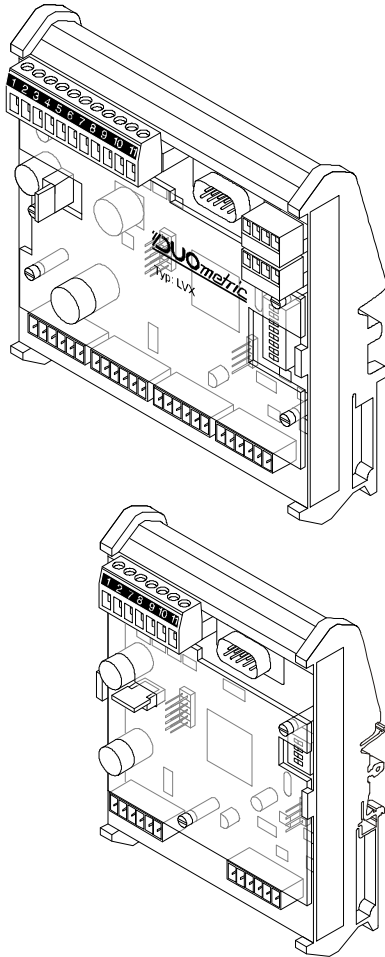


## Startup LVX/LVE



### Important notes



- The light grids are not certified security light screens according to EN 61496. They are not safety components in accordance with EU machine guidelines 89/392/EWG with supplement 93/44/EMW appendix 4. Therefore, they must not be used to protect individuals from danger.
- Handling of the devices and connecting/disconnecting lines is only permitted with the operating voltage switched off.
- Please notice the technical information light curtain bar pairs and other technical information to the devices mentioned.

## Procedure of start- up

1. Snap the LVX/LVE onto the rail mounting module.
2. Connect the transmitter- and receiver profiles to the control unit.
3. Plug in connectors.  
(see configuration sheet and hardware description)
4. Execute the self calibration: (for details see next page)
  - switch DIP3 to “on”
  - connect the supply voltage
  - switch DIP3 back to “off”
5. Verify the correct function in the whole monitoring area.

### **Note:**

Extension modules (e.g. -O16, -ALX) need separate connections to the supply voltage!

## Self calibration

During self-calibration the controller set up the correct gain for the light grid profiles, stores the bar configuration and executes an error-test. The self-calibration has to be done with an uninterrupted monitoring area. (Exceptions: see chapter auto blanking in the parameterization documentation)

### Procedure:

- Supply voltage must not be turned on.  
The device has to be turned off.
- The monitoring area is without obstacles.
- Set DIP-switch 3 to position "on".
- Power up the device.
- Take notice of the LEDs:  
The green LED D should be on.  
No flashing or illuminating of any red error-LED.
- Set DIP-switch 3 back to position "off" while the system stays powered up.  
=> the controller stores the calculated values to the EEPROM and turns back to normal operating mode. If you don't want to save the settings: turn off the device while DIP3 is still in „ON“ position.



### Note:

If the device is turned off while saving is in progress (before LED "B" flashes), unexpected beam blankings could occur.

### LED state during self-calibration

	LED			Note
	D	E	Rx, Tx	
	on	off	off	Self-calibration o.k.
	off	on	off	acceptable Possible reasons: <ul style="list-style-type: none"> <li>Large distance between receiver and transmitter =&gt; reduce distance; use transmitter with option „higher transmitter power“.</li> <li>Single beams covered or polluted.</li> <li>Difference of the signal strength between the brightest and the darkest beam is too big.</li> </ul>
			on or flashing	Self-calibration <b>failed!</b> Single beams are detected as defect. Only limited operation possible!

Other LED states see chapter LEDs.

## Auto blanking

Interrupted beams are automatically blanked if the configuration value "Auto blanking on cal." is set to "1".

Please notice that beams must be covered completely for the auto blanking procedure. If beams are blanked LED A turns on.

During command mode:

- The blanking can be checked with 'b'.<sup>1</sup>
- Requesting the error report with command 'e' includes a notice for blanked beams.

---

<sup>1</sup> The control unit has to have worked in normal operation mode before.

## Technical Data

Maximum number of beams	500 beams (diagonal beams included)
Transmitter/Receiver	Terminals available for connecting 2 Transmitter/receiver
Cycle time	Depends on range and parameter definition from approx. 50µs/beam
Power supply	24 (19...30) VDC (grounded supply)
Current consumption	See hardware description LVX/LVE
Range	with standard transmitter/receiver 250 ... 6000 mm
Serial interface	115200 Bits/s (38400 Bits/s <sup>2</sup> ) (parameter definable, 8n1)
Temperature	-25 ...+40 °C
Humidity	up to 90% relative humidity, non-condensing

## Mechanics

Type	mounting rail module
Protection	IP00
Dimensions	see hardware description LVX or LVE

## DIP-switches

The delivery status and the normal operation mode for all DIPs is OFF.

