

# TEMPERATURE MONITORING

G2S-T



## 1. Introduction

The G2S-T module allows easy control of any device by a NO (normally-open) relay contact. It can be used to control, for example, barrier gates, overhead doors and similar devices via a mobile phone. The maximum relay contact load is 240V/2A. In addition, in the temperature monitoring mode, the module can monitor two temperatures using the resistance thermometers connected to its inputs IN1 and IN2. When the set temperature is exceeded, the module can drop-call (just ring and then hang up) the selected group of users or send them the alarm SMSs. The module is intended for indoor use where it will not be exposed to limit temperatures and humidity. To control the module output, the GSM communication is used. There are similar rules for using the module like for common mobile phones. The connected device is controlled only by ringing, so no call is charged and only the minimum credit is required on the inserted SIM card. When the module is used to monitoring the temperatures and the option for sending the alarm SMSs is set, these are charged according to the tariff of the mobile operator used. In any case, it is necessary to ensure the validity of the SIM card credit or select a tariff without a time limit in accordance with the operator's conditions. In the place of use of the GSM module, there must be sufficiently strong signal of the corresponding GSM network. This can be verified on the spot by making a call from a mobile phone. If such a call can be made, the signal is sufficient to operate the G2S-T module, too.

## 2. Description of the G2S-T Module

The module, including the backup battery (accumulator) 3.6V/600mAh, is built in a plastic box with dimensions approx. 115 x 67 x 28 mm. On the front side, it is equipped with connectors for the power supply, inputs IN1, IN2 for connecting the thermometers and output of the relay NO contact. On the opposite side there is an SMA connector for GSM antenna and on the side of the box there is a USB connector for computer connection and a SIM card slot. The indicating LED is located on the top of the box.



The supply includes the 230V/50Hz power supply adapter with the output voltage of 12V/1A, two 10k $\Omega$  temperature sensors ( $\beta = 3435$ ), USB cable and disc containing the software and manual. Up to 16 user numbers can be stored in the module's memory. These users can control the connected device via their mobile phones, or, if the set temperature limits are exceeded, they will get a drop-call (ring) or receive an alarm SMS. The phone numbers of the authorized users can be entered into the G2S-T module from PC using the USBCommunicator utility software, numbers in positions 0 to 9 can also be transferred to the module using the SIM card prepared in the mobile phone.

### 3. Preparing and Inserting the SIM Card into the Module

To ensure the proper functioning, it is necessary to perform the following steps before inserting the SIM card into the module.

1. If the SIM card is not activated, activate it in the mobile phone according to the SIM card manual.
2. Disable the voice mail. Refer to instructions of the selected GSM operator or call its hotline.
3. Disable the use of the PIN code according to the mobile phone manual.
4. Delete all saved contacts and SMSs from the SIM card.
5. When using the USBCommunicator utility, you need to insert the SIM card without phone numbers of authorized users. If the computer is not available, the phone numbers of the authorized users must be stored in the SIM card. Any mobile phone can be used for this.

**With the power supply off**, insert the prepared SIM card into the G2S-T module. The card insertion method is shown on the side of the module. The card should be pushed in until it clicks and remains in the slot. To remove the SIM card, push it again to release it and then pull it out of the module.

### 4. Setting the Authorized Phone Numbers Using the SIM Card

Without using the USBCommunicator utility, you can enter up to ten phone numbers using a mobile phone. The numbers must be stored on the SIM card in the **international format**, including the leading characters + or 00 (e.g. +420123456789). Users' names must be **USER0**, **USER1**, ..., to **USER9**. After inserting the SIM card into the G2S-T module and turning the module on, the stored phone numbers are transferred from the SIM card to the internal memory of the module. **The numbers are transferred from the SIM card to positions 0 to 9 of the G2S-T module every time it is switched on. This will overwrite the corresponding number of internal module memory positions according to the number of users stored in the SIM card!**

### 5. Setting the Module Using the USBCommunicator Utility

For a more convenient setting of the G2S-T module, you can use the supplied USBCommunicator software. **To avoid overwriting of the stored phone numbers when the module is turned on, no phone numbers can be stored in the inserted SIM card, otherwise changes in the first 10 positions made using the utility may be overwritten by numbers from the SIM card when the module is turned on.** When preparing the SIM card according to Chapter 3, it is necessary to perform only steps 1 to 4 and insert the SIM card without stored phone numbers into the module.

