

SECURECOM

SC-3G

Remotely manageable alarm monitoring communicator with HSPA/GPRS primary and PSTN backup connection

Manual v1.1



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1. Introduction

The SC-3G device is a modern remote monitoring communicator which operates on the 3G/2G mobile network, converts the Contact ID signals of alarm control panels into SIA DC-09 digital format and forwards to the predefined remote monitoring station's receivers. The signals are embedded in TCP or UDP packages and sent over 3G data (HSPA) and 2G data (GPRS) network.

If the mobile network connection is defected or the monitoring receivers are unavailable, the communicator provides a secondary option for report sending, switching to PSTN network connection. For increasing the security of signal transmission landline or another backup communicator can be connected to the PSTN input, if it fits to the standard alarm control panels' communication.

Besides this, additional device features are provided through connection to an IoT service server. This service allows connection to the device through a simple web browser, to review status and events, control the device, or change device firmware. Also, it allows remote connection to the alarm device with a transparent serial port, and the support for the Smartphone application, used by the alarm system user to receive information from alarm system and control it.

1.1 Functions

- Alarm control panel signal transmission over 3G network
- Automatic or predefined Contact ID signal transmission logic
- Signal transmission triggered with contact inputs
- Status events reporting (supply failure, setup changed, etc.)
- Output control by SMS commands or through Smartphone application
- PSTN Pass-through connection, for backup communication
- Providing TCP/IP or UDP connection to SIA DC 09 receiver
- Configuration and diagnostic via USB connection or through Internet connection (Server)
- Test report setting from 30 to 600 sec

1.2 Features

- Emulated phone line for alarm panel's phone line connection
- USB Connector for local programming/diagnostics
- 1 contact inputs
- 1 controllable open collector output
- Settings for 2 independent IP monitoring receivers
- Powered by 3G UMTS cellular engine
- Small (0.2 kB) data package of UDP
- Serial port connection, for transparent connection from remote PC (virtual serial port)

2. Device review



Sign	Part	Description
1	ANTENNA CONNECTOR	UMTS / GSM network antenna Connector: SMA, Impedance: 50 ohm, Frequency: 900/1800/2100 MHz
2	SIM CARD HOLDER	For mobile network connection Type: M2M data card, Dimension: 2FF mini SIM
3	LED status display	The LED status signals are described in next chapter
6	DC POWER (DC+/DC-)	Main power supply Rated voltage: DC 9-30V, Rated current: max. 500mA
7	Communication line (TIP/RING)	Simulated landline for the alarm control panel's TIP/RING input Line voltage: 48V, Loop current: 25mA, Impedance: 300ohm
8	INPUT (IN)	Contact Input (to DC-) for transmission of the signal of external switches
9	OUTPUT (OUT)	Open Collector Output Nominal load: 50mA
10	PHONE DEVICE (TEL/TEL)	Landline output for telephone PBX or home desktop phone Polarity independent.
11	LANDLINE phone input (PSTN/PSTN)	Backup PSTN line input If the communication to both monitoring receivers fails, the communicator will switch to the backup landline. Polarity independent.
4	USB CONNECTOR	For parameters setting , the communicator must be connected to the computer through USB port. Type: USB mini-B
5	Serial port connector	For transparent port forwarding from alarm panel Detailed information in chapter 9

3. Status LED signals

Red flashing	SIM card is missing or the given PIN code is incorrect
Red constant	Signal strength of the antenna is under 20%
Yellow flashing	Network connection is OK, but APN is incorrect or missing IP address/Port
Yellow constant	Data link is OK, but the receiver is still not responding
Green flashing	Idle mode, any receiver is available
Green constant	Sending test report
Blue flashing	Alarm control panel is on hook or dialing
Blue constant	Sending CID signals to the monitoring station

4. How to start

All programming can be made using the direct USB connection to the PC, with the programming software running on it. Also, programming and maintenance can be made remotely, using the web site interface. Only the SIM card data **MUST** be loaded to the device using the USB connection, so it could connect to the Puloware IoT server. After that, all other settings and maintenance can be made through remote connection, on web site www.puloware.com. Please, register to this server before you attend to use the functions available through it.

If you want to use the Smartphone application, you can download it on Google play store.

