LSI GRT2A0110 G.Re.T.A. Environmental Monitoring Solutions User Guide

Contents

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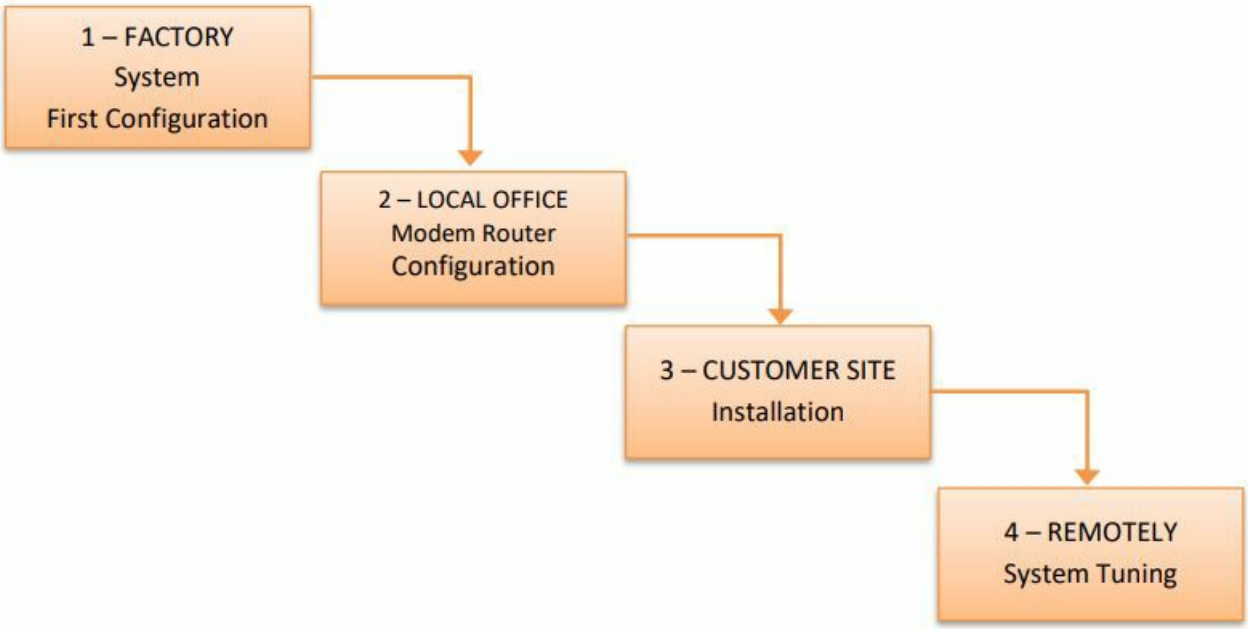
Revision list

- **Revision**
  - Origin
- **Date**
  - 19/06/2023
- **Description**

Block diagram of operations



Introduction

The block diagram shows the phases of installation and commissioning of a new G.Re.T.A. system. In details:

- 1- FACTORY – SYSTEM FIRST CONFIGURATION: it takes place in LSI LASTEM factory. The G.Re.T.A. system is configured associating the serial number of the system to the Customer Account in the G.Re.T.A. Cloud.
- 2 – LOCAL OFFICE – MODEM ROUTER CONFIGURATION: this phase take place done in a clean environment (office) before taking the System to the site while using a local SIM card. The aim is to configure the modem router and tests the functionality of the system before taking it at site. Furthermore, if the STU001 simulator with DWA905 cables is supplied, it is possible to perform a preliminary contact resistance test and verify the correct data transmission to the G.Re.T.A. Cloud.
- 3 – SITE – INSTALLATION: In this phase, the equipment and the cables are installed at site. It is important that, before this operation, the trench is dug, and the pole with its plinth already in place.
- 4 – REMOTELY – SYSTEM TUNING: this operation is done from remote by LSI LASTEM technicians, in collaboration with the customer/installer, to finalize the configuration of the system with the actual installation data and optimize the system functioning by tuning its parameters (injected current, time of injection etc.)

Phase 1 – FACTORY – FIRST CONFIGURATION
A first configuration of the system is done at the Factory to make sure, first of all, that all the measurements of that specific unit will be transmitted to the cloud software account of the specific customer. In this phase, some preliminary data are input such as the future geo-localization of the system and the cables (Latitude and Longitude), the name of the station and the name of the site. These preliminary data can be changed later on.

