control solutions
TERACOM



TCG210-4

4G Parcel Temperature and Humidity Logger

USER MANUAL

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

1. Short description

TCG210-4 is a battery-powered 4G parcel temperature and humidity logger with fallback support for 2G communication. The device is compatible with HTTP/HTTPS API protocols, making it suitable for modern IoT applications. It periodically sends HTTP/HTTPS POST requests to a remote server, containing a status file in JSON format and the most recent logged data in CSV format.
The logger operates on a built-in non-rechargeable Lithium-thionyl chloride ($Li\text{-}SOCl_2$) battery, ensuring long-term autonomous operation. Thanks to advanced low-power techniques, the device can run for several months without maintenance. The lithium content per cell is less than 2 g, making the battery fully compliant with IATA Dangerous Goods Regulations (DGR), UN 3091, Packing Instruction 970, Section II — allowing safe air transportation.
The primary application of the TCG210-4 is the monitoring of temperature and humidity in sensitive parcel shipments containing pharmaceuticals, food, and other perishable goods. It can also be used as a standard data logger in warehouses, greenhouses, and other environments requiring reliable climate monitoring.

2. Features

- Global connectivity - Quad-band 4G LTE Cat.1 with 2G fallback ensures reliable operation worldwide.
- Battery-powered autonomy - Operates for months without external power, ideal for parcel monitoring and remote applications.
- Intelligent power management - Advanced sleep mode significantly extends battery life.
- Flexible configuration - Easy setup via Wi-Fi, SMS, or HTTP API.
- Real-time alerts - Instant SMS alarm notifications to up to five phone numbers.
- Integrated sensing - High-accuracy temperature and humidity sensor for critical parcel monitoring.
- Large data storage - Onboard memory for up to 70,000 logged records.
- Seamless IoT integration - Periodic HTTP/HTTPS POST with current status in JSON format.
- Data export - Automatic upload of logged data in CSV format to a remote server.
- Remote management - Full device control through HTTP API commands.
- Future-proof - Firmware update over Wi-Fi or 4G LTE keeps the device always up to date.
- Compact and lightweight - Designed for easy deployment in parcel logistics, cold chain transport, and warehousing.
- Safe for air transport - Powered by a compliant $Li\text{-}SOCl_2$ battery (IATA DGR, UN 3091, PI970 Section II), suitable for air shipment.

3. Applications

- Pharmaceutical and food parcels - Continuous monitoring of temperature and humidity during transportation of medicines, vaccines, and perishable food products.
- Cold chain logistics - Reliable temperature and humidity tracking throughout the delivery process to ensure product integrity.
- Air cargo shipments - Fully compliant with IATA regulations, making it ideal for monitoring small parcel shipments transported by air.
- Warehousing and storage - Reliable climate monitoring in warehouses, storage rooms, and distribution centers.
- Agriculture and horticulture - Suitable for greenhouses, nurseries, and mushroom farms requiring precise climate control.
- Wine and beverage industry - Monitoring of temperature and humidity in wine cellars, breweries, and beverage storage facilities.
- Smart IoT monitoring - Seamless integration into modern IoT platforms for real-time data acquisition and remote control.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4. Specifications

- Physical characteristics

  Dimensions: 163 × 63 × 42 mm (including sensor)
  Weight: 180 g (without battery)

- Environmental limits

  Operating temperature range: -20 to 60°C
  Operating relative humidity range: 10 to 90% (non-condensing)

  Recommended operating range is 20% to 80% RH (non-condensing) over –10 °C to 50 °C. Prolonged operation beyond these ranges may result in a shift of sensor reading, with slow recovery time.

  Storage temperature range: -20 to 60°C
  Storage relative humidity range: 10 to 90% (non-condensing)

- Protection

  Ingress protection: IP54

- Battery (not included)

  Type: ER26500 Non-rechargeable Lithium-thionyl chloride (Li-$SOCl_2$)
  Voltage: 3.6 V
  Capacity: 6000 mAh
  Typical current consumption: 0.140 A @ 3.6 VDC
  Sleep mode current: 6 µA
  Recommended continuous current: >1300 mA
  Pulse capability: >2000 mA

- Cellular interface

  Standards: LTE-FDD, EDGE, GPRS
  LTE bands: B1, B2, B3, B4, B5, B7, B8, B12, B13, B18, B19, B20, B25, B26, B28, B34, B38, B39, B40, B41, B66
  3G bands: B1, B2, B4, B5, B6, B8, B19
  2G bands: B2, B3, B5, B8
  GPRS multi-slot class: 12 (1–12 configurable)
  GPRS terminal device class: Class B
  GSM compliance: Phase 2/2+ (Class 4 – 2 W @ 850/900 MHz; Class 1 – 1 W @ 1800/1900 MHz)
  SIM card: Micro

- Data logger

  Capacity: Up to 70,000 records

- Internal Flash memory

  Settings endurance: 100,000 cycles (each setting change counts as one cycle)
  Data logger endurance: 100,000 cycles of 70,000 records
  Firmware update endurance: 100,000 cycles

- Warranty

  Warranty period: 3 years

5. Installation

This device must be installed by qualified personnel only.
The installation process includes:

- Inserting a SIM card.
  Attention!
  Before inserting the SIM card into the slot, ensure that the PIN code is disabled. Otherwise, the device will not be able to register on the cellular network.
- Insert the ER26500 type battery into the holder.
  Attention!
  Observe the correct polarity when inserting the battery.
- Connecting to the cellular network.
- Configuring the device via Wi-Fi and a web browser.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

6. Setup concept

The device supports three configuration methods:

- Via Wi-Fi – can be used only when the device is nearby. This is the most convenient method for initial setup.
- Via HTTP API – allows remote configuration whenever the device sends an HTTP POST message.
- Via SMS – allows remote configuration; the commands are executed at the next device wake-up. This method can be used even when the device is part of a system operating through the HTTP API.

The recommended sequence for initial configuration (via Wi-Fi) includes the following steps:

- Check whether temperature and humidity parameters are displayed on the Monitoring page. This confirms that the device is functioning properly with respect to measurement.
- Configure the device to connect to the mobile network and verify connection status on the System page. This confirms that cellular communication is working correctly.
- Add at least one phone number (Master) on the SMS page and verify that you can send commands. SMS is not considered a reliable communication channel (mobile operators may limit it), but it provides a useful backup link to the device.
- It is recommended to fill in or correct the fields in the General setup section on the System page. This ensures proper identification of the device within your system.
- Configure communication with your server on the HTTP POST page.
- Set up the device clock on the NTP page to ensure correct timestamps in the data logger records.
- Finally, configure Power saving and Logger settings, ensuring that their timing is synchronized. The less frequently the device wakes up, the longer it will operate on the installed battery.

To save setup time, use the Backup/Restore feature.

After configuring the first device, create a backup file and use the Restore function to apply the same configuration to additional units.

