ELGATO
COMMUNICATIONS

ELGATO Communications – the company developing and manufacturing telecommunication equipment

We offer:
- Multichannel GSM Gateways (E1/PRI, SIP, H.323. 4-32 channels, 19" rack mounted, height 1U & 4U)
- SIM Server
- SIM Bank (200 SIM cards)
- 8 Channel GSM Board ISA/PCI (100% compatibility with Linux/Asterisk)
- GPS/GSM Tracker
- GSM Rebooter (complete with 6 sockets 220V, On/Off control by SMSs, calls and USB)

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GSM Rebooter

GSM power control and environment monitoring unit with USB and Ethernet interfaces.

Standard.

Transit.

Multipurpose.

Standard 1U high with a socket set.

In DIN housing.

Three-channel.

Description

The unit controls six channels (0-5) 90...240V/50Hz and also reads the external sensors measurements. For communication with the owner, GSM network is used via **calls, SMSs, DTMF commands**; in addition **USB and Ethernet** *(custom option)* interfaces are possible.

After the unit is connected to 90...240V/50Hz main power source, all the channels are energized **by default**. Using GSM commands (SMS, calls, **DTMF**), every channel or all the channels together may be switched on, off or reset (switching off for the time divisible by 60 seconds with further on action). Depending on the command format (acknowledged or not), the SMS command acknowledgment may be sent. By status inquiry, the SMS listing the current channels settings, the control channels and sensors status is sent.

The unit may store **0 to 6** phone numbers for notification and control (**the numbers are stored in EEPROM and are not erased when switched on/off**)**.** Numbers 1…3 are used for alarms signaling using **SMSs**, numbers 4…6 are used for emergency **redial**. One and the same number may be found in both lists. Calls from any of the set numbers control the unit according to the settings.

The integrated sensor (accuracy of 2…5°C, adjusted) measures the temperature inside the device. If the temperature exceeds the upper limit (**default +60°C**) and the increase alarm has "**enabled**" setting, or if the temperature drops below the lower limit (**default 0°C**) and the decrease alarm has "**enabled**" setting, a warning **SMS is sent** to the preset numbers or **redial** is performed. Emergency alarm is generated once in case the temperature rises above the set limits and then after the temperature returns to norm. Both threshold temperatures and alarm permissions are configured independently by high and lower limits. Optionally, you can order **extension temperature sensors (DS18B20 microcircuit) – up to 4 sensors with extended distance up to 100m, accuracy 0.5°C, range -55°C…+125°C**. There are **three external alarm channels** (presented by **smoke, flood, movement detectors**, etc. and fed by internal source +3.8…+4.2V (default) or external source +12V (optionally)) which status change triggers an SMS sending or the device calling to the preset numbers, and **two auxiliary control channels** (open collector 200mA with voltage up to 40V) used for controlling additional units selected by the owner. For the room acoustic monitoring, optional **integrated microphone** should be ordered.

Integrated battery ensures **communication in case of external power failure**. In this case, if the notification numbers are set (Number1…. Number6), they are sent an SMS notifying of the event or redial is performed **(when redialing at power failure, an alarm is heard in the receiver and as soon as the power in on, alarm is canceled).** Another SMS is sent as soon the the main power is reactivated. **The battery ensures the unit status information is not lost at power failure and any channels that were switched off will stay switched off after the power is connected again. In addition, alarm detectors are constantly inquired and their status information is constantly issued.** Power status is stored in EPROM, therefore **even at power failure for the period of time longer than the battery resource (typically 6…10 hours), the unit is disabled, but enabled again as soon as the power is on, with the respective message being sent**. If an uninterruptable power source (UPS) is used, it is recommended to order additional **extension supply voltage transducer**, which is plugged directly to the mains. As the status of this sensor changes, the unit will send an SMS warning of the primary network active or inactive status. If the power sensor is not used, its outlet may be used, for example, to connect to the extension **room security limit switch, etc**. If **supply voltage monitoring** is required, the pulse power source is replaced with a transformer and **Uin Measurement** function is enabled, with the measurements being performed once every minute and the alarm range set at 180…260V (optionally).

When enabled, **Heater** function transfers **channel 0** to automatic temperature maintaining mode within the range set by the user – NO contacts are used for heating, NC contacts are used for cooling. When enabled, **Timer** function transfers **channel 1** to automatic switching on and off mode during the time period set by the user, for example lighting in the monitored object is switched on at 8:00 p.m. and switched off at 6:00 a.m. – NO contacts. Please, specify on-line module in your order.

