



plum GAS portfolio

metering gas
transfer

efficient
measurements



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we are the manufacturer of electronics for intelligent management of the natural gas transmission and distribution system

We deliver comprehensive metrological and telemetry solutions for the gas industry. Our solutions provide remote transmission and reading of data from natural gas measuring devices installed at our clients' measurement stations. Products are developed according to the specific needs and technical standards of the installations and clients.



We provide solutions that meet the technical requirements of European and global markets. We offer OEM solutions tailored to individual client needs in gas metering. We provide full implementation and after-sales support in product development and operation.



Partnership with us means more than just a reliable product, it is a full package of additional services. We provide after-sales support in product R&D, marketing activities, technical trainings and remote technical support.

We manufacture in Poland, ensuring product delivery certainty through locally controlled, quality-monitored production. Our devices are designed to be competitive and interoperable, allowing seamless integration with devices from other providers.





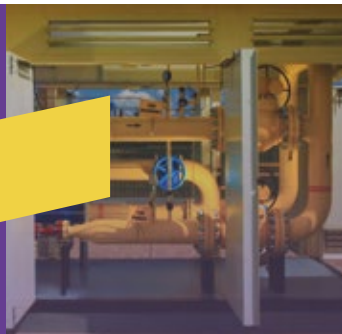


our solutions for the gas industry

While working on solutions for natural gas metering, we were guided by the vision of comprehensive fulfillment of the needs of various customer groups within this sector.

Our long-term global experience in the natural gas industry helped us to propose solutions for effective management of pressure reducing and metering stations (PRMS), remote gas consumption reading, and gas network monitoring. Our products are designed according to both commercial and industrial solution requirements. We effectively utilize the concept of remote data access and IoT solutions.

pressure reducing
and metering
stations
management



Automatic Meter
Reading (AMR)
and peak
power logging



gas grid
monitoring





pressure reducing and metering stations management

comprehensive solution for gas measurement and telemetry

The solution enables increased levels of safety, reliability, and reduces operational costs of pressure reduction installations in natural gas transmission and distribution processes.

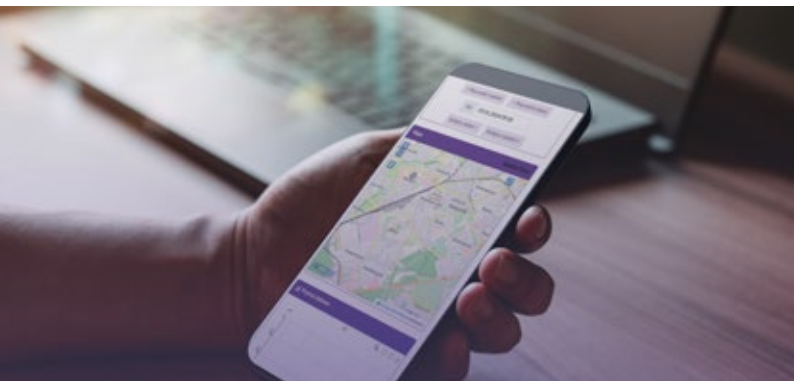
The built-in modem remotely transmits measurement data to the information systems of the gas network operator. It does not require the use of solar installations or the power supply connection.

benefits

- volume correction for every type of gas meter regardless of pressure, type, or gas mixture composition
- gathering diagnostic information from binary sensors, pressure and temperature sensors, connected digital sensors, and attached devices such as odorizers or process chromatographs
- intuitive configuration and control of device operation

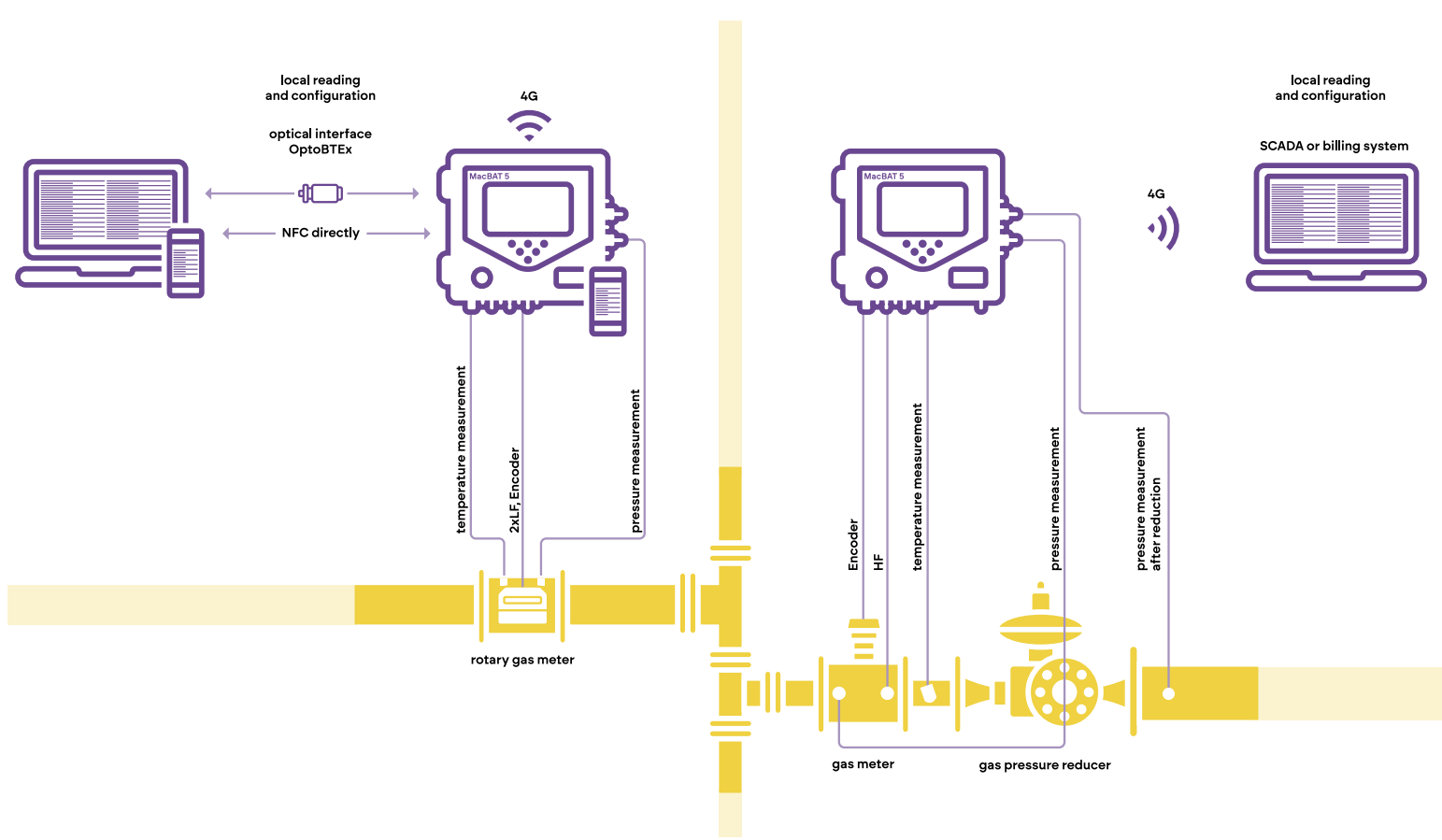
Our devices are compatible with popular gas measurement equipment. We provide compatibility over many years of operation of the measuring system.

The solution can be expanded to include MacREJ 5 data logger for monitoring the operation of the gas pressure reduction system.



**devices
used in this solution**

- ▬ MacBAT 5 read more: p. 17
- ▬ MacREJ 5 read more: p. 24





Automatic Meter Reading (AMR) and peak power logging

natural gas network billing without the need for local readings

Compact solution that tariffs consumption and provides remote reading of gas consumption from gas meters.

The MacR8 concept aims to eliminate the need for local gas meter readings.

benefits

- efficient data transmission thanks to IoT technology with highest radio signal penetration
- NB-IoT and LTE Cat.M1 technologies allow operation in the latest cellular networks
- a patented flow detection method from the gas meter (for selected types) ensures correct meter reading
- the built-in battery provides even 15 years of operation

Dedicated adapters allow direct mounting of MacR8 on gas meters from all leading manufacturers.



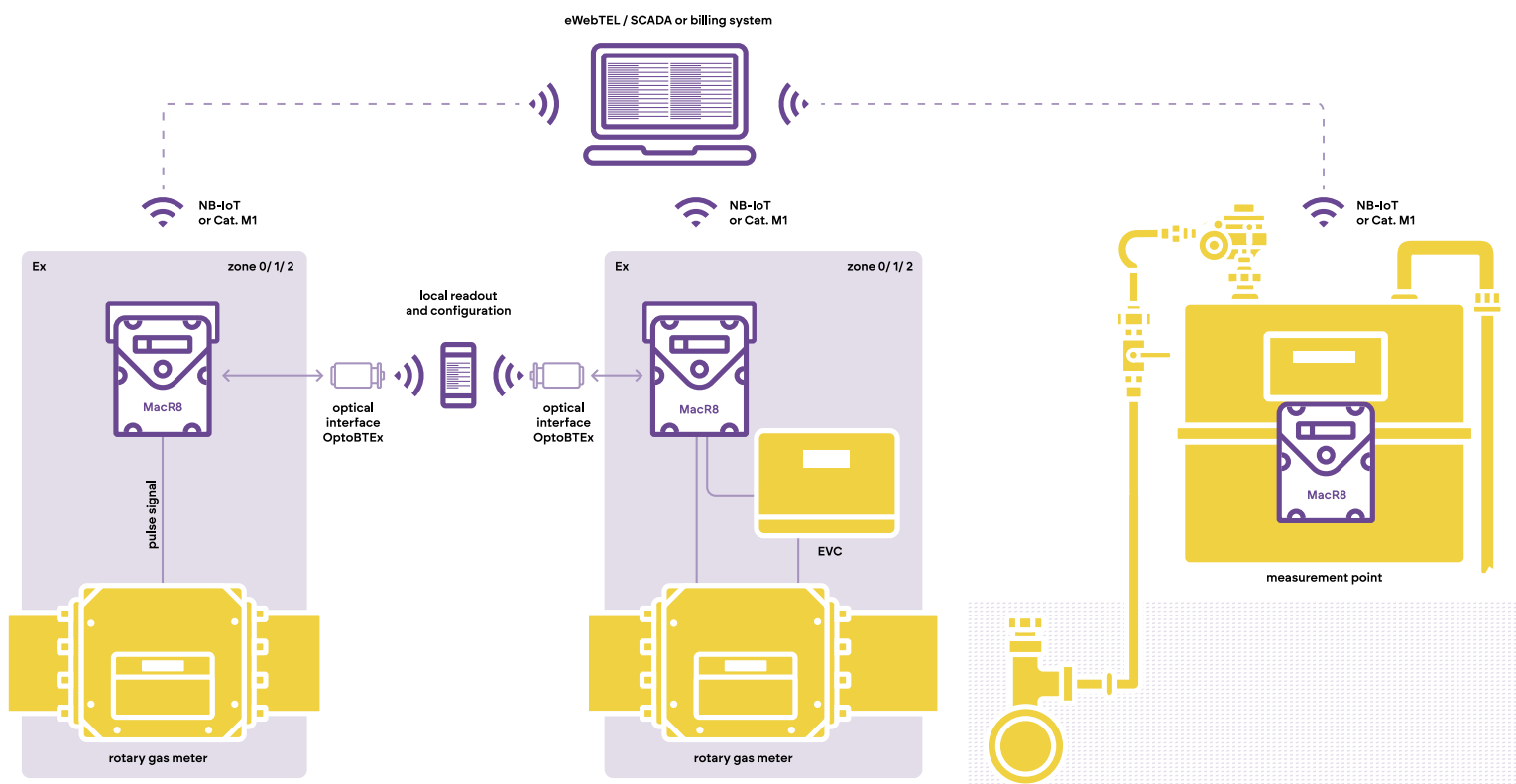
automatic meter reading solutions with NB-IoT / LTE Cat. M1 technology

The MacR8 data logger sends the gas consumption profile to the gas distribution system operator's IT system. The MacR8 IoT module operates in the latest LPWAN telecommunication networks: NB-IoT/ LTE Cat.M1, and additionally also in older 2G infrastructure, enabling efficient and secure data transmission. MacR8 data logger helps to implement tariffication system for gas consumption and distribution services. Consumption data is available in the form of volume as well as energy. One of the key functionalities is real-time alarming system that detects tampering attempts.



devices used in this solution

- MacR8 [read more: p. 34](#)





gas grid monitoring

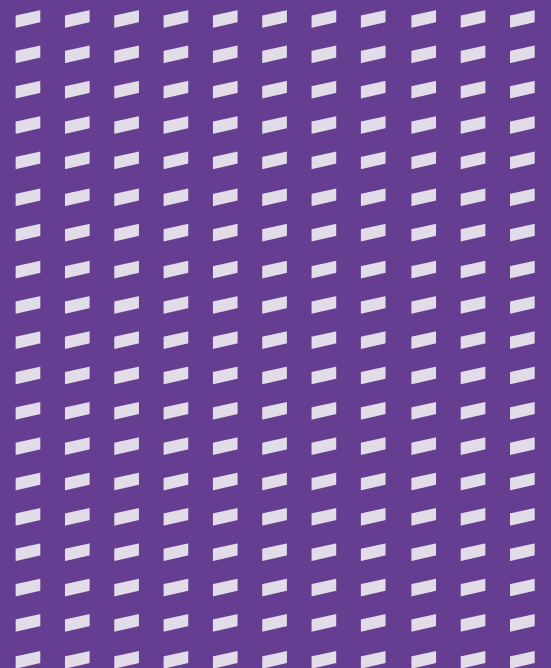
IoT solutions for gas networks

A solution for controlling the operation and pressure of natural gas distribution system, which provides the capability of automatic meter reading and monitoring.

