



data loggers

- **MacIQ WM**
- **MacIQ WM Pulse**
- **MacR6 N**





MacIQ WM

IoT telemetry module

MacIQ WM is a compact telemetry module which is an element of stationary water meter reading system.

This simple Plug & Play solution does not require construction of an infrastructure. The product utilises cutting-edge technology aligned with the Internet of Things (IoT) trend, with an enhanced radio signal propagation and a particular focus on coverage. The device operates in licensed telecommunication networks in the NB-IoT or LTE Cat.M1 standard.

Module ensures effective data transmission even from challenging locations, and is tailored to the real-time system requirements, enabling immediate incident reporting. It allows for optimised water network efficiency and the generation of reports.

Device is also equipped with an NFC interface for local configuration and reading of the device's recorded data using the ConflIT! data loggers mobile application.

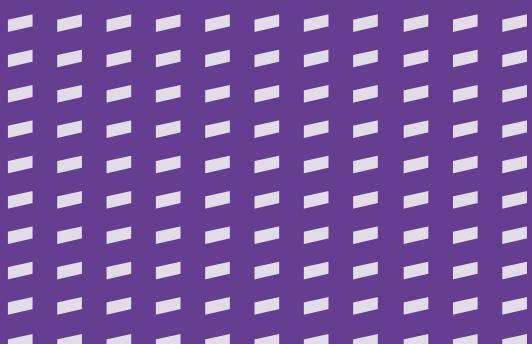
accessories

- eWebtel p. 25
- ConflIT! data loggers p. 27
- ConflIT! MacIQ WM p. 28



key benefits

- easy solution to enable remote readouts from the mechanical water meters
- readouts efficiency independent from environmental factors like constantly flooded water meter chamber
- readouts always in time guaranteed by the remote transmission
- eliminating risk of human mistake when manually reading the meter or illegible water meter totalizer
- immediate alarm action when consumption profile suddenly changes - leaks monitoring



main features

of the MacIQ WM module

- communication standard based on NB-IoT or Cat. M licensed bands
- efficient two-way communication with low level signal
- working period of more than 10 years
- multiplanar magnetic field interference detection
- optical indicator of connection with data platform

compatibility

of the MacIQ WM module

Diehl water meters



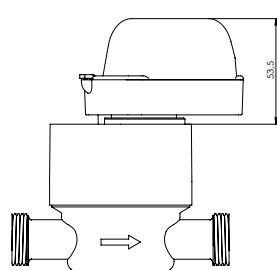
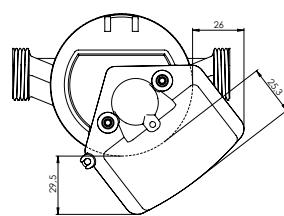
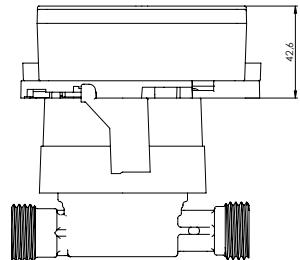
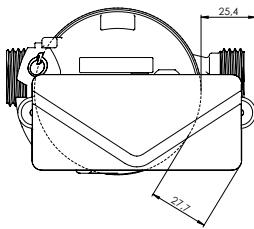
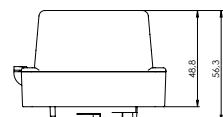
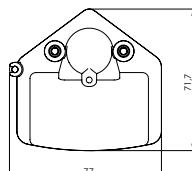
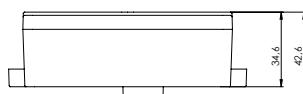
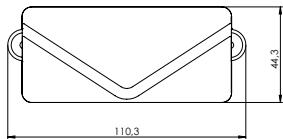
Itron water meters



Apator water meters
in the MacIQ WM+
version



Sensus HRI water meters
(120, 420, 620, 820) in the
MacIQ WMS version



antennas

of the MacIQ WM module

internal antenna



- designed for installation in dry locations above ground level
- protection class IP 65

external antenna



- designed for installation in water meter wells and locations with poor coverage
- fully submersible - reports until antenna is submerged
- dedicated IP68 sealed antenna
- version with SMA connector available on request

**technical data
of the MacIQ WM module**

dimensions	MacIQ WM: 109.2 x 40 x 44.7 mm; MacIQ WM S: 76.8 x 71.7 x 48.1 mm
housing material	polycarbonate
protection level	IP68 in accordance with the requirements of EN 60529
operating temperature	storage from -25 °C to +50 °C; operation from -5 °C to +50 °C
display	optical display server communication indicator
communication with water meter	inductive sensor allows for direct installation on water meters
supply	<ul style="list-style-type: none"> lithium battery with nominal voltage of 3.6 V, size C according to IEC 60086-1 with 8 Ah capacity service life: more than 10 years depending on frequency of synchronization of data to the server
data transmission	<ul style="list-style-type: none"> local data readout via mobile device with NFC NB-IoT or NB-IoT + LTE Cat. M1 modem support for transmission protocols depending on the technology: TCP, UDP, LwM2M* built-in internal antenna or external antenna without connectors
radio frequency	<ul style="list-style-type: none"> MacIQ WM H7.X LTE NB2 LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B17/B18/B19/B20/B25/B28/B66/B70/B85 MacIQ WM H4.X Cat M1 LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26/B27/B28/B66 Cat NB2 LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B28/B66/B71
data registration period	<ul style="list-style-type: none"> data recorded at a 60-minute interval unique identifier for each record registered data is stored in internal memory (6060 records)
configurable alarms	<ul style="list-style-type: none"> minimum and maximum flow alarm thresholds minimum and maximum flow warning thresholds leakage threshold backflow integration of magnetic and electromagnetic fields mechanical dismantling of the water meter discharged battery
reporting period	can be configured to send reports at a specific hour or hours, on a specific day of the week or weeks, on a specific day or days of the month, and special functions on the last day of the month, smart mechanism predicting remaining battery capacity and automatically adjusting reporting frequency to last even more than 10 years
time synchronization	NTP server or telecommunications service delivery network
accessories	eWebtel - measurement data acquisition system ConFIT! MacIQ WM- telemetry module configuration application ConFIT! data loggers - application for advanced module management via NFC

