



renkforce

® Operating Instructions

GSM Alarm Device with GPS Tracking „GX111“

Item No. 1168681



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1. Introduction

Dear Customer,

thank you for purchasing this product.

This product complies with the statutory national and European requirements.

To maintain this status and to ensure safe operation, you as the user must observe these operating instructions!



These operating instructions are part of this product. They contain important notes on commissioning and handling. Also consider this if you pass on the product to any third party. Therefore, retain these operating instructions for reference!

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If there are any technical questions, please contact:

International: www.conrad.com/contact

United Kingdom: www.conrad-electronic.co.uk/contact

2. Explanation of Symbols



An exclamation mark in a triangle indicates important notes in these operating instructions that must be strictly observed.



The „arrow“ symbol indicates that special advice and notes on operation are provided here.

3. Intended Use

The product serves to monitor your property. It must not be used to monitor persons.

Sensors for shock, position change, brightness measurement, temperature measurement and external accessories for noise level measurement (via external head set with 4-pin round plug).

The integrated GPS receiver serves precise determination of the position, GeoFence monitoring and tracking of position data.

All functions can be controlled remotely by text message.

Any use other than that described above can damage the product and may involve additional risks such as short circuit, fire, electric shock, etc.

No part of this product must be modified or converted.

The safety information must be observed at all times!

This product complies with the statutory national and European requirements. All company names and product names are trademarks of their respective owners. All rights reserved.

4. Scope of Delivery

- GX111 with rechargeable battery
- CD with detailed operating instructions (PDF format)
- Brief instructions
- Mini USB cable

The following accessories are needed for operation. They are not enclosed:

- Micro-SIM card (either a prepaid card or a conventional contract card)



Important!

Set the PIN of this card to 1513 before inserting it into the GX111.

- Phillips screwdriver (size to match M2 screws) to open the cover flaps

5. Safety Information



The guarantee/warranty will expire if damage is incurred resulting from non-compliance with these operating instructions. We do not assume any liability for consequential damage!

Nor do we assume any liability for damage to property or personal injury caused by improper use or failure to observe the safety information. The warranty/guarantee will expire in such cases!

- For safety and approval reasons (CE), unauthorised conversion and/or modification of the device are not permitted. Never dismantle the product.
- The product is not a toy and must be kept out of reach of children. The product contains small parts and a rechargeable battery. Operate the product in a way that it is out of reach of children.
- Do not use this product in hospitals or medical facilities. The GSM radio signals may cause functional impairment in life-maintaining systems. The same may apply in other areas.
- Handle the product with care; impacts, shock or fall even from low heights will damage it.
- The product only serves to trigger alarms but does not relieve the user from his diligence obligation.

The GPS functions only serve to monitor property. You are personally responsible for compliance with the statutory requirements for further monitoring.

- If you find any damage at the product, stop operating it and take it to a specialist workshop.
It can be assumed that safe operation is no longer possible if:
 - the product is visibly damaged
 - the product no longer functions
 - the product was stored under unfavourable conditions for an extended period of time
 - if it was subjected to heavy stress during transport
- If the product is brought from a cold into a warm room (e.g. in transport), it is possible that condensation develops.
Therefore, first let the product reach room temperature before connecting it to the power supply. This may take several hours.
- Do not leave the packaging material lying around carelessly as it can become a dangerous toy for children.
- If there are any questions that are not answered in this operating manual, contact our technical support or another expert.

6. Notes on Rechargeable Batteries

- Batteries do not belong in the hands of children.
- Do not leave rechargeable batteries lying around openly. Children or pets may swallow them. If swallowed, consult a doctor immediately.
- Leaking or damaged rechargeable batteries may cause caustic burns if they come into contact with skin. Therefore you should use suitable protective gloves for this.
- Liquids leaking from rechargeable batteries are chemically highly aggressive. Objects or surfaces that come into contact with them may take severe damage. Therefore, keep rechargeable batteries in a suitable location.
- Make sure that rechargeable batteries are not short-circuited, dismantled or thrown into fire. There is a danger of explosion!
- Always observe correct polarity (observe plus/+ and minus/-) when connecting the rechargeable battery to the GX111.
- Use only the enclosed rechargeable batteries or accessory rechargeable batteries of the same build to supply the GX111 with power.
- If not used for a longer period (e.g. in case of storage), remove the inserted rechargeable battery from the GX111. If the rechargeable battery is too old, it may leak and cause damage to the product, which leads to the cancellation of the warranty/guarantee!
- A damaged rechargeable battery must no longer be used. Dispose of it in an environmentally compatible manner.
- Read chapter „Disposal“ about the environmentally friendly disposal of batteries.

7. General Information

These operating instructions describe the function and operation at the time of printing (27 January 2014). Changes that serve product improvement can be performed by the manufacturer at any time. The most recent operating instructions will be provided on the associated product page on www.conrad.com in a timely manner.

The GX111 has an update function. However, an update should only be performed to solve wrong behaviour. Every update process has risks (e.g. cancellation during the update, etc.). It must be assumed that the product must be sent to the manufacturer after a defective update process.

In the following, the most important items that you must observe when using the product are noted.

→ All text message answer examples are to be understood symbolically. Actual implementation may vary. The examples should only show the information on the format and writing to be expected.

Prior to commissioning of the product, check whether it is generally suited for the intended application!

If in doubt, ask a suitable specialist.

a) General Descriptions

This product is to be used to monitor the customer's property. In case of alarm, its task is to inform the customer of it by text message as quickly as possible.

It may monitor shock, position changes, brightness differences and temperature. Noise measurement requires an external microphone (4-pin jack plug) (not part of the delivery, can be ordered separately). In case of alarm, the GX111 sends an alarm text message to up to 4 stored phone numbers.

The GPS receiver is used to determine and monitor GPS zones („GeoFence“), i.e. a place or area where the product may be present.

The product is designed for maximum battery life. The regular condition is sleep mode, where only the configured sensors are active. They wake up the module to send text message alarms if a threshold is exceeded.

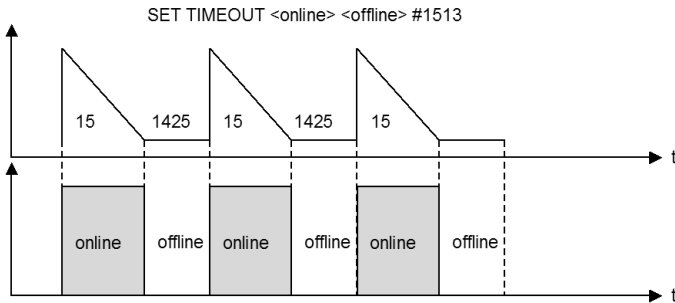
Apart from this, the module will wake up every 24 h, e.g. for 15 minutes (default) and will check for any text messages received. Upon receipt of a text message, the „ONLINE“ timeout is reset and can be considered further. During this time, e.g. the current position can be determined. For this it is possible to have a link to OpenStreetMap.org (open-source map provider) sent by text message command.

Furthermore, the product may also record and save (track) the current GPS position. These saved data can be read by USB.

b) Operating Mode

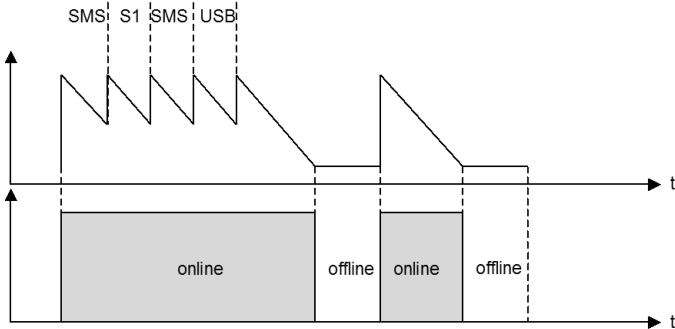
The product is optimised for the longest battery life. This is achieved by targeted deactivation of the GSM-/GPS-module („OFFLINE“ mode).

For the product to continue to be available, the GSM module will wake up automatically after a specific time („ONLINE“ mode) and check whether there are any new text messages. The standard settings are 15 minutes for the „ONLINE“ mode and 1425 minutes for the „OFFLINE“ mode (15 +1425 = 1440 minutes = 24 h). The „TIMEOUT“ command can be used to change these settings on demand (described farther towards the back of these instructions).