7. Setup via Wi-Fi

The device can be configured using a standard web browser on a computer or mobile device.
After inserting the battery, TCG210-4 automatically activates a Wi-Fi access point with the following parameters:

- SSID: tcg210-4ap
- Password: tcg210-4ap

Once the computer or mobile device connects to this Wi-Fi network, open a web browser and enter the following address in the address bar:

http://192.168.4.1

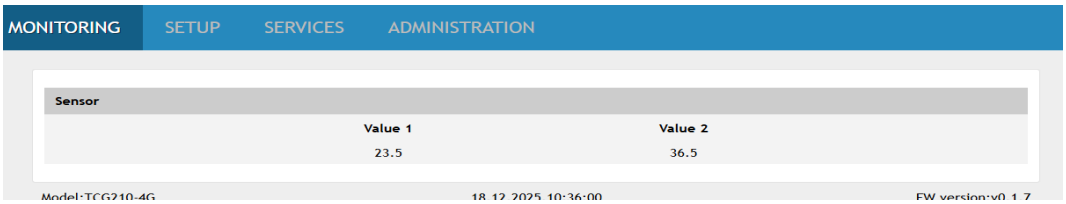
This will open the device's web configuration interface, where you can set up network parameters, server connection, and other operating options.

Note:

The Wi-Fi access point remains active for 10 minutes after power-on or until configuration is completed.

7.1. Monitoring

The Monitoring page displays the current values of temperature and humidity.
The page is automatically refreshed every second, ensuring that all displayed values are always up to date.



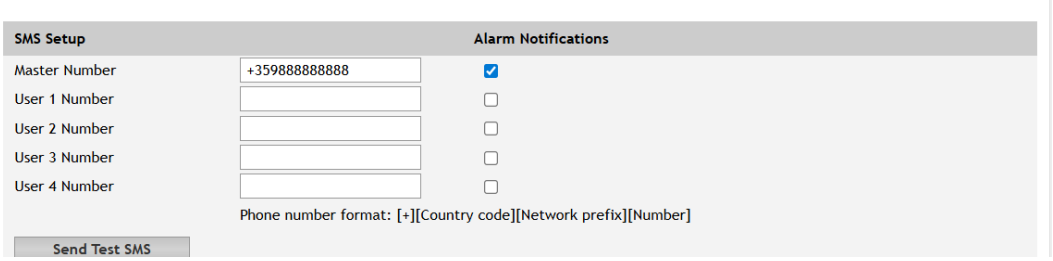
7.2. Setup

7.2.1. SMS

SMS Setup

In this section, you can configure the phone numbers that will receive SMS alarm notifications.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000



One number is designated as the Master number.
The Master has special rights to modify device settings and request information via SMS commands.
Up to four additional recipients can be configured to receive SMS notifications when a monitored parameter enters an alarm condition.
To enable notifications for a specific recipient, select the corresponding “Alarm Notification” checkbox on Setup->Alarms page.
These recipients can also query the current parameter values by sending SMS requests to the device.
By pressing the “Send test SMS” button, all configured recipients will receive a test message confirming that the SMS notification service is active.
Note: Phone number should be in E.164 international format.
Example: +359888800444
A detailed list of supported SMS commands, their syntax, and response formats is provided in the “Setup via SMS” section.

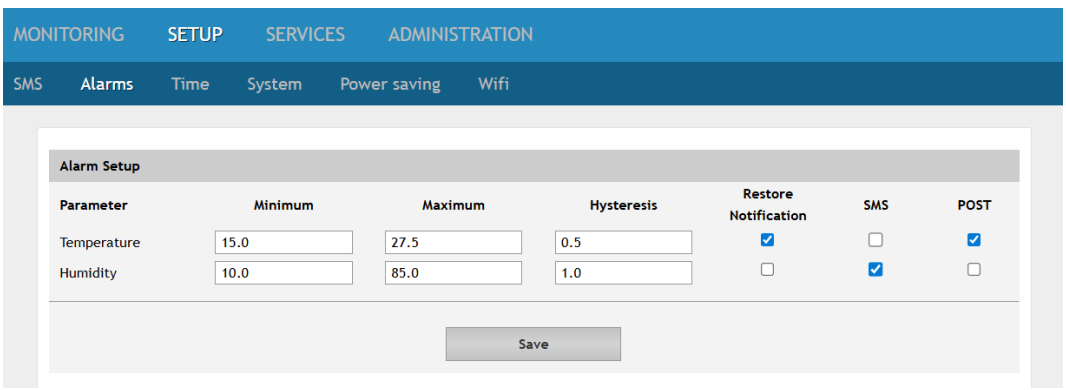
Periodic check for SMS
Most of the time, the device operates in sleep mode to conserve battery power.



When SMS communication is enabled, the device periodically wakes up to check for incoming messages at the interval defined by the “Check period” parameter.
The optimal check period depends on the specific application. To balance battery life and responsiveness, choose the longest acceptable interval.
A shorter interval increases power consumption and reduces battery life.
By default, this service is disabled.
Note: Mobile network operators do not always prioritize or guarantee SMS delivery.
Therefore, SMS communication is not considered fully reliable and should only be used as

7.2.2. Alarms

The Alarms page allows you to define threshold levels for temperature and humidity.
When a measured parameter goes outside the specified range, the controller can send an alarm notification via SMS and/or HTTP POST to the remote server.

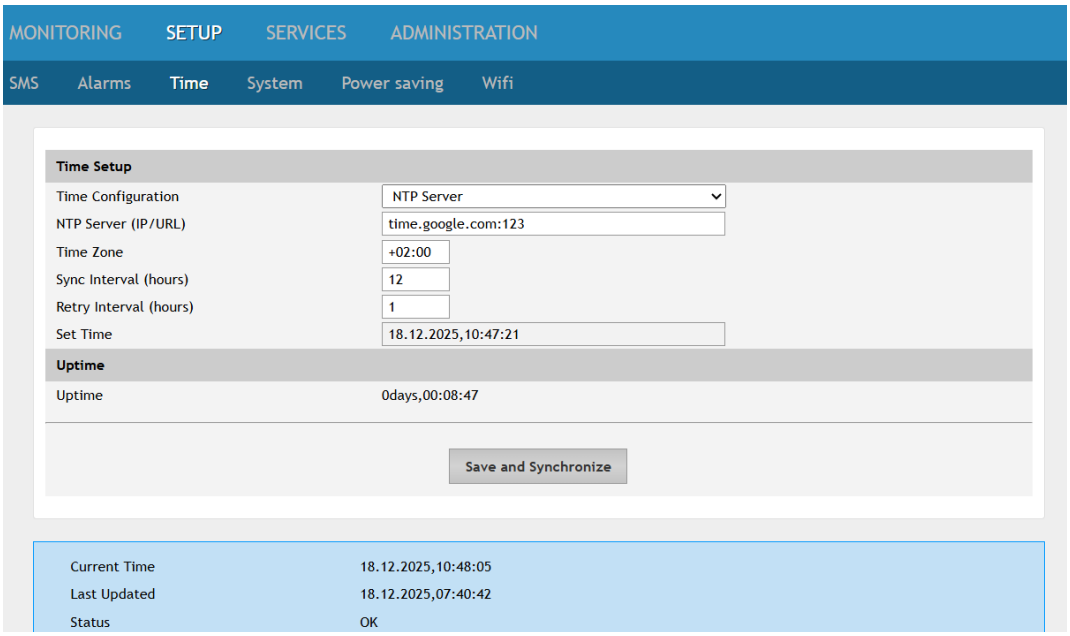


Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

To prevent excessive alarm messages near the threshold values, an appropriate hysteresis should be applied. As a general guideline, a hysteresis of 2–3% of the parameter value is recommended to ensure stable operation.
If the “On return” option is selected, the device will also send an SMS or HTTP POST message when the parameter returns to its normal range.

