

# PRODUCT CATALOGUE

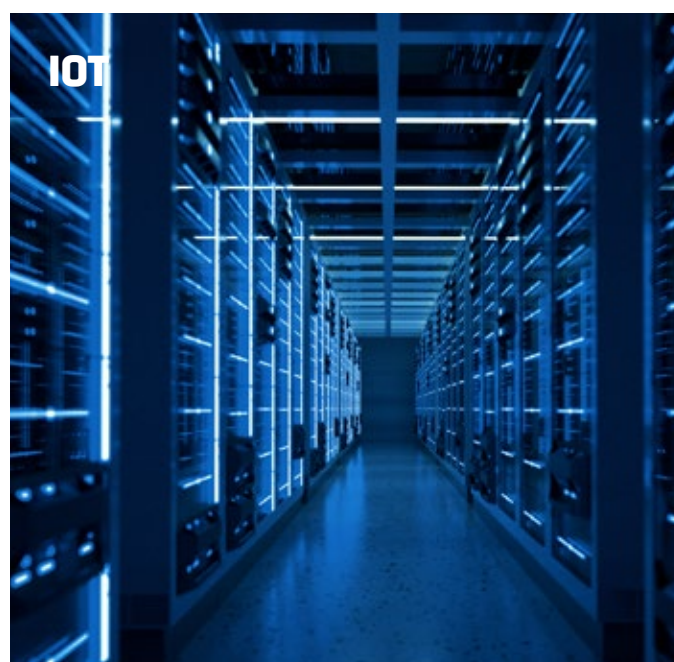
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# APPLICATIONS





TRANSMITTERS



TWP4AI    TWP-4AI4DI1UT    TWP-1AI  
TWP-2AI    TWP-1DI  
TWP-2DI    TWP-1UT  
TWP-2UT    TWPH-1UT    WSM101

SENSORS

REPEATERS

GATEWAYS



WRP001



WGW420



PIM101  
IOT MODULE



TEMP    HYGROTEMP    DI + TEMP    CO2    inTEMP    inHYGROTEMP    inCO2    inAIR    uTEMP



Temperature and  
Humidity Probe



CO<sub>2</sub> Probe



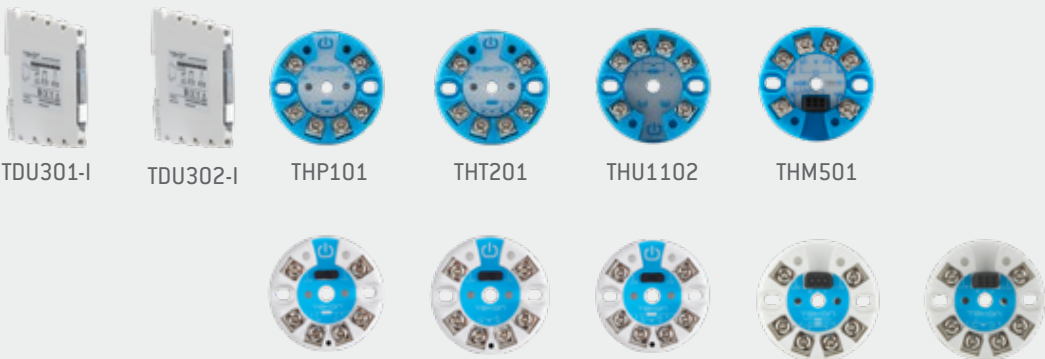
REPEATER



GATEWAY



GATEWAY IOT



TDU301-I    TDU302-I    THP101    THT201    THU1102    THM501  
THP102-I    THT202-I    THU301-I    THM502-I    THM602-I



RTD



THERMOCOUPLE



THERMISTORS



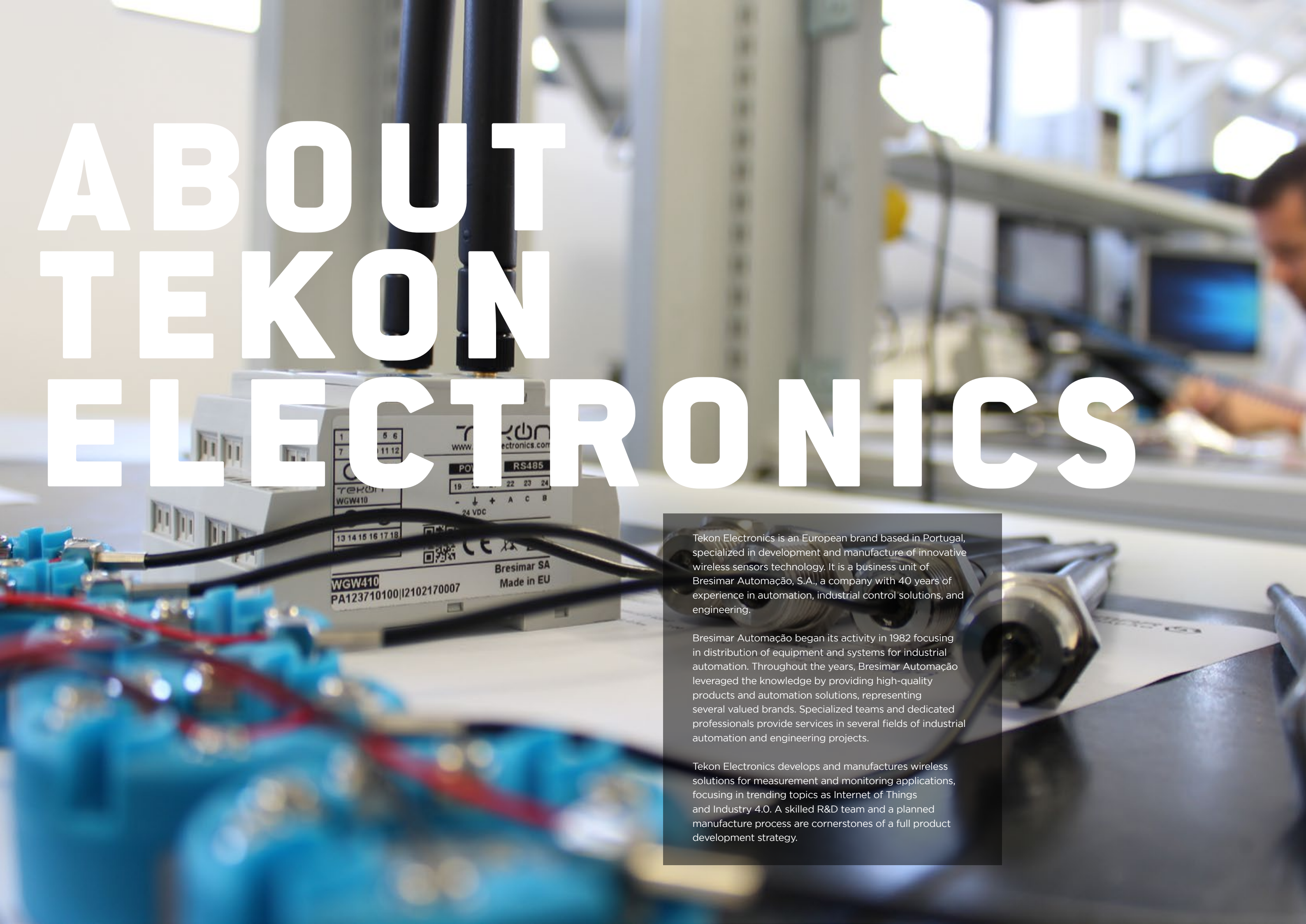
LEVEL



DIGITAL



TEKON IOT PLATFORM



# ABOUT TEKON ELECTRONICS

Tekon Electronics is an European brand based in Portugal, specialized in development and manufacture of innovative wireless sensors technology. It is a business unit of Bresimar Automação, S.A., a company with 40 years of experience in automation, industrial control solutions, and engineering.

Bresimar Automação began its activity in 1982 focusing in distribution of equipment and systems for industrial automation. Throughout the years, Bresimar Automação leveraged the knowledge by providing high-quality products and automation solutions, representing several valued brands. Specialized teams and dedicated professionals provide services in several fields of industrial automation and engineering projects.

Tekon Electronics develops and manufactures wireless solutions for measurement and monitoring applications, focusing in trending topics as Internet of Things and Industry 4.0. A skilled R&D team and a planned manufacture process are cornerstones of a full product development strategy.



## PEOPLE

**110**  
EMPLOYEES

**40 YEARS**  
AVERAGE AGE

**7 YEARS**  
AVERAGE EMPLOYEE TIME

**75%**  
HIGHER EDUCATION

**84,4%**  
SATISFACTION RATE

**TOP 5**  
EXCELLENCE INDEX 2021

**TOP 25**  
BEST PORTUGUESE  
COMPANIES TO WORK FOR 2021

## CERTIFICATIONS



## SERVICES AND PRODUCTS

HOW TEKON ELECTRONICS **CAN HELP YOUR BUSINESS**

### COMMERCIAL SUPPORT

We provide  
sales support  
with reduced  
response time

### TECHNICAL SUPPORT

Permanent  
technical  
assistance,  
performed  
by skilled  
professionals

### R&D OEM

We develop  
solutions  
tailored to your  
needs

**+351 234 303 320**  
**+351 933 033 250**  
**+351 932 194 163**

**sales@tekonelectronics.com**  
**www.tekonelectronics.com**



# SMART TRANSMITTERS

Special features include extremely easy assignment of inputs and outputs. Tekon's Wireless Smart Transmitters are the ideal choice for reliable use in industrial environments, collecting data from multiple sensors and multiple variables. With a comprehensive range, it merges sensors and devices that transmit real-time data to the cloud, transforming monitoring and control of multiple parameters and locations, an easy task.

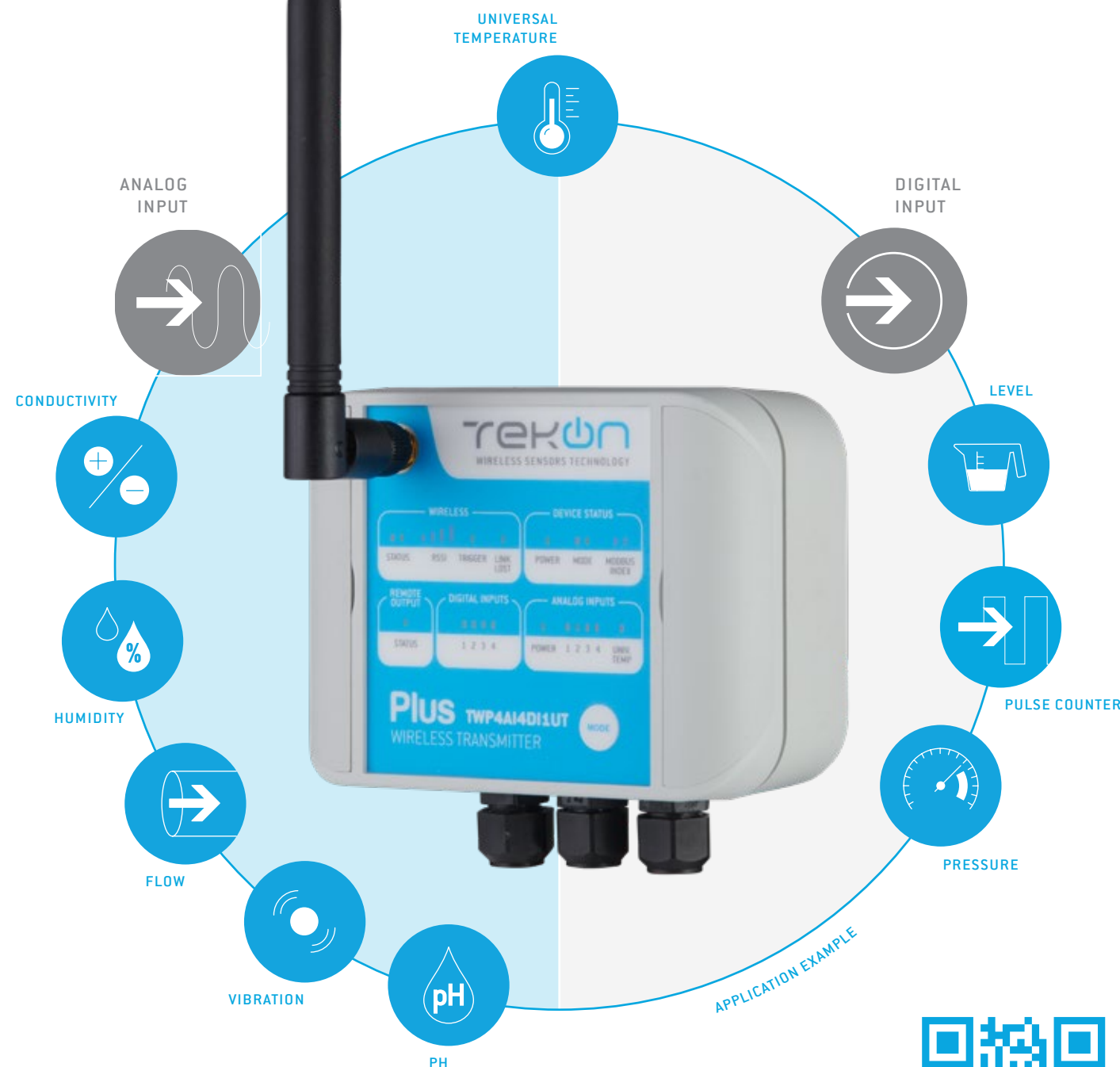
The key to Industry 4.0 is not just collecting data, but taking this abundance of data and converting it into useful and understandable information that can be used to control the process and business properly.





## PLUS system overview

Predictive maintenance has the potential to open up new service models for machine builders. Using machine data, it is possible to predict maintenance cycles more accurately. Machine builders can offer customers custom tailored service that keeps machines in the field in optimal condition at all times.



Know more about PLUS smart transmitters system.



Nowadays, the term “Industrial Internet of Things” (IIoT) has become progressively more widespread in the context of industry as digitalization has become a business priority for many organizations. Industrial Internet of Things, also known as the Industrial Internet, brings together brilliant machines, advanced analytics, and people at work. It's the network of a plethora of industrial devices connected by multiple communication technologies that results in systems that can monitor, collect, exchange, analyze, and deliver valuable new data-based insights like never before. These insights can foster to drive smarter, faster business decisions

for industrial organizations. IIoT is shifting the industry, changing the way that industrial companies operate their daily basis. Whether allowing analytics to prevent non-conformities in production infrastructure, providing real-time data to unfold additional capacity in a factory, or accelerating new product development by powering the product design cycle, IIoT is helping to achieve unprecedented levels of efficiency, productivity, and performance leading companies to produce groundbreaking products, quickly available due to optimized production process.

## Application cases



### Tank Level Monitoring

The PLUS product family monitored a water tank supply system, designed to guarantee the water supply in a displaced industrial unit. The instrumentation of the application with diversified sensors, which monitor the pressure, temperature, flow, level and safety valve, support the maximum guarantee of the continuous availability of the process.



[Read the full case study.](#)

### Biodegradable waste monitoring

Inside of a waste management facility, the process of composting biodegradable elements must be constantly monitored, in order to control the ideal stage of raw materials and accelerate the turnover of resources. The development of a wireless monitoring system, composed by a PLUS transmitter, powered by batteries, together with the Tekon Electronics cloud solution, Tekon IoT Platform, certified the process of placing probes and real-time monitoring of all phases.

[Read the full case study.](#)



### Heat treatment in industrial drum

Several industries are equipped with rotating drums for heat treatments as part of the production process. Temperature monitoring can be simplified with the use of wireless solutions, without having any interference in the normal rotating movement of the equipment, instead of the wired solutions, which can be an obstacle in this environment. The positioning of TWPH-1UT wireless transmitters, along the drum, offered several temperature measuring points and greater reliability of the measurement process. The connection of the WGW420 gateway with the local automation structure, made the data available in an instance in the Tekon IoT Platform, with an alarm configuration focusing on process temperatures and RSSI values.



[Read the full case study.](#)





System overview



Machine condition monitoring drives the product quality, improves OEE and prevents downtimes.



Wireless solutions can be easily adapted to work in different environments.



Production lines can provide data with added value for the optimization of maintenance and production indicators

Many industrial sectors have long used data from monitoring systems to help direct their strategy to maximize profits. Enabling the connectivity with cloud-base solutions, has become a priority to the companies, in order to streamline the access to the condition monitoring systems of their equipment. The multiplicity of secure protocols and communication architectures are making the use of cloud-based solutions essential.



up to 55 transmitters  
1 second to 12 hours communication period



# PLUS

Smart Transmitters

## TWP-1AI/TWP-2AI

WIRELESS TRANSMITTERS



TWP-1AI



TWP-2AI



### KEY FEATURES

**1 or 2 configurable analog input**

**1 remote switch output**

**Dual operating mode**

Transmitter or transmitter and repeater

**Configurable communication period**

**Up to 4 Km communication distance (LoS)**

Read more on page 116

PLUS TWP-1AI Wireless Transmitter was designed to monitor 4..20 mA / 0..10V signals from sensors with the same analog output span. Variables like conductivity, flow, level, vibration, humidity, pressure, and temperature can be clustered in a single transmitter. When embedded in a PLUS devices network, it can work as transmitter and repeater simultaneously, a feature provided by the dual operational mode.

VERSION  
REFERENCE

TWP-1AI	868 MHz	PA202320310
	915 MHz	PA202320320
TWP-2AI	868 MHz	PA202320410
	915 MHz	PA202320420

### TECHNICAL SPECIFICATIONS

Applicable data at 23°C

RADIO SPECIFICATIONS	Range	Up to 4 Km LoS	Up to 4 Km LoS
	Frequency band	868 to 869 MHz	902 to 928 MHz
	Number of channels	16	50
	Reception sensitivity	-97 to -110 dBm	-97 to -110 dBm
	Transmission power	25 to 27 dBm	8 to 27 dBm
	Encryption method	AES 128 (Advanced Encryption Standard)	AES 128 (Advanced Encryption Standard)
WIRELESS NETWORK	Maximum devices	55	
	Maximum hops	13	
	Communication period	1 second to 12 hours (configurable)	
ANALOG INPUT	Range	0 to 12V DC	0 to 24mA
	Resolution	0.38mV (15bit)	0.96uA (15bit)
	Accuracy	<5mV (<0.05% FS)	<100uA (<0.5% FS)
SUPPLY VOLTAGE	Range	5 to 24V DC	
	Maximum current	500mA DC @ 5V DC / 100mA DC @ 24V DC	
Operating temperature		-30 to 80°C	

ACCESSORIES

	<b>PLUS INTERNAL RECHARGEABLE BATTERIES KIT</b> Battery pack with rechargeable batteries directly connected to a solar panel. Installed inside PLUS transmitters with 18650 type batteries.
	<b>PLUS INTERNAL PRIMARY BATTERIES KIT</b> Battery pack for PLUS wireless transmitters. Installed inside PLUS transmitters with AA type batteries.
	<b>SOLAR PANEL 1W</b> Solar panel for rechargeable battery kit and power box.
	<b>PLUS PRIMARY BATTERIES POWER BOX</b> External battery pack for PLUS transmitters without internal battery case.
	<b>PLUS RECHARGEABLE BATTERIES POWER BOX</b> External battery pack with rechargeable batteries for PLUS transmitters without internal battery case.



# PLUS

Smart Transmitters

## TWP-1DI/TWP-2DI

WIRELESS TRANSMITTERS



TWP-1DI



TWP-2DI



### KEY FEATURES

**1 or 2 configurable digital inputs**

**1 remote switch output**

**Absolute pulse counter**

**Dual operating mode**

Transmitter or transmitter and repeater

**Configurable communication period**

**Up to 4 Km communication distance (LoS)**

Read more on page 116

PLUS TWP-1DI is a wireless transmitter with one digital input designed to monitor digital signals and pulses, working as a pulse counter, providing a secure communication, without cable requirements of a complex wired solution. When embedded in a PLUS devices network, it can work as transmitter and repeater simultaneously, a feature provided by the dual operational mode.



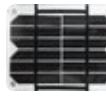


VERSION  
REFERENCE

TWP-1DI	868 MHz	PA202320510
	915 MHz	PA202320520
TWP-2DI	868 MHz	PA202320610
	915 MHz	PA202320620

### TECHNICAL SPECIFICATIONS

Applicable data at 23°C

RADIO SPECIFICATIONS	Range	Up to 4 Km LoS	Up to 4 Km LoS
	Frequency band	868 to 869 MHz	902 to 928 MHz
	Number of channels	16	50
	Reception sensitivity	-97 to -110 dBm	-97 to -110 dBm
	Transmit power	25 to 27 dBm	8 to 27 dBm
	Encryption method	AES 128 (Advanced Encryption Standard)	AES 128 (Advanced Encryption Standard)
DIGITAL INPUTS	Range	0 to 24V DC	
	On detection level	3,0 V	
	Off detection level	2,5 V	
	Input current	10 mA	
	Galvanic isolation	Yes	
	Activation detection	Falling Edge / Rising Edge / Both	
PULSE COUNTER	Type	PNP or NPN	
	On detection level	± 100 mV	
	Frequency range	10 kHz	
	Minimum pulse width	15 µs	
	Absolute counter		
WIRELESS NETWORK	Maximum devices	55	
	Maximum hops	13	
	Communication period	1 second to 12 hours (configurable)	
SUPPLY VOLTAGE	Range	5 to 24V DC	
	Maximum current	500mA DC @ 5V DC / 100mA DC @ 24V DC	
	Operating temperature	-30 to 80°C	

ACCESSORIES		<b>PLUS INTERNAL RECHARGEABLE BATTERIES KIT</b> Battery pack with rechargeable batteries directly connected to a solar panel. Installed inside PLUS transmitters with 18650 type batteries.
		<b>PLUS INTERNAL PRIMARY BATTERIES KIT</b> Battery pack for PLUS wireless transmitters. Installed inside PLUS transmitters with AA type batteries.
		<b>SOLAR PANEL 1W</b> Solar panel for rechargeable battery kit and power box.
		<b>PLUS PRIMARY BATTERIES POWER BOX</b> External battery pack for PLUS transmitters without internal battery case.
		<b>PLUS RECHARGEABLE BATTERIES POWER BOX</b> External battery pack with rechargeable batteries for PLUS transmitters without internal battery case.