Structure description

Structurally, there are five unit versions:

- **standard (1.5U)**: input – EU standard plug, circuit breaker, outputs - six EU standard sockets supplied by a relay with normally closed contacts **(compatible with 19" racks)**;
- **standard 1U**: input – EU standard plug, circuit breaker, outputs - six EU computer sockets supplied by a relay with normally closed contacts **(compatible with 19" racks)**;

- **transit (1.5U)**: six independent "computer plug - computer socket" pairs supplied by a relay with normally closed contacts **(compatible with 19" racks)**;**Note: With transit version, the control unit and relay windings are supplied from channel 0!**

- **Multipurpose (wall mounted/desktop with DIN rail installation option)**: input – high current terminal block, outputs - six **breakable** terminal blocks where both **normally closed (NC)** and **normally opened (NO) relay outputs** are present, and, on the housing side wall, alarm inputs and outputs are connected via low voltage terminal blocks with integrated Ethernet converter;

- **three channel**: input – breakable terminal block, outputs - three breakable terminal blocks where both **normally closed (NC)** and **normally opened (NO) relay outputs** are present, an alarm inputs and outputs are connected via a loop directly to the control board (available only by a separate order).

- **DIN (for installation in electric cabinets on a DIN rail)**: input – high current terminal block, outputs - six **breakable** terminal blocks where both **normally closed (NC)** and **normally opened (NO) relay outputs** are present, and, on the opposite side of the housing, alarm inputs and outputs are connected via low voltage terminal blocks;

Breakable terminal blocks allow, first, to connect wires to loads with the the external part of the terminal block and, then, to insert it directly to the active unit without any risk of electrical shock, or to change 'hot' loads. The NO contact (middle) facilitates the operation of units which default setting is 'disconnected'.

In all the versions, **mini-USB connector and two inputs: for extension supply voltage transducer and external temperature sensor** are found on the external panel.

Integrated Ethernet converter is available in Multipurpose option, otherwise extension option shall be used.

Next to the unit outputs, there are neon indicators to signal the presence of voltage on the respective channels (NC). Another group of three LEDs indicates the master unit status: **green** - blinking LED indicates the GSM transmitter is in operation, **yellow** – battery is being charged, **red** – **integrated supply voltage transducer indicator** – indicates the power is supplied to the internal battery. In addition, there is a toggle switch for switching on and off the battery (it is required, for example, when handling the unit, or when isolating the power manually), and a reset button - when pressed, this button reboots the control unit manually and the slave channels are returned to their initial "On" status.

Switching current in each channel is not more than **7A** (1.5kW for 200V) by default, and **16A** (3.5kW for 220V) for **transit version** in **each** channel.

Operation manual

1. SIM card installation procedure.

1. Install a SIM card to any cell phone.
2. Switch off the PIN code request.
3. Check the SIM card operation: logging to the network, SMS sending.
4. Check the balance.
5. Install the SIM card to the unit SIM holder. **Caution**: all the received SMSs stored on the SIM card are removed by the unit.

2. Unit installation.

The location where the unit will be installed shall be protected from any dirt and moisture. GSM antenna is preferably directed towards an open space not obstructed with any steel objects.

3. Unit connection.

1) **When selecting the units to control, make sure, the useful current of each unit does not exceed 7A (1.5kW for 220V) and 16A (3.5kW for 220V) for transit option. For reactive load, it's desirable to connect anti-spark circuits and use lower useful current. Suppose we have inductive load (electric motor or actuator), it would be a good decision to connect RC circuit in parallel with load** *(for 1A inductive load: C = 0.1 □F, R = 20 □).* **For the computer power adapter (capacitive load), it is recommended to consider current up to 3A. For switching higher currents, it is recommended to order modifications for 16A per channel or to use unit channels as master channels for external contactors; it is possible to order package unit "GSM power electric cabinet" switching** six double channel up to 63A each**. For description, see below.**

If any control relay is failed due to the buyer's negligence (channel overload), the warranty for this unit is annulled.

2) Connect the unit to mains 90...240V/50Hz taking into account any planned load - every channel switches up to 7A, **total consumption shall not exceed 24A** for standard (the current is limited by a circuit breaker), multipurpose and DIN versions, and **15A** for three-channel version; **for transit version, total current is not critical**. **Note: With transit option, the control unit and relay windings are supplied from channel 0!** Channels power indicators are switched on. If the green LED is blinking on the master unit, the unit is logging to the GSM network.

3) After the unit is connected, position the toggle switch to "on", it means the backup power supply (battery) to the master unit is activated. ***In addition, when a unit is switched off, the battery shall be, first, deactivated by placing the toggle switch to off position, otherwise a main power failure alarm message will be generated.***

Caution*: During the operation, a* **yellow** *LED indicator will be lit from time to time signaling the internal battery charging process.*

4) Dial the number of the SIM card in the unit. The unit will reply with "busy" signal while **checking the unit logging to the GSM network and its proper operation**.

