GSM communicator *G16*

USER MANUAL

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Contents

Safety requirements

The security alarm system should be installed and maintained by qualified personnel.

Prior to installation, please read carefully this manual in order to avoid mistakes that can lead to malfunction or even damage to the equipment.

Disconnect power supply before making any electrical connections.

Changes, modifications or repairs not authorized by the manufacturer shall void your rights under the warranty.

Please act according to your local rules and do not dispose of your unusable alarm system or its components with other household waste.

1 Description

Communicator G16 is intended to upgrade compatible intruder alarm panels for event signalling via cellular network.

Communicator transmits full event information to Alarm Receiving Centre.

Customers are informed about security system events in Protegus apps or with SMS messages. They can Arm/Disarm the alarm system remotely (via panel's keyswitch zone or directly via Serial for Paradox panels®, UTC Interlogix® (CADDX), Texecom®).

Features

Connection

- Connection to control panels via:
  - Keypad data bus; or
  - Serial port

Communications

- Two main communication channels working simultaneously
- Each channel has a back-up channel
- Connection control with ARC
- Simultaneous event reporting to Protegus Mobile/Web application, allowing user to remotely monitor and control its alarm system
- Event messages are transmitted in Contact ID codes
- Event reporting via SMS messages to four different users in user friendly SMS messages
- Remote Arm/Disarm feature with Paradox, Texecom and UTC Interlogix security control panels.

Configuration

- Quick and easy installation
- Remote configuration and firmware updates
- Two access levels for setting of operating parameters

Inputs and outputs

- 1 selectable type input: NC, NO, NC with EOL, NO with EOL, NC with DEOL, NO with DEOL.
- 2 Outputs controlled via:
  - Mobile/Web application or
  - SMS

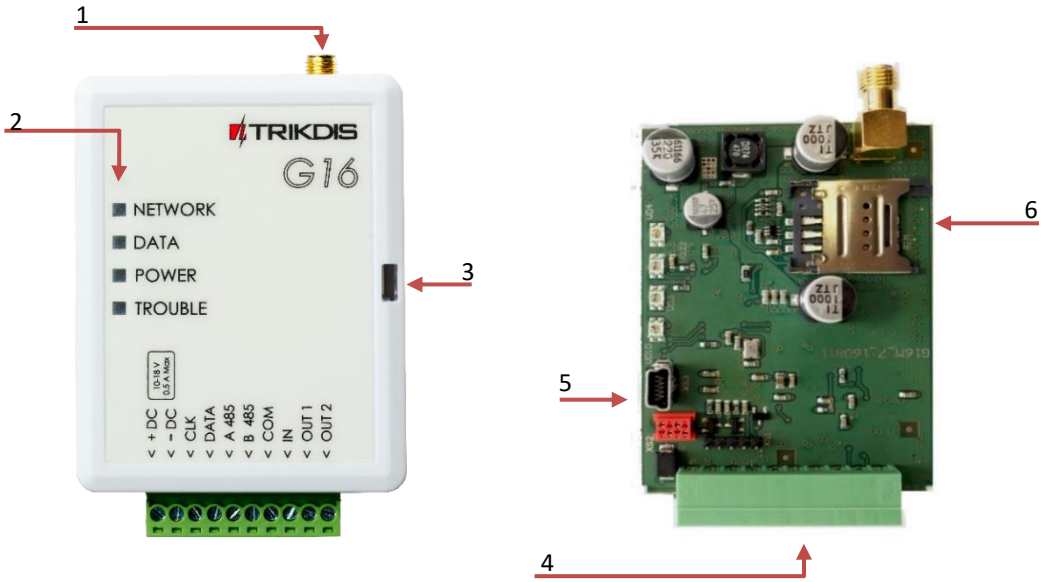
1.1 List of compatible control panels

Manufacturer	Model
DSC®	PC1404, PC1565, PC5020, PC1616, PC1832, PC1864
PARADOX®	SPECTRA SP4000, SP5500, SP6000, SP7000
	MAGELLAN MG5000, MG5050
	DIGIPLEX EVO192
UTC Interlogix®	NetworX (Caddx) NX-4v2, NX-6v2, NX-8v2, NX-8e
Texecom®	Premier 24, 48, 88, 168 Premier Elite 12, 24, 48, 64, 88, 168
Pyronix®	MATRIX 424, MATRIX 832, MATRIX 832+, MATRIX 6, MATRIX 816

1.2 Specifications

Parameter	Description
GSM modem frequencies	850 / 900 / 1800 / 1900 MHz
3G modem frequencies	800 / 850 / 900 / 1900 / 2100 MHz
Power supply voltage	10-18 VDC
Current consumption	60-100 mA (on standby) Up to 250 mA (while sending data)
Transmission protocols	TRK, DC-09_2007, DC-09_2012
Message encryption	AES 128
Memory	Up to 60 messages
Inputs	1 selectable type input: NC, NO, NC with EOL, NO with EOL, NC with DEOL, NO with DEOL
Output	2, OC type, commutating up to 0,15 A, 30 VDC max
Parameter configuration	Locally via USB port or remotely
Operating environment	Temperature from -10 °C to 50 °C, relative humidity – up to 80% at +20 °C
Communicator dimensions	65 x 77 x 25 mm

1.3 Communicator board



1. GSM antenna SMA connector
2. Light indicators
3. Frontal case opening slot
4. Terminal for external connections
5. USB Mini-B port for communicator programming
6. SIM card slot

1.4 Purpose of terminals

Terminal	Description
+DC	+10 V/+18 V power supply
-DC	Common (negative)
CLK	Serial bus terminal for direct connection to control panel
DATA	Serial bus terminal for direct connection to control panel
A 485	RS-485 connection positive contact (enables connect iO and iO-WL expanders)
B 485	RS-485 connection negative contact (enables connect iO and iO-WL expanders)
COM	Common (negative)
IN	Input
OUT1	1st open-collector output
OUT2	2nd open-collector output

