center, and right portions of the Field of View. **All barcodes should be read.**
5. If there is a problem reading any of the barcodes, run the Image Viewer to view the codes. The barcodes used should reflect a sampling of the various codes to be read by the system.
 - Variation in contrast
 - Variation in barcode's X dimensions
6. Make sure all the barcodes are read successfully.

5.4.2 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.

5.5 REPLACING AN AV7000 CAMERA

Use the following procedures to replace an AV7000 Camera, either a stand-alone unit, a Master in a tunnel/array, or a Slave unit in a tunnel/array.



ESD CAUTION: 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. Disconnect all the cables except for the fan cable from the camera.



Figure 121: Remove cables

3. Remove the camera from the illumination by unscrewing the four (4) mounting bolts.

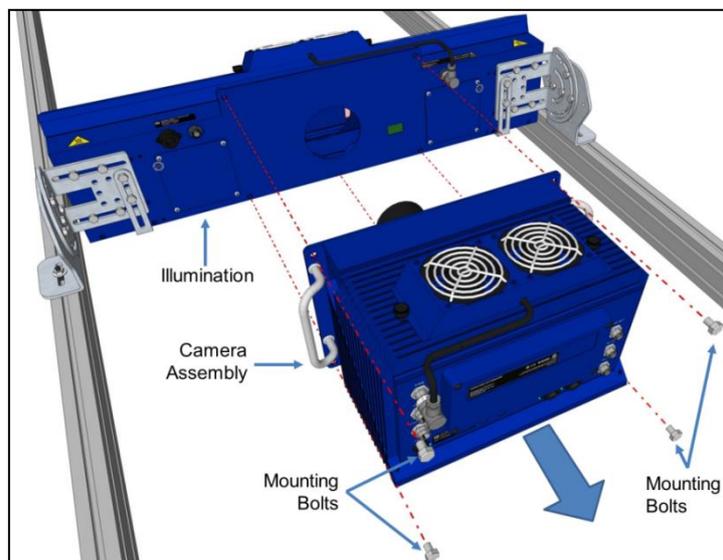


Figure 122: Removing the camera

- Place the old camera on a flat surface and remove the back access panel by loosening the retaining screws.



Figure 123: Removing the access panel

- Locate the memory card inside the access opening on the upper left side.

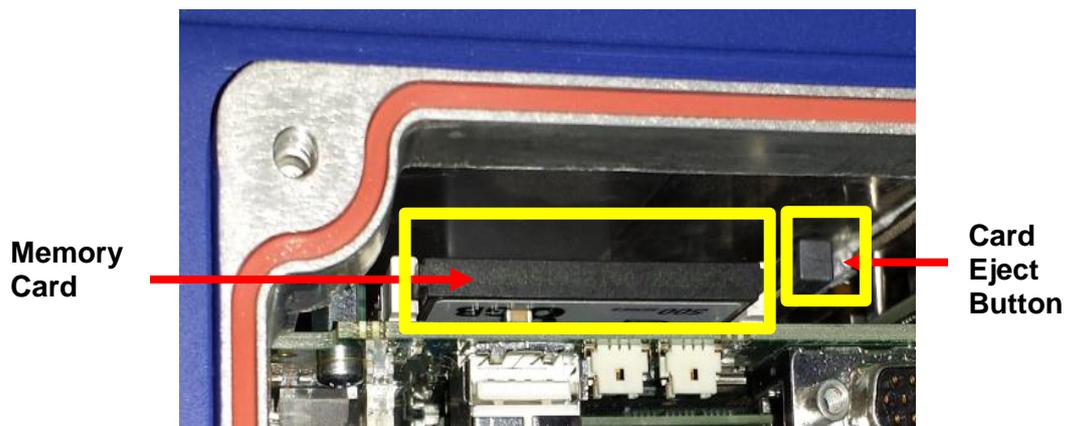


Figure 124: Memory card and eject button location

- Press the card eject button and remove the memory card from the camera.



Figure 125: Removing the memory card

7. Place the replacement camera on a flat surface, and remove the back access panel.
8. Insert the memory card firmly into the card slot in the replacement camera.
9. Reattach the back access panels and secure it with the retaining screws.
10. Attach the replacement camera assembly to the illumination. Lift the camera into place, inserting the lens through the lens hole and the Locator Pin into the Locator Pin Hole (see *section 2.4.11*).
11. Screw the mounting bolts in place to secure the camera
12. Reattach the cables to the camera in their original locations.
13. Apply power to the AV7000 Camera.

5.6 REPLACING AN AV7000 CAMERA WITH A FAILED MEMORY CARD

Sometimes a failed memory card can cause a Camera Assembly to fail. In this case replacing the camera assembly and transferring its memory card to a replacement unit will not resolve the problem. In these situations, you need to replace an AV7000 Camera with a failed Memory Card.

This procedure works for both a controller and a client in a tunnel/array. A standalone unit will be handled differently.

1. Disconnect the power source from the camera.
2. Disconnect all the cables except for the fan cable from the camera.



Figure 126: Remove the cables

3. Remove the camera from the illumination assembly by unscrewing the four (4) mounting bolts.

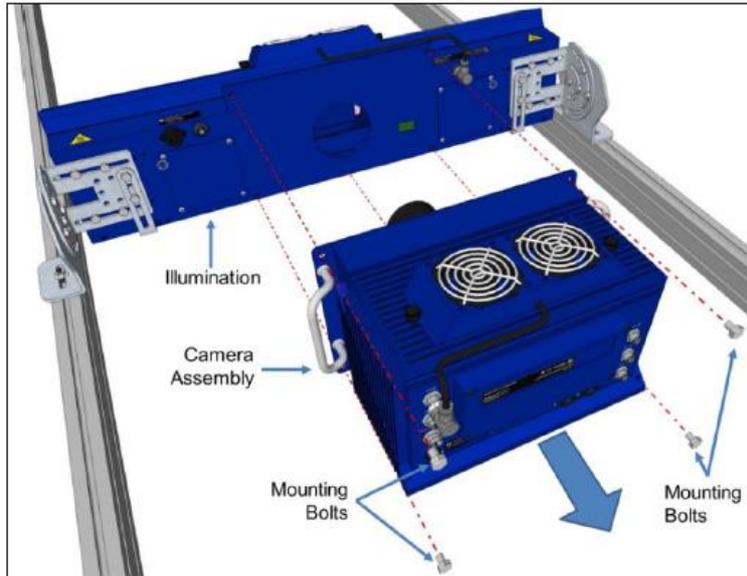


Figure 127: Removing the camera

4. Attach the replacement camera assembly to the illumination.
5. Lift the camera into place, inserting the lens through the lens hole and the Locator Pin into the Locator Pin Hole.
6. Screw the mounting bolts back in place to secure the camera.



Figure 128: Re-attaching the camera

7. Connect only the power cable to the camera assembly.



DO NOT CONNECT ANY OTHER CABLES UNTIL THE FOLLOWING STEPS ARE COMPLETED. If other cables are connected there is a risk that the existing tunnel parameters may get corrupted.

8. Connect the Controller Key (tach dongle) to the I/O port of the AV7000.

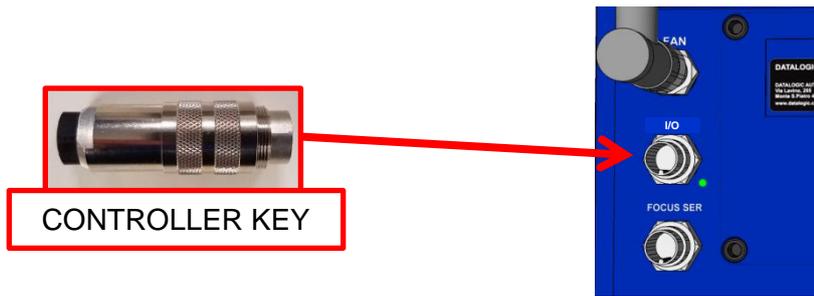


Figure 129: Controller Key

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.

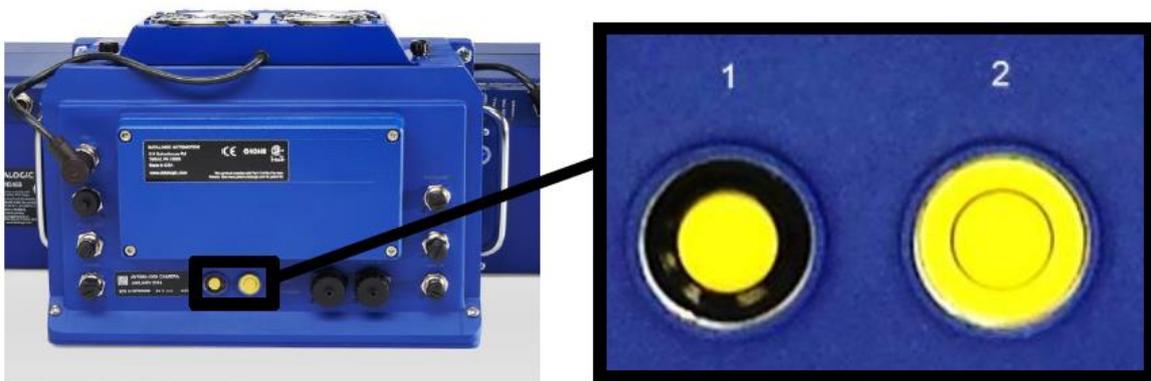


Figure 130: Buttons – Close-up

10. Disconnect the power connection from the camera assembly.
11. Remove the CONTROLLER KEY from the I/O port of the AV7000.
12. Re-attach all of the cables to the camera in their original locations.
13. Apply power to the AV7000 Camera.
14. Connect the browser to any AV7000 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 AV7000 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).

The screenshot shows the Datalogic camera management interface. The main content area is titled "System Info" and contains a "Tunnel Information" section and two tables of camera data.

Tunnel Information

Number of Camera's Detected	7
Position Sensor	Dimensioner

This Cluster

Online	Status	MAC Address	IP Address	Camera Position	Camera Name	Action
●	●	00:0E:13:06:00:2C	192.168.0.145	Right	Right_Front	Blink
●	●	00:0E:13:06:00:3E	192.168.0.205	Bottom	Bottom	Blink
●	●	00:0E:13:06:00:20	192.168.0.206	Top	Top	Blink
●	●	00:0E:13:06:00:36	192.168.0.207	Right	Right_Back	Delete
●	●	00:0E:13:06:00:24	192.168.0.209	Left	Left_Back	Blink
●	●	00:0E:13:06:00:26	192.168.0.218	Left	Left_Front	Blink

Cameras not in this Cluster

Online	Status	MAC Address	IP Address	Action	Name	Blink
●	●	00:0E:13:06:01:23	192.168.0.219	Ignore this camera Add to Cluster as new Replace 00:0E:13:06:00:36	Unknown	Blink

Annotations in the image:

- Cameras in the cluster:** A red box highlights the "This Cluster" table.
- Failed Camera:** A red box and arrow point to the camera with MAC address 00:0E:13:06:00:36 in the "This Cluster" table.
- Replacement Camera:** A red box and arrow point to the camera with MAC address 00:0E:13:06:01:23 in the "Cameras not in this Cluster" table.
- Failed Camera's MAC Address:** A red box and arrow point to the "Replace 00:0E:13:06:00:36" option in the dropdown menu for the failed camera.

5.7 AS1 AREA SENSOR ALIGNMENT

The photoelectric light grids of the **AS1** series are crossed-beam area sensors able to detect all objects, with even 0.2mm thickness, inside a 100mm height, over operating distances reaching 3m between emitter and receiver.

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.

Align the receiver (RX) and emitter (TX) units, verifying that their distance is inside the device operating distance, with the units facing each other, with the connectors oriented in the same direction. Alignment of the units is signalled by the fast blinking of the green receiver LED.

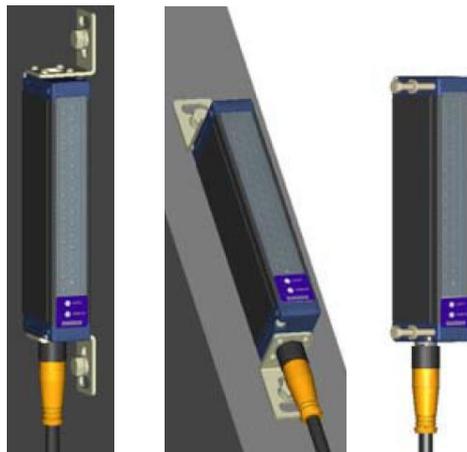


Figure 131: AS1 Mounting

The receiver and emitter units must be mounted on rigid supports which are not subject to strong vibrations, using specific fixing brackets and /or the holes present on the device lids.

For wiring information, see section 3.10.2, *AS1 Area Sensor Connections to CBX100/CBX500* and section 3.11.2 *AS1 Area Sensor to CBX510 Connections*.

5.8 LED INDICATORS

5.8.1 AV7000 LEDs

The AV7000 Camera has several LEDs on its back panels.



Figure 132: AV7000 LED Indicators

The indicators have the following meanings:

#	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.
③	STATUS	Solid Green – Good status Solid Yellow – active warning exists Solid Red – active error exists
④	TACH	Yellow – Blinks with tachometer/encoder input
⑤	TRIGGER	Yellow – Blinks on when Photoelectric Sensor is triggered
⑥	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.

