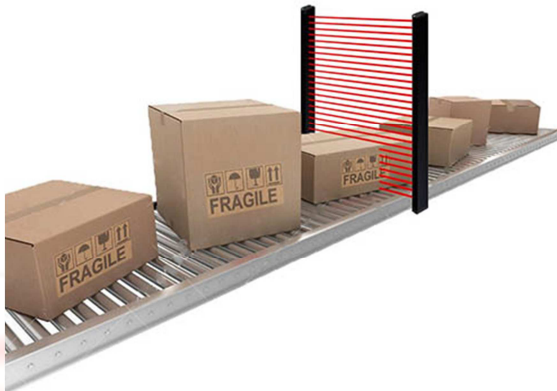


### NS series Measuring Barriers

1811

The system, formed by a transmitter and a receiver, cover a zone with infrared parallel beams to detect presence, form and position of the object inside, and to communicate it to the control system.



Different outputs and communication systems are available:

**Analog** available 0-10V or 4-20mA,

**A1 A2 A3 type** gives the position of the beam obscured.  
**B type** gives a signal proportional to the number of obscured beams

**Serial RS 485** with Mod-Bus RTU protocol, gives the indication of the status of every beam

The beam center of the system can be of 2.5, 5, 10, 12, 24, 48 mm.

The detection height is between 80 and 3000 mm, with range up to 10 m.

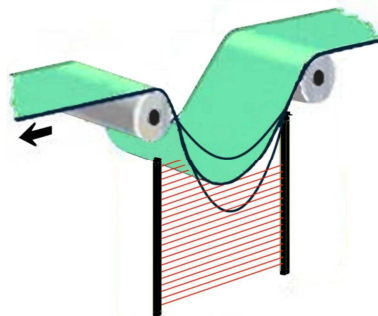
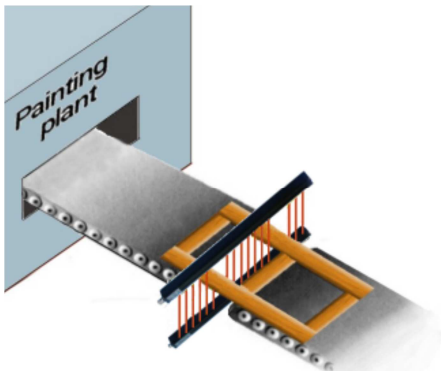
All the control and communication circuits are contained in the optical part, there are no further external unit, for the maximum space saving, reducing the installation time and cost.