* in the process of implementation



MacIQ WM Pulse

IoT pulse module for flow meters/ water meters

MacIQ WM Pulse is a compact IoT module designed to work with flow meters or water meters equipped with pulse outputs. It forms an integral part of a stationary remote reading system, enabling precise measurement and monitoring of water consumption. The counted pulses are converted into digital data, then sent to a defined data aggregation system. A solution recommended for particularly difficult to access locations.



key benefits

- compatible with any meter that has pulse outputs, has extensive functionality for detection of flow direction, configuration of pulse duration and length
- outputs replicating input pulses for connection to a local BMS or industrial automation system
- continuous monitoring and alarms allow immediate response to failures and leaks
- reliable data transmission in harsh field conditions through the use of modern NB-IoT wireless communication technologies
- safety is ensured by built-in encryption of data transmission
- easy installation and configuration thanks to NFC-enabled phone app or configuration via IT system

accessories

- eWebtel p. 25
- ConFIT! data loggers p. 27
- ConFIT! MacIQ WM p. 28

**technical data
of the MacIQ WM Pulse module**

dimensions	109.2 x 40 x 44.7 mm
housing material	polycarbonate
protection level	IP68 in accordance with the requirements of EN 60529
operating temperature	storage from -25 °C to +50 °C; operation from -5 °C to +50 °C
display	optical display server communication indicator
inputs / outputs	<p>up to 3 digital inputs designed for:</p> <ul style="list-style-type: none"> input pulses from water meter backward pulses detection water flow detection tamper switch / alarm line <p>up to 2 digital outputs designed for:</p> <ul style="list-style-type: none"> pulse / volume replication alarm output – normally opened or normally closed
supply	<ul style="list-style-type: none"> lithium battery with nominal voltage of 3.6 V, size C according to IEC 60086-1 with 8 Ah capacity service life: more than 10 years depending on frequency of synchronization of data to the server
data transmission	<ul style="list-style-type: none"> local data readout via mobile device with NFC NB-IoT modem support for transmission protocols depending on the technology: TCP, UDP, LwM2M* built-in internal antenna or external antenna without connectors
radio frequency	LTE NB2 LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B17/B18/B19/B20/B25/B28/B66/B70/B85
data registration period	<ul style="list-style-type: none"> data recorded at a 60-minute interval unique identifier for each record registered data is stored in internal memory (3030 records)
configurable alarms	<ul style="list-style-type: none"> minimum and maximum flow alarm thresholds minimum and maximum flow warning thresholds leakage threshold backflow discharged battery
reporting period	can be configured to send reports at a specific hour or hours, on a specific day of the week or weeks, on a specific day or days of the month, and special functions on the last day of the month, smart mechanism predicting remaining battery capacity and automatically adjusting reporting frequency to last even more than 10 years
time synchronization	NTP server or telecommunications service delivery network
accessories	eWebtel - measurement data acquisition system ConFIT! MacIQ WM - telemetry module configuration application ConFIT! data loggers - application for advanced module management via NFC Wall or mounting bracket

* in the process of implementation

**antennas
of the MacIQ WM Pulse module**



**short
antenna**

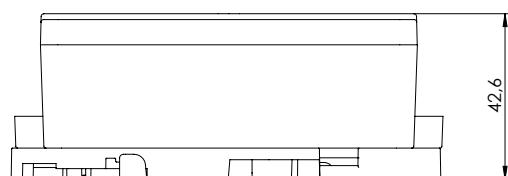
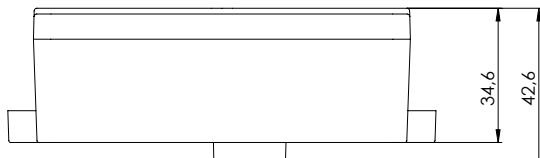
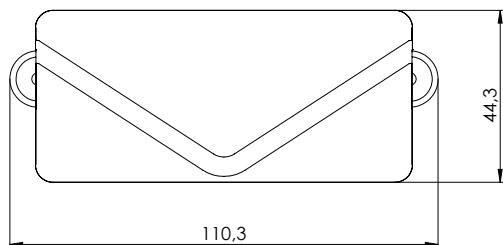
- fully submersible, report sent only after the water level has dropped below the antenna
- dedicated IP68 sealed antenna



**external
antenna**

- designed for installation in water meter wells and locations with poor coverage
- fully submersible - reports until antenna is submerged
- dedicated IP68 sealed antenna
- version with SMA connector available on request

**dimensions
of the MacIQ WM Pulse module**





MacR6 N

water flow and pressure data logger

MacR6 N is a compact device which records pressure and the water flow. It uses the current GSM network infrastructure for remote data transmission. MacR6 N data logger can be mounted in the metering area using cable connection.

It is equipped with two configurable inputs that can be used as: pulse inputs to connect water meters, pressure sensor inputs, digital binary inputs.

MacR6 N data logger transmits data remotely to eWebtel platform by default. Thanks to open protocol it can be adapted into other platforms.

