

- Program timeouts (if needed)
SET PITO=, SET NETO=, SET INTO=
- Program network com-port parameters (baud rate, parity) if needed
SET COM2=

3. Electrical connections

MBGP-1A should be mounted on standard M35 din-rail. Power connection should be made with isolated multi-wire cables with cross section 0.5mm²-2.5mm². All the connections are shown in the figure and the tables below:

C1 'Power' - 3P terminal block

No	Description
1, 3	Power input L, N
2	Power Grounding input PE

C2 '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-1 to an m-bus converter type MBRS (RS-232 RJ45-RJ45 cross) is part of the package. The cable for initial programming (RS-232 DB9-RJ45 cross) is not delivered with MBET-2 as it is part of the package of every m-bus converter type MBRS.

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 instructions are not met, warranty seals are removed or the device was opened by unauthorized by the manufacturer personnel.

Serial number:.....

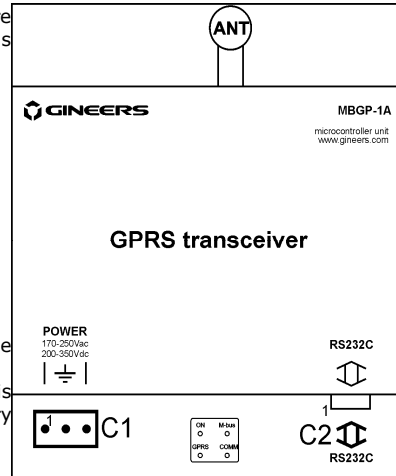
Date of sale:.....

5. The package contains

- MBGP-1 with antenna - 1 pc.
- Instruction manual - 1 pc.
- Configuration utility CD - 1 pc.
- Data cable for connection to m-bus converter RJ45-RJ45, cross 1-3 m - 1 pc.

6. Manufacturer

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Ethernet/Internet modem MBGP-1A

M-BUS Series

Instruction manual

MBGP-1 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. It operates in GSM networks and needs operational SIM card (mini-SIM) with activated GPRS service.

1. General technical data

- connection protocol
 - TCP/IP over GPRS on GSM networks
- power supply
 - 170-250Vac/ 200-350Vdc
- max. power consumption
 - <1W (not transmitting), <2.5W (transmitting)
- serial port baud rate
 - 300/1.2k/2.4k/4.8k/9.6k/19.2k/38.4k bps
- ambient temperature, operating
 - -20÷+50 °C
- ambient temperature, storage
 - -50÷+90 °C
- air humidity, operating & storage
 - 40÷90 %
- dimensions (H/W/D)
 - 105/107/74 mm (w/o antenna) / 106/107/85 mm (w/t antenna)
- protection class
 - IP30
- display
 - 4 LEDs (on, GPRS, M-bus /local communication/, line /remote communication/)
- weight
 - 350 g

2. MBGP-1 operation

MBGP-1 begins operation immediately after power-up. After initialization (about 2s), the programmed MBGP-1 enters "Command mode"/ checks for connection time. The connection with servers is initiated by MBGP-1 (client). All of the contacted servers must have static real IP-addresses in order for MBGP-1 to be able to connect to them. MBGP-1 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-1 tries to connect to the servers after predetermined period of time (default 1h). Each of the servers can accept or reject the incoming connection. If the connection is accepted, MBGP-1 starts with identification data packet to identify the remote reading network, connected to this particular MBGP-1. 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-1 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-1 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 300s), MBGP-1 drops the connection and goes to the next server in the list. The connection is dropped after the same period of inactivity from the server.

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 send 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	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
4	PASS	Mobile operator GPRS password	None	String, up to 19 characters, or 0 to delete it	This parameter can be programmed only locally
5	GATE	Mobile operator GPRS Gateway	255.255.255.255 (automatic)	0.0.0.0-255.255.255.255	This parameter can be programmed only locally
6	IPMA	First control operator (manufacturer) IP-address	Manufacturer designated IP-address	0.0.0.0-255.255.255.255	Can be reprogrammed
7	IPCO	Second control operator IP-address	255.255.255.255	0.0.0.0-255.255.255.255	A "must" parameter
8	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
9	COM2	Serial port parameters (baud rate, parity)	2,0 (2400bps, even)	0-6,0-2 (300bps-38.4kbps, even/odd/none)	
10	DATE	Current date (dd,mm,yy)	01/01/10	01/01/00-31/12/99	
11	TIME	Current time (hh,mm)	00,00	00,00-23,59	
12	PITO	Time between two consecutive connection attempts	12	01-48	Two digits must be set (01 instead of 1)
13	NETO	Remote reading network message timeout, in 0.1s	20 (2.0s)	03-25 (0.3-2.5s)	Two digits must be set (07 instead of 7)
14	INTO	Server inactivity timeout, in x10s	30 (300s)	01-60 (10-300s)	Two digits must be set (02 instead of 2)
15	NETN	M-bus network number	255.255.255.255	0.0.0.0-255.255.255.255	A "must" parameter
16	DUED	Set due-date (dd,hh,mm)	inactive	01,00,00-31,23,59	

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:

- Open MBGP-1 (as shown) on the figure and 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.
- Close MBGP-1 and power it up. 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-1.
- Set all basic network parameters
 - Parameters for GPRS connection (access point name /APNM/, user id /USER/, password /PASS/ and gateway /GATE/. 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). Default gateway (255.255.255.255) uses automatic (operator assigned) gateway.
 - Set PIN code (PINC). Even if PIN required is switched off, MBGP-1 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-1, so the card must be taken out and PIN restored in any mobile phone. Then the right PIN must be programmed before the card is inserted back into the MBGP-1.
 - Remote reading network number (NETN). This setting is essential as this is the only way the server can identify the network to read.
 - COM port (COM2) settings for remote reading network (baud rate and parity) – only if different from defaults.
 - Network message timeout (NETO) – if there is no response from the network after MBGP-1 has issued command, MBGP-1 responds to the server with timeout error.

- Set IP-addresses of control and data operators (IPMA, IPCO, IPO1-IPO4). 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
 - Current date (DATE) and time (TIME) set. These are lost at power interruption.
 - Time between two connections (PITO), in hours (1-48, default 12h).
 - Due date set (DUED). At due-date MBET-2 connects only to the data operators. Set day, hour, minute.
 - Server inactivity timeout (INTO). MBGP-1 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).

- GET MAIN – returns current firmware version, current date & time, MBGP-1'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.

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-1, make sure it is not powered when the card is inserted
- Close the lid of MBGP-1A, power the device.
- 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)
 - Set gateway
(do not set gateway for any of these operators, it is automatic – 255.255.255.255)
- Program SIM PIN
SIM PIN=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 network number
SET NETN=