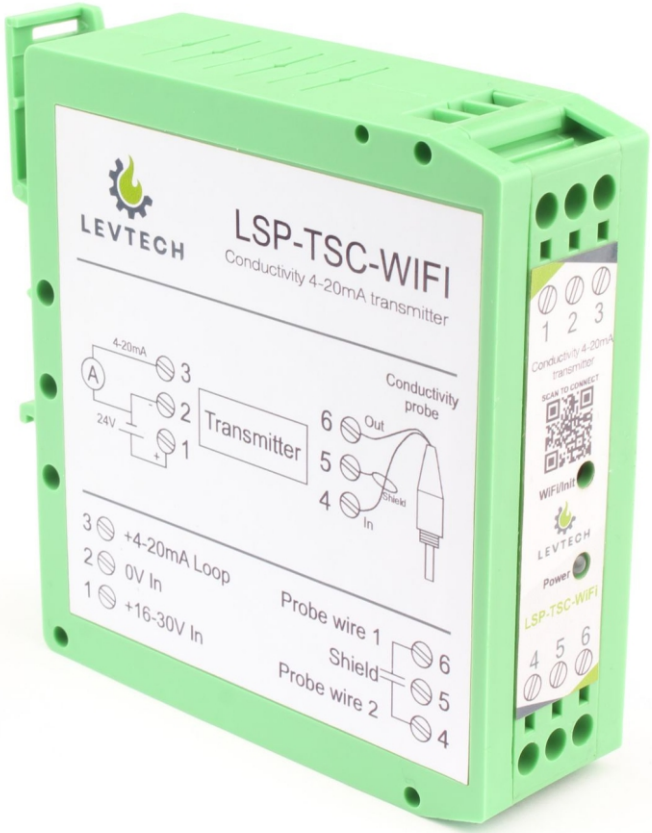
LEVTECH

# User Manual

CE

## Conductivity 4-20mA transmitter WiFi
## LSP-TSC-WIFI





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# Table of Contents

# PREFACE

Thank you for selecting our isolated signal converter splitter.

This User Manual contains information needed for proper installation, operation, and maintenance of your product. A thorough understanding of these simple instructions will help you get the most of your product.

This document should be read thoroughly, and the safety instructions described in this manual should be followed carefully. If you have questions or concerns about the operation and maintenance of this product, please contact our customer support.

Should a problem arise with the product, check if you followed the installation steps correctly. If the problem persists, contact an authorized Levtech dealer or our customer support.

All information in this User Manual is based on the latest product information available at the time of printing approval. Levtech reserves the right to make changes at any time without notice and without incurring any obligation.

Please always keep this manual together with the isolator as a reference to everyone who uses this product.

## Document Revisions

| Date | Version Number | Document Changes |
|---|---|---|
| 03-11-2021 | 1.0 | Initial draft |
| 04-13-2021 | 2.0 | Overall improvements |
| 04-15-2021 | 3.0 | Application examples added |
| 11-21-2023 | 3.1 | Sensor choosing guide added |
| 12-06-2023 | 3.2 | Webinterface update-no password |

## Approvals

**This document requires following approvals:**

| Name | Title |
|---|---|
| Levi Mihaly | General Manager |
| | |
| | |
| | |

# 1. INTRODUCTION

## 1.1. General Information

This manual is the designated User Manual for the installation, safe operation, and maintenance of your product. It is divided into nine chapters covering general information, safety instructions, how to safely install and operate the product, maintenance, warranty, and contact information.

All personnel involved in the installation, operation, and maintenance of this equipment should read and understand this manual, particularly its safety instructions. Substandard performance and longevity, property damage, and personal injury may result from not knowing and following these instructions.

In order to ensure long product life, Levtech recommends that you utilize the product and perform maintenance by correctly following the instructions described in this guide. The manufacturer's warranty does not cover any damage resulting from the neglect of these instructions.

Levtech assumes no liability for damage caused by operation contrary to what is specified in this operating manual.

## 1.2. Support and Services

For information about further questions that are not answer in this manual, additional materials, and support, please contact:


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## 1.3. Disposal Remarks

**DO NOT** dispose of the outboard motor with domestic waste! 
Electronic devices have to be disposed of according to the regional directives on electronic and electric waste disposal. In case of further questions, please consult your supplier. The supplier may take care of proper disposal.

