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Datasheet piMulti-Sensor

Sensor

piMulti-Sensor

item number: 911130614

Features

- Supply of power via usb-c
- Motion detection through radar
- Sensors for air-quality, temperature, lighting conditions, sounds, acceleration
- Connectivity through Wi-Fi or LTE (optional)
- GNSS

Overview

The piMulti-sensor can detect and analyse movements, sounds, temperature changes as well as air-quality by using build in sensors. The complexity of the build-in sensors allow for the use in a wide range of areas like e.g., Smart Homes.

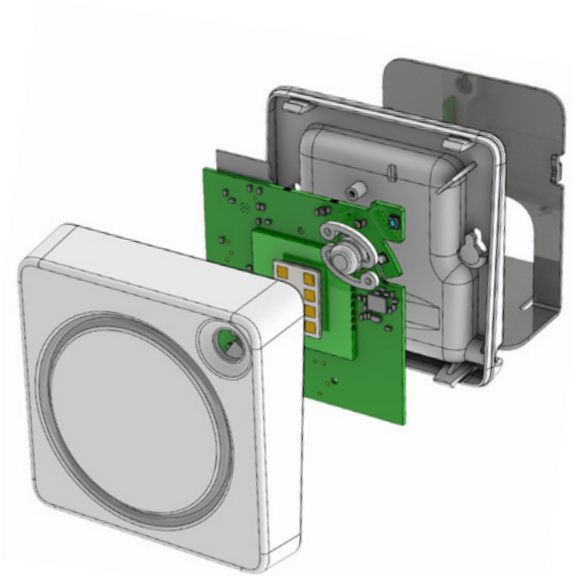
As an example, the temperature detection in combination with movement detection can be used for aiding an efficient and smart heating control system.

The hardware can be used multifunctionally. The device was primarily developed to register activity / or inactivity in the home of people. The data is continuously collected and processed on the device. Evaluated measurement data is sent as a reduced data stream via MQTT to the background system pironex-iot.de.

WiFi or cellular network (optional) are used for the transmission of necessary data.

Area of application:

- Operating hours counter
- Datalogger
- Device control
- Surveillance / monitoring
- Inactivity senor / activity sensor



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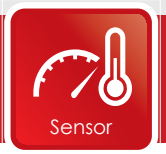

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Technical Specifications

Microcontroller/Processor

Processor	ESP32-WROVER-E Dual-Core 32 bit Xtensa LX6 Microprocessor up to 240 MHz
Flash	8MB
PSRAM	64Mbit
SRAM	520KB
ROM	384 KB
SRAMin RTC	8 KB

Interfaces

USB-C 2.0	5V/1A, used power adapter has to support a current of 1A!
Radar	
Frequencies/Bands	24,125GHz - 24,250GHz
Transmission Power	21,7dBm
Wifi	IEEE 802.11b/g/n
Frequencies/Bands	2412MHz - 2484MHz
Transmission Power	max. 20,5dbm
LTE	LTE Cat M1
Frequencies/Bands	B3/B7/B20
Transmission Power	max. 21dbm
GNSS	GPS, BeiDou, GLONASS, Galileo
Frequencies/Bands	L1
Sensitivity	-159dbm

Additional Features

Sensors	Air Qualitiy Sensor · VOC · Humidity · Air Pressure 3G-Sensor: · 3 axis · 16 bit Ambient Light Sensor · wide range (0,01 lx to 64k lx) · temperature compensation · luminous intensity · brightness change Audio: · Sounds · Signals · Speech Radar Sensor: · Motion detection · Distance

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Display elements	4x RGB-LED Buzzer
Control elements	1x Switch 1x Bluetooth Beacon

Enviromental Conditions

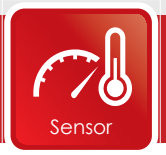
Operating Location	Indoor, protect from direct sun
Operating Temperature	· 40°C to +60°C
Storage Temperature	· 40°C to +80°C
Transport Temperature	· 40°C to +80°C
Gradient of Temperature	5 K/min, avoid dew
Relative Humidity	Max. 70%, avoid dew
Height above Sea Level	up to 2000 m
Height above Sea Level (Storage/ Transport)	up to 3000 m
Degree of Pollution	Pollution Degree 2

Voltage Supply

Voltage VDC	5V (±10%)
max. Current Imax	0,8A
max. Power Pmax	4W

Directives

2014/53/EU	Radio Equipment Directive
2011/65/EU	Restriction of certain Hazardous Substances (ROHS)
2012/19/EU	Waste of Electrical and Eletronic Equipment (WEEE)
EC 1907/2006	Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)