Device is also equipped with an NFC interface for local configuration and reading of the device's recorded data using the Confit! data loggers mobile application.



key benefits

- single type of the device with adjustable software to cover different measurement scenarios with water meters and pressure monitoring
- mobility of the device and easy adjustment between GSM networks without losing any features
- real-time water leak detection
- fully adjustable logging properties like frequency of reporting, sampling, alarming thresholds
- possibility to prioritize the alarms by giving them flags of only warning or alarm
- communication in newest industrial transmission standards
- can work as stationary data logger for local data collection by mobile phone

accessories

- eWebtel p. 25
- Confit! data loggers p. 27
- Mac-PW p. 30
- Mac-HS p. 30

**technical data
of the MacR6 N data logger**

dimensions	114 x 110 x 45 mm
supply	lithium battery with a nominal voltage of 3.6 V, size D according to IEC 60086-1 and a maximum capacity of 14 Ah; battery life: 10 years depending on frequency of synchronization of data to the server
protection level	IP68 in accordance with the requirements of EN 60529
operating temperature	from -25 °C to +50 °C
inputs	<ul style="list-style-type: none">• flood sensor• magnetic field sensor• 2 measurement inputs: voltage 0.5 to 4.5 V• 4 digital inputs: binary – signaling or counting
pressure sensor	<ul style="list-style-type: none">• option 1: pressure sensor 0-10 bar (measurement accuracy: 0.5% FS)• option 2: pressure sensor 0-26 bar (measurement accuracy: 0.5% FS) <p>operating temperature: from 0 °C to +30 °C</p>
data registration period	measurement data from 1 to 60 minutes, events with timestamp when event started and ended
reporting frequency	configurable from 1 to 24 times per day, direct report after occurrence of the alarm
data transmission	<ul style="list-style-type: none">• local data readout via mobile device with NFC• integrated LTE Cat. M1/ NB IoT/ 2G modem• support for transmission protocols: TCP, UDP, HTTP
clock	built-in clock with time zone adjustment; synchronized with the GSM network operator or NTP time server
accessories	eWebtel - measurement data acquisition system ConfiT! data loggers - telemetry module configuration application Mac-PW - industrial pressure sensor Mac-HS - hydrostatic liquid level sensor

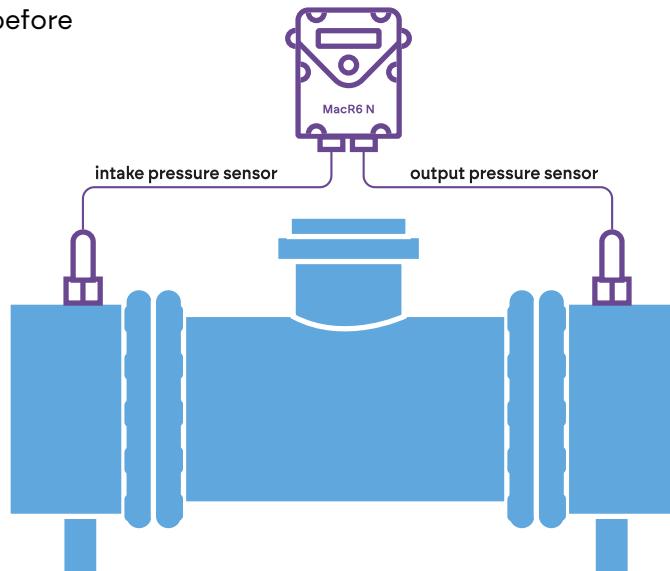
configurable alarms of the MacR6 N data logger

- two-level identification of exceeding minimum and maximum flow rates independently for both cooperating water meters/ flow meters – 4 thresholds in total
- two-level identification of exceeding lower and upper water pressure levels or its level, independently for both measurement inputs – 4 thresholds in total
- alarm for detecting programmed water leakage
- reverse water flow
- motion detection
- housing opening
- removal from the water meter
- flooding of the water meter chamber
- status alarm from up to four binary sensors, e.g., opening, position, level, with the possibility of label assignment
- no GSM network coverage

application of the MacR6 N data logger

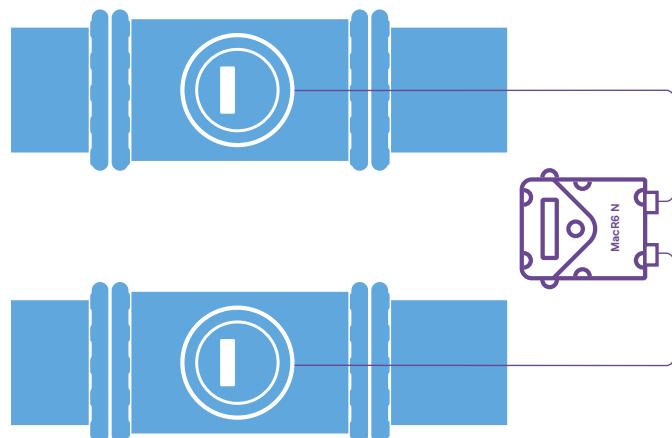
– pressure measurement

Pressure measurement before and after reduction.



– two water meters

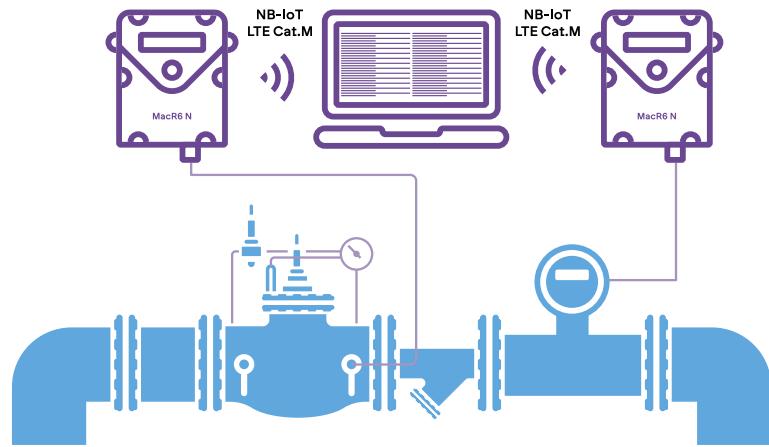
Remote measurement and registration of flow from two water meters.



