

## Remote reading of tax instruments

### M-bus networks - definitions and setup

M-bus (Meter-bus) is new European standard for remote reading of tax instruments as well as various sensor types. The reading of the instruments can be implemented in various ways - from direct reading of device by human to fully automated remote reading of all devices in related networks by central server system using wireless GPRS-connection to each of the networks.

*Remote reading by m-bus networks allows fully electronic reading of all data with all the advantages in consequence:*

- avoids entering of supplier employees in private property
- avoids any human errors
- significantly reduces cost for both suppliers and customers
- allows fully automated remote reading of data in one or more networks (without any human intervention) and automated reports creation
- ensures high data security and prevents malicious attempts of manipulating the data
- allows minimizing readout intervals
- allows placement of meters in distant or hard- to-reach places
- allows fast data readout
- creation of databases for every consumer and possibility to make instant reports
- creation of statistic reports for consumption optimizing (fully automated)

Automated/remote reading requires the devices to be connected in a network. In one m-bus network can be connected up to 250 devices (tax meters, sensors, etc.). If it is needed for more devices to be connected, they can be either connected in more than one network or m-bus repeaters may be used, each doubling the number of devices in the network.

*A m-bus network needs the three following device types:*

**- m-bus master devices/ converters**

M-bus masters maintain the voltage and communications in a network. They connect the slave devices and the data collecting devices.

**- m-bus slave devices**

Slave devices are all tax and other meters that have m-bus interface for readout as well as all devices connecting various types of meters without m-bus connectivity to a m-bus network (as m-bus pulse counters for connecting water meters/ electricity/etc. meters to a m-bus network).

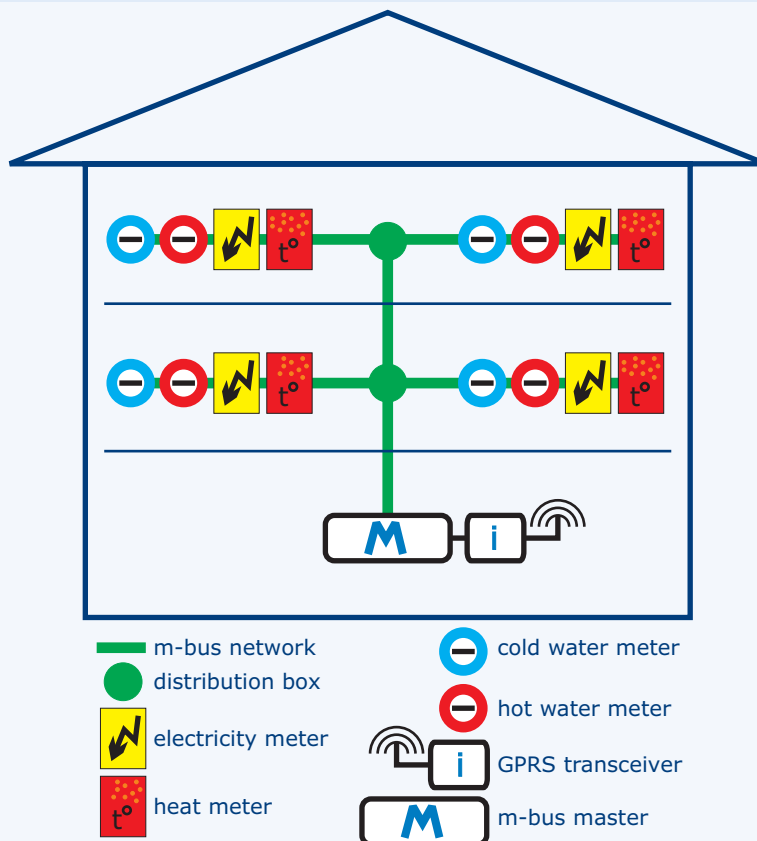
**- data collecting devices**

These devices save permanently the data read from tax- and other meters. Usually these are centralized computer systems.

Other types of devices exist as well to further enhance the functionality of data reading networks - m-bus repeaters used for network segmentation, various types of data converters, intermediate data saving devices for temporary data storage, wireless transceivers (like GPRS-transceivers), etc.