# PLUS

Smart Transmitters

## TWP-1UT/TWP-2UT

WIRELESS TRANSMITTERS



TWP-1UT



TWP-2UT



### KEY FEATURES

**1 or 2 universal temperature input**

**1 remote switch output**

**Dual operating mode**

Transmitter or transmitter and repeater

**Configurable communication period**

**Up to 4 Km communication distance (LoS)**

Read more on page 116

PLUS TWP-1UT and PLUS TWP-2UT are wireless transmitters with one and temperature inputs, fully dedicated to collect and transmit temperatures from PT100 and thermocouples sensors. When embedded in a PLUS devices network, it can work as transmitters and repeaters simultaneously, a feature provided by the dual operational mode.

VERSION REFERENCE				BUILT-IN ANTENNA
TWP-1UT	868 MHz	PA202320110	PA202320111	
	915 MHz	PA202320120	PA202320121	
TWP-2UT	868 MHz	PA202320210	PA202320211	
	915 MHz	PA202320220	PA202320221	






### TECHNICAL SPECIFICATIONS

Applicable data at 23°C

RADIO SPECIFICATIONS	Range	Up to 4 Km LoS	Up to 4 Km LoS
	Frequency band	868 to 869 MHz	902 to 928 MHz
	Number of channels	16	50
	Reception sensitivity	-97 to -110 dBm	-97 to -110 dBm
	Transmission power	25 to 27 dBm	8 to 27 dBm
	Encryption method	AES 128 (Advanced Encryption Standard)	AES 128 (Advanced Encryption Standard)
TEMPERATURE MEASUREMENT	Sensor type	PT100 (2, 3 and 4 wires)	C, J, K, N, R, S and T
	Short-circuit monitoring	Always active (cannot be disable)	Not available
	Open-circuit monitoring	Always active (cannot be disable)	Always active (cannot be disable)
WIRELESS NETWORK	Maximum devices	55	
	Maximum hops	13	
	Communication period	1 second to 12 hours (configurable)	
SUPPLY VOLTAGE	Range	5 to 24V DC	
	Maximum current	500mA DC @ 5V DC / 100mA DC @ 24V DC	
	Operating temperature	-30 to 80°C	

### Versions with built-in antenna available!

PLUS TWP-1UT and PLUS TWP-2UT transmitters were developed with built-in antennas to simplify installation and commissioning of remote and outdoor applications like compost temperature monitoring.

ACCESSORIES		<b>PLUS INTERNAL RECHARGEABLE BATTERIES KIT</b> Battery pack with rechargeable batteries directly connected to a solar panel. Installed inside PLUS transmitters with 18650 type batteries.
		<b>PLUS INTERNAL PRIMARY BATTERIES KIT</b> Battery pack for PLUS wireless transmitters. Installed inside PLUS transmitters with AA type batteries.
		<b>SOLAR PANEL 1W</b> Solar panel for rechargeable battery kit and power box.
		<b>PLUS PRIMARY BATTERIES POWER BOX</b> External battery pack for PLUS transmitters without internal battery case.
		<b>PLUS RECHARGEABLE BATTERIES POWER BOX</b> External battery pack with rechargeable batteries for PLUS transmitters without internal battery case.



# PLUS

Smart Transmitters

## TWP-4AI4DI1UT

WIRELESS TRANSMITTER



### KEY FEATURES

**4 configurable analog inputs**

**4 configurable digital inputs**

**1 universal temperature input**

**3 configurable digital outputs**

**Up to 4 Km communication distance (LoS)**

Read more on page 116

PLUS TWP-4AI4DI1UT Wireless Transmitter was designed to monitor 4..20 mA / 0..10V signals, digital inputs, and universal temperature inputs, providing a secure communication, without cable requirements of a complex wired solution.

VERSION  
REFERENCE

868 MHz

PA164510610

915 MHz

PA164510620

### TECHNICAL SPECIFICATIONS

Applicable data at 23°C

RADIO SPECIFICATIONS	Range	Up to 4 Km LoS (2.5mi)	Up to 4 Km LoS (2.5mi)
	Frequency band	868 to 869 MHz	902 to 928 MHz
	Number of channels	16	50
	Reception sensitivity	-97 to -110 dBm	-97 to -110 dBm
	Transmission power	25 to 27 dBm	8 to 27 dBm
	Encryption method	AES 128 (Advanced Encryption Standard)	AES 128 (Advanced Encryption Standard)
ANALOG INPUT	Range	0 to 12V DC	0 to 24mA
	Resolution	0.38mV (15bit)	0.96uA (15bit)
	Accuracy	<5mV (<0.05% FS)	<100uA (<0.5% FS)
DIGITAL INPUTS	Range	0 to 24 V DC	
	ON detection level	> 4.5V	> 12V
	OFF detection level	< 2.5V	< 9V
	Input current	4.5mA @ 12V DC / 6mA @ 24V DC	2.47mA for Type 3
	Galvanic Isolation	No	Yes
	Activation detection	Raising Edge/ Falling Edge/ Both	
DIGITAL OUTPUTS	Communication loss		
	Remote output		
	External power supply		
SUPPLY VOLTAGE	Range	5 to 24V DC $\pm$ 5% / USB	
	Maximum current	500mA DC @ 5V DC / 100mA DC @ 24V DC	
WIRELESS NETWORK	Maximum devices	55	
	Maximum hops	13	
	Communication period	1 second to 12 hours (configurable)	
	Operating temperature	-30 to 80°C	

ACCESSORIES



#### SOLAR PANEL 1W

Solar panel for rechargeable battery kit and power box.



#### PLUS PRIMARY BATTERIES POWER BOX

External battery pack for PLUS transmitters without internal battery case.



#### PLUS RECHARGEABLE BATTERIES POWER BOX

External battery pack with rechargeable batteries for PLUS transmitters without internal battery case.

# PLUS

Smart Transmitters

## TWP4AI

WIRELESS TRANSMITTER



### KEY FEATURES

**4 configurable analog inputs**

**3 configurable digital outputs**

**Configurable communication period**

**Multi-hop mesh network**

**Up to 4 Km communication distance (LoS)**

Read more on page 116

PLUS TWP4AI Wireless Transmitter was designed to monitor 4..20 mA / 0..10V signals from sensors with the same analog output span. Variables like conductivity, flow, level, vibration, humidity, pressure and temperature can be clustered in a single transmitter.

VERSION  
REFERENCE

868 MHz	PA164510110
915 MHz	PA164510120

### TECHNICAL SPECIFICATIONS Applicable data at 23°C

RADIO SPECIFICATIONS	Range	Up to 4 Km LoS	Up to 4 Km LoS
	Frequency band	868 to 869 MHz	902 to 928 MHz
	Number of channels	16	50
	Reception sensitivity	-97 to -110 dBm	-97 to -110 dBm
	Transmission power	25 to 27 dBm	8 to 27 dBm
	Encryption method	AES 128 (Advanced Encryption Standard)	AES 128 (Advanced Encryption Standard)
WIRELESS NETWORK	Maximum devices	55	
	Maximum hops	13	
	Communication period	1 second to 12 hours (configurable)	
ANALOG INPUT	Range	0 to 12V DC	0 to 24mA
	Resolution	0.38mV (15bit)	0.96uA (15bit)
	Accuracy	<5mV (<0.05% FS)	<100uA (<0.5% FS)
DIGITAL INPUT - TRIGGER	Range	0V DC to Supply Voltage	
	Type	Sinking	
	Activation detection	Falling Edge / Rising Edge / Both	
DIGITAL OUTPUTS	Communication loss		
	Remote output		
	External power supply		
SUPPLY VOLTAGE	Range	5 to 24V DC $\pm$ 5% / USB	
	Maximum current	500mA DC @ 5V DC / 100mA DC @ 24V DC	
	Operating temperature	-30 to 80°C	

ACCESSORIES

	<b>SOLAR PANEL 1W</b> Solar panel for rechargeable battery kit and power box.
	<b>PLUS PRIMARY BATTERIES POWER BOX</b> External battery pack for PLUS transmitters without internal battery case.
	<b>PLUS RECHARGEABLE BATTERIES POWER BOX</b> External battery pack with rechargeable batteries for PLUS transmitters without internal battery case.



# PLUS

Smart Transmitters

## TWPH-1UT WIRELESS TRANSMITTER



### KEY FEATURES

**Universal Sensor Input (PT100, Thermocouples: C, J, K, N, R, S, T)**

**Up to 4km communication distance (LoS)**

Read more on page 116

**Dual operating mode:  
Transmitter or transmitter and repeater**

**Ultra low power mode**

**6 Status Leds**

TWPH-1UT is a wireless transmitter fully dedicated to collect and transmit temperatures from PT100 and thermocouples sensors. When embedded in a PLUS devices network, it can work as transmitter and repeater simultaneously, a feature provided by the dual operational mode.

VERSION  
REFERENCE

868 MHz	PA164510510
915 MHz	PA164510520

Connection Head sold separately

### TECHNICAL SPECIFICATIONS Applicable data at 23°C

RADIO SPECIFICATIONS	Range	Up to 4 Km LoS	Up to 4 Km LoS
	Frequency band	868 to 869 MHz	902 a 928 MHz
	Number of channels	16	50
	Reception sensitivity	-97 to -110 dBm	-97 to -110 dBm
	Transmission power	25 to 27 dBm	8 to 27 dBm
INPUT	Encryption method	AES 128 (Advanced Encryption Standard)	
	Sensor type	PT100 (2,3 or 4 wire)	C, J, K, N, R, S, T
	Short-circuit monitoring	Always active (cannot be disabled)	Not available
	Open-circuit monitoring	Always active (cannot be disabled)	
WIRELESS NETWORK	Maximum devices	55	
	Maximum hops	13	
	Communication period	1 second to 12 hours (configurable)	
SUPPLY VOLTAGE	Range	5 to 24V DC	
	Accuracy	±50mV	
Operating temperature		-40 to 80°C	



ACCESSORIES



**CONNECTION HEAD**  
Buz Connection Head for transmitters with battery holder

# PLUS

Smart Transmitters

## WGW420

WIRELESS GATEWAY



### KEY FEATURES

#### Modbus RTU via RS-485 interface

#### 8 analog outputs (4..20 mA current loop)

#### Scalable network up to 55 PLUS transmitters

#### Multiple networks with extra gateways and extra long range with several repeaters

#### Multi-hop Mesh Network with Self-Forming, Self-Healing and Self-Optimizing features

WGW420 gateway is equipped with 8 analog outputs configurable for several application scenarios such as integration of variable display systems with local displays, configuring analog charts, digital input dataloggers and 4..20mA signal replication. RS485 port enables the connection to automation systems, using Modbus RTU protocol to communicate the data from the PLUS transmitters.

VERSION  
REFERENCE

868 MHz

PA164510210

915 MHz

PA164510220

### TECHNICAL SPECIFICATIONS

Applicable data at 23°C

RADIO SPECIFICATIONS	Range	Up to 4 Km LoS	Up to 4 Km LoS
	Frequency band	868 to 869 MHz	902 to 928 MHz
	Number of channels	16	50
	Reception sensitivity	-97 to -110 dBm	-97 to -110 dBm
	Transmission power	25 to 27 dBm	8 to 27 dBm
	Transmission rate	19 to 76.8kbit/s	19 to 76,8kbit/s
	Encryption method	AES 128 (Advanced Encryption Standard)	AES 128 (Advanced Encryption Standard)
	Modulation	GFSK	GFSK
	Antenna	Articulated dipole antenna	Articulated dipole antenna
	Antenna gain	SMA	SMA
WIRELESS NETWORK	Antenna impedance	50Ω	50Ω
	Maximum devices	55	
RS-485 COMMUNICATION	Maximum hops	13	
	Protocol	MODBUS RTU (Slave)	
ANALOG OUTPUT	Galvanic isolation	1kV AC	
	Output range	4 to 20mA	
	Out of range indication	[3.2;4.0]mA and [20.0;20.2]mA	
Power supply	Error indication	3.1mA and 20.4mA	
	Power supply	12 to 24V DC ± 5%	
Operating temperature		0 to 80°C	

RELATED  
PRODUCT

#### PIM101 IOT MODULE

Cloud connectivity for PLUS wireless system to Tekon IoT Platform or third-party applications.

ACCESSORIES



#### RS485 TO USB CONVERTER CABLE

Cable to connect WGW420 Gateway to an USB port



# PLUS

Smart Transmitters

## PIM 101

IOT CONNECTIVITY MODULE



### KEY FEATURES

**Modbus TCP/IP communication**

**Ethernet TCP/IP communication**

**Native integration of PLUS product family with Tekon IoT Platform**

**Integration with third-party applications through REST API**

Works exclusively with WGW420 PLUS Gateway

PIM101 IoT module adds IoT connectivity to all products in the PLUS family, necessary for a fast, simple, and transparent integration of the data of each sensor with the Tekon IoT Platform. Acting as middleware between WGW420 gateway and Tekon IoT Platform, it provides all operating configurations as well as it sends and collects data, via Ethernet connection, from transmitters installed in the field. In addition to IoT connectivity, it adds the Modbus TCP / IP interface, useful for industrial integrations with PLC, HMI, or local networks. Through PIM101, the data from the PLUS wireless family can be integrated with other applications via REST API.

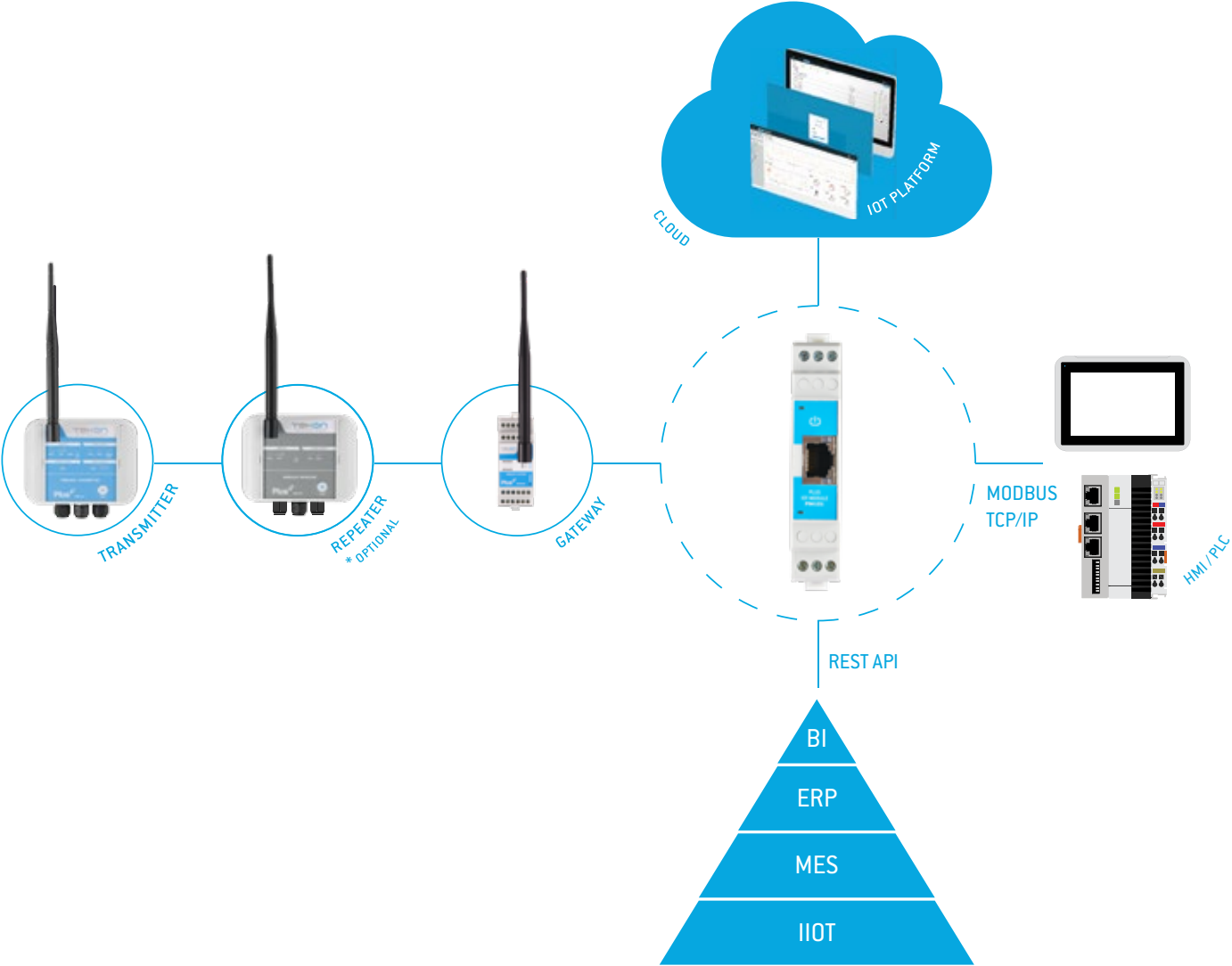
VERSION  
REFERENCE

PA201620110

### TECHNICAL SPECIFICATIONS

Data applicable at 23°C

RS485 COMMUNICATION	Protocol	Modbus RTU (master)
	Baud rate	4,8 to 115,2 kbit/s (configurable)
	Parity	none/even/odd
	Stop bits	1 (even/odd) or 2 (none)
	Addresses	1 to 247
ETHERNET COMMUNICATION	Interface	Ethernet port
	Speed	100 Mbps
	IP address	Dynamic or Static
	Protocol	Modbus TCP/IP (server/slave) / HTTPS / REST API
	Modbus TCP/IP port	1502
	Proxy	Configurable
POWER SUPPLY	Integration with Tekon IoT Platform	
	REST API	
POWER SUPPLY	Range	12 to 24V DC
	Maximum current	100mA DC @ 24V DC / 200mA DC @ 12V DC
Operating temperature		0 to 80°C



# PLUS

Smart Transmitters

## WRP001 WIRELESS REPEATER



### KEY FEATURES

#### Network redundancy and robustness

PLUS devices network redundancy can be increased with multiple PLUS WRP001 repeaters, benefiting from the mesh network topology, providing the best wireless signal and ensuring the reliability on data transmission.

- Up to 12 repeaters in series for extra-long range
- Up to 4 Km communication distance (LoS)
- Read more on page 116

#### Multi-hop mesh network

#### Simple and intuitive USB configuration

VERSION REFERENCE	868 MHz	PA164510310
	915 MHz	PA164510320








### TECHNICAL SPECIFICATIONS Data applicable at 23°C

RADIO SPECIFICATIONS	Range	4 Km LoS (2.5mi)	4 Km LoS (2.5mi)
	Frequency Band	868 to 869 MHz	902 a 928 MHz
	Number of Channels	16	50
	Reception Sensitivity	-99 to -104 dBm	-97 to -110 dBm
	Transmit Power	0 to 27 dBm	8 to 27 dBm
	Transmission Rate	19 to 76.8kbit/s	19 to 76.8kbit/s
	Encryption method	AES 128 (Advanced Encryption Standard)	AES 128 (Advanced Encryption Standard)
	Modulation	GFSK	GFSK
	Antenna	Articulated dipole antenna	Articulated dipole antenna
	Antenna impedance	50Ω	50Ω
Maximum Repeaters		12	
Power Supply		5 to 24V DC ± 5%	
Operating Temperature		-30 to 80°C	











## POWER SUPPLY

PA123791200		<b>PLUS INTERNAL PRIMARY BATTERIES KIT<sup>1</sup></b> Battery pack for PLUS wireless transmitters. Installed inside PLUS transmitters with AA type batteries.
PA123791300		<b>PLUS INTERNAL RECHARGEABLE BATTERIES KIT<sup>1</sup></b> Battery pack with rechargeable batteries directly connected to a solar panel. Installed inside PLUS transmitters with 18650 type batteries.
PA123791201		<b>PLUS PRIMARY BATTERIES POWER BOX<sup>2</sup></b> External battery pack for PLUS transmitters without internal battery case.
PA123791301		<b>PLUS RECHARGEABLE BATTERIES POWER BOX<sup>2</sup></b> External battery pack with rechargeable batteries for PLUS transmitters without internal battery case.
PA123791700		<b>PLUS MOUNTING BRACKET<sup>2</sup></b> Stainless steel bracket for PLUS transmitters and repeater.
PA123791601		<b>SOLAR PANEL MOUNTING BRACKET</b> Mounting bracket to install solar panel.
PA123791600		<b>SOLAR PANEL 1W</b> Solar panel for rechargeable battery kit and power box.

<sup>1</sup> Only available for PLUS TWP-1AI, PLUS TWP-2AI, PLUS TWP-1DI, PLUS TWP-2DI, PLUS TWP-1UT and PLUS TWP-2UT transmitters.

<sup>2</sup> Available for all transmitters.

## ACCESSORIES

PA123772100		<b>ANTENNA CABLE EXTENSION 2MT</b> Cable extension to connect PLUS transmitters with an antenna.
PA123790200		<b>BUZ CONNECTION HEAD FOR WIRELESS TRANSMITTERS</b> Metallic buz head to protect TWP-1UT transmitters. Temperature probe not included.
PA123790400		<b>RS485 TO USB CONVERTER CABLE</b> Cable to connect WGW410 Gateway to an USB port.
PA123791400 PA123791401		<b>WALL MOUNT ANTENNA WITH 3M CABLE 868MHZ / 915MHZ</b> Set of antenna with 3 meter cable supported by a wall mount fixing base.
PA123792200		<b>ANTENNA BASE</b> Magnetic base for antenna with SMA(f) RG174/U cable with SMA(m) connector
PA123791500		<b>POLE MOUNT DIRECTIONAL ANTENNA W/ 5M CABLE 868/915MHZ</b> Antenna for outdoor applications with 5 meter cable and fixing accessories.

