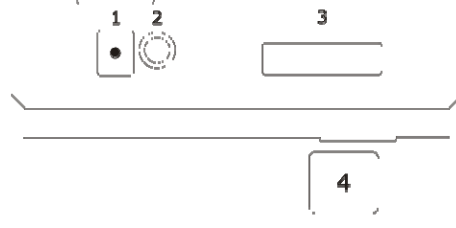


3. Electrical connections

MBGP-3EP by default is not for din-rail. Power adapter is included with each MBGP-3. All the connections are shown in the figure and the tables below:

C1, C2 (plugs) and C3 (terminal block)

No	Description
1	Power adapter
2	GSM Antenna
3*	Pulse inputs – if present



C4 'RS-232C' – RJ-45 (programming/readout)

No	Description
1, 4, 6, 7, 8	Not connected
2	RXD
3	TXD
5	GND

The cable, connecting MBGP-3 to an m-bus converter type MBRS (RS-232 RJ45-RJ45 cross) is part of the package. Cross means that pin 2 from one side goes to pin 3 on the other and vice-versa.

The cable for initial programming (RS-232 DB9-RJ45 cross) is not delivered with MBGP-3 as it is part of the package of every m-bus converter type MBRS.

Software for setting or reading this device can be downloaded from our site or contact support@gineers.com.

4. Warranty

The warranty of the device is limited to 3 years from the date of sale. If the device shows any defect or malfunctions during that period, the manufacturer is obligated to repair the device in its own service for manufacturer's expense, or, if the repair is impossible, to replace the device with new one. The transportation costs to the manufacturer's service are due to the client. The warranty voids if this manual's instructions are not met, warranty seals are removed or the device was opened by unauthorized by the manufacturer personnel.

Serial number:.....

Date of sale:.....

Signature:.....

5. The package contains

- MBGP-1 with antenna - 1 pc.
- Instruction manual - 1 pc.
- Power adapter 12VDC/1.0A – 1 pc.
- Data cable for connection to m-bus converter RJ45-RJ45, cross (RS-232) 1-3 m – 1 pc.

6. Manufacturer

Gineers Ltd.
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tel./fax (+359-2) 9758105
URL: <http://www.gineers.com>, e-mail: info@gineers.com

Ethernet/Internet modem **MBGP-3EP**

M-BUS Series

Instruction manual

MBGP-3EP is a GSM/GPRS data transceiver for use in remote reading systems, mostly **m-bus**. It has one RS-232C interface for connection to the network master converter (like MBRS-xx) and for initial programming. In addition, 4 pulse inputs for connecting meters are provided. It operates in GSM networks and needs operational SIM card (mini SIM) with activated GPRS service.

1. General technical data

- connection protocol
- power supply
- max. power consumption
- serial port baud rate
- ambient temperature, operating
- ambient temperature, storage
- air humidity, operating & storage
- dimensions (H/W/D)
- protection class
- display
- weight
- TCP/IP over GPRS on GSM networks
- adapter 12VDC/1.0A, included
- < 0.3W (not transmitting), <8W (peak, transmitting)
- 300/1.2k/**2.4k**/4.8k/9.6k/19.2k/38.4k bps
- -20÷+50 °C
- -50÷+90 °C
- 40÷90 %
- 125/70/30 mm (without antenna)
- IP30
- 2 LEDs (on, GPRS)
- 150 g

2. MBGP-3EP operation

MBGP-3EP begins operation immediately after power-up. After initialization (about 2s), the programmed MBGP-3 enters "Command mode"/ checks for connection time. The connection with servers is initiated by MBGP-3 (client). All of the contacted servers must have static real IP-addresses in order for MBGP-3 to be able to connect to them (or proper routing). MBGP-3 can contact up to six servers – two "control" operators and four "data" operators. The two control servers can program all network access settings and have no access to the transmitted data. Otherwise, the data operators can access only the data, but cannot program any network parameters. If it is needed for an operator to have access both to the network settings and the data, its IP-address must be set both as control and data operator. Accessible mediums for every data operator may be programmed, so, for example, the operator which monitors water consumption, cannot access the data, monitored by gas supplier and vice-versa.