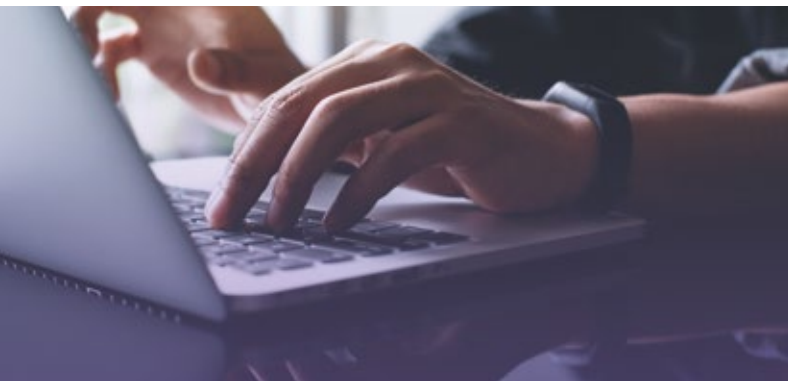
This solution helps to monitor disruptions in the gas distribution system. The loggers send data to the data acquisition system in real time when disruptions occur.

benefits

- easy to use and configure comprehensive monitoring solution
- real-time data transmission
- monitoring of auxiliary devices
- suitable for hazardous areas
- filter status control
- logging of temperature, pressure, and gas volume

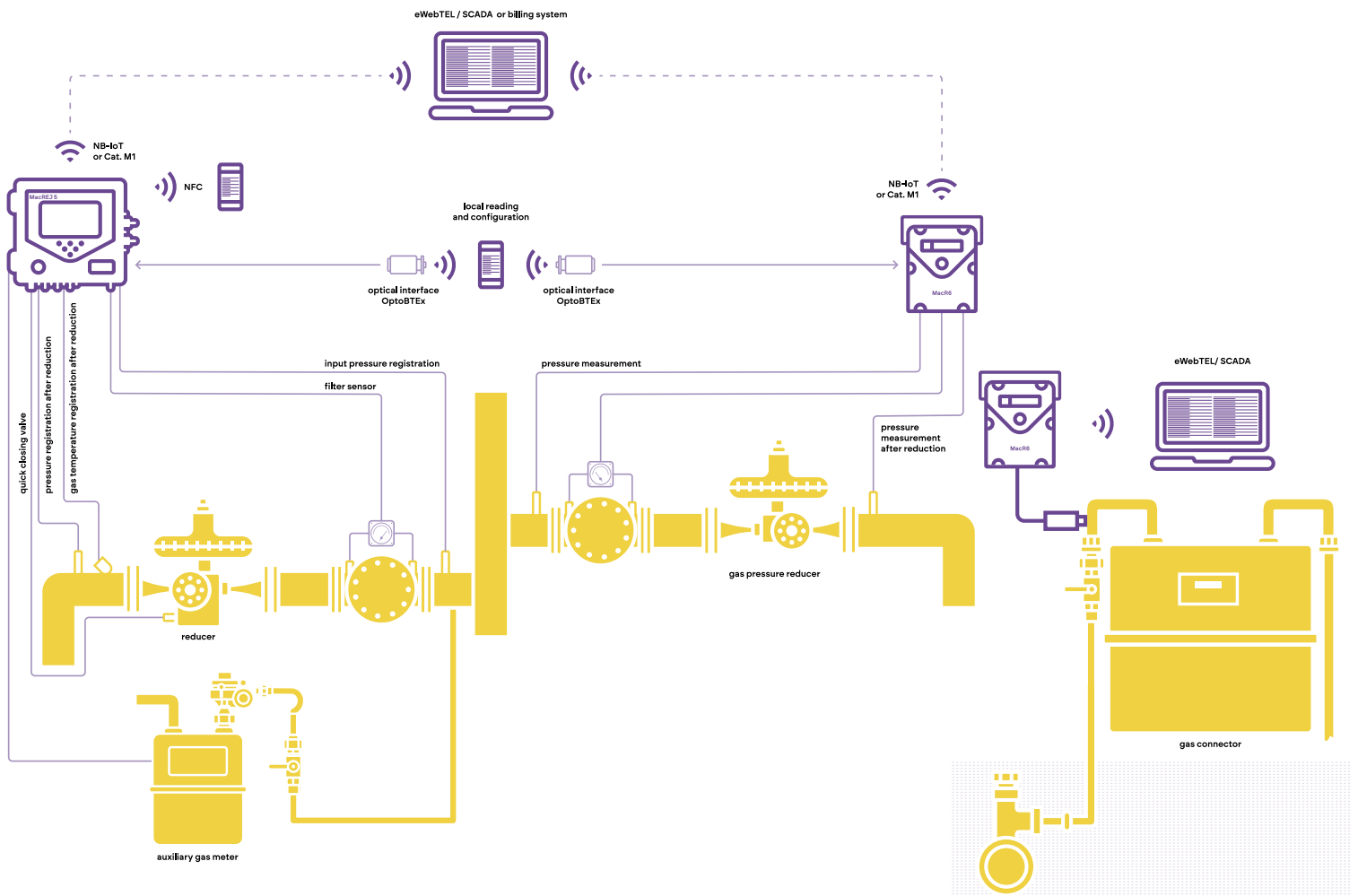


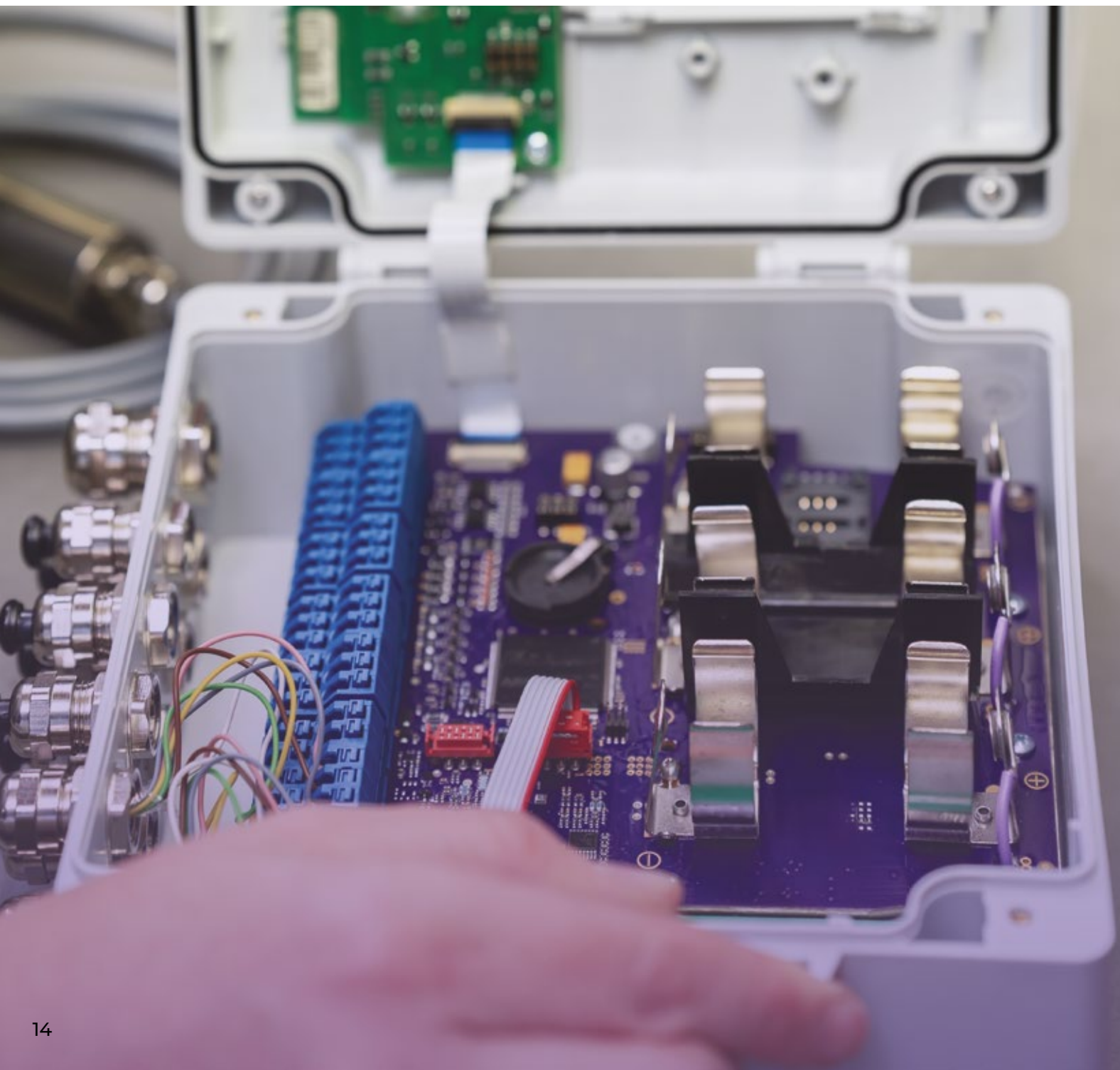
The solution with MacR6-Z0-P and MacREJ 5 devices has been approved for operation in hazardous areas.



devices used in this solution

- MacREJ 5 read more: p. 24
- MacR6-Z0-P read more: p. 38







products

volume
correctors



flow and pressure
data loggers



internet
system



configuration
tools



accessories





volume correctors

MacBAT 5



- increase accuracy, frequency, and measurement quality using MID certified devices
- eliminate issues with device maintenance; utilize a mobile application with a simple interface and a large, graphic display
- detect gas meter faults and deviations in natural gas consumption in real-time; ensure quick service response
- manage, configure, and analyze gas transmission processes remotely using your own data acquisition system



MacBAT 5

gas volume and energy corrector



The MacBAT 5 corrector offers PTZ, PT, or T type corrections. The device is powered by an internal battery with the option of external power connection. MacBAT 5 converts gas volume measured by a rotary, turbine, or ultrasonic gas meter to base conditions.

The gas compressibility factor is calculated using algorithms: SGERG-88, SGERG-mod-H2, AGA92-DC, AGA8-G1, AGA8-G2, AGA NX-19-mod, or a constant value of the compressibility factor K1.

MacBAT 5 is an intrinsically safe device that can be installed in Zone 0 explosive hazard areas.

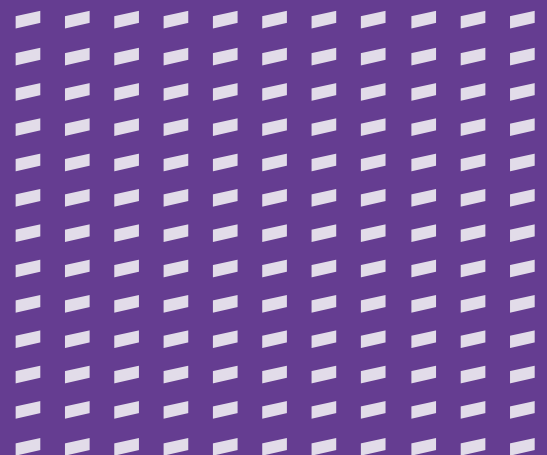
accessories

- eWebTEL p. 42
- ConfIT! p. 45
- ConfIT! volume corrector p. 46
- OptoBTEx p. 47
- INT-S3 p. 47
- IK-401 p. 47
- EM-1 p. 48
- EM-2 p. 48
- EM-2Ex p. 48

why is it worth

choosing MacBAT 5 corrector?

