

Micron

 **IO-Link**



Copy of the original Instructions

ENGLISH



Contents

INTRODUCTION	3
Beam positioning	3
Working range	4
ELECTRICAL CONNECTIONS.....	5
Emitter connections and LEDs	5
Receiver connections and LEDs.....	6
IO-Link master – Micron connection via custom Y cable.....	7
Warnings about connection cables	7
TECHNICAL specifications.....	8
Technical features	8
Mechanical dimensions.....	9
Mechanical dimensions.....	10
Configuration.....	11
IO-Link identification	11
Vendor id	11
Device id	11
IO-Link Parameters	12
Vendor parameters	12
IO-Link Process Data	13
PDIn measurement.....	13
PDIn beams status	13
PDOut.....	13
IO-Link events	14

INTRODUCTION

The Micron photoelectric light curtain is a multi-beam optoelectronic system consisting of an emitter and a receiver, used to detect or measure objects.

The two units can be synchronised via optical link or cable.

The status of the light curtain outputs (which reside in the receiver) changes as soon as a measurement is performed (or an object is detected).

Micron light curtains **MUST NOT** be used as safety devices for protection of operators in hazardous areas.

Beam positioning

The following figure shows the arrangement of the beams and their numbering:

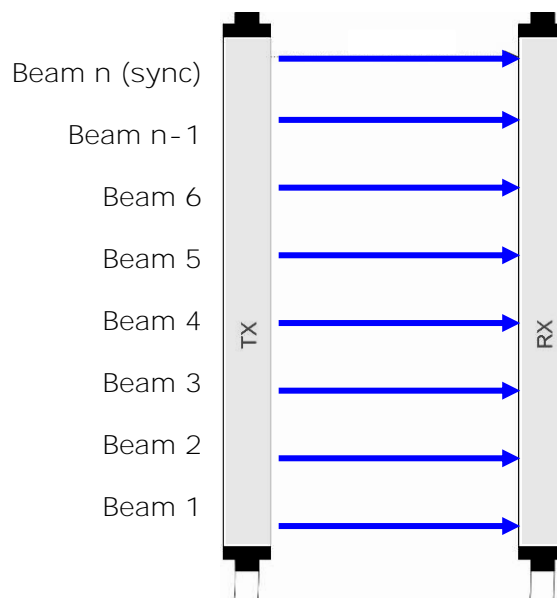


Figure 1

- ➔ Note that beams must always be numbered starting from the bottom, as shown in figure 1. If synchronised via cable, the last beam can also be used for measurements.
- ➔ With optical synchronisation, the uppermost beam must never be obstructed as this would interrupt the measurement function.

Working range

→ Particular operating conditions may affect the sensing level of photo-electric devices. In environments characterised by fog, rain, fumes or dust, to always guarantee correct operation of the appliance, it is advisable to apply suitable correction factors Cf so as to maximum working range values. In these cases:

$$P_u = P_m \times F_c$$

where P_u and P_m are, respectively, the working and maximum range expressed in metres.

The recommended correction factors CF are indicated in the table below.

OPERATING CONDITIONS	CORRECTION FACTOR Cf
Fog	0.25
Vapours	0.50
Dust	0.50
Dense fumes	0.25

→ If the device is installed in environments characterised by sudden changes in temperature, suitable precautions must be taken to prevent the formation of condensation on the mirrors, which could impair detection capability.

ELECTRICAL CONNECTIONS

- ➔ Perform the connections as shown in below tables, in order to ensure the correct functioning of the barrier.
- ➔ We recommend the use of separate power supplies for the barrier and for other electrical power equipment (electric motors, inverters, frequency converters) or other sources of disturbance.