The following data must be obtained from appropriate service providers, in order to use the complete device functionality:

4.1 Monitoring Receiver data

Make sure that the monitoring receiver is equipped with the system that allows receiving SIA DC-09 IP protocol messages before you start using SC-3G and the following information should be obtained.

IP address	
Port	
Protocol	
Test period	

4.2 GPRS/3G SIM Card and APN data

For using the SC-3G device a mobile DATA SIM card is needed. During the configuration you need to add the APN (Access Point Name) of the GPRS/3G SIM card and the following possible configuration parameters.

SIM PIN code	
APN	
User name	
Password	

4.3 Setup application

The Setup application is downloadable from this web address:

<http://www.securecom.eu/scdevice/sc-3g?lang=EN>

Run the **3GConfiguratorSetup.exe**. If it is needed, install the proper version of .NET Framework should be installed (Prompt up window will warn you)

NOTE: The configuration software is running only on MS Windows 7 operating systems or above!

5. Configuring the device

USB connection steps:

1. Run the **3GConfiguratorSetup.exe** application
2. Connect the SC-3G communicator to the computer with the USB 2.0 Cable (A-Male to Mini-B)
3. The application verifies the USB connection
4. If the connection is established successfully, the application reads the stored configuration and module status from the device

5.1 Information and Administration Area



Manufacturer logo: **SECURECOM**

Product type with network standard (Europe / North America): **SC-3G**

Firmware version: **V2.05**



Open previously saved configuration.



Save the current configuration into a file.



Load the configuration into the device memory.



Password protection for installer

5.2 Module Status

MODULE STATUS	
SIM status:	OK
Network, signal (%):	Vodafone 69
Data connection:	Connected
Monitoring station 1:	OK
Monitoring station 2:	OK
Dial capture:	ONHOOK
INPUT:	INACTIVE
Control OUT:	INACTIVE
TELEPHONE:	ACTIVE
PSTN Line:	CONNECTED

SIM status	Wait for SIM / OK / PIN request
Network, signal (%)	3G/2G signal strength ¹ (0-100%)
Data connection	Data connection status and type
Monitoring station 1	Connection status of MS1
Monitoring station 2	Connection status of MS2
Dial capture	Status of the dial capture hook
INPUT 1	Status of INPUT 1: Active – Inactive
Control OUT	Status of Output: Active – Inactive
TELEPHONE	Status of outgoing Telephone line
PSTN Line	Status of incoming PSTN landline

¹The transmission is stable in case of minimum 30% signal strength. If the signal strength is lower than 30%, move the device to another place where the signal strength is higher.

5.3 SIM and APN Settings

MODEM AND GPRS SETTINGS	
PIN code:	
GPRS APN:	internetm2m.air.com
User:	
Password:	

PIN code	The PIN code of the inserted SIM card can be set, if the card is protected by PIN code.
GPRS APN	The APN of the SIM card must be set, regardless if it is using a public or non-public APN (Private APN)
User	Add the user name for the APN if necessary
Password	Add the password for the APN if necessary

5.4 Latest Events

In this window the communication events of the SC-3G device can be tracked.

LATEST EVENTS MORE...	
2017.12.05 13:30:58:	EVENT: NEW: 111118140101001B
2017.12.05 13:30:59:	Monitoring Station (1): Send CID: 111118140101001
2017.12.05 13:31:00:	Monitoring Station (1): Reply: ACK
2017.12.05 13:31:01:	DIAL CAPTURE: CID: 111118140101001B
2017.12.05 13:31:01:	EVENT: ACK: 111118140101001B
2017.12.05 13:31:01:	DIAL CAPTURE: KISS-OFF
2017.12.05 13:31:03:	DIAL CAPTURE: HOOK ON
2017.12.05 13:31:15:	Monitoring Station (1): connection closed

5.5 Monitoring Station Settings

MONITORING STATION 1 SETTINGS	
IP address:	siatest.securecom.eu
Port:	9999
Protocol:	TCP
SIA prefix:	
Object identifier:	5566
Replace obtained identifier:	YES
Dialed number by alarm system:	
Link test period:	3 min
Link test code:	

MONITORING STATION 2 SETTINGS	
IP address:	52.28.118.208
Port:	9999
Protocol:	TCP
SIA prefix:	
Object identifier:	5566
Replace obtained identifier:	YES
Dialed number by alarm system:	
Link test period:	3 min
Link test code:	