A sensor alarm or push on the external button „S1“ will wake up the module at once.

Each user activity (text message, USB data) will also reset the active timeout; you will have 15 minutes' time (by default) again after each action.



c) Alarm Mode

There is the important alarm mode in parallel to and independent of the operating mode. This mode defines whether the GX111 is „armed“ as an alarm device and may send text message alarms when sensors are triggered and optionally issue an alarm sound.

The conditions are as follows:

ENABLE ALARM #1513

The alarm mode is switched on.

DISABLE ALARM #1513

The alarm mode is switched off.

Alarm mode on:

This mode is entered via the command „ENABLE ALARM #<PIN>“. Whether the alarm mode is active or not can only be requested via the command „TEST STATUS #1513“. If the alarm mode is on and recognises an alarm incident via an activated alarm source (shock, position, microphone,...), all phone numbers in the phone book of the GX111 (not the SIM card!) will receive the corresponding alarm text message and an optional alarm sound can be issued.

Alarm mode off:

In this mode, GSM costs arise only when an action performed by you causes a reaction of the GX111. The GX111 only sends answer text messages when a text message with the correct PIN has been received. The GX111 does not send out any alarm text messages on its own.

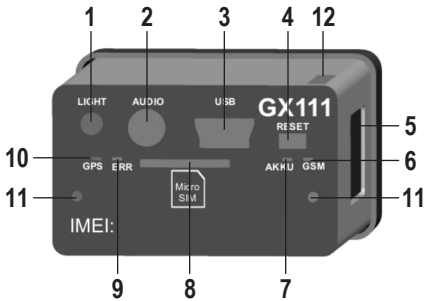
→ The alarm mode is (deliberately) off by default.

Observe that high costs may arise from sending text messages (particularly abroad), depending on how the GX111 is configured.

d) Housing/Operating Elements

→ The GX111 has no further labels or LEDs on the outside because it is to be as unobtrusive and merge with its environment as well as possible.

The figure shows the housing without the front cap.



- 1 Light sensor „LIGHT“
- 2 Jack socket „AUDIO“
- 3 USB-socket (charging rechargeable battery)
- 4 Button „RESET“ for resetting
- 5 Button „S1“ (wake up)
- 6 „GSM“ LED (green)
- 7 „AKKU“ LED (yellow)
- 8 Micro-SIM card holder (set the card's PIN to 1513!)
- 9 „ERR“ LED (red)
- 10 „GPS“ LED (blue)
- 11 Screw connection
- 12 Position of the GPS receiver in the housing

Find the description of the operating elements below:

- 1 Light sensor „LIGHT“

The light sensor measures the ambience brightness. The alarm value is set from 1 (bright) to 10 (dark). When the set brightness value is exceeded, an alarm message is sent. This may be used to detect, e.g., opening of a cabinet or gate (light ingress) (command „LIGHT“).

As a special product feature, the light sensor reacts to the entire visible and invisible light spectrum from UV (ultraviolet, e.g. UV-lamps) to IR (infrared, e.g. IR-remote controls).

Therefore, place the GX111 correctly before assuming incorrect triggering.

2 Jack socket „AUDIO“

An external microphone can be used to measure the ambience sounds and recognise an alarm if an adjustable reference volume of 1 to 10 is exceeded. This can detect events from the environment that would be invisible to the other sensors (command „VOICE“).

The connection also has an audio output for use of an active, external speaker to issue an alarm sound. This way, the product can draw attention to itself or scare off a burglar.

The jack socket is also intended for connection of future expansions. If the corresponding expansions are available, this is reported on the website for the product on www.conrad.com.

→ Only officially released accessories must be connected to this socket.

Therefore, always observe the information on the website for the product www.conrad.com.

3 USB-socket (charging rechargeable battery)

The rechargeable battery of the GX111 is charged via the USB socket and an interface is provided for control/configuration of the GX111. Permanent operation (power supply) via USB is possible as well.

Connected to the PC, a driver is needed for the „virtual COM port“ so that the GX111 can be configured/controlled via USB and a firmware update performed. The required software and firmware files are available online at www.conrad.com, in the download section for the product.

→ The GX111 must only be used with the officially provided software (download area on the product website).

4 Button „RESET“ for resetting

This button is used to restart the GX111.

In combination with the button „S1“, the GX111 is reset to factory settings. For more information, see chapter „Factory settings“ farther back in these operating instructions.

5 Button „S1“ (wake up)

This button wakes up the GX111 so that it can be configured in the „ONLINE“ mode via text message. USB configuration is only possible in „ONLINE“ mode either.

The button for panic alarm can be configured as well. Once the button is pushed, a text message alarm is sent when the alarm mode is activated (command „S1“).

6 „GSM“ LED

This LED is used to recognise the activity and status of the GPS module in the GX111. In the „ONLINE“ mode, this LED will always flash or be lit.

A more detailed description of this LED is found in the chapter on description of the error codes and LED flashing sequences.

7 „AKKU“ LED (yellow)

The internal rechargeable battery is charged and monitored via a charging electronic system in the GX111. For more information, see the chapter on description of the error codes and LED flashing sequences.

8 Micro SIM card holder

The micro SIM card holder is used to hold any micro SIM card.

→ The GX111 can only be activated with the micro SIM card inserted. The SIM card holder recognises insertion of the card and releases the remaining hardware of the GX111.

Without the inserted SIM card, only charging of the rechargeable battery via USB is available, but no other functions!

Observe that considerable costs may arise from mobile phone data consumption when using the SMTP and GPRS functions.

9 „ERR“ LED (red)

This LED is used as „Error“ LED and will inform of activities or errors according to the chapter on description of the error codes and LED flashing sequences.

10 „GPS“ LED (blue)

This LED indicates activities of the GPS module. Also observe the chapter on description of the error codes and LED flashing sequences.

11 Screw connection

The cover cap is attached here.

12 Position of the GPS receiver in the housing

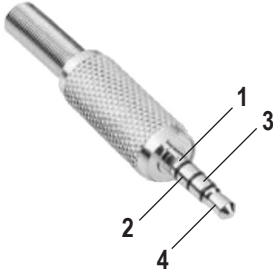
To warrant best GPS reception, the GX111 must have a free view of the GPS satellites in the sky.

e) Description of the Connections

The product has two external connections, one 3.5 mm jack socket and a USB socket.

Jack socket:

This is a special 3.5 mm jack socket with 3 signal lines and GND.



- 1 Microphone input for regular Elektret microphones
- 2 GND-connection
- 3 Audio output
- 4 Expansion

The microphone is used for sound monitoring („VOICE“ alarm) and listening in on ambience sound („INCALL“, not for person monitoring).

The audio output is configured using the command „ALARMSOUND“ and can issue a signal at alarm.

→ There is only low output power at this audio output, e.g. for headphones, e.g. of a headset. More power requires an external end stage or active speaker.

The expansion pin is used to connect further sensors and actors via a single-wire connection.

If the corresponding expansions are available, this is reported on the website for the product on www.conrad.com.

→ Only officially released accessories must be connected to this socket.

Therefore, always observe the information on the website for the product www.conrad.com.

USB socket:

This connection is used to charge the rechargeable battery of the device with a charging current of 100 mA. This does not require drivers and any commercial USB plug-in mains unit can be used.

A higher charging current (500 mA) requires release from a USB host (e.g. PC with USB-port). Only then will the charging times described in the technical data be available.

Data communication takes place via a standard USB chip that signs on to the Windows-PC as a virtual COM port. The corresponding driver can be procured either from www.conrad.com or directly from the manufacturer's website:

<http://www.ftdichip.com/Drivers/VCP.html>

f) Notes on Use

- There is no prescribed usage position.
- When using the USB or jack socket, observe that there is enough room for the plugs. Lateral forces on the plugged-in plugs can lever the sockets from the PCB and thus cause irreparable damage, loss of warranty/guarantee!
- To warrant the device function, choose a site of use where the GMS network reception is as good as possible and the GPS signal can be received.
- The product should be taken to a site where object shock can be measured („SHOCK“ alarm).

g) Notes on Connection

- The external cables must be kept as short as possible and remaining line lengths must not be coiled. The maximum line length is 3 m.
- Too-strong temperature fluctuations may lead to temporary impairment and require manual reset in extreme cases.
- The product is not intended for the „Safety“ area and also does not correspond to any SIL/ASIL level.