#### Example of applications

Shape detection for painting plant

Loop monitoring

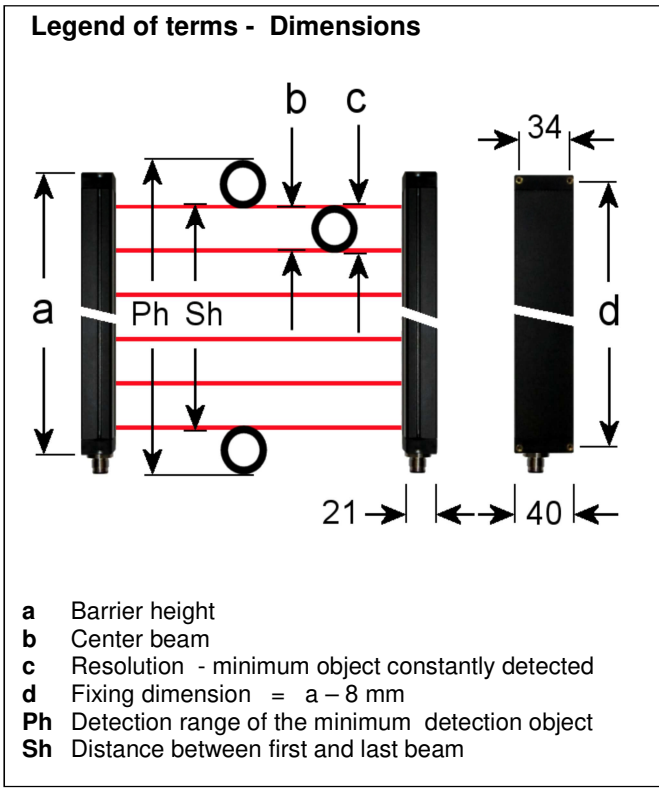
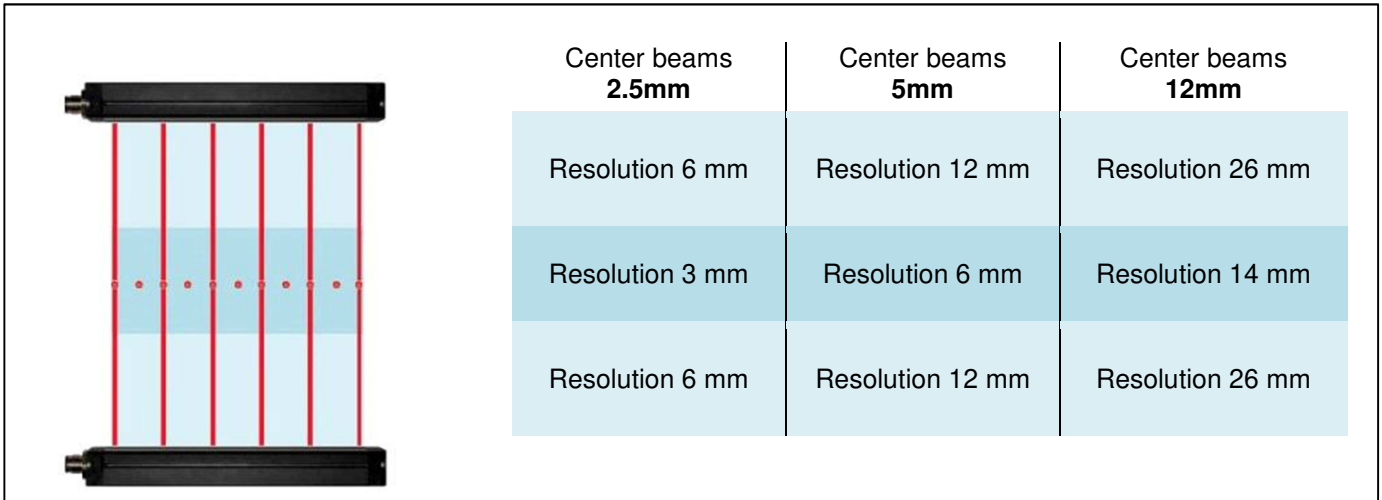
Dimensional detection for packaging



## NS interpolated detection version

Thanks to a special processing of the received signals in the central area it can provide a number of reading points double compared to a traditional constant resolution system. This scan mode is particularly suitable for the detection and measurement of items in transit in the central area, offering a good resolution at low cost.

A detailed application note is available on request to show all the detection characteristics.



### IMPORTANT

These equipment are not proper for operators protection in dangerous applications.

Center beams 2.5-5mm – Resolution 3 – 6mm, Range 0..500mm					
Modelli	Protected Height	Sensible Height	N of beams	Response time	Barrier height
	mm	mm		ms	mm
NS a 02- 080 PR	80	75	31	2	155
NS a 02- 160 PR	160	155	63	3	180
NS a 02- 240 PR	240	235	95	4	260
NS a 02- 320 PR	320	315	127	5	340
NS a 02- 400 PR	400	395	159	6	420
NS a 02- 480 PR	480	475	191	7	500
NS a 02- 560 PR	560	555	223	6	580
NS a 02- 640 PR	640	635	255	6	660
NS a 02- 720 PR	720	715	287	6	740
NS a 02- 800 PR	800	795	319	7	820
NS a 02- 880 PR	880	875	351	7	900
NS a 02- 960 PR	960	955	383	8	980
NS a 02- 1040 PR	1040	1035	447	8	1060
NS a 02- 1120 PR	1120	1115	479	9	1140
NS a 02- 1200 PR	1200	1195	511	9	1220
NS a 02- 1280 PR	1280	1275	543	9	1300
NS a 02- 1360 PR	1360	1355	575	10	1380
NS a 02- 1440 PR	1440	1435	607	10	1460
NS a 02- 1520 PR	1520	1515	639	11	1540
NS a 02- 1600 PR	1600	1595	671	11	1620
NS a 02- 1680 PR	1680	1675	703	12	1700
NS a 02- 1760 PR	1760	1755	735	12	1780
NS a 02- 1840 PR	1840	1835	767	13	1860
NS a 02- 1920 PR	1920	1915	799	13	1940
NS a 02- 2000 PR	2000	1995	831	14	2020
NS a 02- 2080 PR	2080	2075	863	14	2100
NS a 02- 2160 PR	2160	215	895	14	2180
NS a 02- 2240 PR	2240	2235	927	15	2260
NS a 02- 2320 PR	2320	2315	959	15	2340
NS a 02- 2400 PR	2400	2395	991	16	2420
NS a 02- 2480 PR	2480	2475	1023	16	2500
NS a 02- 2560 PR	2560	2555	1055	17	2580
NS a 02- 2640 PR	2640	2635	1087	17	2660
NS a 02- 2720 PR	2720	2715	1119	18	2740
NS a 02- 2800 PR	2800	2795	1151	18	2820

