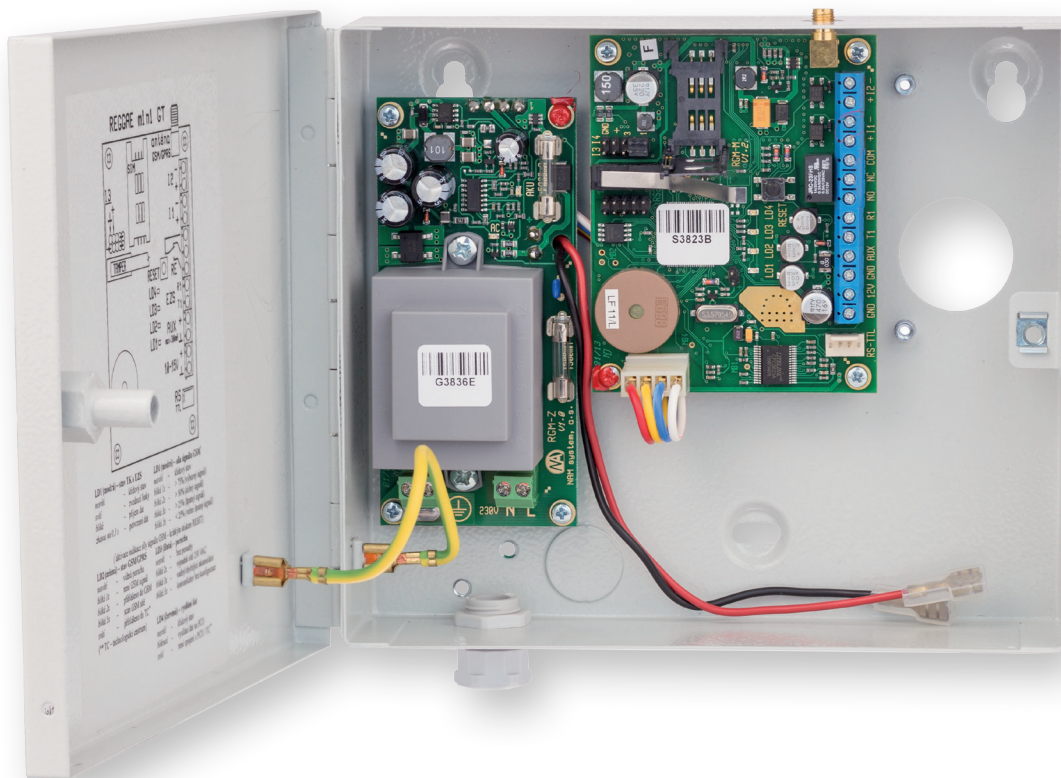


**REGGAE mini GT/GTbz**  
Communicator for GPRS transmission

Document: 1.60



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## INTRODUCTION

Communicators REGGAE mini GT and REGGAE mini GTbz are devices, which facilitate the receiving of messages and events from Electronic Security Systems (AS) security centres and allow the transmission of these messages and events, by different communication channels to Alarm Receiving Centres. Messages from AS panels are received via telephone lines. Reception of occurrences is also ensured by two insulated inputs and one uninsulated input. Communicators also generates several events according to internal states. Messages and occurrences are then transmitted to ARC by GPRS channel or via backup SMS (GSM channel).

The telephone part of REGGAE mini GT and REGGAE mini GTbz is capable of communication with AS panels in all common pulses and DTMF formats. Reception of incoming phone numbers dialled from the AS may be pulse and also DTMF.

Configuration of the communicators can be done remotely via the GPRS channel, or locally via serial/USB port.

Diagnostics of operation and fault states of the communicators can be done locally via serial/USB port or remotely via the GPRS channel.

Communication between REGGAE mini GT or REGGAE mini GTbz communicators and ARCs is two-way with confirmation of message receipt from the ARC.

Connections between communicators and ARC are regularly checked via the GPRS channel. Communication failure is reported to the ARC.

The communicator REGGAE mini GTbz is a version of the REGGAE mini GT supplemented by the REGGAE mini power source and placed into a metal case.

## OPERATING CONDITIONS

Devices REGGAE mini GT and REGGAE mini GTbz contain a radio transmitter in the GSM band (900/1800 MHz). Their operation is possible under the general authorization number VO-R/a/12.2008-17 issued by The Czech Telecommunication Office.

