COMMUNICATION MODULE
A-GSM

OPERATIONS MANUAL

AAIIIX.464512.004 HE

Content

This Operating Manual (hereinafter - OM) applies to communication modules A-GSM (hereinafter - modules).

The OM describes the operation of modules, use, maintenance, storage, and transportation.

1. A-GSM function

1.1. A-GSM communication module is designed to implement various wireless data collection and/or control systems using GPRS packet data transmission technology in GSM cellular networks.

2. Technical specifications

2.1. Technical specifications are shown in Table 1.

Table 1. Technical specifications

GSM / GPRS parameters	
Operating bands GSM / GPRS, MHz	900/1800
GPRS communication class	B
Compliance with GSM classes	Class 4 (2 W for EGSM900) Class 1 (1 W for DSC1800)
Power settings from the AC mains	
Nominal voltage, V	230
Nominal current, mA	30
Operating voltage range when powered by a single-phase network, V	from 100 to 265
Power consumption, W.	less than 10
Nominal network frequency, Hz	50
Parameters of reserve power supply from a direct current network	
Nominal voltage, V	12
Nominal current, mA	300
Operating voltage range when supplied from the DC network, V	from 7 to 15
Power consumption, W.	less than 5
Output settings for powering external devices	
The nominal output voltage, V	5
Maximum output current Imax, mA	300
RS-485 communication interface parameters	
Exchange rate, Bit / s	from 300 to 115200
Default exchange rate, Bit / s	115200
The maximum number of devices on the bus, pcs	32
Galvanic isolation (insulation breakdown voltage): – between RS-485 and 230 V, kV power supply – between RS-485 and the digital part of the device, kV	 at least 4 at least 1
Parameters of discrete inputs	
Number of inputs	1
Input type	passive
Maximum voltage, V	15
Maximum input current, mA	15
Parameters of discrete outputs	
Number of outputs	1
Output type	Open collector
Maximum voltage, V	15
Maximum current, mA	100

Service port settings	
Connector version	mini USB
Connector type	B
Interface version	USB 2.0
Operation and storage parameters	
Temperature range, °C: – operating – storage	 from -40 to +70 from -45 to +80
Relative humidity at a temperature plus 30 ºC, %	less than 95
Weight, kg	less than 0.5

3. Supply package

3.1. The supply package is shown in table 2.

Table 2. Supply package

Name	Number
Communication Module A-GSM	1 pc.
Antenna*	1 pc.
Passport	1 copy
Consumer packaging	1 pc.
* Antenna AP22A, GSM/3G, SMA male, 2 dBi, 45x5 mm or ADA-900M-SMA-3.0m (depending on order)	

3.2. Versions of A-GSM are shown in table 3.

Table 3. Versions of **A-GSM-0X.YZ.A**

Item	Description and possible values
A-GSM	Device name
X	1 – GSM / GPRS
YZ	Interface block: Y = 1 – RS-485 Y = 2 – 2xRS-485 Z always equals zero (0)
A	Power supply configuration: 1 – AC (AC power) 2 – DC (DC power supply) 3 – AC + DC (power supply from both types of network)

4. General view of Communication Module

4.1. The general view of the communication module is shown in Figure 1.

Figure 1. General view of Communication Module A-GSM

5. Montage

5.1. Mounting and removal of the A-GSM module should be performed only by authorized organizations. Installation and dismantling should be performed only by persons who have the third (III) and higher group according to the rules of safe operation of electrical equipment.

5.2. Commissioning and maintenance personnel must have experience of working with this type of equipment.

5.3. A-GSM module is mounted on a 35 mm DIN rail. Working position - arbitrary.

WARNING!

A-GSM module must not be used in explosive environments, such as conductive dust and aggressive fumes and gases.

6. Operation principle

6.1. Device connection

To use the device, you need to connect:

- Power supply;
- external device to one of the RS-485 ports;
- antenna;
- SIM card.

A-GSM module cannot be switched on with an installed SIM card and without the installed antenna.

Before inserting a SIM card into the device, the PIN verification feature must be turned off.

6.2. Indication

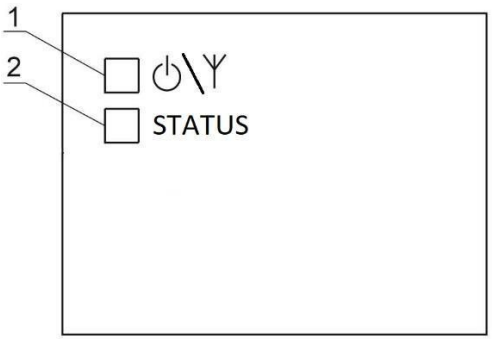


Figure 2. LEDs designation

LEDs designation is shown in Figure 2. The description of parts and methods of indication is given in Table 4.

Table 4. Indication organs description

Designation	**Description**	**Event indication method**		
1 (⏻/Y)	Power indication (**green LED**)	ON - power is supplied to A-GSM OFF - power is not supplied		
	GSM network status indication (**red LED**)	**LED is on**	**LED is off**	**Status**
		0 ms	constantly	The module doesn't work
		64 ms	800 ms	The module is not synchronized with GSM network
		64 ms	2000 ms	The module is synchronized with GSM network
		64 ms	600 ms	GPRS data transfer after dialing the PPP

		Green	Red	Status
2 (STATUS)	Network status indication	LED is on	LED is on	Program initialization
		LED is off	LED is on	Initializing the PPP Stack
		LED is off	LED flashing	Normal operation

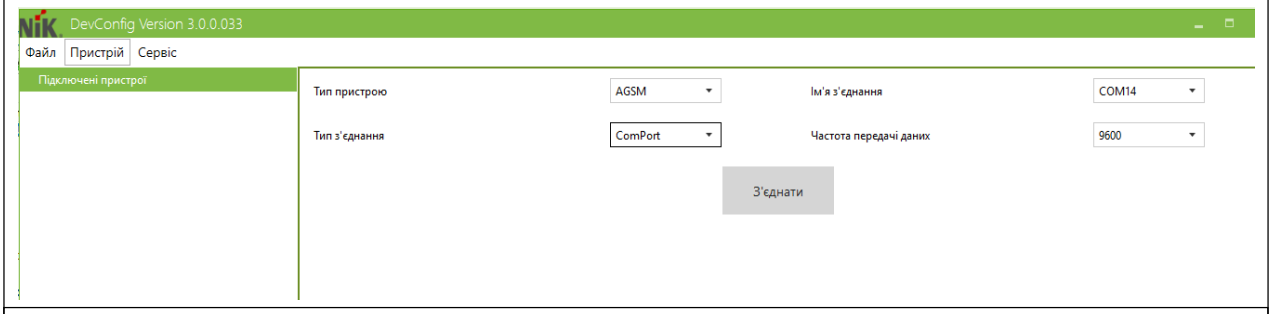
6.3. Connection to the device

Information about the device can be read using the DevConfig parameterization program.