#	LED	Description
7	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.
8	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.
10	FOCUS NET	Green – Focus Network Link at 100Mbit speed Red – Focus Network 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.

5.8.2 AI7000 Illumination LEDs

The AI7000 Illumination has several LEDs on its back panel.



Figure 133: LED Indicators

The indicators have the following meanings:

LED	Description
OVERTEMP	Solid Red – Indicates internal temperature exceeding software or hardware threshold
FAN FAIL	Solid Red – Indicates external cooling fan failure
LED FAIL	Solid Red – Indicates one or more Illuminator LED boards has low current or a failure
POWER	Solid Blue – Indicates illuminator Power ON

5.9 CONTROL PANEL BUTTONS

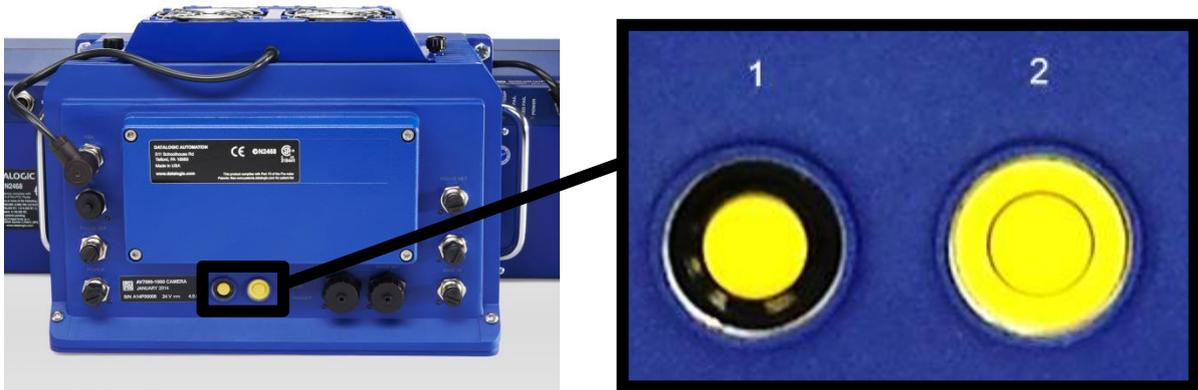


Figure 134: Control Panel Buttons

Function	Description
Reset Camera to Factory Defaults	With the unit powered up, hold down buttons 1 and 2 at the same time. The STATUS LED will blink GREEN and then RED to indicate that the unit has been defaulted.

5.10 SETTING UP WEBSENTINEL PLUS IN THE AV7000



IMPORTANT: Set the parameters *in the order they appear* in this documentation.

Update the settings in **e-Genius** (see *chapter 4*) as shown in the following procedure:

1. In the menu tree under Modify Settings, navigate to **Global Settings | Image Saving | Destination Settings**. The **Destination Settings** window opens.
2. Set up the **Destination Settings** options as shown below.

Image Destination Settings

Image Destination List

Enable Image Dest 1	<input checked="" type="checkbox"/>
Enable Image Dest 2	<input type="checkbox"/>
Enable Image Dest 3	<input type="checkbox"/>

Image Index 1 Destination Settings

Destination Type: FTP Server

FTP Settings

FTP Server IP Address	10.0.40.50
FTP Server Port Number	21
FTP Cameras common Username	<input checked="" type="checkbox"/>
FTP Username	ftpuser
FTP Password	asiroot
FTP PassiveMode	<input checked="" type="checkbox"/>
FTP Server Timeout	900 sec
FTP Server Destination Directory	/raid/images

Update Reset

3. Click **Update** to save the changes.
4. In the menu tree under **Modify Settings**, navigate to **Global Settings | Image Saving | Image Settings**. The **Image Settings** window opens.

- Set up the **Image Saving** options as shown below.

Image Saving Settings

Image Settings List

Index	File Type
<input checked="" type="radio"/> 1	JPEG 80
<input type="radio"/> 2	Disabled
<input type="radio"/> 3	Disabled

Image Index 1 Settings

Enable

Image Saving Options

File Type:

Downsample:

JPEG Quality:

Left and Right Offset: pixels

Cropping Mode:

Metadata:

Assign a Destination for each Device

Top's Destination Index:

Image Saving Criteria Options

Save Criterion:

Minimum Height of Object to Save: mm

Image Name

Image Specific String:

Top Specific String:

Number of Items in Filename:

Image Name Item 1

Item Type:

Image Name Item 2

Item Type:

Image Name Item 3

Item Type:

- Click **Update** to save the changes.
- In the menu tree under **Modify Settings**, navigate to **Global Settings | Communications | Transports**. The **Transports** window opens.

8. Set up the **Transports** options as shown below.

Transport List

Idx	Type
<input type="radio"/> 6	Disabled
<input type="radio"/> 7	Disabled
<input type="radio"/> 8	Disabled
<input checked="" type="radio"/> 9	Socket

Transport 9 Settings

Enable

Socket Settings

Socket Type:

Server Port:

Max Clients:

Data Output Protocol:

Heartbeat Enable:

Protocol Index Settings

Enable:

9. Click **Update** to save the changes.

5.10.1 WebSentinel PLUS Configuration

Before setting up WebSentinel PLUS for an AV7000 tunnel/array, the system administrator must provide user access (user names and passwords), and scan points must be defined. See the *WebSentinel PLUS Reference Manual*.

10. The Remote Monitor server is usually connected to the **Image Net** port of the AV7000. Open a browser and enter the IP address of the **Remote Monitor** server, typically 10.0.40.50. A login windows appears.

Login

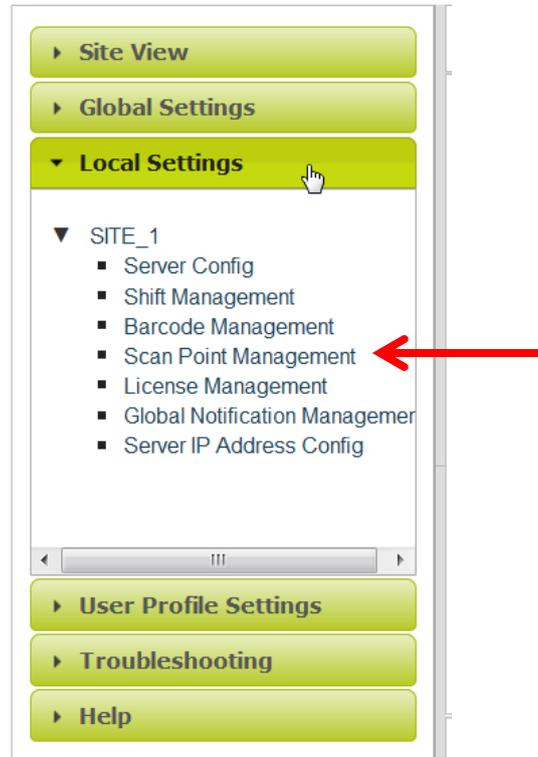
*User ID:

*Password:

*Language:

*Unit: Metric
 Imperial

11. Log in to the **WebSentinel PLUS** server. You can also select a language and metric or imperial units before logging in.
12. From the WebSentinel PLUS menu tree, select **Local Settings / Scan Point Management**.



13. Add a scan point by clicking the plus sign in the upper left corner of the **Scan Point Management** window. The **Add Scan Point Device** window opens.

Scan Point Management



Add Scan Point Device

General | Array Controller | Client Devices | Image Server Configuration

Remaining Scan Point : 9

*Facility Name: RM #2

*Scan Point Name:

*Scan Point IP Address:

*Report Category Type: Type 1

*Report Category Name: Primary

*Controller Type: WebSe

*Controller Port No: 51232

Redundant /Secondary Controller

*IP Address :

*Alarm Level: 80.0

*Warning Level: 80.0

*Consecutive No-Read Alarm:

Add Clear Fields Cancel

14. Configure the following fields

General Tab

- **Scan Point Name:** Identifies where the scan point is located.
- **Scan Point address:** IP address of the controller unit in the tunnel/array.
- **Report Category Name:** The unique name of the tunnel used for reporting purposes.
- **Controller Type:** select WebSentinel from the drop-down list (subject to change at release).
- **Controller Port No:** This is the port number set in the scan point scanner.
- **IP Address:** Used for an redundant array only.
- **Alarm Level:** The percentage below which read rates are unacceptable.
- **Warning Level:** The percentage below which read rates are questionable and may indicate a problem.
- **Consecutive No-Read Alarm:** The number of consecutive no-read conditions allowed before an alarm is triggered.

Array ControllerTab

Not used for a standard configuration.

Client Devices Tab

Add Scan Point Device

ID	Name	Type	Alarm	Warning	Delete
A		UNKNOWN			Delete
		UNKNOWN			
		AV7000Client			

- **ID:** For a single unit in a scan point there will be only one device added. An entry will need to be made for each unit in a tunnel
- **Name:** Enter the name of the mounting location. Ex- Left_Front
- **Type:** Select the type of scanner from the drop-down list. In this example the **AV7000Client** is used.
- **Alarm:** Enter the Alarm level
- **Warning:** Enter the Warning level

Image Server Configuration Tab

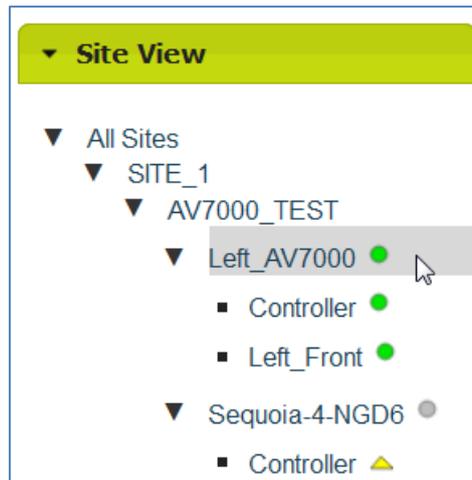
- **URL:** IP address of WebSentinel PLUS (in most cases this will be 10.0.40.50)
- **Image Path:** Location in WebSentinel PLUS where the images are saved (**For Linux Version:** /raid/images; **For Windows Version:** /images)

URL:

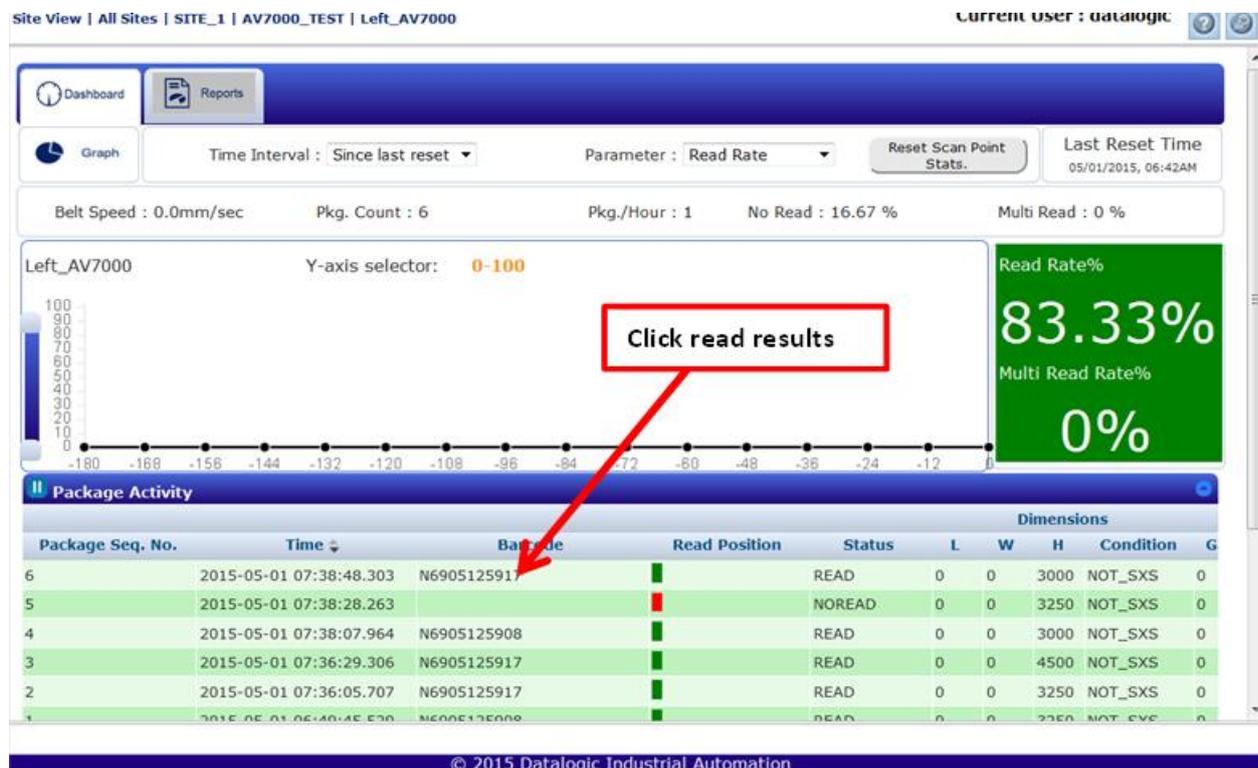
Image Path:

Test Connection

Once connected the scan point will be identified under Site View in the menu tree. The active tunnel is identified by the green dot located to the right of the tunnel scan point name.