# 2. SAFETY INSTRUCTIONS

## 2.1. Symbols

| | |
|---|---|
| ⚠ WARNING | This symbol indicates information that, if ignored, could result possibly in personal injury or even death due to incorrect handling. |
| ⚠ CAUTION | This symbol indicates information that, if ignored, could possibly result in personal injury or physical damage due to incorrect handling. |
| *NOTICE* | Indicates information considered important, but not hazard-related. |

## 2.2. Receipt and unpacking

Unpack the device without damaging it and check whether the device type corresponds to the one ordered. The packing should always follow the device until this has been permanently mounted.

## 2.3. Environment

Avoid direct sunlight, dust, high temperatures, mechanical vibrations and shock, and rain and heavy moisture.

## 2.4. Mounting

- Only technicians who are familiar with the technical terms, warnings, and instructions in the manual and who are able to follow these should connect the device.
- Mounting and connection of the device should comply with national legislation for mounting of electric materials, i.e. wire cross section, protective fuse, and location. Descriptions of input / output and supply connections are shown in this installation guide and on the side label.
- Use this device only in accordance with this instruction manual, as well as all applicable local and national laws and regulations. Only allow this device to be installed, operated, maintained, repaired, etc. by others who have also read and understood the user manual.
- Do not allow minors, untrained personnel, or personnel suffering from physical or mental impairment that would affect their ability to follow this manual to install, operate, maintain, or repair this device.
- Any untrained personnel who might be near the device while it is in operation MUST be informed that it is dangerous and fully instructed on how to avoid injury during its use.

**⚠ WARNING**

**To avoid the risk of electric shock and fire, the safety instructions of this guide must be observed and the guidelines followed.**

## 2.5. Cleaning

When disconnected, the device may be cleaned with a cloth moistened with distilled water.

**⚠ WARNING**

- **The specifications must not be exceeded, and the device must only be applied as described in the following.**
- **Do not use the device near water or moisture.**
- **Do not install near any heat sources such as radiators, stoves or other heaters that produce heat.**
- **To prevent ignition of the explosive atmospheres, disconnect power before servicing and do not separate connectors when energized and an explosive gas mixture is present.**
- **Do not mount or remove devices from the power rail when an explosive gas mixture is present.**
- **Before the commissioning of the device, this installation guide must be examined carefully, and only qualified personnel (technicians) should install this device.**
- **If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.**

**⚠ CAUTION**

**To avoid the risk of explosion due to electrostatic charging of the enclosure, do not handle the units unless the area is known to be safe, or appropriate safety measures are taken to avoid electrostatic discharge.**

## 3. DESCRIPTION

The LSP-TSC-WIFI conductivity transmitter is a simple and high precision instrument for liquid conductivity measurement, it measures the conductivity of liquids with the corresponding 2 electrode sensor and transmit a 4-20mA analog signal without temperature compensation. The calibration can be performed using the device's webinterface, like the measuring range and cell constant.

A conductivity transmitter functions by leveraging a conductivity sensor. This conductivity sensor consists of two electrodes, and the conductivity transmitter measures the electrical conductivity between them. Using a 2-wire current loop communication process, the transmitter translates the measurement into a 4-20mA output.

For instance, if we immerse the conductivity sensor in saltwater, a good conductor, it registers high conductivity due to the effortless flow of current between the electrodes. Conversely, when the sensor is placed in purified water, which lacks good conductive properties, the transmitter records low water conductivity.

The precision of these conductivity measurements significantly hinges on the quality of the conductivity sensor. While our conductivity transmitter can be paired with any conductivity sensor, we always suggest using our high-quality sensors to achieve the best results.

## 4. FEATURES

- Cable capacity compensation
- 4-20 mA output
- TS-35 DIN rail mounting
- +/-0.1% accuracy
- IP20 case
- Screw terminals
- Easy to install
- Electrically isolated input, output, and supply for safety
- Indicator LED
- Cyclical self-calibration
- WiFi module for easy configuration.

# 5. INSTALLATION AND WIRING

The module is designed to be installed, in a vertical position, on TS-35 DIN rail. For the best module performance and duration, avoid placing objects that could obstruct the ventilation. Never install the modules near heat sources.