- the built-in 4G LTE modem provides ability for remote data reading
- prevents discrepancies in gas meter readings and the corrector
- detects and compensates reverse flows
- conducts measurements every second
- supports the most popular digital communication standards
- certified algorithms for natural gas, hydrogen blends and biomethane
- operates up to 14 years without battery replacement
- large memory capacity, up to 10 years of measurement data
- offers intuitive operation and configuration via NFC with a phone



functionalities of the MacBAT 5 corrector

- designed for turbine, rotary, or ultrasonic gas meters via LF, HF, Encoder, Wiegand (optional)
- supports NAMUR and SCR encoders in the battery mode operation
- MID certified for measuring the volume of a gas mixture containing up to 30% hydrogen (H₂)
- advanced solutions preventing differences in gas meter and corrector measurements, detecting gas meter backflow
- measurement of volume increment every second from the HF input, also available during battery-powered operation
- four independent serial transmission ports (2x RS485/ RS232, Optical 62056-21, NFC IEC 14443)
- built-in 4G LTE Cat.1 and 2G modem (optional)
- up to 8 intrinsically safe configurable binary inputs, including two NAMUR inputs for inductive sensors, functioning even during battery mode operation
- intrinsically safe digital and frequency outputs
- internal or external pressure sensors
- built-in gas meter load profile analysis function
- support for biogas measurement
- integration with a Building Management System (BMS) via MODBUS RTU, MODBUS TCP, or pulse-driven communication with Vb and Vm counters
- capability of reading/controlling in MODBUS MASTER mode for up to 16 external devices, using MODBUS RTU protocol via RS485 (e.g., digital pressure transducers, EM series expansion modules)
- capability to control gas odorizers (using a frequency/ current loop converter or EM-1 expansion module)
- direct collaboration with gas chromatograph



technical data

the MacBAT 5 corrector

dimensions/ weight	207 x 194 x 77 mm/ 1.3 kg (version 1) 202 x 167 x 93 mm/ 3.5 kg (version 2)
housing material	polycarbonate (version 1)/ aluminum (version 2)
relative humidity	maximum 95% at temperature of 70°C
ambient temperature range	from -25°C to 70°C
housing protection class	IP66 for outdoor installations
keyboard	6 pushbuttons (version 1)/ 18 pushbuttons (version 2)
display	graphical, 4", backlight, operation in the full range of operating temperatures
Ex feature	II 1G Ex ia IIB T4 Ga certificate: FTZÚ 17 ATEX 0047X
internal power supply	one lithium battery size D 3.6V/ 17Ah; operation time: 5 years
modem power supply	two lithium batteries size D 3.6V/ 17Ah (one, for version with p2 internal sensor in aluminium housing); operation time: 5 years with two transmissions per day (for two supplying batteries)
external power supply	interface/ battery Ex INT-S3 – switchable RS485 port, 5.7V intrinsically safe power supply, two digital inputs/ outputs; interface supply voltage 11-30V DC
transmission protocols	MODBUS RTU, MODBUS TCP (available in version with integrated modem), MODBUS RTU MASTER MODE, GAZMODEM 1, 2, 3 (other protocols per request)
transmission ports	<ul style="list-style-type: none">two independent serial transmission ports (COM1 - RS485 or optional RS232 - option available only in non MID version, COM2 - RS485 - shared with MODBUS MASTER input - option available from firmware series S011.xx, currently non MID version), speed up to 256 kb/soptical interface IEC 62056-21NFC IEC 14443 interfaceoptional integrated modem 4G LTE/ 2G
resistance to mechanical and electromagnetic conditionse	M2/ E2
base conditions	set by authorized personnel; available options: <ul style="list-style-type: none">base pressure (absolute) pb: range (0,95 ÷ 1,05) bar, default 1.01325 barbase temperature Tb: range (270 ÷ 300) K, default 273.15 K (0°C)reference temperature determined for combustion process T1: range (270 ÷ 300) K, default 298.15K (25°C)
maximum permissible error (MPE) according to standard „EN 12405-1“	<ul style="list-style-type: none">0.5 % at reference conditions1 % at nominal operating conditionstypical error < 0.15%
maximum permissible error (MPE) according to standard „EN 12405-2“	ECD class A
algorithms for calculation of compressibility factor	SGERG-88, SGERG-mod-H2, AGA8-92DC, AGA8-G1, AGA8-G2, AGA NX-19 mod (all algorithms with possibility of using full gas composition), fixed compressibility factor value K=1
meets the requirements of 2014/ 32/ UE (MID)	certificates: <ul style="list-style-type: none">DE-19-MI002-PTB004 - PLUM PTZ converterDE-21-M-PTB-0012 - PLUM load recorder

technical data

the MacBAT 5 corrector

horizon of data registration

- data registered in period 1-60 minutes – 36000 records (over 4 years @60min)
- momentary data (1-second logging)
- hourly data – over 16 months
- daily data – over 4 years
- monthly data – over 10 years
- alarms/ events memory – over 6000 records

control outputs

- up to 4 intrinsically safe, configurable digital outputs (OC type):
 - 1 configurable as binary or frequency (0-5000Hz) output
 - 3 binary outputs
- binary outputs triggered by alarm/event or counter (Vb, Vm, E, M etc.)
- frequency output triggered by measured value (p1, t, Qb, Qm etc.)

inputs

- up to 6 intrinsically safe, configurable, binary digital inputs, shared with:
 - 2 LF inputs, frequency 0-2Hz, WIEGAND standard 0-60Hz (option), flow direction detection
 - 1 tamper switch input - normally closed
 - 1 SCR ENCODER input (interchangeable with 1 binary digital input as an option)
- up to 2 intrinsically safe, configurable digital inputs NAMUR type, shared with:
 - 2 HF inputs, frequency 0÷5000Hz, EN60947 5-6, ability of temporary operation on battery
 - 1 ENCODER (NAMUR type)
- MID-certified support for gas meters through LF, HF, ENCODER NAMUR, ENCODER SCR, WIEGAND and 10-point gas meter characteristics correction
- pressure sensor p1 – measuring range up to 6 bar abs as standard. Internal or external sensor. Sensor ended with M12x1.5 (internal or external sensor) or 1/4" NPT (external sensor) thread. Pressure ranges: 0.8÷6/ 0.8÷10/ 2÷10/ 4÷20/ 7÷35/ 4÷70/ 10÷70/ 10÷100/ bar abs; maximum permissible error for pressure measurements:

20 °C (± 3 °C)	(-25 ÷ 70) °C
± 0.2 % of measured value	± 0.5 % of measured value

typical error of p1 pressure measurement: 0.15% of measured value

- temperature sensor Pt1000 class A or B with cable length compensation, two- or four wires, diameter 5.7mm; maximum permissible error for measurements

20 °C (± 3 °C)	(-25 ÷ 70) °C
± 0.1 %	± 0.2 %

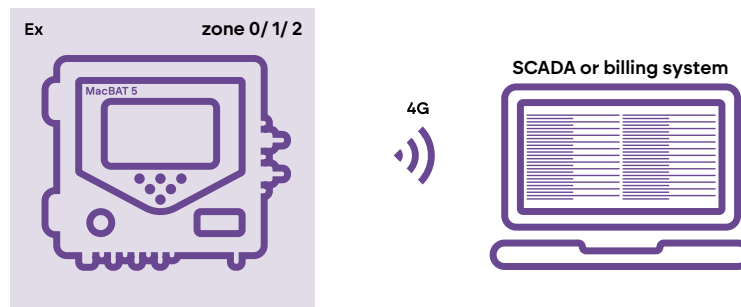
typical error of temperature measurement: 0.08%

- pressure sensor p2 – optional, internal or external – absolute or gauge pressure sensor. Gauge pressure ranges: 0÷0.1/ 0÷0.3/ 0÷6/ 0÷10/ 0÷20/ 0÷40/ 0÷70/ 0÷100 bar G; absolute pressure ranges the same as for p1 sensor; typical error of p2 pressure measurement (gauge): 0.15% of range
- RS485 MODBUS MASTER input (with 3.6V power supply output) for readout of up to 16 external devices with MODBUS RTU output (e.g. digital pressure or temperature transducers), capable to operate on battery (option available from firmware series S011.xx, currently non MID version)

the application of the MacBAT 5 corrector

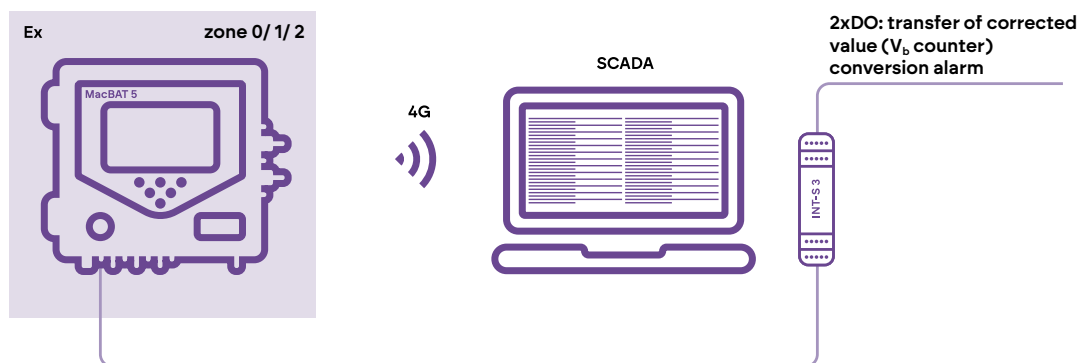
➤ direct data transmission to the system

Reading data through the built-in 4G LTE modem with battery power supply.

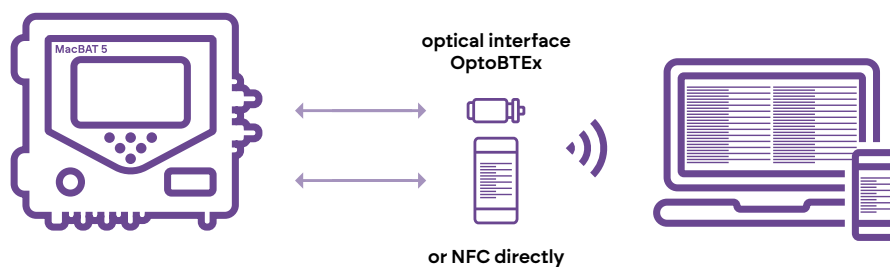


➤ remote data reading

Connection via the communication interface INT-S3 and the built-in 4G LTE modem.