application of the MacR6 N data logger

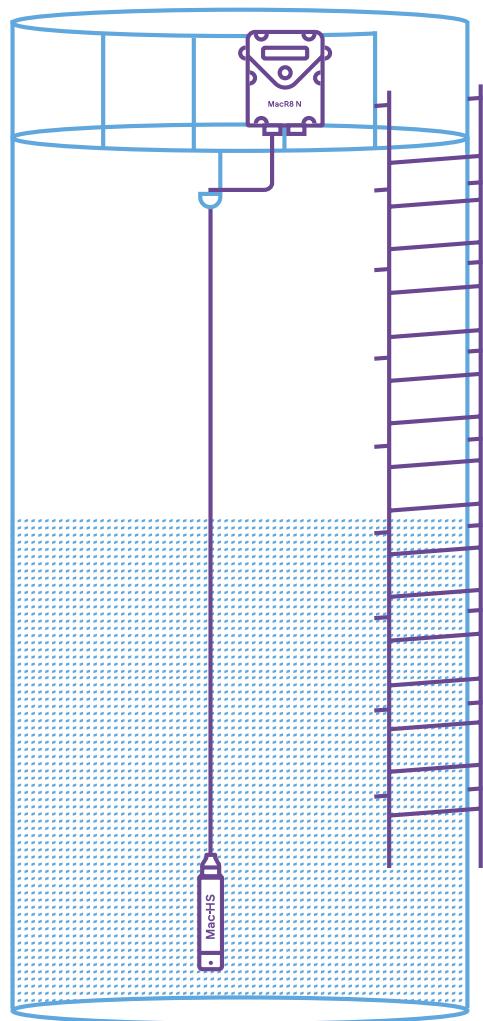
— forward and reverse flow monitoring

Remote measurement and registration of two way direction flow with data record.



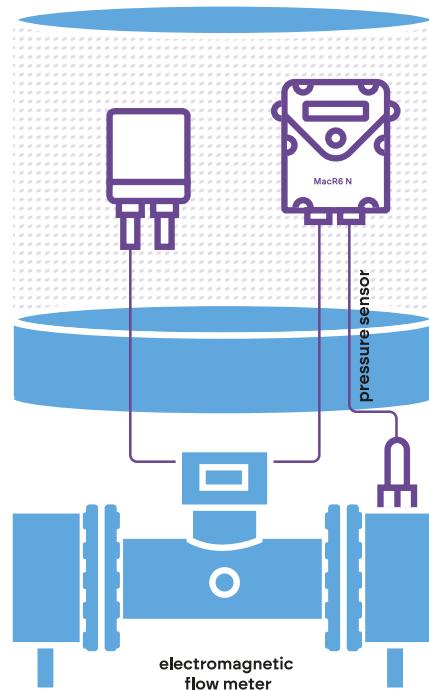
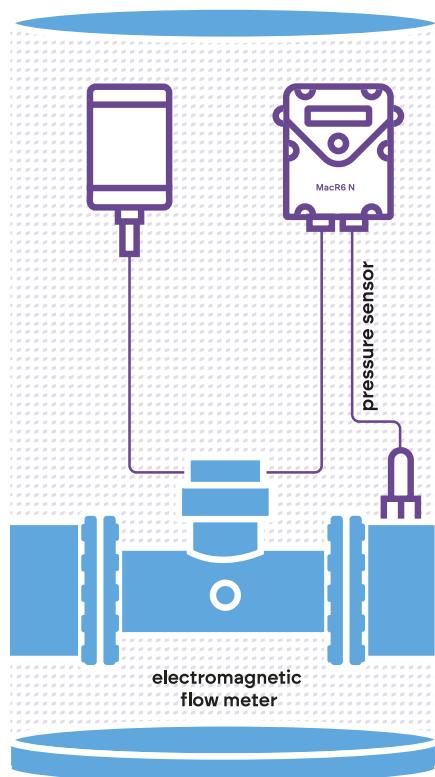
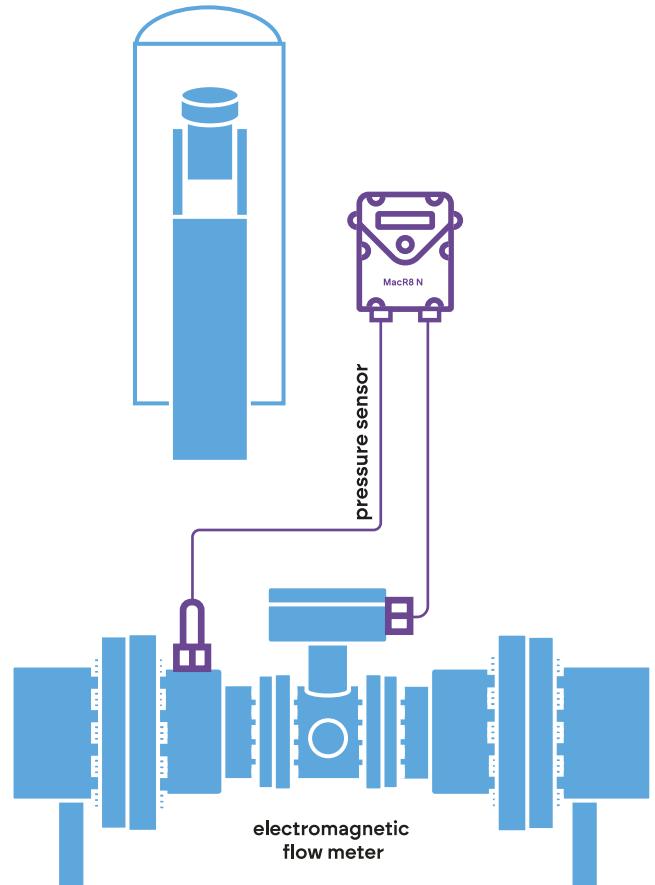
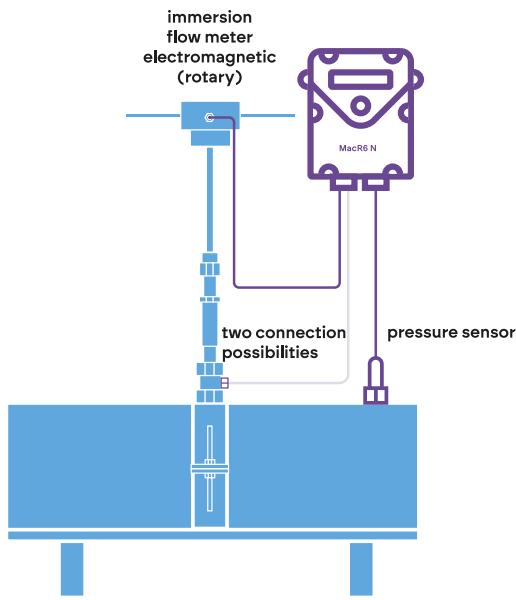
— water level monitoring

