



LEVTECH

Installation and User Instructions

RS485 Signal Transducer on Radio

LSP-STR-485



STR-485-24/09-1.0-1.0 EN

INTRODUCTION

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All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer shall perform repairs to components. Failure to observe this information can result in injury or equipment damage.

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Product Modifications

Year	Type	Modifications
2024	V1	First model

Document Revisions

Date	Version Number	Document Changes
26-09-2024	1.0	Initial draft

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1 Preface

1.1 Description of the user

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.

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.

1.2 Conventions Used in This Manual

The following style conventions are used in this document:

Bold

Names of product elements, commands, options, programs, processes, services, and utilities
Names of interface elements (such windows, dialog boxes, buttons, fields, and menus)

Interface elements the user selects, clicks, presses, or types

Italic

Publication titles referenced in text

Emphasis (for example a new term)

Variables

`Courier`

System output, such as an error message or script

URLs, complete paths, filenames, prompts, and syntax

User input variables

< > Angle brackets surround user-supplied values

[] Square brackets surround optional items

| Vertical bar indicates alternate selections - the bar means “or”

1.3 Explanation of Safety Warnings

DANGER

Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury

WARNING

Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

CAUTION

Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

NOTICE

Indicates information considered important, but not hazard-related.

HOW TO...

This label is followed by a user instruction explained in simple steps.

1.4 Obtaining Documentation and Information

1.4.1 Internet

The latest version of the documentation is available at the following address:

- <https://levtech.ro/product/signal-transducer/>

1.4.2 Other languages

This is the English user manual. Manuals in other languages are available upon request.

1.4.3 Support and service

For information about special tools and materials or for other questions, information, technical assistance or ordering user instructions, please contact the importer/manufacturer/distributor:

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2 General informations

2.1 Product overview

Manufacturer	Levtech Service & Production SRL
Product	RS485 Signal Transducer on Radio
Model	LSP-STR-485

2.2 Short Description

The LSP-STR-485 is a radio frequency transmitter/receiver that can be used as a link between 2 RS-485 communication devices. You will need 2 units of this product. One of them should be mounted on the side of the transmitter and the other on the side of the receiver. Once configured, our device will allow you to communicate wirelessly with 2 RS-485 devices by means of radio waves. This device represents an excellent solution for locations where a cable connection is not feasible or challenging to establish. Furthermore, it would be unlikely to meet aesthetic standards. This technology can be used to transmit measured data from a distant field or for remote control applications.

2.3 Features

- High range AC power supply (100-240 VAC)
- Less cables on the field
- This solution eliminates the need for any wall drilling, saving time and effort
- External changable SMA antenna
- RS485 communication line surge protection
- Selectable channels
- Optional communication key for data protection

2.4 Technical Data

Product	Levtech RS485 Signal Transducer on Radio
Model	LSP- STR-485
Dimensions	80 x 85 x 25 mm
Weight	75 g
Supply voltage	100-270 VAC
Protection class	IP20
Transmission range	800 m
Input/Output	RS-485
Power dissipation	1 W
Radio frequency	868 MHz
Housing material	Polyamide
Baudrates	9600-115200
Antenna connector	SMA
Mounting	DIN Rail
Working temperature	-25°C to +75°C
Implemented protocol	Modbus