4. Initial setup.

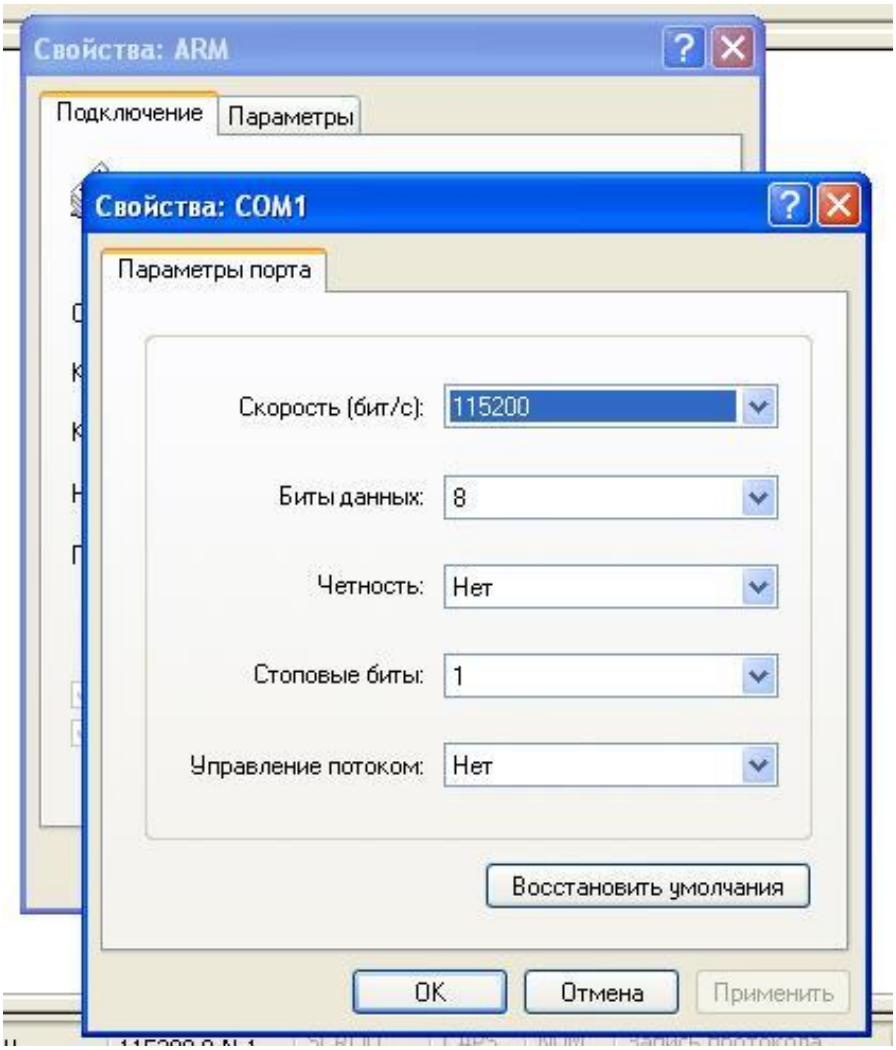
For initial unit setup, two procedures are possible: standard (each command requires sending individual SMS) or via USB interface.