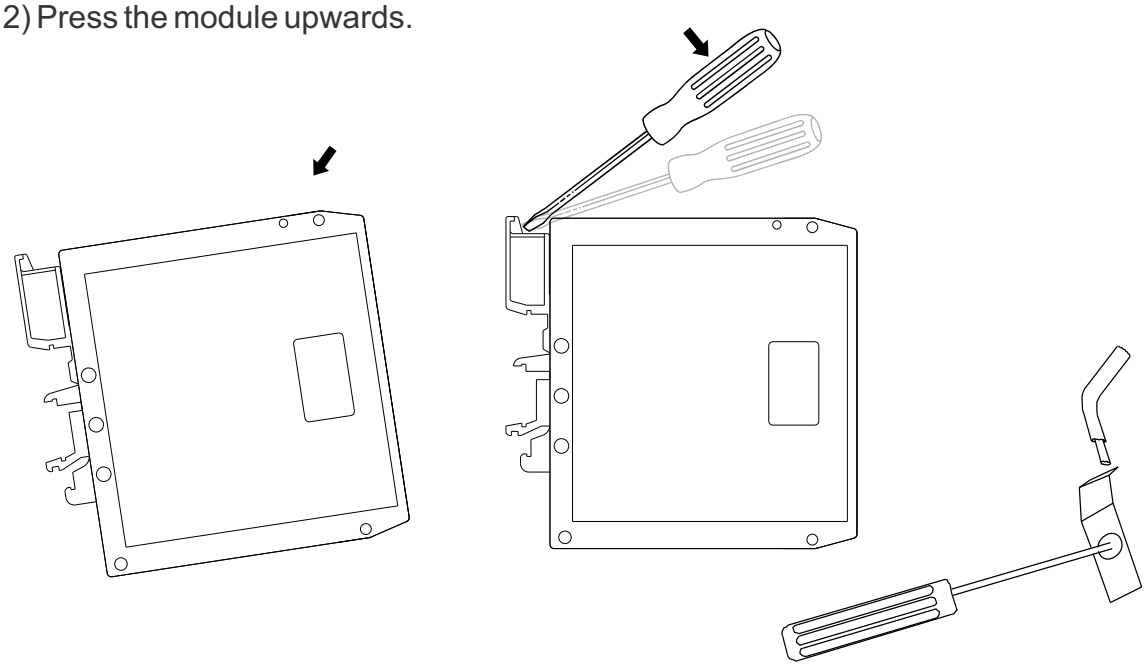
## 5.1. Installation on TS-35 DIN Rail

**Inserting the Module in the Rail:**

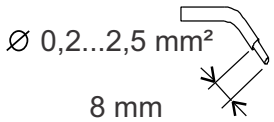
1) Attach the module in the upper part of the rail, as shown in the left figure below.
2) Press the module downwards.

**Removing the Module in the Rail:**

1) Apply leverage using a screwdriver, as shown in the right figure below.
2) Press the module upwards.



## 5.2. Connections with Screw Terminals



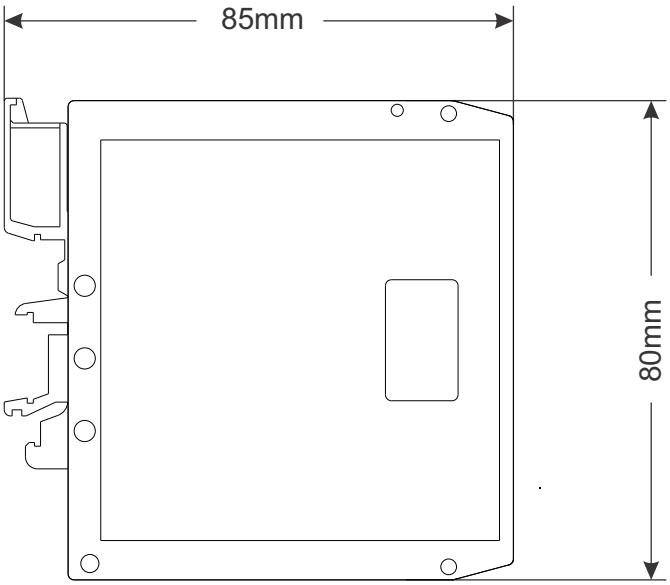

The module has been designed for screw-type terminal electrical connections. Proceed as follows to make the connections:

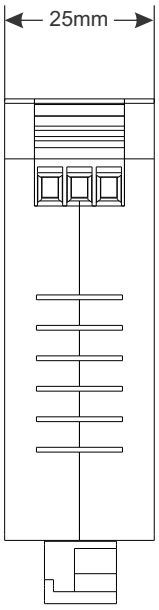
1) Strip the cables by 8mm.
2) Insert a screwdriver in hole, unscrewing the screw.
3) Insert the cable in the round hole.
4) Again, use the screwdriver to tight the screw.
5)Remove the screwdriver and make sure that the cable is tightly fastened in the terminal.