NAM system, Inc. hereby declares, that devices REGGAE mini GT and REGGAE mini GTbz are in conformity with the essential requirements and other relevant provisions of Guideline 199/5/ES and of Government Regulation number 426/2000 collection.

“Declarations of conformity” are released for communicators REGGAE mini GT and REGGAE mini GTbz, according to Government Regulation number 426/2000 collection, which are stored at the device manufacturer.

Operating REGGAE mini GT and REGGAE mini GTbz is not possible near medical instruments and other equipment sensitive to electromagnetic fields.

The manufacturer shall not be liable for any damages resulting from interference to the devices REGGAE mini GT and REGGAE mini GTbz outside the scope of this installation manual (in particular the method of installation, repair and modifications not approved by the manufacturer).

Devices connected to REGGAE mini GT and REGGAE mini GTbz must comply with the applicable standards (according to security EN 60950-1, EN 50131 etc.).

Computer PCs with class 1 protection can be connected to the devices REGGAE mini GT and REGGAE mini GTbz only if it has properly applied its own protection against accidental contact, or against electric shock.

Devices must be installed and operated in dry areas and in the temperature range between -25 °C to +65 °C.

## DESCRIPTION OF COMMUNICATORS

### Basic technical parametres

#### REGGAE mini GT

Power requirements	10 – 15 VDC; max. 400 mA (without consumption on AUX)
Medium consumption	< 35 mA (0.5 W)
AUX Output voltage	12.80 V ± 0.5 V @ 300 mA; +25 °C (when Unap = 13.8 V)
AUX Output current	max. 400 mA @ -20 °C, max. 300 mA @ +25 °C, max. 200 mA @ +65 °C
AUX Output fuse	return safety fuse
Enviroment	class II, inner according to general ČSN EN 50131-1
Operating temperature range	-25 °C to +65 °C
Operating humidity	0 – 95 % noncondensing
Dimensions REGGAE mini GT	95 × 75 × 20 mm

Inputs	2× voltage insulated 1× voltage uninsulated
Outputs	1× changeover relay contact max. 1 A / 30 VDC (0.3 A / 60 VDC), 0.5 A / 125 VAC acoustic output for interception of phone line

Communication channels	serial port RS-TTL – of level TTL (3V) uninsulated (RxD, TxD)
	telephone communicator (line AS)
	GSM/GPRS communicator (SMS/data channel)

**REGGAE mini GTbz**

Power requirements	230 VAC ± 10% (207 VAC – 253 VAC)
Supply current	max. 0.07 AAC
Medium wattage	< 2 W
Power frequency	50 Hz ± 2 Hz
Type of backup battery	12 V, service-free hermetically sealed lead battery (VRLA/SLA)
Capacity of backup battery	1.2 / 1.3 Ah
Battery charge current	typ. 220 mA, max. 260 mA
Operating hours on backup battery	36 hours
Operating temperature range	-25 °C to +65 °C (except backup battery)
Operating humidity	Operating humidity
Protection level	IP20
Class of device protection	class I
Dimensions REGGAE mini GTbz	195 × 167 × 55 mm (without cable bushing)

**GSM/GPRS**

Communication band	900 / 1800 MHz
Output power	2 W / 900 MHz, 1 W / 1800 MHz
GPRS class	8
Antenna impedance	50 Ω
Connector type	SMA

**Circuit board of REGGAE mini GT communicator**

The circuit board of the REGGAE mini GT communicator enables the control and configuration of the complete mechanism. It includes terminal plates and a connector for connecting voltage uninsulated inputs, relay outputs and telephone lines. It also contains a connector for connecting serial/USB port (RS-TTL) and a connector for connecting antenna for GSM/GPRS.

It is possible to power the communicator from the power source of the AS panel, as long as the source of the panel is sufficiently dimensionalized for this additional consumption.

It is assumed that the voltage supply is protected at the source, this being with a fast fuse with a current rating of 800 mA to 1A (F800 mA/250V to F1 A/250V). If the power source does not contain this type of fuse at its output, it is necessary to add this to the power carrier of the communicator (as close as possible to the power source output).

**Voltage of insulated inputs I1 and I2**

The communicator has two voltage insulated inputs I1 and I2, which switch the supplied voltage to the correct pole. Each input is implemented by two terminal plates, on which the polarity of the incoming voltage is marked.