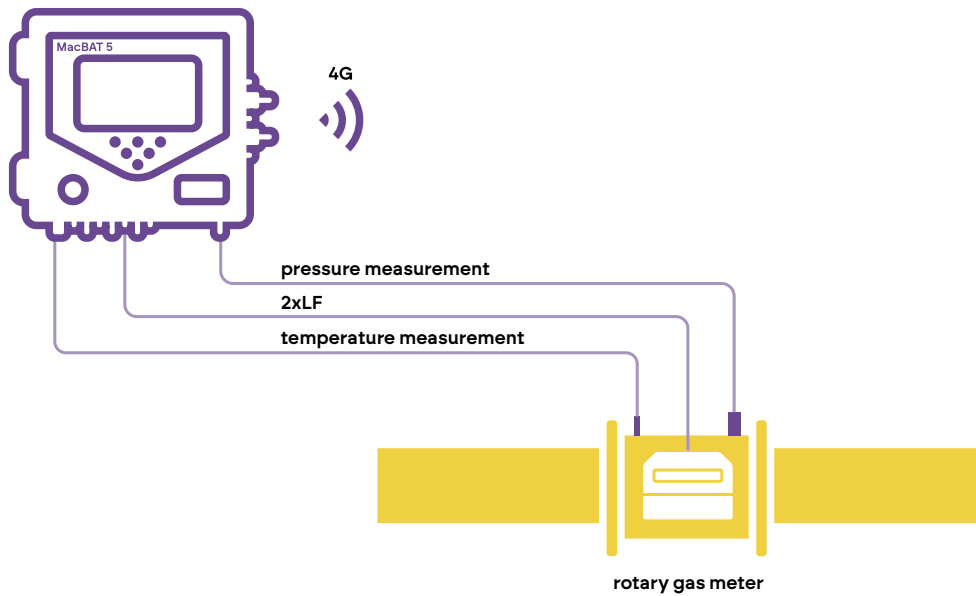


➤ local reading and configuration



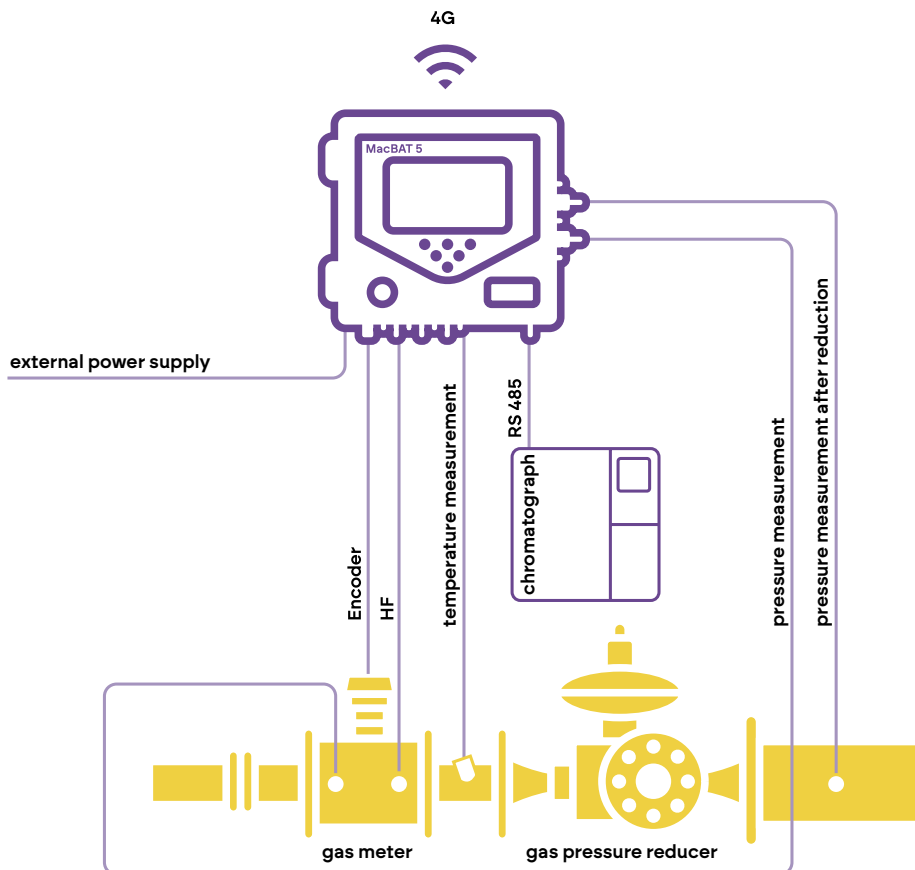
➤ **MacBAT 5 connected with a rotary gas meter**

Connection via 2 x LF ensures precise synchronization between the gas meter and the corrector, taking into account volume reversals on the gas meter.



➤ **pressure measurement using MacBAT 5 operating with additional turbine gas meter**

System recommended for operating a high-pressure gas meter.





flow and pressure data loggers

- **MacREJ 5**
- **MacREJ 5R**
- **MacR6-Z0-P**
- **MacR8**



- monitor the operation of the PRMS station remotely, in real-time
- record all measurement events; have constant access to the station's work history
- synchronize measurement data with other systems, e.g., SCADA
- introduce tariff price management; accurately and timely bill gas consumption
- reduce meter reading service costs
- safely and interference-free transmit data using NB-IoT technology
- record data from any gas meter using dedicated adapters



MacREJ 5

electronic gas volume, pressure and temperature data logger

The MacREJ 5 data logger is a device monitoring the operation status of gas stations and their components. MacREJ 5 records input and output pressure, temperature, and gas volume, monitoring the operation of regulators and safety devices.

MacREJ 5 is an intrinsically safe device that can be installed in the zero explosion hazard zone. The device with a built-in modem, when powered by an external power source, allows online access to data. When operating on batteries, it transmits data according to a schedule and in case of an alarm state.

accessories

- eWebTEL p. 42
- ConFIT! p. 45
- ConFIT! data loggers p. 46
- OptoBTEx p. 47
- INT-S3 p. 47
- IK-401 p. 47
- EM-1 p. 48



why is it worth

choosing MacREJ 5 data logger?

- built-in GSM modem (4G LTE and 2G)
- remote data transmission
- simple installation and configuration using a smartphone with NFC interface
- autonomous communication with external sensors and devices
- low operating costs thanks to lithium batteries
- screen ensuring comfortable operation even in very low temperatures

functionalities of the MacREJ 5 data logger

- integrated GSM modem (optional) operating in 4G LTE and 2G networks
- support for NFC communication standard, optical connection and two RS485 / RS232 serial ports
- graphical 4" display with backlight works in temperatures down to -30 °C
- configurable main screen widgets showing daily/ monthly graphs as bargraphs
- ATEX-certified for operation in any explosion hazardous zone (up to zone 0, 1, 2), also with integrated modem
- pressure sensors as internal or external
- supports NAMUR and SCR encoders in the battery mode operation
- configurable two LF pulse inputs for gas meters
- MODBUS RTU MASTER function for autonomous communication with external sensors/devices
- 10 cable glands for connection of signal and measurement circuits
- built-in illumination of the connection terminals (aluminum housing version)
- low operating costs due to the use of standard lithium batteries



**technical data of
the MacREJ 5 data logger**

dimensions/ weight	207 x 194 x 77 mm/ 1.3 kg (version 1), 202 x 167 x 93 mm/ 3.5 kg (version 2)
housing material	polycarbonate (version 1)/ aluminum (version 2)
relative humidity	maximum 95% at temperature of 70°C
ambient temperature range	from -25°C to 70°C
housing protection class	IP66 for outdoor installations
keyboard	6 pushbuttons (version 1)/ 18 pushbuttons (version 2)
display	graphical, 4", backlight, operation at full range of work temperature
Ex feature	II 1G Ex ia IIB T4 Ga, certificate: FTZÚ 17 ATEX 0047X
internal power supply	standard lithium battery size D 3.6V/ 17Ah.; operation time: 5 years/ one battery
modem power supply	two lithium batteries size D 3.6V/ 17Ah; operation time: up to 5 years with three transmissions per day
external power supply	INT-S3 communication interface – switchable RS485 port, intrinsically safe power supply, two digital inputs/ outputs; interface supply voltage 11-30V DC
transmission protocols	MODBUS RTU, MODBUS TCP (integrated modem version), MODBUS RTU MASTER MODE, GAZMODEM2, GAZMODEM3, other protocols per request
transmission ports	<ul style="list-style-type: none"> • two independent RS485 or RS232 COM1 and COM2 serial transmission ports, speed up to 256 kb/s • optical interface IEC 62056-21 • NFC IEC 14443 interface • optional integrated modem 4G LTE/ 2G
resistance to mechanical and electromagnetic conditions	M2/ E2
horizon of data registration	<ul style="list-style-type: none"> • data registered in period of 1 second • hourly data – over 2 years • daily data – over 3 years • monthly data – over 10 years • events memory – over 4000 records
control outputs	<ul style="list-style-type: none"> • four intrinsically safe, bistate OC outputs: - one configurable as bistate or frequency (0-5000Hz) - three bistate outputs

**technical data of
the MacREJ 5 data logger**

inputs

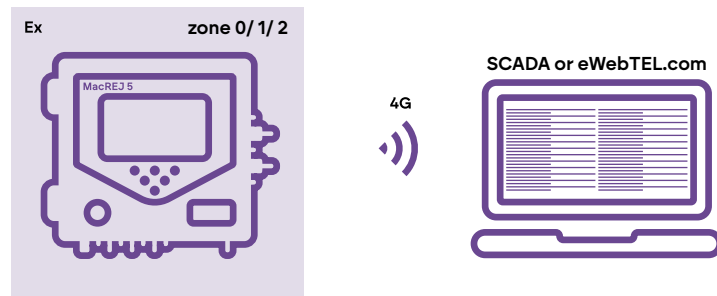
- 8 intrinsically safe programmable digital inputs:
 - 2 reed LF/ bistate inputs
 - 4 reed bistate inputs
 - 2 intrinsically safe inputs NAMUR type in EN60947 5-6 standard, ability to operate inputs on battery
 - pressure sensor p1, p2: 0÷0.1/ 0÷0.3/ 0÷6/ 0÷10/ 0÷20/ 0÷40/ 0÷70/ 0÷100 bar ended with M12 x 1.5 or NPT 1/4" thread – typical pressure indications accuracy – 0.15% of the range
 - temperature sensor PT1000 class A (4-wired) with cable length compensation, diameter 5.7mm
-



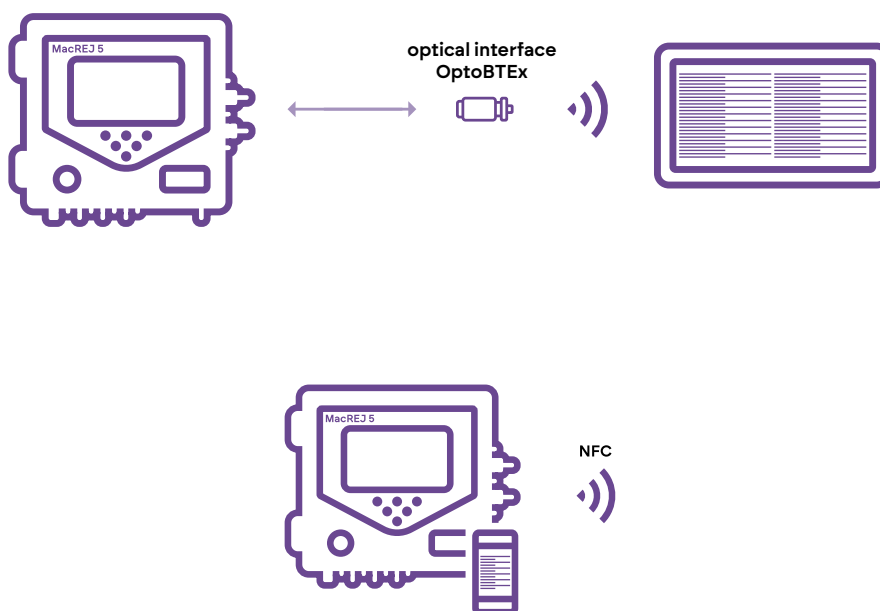
application of the MacREJ 5 gas flow data logger

