

Professional solutions for remote monitoring, maintenance, control and location of objects, installations and devices based on GSM/GPRS and GPS mobile technologies

POLISH PRODUCT – WORLDWIDE STANDARD



for MT-0xx, MT-1xx, MT-2xx and MT-5xx modules

Short Overview

For several years INVENTIA company has specialised in providing of professional telemetry, data logging and location tracking devices based on GSM/GPRS and GPS technologies. In cooperation with AB-MICRO, company well known on the industrial automation market, we have sold over 20 thousands of modules to 27 countries worldwide. The market success results not only from the high quality products and their innovative functionality, but also

from the consequently implemented concept of solutions that are freely configurable by the user. The telemetry modules of MT series won the prestigious awards, e.g. Gold Medal on AUTOMATICON Fair and Grand Prix on WOD-KAN Fair. The designing, manufacturing, sales and services procedures performed by INVENTIA has been certified according to ISO 9001:2008 Quality Management System.



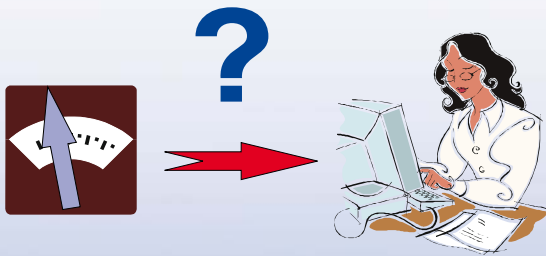
ISO 9001:2008
Certified Quality Management System

inventia

GPRS Telemetry – BENEFITS

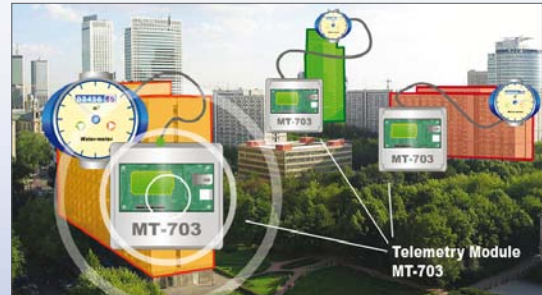
Instant access to the information

- on-line supervision without establishing connection
- possibility of inspection at any time of any object in any distance
- immediate messaging on important changes, events and alarms
- monitoring and control capabilities with mobile devices
- remote object data accessible via Internet



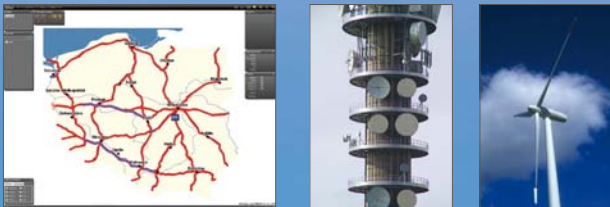
Growth in Customer satisfaction

- remote diagnostics
- short failure detection and repair time
- preventing failures before they appear
- remote reading of meters
- assuring the continuity of raw materials, consumables or products delivery



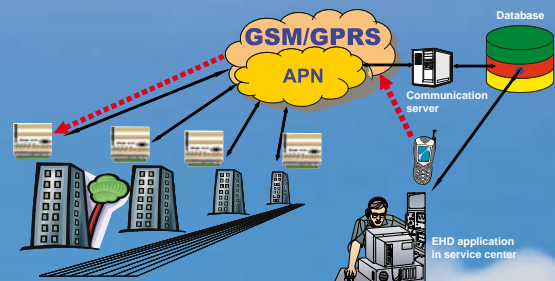
Safety of devices, installations and systems

- quick alarming on threats and failures
- preventing failures before they happen
- remote diagnostics of distant objects
- access security
- supervision of warning lights operation



Compliance with regulations

- lift monitoring
- gas sensor monitoring (garages, boiler rooms)
- emission, imission and sewage monitoring
- cold stores monitoring



Cost savings

- decreasing the number of failures, loss reduction and shortening of repair time
- reduction of trips to distant sites
- better security of devices and installations
- more effective diagnostics
- optimising of logistic actions



Environment protection

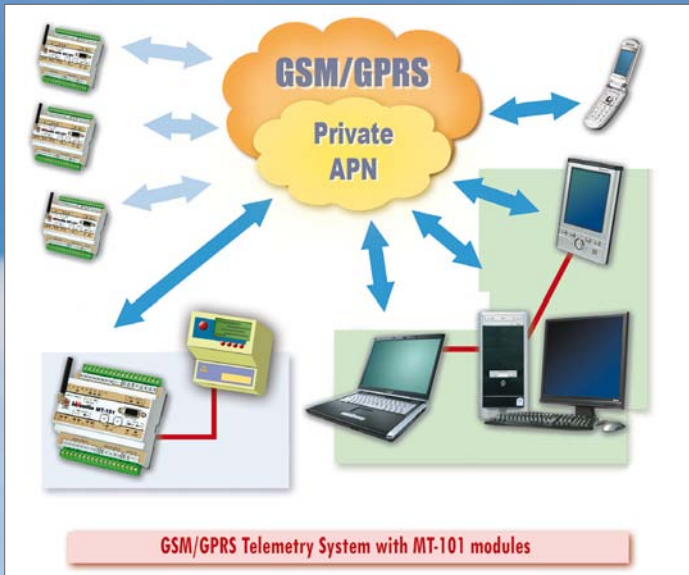
- air and water purity monitoring
- early detection of dangerous leakage or harmful emissions
- failure prevention in sewage pumping stations
- sewage treatment plants monitoring
- ground water and river levels monitoring
- energy consumption reduction



POLISH PRODUCT – WORLDWIDE STANDARD

GSM/GPRS telemetry modules for remote monitoring, maintenance, control, diagnostics and measuring without distance limits.

The GSM/GPRS technology quickly conquers the professional telemetry applications market and gets the advantage over the radio modem solutions being commonly used up to now. The wide areas of applications include an environment protection, water-sewage systems, agriculture, forestry, power and gas industries, utilities, remote reading of media consumption and object security. The basic benefits of wireless GSM/GPRS systems usage in an remote monitoring and control are low costs, short time of implementation, unlimited distance between the objects, insensibility to lay of the land and natural obstacles (e.g., forests or high buildings), lack of complicated antenna systems and capability to announce the alarm events directly to the mobile phones of responsible persons. The GPRS technology provides direct and secure access to the information using mobile devices (phones, PDAs and computers). Additionally, there is no bottleneck effect in the central station in case of complex telemetry systems. An HSDPA router used in the central station normally provides up to 1.8 Mbit/s throughput, and even up to 10 Mbit/s with the fixed link to the network operator. The event-driven transmission (when the object itself is sending data under defined circumstances) allows fast and simultaneous sending the information about state changes of the arbitrary located objects to the central system, even in the case of very large installations with hundreds of monitoring points.



Few years ago the fast progress of mobile telephony was driven only by voice and SMS technologies. This changed when GPRS (General Packet Radio Services) services were introduced enabling packet data transmission (like in Ethernet network) in GSM environment. The barrier for GPRS technology applications in the professional telemetry systems was the lack of devices with capabilities of: direct connection to input/output signals, direct communication with measuring instruments (e.g., air or water analysers, flow meters, energy meters, PLC controllers), long term data logging and easy configuration by the user himself. The standard GSM/GPRS modems do not meet such requirements.