### General Information

There is an example of various tax meters remote reading system of residential or office building shown on the figure. The connection shown is for meters with m-bus interface. If the meters have pulse output instead of m-bus interface, m-bus pulse counter is needed for their connection to the m-bus. M-bus pulse counters are devices which connect the devices with pulse outputs to the m-bus network. They usually have more than one pulse input for connection of some number of meters and are powered by the m-bus. The usage of GPRS-transceiver (as shown) is not obligatory. The data from all the meters may be read locally through m-bus master by some intermediate data device. The data may be read by connected to the master PC with LAN/WAN connectivity. The latter case is usually well-suited for use in office buildings for fast, low-cost and correct distribution of the consumption of the tenants.



### Setting up devices in a m-bus network

The mounting of the tax meters has to be done according to their manufacturer specifications. If they have m-bus interface provided it is only needed to connect the devices and the master physically to the m-bus 2-wire cable network. If the network has branches it is convenient to use distribution boxes. If the meters have pulse outputs instead of m-bus interface, it is needed that m-bus pulse counters (like MBCS/MBSS) are used (our pulse counters have 2 to 8 pulse inputs thus providing the possibility for 2 to 8 tax meters to be connected to the single node of the m-bus network). After finishing the physical connections of all cables, devices, master, etc. it is needed the slave devices to be programmed. This includes setting the unique address of every slave device in order to be uniquely recognized in the m-bus network as well as date, time, tariffs, cost of tariffs, setting other parameters for user's convenience, etc. All parameters except the unique address of the slave in the network which is set once are not obligatory and are programmed by the data collecting device through the m-bus master and the m-bus network. They can be pre-programmed any time by the data collecting device and it is not allowed to be programmed directly by the device.

### Normal operation of the devices in a m-bus network

Collecting data from the slave devices in m-bus network can be done only by request from data collecting device. It can be connected to the m-bus master permanently or only when reading data. If it is not connected to m-bus network master, it doesn't interfere the normal work of the network or the slaves in any way. If the m-bus network fails for any reason (electricity interruption, malfunction, cable break, etc.) slave devices continue their work normally. When reading data, the collecting device requests data from certain slave using its unique network address. If it is needed to change certain parameters of the slave, it is done automatically by the software of the data collecting device. All important parameters of slaves are also saved in data collecting device database.



## M-bus devices

M-bus devices are produced for building remote reading systems for residential, office and industrial appliances. These systems are low-cost and easy to build and maintain. They also have high reliability. The data can be read locally as well as centrally, manually or fully automatically.

Gineers Ltd. produces the whole variety of devices and software for building any kind of m-bus remote reading system as well as transmitting the data to the centralized system.

### M-bus devices produced by Gineers Ltd.

<b>MBRS-32/64/250</b>	m-bus masters/ m-bus to RS-232C converters for up to 32/64/250 slaves
<b>MBRP-64/250</b>	m-bus repeaters for up to 64/250 slaves
<b>MBCS-2/4/6/8</b>	m-bus pulse counters with 2/4/6/8 inputs for connection of tax meters with pulse outputs to a m-bus network, w/t display
<b>MBSS-2/4/6/8</b>	m-bus pulse counters with 2/4/6/8 inputs for connection of tax meters with pulse outputs to a m-bus network, w/o display
<b>MBPS-2/4/6/8</b>	m-bus pulse counters with 2/4/6/8 inputs for connection of tax meters with pulse outputs to a m-bus network, waterproof (IP66)
<b>MBGP-1A</b>	GPRS-transceiver for connection of a m-bus network to a centralized system for remote reading
<b>MBET-1A*</b>	Ethernet-transceiver for connection of a m-bus network to a centralized system for remote reading