7.2.3. Time

The internal RTC (Real-Time Clock) of the controller can be configured either manually or automatically.



For automatic synchronization, the controller supports NTP (Network Time Protocol).
All parameters required for automatic synchronization can be configured in this section.
Synchronization is performed at the interval defined by the “Period” parameter.
If synchronization is unsuccessful, the next attempt is made after the delay defined by the “If not found” parameter.
Pressing the “Save and synchronize” button immediately initiates a time synchronization attempt.
The “Status” field (displayed in the blue box) provides diagnostic information about the availability of the NTP server and the Internet connection.
When HTTP POST is enabled, the current system time is included in the JSON file sent to the remote server.

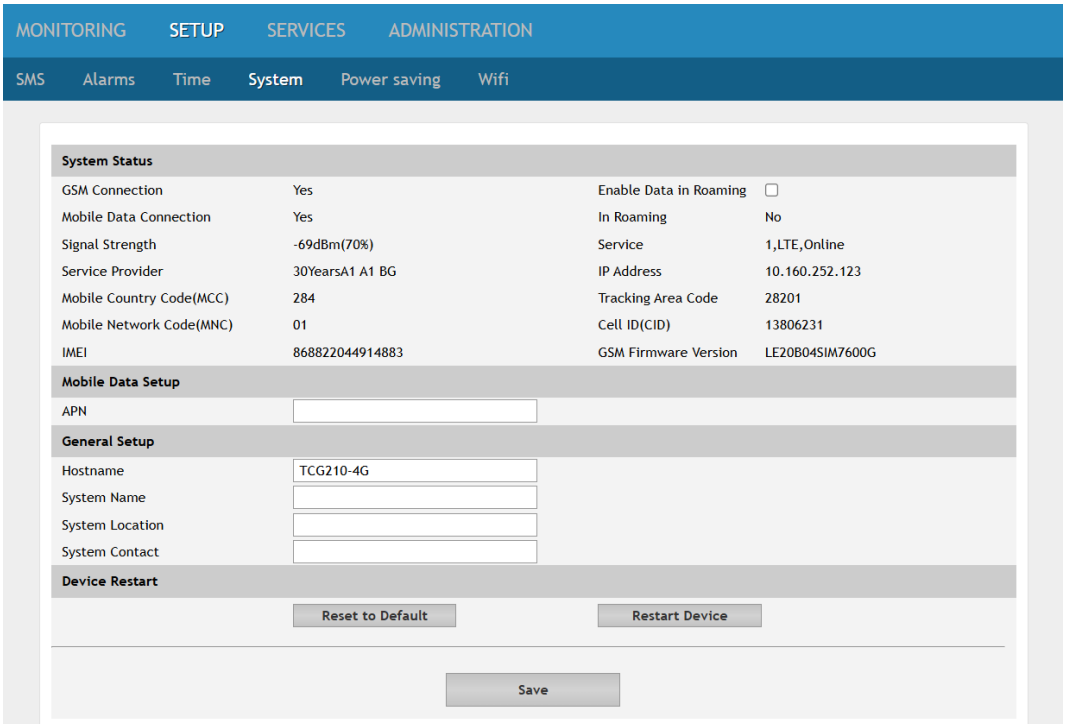
Default settings:

- NTP server: time.google.com
- Port: 123
- Time zone: +00:00
- Synchronization period: 12 hours

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

7.2.4. System

This page provides access to the general system settings of the device.



System status

This section displays detailed information about the controller's current network and system status.
The only configurable option is the "Data in roaming" checkbox.
By default, this option is disabled to prevent additional charges for data transfer while roaming.
If the device operates with a SIM card from another mobile operator, the "Data in roaming" option must be enabled.
Otherwise, services that require data connectivity – such as HTTP POST communication and NTP synchronization - will not be available

GPRS setup

To establish a mobile data connection (GPRS or LTE), the APN (Access Point Name) normally needs to be configured.
The APN value depends on the GSM service provider and is typically provided by the mobile network operator.
For detailed information about the correct APN settings, please contact your mobile network operator.

General setup

This section contains general configuration parameters used for device identification.
The following parameters can be defined:

- Hostname
- System name
- System location
- System contact

These values are stored in the identification header of CSV files and included in JSON messages sent to the server.
They provide flexible options for identifying and managing the device remotely.

Device restart

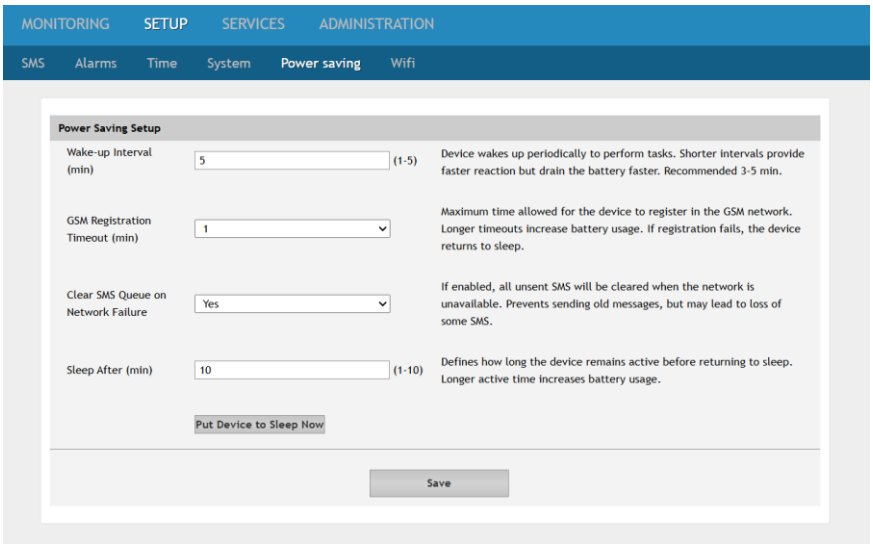
This section provides tools for restarting the controller or restoring it to factory default settings:

- Device restart - performs a full system restart without changing any configuration.
- Reset to default - restores all parameters to factory default values.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

7.2.5. Power saving setup

This section allows configuration of the device's power-saving parameters.
These settings define how often the controller wakes up from sleep mode and how it behaves during GSM registration and communication issues.



Wake-up period (min):

Determines how often the device wakes up from sleep mode. Possible values are from 1 to 5 minutes.
A longer wake-up period extends battery life but reduces the device's responsiveness.
A shorter wake-up period provides faster response but increases battery consumption.
By adjusting this setting, you can balance battery lifetime and responsiveness according to your specific application.

GSM registration timeout (min):

Specifies how long after waking up, the device will attempt to register on the GSM network.
A longer timeout increases power consumption and leads to faster battery discharge.
Possible values are from 1 to 5 minutes.