Remote water level monitoring.



application of the MacR6 N data logger

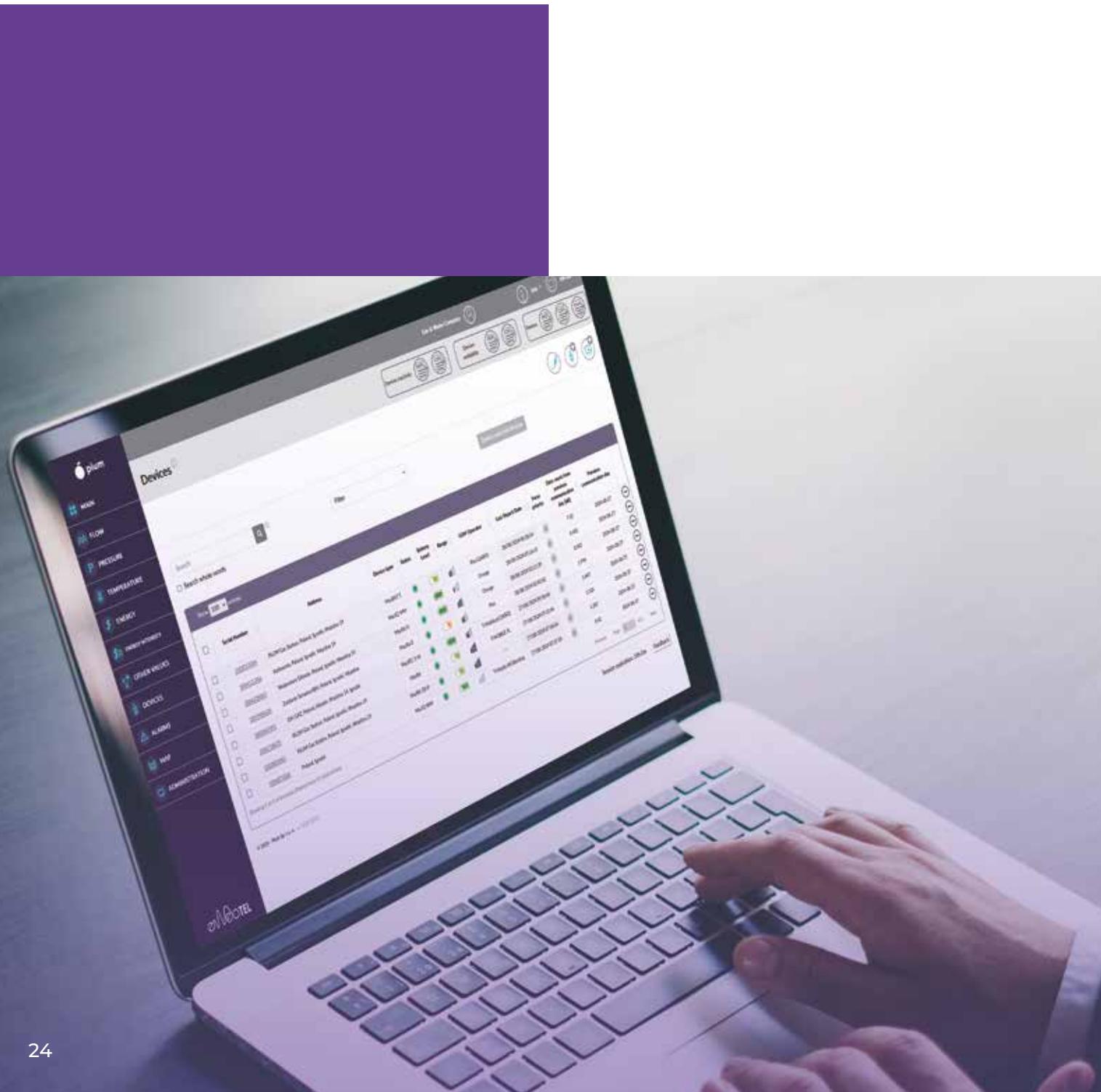
- other examples of installations
with the MacR6 N data logger





data acquisition system

- eWebtel





eWebtel

measurement data acquisition system

eWebtel system is a measurement data acquisition system, operating both on the internet and in a dedicated private network. eWebtel is designed to handle billing, monitor network parameters, and assess the selection of measurement devices.