Connecting to the device and changing its settings is available via a wired serial USB interface or GPRS.

To connect to the device via the wired interface, the following settings should be specified:

- **"Device type":** AGSM (from drop list)
- **"Connection type":** RS (from drop list)
- **"RS-port number":** COM-port number in the system (from drop list)
- **"RS-port speed":** 9600 by default (from drop list) and click "**Connect**".

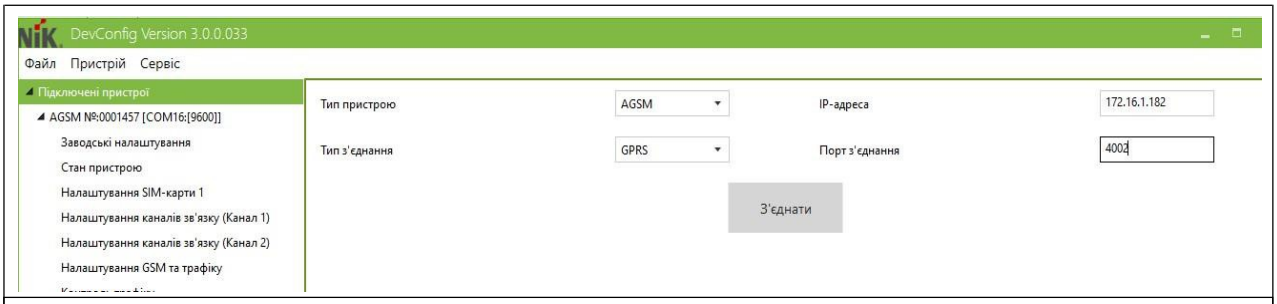


Connection via wired serial USB interface (COM port)

The device is always available in server mode for remote parameterization. To connect to the device the IP address of the active SIM card is needed. Port for connection - 4000.

To connect to the device via GPRS the following parameters should be specified:

- **"Device type":** AGSM (from the drop list)
- **"Connection type":** Ethernet / GPRS (from the drop list)
- **"IP address":** IP address of SIM card
- **"IP port":** default - 4002 and click **"Connect".**



GPRS connection

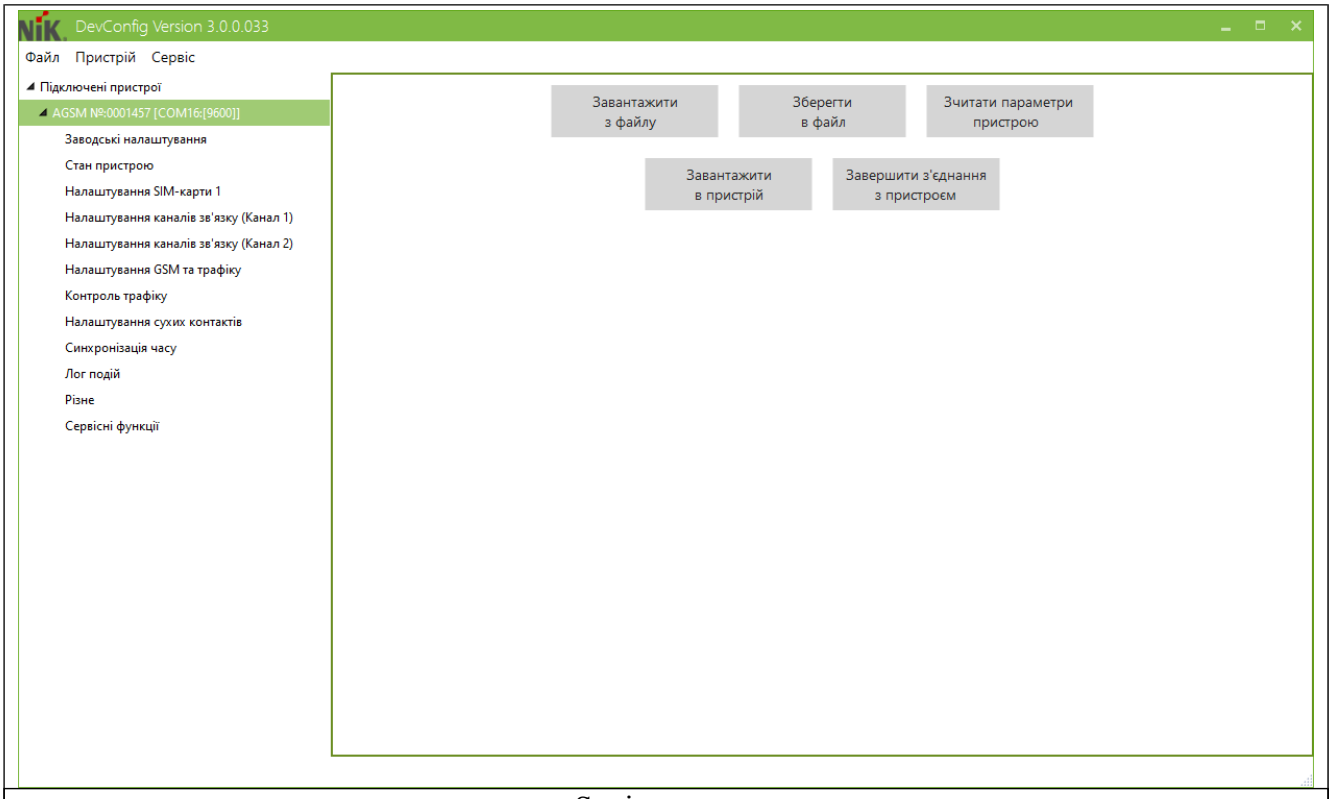
After the connection is established, an AGSM device will appear in the "Devices" section (indicating connection parameters) and a complete list of settings will be available.