Center beams 2.5-5mm – Resolution 3 – 6mm, Range 4 m					
Modelli	Protected Height	Sensible Height	N of beams	Response time	Barrier height
	mm	mm		ms	mm
NS a 02- 080 L4	80	75	31	2	155
NS a 02- 160 L4	160	155	63	3	180
NS a 02- 240 L4	240	235	95	4	260
NS a 02- 320 L4	320	315	127	5	340
NS a 02- 400 L4	400	395	159	6	420
NS a 02- 480 L4	480	475	191	7	500
NS a 02- 560 L4	560	555	223	6	580
NS a 02- 640 L4	640	635	255	6	660
NS a 02- 720 L4	720	715	287	6	740
NS a 02- 800 L4	800	795	319	7	820
NS a 02- 880 L4	880	875	351	7	900
NS a 02- 960 L4	960	955	383	8	980
NS a 02- 1040 L4	1040	1035	447	8	1060
NS a 02- 1120 L4	1120	1115	479	9	1140
NS a 02- 1200 L4	1200	1195	511	9	1220
NS a 02- 1280 L4	1280	1275	543	9	1300
NS a 02- 1360 L4	1360	1355	575	10	1380
NS a 02- 1440 L4	1440	1435	607	10	1460
NS a 02- 1520 L4	1520	1515	639	11	1540
NS a 02- 1600 L4	1600	1595	671	11	1620
NS a 02- 1680 L4	1680	1675	703	12	1700
NS a 02- 1760 L4	1760	1755	735	12	1780
NS a 02- 1840 L4	1840	1835	767	13	1860
NS a 02- 1920 L4	1920	1915	799	13	1940
NS a 02- 2000 L4	2000	1995	831	14	2020
NS a 02- 2080 L4	2080	2075	863	14	2100
NS a 02- 2160 L4	2160	215	895	14	2180
NS a 02- 2240 L4	2240	2235	927	15	2260
NS a 02- 2320 L4	2320	2315	959	15	2340
NS a 02- 2400 L4	2400	2395	991	16	2420
NS a 02- 2480 L4	2480	2475	1023	16	2500
NS a 02- 2560 L4	2560	2555	1055	17	2580
NS a 02- 2640 L4	2640	2635	1087	17	2660
NS a 02- 2720 L4	2720	2715	1119	18	2740
NS a 02- 2800 L4	2800	2795	1151	18	2820

Center beams 5-10 mm - Resolution 6-12mm - Range 4 m					
Model	Protected Height	Sensible Height	N of beams	Response time	Barrier height
	mm	mm		msec	mm
NS a 05- 080	80	72	15	2	155
NS a 05- 160	160	152	31	3	180
NS a 05- 240	240	232	47	4	260
NS a 05- 320	320	312	63	5	340
NS a 05- 400	400	392	79	6	420
NS a 05- 480	480	472	95	7	500
NS a 05- 560	560	552	111	8	580
NS a 05- 640	640	632	127	9	660
NS a 05- 720	720	712	143	11	740
NS a 05- 800	800	792	159	12	820
NS a 05- 880	880	872	175	13	900
NS a 05- 960	960	952	191	14	980
NS a 05- 1040	1040	1032	207	15	1060
NS a 05- 1120	1120	1112	223	16	1140
NS a 05- 1200	1200	1192	239	17	1220