8. Commissioning - First Steps

The following is needed for operation and configuration of the device:

- A conventional mobile phone that permits insertion of a micro SIM card for configuration of the GX111.
→ If your mobile phone is not equipped for use with a micro-SIM card, you will need the corresponding adapter.
- An additional micro SIM card for the GX111
- A USB port (PC, notebook or included mains adapter) with USB cable
- A small Phillips screw driver for M2 screws to remove the covers of the GX111

a) Assembly and Charging of the Product

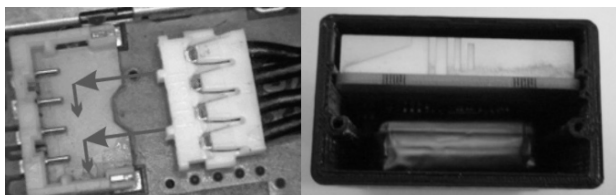
The product is delivered with the rechargeable battery inserted. However, it is not connected to prevent deep discharge.

Therefore, the housing of the GX111 must be opened and the PCB removed for first commissioning. Then the rechargeable battery can be connected and the GX111 assembled again.

Particularly observe the following items during assembly:

Rechargeable battery connection:

There is a connection for the rechargeable battery on the PCB side with the SIM holder right next to it. The plug is pushed onto the holder from the top. The plug is protected against polarity reversal.



Rear cover (without opening for light sensor)

The cover is firmly screwed to the housing and covers the large opening with the PCB and the rechargeable battery. The cover must be removed to replace the rechargeable battery. Then the PCB with the rechargeable battery can be pulled from the housing.

When putting it together, observe that the seal on the cover inside is placed cleanly and has no damage.

The rubber washers also must be used for screwing to ensure best weather resistance.

Front cover

This cover covers all connections and status LEDs and has only a transparent opening for the light sensor. Only this cover needs to be unscrewed for regular access to the product (USB, SIM, etc...).

The requirements to assembly of the front cover are the same as for the internal cover. However, observe that the transparent opening should be checked for contamination so that the light sensor can work properly.

b) Changing the PIN Code to „1513“

Every SIM card has a PIN code. Because this GSM product uses its own PIN processing for reasons of safety, the SIM card PIN code must be changed to that of the product.

The following steps are required for this:

- The micro SIM card intended for the product must be inserted in a mobile phone. If your mobile phone is not equipped for use with a micro-SIM card, you will need the corresponding adapter.
- According to the operating instructions of the mobile phone, the PIN code must be changed to 1513.
- The micro SIM card with the changed PIN code must be removed from the mobile phone.
- The micro SIM card with the changed PIN code can now be inserted into the GX111 (see next chapter).

→ We urgently advise against deactivating the SIM card PIN query. In addition to the risk at theft and connected illegal use, deactivation of the PIN function means that the device is used in a non-intended mode. There may be functional errors!

c) Micro SIM Card Insertion

The micro SIM card with the PIN number „1513“ must be inserted in the intended SIM card holder of the GX111.

After insertion of the micro SIM card, the GX111 is switched on.

During starting of the GX111, the „ERR“ LED flashes at an interval of one second. After a short time, the „GSM“ LED will flash green (in intervals of ½ second) (network scanning) and after a few seconds, the „GSM“ LED should change its flashing pattern.

If the „GSM“ LED does not change its flashing pattern, there is no connection to the GSM network. In this case, the network quality and function of the micro SIM card at the site of the GX111 must be inspected with a separate mobile phone.

Use a mobile phone to check if the SIM card is activated at all. If the mobile phone cannot log into the GSM network with the set PIN 1513, there is a problem with the SIM card. In this case, contact the provider of the SIM card.

If an error occurs while connection to the GSM network is established, it is signalled with the „ERR“ LED. In this case, push the „RESET“ button at the GX111.

→ If the GX111 used to be used with another SIM card, there is the option of the PIN number in the product being changed and now no longer matching the default setting „1513“. In this case, the GX111 must be reset to factory settings (see corresponding chapter farther back in these operating instructions), then the PIN of the micro SIM card must be set to „1513“ in the mobile phone.

The micro SIM card may have been locked in the meantime and must be unlocked with the PUK. In this case, use a separate mobile phone and unlock the micro SIM card.

9. Configuration via Text Message

To receive the full functional scope of the GX111, it must first be configured. The entire configuration is performed by simple text message commands you send to the GX111 (the phone number of the micro SIM card in the GX111) from your mobile phone.

This method makes it possible to activate, deactivate or change the settings of the GX111 from anywhere.

Alternatively, the GX111 can be configured via the USB interface using PC software (available via www.conrad.com).

→ These operating instructions do not deal with configuration via PC software. This only describes how the product can be controlled via a mobile phone, without any other aids.

To protect against unauthorised access, the GX111 generally reacts to authenticated messages only. In a text message, you authenticate yourself by including the correct SIM PIN of the GX111 (not the one of the mobile phone on which the text message has been written!).

For your own safety, the SIM PIN number must be changed under all circumstances after commissioning of the product. This is described in the corresponding chapter.

If the GX111 is in „OFFLINE“ mode (control commands via text message are not possible), the GX111 can be put into „ONLINE“ mode by pushing the button „S1“ on its side. The standard settings are 15 minutes for the „ONLINE“ mode and 1425 minutes for the „OFFLINE“ mode (15 + 1425 = 1440 minutes = 24 h).

Introduction into the command format

The text messages to program the GX111 are set up according to the following chart:

<ACTION> **<FUNCTION>** **<PARAMETER1>** **<...>** **<#PIN>**

Examples:

SET	TEL1	+49177556644221		#1513	(phone book)
RESET	TEMP			#1513	(alarm off)
TEST	TEMP			#1513	(query)
ENABLE	ALARM			#1513	(alarm on)
DISABLE	ALARM			#1513	(alarm off)



Important!

Every text message sent to the GX111 must end with the PIN set as protection. Without „#<PIN>“ at the end of the text message, it is discarded and no answering text message will be generated!

The commands and parameters must be separated by a single space each.

If the GX111 does not react, it may be in „OFFLINE“ mode. Push the lateral button „S1“ to wake it up.

„ACTION“

The „ACTION“ commands permit the following:

- SET = switch on / activate / configure
- RESET = switch off / deactivate / factory settings
- TEST = test / check / request
- ENABLE = activate the alarm system (only for the function „ALARM“)
- DISABLE = deactivate the alarm system (only for the function „ALARM“)

→ Note on the „RESET“ command:

If a function is to be switched off or reset due to an error, the corresponding „RESET“ action must be used with the corresponding function word! This action is universally applicable to all functions/text message commands and resets the corresponding function to the default settings.

„FUNCTION“

This is used to select the function you want to change or perform:

- TEL1 = phone book entry no. 1
- NAME = Name of the GX111

„PARAMETER“

Both the presence and the number of parameters depend on the function and action used. Therefore, most „RESET“ actions have no parameters while „SET“ actions without parameters are rather rare (what should be set to which value).

A parameter may be the following:

- List: You may choose a parameter from a pre-defined list.
e.g.: DE, EN
Writing: <DE/EN>
- Number: An integer without decimal digits.
e.g.: 60 = time [seconds] (SET IDLEALARM 60 #1513)

More information:

- Capitalisation is not relevant; you may use capital and small letters as you wish.
- Every new command of the same function will overwrite the previous settings.
- After every valid text message command, the GX111 will send a text message answer to confirm programming to your mobile phone (if the PIN in the text message command was correct).

10. Functional Descriptions

→ The following examples assume that the PIN is „1513“.

The action „TEST“ ALWAYS contains answering with the correct parameters for the function and thus is not indicated. Several functions share one answer text message to use the maximum of a text message.

The action „RESET“ is ALWAYS resetting of a function to the factory settings (all parameters). Deviations are indicated separately below.

a) Determining „STATUS“

The command „STATUS“ returns a summary of the most important settings and conditions of the GX111.

TEST STATUS #1513

Then the GX111 sends an answer text message.

Example (the right column shows only a description; it is not contained in the text message):

GX111 01.XX	Name of the GX111, firmware version
GSM: 59%	GSM signal strength
GPS: on	GPS receiver is on
TEMP: 28 C	Currently measured temperature
Accu: 75%	Current charge condition of the rechargeable battery
Slope: 0 degree	Measured position angle 0° or no reference angle set
Diagnose: off	Diagnosis mode off
Alarm: Disabled	Alarm treatment via text message deactivated

b) General Configuration Commands

This sub-chapter describes all general configuration commands.