After highlighting the device name, 5 sections of settings will be available:

1. Factory settings:
   - Serial number;
   - Software version;
   - IMEI;
   - Date of production;
   - Maximum CPU temperature;
   - Program compilation date;
   - Connection mode;
   - RS485 Duplex mode;
   - Server IP;
   - Control server IP;
   - Control server polling period (c);
   - Place of installation of the device.
2. Device status:
   - Communication operator;
   - GSM network status;
   - Own IP address;
   - SIM card balance;
   - CPU temperature;
   - Total operating time (h: min: sec).
3. SIM card settings:
   - USSD balance check request;
   - APN entry point for GPRS.
4. RS485 settings (Channel 1):
   - Port;
   - UART speed;
   - Data size;
   - Parity bit;
   - Stop bits.
5. RS485 settings (Channel 2):
   - Port;
   - UART speed;
   - Data size;
   - Parity bit;
   - Stop bits;
6. GSM and traffic settings:
   - Modem restart period (days);
   - Modem restart period (hours);
   - Modem restart period (minutes);
   - Maximum daily traffic (bytes);
   - Maximum monthly traffic (bytes).
7. Traffic control:
   - GSM traffic: current day *** (bytes);

- GSM traffic: last day *** (bytes);
- GSM traffic: current month *** (bytes);
- GSM traffic: last month *** (bytes);
- Channel 1: traffic: total *** (bytes);
- Channel 2 traffic: total *** (bytes).

8. Dry contact settings:
   - Discrete input state;
   - User description for level 0 ISO input;
   - User description for level 1 ISO input;
   - Discrete output state;
   - Selection of the event for the ISO output response.
9. Time synchronization:
   - Current time;
   - Time zone;
   - Auto synchronization period;
   - Manual synchronization button;
   - IP of the time server.
10. Event log:
    - Event log clear button;
    - Event log output field.
11. Other:
    - Request to reboot the device.



Settings menu

Завантажити з файлу	Зберегти в файл	Зчитати параметри пристрою
Download from file	Safe to file	Read device parameters

Завантажити в пристрій	Завершити з’єднання з пристроєм
Download to device	Disconnect the device
1. Заводські налаштування 2. Стан пристрою 3. Налаштування SIM-карти 4. Налаштування RS485 (Канал 1) 5. Налаштування RS485 (Канал 2) 6. Налаштування GSM та трафіку 7. Контроль трафіку 8. Налаштування сухих контактів 9. Синхронізація часу 10. Лог подій 11. Різне	1. Factory settings 2. Device status 3. SIM card settings 4. RS485 settings (Channel 1) 5. RS485 settings (Channel 2) 6. GSM and traffic settings 7. Traffic control 8. Dry contact settings 9. Time synchronization 10. Event log 11. Other

To change the settings of a specific section, this section should be selected from the list. To read current device settings, click the "Read" button in the appropriate settings section. After making changes to the parameterization program, to save the new settings to the device, click the "Read/Save" button in the appropriate settings section.

At the bottom of the program window is the event log field "Program log". You need to press the "Tools" button from the menu - "Program Log" to view it. This section displays the system log of DevConfig software with connected devices. To display the log of data exchange, you need to follow the path leading to the installed DevConfig, then open the following folders "log" - "DATE" - "log file".

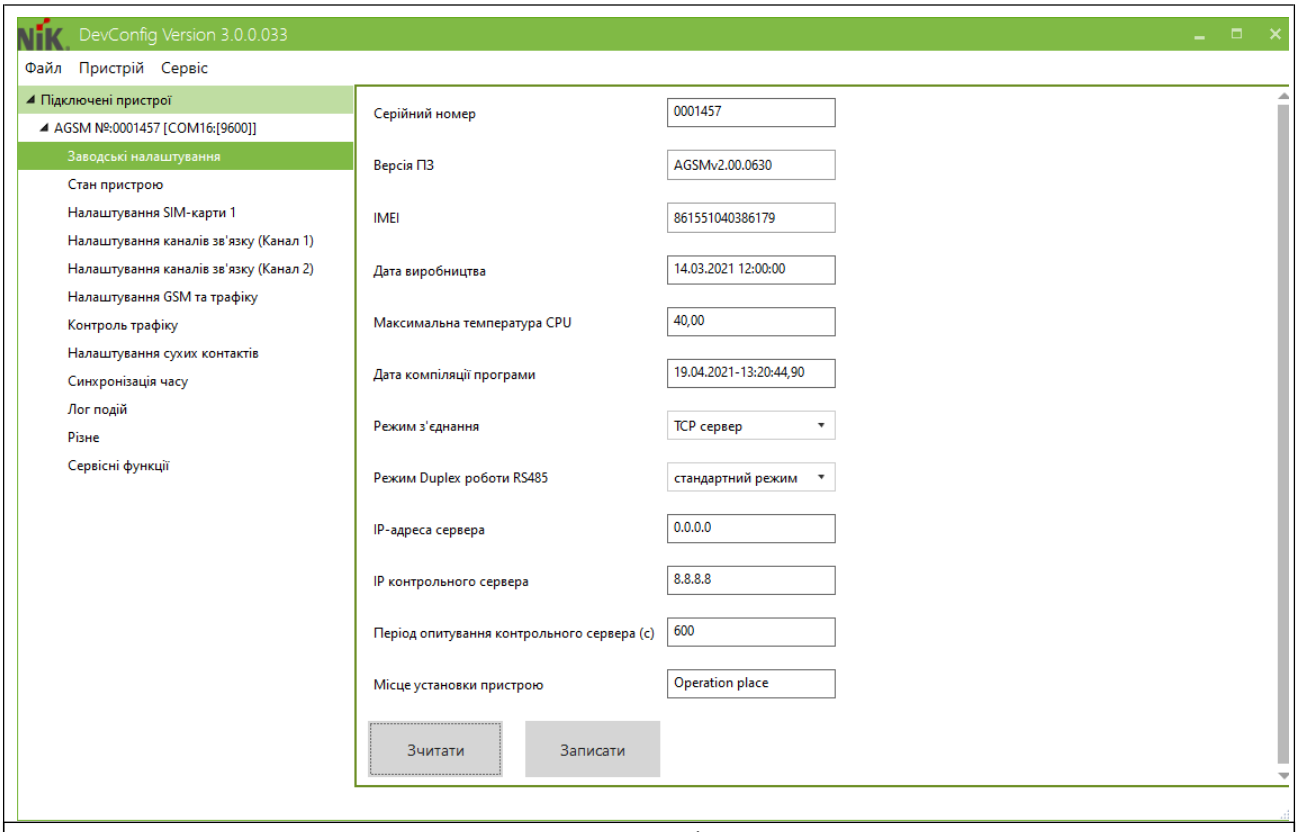
The selected folder contains the log files of the session that was started during the "DATE" time, namely:

- MainLog.txt (DevConfig system log);
- AGSM_SERIAL_NUMBER.txt (data exchange log).

WARNING! When you click the "Read/Save" button, all fields of the current section are recorded, including those that are not filled. Therefore, if you need to make changes to one or more fields, it is advisable to first read from the device the settings of this section, make the necessary changes, and then record to the device.