Center beams 12-24 mm - Resolution 14-26 mm - Range 4 m					
Model	Protected Height	Sensible Height	N of beams	Response time	Barrier height
	mm	mm		msec	mm
NS a 12- 095	94	74	7	1	155
NS a 12- 190	190	170	15	2	212
NS a 12- 290	286	266	23	2	308
NS a 12- 380	382	362	31	3	404
NS a 12- 480	478	458	39	3	500
NS a 12- 580	574	554	47	4	596
NS a 12- 670	670	650	55	4	692
NS a 12- 770	766	746	63	5	788
NS a 12- 860	862	842	71	5	884
NS a 12- 960	958	938	79	6	980
NS a 12- 1060	1054	1034	87	7	1076
NS a 12- 1150	1150	1130	95	7	1172
NS a 12- 1250	1246	1226	103	8	1268
NS a 12- 1340	1342	1322	111	8	1364
NS a 12- 1440	1438	1418	119	9	1460
NS a 12- 1540	1534	1514	127	9	1556
NS a 12- 1630	1630	1610	135	10	1652
NS a 12- 1730	1726	1706	143	11	1748
NS a 12- 1820	1822	1802	151	11	1844
NS a 12- 1920	1918	1898	159	12	1940
NS a 12- 2020	2014	1994	167	12	2036
NS a 12- 2110	2110	2090	175	13	2132
NS a 12- 2210	2206	2186	183	13	2228
NS a 12- 2300	2302	2282	191	14	2324
NS a 12- 2400	2398	2378	199	14	2420
NS a 12- 2500	2494	2474	207	15	2516
NS a 12- 2600	2590	2570	215	16	2612
NS a 12- 2700	2686	2666	223	16	2708
NS a 12- 2800	2782	2762	231	17	2804
NS a 12- 2900	2878	2858	239	17	2900

The NSa 05 and NSa 12 barriers are available also in long range version

**NSa 05 L5**  
max range 5 m, resolution 6- 12mm

**NSa 12 L10**  
max range 10 m, resolution 16- 30mm

Other characteristics as above table.

**NS constant resolution version**

Center beam 10 mm - Resolution 12 mm - Range 4 m					
Model	Protected Height	Sensible Height	N of beams	Response time	Barrier height
	mm	mm		msec	mm
NS 10-080	92	72	8	2	155
NS 10-160	172	152	16	2	180
NS 10-240	252	232	24	2	260
NS 10-320	332	312	32	3	340
NS 10-400	412	392	40	3	420
NS 10-480	492	472	48	4	500
NS 10-560	572	552	56	4	580
NS 10-640	652	632	64	5	660
NS 10-720	732	712	72	6	740
NS 10-800	812	792	80	6	820
NS 10-880	892	872	88	7	900
NS 10-960	972	952	96	7	980
NS 10-1040	1052	1032	104	8	1060
NS 10-1120	1132	1112	112	8	1140
NS 10-1200	1212	1192	120	9	1220
NS 10-1280	1292	1272	128	9	1300
NS 10-1360	1372	1352	136	10	1380
NS 10-1440	1452	1432	144	11	1460
NS 10-1520	1532	1512	152	11	1540
NS 10-1600	1612	1592	160	12	1620
NS 10-1680	1692	1672	168	12	1700
NS 10-1760	1772	1752	176	13	1780
NS 10-1840	1852	1832	184	13	1860
NS 10-1920	1932	1912	192	14	1940
NS 10-2000	2012	1992	200	15	2020
NS 10-2080	2092	2072	208	15	2100
NS 10-2160	2172	2152	216	16	2180
NS 10-2240	2252	2232	224	16	2260
NS 10-2320	2332	2312	232	17	2340
NS 10-2400	2412	2392	240	17	2420

Center beam 24 mm - Resolution 26 mm - Range 4 m					
Model	Protected Height	Sensible Height	N of beams	Response time	Barrier height
	mm	mm		msec	mm
NS 24-095	118	74	4	1	155
NS 24-190	214	170	8	1	212
NS 24-290	310	266	12	2	308
NS 24-380	406	362	16	2	404
NS 24-480	502	458	20	2	500
NS 24-580	598	554	24	2	596
NS 24-670	694	650	28	2	692
NS 24-770	790	746	32	3	788
NS 24-860	886	842	36	3	884
NS 24-960	982	938	40	3	980
NS 24-1060	1078	1034	44	4	1076
NS 24-1150	1174	1130	48	4	1172
NS 24-1250	1270	1226	52	4	1268
NS 24-1340	1366	1322	56	4	1364
NS 24-1440	1462	1418	60	5	1460
NS 24-1540	1558	1514	64	5	1556
NS 24-1630	1654	1610	68	5	1652
NS 24-1730	1750	1706	72	6	1748
NS 24-1820	1846	1802	76	6	1844
NS 24-1920	1942	1898	80	6	1940
NS 24-2020	2038	1994	84	6	2036
NS 24-2120	2134	2090	88	7	2132
NS 24-2210	2230	2186	92	7	2228
NS 24-2300	2326	2282	96	7	2324
NS 24-2400	2422	2378	100	8	2420
NS 24-2500	2518	2474	104	8	2516
NS 24-2600	2614	2570	108	8	2612
NS 24-2700	2710	2666	112	8	2708
NS 24-2800	2806	2762	116	9	2804
NS 24-2900	2902	2858	120	9	2900