#### 5.1. Installation

The USBCommunicator utility requires Microsoft Windows 2000 or later installed on the PC. For Windows 2000, Windows XP, and Windows Vista operating systems, Microsoft .NET Framework 4.0 must also be installed. This is already included in the Windows 7 to 10 operating systems and does not need to be installed. The installation software can be downloaded from the Microsoft website.

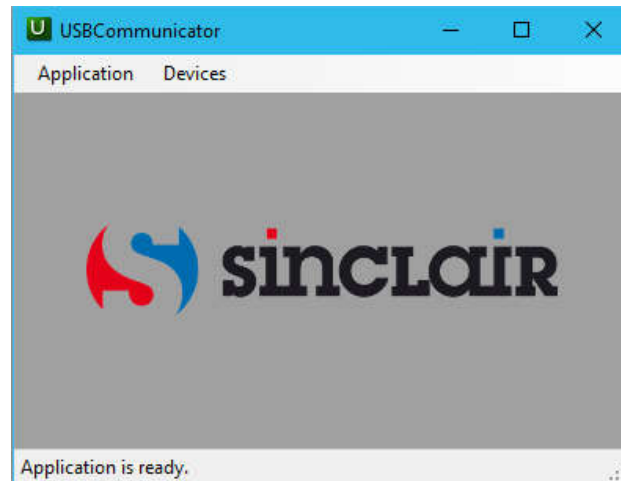
<https://www.microsoft.com/cs-cz/download/details.aspx?id=17851>

The installation file of the USBCommunicator utility is available for download after logging into the B2B section at [www.sinclair-solutions.com](http://www.sinclair-solutions.com). After running the installation file, you must follow

the instructions and run the utility program after the installation is complete.

## 5.2. The Main Application Window

In this window, the tabs show data from the connected devices. In the upper part, there is the main menu. and in the lower part, there is a status bar informing about the connection status and ongoing processes.



## 5.3. Application Menu

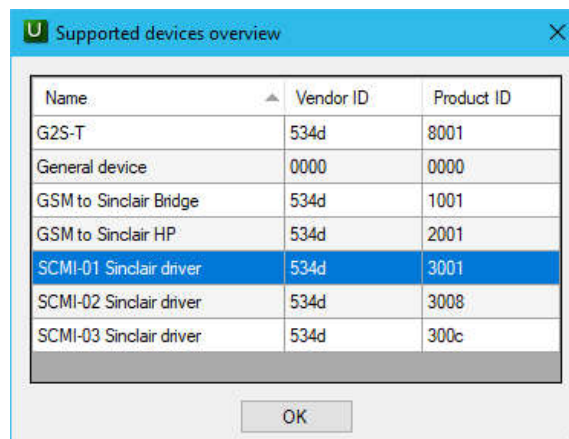
The Application menu contains the following items:

- **About** – Displays the program version and copyright.
- **Language** – English, German, Czech, Slovak, Polish, Croatian and Hungarian versions of USBCommunicator utility are available.
- **Exit** – Closes the application.

## 5.4. Device Menu

The Device menu contains an item:

- **Supported devices** – Displays a list of all devices supported by the current version of the USBCommunicator.



## 5.5. G2S-T Module User Interface

The G2S-T module can be connected to the computer's USB port using the cable provided. At this case, the module does not need a power supply from the AC adapter as it is powered from the USB port. To limit the current consumption from the USB port and to avoid potential collisions while writing data from the USB port to the G2S-T memory, logging the module to the GSM network is blocked while the USB port is connected, even when the module is powered from the AC adapter. After connecting the module to the USB port, the program recognizes the device type and displays the corresponding user interface on the tab. At the same time, the phone numbers and module settings are read automatically and displayed in the USBCommunicator window. Saved phone numbers and settings of the connected module can also be read and displayed using the **Read** button. The USBCommunicator interface for the G2S-T is divided into three parts:

Index	Phone Number
0	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

Output settings

☒ pulse output (monostable)

pulse duration: 1.0 sec

relay logic: direct (N.O.)

☐ switch output (bistable)

relay state after reset: ON

☐ safe open (ring and hang up to open)

☐ antivandal mode (answer and hang up all unauthorized phone numbers)

Temperature alarms settings

☐ T1: 20.00 °C SMS

Count of users to be notified: 1

☐ T2: 20.00 °C SMS

Count of users to be notified: 1

Notification interval (min): 30

Notification duration (sec): 15

Other settings

FW version: 1.11

Blackout notification delay (min): 5

Count of users to be notified (blackout): 1

Switch off notification delay (min): 60

Count of users to be notified (switch off): 1

Read Reset to factory defaults Write

Device 'G2S-T' was plugged in.