Phase 2 – LOCAL OFFICE- MODEM ROUTER CONFIGURATION
Before proceeding with the installation of the G.Re.T.A. system at the site it is highly recommended to carry out the configuration of the modem router with the local SIM card in a clean office. By doing so, the functionality of the system can be tested. The steps to

1. Insert the SIM into the modem/router.

2. Configure the modem/router with the APN of the SIM operator in use and check that it works. Power the device by turning on the Power Unit as described at point 1 of chap.3.

Ref.

- IST_04068 (supplied with the product)
- Tutorial video #1-Wireless router configuration -YouTube

3. Perform preliminary test with resistance simulator (if supplied)

- Connect the cables of the resistance simulator to their respective connectors on the main box.

- Follow all the operations described in chap.1.2.

4. Proceed to check the measurements on G.Re.T.A. Cloud as described in chap. 1.5. If you have not performed the preliminary test, only verify the access to the site.

SITE INSTALLATION

Installation of G.Re.T.A.

1. Install the main box and, if present, the Power Box and the photovoltaic panel.
   Ref.: INSTUM_04546 e DISACC_210024

2. Unwind the electrode lines according to the type of electrode used.

Cable unwinding with plate electrode

a. Escavate the trench.

Ref.: INSTUM_04546

b. Unwind the cables along the edge of the trench and screw the electrodes to the cables.

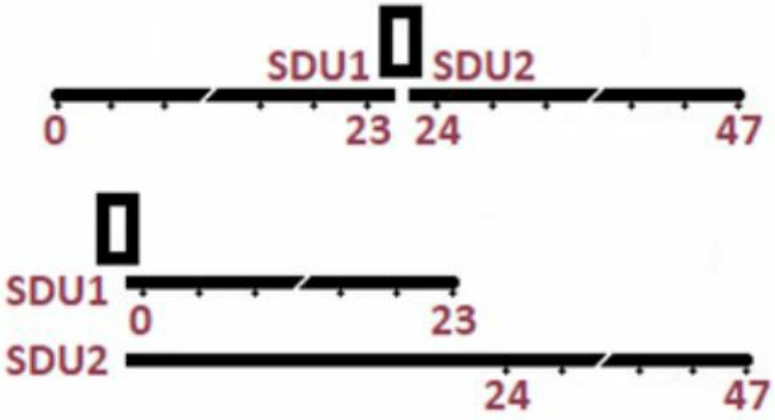
c. Place the cables inside the trench and partially cover the electrodes with soil in order to ensure optimal-contact with the ground.

Cable unwinding with picket electrode

- Unwind the cable on the ground to be monitored and, near the sleeves, plant the picket in the ground.
  - **Ref.:** INSTUM_04546

- Fix the cable of each single picket to the corresponding sleeve using the screws supplied.
  - **Ref.:** INSTUM_04546

- It is recommended to identify the electrodes of the two cables by numbering them as follows:
  - Cable connected to SDU1: from 0 to 23, starting from the end furthest from G.Re.T.A.
  - Cable connected to SDU2: from 24 to 47, starting from the electrode closest to G.Re.T.A.



The identification of the electrodes is useful for the next stage of testing and in case of maintenance.

Ref.: INSTUM_04546

1. Connect the cables to their respective connectors on the main box.
   Ref.: INSTUM_04546

2. If present, connect the 230 V ac power supply.
   Ref.: INSTUM_04546

First start-up and functional test

1. Turn on the Power Unit using the On-Off button on the top panel of the unit and check that the On LED lights up.

2. After a while, the Main Power Unit turns on, confirmed by the lighting of the green and red LEDs.

3. Within about two minutes the Signals Driving Unit turns on; this does not happen if the system is probably set to use the low power mode OMLP. To exit this mode, press the button on the top panel of the Main Power Unit

for at least 30 seconds.

4. At the same time, the modem/router power is also activated, indicated by the green LED lighting at the Modem icon of the Power Unit panel. The modem/router may still be on if its power supply has been preset in a fixed way, without necessarily activating the corresponding section of power from the Power Unit.

Ref.: INSTUM_04378

1. Perform the contact resistance test of the electrodes us-ing the Contact function. Navigation in the function menu takes place by pressing the button located on the upper panel of the Main Power Unit (MPU) while the information is shown on the Signal Driving Unit (SDU) display.

Using the MPU button

- Pressing the button activates the menu, if not already active, or switches to the next menu func-tion; if the current option is the last in the list, the menu selects the first available option again.
- The first available option is always No action; the activation of this choice leads to the initial waiting condition, indicated by the written Ready.
- The activation of the function corresponding to the selected menu item takes place by waiting 10”; the wait is

indicated by a countdown shown on the same menu item. At the end of the count the function is activated.