SMS queue clearing in network problem:

Defines whether pending outgoing SMS messages are cleared when the device cannot register on the GSM network or a network error occurs.
If enabled, unsent SMS messages will be lost in such cases.

Go to sleep after (min):

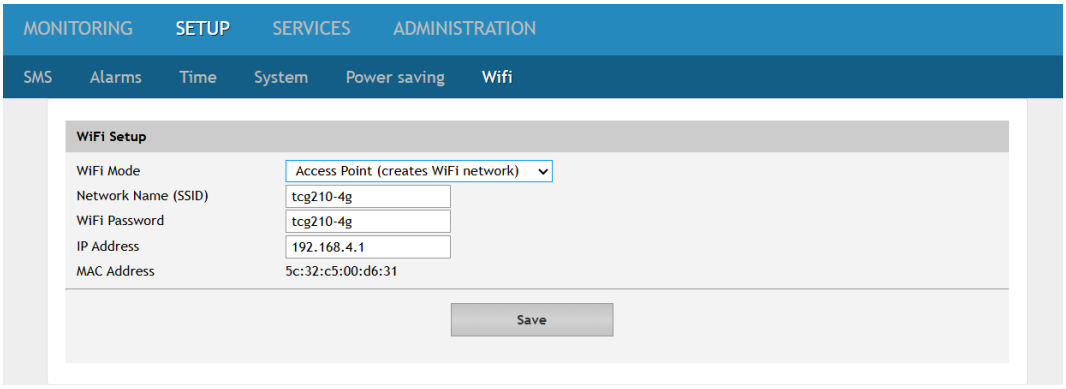
Determines the delay after which the device enters sleep mode automatically.
Possible values are from 1 to 10 minutes.
The "Go to sleep now" button immediately puts the device into sleep mode, regardless of the configured timeout.

7.2.6. Wi-Fi

This section allows configuration of the Wi-Fi communication.
The device can operate in two modes:.

- Access Point - the device creates its own Wi-Fi network. (default mode)
- Station - the device connects to an existing Wi-Fi network.

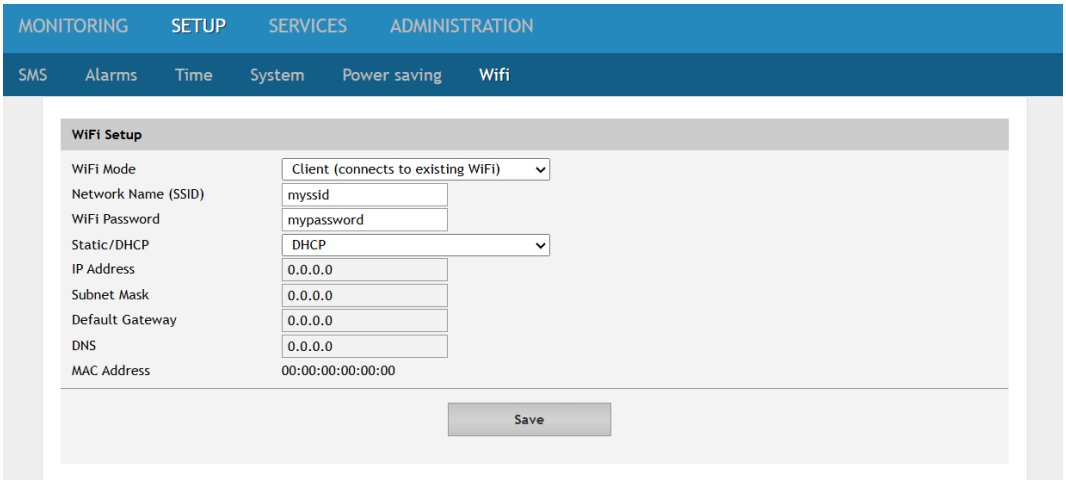
Access Point mode



When operating as an Access Point, the following parameters are available:

- SSID - name of the Wi-Fi network. Default: tcg210-4ap
- Password - password for accessing the network. Default: tcg210-4ap
- IP address - IP address for accessing the web interface. Default: 192.168.4.1
- MAC address - informational, cannot be changed.

Client (Station) mode



When operating as a client (station), the following parameters must be configured:

- SSID – name of the Wi-Fi network to which the device will connect.
- Password – password for the target Wi-Fi network.
- Static/DHCP – network configuration type. Choose between:
  - DHCP – automatically obtains IP address and network settings.
  - Static – manually set IP address, Subnet mask, Default gateway, and DNS servers.
- MAC address – informational, cannot be changed.

7.3. Services

The Services section provides configuration options for data logging and communication with external servers. These functions enable the TCG210-4 to record temperature and humidity data, store it locally, and periodically upload it to a remote server for further processing or integration into IoT platforms.

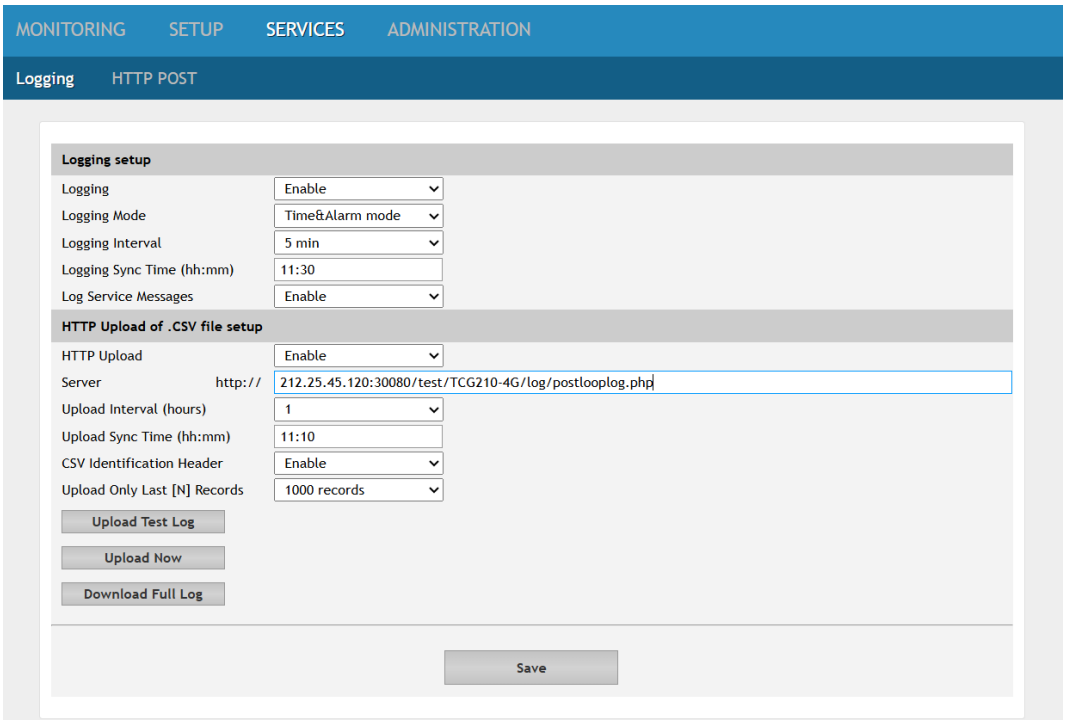
7.3.1. Data logger

The Data logger function allows the TCG210-4 to record temperature, humidity, and network-related data in non-volatile memory.