1.5 Light indication of operation

Indicator	Light Status	Description
Network	Off	No connection to GSM network
	Yellow blinking	Connecting to GSM network
	Green solid with yellow blinking	Communicator is connected to GSM network. Sufficient GSM signal strength for GPRS is level 5 (five yellow flashes) and for 3G level 3 (three yellow flashes)
Data	Off	Empty buffer
	Green solid	Unsent event messages is presented in buffer
	Green blinking	***(Configuration mode)*** Data is transferred to/from communicator
Power	Off	Power supply is off or disconnected
	Green solid	Power supply is on with sufficient voltage and microcontroller is operational
	Yellow solid	Power supply voltage is insufficient (≤11.5V), microcontroller is operational
	Green solid and yellow blinking	***(Configuration mode)*** Communicator is ready for configuration
	Yellow solid	***(Configuration mode)*** No connection with computer
Trouble	OFF	No operation problems
	1 red blink	No SIM card
	2 red blinks	SIM card PIN code problem (incorrect PIN code)
	3 red blinks	Programming problem (No APN)
	4 red blinks	Registration to GSM network problem
	5 red blinks	Registration to GPRS/UMTS network problem
	6 red blinks	No connection with the receiver
	7 red blinks	Lost connection with control panel
	Red blinking	***(Configuration mode)*** Memory fault
	Red solid	***(Configuration mode)*** Firmware is corrupted

1.6 Before you begin

Before you begin, make sure that you have the necessary:

1) USB cable (Mini-B type) for configuration.
2) At least 4 wires cable for connecting communicator to control panel.
3) CRP2 cable for connecting to Paradox panel`s Serial port.
4) Flat-head screwdriver.
5) Sufficient gain GSM antenna.
6) In GSM network registered standard size SIM card.
7) Particular security control panel`s installation manual.

Order them separately from your local distributor.

2 Connect G16 to TrikdisConfig

Communicator can be configured using **TrikdisConfig** software for MS Window OS via USB cable or remotely.

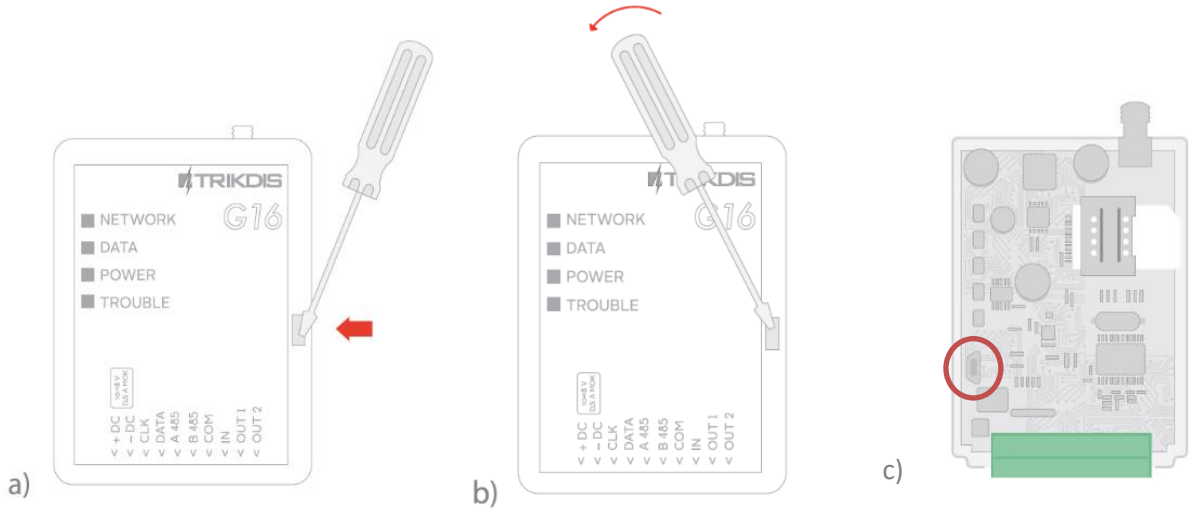
IMPORTANT: To use remote configuration function, Protegus service must be enabled.
To configure the communicator remotely, insert registered SIM card with the PIN code request function disabled.

1) Download **TrikdisConfig** from www.trikdis.com (in search field type *TrikdisConfig*), and install it.
2) Connect the communicator to TrikdisConfig:

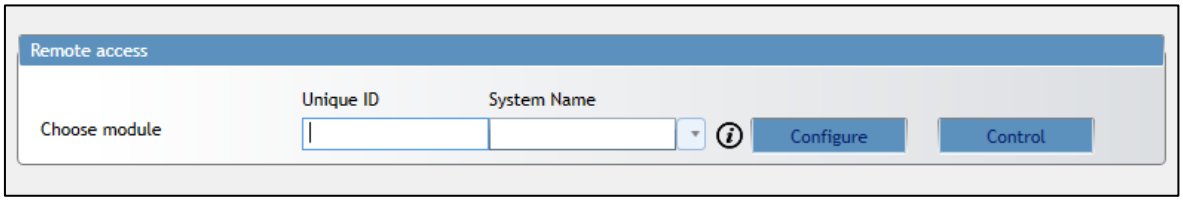
Using USB cable: Carefully open the casing with flat-head screwdriver as shown below:

a) Insert screwdriver into the slot (red arrow). (it is unnecessary to put in screwdriver`s head to the bottom of the casing).
b) **Hold the casing`s bottom part with one hand** and gently push screwdriver to the left side.

c) Plug in USB cable. Run the configuration software **TrikdisConfig**. The software will automatically recognise connected communicator and will open a window for communicator configuration;



- **Remotely:** run configuration program **TrikdisConfig.** In section, *Remote access*, field **Unique ID** enter IMEI address of communicator (IMEI address is provided on the product package). (Optional) in the field **System Name** enter the desired name to the communicator. Press **Configure**.