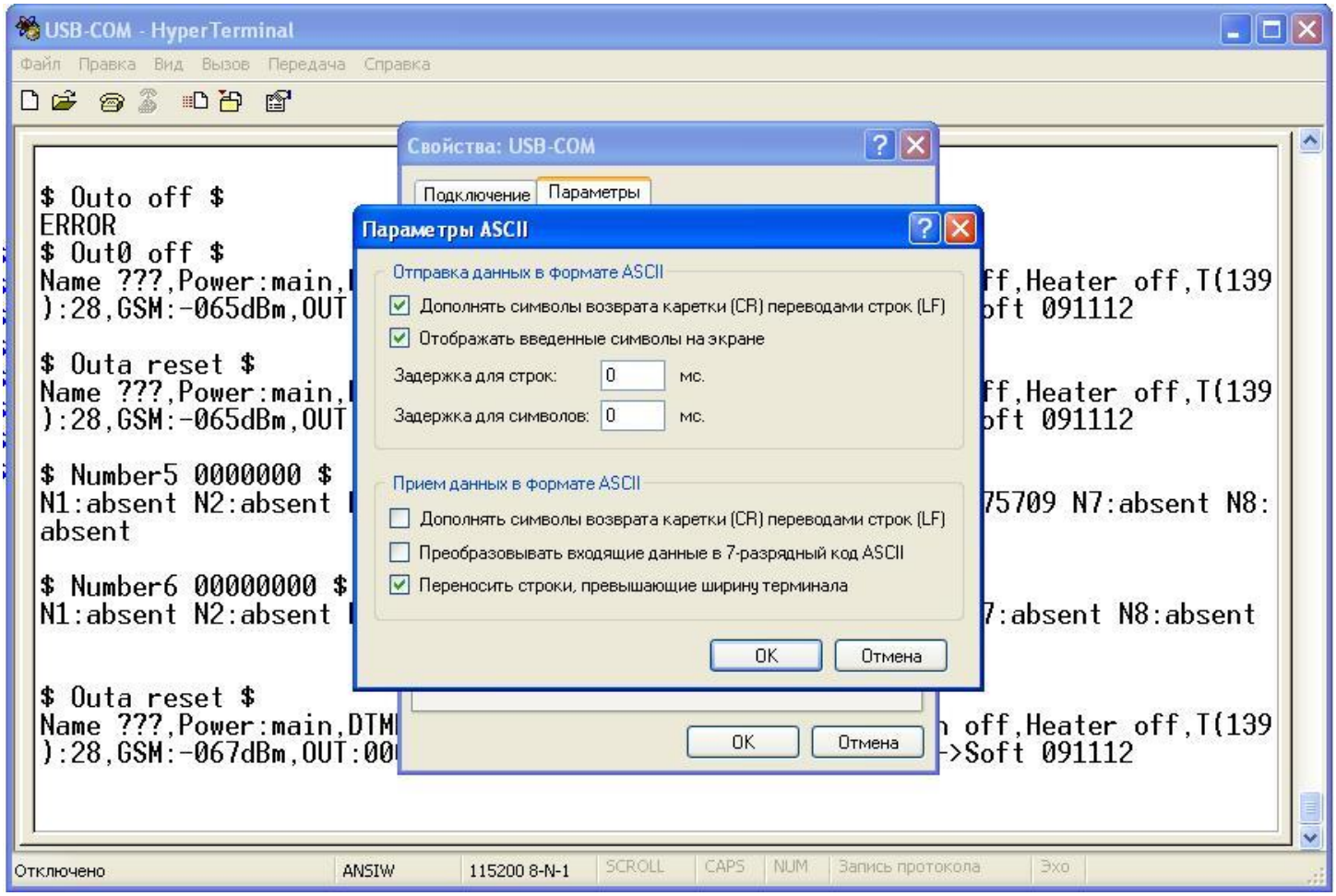
To configure the unit using standard procedure, **you can** send the following SMS (command) form any cell phone to the SIM card number:"**NumberY XXXXXXXXXXX**" where Y is a number 1 to 6, XXXXXXXXXXX is the phone number that will receive alarms in the future (number of 3 to 14 digits preferably in **international format** – example for Ukraine: **Number8 +380956004090)**. In reply, an SMS containing the numbers entered or "Error" message in case of syntax error will be received**. If the notification to any of the six numbers is not necessary (for example, to save money on the unit SIM card), there's no need in its entering, and to erase already entered number from the memory, send the following command "NumberY 000" where Y=1…6.**

For initial setup or testing, USB (or Ethernet) control is more convenient.

Note: *If Ethernet convector is ordered, USB interface continues functioning, duplicating the messages from the unit sent over Ethernet, but the commands are received only over Ethernet.*

To establish USB connection, connect the activated unit with your PC using USB - mini USB cable and launch Hiperterminal (for Windows XP Operating System) or similar software. For Windows 7 or Windows 8, proper software may be downloaded from the Internet. **A new port will appear** in the list of available COM ports. Configure it as follows:





Upon switching on (or after the reset), the unit sends Start message to the terminal followed by a list of entered numbers and the device status.

After the unit is logged to the GSM network, **"command?"** message will be displayed. It means the commands described in section 5 may be entered. But unlike the SMS command, USB command shall start with "$" and " " (dollar and space) symbols and finish with " " and "$"(space and dollar) symbols. That is, SMS Command **"Dtmf on"** for USB will be: **"$ Dtmf on $"**.

Please, remember, even in case with no emergency number entered, the alarms will still be received to the monitor connected to the USB interface. As, unlike SMS, the message length is not limited, the status information sent via USB is more comprehensive.

Etherhet converter allows for creating a virtual COM port instead of USB.

Free Virtual Serial Port to connect any TCP/IP Terminal server to your Windows as a virtual serial port (e.g. COM 7). Produced by www.HW-group.com.
Installation package may be downloaded from the server, too:

Virtual COM port for Ethernet.

Install the software. Launch. Go to Virtual Serial Port tab. Set the desired COM port number, specify the IP address of the converter and the port (default is 9761).

Click Create COM button. COM port with the specified number is created in several seconds and connection with the converter is established. For the connection indication, "Eth" LED is lit on the converter.

Then, alarms and acknowledgments are sent to this PC, and commands are received from it.

5. Commands (only using Latin alphabet, any character except the first one, lower case).

- **Configuration commands**:

"NumberY XXXXXXXXXXX" (Y=1…6) - number assigned for notification and control. If no syntax error is present in the command, an SMS listing the numbers assigned will be sent in reply, otherwise **"Error"** message is received.