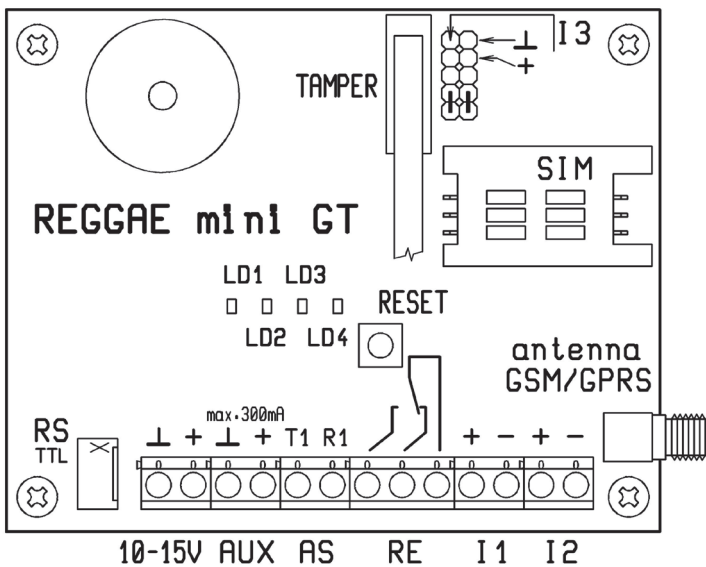
Each input is insulated by an optocoupler. The strength of insulation between the input terminal plates I1 and I2 and the remaining circuits of the REGGAE mini GT communicator is at least 1 kVAC (50 Hz). The same strength of insulation is also mutually between each input.

Voltage at the inputs must be brought in for longer than the time set in the configuration of the communicator in order to make sure that inputs are clamped closed (100 ms – fast input or 300 ms – slow input).

The reaction of inputs to inflowing voltage can be inverted in the configuration of the communicator.

The table below shows the reaction of inputs to inflowing voltage:

Input status	Voltage in input	Consumption
Closed – alarm	+8 V to +40 V	max. 6 mA
Unspecified status	+5 V to +8 V	
Released – idle-circuit condition	-40 V to +5 V	max. 6 mA



**Powering REGGAE mini GT communicators**

Voltage supply to the REGGAE mini GT communicator is brought in through the terminal plates marked „12V“ and „GND“. Positive field supply is connected to terminal „12V“, negative to terminal „GND“. The communicator must be powered by direct current voltage in the range of 10 – 15 VDC. Supply voltage cannot have undulations of more than 0.2 Vrms. During supply of voltage there cannot be a faster decline in supply (during normal operation) of more than 2 V per 1 s (a faster decline will be detected as a power failure).

Medium current consumption of the communicator is less than 35 mA (0.5 W). During telephone communication medium current consumption may increase up to 150 mA.

During communication with GSM/GPRS, consumption may rise to up to 400 mA. At this highest consumption level the power source must be dimensionalized.



**Uninsulated voltage input I3**

The communicator has one voltage uninsulated input I3. The input connector is implemented by using 2 pins situated on the two-row pin lath. The input pins are marked “+” and “GND” in the row next to the marking “I3”.

The pin marked “+” is the live terminal input, the second pin of the input is marked “GND” is connected to the ground of the communicator.

The communicator recognizes two function statuses at this input – closed and released. It is possible to close the input by connecting the pins together. The resistance for each input status is shown in the table. It is possible to switch the input at voltage levels shown in the table. For switching inputs it is possible to use outputs with open collectors of the connected AS panel.

In order to close the input, the appropriate voltage level must be at the input longer than the time set in the configuration of the communicator (100ms – fast input or 300ms – slow input).

The table below shows the reactions to the inflowing voltage respectively the connected resistance for input I3

Status of input	Voltage at input	Resistance at input
Closed – alarm	-15 V to +1.5 V	0 to 1.5 kΩ
Unspecified status	+1.5 V to +1.8 V	1.5 to 2.2 kΩ
Released – idle-circuit condition	+1.8 V to +15 V	> 2.2 kΩ

**Diagnostics and configurations serial port RS-TTL**

The connector of serial port RS-TTL serves for using diagnostic and configuration software on the PC. The level of these serial ports is TTL (3V). This serial port is not insulated from the remaining parts of the communicator. The programming cable RS/USB for REGGAE mini GT is used to connect the circuit board of the REGGAE mini GT communicator and PC. Please contact the producer, NAM system, a.s. for this type of cable.