## 6. SPECIFICATIONS

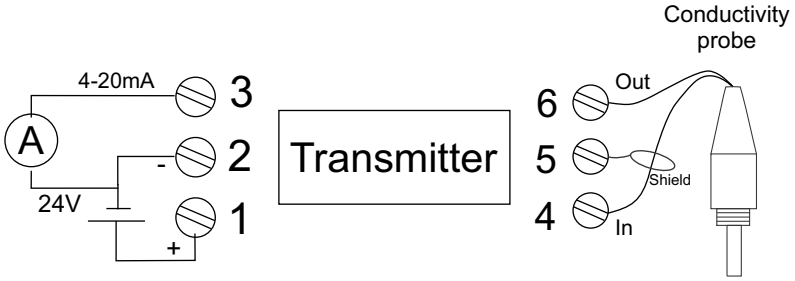
| | |
|---|---|
| **Input** | |
| Input type | Conductivity sensor |
| Conductivity cell types | k=0.1; k=1; k=10 |
| **Output current type** | |
| Output Signal type | 0-20; 0-24; 4-20mA on current loop |
| Over-Scale Limit | 27mA |
| Under-Scale Limit | 2,2mA |
| Output Resistance | >75Ω |
| **General** | |
| Sensor type | Resistive 2 electrodes |
| Output/ Input isolation | 2800VDC |
| Output accuracy 0 to 200uS/cm | +/-0.02 uS/cm |
| Output accuracy 0 to 2000uS/cm | +/-0.1 uS/cm |
| Response time | 0.8ms |
| **Power Supply** | |
| Supply Voltage | 16 ~ 30VDC |
| Power Consumption | <25mA |
| Over Voltage surge protection | 36V |
| Reverse-Polarity Protection | Yes |
| **Enclosure** | |
| IP Rating | IP20 |
| Dimensions (L x D x H) | 85x 25x 80mm |
| Weight | 74g |
| Mounting | TS-35 DIN |
| Maximum Cable Cross-Section | 2.5mm$^2$ (max.) |
| **Enviromental Conditions** | |
| Ambient Temperature Range | -10 ~ +60ºC |
| Storage Temperature Range | -30 ~ +80ºC |
| Humidity Level | 0 ~95% RH at 40ºC, no condensation |

## 7. DIMENSIONS




## 8. TERMINAL DESIGNATION





3 +4-20mA Loop
2 0V In
1 +16-30V In

Probe wire 1 — 6
Shield — 5
Probe wire 2 — 4

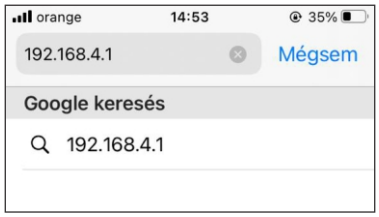
## 9. CALIBRATION VIA WEBINTERFACE


### Step 0

Before starting configuration, you need to turn on the WiFi by pressing and holding the **WiFI/Init** button on the device until the Power LED starts blinking blue.

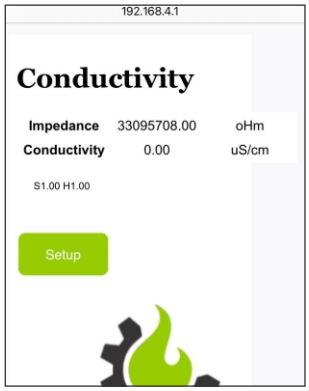

### Step 1

Turn on the WiFi on your phone/computer and connect to "**Conductivity_S**" network.



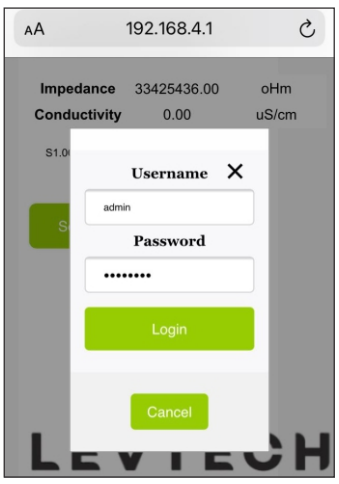

### Step 2

Scan the QR code on the label of the product or open your browser on your device and type in the searching line **192.168.4.1**




### Step 3

When the page is loaded, click on the "**Setup**" button.