IP address	IP address or domain name of the monitoring station
Port	Port number of the monitoring station's IP address
Protocol	Selectable communication IP protocol: TCP, UDP
SIA prefix	2 characters long SIA prefix, it can be used if the identifier of the connected alarm control panel is just 4 characters long, but the necessary identifier of receiver is 6 characters long
Object identifier	The self identifier of the SC-3G device (4 characters long).
Replace obtained identifier	If it is enabled than the SC-3G exchange the alarm control panel's identifier, to given self object identifier. YES : exchange, NO : not change
Dialed number by alarm system	If this field is empty, the communicator forwards the signals independently of the dialed number by the alarm system (any number can be dialed, the communicator will forward the CID code). If the alarm panel dialed the number in the field, the communicator forward the report codes to selected monitoring station only.

Link test period	Sending test report to the monitoring station <ul style="list-style-type: none"> •NO: test report is not sent •30sec – 24 hours: the device sends test reports to the monitoring station by the given interval
Link test code	Any code can be defined. If this field is empty than the communicator sends Null Message, as defined by standard.

5.6 Input Settings

The triggered input event destination can be selected.

INPUT SETTINGS	
Sensitivity:	0.1 sec ▾
Contact type:	NO ▾
Event code:	130
Reporting:	MS2 ▾

Sensitivity	The switching time of the INPUT 1 and INPUT 2 can be set from 0.1 sec up to 10 minutes
Contact type	Physical setting. NO – Normally Open, NC – Normally Close
Event code	The Contact ID code of the triggered event can be set. If the field is blank, the input will be inactive.
Reporting	The triggered input event destination can be selected. MS1, MS2, MS1 or MS2

5.7 Status Event Codes

In this area you can set the Contact ID codes for the communicator events. The event codes are standard 3 characters long (1 and 3, for “event” and „restore” are added automatically). If the event code field is blank, the event is not reported to the monitoring station.

COMM. EVENT CODES	
PSTN failure:	350
Setup changed:	306
OUT controlled:	205
Reporting:	MS2 ▾

PSTN failure	PSTN is failed or disconnected.
Setup changed	The settings have been changed.
OUT controlled	OUTPUT has been controlled.
Reporting	Destination receiver can be selected.

5.8 Serial port settings

If you use the SERIAL PORT connection (details explained in chapter 9), the serial port settings must fit the setting of the software that is used. As this software is used as if it would be physically connected to the serial port of the device whose signals are forwarded, the SC-3G device must treat the signals from this port same way, and have the same port settings in order to properly forward the signals from it to this software. Only basic PORT settings are required, since signals are simply forwarded TRANSPARENTLY, without any checking or protocol handling.

SERIAL PORT SETTINGS	
Baud rate:	9600 ▾
Data bits:	8 ▾
Parity:	None ▾
Stop bit:	1 ▾

6. Signal Transmission

6.1 Description of the Signal Transmission

The signal transmission between the alarm control panel and the monitoring station through the SC-3G communicator works with following steps:

- The alarm control panel is dialing (over TIP/RING line) a programmed phone number (e.g. 1111)
- The communicator detects the dialing and sends back the Handshake signal to the alarm control panel
- The alarm control panel sends the Contact ID of the first event code
- The communicator receives and converts the signals to digital format and forwards it to the active IP address of the monitoring station then waiting for the acknowledge message.
- The alarm control panel repeat the first Contact ID signal due the missing response of the communicator (the transmission time of the network is around 1-3 seconds)
- If the communicator receives the sign of the successful message sent by the IP receiver, it sends Kiss-off signal (over TIP/RING line) as a response for the alarm control panel's repeated signal and it is recorded as successful event.
- The process is repeated (without dialing and handshake) by sending the new event code, as long as there are events to be reported from alarm panel. When all messages are successfully sent, the process is finished and the alarm control panel hangs up the line.

6.2 Signal Transmission Logic

If both monitoring stations are entered, the direction if signal sending can be:

- Automatic: MS1 receiver is the primary, MS2 is the secondary, and every signal is forwarded to the MS1 until it is available. If MS1 is unavailable, every signal is forwarded to MS2. As the MS1 receiver becomes available, the reports are sent to it again. **NOTE:** This function is working if the field "**Dialed number by alarm system**" is empty!
- Custom: You can define a number for both monitoring stations which is dialed by the alarm system. Using this option the alarm system will choose the specific receiver based on its dialing order independently of the availability of the receivers.