**Relay output**

On the circuit board of the REGGAE mini GT communicator there is one relay output RE with one contact switch.

The terminal plate markings are standard. The mutual outlet of the switch contact is marked „C“ (Common). The contact outlet that is clamped close when the status is idle-circuit is marked „NC“ (Normally-Closed). The contact outlet that is in release when the status is idle-circuit is marked „NO“ (Normally-Open).

The carrying capacity relay output is a maximum of 1 A / 30VDC (respectively 0.3 A / 60VDC) or 0.5 A / 125 VAC.

**Supply output AUX**

Supply of output AUX is achieved by using the terminal plates marked „AUX“ and „GND“. This output is meant for possible supply of the circuit of the voltage insulated inputs I1 and I2 on the circuit board of the REGGAE mini GT communicator. The AUX output is not insulated from the remaining parts of the communicator REGGAE mini and so its usage for supplying any of the inputs I1 or I2 leads to the breach of the insulation of the inputs involved.

During operation of the circuit board of the REGGAE mini GT at a supply voltage of 13.8 V, the AUX output allows direct current voltage in the range of 12.3 – 13.6 V depending on the connected consumption. During operation of the communicator using the back-up accumulator, the voltage at the AUX output changes according to the state of the accumulator and may fall to a value of 8.0 V. The maximum power consumption of the AUX output is 300 mA at a temperature of approximately +25 °C.

The AUX output is protected from short-circuiting by a return safety fuse. This guarantees the limiting of power coming from the short-circuit of the output to less than 100 mA.

**RESET button**

The RESET button serves to carry out the initiation of the status of the REGGAE mini communicator. Pressing the RESET button for a longer time (longer than 1s) initiates the restart of the communicator. During this restart, initiation of all communication channels is carried out. Restart of the communicator does not cause the deletion of news and occurrences tables and corresponds to the turning on of supply to the communicator.

Pressing the RESET button for a short time starts the indication of the signal strength of GSM/GPRS on the blue LED LD1. This indication is active for 1 minute. After this time, the blue LED LD1 will again indicate the status of the telephone communication with the AS.

**Indication of the state of the communicator - LED lights**

LED LD1 to LD4 on the circuit board of the REGGAE mini GT communicator serve to indicate the present state of the REGGAE mini communicator.

The meaning of the LED indication lights are as follows:

**LD1 (blue) – state of telephone communication with AS**

LD1 (blue)	Meaning
Not shining	Idle-circuit state
Shining	Ready to receive
Flashing	Receiving data
Turns off for 0.5 s	Confirmation of data receipt

**LD1 (blue) – strength of GSM/GPRS signal**  
(1 minute after a short press of the RESET button)

LD1 (blue)	Meaning
Not shining	Idle-circuit state
Flashes 1x	Excellent signal (>75 %)
Flashes 2x	Good signal (>50 %)
Flashes 3x	Bad signal (>25 %)
Flashes 5x	Very bad signal (<25 %)

**LD2 (green) – state of GSM/GPRS**

LD2 (green)	Meaning
Not shining	Serious breakdown of GSM/GPRS
Flashes 1x	No GSM signal
Flashes 2x	Logged in GSM
Flashes 5x	Scanning of GSM network
Shining	Logged in TC (*)

(\*) technological centre

**LD3 (yellow) – breakdown of communicator**

LD3 (yellow)	Meaning
Not shining	No breakdown
Flashes 2x (*)	Outage of 230 VAC network
Flashes 3x (*)	Defective/missing accumulator
Flashes 5x	Communicator without configuration

(\*) only for communicators GTbz/GTbzxxx

If a number of breakdowns occur at one time, they are shown in sequence with 1 second gaps between each breakdown.

**LD4 (red) - data transmission**

LD4 (red)	Meaning
Not shining	Idle-circuit state
Flashing	Transmitting data to ARC
Shining	Not connected to ARC or to TC (*)

(\*) technological centre



**Antenna connector - GSM/GPRS**

For connecting antennas for GSM/GPRS there is a connector of type SMA on the circuit board of the REGGAE mini GT communicator. Any antenna that satisfies the necessary operation conditions in the range GSM/GPRS 900/1800 MHz with impedance 50  $\Omega$  can be used.

Antennas can be adapted for both indoor and outdoor usage.

On the REGGAE mini GTbz communicator it is most common to use a thin rod antenna screwed directly on the SMA connector.