The stored information can be used for traceability, shipment verification, or environmental monitoring purposes.

Depending on the selected operating mode, the logger can create records at fixed time intervals, upon alarm events, or both.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000



Note:
The TCG210-4 is not a real-time device.
All processes are executed during its periodic wake-up cycles.
The wake-up interval is defined in the Power saving page.
For correct operation, both the logging period and synchronization times must be set as multiples of the wake-up interval.
Logger modes
The logger supports three operating modes:
Time mode – Records are generated periodically according to the configured log period.
Alarm mode – Records are generated whenever an alarm condition occurs.
Time & Alarm mode – Records are generated both periodically and on alarms.

Log period

Defines the interval between two log entries.

- A shorter log period provides higher temporal resolution but reduces the total historical range.
- A longer log period conserves memory and battery life but provides less detail.

By adjusting this setting, you can optimize the balance between data granularity and power efficiency.

Accessing log records

Log records can be accessed in two ways:

- Download full log – Exports the entire log file via the web interface.
- Periodic upload – Automatically sends the latest log entries to a remote HTTP server.

Log files are transmitted in CSV format.
The upload period can be configured from 1 to 24 hours.
The sync time defines the daily reference point for upload alignment.
Example:
If the current time is 19:31, the upload period is 3 hours, and sync time is 09:00, uploads occur at:
09:00, 12:00, 15:00, 18:00, 21:00, 00:00, 03:00, and 06:00.
If the logger is enabled at 19:31, the first upload will occur at 21:00.

The Force upload button immediately sends all unsent records.
By default, the data logger is disabled.

Memory management

The logger uses a circular buffer stored in flash memory:

- When memory is full, new records overwrite the oldest ones.
- A complete log is always available for download.
- A semicolon (;) is used as a field delimiter.
- If enabled, the first row contains the identification header (Device name, Device ID, Host name, System name, System location, System contact).
- The second row contains the column headers.

Log file structure

Each record starts with a UID and a timestamp.
The data structure of each record is as follows:

UID;Time;Type;Temperature;Humidity;MCC;MNC;LAC;CELLID;SQ;Alarm T;Alarm H;

Field definitions:

- UID - 32-bit unique record number.
- Time - Timestamp in format yyyy.mm.dd, hh:mm:ss.
- Type – Record type:
  - Time - Periodic record.
  - Event - Record triggered by alarm.
  - Geo - Successful GSM connection with MCC, MNC, LAC, CELL ID, and signal quality.
  - GSM stop - GSM disconnection event.
  - Type - Header record.
  - Start - Device power-up event.
  - Restart - Device restart.
  - Power Down - Power-down event.
  - RCON:xxh - Service information.
  - Bad - Invalid or corrupted record.
- Temperature / Humidity – Measured values (°C, %RH).
- Alarm T / Alarm H – Active alarm flags (1 = active).

Example log file

UID;Time;Type;Temperature;Humidity;MCC;MNC;LAC;CELLID;SQ;Alarm T;Alarm H;
251;10.03.2021,09:30:00;Geo;27.8;30.6;284;1;28200;38208;-69;0;0;
252;10.03.2021,09:40:00;Time;27.7;30.5;284;1;28200;38208;-67;0;0;

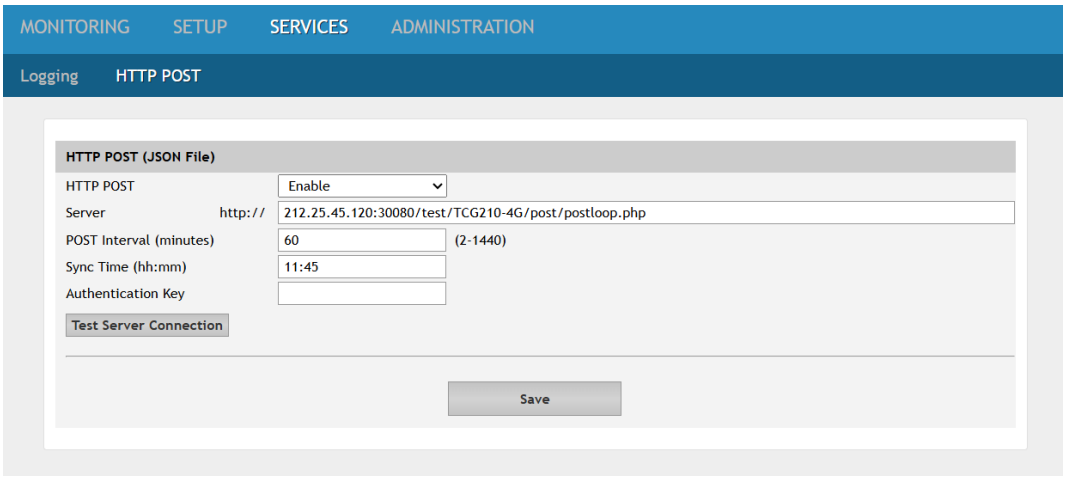
Notes:

The log file is compatible with standard spreadsheet applications (e.g., Excel, LibreOffice Calc).
For accurate operation, ensure that time synchronization via NTP or manual setup is correctly configured.

7.3.2. HTTP Post

The HTTP POST function enables the TCG210-4G to automatically transmit measurement data and device status information to a remote server using the HTTP or HTTPS protocol.
This service ensures seamless integration with cloud platforms, monitoring systems, or custom web applications by periodically sending structured JSON files containing the latest readings and system parameters.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000



Note:
The TCG210-4 is not a real-time device.
All processes are executed only during the periodic wake-up cycles.
The wake-up interval is configured in the System page.
For proper operation, both the POST period and Sync time must be set as multiples of the wake-up interval.

Purpose

The HTTP POST service periodically uploads a JSON file to a remote server using the HTTP POST method.
This JSON file contains the current status of all monitored parameters together with additional system information.

- The Server field defines the destination server by domain name or IP address.
- The POST period determines how often the JSON file is transmitted.
  - Range: 2–1440 minutes
  - A shorter period provides more frequent updates (closer to real-time) but increases data traffic and power consumption.
  - A longer period conserves power and reduces traffic but provides less frequent updates.
- The Sync time parameter aligns uploads to specific times of the day (format hh:mm).

Identification

The Key field is a user-defined string included in the JSON file.
It can be used by the remote server for device identification, authentication, or grouping of devices.

HTTP POST Commands

The TCG210-4 supports a set of HTTP POST commands that allow remote configuration through the server. All commands are case-sensitive.