NOTE: This function is working if the **Dialed number by alarm system** filed is **NOT** empty!

In every communication, the receiver availability is checked when a message is to be sent (a test report or a CID message), and the connection is closed immediately after the message was confirmed from receiver (kiss-off signal received).

6.3 Backup PSTN Line Operation

If the monitoring stations are unavailable via 2G/3G network the communicator switches to PSTN line. In that case the line voltage is ended on TELEPHONE output, and the landline is only available for the alarm system. If any of the set receivers (MS1 or MS2) is available again, the communicator switches back to "normal operation", and the line for alarm panel is provided from mobile network. **In case of device failure or power supply loss, the basic communication line will be PSTN.** The condition of PSTN line usage is that the phone line must be connected!

7. Controlling Output

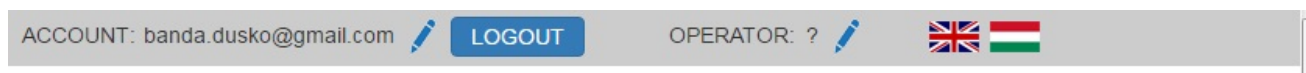
Device is equipped with one open collector type output. The output can be controlled two ways, each of them differs in purpose and operating way. It is possible to control the output through Smartphone application, which requires a Puloware service. The web site of the Puloware server also contains a button that is used to switch the OUT of the selected device.

NOTE: Please contact to your distributor for further information about Puloware service.

8. Remote managing by PULOWARE service WEB site

For the devices remote manageability you can be reached on the web site www.puloware.com. It requires a registration, and the same email address that is used for registration on server must be used in Smartphone account if you want to use the application.

Once registered, the account is created and when you log in, using the buttons on top of the screen you can edit your account, select operator name, or select a language.



All devices that were assigned to this account are displayed on the left side, along with their status (online-offline). Pulling the mouse on some device in list (without click), shows a little red cross. This button can be used to delete that device from the list. Naturally, device stays connected to the Puloware server, but it is not shown in this account any more. At the bottom of the list, there is a „ add device” button. To add a new device, a device ID must be entered, and after confirming it („add” button), the device is added to the bottom of the list.

NOTE: in case that the device was already added or the number is invalid, the software „kicks out” from the account, and you must log in again. This way the user knows that there is something wrong with the number that was entered.

When you select some device from the list, all options for this device are displayed. At the screen top „header” shows device information and provides basic controls



Here you can **RESTARTING** the SC-3G communicator, **FORCE to PSTN** mode the device (switch the incoming PSTN line directly to the alarm panel, so it can receive modem calls), **SWITCH** the **OUTPUT**, **LOAD** settings file, **SAVE** the current settings to a file, and **DOWNLOAD** the current settings that are presented on the page (when you make some changes in setting) to the device. Also, here you can **ADD NAME** to the device and select the open collector output **ARMED** mode.

Other fields in the web page are same as the programming software screen, providing same functions. These fields are described in section 5 of this manual.

Below the „programming area”, there are options to view detailed event list, add event filter, and add names to the user. With this feature, users of alarm system are recognized with a name instead of user number, in the event list and in the Smartphone application. Also, a firmware upload option is placed here.

Using this feature, you can remotely change the device firmware through Internet connection. Select a new firmware file for device and automatically start the upload to the device. Once finished, the device restarts with the new firmware.

9. Transparent Serial port forwarding

The device provides transparent serial port forwarding, so the installers can remotely connect to the alarm panel and make required operations in it without traveling to the site.

The connector on device is a 4-pin connector, providing power, RxD and TxD signals.

NOTE: The power and signal levels are differing in alarm panels! Be sure to use the appropriate cable for connection. Wrong connections can damage the device!

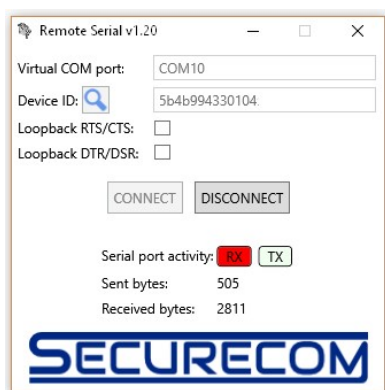
Once alarm panel's serial port is connected to device, all signals from it are forwarded to the Pulwara server. All you need on your location is the „Remote Serial” software to create a VIRTUAL port on your Windows machine, and all outgoing and incoming signals will be forwarded from physical port on SC-3G device to that virtual port, in REAL time (with very small response time).