2.5 Product elements

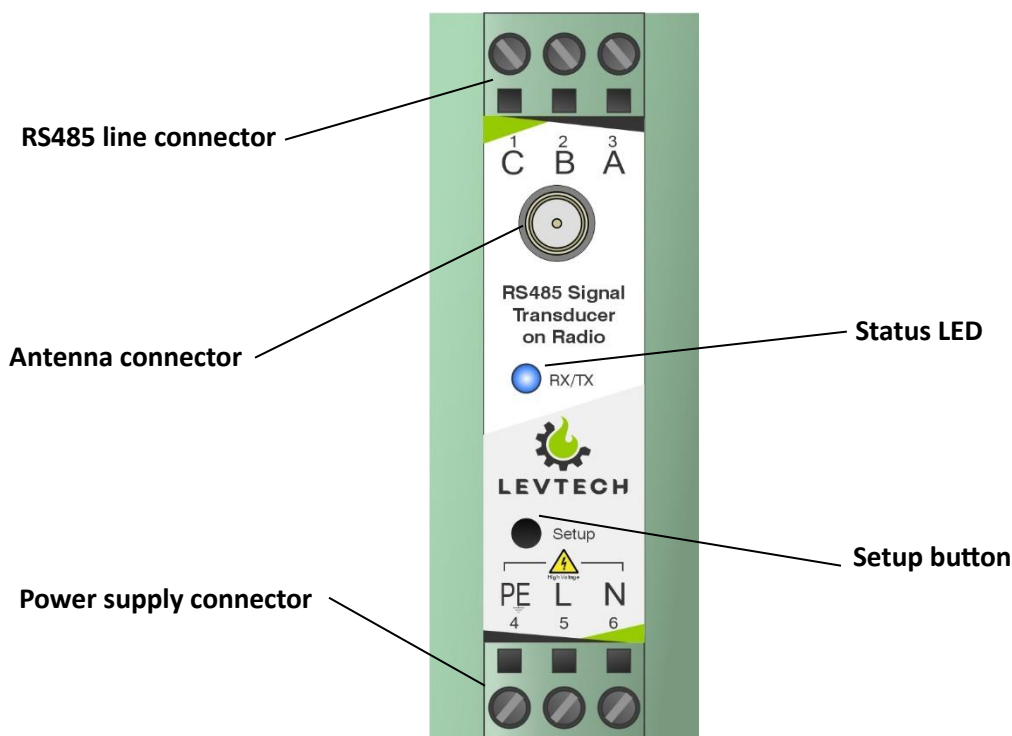


Figure 1 LSP-STR-485 Front elements

2.5.1 RS485 line connector

This connector stands for connecting the RS485 line consisting of 3 conductors. A twisted pair – A and B – and the common wire. Cables can be mounted with a flat-head screwdriver.

2.5.2 Antenna connector

Here need to connect the external antenna with a standard SMA connector. The antenna is very specific and it can only be replaced with the same as the original. Replacing with other compatible antenna, may result a shorter range between the transmitter and the emitter.

2.5.3 Power supply connector

Here we connect the power supply to the module. Cables can be mounted with a flat-head screwdriver.

⚠ DANGER

When touching this connector, be aware that mains voltage may be present.

2.5.4 Status LED

This LED provides feedback on the functioning of the product. It is a two-colour LED. It can vary in colour, blue or red. Depending on which mode the module is in, reading or writing, the colour changes.

LED status		Meaning
	Turned off	The device has no power
	Constant blue light	The device has power, but not communicating
	Constant red light	The device is in configuration mode
	Flashes red and blue	The device is communicating properly

2.5.5 Setup button

Press this button to enter configuration mode. In the configuration mode you can change the parameters of the device.

3 Safety Instructions

⚠ WARNING

Read and understand this manual and its safety instructions before using this product. Failure to do so can result in serious injury or death.

3.1 Safety information for vulnerable people

- 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.
- 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.

3.2 Technical life span

- In order to maintain the estimated lifetime of the product, it is essential that you read and understand this documentation and follow the instructions contained herein.

3.3 Personal protective Equipment

- The device contains ESD sensitive components that must be protected from electrostatic discharges. The use of ESD safe gloves and bracelets is recommended during service or repairing.



Figure 2 ESD sensitive device

3.4 Installation safety information

- When installing, care must be taken to preserve the integrity of the product and the physical integrity of the installing personnel
- Before connecting, make sure that the appropriate fuse(s) are disconnected so that the installation personnel cannot be electrocuted
- The area around the installation must be carefully fenced off, drawing attention to the work being carried out there, where unauthorized persons are not allowed to enter
- People working in the environment should be aware of the work that is currently being done

3.5 Safety information regarding the use

- Never touch the connectors during use. Connectors may be live. Pay particular attention to the power supply connector



3.6 Maintenance safety information

- Maintenance should be periodic
- Remove the power supply before cleaning
- A slightly damp cloth should only be used to wipe the product's cover

3.7 Service and repair safety information

- The product must not be repaired by anyone other than a professional
- If the product is under warranty, do not attempt to repair it other than through the manufacturer or distributor

3.8 Safe Disposal

DO NOT dispose of the product 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

3.9 Graphical Symbols

Symbol	Meaning
	The CE Marking on the product is the manufacturer's declaration that the product complies with the essential requirements of the relevant European health, safety and environmental protection legislation. The number behind the CE mark is the identification number of the notified body where the conformity assessment procedure s is applied.
	The symbol on the product, the accessories or packaging indicates that this device must not be treated as unsorted municipal waste, but must be collected separately.
	Read and understand the manual and its safety instructions before using this product.

	High voltage around the indicated connector. Always check the voltage before touching that area.
---	---

3.10 Potential Health Consequences

There is a risk of electric shock when using the product. Depending on the model, the device may be powered by mains voltage. Make sure that the sides covering the electrical parts of the device are secured with screws. Make sure that the electrical wires connected to the device are in good condition and not interrupted, preventing short-circuiting

4 User operations

5 Preparation

5.1 How to Transport and Store the Product

- Always remove any attachments when transporting the product
- Always transport the product in its factory box
- Seal the product box after placing it inside

5.1.1 Dimensions

The dimensions without attached antenna.

