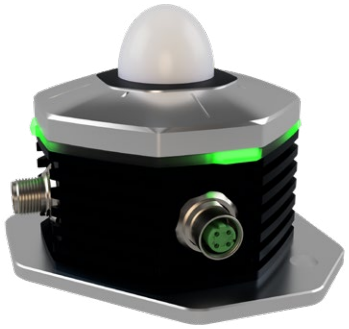
For demanding measurement tasks with liquid metal

RAD78L | **PROFINET IO**



For measuring the level of molten metal.

Analog Output

PNP NPN

Order code
Measuring range 0.10 m ... 6 m

RAD78L . 006 . 11 X[a] 5 3 . 3C12
Type

Opening angle: ±1.5° (3°)
Measurement rate: 500 Hz
Interfaces: PROFINET
4 ... 20 mA + 3 x switching output PNP/NPN
RS485 as communication interface
Radar frequency: 119 ... 125 GHz (selectable 122 ... 123 GHz)

[a] *Linearity*
1 = up to ±1.0 mm
3 = up to ±0.3 mm
7 = up to ±0.7 mm

Order code
Measuring range 0.3 m ... 30 m

RAD78L . 030 . 11 2[a] 1 2 . 3C12
Type

Opening angle: ±1.5° (3°)
Measurement rate: 100 Hz
Interfaces: PROFINET
4 ... 20 mA + 3 x switching output PNP/NPN
RS485 as communication interface
Radar frequency: 119.6 ... 123 GHz (selectable 122 ... 123 GHz)

[a] *Linearity*
2 = up to ±2.0 mm

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Accessories		Order no.
Starter Kit RAD78x PROFINET	Preconfigured router and power kit for immediate access to the sensor and the integrated web interface—without changing the PC's IP address or admin rights. The kit consists of a mini router and a 24 V sensor power supply.	**8.0010.9000.0025**
Radar corner cube 	• Increasing the signal strength received from a target. • Increasing the possible angle between sensor and target. • Increasing the measurement accuracy by increasing the signal strength. For the measuring range: 0.5 m ... 20 m **side length 100 mm** Dimensions: 100 x 82 x 91 mm	**8.0000.7000.0081** [1]
	For the measuring range: 10 m ... 30 m **side length 250 mm** Dimensions: 250 x 171 x 221 mm	**8.0000.7000.0082** [1]
	For the measuring range: 20 m ... 70 m **side length 350 mm** Dimensions: 350 x 210 x 307 mm	**8.0000.7000.0091** [1]
Mounting plate for precise angle adjustment 	To ensure that the sensor is correctly aligned perpendicular to the intended target Horizontal angle adjustment ± 2° Vertical angle adjustment ± 1.5° Dimensions: 288 x 175 x 88 mm	**8.0000.7000.0088**
Heat protection housing 	Air-cooled housing for extreme radiant heat, e.g. from molten metal Resistance up to 1600°C Short-term load tolerance up to 700°C Suitable for ambient temperatures up to 120°C	**8.0000.7000.0085**
Heat protection housing with deflection 	With a connection for air cooling.	**on request**
Heat protection housing for closed furnaces and containers 	For enclosed furnaces and containers with high process temperatures. With a connection for air cooling	**on request**

1) Stock types

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Cables and connectors		Order no.
Preassembled cables	M12 male connector with external thread, 4-pin, D-coded, straight M12 female connector with coupling nut, 4-pin, D-coded, straight 2 m [6.56'] PUR cable	**05.00.6031.4444.002M**
	M12 male connector with external thread, 4-pin, D-coded, angled M12 female connector with coupling nut, 4-pin, D-coded, straight 2 m [6.56'] PUR cable	**05.00.6031.4542.002M**
	M12 male connector with external thread, 4-pin, D-coded, straight RJ45 connector 2 m [6.56'] PUR cable	**05.00.6031.7444.002M**
	M12 female connector with coupling nut, 8-pin, A-coded, straight M12 male connector with external thread, 8-pin, A-coded, straight 2 m [6.56'] PUR cable	**05.00.6051.8284.002M**
Connectors	M12 male connector with external thread, 4-pin, D-coded, straight (metal)	**05.WASCSY4S**
	M12 male connector with external thread, 4-pin, D-coded, angled (metal)	**8.0000.5128.0000**
	M12 female connector with coupling nut, 8-pin, A-coded, straight (metal)	**05.CMB 8181-0**

Further Kübler accessories can be found at: kuebler.com/accessories
Further Kübler cables and connectors can be found at: kuebler.com/connection-technology