Command	Description
sn**a**=??.?	Set Min threshold for the parameter. (a = 1 → temperature; a = 2 → humidity) Example: sn1=30.0 sets Min threshold for temperature. sn2=10.0 sets Min threshold for humidity.
sx**a**=??.?	Set Max threshold for the parameter. (a = 1 → temperature; a = 2 → humidity) Example: sx1=40.0 sets Max threshold for temperature. sx2=80.0 sets Max threshold for humidity.

sy**a**=?.?	Set Hysteresis for the parameter. (a = 1 → temperature; a = 2 → humidity) Example: sy1=1.5 sets hysteresis for temperature. sy2=2.0 sets hysteresis for humidity.
wper=**x**	Set wake-up period in minutes, where **x** can be from 1 to 5.
purl=**yyy**	Define the full HTTP POST server URL where data will be uploaded. The value **yyy** must include both the domain name (or IP address) and the full path to the server script. Example: purl=www.teracomsystems.com:8801/posttest.php
pper=**x**	Set HTTP POST period in minutes, where **x** can be from 2 to 1440.
psync=**hh:mm:ss**	Set HTTP POST synchronization time.
dk=**xxx**	Define HTTP POST key, where **xxx** can be up to 17 characters.
flmod=**x**	Set "flight mode" - disables cellular connectivity for **x** hours, where **x** can be from 1 to 24.
save	Save all previous changes (except relay settings) to FLASH memory. Since each save operation affects flash memory endurance, use this command carefully. Example: pper=2&save sets the HTTP POST period to 2 hours and saves it.
FIN	Terminates the current HTTP POST session (used only for HTTP POST operations).

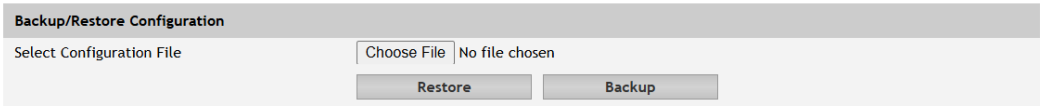
7.4. Administration

The Administration section provides tools for managing system configuration and maintenance of the device.

It includes functions for backing up and restoring settings, updating firmware, and performing other administrative operations that ensure reliable and consistent device management.

7.4.1. Backup/Restore

The controller supports full backup and restore of all user-defined settings.



All configuration parameters can be exported to an XML backup file.

This file can later be used to restore the configuration on the same device or to quickly deploy identical settings across multiple devices.

This functionality ensures consistent setup, reduces configuration time, and minimizes the risk of manual errors during mass deployment.

This feature is particularly useful for managing multiple units with identical operating parameters or for maintaining configuration consistency after firmware updates.

7.4.2. Firmware update

The controller supports firmware updates via the web interface.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000



This feature allows users to easily install the latest firmware version, ensuring optimal performance and access to new features.

The update procedure is straightforward:

- Download the latest firmware file from www.teracomsystems.com.
- In the web interface, select the downloaded file using the “Choose File” button.
- Press “Upload” to start the update process.

Attention!

Do not turn off the power supply or remove the battery during the update.

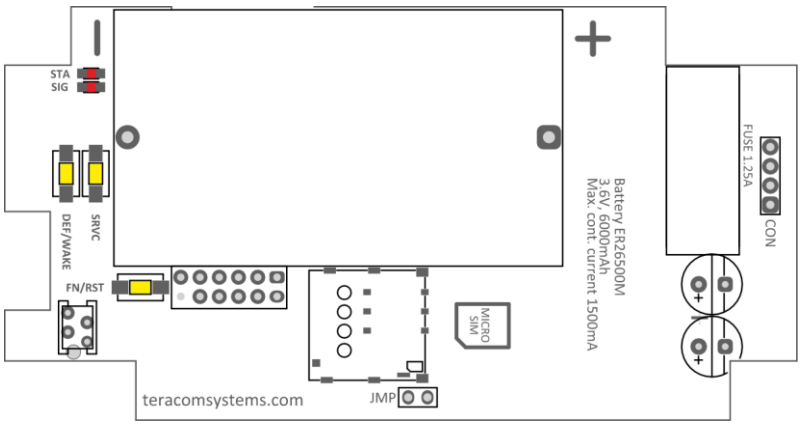
Interrupting the process may damage the device and render it inoperable.

Tip:

After a successful firmware update, it is recommended to restart the device and verify the firmware version displayed in the Firmware update section.

8. Buttons and LED’s

The device is equipped with buttons for service and configuration modes, as well as LEDs for status.



8.1. Reset and Factory default

This section describes the hardware buttons and their functions for resetting, waking up, or restoring the device to its factory default settings.

These operations are useful for troubleshooting, performing a manual restart, or recovering from configuration issues.

Use reset and factory restore functions with care, as some operations will permanently erase all user settings.

The device is equipped with two hardware buttons that have multiple functions depending on how they are pressed or combined. The button names printed on the enclosure reflect their dual roles:

- DEF/WAKE – used both for restoring Factory Default (DEF) settings and for waking up (WAKE) the device from sleep mode.
- FN/RST – used as a Function (FN) button in combination procedures and for performing a Reset (RST) during normal operation.

Different operations are triggered by single presses or button combinations, as described below.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Reset

If the FN/RST button is pressed for approximately one second during normal operation, both LEDs will turn OFF, then ON simultaneously for two seconds, after which the device will restart.

This procedure performs a standard software reset without affecting the saved configuration.

Wake-up

If the DEF/WAKE button is pressed while the device is in sleep mode, it will immediately wake up and resume normal operation.

This is useful when you need to perform configuration or maintenance without waiting for the next scheduled wake-up cycle.

Factory default

To restore the device to factory default settings:

- Press and hold the DEF/WAKE button.
- While holding DEF/WAKE, briefly press and release the FN/RST button.
- Both LEDs will flash together briefly, then turn ON again.
- Release the DEF/WAKE button.

The device will restart with all parameters restored to their factory default values.
After performing a factory reset, all user-defined settings (Wi-Fi, alarms, HTTP POST configuration, etc.) must be reconfigured manually or restored from a previously saved backup file.

Summary

Reset - restarts the device without changing the configuration.
Wake-up - activates the device from sleep mode.
Factory Default - erases all custom settings and restores original factory parameters.

Warning

After performing a Software Reset (using the Restart Device button on the System page), Factory Default, Restore, or Update, the device automatically enters Sleep (power-saving) mode.

To access it via Wi-Fi, the device must be woken up by pressing the DEF/WAKE button.