➤ direct data transmission

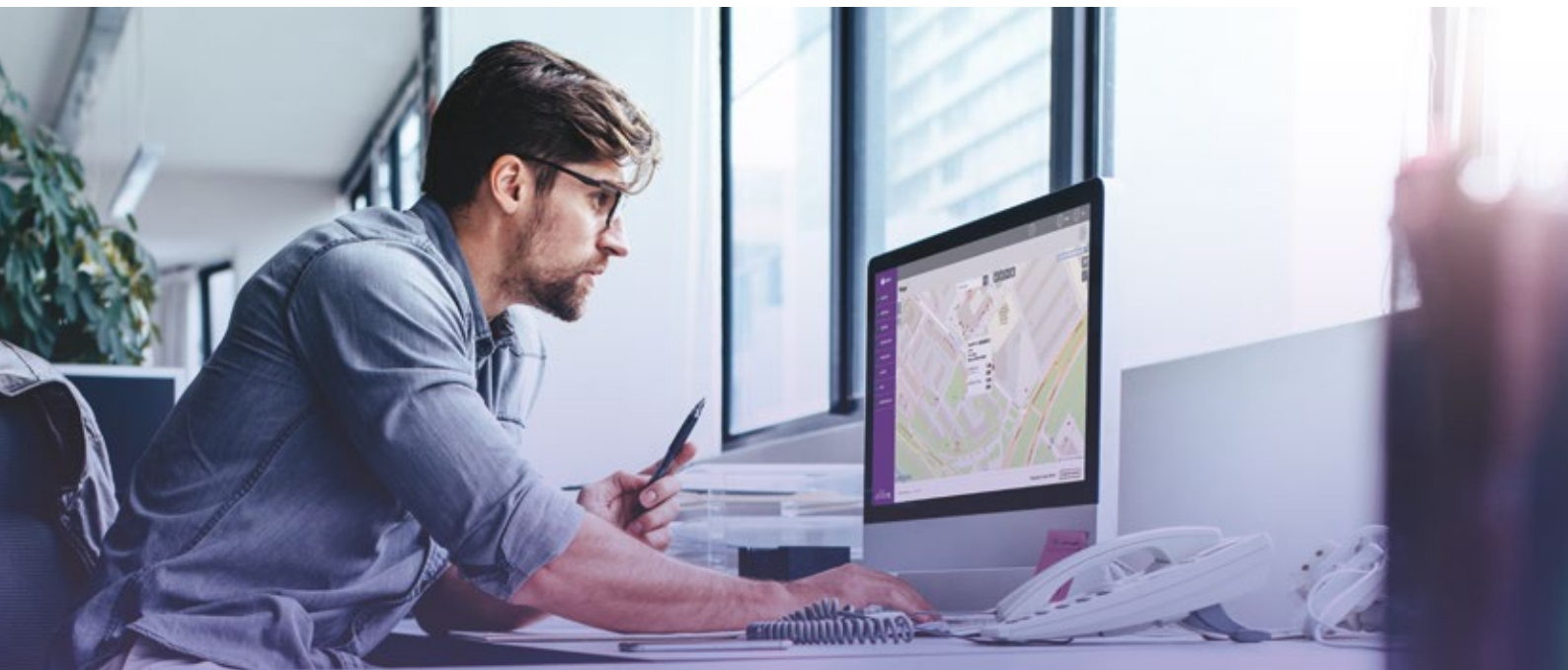
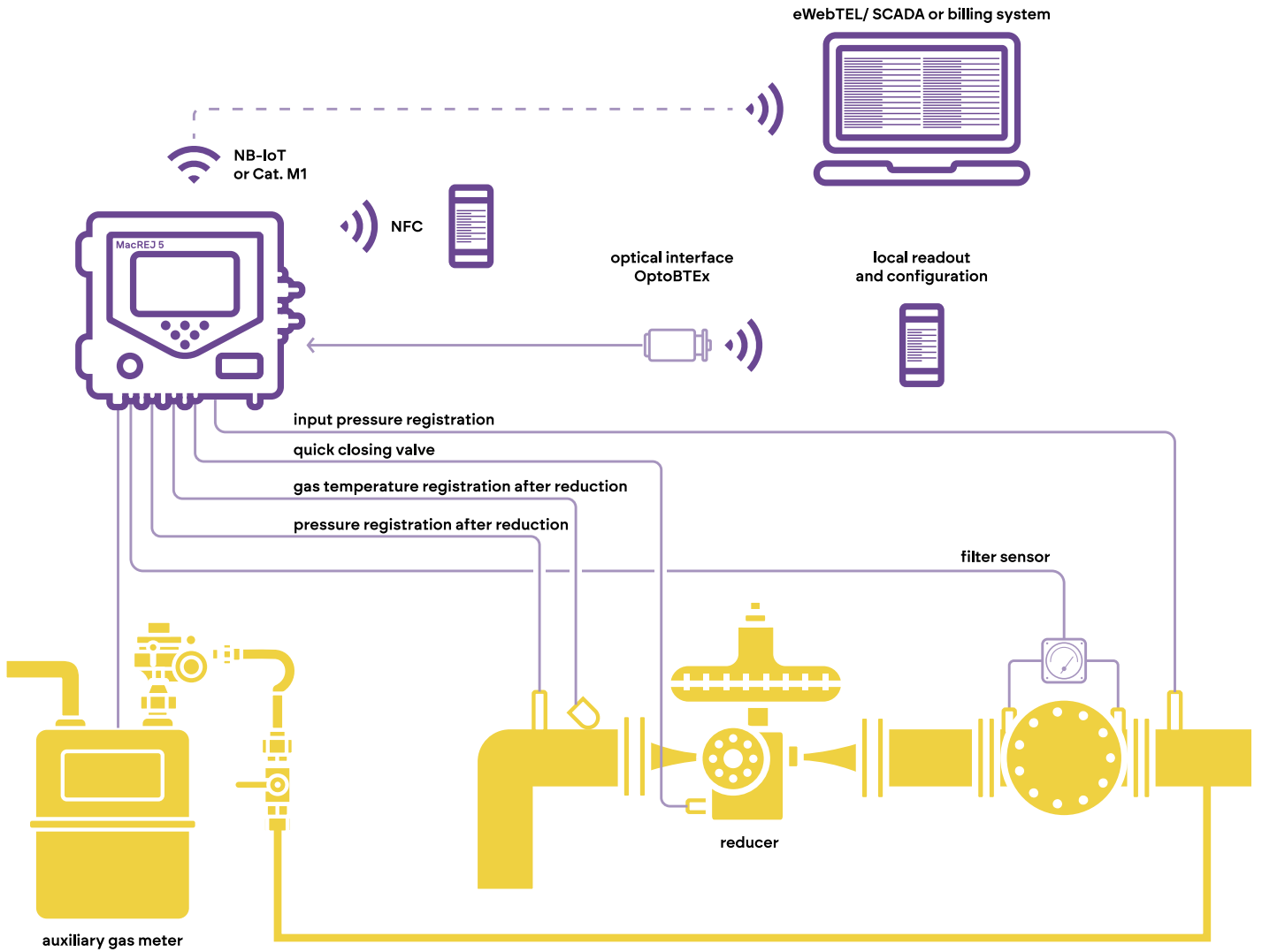
Direct data transmission to the IT system via built-in 4G LTE modem.



➤ local reading and configuration



application of
the MacREJ 5 data logger





MacREJ 5 R

electronic gas volume data logger

MacREJ 5 R is a gas flow logger that allows real-time transmission of information about recorded gas consumption to two independent information systems, such as SCADA system and balancing system.

MacREJ 5 R is an intrinsically safe device that can be installed even in the zone 0 explosion hazard area.

accessories

- eWebTEL p. 42
- ConFIT! p. 45
- ConFIT! data loggers p. 46
- OptoBTEx p. 47
- INT-S3 p. 47
- IK-401 p. 47
- EM-1 p. 48



why is it worth

choosing MacREJ 5 R data logger?

- easy installation and configuration via NFC
- option for mains power connection
- operation on battery up to 15 years
- comfortable operation even in low temperatures

functionalities of the MacREJ 5 R data logger

- built-in GSM modem (optional) operating in 4G LTE and 2G networks
- support for proximity communication standard NFC, optical link OptoGAZ, and two RS485 serial links
- 4" graphical display with backlight, works at temperatures up to -30°C
- configurable widgets presenting daily/monthly charts in the form of bar graphs
- ATEX-certified, suitable for operation in any explosion hazard zone (up to zone 0, 1, 2), including for the built-in modem
- compatibility with diaphragm, rotary, and turbine gas meters with reed switch or OC output
- up to two gas meters via low-frequency (LF) inputs
- five digital inputs for potential-free sensors
- low operating costs thanks to the use of standard lithium batteries
- integration with BMS (Building Management System) via MODBUS RTU/TCP or Vb and Vm pulses



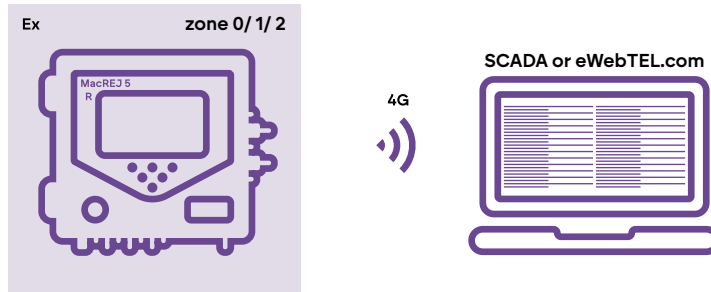
**technical data of
the MacREJ 5 R data logger**

dimensions/ weight	207 x 194 x 77 mm/ 1.3 kg
housing material	polycarbonate
relative humidity	maximum 95% at temperature of 70°C
ambient temperature range	from -25°C to 70°C
housing protection class	IP66 for outdoor installations
keyboard	6 pushbuttons
display	graphical, 4", backlight, operation at full working temperatures range
Ex feature	II 1G Ex ia IIB T4 Ga, certificate: FTZÚ 17 ATEX 0047X
internal power supply	one standard lithium battery size D 3.6V/ 17Ah; operation time: 5 years
modem power supply	two lithium batteries size D 3.6V/ 17Ah; operation time: 5 years with two transmissions per day (two batteries)
external power supply	communication interface INT-S3 – switchable RS485 port, intrinsically safe power supply, two digital OC inputs/ outputs. Interface supply voltage 11-30V DC
transmission protocols	MODBUS RTU, MODBUS TCP (available in version with integrated modem), GAZMODEM1, 2, 3, other protocols per request
transmission ports	<ul style="list-style-type: none"> • two independent serial transmission protocols, speed up to 256000 b/s • RS485 standard; COM1, COM2 • optical interface IEC 62056-21 • NFC IEC 14443 interface • integrated 4G LTE/ 2G module (optional)
resistance to mechanical and electromagnetic conditions	M2/ E2
inputs	<ul style="list-style-type: none"> • 5 intrinsically safe programmable digital inputs: - 2 reed LF inputs/ bistate - 3 reed bistate inputs
control outputs	<ul style="list-style-type: none"> • four intrinsically safe oputputs OC type: - one configurable as bistate or frequency (0-5000Hz) - three bistate outputs

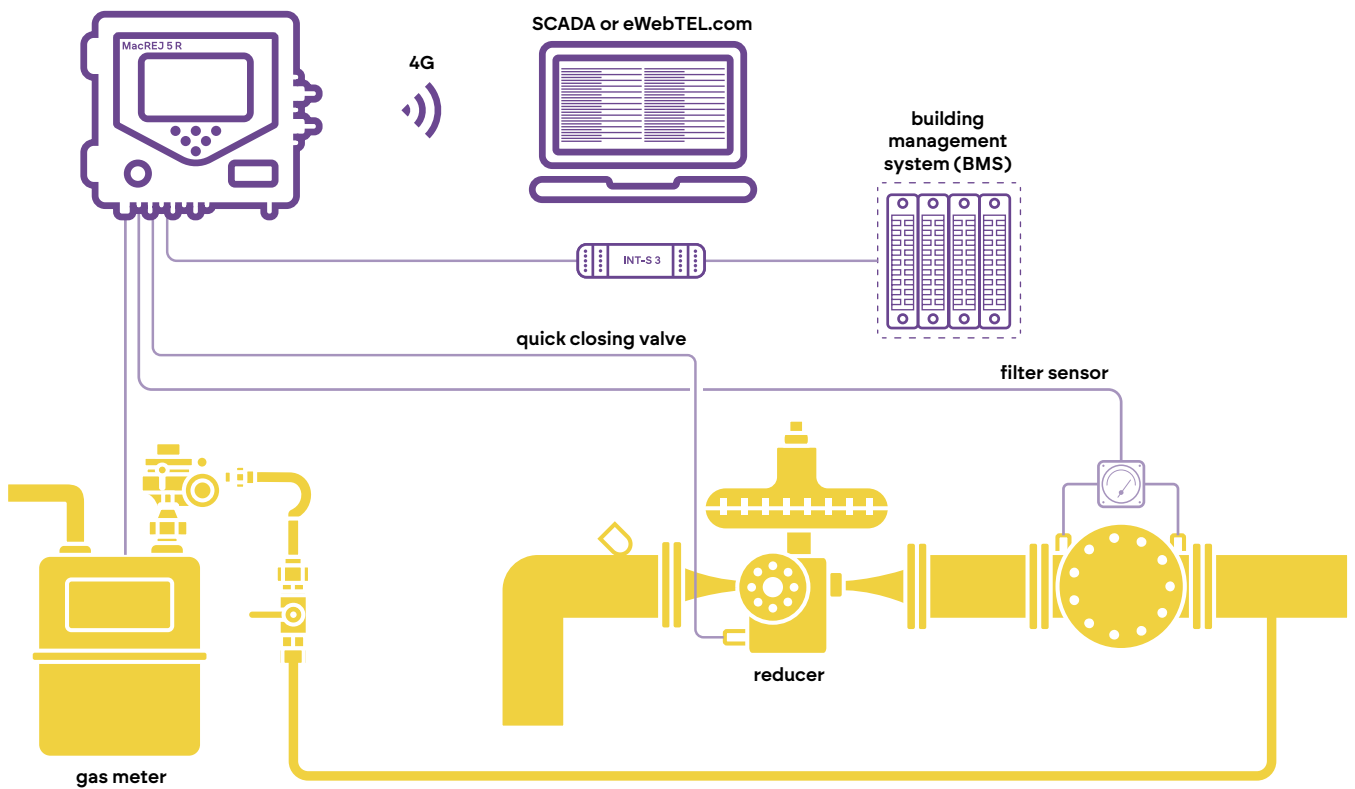
application of the MacREJ 5 R data logger

direct data transmission to the system

Data transmission via the built-in 4G LTE modem.



application diagram



local reading and configuration





MacR8

data logger for gas meters



AMR data logger for diaphragm gas meters with a built-in IoT LTE Cat.M1, NB-IoT, 2G module.