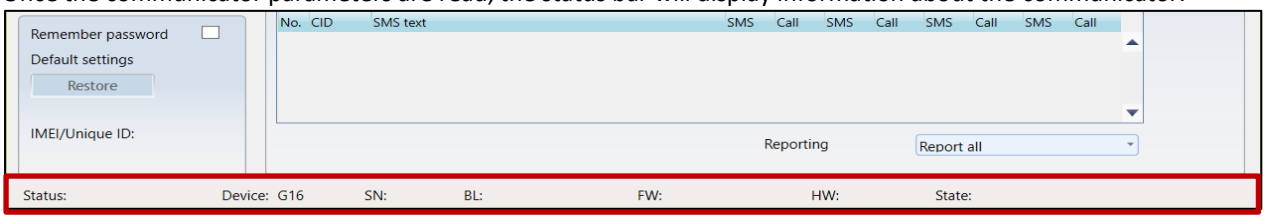


3) Click **Read [F4]** to read the communicators parameters and enter the Administrator or Installer code in pop-up window. For the program to remember the code, check the box next to **Remember password**.

Note: If administrator code is set as default (123456), it is not required to enter it and the request window will not appear.
To set up the communicator from a saved configuration file, click **Open [F8]** and browse your computer to find the configuration file.

2.1 Status bar description

Once the communicator parameters are read, the status bar will display information about the communicator.

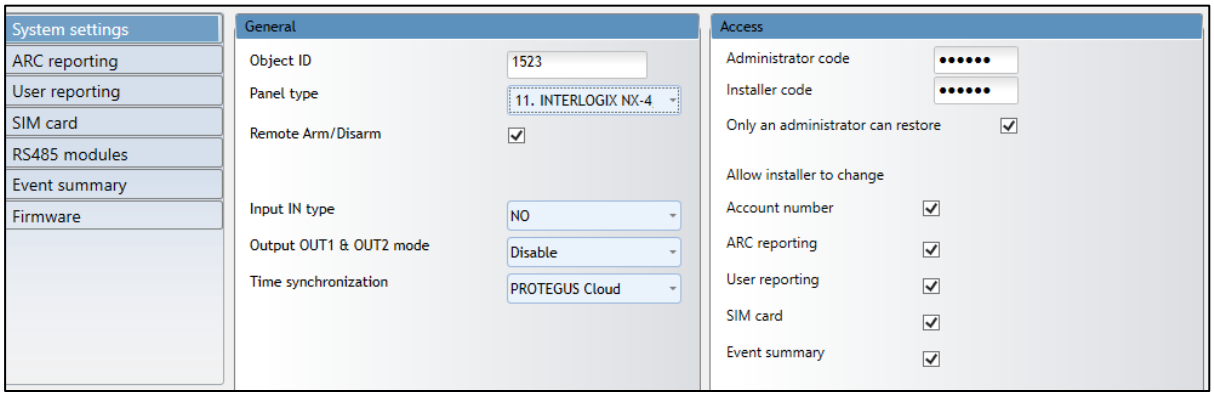


Status bar

Name	Description
IMEI/Unique ID	IMEI number of the communicator
Status	Action status
Device	Communicator type (shows G16 or G16_3G)
SN	Serial number
BL	Bootloader version
FW	Firmware version
HW	Hardware version
State	Connection status
Admin	Access level (shows up after access code is confirmed)

3 Set operation parameters

3.1 System settings window



General

- Write an appropriate **Object number** (4 symbols hexadecimal number).
- For communication with control panel, panel type must be selected in **Panel type**.
- To arm/disarm remotely (e.g. via PROTEGUS service) control panel through its Serial port, enable the option **Remote Arm/Disarm** and enter **PC download password**.
- **PC download password** – 4-digit password identifies the PC to the panel before establish communication. If the codes match, access to the control panel is granted, otherwise access is denied. (See how to program control panel in **5 Program security control panel to use G16 Direct Control feature**).
- Choose an input operation type from list **IN1.** NC with EOL, NO with EOL, NC with DEOL, NO with DEOL type is selectable only starting from communicator version 1.14.
- Choose an output operation type from list **OUT1-OUT2.**
- Specify time synchronization (Communicator will use time according to selected server) and output/input parameters.

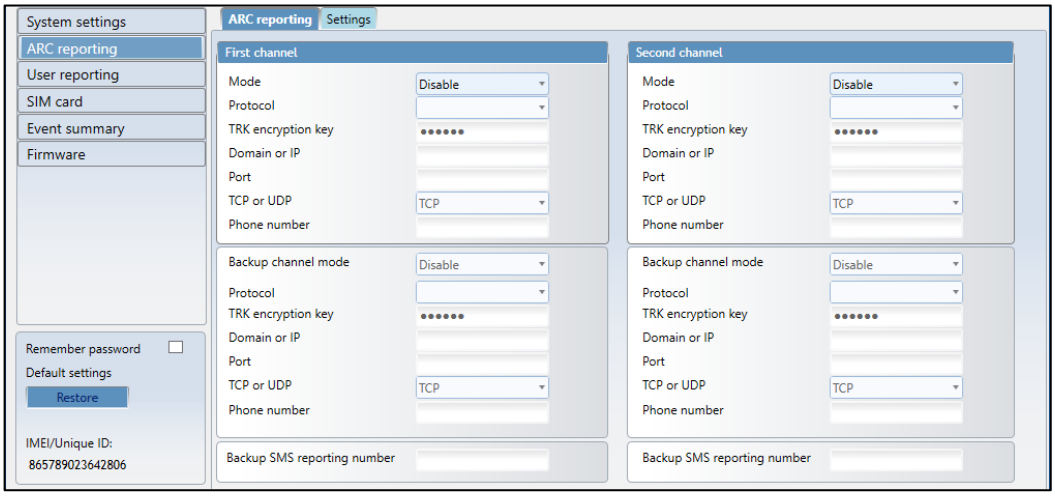
Access

The communicator G16 have two access levels for configuring the communicator:

- **Administrator code** - allows full access to the configuration.
- **Installer code** - allows limited access for installer to the configuration.

Note: Administrator and Installer codes must be six symbols in length, and contain digits or Latin characters only.