Emitter connections and LEDs

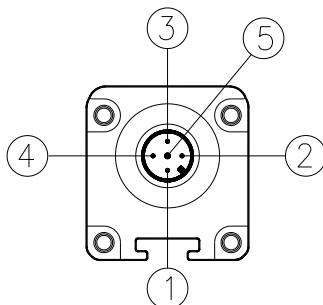


Figure 2

PIN	NAME	TYPE	DESCRIPTION
1	24VDC	-	24 VDC power supply
2	RANGE	DI	24 VDC input → HIGH range 0 DC input → LOW range
3	0VDC	-	0 VDC power supply
4	SYNC	DI	RX-TX SYNC INPUT (OPTIONAL)
5	PE	-	Ground connection

NOTE: PE can not be used with Reer adapter cables cod. 1250902/1250903

M12 5-pole

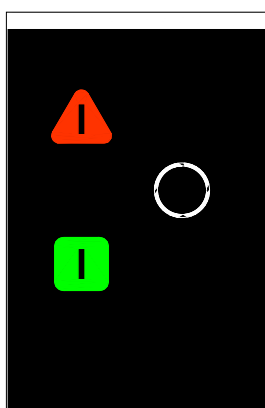


Figure 3

RED	System start
RED BLINKING	FAIL condition
GREEN	Normal operation. At power on: 2 slow blinks -> Low range 2 fast blinks -> High range
ORANGE BLINKING	No synchronisation via cable

Receiver connections and LEDs

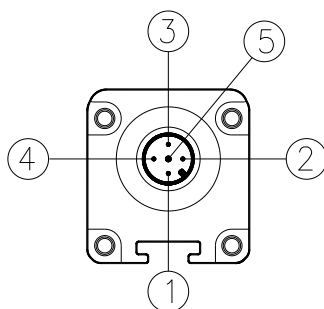


Figure 4

PIN	NAME	TYPE	DESCRIPTION
1	L+	-	24 VDC power supply
2	SYNC	DO	RX-TX SYNC INPUT (OPTIONAL)
3	L-	-	0 VDC power supply
4	Q	IEC 61131-2	"Switching signal" DI (SIO)
	C	IEC 61131-9	"Coded switching" (COM1, COM2, COM3)
5	NC	-	Not connected

M12 5-pole



Figure 5

IO-LINK LED	
RED BLINKING	No connection to the IO-Link master
GREEN BLINKING	Connection to the IO-Link master
STATUS LED	
RED FIXED	Curtain occupied
GREEN FIXED	Curtain free
YELLOW BLINKING	Teach-in enabled
YELLOW FIXED	Object recognized

IO-Link master – Micron connection via custom Y cable

A custom Y cable (Reer CSYIOLH 1250902/ CSYIOLH 1250903) can be used to simplify connection between the emitter and the receiver to the IO-Link master. Two different cables are available to manage the Range of the emitter.

Alternatively the receiver can be connected to the IO-Link master with a standard IO-Link cable and the receiver can be wired with a standard M12 5 pole cable. In this case the range can be chosen with the appropriate wire and the Receiver/Emitter synchronization via cable is not possible.

Warnings about connection cables

- Cables must not be more than 20m long.
- Keep the power supply to the light curtain separate from that to other electric power equipment (electric motors, inverters, frequency converters) or other sources of disturbance.
- Connection cables must follow different paths from other power cables.

TECHNICAL SPECIFICATIONS

Technical features

Micron 10mm / 30mm MEASURE CURTAIN TECHNICAL FEATURES		Unit
Operating range	Low Range: 0÷2/ High Range: 1÷10	m
Power supply	24 ± 20%	VDC
Connections	Emitter: M12 - 5-pole / Receiver: M12 - 5-pole	
Measurement time	(70 us * number of beams + 500 us)*n (n = 1÷3 based on the scan cycles configured)	
Synchronisation	Optical or via cable, selectable	
Max power	1 (Emitter) / 3 (Receiver)	W
IO-Link specifications	IO-Link Interface and System specification - Version 1.1.3 June 2019 Port Class A (Type A) COM 2 = 38.4 kbaud	
IO-Link cycle time	10	ms
Max. connection length	20	m
Operating temperature	-10 ÷ 55°C	°C
Protection class	IP 65 - IP 67	

Micron 25mm, 50mm, 75mm MEASURE CURTAIN TECHNICAL FEATURES		Unit
Operating range (REDUCED) (selectable from software)	Low Range: 0÷3/ High Range: 0÷8	m
Operating range (NORMAL) (selectable from software)	Low Range: 0÷8/ High Range: 1÷18	
Power supply	24 ± 20%	VDC
Connections	Emitter: M12 - 5-pole / Receiver: M12 - 5-pole	
Measurement time	(70 us * number of beams + 500 us)*n (n = 1÷3 based on the scan cycles configured)	
Synchronisation	Optical or via cable, selectable	
Max power	1 (Emitter) / 3 (Receiver)	W
IO-Link specifications	IO-Link Interface and System specification - Version 1.1.3 June 2019 Port Class A (Type A) COM 2 = 38.4 kbaud	
IO-Link cycle time	10	ms
Max. connection length	20	m
Operating temperature	-10 ÷ 55°C	°C
Protection class	IP 65 - IP 67	