15. Click on the scan point name to view the **Dashboard** window for that device.



16. Click on the **Package Activity** results to show more information. The **Image Management** window opens.

Image Management

Package Id :	17375	Slave_0
Scan Point :	AV7000-5	
Site Id :	SITE_2	Slave_1
Package Information		
Time :	2015-09-16 16:03:58.731	Slave_2
Barcode :	S_1_1_E	
Read Status :	READ	Slave_3
Length :	1361.9	
Width :	2169.4	
Height :	1539.1	
Gap :	2557.2	
Host Message :		

Download Images

17. Click on an image to open the **Image Viewer** with additional information.

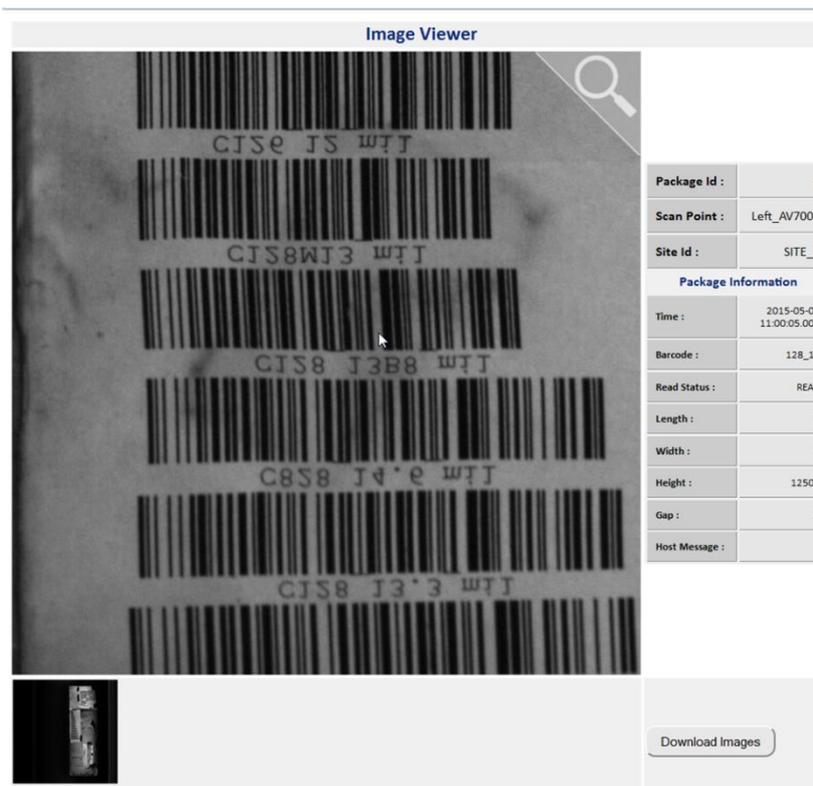
Image Viewer



Package Id :	7
Scan Point :	Left_AV7000
Site Id :	SITE_1
Package Information	
Time :	2015-05-01 11:00:05.000
Barcode :	128_13
Read Status :	READ
Length :	0
Width :	0
Height :	12500
Gap :	0
Host Message :	

Download Images

18. Click and hold the left mouse button over the image to zoom in.



19. To pan the image, click and hold down the left mouse button while moving the cursor around the viewing window.

5.11 READING DIAGRAMS

How to identify the camera model:

The camera and illumination model numbers are shown on the serial label.