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Harmonised Standards

Health/safety:	
EN 62311:2008	Assessment of compliance of low power electronic and electrical equipment with the basic restrictions for human exposure to electromagnetic fields (10 MHz to 300 GHz)
EN 62368:1:2014/AC:2015	Audio/video, information and communication technology equipment - Part 1: Safety requirements
EMC:	
EN 301 489-1 V2.2.3	EMC standard for radio equipment and services; Part 1: General technical requirements
EN 301 489.7 V1.3.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 7: Specific conditions for mobile and portable radio and ancillary equipment of digital cellular radio telecommunications systems (GSM and DCS)
EN 301 489-17 V3.2.4	Electromagnetic compatibility (EMC) standard for radio equipment and services - Part 17: Specific conditions for wideband data transmission systems
EN 301 489-52 V1.2.1	EMC standard for radio equipment and services; Part 52: Specific conditions for cellular communication equipment
Radio:	
EN 300 328 V2.2.2	Broadband transmission systems; data transfer equipment in the 2.4 GHz band
EN 301 908-1 V15.1.1	IMT cellular networks, harmonised standard for access to the radio spectrum: Part Introduction and general requirements
EN 301 908-18 V15.1.1	IMT cellular networks, harmonised standard for access to the radio spectrum: Part 18: E-UTRA, UTRA, GSM/EDGE, Multi-Standard Radio (MSR), Base Station (BS)
EN 303 413 V1.2.0	Satellite Earth Stations and Systems (SES); Global Navigation Satellite Systems (GNSS) receivers; Radio equipment in the 1165MHz to 1300MHz and 1559MHz to 1601MHz frequency bands; harmonised standard for access to the radio spectrum

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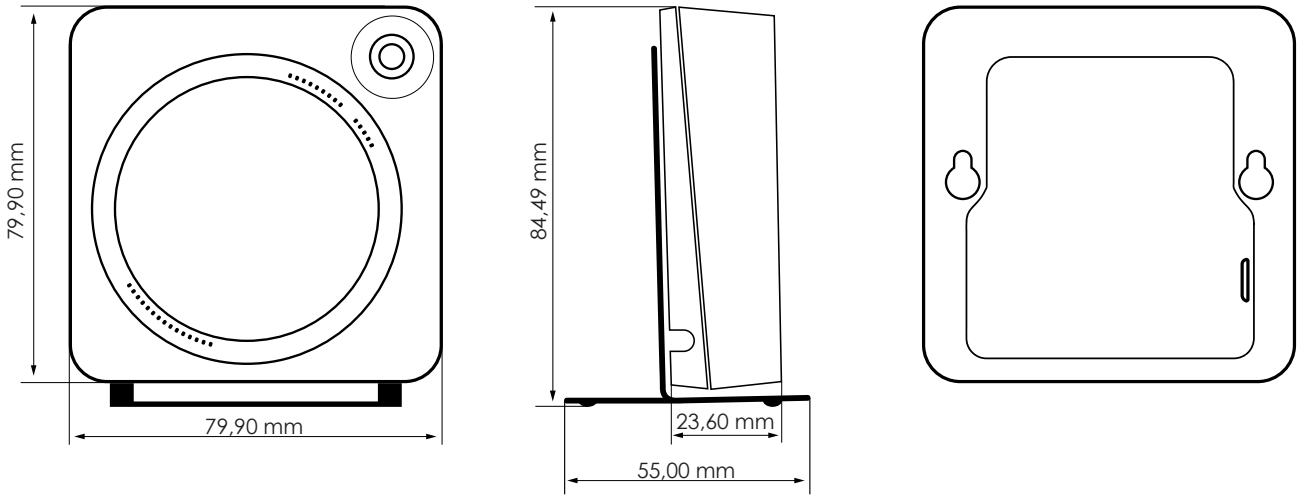
Mechanic

Dimensions	79,9 x 79,9 x 23,6 mm (without stand), 85 x 79,9 x 55 (with stand)
Weight	65g(without stand), 176g (with stand)
IP-Class	IP50 (DIN EN 60529:2014-09; VDE 0470-1:2014-09)
Material	Housing: ABS PA-765A; Stand: Stainless Steel



Software	Revision
Version	1.0
Bootloader	Esp32 default bootloader
SDK	esp-idf v4.4.3