6.3.1. Factory settings

This section displays information fields and general device settings. Fields that can be recorded can change the content. The fields "Serial number", "Date of production" are exceptions.



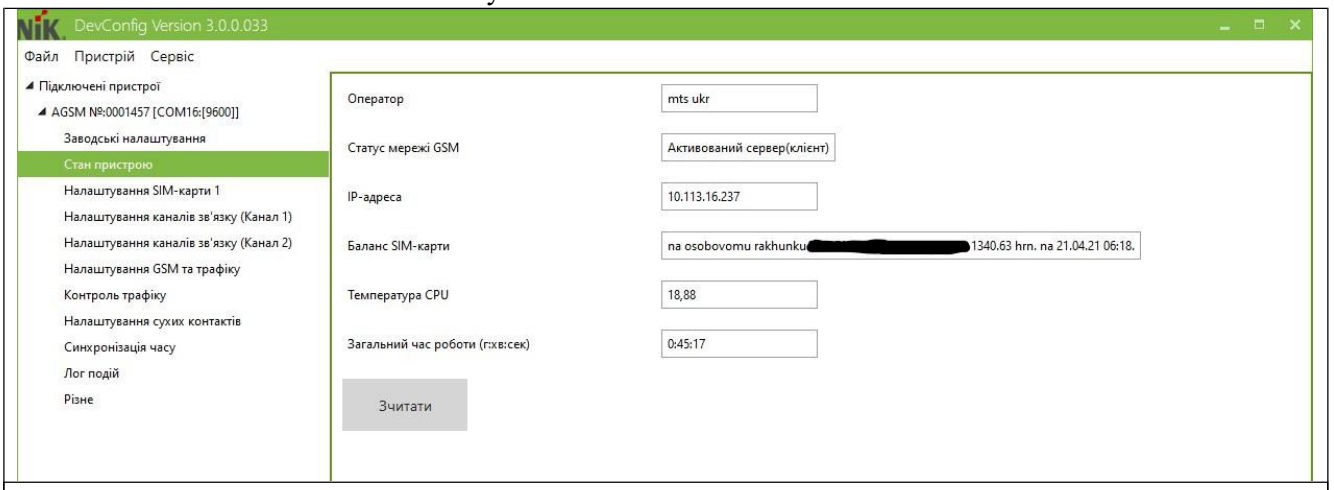
Factory settings

6.3.2. Device status

This section displays the following information:

- **Operator** - Brief description of the activated SIM-card operator ;
- **GSM network status** - Displays the status of the GSM modem;
- **IP address -** IP address of the device;
- **Balance -** activated SIM-card balance;
- **CPU temperature** - current processor temperature ;
- **Total operating time (h: min: sec) -** operating time without power loss.

Section fields are read-only.

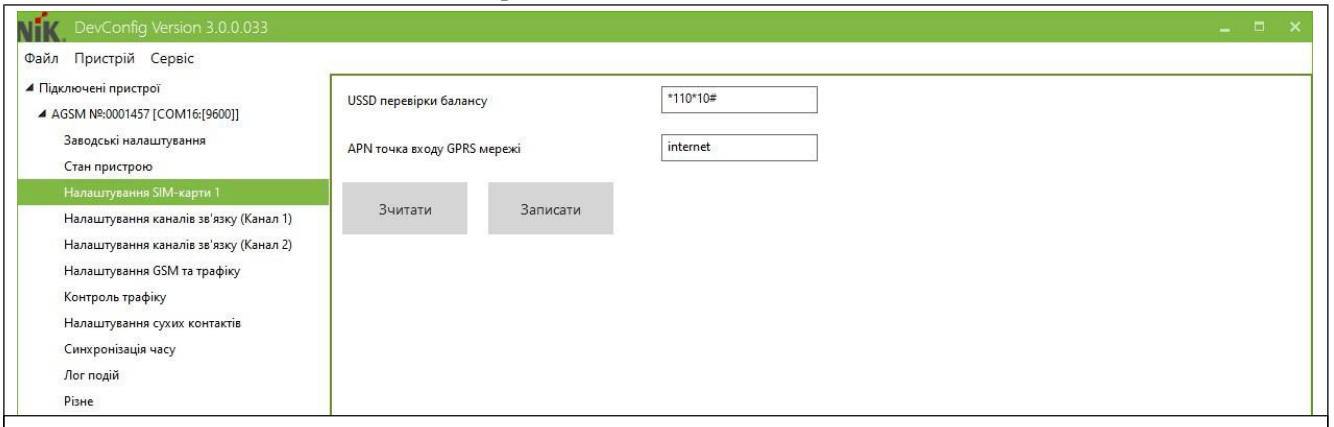


Device status

6.3.3. SIM card settings

This section displays the following information:

- **APN** – APN of the mobile operator (determined by the network operator);
- **USSD balance check** - request to check the balance.

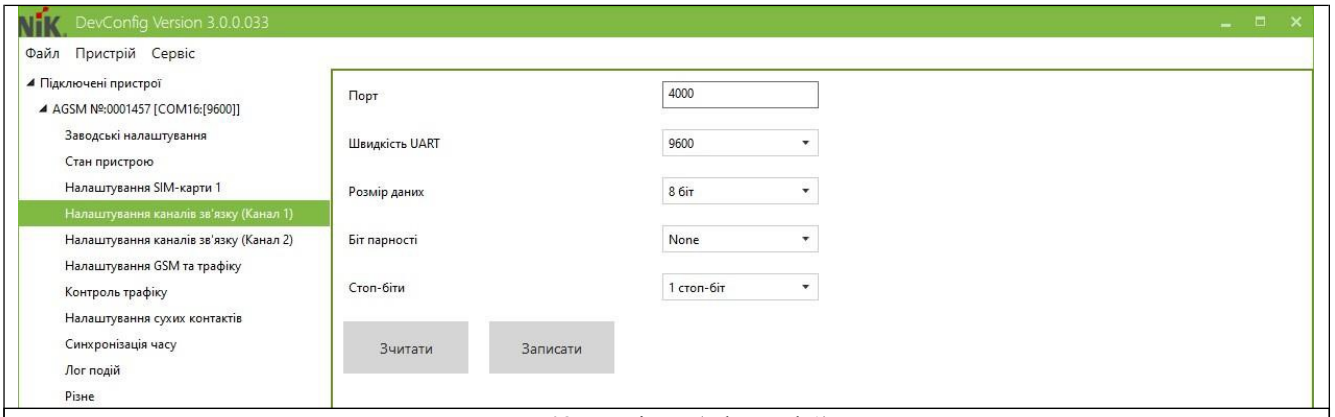


SIM card settings

6.3.4. RS-485 settings (Channel 1)

This section displays information about the port for receiving / transmitting data over TCP, data rate, data size, parity bit, and stop bit of the RS-485 interface. Their values can be selected from the drop-down list (except the port field). The default data rate is 9600 Bit / s.