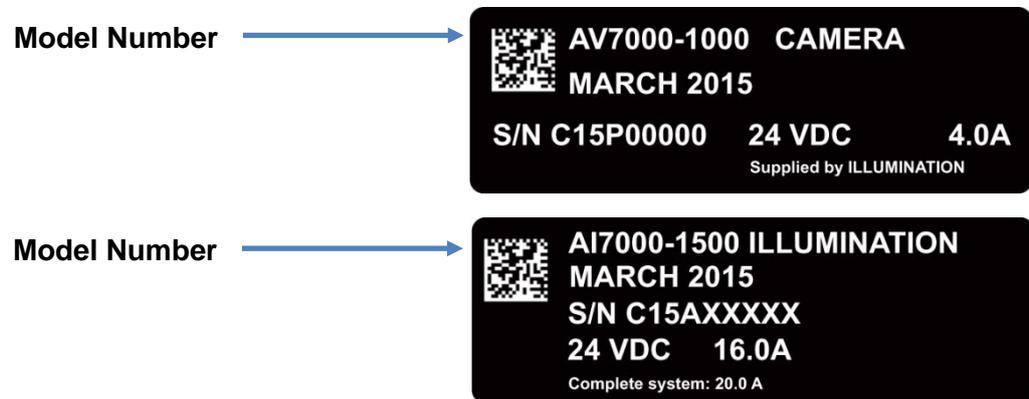


Figure 135: Identifying the Camera Model

5.11.1 Reading Linear Barcodes

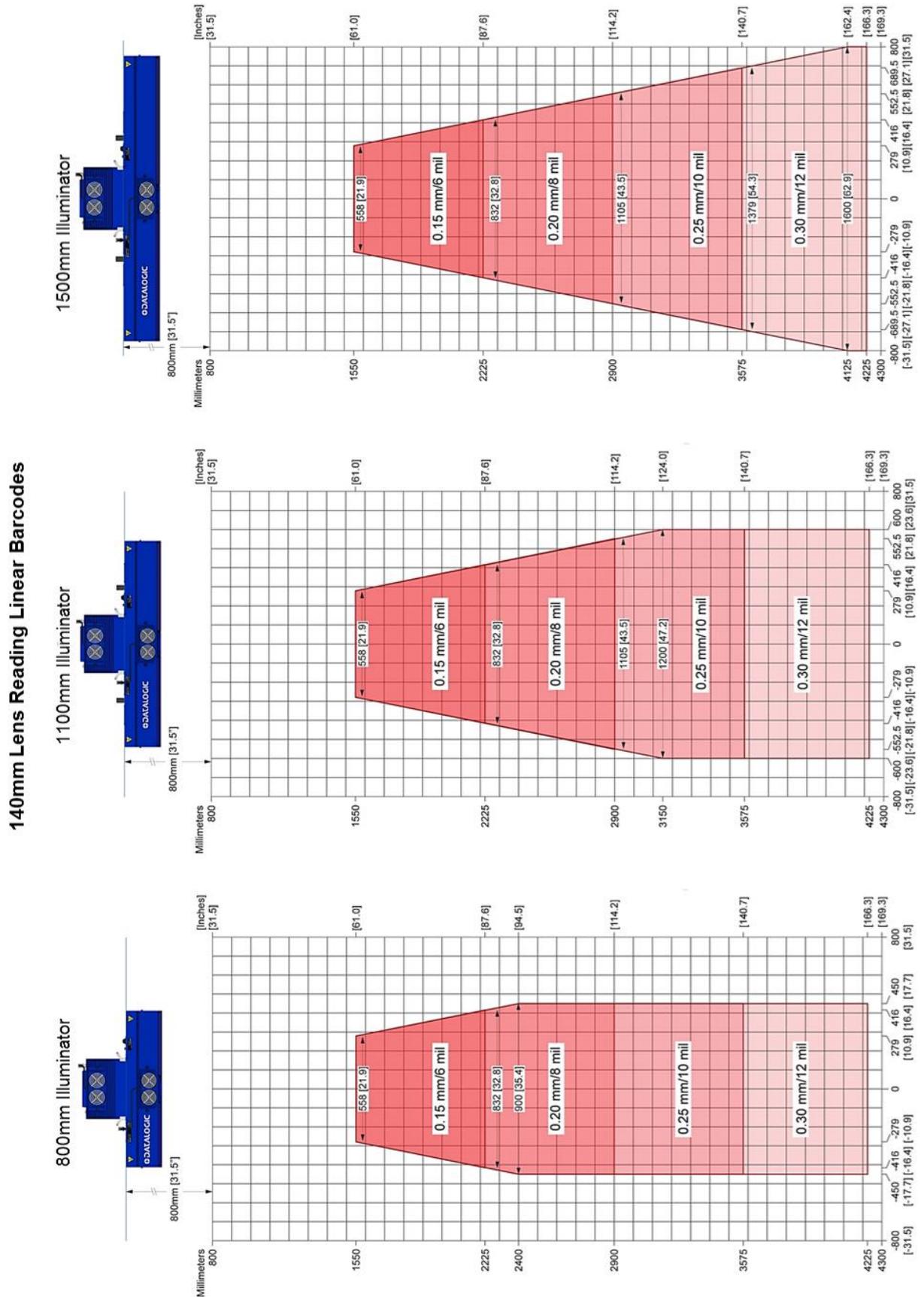


Figure 136: 140mm Lens Reading Linear Barcodes

140mm Short Lens Reading Linear Barcodes

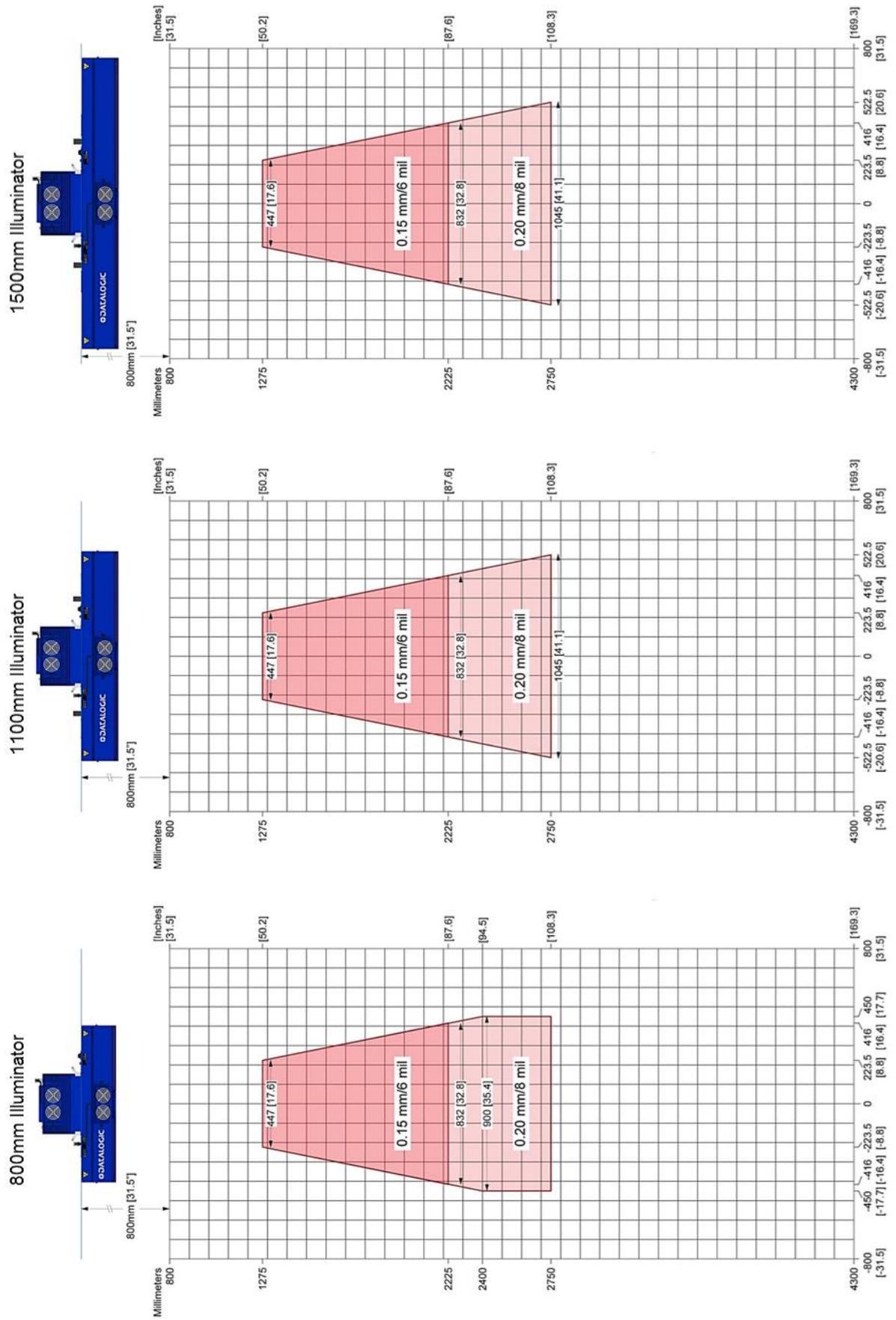


Figure 137: 140mm Short Lens Reading Linear Barcodes

110mm Lens Reading Linear Barcodes

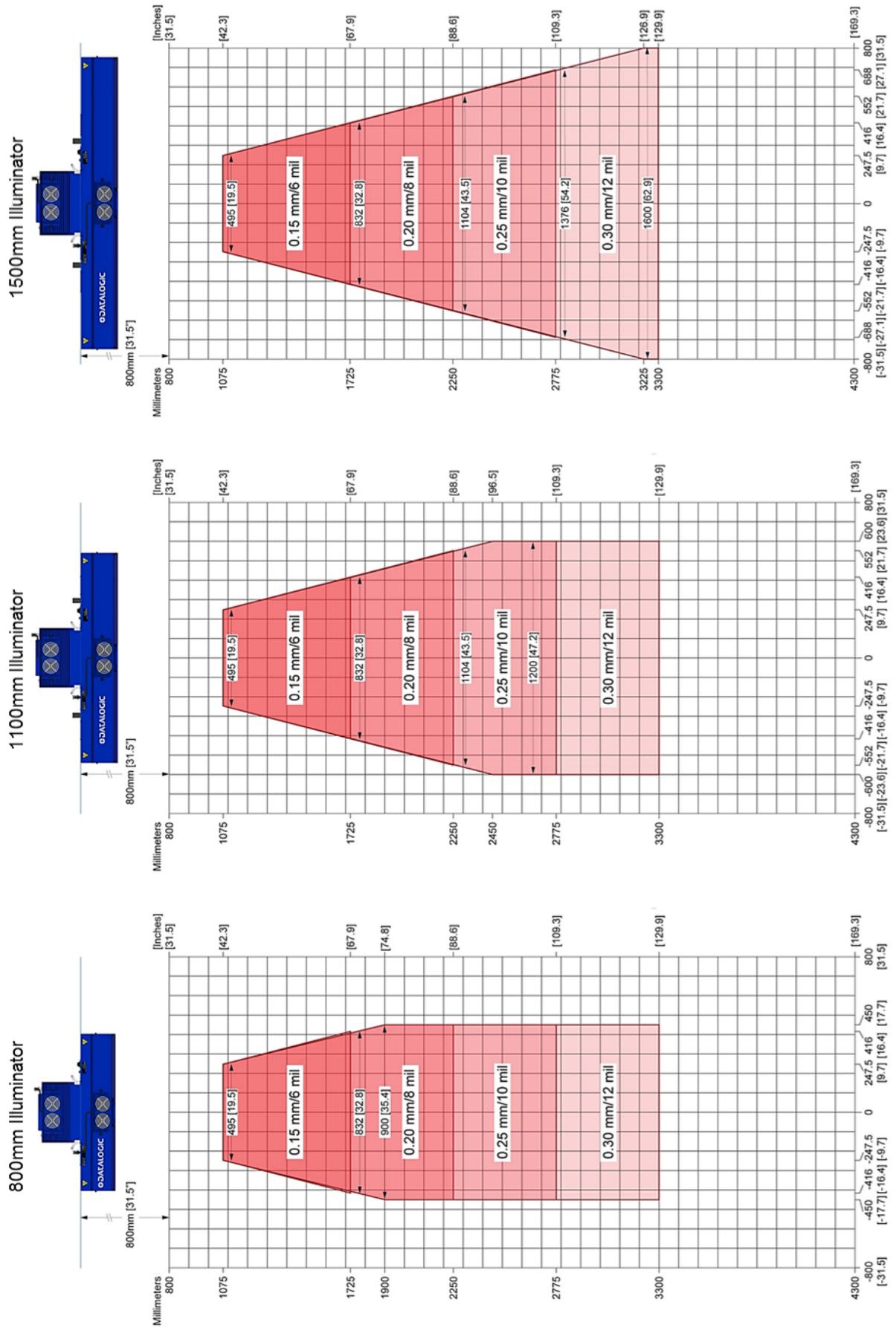


Figure 138: 110mm Lens Reading Linear Barcodes

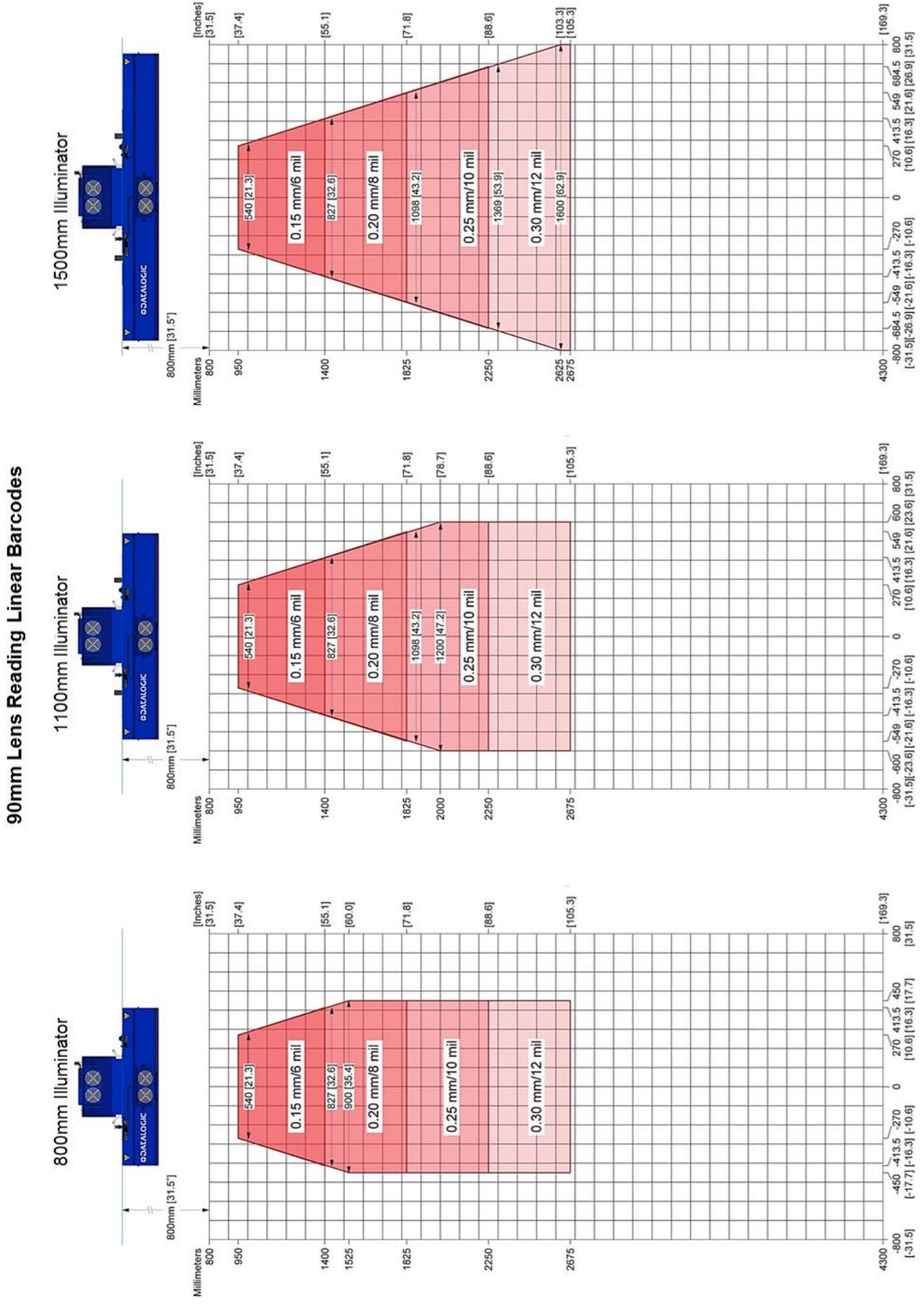


Figure 139: 90mm Lens Reading Linear Barcodes

5.11.2 Reading 2D Barcodes

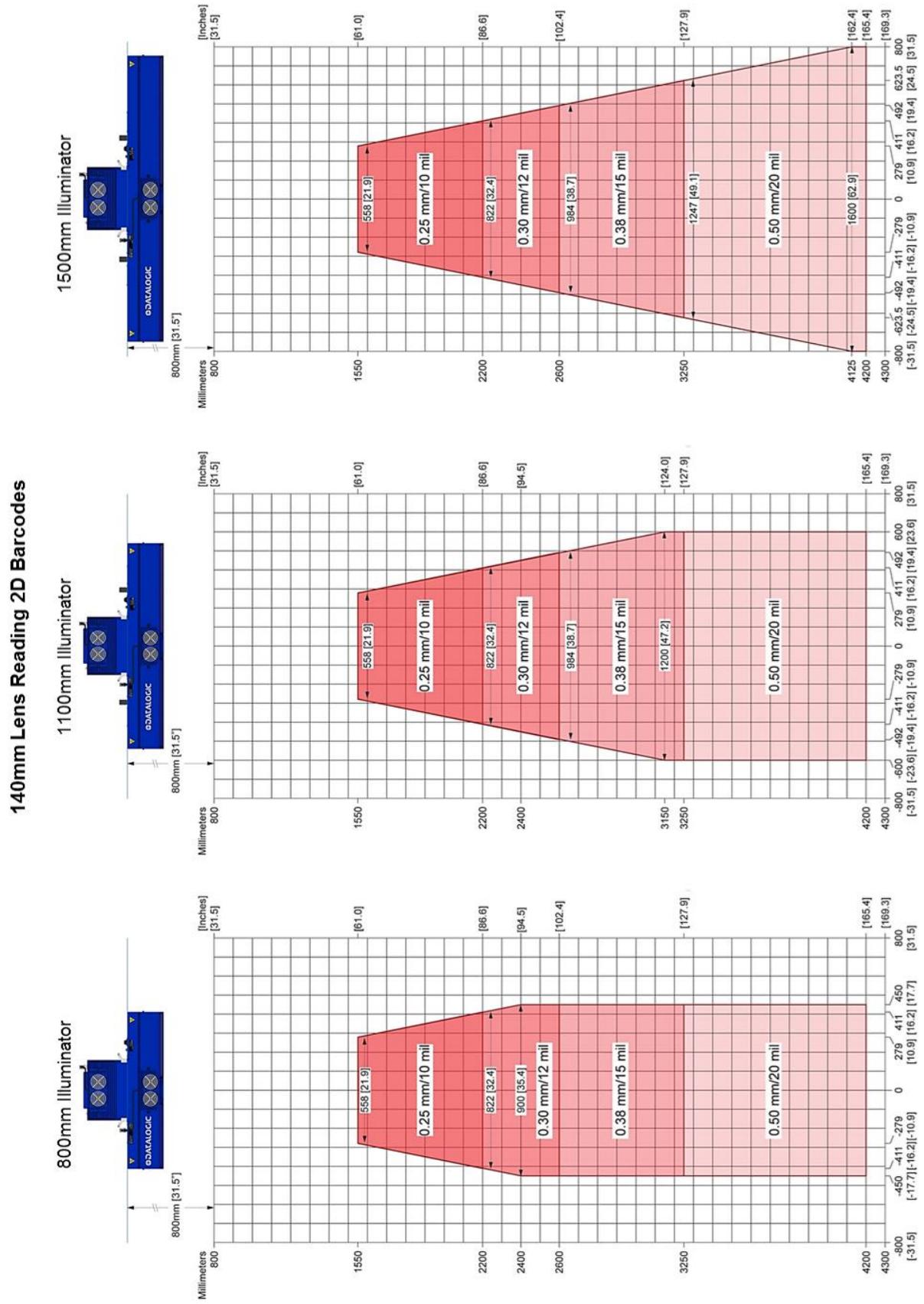


Figure 140: 140mm Lens Reading 2D Barcodes

140mm Short Lens Reading 2D Barcodes

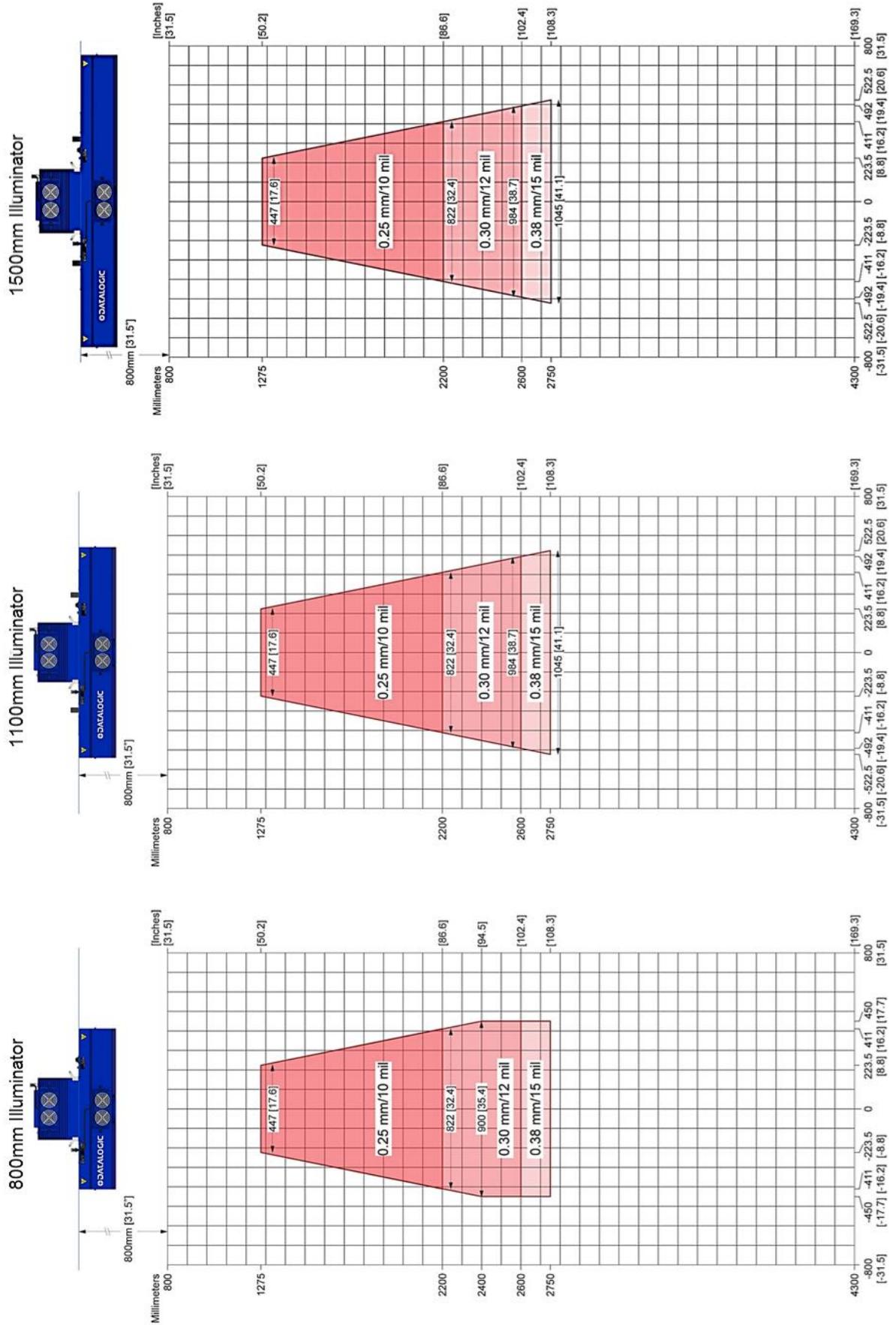


Figure 141: 140mm Short Lens Reading 2D Barcodes

110mm Lens Reading 2D Barcodes

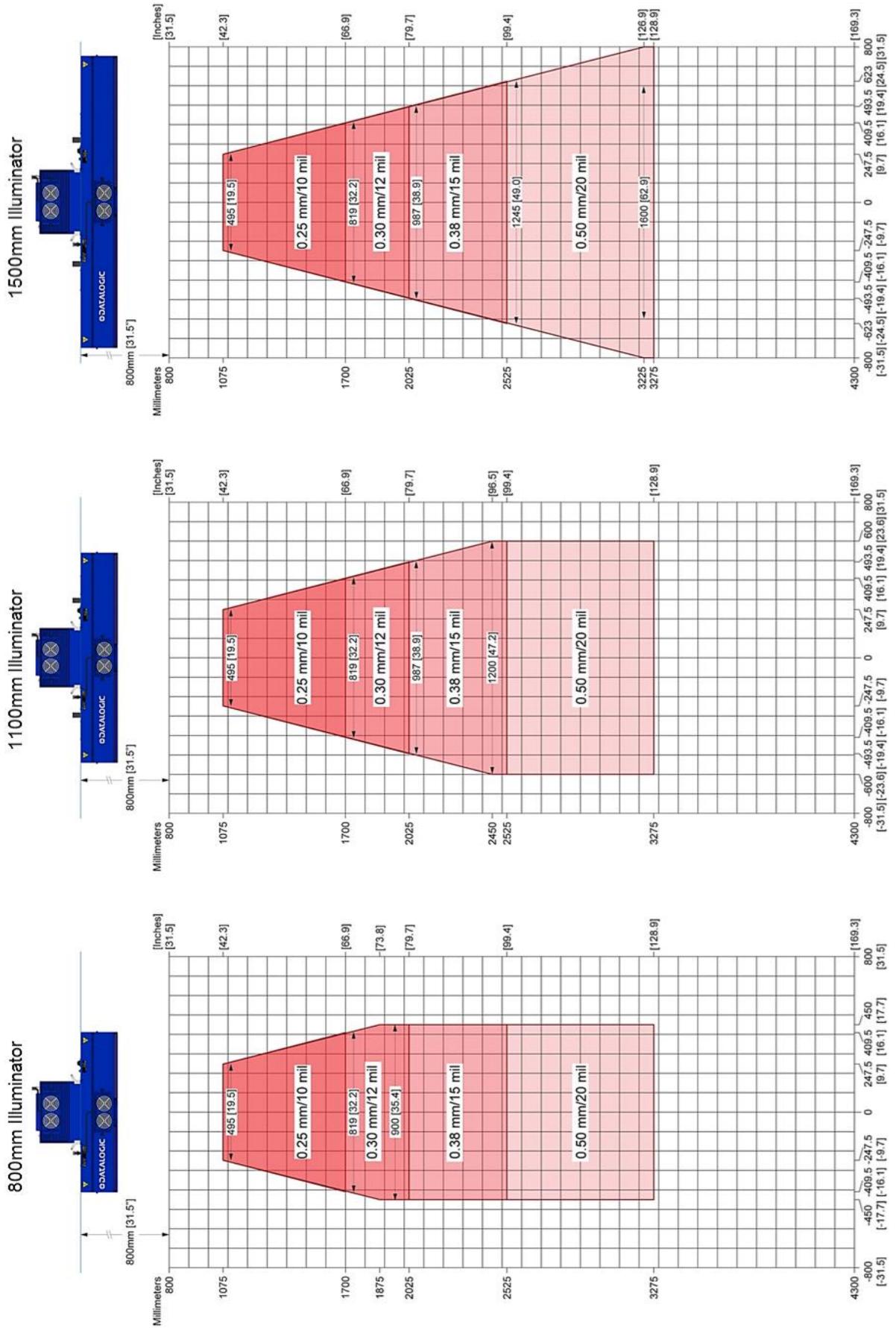


Figure 142: 110mm Lens Reading 2D Barcodes

90mm Lens Reading 2D Barcodes

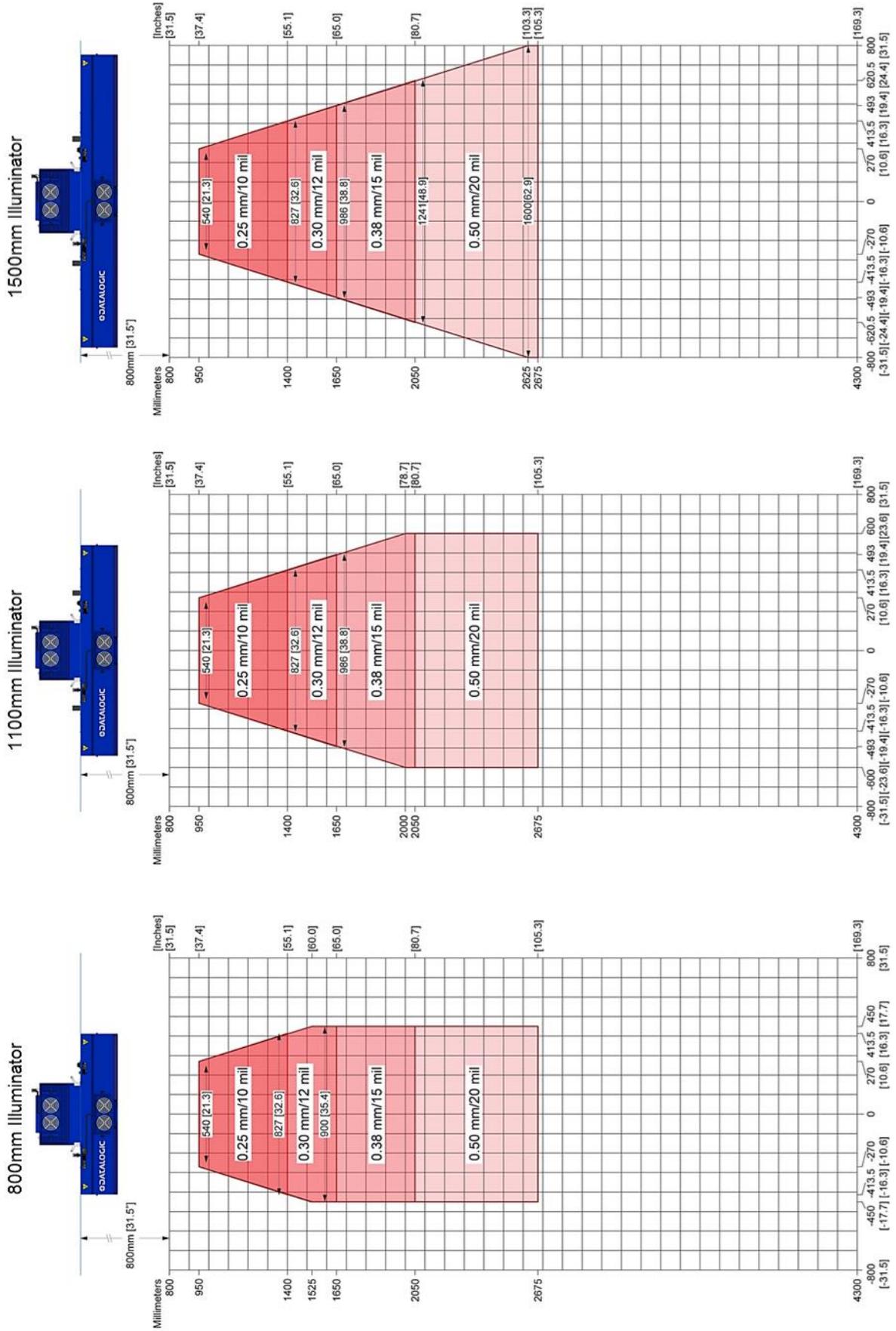


Figure 143: 90mm Lens Reading 2D Barcodes

6 MAINTENANCE

6.1 OVERVIEW

This chapter provides instructions for maintaining optimum performance and life for your AV7000 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 lint-free cloth	Use to clean illumination exit window



IMPORTANT: Due to the complex and application-specific nature of these installations, AV7000 camera systems must be setup and serviced by authorized technicians trained by Datalogic.

The 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.

THERE ARE NO USER SERVICEABLE PARTS WITHIN THE AV7000.

DO NOT OPEN THE UNIT. OPENING THE AV7000 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.

6.2 RECOMMENDED MAINTENANCE FREQUENCY

The AV7000 Camera Barcode Reading 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.

6.3 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



CAUTION: Do not use any chemical on the barcode reader 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 barcode reader 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 and cooling fans. If necessary, clean under the fans by removing them from the camera and illumination. Unscrew the knurled knobs at the sides of the fan and lift it free.
5. Wipe the exterior with a clean, soft cloth dampened slightly with a mild detergent solution.

6.3.1 Cleaning the Illumination and 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.



CAUTION: 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.

20. Switch off the conveyor.
21. Switch off the camera system.
22. Follow the exterior cleaning procedure before cleaning the window.
23. Check the window surface for any dust, dirt, or smudges. If the window needs to be cleaned, proceed to Step 5.
24. 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.)
25. Apply the cleaning solution to a lint-free cotton cloth.