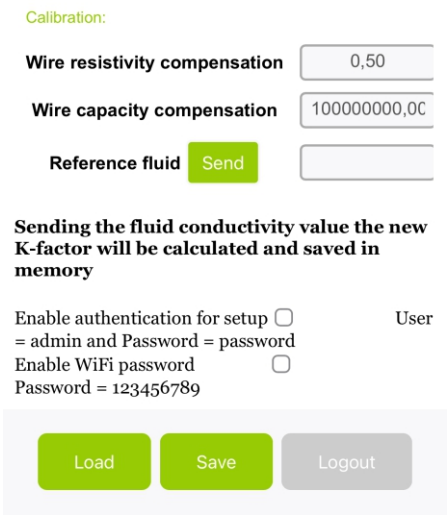

### Step 4

It's required to type in the admin name and the password and click on Login button

Admin name: **admin**
Password: **password**

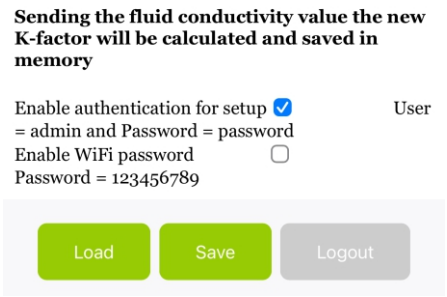
## 9. CALIBRATION VIA WEBINTERFACE

You have the option to enable and disable the access point password and the setup menu password, which can be changed as follows:

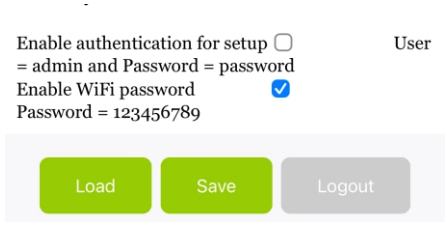



### Step 1
Enter the Setup

### Step 2
Scroll to the bottom of the page




### Step 3
To set the password for the Setup menu, tick the top box and Save.
When ticked:
Username = **admin**
Password = **password**




### Step 4
To set the password for the WiFi access point, tick the box at the bottom and Save.
When ticked:
Conductivity_S password = **123456789**

*Restoring the factory settings does not change the changes made to the passwords.

## 9. CALIBRATION VIA WEBINTERFACE

If the login was successful, the flashing blue light become to a continuos blue light on the transmitter and you are able to change the parameters to set up your device correctly.

On the **SETUP PAGE** there are informations about the transmitter, like the serial number and the firmware version.

Next, there are the actual values measured by the transmitter in real time:

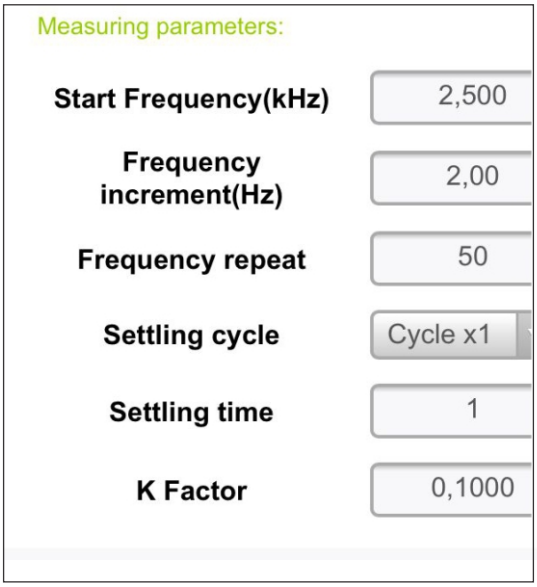
- Impedance (measured in Ohms)
- Conductivity (uS/cm)

Below, there are all the settings that can be modified by scrolling down: Measuring parameters, Configuration of the analog outputs, Calibration.

On the very bottom of the screen, the user can Load and Save the parameters or Log out from the setup page by clicking on them.