System enables graphical presentation of received data, which is displayed in the form of functional charts, tables, and text-graphic reports.

related devices

- MacIQ WM
- MacIQ WM Pulse
- MacR6 N



key

benefits

- monthly water consumption reports for individual recipients or recipient groups
- notifications about alarm events, such as pressure exceedance or water leakage
- access to consumption history for individual recipients or recipient groups
- compatibility with all Plum GAS & WATER devices

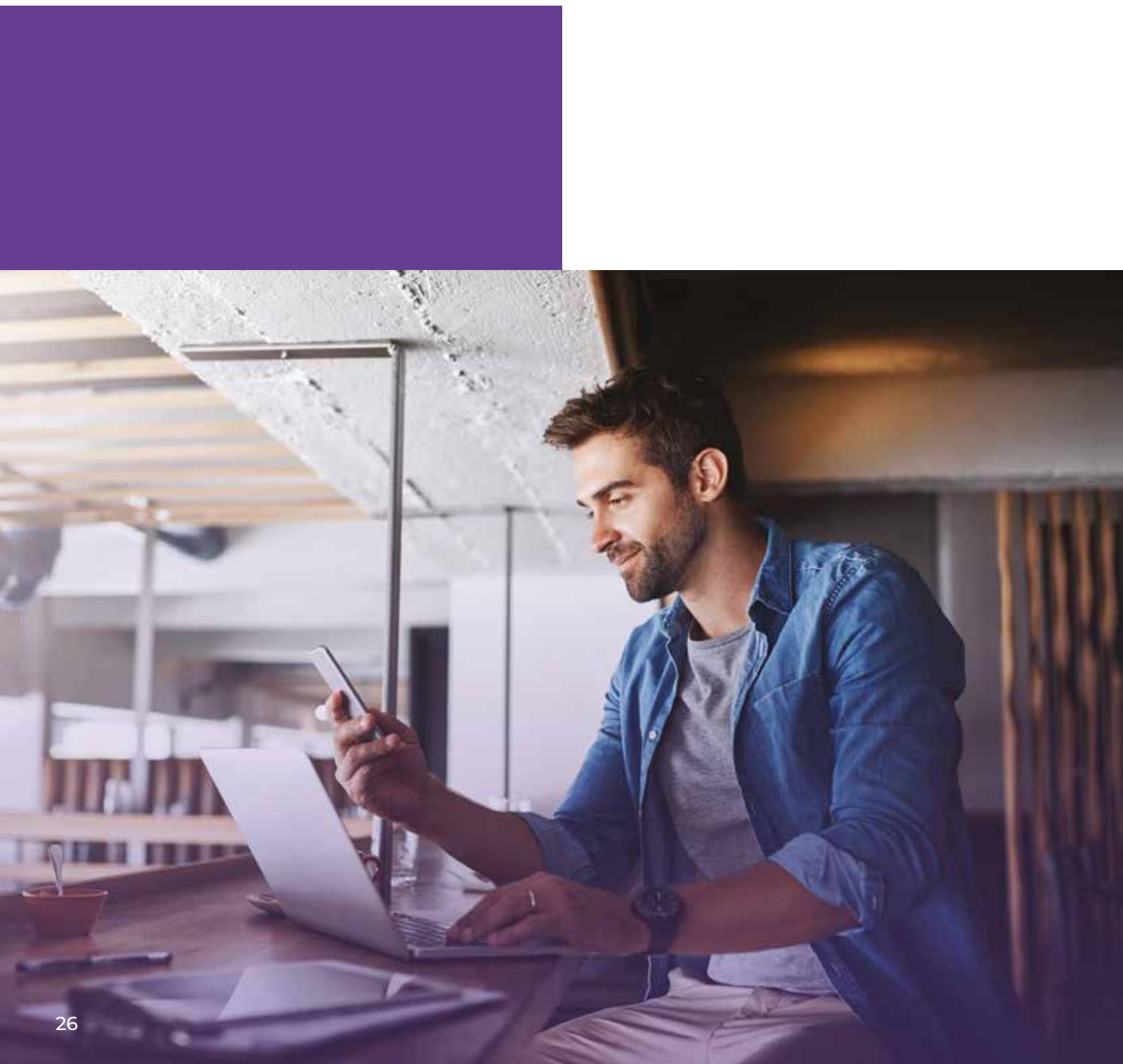
functionalities

- e-mail notifications for alarm events
- adaptation for both computer and mobile browsers
- ability to define the scope and type of transmitted data
- creation of measurement points and groups
- remote configuration of devices, including setting flow and pressure limits and scheduling data transmissions
- easy data analysis
- available as SaaS or installation at your own server
- visualization of devices on a map using geolocation
- data export capabilities to CSV, XML, Excel files
- support for encrypted TCP protocol
- simple user account management system



configuration tools

- **ConFIT! data loggers**
- **ConFIT! MacIQ WM**

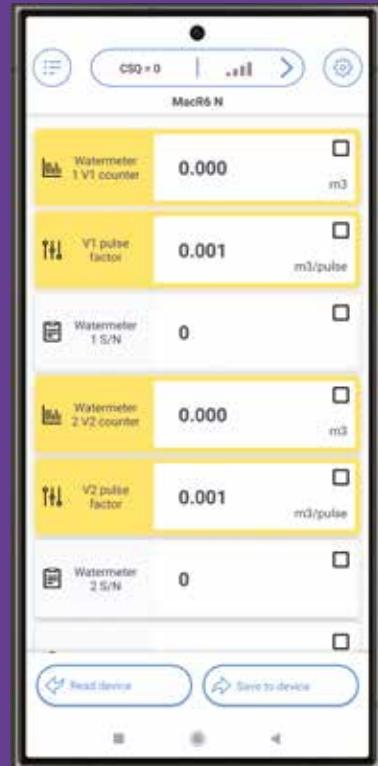




ConFIT! data loggers

mobile application for data loggers configuration

Mobile application ConFIT! data loggers is designed for configuring telemetry modules and pressure recorders produced by Plum. The application supports on-site installation and allows for configuration of the device and editing of basic logger parameters. The application communicates with devices via bluetooth standard, using the OptoBTEx head through the optical channel, and directly using NFC.