26. Apply the cloth with cleaning solution to the camera and illumination window.
27. Remove any streaks or remaining moisture from the window with a dry, soft, lint-free cloth or lens paper.
28. Verify camera operation.



Figure 144: Window locations

6.3.2 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.



CAUTION: 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.



Figure 145: Deflection Mirror

6.3.3 Cleaning the RangeFinder Windows



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.



CAUTION: Use care when cleaning the RangeFinder to assure the windows are not scratched or damaged in any way. Never apply cleaning solution directly to the windows. Always apply the solution to a cloth, and then the cloth to the windows.

This procedure is recommended only if it is noticed that the environment is dirty enough that deposits are appearing on the RangeFinder windows. The cleaning procedure should be performed without removing the RangeFinder from the mounting structure.

1. Switch off the conveyor.
2. Switch off the camera system.
3. Review the exterior cleaning procedure before cleaning the three windows.
4. Check the windows for any dust, dirt, or smudges. If the window needs to be cleaned, proceed to Step 5.
5. Use a dry, soft, lint-free cloth to remove accumulated dust.
6. If the windows are 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 cotton swab or lint-free cloth.
8. Apply the cleaning solution to the windows.
9. Remove any streaks or remaining moisture with a dry, soft, lint-free cloth or lens paper.
10. Verify RangeFinder operation.



Figure 146: RangeFinder Windows

6.3.4 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.

6.3.5 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.



Figure 147: Tachometer Wheel

6.3.6 Tighten Mounting Hardware

1. Check all AV7000, 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.

6.3.7 Checking Barcode Reading System Connections

This is a safety check recommended for harsh environments where vibration may be a problem. (See *Chapter 3, Electrical Installation.*)

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.

6.3.8 Verify Barcode Reader 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.

6.3.9 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.

If the photoelectric sensor's LED does not change status, adjust the photoelectric sensor so that it is properly aligned with the reflector.

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.

6.3.10 Verify Tachometer Operation

Rotate the tachometer wheel slowly.

The **TACH** LED on camera's connector panel should flash indicating the tachometer is operational.

7 TROUBLESHOOTING



IMPORTANT: 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.



NOTE: When contacting Datalogic for help with an AV7000 camera or AI7000 Illumination, 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.