MBGP-3 tries to connect to the servers after predetermined period of time (default 15 minutes). Each of the servers can accept or reject the incoming connection. If the connection is accepted, MBGP-3 starts with identification data packet to identify the remote reading network, connected to this particular MBGP-3. After identifying the network the server can reprogram network parameters (for control operators) or access network data (data operators). After reprogramming the parameters or gathering the data, the server sends packet for closing the connection. After receiving this packet, MBGP-3 closes the connection and tries to connect to the next server in the list until all the servers in the list are contacted. Then MBGP-3 waits for predetermined period of time before attempting to connect again to the first server in the list.

If the connection is accepted by the server, but then there is no communication for predefined period of time (default 60s), MBGP-3 drops the connection and goes to the next server in the list. The connection is dropped from the server, if idled, after 180 seconds. The device has two leds – first indicating power is applied to the device, and the second is lit or blinks when GPRS is active and -RSSI info can be read from the network. If the second LED is lit, then the signal strength is better than -75dBm, if the LED blinks, it is below that value. If this LED is off – no GSM/GPRS connections available.

Initial parameters programming is essential and includes setting the connection parameters (Access Point Name, user id, password, SIM PIN) and remote reading network parameters (baud rate and parity of serial connection, remote reading network number). These parameters must be set first, and after successful connection all the parameters can be set remotely by the server.

Direct programming of the parameters can be done with simple terminal program (like GiCom) or by special software. When using terminal program, the parameters are set as follows: each line starts with the keyword "SET", then space, then parameter code, "=" sign, value of the parameter. Like this:

SET IPMA=77.70.121.93 sets the first control operator (manufacturer) IP-address for this network to 77.70.121.93

After parameter value there should not be any additional characters (like CR, LF, etc.), the string should be sent to the MBGP-1 directly. MBGP-1 responds to every command with either success or error.

The direct programmable parameters are these:

#	Des.	Description	Default value	Value range	Note
1	PINC	PIN code for the SIM card	None	0000-9999	A "must" parameter, programmed only locally
2	APNM	Mobile operator GPRS Access Point Name	None	String, up to 29 characters, or 0 (deletes current string)	A "must" parameter, programmed only locally; The string must be enclosed in quote signs ("")
3	USER	Mobile operator GPRS User ID	None	String, up to 19 characters, or 0 to delete it	This parameter can be programmed only locally; The string must be enclosed in quote signs ("")
4	PASS	Mobile operator GPRS password	None	String, up to 19 characters, or 0 to delete it	This parameter can be programmed only locally; The string must be enclosed in quote signs ("")
5	IPMA	First control operator (manufacturer) IP-address	Manufacturer designated IP-address	0.0.0.0-255.255.255.255	Can be reprogrammed
6	IPCO	Second control operator IP-address	255.255.255.255	0.0.0.0-255.255.255.255	A "must" parameter
7	IPOx	Data operator x IP-address (x=1-4)	255.255.255.255	0.0.0.0-255.255.255.255	A "must" for at least one operator
8	COM2	Serial port parameters (baud rate, parity)	2,0 (2400bps, even)	0-6,0-2 (300bps-38.4kbps, even/odd/none)	
9	MINC	Contact timeout (PITO) is in minutes or hours	0	0 (hours), 1 (minutes)	
10	PITO	Time between two consecutive connection attempts	15 minutes	01-96 if hours, 15-90 if minutes	Two digits must be set (01 instead of 1)
11	NETO	Remote reading network message timeout, in 0.1s	20 (2.0s)	05-99 (0.5-9.9s)	Two digits must be set (07 instead of 7)
12	INTO	Server inactivity timeout, in x10s	06 (60s)	01-60 (10-600s)	Two digits must be set (02 instead of 2)
13	DEBD	Set debounce time of pulse inputs in 10 ms units	20ms	01-25 (10-250ms)	Two digits must be set (03 instead of 3); valid only if pulse inputs present
14	PORT	Set port to connect to	615 (port 59615)	0 to 999	Always 3 digits, actual is 59000+port
15	ROAM	Set roaming access	0 (disabled)	0 (disable) or 1 (enable)	0 - disabled, 1 - enabled

The command and parameters are upper or lower case, with no preceding or trailing characters like space, CR, LF, etc.

