



Innovate with Radar:

**2π SENSE**

**Scientific D-Band Radar  
Turns Ideas to Reality**

## **2π SENSE – Pocket-Size Sensor with Maximum Scientific Freedom**

The X1000 series scientific radar sensors offer maximum freedom to advance your research. Based on our high-performance *2π SENSE* technology the sensors offer outstanding range resolution, stability and accuracy. Scientific variants of the X1000 series are equipped with a WR 6.5 (IEEE WM-1651) waveguide interface with an UG-387/U standard flange. Dielectric lens antennas are available as an alternative upon request. A plug & play and easy to use lab-suitable USB-C interface for power and data based on USBTMC, a SCPI-like protocol interface and an open source Python wrapper library offers convenient connectivity to connect with the research tools of your choice.



Parameter	Specification
Operating Frequency:	126 to 182 GHz* D-band
Sweep Bandwidth:	56 GHz* -3 dB range resolution of 2.4 mm in air
Modulation:	FMCW Frequency Modulated Continuous Wave
Channels:	1x TRX transceiver, copolar 2x RX receivers <u>Options:</u> Co-Polar left & right Cross-Polar embedded OMT
Measurement Rate:	Up to 1 kHz at 5.5 m maximum distance and full sweep bandwidth
Temperature Range:	-40°C to +60°C / -40°F to +140°F
Protection Level:	None lab-tool with open waveguide and USB-C
Power Supply:	20 to 55 VDC galv. isolated or <u>Options:</u> USB-variant: USB-C power and data ETH-variant: PoE Power-over-Ethernet IEEE 802.3at Type 1 (13W)
Interfaces	BLE - Bluetooth Low Energy PNP Input TTL-Level PNP Output 3.3V to 55V galv. isolated  <u>Options:</u> USB-C Dual 1G Ethernet switched 1 Gigabit Ethernet, TSN ready switch
Protocols:	SCPI Standard Commands for Programmable Instruments for Raw Data OPC-UA OPC Unified Architecture
Waveguide / Antennas:	<u>Options:</u> Waveguide WR6.5, IEEE WM-1651, UG-387/U flange Antennas dielectric lens: a) Collimated 3° HPBW half-power beam-width dielectric lens b) F=100 focal dielectric lens c) F=150 focal dielectric lens d) Custom focal dielectric lens
Mechanical:	<b>Dimensions:</b> 120 mm x 60 mm x 70 mm (L/H/W) <b>Mounting:</b> 4 through holes for M4 fasteners, 4 blind holes for 3.0 mm dowel pins
Compliance /Certificates:	Work in progress (subject to change) and planned for 2024: EU & CEPT: CE "RDI-S" device class according to ECC DEC (22)03 US: FCC Part 18

\*: Frequency bands subject to ITU RR 5.340 might be excluded depending on used regulation / national implementation



2pi-Labs GmbH  
Universitätsstraße 150  
44801 Bochum

Phone: +49 234 545069 00  
E-Mail: info@2pi-labs.com