To satisfy the market needs, the engineers from AB-MICRO and INVENTIA developed the freely user-configurable MT family of telemetry modules based on the GPRS technology for wireless data transmission. The most universal design is the MT-101 module with embedded functionality of GSM/GPRS modem, PLC, data logger and transmission protocols converter. The MT telemetry modules log automatically onto the GPRS network after power up, and then, without external sequence of AT commands, execute the required functions defined by the user with intuitive software tools. The MT modules quickly won the recognition not only in Poland (Gold Medal on AUTOMATICON Fair, Grand Prix on WODKAN Fair), but worldwide as well: in Denmark, Sweden, Norway, Germany, Slovakia, Russia, UK, Spain, Israel, Belgium, Greece, Croatia, Columbia, South Africa, Lithuania, the Netherlands, Turkey, USA, Thailand, Mexico, South Africa, Malaysia, Italy and Hungary.

The MT telemetry modules allow effective application of GPRS technology in the modern telemetry and telematics systems, as an attractive to the older, radiomodem based systems:

- without special permissions
- without complicated antenna systems
- without distance limitations
- without network topology limitations
- without huge investments
- without long lasting implementation process
- without problems

INVENTIA created complete offer for telemetry market, that includes telemetry equipment, software tools, telemetry SIM cards with static IP addresses, private APNs, telemetry WEB portal, advisory and training services, sales and implementation services performed by more than 20 authorised partners worldwide.

Complete offer of telemetry systems

INVENTIA offers a wide range of devices, software and services for GSM/GPRS/GPS wireless systems being used for remote measurements, data logging, control, diagnostics and object location.

Our long experience in GPRS/GPS technologies, reference base of over 20 000 devices working in 27 countries worldwide, the received awards and ISO 9001:2008 certified Quality Management System guarantee our customers security of their investments and the highest technological level in this domain. The important advantages of our solutions are scalability, open architecture and ease of implementation and reconfiguration by the user with intuitive software tools.

The telemetry offer consists of:

Hardware

- Telemetry and control modules of economic series
- Telemetry and control modules of professional series which provide the execution of local control programs and the communication with external devices
- Battery powered, energy saving measuring and data logging devices
- Battery powered location tracking modules capable to monitor the basic parameters of a vehicle (fuel level, door opening, engine operation)
- Communication gateways, converters and input/output expanders
- GPRS modems and routers, antennas, cables, spare batteries, measuring sensors and converters, and buffered power supplies
- Telemetric SIM cards with static IP address in the "telemetria.pl" APN (with or without monthly limit for data transfer)

Software

- Software tools for local and remote configuration and for programming the modules
- Software for remote management of energy saving modules
- Communication software for data acquisition via telemetry module, GPRS modem, GPRS router or Internet. This software provides access to the data via standard OPC or ODBC interfaces (with direct writing to standard relational database) or via CSV files
- Software tools for visualisation, data archiving, web-based analysis and reporting

Services

- Fixed telemetric rate for data transmission in private APN
- Data hosting services
- Training services and support on offered solutions
- Turnkey implementation of telemetry systems made by our authorized partners

The main application areas of our wireless solutions are water-sewage systems, an environment protection, heating and power industry, utilities, transportation and object security. Examples include pumping station monitoring and control, monitoring of gas pressure reduction stations, remote reading of media consumption (water, heat, gas, electrical energy), contactless measurement of temperature in electrical switch rooms, vehicle or asset location tracking, water level monitoring (wells, water intakes, rivers), filling level monitoring in reservoirs, monitoring of electrical power aerial lines, temperature and humidity monitoring in grain silos, data transmission from weather stations and air pollution measurements.



MT-101 telemetry module

– powerful device combining industrial grade GPRS modem, PLC controller, data logger and transmission protocol converter

The MT-101 telemetry module provides features of freely programmable PLC controller equipped with integrated GSM/GPRS modem, data logger and isolated RS-232/422/485 port for communication with the external world. The MT-101 allows building of modern wireless systems for the supervising, monitoring, measuring, diagnostics and control based on packet GPRS transmission technology. The important feature of the MT-101 module is the capability of data transmission not only in the polling process, but also as an event-driven mechanism (for example when binary input/output changes its state or when the signal on analog input changes by certain degree). The module provides built-in data logger of 100 ms time resolution (RTU functionality). MT-101 is fully configurable and programmable by the user in intuitive, user-friendly MT Manager software environment, either locally via serial port or remotely via GPRS network.

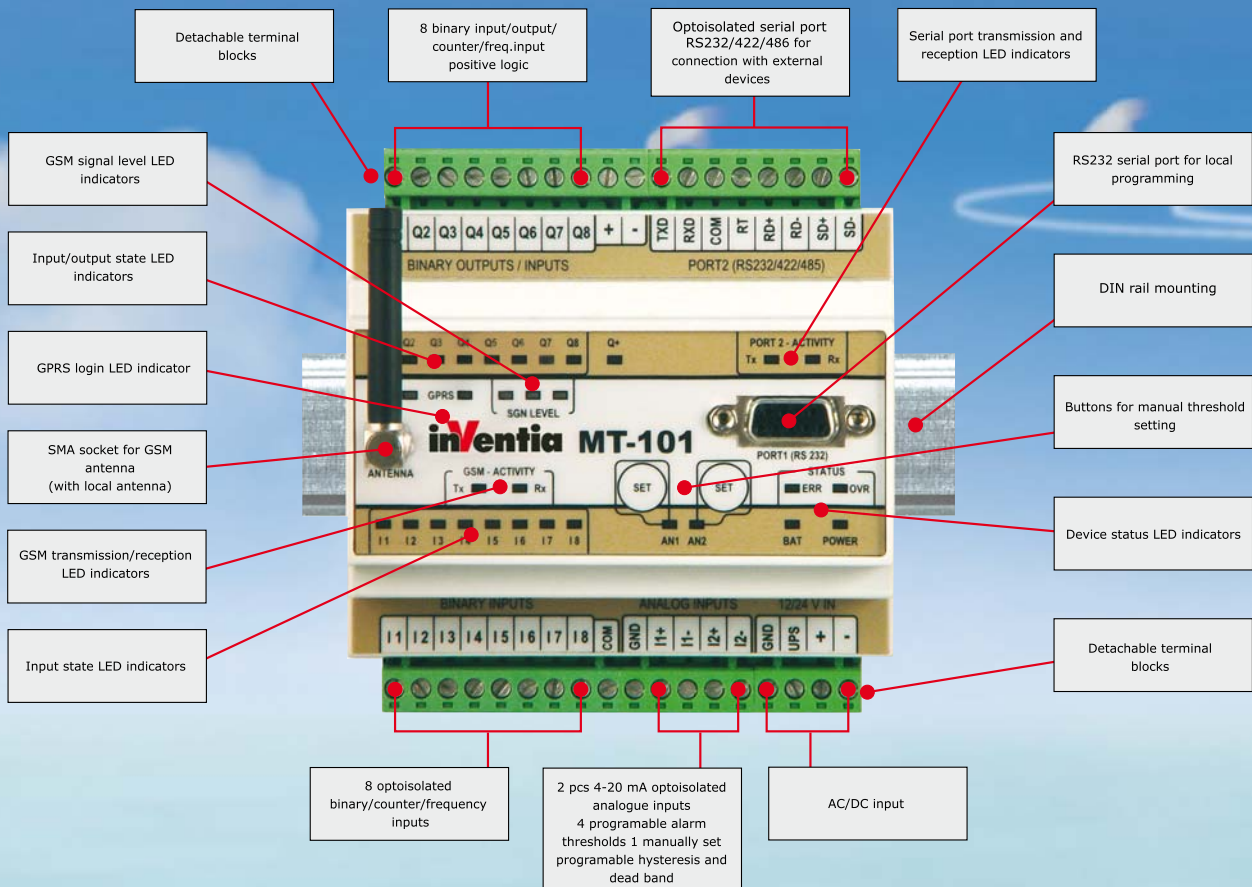
The MT-101 module allows direct connection of external signals to the device inputs/outputs. The resources can be expanded with external modules (e.g. the EX expanders manufactured by INVENTIA, standard PLC devices or I/O modules) operating in Modbus RTU Slave mode.