1. Changing the PIN Code („PIN“)

To secure the GX111 from unauthorised access, the standard PIN „1513“ may be set to any other value. The PIN code can be changed as follows:

SET PIN <new PIN> #<old PIN>

Example: Changing old PIN 1513 to new PIN 1234:

SET PIN 1234 #1513

For every new text message command, the new PIN code now has to be appended (to stick with the example: 1234), preceded by a crosshatch (#). If the wrong PIN code is entered or the PIN code is not sent, you will not receive an answering text message. Changing of the PIN code will change both the settings of the product and the PIN code of the micro SIM card! The PIN code always has 4 digits.

There is no „TEST“ action for testing this function.

→ If you lose the PIN code, the GX111 can be reset to factory settings (see chapter „Factory Settings“). All settings will be lost when resetting! Then the device must be set again.

Resetting the GX111 to factory settings will not affect the micro SIM card. The PIN code of the micro SIM card is not changed.

2. Changing the Device Name („NAME“)

If several GX111 are operated at the same time, it is recommended to assign a different name to each GX111. This makes it easier to assign alarm messages to the correct device.

→ The device name has a maximum length of 20 characters.

To change the name at your GX111, send the following text message command:

SET NAME <new name> #1513

Example: Renaming to „NEWNAME“:

SET NAME NEWNAME #1513

You will receive the following confirmation text message:

NEWNAME GX111 1.xx

To reset the device name to factory settings (no name), use the following command:

RESET NAME #1513

3. Setting the Language (Function „LANGUAGE“)

The GX111 sends alarm text messages in the German language. If the text messages are to be sent in the English language, send the following text message command to the GX111:

SET LANGUAGE EN #1513

To receive the text message in German again, send the following text message command to the GX111:

SET LANGUAGE DE #1513

4. Administration of the Phone Book (Functions „TEL“, „TEL1“,...)

The GX111 can save up to 4 phone numbers. In case of alarm, a notification text message is sent to each of these phone numbers. These phone numbers can also use the function „INCALL“.

→ If the same number is in the list several times, it will receive the same text message as many times.

The GX111 may process phone numbers in national and international format. However, the international format should be used at all times, since use otherwise may cause problems.

Example: 0172/xxxxxxx (national) becomes +49172xxxxxxx (international)

Saving Phone Numbers

Use the following command to save a phone number in the GX111:

SET TEL1 +49111... #1513

SET TEL2 +49222... #1513

SET TEL3 +49333... #1513

SET TEL4 +49444... #1513

There is the option of programming several phone numbers in a single command, e.g. 3 phone numbers (TEL1 to TEL3):

SET TEL1 +49111... +49222... +49333... #1513

Concurrent programming of phone numbers is possible with a list starting from the indicated phone book entry and ending at the last phone book entry as follows:

SET TEL1 <tel-nr1> <tel-nr2> <tel-nr3> <tel-nr4> #1513

SET TEL2 <tel-nr2> <tel-nr3> <tel-nr4> #1513

SET TEL3 <tel-nr3> <tel-nr4> #1513

SET TEL4 <tel-nr4> #1513

After sending the command „SET TEL1...“, you will receive a text message answer with a list of saved phone numbers:

GX111 1.xx

TEL1: +49111...

TEL2: +49222...

TEL3: +49333...

TEL3: +49444...

Deleting the phone numbers saved

To delete phone number 1 and 3, for example, you need to send two text messages:

RESET TEL1 #1513

RESET TEL3 #1513

After sending the command „RESET TEL...“, you will receive a text message answer.

Testing phone numbers

To check the phone numbers stored in the product, use the following command:

TEST TEL #1513

The text message commands (SET TEL1, SET TEL2, SET TEL3,...) with a specified phone number only change the phone number of the corresponding memory. The numbers of the other phone book entries are retained.

5. Sound Signal when Triggering Alarm („ALARMSOUND“)

Due to the small size of the GX111, it may be of disadvantage if the product draws attention by an alarm sound. Unauthorised persons would be able to destroy the product to prevent notification.

Therefore, the GX111 has no installed speaker and can only generate a sound via an external speaker. To use the alarm sound you first need an adapter for the jack socket to which the external, active speaker is connected. Only after correct connection of the external (active!) speaker will this command have any recognisable function.

→ Activating this function activates a usually deactivated hardware component that requires the corresponding energy. Depending on load at the speaker output, the battery life will reduce drastically, possibly even if no sound is heard.

The following command will immediately output a sound signal for 1 second.

SET ALARMSOUND #1513

The alarm sound signal can be set as follows:

SET ALARMSOUND <Alarm position> <Duration> #1513

Position: 1 = Alarm sound after alarm text message dispatch

2 = Alarm sound immediately after the alarm occurs

Duration: 1 to 255 seconds (default setting: 60 seconds)

E.g. to deactivate the alarm sound signal:

RESET ALARMSOUND #1513

To activate the alarm sound signal for 30 seconds after all alarm text messages have been sent:

SET ALARMSOUND 1 30 #1513

c) Configuration of the Sensors

The GX111 has various sensors that can be used to trigger an alarm. The shock sensor reacts to mechanical shock, e.g. when an object drops down.

The position sensor recognises inclinations/position changes and falling over of the object.

The brightness sensor can record a change of brightness of the ambience lighting, e.g. opening of a drawer (the sensor also recognises UV and IR light).

An externally connected microphone can be used to monitor sounds.

Whether alarm is triggered at all (sending text message and possibly issuing sound signal) is centrally controlled by the command „ENABLE ALARM“ or „DISABLE ALARM“.

The following commands are used to configure which of the sensors are allowed to trigger alarm at once and where the acceptance thresholds are.

Every sensor's sensitivity can be set. The best sensitivity settings depend on many factors such as installation site, object size, etc. and must be found individually by testing. The command „SET DIAGNOSE“ can be used for this.

→ Each activated sensor will consume energy. This reduces the battery life accordingly.

To give you time to react to the event, the sensor is deactivated for a specific period of time (default setting: 2 minutes) after an alarm and cannot send any new alarm text messages. Particularly with fast sensors, such as shock sensors, the „IDLEALARM“ function reduces the dispatch of text messages.

1. Setting Support („DIAGNOSE“)

This command is used to make the sensors easier to configure. After activating the diagnosis mode, exceeding of the thresholds (triggering of an alarm) is displayed by a permanently lit „ERR“ LED.

If the threshold is undercut (alarm is not triggered), the „ERR“ LED is off. No text message is sent. The basis is the current sensor configuration. The diagnosis mode is available for alarms „VOICE“ (sound alarm), „SHOCK“ (vibration alarm), „LIGHT“ (brightness alarm) and „SLOPE“ (position change alarm).

→ It is not possible to differentiate between which sensor was responsible for triggering. Therefore, the individual sensors should be tested separately.

The function „DIAGNOSE“ is only functional when the alarm mode is on („ENABLE ALARM“).

The following command is used to activate this function:

SET DIAGNOSE #1513

ENABLE ALARM #1513

The following command is used to deactivate it:

DISABLE ALARM #1513

RESET DIAGNOSE #1513

→ The function „ALARMSOUND“ can be used to check the effects of <IDLEALARM>. The command „DIAGNOSE“ keeps the GX111 from sending text message alarms. The parallel function „ALARMSOUND“, in contrast, is not impaired by diagnosis mode.

2. Shock („SHOCK“)

This sensor reacts to shock from any direction. An internal measured value is determined that is derived from the acceleration. Even movements and permanent accelerations below the threshold do not trigger alarm.

The following command sets the threshold for shock to the value <threshold> and the minimum time for occurrence of the shock to 1 second:

SET SHOCK <threshold> #1513

Threshold: 1 - 10 (1 = minimum sensitivity, 10 = maximum sensitivity)

The following command sets the threshold for shock to the value <threshold> and the minimum time for occurrence of the shock to <trigger time>.

SET SHOCK <threshold> <trigger time> #1513

Threshold: 1 - 10 (1 = minimum sensitivity, 10 = maximum sensitivity)

Trigger time: 1 - 255 (seconds); this corresponds to the time that a shock must persist before an alarm is triggered.