### Authorized phone numbers

In the left part of the program window, there is a list of stored phone numbers. Phone numbers in positions 0 to 9 can be overwritten by numbers stored in the SIM card when the module is switched on. The numbers in positions 10 to 15 are not overwritten when the module is switched on; their settings can only be made using the utility. Numbers in **international format** can be entered without the leading characters **+** or **00** (e.g. 420123456789). The leading character is added automatically after confirming the entered number by the ENTER key. To add or edit a phone number, click to select the desired position and enter the desired number. Entering is finished by pressing the **Enter, Up arrow or Down arrow** key. Pressing the **Left arrow** key or clicking another button in the USBCommunicator window will terminate entering the number without changing it.

**After editing, you need to save the numbers to the G2S-T module with the Write button, otherwise the changes will not take effect and will be lost!**

## Output settings

The **G2S-T** module output relay settings are shown in the middle-upper part of the program window. These settings are as follows:

- **Pulse output (monostable)** – With this option, one pulse of the set duration appears on the module output after ringing from the authorized phone number. According to the set logic of its switching, the relay switches on or off for the set period of time.
  - **Pulse duration** – Set the output relay on/off period of time in the monostable mode. You can set 0.1 to 6553 seconds (i.e. approx. 109 minutes).
  - **Relay logic** – Set the default relay state before ringing. The option **direct (N.O. - normally open)** means that the relay is open before ringing and switches on for the set period of time after ringing from the authorized number. The option **inverse (N.C. - normally closed)** means that the relay is closed before ringing and switches off for the set period of time after ringing. A detailed description of **N.O.** and **N.C.** is based on the usual designation of the relay contacts
- **Switch output (bistable)** – This option always changes the state of the output relay to the opposite state after ringing from the authorized phone number and this state lasts until the next ringing.
  - **Relay state after reset** – Allows to set the default relay state in the bistable mode after power-up. It is possible to select **ON** – relay closed, **OFF** – relay opened, and **as before RST** i.e. the same state as before power failure or switching off the power supply of the module.
- **Safe open (ring and hang up to open)** – *This option provides protection against unintentional activation of the controlled device by accidentally pressing the mobile phone keys in the purse bag, jacket pocket etc.* If this option is active, you must **ring** the G2S-T module **and hang up after the first ring tone**. The module then performs the required action. Otherwise, i.e. without hanging up after the first ring, the call will be rejected, and the output relay will not be activated. No call is charged.
- **Anti-vandal mode (answer and hang up all unauthorized phone numbers)** – This option is designed to limit attempts to connect to the module phone number from unknown phone numbers (e.g. telemarketing agencies). In the anti-vandal mode, the G2S-T module receives a call from an unknown phone number and then hangs up without performing any action. Such a call is charged. When calling from the authorized phone number, the module hangs up and activates the output relay without charging the call.

## **Temperature alarm settings**

The temperature alarm settings are shown in the middle-lower part of the program window. By clicking on the checkbox to the left of the temperature inputs T1 and T2, you can select which temperature inputs of the module will be used and enable their settings. These settings can be different for each input and have the following options:

- **Temperature alarm type** – The temperature alarm can be triggered at a higher or lower temperature than the set limit. In this case, if the ring alarm is selected, the module will ring the selected users in the selected interval for the duration of the temperature alarm until the call is rejected (hang up) by the user. The other two types of temperature alarm allow to ring the selected users once when the temperature exceeds or falls below the set limit
- **Temperature limit** – Set the temperature at which the temperature alarm should occur.
- **Temperature alarm notification** – Select the way how the selected users should be informed about the temperature alarm. It can be a free ringing or an alarm SMS.
- **Count of users to be notified** – Set the number of users to whom the temperature alarm should be sent. Alarm is then sent in the order in which their numbers are stored in the module.

Both temperature inputs share the following settings of interval and duration of user notification:

- **Notification interval (min)** – Set the interval of ringing the selected users in minutes. The user can end the ringing by rejecting (hanging up) the call.
- **Notification duration (sec)** – Set the duration of each ringing in seconds

## **Reset to factory defaults**

This button is intended to reset the G2S-T module to its default (factory) settings.