The MT-101 ensures easy integration in GPRS network of any kind of intelligent devices (like PLCs, measuring instruments, operator panels) equipped with RS-232/422/485 serial communication port. In case the device supports standard Modbus RTU protocol, the advanced functions of local communications, data processing, data logging, and spontaneous event-driven GPRS transmission are available.

The user of MT-101 module has no obligation to know neither the GPRS transmission details, nor the AT control commands, the session negotiation protocols, the rules of verification of session activity and its re-negotiation after a break, the network access security restrictions, the data integrity rules nor the delivery validation of transmitted frames. Moreover, the communication of external devices with MT-101 module does not require any changes of their configuration settings or their application software. The MT-101 can operate as a local Master device which periodically polls an external device to get the user defined resources (inputs, outputs, analog inputs, registers, and internal flags). These resources are mirrored in the MT-101 memory, allowing detection of alarms, state changes, analog value changes, and meeting logical conditions, all these with the use of direct or calculated values. Data are transmitted via GPRS according to the rules defined by the user:

- as a response to a query
- autonomously by the module at defined moments of time
- spontaneously by the module as a result of the defined event (an alarm, a state change, an important change of an analogue value, fulfilled logical expression, etc.)

An event-driven transmission makes possible the creation of wireless systems of virtually unlimited size and distance with precise time resolution and short response time (2-3 seconds), and with very efficient use of GPRS transmission.



MT-101

– much more than industrial grade GPRS modem

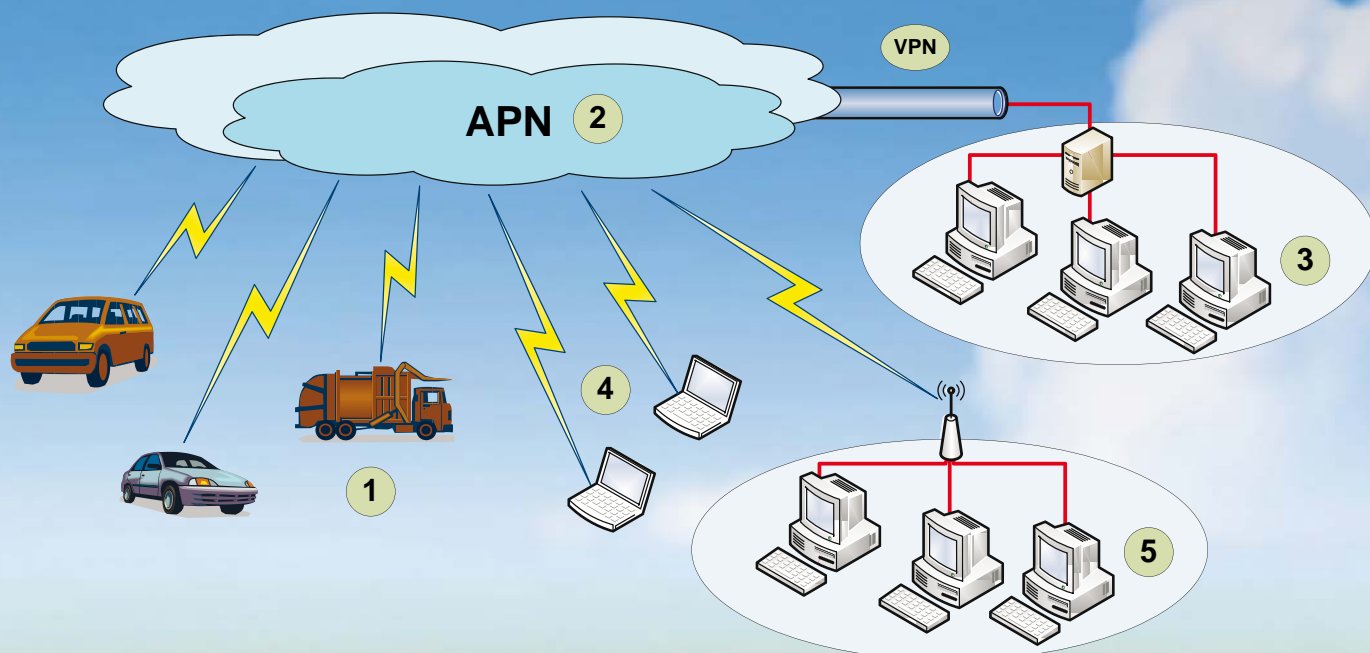
- Galvanically isolated inputs/outputs with filtering,
- hysteresis, alarm thresholds and deadband functionality
- Counting inputs of 32 bit capacity
- Local control programs
- Autonomous logging to GPRS network and session recovery
- Automated self-diagnostic system with rich set of diagnostic LEDs
- Possible operation in transparent mode as a wireless serial port
- Functionality of a local Master for external devices (Modbus RTU, Gazmodem, NMEA, M-BUS, and other protocols)
- Mirroring of the external device resources with data processing and analysis capabilities
- Event-driven GPRS transmission processor
- Real time clock (RTC)
- Data logger of 100 ms time resolution
- Transmission protocol converter
- Packet router
- Protection against frames from non-authorized sources
- Control of data integrity and frame delivery
- confirmation
- "Watchdog" circuit (for automatic reset of abnormal states)
- Remote configuration, programming and firmware update via GPRS
- Industrial grade design, DIN rail mounting, wide range of supply voltage (9...30 VDC or 24 VAC), isolated RS232/422/485 port, detachable terminal blocks, backup supply input

ML-211 location tracking module

– remote localization and monitoring with open data access

The ML-211 is a new generation AVL module, extending the present offer of telemetry modules with solution for continuous tracking not only monitored parameters of the object, but its geographical position as well. The integrated inputs and outputs ensure the monitoring of ignition, alarm, door sensors and fuel level in case of car being monitored. According to our strategy, the data acquired by the ML-211 module can be received by the standard MT-DP driver and then they can be presented via OPC interface, or in CSV form, or can be written to a database using the ODBC mechanism.