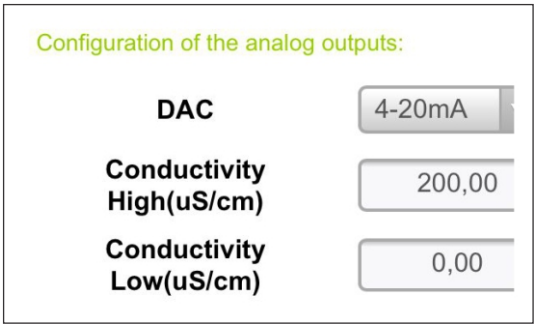

## 9. CALIBRATION VIA WEBINTERFACE

# Measuring parameters




**Start Frequency(kHz)**
Before the measuring, it can be set the start frequency, where the measuring starts.
**Frequency increment(Hz)**
This value is added to Start Frequency in every measuring cycle.
**Frequency repeat**
It means that how many measures wanted to be performed.
**Settling cycle**
How many times will be applied the settling time after every measurement.
**Settling time**
How long is the Settling time.
**K Factor**
It's given by manufacturer of the probe that's used

# Configuration of the analog outputs



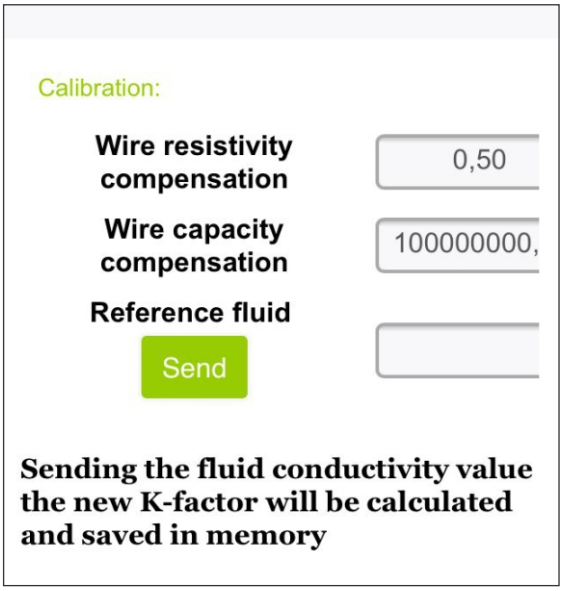

**DAC**
Digital to Analog Converter
It can be selected the type of the output between :

- 4-20mA
- 0-20mA
- 0-24mA

**Conductivity High(uS/cm)**
Assign the desired upper limit of the conductivity value to the upper limit of the analog output. For example, if you want the analog output to be 20 mA, when the measured conductivity is 200uS/cm we select the 4-20 mA output for the DAC and enter 200 in the "Conductivity High" window, then "Save".

**Conductivity Low(uS/cm)**
Assign the desired lower limit of the conductivity value to the lower limit of the analog output. In that case, if you want to 100uS/cm corresponds to 4 mA, you need to select the 4-20 mA output for the DAC and enter 100 in the "Conductivity Low" window, then "Save".

## 9. CALIBRATION VIA WEBINTERFACE




**Wire resistivity compensation**
The resistance value of the conductivity probe wire must be specified. Entering this value correctly will affect the result of the temperature measurement.

**Wire capacity compensation**
If non-automatic cable capacity compensation is used, the impedance value measured with a dry probe must be entered here. This eliminates the effect of cable capacity on the measurement.

**Reference fluid**
If the probe K factor is not specified, the meter can be calibrated using a reference fluid. This value should only be entered during calibration, otherwise it will result a false calibration and the measurement will not be real. When the conductivity probe is in the reference fluid at 25 degrees Celsius,you can enter the value of the reference fluid and calibrate the instrument by pressing the **Send** button. After this operation you can see, that the value of the K factor has changed.

**Changing these datas, need to consulting a specialized person.**

## 10. DEFAULT CONFIGURATION

To reset the transmitter to factory settings, it can be performed by turning off the device, then restart it. When it starting up, the blue light starts blinking. During the blinking time, needed to press the configurator button and all the saved datas will be resetted.
To perform the resetting, follow the steps below.

**Step 1**
Disconnect the transmitter from the power source. It has to turn off.

**Step 2**
Reconnect the power supply.

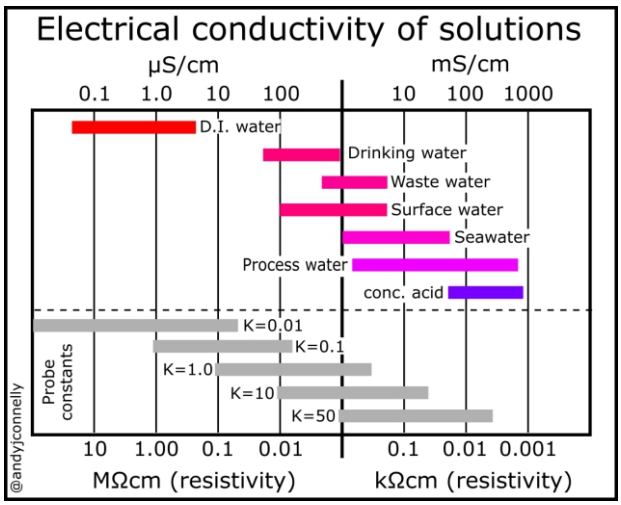
**Step 3**
At this step, need to be quick, because from the moment as it get powered up, 3 seconds is given to push and hold the WiFi/Init button for 2 seconds to reset the device to the factory values.