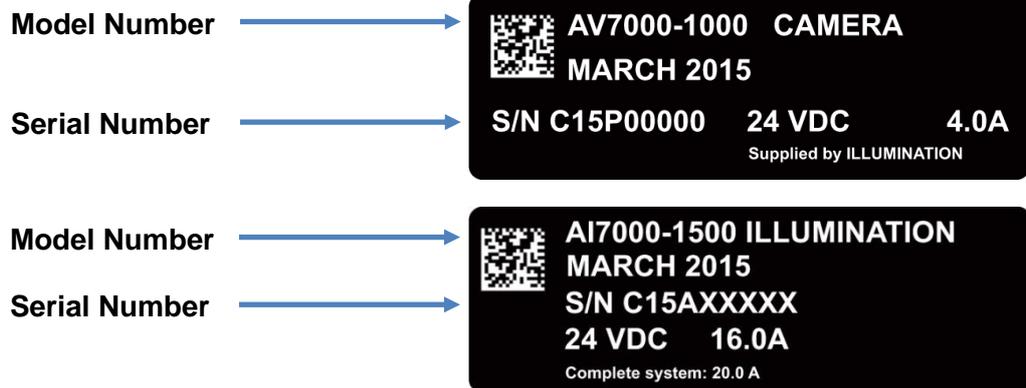


Figure 148: Serial Tags

7.1 ERROR CODES AND RESOLUTIONS

7.1.1 Decoder Errors

Alphabetical by type: Error / Warning / Info

e-Genius Description	Type	Explanation	Possible Cause	Solution
Application failed to shutdown	Info	The application was in a state where it could not shut down properly.	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.
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.
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.
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.
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 next camera. Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
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.

e-Genius Description	Type	Explanation	Possible Cause	Solution
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 AV7000. 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 (See section 4.5.7).
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.) are 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.	Cycle the unit's power. If software was recently loaded, try to reload the new software. If the error persists, contact Datalogic Support.

e-Genius Description	Type	Explanation	Possible Cause	Solution
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.	Cycle the unit's power. If software was recently loaded, try to reload the new software. If the error persists, replace the camera and/or contact Datalogic Support.
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 BMP 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.
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 Range finder 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 Ethernet Focus port of one of the cameras. Cycle the RangeFinder power. 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 out of date.	Load the appropriate software 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 (see section 0).	Check the Real-Time Processor section of the System Info > Device Details window for detailed error information (see section 0). 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.
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.
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.	Debris on the conveyor.	Check for junk on the conveyor resulting in extremely small packages.

e-Genius Description	Type	Explanation	Possible Cause	Solution
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.
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 Modify Settings System Info > Device Details window for detailed warning information (See <i>section 0</i>).	Check the Real-Time Processor section of the Modify Settings System Info > Device Details window for detailed warning information (See <i>section 0</i>). 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.
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 Modify Settings Global Settings Image Saving Destination Settings window are not correct (See <i>section 4.5.7</i>). 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 Modify Settings Global Settings Image Saving Destination Settings window are properly set (See <i>section 4.5.7</i>). 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 (See <i>section 4.4</i>).
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.

e-Genius Description	Type	Explanation	Possible Cause	Solution
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.

7.1.2 Real-Time Processor Errors

Alphabetical by type: Error / Warning / Info

e-Genius Description	Type	Explanation	Possible Cause	Solution
Error: Calibration Manager stopped responding	Error	The Calibration Manager application has stopped.	The application has stopped responding or crashed.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Error: Diagnostic Monitor stopped responding	Error	The Diagnostic Monitor application has stopped.	The application has stopped responding or crashed.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Error: Failed to Load Focus Table	Error	RTP failed to load the focus table.	Focus table was not received or is corrupt.	Contact Datalogic Support.
Error: Failed to Load Gain Table	Error	RTP failed to load the gain table.	Gain table was not received or is corrupt.	Contact Datalogic Support.
Error: Failed to Load Illumination Table	Error	RTP failed to load the illumination table.	Illumination table was not received or is corrupt.	Contact Datalogic Support.
Error: Failed to read illumination profile	Error	The camera was unable to read the illumination profile from the illumination.	Illumination not present. Interface window between camera and illumination blocked. Illumination internal failure.	Verify the camera is fully seated to the illumination. Verify there is nothing blocking the small windows between the camera and the illumination. Verify the illumination is powered up and has no errors. Cycle the unit's power. If the error persists, replace the camera or illumination and/or contact Datalogic Support.
Error: Failed to read Illumination temp	Error	The illumination interface is unable to read the internal temperature.	An internal failure occurred in the illumination.	Cycle the unit's power. If the error persists, replace the illumination and/or contact Datalogic Support.
Error: Failed to save illumination profile	Error	The illumination profile could not be saved.	Communication with the illumination has been compromised.	Contact Datalogic Support.
Error: Fixed Focus Value Out of Range	Error	The current fixed focus value is set beyond the far working distance for the camera.	Parameter set incorrectly.	Change the fixed focus value to be equal to or less than the far working distance value.
Error: Focus Port Mon stopped responding	Error	The Focus Port Monitor application has stopped.	The application has stopped responding or crashed.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Error: Focus Servo Mon stopped responding	Error	The Focus Servo Monitor application has stopped.	The application has stopped responding or crashed.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.

e-Genius Description	Type	Explanation	Possible Cause	Solution
Error: FSM Data Valid	Error	The focus servo EEPROM is not valid or is corrupt.	Data corruption while reading the EEPROM.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Error: FSM exceeded max temp	Error	The focus servo exceeded the maximum internal 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.
Error: FSM Invalid Servo command received	Error	The camera received an invalid command response from the focus servo.	Internal communication failure.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Error: FSM Invalid Servo packet received	Error	The camera received an invalid data packet for the command from the focus servo.	Internal communication failure.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Error: FSM PWM Over Limit	Error	The focus servo exceeding the maximum PWM attempting to get to the commanded position.	The shipping lock is still engaged or partially engaged. There is an internal hardware failure.	Verify the shipping lock is fully dis-engaged. Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Error: FSM PWM Over Time	Error	The focus servo exceeding the maximum PWM timeouts attempting to get to the commanded position.	The shipping lock is still engaged or partially engaged. There is an internal hardware failure.	Verify the shipping lock is fully dis-engaged. Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Error: FSM Servo reception	Error	The camera is unable to receive messages from the focus servo.	Internal communication failure.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Error: FSM Servo Transmission	Error	The camera is unable to send messages to the focus servo.	Internal communication failure.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Error: GPIO Handler stopped responding	Error	The GPIO Handler application has stopped.	The application has stopped responding or crashed.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Error: Illumination exceeded max temp	Error	The illumination exceeded the maximum internal 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, particularly at the ends of the illumination. Replace fans if necessary.
Error: Illumination Mon stopped responding	Error	The Illumination Monitor application has stopped.	The application has stopped responding or crashed.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Error: Image Line Handler stopped responding	Error	The Image Line Handler application has stopped.	The application has stopped responding or crashed.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Error: Image Sensor Mon stopped responding	Error	The Sensor Monitor application has stopped.	The application has stopped responding or crashed.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Error: Interrupt Handler stopped responding	Error	The Interrupt Handler application has stopped.	The application has stopped responding or crashed.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.

e-Genius Description	Type	Explanation	Possible Cause	Solution
Error: LED Bar Failed	Error	The illumination controller has indicated an issue with a LED module.	An internal failure occurred in the illumination.	Cycle the unit's power. Verify all of the LED modules in illumination come on. If the error persists, replace the illumination and/or contact Datalogic Support.
Error: Network Logger stopped responding	Error	The Network Logger Monitor application has stopped.	The application has stopped responding or crashed.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Error: Network Rx stopped responding	Error	The Network Receive Monitor application has stopped.	The application has stopped responding or crashed.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Error: Network Tx stopped responding	Error	The Network Transmit Monitor application has stopped.	The application has stopped responding or crashed.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Error: Parameter Manager stopped responding	Error	The Parameter Manager application has stopped.	The application has stopped responding or crashed.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Error: Position Sensor Too Close to Camera	Error	The position sensor is mounted too close to the camera and incoming focus data cannot be processed.	The camera is mounted too close to the position sensor or the distance to scan line parameter is not set properly.	Check the distance to scan line parameter. The camera will need to be moved if the distance to scan line parameter is set to the correct value.
Error: Proc Tach Array stopped responding	Error	The Process Tach Array application has stopped.	The application has stopped responding or crashed.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Error: Process Tracking Manager stopped responding	Error	The Process Tracking Manager application has stopped.	The application has stopped responding or crashed.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Error: Recovery Mode. Software Load Required!	Error	RTP is running recovery applications. RTP software must be loaded before the camera will function properly.	RTP software upload failed or the RTP SD card is new.	Load RTP software via the GUI.
Error: Sensor Board Communication	Error	The Real-Time Processor is unable to communicate to the sensor.	Internal communication failure.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Error: Sensor Board Error Loading CCI	Error	An error may have occurred while writing the CCI software to the sensor.	An error occurred writing the software to the sensor.	Cycle the unit's power. Verify the Sensor SW did not update by checking the version. If the version updated then it loaded correctly. If not, re-attempt to load the software. If the error persists, replace the camera and/or contact Datalogic Support.
Error: Sensor Board Error Loading FPGA	Error	An error may have occurred while writing the FPGA software to the sensor.	An error occurred writing the software to the sensor.	Cycle the unit's power. Verify the Sensor SW did not update by checking the version. If the version updated then it loaded correctly. If not, re-attempt to load the software. If the error persists, replace the camera and/or contact Datalogic Support.

e-Genius Description	Type	Explanation	Possible Cause	Solution
Error: Sensor Board Error Loading Micro	Error	An error may have occurred while writing the Micro software to the sensor.	An error occurred writing the software to the sensor.	Cycle the unit's power. Verify the Sensor SW did not update by checking the version. If the version updated then it loaded correctly. If not, re-attempt to load the software. If the error persists, replace the camera and/or contact Datalogic Support.
Error: Sensor Board Failure Detected	Error	The camera detected a failure with the sensor.	An internal sensor failure occurred.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Error: Status Mon stopped responding	Error	The Status Monitor application has stopped.	The application has stopped responding or crashed.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Error: Unable to Read FSM Hardware Version	Error	The camera is unable to receive messages from the focus servo.	Internal communication failure.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Error: Unable to Read FSM Software Version	Error	The camera is unable to receive messages from the focus servo.	Internal communication failure.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Error: Unable to Read FSM Temperature	Error	The camera is unable to receive messages from the focus servo.	Internal communication failure.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Waiting for first parameter update	Error	The Real-Time Processor is waiting for the parameters from the Decoder.	The Decoder is still booting and has not sent the parameters yet. Communications failure between the Real-time processor and the Decoder.	Wait a couple minutes for the Decoder to complete initialization and send the parameters. If the error remains, Cycle the unit's power. If the error still persists, replace the camera and/or contact Datalogic Support.
Warning: External fan failure	Warning	The external fan(s) mounted to the camera have stopped functioning.	Fans are disconnected. Fan hardware failure.	Verify the external fans are connected properly. Replace fan assembly.
Warning: Forced Fixed Focus in PE Only Mode	Warning	Camera is being forced into Fixed Focus because the Photo Sensor is set to Photo-eye only mode.	Photo Sensor is set to PE Only and focus is set to Profile. The RTP will force focus to <i>fixed</i> in this case.	Set focus to fixed and set the fixed focus value.
Warning: Forced Fixed Gain in PE Only Mode	Warning	Camera is being forced into Fixed Gain because the Photo Sensor is set to Photo-eye only mode.	Photo Sensor is set to PE Only and gain is set to Profile. The RTP will force gain to <i>fixed</i> in this case.	Set gain to fixed and set fixed gain and fixed exposure.
Warning: Illumination Fan1 Failed	Warning	The external fan mounted to the illumination has stopped functioning.	Fans are disconnected. Fan hardware failure.	Verify the external fans are connected properly. Replace fan assembly.
Warning: Illumination Fan2 Failed	Warning	The external fan mounted to the illumination has stopped functioning.	Fans are disconnected. Fan hardware failure.	Verify the external fans are connected properly. Replace fan assembly.
Warning: Internal fan failure	Warning	The internal fan has stopped functioning.	Internal fan hardware failure.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Warning: Invalid End of IV Detected	Warning	The RTP tried to end a new package before the new package started.	Parameter update was performed with packages running. Multiple focusing devices connected.	Contact Datalogic Support.

e-Genius Description	Type	Explanation	Possible Cause	Solution
Warning: Invalid Start of IV Detected	Warning	The RTP tried to start a new package before the previous package ended.	Parameter update was performed with packages running. Multiple focusing devices connected.	Contact Datalogic Support.
Warning: Linerate exceeds Maximum Linerate	Warning	The required line rate is exceeding the maximum expected line rate based on the belt speed.	The belt speed parameter is set below the actual belt speed. The LPI is set too high.	Verify the belt speed is set just above the actual maximum belt speed. Verify the LPI is set correctly to the application specification.
Info: Failed to Send Focus Command	Info	The camera is unable to send messages to the focus servo.	Internal communication failure.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Info: Focus Command Above Max Range	Info	RTP attempted to focus beyond the far working distance of the camera.	Far working distance is not set to the left/right edge of the DM3610 or RangeFinder.	Make sure the far working distance of the camera is set to the left/right edge of the DM3610 or RangeFinder.
Info: Focus Command Below Min Range	Info	RTP attempted to focus beyond the near working distance of the camera.	The camera is mounted too close.	Physically move the camera farther away.
Info: Invalid Height from Position Sensor	Info	Height received from the position sensor is out of range.	Package presented was too tall causing the camera to attempt to focus beyond its near working distance.	Physically move the camera farther away from the conveyor surface.
Info: Invalid Left Offset from Position Sensor	Info	Left offset received from the position sensor is out of range.	Far working distance of right side cameras is not set to the left edge of the DM3610/RangeFinder or the left offset of the DM3610/RangeFinder caused a left side camera to attempt to focus beyond its near working distance.	Make sure the cameras are mounted properly and the far working distance of each camera matches the DM3610/RangeFinder left/right edges.
Info: Invalid Right Offset from Position Sensor	Info	Right offset received from the position sensor is out of range.	Far working distance of left side cameras is not set to the right edge of the DM3610/RangeFinder or the right offset of the DM3610/RangeFinder caused a right side camera to attempt to focus beyond its near working distance.	Make sure the cameras are mounted properly and the far working distance of each camera matches the DM3610/RangeFinder left/right edges.
Info: Issue Writing to Network	Info	The RTP could not write a message to the network.	A network issue exists between the RTP and computing module.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Info: Maximum Digital Gain being used	Info	The digital gain value being used is the maximum value allowed. This could result in noisy and/or dark images.	Conveyor Speed and/or LPI settings are too high. Physical belt speed is too high for the LPI setting required.	Reduce LPI. Make sure the Conveyor speed parameter is set properly. Contact Datalogic Support if all settings are correct .
Info: Reading Calibration tables...	Info	RTP is in the process of reading calibration tables. This only happens during boot up.	Not an issue.	Wait until the calibration tables are loaded.
Info: Reading Illumination Profile...	Info	The camera is reading the illumination profile from the illumination.	The camera reads this data from the illumination on power up.	Wait for the camera to finish reading the illumination profile.