The main purpose of MacR8 is to transmit information about registered gas consumption and alarm states to the data collection system. The device allows integration into the local Building Management System (BMS) and control of tariff power usage.

MacR8 is designed to operate in Zone 2 hazardous areas (available version of the device designed for operation in zone 0 hazardous areas - MacR6-Z0-V).

accessories

- eWebTEL p. 42
- ConFIT! p. 45
- ConFIT! data loggers p. 46
- OptoBTEx p. 47

why is it worth

choosing MacR8 data logger?

- low operating cost; powered by the most economically efficient 20Ah battery
- works in challenging locations, even with signal drops of up to 164 dBm
- even 15-years operating period without battery replacement
- automatic tampering notifications
- intuitive and fast configuration via ConFIT! application for data loggers

functionalities of the MacR8 data logger

- support for low energy LPWAN mobile network data transmission technologies: LTE Cat.M1 and NB-IoT (LTE Cat.NB2)
- supports Mobile Virtual Network Operators (MVNOs)
- standard commercially available D-size lithium battery, up to 15 years of operation
- LCD display presenting connection status, network level, battery status and volume increment logging
- IEC 62056 optical interface for configuration
- effective data transmission in harsh environments
- dedicated mobile application for device configuration and reading logged data
- implemented Smart-gas, DLMS or GazModem protocols
- collaboration with diaphragm, rotary, and turbine gas meters with reed switch or OC output type
- optional built-in outputs: pulse outputs for counting and control



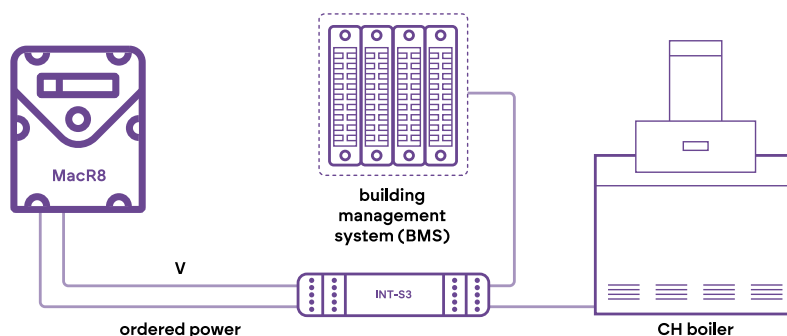
**technical data of
the MacR8 data logger**

dimensions/ weight	124 x 90 x 40 mm/ 0.3kg
housing material	polycarbonate
relative humidity	maximum 95% at temperature of 55°C
ambient temperature range	from -30°C to 60°C
housing protection class	IP66 in accordance with EN 60529 for outdoor installations
Ex feature	II 3 G Ex ic IIA T3 Gc certificate: FTZU14 ATEX 0037
display	segmented LCD display allowing device diagnostics and showing values: counter, monthly increments and hourly peaks
transmission protocols	GAZMODEM 2, 3, Smart-gas, DLMS
resistance to mechanical and electromagnetic conditions	M2/ E2
power supply	replacable lithium battery D-size
transmission	<ul style="list-style-type: none"> • IEC 62056-21 optical interface • support for 3FF (Micro SIM) or MFF2 (MIM) standard cards • Cat. M1: B1/ B2/ B3/ B4/ B5/ B8/ B12/ B13/ B18/ B19/ B20/ B25/ B26/ B27/ B28/ B66/ B85 • Cat. NB2 (nb-IoT): B1/ B2/ B3/ B4/ B5/ B8/ B12/ B13/ B18/ B19/ B20/ B25/ B28/ B66/ B71/ B85 • EGPRS: 850/ 900/ 1800/ 1900 MHz
outputs	<ul style="list-style-type: none"> • two built-in DO type OC outputs (optional version) - DO1 - two-state output for gas consumption limitation control in case of consumption of ordered tariff power (dVh limit), - DO2 - volume pulse output, e.g. for BMS systems
compatibility with gas meters	<ul style="list-style-type: none"> • direct connection: Honeywell/ Elster BK-Gxx series, Itron RF1 counter „o“ Apator/ Metrix UG • cable connection to any gas meter with reed switch or OC output through LF input (DI1) and magnetic field control contact - TS input (DI2)

**application of
the MacR8 data logger**

system diagram

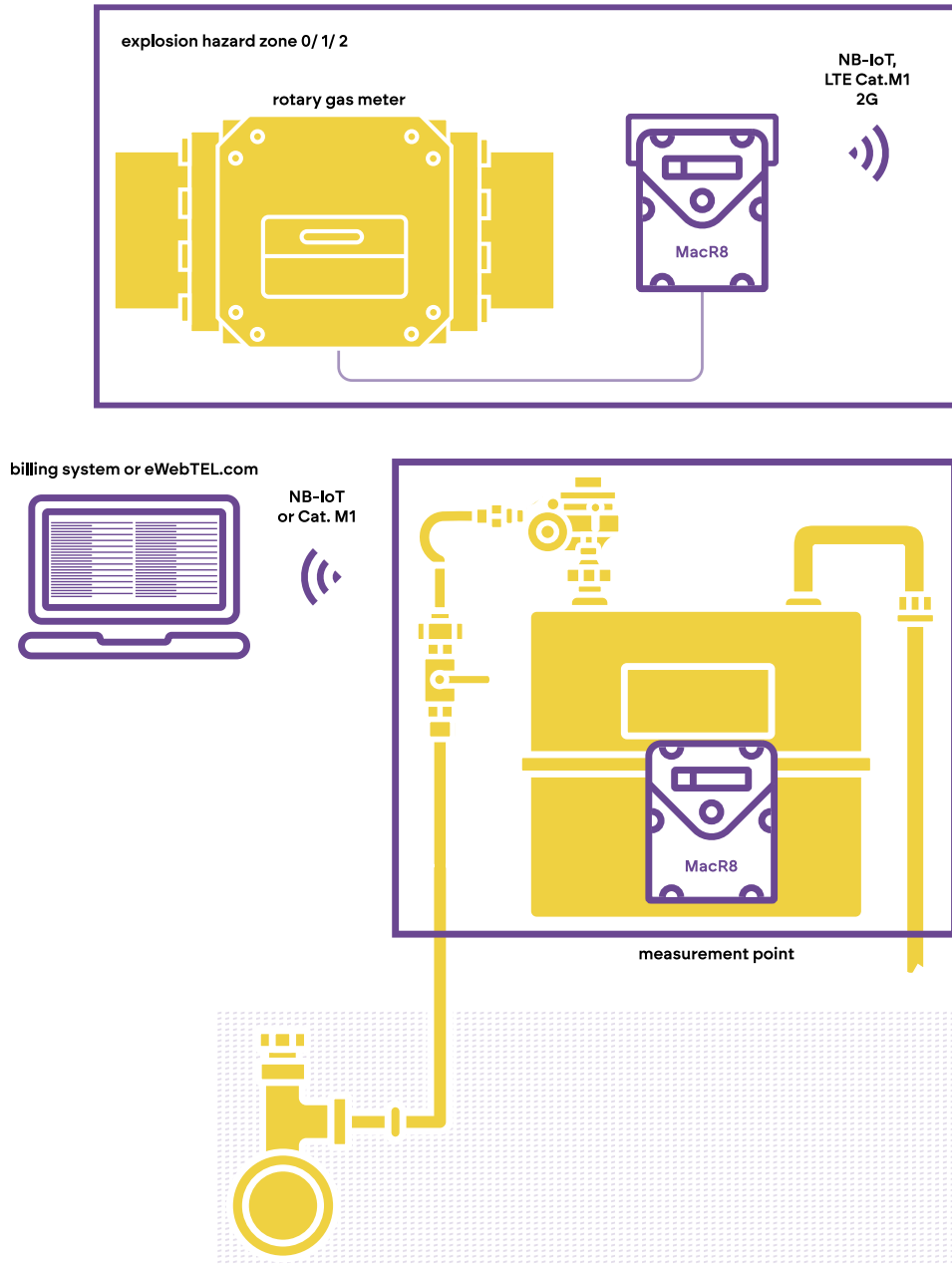
Automatic control system diagram for ordered power usage.



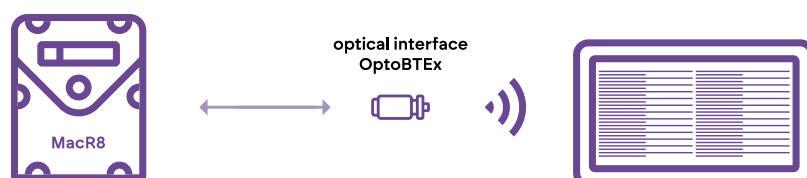
application of
the MacR8 data logger

remote
data reading

Remote data reading using MacR8 (direct and wired LF/ TS connection).



local reading
and configuration





MacR6-Z0-P

gas pressure data logger with built-in IoT telemetry module

The main application of MacR6-Z0-P is to transmit pressure trend information and alarm states to the SCADA system or eWebTEL. The logger is equipped with an integrated modem operating in NB-IoT, LTE Cat.M1, and 2G technologies.

The integrated battery allows for long-term operation of the device. MacR6-Z0-P is designed to operate in zone 0 explosion hazard areas.

accessories

- eWebTEL p. 42
- ConfIT! p. 45
- ConfIT! data loggers p. 46
- OptoBTEx p. 47



why is it worth

choosing MacR6-Z0-P gas pressure logger?

- simultaneous registration of two pressures
- effective data transmission and remote delivery through telecommunication networks
- battery lifetime up to 10 years
- automatic disturbance notifications
- intuitive and fast configuration via ConfIT! data logger application

functionalities of the MacR6-Z0-P gas pressure logger

- support for low-power data transmission technologies LPWAN in cellular networks: LTE Cat.M1 and NB-IoT (LTE Cat.NB2)
- support for Mobile Virtual Network Operators (MVNOs)
- standard D-size lithium battery, up to 10-year operating period
- LCD display presenting connection status, network level, battery status, and pressure reading
- IEC 62056 optical interface for configuration
- effective data transmission in challenging conditions through support for LPWAN technology
- dedicated mobile application for device configuration and data reading
- implemented GAZ-MODEM 2 and 3 transmission protocol
- event-based data transmission for pressure limit exceedances

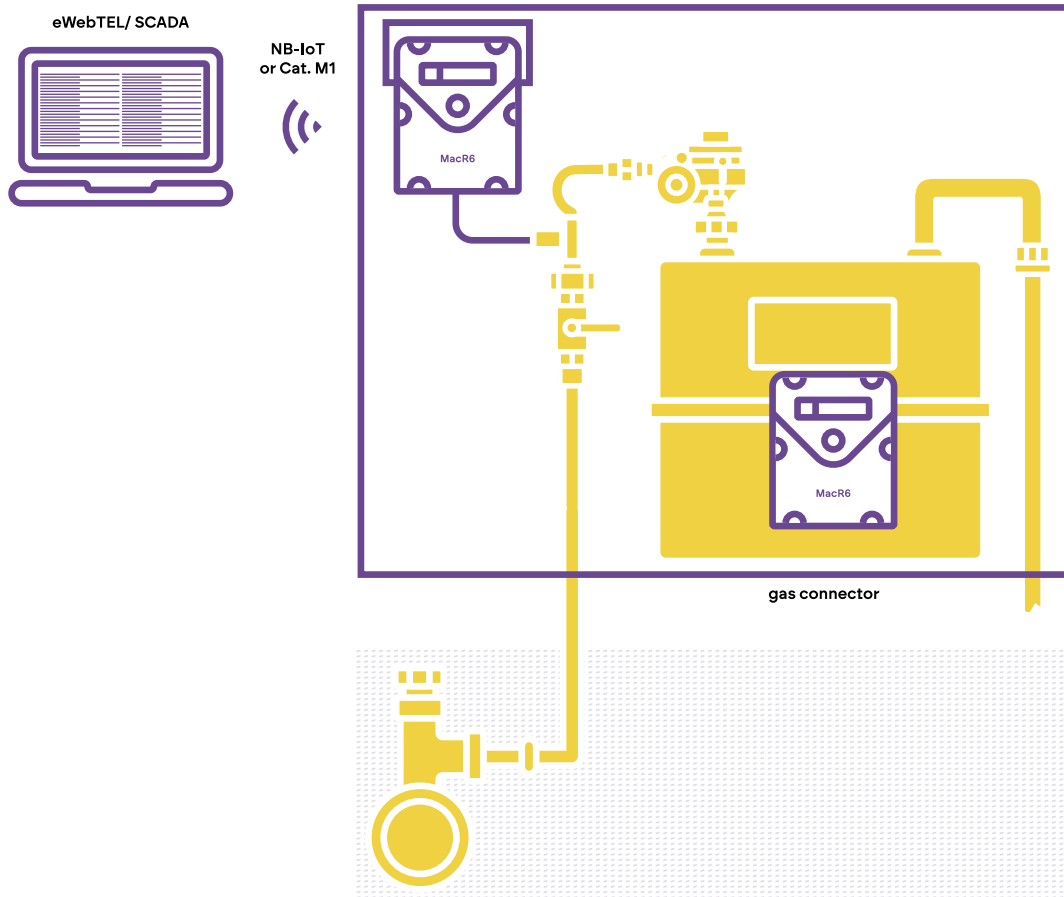
technical data of the MacR6-Z0-P gas pressure logger