## 11. SELECTING THE SUITABLE CONDUCTIVITY SENSOR

When it comes to measuring water conductivity, it's essential to choose the right conductivity sensor. This choice relies on understanding the details of your project, such as the expected water conductivity levels, temperature variations, and the sensor's intended location.

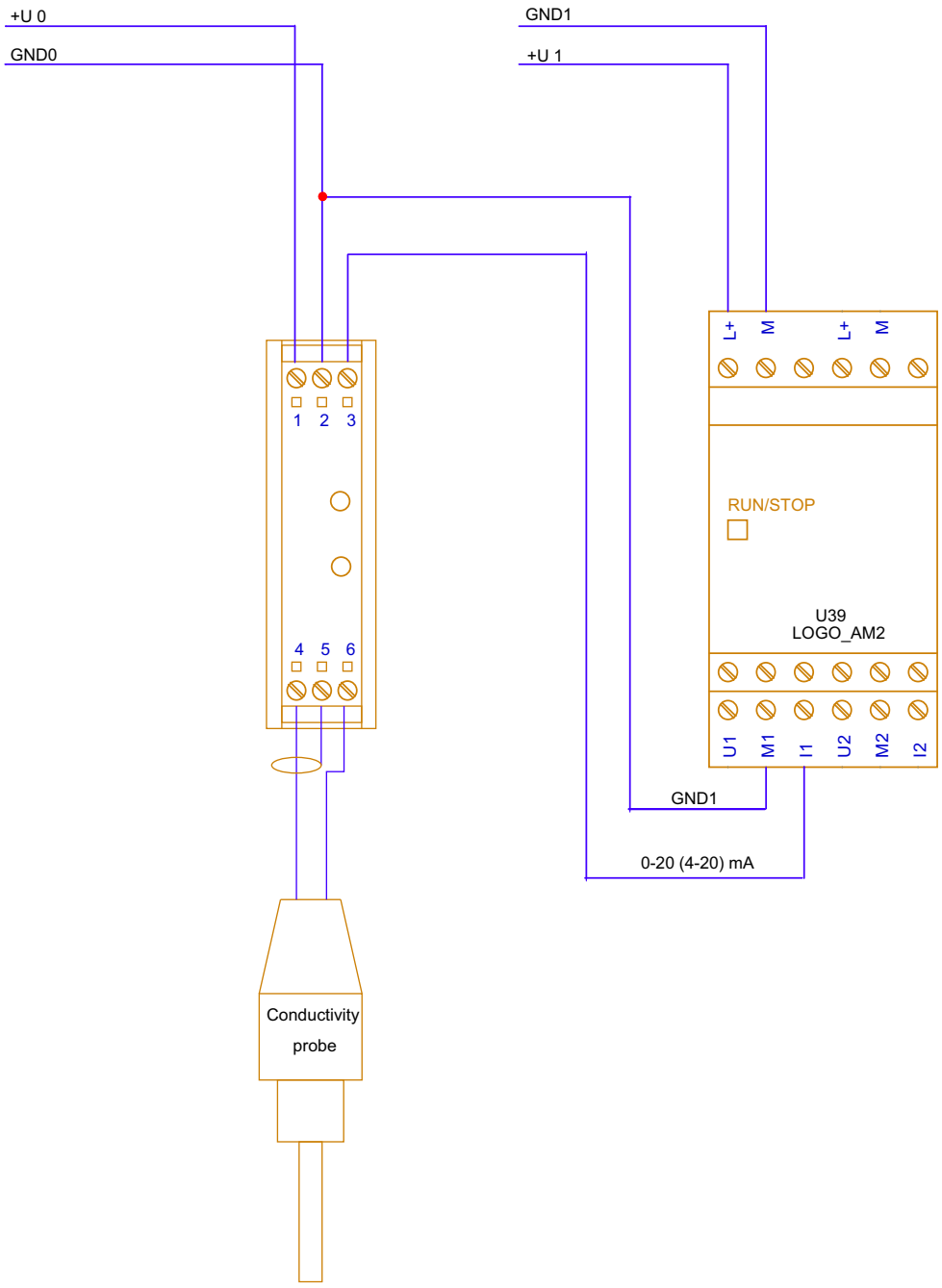
One key factor to consider when selecting between sensors is the cell constant or K factor. This value describes the probe's geometry, informing you about the type of liquids it can accurately measure.