The ML-211 is the first offer on the market which does not force the monthly payments for the access to the location data being acquired. Open access functionality allows creation of user-owned systems for monitoring vehicles and other mobile objects, using solutions proven with the MT series modules. The user of ML-211 module can store the received location data himself, and can use them either for building a standard location system oriented for fleet management or as an extension of existing systems used for other purposes. The data sent by mobile objects (1) are transmitted by a separate APN (2) and reach either the stationary users (3) (5) who store data continuously or the mobile users (4) who receive the data from time to time, when needed. Despite the operation mode, all users can receive current data from the monitored objects provided that the devices are properly configured and the user terminals have the appropriate rights. An access to historical data must be ensured by the client application.



MT-713 Telemetry Module

– battery powered, energy saving data logger with GPRS transmission

MT-713 module is a development of the MT-703 concept - battery module with a large telemetry recorder. It has a range of solutions and functionality designed as a respond to customer comments and inquiries. It is characterized by enriched capabilities compared to the original communication, and supports a wider range of measuring equipment.

MT-713 is a device designed for facilities where there is no main power supply. A special package of high-capacity batteries is the source of electricity for the module. There are two types of batteries: alkaline, and of much higher capacity - lithium. They allow the module to operate with one set up to 10 years. Achieving this result required usage of highly efficient electronic circuits, and application of technique of setting the device into a low power state when there is no need to send data or make measurements of analogue values.

However, do not combine savings with limited resources of the device. MT-713 module is richly endowed. Each of the five binary inputs can be used as input counting pulses from potential free contacts, such as those used in water meters (pulse frequency up to 250 Hz). It also has two relay outputs that can operate, depending on the configuration, as mono- or bistable outputs, and three analog inputs capable of processing signals within range of 0-5V. Module provides special key analog output for powering sensors. Output voltage is configurable from 0 to 5 V with a resolution of 0.1 Volt. This allows to use any analog sensor, which output signal does not exceed 5V. Isn't that a flexible solution?



voltage level and many others. The module also responds to queries being sent by SMS or GPRS. Powerful built-in logger unit (4MB of nonvolatile Flash memory - more than 10 000 records) allows to collect measurement data from a long period of time and send it in one package.

Since the MT-713 is a device that is installed in the most inaccessible places, very important in its construction was to ensure adequate protection of electronic parts from unfavorable environmental conditions and minimizing administrative tasks performed on the object. The first condition is fulfilled through the use of enclosure protection IP-67, which provides complete protection against dust and against flooding to a depth of 15 cm at a given time.

Fulfillment of the second postulate, and therefore reduction of administrative work, also does not cause problems in the case of MT-713. The majority of this type of activity, like making changes in configuration (e.g. adding new phone number to receive SMS), or loading new firmware (new functionalities), can be done remotely, within the period convenient for user. The only step that must be performed locally, is replacing the batteries... once every 10 years. This need can be reported by module itself, via SMS for example.

MT-713 is a device that was created from a combination of experience of the Inventia engineers and the needs signaled by our clients. We hope that the size of work and effort inserted into creation of MT-713 module will allow our customers to save time while designing and operating their own applications.



MT-713 module controls brine level in wells

Telemetry module is not only its resources, but above all it is a device which communicates with a remote system of data collection and processing. User has access to mechanisms of sending and receiving SMS messages and data via the GPRS network. Each transmission can be initiated by any event defined by the user, e.g. the expiry of the specified time (accurate to 1 minute), analog input alarm, pressing the button on the panel, cover opening, an alarm of low battery



INVENTIA Telemetry Modules, Expanders & Converters

Features	Model	MT-021 Telemetry Module	MT-101 Telemetry Module	MT-102 Telemetry Module	MT-202 Telemetry Module	MT-301 Telemetry Module	MT-302 Telemetry Module	MT-303 Telemetry Module	MT-304 Telemetry Module	MT-512 Telemetry Module	MT-703 Telemetry Module	MT-713 Telemetry Module	MT-723 Telemetry Module	ML-211 Localization Module	EX-101 Expander	RM-120 RS232/M-Bus Converter
I/O Resources																
Binary inputs		4	8...16 ¹⁾	0...8 ¹⁾	-	4	8	6	7	8	2	5	4,6 ⁸⁾	5	8...16 ¹⁾	-
Binary outputs		4	0...8 ¹⁾	0...8 ¹⁾	-	2	-	2	-	2	-	2	2	2 ¹¹⁾	0...8 ¹⁾	-
Counter inputs		4	8...16 ^{1,2)}	0...8 ^{1,2)}	-	4 ³⁾	8 ³⁾	6 ³⁾	7 ³⁾	8	2	5	4,6 ⁸⁾	2 ^{1,3)}	8...16 ^{1,2)}	-
Analog inputs		2	2	6	-	2	-	-	1	-	2	3	3	1	2	-
Analog outputs		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-wire input		2	-	-	-	-	-	-	-	-	-	-	-	YES	-	-
Real Time Clock (RTC)		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	-	-
Serial port RS232/422/485		-	2	2	2	-	-	-	-	1 ⁸⁾	-	-	-	-	1	1 ¹³⁾
Dedicated configuration port		USB	RS-232	RS-232	RS-232	RS-232	RS-232	RS-232	RS-232	USB	USB	USB	USB	USB	RS-232	-
Voice channel		-	-	-	-	-	-	-	-	YES	-	-	-	YES ⁸⁾	-	-
Functionality																
Local configuration via RS232/USB		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	-
Remote configuration		YES ¹⁰⁾	YES	YES	YES	YES	YES	YES	YES	YES	YES ⁹⁾	YES ⁹⁾	YES ⁹⁾	YES	-	-
Unsolicited messaging		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	-
Data packet sending		-	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	-
SMS sending		YES ⁴⁾	YES ⁴⁾	YES ⁴⁾	YES ⁴⁾	YES	YES	YES	YES	YES	YES	YES	YES	YES	-	-
Local control programming		YES ⁸⁾	YES	YES	YES	-	-	-	-	-	-	-	-	-	YES	-
Standard serial protocols ⁵⁾		-	YES	YES	YES	-	-	-	-	YES ⁸⁾	-	-	-	-	YES ¹²⁾	-
Data packet routing		-	YES	YES	YES	-	-	-	-	-	-	-	-	-	-	-
Manual alarm setting for analog inputs		-	YES	YES ⁶⁾	-	-	-	-	-	-	-	-	-	-	YES	-
Number of analog input alarm levels		4	6	4/6	-	4	-	-	1	-	4	4	4	-	6	-
Configurable hysteresis		YES	YES	YES	-	YES	-	-	YES	-	YES	YES	YES	-	YES	-
Remote read/write with SMS		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	-	-
Access control		YES ⁷⁾	YES ⁷⁾	YES ⁷⁾	YES ⁷⁾	YES ⁷⁾	YES ⁷⁾	YES ⁷⁾	YES ⁷⁾	YES ⁷⁾	YES ⁷⁾	YES ⁷⁾	YES ⁷⁾	YES ⁷⁾	YES ⁷⁾	-
Local mirroring of external resources		-	YES	YES	YES	-	-	-	-	-	-	-	-	-	-	-
Datalogger		YES ⁸⁾	YES	YES	YES	-	-	-	-	YES ⁸⁾	YES	YES	YES	YES	YES	-
MT-DP compatibility (OPC, CSV, ODBC)		-	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	-
Remote firmware upgrade		YES	YES	YES	YES	-	-	-	-	YES	-	YES	YES	YES	-	-
Other																
Integral GSM/GPRS modem		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	-	-
Integral GPS receiver		-	-	-	-	-	-	-	-	-	-	YES ⁸⁾	YES ⁸⁾	YES	-	-
DC power supply (V)		9...30	10,8...36	10,8...36	10,8...36	9...30	9...30	9...30	9...30	9...30	-	-	7...30	9...30	10,8...36	21,6...42
AC power supply (Vrms)		-	18...26,4	18...26,4	18...26,4	-	-	-	-	-	-	-	-	-	18...26,4	-
Power supply monitoring input		YES	YES	YES	YES	-	-	-	-	-	YES	YES	YES	YES	YES	-
Internal rechargeable battery		-	-	-	-	YES	YES	YES	YES	-	-	-	-	YES ⁸⁾	-	-
Internal battery		-	-	-	-	-	-	-	-	-	3(6)xR20	3(6)xR20	1xR14 ¹⁴⁾	-	-	-
Low power operation modes		-	-	-	-	-	-	-	-	-	YES	YES	YES	YES	-	-
External antenna connector		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	-	-
Protection class		IP40	IP40	IP40	IP40	IP40	IP40	IP40	IP40	IP40	IP67	IP67	IP68	IP40	IP40	IP40
Operating temperature range (°C)		0...+55	-20...+55	-20...+55	-20...+55	0...+55	0...+55	0...+55	0...+55	-20...+55	-20...+55	-20...+55	-20...+55	-20...+55	-20...+55	-20...+55
Removable terminal blocks		YES	YES	YES	YES	YES	YES	YES	YES	YES	-	-	-	YES	YES	YES
DIN rail mounting		YES	YES	YES	YES	YES	YES	YES	YES	YES	-	-	-	-	YES	YES
Warranty		3 years	3 years	3 years	3 years	1 year	1 year	1 year	1 year	3 years	1 year	1 year	3 years	3 years ⁸⁾	3 years	1 year