## STARTER KITS



Configure your PLUS starter kit to try our PLUS wireless solutions and kickstart your journey on the digitalization path.

### 1. Transmitters

Pick one transmitter from PLUS product family and a power supply option.

### 2. Gateway

PLUS WGW420 gateway will be automatically included in the starter kit.

### 3. IoT Module

If you would like to connect your PLUS starter kit to our Tekon IoT Platform for data analysis, choose our PIM101 IoT Module.

### 4. Tekon IoT Platform

If you choose PIM101 IoT Module you will have 1 month free-access to Tekon IoT Platform with tools for data analysis and visualization.

### 5. Accessories

Depending on your previous configuration, accessories will be automatically added.

**For more configurations, please contact us.**

# QUEST FOR FACTORY FLOOR DIGITALIZATION

Digitalization is the first step towards Industry 4.0. If you want to be competitive, digitalization is mandatory, and the tools are available. Some questions may arise: Where to start? Is this affordable? Which type of technologies should be used? Having a feedback of your process it's easier than you may think. Collect, gather and analyse your application data is no longer a hard and costly task. Tekon Electronics provides solutions to build a digitalization process from sensor to cloud, where you can view your data, from anyplace, anywhere, anytime.

Our IoT Platform will be the interface to your processes regardless of the scale or relevance.

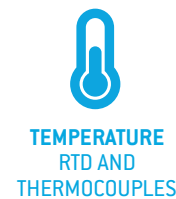
## MAIN GOALS OF DIGITALIZATION

### Operational

- Collect data from running machines and systems
- View and analyze data in real-time
- Real-time notifications and alarms

### Economic

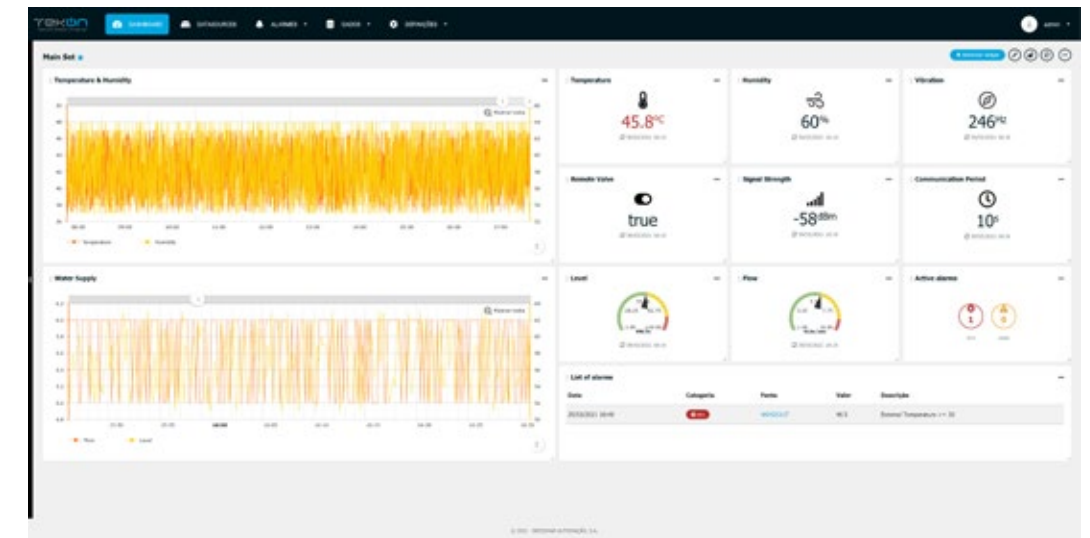
- Increase OEE (Overall Equipment Effectiveness)
- Reduce waste and non-conforming products
- Predict maintenance and reduce downtime



## Insights provided by data

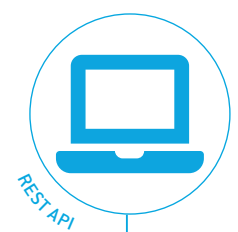
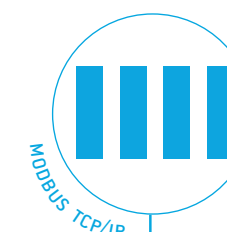
Organize data to get new insights that will help you make data driven decisions. Simplify data processing and adjust it to your application. Real-time monitoring provides real-time feedback that keeps you updated about operation status.

Discover more about Tekon IoT Platform on [page 74](#).



### AUTOMATION

### EXTERNAL APPLICATIONS





# WIRELESS SERIAL MODULES

Transformation of physical connections to wireless communication systems has driven the evolution of communications between control and monitoring processes in different industrial contexts.

Transparent communication ensures the data transmission of several widely used industrial protocols, such as Modbus. The versatility of the wireless serial module makes it possible to implement networks with multiple structures, ranging from point-to-point communication to complex mesh networks.

# WSM

Wireless Serial Module

## WSM101

WIRELESS SERIAL DATA TRANSMITTER/GATEWAY



### KEY FEATURES

- Up to 256 devices in RS485 driver
- Operation as gateway or repeater
- 9 status LED
- RS485 interface
- Configurable baud rate
- Transparent data transmission

WSM101 Wireless Serial Module is a wireless solution to ensure the reformulation of connections in applications with communication through serial protocols. Transform wired serial communications in wireless serial communications, eliminating long wires across your plant. Reduce installation and maintenance costs, and ease serial data transmission on point-to-point or master-to-slave architectures.

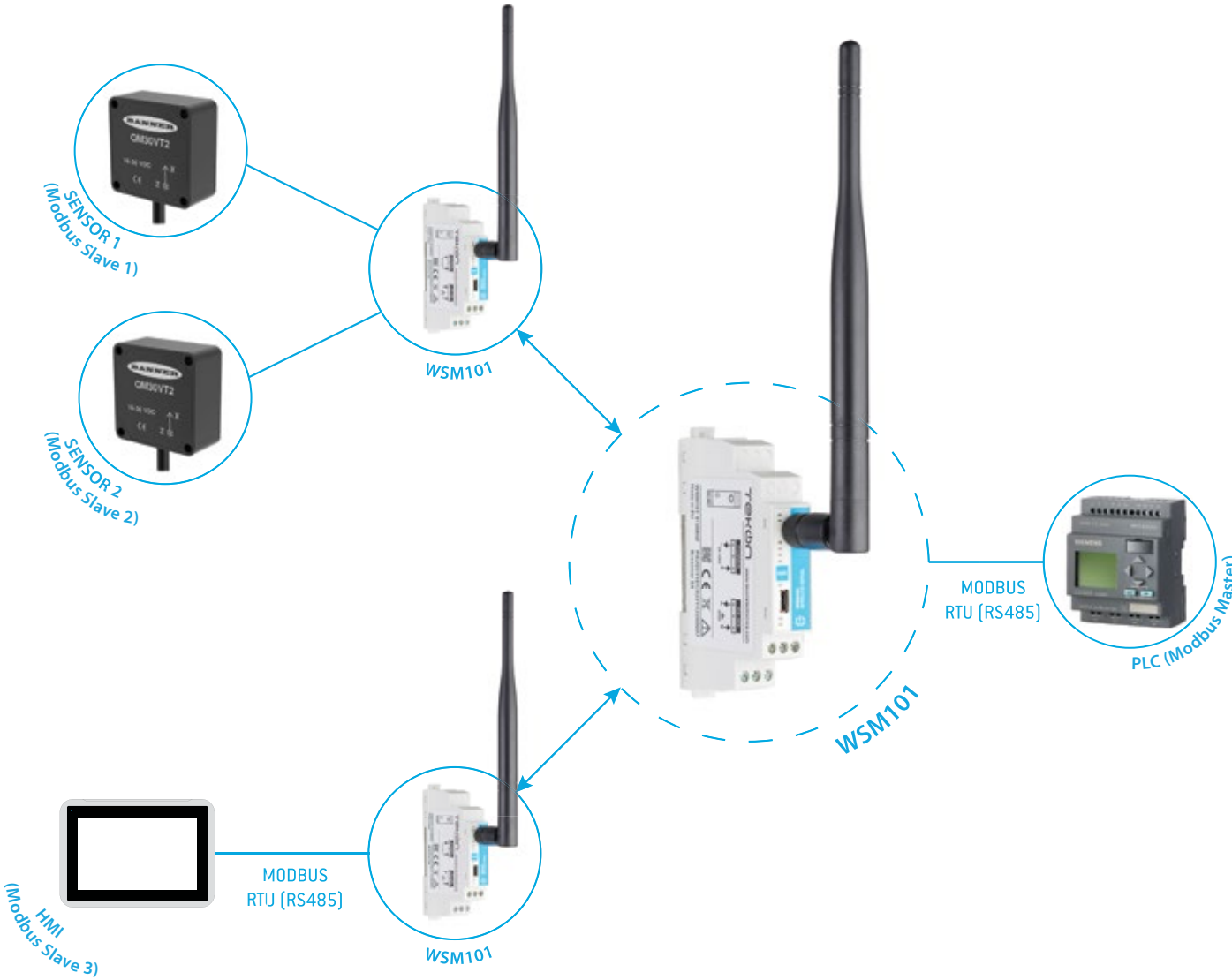


VERSION REFERENCE	868 MHz	PA202310110
	915 MHz	PA202310120

### TECHNICAL SPECIFICATIONS

Applicable data at 23°C

RADIO SPECIFICATIONS	Range	Up to 4 Km LoS	Up to 4 Km LoS
	Transmit Power	25 to 27 dBm	27 dBm
	Receiver Sensitivity	-99 to -104 dBm	-99 to -104 dBm
	Frequency Band	868 to 869 MHz	902 a 928MHz
	Number of Channels	16	50
	Encryption method	AES 128 (Advanced Encryption Standard)	
SERIAL INTERFACE	Type of serial port	RS485	
	Baudrate	4800, 9600, 14400, 19200, 38400, 57600, 115200	
	Stop Bits	One, Two	
	Parity	None, Even, Odd	
	Driver RS485	1/8 unit load, up to 256 devices	
SUPPLY VOLTAGE	Range	5 to 24V DC $\pm$ 5% USB	
	Maximum current	500mA DC @ 5V DC / 100mA DC @ 24V DC	
Operating Temperature		-20 to 80°C	
Relative humidity		$\leq$ 95%, without condensation	





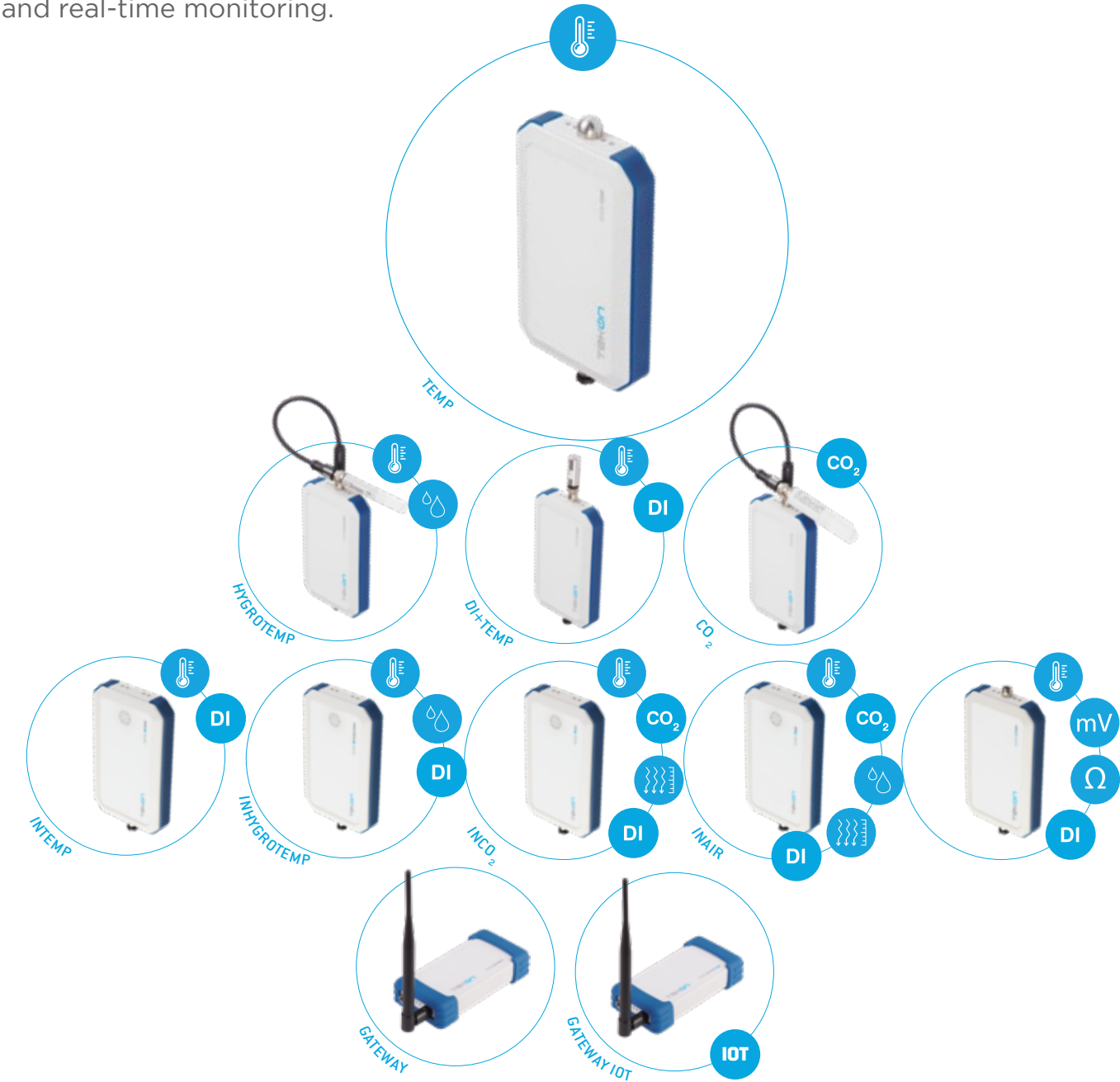
Digitalization is shifting towards the sensor in the era of Industry 4.0 process automation. Implementation of smart sensors that can be integrated anywhere in a complex network allows them to pass on the digital form of recorded physical quantities over the network, versus digitalizing analog signals transmitted to a controller.

Smart Sensors generate and receive data and information which goes beyond traditional switching signals or measured process parameters. Therefore they enable substantial increases in efficiency, more flexibility, and better planning security for predictive maintenance.

# SMART SENSORS

System overview

The implementation of smart sensors in cold chain has been a reliable IoT solution to promote the digitalization of operations, more quickly and promptly. Smart sensors offer essential features such as rapid deployment, secure connectivity and real-time monitoring.



- Temperature
- Humidity
- CO<sub>2</sub>
- Barometric Pressure
- DI Digital Input
- mV Millivolts
- Ω Ohms
- IOT Internet of Things

Know more about DUOS smart sensors system.



Application case



Fast food chain restaurants

The multitude of processes, which can be monitored, available in a fast food restaurant environment allowed the integration of the different DUOS monitoring solutions - temperature, humidity, CO2 and digital inputs - related to tasks ranging from air quality monitoring in the main room, refrigeration equipment temperature and door temperature status in perishable product storage.

Temperature monitoring in mineral insulated inconel storage

The vulnerability of elements related to the production of temperature probes with mineral insulated inconel, implies the use of storage equipment with controlled environment, where temperature and humidity influence the final product. Real-time monitoring of the storage environment, with alarms set for operational limit values, fosters a continuous process of observation and quality control.



Temperature monitoring in freezing and processed food storage

Food processing is characterized by several steps until reaching the final product. The cold chain starts in the production phase. In this application, it was essential to monitor the deep-freezing food process and the subsequent transition to storage equipment, which anticipates the availability of the final product, for the distribution chain.

Air quality monitoring in workplaces

Temperature, humidity, CO2 and barometric pressure are some of the critical variables that need to be measured in order to keep the environment in safe patterns. Wireless monitoring with alarms and user notifications to ventilate the area allow to keep all the values in a healthy standard.





System overview



Due to its IP67 certification, DUOS wireless transmitter performs in harsh enviroments.



The implementation of DUOS solutions is carried out quickly and is suitable for several environments



XXX

up to 55 transmitters  
1 second to 12 hours communication period



Smart sensors are advanced devices with embedded resources such as diagnostics, and connectivity tools that transform traditional feedback signals into true digital insights. The ability to provide relevant, timely data regarding both products and conditions can be used to generate a more holistic, accurate perception of the operating environment.

Solutions with cloud connectivity boost the availability and security of information, effectively distributing it across management and analysis platforms. Products and services connected to this ecosystem strengthen the presence and performance of organizations, with renewed sights of the surrounding chains.

# DUOS

Smart Sensors

## TEMP WIRELESS SENSOR



### KEY FEATURES

**-40 °C to 60 °C Temperature Range**

**Dual temperature probe**

**Internal and External probes**

**Up to 4 Km communication distance (LoS)**

Read more on page 116

**Low power and long battery life**

**Water Resistant  
with IP67 protection**

DUOS TEMP has a unique function - to record temperatures. The external probe records the ambient temperature and the internal probe enables to simulate the temperature of the product that is in the same physical space.

VERSION REFERENCE	BUILT-IN PROBE		
		868 MHz	915 MHz
EXTERNAL PROBE	BLACK HOUSING	PA160411710	PA160411720
		PA160411730	PA160411740
	WHITE HOUSING	PA160410110	PA160410120
		PA160410130	PA160410140
	BLACK HOUSING		

### TECHNICAL SPECIFICATIONS Applicable data at 23°C

RADIO SPECIFICATIONS	Range	868MHz	Up to 4 Km LoS	915MHz	Up to 4 Km LoS
	Radio transmit power		0 to 27 dBm		8 to 27 dBm
	Radio receiver sensitivity		-97 to -110 dBm		-97 to -110 dBm
	Frequency band		868 to 869 MHz		902 to 928 MHz
	Radio channels		16		50
	Encryption method	AES 128 (Advanced Encryption Standard)			
TEMPERATURE MEASUREMENT		EXT		INT	868MHz915MHz
	Range	-40 to 125°C			-40 to 60 °C
	Resolution	0.1 °C			
	Accuracy	Typical: ± 0.25 °C / Maximum: ± 0.5 °C			
	Sensor type	I2C digital sensor			
SUPPLY VOLTAGE	3x 1,5V AA lithium/alkaline/Ni-MH batteries				
	External power supply with 12 VDC ± 5%				
OPERATING ENVIRONMENT	Temperature range-40 °C to 60 °C				

ACCESSORIES		



# DUOS

Smart Sensors

## HYGROTEMP

WIRELESS SENSOR



### KEY FEATURES

**0% to 100% Humidity Range**

**-40 °C to 60 °C Temperature Range**

**Dual Temperature and Humidity Probe**

**Up to 4 Km communication distance (LoS)**

Read more on page 116

**Low power and long battery life**

**Battery voltage and wireless link quality (RSSI) monitoring**

**With IP67 Water Resistant protection**

VERSION  
REFERENCE

868 MHz	BLACK HOUSING	PA164520110
	WHITE HOUSING	PA164520120
915 MHz	BLACK HOUSING	PA164520130
	WHITE HOUSING	PA164520140

External probe sold separately with calibration certificate from manufacturer

### TECHNICAL SPECIFICATIONS Applicable data at 23°C

RADIO SPECIFICATIONS	Range	Up to 4 Km LoS	Up to 4 Km LoS
	Radio transmit power	0 to 27 dBm	8 to 27 dBm
	Radio receiver sensitivity	-97 to -110 dBm	-97 to -110 dBm
	Frequency band	868 to 869 MHz	902 to 928 MHz
	Radio channels	16	50
	Encryption method	AES 128 (Advanced Encryption Standard)	
TEMPERATURE MEASUREMENT	Range	-40 to 80 °C	
	Resolution	0.01 °C	
	Response time	1 second	
	Sensor type	I2C digital sensor	
INTERNAL TEMPERATURE MEASUREMENT	Range	-40 to 60°C	
	Resolution	0,1 °C	
	Accuracy	Typical: ± 0.25 °C / Maximum: ± 0.5 °C	
	Sensor type	I2C digital sensor	
HUMIDITY	Range	0 to 100%	
	Resolution	0,01%	
	Accuracy	±2% (0 to 90%); ±3% (90 to 100%)	
	Sensor type	I2C digital sensor	
SUPPLY VOLTAGE	Range	3x 1,5V AA lithium/alkaline/Ni-MH batteries	
	External power supply with 12 VDC ± 5%		
OPERATING ENVIRONMENT	Temperature range	-40 °C to 60 °C	

ACCESSORIES

	<b>DUOS HUMIDITY + TEMPERATURE PROBE TK07-PFT5</b> 0..100 % RH and -40..80 °C T measurement ranges
	<b>DUOS HUMIDITY + TEMPERATURE PROBE TK07-PFT5 WITH 2M CABLE</b> 0..100 % RH and -40..80 °C T measurement ranges
	<b>DUOS POWER SUPPLY 230 V AC/5 V DC TYPE C</b> DUOS transmitter 110-230 VAC / 50-60 Hz (5 V DC output) EU plug power supply

# DUOS

Smart Sensors

## DI+TEMP

WIRELESS SENSOR



### KEY FEATURES

**-40 °C to 60 °C Temperature Range**

**Dual temperature probe**

**External digital input**

**Up to 4 Km communication distance (LoS)**

Read more on page 116

**Low power and long battery life**

**Battery voltage and wireless link quality (RSSI) monitoring**

**With IP67 Water Resistant protection**

DUOS DI+TEMP is the right device to monitor temperature in equipment and spaces with doors. The digital input allows you to monitor the two possible status of the doors, and thus be able to relate the temperature fluctuation to the status of the doors.

