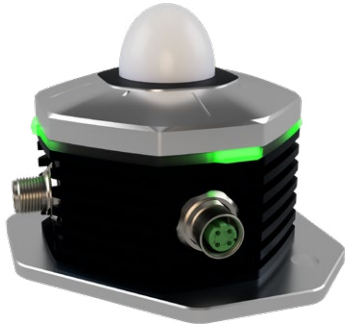


# Radar sensors

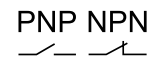
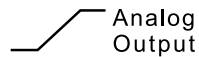
**For demanding measurement tasks with maximum precision**

**RAD78D**

**PROFINET IO**



For distance measurement, positioning, and object detection.



**Order code**

Measuring range 0.10 m ... 6 m

**RAD78D . 006 . 11 X 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 ... 50 m

**RAD78D . 050 . 11 2 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

# Radar sensors

For demanding measurement tasks with maximum precision		RAD78D	PROFINET IO
Accessories			Order no.
<b>Starter Kit RAD78x PROFINET</b>	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.		<b>8.0010.9000.0025</b>
<b>Radar corner cube</b>	<ul style="list-style-type: none"> <li>Increasing the signal strength received from a target.</li> <li>Increasing the possible angle between sensor and target.</li> <li>Increasing the measurement accuracy by increasing the signal strength.</li> </ul>		
	For the measuring range: 0.5 m ... 20 m Dimensions: 100 x 82 x 91 mm	<b>side length 100 mm</b>	<b>8.0000.7000.0081</b> <sup>1)</sup>
	For the measuring range: 10 m ... 30 m Dimensions: 250 x 171 x 221 mm	<b>side length 250 mm</b>	<b>8.0000.7000.0082</b> <sup>1)</sup>
	For the measuring range: 20 m ... 70 m Dimensions: 350 x 210 x 307 mm	<b>side length 350 mm</b>	<b>8.0000.7000.0091</b> <sup>1)</sup>
<b>Mounting plate for precise angle adjustment</b>	To ensure that the sensor is correctly aligned perpendicular to the intended target Horizontal angle adjustment $\pm 2^\circ$ Vertical angle adjustment $\pm 1.5^\circ$ Dimensions: 288 x 175 x 88 mm		<b>8.0000.7000.0088</b>
			
<b>Heat protection housing</b>	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		<b>8.0000.7000.0085</b>
			
<b>Heat protection housing with deflection</b>	With a connection for air cooling.		<b>on request</b>
			
<b>Heat protection housing for closed furnaces and containers</b>	For enclosed furnaces and containers with high process temperatures. With a connection for air cooling		<b>on request</b>
			

1) Stock types

## Radar sensors

For demanding measurement tasks with maximum precision		RAD78D	PROFINET IO
Cables and connectors			Order no.
<b>Preassembled cables</b>	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		<b>05.00.6031.4444.002M</b>
	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		<b>05.00.6031.4542.002M</b>
	M12 male connector with external thread, 4-pin, D-coded, straight RJ45 connector 2 m [6.56'] PUR cable		<b>05.00.6031.7444.002M</b>
	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		<b>05.00.6051.8284.002M</b>
<b>Connectors</b>	M12 male connector with external thread, 4-pin, D-coded, straight (metal)		<b>05.WASCSY4S</b>
	M12 male connector with external thread, 4-pin, D-coded, angled (metal)		<b>8.0000.5128.0000</b>
	M12 female connector with coupling nut, 8-pin, A-coded, straight (metal)		<b>05.CMB 8181-0</b>

Further Kübler accessories can be found at: [kuebler.com/accessories](http://kuebler.com/accessories)

Further Kübler cables and connectors can be found at: [kuebler.com/connection-technology](http://kuebler.com/connection-technology)

# Radar sensors

**For demanding measurement tasks with maximum precision**

**RAD78D**

**PROFINET IO**

## Technical data

### General data – Order code **a** = 3

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

### General data – Order code **a** = 1

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

### Electrical characteristics

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

### General data – Order code **a** = 7

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

### General data – Order code **a** = 2

<b>Measuring range</b>	0.3 ... 50 m
<b>Linearity</b>	up to 4 m ±2 mm > 4 m ±0.05 % of the measurement section
<b>Repeatability</b>	up to 4 m ±0.5 mm > 4 m ±0.005 % of the measurement section
<b>Radar frequency (FMCW)</b>	119.6 ... 123 GHz (selectable 122 ... 123 GHz)
<b>Radiation power</b>	EIRP < 100 mW
<b>MTTF</b>	> 105 years
<b>Measurement rate</b>	100 Hz
<b>Opening angle</b>	±1.5° (3°)

### Mechanical characteristics

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

### Approvals

<b>CE compliant</b> in accordance with	EMC Directive 2014/30/EU RoHS Directive 2011/65/EU
<b>Approvals/Certificates</b>	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)

# Radar sensors

**For demanding measurement tasks with maximum precision**

**RAD78D**

**PROFINET IO**

## Interface characteristics PROFINET

### General information

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

### Adjustable parameters

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


### PROFINET characteristics

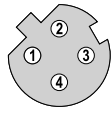
- I&M 0 ... 3
- MRP
- LLDP
- PDEV
- SNMP

### Process data

- Distance
- Peak
- Ramp Count

## Terminal assignment

Function	M12 connector, 8-pin, A-coded										
Power supply	Signal:	A	+V	CL	OUT 2	OUT 1	B	0 V	OUT 3	⊥	
Analog output Switching outputs	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)

# Radar sensors

**For demanding measurement tasks with maximum precision**

**RAD78D**

**PROFINET IO**

## Dimensions

Dimensions in mm