Center beam 48 mm - Resolution 50 mm - Range 4 m					
Model	Protected Height	Sensible Height	N of beams	Response time	Barrier height
	mm	mm		msec	mm
NS 48-190	238	146	4	1	212
NS 48-380	430	338	8	1	404
NS 48-580	622	530	12	1	596
NS 48-770	814	722	16	2	788
NS 48-960	1006	914	20	2	980
NS 48-1150	1198	1106	24	2	1172
NS 48-1340	1390	1298	28	2	1364
NS 48-1540	1582	1490	32	3	1556
NS 48-1730	1774	1682	36	3	1748
NS 48-1920	1966	1874	40	3	1940
NS 48-2120	2158	2066	44	4	2132
NS 48-2300	2350	2258	48	4	2324
NS 48-2500	2542	2450	52	4	2516
NS 48-2700	2734	2642	56	4	2708
NS 48-2900	2926	2834	60	5	2900

The NS 10, NS 24 and NS 48 barriers are available also in long range version.

NS 10 L6                   max range 6 m, resolution 12 mm  
 NS 24 L10               max range 10m, resolution 30 mm  
 NS 48 L10               max range 10m, resolution 55mm

Other characteristics as above table.

The barriers are available with the BLUE LED version instead of the infrared for a better detection of transparent materials (UV option). This version has a lower range than that shown in the table, and the effectiveness of the detection is variable depending on the material to be detected. Contact us for more information.

### - ANALOG OUTPUT AN1 / AN2

The version with analog output provides a voltage or current variation, in percentage of the position or of the number of the interrupted beams.


This version is particularly used in position control, loop monitoring and dimension control.

Is available the output 0 – 10 V ( **AN1** ) or 4 – 20 mA ( **AN2** ).

The analog output offers four different possibility of employment:

- **AN1 ax or AN2 ax** for position indication, gives an output proportional at the position of the first interrupted beam.
- **AN1 b or AN2 b** for dimension indication, gives an output proportional at the total number of obscured beams.

Is possible to order the desired output option, or to order the barrier with the **SL** option, 2 switch selector on the receiver to choose the desired configuration.

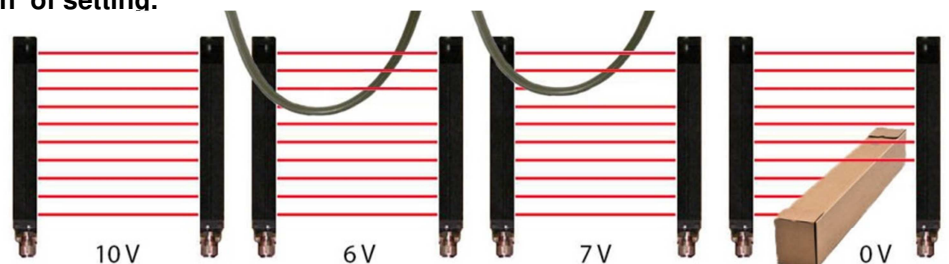
ON	Switch	a1	a2	a3	b
 1 2	1	OFF	OFF	ON	ON
	2	OFF	ON	ON	OFF

After the modification of the switch, turn on-off the power supply to validate the setting.

#### Example of AN1 output in function of setting.

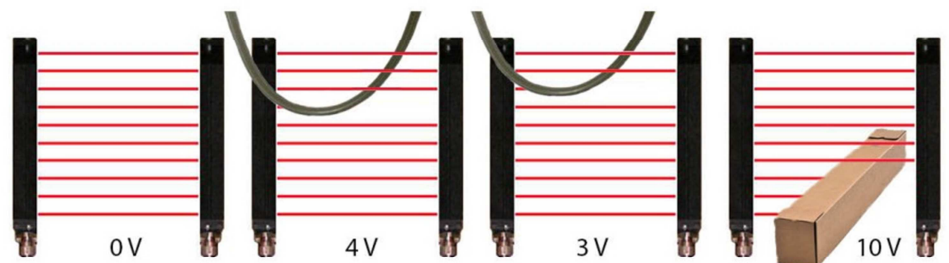
##### AN1 a1 ( switch off-off )

Proportional to the number of beams free, from the bottom up to the first interrupted.