dimesnions/ weight	124 x 90 x 40mm/ 0.3kg
housing material	polycarbonate
relative humidity	maximum 95% at temperature of 55°C
ambient temperature range	from -30°C to 55°C
housing protection class	IP66 in accordance with EN 60529 for outdoor installations
Ex feature	II 1 G Ex ia IIA T4 Ga certificate: FTZU16 ATEX 0051X
display	graphical LCD display allowing device diagnostics and showing current pressure value
transmission protocols	support for TCP, UDP, FTP, NTP, HTTPS
resistance to mechanical and electromagnetic conditions	M2/ E2
power supply	replacable lithium battery D-size; up to 10 years of operation
transmission	<ul style="list-style-type: none"> • IEC 62056-21 optical interface • Cat M1: B1/ B2/ B3/ B4/ B5/ B8/ B12/ B13/ B18/ B19/ B20/ B25/ B26/ B27/ B28/ B66/ B85 • Cat NB2: B1/ B2/ B3/ B4/ B5/ B8/ B12/ B13/ B18/ B19/ B20/ B25/ B28/ B66/ B71/ B85 • EGPRS: 850/ 900/ 1800/ 1900 MHz
registration period	<ul style="list-style-type: none"> • data registered at intervals of 1-60 minutes; 1920 records allowing to save in device memory data from max. 3 months • memory of events - around 200 records
inputs/ sensors	<ul style="list-style-type: none"> • accelerometer - position sensor • housing opening sensor • gauge pressure sensors with ranges 0÷0.1/ 0÷0.3/ 0÷6/ 0÷10/ 0÷20/ 0÷40 bar • optional secondary pressure sensor • preassure sensors ended wirh metric thread M12 x 1.5 (Ermeto) or NPT 1/4"

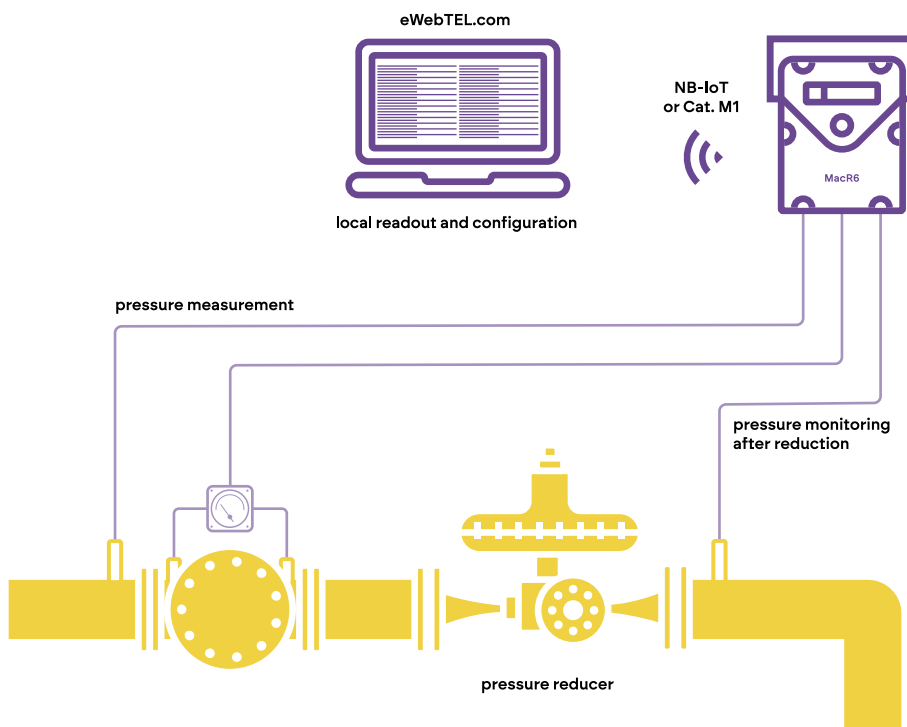
**application of
the MacR6-Z0-P gas pressure logger**

pressure monitoring

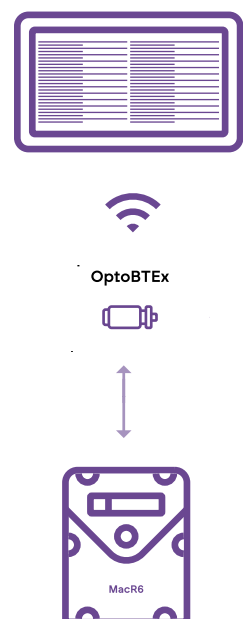
Monitoring pressure at the end of the gas grid using MacR6-Z0-P.



application diagram



local reading and configuration





internet system

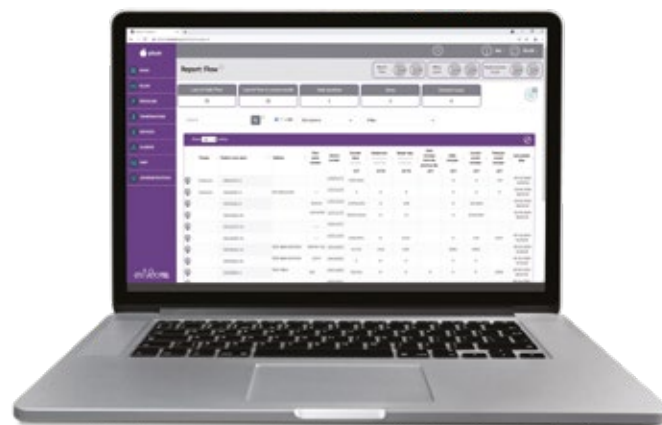
▬ eWebTEL





eWebTEL

measurement data acquisition system



The 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.

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

why is it worth using the eWebTEL system?

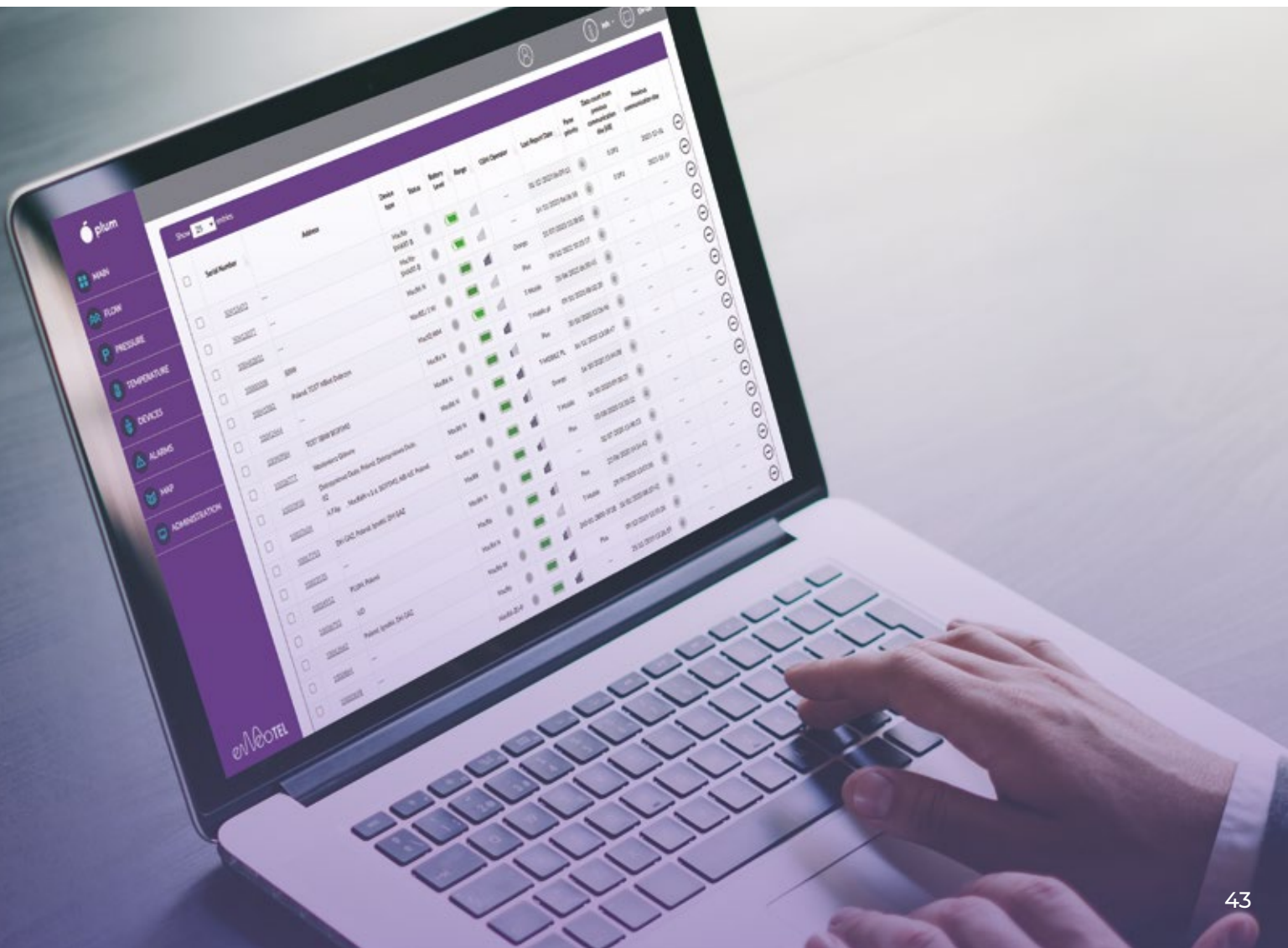
- monthly gas consumption reports for individual recipients or recipient groups
- notifications about alarm events, such as pressure exceedance or gas leakage
- access to consumption history for individual recipients or recipient groups

related devices

- MacBAT 5
- MacREJ 5
- MacREJ 5 R
- MacR6-Z0-P
- MacR8

functionalities of the eWebTEL data acquisition system

- e-mail notifications for alarm events
- adaptation for both desktop and mobile browsers
- ability to define the range 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! desktop**
- **ConfiT! data loggers**
- **ConfiT! volume correctors**





ConFIT! desktop

software for desktop
configuration



The ConFIT! desktop software enables configuration of PLUM products through a clear graphical interface that can be customized as needed.

The basic functionality of graphical device profiles allows configuration in both basic and advanced modes. Table based configuration is also available. Each modified and unsaved value is highlighted with a distinct color, ensuring the user is aware of every change made. Firmware can be upgraded on PLUM devices without the need for additional interfaces or softwares. ConFIT! desktop remembers the list of recently used devices, eliminating the need to search for a new device each time.

