LoRa Sensor Nodes
Type IoP-S & IoP-M

Technical Specifications

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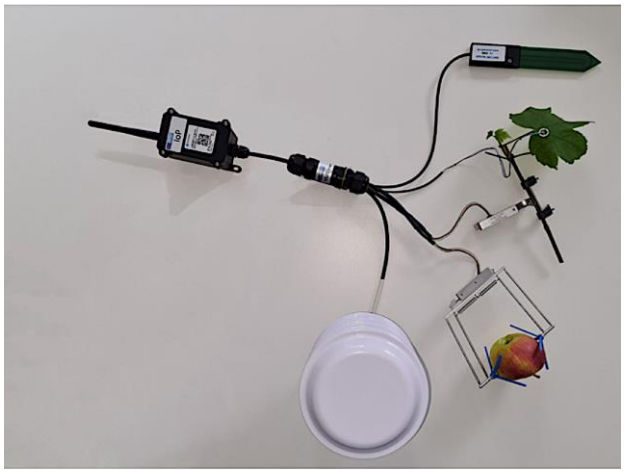

Model: IoP-S

Model: IoP-M

Device name	**LoRa IoP Sensor node** **Type IoP-S**	**Type IoP-M**
Short description	LoRa node with 2x analog in-puts + 1x I2C for SHT31 T/RH sensor	LoRa Node + Multi-Interface = IoP-M - 4 analog precision measurement channels - different digital input channels
Application	Battery-powered sensor measurements with remote data transmission under outdoor conditions	
Number of analog Input Channels and digital interfacing options	2 analog input channels, 1x I2C (for SHT31 only)	4 analog input channels, 1x UART (3.3V), 1x I2C (3.3V), 1x SDI-12, 1x RS485 (ASCII)
Compatible Sensors	Sensors with analog output signal, e.g.: - Dendrometer (all models) - Temperature probes (T series) - Leaf temperature sensor (LAT-B3) Sensors with digital output signal (I2C): - only SHT31 T/RH air sensor.	Sensors with analog output signal, e.g.: - Dendrometer (all models) - Temperature probes (T series) - Leaf temperature sensor (LAT-B3) Sensors with digital output signal (SDI-12 & I2C), e.g.: - SMT100 soil moisture and temperature sensor - T/RH air sensor - light (PAR, pyranometer) - and more..

	Type IoP-S	Type IoP-M
Analog Measurement Resolution (noise-free, for ratiometric measurements)	11 Bit (real noise-free resolution, in ratiometric measurements) Resolution in case of dendrometer models with different measurement range: - 11 mm (e.g. DD-L1): 5 µm - 25 mm (e.g. DD-L2): 12 µm - 50 mm (e.g. DD-L3): 25 µm - 120 mm (e.g. DF4): 73 µm NOTE: Together with dendrometer models with a large measuring range (> 25 mm), the IoP-S node is not recommended for recording small daily diameter changes and daily fruit growth, due to it's lower analog measurement resolution. For that, use IoP-M with higher measurement resolution.) Temperature sensors - T-Series, LAT-B3: 0.1 °C (for measured temperatures of < 50°C)	16 Bit (real noise-free resolution, in ratiometric measurements) Resolution in case of dendrometer models with different measurement range: - 11 mm (e.g. DD-L1): 0.2 µm - 25 mm (e.g. DD-L2): 0.4 µm - 50 mm (e.g. DD-L3): 0.8 µm - 120 mm (e.g. DF4): 2.3 µm Temperature sensors - T-Series, LAT-B3: 0.003 °C (for measured temperatures of < 50°C)
Provided Sensor Supply-voltage for analog and digital Sensors	3.3 V (switched, not regulated) and 5V (switched, regulated)	3.3 V and 5.3 V (both switched, regulated)
Configuration interface of LoRa Node	Programmable via AT commands in a serial terminal using a TTL serial adapter to connect node to PC with Windows or macOS operating system and via downlink. (If required nodes will be supplied pre-programmed)	
Transmission characteristics	LoRaWAN v1.0.3 Class A Available frequency bands (please specify when ordering): CN470/EU433/KR920/US915/EU868/AS923/AU915/IN865	
Measurement & Transmission Interval	Adjustable, depending on the connected sensor types. Suitable for most applications are intervals of 10 to 30 minutes. In this context, airtime limitations of the LoRa service used may have to be observed (payload 12 bytes, data transmission rate depending on signal strength at the gateway, configuration option: spreading factor automatically regulated or fixed).	
Power & Battery Life	8500mAh Li-SOCI2 battery Battery life: typically > 1 year, depending on the measurement and transmission interval, connected sensors and radio transmission power.	
Operating conditions & Protection class	normal outdoor conditions, IP67, temperature -20 to 70 ° C, 0 to 100% relative humidity	
Size & Weight	6x10x5 cm (only node housing), 320 g (only LoRa IoP node, without connected sensors)	