**Telephone part of communicator**

The telephone part of the circuit board of the REGGAE mini GT communicator is able to communicate with the AS panel in all common pulsation and DTMF formats. Supported formats are 4+2, Ademco Point ID (Contact ID), communication speed 10, 20 or 40 bps with handshake 1400 Hz, 2300 Hz or multi-tone.

Dialled telephone numbers can be set up as pulsation or DTMF at the AS panel.

The terminal plates marked „T1“ and „R1“ are used for connecting telephone lines from the AS panel.

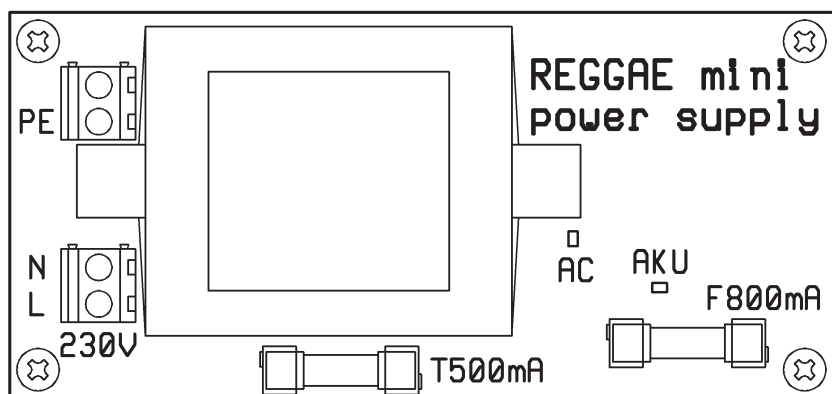
For powering telephone lines, the REGGAE mini communicator creates voltage of approximately 24 V and this is on the terminal plate T1 / R1 in cases where the AS panel does not answer the telephone.

The telephone part of the REGGAE GT communicator can generate the dialling tone of the line for the AS panel. This function is optional in the communicator configuration.

The circuit board of the REGGAE mini GT is not capable of GSM portal function.

**Acoustic output**

On the circuit board of the communicator there is an acoustic output for monitoring the telephone lines of the communicator. Turning on the monitor is carried out by the NAM manager software through configuration and diagnostics.



### Power source circuit board – REGGAE mini GTbz

REGGAE mini GTbz communicators are powered by alternating supply grid 230 V / 50 Hz. The power source circuit board is used to create direct current power voltage 13.8 V for the REGGAE mini GT communicator. The output of direct current voltage from the power source circuit board is backed up by a leaden hermetically sealed accumulator 12 V without maintenance (VRLA/SLA).

#### Powering the REGGAE mini GTbz communicator

Direct current power voltage 230 V / 50 Hz is brought into the communicator through the terminal plates marked „L“, „N“ and „PE“. The maximum power consumption of the communicator from the alternating current supply grid is less than 70 mA.

#### Back-up accumulator

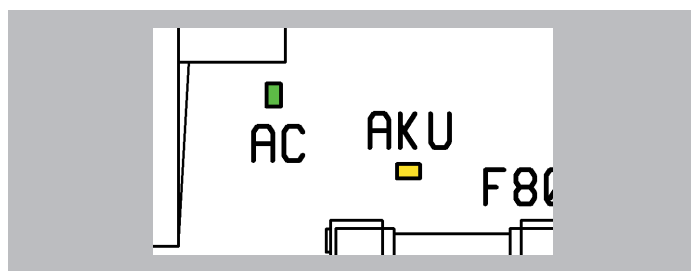
The back-up accumulator is connected to the red and black conductors of the power source circuit board (with end fasteners). The power source circuit board ensures the operating state of the accumulator – this means charging and connection/disconnection of the accumulator from the direct current output from the power source circuit board. The maximum charging supply of the accumulator is limited to 260 mA. During operation of the power source circuit board at alternating grid 230 V, the accumulator is constantly charged at a voltage of 13.8 V. The power source is designed to serve VRLA accumulators 12 V with a capacity 1.2 / 1.3 Ah.

The power source circuit board ensures automatic disconnection of the accumulator in cases where its open circuit voltage falls below 8.9 V during operation of the communicator by the accumulator (this means at times of loss of alternating current supply voltage 230 V). Even during the absence of alternating current supply voltage

230 V it is possible to put the communicator REGGAE mini GTbz into operation by connecting an accumulator with an open circuit voltage of more than 11.5 V.