1) - number of binary inputs/outputs and counter inputs is configurable
 2) - fmax < 100Hz
 3) - fmax = 2,5Hz
 4) - with dynamic variable value insertion
 5) - Modbus RTU Master/Slave, transparent mode, other...

6) - for 2 inputs
 7) - password + internal list of authorized IP and telephone numbers
 8) - option
 9) - requires MTSpooler
 10) - possible configuration with SMS commands

11) - general purpose and/or power up for external sensors
 12) - if connected to MT-101/102
 13) - RS-232 to M-Bus converter
 14) - essential external power supply

Complete family of telemetry and location tracking modules

The MT series telemetry modules and ML location tracking modules offered by INVENTIA are fully professional devices for wireless monitoring and control applications either in large or small systems. Powerful features and flexible configuration capabilities, integral inputs and outputs for real world signals, and supported standard transmission protocols for industrial automation devices, make the MT modules an unparalleled solution for advanced telemetric and telematic systems.

An additional advantage of the offered solution is a dedicated configuration software, which does not require high skills from the user and allows proper and quick configuration of the modules. The modules can be configured either locally using serial port, or remotely using GPRS. Particularly important feature is the remote configuration capability which ensures the maintenance costs savings in case of widespread systems.

We offer a wide range of modules that are designed for different applications and which belong to different price groups.

MT-021 MT-021 MT-021 MT-021 MT-021 MT-021 MT-021 MT-021 MT-021 MT-021



Telemetry Module MT-021, with built-in GSM modem, is a dedicated device for remote monitoring, diagnosis and control of distant objects using text messages (SMS) or calling in. Configurable messages of fixed or variable content are a convenient way of transferring information to the monitoring center or directly to responsible personnel mobile phones. Alarm messages can be generated as a result of change of input state, exceeding of defined levels of analog signals (e.g. from PT100 temperature sensor), changes of markers state, counters and clocks. Industrial design, practical input/output resources, easy to use software tools as well as ability to configure the module with SMS commands are the advantages of MT-021 module. Direct connection of temperature sensors significantly lowers the cost of measurement, diagnostic and alarm systems building. 1-wire inputs allow you to use Dallas pellets for the identification or authorization. The module supports different kind of sensors: humidity, liquid level, pressure, flow, smoke, gas, water, motion, shock, noise, intrusion, etc...

This is the flagship product of MT series, awarded with Gold Medal on AUTOMATICON Fair. The module provides optoisolated inputs/outputs: 8 binary inputs, 8 binary outputs (that can operate as inputs as well), and 2 analogue inputs 4-20 mA. The optoisolated serial port configurable to one of

MT-101 MT-101 MT-101 MT-101 MT-101 MT-101 MT-101 MT-101 MT-101 MT-101

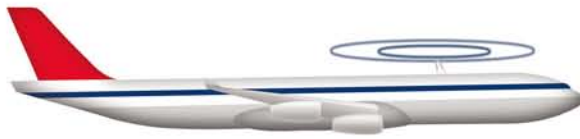


three standards: RS-232, RS-422 or RS-485, makes possible to use the module as a wireless communication gateway for external devices with advanced functionality of the local Master for mirroring of the external resources. Each binary input has pulse counting capability, and both analogue inputs have the configurable alarm thresholds (one threshold can be set manually), the configurable filtering, hysteresis and deadband ranges. The module is equipped with a data logger, diagnostic LEDs, detachable terminal blocks, DIN rail mounted housing and power supply circuit working in voltage ranges commonly used in automation. The power can be supplied from battery as well. The module can operate as an element of the control and data acquisition system with a central supervising. Moreover, it can operate autonomously in event-driven mode initiating by itself the local control functions, transmission of input/output states, SMS messages with dynamically changed contents, and the data packets or dials to given phone number for CLIP identification. The communication using queries and control commands sent as SMS is possible as well. All modes of operation ensure data security and protection against unauthorized access, including remote control and configuration.

MT-102 MT-102 MT-102 MT-102 MT-102 MT-102 MT-102 MT-102 MT-102 MT-102



This telemetry module has all advantages of MT-101 unit, but it is designed for applications which require higher number of analogue inputs. The MT-102 module has 6 analogue inputs 4-20 mA and 8 binary inputs/outputs. All other functions and parameters are the same as in the MT-101 model.



EX-101 EX-101 EX-101 EX-101 EX-101 EX-101 EX-101 EX-101 EX-101 EX-101

MT-30x MT-30x MT-30x MT-30x MT-30x MT-30x MT-30x MT-30x MT-30x MT-30x

EX-101



MT-30x



The expansion module EX-101 extends the resources of MT-101 and MT-102 telemetry modules by the additional 8 binary inputs, 8 binary inputs/outputs and 2 analogue inputs. The EX-101 can be also used separately as an universal input/output station (8DI, 8DI/DO, 2AI) with galvanically isolated RS232/422/485 interface, working with standard MODBUS RTU protocol either in Slave or in Master mode. Thanks to the capability of the local program execution, the EX-101 can be used as freely programmable PLC controller as well.

integrated GSM/GPRS modem and provided technical features make the MT-3xx module an attractive solution either for simple professional systems and for private use. The MT-301 has 4 binary inputs, 2 binary outputs and 2 analogue current inputs. It can operate simultaneously as the GPRS packet and SMS sending device providing information about occurred events. The module supports remote polling for current inputs and counters states and remote control of the outputs as well. It has metal housing with DIN rail mounting option, built-in battery, real time clock (RTC) and non-volatile Flash memory ensuring the remote update of the configuration parameters. Other modules of MT-3xx series differ only in the input/output resources (MT-302 provides 8 DI, MT-303 - 6 DI/2 DO, MT-304 - 7 DI/1 AI).