3.2 ARC reporting window→ ARC reporting tab

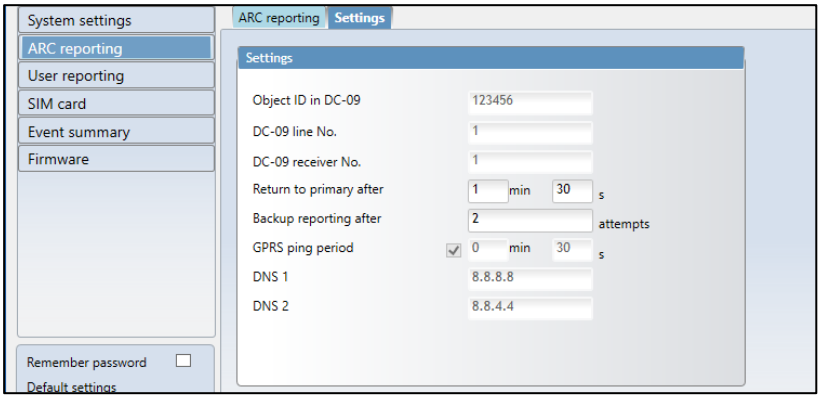


First and Second channels (and Backup channels)

First and second channels can work in parallel, by allowing the communicator to simultaneously transmit data via both channels.

- Select communication **Mode** and **Protocol**.
  - If SMS reporting will be used – enter **TRK encryption key** and receivers phone number.
- Enter receiver`s **Domain** or **IP** address and **Port**.
- Choose event transmission protocol **TCP or UDP**.
- Enter **Phone number** which will receive messages (phone numbers must contain country code, for example +370xxxxxxxx, 00370xxxxxxxx, or 370xxxxxxxx).
- **Backup SMS reporting number –** when GPRS mode is set in the first and the first's backup channel, only then this option becomes enabled. SMS to SMS receiver at ARC will be sent: 1) as soon as a communicator has started working for the first time and 2) after the fail of TCP/IP or UDP/IP communication via both the first and the first's backup channel.

3.3 ARC reporting window→ Settings tab

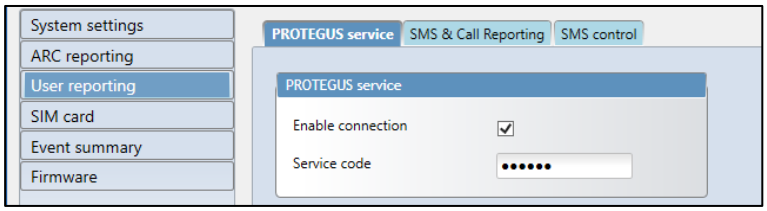


Settings

- Write **Object ID in DC-09** code, if event is transferred using SIA DC-09 protocol (4-16 symbol hexadecimal number).
- Enter required **DC-09 line No**.
- Enter required **DC-09 receiver No.**
- After a number of attempts to reconnect fails, as set in **Backup reporting after** field.
- It will attempt to return to the primary channel after a time, as set in **Return to primary after** field.
- **GPRS ping period** - and set time between signals in seconds (required for communication control).
- Enter required **DNS** addresses.

3.4 User reporting window → Protegus service tab

Protegus service allows users to remotely monitor and control the communicator.
Protegus service allows simultaneous transmission of data to the Protegus server for Mobile/Web application. For more information about PROTEGUS service visit www.protegus.eu.

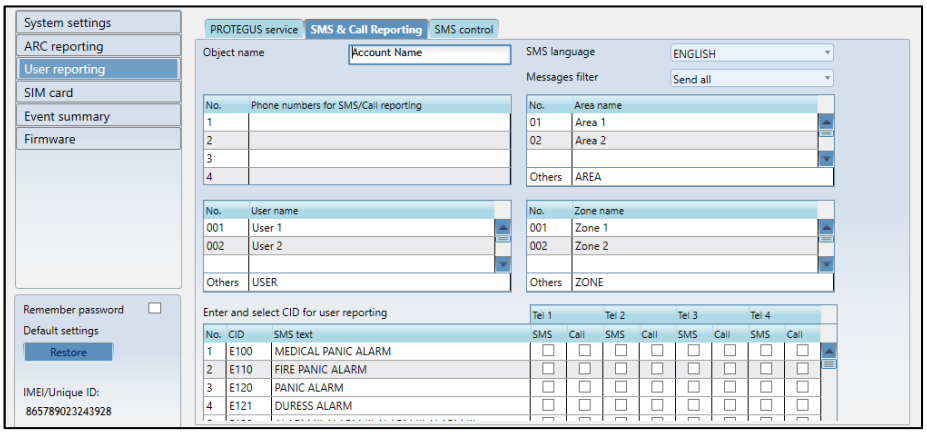


IMPORTANT: When Protegus service is used – SMS & Call reporting tab will be disabled automatically.

Protegus service

- Enable cloud service at **User reporting** > **PROTEGUS service** tab.
- Enter **Service code** (default code – 123456), for more safety change it to six symbol code.

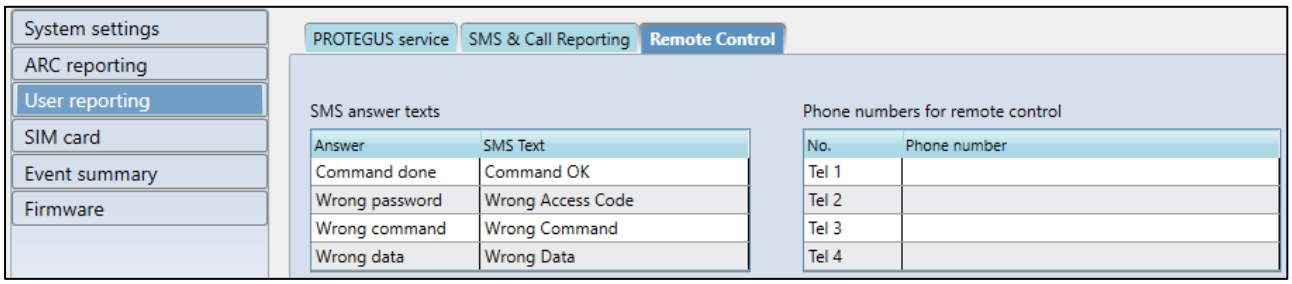
3.5 User reporting window → SMS & Call Reporting tab



Received event and internal communicator events messages can be reported to the users mobile phones via SMS messaging and calls.