VERSION  
REFERENCE

868 MHz	BLACK HOUSING	PA160411210
	WHITE HOUSING	PA160411220
915 MHz	BLACK HOUSING	PA160411230
	WHITE HOUSING	PA160411240

External probe sold separately

### TECHNICAL SPECIFICATIONS Applicable data at 23°C

RADIO SPECIFICATIONS	Range	Up to 4 Km LoS	Up to 4 Km LoS
	Radio transmit power	0 to 27 dBm	8 to 27 dBm
	Radio receiver sensitivity	-97 to -110 dBm	-97 to -110 dBm
	Frequency band	868 to 869 MHz	902 to 928 MHz
	Radio channels	16	50
Encryption method AES 128 (Advanced Encryption Standard)			
TEMPERATURE MEASUREMENT	Range	-40 to 125°C	-40 to 60 °C
	Resolution	0.1 °C	0.1 °C
	Accuracy	Typical: ± 0.25 °C / Maximum: ± 0.5 °C	Typical: ± 0.25 °C / Maximum: ± 0.5 °C
	Sensor type	I2C digital sensor	
	Response time	1 second	
DIGITAL INPUT	Contact type	Dry contact	
	Standby state	Open / OFF	
	Current consumption	DI ON: 28uA / DI OFF: 0uA	
	Communication time after DI activation	< 1.1 seconds	
	DI debounce time	60ms	
SUPPLY VOLTAGE	Edge trigger	Open Close	
	3x 1,5V AA lithium/alkaline/Ni-MH batteries		
OPERATING ENVIRONMENT	External power supply with 12 VDC ± 5%		
	Temperature range	-40 °C to 60 °C	

ACCESSORIES



**DUOS DI+TEMP EXTERNAL CABLE**  
DUOS DI+TEMP digital input cable



**DUOS POWER SUPPLY 230 V AC/5 V DC TYPE C**  
DUOS transmitter 110-230 VAC / 50-60 Hz (5 V DC output) EU plug power supply



# DUOS

Smart Sensors

CO<sub>2</sub>  
WIRELESS SENSOR



## KEY FEATURES

**-40 °C to 60 °C Temperature Range**

**Dual probe external CO2 and internal temperature**

**Up to 4 Km communication distance (LoS)**

Read more on page 116

**Multi-hop mesh network**

**Battery voltage and wireless link quality (RSSI) monitoring**

**Water Resistant with IP67 protection**

DUOS CO2 uses a dual wavelength NDIR CO2 sensor with automatic temperature compensation for ageing effects and high accuracy over the entire temperature operating range. The sensor IP65 enclosure together with transmitter IP67 protection level, ensures operation in harsh, wet and polluted environments

VERSION  
REFERENCE

868 MHz	BLACK HOUSING	PA160411110
	WHITE HOUSING	PA160411120
915 MHz	BLACK HOUSING	PA160411130
	WHITE HOUSING	PA160411140

External probe sold separately

## TECHNICAL SPECIFICATIONS

Applicable data at 23°C

RADIO SPECIFICATIONS	Range	Up to 4 Km LoS	Up to 4 Km LoS
	Radio Transmit Power	0 to 27 dBm	8 to 27 dBm
	Radio Receiver Sensitivity	-97 to -110 dBm	-97 to -110 dBm
	Frequency Band	868 to 869 MHz	902 to 928 MHz
	Radio Channels	16	50
	Encryption method	AES 128 (Advanced Encryption Standard)	
CO <sub>2</sub> MEASUREMENT	Operating Temperature	-40°C to 60°C (0-100%RH non-condensing)	
	Acquisition Range	0-5000ppm	
	Accuracy at 25°C and 1013 mbar	0 to 5000ppm: + 50ppm + 3% measured value	
TEMPERATURE MEASUREMENT	Range	-40 to 60 °C	
	Resolution	0.1 °C	
	Accuracy	Typical: ± 0.25 °C / Maximum: ± 0.5 °C	
SUPPLY VOLTAGE	3x 1,5V AA lithium/alkaline/Ni-MH batteries		
	External power supply with 12 VDC ± 5%		

ACCESSORIES

	<b>DUOS TK871-HR5000J2 CO2 PROBE</b> Measurement range: 0..5000 ppm
	<b>DUOS TK871-HR5000J2 CO2 PROBE WITH 2M CABLE</b> Measurement range: 0..5000 ppm
	<b>DUOS POWER SUPPLY 230 V AC/5 V DC TYPE C</b> DUOS transmitter 110-230 VAC / 50-60 Hz (5 V DC output) EU plug power supply

NEW

DUOS

Smart Sensors

inTEMP

WIRELESS SENSOR



KEY FEATURES

-40°C to 60°C Temperature Range

Built-in sensor

Discrete digital input

Up to 4 Km communication distance (LoS)

Read more on page 116

Battery voltage and wireless link quality (RSSI) monitoring

With IP65 water resistant protection

DUOS InTEMP is a wireless solution fully optimized to monitor ambient temperature. This transmitter is equipped with a built-in sensor that can collect data from surrounding temperature. A wireless solution for applications where this environmental variable has a critical impact. The discrete digital input allows to monitor open/close state events.

VERSION REFERENCE	868 MHz	PA160411120
	915 MHz	PA160411140

TECHNICAL SPECIFICATIONS Applicable data at 23°C

RADIO SPECIFICATIONS	Range	868MHz	Up to 4 Km LoS	915MHz	Up to 4 Km LoS
	Radio transmit power		0 to 27 dBm		8 to 27 dBm
	Radio receiver sensitivity		-99 to -110 dBm		-99 to -110 dBm
	Frequency band		868 to 869 MHz		902 to 928 MHz
	Radio channels	16	50		
Encryption method AES 128 (Advanced Encryption Standard)					
TEMPERATURE MEASUREMENT	Operating temperature -40°C to 60°C				
	Resolution 0,1° C				
	Accuracy Typical: ± 0.25° C / Maximum: ± 0.5° C				
	Sensor type I2C digital sensor				
DIGITAL INPUT	Contact type Dry contact				
	Standby state 500mA DC @ 5V DC / 100mA DC @ 24V DC				
	Current consumption DI ON: 28uA / DI OFF: 0uA				
	Communication time after DI activation < 1,1 seconds				
	DI debounce time 60ms				
	Edge trigger Open -> Close				
POWER SUPPLY	3x 1,5V AA lithium/alkaline/Ni-MH batteries				
	External power supply with 5 VDC ± 5%				

ACCESSORIES		<b>DUOS DI+TEMP EXTERNAL CABLE</b> DUOS DI+TEMP digital input cable
		<b>DUOS POWER SUPPLY 230 V AC/5 V DC TYPE C</b> DUOS transmitter 110-230 VAC / 50-60 Hz (5 V DC output) EU plug power supply
		<b>DUOS EXTERNAL POWER CABLE</b> DUOS transmitter power supply cable



NEW

DUOS

Smart Sensors

inHYGROTEMP  
WIRELESS SENSOR

## KEY FEATURES

**-40°C to 60°C Temperature Range****0% to 100% Humidity Range****Built-in sensor****Discrete digital input****Up to 4 Km communication distance (LoS)**

Read more on page 116

**Battery voltage and wireless link quality (RSSI) monitoring****With IP65 Water resistant protection**

DUOS inHYGROTEMP is suitable to monitor environmental variables such as temperature and relative humidity. This wireless solution is indicated for applications like greenhouses, storage and exhibition areas in which temperature and humidity need to be monitored for quality control. The discrete digital input allows to monitor open/close state events.

VERSION  
REFERENCE

868 MHz	PA210310210
915 MHz	PA210310220

## TECHNICAL SPECIFICATIONS Applicable data at 23°C

RADIO SPECIFICATIONS	Range	Up to 4 Km LoS	Up to 4 Km LoS
	Radio transmit power	0 to 27 dBm	8 to 27 dBm
	Radio receiver sensitivity	-99 to -110 dBm	-99 to -110 dBm
	Frequency band	868 to 869 MHz	902 to 928 MHz
	Radio channels	16	50
	Encryption method	AES 128 (Advanced Encryption Standard)	
TEMPERATURE MEASUREMENT	Operating temperature	-40°C to 60°C	
	Resolution	0,1° C	
	Accuracy	Typical: ± 0.25° C / Maximum: ± 0.5° C	
	Sensor type	I2C digital sensor	
HUMIDITY MEASUREMENT	Range	0% to 100%	
	Resolution	0,01 %	
	Accuracy (at 25°C)	± 3%	
	Sensor type	8 seconds	
DIGITAL INPUT	Contact type	Dry contact	
	Standby state	500mA DC @ 5V DC / 100mA DC @ 24V DC	
	Current consumption	DI ON: 28uA / DI OFF: 0uA	
	Communication time after DI activation	< 1,1 seconds	
	DI debounce time	60ms	
	Edge trigger	Open -> Close	
POWER SUPPLY	3x 1,5V AA lithium/alkaline/Ni-MH batteries		
	External power supply with 5 VDC ± 5%		

ACCESSORIES



**DUOS DI+TEMP EXTERNAL CABLE**  
DUOS DI+TEMP digital input cable



**DUOS POWER SUPPLY 230 V AC/5 V DC TYPE C**  
DUOS transmitter 110-230 VAC / 50-60 Hz (5 V DC output) EU plug power supply



**DUOS EXTERNAL POWER CABLE**  
DUOS transmitter power supply cable

NEW

DUOS

Smart Sensors

inCO<sub>2</sub>

WIRELESS SENSOR



KEY FEATURES

-40°C to 60°C Temperature Range

0 to 5000 PPM CO<sub>2</sub> Range

700 to 1100 mbar Barom. Pressure Range

Built-in sensor

Discrete digital input

Up to 4 Km communication distance (LoS)

Read more on page 116

Battery voltage and wireless link quality (RSSI) monitoring

With IP65 water resistant protection

DUOS inCO<sub>2</sub> is suitable to monitor environmental variables such as temperature, CO<sub>2</sub> and barometric pressure. This wireless solution is indicated for applications like HVAC, smart agriculture, indoor and outdoor air quality. The discrete digital input allows to monitor open/close state events.

VERSION REFERENCE	868 MHz	PA210310310
	915 MHz	PA210310320

TECHNICAL SPECIFICATIONS Applicable data at 23°C

RADIO SPECIFICATIONS	Range	Up to 4 Km LoS	Up to 4 Km LoS
	Radio transmit power	0 to 27 dBm	8 to 27 dBm
	Radio receiver sensitivity	-99 to -110 dBm	-99 to -110 dBm
	Frequency band	868 to 869 MHz	902 to 928 MHz
	Radio channels	16	50
	Encryption method	AES 128 (Advanced Encryption Standard)	
TEMPERATURE MEASUREMENT	Operating temperature	-40°C to 60°C	
	Resolution	0,1° C	
	Accuracy	Typical: ± 0.25° C / Maximum: ± 0.5° C	
CO <sub>2</sub> MEASUREMENT	Range	0% to 100%	
	Resolution	0,01 %	
	Accuracy (at 25°C)	± 3%	
	Sensor type	8 seconds	
MEASUREMENT MEASUREMENT	Range	700 to 1100 mbar	
	Resolution	± 2 mbar (20 to 80% RH)	
	Accuracy (at 25°C)	± 0,015 mbar/K	
DIGITAL INPUT	Contact type	Dry contact	
	Standby state	500mA DC @ 5V DC / 100mA DC @ 24V DC	
	Current consumption	DI ON: 28uA / DI OFF: 0uA	
	Communication time after DI activation	< 1,1 seconds	
	DI debounce time	60ms	
	Edge trigger	Open -> Close	
POWER SUPPLY	3x 1,5V AA lithium/alkaline/Ni-MH batteries		
	External power supply with 5 VDC ± 5%		

ACCESSORIES		<b>DUOS DI+TEMP EXTERNAL CABLE</b> DUOS DI+TEMP digital input cable
		<b>DUOS POWER SUPPLY 230 V AC/5 V DC TYPE C</b> DUOS transmitter 110-230 VAC / 50-60 Hz (5 V DC output) EU plug power supply
		<b>DUOS EXTERNAL POWER CABLE</b> DUOS transmitter power supply cable



NEW

DUOS

Smart Sensors

inAIR  
WIRELESS SENSOR

## KEY FEATURES

**-40°C to 60°C Temperature Range****0% to 100% Humidity Range****0 to 5000 PPM CO2 Range****700 to 1100 mbar Barom. Pressure Range****Built-in sensor****Up to 4 Km communication distance (LoS)**

Read more on page 116

**Discrete digital input****Battery voltage and wireless link quality (RSSI) monitoring****Water resistant with IP65 protection**VERSION  
REFERENCE

868 MHz	PA210310410
915 MHz	PA210310420

DUOS inAIR is suitable to monitor environmental variables such as temperature, CO2, relative humidity and barometric pressure. This wireless solution is indicated for applications like HVAC, smart agriculture, and indoor/outdoor air quality. The discrete digital input allows to monitor open/close state events.

## TECHNICAL SPECIFICATIONS Applicable data at 23°C

RADIO SPECIFICATIONS	Range	868MHz	Up to 4 Km LoS	915MHz	Up to 4 Km LoS							
	Radio Transmit Power		0 to 27 dBm		8 to 27 dBm							
	Radio Receiver Sensitivity		-99 to -110 dBm		-99 to -110 dBm							
	Frequency Band		868 to 869 MHz		902 to 928 MHz							
	Radio Channels	16	50									
	Encryption method						AES 128 (Advanced Encryption Standard)					
TEMPERATURE MEASUREMENT	Operating Temperature						-40°C to 60°C					
	Resolution						0,1° C					
	Accuracy						Typical: ± 0.25° C / Maximum: ± 0.5° C					
HUMIDITY MEASUREMENT	Range						0% to 100%					
	Resolution						0,01 %					
	Accuracy (at 25°C)						± 3%					
	Sensor type						8 seconds					
CO <sub>2</sub> MEASUREMENT	Range						0% to 100%					
	Resolution						0,01 %					
	Accuracy (at 25°C)						± 3%					
	Sensor type						8 seconds					
BAROM. PRESS. MEASUREMENT	Range						700 to 1100 mbar					
	Resolution						± 2 mbar (20 to 80% RH)					
	Accuracy (at 25°C)						± 0,015 mbar/K					
DIGITAL INPUT	Contacte type						Dry contact					
	Standby state						500mA DC @ 5V DC / 100mA DC @ 24V DC					
	Current consumption						DI ON: 28uA / DI OFF: 0uA					
	Communication Time after DI activation						< 1,1 seconds					
	DI debounce time						60ms					
	Edge trigger						Open -> Close					
POWER SUPPLY	3x 1,5V AA lithium/alkaline/Ni-MH batteries											
	External power supply with 5 VDC ± 5%											

ACCESSORIES		<b>DUOS DI+TEMP EXTERNAL CABLE</b> DUOS DI+TEMP digital input cable
		<b>DUOS POWER SUPPLY 230 V AC/5 V DC TYPE C</b> DUOS transmitter 110-230 VAC / 50-60 Hz (5 V DC output) EU plug power supply
		<b>DUOS EXTERNAL POWER CABLE</b> DUOS transmitter power supply cable

NEW

DUOS

Smart Sensors

uTEMP

WIRELESS SENSOR



KEY FEATURES

Multiple temperature inputs

RTD, Thermocouples, linear Ohm and linear mV

Discrete digital input

Up to 4 Km communication distance (LoS)

Read more on page 116

Battery voltage and wireless link quality (RSSI) monitoring

With IP67 water resistant protection

DUOS uTemp is the perfect temperature wireless solution for monitoring applications, automation and centralization of temperature measurements throughout the production substances, distribution and storage of refrigerated foods, frozen and deep-frozen, HVAC and other industry processes. The universal temperature inputs allow to connect a large range of temperature probes like RTD's and thermocouples. It is also possible to measure linear mV and linear ohms.

VERSION REFERENCE	868 MHz	PA210310410
	915 MHz	PA210310420

TECHNICAL SPECIFICATIONS Applicable data at 23°C

RADIO SPECIFICATIONS	Range	Up to 4 Km LoS	Up to 4 Km LoS
	Radio transmit power	0 to 27 dBm	8 to 27 dBm
	Radio receiver sensitivity	-99 to -110 dBm	-99 to -110 dBm
	Frequency band	868 to 869 MHz	902 to 928 MHz
	Radio channels	16	50
	Encryption method	AES 128 (Advanced Encryption Standard)	
INTERNAL TEMPERATURE MEASUREMENT	Range	-40°C to 60°C	
	Resolution	0,1° C	
	Accuracy	Typical: ± 0.25° C / Maximum: ± 0.5° C	
	Sensor type	I2C digital sensor	
	Response time	1 second	
TEMPERATURE SENSORS	RTD	PT100, PT500, PT1000	
	Thermocouples	C, J, K, N, R, S, T	
	Measuring range	Not configurable	
RESISTANCE SENSORS	Sensor type	Resistance, Potentiometer	
	Units	Ω	
	Measuring range	Not configurable	
	Sensor type	8 seconds	
MILIVOLT SENSOR	Sensor type	DC voltage source	
	Units	mV	
	Measuring range	Not configurable	
DIGITAL INPUT	Contact type	Dry contact	
	Standby state	500mA DC @ 5V DC / 100mA DC @ 24V DC	
	Current consumption	DI ON: 28uA / DI OFF: 0uA	
	Communication time after DI activation	< 1,1 seconds	
	DI debounce time	60ms	
	Edge trigger	Open -> Close	
POWER SUPPLY	3x 1,5V AA lithium/alkaline/Ni-MH batteries		
	External power supply with 5 VDC ± 5%		

ACCESSORIES		<b>DUOS DI+TEMP EXTERNAL CABLE</b> DUOS DI+TEMP digital input cable
		<b>DUOS POWER SUPPLY 230 V AC/5 V DC TYPE C</b> DUOS transmitter 110-230 VAC / 50-60 Hz [ 5 V DC output ] EU plug power supply
		<b>DUOS EXTERNAL POWER CABLE</b> DUOS transmitter power supply cable
		<b>DUOS M8 MALE CONNECTOR WITH NTC</b> M8 male connector for NTC cold-junction compensation



# DUOS

Smart Sensors

## DUOS WIRELESS IOT GATEWAY



### KEY FEATURES

Ethernet TCP/IP Modbus Communication

Integration with Tekon IoT Platform

Scalable Network

Multiple Networks Simultaneously

Up to 4 Km communication distance (LoS)

Read more on page 116

Automatic Mesh Network Management

DUOS IoT Gateway offers IoT connectivity, through the Ethernet port, with Modbus TCP/IP and system integration with REST API. DUOS IoT Gateway is natively integrated with Tekon IoT Platform.

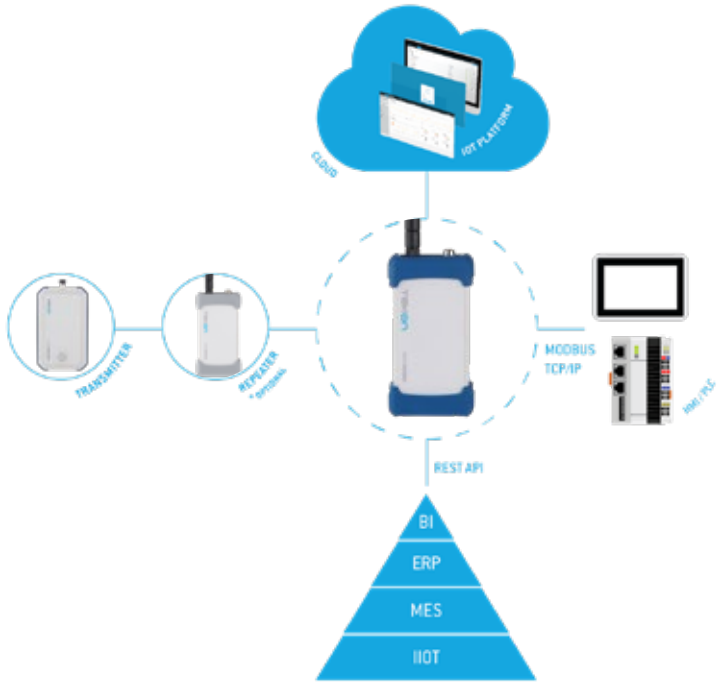
VERSION  
REFERENCE

868 MHz	BLACK HOUSING	PA160410220
	WHITE HOUSING	PA160410240
915 MHz	BLACK HOUSING	PA160410260
	WHITE HOUSING	PA160410280

### TECHNICAL SPECIFICATIONS

Applicable data at 23°C

RADIO SPECIFICATIONS	Range	Up to 4 Km LoS	Up to 4 Km LoS
	Radio transmit power	0 to 27 dBm	8 to 27 dBm
	Radio receiver sensitivity	-97 to -110 dBm	-97 to -110 dBm
	Frequency band	868 MHz	915 MHz
	Radio channels	16	50
	Encryption method	AES 128 (Advanced Encryption Standard)	
WIRELESS NETWORK	Maximum Devices	55	
	Maximum Hops	13	
OPERATING ENVIRONMENT	Temperature range	-10 °C to +60 °C	
	Relative humidity	95% maximum relative humidity (non-condensing)	
SUPPLY VOLTAGE	External power supply with 12 VDC ± 5%		
	Maximum current draw of 250 mA		
INTERFACES		RS-485	ETHERNET
	Protocol	Modbus RTU (Slave)	TCP / IP Modbus
	Physical connection	2-wire RS-485	Ethernet
IOT CONNECTIVITY	Native integration with Tekon IoT Platform		
	REST API		



ACCESSORIES		<b>DUOS POWER SUPPLY</b> DUOS repeater and transmitter 110-230 VAC / 50-60 Hz
		<b>DUOS GATEWAY EXTERNAL CABLE</b> DUOS gateway communication (via RS-485) and power supply cable
		<b>DUOS GATEWAY/REPEATER MOUNTING CLIP</b> Stainless steel wall mounting clip
		<b>DUOS POWER SUPPLY 230 V AC/5 V DC TYPE C</b> DUOS transmitter 110-230 VAC / 50-60 Hz (5 V DC output) EU plug power supply

# DUOS

Smart Sensors

## DUOS WIRELESS GATEWAY



### KEY FEATURES

**Scalable network  
up to 55 DUOS transmitters**

**Up to 4 Km communication distance (LoS)**

Read more on page 116

**Multiple networks simultaneously with  
extra gateways**

**Multi-hop mesh network**

**Modbus RTU communication protocol  
via RS-485 interface**

With the DUOS Gateway you can connect your DUOS wireless system to automation equipments like SCADA, PLC, HMI or a computer and access data using Modbus RTU protocol through RS485 port.