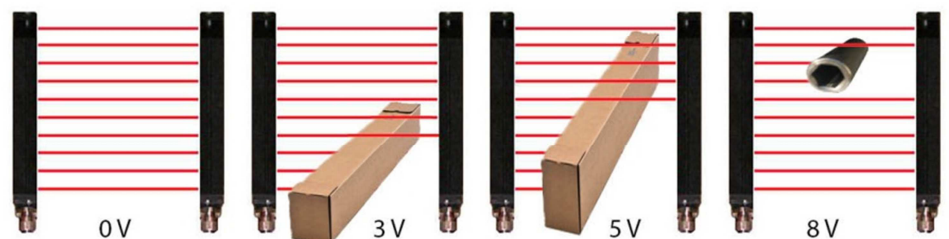
##### AN1 a2 ( switch off-on )

Inversely proportional to the number of the beams free from the bottom up to the first interrupted



##### AN1 a3 ( switch on-on )

Inversely proportional to the number of the beams free, from the top up to the first interrupted.



##### AN1 b ( switch on-off )

Proportional to the total number of interrupted beams



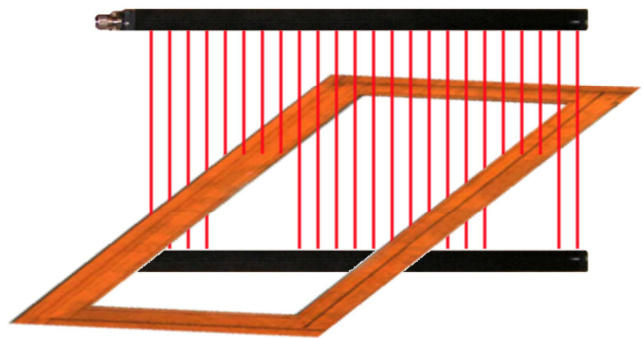
### - SERIAL OUTPUT 485

This interface has an RS 485 output, with Mod-Bus protocol, and give the indication of the status of every beam. Especially used in painting plants, lapping and where is important to know the location, size and holes in the workpiece.

Through an optional dip switch ( **SL option** ) is possible the selection of :

1 1 1 1 0 0 0 0 1 1 1 1 1 1 1 1 1 1 0 0 0 1 1

- Operation mode            Master / Slave
- Scanning mode            Straight or reverse
- Master address / Slave address
- Communication speed

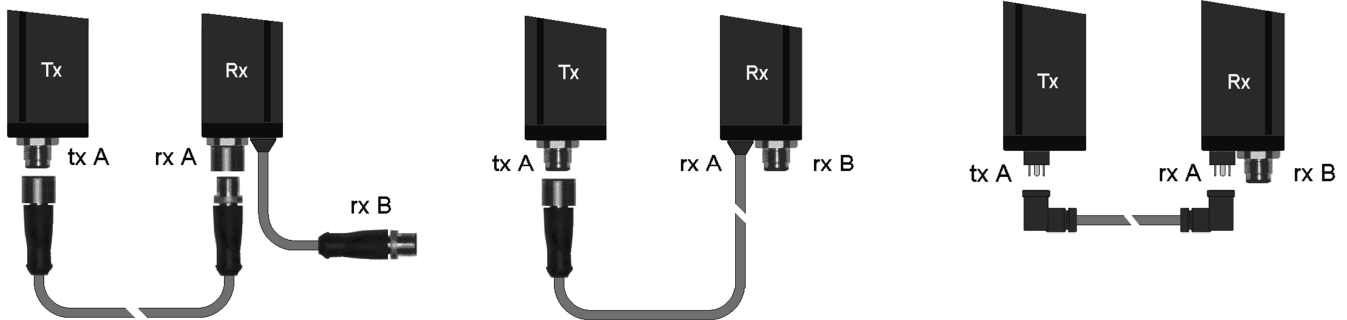


A detailed Mod-Bus manual is available on request

Switch	1	2		3	4
	Scan direction	Address		Master / Slave	Baud rate
		If slave	If master		
ON	Revers	15	67	Barrier slave	38400
OFF	Stright	1	51	Barrier master	19200