SDU function menu navigation

- No Action
- Tasks
  - No action
  - Ground
  - Contact
- Tools
  - No action
  - Send data
  - Send status
  - Check new config
  - Reboot
- Always on
  - No action
  - Enabled
  - Disabled

Check the status of the contact resistance measurements on the display. At the end of the process, the contact resistance data are visualized on the cloud platform (see §1.5). In case of non-optimal values, resistances over 800…1000 ohms, optimize the contact of the electrode with the ground using bentonite, if required, then repeat the test until the optimal values are reached.

Installation of E-Log for environmental measurements (optional)
If E-Log is supplied together with G.Re.T.A., as is the case for example for the GRT2A0110 model, the data logger is already configured. All that remains is to connect the sensor cables to the E-Log terminal board referring to the documentation supplied with the product. If not present, use the 3DOM software to download the configuration from the data logger and to generate the Configuration Report, useful as a reference for sensor wiring.

1. Install the sensors as indicated in their respective manuals.

   Ref.: INSTUM of a single sensor

2. Install 3DOM software on the PC.

Ref.:

- #1-3 DOM installation from the LSI LASTEM website – YouTube
- #5-Change the language of 3 DOM – YouTube

3. Register the serial number of the E-Log in 3DOM and download its configuration.

   Ref.:

   - INSTUM_00951
   - #3-E-Log connection to PC and new instrument in 3DOM program list – YouTube

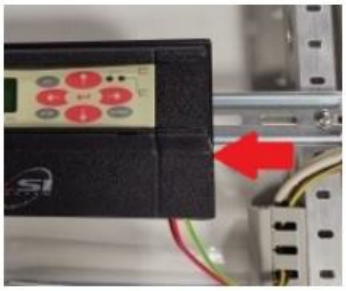
4. Generate the Configuration Report in 3DOM and connect the sensors to the E-Log terminal block as indicated in the document. This opera-tion must be performed with the data logger switched off. At the end restore the connection of the serial cable of the G.Re.T.A. box to the se-rial port 1 of E-Log.

Ref.:

- DISACC of single sensor
- INSTUM_00951
- #6-Sensors wiring report by 3DOM program – YouTube

Functional test of E-Log

1. Turn on E-Log using the button on the right side and check the presence of the environmental measurements on the display. The values are updated according to the configuration (1 minute by default).



Ref.: INSTUM_00351

2. Check the rain measurement as follows:
    - Loosen the three radial knurled screws and remove the rain gauge cone.

CAUTION! In the versions with a heater there is a cable that connects the base of the rain gauge to the thermo-cover sticking to the cone; remove the cone carefully and remove the plug from the box placed on the base.

- Remove the elastic band that blocks the tipping bucket, if not done during the installation phase.
- Read the rain value displayed on the data logger display.
- Lower the top end of the tipping bucket until it reaches the support screw in order to generate a pulse.
- Now check that the previously read value is increased by 0.2 mm (0.1 mm for model DQA230.3). Remember that the measurement on the display is updated every.

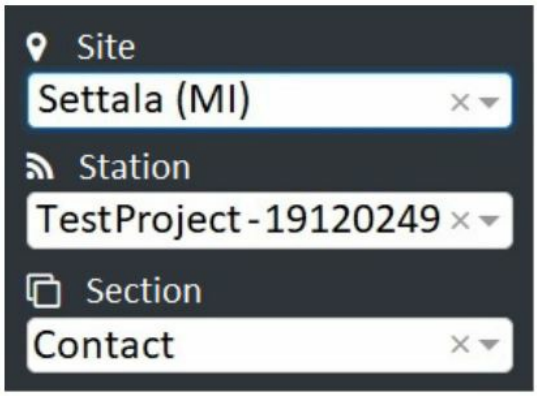
At the end of the operation, reconnect the plug of the heater cable, if the model is with the heater, and replace the cone fixing it with the three radial knurled screws.

3. The check of the air/soil temperature and relative humidity measurements must be performed by comparison with a reference instrument.
4. The check of the piezometric measurements must be performed by comparing them with the phreatic measurements; the data logger must have already been properly configured by LSI LASTEM according to the specific calibration data of each piezometer.