### Software for remote reading systems

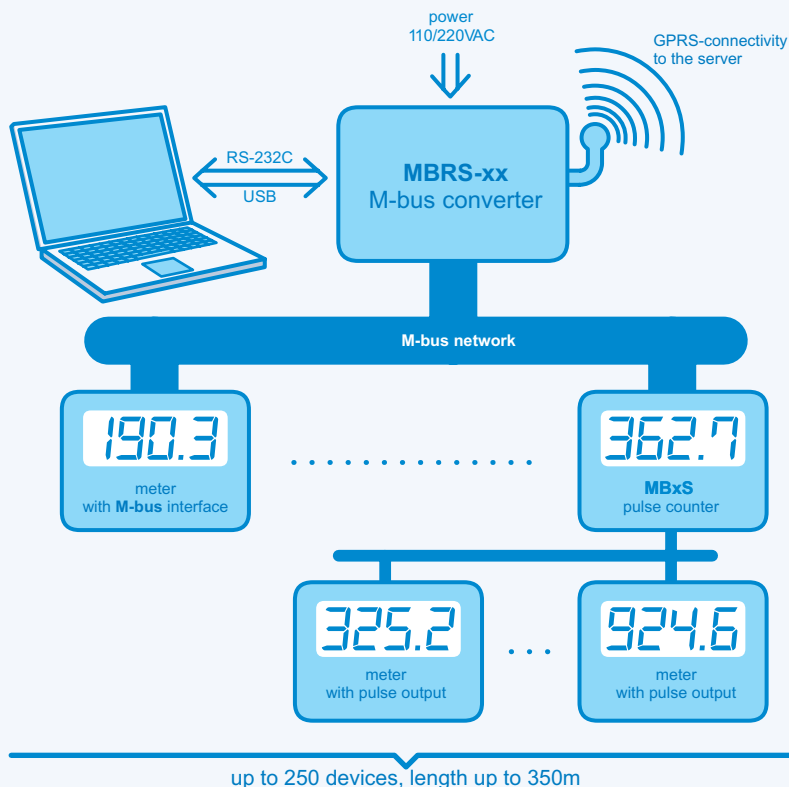
<b>M-bus serial communicator</b>	software for direct readout of remote reading network (m-bus, RS-485, etc)
<b>M-bus GPRS Server</b>	server-side software for readout of multiple remote reading networks through GPRS
<b>M-bus config</b>	free configuration software for our pulse counters and other standard m-bus slave devices

\* - in testing process

***If you have any questions or need more information, please feel free to contact us!***

### General Information

There is fully built tax meters remote data reading system shown on the figure. When designing the devices it is considered that setting up and maintaining the networks had to be made easier, thus keeping the cost low for both the service providers and the consumers. The maximum number of the slave devices in a network is limited to 250 and the maximum length of the network cable is limited to 350m (with no repeaters used), which is well enough to remote read the data from more than 60 households (both slave device number and distance may be increased by using m-bus repeaters).



### Building m-bus network

For building m-bus network several components are needed:

- *M-bus master (MBRS-32/64/250)*

A m-bus master maintain the voltage and communications within the network. They power all the slave devices and carry out the communication between slave devices and data collecting device (PC, laptop, PDA, central server station, etc.).

- *Slave devices*

These are all tax or other meters with m-bus interface or devices with a m-bus interface that connects meters/sensors without m-bus interface to a m-bus network (like m-bus pulse counters).

- *Data collecting devices*

These could be PC, PDA, laptop, central server stations. It is not needed these devices to be connected to the master all the time, connection is needed only when interchanging data.

### Security

When designing the devices, serious measures have been taken, against intentional manipulation of data collected. Thus m-bus masters do not save any data, pulse counters unique network address is programmed only once - when they are set up, then address programming is disabled (the device is locked). All other parameters are programmed through the network by the software of the data collecting device. When reading slave devices it is only the pulses counted that are actually read, all other parameters are for user's convenience (except tariff management). For higher safety it is recommended that pulse counters and tax meters with pulse outputs are used instead of tax meters with m-bus interface.



## M-bus masters/ converters

M-bus masters are the main devices that every m-bus network is built around. They have the following functions:

- maintain the voltage of the network and power the slave devices
- carry out all communications between all slave devices and data collecting devices

Since m-bus converters provide power for all slave devices in the network, we produce converters with different power capability thus optimizing the cost of the networks.