- Each message come with an object name: enter the **Object name** of your choice to the text field.
- From **SMS language** drop-down list select required language (SMS messages can be sent in various character sets).
- It is possible to choose **Reporting mode**, by which events will be reported to user:
  - **Send all** – reports all events, even not described, or
  - **Send described only** - the ones that has zone, areas and user names entered.
- Message can be send up to 4 different phone numbers. List them in **Phone number** table (Phone numbers must contain country code, for example +370xxxxxxxx, 00370xxxxxxxx, or 370xxxxxxxx).
- Information about the received events as **Areas**, **Users** and **Zones** are coded in digits. Each of them can be named and the given names will be used in SMS messages sent to the users. Write your chosen names into their appropriate tables.
- To receive event messages, specify which CID events will be reported. Also, can be selected which phone numbers receives (SMS/Call) notifications about the events.

3.6 User reporting window → Remote control tab



Note: SMS commands can be sent from any phone numbers if there is no described numbers in list.

Remote control

- Answers to the SMS commands can be customised in **SMS answer text** field.
- List a phone number for remote control to a table **Phone numbers for remote control.** SMS text, that user receives after sending a command (to receive an SMS answer message, the user **access code** must be correct).

3.6.1 SMS commands list

SMS Commands are used to remotely control the communicator**.**
As access code use "Administrator code" or "Installer code", "_" represents a space.
SMS command structure: `AccessCode_Command_Data`.

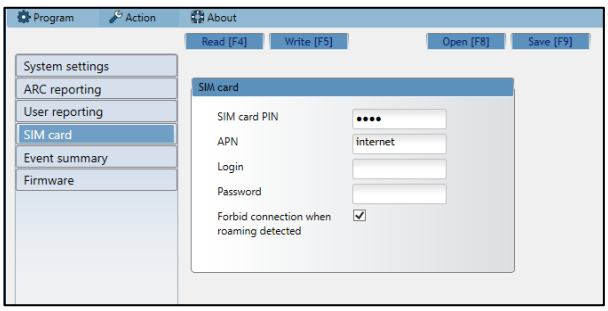
Command	Data	Description
INFO		Information about the communicator request. The response will include: communicator type, IMEI number, serial number and firmware version.
RESET		Restart the communicator.
OUTPUTx	ON	Turn on the output, where "x" represents output number 1 or 2.
	OFF	Turn off the output, where "x" represents output number 1 or 2.
	PULSE=tttt	Turn on the output for a number of seconds, where "x" represents output number (1) and "tttt" a four-digit number representing pulse duration in seconds.
CONNECT	PROTEGUS=ON	Turn on Protegus cloud service
	PROTEGUS=OFF	Turn off Protegus cloud service
	APN=internet	APN name
	USER=user	APN user
	IP=0.0.0.0:1000	Main server IP and Port
	ENC=123456	TRK encryption key
	CP=	Panel type from panel type list
	DIR=ON	Turn on control panel`s control from Protegus
	DIR=OFF	Turn ooff control panel`s control from Protegus

Examples
For the example purposes access code is 123456.

To receive information about the communicator:
"123456 INFO"
To turn on the output OUT1:
"123456 OUTPUT1 ON"
To turn on the output OUT1 for 3 seconds:
"123456 OUTPUT1 PULSE=0003"
To turn on Protegus, set APN and turn on DSC PC1616 control panel:
"123456 CONNECT PROTEGUS=ON,APN=internet,CP=2"

3.7 SIM card window

Ensure that the SIM card is working, before using it.
If GPRS or 3G communication is required, ensure mobile data service is enabled.
For information, how to enable this service please contact your GSM service provider.



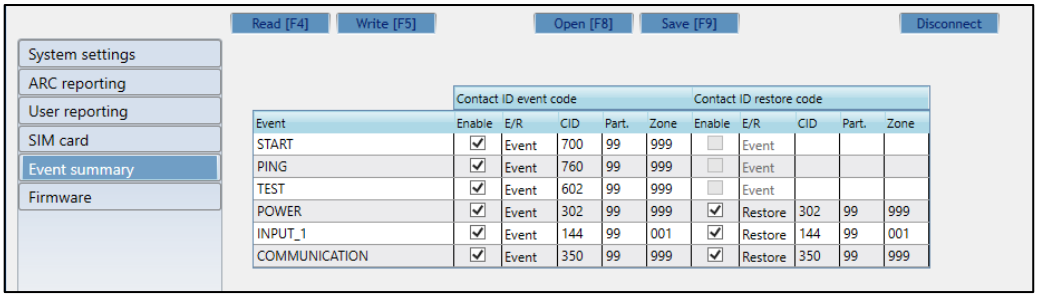
SIM card

- Enter **SIM card PIN, APN.**
- If it is required enter GSM network name and password in fields **Login, Password.**

- **Forbid connection when roaming detected** (use it when security system is installed near country border, this will ensure that communicator would not connect wrong GSM network).

3.8 Event summary window

The communicator can generate periodical test messages.
To enable globally periodical test messages and set the period time, navigate to **System settings → General → Test period**.
Time is set in day(s) and hours (Maximum 7 days).



Local changes of periodical test messages can be done in **Event summary window:**

- **Test and other internal events** can be enabled/disabled and their Contact-ID number can be customised.

3.9 To write new parameters to the communicator, click Write [F5].

Note:
To restore default settings of the communicator, press the **Restore** button under the **Default settings** in the bottom left corner of the configuration window.