Mechanical dimensions

Beam spacing 10 mm										
Model	151	301	451	601	751	901	1051	1201	1351	1501
Measurement height (mm)	140	290	440	590	740	890	1040	1190	1340	1490
Number of beams	15	30	45	60	75	90	105	120	135	150
Model	1651	1801	1951	2101	2251	2401	2551	2701	2851	3001
Measurement height (mm)	1640	1790	1940	2090	2240	2390	2540	2690	2840	2990
Number of beams	165	180	195	210	225	240	255	270	285	300

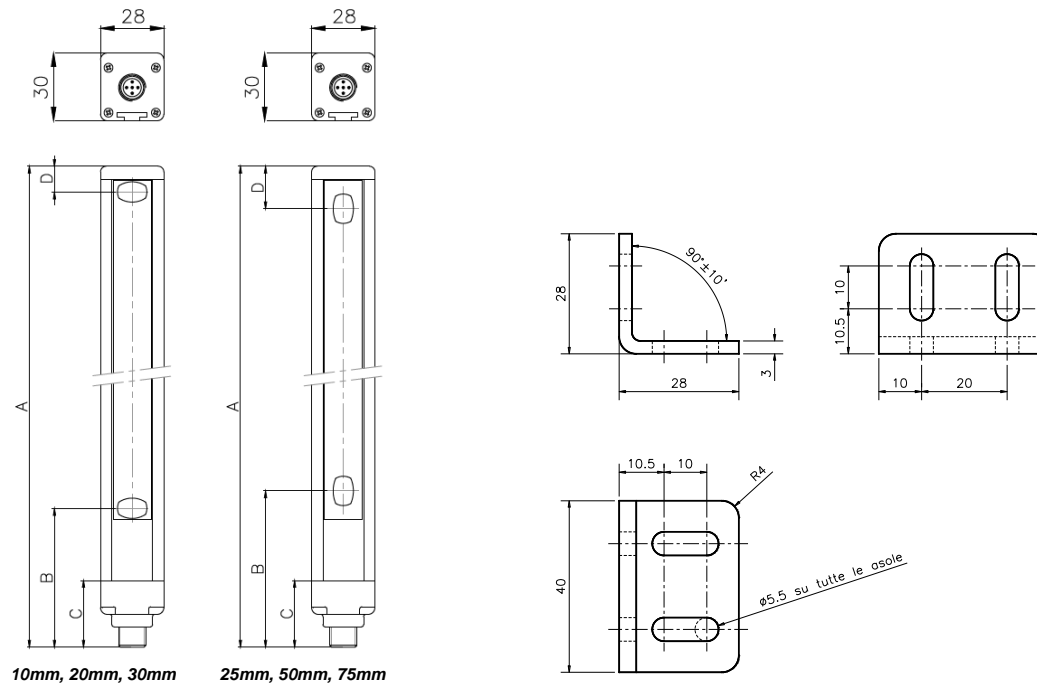
Beam spacing 25 mm										
Model	152	302	452	602	752	902	1052	1202	1352	1502
Measurement height (mm)	125	275	425	575	725	875	1025	1175	1325	1475
Number of beams	6	12	18	24	30	36	42	48	54	60
Model	1652	1802	1952	2102	2252	2402	2552	2702	2852	3002
Measurement height (mm)	1625	1775	1925	2075	2225	2375	2525	2675	2825	2975
Number of beams	66	72	78	84	90	96	102	108	114	120

Beam spacing 30 mm										
Model	153	303	453	603	753	903	1053	1203	1353	1503
Measurement height (mm)	120	270	420	570	720	870	1020	1170	1320	1470
Number of beams	5	10	15	20	25	30	35	40	45	50
Model	1653	1803	1953	2103	2253	2403	2553	2703	2853	3003
Measurement height (mm)	1620	1770	1920	2070	2220	2370	2520	2670	2820	2970
Number of beams	55	60	65	70	75	80	85	90	95	100