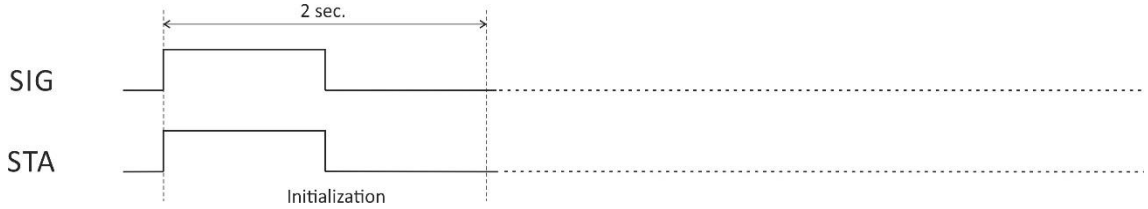
8.2. LED indicators

The LED indicators provide visual feedback about the device's operating status, network connection, and signal strength.
Two LEDs are available on the TCG210-4 device:

- SIG (red)
- STA (yellow)

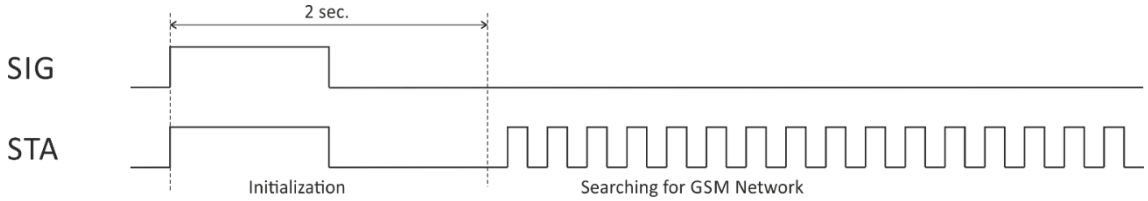
The LEDs indicate the following states:

- Controller initialization
  After power-on or firmware update, both SIG and STA LEDs turn ON for one second, then OFF for another second.

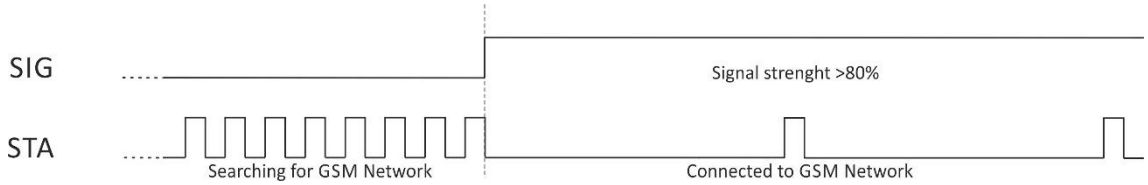


Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

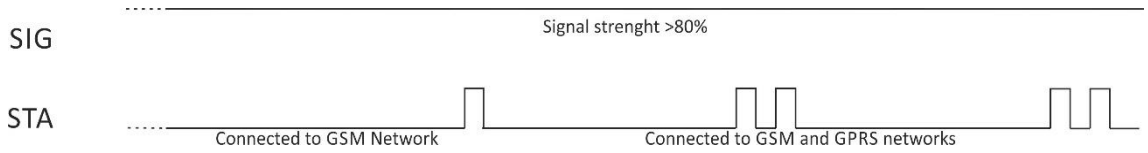
- Searching for mobile network (LTE or GSM fallback)
  After initialization, SIG remains OFF, while STA flashes with a period of 2 seconds (flash length 200 ms)



- Connected to mobile network
  After successful connection to a mobile network, STA shows the type of connection, while SIG indicates the signal strength.
  STA flashes once for 200 ms in a 2-second period - the device is registered to the cellular network (voice/idle mode).

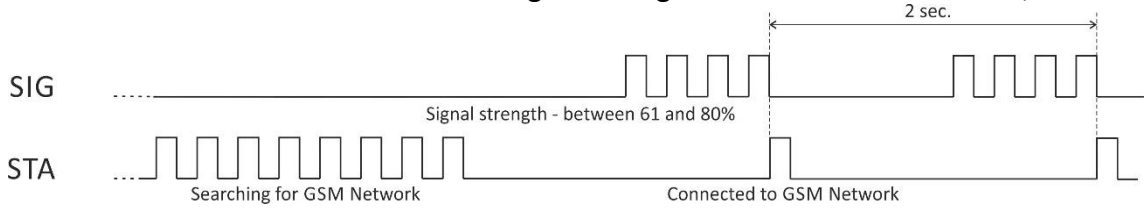


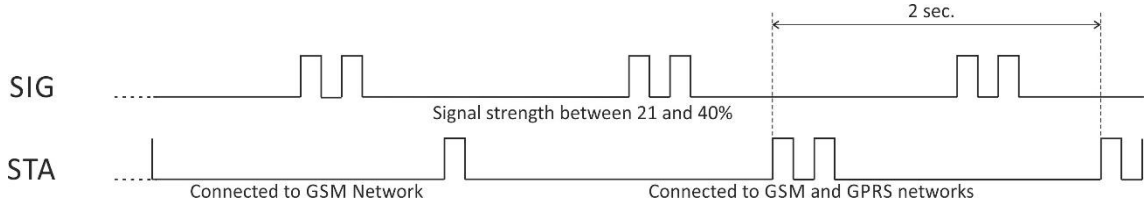
  STA flashes twice for 200 ms in a 2-second period – the device has an active data connection (LTE or GPRS).



  At the same time, SIG indicates five signal strength state:

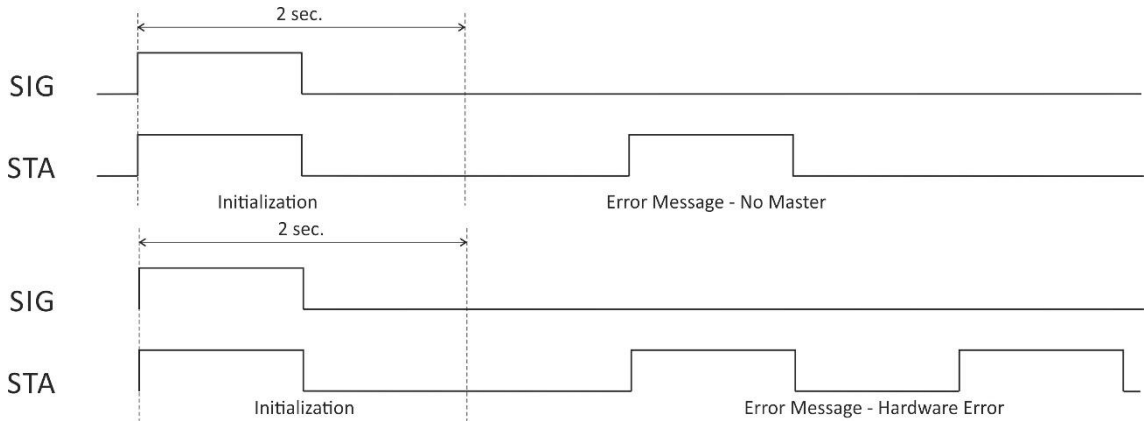
SIG flashes 1 time in period of 2S - signal strength is between 0 and 20%;
SIG flashes 2 times in period of 2S - signal strength is between 21 and 40%;
SIG flashes 3 times in period of 2S - signal strength is between 41 and 60%;
SIG flashes 4 times in period of 2S - signal strength is between 61 and 80%;
SIG is solid ON - signal strength is between 81 and 100%;





- Error indication
  If an error occurs after initialization, the SIG LED remains OFF, while the STA LED flashes to indicate the type of error:
  STA flashes ones for 1S - master phone number is not set.
  STA flashes permanently for 1S in a period of 2S - permanent hardware error.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000



9. SMS commands

The TCG210-4G supports SMS commands for changing parameters, requesting status information, and performing remote firmware updates (over-the-air).

This feature allows remote configuration and monitoring of the device even in areas without Internet connectivity.

Commands are accepted only from phone numbers stored in the device configuration.