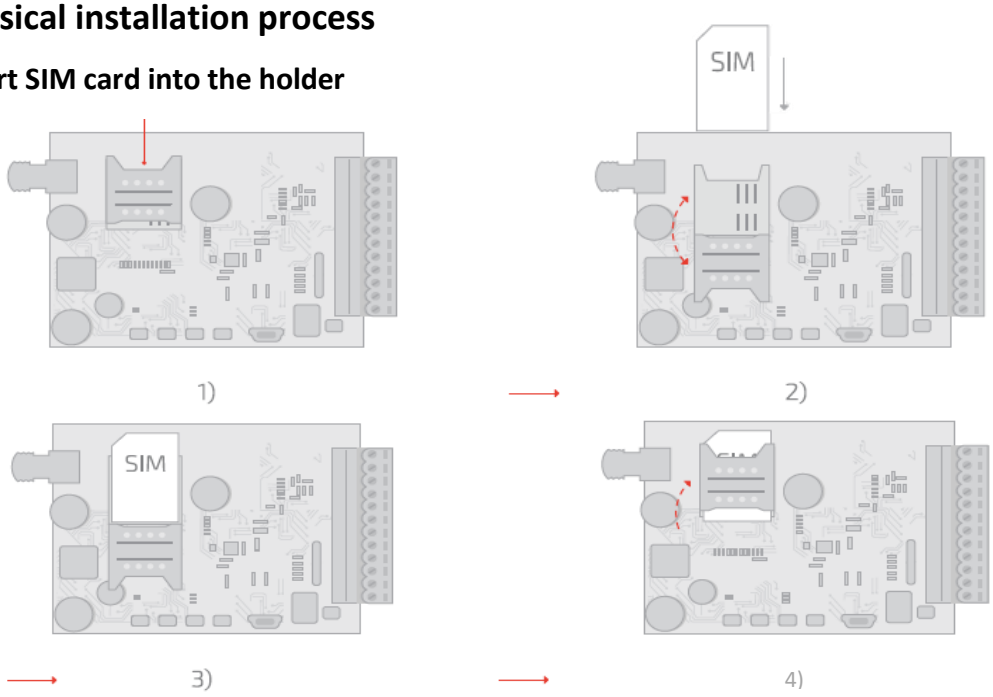
To create a configuration file which contains current parameters, click **Save [F9]**.

3.10 Disconnect communicator:

- Click **Disconnect** to disconnect from roles (installer or admin) while communicator is connected via USB cable to computer.
- If a configuration is done via USB cable, unplug the USB cable, click **Disconnect** to go back to first window.

4 Physical installation process

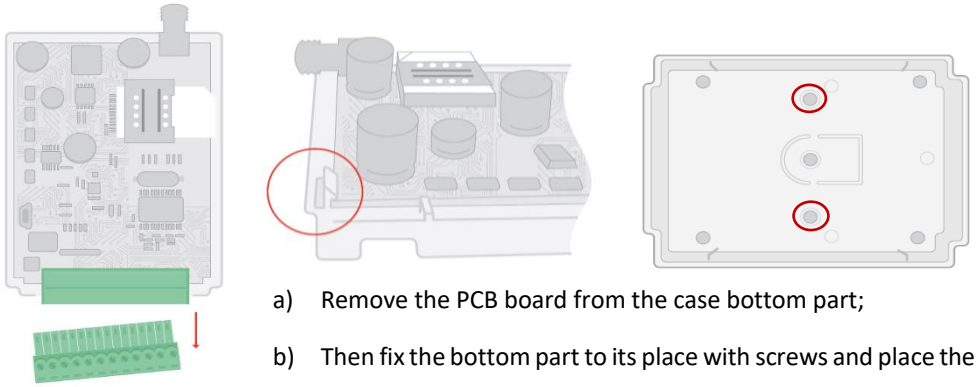
4.1 Insert SIM card into the holder



a) SIM card must be already registered to the GSM network, if GPRS communication will be used, ensure to enable mobile data service.
b) To configure the communicator remotely, insert a SIM card with the PIN code request function disabled.

4.2 Install the communicator into a mounting case.

If the screw mounting will be used:



a) Remove the PCB board from the case bottom part;

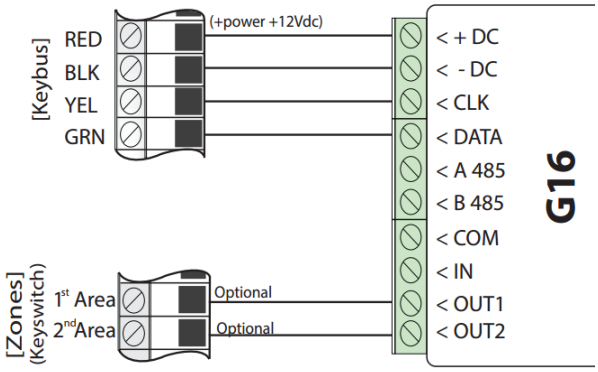
b) Then fix the bottom part to its place with screws and place the PCB board back into case.

a) Close the communicator's case.

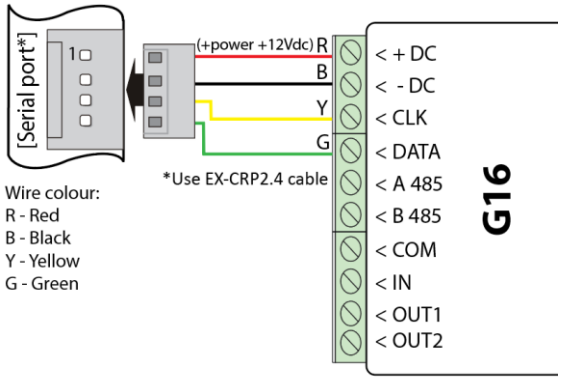
4.3 Wiring diagrams

Following provided schematics connect the control panel, sensors and output connections.