The steps of installation and initial programming are the following:

- Insert the SIM-card in its socket. The SIM card must be operational and with activated GPRS-service. SIM PIN requirement may be switched off.
- Power up MBGP-3. Connect it to the PC/laptop's serial port with RS232 (DB9-RJ45) data cable, which is supplied with every m-bus converter type MBRS. This cable is NOT supplied with MBGP-3.
- Set all basic network parameters
 - Parameters for GPRS connection (access point name /APNM/, user id /USER/ and password /PASS/. All of these can be obtained from the mobile operator. The majority of the operators require just Access Point Name for GPRS service attachment. If user id and/or password are set by mistake, they can be deleted by setting any of them to 0 (SET USER=0, SET PASS=0).
 - Set PIN code (PINC). Even if PIN requirement is switched off, MBGP-3 needs a "dummy" PIN (any PIN you want) to access the SIM-card. If a wrong PIN is entered and the device is turned off/on more than two times, the SIM card requires PUK code in order to be accessed. This cannot be done in MBGP-3, so the card must be taken out and PIN restored in any mobile phone

- COM port (COM2) settings for remote reading network (baud rate and parity) – only if different from defaults, which are 2400, Even, 8, 1.
- Network message timeout (NETO) – if there is no response from the network after MBGP-3 has issued command, MBGP-3 responds to the server with timeout error.
- Set IP-addresses of control and data operators (IPMA, IPCO, IPO1-IP04). At least one control operator IP-address must be set in order to gain remote control of the network. All operator IP-addresses can be set remotely by control operator.
- other parameters
 - Time between two connections (PITO), in hours or minutes.
 - Server inactivity timeout (INTO). MBGP-3 drops connection after expiration of this timeout without server activity.

The parameters can be reprogrammed remotely by control operator. Allowed mediums for all the four data operators can be programmed only remotely by control operator. All mediums are allowed for all data operators by default.

Current settings can be checked locally by issuing command "GET", space, parameter code.

Parameter codes are: **MAIN, SERV, CONN, GPRS, MEDx (x=1-4), PULS.**

- **GET MAIN** – returns current firmware version, current date & time, MBGP-3's ID-number, network number, working time after power-up or power interruption in days, server and GPRS connections.
- **GET SERV** – returns current firmware version, all operators IP-addresses, predefined server connection time and the time remaining to the next connection attempt.
- **GET CONN** – returns current firmware version, pin code, mobile operator, GPRS attachment status and remote reading network parameters (baud rate, parity, message timeout).
- **GET GPRS** – returns current firmware version and GPRS connection data (APN, user ID, password, gateway)
- **GET MEDx** – returns allowed mediums for data operator x, x=1-4. The mediums can be programmed only remotely by control operator
- **GET PULS** – returns counted pulses on 4 pulse inputs, if they are active and physically provided in the device

Example of setting the device up for use in Bulgaria, operators Mobiltel, Globul, Vivatel:

- First make sure the GPRS is activated for this SIM card.
- Insert SIM card into the MBGP-3, make sure it is not powered when the card is inserted. Be careful to insert SIM card correctly
- Program GPRS parameters:
 - Set APN:
SET APNM="inet-gprs.mtel.bg" (Mobiltel)/ SET APNM="internet.globul.bg" (Globul)/ SET APNM="internet.vivatel.bg" (Vivatel)
 - Set User ID
(Mobiltel does not require user to be set)/ SET USER="globul" (for Globul)/ SET USER="vivatel" (for Vivatel)
 - Set Password
(Mobiltel and Globul does not require password to be set)/ SET PASS="vivatel" (for Vivatel)
- Program SIM PIN
Set PINC=0000
(now the device registers to network and checks if GPRS is available)
In 1-2 min check if the device is registered to the network and if the device is attached to GPRS network (GET CONN), if the device is not registered to a network within a few minutes, then the SIM card may be defective or the SIM PIN is not correct. If the MBGP is not attached to the GPRS network, then GPRS service is not activated and connection to any of the servers is not possible.
- Program control and data operator IPs
SET IPMA=, SET IPCO=, SET IPO1=, ..., SET IPO4=
- Program desired connection period (SET PITO). Be sure to make it in hours or minutes first
SET MINC=0 (now it is Hours); set PITO= 12 (12 hours between connections)
- Program serial port parameters, if needed. Default is 2400, Even, 8, 1

Now start your server with software (from Gineers or other) and wait for connection on port 59615 (by default, can be changed). All settings (except GPRS settings) can be set through GPRS connection with proper Gineers software. In each telegram pulse input info is sent (if pulse counting is active) and can be registered.