Sample: LVX



### Functions:

DIP 1	Firmware update
DIP 2	Command Mode <sup>3</sup>
DIP 3	Self calibration on power up
...	
DIP 8	Override for encoder mode

<sup>2</sup> For firmware version up to x255.

<sup>3</sup> See technical information functions and parameterization LVX/LVE

## LEDs

The LVX indicates operational errors and faults via the eight adjacent LEDs RX, TX, A... F. If the status is normal, LEDs C, D, E, F indicate the signal strength. Please note that the error cannot be localized with 100% accuracy. The LEDs only provide you with a good idea of where to start looking.

### LED A

	Signal	Status	Possible causes
	A (yellow) illuminated	Warning	Blanked beams, watchdog.

### LED B

	Signal	Status
	Even flashing (approx. 2 Hz)	Normal operation.
	Double-flash	Configuration mode
	Continuously on or off	Synchronization fault, serial communication "crashed", defective

### Fault LEDs

	Signal	Fault
	RX (red) illuminated	Receiver A
	TX (red) illuminated	Transmitter A
	RX & TX illuminated	Controller; Synchronization fault

	Signal	Fault
	RX (red) flashing	Receiver B
	TX (red) flashing	Transmitter B

### Special LED combinations

	Hardware fault, please inform manufacturer
	Parameter outside of permitted limit values => correct in configuration mode (reset to defaults if necessary)

	Hardware fault, please inform manufacturer
	Length of connected rods does not correspond with stored values => perform self-comparison (self-test)

## PIN assignments

### LVX

Terminal	Des.	Comment / Function
1	+24 VDC	
2	Minus	
3	+24 VDC	
4	Minus	
5	OUT 1	Switching output 1
6	OUT 2	Switching output 2
7	OUT 3	Switching output 3
8	IN 4/ OUT 4	Combined IO: Input 4; Output 4
9	IN 3/ OUT 5	Combined IO: Input 3; Output 5
10	IN 2/ OUT 6	Combined IO: Input 2; Output 6
11	IN 1	Input 1

### LVE

Terminal	Des.	Comment / Function
1	+24 VDC	
2	Minus	
7	OUT 1	Switching output 1
8	IN 4/ OUT 2	Combined IO: Input 4; Output 2
9	IN 3 / OUT 3	Combined IO: Input 3; Output 3
10	IN 2 / OUT 4	Combined IO: Input 2; Output 4
11	IN 1	Input 1

### ALX

Take notice of the PIN assignment mentioned in the hardware description!

Terminal	Des.	Comment / Function
51	+24 VDC	
52	+24 VDC	
53	Minus	
54	Analog 1	Output 1 (0...10 V)
55	Analog 2	Output 2 (0...10 V)

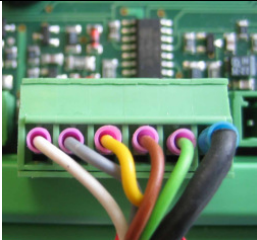
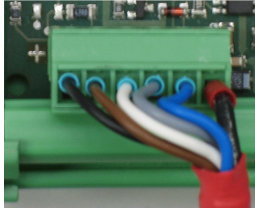
### O16

Terminal	Des.	Comment / Function
21	+24 VDC	
22	+24 VDC	
23	Minus	
31	OUT 1	Output 1 (extension module O16)
...		
38	OUT 8	Output 8
41	OUT 9	Output 9 (extension module O16)
...		
48	OUT 16	Output 16

### PBI, ALM

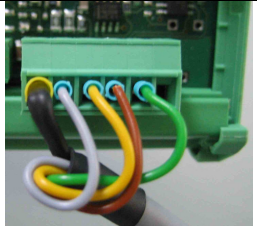
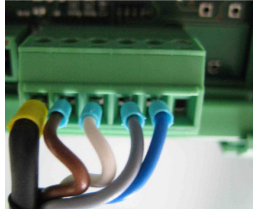
Take notice of the PIN assignment mentioned in the hardware description!

## Connector configuration of transmitter and receiver

Profile connection wiring	Photo	Colour assignments					
<b>Standard</b> and option A8=H		White	Grey	Yellow	Brown	Green	Shielding
M12, 5 pin plug/socket		Black	Brown	White	Grey	Blue	Shielding

The M12-connector housing and the light curtain housing have same electric potential.

Connector configuration of **receiver** for isolated mounting or with double shielding:

Profile connection wiring	Photo	Colour assignments					
<b>Standard</b> and option A8=H		White and Shielding	Grey	Yellow	Brown	Green	
M12, 5 pin plug/socket		Black and Shielding	Brown	White	Grey	Blue	

The M12-connector housing is connected to 0V and has to be isolated.

### Notes:

- All cables must be connected in an EMC-compatible manner!  
Take special notice that unshielded parts of a cable shall not exceed 2cm.
- Don't mix up assignments!  
The light grid profiles can be damaged as a result of mixed up pin-assignments.
- Light grid warranty is voided as a result of modifications to connectors or cables.
- Special connector cables often differ in the pin-assignment.
- In case of doubt please call our technical service for information.