MT-202 MT-202 MT-202 MT-202 MT-202 MT-202 MT-202 MT-202 MT-202 MT-202

MT-202



MT-512 MT-512 MT-512 MT-512 MT-512 MT-512 MT-512 MT-512 MT-512 MT-512

MT-512



MT-202 module has been designed for easy, wireless integration via GPRS network of various remote intelligent devices (e.g. PLC controllers, I/O stations, measuring devices, operator panels) equipped with serial port RS-232/422/485. MT-202 can be used as wireless, "transparent" serial port, but it can also play a role of a local Master querying periodically an external device for user defined resources (e.g. inputs, outputs, analog inputs, internal registers and flags). In such case MT-202 creates in memory a mirror of the external resources and detects alarms, state changes, analog value changes and fulfilled logic conditions incorporating raw and calculated values. Data are transmitted via GPRS according to user defined rules.

The MT 512 Specialized Alarm Module for elevators is a dedicated device compliant with the norm PN EN81-28:2004 "Remote alarming in personal and industrial elevators" harmonized with Elevator Directive 96/12WE. This module monitors 8 binary inputs, controls 2 outputs, can establish a voice connection with Service Center and reply recorded messages. Optionally, the module can be equipped with RS-232 or RS-485 communication port for monitoring and diagnostics of peripheral equipment.

The MT-3xx series consists of cost-effective telemetry modules designed for alarm monitoring and other applications which do not require any local control programs and local communication with external devices. The compact design,

MT-703 MT-703 MT-703 MT-703 MT-703 MT-703 MT-703 MT-703 MT-703 MT-703

MT-703



The MT-703 module is a battery powered, energy saving measuring and recording device which uses GPRS transmission. The module has been awarded with GRAND PRIX of WODKAN Fair. MT-703 provides 2 binary / counting inputs (designed for use with potential free contacts, e.g., with water counter), and 2 analogue inputs for the measurement of such parameters as pressure, temperature, level, etc. IP-67 rated housing of the module and membrane technology based ventilation plugs allow installation in severe environment without external power supply (e.g., in measuring chambers of water supply systems). The integrated, user replaceable battery set is sufficient for 5 years of the module operation, assuming one data transmission per a day. The battery voltage level is continuously monitored and transmitted together with the measured data.

MT-723 MT-723 MT-723 MT-723 MT-723 MT-723 MT-723 MT-723 MT-723 MT-723

MT-723



The design of this module is a combination of the best features of MT-713, enriched with the new ideas and improvements, with the elements that provide the fulfillment of IP68 requirements - the highest level of electrical equipment protection against penetration by external factors (dust and water). MT-723 module is equipped with five binary inputs, which in addition to standard functions can cooperate with the pulse output of water meters. Module, after appropriate configuration, can count the pulses transmitted by the water meter and calculate the flow in engineering units per hour or minute (e.g. m3/h). This module is equipped also in three 0-5V standard analog inputs. Measuring probes can be supplied directly from the module using the power supply output 0-5V. Voltage output is configurable, that permits using the probes with a lesser supply voltage, such as supported by older MT-703 sensor powered with 3.3V.

MT-713 MT-713 MT-713 MT-713 MT-713 MT-713 MT-713 MT-713 MT-713 MT-713

MT-713



The MT-713 module is an improved version of the MT-703 design, with 5 binary / counting inputs, 3 analogue inputs 0 - 5 V range with sensor power supply (powered only for the short interval of the measurements), and high capacity data logger (storing up to several thousands of records). The MT-713 allows operation with wider range of measuring converters, more frequent measurements (with lower energy consumption) and longer operational time without battery replacement (up to 10 years with lithium batteries). GPS option is also available.

ML-211 ML-211 ML-211 ML-211 ML-211 ML-211 ML-211 ML-211 ML-211 ML-211

ML-211



The location tracking module ML-211 is a modern solution combining location functions and integrated different inputs/outputs of telemetry module in one device. To determine the geographic position the GPS satellite signal is used and data are sent via GPRS to the monitoring station. In case when a car is monitored, the integrated inputs and outputs of the module provide the monitoring of ignition, alarm, door contacts and fuel level. The market innovative approach is an open and easy access to the data directly by the user, without participation of any service providers and without bearing costs of such services.





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ANTENNAS



We offer different antenna types for the telemetry and location tracking modules. The antennas can be installed directly on the module or connected by cables. They can be equipped with magnetic or screw mounts. Our offer includes flat antennas for mounting on control cabinets, directional antennas with high gain and special purpose antennas.

SIM CARDS SIM CARDS SIM CARDS SIM CARDS SIM CARDS SIM CARDS SIM CARDS SIM CARDS

SIM CARDS

with static IP addresses



Professional telemetry systems require the SIM cards with static IP addressing. Our telemetry modules can operate in any properly configured private APN network of any GSM provider. The users that do not have their private APN can use our SIM cards with static IP addressing registered in the private APN. We offer either the cards with subscription including limited data transmission package or the cards without transmission limits. The cards registered in the private APN ensure reliable GPRS transmission and our technical support for complete solution.

ACCESSORIES

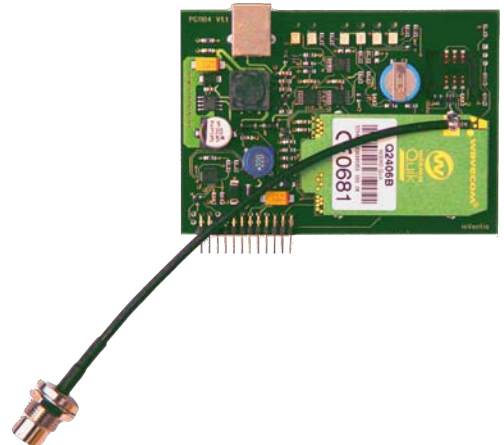
and other modules



Our offer includes also converter modules (e.g., MBUS-RS232), buffered power supplies, input/output simulators, communication cables, spare connectors and batteries, 3G/EDGE/GPRS modems and routers, sensors and converters for temperature, humidity, pressure and level measurements. We offer specialized solutions as well, e.g. the contactless measurement of temperature using Exertherm optical thermocouple sensors, or the ultrasound AirMar weather stations (temperature, pressure, humidity, wind strength and direction, GPS position and dew point temperature).