#### LED indicators on the power source of the circuit board

Two LED indicators are located on the power source circuit board.



When the green LED light marked „AC“ shines this indicates the presence of alternating current voltage at the input 230 V.

When the yellow LED light marked „AKU“ shines, this indicates that the power source is ready to charge the circuit board of the REGGAE mini GT communicator from the accumulator and also from the grid 230 VAC. The LED light „AKU“ shines even when the accumulator is not connected as long as alternating current power voltage 230 V is connected. The LED light „AKU“ does not indicate the status of the accumulator. Diagnosis of the state of the accumulator is carried out and indicated on the circuit board of the REGGAE mini GT communicator.

During operation of the REGGAE mini GTbz communicator by the back-up accumulator, the LED light „AKU“ will shine when the accumulator is connected to the power source circuit board of the REGGAE mini GT communicator. If the circuit source disconnects the accumulator due to its low open circuit voltage (< 8.9 V), the LED light „AKU“ will turn off.

**Safety fuses**

Two safety fuses are located on the power source circuit board. Safety fuse T500mA serves to protect output transformers at source in the case of serious violations of the output circuit source.

Safety fuse F800 mA protects the circuit source against the reserval of poles on the accumulator. It also protects the accumulator in the case of serious violations of the output circuit source.

**Operating time of REGGAE mini GT/GTbz communicators using the back-up accumulator**

The table below shows the approximate times that REGGAE mini GT and REGGAE mini GTbz communicators are capable of operating when using back-up accumulators of 1.2 /1.3 Ah.

Capacity accumulator	Operating time new accumulator	Operating time older accumulator
1.2/1.3 Ah	36 hours	30 hours

The times shown in the table are for standard operation of the communicators (e.g. 10 telephone line communications daily with the AS including news sent on the ARC channel GPRS). Operation of the communicator is expected up to a voltage of 9 V on the accumulators terminal.

The operating times for new accumulators shown in the table are valid when the capacity of the accumulator is 100 % of its voltage rating.

The operating times shown for older accumulators are valid when the capacity of the accumulator is 80 % of its voltage rating. Standard VRLA accumulators usually reach a capacity of 80 % of voltage rating after approximately 2 years of operation at room temperature (20 °C to 30 °C), according to information from the producers of the accumulators.

## INSTALLATION OF THE COMMUNICATOR REGGAE MINI GT/GTBZ

### Location requirements for communicator REGGAE mini GT

Handle the REGGAE mini GT communicator circuit board with care to avoid damaging (breaking) ferrite inductors, particularly on the underside of the circuit board.

Fasten the circuit board into the panel box or into other device with four self-adhesive distance columns (included in the package of REGGAE mini GT communicator). While placing the circuit board of the communicator onto a metal surface, secure the space underneath the bottom side. Check if any surface inequalities are not too close to the board components. The minimum distance between components and the surface must be more than 2 mm.

### Placement requirements for communicator REGGAE mini GTbz

In the back wall of the metal case for the REGGAE mini GTbz there are holes through which all cabling should be pulled. Holes are blocked off during production. Remove the metal discs from holes needed and pull the cabling through into the case of the communicator.

Fasten the communicator case onto the wall using three screws (there are three holes on the back of the metal case designated for these screws). Two holes in the upper corners of the case are adapted for hanging up the case. Fix a screw into the third hole in the middle of the bottom part of the case in order to protect the case from slipping from its hung position.

After installing the metal case on the wall, always check the strength of fixation in order to prevent later injury or property damage caused by the communicator case falling down!

### Connecting the GSM/GPRS antenna

The GSM/GPRS antenna must be placed outside the metal case where the communicator is placed, otherwise proper communication will not be ensured.

High frequency output emitted by an antenna may cause interference to nearby mechanisms that are sensitive to high frequency fields and if the antenna is badly placed, this may cause the disruption of the circuit of the communicator itself. If disruptions occur on the telepho-

ne line or on other parts of the connected mechanism, either change the type of antenna used or place the antenna further away from the interference mechanism.

The coaxial antenna cable designed for interior usage is thin and flexible. Such antenna types are possible to connect without major problems directly to the SMA connector of the communicator. Always make sure to avoid breakage of the coaxial cable (e.g. by not bending into small loops).

It is most common to use thin rod antennas for bands GSM 900/1800, screwed directly on the SMA connector of the REGGAE mini GTbz communicator.