"Dtmf on/off" – If "off" (default), the call from any of the set numbers is canceled, **all** the channels are switched off for 60 seconds and then switched on again (just like with command **"Outa reset")**. If "on", the unit will answer the call, then any channels may be switched on, off or reset by DTMF commands. If the unit is complete with integrated microphone, **the room acoustic monitoring** may be performed. **The default mode is off.**
"***T limit h XX*** *"* - setting the high limit for temperature alarm (XX is **up to 99** degrees, inclusive). If no syntax error is present in the command, a settings status SMS will be sent in reply. **Default setting is "60".**

*"**T alarm h on**" or "**T alarm h off**"* – enabling/disabling the temperature alarm message if above the limit (checked every minute, SMS is sent after the temperature increase and return to norm). If no syntax error is present in the command, a settings status SMS will be sent in reply. **Default setting is "disabled".**

"***T limit l XX*** *"* - setting the low limit for temperature alarm (XX is **0 to 20** degrees, inclusive). If no syntax error is present in the command, a settings status SMS will be sent in reply. **Default setting is "0".**

*"**T alarm l on**" or "**T alarm l off**"* – enabling/disabling the temperature alarm message if below the limit (checked every minute, status SMS is sent if temperature is below the limit and when it returns to norm, upper and lower thresholds are monitored independently). If no syntax error is present in the command, a settings status SMS will be sent in reply. **Default setting is "disabled".**

*"**T shift +X**" or "**T shift -X**"*- adjusting the integrated temperature sensor readings for +X or -X degrees (X is 0 to 9, inclusive). If no syntax error is present in the command, a status SMS will be sent in reply. **Default setting is "0".**

*"**Name XXXXXXXX**"* - assigning or editing the name of **8 symbols** sent in the messages, if no syntax error is present in the command, a status SMS with the name entered will be sent in reply.

*"**Password XXXXXXXX**"* - assigning or editing the password of **4 DIGITS**, if no syntax error is present in the command, a settings status SMS will be sent in reply. If the password is set, all the SMS commands will be acknowledged only in this password (4 digits) and a space are added in the beginning of the text, otherwise the commands are ignored. Example: **" 1234 Outa off***"*. To remove, command *" **XXXX Password 0000** " is sent.* **By default**, password is **off.**

*"**Ds18b20 on**"/" **Ds18b20 off**"*- enabling/disabling the accurate temperature measurement over the loop of **DS18B20 temperature sensors (1 to 4)**, at the same time, the integrated sensor is enabled/disabled. If no syntax error is present in the command, a settings status SMS will be sent in reply.

*"**Heater on**"/" **Heater off**"* – switching the temperature maintaining function of/off. **Channel 0** switches to heating on|off mode. Function is designed for **normally opened (NO)** contact. It is based on set lower and upper temperature limits. Upon reaching the lower limit **at any DS18B20** of the loop, heating switches on. Upon reaching the upper limit **at any DS18B20** of the loop, heating switches off. If no syntax error is present in the command, a settings status (unit status) SMS will be sent in reply. The status message includes: **"Heater on"**, channel 0 status **'OUT:111110"** – heating **on**, **'OUT:111111"** – heating**off**. Using **normally closed (NC)** contact of channel 0 with this command enables **cooling system** instead of heating. **Default setting is "off".**

*" **Timer AB-CD**"/" **Timer off**"*- **Timer** function on/off transferring **channel 1** to automatic enabling **(time *AB)*** disabling **(time *CD)*** mode within the time period set by the user. **Default setting is "off".**

" ***Uin on***"/" ***Uin off***"- **supply voltage monitoring** function on/off; the pulse power source shall be replaced with a **transformer (if ordered)** – measurement every minute, alarm free range is – 180…260V. If no syntax error is present in the command, a settings status (unit status) SMS will be sent in reply. **Default setting is "off".**

- **Inquiry command**:

"***Get status***" - current status inquiry.

The reply to inquiry command is **the list of enable functions and total unit status** – the status of control and alarm channels, battery voltage, ambient temperature, GSM signal level, etc**.**

"***Numbers?*** "- inquire the numbers (first to eighth) used by the unit.

"***Ussdxxxxxxxxxxx***" – USSD – inquiry.

Examples: account balance inquiry - for MTC - **"Ussd*101#"**, for Kyivstar - **"Ussd*111#"**; account replenishment - for MTC - **"Ussd*100*12345671234567#",** for Kyivstar - **"Ussd*123*12345671234567#"** and so on. Network answer to USSD – the inquiry will be sent as an SMS to number – command source.

- **Control commands**:

"***OutX off***" - switching channel X (where X =0…5) to "off" status. "***OutX off a***" - switching channel X (where X =0…5) to "off" status and sending a channel status SMS **(if X = a - for all the channels)**.

"***OutX on***" - switching channel X (where X =0…5) to "on" status. "***OutX on a***" - switching channel X (where X =0…5) to "on" status and sending a channel status SMS **(if X = a - for all the channels)**.

"***OutX reset***" - switching off for 60 seconds and switching on channel X again (where X =0…5).