### M-bus master converters produced by Gineers Ltd.

<b>MBRS-32</b>	Microcontroller-based m-bus master for max 32 slave devices (32 std. m-bus loads)/ M-bus to RS-232C converter
<b>MBRS-64</b>	Microcontroller-based m-bus master for max 64 slave devices (64 std. m-bus loads)/ M-bus to RS-232C converter
<b>MBRS-250</b>	Microcontroller-based m-bus master for max 250 slave devices (250 std. m-bus loads)/ M-bus to RS-232C converter

MBRS-type bus masters can be connected to the data collecting device or GPRS-transceiver by RS-232C interface. Anyway, it is possible that MBRS masters are connected to the data collecting devices by various types of standard interface converters:

- **RS-232C - USB** for using data collecting device with USB-interface
- **RS-232C - IRDA** for using data collecting device (PDA/laptop) with IRDA-interface
- **GPRS-transceiver** with RS-232C interface for building fully automated remote reading system

### General technical specifications of MBRS-32/64/250

	MBRS-32	MBRS-64	MBRS-250
m-bus std. loads, max	32	64	250
output current, max	70 mA	120 mA	450 mA
output current protection, max	90 mA	140 mA	470 mA
output voltage (mark)	35-37 Vdc		
output voltage (space)	22-25 Vdc		
power supply	150-250 Vac / 200-350 Vdc		
power consumption, max *	< 5.5 W	< 8.5 W	< 21 W
data rate, max	4800 bps		
working ambient temperature	-20 °C - +55 °C		
storage ambient temperature	-50 °C - +90 °C		
dimensions (H/W/D)	75/50/105 mm	105/107/74 mm	105/142/74 mm
display	3 led	7 led	7 led
IP protection class	IP30		
weight	145 g	340 g	475 g

\* - at max. load

#### MBRS-32/64/250 short description

MBRS are m-bus masters with following functionality:

- power all devices in a m-bus network (tax meters, pulse counters, etc.)
- carry out the communications between all slave devices in a network and the data collecting device

They maintain the voltage of a m-bus network which supplies all slave devices and serves for communication. The RS-232C interface is isolated from the network (insulation voltage > 1000VDC). RS-232C is an industry-standard interface which allows linking the master to any type of data collecting or data transmitting device directly or by cheap standard converter.

MBRS-32/64/250 have output short-circuit protection.

MBRS-64/250 have LED signalization in case of following events:

- turned on (**ON**) - MBRS-xx is powered
- output voltage (**BUS**) - m-bus voltage is present
- protection (**PROT**) - output short circuit occurred
- overload (**OVER**) - overload (increased bus consumption)
- collision (**COLL**) - simultaneous multiple slave data transmit
- receive (**RX**) - slave->master data flow
- transmit (**TX**) - master->slave data flow

MBRS-32 has LED signalization in case of following events:

- output voltage/ transmit (**BUS/TX**) - light when output in "mark" state
- **ALARM** - in case of output short circuit or overload
- collision (**COLL**) - simultaneous multiple slave data transmit

### General technical specifications of MBRP-64/250

	MBRP-64	MBRP-250
m-bus std. loads, max	64	250
output current, max	120 mA	450 mA
output current protection, max	140 mA	470 mA
output voltage (mark)	35-37 Vdc	
output voltage (space)	22-25 Vdc	
power supply	150-250 Vac / 200-350 Vdc	
power consumption, max *	< 8.5 W	< 21 W
m-bus input consumption, max	3 mA (2 std. m-bus loads)	
working ambient temperature	-20 °C - +55 °C	
storage ambient temperature	-50 °C - +90 °C	
dimensions (H/W/D)	105/107/74 mm	105/142/74 mm
display	7 led	
IP protection class	IP30	
weight	340 g	475 g

\* - at max. load

#### MBRP-64/250 short description

MBRP are m-bus repeaters with following functionality:

- power all devices in a m-bus segment they form (tax meters, pulse counters, etc.)
- carry out the communications between all slave devices in their segment and the master converter

They maintain the voltage of the m-bus segment they form which supplies all slave devices and serves for communication. The m-bus input and the m-bus output are isolated (insulation voltage > 1000VDC).

MBRP-64/250 have output short-circuit protection.

MBRP-64/250 have LED signalization in case of following events:

- turned on (**ON**) - MBRP-xx is powered
- output voltage (**BUS**) - m-bus voltage is present
- protection (**PROT**) - output short circuit occurred
- overload (**OVER**) - overload (increased bus consumption)
- collision (**COLL**) - simultaneous multiple slave data transmit
- receive (**RX**) - slave->master data flow
- transmit (**TX**) - master->slave data flow

## M-bus repeaters

M-bus repeaters are m-bus master devices for expanding existing m-bus networks by segmentation. The existing network is expanded by providing the possibility to connect additional slave devices to the network as well as increasing the maximum length of the network cable. As the data is concerned, the repeaters are “transparent” devices.