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Technical data

General data – Order code a = 3

Measuring range		0.1 ... 6 m
Linearity	up to 2 m > 2 m	±0.3 mm ±0.015 % of the measurement section
Repeatability	up to 2 m > 2 m	±0.03 mm ±0.0015 % of the measurement section
Radar frequency (FMCW)		119 ... 125 GHz (selectable 122 ... 123 GHz)
Radiation power		EIRP < 100 mW
MTTF		> 105 years
Measurement rate		500 Hz
Opening angle		±1.5° (3°)

General data – Order code a = 7

Measuring range		0.1 ... 6 m
Linearity	up to 2 m > 2 m	±0.7 mm ±0.035 % of the measurement section
Repeatability	up to 2 m > 2 m	±0.07 mm ±0.0035 % of the measurement section
Radar frequency (FMCW)		119 ... 125 GHz (selectable 122 ... 123 GHz)
Radiation power		EIRP < 100 mW
MTTF		> 105 years
Measurement rate		500 Hz
Opening angle		±1.5° (3°)

General data – Order code a = 1

Measuring range		0.1 ... 6 m
Linearity	up to 2 m > 2 m	±1 mm ±0.05 % of the measurement section
Repeatability	up to 2 m > 2 m	±0.1 mm ±0.005 % of the measurement section
Radar frequency (FMCW)		119 ... 125 GHz (selectable 122 ... 123 GHz)
Radiation power		EIRP < 100 mW
MTTF		> 105 years
Measurement rate		500 Hz
Opening angle		±1.5° (3°)

General data – Order code a = 2

Measuring range		0.3 ... 30 m
Linearity	up to 4 m > 4 m	±2 mm ±0.05 % of the measurement section
Repeatability	up to 4 m > 4 m	±0.5 mm ±0.005 % of the measurement section
Radar frequency (FMCW)		119.6 ... 123 GHz (selectable 122 ... 123 GHz)
Radiation power		EIRP < 100 mW
MTTF		> 105 years
Measurement rate		100 Hz
Opening angle		±1.5° (3°)

Electrical characteristics

Power supply		24 V DC
Current consumption		125 mA
Power consumption		3 W
Reverse polarity protection		yes
Analog output	power supply	4 ... 20 mA 8 ... 40 V
Switching outputs	power supply	3 x PNP/NPN 10 ... 40 V

Mechanical characteristics

Material	housing lens	die-cast aluminum, coated PTFE
Weight		800 g [28,22 oz]
Protection acc. to EN 60529		IP67
Working temperature range		-40 °C ... +70 °C [-40 °F ... +185 °F]
Storage temperature range		-40 °C ... +85 °C [-40 °F ... +158 °F]
Shock resistance (EN 60068-2-27)		100 g; 11 ms

Approvals

CE compliant in accordance with		
	EMC Directive	2014/30/EU
	RoHS Directive	2011/65/EU
Approvals/Certificates		FCC / CFR-47 part 15 (USA) RSS-210 Issue 10 (Canada) EN 305 550-1 V.1.2.1 (European Union) EN 305 550-2 V.1.2.1 (European Union)

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Interface characteristics PROFINET

General information

Communication interface	Profinet RT
Cycle time	1 ms
Data transfer	100 MBit/s
Line length	100 m
Classifications	RT Class 1 Conformance Class B Netload Class III

Adjustable parameters

- IP address
- Device name
- I&M 0…3 Parameter

PROFINET characteristics

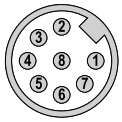
- I&M 0 ... 3
- MRP
- LLDP
- PDEV
- SNMP

Process data

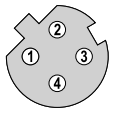
- Distance
- Peak
- Ramp Count

Terminal assignment

Function	M12 connector, 8-pin, A-coded									
Power supply Analog output Switching outputs	Signal:	A	+V	CL	OUT 2	OUT 1	B	0 V	OUT 3	⏚
	Pin:	1	2	3	4	5	6	7	8	PH



Function	M12 connector, 4-pin, D-coded			
Profinet communication	Signal:	RxD+	RxD-	TxD+	TxD+
	Abbreviation:	Receive data+	Receive data-	Transmit data+	Transmit data-
	Pin:	2	4	1	3



+V: supply voltage sensor +V DC
0 V: ground sensor GND (0V)
A, B: RS485 communication
CL: analog output (4 ... 20 mA)
OUT 1, 2, 3: switching outputs
PH ⏚: connector housing (shield)

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Dimensions

Dimensions in mm