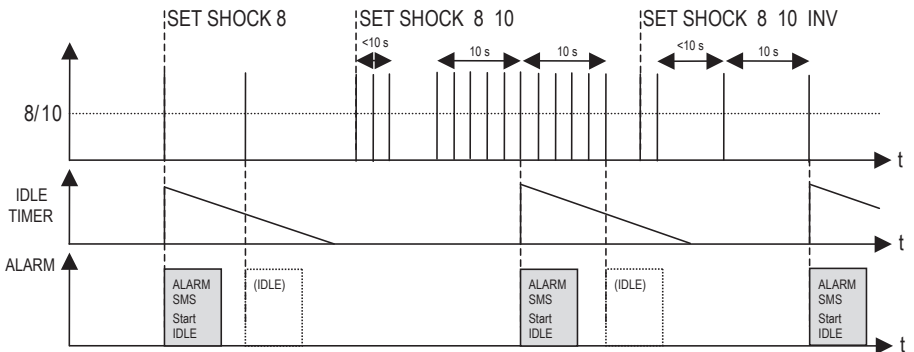
The following command sets the threshold for shock to the value <threshold> and the minimum time during which no shock occurs to <trigger time>. The additional parameter „INV“ inverts the alarm criteria, i.e. the alarm is triggered if there is no shock for a set period of time.

SET SHOCK <threshold> <trigger time> INV #1513

Threshold: 1 - 10 (1 = minimum sensitivity, 10 = maximum sensitivity)

Trigger time: 1 - 255 (seconds); this corresponds to the time that a shock must not occur before an alarm is triggered.

The interrelation of shock, trigger time, idle alarm and alarm is illustrated below:



Description:

The top line shows the „shock impulses“ above the set shock threshold „8/10“. Above it, it has been marked from when onwards which „SHOCK“ settings are valid.

The middle line shows the „IDLE TIMER“ described in the chapter on the command „IDLEALARM“. The „IDLE TIMER“ defines the shortest distance between two text message alarms. This is particularly important for fast alarm sources that would otherwise cause many alarm messages to be sent before you can react (e.g. shock from movement of a stolen vehicle).

The bottom line shows when the sensor would trigger an alarm message („ALARM SMS“) at the valid settings and which ones would be blocked by the „IDLE TIMER“ („IDLE“).

„SET SHOCK #1513“ (without time) or „SET SHOCK 1 #1513“ (time = 1 s) cause immediate alarm once a shock is above the threshold. The shock is measured at 250 kHz. When the alarm is triggered, the „IDLE TIMER“ is started at the same time. During this time, the sensor cannot trigger a new alarm even if the condition for a new alarm would be present.

„SET SHOCK xxx #1513“ (xxx = time indicated in seconds) requires all (!) sensor values to be above the shock threshold within these, e.g., 10 seconds.

→ Observe that a measurement takes place every second. Accordingly, the vibration must not cease or drop below the sensor threshold for more than 1 second since this would restart the time indication (10 seconds).

This also applies to inverted mode („INV“), where a time needs to be indicated as well. However, the distance between the shocks is measured here. If the time sets above the set trigger time, an alarm is generated.

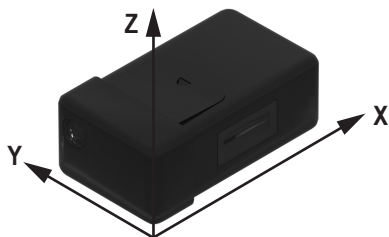
3. Position Change („SLOPE“)

The same sensor as for „SHOCK“ is able to determine the direction of gravity and thus define the current position of the GX111. If the GX111 changes its position (angle, not location!), this may be used to trigger an alarm.

It is not important which axis the product turns around, but that each axis is looked at separately.

→ Thus, a diagonal can lead to a higher total angle than permitted. This must be observed when determining the threshold.

The axes run along the housing edges.



The following command sets the threshold of a position change to <slope threshold>. At the time, the current position in space is saved as a reference value. If the position deviates from the set reference value by the set threshold, an alarm is triggered.

SET SLOPE <slope threshold> #1513

Threshold: 1 - 180 (1 = minimum slope in degrees, 180 = maximum slope in degrees)

→ Note:

As a threshold, the angle change to the position is set in which the product was at the time of „SET SLOPE...“.

The currently measured value for „STATUS“ is also based on this reference position.

There is no differentiation between the individual axes; the measured value of the axis with the highest deviation is assessed and displayed at all times.

Diagonal angles are not considered.

A „diagonal“ zero position of the GX111 can reduce the accuracy of the angle calculation. The GX111 therefore should always be in parallel with the surface of the earth on the one side.

4. Brightness Change („LIGHT“)

At the front, there is a brightness sensor that can be used to monitor light intensity.

The following command measures the current ambience brightness and sets the next-higher (!) threshold as reference. When this (higher) threshold is exceeded, alarm is triggered.

SET LIGHT #1513

The following command specifies the indicated ambience brightness threshold. When this threshold is exceeded, alarm is triggered.

SET LIGHT <threshold> #1513

Threshold: 1 - 10 (1 = minimum sensitivity, 10 = maximum sensitivity)

Example: 1 = GX111 in a dark room will recognise light

10 = GX111 in a bright room will recognise additional light

Deactivate the alarm with the following command:

RESET LIGHT #1513

→ The sensor has a wider range than the human eye. Accordingly, observe light sources outside of the visible range (IR = infrared and UV = ultraviolet), particularly in case of continuous wrong alarms.

The cap and its window for the sensor reduce sensitivity and the measurable spectrum of light. You need to consider the effects depending on site of use; in any case, check that the alarm is triggered correctly at the installation site of the GX111.

5. Temperature Limits („TEMP“)

The sensor is located on the PCB and thus only determines the temperature within the housing. Quick temperature changes thus cannot be recognised since the housing of the GX111 has to heat up or cool down first.

You can set a MAX and MIN temperature value for the temperature sensor. If the MIN value is undercut or the MAX value exceeded, an alarm message is sent to all stored phone numbers.

SET TEMP <upper threshold> <lower threshold> #1513

Upper threshold: max. 55 °C (corresponds to the standard value for the upper threshold)

Lower threshold: min. -4 °C (corresponds to the standard value for the lower threshold)

Example:

SET TEMP 20 -2 #1513

At a temperature of -3.0 °C or +21.0 °C, the GX111 will trigger an alarm.

→ The battery capacity very strongly depends on ambience temperature. A charge condition of the battery that would have lasted months at 20 °C may be able to send a single text message before emergency deactivation at 0 °C (protection of the rechargeable battery from deep discharge. Accordingly, a minimum temperature of, e.g., 10 °C is sensible.

The electronics as such can bear higher temperatures, particularly in „OFFLINE“ mode. The housing and rechargeable battery, however, cannot bear too-high temperatures. Therefore, an alarm value of +30 °C would be sensible.

6. Sound Level („VOICE“)

The sound level can only be determined via a connected external microphone (e.g. via the microphone of a headset with a 4-pin jack plug).

The alarm for the sound level can be configured without connecting a head set. The alarm remains inactive, however. If a headset is connected with a sound level alarm already configured, it is activated (armed).

The following command sets the threshold for the sound level to <threshold>. When this threshold is exceeded, an alarm is triggered.

SET VOICE <threshold> #1513

Threshold: 1 - 10 (1 = minimum sensitivity, 10 = maximum sensitivity)



The sound level alarm can only be used with a connected head set! An alarm can be triggered only when sleeping.

→ If the sensitivity is set too high, undesired text message alarms may result, depending on application case.

For best setting, we recommend the command „DIAGNOSE“.

The signal from the microphone is assessed via a separate circuit within the GX111 that is only activated for this function and that requires energy accordingly. This reduces the battery life accordingly.

Example: If a microphone with a current consumption of 150 μ A is connected, the battery life will reduce by 25 - 30%. Therefore, we only recommend this function if the GX111 has an external power source.

The sensitivity depends directly on the microphone used. The matching threshold for operation of the GX111 must be adjusted to and tested with each microphone anew.

7. Alarm when Unplugging the Headset („UNPLUG“)

When a connected head set (4-pin. jack plug) is disconnected from the audio socket of the GX111, an alarm can be triggered.

To activate the alarm triggered when the head set is pulled out, use the command:

SET UNPLUG #1513

To deactivate the alarm triggered when unplugging the head set, use the command:

RESET UNPLUG #1513

8. Panic Alarm („S1“)

The button „S1“ at the side of the housing can trigger a panic alarm. To trigger the panic alarm, push the button „S1“ for 3 seconds.