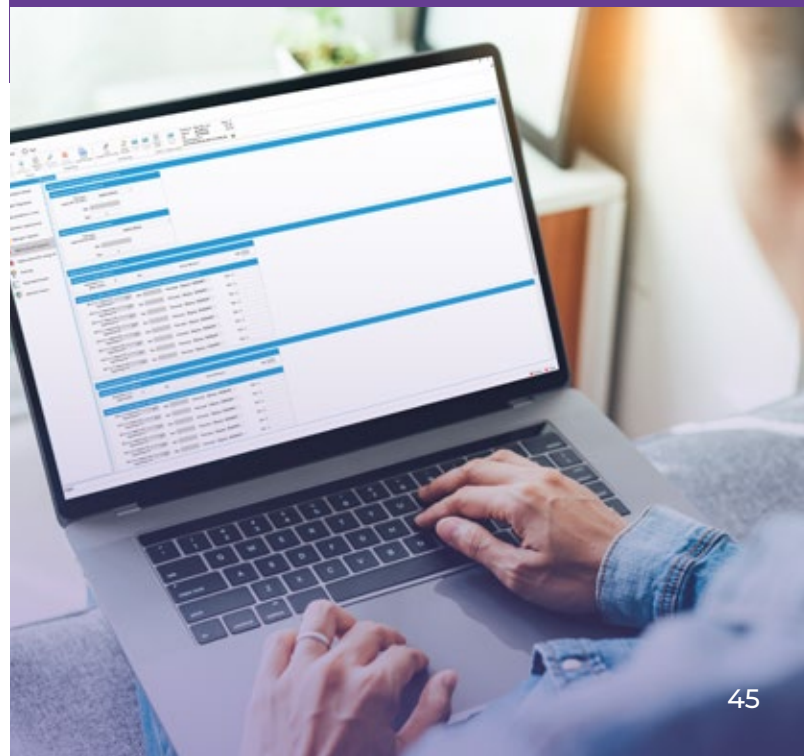
The user-friendly graphical interface, along with the functionality of graphical device profiles, facilitates this process. Additional configuration is available in text mode. The software is designed for installation and operation in the Windows operating system.

why is it worth using the ConFIT! desktop system?

- configuration and firmware update on PLUM devices without the need for additional programs
- installation and operation in the Windows operating system
- configuration settings can also be adjusted in an additional text mode
- functional, graphical device profiles
- clear user interface



download from
gas.plum.pl



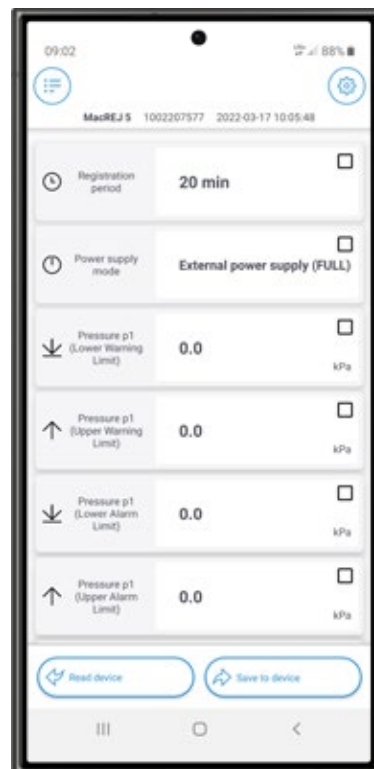
ConfIT! data loggers

mobile application for data loggers configuration

The mobile application ConfIT! data loggers is designed for configuring telemetry modules, gas meters, 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 OptoBTE_x head through the optical channel, and directly using NFC.



download the ConfIT!
data loggers application



ConfIT! volume correctors

mobile application for gas volume correctors

The application supports on-site installation and allows for configuration of the device and editing of basic volume corrector parameters.

The application communicates with devices via bluetooth standard, using the OptoBTE_x head through the optical channel, and directly using NFC.

ConfIT! volume correctors application is designed for configuring gas volume correctors produced by PLUM.



download the ConfIT!
volume correctors application





accessories

- IK-401
- INT-S3
- OptoBTEx
- EM-1
- EM-2
- EM-2Ex





IK-401

**industrial router/
communication interface 4G**

The LTE communication interface type IK-401 is a device operating in a 4G/3G/2G network. It provides network infrastructure via an Ethernet port and three RS485 ports.

The device's operating parameters can be modified both locally and remotely, through a web browser (with password-protected WEB server) as well as dedicated software. Remote management of the device's operation is also possible using SNMP protocol or GAZ-MODEM 3.



OptoBTeX

optical interface

OptoBTeX is used for reading and wirelessly BLE Bluetooth Low Energy transmitting data from devices equipped with an optical communication interface compliant with the IEC 62056-21 standard to configuration software primarily installed on mobile devices with MS Windows, Android (tablet, smartphone, laptop) operating systems.

OptoBTeX is battery powered device, charged via USB-C interface.

ATEX: II 3G Ex ic IIA T4 Gc



INT-S3

interface

The interface provides power supply and isolation for connected measuring devices in stationary telemetry systems, powered by either 230VAC mains or solar batteries.

Data transmission is possible to computers or other battery-powered/network-powered devices equipped with an RS485 port. It allows for reading data from devices placed in hazardous areas. It also enables the control of devices in safe zones.

The interface power supply is VIN=11-30VDC.

ATEX: II (2)G [Ex ib Gb] IIA





EM-1

expansion module

The EM-1 module is an expansion device that enhances the functionality of the compatible PLUM devices with two additional current outputs operating in the 4-20mA current loop standard and four two-state OC outputs. The module can also operate as a standalone device. It has its own table of available parameters, which can be remotely programmed using the GAZMODEM2 and MODBUS transmission protocols. Data reading and modification can be performed from a computer or other battery-powered/ network-powered device equipped with an RS485 serial port.



EM-2

expansion module

The EM-2 module is an expansion device that enhances the functionality of the MacBAT 5 corrector with an additional 8 normal state digital inputs. It can also operate as a standalone device, as it has its own parameter table for remote modification using MODBUS RTU transmission protocols. Data reading and modification can be performed using a SCADA system.

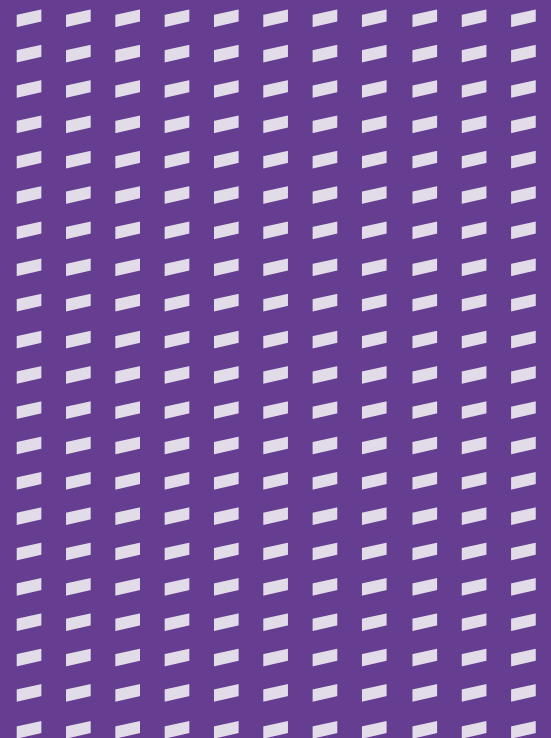


EM-2Ex

expansion module

The EM-2Ex module is an expansion device that enhances the functionality of the compatible PLUM devices with an additional 8 intrinsically safe digital inputs. It can also operate as a standalone device, as it has its own parameter table for remote modification using MODBUS RTU transmission protocols. Data reading and modification can be performed using a SCADA system.

ATEX: II (1)G [Ex ia Ga] IIC







why it's worth choosing 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
- ▬ we organize dedicated technical training
- ▬ we provide marketing support
- ▬ easy configuration and operation through dedicated communication interfaces, web systems and mobile applications
- ▬ we focus on business partnership, that is, we help solve technical problems and technological challenges

We develop complete metrology and telemetry solutions for the natural gas industry. 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.

for whom

do we create our solutions

- ▬ gas distribution operators
- ▬ gas transfer providers
- ▬ metering devices suppliers
- ▬ commercial customers
- ▬ manufacturer of the natural gas equipment



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 collaborate with devices from other suppliers.

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





cooperation process

step 1.



establish technical assumptions

We agree on
technical specifications
in detail.

step 2.



device development

We are developing
the hardware
and software.

step 3.



order processing

We begin the
manufacturing of your
device.

step 4.



device implementation

We offer dedicated
technical
and implementation
training.

step 5.



post-sales support

We provide technical,
service and marketing
support.



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.

The quality of Plum solutions is confirmed by many years of cooperation and trust with the various gas distribution companies and transmission operators (TSO) 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.

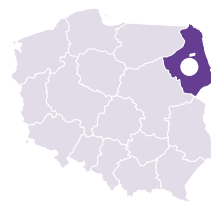
We continuously improve the efficiency of our design and production processes to quickly respond to changing market requirements and customer needs.

- 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**

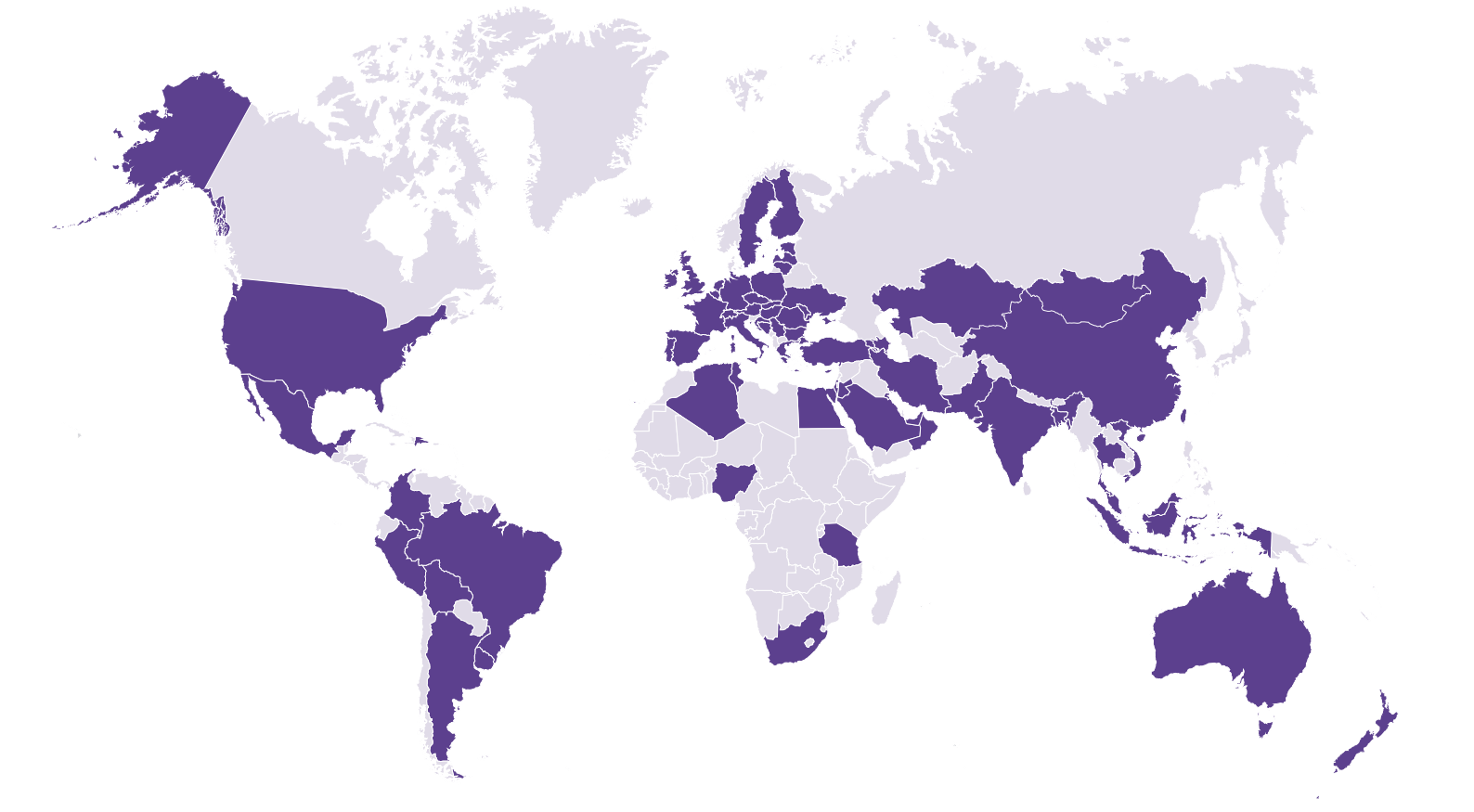




We develop our electronics with several areas in mind. We manage 5 brands: plum HVAC, plum GAS, plum WATER, plum LAB, plum EMS. The accumulated experience serves as added value for all our activities and projects.



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






get in touch with us

Secretariat Plum

We work from Monday to Friday from 7:00 a.m. to 3:00 p.m.

 phone: +48 85 749 70 00

fax: +48 85 749 70 14

 e-mail: plum@plum.pl

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National Waste Database No. 000009381