This way, the software that normally connects to the device through physical serial port can be used the same way- only the selected serial port must be changed from physical port to this virtual port, that created by remote serial software.

The serial port settings (baud rate, bit number, parity, and stop bit) in Pulwara server must be appropriate set, to fit the settings in software used for serial connection (chapter 5.8).

9.1 Remote Serial software

The software is available at <http://pulwara.com/public/RemoteSerialSetup.exe> web site. When you start it, since this software is affecting the system (serial ports), the PC protection will ask for a confirmation to make changes that this software wants to make. If you deny this, the software cannot run. When you allow changes, the software opens a window with settings



→ The virtual port number, MUST be FREE, not used in system.

→ The device ID code of the SC-3G, added to account of the IoT server

Selected virtual port should be set in the used software as well.



In case you do not know the Device ID, using the search button (blue magnifier) you can log to the server with same credentials as for the web site and select the wanted device.

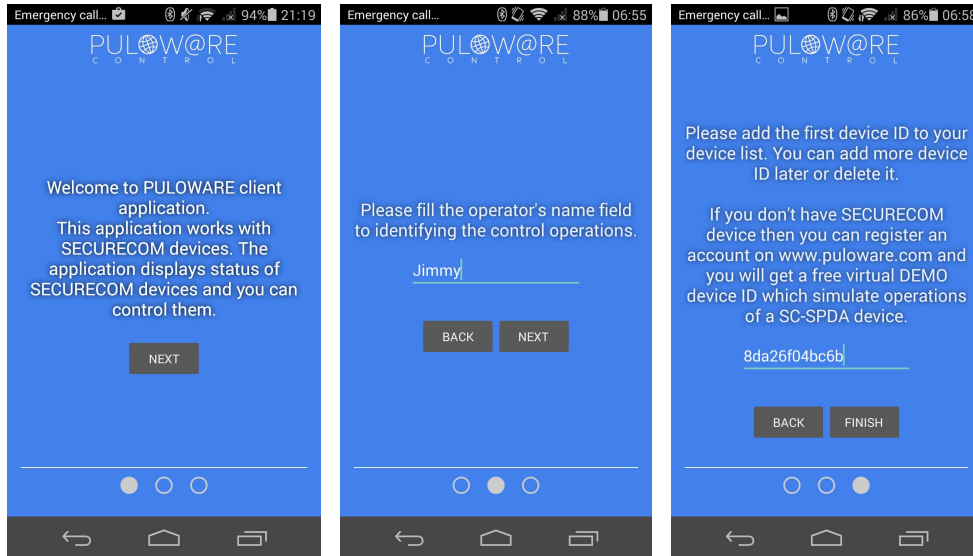
Once all data is entered CONNECT to the serial port and status will be displayed, showing the Rx and Tx data that went through this transparent connection. A short movie, showing the serial port connection with Paradox alarm panel is available on YouTube:

https://www.youtube.com/watch?time_continue=4&v=HXmn_0hloEM

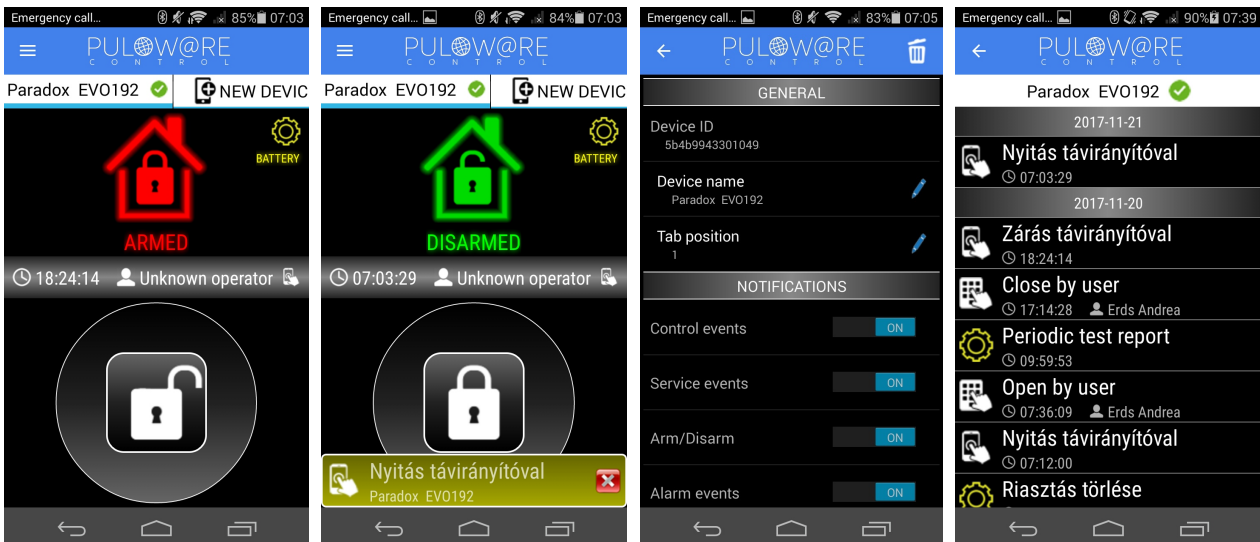
10. Smartphone application

A simple Smartphone application, designed for users of alarm system with SC-3G device can be downloaded from Google play.

When you start the application first time, a setup wizard requires an operator name to be entered. This name is used for identification in event list (who activated the output, i.e. disarmed the system...). After that, a device that you want to control with this application must be added, entering its serial number. After the number is typed in, you can finish the setup.



This application can be used to handle more than one device, other devices (different device types as well) can be added within the application. The look of the application „main screen” is:



Note: Application can not show alarm status until some reports (events) are made. Therefore, disregard the displayed status on application first start, until first arming/ disarming.

It presents the status of the alarm panel and contains a button that is used to control the alarm output- it must be held for 3 seconds in order to activate it. The button also shows the alarm status- “padlock closed” for armed, and unlocked for disarm.

The application second page is opened by swiping the main page to left. Shows the event list, filtered with names that were made on web site. For example: If user 003 armed the system, and the filter on web site says that user 003 is Jimmy, the event list will display that Jimmy has armed the system.

NOTE: The alarm panel must be properly programmed and connected to the device, in order to have the application working correctly.

11. Potential usage areas

- Forwarding of Contact ID based alarm signals through 3G/2G network
- Alarm, fire alarms, „direct connection” based programmable devices remote programming, through Internet connection (diagnostics, bypass, maintenance or supervision...)
- Double reporting through two different media (3G/PSTN) for high security level
- Monitoring of small home alarm through Smartphone
 - Arm/disarm commanding remotely
 - Receive important messages through "push notification,
 - Event list and presence supervision remotely
 - Filtering and displaying the event (alarms, arm/disarm, troubles)
 - Alarm system status displaying on Smartphone
 - Multiple operators, controlling and supervision of one device

12. Package Contents

- 3G communicator in plastic housing
- UMTS / GSM antenna
- USB mini B cable
- Manual and configuration software are available on web site

13. Technical Specifications

Transmission paths	
Primary communication channel: HSPA / GPRS data connection	Freq. Bands 2G: 900/1800MHz
	Freq. Bands 3G: 900/2100MHz
Secondary communication channel: PSTN landline	
Communication features	
Simulated phone line for alarm panel connection (TIP / RING)	Line voltage: 48V Loop current: 25mA Load impedance: 100-470 Ohm
Communication protocols	Dial capture side: SIA DC-05-1999: Contact ID Protocol 3G IP connection side: SIA DC-09-2013: Internet Protocol
Self events reported to monitoring centre	Settings changed Output controlled Test report
Controllable outputs (OUT1, OUT2)	
Open collector outputs (Output connects to negative power supply (DC-), otherwise „floating” (Cannot be resistance measured with ohm meter or volt meter, until a pull-up resistor or load is applied.)	Nominal load: 50mA (protected from shortcut or overload)
Power supply (DC+ / DC-)	
Supply voltage	9-24V DC
Maximum consumption	200mA @ 12V DC
Nominal consumption	100mA @ 12V DC
Maximum dimensions	98x75x24 mm