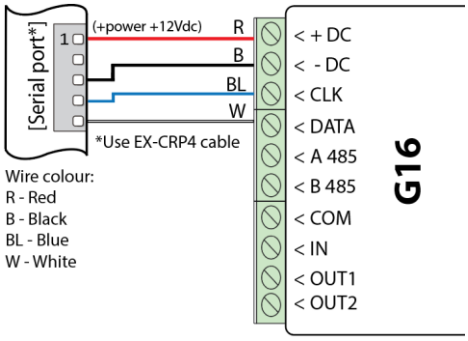
DSC



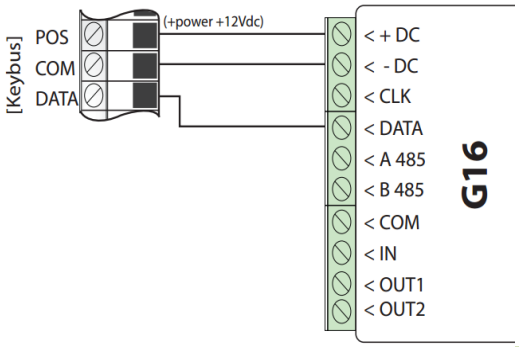
PARADOX



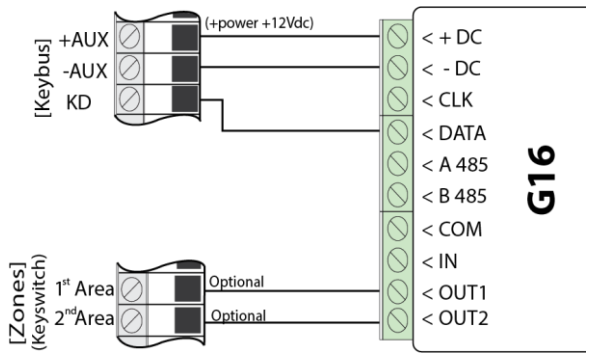
TEXECOM



CADDX



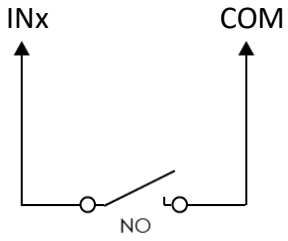
PYRONIX



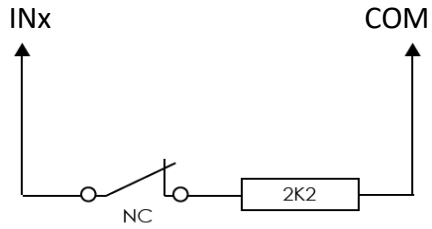
4.3.1 Input connection

The communicator contains one input terminal (IN1) for connection of sensors. For setting the input connection type see **3.1 General system settings**. NC with EOL, NO with EOL, NC with DEOL, NO with DEOL type is selectable only from communicator 1.14 version.

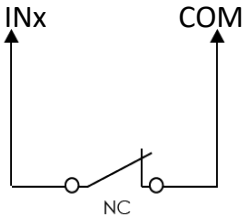
NO, Normally Open
Short – Alarm;
Open - Restore



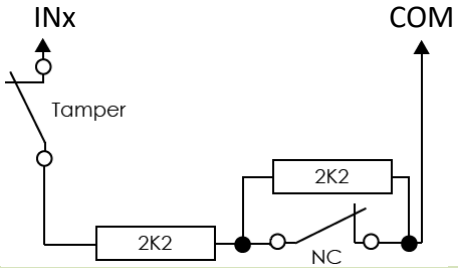
Normally closed circuit with end of line resistor (EOL, End of Line)
Short – Alarm; Open – Alarm;
2,2k – Restore



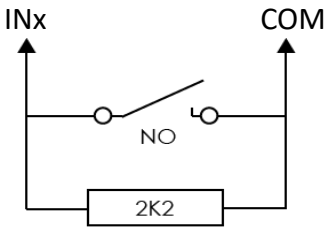
NC, Normally Closed
Short – Restore;
Open - Alarm



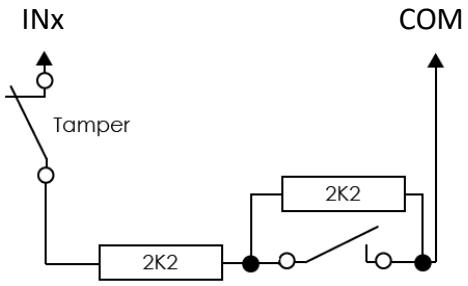
Normally closed circuit with end of line resistor and tamper recognition (NC with EOL & tamper recognition)
Short – Tamper; 2,2k –Restore;
3,3k – 5,5k -Alarm; Open - Tamper



Normally open circuit with end of line resistor (EOL, End of Line)
Short – Alarm; Open – Alarm;
2,2k – Restore



Normally open circuit with end of line resistor and tamper recognition (NO with EOL & tamper recognition)
Short – Tamper; 2,2k – Alarm;
3,3k - 5,5k - Restore; Open - Tamper



4.4 Connect a DC power supply.

4.5 Turn on the power supply.

Note: Sufficient GSM signal strength is level 5 (five yellow flashes of indicator Network).
Sufficient 3G signal strength is level 3 (three yellow flashes of indicator Network).

5 Program security control panel to use G16 Direct Control feature

PARADOX

The **PC download password** is not set as default parameter in Paradox control panel. To set this password you need to perform following actions, by using PARADOX keypad:
For MAGELLAN, SPECTRA series: enter the cell [9][1][1] and write in 4-digit password, this password must be the same as in the communicator G16.

For DIGIPLEX EVO series: enter the cell [3][0][1][2] and write in 4-digit password, this password must be the same as in the communicator G16.

TEXECOM

Use Texecom software Wintex to program control panel. To enable Direct Control feature:

1) Program **UDL passcode** – 4-digit password**,** in Communication Options window, tab Options.
2) Make sure control panel **UDL passcode** matches with communicator G16 PC download password.

Also, UDL passcode can be programed using keypad:

1) Enter Programing menu from the keypad, by entering 4-digit Engineers code, press [Menu] button and then button [9].
2) Enter [7] [6], and option [2], now enter 4 – digit passcode (matching G16 **PC download password).**
3) Press [Yes] and leave programing menu, by pressing [Menu] button.

UTC INTERLOGIX (CADDX)

To enable Direct control of Caddx, G16 should be wired to Caddx control panel and power supply turned on and follow steps bellow:

1) Ensure that, in TrikdisConfig Caddx control panel is selected.
2) Using keypad enter programming mode:
   a. Press [*][8] [9][7][1][3] and enter device number [7][2][#],
   b. Exit programming mode by pressing [Exit].
3) Now control panel automatically will find communicator G16.

DSC and PYRONIX

At this moment there is no possibility to use direct control for DSC control panels, but there is way to use remote control.