Section fields are available for both reading and recording.



RS-485 settings (Channel 1)

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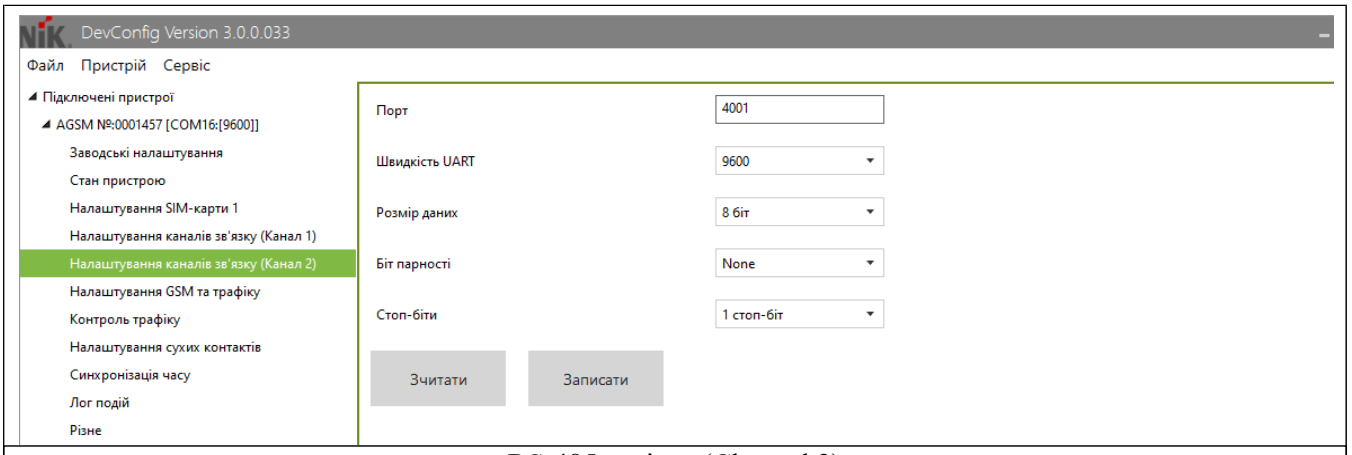
6.3.5. RS-485 settings (Channel 2)

This section displays information about the port for receiving / transmitting data over TCP, data rate, data size, parity bits, and RS-485 interface stop bits. Their values can be selected from the drop-down list (except the port field). The default speed is 9600 Bit / s.

Section fields are available for both reading and recording.



RS-485 settings (Channel 2)

6.3.6. GSM and traffic settings

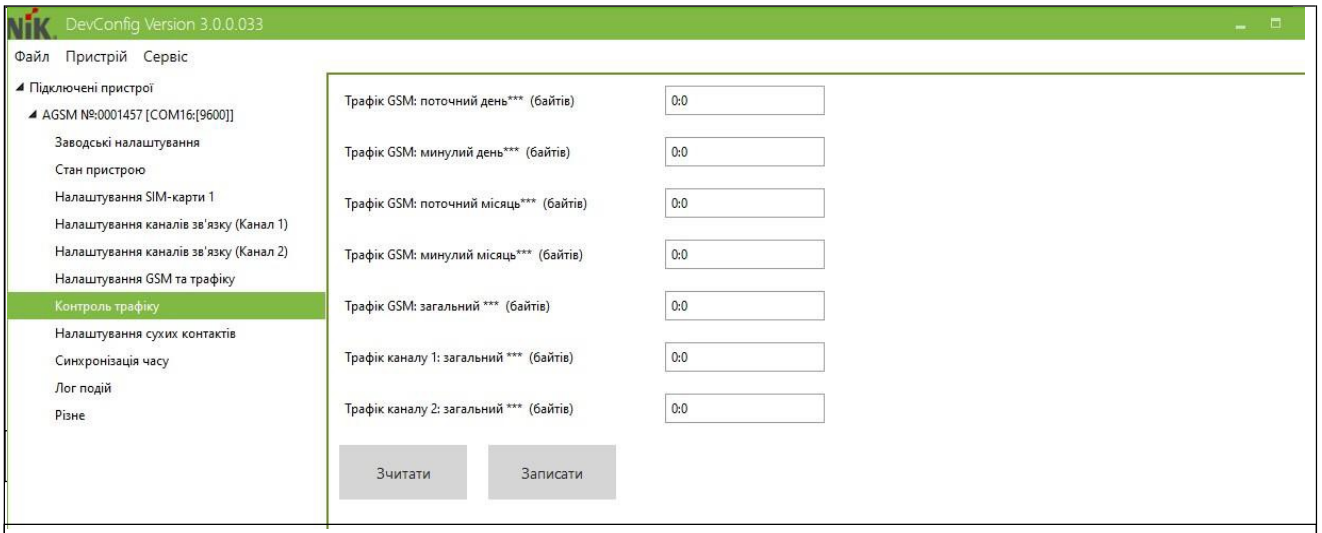
This section displays the following information:

- Settings of the interval of an automatic restart of the device;
- Maximum daily traffic. If the indicator is exceeded, the event is recorded in the event log;
- Maximum monthly traffic. If the indicator is exceeded, the event is recorded in the event log.

6.3.7. Traffic control

The section displays statistics on the total traffic used by the device for a certain period, and the total traffic on a certain interface.

Section fields are available for read-only.