"***OutX reset a***" - switching off for 60 seconds and switching on channel X again (where X =0…5) and sending a channel status SMS **(if X = a - for all the channels)**.

"***OutX reset Y***" *or* "***OutX reset Y a***" – *if argument* ***Y*** (1 to 9) is entered, "***reset***" status lasts not for 60 seconds as default, but 2 to 10 minutes, respectively.

"***ExtoutX off***" - switching additional channel X (where X =0, 1 or a) to "off" status. "***ExtoutX off a***" - switching channel X (where X =0, 1 or a) to "off" status and sending a channel status SMS (of X = a - for all the channels).

"***ExtoutX on***" - switching additional channel X (where X =0, 1 or a) to "on" status. "***ExtoutX on a***" - switching additional channel X (where X =0, 1 or a) to "on" status and sending a channel status SMS (if X = a - for all the channels).

6. Unit Control Using*DTMF* Commands

– this method is the most appropriate if many different switchings are to be performed in a short period of time.

1) Call to the unit from the telephone **which number is stored in the unit's memory**. **"Dtmf"** setting shall be set at **"on".**

2) The unit will "lift the receiver" – the commands may be entered.

3) Press **"*"** key on the telephone. The unit is ready to switch to the mode.

4) Press a numbered key set for the mode on the telephone: 0 – channels off, 1 – channel on, 2 – short-term off (for 60 seconds).

5) When pressing a number set for channel 1...5 (6 is for all the channel at a time), you send an instant command for this channel to switch on, off or reset depending on the mode selected. Fo example, pressing **"*", "0"** and **"2"**, **"0"**, **"5"** keys, you will enable channels 2, 0 and 5 in series.

6) To change the mode, press **"*"** and go to step 4.

7) To receive the unit status SMS, press **"#"**.

8) Having completed the procedure, disconnect the call.

Example: ***having dialed a series of "*", "0", "4", "5", "*", "2", "0", "1", "3""*", "1", "2", "5", "0", you will switch off channels 4 and 5, reset channels 0, 1 and 3, switch on channels 2, 5, 0.***

7. Examples of SMSs sent by the unit.

- Answer tot he inquiry for set numbers:

N1:+380956837057 N2:absent N3:absent N4:absent N5:absent N6:absent

- The main power source was switched to the backup power source:

Power:alarm

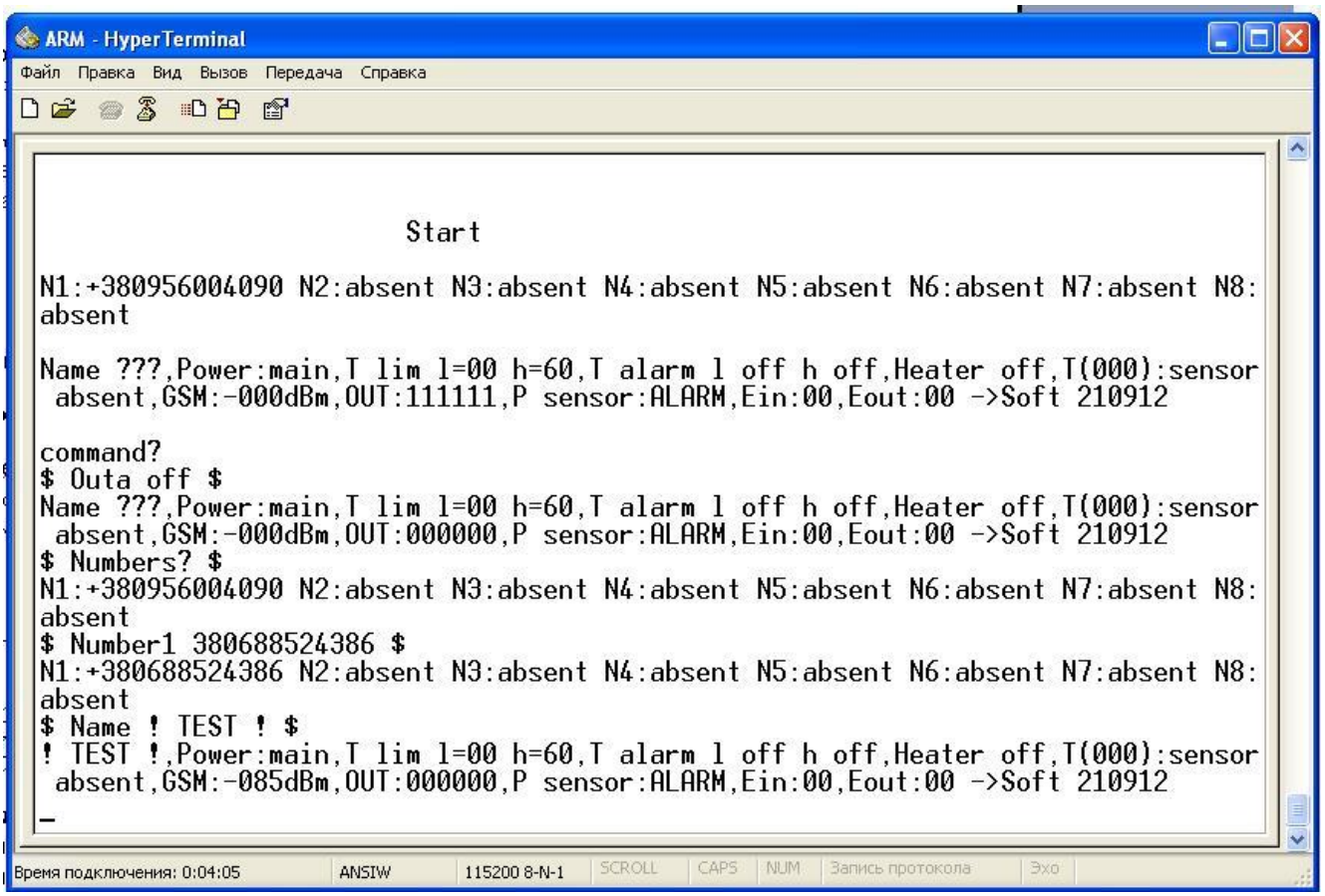
- Temperature above the upper limit is measured, name is not assigned:

OVERHEATING T0:70-ALARM

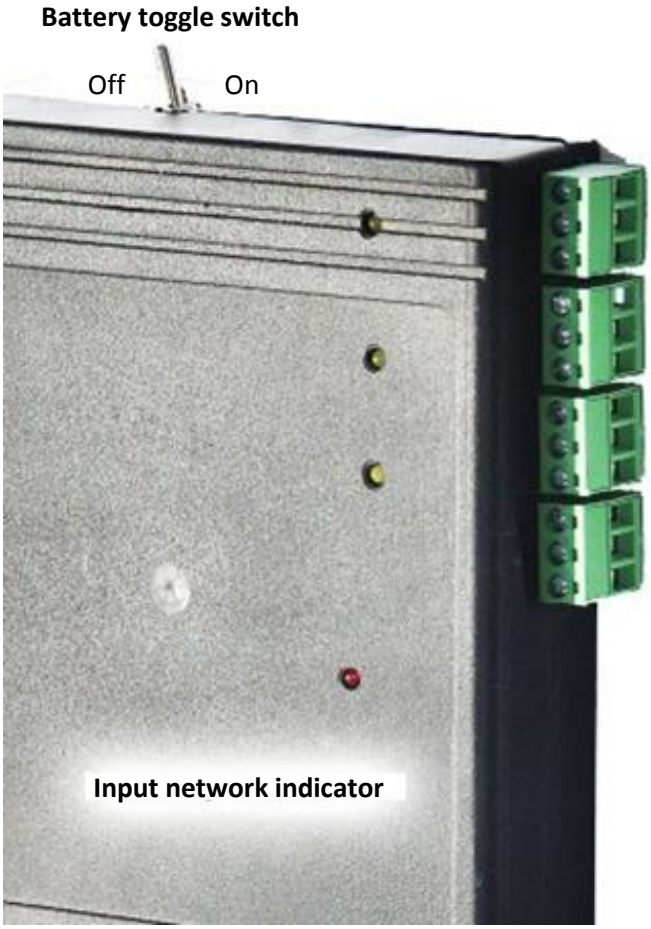
- Primary power failure, UPS is still in operation, name is not assigned:

P sensor(0->1)!,Ein:000

8. Example of commands transmission over USB and the unit's answers to them.



9. Three-channel version connection diagram.



Controlled outputs 220V
(Out 0…Out 2)

	"Neutral"
Out 2	"Phase" NO (normally opened)
	"Phase" NC (normally closed)
	"Neutral"
Out 1	"Phase" NO (normally opened)
	"Phase" NC (normally closed)
	"Neutral"
Out 0	"Phase" NO (normally opened)
	"Phase" NC (normally closed)

“Neutral”

Power supply input (110-220V)

"Phase"

10. Multipurpose version

– power circuits are connected similarly to DIN,

- alarm terminal block (starting from the SIM card) : "Earthing", +4.2V (battery +), In0, In1, In2, Eout0, Eout1, +12B.