For example, sensors with a low cell constant, indicating small distances between conductor surfaces, are ideal for measuring pure and ultrapure water. On the other hand, sensors with a larger cell constant, offering more significant sensing surfaces and allowing more liquid, are suited for liquids expected to have higher conductivity than pure water. By taking into account these factors, you can confidently select the right cell constant probe for your water treatment needs. the WiFi/Init button for 2 seconds to reset the device to the factory values.



## 12. WIRING EXAMPLE

The figure below shown an example of a connection of our conductivity transmitter with a conductivity probe on its input and connected to a PLC.



# 13. OPERATION AND MAINTENANCE

## 13.1. Operation

This isolator requires no user adjustments during commissioning. It comes with factory calibration ready for use.

If the isolator fails to operate, check for bad connections. In the unlikely event of the isolator not working, it should be returned to the supplier for repair or replacement.

## 13.2. Maintenance

Levtech suggests a quick check for terminal tightness and general unit condition. Always adhere to any site requirements for programmed maintenance.

# 14. WARRANTY DISCLAIMER

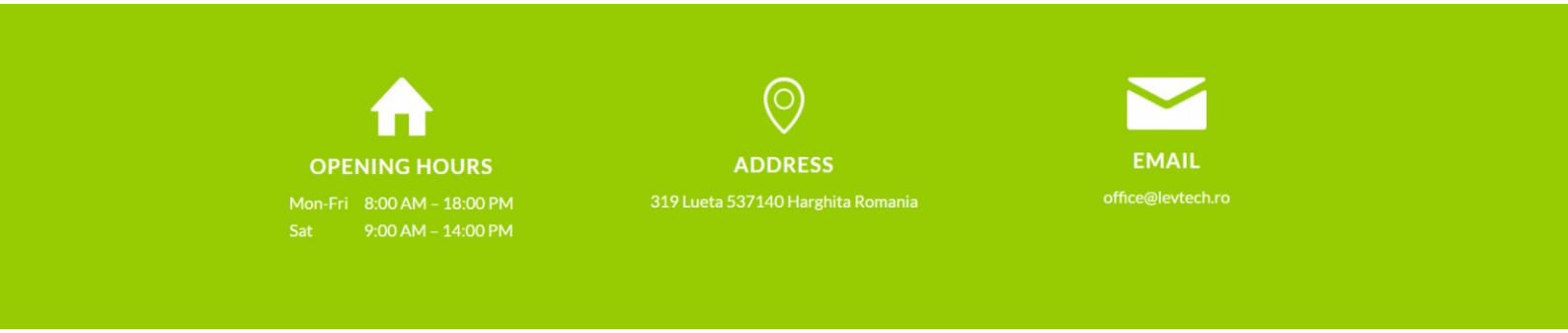
Levtech warrants this product to be free from significant deviations in material and workmanship for a period of 3 year from date of purchase. If repair or adjustment is necessary and has not been the result of abuse or misuse, within the 3 year period, please return-freight-prepaid and the correction of the defect will be made free of charge. If you purchased the item from our distributors and it is under warranty, please contact them to notify us of the situation. Levtech Service Department will determine if the product problem is due to deviations or customer misuse.
Out-of-warranty products will be repaired on a charge basis.

## 14.1. Return of items

Authorization must be obtained from one of our representatives before returning items for any reason. When applying for authorization, have the model and serial number handy, including data regarding the reason for return. For your protection, items must be carefully packed to prevent damage in shipment and insured against possible damage or loss.
Levtech will not be responsible for damage resulting from careless or insufficient packing. A fee will be charged on all authorized returns.

Levtech reserves the right to make improvements in design, construction and appearance of our products without notice  on which the buyer could reasonably have discovered the alleged defect or breach.

## 15. CONTACT INFORMATION

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### COMPANY DATA

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Fiscal code (CIF): RO35733217
Trade Register: RC J19/134/2016
IBAN: RO39RNCB0152150349440001
BCR BANK