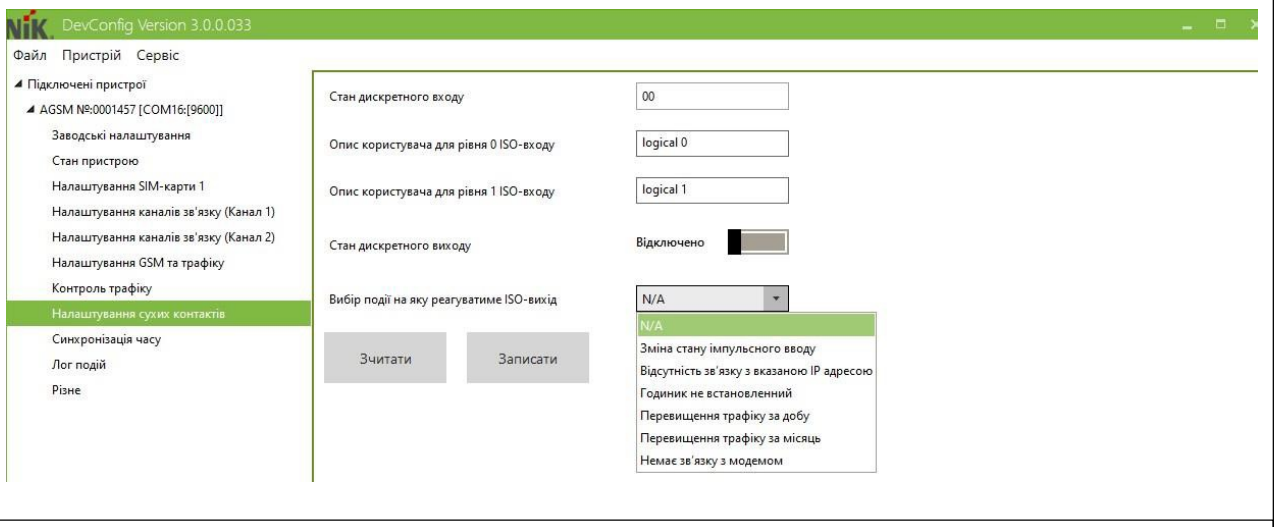
Traffic control

6.3.8. Dry contacts setting

This section displays the following information:

- **Discrete input status** is read-only and can be set to "0" or "1". "0" - the signal is fed to the digital input, "1" - the signal is removed from the digital input.
- **User description for level 0 ISO-input** - An entry that is recorded in the event log when the discrete input is triggered at level "0". **Only Latin alphabet symbols are allowed in this field.**
- **User description for level 1 ISO-input** - An entry that is recorded in the event log when the discrete input is triggered at level "1". **Only Latin alphabet symbols are allowed in this field.**
- **The state of the discrete output** - displays the current state of the output during reading, and applies the set value during recording. "0" - corresponds to the open state of the key, "1" - corresponds to the closed state of the key.
- **Selecting an event to which the ISO output will respond** - selecting an event when discrete output will change its state:

  - Changing the state of pulse input
  - No connection to the specified IP address
  - The clock is not set
  - Excess traffic per day
  - Excess traffic per month
  - No connection to a modem



Dry contacts setting

6.3.9. Time synchronization

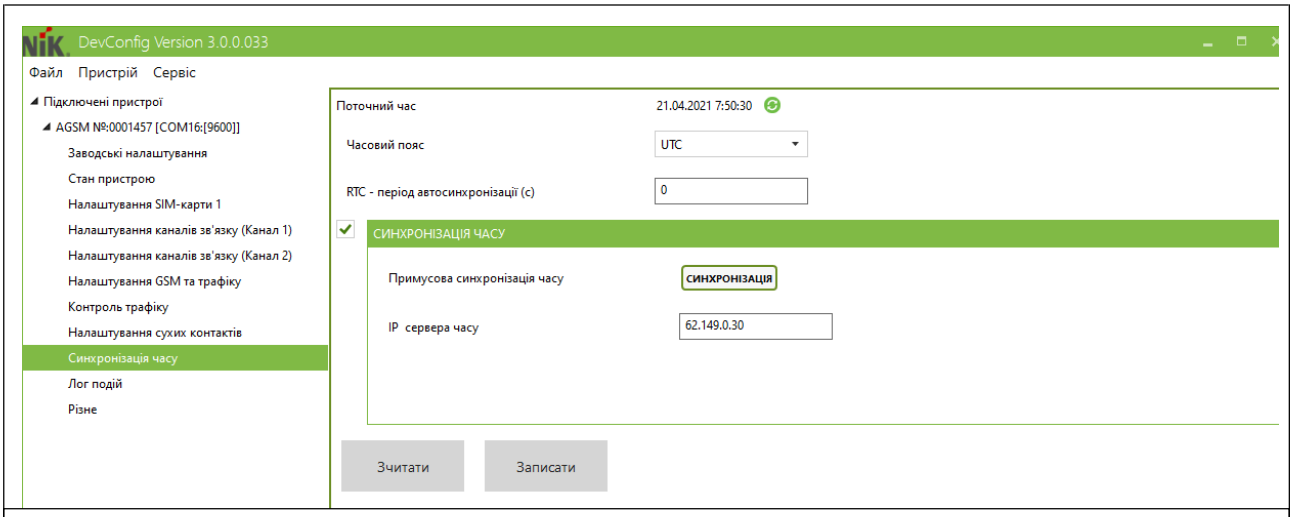
The device does not include a separate watch with autonomous power. Therefore, each time the device is disconnected from the power source, the clock is reset to the last saved time value. The current time is fixed every 5 minutes.

To set the time in manual mode the following steps should be followed:

1. "Read" data in the section "Time synchronization"
2. Press the button to read the local time of the computer to which the module is connected
3. Click the "Read/Save" button to apply changes to the device

Forced time synchronization occurs when the "Synchronization" button is pressed. The AGSM software requests the server specified in the "Time server IP" field. To see the current date, click "Read". The time saved in the device will return to the "Current time" field.

Auto synchronization period - used for periodic time correction in automatic mode. When the value of the field is "0" synchronization does not occur.



Time synchronization

6.3.10. Log of events

This section displays information about events that occurred during the operation of the device, namely:

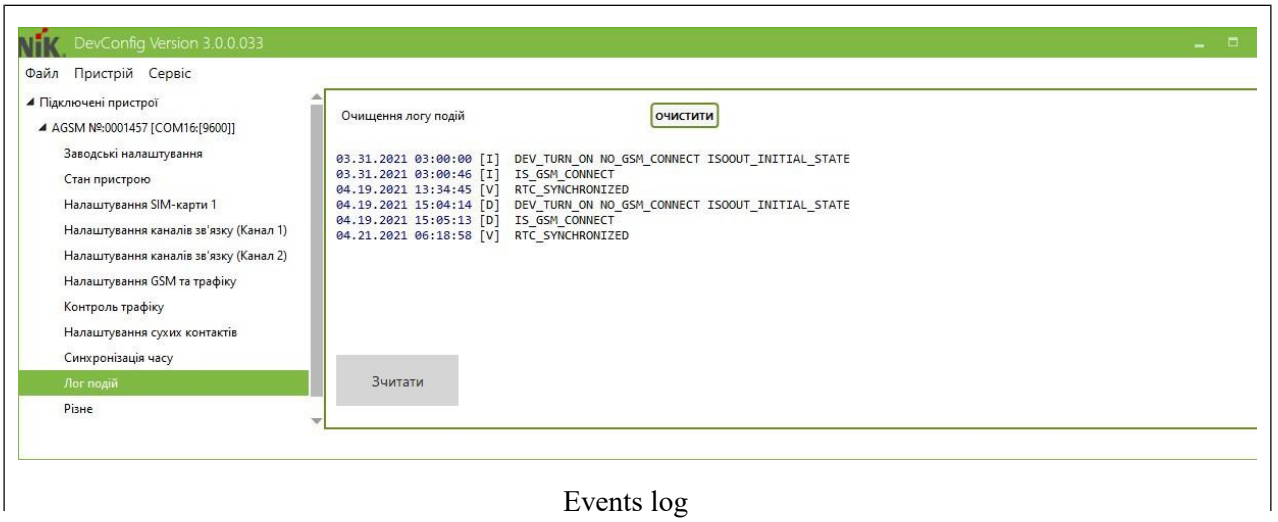
- Turn on;
- Time setting;
- Exceeding the internal temperature;
- Report on the lack of connection to the modem;
- Report on no connection to the server that checks connection status.