It is appropriate to connect the external antenna and the communicator with a high quality coaxial cable (impedance 50  $\Omega$ ), e.g. type RLH1000. Such cable types cannot be directly connected to the SMA connector of the communicator. To connect inflexible coaxial cables to communicator connectors use short flexible cable reduction with corresponding connectors (e.g. SMA <--> N).

### Connecting the inputs

Connect the insulated voltage inputs and uninsulated input. In the inputs description and in the communicator configuration you will find detailed information about input functions.

### Connecting the output

Connect the relay output. In the relay outputs description and in the communicator configuration you will find detailed information about technical parameters and about output functions.

### Connecting the telephone line

Connect the panel AS telephone line RING/TIP onto the terminal plates marked „R1“ and „T1“ on the communicator REGGAE mini GT circuit board.

Detailed information about technical parameters and about telephone communication functions can be found in the description of the telephone section of communicator and in the description of communicator configuration.

In case of problems during communication of the AS panel with the circuit board of the REGGAE mini GT communicator, monitor the telephone line in order to remove the defects.

### Power supply connection to the communicator REGGAE mini GT

Connect power supply 10 – 15 VDC to the communicator REGGAE mini GT. Conduction of the supply voltage wires, which is used for communicator, must be secured against possible circuiting sabotage. Therefore it is inappropriate to use the same power supply as for the sensors, where short-circuiting in this often easily accessible charge would cause the communicator to malfunction. It is necessary, that on the terminal plates of the communicator, parameters of charging voltage are respected (according to details listed in the communicator instructions for voltage supply). Detailed information of power supply technical parameters can be found in the instructions for supplying REGGAE mini GT communicators.

### Power supply connection to the communicator REGGAE mini GTbz

Connect the power supply 230 VAC of the communicator REGGAE mini GTbz to the terminal plates "PE", "N" and "L" on the power source circuit board. **The communicator must be always connected to the protective conductor of the grid 230 V.** Carry out connection to the 230 V grid by using a flexible supply line with a forked plug or by fixed supply. **Flexible supply lines must lead through bushing.** Inside the bushing this must be well fixed to avoid being pulled out. The bushing also protects the supply line against abrasion of the insulation caused at the sharp corners of the case. **The network forked plug of the flexible supply line serves as a means for disconnecting the communicator from the grid. The power socket must be close to the device and must be easily accessible. Overcurrent protection must be part of the installation of the socket.** If necessary, the flexible supply line with forked plug can be replaced by fixed connection. **Fixed inflow connection must be performed only by a person with a valid certificate for such activity! When connecting the fixed inflow, there must be an appropriate disconnecting medium implemented as part of the electrical installation in the building. The nominal value of superposed overcurrent protective element can be maximum 16 A.** Detailed information about the technical parameters of supply voltage can be found in the description of the power supply of the communicator REGGAE mini GTbz.

### Configuration and testing the communicator

Configure the communicator locally on PC by using programme NAM manager (connecting via serial/USB port), or remotely again by using the NAM manager programme. The configuration process is listed in the user manual of the NAM manager programme.

Test all of the installed communication channels (communication with panel AS, communication with ARC over GSM/GPRS). Then also test functions of all installed inputs and outputs. For testing preferably use a serial/USB port connection to PC and programme NAM manager. Detailed information about testing options are listed in the user manual of the programme NAM manager, in description of diagnostics of the communicator. For cursory communicator function testing, status indication via LED LD1 to LD4 can be used.

## MESSAGE RECEPTION FROM REGGAE MINI GT/GTBZ COMMUNICATORS

We use a NSG Receiver for receiving messages from REGGAE mini communicators. The receiver can communicate with ARC via TCP/IP or via serial port (optional accessories) by universal format Sur-Gard. This format is supported by almost all common software for ARC.

### Basic parameters of the NSG Receiver

- Main channel for communication with NSG: Encrypted connection via internet
- Backup channel for communication with NSG: GSM/GPRS
- Output Sur-Guard: Serial (assisted by MOXA convertor) or via TCP/IP
- Number of connectable devices (REGGAE): 0xFFFF = 4095
- Formats of output codes: 4+2, Contact ID, BSD

The table of occurrence codes from the REGGAE mini communicator can be found in the separate manual for the NSG Receiver, document 1.60.

NAM<sup>®</sup>technology



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