M-bus repeaters have m-bus input for connection to the existing part of the network and m-bus output for powering the added segment. Their use in m-bus networks is unlimited. Since they provide power for all slave devices in the added segment, we produce repeaters with different power capability thus optimizing the cost of the networks.

### M-bus repeaters produced by Gineers Ltd.

<b>MBRP-64</b>	Microcontroller-based m-bus repeater for max 64 slave devices (64 std. m-bus loads)
<b>MBRP-250</b>	Microcontroller-based m-bus repeater for max 250 slave devices (250 std. m-bus loads)





## M-bus pulse counters with display type MBCS

The m-bus pulse counters are slave devices that connect tax meters with pulse output to m-bus network. Tax meters with pulse outputs are relatively cheap and has the majority of market share compared to the devices with m-bus output. They are heat meters, water meters (hot/cold), electricity meters, heat cost allocators, etc. Pulse counters count and accumulate the number of pulses each of these device generates and send the count to the data collecting device upon request. Usually they have more than one pulse input thus more devices with pulse outputs can be connected to a single pulse counter - this keeps total cost of the network low. Pulse counters are supplied with embedded rechargeable battery providing more than one week of work if the m-bus fails (electricity interruption, cable break, m-bus master malfunction, etc.) so there is no need for the pulse counters to be reprogrammed. These batteries are charged by the m-bus. There is an option for secondary non-rechargeable battery, which allows more than one year of work without external m-bus power supply.

### MBCS-type m-bus pulse counters produced by Gineers Ltd.

<b>MBCS-2</b>	Microcontroller-based two-input pulse counter with display, rechargeable battery and m-bus interface
<b>MBCS-4</b>	Microcontroller-based four-input pulse counter with display, rechargeable battery and m-bus interface
<b>MBCS-6</b>	Microcontroller-based six-input pulse counter with display, rechargeable battery and m-bus interface
<b>MBCS-8</b>	Microcontroller-based eight-input pulse counter with display, rechargeable battery and m-bus interface

### General technical specifications of MBCS-2/4/6/8

	MBCS-2	MBCS-4	MBCS-6	MBCS-8
number of pulse inputs	2	4	6	8
bus voltage	12-42 Vdc			
m-bus current consumption, max	2 mA (1.3 std. m-bus loads)		3 mA (2 std. m-bus loads)	
pulse frequency, max	5-100 Hz programmable			
pulse input cable length, max	20 m			
input closed contact resistance, max	1 kOhm			
input open contact resistance, min	1 MOhm			
data rate	300/ 2400 (factory default)/ 4800 bps			
working ambient temperature	0 °C - +55 °C			
storage ambient temperature	-50 °C - +90 °C			
dimensions (H/W/D)	75/70/105 mm			
display	7-segmen 8-symbol alphanumeric LCD			
keyboard	4 tactile switch keys			
weight	175 g			

MBCS are pulse counters for connection of pulse-output tax meters (or other pulse-output meters) to a m-bus network. They are intended to be used in residential buildings where the end-users can monitor their consumption in real time via the devices' display.

MBCS pulse counters are dual-powered - normally powered from the m-bus network, which also charges the battery and powered by the back-up battery when m-bus fails for any reason. The devices are designed in a way that back-up battery can power them for more than 168h - enough time to recover the malfunction of the network. MBCS has the option of adding an extra non-rechargeable battery, which can power the device more than a year with no network power. Upon readout request MBCS sends information about current state and the number of charge/discharge cycles of the back-up battery to the data collection device in order the battery to be changed if needed.

MBCS have realtime clock/calendar incorporated which allows them to have up to four tariffs for each input. Accumulated pulses for every tariff as well as total number of pulses for every input are kept in separate registers and are accessible for reading through the network. Tariff programming (start time, duration, cost) can be carried out only through the network.

For user's convenience an 8-character alphanumeric display is provided so current date, time, accumulated pulses, tariffs start time, duration and cost, pulse value (m<sup>3</sup>, kWh, ...), total cost of the service paid, cost of service to be paid can be checked any time. These parameters are valid only when programmed right and cannot be used for information to the service provider - it is only for user's convenience.