## **Other settings**

In the right part of the program window, you can set the operation of the G2S-T module in the event of a power failure. In the event of a power failure, the module is powered from its built-in accumulator and after the set **Blackout notification delay**, the module notifies the selected number of users of the power failure. If the power failure continues, the module remains in operation and is powered by its built-in accumulator until the **Switch off notification delay** is reached. If the **Switch off notification delay** expires, the module notifies the selected number of users of the shut-down and then shuts down.

**After editing, it is necessary to press the Write button to write the modified settings to the G2S-T module, otherwise the changes will not take effect and the modified data will be lost! Because logging the G2S-T module into the GSM network is blocked during its connection to the USB port of the computer, after writing the required data it is necessary to disconnect the module from the computer's USB port first, and then connect it to the power supply. The connection to the USB port is intended only for the module setting; after that, the module must always be disconnected from the USB port!**

## 6. Module Operation After Switching On the Supply Voltage

After inserting the SIM card into the module and switching on the power, the module logs into the GSM network. It then reads the authorized users from the SIM card and stores them in the internal memory of the module. This process can take up to 1 minute, after which the module is ready for operation. The data stored in the module memory is retained even after the supply voltage is switched off. **Within about one minute after logging into the GSM network, the module will ring the authorized users. If the utility program is used to enter the phone numbers, the numbers should not be stored on the SIM card at the same time, otherwise changes made using the utility program in the first ten positions will be overwritten by the phone numbers from the SIM card when the module is switched on!**

### 6.1. Indicating the Status

To indicate the GSM module status, the yellow LED on the top of the GSM module is used. When the supply voltage is connected and the module is initialized, the LED glows slightly and at the same time flashes to indicate the status of the module. While the module is searching for and logging into the GSM network, the LED flashes at 1-second interval; after logging in, the interval is extended to 3 seconds and the module is ready for use.

## 7. Control of the Connected Device

You can use the G2S-T module to control almost any device. Typically, it is a gate, overhead doors or barrier gate. It can be another appliance if the permissible load of the output relay contacts is not exceeded. The allowed voltage between the contacts is 240V; the contact current must not exceed 2A. The connected device is controlled by ringing the module from the authorized phone number. This method (drop-call) is free of charge and by default, the output relay closes for 1 second each time when the module has detected the incoming call. Other options for setting the output relay and how to control it are described in Chapter 5.5.

## 8. Temperature Monitoring Mode

In the temperature monitoring mode, the module can monitor two temperatures measured by the resistance thermometers connected to its inputs IN1 and IN2. For proper operation of the module, it is necessary to set it first using the USBCommunicator utility. To set the temperature monitoring mode, check the **T1** and **T2** checkboxes in the temperature alarm section of the program window according to the number of monitored temperatures. It is also necessary to set the temperature limits and conditions for triggering the alarm. If the **>** (**<**) option is selected, the alarm is activated when the monitored temperature rises (drops) above (below) the set limit and the module notifies the selected number of users by SMS or repeated ringing for the duration of the temperature alarm. The notification interval and duration must be set using the utility program. If the **↑** (**↓**) option is selected, the alarm is activated once the monitored temperature exceeds (falls below) the set limit and the module notifies the selected number of users by the SMS or one-time ringing. If the temperature alarm is activated and triggered, the module goes sequentially through the phone numbers stored in the memory and rings or sends an SMS to the selected number of authorized users by their order in the list. Both monitored temperatures and their set limits are transferred in the alarm SMS.



For example, when using both thermometers and exceeding the set temperature T1 of 15.0°C, the alarm message may have the following form:

**G2S-T ALARM:**

**T1 = 15.8 deg.C(> 15.0)**

**T2 = 8.0 deg.C(> 10.0)**

**PWR = OK.**

Authorized users whose phone numbers are stored in the module can check the monitored temperatures via SMS. This function is available regardless of the temperature alarm status. The SMS to inquire the temperature has the following form:

**GETTEP**

At the same limits as above and temperatures T1 and T2 lower than the set limits, the module could respond:

**G2S-T INFO:**

**T1 = 12.8 deg.C(> 15.0)**

**T2 = 8.0 deg.C(> 10.0)**

**PWR. = OK**

## 9. Module Operation in the Event of Power Failure

During a power failure, the module is powered from its built-in rechargeable battery and also checks its voltage. After the set time of the **Blackout notification delay** expires, the module will send to authorized users an SMS message about the power failure and current value of the built-in battery voltage.