To control remotely DSC control panels, follow steps:

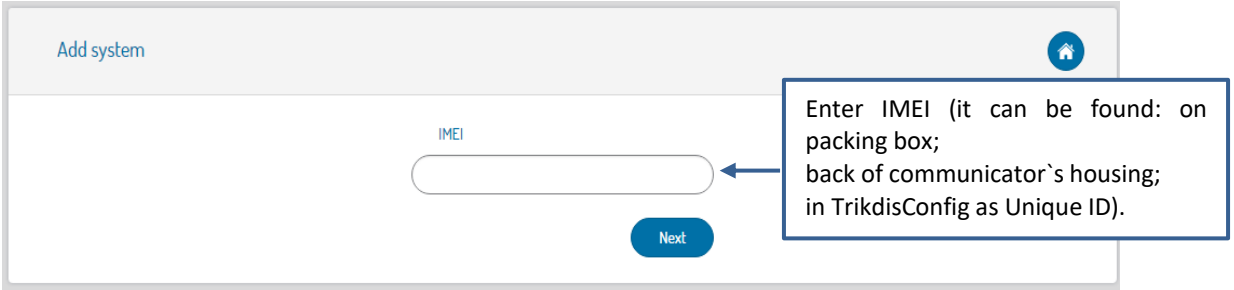
1) Connect G16 output to the panel's keyswitch zone input (one wire, no resistors).
2) Program alarm panel`s zone as momentary keyswitch zone (see security control panel`s programming manual).

6 Add communicator in Protegus

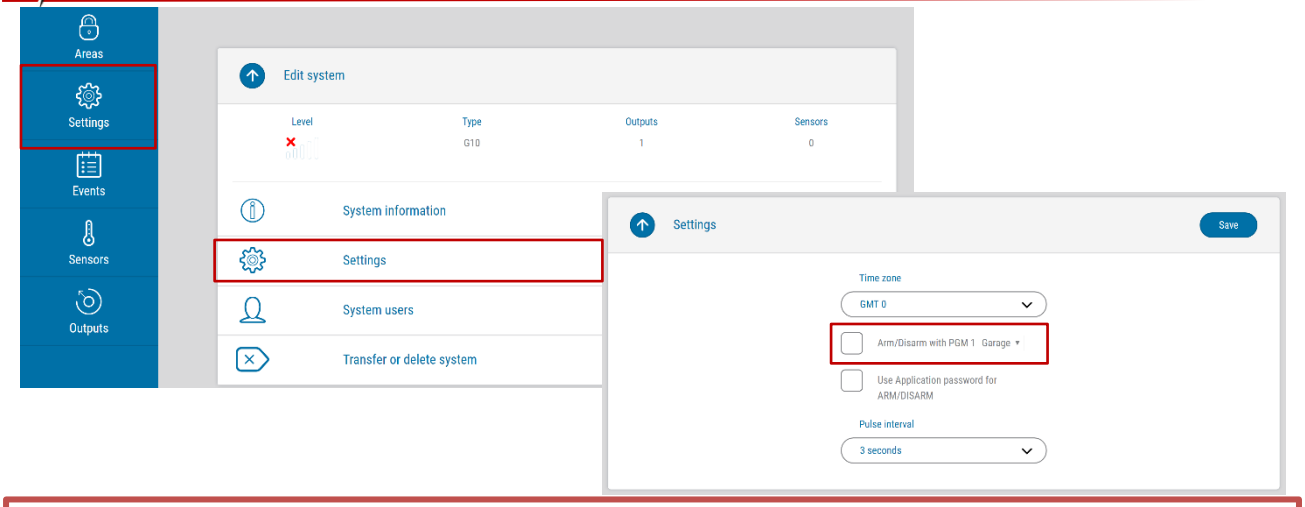
Protegus service is a Web Service for remote intrusion or fire alarm self-monitoring, and control of both Trikdis and 3rd party devices via Web, iOS or Android apps.

Android Google play store:
https://play.google.com/store/apps/details?id=lt.apps.protegus&hl=lt
Apple App store:
https://itunes.apple.com/us/app/protegus-smart-security/id1092492126?mt=8

1) Log in or sign in to www.protegus.eu.
2) Add the system to the Protegus: press **“Select system”**; next **“Add new system +”**, and enter the required data as shown below (you can skip fields “Name”, “Address” and fill it later).



3) (Optional) If you will use remote arm/disarm feature, in Protegus main window, choose “**Settings”** tab and then tick the checkbox: **“Arm/Disarm with PGM”.**



IMPORTANT: In Protegus app one PGM output can be assigned to control one Area (1 PGM - 1 Area; 2 PGM - 2 Areas) regardless of how many areas are controlled by same keyswitch zone in panel.

Set which Area will be controlled by Protegus in system **"Settings".** There select the checkbox **"Arm/Disarm with PGM",** and the number of Area, which you want to control.
In Protegus **"Areas"** window, you will see all areas available in the system, with controllable areas highlighted.

7 Test communicator performance

After configuration and installation is complete, perform a system test:

1. Check network connection (Light indication): sufficient GSM signal strength is level 5 (five yellow flashes of indicator Network). Sufficient 3G signal strength is level 3 (three yellow flashes of indicator Network). If red trouble light flashes 5 times, search for another place to leave communicator.
2. Activate an event in the control panel, and make sure that the event arrives to the alarm receiving centre or is received in the mobile application.
3. To test communicator input, activate it and make sure that the correct messages arrives to recipients.
4. To test the communicator outputs, please activate them remotely and make sure that the correct messages arrives to recipients, and output activates as it should.
5. To test Direct control feature, using Protegus service Arm/Disarm system, check if commands were performed.
6. Carry out alarm signalling tests to make sure that the alarm receiving centre receives the signals correctly.

8 Manual firmware update

The communicator firmware can be updated or changed manually. After an update, all the previous communicator parameters will remain the same.
When writing firmware manually, it can be changed to a newer or older version. To update:

1) Run TrikdisConfig.
2) Connect the communicator via USB cable to the computer or connect to the communicator remotely.
   - If newer firmware version exists, the software will offer to download the newer firmware version file.
3) Select the menu branch **Firmware**.

Note: If there is an installed antivirus software on your computer, it might block automatic firmware update option. In this case you must reconfigure your antivirus software.

4) Press **Open firmware** and select the required firmware file.
   - If you do not have the file, the newest firmware file can be downloaded by registered user from www.trikdis.com , under the download section of the G16 communicator.
5) Press **Update [F12]**.
6) Wait for the prompt of update to complete.
7) Click **OK** in the prompted window.