Activate panic alarm:

SET S1 #1513

Deactivate panic alarm:

RESET S1 #1513



The answer to this command can be delayed by up to 1 minute due to the GPS search. Immediate localisation is more important, since this documents the location of the incident. The time of reaction to the alarm text message, in contrast, is not known at all - therefore, GPS search takes precedence.

d) Additional Functions

1. Connecting to the GX111 for Listening in („INCALL“)

The GX111 has the option to automatically accept incoming calls with a headset (with 4-pin jack plug) connected to listen in to the ambience sounds at the site of installation of the GX111.

With the following command, the call is always answered at once when the incoming number is entered in the phone book of the GX111.

SET INCALL #1513

The GX111 behaves as follows:

- Call without number: rejected at once
- Call from unknown number: rejected at once
- Call from known number: answered at once

To call the current configuration of the „INCALL“ function, use the following command:

TEST INCALL #1513

To switch off the „INCALL“ function, use the following command:

RESET INCALL #1513

Then all calls are rejected at once; listening in is not possible.

2. Alarm History („ALARMHISTORY“)

The triggered alarm is logged in the device using a list. The list can save 2730 alarm entries. If the number of alarms exceeds the threshold of 2730, the oldest entries are overwritten.



Since the alarm entry contains the date and time, alarm entries are only written into the list if the date in the GX111 has been set (see chapter „GPSDATE“). The time is indicated in UTC.

If the following command was sent to the GX111, the two latest alarms are returned.

TEST ALARMHISTORY #1513

If more alarm entries are to be sent, you can add another parameter. This parameter is only considered when sending command by text message, to avoid undesired costs.

TEST ALARMHISTORY <n> #1513

The parameter <n> specifies the number of Alarm entries to be sent out (1 to 10 of the latest alarms).

→ Up to 2 Alarm messages from the history per text message can be sent.

To delete the entire list of alarm entries in the GX111, use the following command:

RESET ALARMHISTORY #1513

11. Location Determination

The GPS receiver can be used to determine the current GPS position. Furthermore, you can be informed when the GX111 leaves a pre-defined (permitted) area („GeoFence“). All functions in connection with position determination are explained below.

First a few technical notes:

—→ Depending on receiver position in the GX111, sight connection to the sky and the weather situation, it may take up to 5 minutes until a GPS localisation can be performed.

The time until the first location is recognised may be reduced by optimised receiver location.

Within the first 30 minutes after first location determination, the GPS position data may have a higher deviation. This is connected with the GPS signal that requires correction data for high accuracy (keyword: Almanach). They are overlaid with the GPS signal and are usually transmitted once every 30 minutes.

a) General GPS Localisation („GPS“)

The following command requests the current GPS coordinates and returns them in an answering text message without assessment. With this command, you need to assess the coordinates, e.g. by entering the coordinates in a route planner or on a website with maps.

—→ Since the GPS coordinates are returned in NMEA-0183 format, these data must be converted into decimal format to be used by online map providers.

These are data directly sent from the GPS recipient. They have not been changed.

The command is as follows:

TEST GPS #1513

Return answer example:

GX111 1.xx Device name, software version

GPS:

5223.53801 N Latitude (ggmm.mmmm)

02112.0730 E Longitude (ggmm.mmmm)

The coordinates are indicated in NMEA-0183 format (g = degree, m = minute)



The answer to this command can be delayed by up to about 5 minutes due to the GPS search.

b) Submission of a Web Link with GPS Position („GPSMAP“)

A Smartphone with internet connection can be used to display the current position via a link to the website OpenStreetMap.org. This directly shows the current location.

The command for this function is:

TEST GPSMAP #1513

If the link is opened with a Smartphone, the current location will be displayed. An example for what this may look like is shown in the figure on the right.



The linked-to OpenStreetMap.org website requires a current browser to display and control the map material. Therefore, a current Smartphone with an internet connection is needed.



c) Reading Date/Time and Synchronising clock („GPSDATE“)

The clock in the GX111 is automatically synchronised with the time delivered by the GPS signal and the date during system start.

If no GPS signal is available, the system time of the GPS signal is unchanged (the clock installed in the GX111 is not updated and thus continues to run unchanged). In this case, you will receive the answering text message „No GPS reception!“.

This command manually starts a search for the current time via GPS:

SET GPSDATE #1513

The current date and time are read from the GPS signal and the internal clock is synchronised. If no GPS is available, the clock is not set.

To check availability of the GPS signal and the contained date and time, use the following command:

TEST GPSDATE #1513

It reads the date and returns it.

d) Activate Position Tracking („TRACK“)

„Tracking“ means regular saving of the current position, including time stamp, in the internal memory. The position is stored every 2 seconds. This cannot be changed.

The number of saved points depends on the current memory utilisation; the current number can only be determined with the TEST command. At a later time, the values can be submitted to a PC by USB. The corresponding programme can be used to track the path over time.

64512 position entries are saved in the GX111. If the number of entries is exceeded, the oldest 64 entries are deleted and overwritten with new data.

Save settings:

Use the following command to configure and activate the records:

SET TRACK [<Name>] #1513

The parameter <Name> is optional and serves only to assign an internal name for recording (up to 10 characters).

In the basic settings, the name is „TRACKING“.

If the character length is exceeded, the GX111 returns an error message and tracking is not started.



If tracking is activated, the GX111 remains in „ONLINE“ mode at all times. The „TIMEOUT“ settings no longer have any effect.

If no GPS data can be found, recording is interrupted for this period. Once new GPS data are received, recording continues.

Checking settings:

To check the settings for the recording mode, use the command:

TEST TRACK #1513

After sending the command, you will receive an answer text message (the time is indicated in UTC time).

Example:

```
GX111 1.xx  
15.02.2013 20:18:12  
Trackdata: 58% 36000  
Track: Name  
Tracking: on
```

The information „Trackdata: 58% 36000“ says that the tracking memory is filled to 58% and that about 36000 tracking sets can still be written.

If you receive the feedback „Trackdata: 100% 0“, the tracking memory is full. New tracking data are written at the start of the memory, deleting the 64 oldest sets of tracking data each. Tracking data are then lost.

Stopping recording:

To stop recording of the tracking data, send the command:

RESET TRACK #1513

The tracking data should be primarily downloaded via USB. Optionally, there is the operation of email dispatch as well.

→ Email dispatch requires higher technical knowledge. For more detailed information, see the chapters on the commands „GPRS“, „SMTP“ and „TRACKDATA“.

e) Programming the GPS Zone („GPSZONE“)

The GX111 may be used for zone monitoring („GeoFence“). After programming the approved zone, each time the zone border is crossed, an alarm message with the current GPS coordinates will be sent to all saved phone numbers.



If the zone monitoring is activated, the GX111 is always in „ONLINE“ mode. This reduces battery life considerably. Therefore, this function should only be used when supplied with power externally via USB.

The following command sets the zone parameters and activates them automatically:

**SET GPSZONE <latitude1> <direction> <longitude1> <direction>
<latitude2> <direction> <longitude2> <direction> [<ZoneName>] #1513**

Important prerequisites:

- <Latitude1> must be further North than <Latitude2>. The following must apply: <Latitude1> larger than <Latitude2>. The <direction> for the latitude is N (North) or S (South).
- <Longitude1> must be further West than <Longitude2>. The following must apply: <Longitude1> smaller than <Longitude2>. The <direction> for the longitude is E (East) or W (West).
- The <ZoneName> is optional (max. length 10 characters).

→ If the character length is exceeded, the GX111 returns an error message and the values are not saved.

Create a GPS zone with an edge length of 250 m around the actual GPS position:

SET GPSZONE #1513

Deactivation of the active zone; the zone parameters are retained:

SET GPSZONE DISABLE #1513

Activation of the deactivated zone:

SET GPSZONE ENABLE #1513

Deleting the zone:

RESET GPSZONE #1513

Reading the zone configuration:

TEST GPSZONE #1513

12. Email Dispatch of the Tracking Data

The GX111 is able to send the tracking data saved with the command TRACK by email. However, this requires advanced knowledge in the area of SMTP protocol, internet architecture, email configuration, etc.

Problem server timeout, bad data connection, GPRS speed:

The product has a GPRS module and thus a maximum upload data speed (from the GX111 to the Internet) of 53.6 kbit/s.