Beam spacing 50 mm										
Model	155	305	455	605	755	905	1055	1205	1355	1505
Measurement height (mm)	100	250	400	550	700	850	1000	1150	1300	1450
Number of beams	3	6	9	12	15	18	21	24	27	30
Model	1655	1805	1955	2105	2255	2405	2555	2705	2855	3005
Measurement height (mm)	1600	1750	1900	2050	2200	2350	2500	2650	2800	2950
Number of beams	33	36	39	42	45	48	51	54	57	60

Beam spacing 75 mm										
Model	157	307	457	607	757	907	1057	1207	1357	1507
Measurement height (mm)	75	225	375	525	675	825	975	1125	1275	1425
Number of beams	2	4	6	8	10	12	14	16	18	20
Model	1657	1807	1957	2107	2257	2407	2557	2707	2857	3007
Measurement height (mm)	1575	1725	1875	2025	2175	2325	2475	2625	2775	2925
Number of beams	22	24	26	28	30	32	34	36	38	40

Mechanical dimensions¹



	150	300	450	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	2550	2700	2850	3000
Dimension A	213	363	513	663	813	963	1113	1263	1413	1563	1713	1863	2013	2163	2313	2463	2613	2763	2913	3063
Dimension B (step 10mm, 30mm)	61,5	61,5	61,5	61,5	61,5	61,5	61,5	61,5	61,5	61,5	61,5	61,5	61,5	61,5	61,5	61,5	61,5	61,5	61,5	61,5
Dimension B (step 25mm, 50mm, 75mm)	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
Dimension C	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
Dimension D (step 10mm)	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Dimension D (step 25mm)	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
Dimension D (step 30mm)	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
Dimension D (step 50mm)	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44
Dimension D (step 75mm)	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
Mounting	2 LE TYPE brackets with 2 inserts								3 LE TYPE brackets with 2 inserts											

¹All measurements are in mm

CONFIGURATION

IO-Link identification

Vendor id

1269

Device id

The Micron IOL will have two different Device Id depending on which process data is needed by the user.

The format of the product Id is:

xxx yyy p

xxx indicates the length of the light curtain in cm;

yyy indicates the resolution of the light curtain in mm;

p indicates the process data type:

0 measurements

1 beams status

Example:

The Micron 451 IOL is 45cm long and has 10 mm resolution, so the two vendor Ids will be as following:

045 010 0 for the Measurement process data

045 010 1 for the Beams status process data

IO-Link Parameters**Vendor parameters**

Parameter	Index	Access	Description	
Pitch	0x0040	RO		
Number of beams	0x0041	RO		
Syncro type	0x0042	RW	0: Optical 1: Cable When switching from Cable to Optical a power cycle on the emitter is needed	
Bearing	0x0043	RW	0: Normal 1: Upside down If Syncro type is Optical, only Normal bearing is allowed	
Scan cycles	0x0044	RW	Allowed values: 1, 2 or 3 Number of curtain cycles to consider a measurement as valid	
Process data type	0x0045	RW	0: Beams status 1: Measurements This will change the product Id of the device	
Data transmission mode	0x0046	RW	Select different PDOut data transmission modes	
			0: Always enabled	Measurements are always transmittend
			1: Enabled on trigger	A 1 level on the PDOut data Trigger enables the measurements transmission
			2: Disabled on trigger	A 1 level on the PDOut data Trigger disables the measurements transmission
			3: Peak detection	A 0 to 1 transition on the PDOut data Trigger starts a sampling and a 1 to 0 transition stops it. During the sampling period the maximum values of all the measurements are memorized and on the falling edge of the Trigger the values are sent on the PDIn data and freezed until a new sampling period starts
Teach-in mode	0x0047	RW	Select different teach-in modes.	
			0: Disabled	Teach-in disabled
			1: Fixed	Fixed object recognition ²
			2: Moving	Moving object recognition ³
Teach-in tolerance	0x0048	RW	Allowed values: 0, 1 or 2 Tolerance on the occupied beam to recognize an object	

To memorize a pattern execute a set and reset cycle on the Teach-in input with the object occupying the beams.

To delete a memorized pattern execute a new memorization with the light curtain completely free.

² The Fixed object recognition can work with objects with or without transparent areas.

³ The Moving object recognition works only for objects without transparent areas that occupies contiguous beams.