**G2S-T ALARM:**

**T1 = 12.8 deg.C(> 15.0)**

**T2 = 8.0 deg.C(> 10.0)**

**PWR. = OFF**

**Vbat. = 4,11V, OK**

**5min.**

where 5 minutes is the set *Blackout notification delay*. After this notification, the module continues to operate and monitors the temperatures according to its settings. A fully charged battery would allow the module to operate for up to 24 hours. Battery status depends on the operating time before the power failure, so the maximum **Switch off notification delay** can be set to only 240 minutes. After the set period of time has elapsed, the module will send an SMS message to authorized users and then will shut down.

**G2S-T ALARM:**

**T1 = 12.8 st.C(> 15.0)**

**T2 = 8.0 st.C(> 10.0)**

**POWER DOWN**

**Bat. = 4.10V, OK**

**60min.**

If the battery voltage drops below the limit of 3.50V before the set **Switch off notification delay** expires, the module will send an SMS to authorized users and then will shut down regardless of the set *Switch off notification delay*.

## 10. Module Operation After Power Supply Recovery

The module operation after power supply recovery depends on the duration of the power failure. If the duration of the power failure is shorter than the set **Blackout notification delay**, the module resumes operation and does not send any messages. If this delay has elapsed and the module has already sent a power failure notification but has not yet been shut down, the module resumes operation and informs the authorized users by an SMS message. If the module has been shut down in the event of the power failure (after *Switch off notification delay* has elapsed or because the built-in battery voltage has dropped below the specified limit), the standard power-on process of the module is initiated when the power supply is restored. After initialization, the authorized users are notified by a ring.

## 11. Operation and Maintenance of the G2S-T Module

The G2S-T module may only be used under the conditions described in this manual. Otherwise, no warranty will be provided. The manufacturer shall not be liable for any damages caused by the use of the device other than as stated in the manual. In case of malfunction or damage, the device must be switched off and disconnected from the mains. Under no circumstances, user can dismantle or attempt to repair the module. Any repairs may only be carried out by the manufacturer or an organization authorized by the manufacturer. The G2S-T module does not require any special maintenance during operation. It must be protected from moisture, water, limit temperatures and mechanical damage. In addition, children should not be allowed to handle the device. Any dirt and dust should be carefully removed from the module surface with a soft cloth. If necessary, a damp cloth with a non-abrasive cleaning agent can be used. In any case, prevent moisture or any other contamination from entering the module, connectors and SIM card slot!

## 12. Specifications

Power supply:	12V DC from the mains power supply adapter
Maximum input current	0.5A at 12V supply voltage
Dimensions (W x D x H):	112 x 67 x 28 mm
Module weight:	160g
Operating temperature:	0°C to +40°C
Storage temperature:	-25°C to +60°C
GSM bands:	GSM 900 and 1800 MHz
Compatible GSM network:	according to the SIM card used
SIM card format:	Mini-SIM (2FF)
Max. relay contact load:	24V/2A
USB port:	Mini-B

### **13. Warranty Conditions**

The manufacturer provides a 24-month guarantee from the date of commissioning, but no longer than 27 months from the date of sale to the customer. During this time, the manufacturer will carry out all repairs of faults caused by material defects or hidden manufacturing defects free of charge. The warranty excludes faults caused by mechanical damage, improper connection, other than intended use, violation of operating or storage conditions and failure to comply with the manufacturer's instructions.

### **14. Package Contents**

- G2S-*T* module
- AC power supply adapter, output 12V/1A DC
- Temperature sensor 10k $\Omega$  ( $\beta = 3435$ ), 2pcs
- Connection cable USB A – mini USB 5pin B, length 1,8m
- User manual

# NOTE CONCERNING PROTECTION OF ENVIRONMENT

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This product must not be disposed of via normal household waste after its service life, but must be taken to a collection station for the recycling of electrical and electronic devices. The symbol on the product, the operating instructions or the packaging indicate such disposal procedures. The materials are recyclable in accordance with their respective symbols. By means of re-use, material recycling or any other form of recycling old appliances you are making an important contribution to the protection of our environment. Please ask your local council where your nearest disposal station is located.

In case of quality problem or other please contact your local supplier or authorized service center.

**Emergency number: 112**

## PRODUCER

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