e-Genius Description	Type	Explanation	Possible Cause	Solution
Info: Running FSM Self Test	Info	RTP is running a test script to test the focus mechanism	A production test script was left on the RTP	Contact Datalogic Support
Info: Saving Illumination Profile...	Info	The RTP is in the process of reading the illumination profile from the illumination.	New illumination was connected to the camera.	Wait until the illumination file is finished saving.
Info: Sensor Board Loading CCI	Info	A Sensor Board software patch was loaded and is being written to the sensor.	A Sensor Board software patch was loaded and is being written to the sensor.	Wait for software load to complete.
Info: Sensor Board Loading FPGA	Info	A Sensor Board software patch was loaded and is being written to the sensor.	A Sensor Board software patch was loaded and is being written to the sensor.	Wait for software load to complete.
Info: Sensor Board Loading Micro	Info	A Sensor Board software patch was loaded and is being written to the sensor.	A Sensor Board software patch was loaded and is being written to the sensor.	Wait for software load to complete.
Info: SyncNetwork is not connected in a loop	Info	The AV7000 sync network is not connected in a loop.	One of the two sync network Ethernet ports, on one of the cameras in the tunnel, does not have a cable connected.	Make sure cables are connected from the "In" port to the "Out" port of each camera in the tunnel.
Info: Verifying Sensor Board Status	Info	The camera is reading the status information from the sensor.		Wait for the camera to finish reading the data.

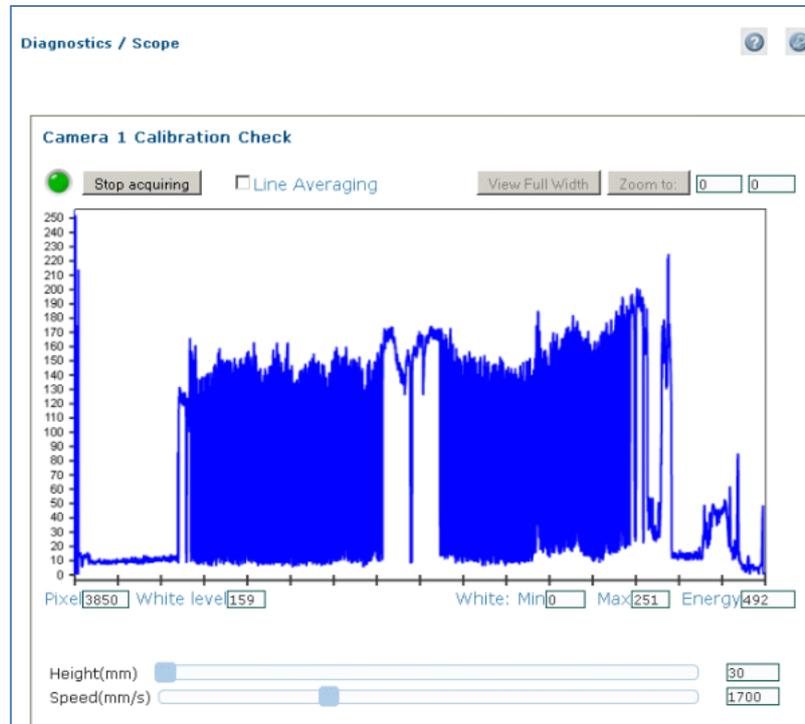
7.1.3 RangeFinder Errors

e-Genius Description	Type	Explanation	Possible Cause	Solution
Error: Image Sensor Read Failure	Error	The RangeFinder is unable to read data from the sensor.	Internal RangeFinder error.	Cycle the unit's power. If the error persists, replace the RangeFinder and/or contact Datalogic Support.
Error: Laser #1 current exceeds limit	Error	The laser current is exceeding its maximum setting.	Laser is at end of life. Internal laser failure.	Cycle the unit's power. If the error persists, replace the RangeFinder and/or contact Datalogic Support.
Error: Laser #1 temperature exceeds limit	Error	The laser is exceeding the maximum temperature limit.	Ambient temperature is exceeding the 50 degrees C maximum operating temperature. Internal laser failure.	Verify the ambient temperature is not exceeding 50 C. Cycle the unit's power. If the error persists, replace the RangeFinder and/or contact Datalogic Support.
Error: Laser #2 current exceeds limit	Error	The laser current is exceeding its maximum setting.	Laser is at end of life. Internal laser failure.	Cycle the unit's power. If the error persists, replace the RangeFinder and/or contact Datalogic Support.
Error: Laser #2 temperature exceeds limit	Error	The laser is exceeding the maximum temperature limit.	Ambient temperature is exceeding the 50 degrees C maximum operating temperature. Internal laser failure.	Verify the ambient temperature is not exceeding 50 C. Cycle the unit's power. If the error persists, replace the RangeFinder and/or contact Datalogic Support.

e-Genius Description	Type	Explanation	Possible Cause	Solution
Error: No valid temperature for laser #1	Error	The RangeFinder is unable to read the laser temperature.	Internal RangeFinder failure.	Cycle the unit's power. If the error persists, replace the RangeFinder and/or contact Datalogic Support.
Error: No valid temperature for laser #2	Error	The RangeFinder is unable to read the laser temperature.	Internal RangeFinder failure.	Cycle the unit's power. If the error persists, replace the RangeFinder and/or contact Datalogic Support.
Error: Sensor data always from DOE #1	Error	Object data is always being detected by DOE#1.	Object stuck on belt. Obstruction in the DOE laser pattern. Beam blockers not set correctly.	Verify there are no objects or obstructions in the DOE laser pattern. Verify the Beam blockers are set correctly. Cycle the unit's power. If the error persists, replace the RangeFinder and/or contact Datalogic Support.
Error: Sensor data always from DOE #2	Error	Object data is always being detected by DOE#2.	Object stuck on belt. Obstruction in the DOE laser pattern. Beam blockers not set correctly.	Verify there are no objects or obstructions in the DOE laser pattern. Verify the Beam blockers are set correctly. Cycle the unit's power. If the error persists, replace the RangeFinder and/or contact Datalogic Support.
Error: Sensor or laser problem (no codewords)	Error	The RangeFinder is unable to see the laser patterns.	There is an obstruction preventing the sensor (in the center of the RangeFinder) to see the laser patterns. An internal Sensor error. The laser patterns are not present or blocked.	Verify there are no obstructions blocking the view of the sensor. Verify there are no obstructions blocking the laser pattern generators. Cycle the unit's power. If the error persists, replace the RangeFinder and/or contact Datalogic Support.
Error: Tach or Tach Sync problem (invalid speed)	Error	The RangeFinder missed a tach sync pulse. The current tach value does not match the tach value in the tach sync message.	Noise on the Ethernet cable connected to the RangeFinder or the tachometer. Device connected without a breakout cable connected to eliminate tach and tach sync.	Make sure cables are not running too close to a motor. Make sure a breakout cable is used when a computer is attached.

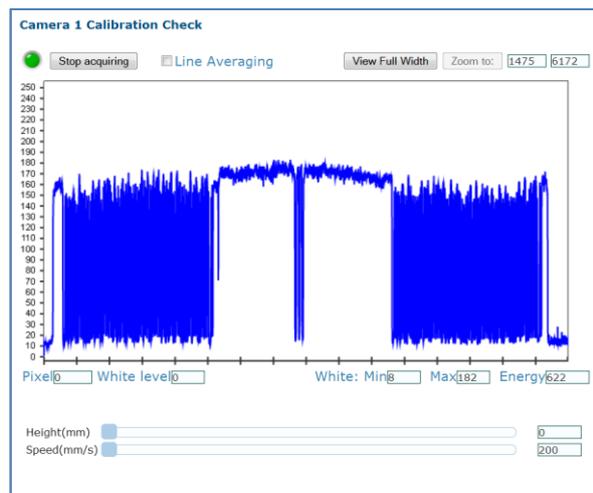
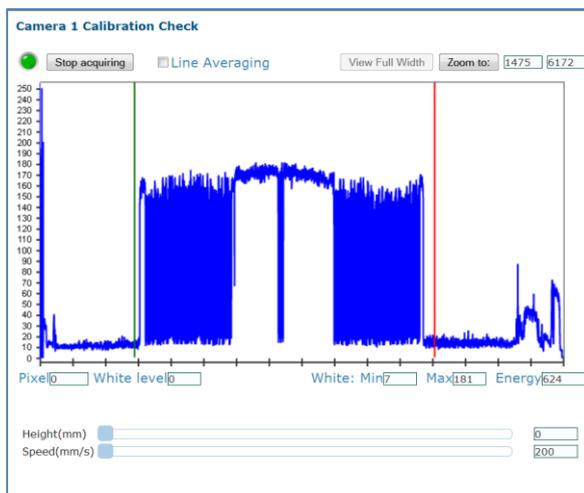
7.2 VERIFYING FUNCTIONALITY OF THE FOCUS MECHANISM

Use the **Scope (Calibration Check)** window to view a software oscilloscope of the camera/illumination performance.

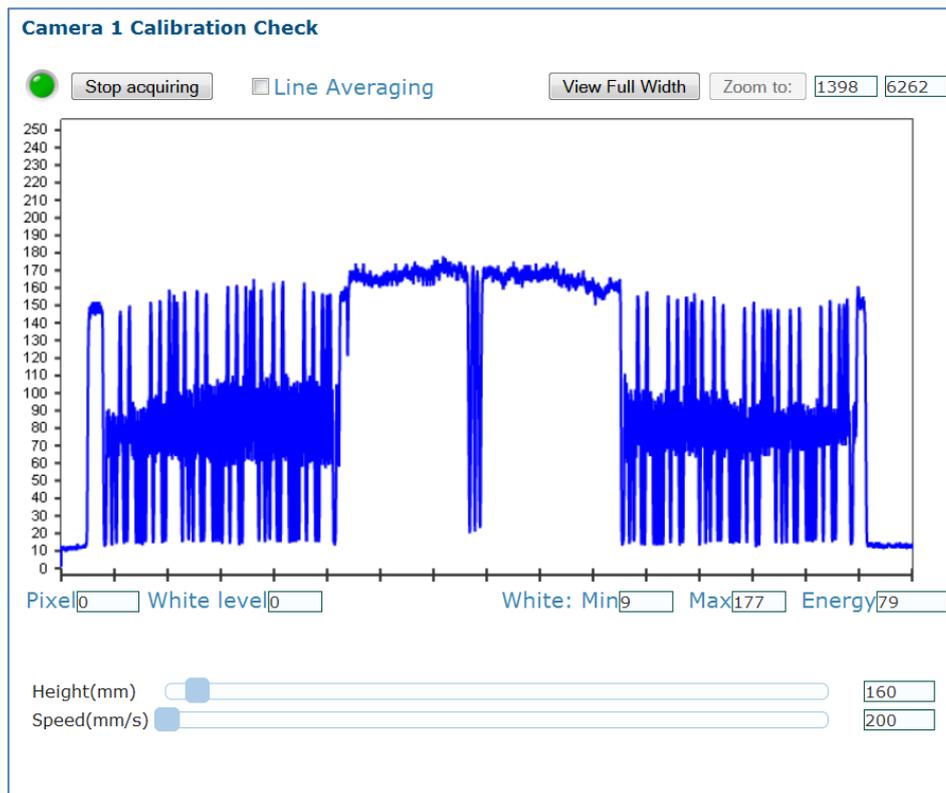


To access the **Scope (Calibration Check)** window:

1. In the menu tree under Diagnostics, click Scope (Calibration Check). The **Scope (Calibration Check)** window opens.
2. To zoom, click on the right and left sides of the area to be zoomed, and then click Zoom to.



- Use the sliders at the bottom of the screen to adjust Height (Focus) and Speed (Amplitude).



- Click **Stop Acquiring** to freeze the scope.

7.3 BYPASSING AN AV7000 IN AN ARRAY (TUNNEL)

If for any reason, a slave AV7000 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 do this, remove the sync cables from **SYNC IN** and **SYNC OUT** connectors of the slave AV7000 and connect the sync cables end-to-end to complete the sync network. When the slave AV7000 is ready to be brought back into the sync network, reattach the cables to its **SYNC IN** and **SYNC OUT** ports. To bring the slave AV7000 back into the array cluster, see *section 4.4*.