The entry in the event log has the following structure:

- Timestamp. For example: 03.31.2021 03:00:00;
- Time status:

  - [V] - valid. Correct time;
  - [I] - invalid. Wrong time. Status is generated in the absence of a saved timestamp in non-volatile memory;
  - [D] - doubtful. Questionable time. Generated after recovery of the time from the non-volatile memory;

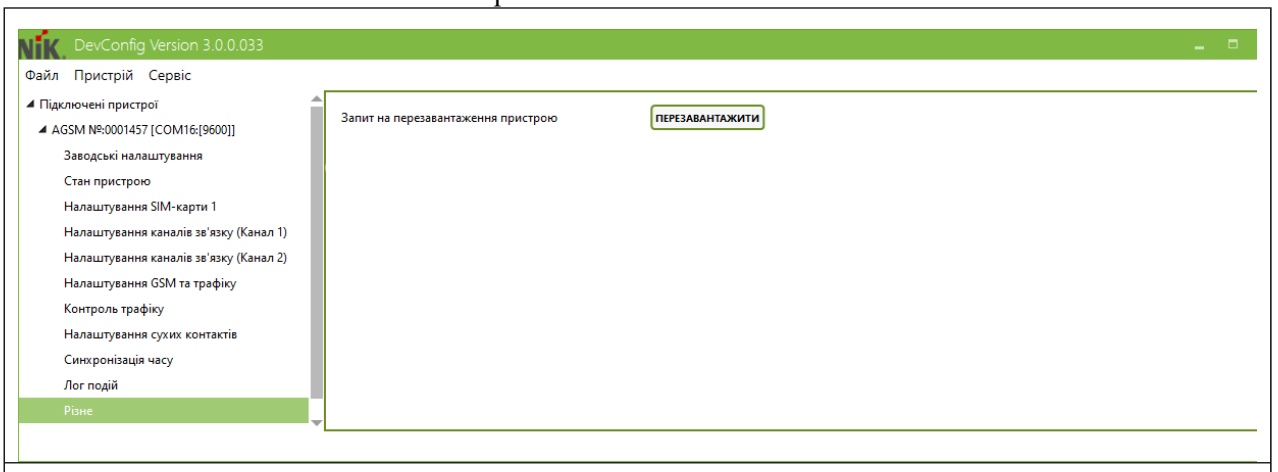
- Description of the event that generated the record.



Events log

6.3.8. Other

The section contains the button for the request for the remote reboot of the device.



Other

7. Manufacturer's warranty

7.1. Warranty period (service life and total storage period) is three years from the date of issue. Expendable components (SIM-card) are not subject to warranty service.

7.2. The communication module, which reveals non-compliance with the requirements of a valid passport during the warranty period, is subject to replacement or repair by the manufacturer or the company authorized to make warranty repairs.

7.3. The warranty period of the communication module is extended for the time calculated from the moment of filing in the application by the consumer until the elimination of defect by the manufacturer.

7.4. At the end of the warranty period, during the service life of the communication module, the repair is carried out by the manufacturer or service organizations. Repairs are carried out at the expense of the consumer.

7.5. A communication module that has damage to the body parts, power terminals, communication connectors, SIM card connector is not subject to a warranty repair.

8. Conditions of transportation and storage

8.1. The A-GSM communication module in the manufacturer's packaging can be transported by any type of transport. During transportation, the device must be protected against mechanical damage, contamination, and moisture.

Appendix A

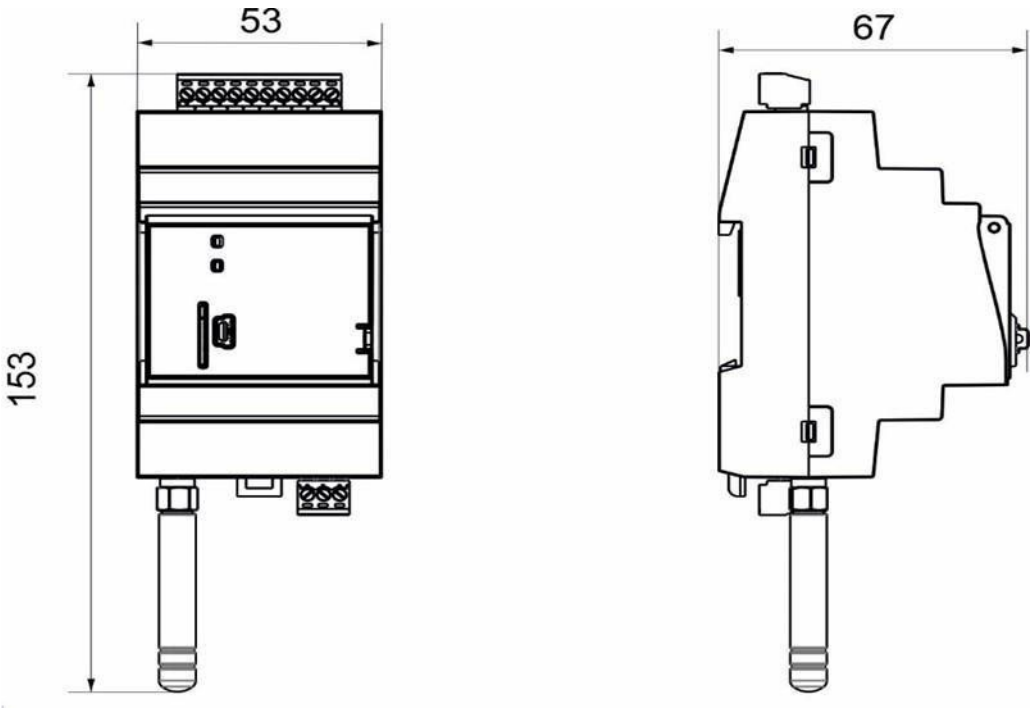
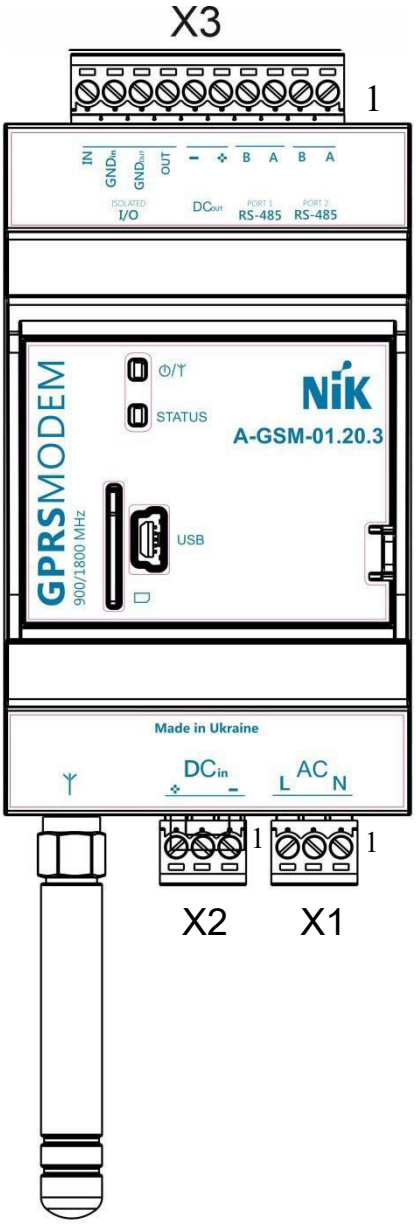