Some commands require Master user privileges to execute.

Below is a list of all supported SMS commands.

Note that the underscore character (“␣”) must be replaced by a single space character when sending the command by SMS.

List of SMS commands:

- Set new master number

  Rights: Master
  Syntax: set␣master␣<number>
  Where
  <number> is a mobile number in the international format

  Example
  Command: set master +359885885885
  Answer: You are the new master!

- Set SMS users numbers - add/delete SMS users

  Rights: Master
  Syntax: set␣sms␣user␣<user>:<number>
  Where
  <number> is a mobile number in the international format
  <user> can be u1, u2, u3 or u4

  Example
  Command: set sms user u1:+359885887766
  Answer: u1:+359885887766,u2,u3,u4
  Command: set sms user u2:+359885999888
  Answer: u1:+359885887766, u2:+359885999888,u3,u4
  Command: set sms user u1:
  Answer: u1, u2:+359885999888,u3,u4

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

- Display SMS users numbers

  Rights: Master, Users
  Syntax: display_sms_users

  Example
  Command: display sms users
  Answer: m:+359885885885,u1:+359885887766,u2:+359885999888,u3,u4
- Status of system - requests main parameters of the device

  Rights: Master, Users
  Syntax: status_system

  Example
  Command: status system
  Answer: 09.03.2021,16:09:06,gprs=y,ss=80%,fw=1.00
- Set wake up period – sets wake up period

  Rights: Master
  Syntax: set_wper=<time>
  Where <time> is one of 1 to 5 in minutes
  Example set wake up period 5 min
  Command: set_wper=5
  Answer: wper=5
- Post URL – sets URL for HTTP Post

  Rights: Master
  Syntax: set_purl=<link>
  Where
  <link> is the address of remote server (domain or IP)

  Example
  Command: set purl= www.teracomsystems.com:8801/posttest.php
  Answer: purl= www.teracomsystemscoolgix.com:8801/posttest.php,post=on, pper=01,psync=00:00
- Status URL – status URL's for HTTP Post

  Rights: Master, User
  Syntax: status_purl

  Example
  Command: status purl
  Answer: purl=212.25.45.120:30080/test/TCG210-4G/post/postloop.php,post=on,pper=01,psync=00:00
- Post period – sets HTTP Post period

  Rights: Master
  Syntax: set_pper=<mm,hh:mm>
  Where
  <mm,hh:mm> - mm is the period in minutes, hh:mm is the sync time
  Example: set post period on 5 minutes and sync on 30 min
  Command: set pper=05,00:30
  Answer: pper=05,psync=00:30
  Example: set post period on 20 minutes
  Command: set pper=20
  Answer: pper=20,psync=00:30

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

- Post on – sets HTTP Post on

  Rights: Master
  Syntax: set_post=on

  Example
  Command: set post=on
  Answer: post=on,pper=20,psync=00:30
- Post off – sets HTTP Post off

  Rights: Master
  Syntax: set post=off

  Example
  Command: set post=off
  Answer: post=off,pper=20,psync=00:30
- Set a time server

  Rights: Master
  Syntax: set_ts=url:port

  Example
  Command: set ts=time.google.com:123
  Answer: ts=time.google.com:123,tz=+02:00
- Set a time zone

  Rights: Master
  Syntax: set_tz=±hh:mm

  Example
  Command: set tz=+03:00
  Answer: ts=time.google.com:123,tz=+03:00
- Restart – restarts the device

  Rights: Master
  Syntax: restart

  Example
  Command: restart
  Answer: Device is restarting!
- Send test SMS – a message for sending a test SMS to the authorized users

  Rights: Master
  Syntax: test_sms

  Example
  Command: test sms
  Answer: This is a test SMS!
- Update – a message for update the device over the air (GPRS)

  Rights: Master
  Syntax: update_<URL>
  Where
  <URL> is a valid URL to public server, pointing update (.cod) file
  Example
  Command: update www.teracomsystems.com/docs/TCG210-4G-v1.000-P-S.cod
  Answer 1: Downloading firmware...
  Answer 2: Firmware file downloaded. Updating...

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Following answers are also possible in different situations:

Answer: File corrupt or wrong version!
Answer: Can't connect to server!
Answer: Download time out!
Answer: GPRS is not connected!
Answer: Connection lost!
Answer: Response timeout!
Answer: Socket error!

10. Safety

The device is intended for monitoring applications only.
It must not be used for medical or life-support purposes, or in systems where device failure could lead to injury or loss of life.
Do not expose the unit to liquids or operate it in environments with excessive moisture or condensation.
Avoid mechanical shock, deformation, or exposure to extreme heat sources.
The built-in lithium battery is not rechargeable.
Do not attempt to open, recharge, short-circuit, or incinerate the battery.
Dispose of the product in accordance with local regulations for lithium-powered electronic equipment.

11. Maintenance

The device requires minimal maintenance during normal operation.
It should be opened only for battery replacement or visual inspection.
Always replace the battery with the same type — ER26500 Li-$SOCl_2$ or an equivalent industrial-grade cell.
Observe the correct polarity when inserting the battery.
Do not use rechargeable batteries or any substitutes with different chemistry or voltage.
Clean the enclosure with a soft dry cloth if necessary.
Do not use liquids, solvents, or abrasive cleaners.
After battery replacement, ensure that the cover is properly closed to maintain protection against dust and moisture.

12. Recycling

Please recycle all applicable materials in accordance with local regulations.



Do not dispose of the device as regular household waste.

The product contains electronic components and a non-rechargeable lithium battery (Li-$SOCl_2$), which must be disposed of or recycled through appropriate collection facilities.



Proper recycling helps to prevent environmental pollution and promotes the sustainable reuse of valuable materials.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

The JSON file structure:


```
{
        "Monitor": {
            "DeviceInfo": {
                "DeviceName": " TCG210-4G ",
                "ID": "865826046797884",
                "HostName": "",
                "SysName": "",
                "SysLocation": "",
                "SysContact": "",
                "FwVer": "TCG210-4G-v1.00"
            },
            "Temp": {
                "Value": "25.2",
                "Min": "-15.0",
                "Max": "50.0",
                "Hys": "1.0",
                "Alarm": "NORMAL",
                "AlarmNum": "0"
            },
            "Hum": {
                "Value": "32.8",
                "Min": "10.0",
                "Max": "85.0",
                "Hys": "1.0",
                "Alarm": "NORMAL",
                "AlarmNum": "0"
            },
            "JPost": {
                "DKey": "",
                "PostPeriod": "1",
                "SyncTime": "00:00:00"
            },
            "Sys": {
                "HwErr": "",
                "HighestAlarm": "NORMAL",
                "HighestAlarmNum": "0",
                "JPCounter": "0",
                "CPCounter": "0"
            },
            "Time": {
                "Date": "04.03.2025",
                "Time": "10:34:03"
            },
            "FlightMode": {
                "FMDate": "0",
                "FMTime": "0"
            },
            "Geo": {
                "MCC": "284",
```


Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

```
                    "MNC": "01",
                    "LAC": "28200",
                    "CID": "38208",
                    "SQ": "-57"
                }
            }
}
```


Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000