Even under the best conditions, complete uploading of the tracking data would take at least 8 minutes.

At GSM radio mast change, in rural areas (weak signal), with high network utilisation (conurbations) or other difficulties, there may be interruptions of the email-server connection.

The longer a connection takes, the higher the probability of cancellation. It cannot be predicted how long the connection is retained and how high the data rate will be.

Therefore, you as the user of the GX111 must decide what „Risk“ is to be taken for the transmission volume. Each unsuccessful attempt will be charged by the GSM provider, no matter if the email was sent successfully or not.

For this reason, the area and thus the data volume to be transferred, is chosen when sending the tracking data. The bigger the data volume, the bigger the risk. The area input permits transmission of the memory in several small steps.

→ Due to the complexity of the many variation options, the technical support for this area is limited. Only help with configuration on the side of the GSM module can be offered.

The questions of how the data required for email-server configuration are determined, how the email server is set and whether the email server even permits an incoming connection can only be answered by the email provider.

You have full control of where to transfer the data. Only the selected data will be transferred, only at the time and only to the server that you have configured.

a) Configuration of the SMTP Access Data (SMTP)

There is the option to have the tracking data sent via SMTP. For this, an email address, the SMTP server, the login name and the password of the email account must be indicated.

SET SMTP <Email address> <SMTP host> <Port> <Config> <Login> <Password> #1513

Email address: max. 30 characters
SMTP host: max. 30 characters
Port: 25, 465, 587
Config: 0 = Normal, 1 = SSL, 2 = EHLO, 3 = SSL/EHLO
Login name: max. 30 characters
Password: max. 15 characters

→ EHLO means „Extended HELO“ and is part of the SMTP protocol. Some servers require EHLO.

Example:

**SET SMTP xxxgx111@yahoo.de smtp.mail.yahoo.com 25 1 xxxgx111@yahoo.de
Password #1513**

The following command will return the current configuration by text message:

TEST SMTP #1513

You will receive, e.g., the following confirmation text message:

GX111 01.xx
SMTP: smtp.mail.yahoo.de
Addr: xxxgx111@yahoo.de
Port: 25
Login: xxxgx111@yahoo.de
PW: XXX
Config: SSL

→ The password is not indicated in plain text in the answer, but as a character string „XXX“.

Here some examples for email configuration:

	Yahoo.com	Arcor.de	Google
SMTP	smtp.mail.yahoo.com	mail.arcor.de	smtp.gmail.com
Login	coresponds to email adress	coresponds to email adress without the „@arcor.de“	coresponds to email adress
Port	25	25	25
Config	1	1	1

b) Configuration of the GPRS Access Data („GPRS“)

Successful connection via GPRS requires configuration of the access data APN, user name and password. This configuration is only used to send tracking data via email.

→ At the time of generation of these operating instructions, many GSM providers in Germany have admitted to not requiring any APN server settings and account data.

You may need to research how this is implemented abroad via your provider.

SET GPRS <APN> [<User name>] [<Password>] #1513

APN: Access point name, max. 30 characters

User name: optional, max. 10 characters

Password: optional, max. 10 characters

→ If one of the character lengths is exceeded, the GX111 returns an error message and the values are not saved.

Both optional parameters or no optional parameter must be indicated at all times!

Example:

SET GPRS internet.eplus.de eplus eplus #1513

You will receive, e.g., the following confirmation text message:

GX111 01.xx

APN: internet.eplus.de

Login: eplus

PW: XXX

Tested providers:

Eplus: internet.eplus.de, no user name or password

O2: works without settings

D1: works without settings

→ Due to the number of providers, it is not possible to make a precise statement on the configuration or the required parameters.

Inquire about this, e.g., online from your provider.

c) Transmission of the Tracking Data („TRACKDATA“)

The command TRACKDATA only works via text message if SMTP and GPRS have been set first.

After receipt of this command, the GX111 will send an email via SMTP server with the tracking data as an attached file. The size of the file can be up to approx. 3.26 MByte.

The tracking data are present in CSV format and prepared for further processing, e.g., in a spreadsheet programme (e.g. Microsoft Excel).

The data are present in the text file as described below:

Date, time, latitude, direction, longitude, direction, track name <line change>

Example: 13.05.2013,16:10:41,01156.6192,E,4932.4173,N,Name

→ The time is indicated in UTC time, the GPS data are indicated in the format „NMEA-0183“, the name corresponds to the respective programming by TRACK command

Conversion of tracking data (NMEA) to decimal digits:

Latitude: $01156.6192 = 011 \text{ degrees}, 56.6192 \text{ minutes} = 011 + (56.6192 / 60) = 11.943653 \text{ degrees}$

Longitude: $4932.4173 = 49 \text{ degrees}, 32.4173 \text{ minutes} = 49 + (32.4173 / 60) = 49.540288 \text{ degrees}$

Command to read the tracking data:

The following command indicates which area of the tracking memory is to be sent by email:

TEST TRACKDATA <First entry> <Last entry> #1513

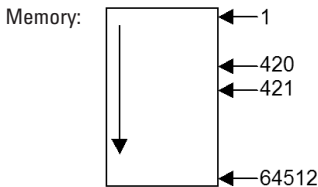
First entry: First entry to be read

Last entry: Last entry to be read

Value range: min. 1 - max. 64512

Example:

TEST TRACKDATA 420 421 #1513



Based on this count, the command would return the two memory values in the positions 420 and 421 by email.

→ A new tracking entry would push in new values „at the top“ into position 1, which would push the last entry out at position 64512 and thus delete it.

The count generally starts at the latest (newest) tracking point and counts backwards into the past.

If a memory area that has not been filled yet is requested, an empty file is returned.



Important!

During the transmission time of the email, the GX111 will not accept any commands, no tracking data are saved and no alarm situations are recognised.

Command to delete the tracking data:

The following command deletes all tracking data in the memory of the GX111:

RESET TRACKDATA #1513

13. System Functions

This chapter explains various important system functions.

The basic settings of these system functions are usually already selected perfectly for most areas of application. Therefore, we recommend only adjusting these parameters in the respective application cases.

→ If the GX111 has any malfunctions, reactivate the default settings first.

Before contacting our hotline (see chapter 1), always ensure that the GX111 is in the standard configuration (factory settings) again.

a) Time between Two Alarm Messages („IDLEALARM“)

In case of alarm, the GX111 will send an alarm message. From this time onwards, a time window (idle window) starts for this input (sensor, GPS, etc...); during this time, no other alarm can be triggered.

→ This reduces the text message costs caused by an incorrectly set configuration of the GX111.

Every alarm source has its own idle time window. A value of 120 seconds is set in the factory for the idle time window.

The following command is used to change this idle window:

SET IDLEALARM <Time> #1513

Time: 30 - 3600 seconds

Example:

SET IDLEALARM 240 #1513

The minimum period between alarm messages is now 240 minutes (4 minutes).



In this time window, you will not receive any new messages on alarm situation changes.

Values below the standard value of 120 seconds should only be used for test purposes where possible.

→ Changing the alarm value of a sensor will reset „IDLEALARM“ timer and the sensor may trigger an alarm again at once.

Example:

The shock sensor is configured with maximum sensitivity. The „IDLEALARM“ timer will start from the time after which all alarm text messages have been sent. If the sensor is triggered again within the idle time window, no alarm is triggered (idle time has not expired yet).

Only after the end of the idle time window can another alarm be triggered by the shock sensor.

→ This does not refer to the other sensors, e.g. the light sensor. Each alarm source has its own idle time window!

b) Online/Offline Times of GSM („TIMEOUT“)

Chapter 7. b) (operating mode) already explained the subject of „ONLINE“ and „OFFLINE“ mode.

The command „TIMEOUT“ sets the times for „ONLINE“ and „OFFLINE“.

→ In the current hardware/firmware version, the GX111 works with an accuracy of $\pm 3\%$ for the set time.

The default setting for the „ONLINE“ mode is 15 minutes, to give you enough time to react. The default setting for „OFFLINE“ mode is 1425 minutes to save energy.

→ This default setting specifies that the GX111 spends 15 minutes in „ONLINE“ mode every day, while remaining in „OFFLINE“ mode the rest of the day ($15 + 1425 = 1440$ minutes = 24 h).