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OEM products



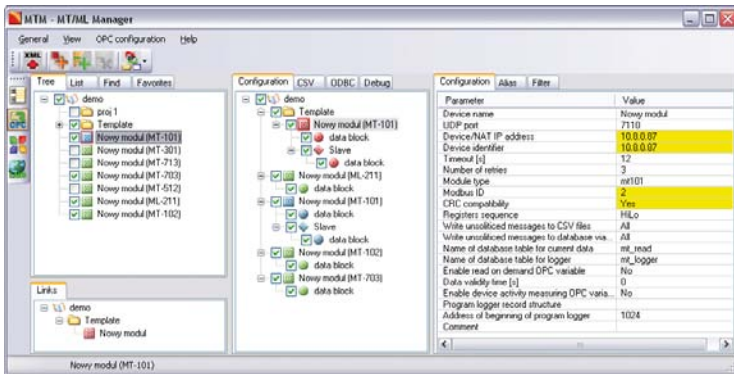
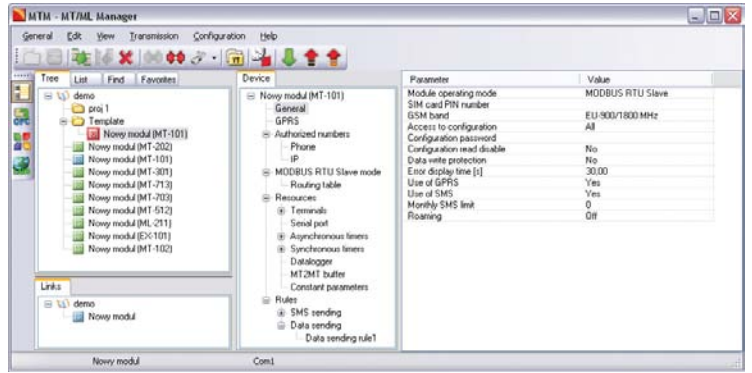
We can also provide products designed for a specific needs of our customers, e.g. GPRS transmission interfaces for measuring devices, units in application specific housings, standard MT modules with dedicated firmware, implementations of specific communication protocols.

Our long experience in GPRS/GPS technologies and standard line telemetry products ensures the highest quality and the customer satisfaction.

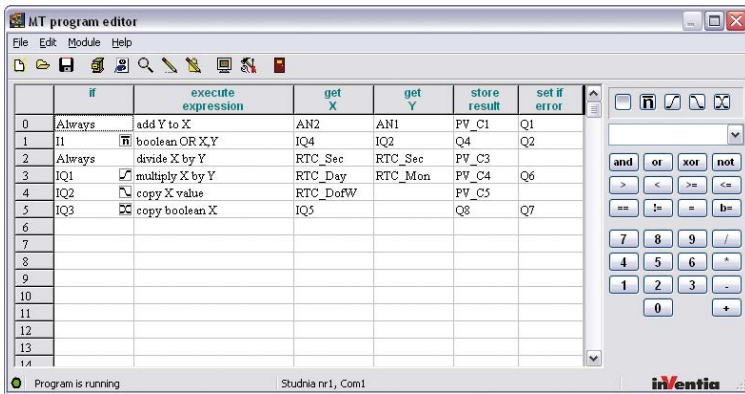


User software tools

Along with the telemetry and location tracking modules we deliver MT Manager (MTM) intuitive software tool for easy configuration of all parameters, operation modes and functions of each module, and for creation of the control program to be executed by the module. The user can freely name the modules and their inputs and outputs to ease the identification. The MT Manager does not require any specialised knowledge, and the meaning of particular fields and functions is clearly described in the documentation delivered in electronic and printed form.



All changes of the configuration and control programs, including firmware updates, can be done remotely via GPRS network. Such capability saves time and reduces number of user trips to remote objects where the modules are installed. The built-in security system provides for each module the access password, and the lists of authorized IP addresses and phone numbers allowed to communicate with the module. All attempts of non-authorized access to the

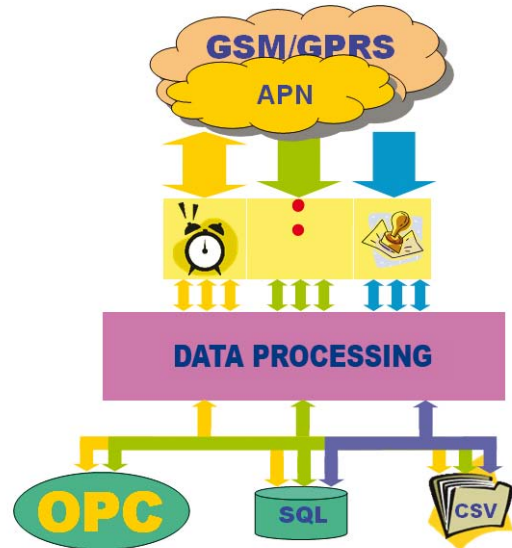


module are ignored. In case of battery powered modules where the GPRS modem is inactive for most of operation time, the remote configuration changes are performed by the additional software package MT Spooler (MTS). The MTS queues the user defined tasks for each module in the system and sends them to the modules during the next connection session.

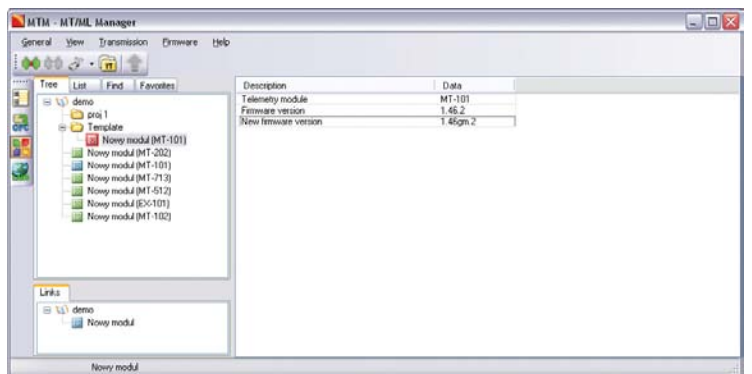
Additionally, we deliver free of charge communication driver MT Data Provider which supports the communication with remote telemetry modules using either MT gateway, GPRS modem or router, or Internet. This driver works on

MS Windows 2000/XP/2003/2008/VISTA/7 platform and makes the current data accessible via standard OPC (OLE for Process Control) interface. All types of data (polled, event triggered, time-stamped logger records) are accessible in the form of CVS/XML files or can be automatically written to any standard relational database (e.g. MS SQL Server, MSDE, Oracle) via ODBC