download
the ConFIT! data loggers application

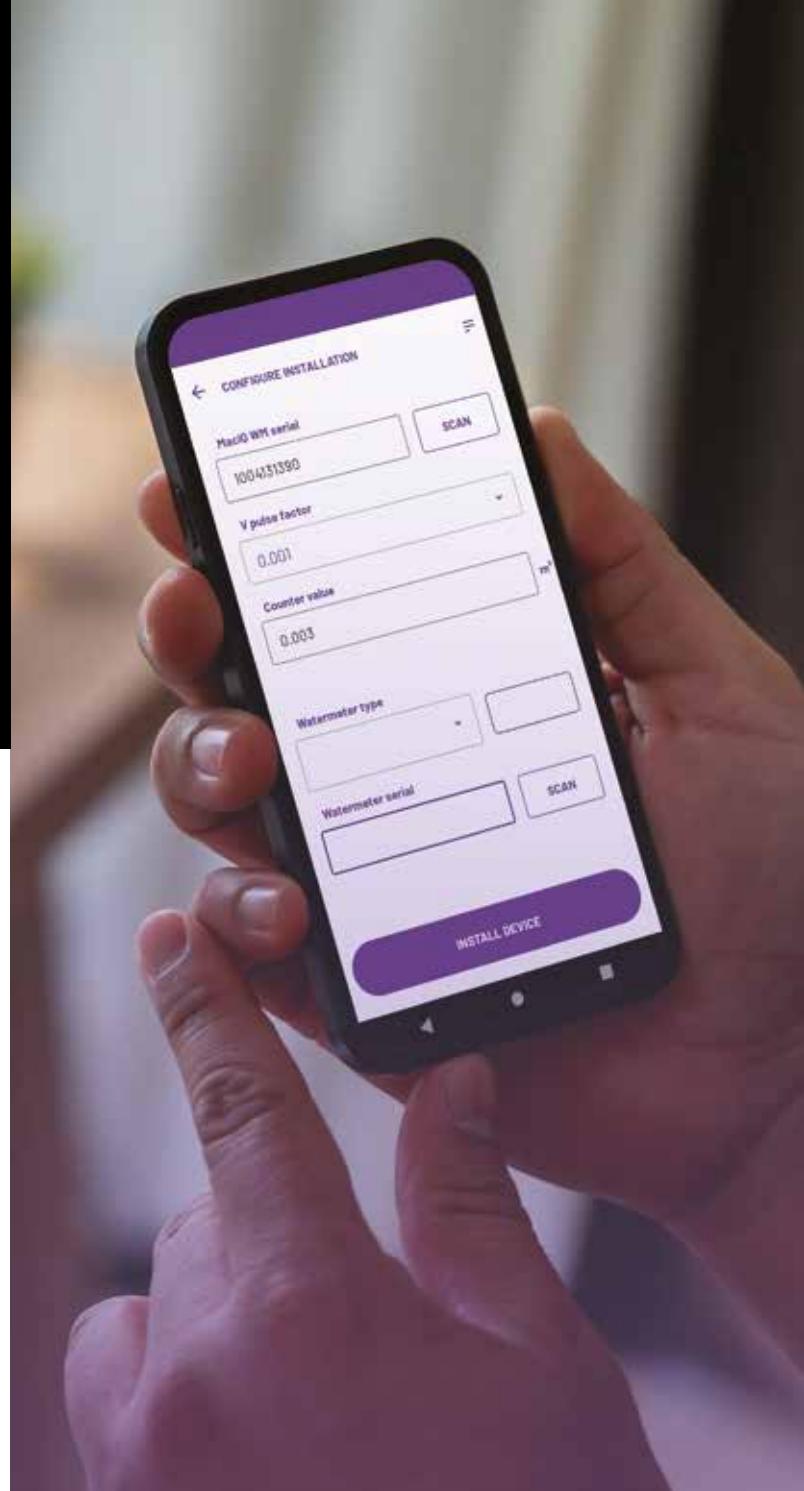




ConFIT! MacIQ WM

mobile application

ConFIT! MacIQ WM is an application created to configure Plum's IoT telemetry module, MacIQ WM. The application was designed to simplify the process of installing the MacIQ WM module in the eWebtel system. With the application, you can easily and conveniently enter the necessary data related to the water meter on which the MacIQ WM module is mounted.



download
the ConFIT! MacIQ WM





accessories

- **Mac-PW**
- **Mac-HS**





Mac-PW

industrial pressure
sensor

- compatible with MacR6 N
- sensor for testing and control of industrial processes, pneumatics, hydraulics, etc.
- durable metal pressure sensor diaphragm
- available in 10 bar and 26 bar versions
- precisely calibrated over the entire measuring range
- accuracy of measurement 0.5%
- anti-corrosion steel body
- wide operating temperature range and small size



Mac-HS

hydrostatic liquid level
sensor

Industrial hydrostatic liquid level sensor dedicated to measuring the level of treated wastewater, water in reservoirs, ponds, rivers, wells, boreholes, and adits.