Available on request  
baude rate 57600

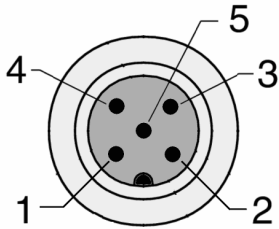
### Connection style for RX M12 and TX interconnection



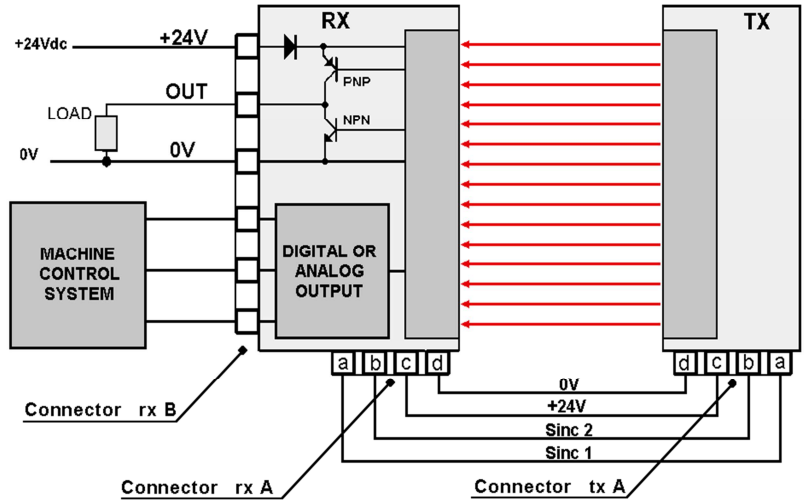
Connection CM12F	Connection MExx	Connection M12C
<p>Rx B, is cable M12 male, 4 or 5 poles, length 300mm.</p> <p>The interconnection tx A - rx A is 4 poles M12 female on receiver, M12 male on emitter.</p>	<p>Rx B is M12 male, 4 or 5 poles. TxA - rxA are connected with a M12 cable of xx centimetres of length.</p> <p>Is the optimal solution for equipment assembled on machines produced in series and for small distances between Tx and RX.</p>	<p>Rx B is M12 male, 4 or 5 poles. TxA - rxA connected with C type connector.</p> <p>The interconnection can be realized with a cable of type and length as preferred during the installation. Is the more flexible solution.</p>

### Connection CM12F, MExx, M12C

RX B M12	AN1 0-10V	AN2 4-20mA	RS 485
1 Brown	+ 24Vdc	+ 24Vdc	+ 24Vdc
2 White	out 0-10V	out 4-20mA	A +
3 Blu	0V	0V	0V
4 Black	out PNP	out PNP	B -
5 Grey			GND