Check measurements reception on G.Re.T.A. Cloud

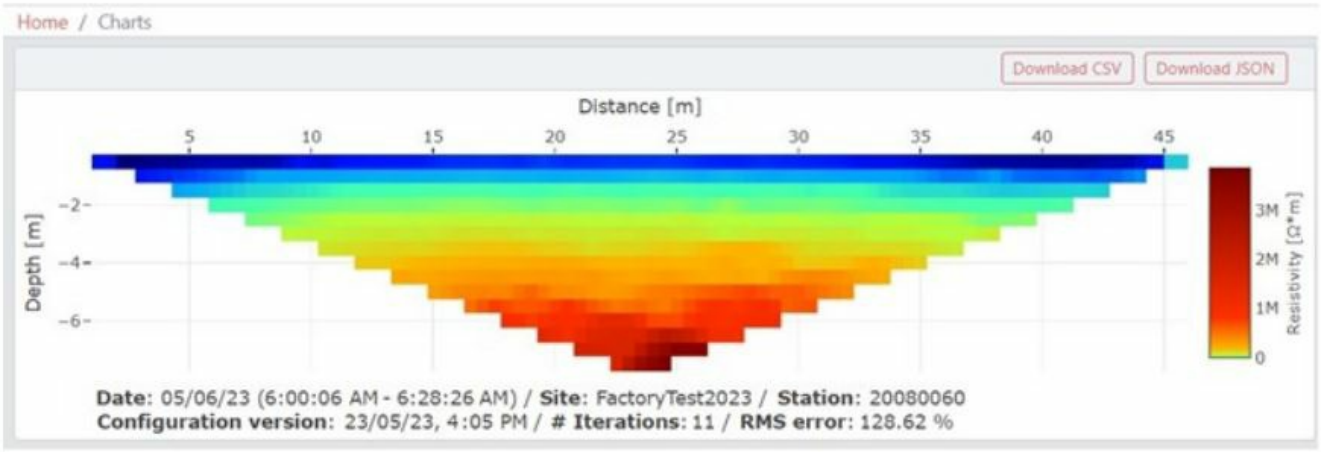
1. Access the site **https://greta.lsi-lastem.com** with the credentials ob-tained during the user registration phase. The password, if forgotten, can be requested by clicking Forgot Password.

2. Click on Charts oppure Contact survey, depending on the survey carried out, and select the desired Site, Station and Section.



3. Select a session compatible with that of the survey done.

4. Check the presence and the quality of the data.



Final operations

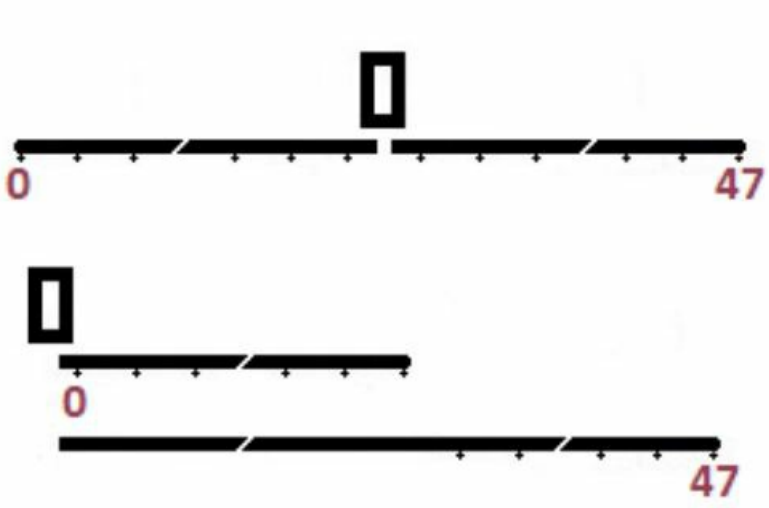
1. Once the functional checks have been completed, secure the site:
    - Cover the trench, if excavated.
    - Close the box lids.
    - Apply safety sign according to local legal regulations.

REMOTE TUNING

Get in contact with the LSI LASTEM after-sales support team and communicate the final exact geographic position (latitude and longitude) of:

1. The station
2. Electrode number 0

3. Electrode number 47.



The figure shows the two types of installation of G.Re.T.A. concerning the electrode lines: G.Re.T.A. in a central position, and G.Re.T.A. in a head position. The LSI LASTEM after-sale team, based on the first measurements and the characteristics of the soil, will optimize the current injection parameters as well as those of the inversion algorithm for the specific site.

Documents / Resources

	LSI GRT2A0110 G.Re.T.A. Environmental Monitoring Solutions [pdf] User Guide GRT2A0110 G.Re.T.A. Environmental Monitoring Solutions, GRT2A0110, G.Re.T.A. Environmental Monitoring Solutions, Environmental Monitoring Solutions, Monitoring Solutions

References

- LSI Lastem Cloud
- LSI Lastem Cloud
- User Manual