- ambient pressure compensated for by using a capillary tube (protected by a moisture proof membrane)
- excellent resistance to impact, overload, vibration, and corrosion
- moisture-proof and protected from electromagnetic interference
- low power consumption

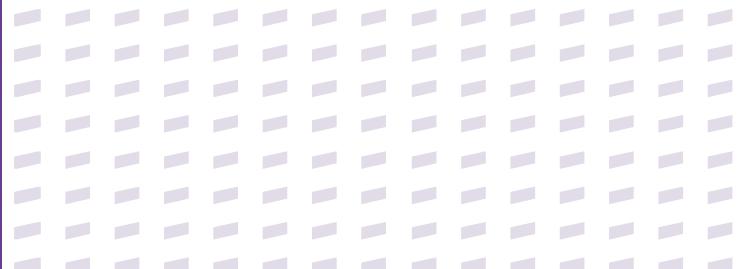
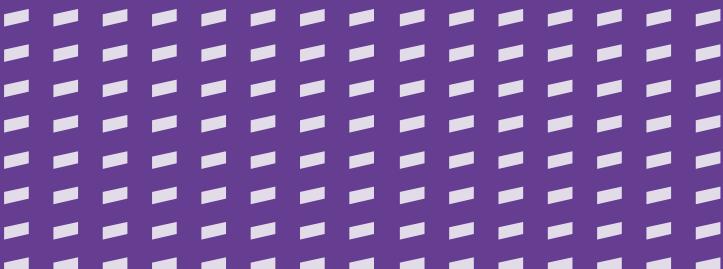




why you should choose our measurement solutions

- complex approach to the entire implementation process
- provide a technically refined product, providing remote data transfer from the system, operating in battery mode
- dedicated technical training
- marketing support
- easy configuration and operation through dedicated communication interfaces, web systems and mobile applications
- focus on business partnership, that is, we help solve technical problems and technological challenges

We develop complete telemetry solutions for the water meter readings. Products are developed according to the needs and technical standards of the installation and the customer. Cooperation with us means, in addition to products, a full package of additional services such as marketing activities and dedicated training from the technical department.



cooperation process

We create OEM solutions. However, we treat each product and its implementation individually. We guarantee full implementation and post-sales support from our R&D department.

We are Agile. We develop all our projects in SCRUM methodology, which allows us to implement our devices faster and more effectively.

We design competitive and interoperable devices, meaning they cooperate with devices from other suppliers.

We manufacture in Poland. We ensure product delivery reliability through local production.



cooperation

process





what sets us apart

The interdisciplinary nature of our activities enables us to draw conclusions and implement the best solutions across all our brand products. We gather experience and utilize knowledge in the most effective way possible.

Quality of Plum solutions is confirmed by many years of cooperation and trust with the various water distribution and management companies all over the world.





Accredited Laboratories

We operate an Accredited Calibration Laboratory AP 074, and an Accredited Electromagnetic Compatibility (EMC) Laboratory AB 1765.



electronics assembly on demand

We provide comprehensive electronics assembly services on demand. We handle the entire production process from design, purchasing necessary materials, assembling printed circuit boards, soldering wires, to assembling finished device enclosures. We cater to both small and large production runs as well as prototypes. We produce over a million printed circuit boards annually and serve companies from all around the world.





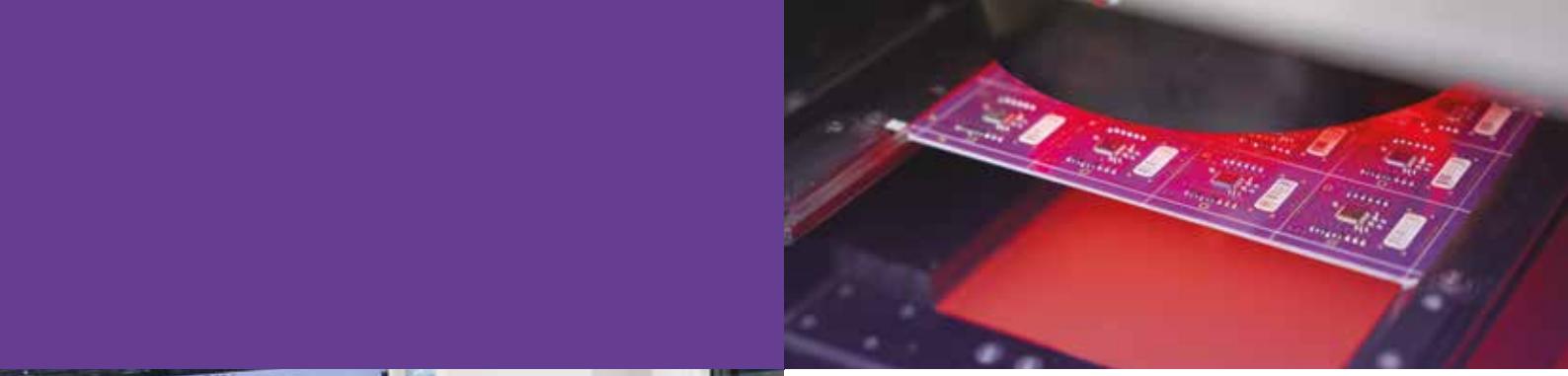
about Plum

We are an electronics manufacturer focusing on the development of systems for intelligent energy management in hvac, gas, and water areas using IoT technology.

We continuously improve the efficiency of our design and production processes to quickly respond to changing market requirements and customer needs.

- the electronics manufacturer and provider of energy management systems utilizing IoT technology**
- solutions dedicated to the hvac, gas, and water industries**
- accredited calibration and testing laboratories**
- family-owned business**
- company established in 1986**
- integrated ISO management system**





We develop our electronics with several areas in mind. We manage 5 brands: plum HVAC, plum GAS, plum WATER, plum LAB, plum EMS. The accumulated experience serves as added value for all our activities and projects.



Our headquarters are located in Ignatki near Białystok. We sell our products both domestically and internationally.