Figure A1. Overall dimensions of the A-GSM communication module.



X3

Contact	Name
1	RS-485 PORT 2 A
2	RS-485 PORT 2 B
3	RS-485 PORT 1 A
4	RS-485 PORT 1 B
5	DC_{OUT} +
6	DC_{OUT} -
7	ISOLATED OUT
8	ISOLATED GND_{OUT}
9	ISOLATED GND_{IN}
10	ISOLATED IN

X1 (AC input)

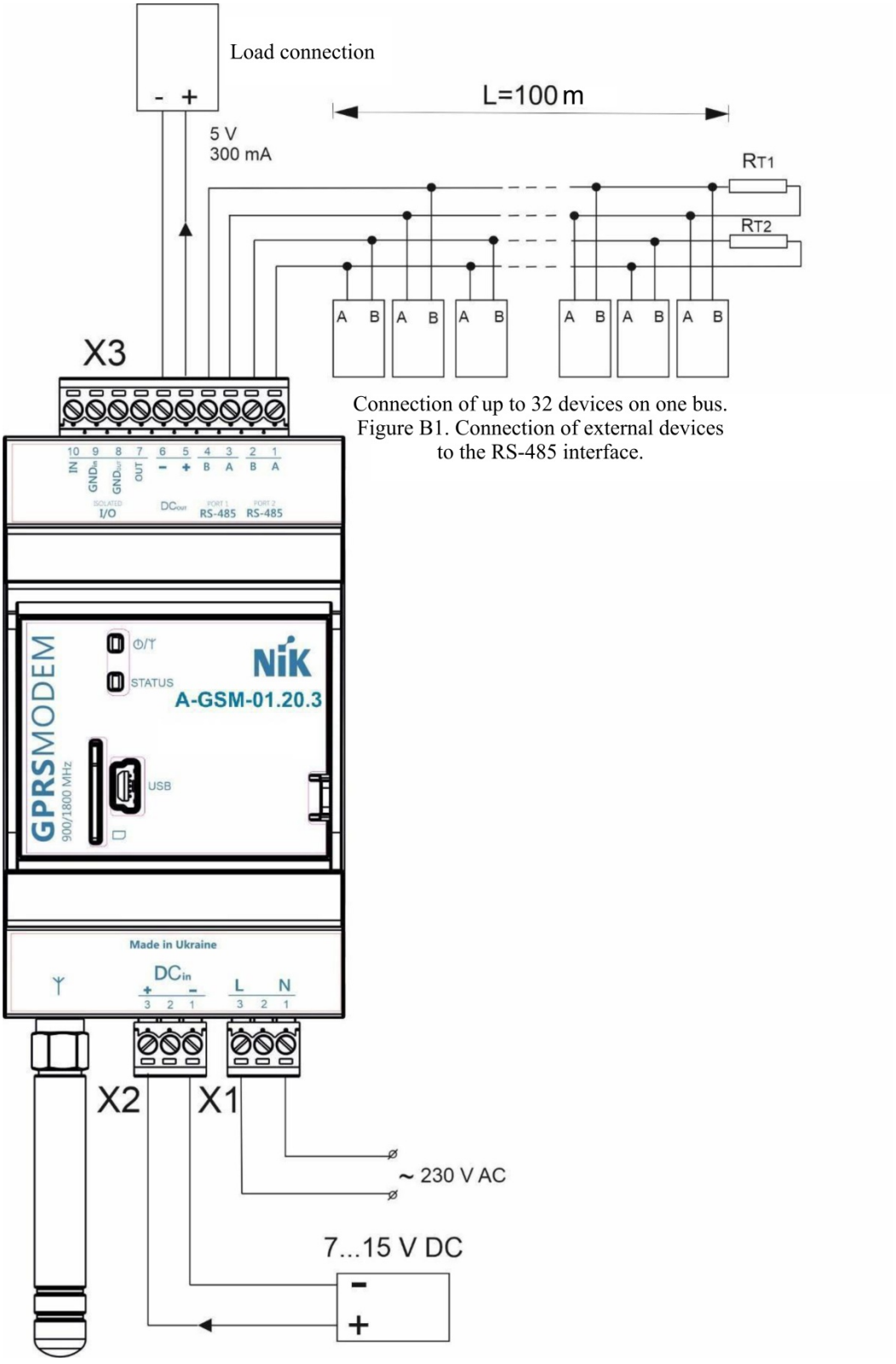
Contact	Name
1	N
2	NC
3	L

X2 (DC input)

Contact	Name
1	-
2	NC
3	+

Figure A2. Scheme of communication module connections to the power supply network and external devices

Appendix B



Connection of up to 32 devices on one bus.
Figure B1. Connection of external devices to the RS-485 interface.

Figure B2. Connection to AC and DC power supply.