VERSION  
REFERENCE

868 MHz	BLACK HOUSING	PA160410210
	WHITE HOUSING	PA160410230
915 MHz	BLACK HOUSING	PA160410250
	WHITE HOUSING	PA160410270

### TECHNICAL SPECIFICATIONS Applicable data at 23°C

RADIO SPECIFICATIONS	Range	Up to 4 Km LoS	Up to 4 Km LoS
	Radio transmit power	0 to 27 dBm	8 to 27 dBm
	Radio receiver sensitivity	-97 to -110 dBm	-97 to -110 dBm
	Frequency band	868 to 869 MHz	902 to 928 MHz
	Radio channels	16	50
Encryption method		AES 128 (Advanced Encryption Standard)	
WIRELESS NETWORK	Maximum devices	55	
	Maximum hops	13	
OPERATING ENVIRONMENT	Temperature range	-10 °C to +60 °C	
	Relative humidity	95% maximum relative humidity (non-condensing)	
SUPPLY VOLTAGE	External power supply from 5 to 24 VDC ± 5%		
	Maximum current draw of 250 mA		



ACCESSORIES

	<b>DUOS RS485-USB CONVERTER</b> DUOS gateway configuration cable (to use with Tekon Configurator)
	<b>DUOS GATEWAY EXTERNAL CABLE</b> DUOS gateway communication (via RS-485) and power supply cable
	<b>DUOS GATEWAY MOUNTING CLIP</b> Stainless steel wall mounting clip



# DUOS

Smart Sensors

## DUOS WIRELESS REPEATER



### KEY FEATURES

**Up to 4 Km communication distance (LoS)**

Read more on page 116

**Auto discovery for the best wireless link**

**Mesh Network**

**Improvement of network coverage**

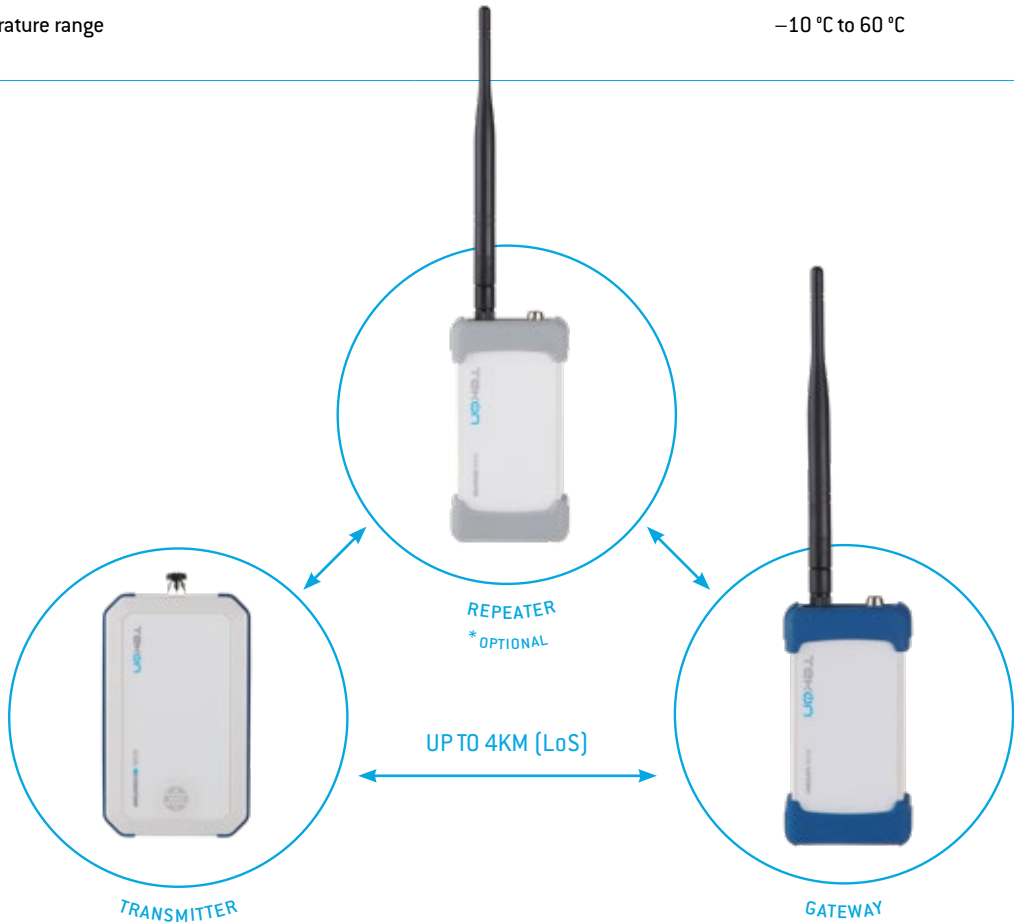
Due to its self-optimizing mesh network features, this equipment has the capacity to auto discover the best wireless link, create alternative paths in a mesh network.

VERSION  
REFERENCE

868 MHz	BLACK HOUSING	PA160410310
	WHITE HOUSING	PA160410320
915 MHz	BLACK HOUSING	PA160410330
	WHITE HOUSING	PA160410340

### TECHNICAL SPECIFICATIONS Applicable data at 23°C









RADIO SPECIFICATIONS	Range	Up to 4 Km LoS	Up to 4 Km LoS		
	Radio transmit power	0 to 27 dBm	8 to 27 dBm		
	Radio receiver sensitivity	-97 to -110 dBm	-97 to -110 dBm		
	Frequency band	868 to 869 MHz	902 to 928 MHz		
	Radio channels	16	50		
Encryption method				AES 128 (Advanced Encryption Standard)	
WIRELESS NETWORK	Maximum devices	55			
	Maximum hops	13			
SUPPLY VOLTAGE	External power supply with 12 VDC ± 5%				
	Maximum current draw of 250 mA				
OPERATING ENVIRONMENT	Temperature range	−10 °C to 60 °C			




ACCESSORIES

	<b>DUOS POWER SUPPLY</b> DUOS repeater and transmitter 110-230 VAC / 50-60 Hz
	<b>DUOS EXTERNAL POWER CABLE</b> DUOS repeater and DUOS transmitter power supply cable
	<b>DUOS GATEWAY/REPEATER MOUNTING CLIP</b> Stainless steel wall mounting clip

ACCESSORIES	PA160410005		<b>TRANSMITTER SARC</b> DUOS transmitter configuration cable (to use with Tekon Configurator)
	PA160410004		<b>RS485-USB CONVERTER</b> DUOS gateway configuration cable (to use with Tekon Configurator)
	PA160412810		<b>DUOS POWER SUPPLY 230 V AC TYPE A</b> DUOS repeater and transmitter 110-230 VAC / 50-60 Hz type A plug power supply Length: 2 meters
	PA160412710		<b>DUOS POWER SUPPLY 230 V AC TYPE G</b> DUOS repeater and transmitter 110-230 VAC / 50-60 Hz type G plug power supply Length: 2 meters
	PA160410006		<b>DUOS POWER SUPPLY 230 V AC TYPE C</b> DUOS repeater and transmitter 110-230 VAC / 50-60 Hz EU plug power supply Length: 2 meters
	PA160413610		<b>DUOS POWER SUPPLY 230 V AC/5 V DC TYPE C</b> DUOS transmitter 110-230 VAC / 50-60 Hz (5 V DC output) EU plug power supply Length: 2 meters
	PA160410007		<b>GATEWAY EXTERNAL CABLE</b> DUOS gateway communication (via RS-485) and power supply cable Length: 2 meters. Connector: Industrial M8
	PA160410008		<b>EXTERNAL POWER CABLE</b> DUOS repeater and DUOS transmitter power supply cable. Length: 2 meters Connector: Industrial M8
	PA160410910		<b>TRANSMITTER MOUNTING CLIP</b> Stainless steel wall mounting clip
	PA160410810		<b>TRANSMITTER MOUNTING BRACKET</b> Stainless steel wall mounting bracket
	PA160411010		<b>GATEWAY/REPEATER MOUNTING CLIP</b> Stainless steel wall mounting clip
	PA160410001		<b>DIGITAL TEMPERATURE PROBE</b> ±0.25°C typical accuracy with 0.1°C resolution digital sensor Stainless steel probe with M8 industrial connector
	PA160410002		<b>DIGITAL TEMPERATURE PROBE WITH 2MT CABLE</b> ±0.25°C typical accuracy with 0.1°C resolution digital sensor Cable length: 2 meters
	PA160410003		<b>DIGITAL TEMPERATURE PROBE WITH 5MT CABLE</b> ±0.25°C typical accuracy with 0.1°C resolution digital sensor Cable length: 5 meters

ACCESSORIES	PA160413410		<b>DIGITAL HIGH TEMPERATURE PROBE WITH 2MT CABLE</b> ±0.25°C typical accuracy with 0.1°C resolution digital sensor Cable length: 2 meters
	PA160413510		<b>DIGITAL HIGH TEMPERATURE PROBE WITH 5MT CABLE</b> ±0.25°C typical accuracy with 0.1°C resolution digital sensor Cable length: 5 meters
	PA164520001		<b>HUMIDITY + TEMPERATURE PROBE TK07-PFT5</b> 0..100 % RH and -40..80 °C measurement ranges
	PA164520004		<b>HUMIDITY + TEMPERATURE PROBE TK07-PFT5 WITH 2MT CABLE</b> 0..100 % RH and -40..80 °C measurement ranges Cable length: 2 meters
	PA160410010		<b>CO2 PROBE TK871-HR5000J2</b> 0 to 5000 ppm measurement range
	PA160410011		<b>CO2 PROBE TK871-HR5000J2 WITH 2MT CABLE</b> 0 to 5000 ppm measurement range Cable length: 2 meters
	PA160410009		<b>DI+TEMP EXTERNAL CABLE</b> DUOS DI+TEMP digital input cable Cable length: 2 meters
	PA160413710		<b>DUOS M8 MALE CONNECTOR WITH NTC</b> M8 male connector with NTC cold-junction compensation suitable for thermocouples



Configure your DUOS starter kit to try our DUOS wireless solutions and set a quick monitoring system.

**1. Transmitters**  
Pick one transmitter from DUOS product family.

**2. Gateway**  
Choose a DUOS gateway. DUOS Wireless Gateway is suitable for connection to local systems. DUOS IoT Gateway will provide an integration with our cloud-based solution Tekon IoT Platform.

**3. Tekon IoT Platform**  
If you choose DUOS IoT Gateway you will have 1 month free-access to Tekon IoT Platform with tools for data analysis and visualization.

**4. Accessories**  
Depending on your previous configuration, accessories will be automatically added.



# SOFTWARE

Tekon IoT Platform has been developed to improve real-time monitoring of multiple applications. With data collection, analysis and visualization tools, Tekon IoT Platform allows users to understand and organize raw data to transform information into business insights.

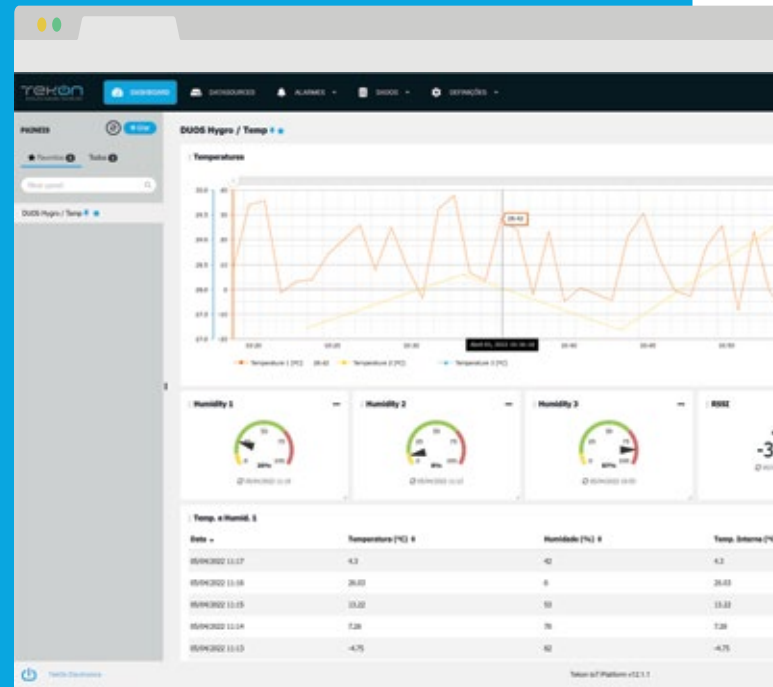
Digitalization offers new possibilities for optimizing manufacturing processes by leveraging data analytics through cloud-based systems. New communication methods for automation systems via standard protocols like MQTT are helping users to fully integrate components regardless the manufacturer.



## Your Online Datalogger

Connect, optimize,  
and scale your digital industrial  
applications

## TEKON IOT PLATFORM



### KEY FEATURES

#### Real-time data visualization

#### Advanced data analysis

#### Periodic reports

#### Alarms and Notifications

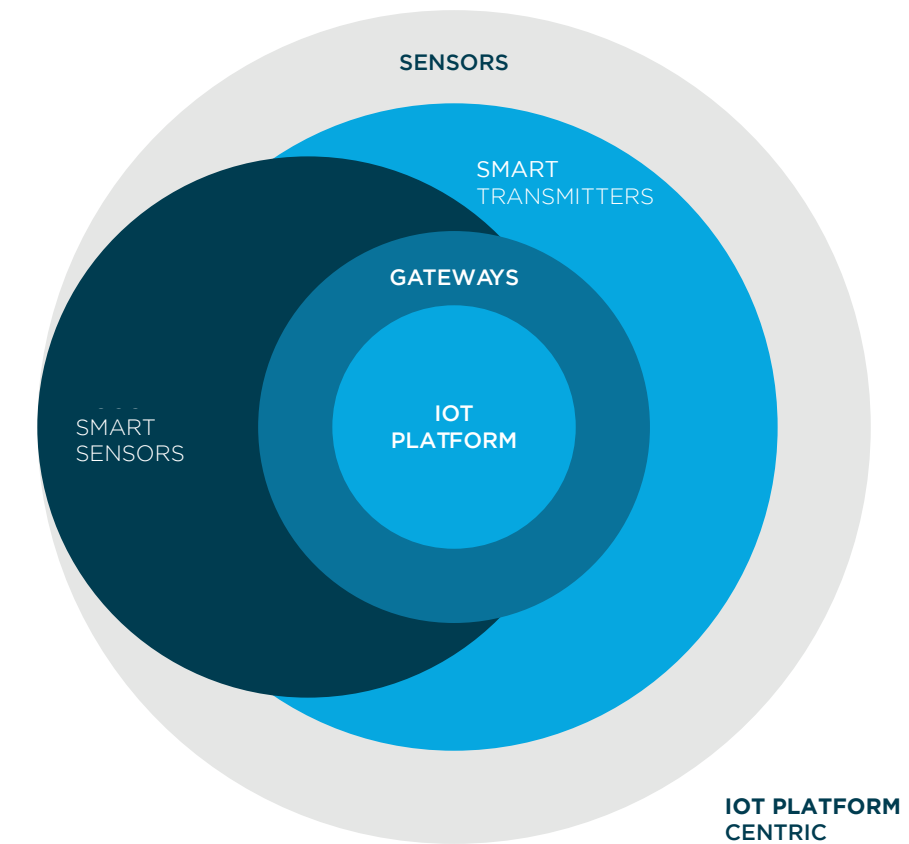
#### IoT Data Encryption

#### Third-party integration

#### Web-based platform

Asset monitoring and event management is the cornerstone of industrial digital transformation and the first step that most companies will take in harnessing the power of cloud-based IIoT. Centralizing assets and data, visualizing, applying analytics and acting on the results opens the door to reduced downtime, lower maintenance costs, and many other concrete benefits.

The implementation of cloud-based IoT solutions will bring a clear overview of the operations, with direct improvements in the production processes and with the profitability of the collected IoT data.



### Data Storage for more than 2 years \*

\* Contact us for customized options

### Capabilities delivered by Tekon IoT Platform

- Reliable devices, sensors and gateways connection
- Secure access management
- Data visualization from multiple sources within one dashboard
- Management and analysis of IoT data

### TEKON IOT PLATFORM - Access Plans

Tekon IoT Platform is available with several access plans that better suit your application. Contact us to know more about the available plans.

CLOUD	5 SENSORS	10 SENSORS	25 SENSORS	50 SENSORS	100 SENSORS
LOCAL	ON PREMISES (UNLIMITED SENSORS)				

### SMS SERVICE

Tekon IoT Platform integrates an external SMS notification service. Contact us to know more about the available SMS plans.

100 SMS	500 SMS	1000 SMS	> 1000 SMS Under Request
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## ALARMS

Real-time monitoring is supported by an alarmistic system that provides a security layer to your process. Tekon IoT Platform allows users to set alarms with notifications to signal process deviations.

- Dashboard notifications
- Alarms active by days or hours
- Email and SMS notifications
- Custom message notifications



## REPORTING

With Tekon IoT Platform, you can create a report file that gathers relevant data about a specific or a generic process. This report is automatically sent to any email address. You can choose a time range over which the data should be exported. Periodic reports can be divided by sections in order to organize data by relevance.

- Easy-to-set reporting parameters
- PDF file sent to all recipients
- Selectable data
- Analyze raw data, charts or alarms



## THIRD-PARTY CONNECTIVITY

Tekon IoT Platform ensures the devices integration from other manufacturers, enabled by off web-based protocol solutions.

- Integration through MQTT or REST API
- Process agnostic
- Quick deployment
- Low complexity



## DATA ANALYSIS

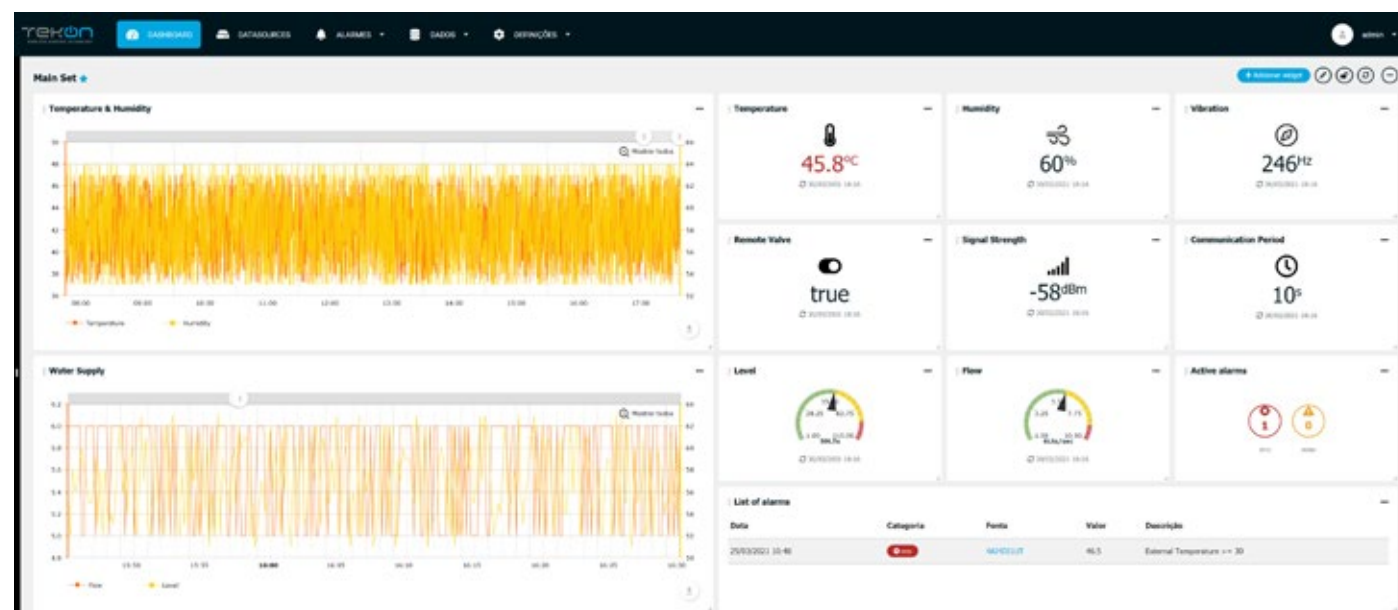
Tekon IoT Platform provides a tool to customize your data analysis to gather the most relevant data about your application or a specific process.