⁴ The Fixed object blanking can work with objects with or without transparent areas.

IO-Link Process Data

PDIn measurement⁵

INT16		INT16				
FBO		LBO				
INT16		INT16				
CBO		NBO				
INT16		INT4	BOOL	BOOL	BOOL	BOOL
NCBO		Device Status	Beams status	Syncro status	SSC2	SSC1

Len.Offset	Data type	Description
16.72	IntegerT16	FBO: first beam occupied
16.56	IntegerT16	LBO: last beam occupied
16.40	IntegerT16	CBO: central beam occupied
16.24	IntegerT16	NBO: number of beams occupied
16.8	IntegerT16	NCBO: number of consecutive beams occupied
4.4	UIntegerT4	Status: copy of DeviceStatus (Index 0x0024)
1.3	Bool	Light curtain beams status: 0 for occupied , 1 for free
1.2	Bool	Light curtain syncro status: 0 for syncro non present, 1 for syncro present
1.1	Bool	SSC2: 0 for „inactive“ (target not detected), 1 for „active“ (target not detected)
1.0	Bool	SSC1: 0 for „inactive“ (target not detected), 1 for „active“ (target not detected)

PDIn beams status

BOOL		INT4	BOOL	BOOL	BOOL	BOOL
BEAMS		Device Status	Beams status	Syncro status	SSC2	SSC1

Len.Offset	Data type	Description
240.8	240 Bool ⁶	Single beams status
4.4	UIntegerT4	Status: copy of DeviceStatus (Index 0x0024)
1.3	Bool	Light curtain beams status: 0 for occupied , 1 for free
1.2	Bool	Light curtain syncro status: 0 for syncro non present, 1 for syncro present
1.1	Bool	SSC2: 0 for „inactive“ (target not detected), 1 for „active“ (target not detected)
1.0	Bool	SSC1: 0 for „inactive“ (target not detected), 1 for „active“ (target not detected)

PDOOut

		BOOL	BOOL
Reserved		Teach-in	Trigger

Len.Offset	Data type	Description
1.1	Bool	Teach-in
1.0	Bool	Trigger

⁵ If more than one zone is obstructed, the data refer to the zone with the highest number of obstructed beams.

⁶ Variable, based on the light curtain's actual number of beams. For light curtains with more than 240 beams only the first 240 are shown.

IO-Link events

Code	Cat.	Status	Event	PW	Error type	Description	Customer action
0x5000	1	4	Yes	Invalid	Error	Device hardware fault	Replace device
0x8CE4	2a	3	Yes	Valid	Error	Sync signal list	Correct device
0x8DFE	3	1	Yes	Valid	Warning	Test event when index 2 is set to 240 Event is canceled if index is changed to 241.	Test event
0x8DFF	3	1	Yes	Valid	Warning	Test event when index 2 is set to 242, Event is canceled if index is changed to 243	Test event



Dichiarazione CE di conformità
EC declaration of conformity

Torino, 05/05/2020

REER S.p.A.
via Carcano 32
10153 – Torino
Italy

dichiara che:

• le barriere fotoelettriche **MICRON IO-Link**
sono dispositivi optoelettronici di misura realizzati in conformità alle seguenti Direttive Europee:

declares that:

• *the **MICRON IO-Link** photoelectric barriers
are Electro-sensitive Measuring Equipments compliant with the following European Directives:*

- **2011/65/EU** "RoHS – Linea Guida"
"RoHS – Guideline"
- **2014/30/EU** "Direttiva Compatibilità Elettromagnetica"
"Electromagnetic Compatibility Directive"
- **IEC 61131-2** "Controllori programmabili - Parte 2: Requisiti e prove delle apparecchiature"
"Programmable controllers – Part 2: Equipment requirements and tests"
- **IEC 61131-9** "Controllori programmabili - Parte 9: "Interfaccia di comunicazione digitale (SDCI)
per piccoli sensori e attuatori"
"Programmable controllers - Part 9: Single-drop digital communication
interface for small sensors and actuators (SDCI)"

Carlo Pautasso
Direttore Tecnico
Technical Director

Simone Scaravelli
Amministratore Delegato
Managing Director



Via Carcano, 32
10153 Torino, Italy
T +39 011 248 2215
F +39 011 859 867
www.reersafety.com
info@reer.it