11. DIN version connection diagram.

"Phase" NC
Out 0 "Phase" NO
"Zero"
"Phase" NC
Out 1 "Phase" NO
"Zero"
"Phase" NC
Out 2 "Phase" NO
"Zero"
"Phase" NC
Out 3 "Phase" NO
"Zero"
"Phase" NC
Out 4 "Phase" NO
"Zero"
"Phase" NC
Out 5 "Phase" NO
"Zero"
Power "Zero"
input --------
90...240V/50Hz **B** "Phase"

+12V
+4.2V (batteries)
Ground
External power sensor input (+)
In0
In1
In2
Eout 0
Eout 1

Specifications

GSM ranges (MHz):	900/1800/1900
Size (mm):	480 / 60 / 70 (for standard version)
Power:	90…240V/50Hz 24A(5.3kW for 220V) (limited by circuit breakers for standard version)
Own consumption:	90…240V/50Hz <3W
Control outputs:	6 (max **7A/16A** 90…240V 50Hz).
Backup power:	integrated battery 950mA/h (+4.2V)
Backup power duration:	6…10 hours (only the control unit)
GSM antenna:	external (extension optional)
Working temperature:	0...+70°C (if no dew is present)
Measurement outputs (encoder):	2 (battery voltage and temperature)

If ordered separately, the units are equipped with extension feeding network sensors, the loop of extension temperature sensors (up to four) (-55°C...+125°C), microphone.

Additionally, the unit may be ordered with the following SW versions:

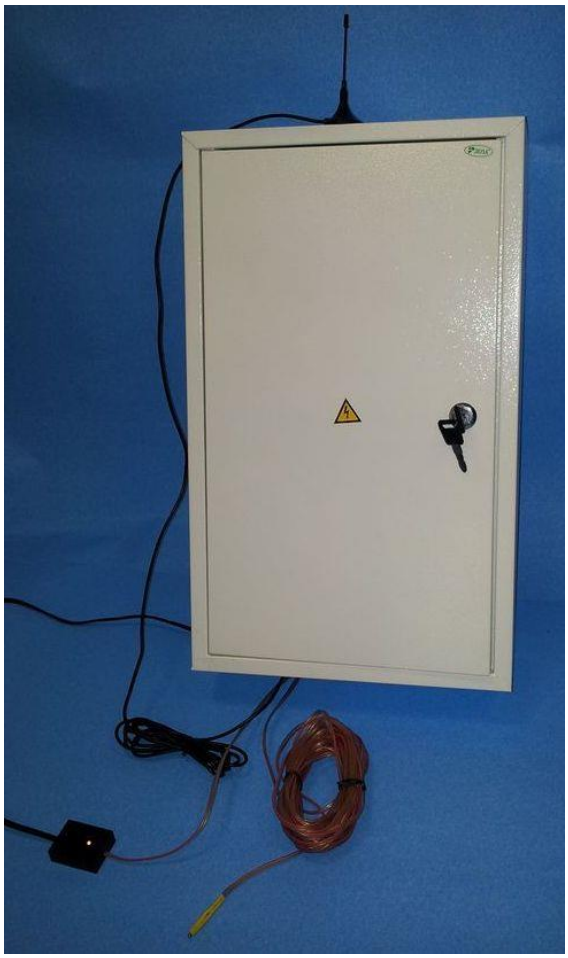
- GPRS – in addition to the interfaces above, all the unit status changes are sent (by the command enabling GPRS) to the site/IP address assigned by the user to the selected port, the commands supporting uninterrupted connection are received from the same port;

- Channel passwords – individual eight symbol password is entered for each channel (may be identical for several channels): each user managers his/her own channel(s) and may request the status; it's only the administrator who can configure and manage all the channels with his/her password. Default password for all the channels is "00000000".

The password is set by the administrator or over USB individual for each channel using SMS command "PasswordX YYYYYYYY", where X (0...5) is a channel. The passwords may be identical, in this case, several channel are managed under the same password. For example, password for channels 2, 3 and 5 are identical. Command "YYYYYYYY Outa reset" switches off challes 2, 3 and 5 for 60 seconds. Command "YYYYYYYY Out3 off" will switch off channel 3. With command "YYYYYYYY Out1 off", no action will take place as the password is not matching, etc.

1. SMS format – 8 symbols of password, space, then like in the manual.
2. Control commands and Get status command are available to all the channels with matching password, configuration commands and requests are available only by admin's password ("YYYYYYYY Password6 XXXXXXXX" where YYYYYYYY is the admin's password).
3. DTMF is disabled, any call is canceled without any action.
4. In emergencies, alarm messages like in the manual are sent; calls or SMSs are used if phone numbers are set (admin's rights are required).
5. USB control is performed without passwords, like in the manual.
6. Additional "YYYYYYYY Passwords?" command where YYYYYYYY is the admin's password.

GSM electric cabinet with remote switching of 6 double channels up to 63A each



Overall view with the external power and temperature sensors (7 m extension) and external antenna (3 m cable).

The unit controls switching on/off of six channels (0 to 5) 220V/50Hz (two lines **20A ... 63A depending on the contactors installed**) and takes the readings from the external sensors. For communication with the owner, GSM network – calls, **DTMF commands**, SMSs – and **USB interface** in setup and testing modes are used.

After the unit is connected to the mains 90...240V/50Hz, all the channels are unenergized by default.

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