- Customized time range and scales
- Analysis with aggregation methods
- Granularity levels
- Export data in PDF, CSV or XLSX

{ **REST:API** } **MQTT**

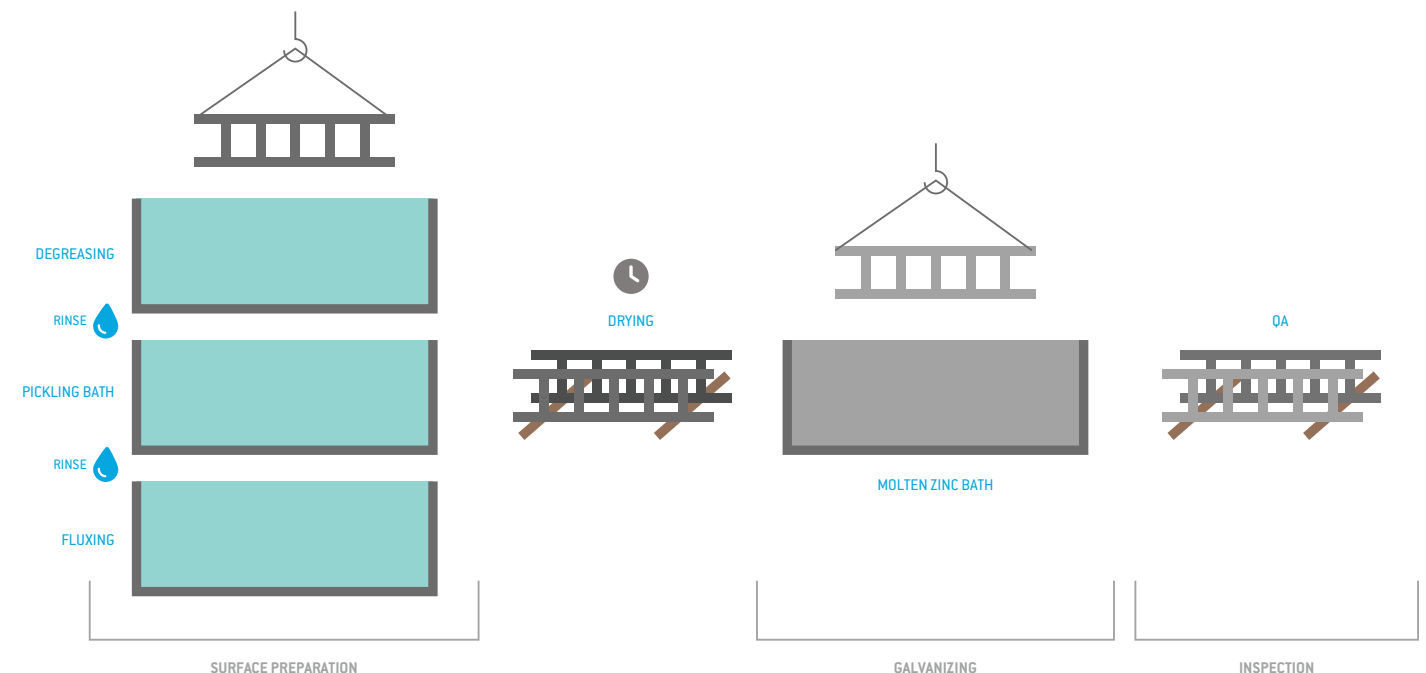
In this section, the user can set parameters that are traditionally associated with data analysis - type of aggregation, time gap, granularity, etc.

All the performed analyses can be printed or exported to files with formats such as PDF, JSON, CSV, XSLX, among others.



# Sensor-to-cloud Monitoring Solutions

Turnkey systems for process monitoring and data analysis



## Hot dip galvanizing process

Tekon Electronics is prepared to design and implement complete monitoring solutions capable of ensuring the collection, communication and processing of data from an equipment or process. The development of sensor monitoring architectures up to the cloud allows for greater adaptation to the customer's application and to the technological ecosystem already installed.

One of the sensor-to-cloud projects that was carried out by Tekon Electronics was aimed to the hot dip galvanizing industry of steel and iron. The customer centralizes information from all stages of the process in a single system, capable of ensuring real-time data analysis and storage of records to comply with legal obligations.

The galvanizing process consists of coating metals in hot baths of molten zinc and drying between

bath stations. The aim of the project would be to implement temperature measurement points in immersion tanks and drying stations for quality control and process safety. Tekon Electronics developed temperature probes with customized features that ease their integration into the infrastructure and prepared a setup that would transmit data through wireless transmitters to avoid installing a wired solution in a hazardous industrial environment.

Data is quickly available on Tekon IoT Platform for analysis by engineers and plant technicians. Storage of the solution in the cloud ensures data security and remote access to facility data.

## Use Cases



### Temperature and humidity monitoring in surgical masks production

Implemented solution to meet compliance requirements and obtain certification by regulatory authority.



### Temperature monitoring in retail food storage

Integrated monitoring solution to comply with the legal obligation to automatically record temperatures in storage equipment.



### Temperature and humidity monitoring in raw material storage

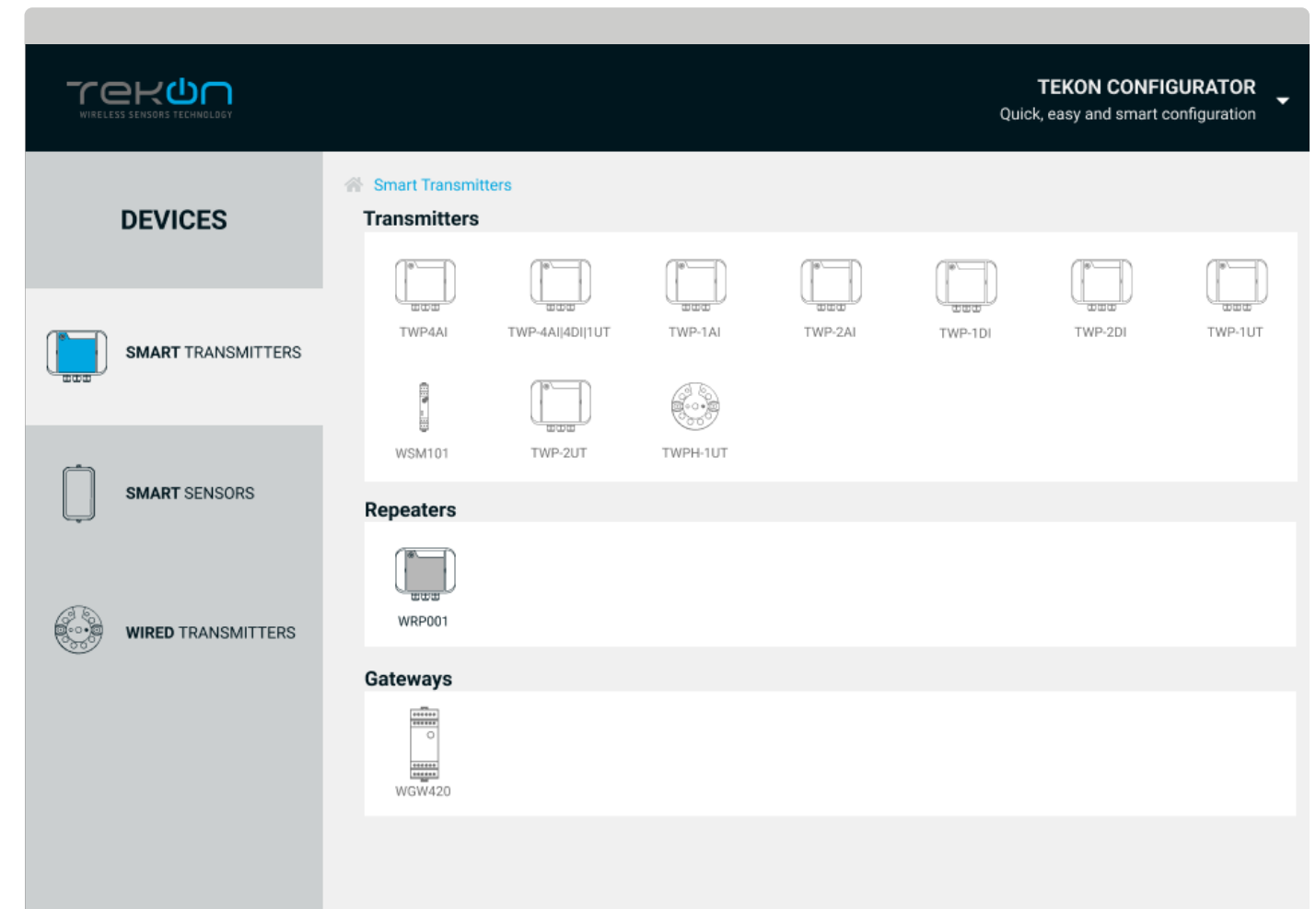
Wireless solution implemented to ensure ideal storage conditions for raw materials used in the production of non-food products, intended for human consumption.



### Coal plant production capacity monitoring

Sensor-to-cloud solution to monitor the production process status with HMI to consult operational data.

# Tekon Configurator



Tekon Electronics' product portfolio is configurable through software, where technicians can define network and measurement parameters. The software called Tekon Configurator has undergone a design renovation and is now more intuitive and simple. An easy-to-navigate and usable configuration interface is directly related to the implementation speed and resource optimization. It's a technological modernization that makes this tool an ally of integrators who will find it easier to use and take more advantage of its full potential.

### NEW MENU

The interface redesign introduces a standardization of the product categories of Tekon Electronics, distributing the products by families that are present in the catalog – Smart Sensors, Smart Transmitters and Wired Transmitters.

### SIMPLE USER INTERFACE

O novo software Tekon Configurator é mais fácil de navegar mas também é uma componente tecnológica mais atual. The initial screen of Tekon Configurator is prepared to reduce configuration time leading users to search for the product tab or using the side menu.

### PRODUCT SELECTION

Each device tab includes all the related products like transmitters, repeaters or gateways to simplify the access to the desired product.

### AVAILABLE SOON

The new software interface will be available soon on Tekon Electronics website on product pages or Download Center page.



# WIRED TRANSMITTERS



Tekon Electronics is a global, customer-oriented partner for reliable monitoring solutions.

Our product range covers Wireless Sensors, Wireless Transmitters, Wired Transmitters, Software, Probes and Accessories.

We are committed with the development of innovative solutions, delivering the highest quality products that fulfill the needs of each customer.

Along with our quality products and solutions, our brand is one of our most valuable assets. We also work with customized products and application solutions, frequently in close collaboration with our customers.



# DIN RAIL

Wired Sensors

## TDU301-I

UNIVERSAL ISOLATED DIN RAIL  
TRANSMITTER



### KEY FEATURES

**Universal Temperature Input**  
Thermocouples J, K, N, R, S and T  
PT100, PT500 and PT100 RTD

**4 to 20 mA analog output**

**2 status LED**

**Galvanic isolation 1,5kV AC**

**High accuracy measurement**

**High EMC Performance**

**Ultra-low profile**

TDU301-I is an ultra-flexible universal temperature transmitter which accepts the most used temperature sensors (resistance thermometers with 2, 3 or 4-wire system and thermocouples) and generates a linear 4 to 20mA output current signal with high stability as output.

VERSION  
REFERENCE

PA201610100

### TECHNICAL SPECIFICATIONS Applicable data at 23°C

INPUT	Measured variable	Temperature	Temperature
	Sensor type	PT100, PT500, PT1000	J, K, N, R, S, T
	Connection	1 Resistance thermometer*	1 Thermocouple (TC)
	Units	°C	°C
	Sensor current	200 µA	<11 nA
	Minimum measured span	50°C	50°C
*RTD in 2-wire, 3-wire or 4-wire.			
OUTPUT	Output signal	4 to 20 mA	
	Power supply (Uaux)	12 to 24V DC	
	Max. load	(Uaux - 12) / 0.021 A	
	Error signal (e.g. following sensor fault ) (conforming to NE43)	Software configurable 3,2mA or 21mA	
	Sample cycle	< 200ms	
	Protection	Against reversed polarity - Surge protection	
OPERATING ENVIRONMENT	Temperature range	-40 to 80°C	
	Relative humidity	≤95%, without condensation	
COMMON SPECIFICATIONS	Isolation voltage (test   operation)	1,5 kV AC   48 V AC	
	Internal power dissipation	40 mW to 0,5W	
	Voltage drop	12 V DC	
	Power-up time (TC)	< 600 ms	
	Power-up time (RTD)	< 1 s	

NEW

# DIN RAIL

Wired Sensors

## TDU302-I

VOLTAGE OUTPUT ISOLATED DIN RAIL TRANSMITTER



### KEY FEATURES

**Universal Temperature Input**  
Thermocouples J, K, N, R, S and T  
PT100, PT500 and PT100 RTD

**0 to 10 V analog output**

**2 status LED**

**Galvanic isolation 1,5kV AC**

**High accuracy measurement**

**High EMC Performance**

**Ultra-low profile**

TDU302-I is an ultra-flexible universal temperature transmitter which accepts the most used temperature sensors (resistance thermometers with 2, 3 or 4-wire system and thermocouples) and generates a 0 to 10 V output current signal with high stability as output.

VERSION  
REFERENCE

PA201610200

### TECHNICAL SPECIFICATIONS Applicable data at 23°C

INPUT	Measured variable	Temperature	Temperature
	Sensor type	PT100, PT500, PT1000	J, K, N, R, S, T
	Connection	1 Resistance thermometer*	1 Thermocouple (TC)
	Units	°C	°C
	Sensor current	200 µA	<11 nA
	Minimum measured span	50°C	50°C
*RTD in 2-wire, 3-wire or 4-wire.			
OUTPUT	Output signal	0 to 10 V	
	Power supply (Uaux)	12 to 24V DC	
	Load (@ voltage output)	≥ 5 kOhm	
	Error signal (e.g. following sensor fault ) (conforming to NE43)	Software configurable 3,2mA or 21mA	
	Sample cycle	< 200ms	
	Protection	Against reversed polarity - Surge protection	
OPERATING ENVIRONMENT	Temperature range	-40 to 80°C	
	Relative humidity	≤95%, without condensation	
COMMON SPECIFICATIONS	Isolation voltage (test   operation)	1,5 kV AC   48 V AC	
	Internal power dissipation	100 mW to 300 mW	
	Voltade drop	12 V DC	
	Power-up time (TC)	< 600 ms	
	Power-up time (RTD)	< 1 s	

# INHEAD

Wired Sensors

## THM501

PT100 TEMPERATURE  
HEAD TRANSMITTER



### KEY FEATURES

**RS-485 Output**

**PT100 sensor input**

**High precision and accuracy**

**Type DIN B connection head  
compatible**

THM501 is a temperature transmitter which accepts exclusively PT100 temperature sensors (with 2,3 or 4-wire configuration), and makes it available in a Modbus RTU slave register.

VERSION  
REFERENCE

PA151700100

### TECHNICAL SPECIFICATIONS Applicable data at 23°C

INPUT	Measured variable	Temperature
	Sensor type	PT100
	Connection	2 wires, 3 wires or 4 wires
	Units	°C
	Sensor current	600uA (2 or 4 wires); 300uA (3 wires)
	Response time	<100 ms
OUTPUT-MODBUS	Measuring range	-200°C to 850°C
	Physical layer	RS-485
	Slave address range	1 to 100
	Support baud rates	4800, 9600, 19200, 38400, 56000, 57600, 115200
	Supported parity	Odd/Even/None
	Response time	<100ms
OPERATING ENVIRONMENT	Communication start up time (after power ON)	10s
	Temperature range	-20 to 80°C
	Relative humidity	≤95%, without condensation

ACCESSORIES



#### RS485 TO USB CONVERTER CABLE

Cable to connect THM501 Transmitter to an USB port



NEW

# INHEAD

Wired Sensors

## THM502-I

RTD ISOLATED MODBUS HEAD  
TRANSMITTER



KEY FEATURES

- PT100, PT500 and PT100 RTD sensor input
- Ohm sensor input
- RS-485 Output
- 2 status LED
- Galvanic isolation 1,5kV AC
- High accuracy measurement

THM502-I is a temperature transmitter with RTD (PT100, PT500 and PT100) and ohm sensors input improved with galvanic isolation and providing data through a RS485 port over Modbus RTU protocol.

VERSION  
REFERENCE

PA212710100

TECHNICAL SPECIFICATIONS Applicable data at 23°C

INPUT	Measured variable	Temperature	Resistance
	Sensor type	PT100, PT500, PT1000	Resistance, Potentiometers
	Connection	2 wires, 3 wires or 4 wires	3 wires
	Units	°C	Ω
	Range	-200°C to 850°C	0 to 6000 ohm
	Sensor current	200 µA	200 µA
OUTPUT MODBUS	Physical layer	RS-485	
	Slave address range	1 to 100	
	Support baud rates	4800, 9600, 19200, 38400, 56000, 57600, 115200	
	Supported parity	Odd/Even/None	
	Response time	<100ms	
	Communication start up time (after power ON)	5 s	
COMMON SPECIFICATIONS	Isolation voltage (test   operation)	1,5 kV AC   48 V AC	
	Internal power dissipation	40 mW to 0,5 W	
	Voltage drop	12 V DC	
	Response time 90%	< 1 s	
	Power-up time (TC)	< 600 ms	
OPERATING ENVIRONMENT	Temperature range	-20°C to 80°C	
	Relative humidity	≤95%, without condensation	

ACCESSORIES



**RS485 TO USB CONVERTER CABLE**  
Cable to connect THM502-I Transmitter to an USB port

NEW

INHEAD

Wired Sensors

THM602-I

RTD ISOLATED MODBUS HEAD TRANSMITTER



KEY FEATURES

- Thermocouples C, J, K, N, R, S and T sensor input
- mV sensor input
- RS-485 Output
- 2 status LED
- Galvanic isolation 1,5kV AC
- High accuracy measurement

THM602-I is a temperature transmitter with thermocouples (C, J, K, N, R, S and T) and mv sensors input improved with galvanic isolation and providing data through a RS485 port over Modbus RTU protocol.

VERSION  
REFERENCE

PA212710200

TECHNICAL SPECIFICATIONS Applicable data at 23°C

INPUT	Measured variable	Temperature	DC Voltage
	Sensor type	C, J, K, N, R and T	DC voltage source
	Connection	2 wires	2 wires
	Units	°C	mV
	Range	Not configurable	-2000 to 2000 mV
OUTPUT MODBUS	Physical layer	RS-485	
	Slave address range	1 to 100	
	Support baud rates	4800, 9600, 19200, 38400, 56000, 57600, 115200	
	Supported parity	Odd/Even/None	
	Response time	<100ms	
COMMON SPECIFICATIONS	Communication start up time (after power ON)	5 s	
	Isolation voltage (test   operation)	1,5 kV AC   48 V AC	
	Internal power dissipation	40 mW to 0,5 W	
	Voltage drop	12 V DC	
	Response time 90%	< 1 s	
OPERATING ENVIRONMENT	Power-up time (TC)	< 600 ms	
	Temperature range	-20°C to 80°C	
	Relative humidity	≤95%, without condensation	

ACCESSORIES



RS485 TO USB CONVERTER CABLE  
Cable to connect THM602-I Transmitter to an USB port

# INHEAD

Wired Sensors

## THP101

PT100 TEMPERATURE  
HEAD TRANSMITTER



### KEY FEATURES

4 to 20 mA Output

PT100 sensor input

High precision and accuracy

Status LED's and test pads

NAMUR NE43 compliant

Sensor cable resistance and current  
output compensation

Type DIN B connection head  
compatible

THP101 is a PT100 temperature head transmitter to comply with the most simple applications. Supporting a current output and a sensor cable resistance compensation, it is a highly used commodity in multi-faceted scenarios.

VERSION  
REFERENCE

PA132720110

### TECHNICAL SPECIFICATIONS

Applicable data at 23°C

INPUT RESISTANCE THERMOMETER	Sensor type	PT100
	Connection	1 Resistance thermometer (RTD) in 2-wire, 3-wire or 4-wire system
	Units	°C
	Sensor current	600uA (2 or 4 wires); 300uA (3 wires)
	Response time	<500 ms
OUTPUT	Output signal	4 to 20mA
	Power supply (Uaux)	9 to 30 V DC
	Max. load	(Uaux - 9)/0.022A
	Over range	3 to 22 mA
	Error signal (e.g. Following sensor fault) (conforming to NE43)	Software configurable ≤3,6mA or ≥21mA
	Sample cycle	<1s
OPERATING ENVIRONMENT	Protection	Against reversed polarity - Surge protection
	Temperature range	-20 to 80°C

ACCESSORIES



**SARC2 - USB CONFIGURATOR**  
Connection between a PC USB port and THP101/THT201 universal temperature head transmitters



# INHEAD

Wired Sensors

## THT201

THERMOCOUPLE TEMPERATURE  
HEAD TRANSMITTER



### KEY FEATURES

- 4 to 20 mA Output
- Universal thermocouple sensor input  
E, J, K, N, R, S and T
- High precision and accuracy
- Status LED's and test pads
- NAMUR NE43 compliant
- Cold-junction and output current  
compensation
- Type DIN B connection head  
compatible

THT201 is a thermocouple temperature head transmitter to comply with the most simple applications. It is a highly used commodity in multi-faceted scenarios.

VERSION  
REFERENCE

PA132720210

### TECHNICAL SPECIFICATIONS

Applicable data at 23°C

INPUT THERMOCOUPLE	Sensor type	Thermocouples: E, J, K, N, R, S, T
	Open-circuit monitoring	Always active (cannot be disabled)
	Short-circuit monitoring	Not available
	Cold junction compensation (CJC)	Integrated resistance thermometer
	Measuring range	Configurable
OUTPUT	Output signal	4 to 20mA
	Power supply (Uaux)	9 to 30 V DC
	Max. load	(Uaux - 9)/0.022A
	Over range	3 to 22 mA
	Error signal (e.g. Following sensor fault) (conforming to NE43)	Software configurable ≤3,6mA or ≥21mA
	Sample cycle	<1s
OPERATING ENVIRONMENT	Protection	Against reversed polarity - Surge protection
	Temperature range	-20 to 80°C

ACCESSORIES



**SARC2 - USB CONFIGURATOR**  
Connection between a PC USB port and THP101/THT201 universal temperature head transmitters

# INHEAD

Wired Sensors

## THP102-I

PT100 ISOLATED TEMPERATURE  
HEAD TRANSMITTER



### KEY FEATURES

**Galvanic Isolation 1,5kV AC**

**PT100 Sensor Input**

**2 Status LEDs**

**High Measurement Accuracy**

**High EMC Performance**

**NAMUR NE 43 Compliant**

Galvanic isolation grant an improved EMC performance and eradicate major measurement errors, turning THP102-I into a reliable head transmitter to comply with several applications where PT100 probes are being used.