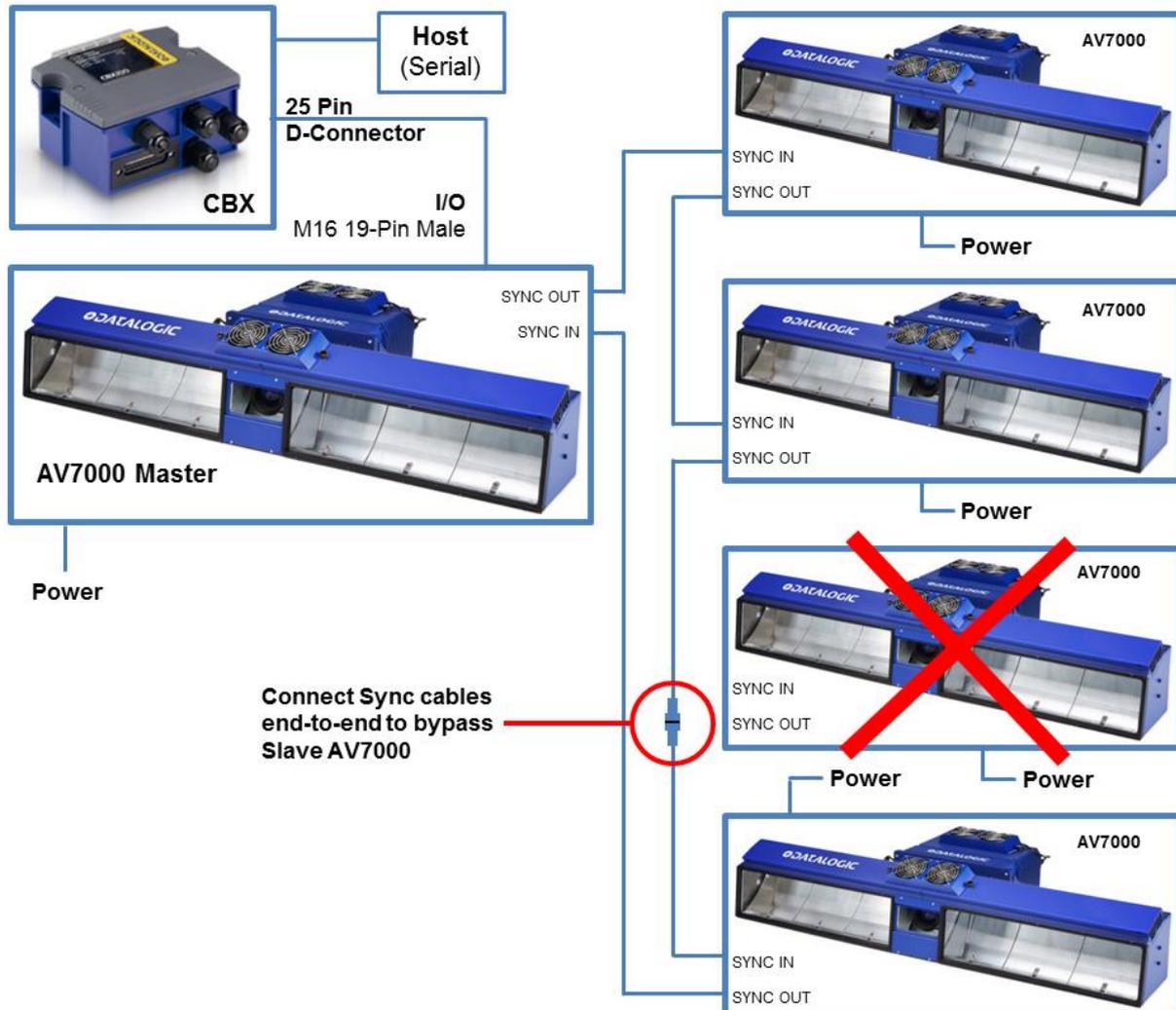


Figure 149: Bypassing a slave AV7000

8 TECHNICAL FEATURES

This chapter provides detailed specifications for the AV7000 Barcode Reading Systems. It provides specific information on:

- Electrical Features
- Optical Features
- Reading Features
- Human Machine Interface
- Software Features
- Environmental Features
- Physical Features

8.1 TECHNICAL SPECIFICATIONS

ELECTRICAL FEATURES			
Supply Voltage	23-26VDC at illumination connector		
	24 VDC ± 2% at power supply connector		
Power Consumption			
AV7000 Camera	4A		
	Illumination Color:	Red	White
AV7000 Camera + AI7000-800 Illumination		12A	15.3A
AV7000 Camera + AI7000-1100 Illumination		16.5A	20A
AV7000 Camera + AI7000-1500 Illumination		20A	22A
Electrical Protection	Internal Electronic Polarity Inversion Protection for both AV7000 cameras and AV7000 illuminators		
Common Communication Interfaces	Main	Baud Rate	
	RS232/RS422	1200 to 115200 up to 115.2 Kbit/s	
	Auxiliary	RS232 up to 115.2 Kbit/s 1200 to 115200	
	Ethernet	2 x Ethernet TCP/IP <ul style="list-style-type: none"> • 1 Ethernet Gigabit for decoding data to Host (may also be used for setup) • 1 Ethernet Gigabit for image file transfer to Host 	
Digital Inputs	3 x Inputs (2 + 1 x “Encoder”), optocoupled, NPN/PNP (5-30 Vdc) <ul style="list-style-type: none"> • 1 Presence Sensor opto-isolated (polarity insensitive) • 1 Optical Encoder opto-isolated (polarity insensitive) • 1 General Purpose opto-isolated (polarity insensitive) 		

Digital Outputs	2 x Outputs SW programmable, optocoupled, event driven, NPN <ul style="list-style-type: none"> • 2 General Purpose opto-isolated open collector or open emitter
Optional Setup Interface	1 USB 2.0 port for Keyboard/Mouse Hub + 1 VGA port for System Monitor
Internal Communication System	SyncNet Technology
Fieldbus	All common Fieldbus communications supported through various Fieldbus modules installed in the CBX800 connection box.

OPTICAL FEATURES

Sensor Type	High Speed CMOS Line Scan - 8192 pixels
Optical Lens	90 mm, 110 mm and 140 mm *
View Angle	8° to 45° *
Max Scan Rate	30 kHz scans/sec
FOV from Top	up to 1400 mm *
DOF from Top	up to 1200 mm *
Resolution	110 to 260 pixels/inch (DPI) *
Focus	Dynamic

* Depends on model and/or application type

HUMAN MACHINE INTERFACE

Keypad	2 buttons
LED Indicators	Status, Tach, Trigger

HARDWARE FEATURES

Decoder CPU	Dual-core Intel® Celeron®, optional Intel® Core™ i5
Operating System	Linux
RAM	8 Gb
Parameter Storage	4 Gb Non-volatile internal FLASH

SOFTWARE FEATURES

Device Programming	Multilanguage, browser-based, on board HTML web server interface
Readable Barcodes	All Standard 1D and 2D Symbologies

ENVIRONMENTAL FEATURES

Temperature	Operating: 0° to 50° C [32° to 122° F] Storage: -20° to 70° C [-4° to 158° F]
Relative Humidity	95% non condensing
Vibration Resistance	<ul style="list-style-type: none"> • SINE vibration as per EN60068-2-6 • 5-9Hz : 1.5mm / 9-150Hz :0.5g • 2h on the primary axis (perpendicular to the face of the camera)
Shock Resistance	As per EN60068-2-27, 15g / 11ms / 3 times up and 3 times down on the primary axis.
Protection Class	IP65
Fan Life	L10 @ 50°C : 50000h

PHYSICAL FEATURES**Mechanical Dimensions:**

AV7000 with external fans and Short Illumination	845x416x237 mm [33.3x16.4x9.3 in]
AV7000 with external fans and Medium Illumination	1150x416x237 mm [45.3x16.4x9.3 in]
AV7000 with external fans and long Illumination	1480x416x237 mm [58.3x16.4x9.3 in]
Weight	
AV7000	11 kg [24 lbs]
Illumination Short, Medium, Long	12 kg [26 lbs], 15 kg [33 lbs], 19 kg [41 lbs]
Enclosure	Aluminum Alloy
Connections	FAN, I/O, FOCUS SER, POWER, HOST NET, IMAGE NET, FOCUS NET, SYNC OUT, SYNC IN

OTHER

Service Options	Installation services and on-site training
Warranty	2-year limited, parts and labor

GLOSSARY

Address

A unique designation for the location of data or the identity of a smart device; allows each device on a single communications line to respond to its own message.

Alignment

The position of a scanning or detection device in relation to the target scanning area or receiving element. Both the barcode reader and photoelectric sensor require proper alignment to assure optimal performance

Alphanumeric

Consisting of letters, numbers, and symbols

Ambient light

The lighting conditions in the scanning area. Ambient light can interfere with successful scanning of bar codes

ANSI (American National Standards Institute)

The principle standards development group in the U.S. A non-profit, non-governmental group supported by over 1000 trade organizations, professional societies, and companies. Member body to the ISO (International Standards Organization).

Aperture

Term used on the required CDRH warning labels to describe the laser exit window.

ASCII (American Standard Code for Information Interchange)

Pronounced as-kee. A standard seven bit plus parity code, representing 256 characters, established by ANSI to achieve compatibility between data services.

Aspect ratio

The ratio of height to width of a bar code symbol. A code twice as high as wide would have an aspect ratio of 2; a code twice as wide as high would have an aspect ratio of $\frac{1}{2}$ or 0.5.

Bar

The dark elements of a printed barcode symbol. Referred to as elements in 2D symbologies.

Barcode

A pattern of variable-width bars and spaces which represents numeric or alphanumeric data in machine-readable form. The general format of a barcode symbol consists of a leading margin, start character, data or message character, check character (if any), stop character, and trailing margin. Within this framework, each recognizable symbology uses its own unique format.

Barcode character

A single group of bars and spaces that represent an individual number, letter, or other symbol.

Barcode density

The number of characters that can be represented in a linear unit of measure. Bar code density is often referred to in characters per inch (CPI).

Barcode label

A label that carries a bar code and can be affixed to an article.

Barcode reader, reader

A single device that performs two functions: 1. examines a printed spacial pattern (bar code) and then, 2. decodes the encoded data.

Barcode symbol

A group of bars that represent a character or group of characters whose width and spacing is determined by a set of rules. In most cases, human readable characters are printed below the bars.

Bar height

The height of the shortest bar in a bar code.

Bar length

The bar dimension perpendicular to the bar width.

Bar width

The thickness of a bar measured from the edge closest to the symbol start character to the trailing edge of the same bar.

Baud Rate

A unit used to measure communications speed or data transfer rate.

DPI

DPI (Dots-Per-Inch) refers to the dot or pixel density in a digital image.

EEPROM

Electrically Erasable Programmable Read-Only Memory. An on-board non-volatile memory chip.

Full Duplex

Simultaneous, two-way, independent transmission in both directions.

Global No Read

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.

Host

A computer that serves other terminals in a network, providing services such as network control, database access, special programs, supervisory programs, or programming languages.

Interface

A shared boundary defined by common physical interconnection characteristics, signal characteristics and meanings of interchanged signals.

LED (Light Emitting Diode)

A low power electronic device that can serve as a visible or near infrared light source when voltage is applied continuously or in pulses. It is commonly used as an indicator light and uses less power than an incandescent light bulb but more than a Liquid Crystal Display (LCD). LEDs have extremely long lifetimes when properly operated.

Local No Read

A configurable No Read message associated with each individual code enabled in the **Barcode Settings Table**.

Parameter

A value that you specify to a program. Typically parameters are set to configure a device to have particular operating characteristics.

Position

The position of a barcode reader or light source in relation to the target of a receiving element.

Protocol

A formal set of conventions governing the formatting and relative timing of message exchange between two communicating systems. Protocol 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.

Resolution

The narrowest element dimension which can be distinguished by a particular reading device or printed with a particular device or method.

RS232

Interface between data terminal equipment and data communication equipment employing serial binary data interchange.

RS422

Interface that specifies the electrical characteristics of generators and receivers for use in balanced digital multipoint systems such as on a Multidrop line.

Reader

A device that examines a printed pattern (barcode) and either passes the uninterpreted data to a decoder or decodes the data and passes it onto the Host system.

Serial Port

An I/O port used to connect a barcode reader to your computer.

Signal

An impulse or fluctuating electrical quantity (i.e.: a voltage or current) the variations of which represent changes in information.

Space

As pertaining to Barcodes, is the blank area between the dark bars.

Symbol

A combination of characters including start/stop and checksum characters, as required, that form a complete scannable barcode.

Trigger Signal

A signal, typically provided by a photoelectric sensor or proximity switch, which informs the barcode reader of the presence of an object within its reading zone.

UPC Acronym for Universal Product Code. The standard barcode type for retail food packaging in the United States

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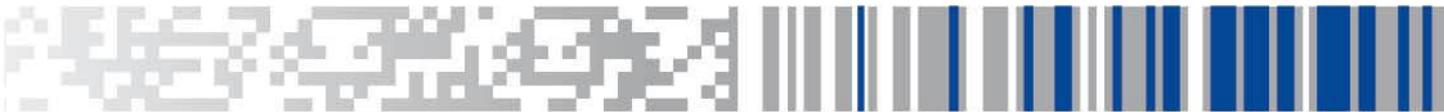
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