If you would like to be able to reach the GX111 more often than 1x per day, or if you would like to have more time to react to the answer of the GX111, the times can be changed with the following command.

SET TIMEOUT <online time> <offline time> #1513

„ONLINE“ mode: 5 - 255 minutes

„OFFLINE“ mode: 0 - 65536 minutes

→ A longer time in „ONLINE“ mode will reduce the operating duration of the GX111.

Resetting online/offline times to the default settings

Send the following command to restore the factory settings:

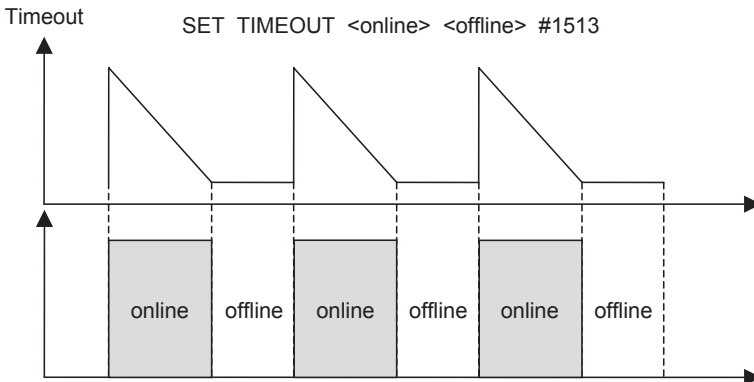
RESET TIMEOUT #1513

„ONLINE“ mode: 15 minutes

„OFFLINE“ mode: 1425 minutes

Time conduct of the GX111 without a triggering alarm:

The GX111 switches its mode in the configured intervals.



Time conduct of the GX111 with a triggering alarm:

Online time: 15 minutes, offline time: 60 minutes

The GX111 is in „OFFLINE“ mode (60 minutes). After the alarm was detected, the GX111 will switch to „ONLINE“ mode for 15 minutes. In these 15 minutes, the alarm text message is sent to all entered phone numbers before the device waits for the end of the 15 minutes.

The GX111 switches back to „OFFLINE“ mode for the configured 60 minutes.

14. ERROR and LED Flashing Sequences

a) „ERR“ LED

The „ERR“ LED displays different error messages and „Busy“ signals. The messages are put out with a flashing code for better differentiation. This sequence is repeated.

→ Additionally, there is the diagnosis mode in which the function of the „ERR“ LED is assumed. For more information, see chapter 10. c) on the command „DIAGNOSE“.

„ERR“ LED is not lit

- no error has occurred
- GX111 is not supplied with power or the rechargeable battery is flat
- Booting and self-test completed

„ERR“ LED is always lit

- PIN-error
- PUK-must be entered
- a hardware error has been found during the self-test (connect the GX111 to a PC and check the USB-protocol)

„ERR“ LED flashes slowly, LED on for 1 second, off for 1 second

- GX111 is booting
- Self-test underway

„ERR“ LED flashes quickly 3 times, LED on for 0.25 seconds, off for 0.25 second

- Resetting to default settings is underway, flashing pattern is displayed before booting

„ERR“ LED flashes slowly, LED on for 1.5 seconds, off for 0.5 seconds

- Error when loading the user settings
- Error when loading the default settings

„ERR“ LED flashes quickly, LED on for 0.25 seconds, off for 0.25 seconds

- Data are being sent via email

b) „GSM“ LED

„GSM“ LED is not lit

- The GX111 is not supplied with power.
- The GX111 is in „OFFLINE“ mode.

„GSM“ LED flashes quickly, LED on for 0.5 seconds, off for 0.5 seconds

- Searching for GSM network.

„GSM“ LED flashes slowly, LED on for 1 second, off for 1 second

- The GX111 is logged on to the GSM network or the GPRS connection is active.

c) „AKKU“ LED

„AKKU“ LED is not lit

- The rechargeable battery is fully charged or not being charged.

„AKKU“ LED is always lit

- The rechargeable battery is charged.

d) „GPS“ LED

„GPS“ LED is not lit

- The GX111 is not supplied with power.
- The GPS receiver is off.
- The position was not found and the timer for position search has expired.

„GPS“ LED flashes slowly, LED on for 1 second, off for 1 second

- Scanning for the GPS position.

„GPS“ LED flashes quickly, LED on for 0.5 seconds, off for 1.5 seconds

- The GPS position was found or the GX111 is in tracking mode

15. Reset to Default

The factory settings are reset with the buttons „RESET“ and „S1“.



Important!

The PIN of the GX111 is reset to the default value #1513 in the reset.

The PIN of the SIM card remains unchanged, however.

If you have set the SIM card's PIN to any other value than 1513, the GX111 will no longer work after the reset, and you have to change the PIN of the GX111 accordingly!

To reset the GX111 to the factory settings via the buttons, proceed as follows (this must be done within 3 seconds):

- Keep the button „S1“ pushed
- Briefly push the button „RESET“.
- Release the button „S1“ again.



If the button „S1“ is pushed for more than 3 seconds in total, the GX111 will not be reset to the factory settings, since it is assumed that you pushed the button by accident.

After successful resetting to factory settings, a flashing pattern is output via the „ERR“ LED. The „ERR“ LED flashes 3 times in quick sequence (0.25 seconds on, 0.25 seconds pause, etc.).

16. Maintenance and Cleaning

The product is maintenance-free for you. Servicing or repair must only be carried out by a specialist or specialist workshop. There are no components on the inside of the product that need maintenance by you. This is why you should never open/disassemble it (apart from the work described in these operating instructions for inserting/changing the rechargeable battery).

A dry, soft and clean cloth is sufficient for cleaning the outside.

Dust can easily be removed with a long-hair, soft and clean brush and a vacuum cleaner.



Never use any aggressive cleaning agents, cleaning alcohol or other chemical solutions, since these may damage the casing or even impair function.

17. Declaration of Conformity (DOC)

We, Conrad Electronic SE, Klaus-Conrad-Straße 1, D-92240 Hirschau, hereby declare that this product complies with the fundamental requirements and the other relevant regulations of the directive 1999/5/EC.

→ The compliance statement for this product is available at www.conrad.com.

18. Disposal

a) General Information



Electrical and electronic products must not be disposed of in domestic waste.

Dispose of the product according to the relevant statutory regulations at the end of its service life.

Remove the inserted rechargeable battery and dispose of it separately from the product.

b) Batteries and Rechargeable Batteries

You as the end user are required by law (Battery Ordinance) to return all used batteries/rechargeable batteries. Disposing of them in the household waste is prohibited!



Batteries and rechargeable batteries containing hazardous substances are marked with the adjacent symbol to indicate that disposal in the household waste is prohibited.

The descriptions for the respective heavy metals are: Cd=cadmium, Hg=mercury, Pb=lead (the names are indicated on the battery/rechargeable battery e.g. below the rubbish bin symbol shown to the left).

You may return used batteries/rechargeable batteries free of charge at the official collection points of your community, in our stores, or wherever batteries/rechargeable batteries are sold!

You thus fulfil your statutory obligations and contribute to the protection of the environment.

19. Technical Data

Operating voltage.....	5 V/DC via USB
Current consumption via PC.....	< 500 mA
Required battery.....	LiPo, 1500 mAh, rated voltage 3.7 V
Rechargeable battery charging time (min = at the PC).....	Sleep mode min/max 3.5 h / 16 h Tracking min/max 4.2 h / 160 h
Rechargeable battery runtime (at +22 °C).....	+ SHOCK / SLOPE 104 days + LIGHT 38 days + VOICE 24 days + GSM + GPS tracking 0.5 days
Accuracy TIMEOUT.....	±3%
GSM module.....	GE864-GPS
GSM frequency bands.....	850 / 900 / 1800 / 1900 MHz
GPS chipset.....	TELIT
GPS sensitivity.....	-163dBm
Maximum memory slot numbers GPS.....	64512 (GPS, Time, Name)
GPS tracking interval.....	2 s
GPS data format.....	NMEA-0183
Vibration sensor.....	Measuring range -4 g to +4 g Scanning rate 250 kHz
Position sensor accuracy.....	±1%
Light sensor wavelengths.....	380 - 1100 nm
Ambient temperature.....	-4 °C to +55 °C
Ambient air humidity.....	20% to 80% rel. humidity, non-condensing
Dimensions (L x W x H).....	77 x 44 x 27 mm
Weight.....	Approx. 85 g

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