VERSION  
REFERENCE

PA183120110

### TECHNICAL SPECIFICATIONS Applicable data at 23°C

INPUT RESISTANCE THERMOMETER	Sensor type	PT100
	Connection	1 Resistance thermometer (RTD) in 3-wire system
	Units	°C
	Sensor current	200 µA
OUTPUT	Output signal	4 to 20mA
	Power supply (Uaux)	12 to 24V DC
	Max. load	(Uaux - 9)/0.021A
	Error signal (e.g. Following sensor fault) (conforming to NE43)	Software configurable 3,2mA or 21mA
	Sample cycle	< 200ms
COMMON SPECIFICATIONS	Protection	Against reversed polarity - Surge protection
	Isolation voltage (test   operation)	1,5 kV AC   48 V AC
	Internal power dissipation	40 mW to 0,5 W
	Voltage drop	12V DC
	Effect of supply voltage variation	< 0,003% of span/ V DC
	Response time 90%	< 1s
OPERATING ENVIRONMENT	Power-up time	< 1s
	Temperature range	-40 to 80°C
	Relative humidity	≤95%, without condensation

# INHEAD

Wired Sensors

## THT202-I

THERMOCOUPLE ISOLATED  
TEMPERATURE HEAD  
TRANSMITTER



### KEY FEATURES

4 to 20 mA Output

Galvanic Isolation 1,5kV AC

Thermocouple Sensor Input  
(J,K,N,R,S,T)

Wide Measurement Range

2 Status LEDs

High Measurement Accuracy

High EMC Performance

NAMUR NE 43 Compliant

Galvanic isolation grant an improved EMC performance and eradicate major measurement errors, turning THT202-I into a reliable head transmitter to comply with several applications where thermocouple probes are being used.

VERSION  
REFERENCE

PA183120210

### TECHNICAL SPECIFICATIONS Applicable data at 23°C

INPUT THERMOCOUPLES	Sensor type	Thermocouples: J, K, N, R, S, T
	Connection	1 Thermocouple (TC)
	Units	°C
	Sensor current	<11 nA
	Cold junction compensation (CJC)	Integrated resistance thermometer
OUTPUT	Output signal	4 to 20mA
	Power supply (Uaux)	12 to 24V DC
	Max. load	(Uaux - 12)/0.021A
	Error signal (e.g. Following sensor fault) (conforming to NE43)	Software configurable 3,2mA or 21mA
	Sample cycle	< 200ms
COMMON SPECIFICATIONS	Protection	Against reversed polarity - Surge protection
	Isolation voltage (test   operation)	1,5 kV AC   48 V AC
	Internal power dissipation	40 mW to 0,5 W
	Voltage drop	12V DC
	Effect of supply voltage variation	< 0,003% of span/ V DC
	Response time 90%	< 1s
OPERATING ENVIRONMENT	Power-up time	< 600ms
	Temperature range	-40 to 80°C
	Relative humidity	≤95%, without condensation



# INHEAD

Wired Sensors

## THU301-I

UNIVERSAL TEMPERATURE  
ISOLATED HEAD TRANSMITTER



### KEY FEATURES

4 to 20 mA Output

Galvanic Isolation 1,5kV AC

Universal Sensor Input  
Thermocouple J,K,N,R,S,T; PT100,  
PT500 and PT1000 RTD

Wide Measurement Range

2 Status LEDs

High Measurement Accuracy

High EMC Performance

NAMUR NE 43 Compliant

Galvanic isolation grant an improved EMC performance and eradicate major measurement errors, turning THU301-I in a reliable head transmitter to comply with several applications where thermocouple probes are being used.

VERSION  
REFERENCE

PA183120010

### TECHNICAL SPECIFICATIONS

Applicable data at 23°C

INPUT	Measured variable	Temperature	Temperature
	Sensor type	PT100, PT500, PT1000	J, K, N, R, S, T
	Connection	1 Resistance thermometer*	1 Thermocouple (TC)
	Units	°C	°C
	Sensor current	200 µA	<11 nA
RTD	Minimum measured span	50°C	50°C
TC			

\*RTD in 2-wire, 3-wire or 4-wire.

OUTPUT	Output signal	4 to 20 mA
	Power supply (Uaux)	12 to 24V DC
	Max. load	(Uaux - 12) / 0.021 A
	Error signal (e.g. following sensor fault ) (conforming to NE43)	Software configurable 3,2 mA or 21 mA
	Sample cycle	< 200ms
Protection		Against reversed polarity - Surge protection

OPERATING ENVIRONMENT	Temperature range	-40 to 80°C
	Relative humidity	≤95%, without condensation

# INHEAD

Wired Sensors

## THU1102

UNIVERSAL TEMPERATURE  
HEAD TRANSMITTER



### KEY FEATURES

4 to 20 mA Output

Universal sensor input  
(RTD, thermocouple, etc)

NAMUR NE43 compliant

Cold-junction, sensor cable resistance  
and output current compensation

Type DIN B connection head  
compatible

THU1102 is an universal temperature head transmitter to comply with different applications. Supporting a current output, sensor cable resistance and cold-junction compensation, it is a highly used commodity in multi-faceted scenarios.

VERSION  
REFERENCE

PA110020100

### TECHNICAL SPECIFICATIONS

Applicable data at 23°C

INPUT	Measured variable	Temperature	Resistance	Temperature	DC Voltage
	Sensor type	PT100, PT500, PT1000	Resistance, potentiometers	E, J, K, N, R, S, T	DC Voltage source
	Connection	1 Resistance thermometer*	2-wire	1 Thermocouple (TC)	-
	Units	°C	Ω	°C	mV
	Sensor current	<0,05 mA (50 uA)	<0,05 mA (50 uA)	<0,05 mA (50 uA)	-
	Response time	<500 ms	<500 ms	<500 ms	<500 ms

\*RTD in 2-wire, 3-wire or 4-wire.

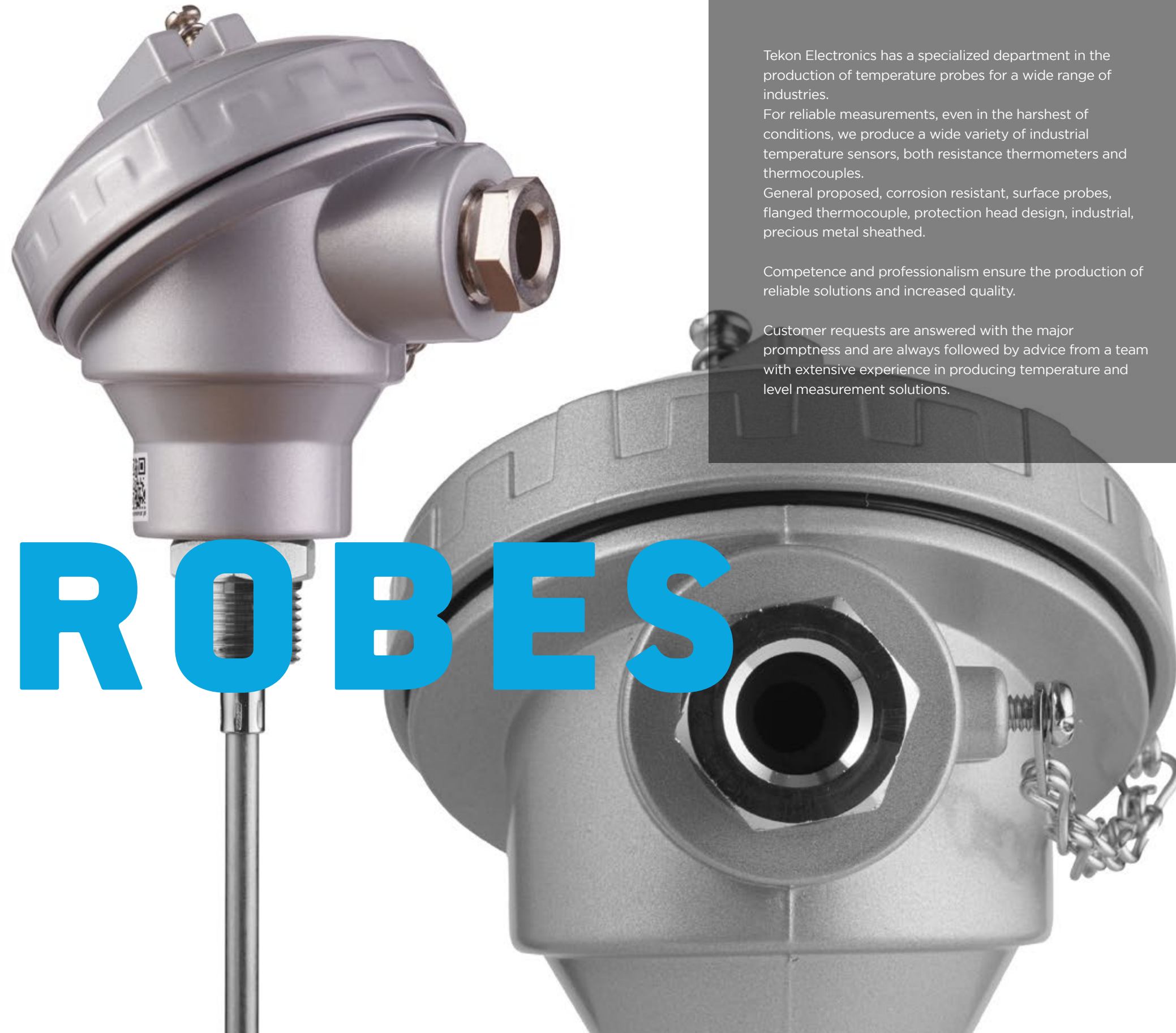
OUTPUT	Output signal	4 to 20 mA
	Power supply (Uaux)	9 to 30V DC
	Max. load	(Uaux - 9) / 0.022 A
	Overrange	3 to 22 mA
	Error signal (e.g. following sensor fault ) (conforming to NE43)	Software configurable ≤ 3,6mA or ≥ 21mA
	Sample cycle	<1s
OPERATING ENVIRONMENT	Protection	Against reversed polarity - Surge protection

OPERATING ENVIRONMENT	Temperature range	-20 to 80°C
	Relative humidity	≤95%, without condensation

ACCESSORIES



**SARC1105 - USB CONFIGURATOR**  
Connection between a PC USB port and THU1102 universal temperature head transmitter;



Tekon Electronics has a specialized department in the production of temperature probes for a wide range of industries.

For reliable measurements, even in the harshest of conditions, we produce a wide variety of industrial temperature sensors, both resistance thermometers and thermocouples.

General proposed, corrosion resistant, surface probes, flanged thermocouple, protection head design, industrial, precious metal sheathed.

Competence and professionalism ensure the production of reliable solutions and increased quality.

Customer requests are answered with the major promptness and are always followed by advice from a team with extensive experience in producing temperature and level measurement solutions.

# PROBES



# Temperature and level probes



## KEY FEATURES

### OEM

**Production according to customized specifications**

**Fast assembly and delivery**

**Digital Temperature Probes**

Tekon has a specialized department in the production of temperature probes for a wide range of industries. Competence and professionalism ensure the production of reliable solutions and increased quality. Customer requests are answered with major promptness and are always followed by advice from a team with extensive experience in producing temperature and level measurement solutions.

Contact us for more information on probes completely produced according to the specific requirements of your process.

## DIGITAL PROBES

Our digital probes offer an I2C/SPI digital interface or other to be specified, adding to the probes the advantages inherent to the digital universe, from traceability, customized configurations to customer data. We manufacture custom-made digital temperature probes suitable for several applications:

- **Cooling and industrial freezing;**
- **Food processing;**
- **Wireless monitoring systems;**
- **Portable devices for temperature measurement**



## RTD

Resistance Temperature Detector (RTD) temperature probes, are featured by the acquisition of temperature through thermoresistors made of metals with fluctuation of electrical resistance. The stability guaranteed by this type of sensors, makes them widely used in various applications. The most common types of RTD's on the market - PT100 and PT1000 - and specially - PT120, PT500 and PT10000 - can be divided into several accuracy classes: B, A, 1/3 and 1/10.

Tekon Electronics produces single RTD temperature probes with 2, 3 or 4 wire connections and double probes with 4 or 6 wire connections.



## THERMOCOUPLES

Thermocouple sensors consists on two wires made of different types of materials, fused at a single point, creating a thermal junction. When this junction experiences a temperature change, a voltage that is proportional to the temperature difference between the connection terminals and the junction is created. The most frequent thermocouple types are J, K, N, S, R, T and E. The special thermocouple types B, G, C and D are used in environments with temperatures that can reach 2600°C. The choice of the thermocouple must consider the following specifications:

- **Temperature range;**
- **Accuracy;**
- **Work conditions.**



## MINERAL INSULATED INCONEL

Our experienced production team is able to build thermocouple probes with an inconel coating, ensuring that all the necessary requirements from storage to the production process are protected in order to obtain a final product with high quality.



## THERMISTOR

Thermistors are temperature sensors that vary the resistance of the semiconductor element according to the temperature to which they are exposed. There are two types of thermistors:

- **NTC** (Negative Temperature Coefficient) - thermistors whose coefficient of resistance variation with temperature is negative: resistance decreases with increasing temperature.
- **PTC** (Positive Temperature Coefficient) - thermistors whose coefficient of resistance variation with temperature is positive: resistance increases with increasing temperature.

Thermistors have a high thermal coefficient which gives them a high sensitivity, causing great resistance variations for small temperature variations.



## LEVEL

Tekon Electronics is also dedicated to the production of magnetic level probes which are easy to install and oriented to vertical assemblies. The level probes can contain up to 5 detection points, operating in applications with temperatures up to 125°C and 10 bar pressure.



## REFERENCE TABLE

PRODUCT DESIGNATION		REFERENCE		
		HOUSING COLOR	868 MHz	915 MHz
PLUS	PLUS TWP4AI Wireless Transmitter	WHITE	PA164510110	PA164510120
	PLUS TWP-1AI Wireless Transmitter	WHITE	PA202320310	PA202320320
	PLUS TWP-2AI Wireless Transmitter	WHITE	PA202320410	PA202320420
	PLUS TWP-1DI Wireless Transmitter	WHITE	PA202320510	PA202320520
	PLUS TWP-2DI Wireless Transmitter	WHITE	PA202320610	PA202320620
	PLUS TWP-1UT Wireless Transmitter	WHITE	PA202320110	PA202320120
	PLUS TWP-2UT Wireless Transmitter	WHITE	PA202320210	PA202320220
	PLUS TWP-1UT-IN Wireless Transmitter	WHITE	PA202320111	PA202320121
	PLUS TWP-2UT-IN Wireless Transmitter	WHITE	PA202320211	PA202320221
	PLUS TWP-4AI4DI1UT Wireless Transmitter	WHITE	PA164510610	PA164510620
	PLUS TWPH-1UT Wireless Transmitter	WHITE	PA164510510	PA164510520
	PLUS WGW420 Wireless Gateway	WHITE	PA164510210	PA164510220
	PLUS WRP001 Wireless Repeater	WHITE	PA164510310	PA164510320
	PLUS PIM101 IoT Module	WHITE	PA201620110	
	WSM101 Wireless Serial Module	WHITE	PA202310110	PA202310120

DUOS	DUOS TEMP Wireless Transmitter Built-in Probe	BLACK	PA160411710	PA160411730
		WHITE	PA160411720	PA160411740
	DUOS TEMP Wireless Transmitter	BLACK	PA160410110	PA160410130
		WHITE	PA160410120	PA160410140
	DUOS HYGR0TEMP Wireless Transmitter	BLACK	PA164520110	PA164520130
		WHITE	PA164520120	PA164520140
	DUOS Di+TEMP Wireless Transmitter	BLACK	PA160411210	PA160411230
		WHITE	PA160411220	PA160411240
	DUOS C02 Wireless Transmitter	BLACK	PA160411110	PA160411130
		WHITE	PA160411120	PA160411140
	DUOS inTemp Wireless Transmitter	WHITE	PA210310110	PA210310120
	DUOS inC02 Wireless Transmitter	WHITE	PA210310210	PA210310220
	DUOS inHygrotemp Wireless Transmitter	WHITE	PA210310310	PA210310320
	DUOS inAir Wireless Transmitter	WHITE	PA210310410	PA210310420
	DUOS uTemp Wireless Transmitter	WHITE	PA210320120	PA210320140
	DUOS Gateway	BLACK	PA160410210	PA160410250
		WHITE	PA160410230	PA160410270
	DUOS IoT Gateway	BLACK	PA160410220	PA160410260
		WHITE	PA160410240	PA160410280
	DUOS Repeater	BLACK	PA160410310	PA160410330
		WHITE	PA160410320	PA160410340

DIN RAIL	TDU301-I - Universal Isolated Transmitter	WHITE	PA201610100
	TDU302-I Voltage Output Isolated Transmitter	WHITE	PA201610200

INHEAD	THP101 PT100 Temperature Transmitter	BLUE	PA132720110
	THT201 Thermocouple Temperature Transmitter	BLUE	PA132720210
	THP102-I PT100 Isolated Head Transmitter	WHITE	PA183120110
	THT202-I Thermocouple Isolated Head Transmitter	WHITE	PA183120210
	THU301-I Universal Isolated Head Transmitter	WHITE	PA183120010
	THU1102 Universal Temperature Transmitter	BLUE	PA110020100
	THM501 PT100 Temperature Transmitter With Modbus output	BLUE	PA151700100
	THM502-I RTD Isolated Modbus Transmitter	WHITE	PA202710100
	THM602-I Thermocouple Isolated Modbus Transmitter	WHITE	PA202710200

## ACCESSORIES

	PRODUCT DESIGNATION	REFERENCE
PLUS	Antenna Cable Extension 2MT	PA123772100
	Buz Connection Head For Wireless Transmitters	PA123790200
	Buz Connection Head For Wireless Transmitters with probe	PA123791100
	RS485 To USB Converter Cable	PA123790400
	Internal Primary Batteries Kit	PA123791200
	Internal Rechargeable Batteries Kit	PA123791300
	Wall Mount Antenna with 3MT cable 868MHZ	PA123791400
	Pole Mount Directional Antenna with 5M Cable 868/915MHZ	PA123791500
	Antenna Base	PA123792200
	Primary Batteries Power Box	PA123791201
	Rechargeable Batteries Power Box	PA123791301
	Solar Panel 1W	PA123791600
	Solar Panel Mounting Bracket	PA123791601
	Mounting Bracket	PA123791700

DUOS	Transmitter SARC	PA160410005
	Power Supply Type A	PA160412810
	Power Supply Type G	PA160412710
	Power Supply Type C	PA160410006
	Power Supply Type C 5 V DC	PA160413610
	Gateway External Cable	PA160410007
	External Power Cable	PA160410008
	Transmitter Mounting Clip	PA160410910
	Transmitter Mounting Bracket	PA160410810
	Gateway/Repeater Mounting Clip	PA160411010
	Digital Temperature Probe	PA160410001
	Digital Temperature Probe with 2MT Cable	PA160410002
	Digital Temperature Probe with 5MT Cable	PA160410003
	Humidity + Temperature Probe TK07-PFT5	PA164520001
	Humidity + Temperature Probe TK07-PFT5 With 2Mt Cable	PA164520004
	C02 Probe TK871-HR5000J2	PA160410010
	C02 Probe TK871-HR5000J2 With 2MT Cable	PA160410011
	Di+TEMP External Cable	PA160410009
	Digital Temperature Probe with 2MT Cable for High Temperature	PA160413410
	Digital Temperature Probe with 5MT Cable for High Temperature	PA160413510
	M8 Male Connector with NTC	PA160413710

INHEAD	SARC1105 – USB Configurator	PA110050100
	SARC2 – USB Configurator	PA132720310

# COMPOSTING

Sensor-to-cloud solution  
to monitor composting process  
in biodegradable waste

Tekon Electronics developed a combined transmitter and probe solution with 1 or 2 measuring points. Measuring probes are powered by internal batteries, rechargeable via a solar panel. Therefore, a continuous and sustainable remote monitoring is ensured.

Temperature measurements are sent to the solution's gateway which, via a module with an internet connection, will send data to the cloud where it can be viewed and analyzed in real time, on the Tekon IoT Platform, a visualization platform and advanced data analysis from Tekon Electronics.

**Note: data can be available to local automation systems. Contact our team to learn more about this option.**



## SOLUTION ANATOMY

Each measuring point consists of a temperature probe and a wireless transmitter. The temperature probe can be composed by 1 or 2 measuring points, according to the customer's requirements. The wireless transmitter, installed on top of the probe, can be powered in two ways:

- **Solar panel:** powered by solar energy that charges rechargeable batteries, existing inside the transmitter. The batteries can also be rechargeable via a mini USB port inside the transmitter.
- **Primary batteries:** lithium/alkaline battery pack for direct supply, inside the transmitter. It can be used with rechargeable batteries externally.