## M-bus pulse counters without display type MBSS

The m-bus pulse counters are slave devices that connect tax meters with pulse output to a m-bus network. Tax meters with pulse outputs are relatively cheap and has the majority of market share compared to the devices with m-bus output. They are heat meters, water meters (hot/cold), electricity meters, heat cost allocators, etc. Pulse counters count and accumulate the number of pulses each of these device generates and send the count to the data collecting device upon request. Usually they have more than one pulse input thus more devices with pulse outputs can be connected to a single pulse counter - this keeps total cost of the network low. Pulse counters are supplied with embedded rechargeable battery providing more than one week of work if the m-bus fails (electricity interruption, cable break, m-bus master malfunction, etc.) so there is no need for the pulse counters to be reprogrammed. These batteries are charged by the m-bus. There is option for a secondary non-rechargeable battery, which allows more than one year of work without power.

### MBSS-type m-bus pulse counters produced by Gineers Ltd.

<b>MBSS-2</b>	Microcontroller-based two-input pulse counter without display, rechargeable battery and m-bus interface
<b>MBSS-4</b>	Microcontroller-based four-input pulse counter without display, rechargeable battery and m-bus interface
<b>MBSS-6</b>	Microcontroller-based six-input pulse counter without display, rechargeable battery and m-bus interface
<b>MBSS-8</b>	Microcontroller-based eight-input pulse counter without display, rechargeable battery and m-bus interface

### General technical specifications of MBSS-2/4/6/8

	MBSS-2	MBSS-4	MBSS-6	MBSS-8
number of pulse inputs	2	4	6	8
bus voltage	12-42 Vdc			
m-bus current consumption, max	2 mA (1.3 std. m-bus loads)		3 mA (2 std. m-bus loads)	
pulse frequency, max	5-100 Hz programmable			
pulse input cable length, max	20 m			
input closed contact resistance, max	1 kOhm			
input open contact resistance, min	1 MOhm			
data rate	300/ 2400 (factory default)/ 4800 bps			
working ambient temperature	0 °C - +55 °C			
storage ambient temperature	-50 °C - +90 °C			
dimensions (H/W/D)	75/45/105 mm		75/70/105 mm	
weight	125 g		175 g	

MBSS are pulse counters for connection of pulse-output tax meters (or other pulse-output meters) to a m-bus network. They are intended to be used in office buildings.

MBSS pulse counters are dual-powered - normally powered from the m-bus network, which also charges the battery and powered by the back-up battery when m-bus fails for any reason. The devices are designed in a way that back-up battery can power them for more than 168h - enough time to recover the malfunction of the network. MBSS has the option of adding an extra non-rechargeable battery, which can power the device more than a year with no network power. Upon readout request MBPS sends information about current state and the number of charge/discharge cycles of the back-up battery to the data collection device in order the battery to be changed if needed.

MBSS have realtime clock/calendar incorporated which allows them to have up to four tariffs for each input. Accumulated pulses for every tariff as well as total number of pulses for every input are kept in separate registers and are accessible for reading through the network. Tariff programming (start time, duration, cost) can be carried out only through the network.

# M-bus waterproof pulse counters type MBPS

The m-bus pulse counters are slave devices that connect tax meters with pulse output to a m-bus network. Tax meters with pulse outputs are relatively cheap and has the majority of market share compared to the devices with m-bus output. They are heat meters, water meters (hot/cold), electricity meters, heat cost allocators, etc. Pulse counters count and accumulate the number of pulses each of these device generates and send the count to the data collecting device upon request. Usually they have more than one pulse input thus more devices with pulse outputs can be connected to a single pulse counter - this keeps total cost of the network low. Pulse counters are supplied with embedded rechargeable battery providing more than one week of work if the m-bus fails (electricity interruption, cable break, m-bus master malfunction, etc.) so there is no need for the pulse counters to be reprogrammed. These batteries are charged by the m-bus. There is option for a secondary non-rechargeable battery, which allows more than one year of work without power.