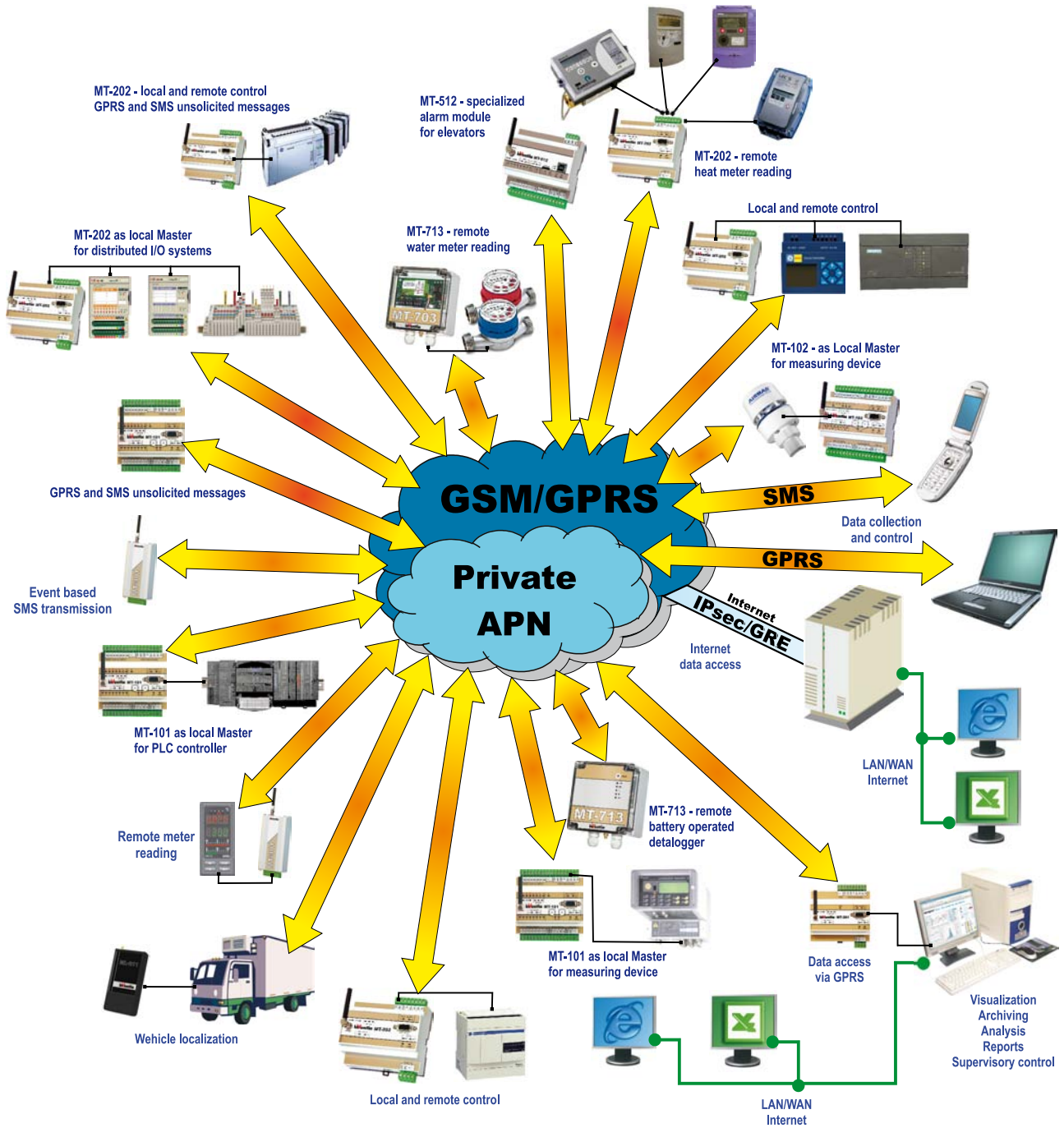
MTDP - MT Data Provider Architecture



mechanism. Such solution ensures open connectivity and easy integration with modern HMI/SCADA visualisation systems (animated graphics, trends, alarms), spreadsheets and data processing systems (billing, analysing, diagnostic and optimising systems).



Application examples of telemetry & location tracking modules



We provide all components for GPRS/GPS monitoring and control systems of any size!

- user friendly
- scalable
- with open connectivity

Do not hesitate to contact us!

Let us know Your needs - we will propose an optimized solution!

Send your questions to:

inventia@inventia.pl or info@telemetry.pl



INVENTIA – innovation and professionalism

INVENTIA – company advantages

- Worldwide provider specialised in telemetry and location tracking devices based on GSM/GPRS and GPS technologies
- The reference base of over 20 000 telemetry and localization modules working in 27 countries worldwide
- Highly qualified specialists, experienced in automation, telecommunication and IT technology
- ISO 9001:2008 certified Quality Management System
- Awards for the high quality of products: ORANGE GSM provider certificate, Gold Medal on AUTOMATICON Fair, Grand Prix on WOD-KAN Fair
- The wide offer of different types of devices that meet the various requirements of users (telemetry modules with different resources, energy saving battery powered modules, location tracking modules)
- The offer of telemetric SIM cards with static IP addresses in private APNs
- Over 20 integrator companies authorised as INVENTIA telemetry partners providing turn-key solutions in various industry branches

INVENTIA – market strategy advantages

- The telemetry modules that are ready to use, easy to install and configure by the user with modern user-friendly tools (without knowledge of AT commands, GPRS technology, complicated and time consuming programming, code testing and troubleshooting)
- Capability of the remote configuration, control logic programming and firmware update of installed devices via GPRS
- Open connectivity based on open standards
 - easy connection to standard devices (PLCs, I/O circuits, measuring devices) supporting standard communication protocols (e.g., Modbus RTU, Gazmodem, MBUS, NMEA)
 - easy integration with HMI/SCADA visualisation systems thanks to the standard OPC interface for data access
 - easy integration with user databases and IT environment using standard ODBC mechanism or CSV files
- Reduced costs of ownership (remote maintenance and update, spontaneous transmission triggered by events, local mirroring of external device resources, advanced diagnostics, system scalability)
- Easy integration of different telemetry modules, battery powered devices and location tracking units in one coherent system according to the user needs

INVENTIA – technical advantages

- MT-101 telemetry module - "all in one" solution combining:
 - GPRS modem
 - PLC controller
 - data logger
 - communication protocols converter

- High reliability, short implementation time, ease and convenience of use, low maintenance costs, high level of data security and access protection
- The advantages over solutions based on PLC with external GPRS modem:
 - the modem is fully controlled, normal operation is recovered in case of critical errors (modem hang-up)
 - ready to use advanced functionality without creating complex applications for modem control by AT commands
 - capability of remote (via GPRS) configuration, control programs changes and firmware update
 - built-in data logger
 - built-in converter for communication protocols used by external devices
 - built-in security system for the access control and data integrity protection
 - built-in advanced diagnostics of GSM/GPRS network and modem operation
 - built-in mechanisms for testing of GPRS network accessibility, communication recovery, and re-sending of non-confirmed frames
- Advanced functionality of spontaneous, event-driven transmission - the optimum method for GPRS technology
- The events can trigger data transmission over GPRS, SMS sending and dialling the phone number for caller identification (CLIP)
- Supported event types
 - defined moments of time
 - changes of input states and internal flags
 - changes of analogue values (deadband)
 - crossing of alarm thresholds, diagnostic alarms
 - meeting conditions evaluated by internal program
- The events regarding the external devices are detected thanks to built-in local support of communication protocols (e.g., Modbus RTU, Gazmodem, NMEA, M-bus) and mirroring the resources of these devices
- Available free of charge modern software tools for the user:
 - The intuitive software tools for local and remote configuration and programming of telemetry modules (MT Manager, MTconfig, MTprog)
 - The tools for local and remote firmware update (MTupdate)
 - The program for remote management of energy-saving modules (MTspooler)
 - The communication software for data acquisition by telemetry modules, GPRS modems, GPRS routers and Internet. The data are accessible via standard OPC and ODBC interfaces and CSV files
 - Optional offer of software for visualisation, data archiving, and for web-based analysis, reporting and diagnostics



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INVENTIA complies with ISO 9001:2008 certified Quality Management System!
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