## QUICK, RELIABLE AND SECURE

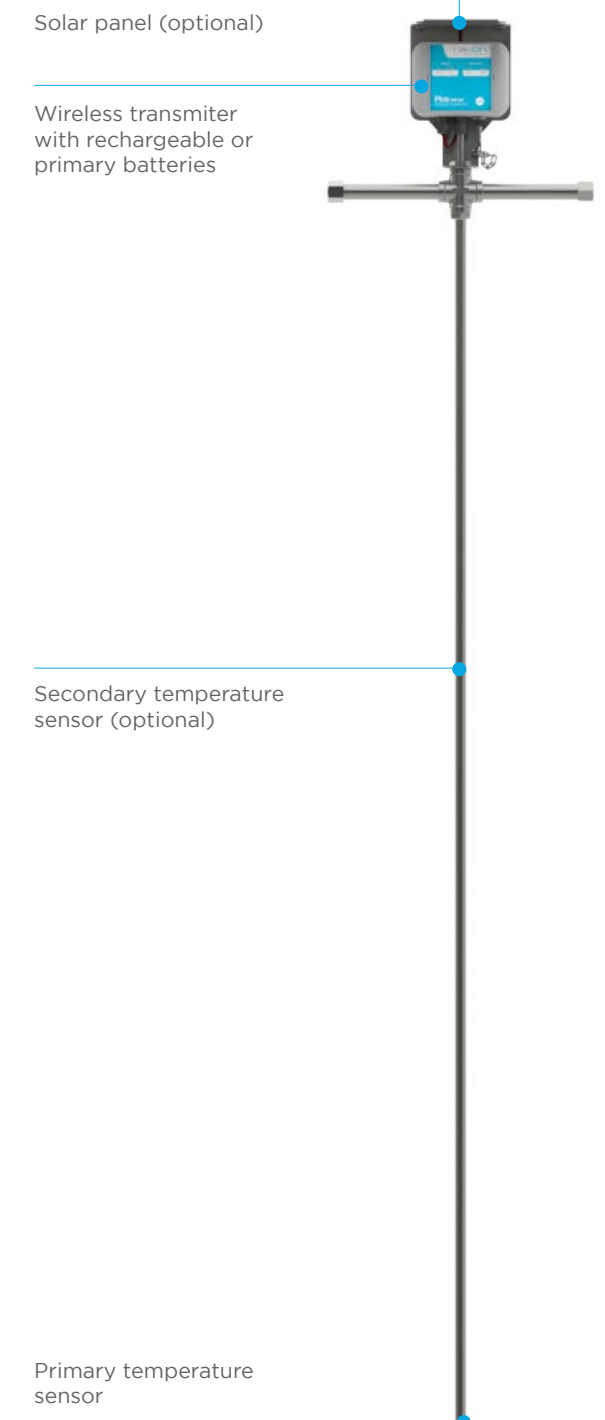
Exclude the manual process of measuring and recording temperatures from the composting process. With Tekon IoT Platform data analysis tool, you can quickly access data from any device and place. Reduce the risk of accidents at work, avoiding contact with the fermentation atmosphere. Monitoring is done remotely and continuously.

## WIRELESS MONITORING

Our composting solutions work under a dedicated network to secure the collected data. All the processes can be monitored in our Tekon IoT Platform, working local or on the cloud.

## TEKON IOT PLATFORM

Tekon IoT Platform is a data visualization and analysis solution, fully developed by Tekon Electronics. Through this tool, you can consult the data from your probes and processes, at any time, from any device. You can configure alerts that focus on temperatures and other variables in the monitoring process, which will send you notifications by email or SMS, whenever the process reaches or exceeds the defined values.







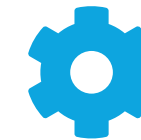
# BENEFITS OF COMPOSTING

## MONITOR SOLUTION



### QUICK INSTALLATION

Suitable design to allow a quick and secure field installation.



### PROCESS KNOWLEDGE

Real-time and continuous monitoring provides a complete overview of all composting process phases – mesophilic, thermophilic and maturation.



### REPORTING

Export data from monitoring process or create periodic reports automatically sent to managers and operators.



### SUSTAINABILITY

A solar powered solution that promotes the sustainability of your application and reduces operational costs. It includes a magnetic on/off switch to save energy when the probe is not in use. Also available without solar panel and with battery pack, for indoor applications.



### SCALABILITY

Each wireless network supports up to 55 measurement points with 1 or 2 temperature sensors.



### IMPROVE WORK SAFETY

Automatic recording of temperatures eliminates the need of having a worker constantly moving to the compost pile to perform manual temperature records, reducing the occurrence of work accidents.

# LoS

## Line Of Sight

The success of wireless communications depends on the environment where communication occurs. The exchange of data between transmitters and receivers via wireless communication requires that the best conditions are compiled for this operation to be carried out effectively. When we are working on wireless communications, in addition to the need to use equipment and components with the intended application characteristics it is essential to analyse the physical environment between the communication points.

### What is Line of Sight?

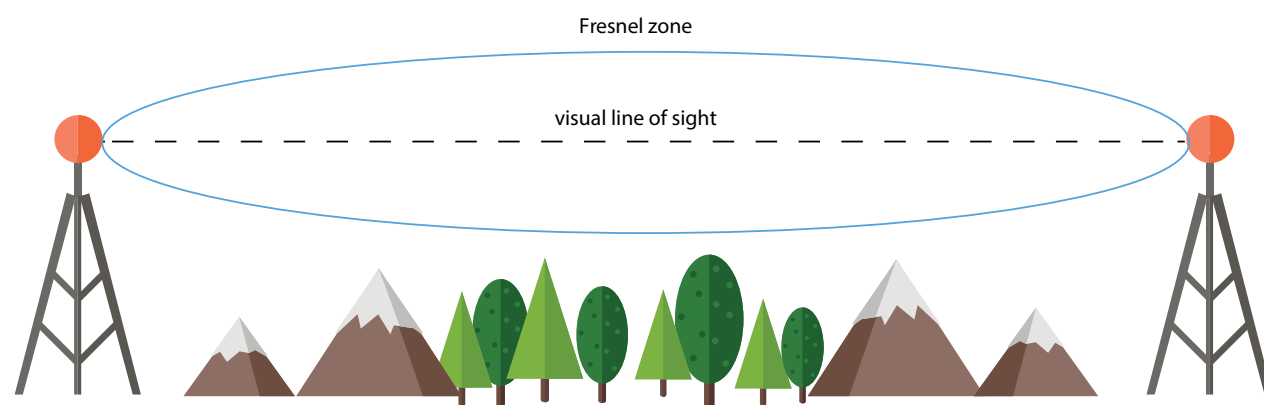
The most common meaning for this term refers to the line of sight between two points, where they can be observed directly to each other. However, LoS which is often referred in the context of wireless communication, or more commonly, in the diffusion of electromagnetic waves, in addition to directional visual field between the points being clear, encompasses in this term the whole environment around that

The space where communication takes place will always have several conditioning factors that lead to communication does not occurring effectively or simply not occurring at all. Usually, technicians and engineers consider communication range feature that in addition to their unit of measurement comes with the LoS abbreviation, known as Line of Sight.

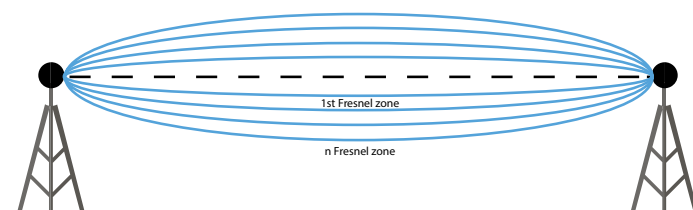
fictitious line, known as Fresnel zone, which should be totally clear, so that the ideal conditions for the propagation of electromagnetic waves are recorded. The obstruction of this zone may be constrained by human construction (e.g. buildings) or by interference from natural sources (e.g. trees and mountains) or even by the curvature of the earth in the case of high communication distances.

Sara can't handle it

Line of Sight



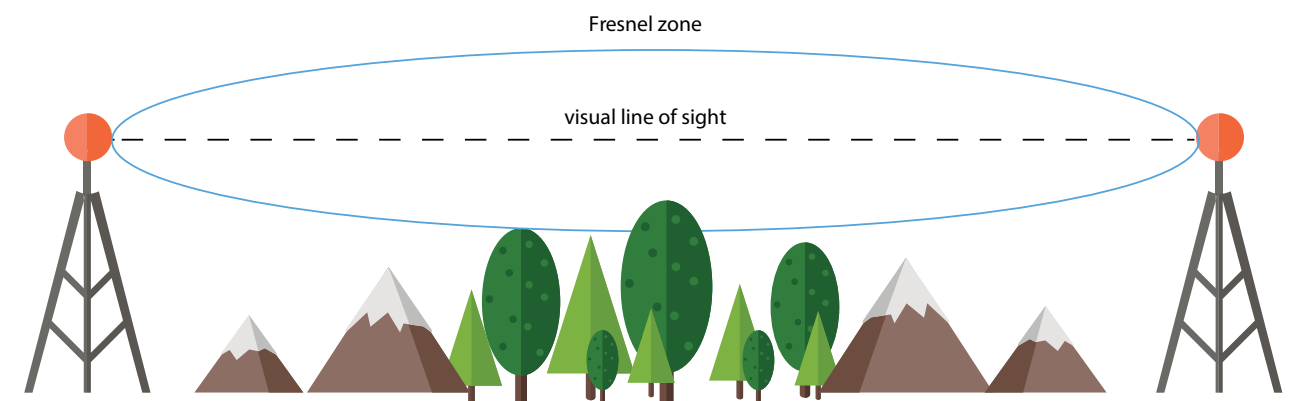
**Fresnel zone** is an elliptical, three-dimensional area formed around the direct line of sight between the two communication points, formed of theoretically infinite layers of the same shape but with different sizes. The degree of interference in the communication increases as the obstruction approaches the closest area of the visual field.



### Near Line of Sight

This term is applied when there are obstructions within the Fresnel zone but where the line of sight between two communication points remains unobstructed. The presence of a partial occupation of the Fresnel zone does not block the communication signal but promotes the degradation of the transmitted signal quality.

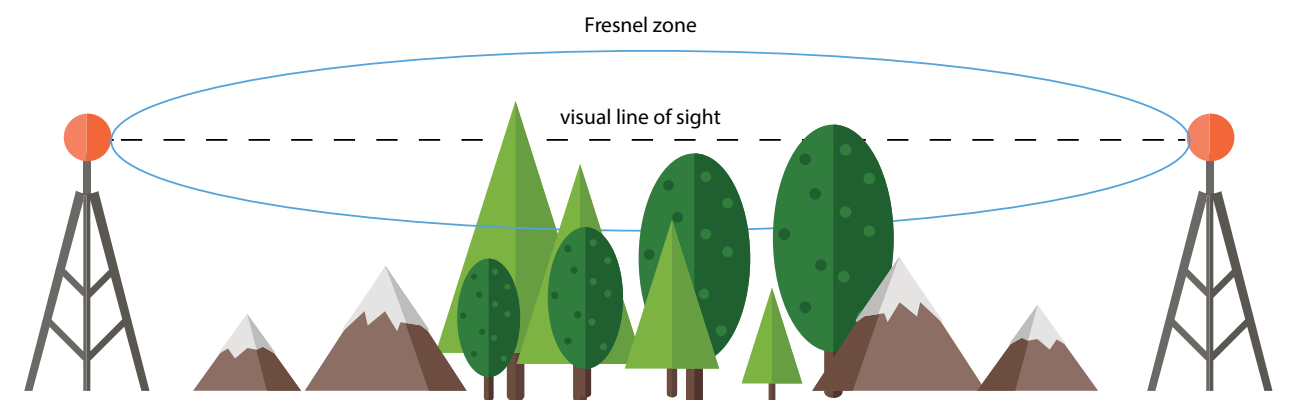
Near Line of Sight



### Non Line of Sight

There is a physical barrier that partially blocks the first Fresnel zone and that completely blocks the visual line between the two communication points. This scenario is usually verified in wireless applications, reducing communication range.

Non Line of Sight



### Wireless communication range

Our portfolio of wireless products is tested in scenarios with LoS conditions, to guarantee a reference unit of measurement for communicational reach. However, most product applications occur in applications where these communication conditions

are not met.

Within an application environment, blockages to communications can be caused by physical infrastructures (concrete walls, isolated chambers, metal plates, etc.) or signal interferences caused by other existing systems.

# WORLDWIDE DISTRIBUTION



Boris Hounkpati  
Technical & Sales Manager  
Instrumentys, France



Tekon's product line, IoT platform, service and support all contribute to excellence. The design of the products reflects a great knowledge of industrial processes, automation and engineering.

Thus with the DUOS range, which has been developed over the years, thanks to the great work of the R&D team, you can monitor the environment of your storage, production and office areas. The commissioning of Smart Sensors is very simple and intuitive.

On the other hand, the Smart Transmitters of the PLUS series fulfil two functions. Eliminate cables and at the same time make installations more flexible and connect industrial process. The aim is brilliantly fulfilled because whatever you are measuring on your process, temperature, pressure, flow, level, vibration, you can now upload these measurements on the cloud. Other manufacturers also offer similar solutions but not the degree of freedom that you have with PLUS Smart Transmitters. The same goes for the Tekon IoT Platform, which allows you to aggregate all your measurement data, view it as a curve, counter and make analyses. The automatic reports allow for an undeniable gain in productivity and the alarms by e-mail, SMS and programmable phone calls give you peace of mind. Data is a very important resource, so Tekon understands customers who want to have this valuable data within their organization. A local version of the Tekon IoT Platform with similar functions is available.

The attention to detail in the designing of the products and the continuously improving IoT Platform make Tekon solutions excellent and worth of trust.



Tekon's advanced wireless technology provided to our clients the possibility to reach blind spots in their operations drastically increasing monitoring and control capabilities while decreasing implementation cost.



Roberto Zac  
Operations Manager  
Dakol, Brazil



# CUSTOMER SERVICE



Fernando Costa  
Sales & Business Development  
Tekon Electronics



Customer service is the act of supporting and advocating for customers in their discovery, use, optimization, and troubleshooting of a product or service. It's also the processes that support the teams making good customer service happen."

This is the first result that showed up on a search engine when I looked for it online and immediately some well-known brands that fit on that definition came to my head.

Nevertheless, large organizations often consider customer service a cost center and lowering expenses quickly becomes a priority for them. Automatic call centers, untrained staff, poor documentation, website loopholes and dead ends, we all know the experience.

And an experience is what happens every time someone engages with a product, or a brand or an organization and it all starts with an expectation or a need that needs to be fulfilled.

So, at Tekon we try to achieve that by learning what our customers need and imagining how we can help them achieve their goals.

Because we show up consistently and keep up with expectations, we don't consider customer service a burden. For us, it is a profit center and it repays many times over.

It's quite simple to understand: a customer that calls us is fully enrolled and so the spotlight is on us and that will create an experience (good or bad), unlike any other marketing or sales interaction.

Also, since our bigger competitors decided to treat this interaction as a cost, we'll probably do a great job and the customer will have a nice story to remember (and spread).

Finally, we know that the most valuable customers are the loyal ones so instead of shouting marketing words to get new ones, we try to convert existing customers into repeating ones and long-term partners.

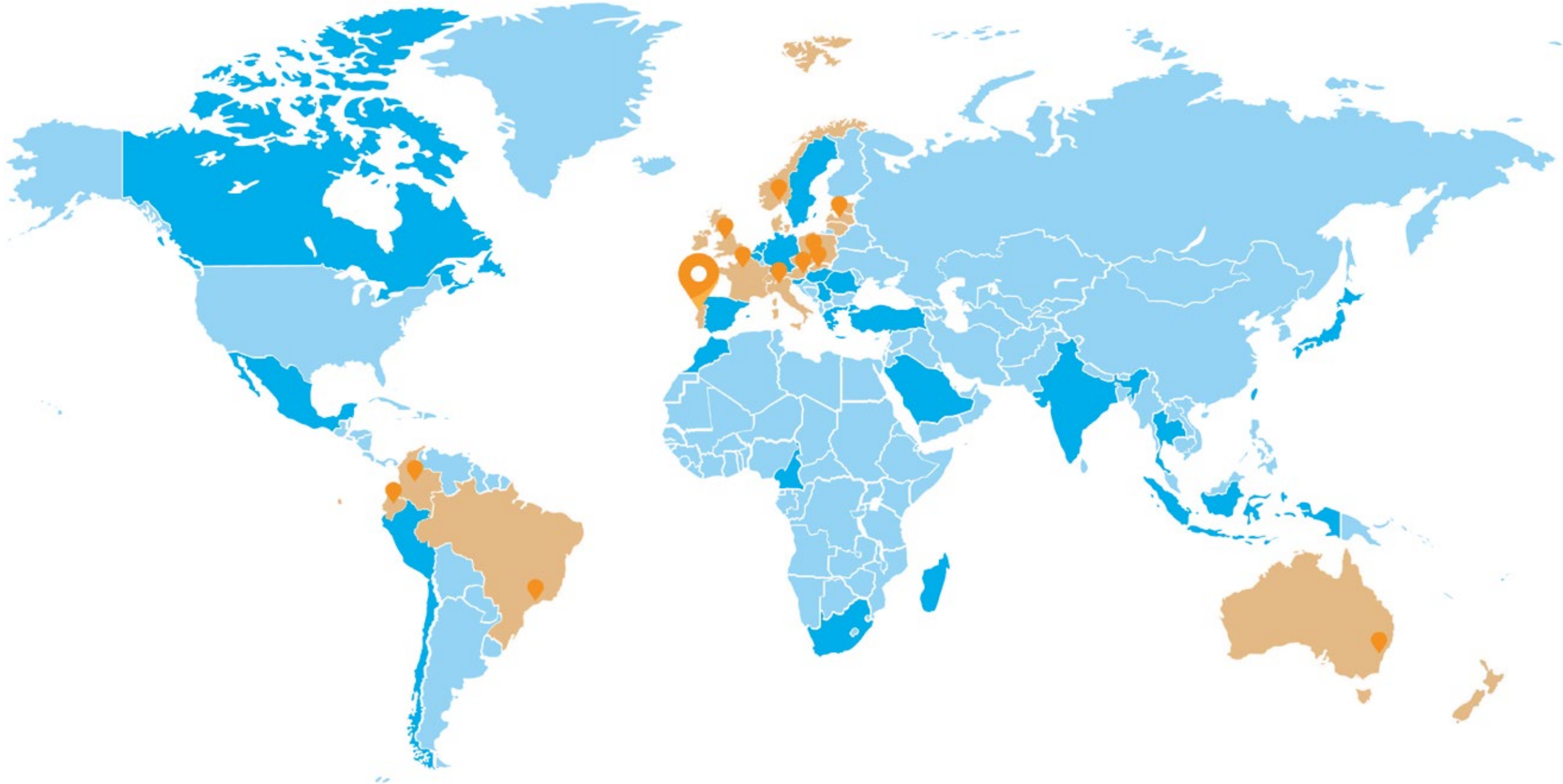
We're willing to make assertions and be wrong in our way to be useful, but we have the courage to meet your pains and listen to you in your terms because we quickly learned that the single most important part of our job as a brand is being sure that we make great products and ship good solutions.

That's the story we want to spread about our brand and the experience you get when you decide to partner with us.

We're ready when you are.

TEKON  
ELECTRONICS  
WORLDWIDE

- Headquarters
- Local Partners
- Product Presence



HEADQUARTERS	AUSTRALIA / NEW ZEALAND	AUSTRIA	BRAZIL	COLOMBIA	ECUADOR	FRANCE		
<b>TEKON ELECTRONICS</b> Avenida Europa, 460 Quinta do Simão - Esgueira 3800-230 Aveiro, Portugal +351 234 303 320 sales@tekonelectronics.com Contact person: Fernando Costa	<b>LEVELTEC ENGINEERING</b> 41 Tate Street, Gloucester, New South Wales, Australia +61 2 6558 9264 sales@leveltec.com.au Contact person: Ben Stokes	<b>BEVMAT E.U.</b> Muehlgasse 8 AT-2544 Leobersdorf, Austria +43 6767820774 office@bevmat.eu Contact person: Martin Mateyka	<b>DAKOL</b> Rua Dr. Mello Nogueira 105/518 CEP 02510-040 Vila Baruel - São Paulo, Brasil +55 11 3855-0060 vendas@dakol.com.br Contact person: Roberto Zac	<b>TECNOMEDICION SAS</b> Carrera 26 N.11 - 48 Bogotá, Colombia +57 3108838506 contactenos@tecnomedicion.com Contact person: Gilberto Lozada	<b>HAMMER SENSORS</b> Alberto Spencer Y Borbon S27-219 Pasaje 2 - 170606 Quito +593 998088040 gerencia@hammersensors.com Contact person: Rommel Castillo	<b>SAS INSTRUMENTYS</b> 4 Ter Rue De La Chaumière 28700 Auneau-Bleury-Saint-Symphorien +33 658672609 bh@instrumentys.com Contact person: Boris Hounkpati		
		ITALY	LATVIA / LITHUANIA / ESTONIA	NORWAY / DENMARK	POLAND	SLOVAKIA / CZECH REPUBLIC	UNITED KINGDOM / IRELAND	
		<b>MAFFIOLETTI SRL</b> Via San Marino 2 24044 Dalmine - Bergamo, Italy +39 035505115 info@maffioletti.net Contact person: Luca Saccinto	<b>ZTF LASMA</b> Krivu street 11, LV-1006, Riga, Latvia +371 6754 5217 info@lasma.lv Contact person: Lauris Berzins	<b>TORMATIC AS</b> Skreppestadveien 24, 3261 Larvik, Norway +47 33165020 christer@tormatic.no Contact person: Christer Dreng	<b>GUENTHER POLAND</b> Ul. Wroclawska 27C 55-095 Dlugoleka, Polska +48 71 352 70 70 biuro@guenther.com.pl Contact person: Szymon Adamski	<b>ELSO PHILIPS</b> Jilemnického 2, 911 01 Trenčín Slovakia +421 32 658 2410 elso@elso.sk Contact person: Marián Hubinský	<b>ELECTROSERV+</b> 4 Heather Cl, Macclesfield SK11 OLR, United Kingdom +44 1625 618526 sales@electroserv.co.uk Contact person: Simon Fisher	

**TEKON ELECTRONICS**  
a brand of Bresimar Automação S.A.

Avenida Europa, 460  
Quinta do Simão - Esgueira  
3800-230 Aveiro  
PORTUGAL

P.: +351 234 303 320  
M.: +351 933 033 250  
+351 932 194 163  
E.: sales@tekonelectronics.com

Authorized Local Distributor

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