## **MBPS-type m-bus pulse counters produced by Gineers Ltd.**

<b>MBPS-2</b>	Microcontroller-based two-input pulse counter without display, rechargeable battery and m-bus interface, waterproof
<b>MBPS-4</b>	Microcontroller-based four-input pulse counter without display, rechargeable battery and m-bus interface, waterproof
<b>MBPS-6</b>	Microcontroller-based six-input pulse counter without display, rechargeable battery and m-bus interface, waterproof
<b>MBPS-8</b>	Microcontroller-based eight-input pulse counter without display, rechargeable battery and m-bus interface, waterproof

### General technical specifications of MBPS-2/4/6/8

	MBPS-2	MBPS-4	MBPS-6	MBPS-8
number of pulse inputs	2	4	6	8
bus voltage	12-42 Vdc			
m-bus current consumption, max	2 mA (1.3 std. m-bus loads)		3 mA (2 std. m-bus loads)	
pulse frequency, max	5-100 Hz programmable			
pulse input cable length, max	20 m			
input closed contact resistance, max	1 kOhm			
input open contact resistance, min	1 MOhm			
data rate	300/ 2400 (factory default)/ 4800 bps			
working ambient temperature	0 °C - +55 °C			
storage ambient temperature	-50 °C - +90 °C			
dimensions (H/W/D)	80/125/60 mm			
weight	320 g			
IP protection class	IP66			

MBPS are pulse counters for connection of pulse-output tax meters (or other pulse-output meters) to a m-bus network. They are intended to be used in places where it's not possible to use pulse counters without water protection.

MBPS pulse counters are dual-powered - normally powered from the m-bus network, which also charges the battery and powered by the back-up battery when m-bus fails for any reason. The devices are designed in a way that back-up battery can power them for more than 168h - enough time to recover the malfunction of the network. MBPS has the option of adding an extra non-rechargeable battery, which can power the device more than a year with no network power. Upon readout request MBPS sends information about current state and the number of charge/discharge cycles of the back-up battery to the data collection device in order the battery to be changed if needed.

MBPS have realtime clock/calendar incorporated which allows them to have up to four tariffs for each input. Accumulated pulses for every tariff as well as total number of pulses for every input are kept in separate registers and are accessible for reading through the network. Tariff programming (start time, duration, cost) can be carried out only through the network.



## GPRS - transceivers

GPRS-transceivers are intermediate communication devices, which connect existing remote reading network to centralized system for remote reading of multiple networks of same or different type.

They have RS-232C interface provided for connection to an m-bus converter type MBRS.

In order to establish communication with to the server, it is needed that the GPRS-transceiver is provided with SIM-card with activated GPRS-service of user-chosen mobile operator.

### GPRS - transceiver produced by Gineers Ltd.

#### **MBGP-1A**

Microcontroller-based GPRS-transceiver for connecting a m-bus network to centralized remote reading system

MBGP-1A is specially developed for use in remote reading systems. By using it a fully automated centralized remote reading of multiple networks can be achieved. The data can be transmitted up to four different data operators, each one of which can access only its "own" data ("own" data is determined by the medium - water, electricity, heat, etc.). The device's settings (data operator access permissions, send/ping timeouts, etc.) can be programmed/changed by two "control" operators, which do not have access to the network devices' data.

## General technical specifications of MBGP-1A

<b>frequency band</b>	Quad-band (EGSM 850/900/1800/1900 MHz)
<b>data operators, max</b>	4
<b>control operators, max</b>	2 (control operator and manufacturer)
<b>power supply</b>	150-250 Vac / 200-350 Vdc
<b>power consumption</b>	< 5 W
<b>display</b>	4 led (On, m-bus, GPRS context, GPRS communication)
<b>working ambient temperature</b>	-10 °C - +55 °C
<b>storage ambient temperature</b>	-50 °C - +90 °C
<b>dimensions (H/W/D)</b>	105/107/74 mm (w/o antenna)
<b>weight</b>	340 g

MBGP-1A requires valid mobile operator's SIM-card with activated GPRS-service in order to work properly and the access parameters (SIM PIN, SIM PUC, Access Point Name, user name and password) must be programmed. We provide free software for parameters programming. This software can program also:

- IP (v4) of at least one data operator as well as mediums for this operator
- IP (v4) of the control operator (and manufacturer, if needed) - they can match each other and any data operator as well. Any further settings can be done by the control operator via GPRS.
- data send time interval
- next due-date time
- etc.