M12 5 poles male looking into pin

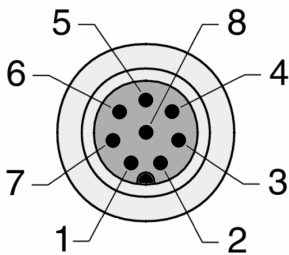


### Connection 8PM12 with RX M12 8 poles RX M12 4 poles TX

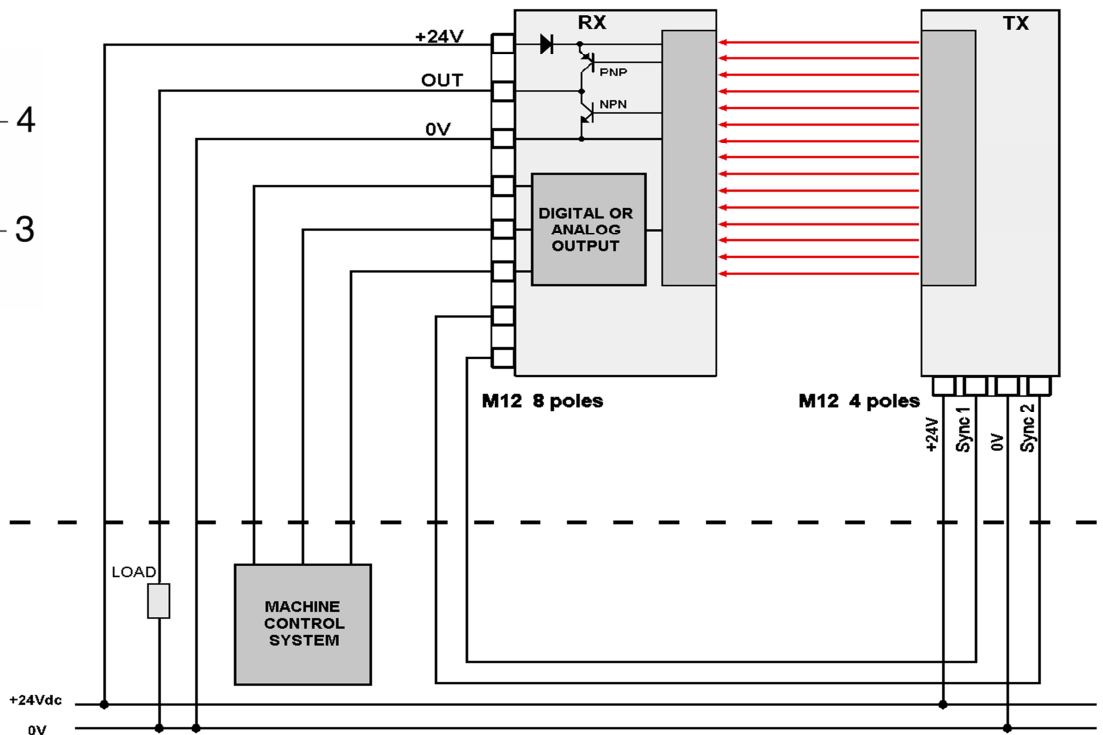


RX M12	AN1 0-10V	AN2 4-20mA	RS 485
1 Brown	+ 24 Vdc	+ 24 Vdc	+ 24Vdc
2 White	out 0-10 V	out 4-20 mA	A +
3 Green	out PNP+NPN	out PNP+NPN	B -
4 Yellow	-	-	-
5 Grey	AN gnd		485 gnd
6 Pink	Sync tx 1	Sync tx 1	Sync tx 1
7 Blu	0 Vdc	0 Vdc	0 Vdc
8 Red	Sync tx 2	Sync tx 2	Sync tx 2

TX M12		
1 Brown	+ 24 Vdc	
2 White	Sync tx 1	
3 Blu	0 Vdc	
4 Black	Sync tx 2	



M12 8 poles male looking into pin



### Common technical characteristics

Power supply	24 Vdc +/- 20%
Power consumption	300 mA max, excluded load current
Protection degree	IP65
Front protection	Standard acrylic, optional glass.
Indicators:	<b>Yellow</b> l.e.d. on emitter to indicate the power supply, <b>Red / Green</b> l.e.d. on receiver to indicate the status of the detection area.
PNP / NPN output current	max. 80 mA source or sink, short circuit protected.
Sun light immunity	> 50 Klux
Flash immunity	standard active

### Identification code

**NS - 10- 480 - AN1 a2 -**

#### MODEL

See model table

#### OUTPUT

<b>AN1 ax - b</b>	0-10V + PNP
<b>AN2 ax - b</b>	4-20mA + PNP
<b>485</b>	RS 485 ModBus

Only for 485 without SL option

#### Protocol

<b>Mb m</b>	ModBus master
<b>Mb s</b>	ModBus slave

#### Baud rate

<b>19</b>	19.2 Kb
<b>38</b>	38.4 Kb
<b>57</b>	57.6 Kb

#### OPTIONS

<b>L</b>	Long range
<b>PR</b>	Reduced distance
<b>SEb</b>	TX with sensitivity regulator
<b>UV</b>	Blu light emitters for a better detection of transparent
<b>SL</b>	Dip switch on RX for functional settings
<b>V</b>	Front window protection glass

#### CONNECTION

<b>CM12F</b>	Rx with cable M12 4-5 poles male, interconnection M12 4 poles M+F
<b>ME xx</b>	Rx with Tx M12 cable, length XX cm
<b>M12C</b>	Rx with M12 4-5 poles, interconnection C style
<b>8PM12</b>	RX M12 8 poles, Tx M12 4 poles

### Kit of bracket KPL02

Bracket kit for mounting of barriers, particularly suitable for barriers higher than 500mm. Is possible using the supplied screws to fix the barrier laterally or by an additional M4 screw can fix the rear.

For the best stability is advisable to place the brackets near the lower and upper end caps.

The kit KPL02 includes:

- N 4 bracket PL02
- N 4 5 x 50 hexagon screw
- N 4 M5 nut