These parameters (without SIM and AP parameters) can be programmed at any time by each of the control operators. The data readout request is initiated by MBGP-1A instead of the server-side application, because it is the only way it could be guaranteed that the device works independently of the mobile operator and the services this operator provides. MBGP-1A contacts the server every "ping-timeout" time (1-24h) and at each of these sessions the server-side application can initiate data readout of part of or the whole network.



## Software for remote reading

We provide software for remote reading which can cover the whole variety of network types and readout from direct readout of single network to centralized readout of multiple networks. These networks can be independent and can use several different data protocols. We provide also free software for configuring m-bus networks.

### Software for remote reading systems

<b>M-bus serial communicator</b>	software for direct readout of remote reading network (m-bus, RS-485, etc)
<b>M-bus GPRS server</b>	server-side software for readout of multiple remote reading networks through GPRS
<b>M-bus config</b>	free configuration software for our pulse counters and other standard m-bus slave devices

#### **M-bus Serial Communicator**

Software for direct readout of devices, connected in m-bus/RS485 networks. Database - SQL. Four-level user-defined groups, detailed reports, billing, automated readout. Different access levels for users, using several serial ports simultaneously.

#### **M-bus GPRS server**

Server-side software for readout of multiple networks via GPRS. Database - SQL. Network definition, definition of devices in four levels for each network, automated readout, detailed reports, billing, different access levels for users, etc.

#### **M-bus Config**

Configuration software for Gineers' pulse counters as well as other standard m-bus slave devices. Free (it can be downloaded from [www.gineers.com](http://www.gineers.com)).

**M-bus Serial Communicator** is developed for remote reading of devices in one/multiple networks via serial RS-232C/ RS-485 interface. It provides vast flexibility to define devices and their organization in groups and networks. It supports m-bus protocol (EN1434-3) and electricity meters readout protocol (IEC1107). Hours and dates for automated readouts can be set as well as manual readout can be performed on every device, group or network. Reports can be with or without billing with protocol printing and VAT calculation. Gineers' slave devices MBCS/MBSS/MBPS extra functions are fully supported. It has several access levels. M-bus Serial Communicator works on Windows 2000/XP/Vista OS. It has several main modules:

- USERS module - 4 access levels
- SETTINGS module - communication settings; visualization of protocols, etc.
- DEVICES module - detailed definition of devices, tariffs and tariffs price definition (up to 4 tariffs)
- GROUPS module - definition of groups of devices, organized in 3 levels in tree-like structure
- AUTOMATED READOUT module - setting up automated readouts (w/o user interaction)
- REPORT module - detailed reports and billing for device/group/network.

The program communicates with the m-bus network via converter (like MBRS-32/64/250). Left standby, it monitors the time for automated readout, activates, reads the data and goes back stand-by. Manual readout can be started by the user at any time by selecting device/group/network and clicking "Read" button. All readouts are stored in SQL database. There are four user-access levels, lowest of which (operator) can only start manual readout and make report for given period of time.

Devices are organized in groups in three independent levels. There are also two extra user-defined fields for each defined device, where user can put any data he wishes to better distinguish the devices.

**M-bus GPRS Server** has all the functionality of *M-bus Serial Communicator* and is capable of communicating with unlimited number of networks for remote reading over internet (and, subsequently, over GPRS).

**M-bus Config** is specially developed configuration program for setting up m-bus devices in a m-bus network while already mounted. Although developed for our devices, it can program standard parameters of any vendor's m-bus devices. It is free and can be downloaded from our website ([www.gineers.com](http://www.gineers.com), section "downloads"). The program works on Windows 95/98/2000/XP/Vista.

M-bus Config builds database for devices and their parameters for every networks it is used to set up. It can address the devices primary using devices' network address as well as secondary using device's ID-number. The parameters, that can be set up, are: ID number (change), time set, baud rate change, medium and unit, tariff parameters (start time, duration and cost) as well as other Gineers' specific parameters. It can lock the entire network, which will disable changing the network address of the devices as well as putting the devices in low-consumption mode (used in transportation). It has also the unique feature of searching the active devices in the network.