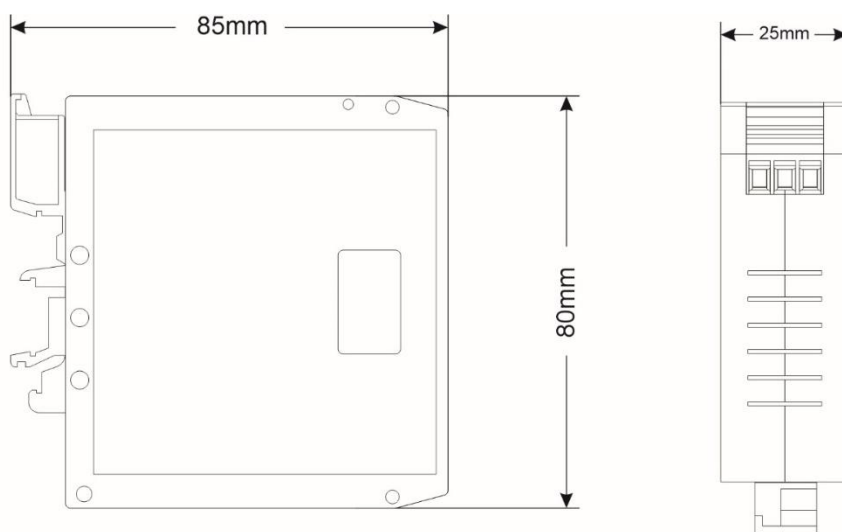


Figure 3 Dimensions

5.2 Storing the product during intervals in normal use

- Before storing, make sure the product is dry, to prevent accidental condensation
- Store the product in its factory box
- The storage environment should be dry and protected from sunlight

5.3 How to install the product

⚠ WARNING

Installation of the product shall only be done by skilled persons. A skilled person is an individual with relevant electronics skills and appropriate training to enable perceiving risks and avoiding hazards occurring during use of a product.

5.3.1 Unpacking the product

When unpacking, make sure that the original packaging can still be used for transport or storage. Open the box only along the seal. Make sure that the used cutter or blade doesn't go too deep to touch the product's surface.

5.3.2 Packaging contents

The LSP-STR-485 device comes in a pack that contains the followings:

- 2 x LSP-STR-485 module
- 2 x antennas

5.3.3 Minimum space needed

The product is supplied in DIN rail mounting version. This can be done inside or outside an electrical cabinet*.

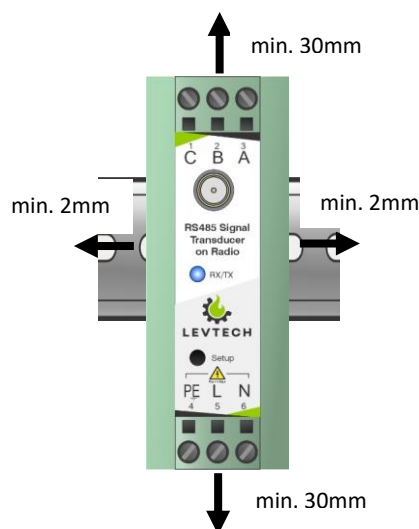


Figure 4 Minimum spaces required

****Keep in mind that the mounting location will greatly affects the range of the device. This can be improved with a properly placed external antenna. Consult the manufacturer in advance about the location of the installation.***

5.3.4 Interconnection diagram

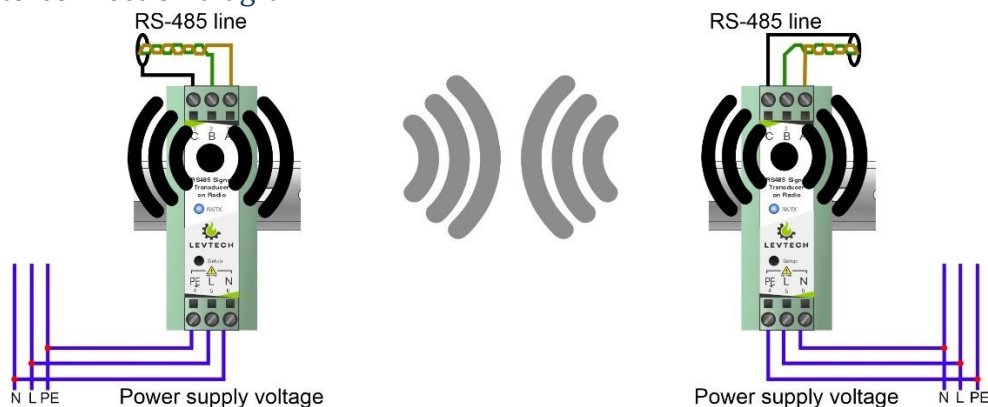


Figure 5 Interconnection diagram

You can see an interconnection diagram (*figure 5*) between two LSP-STR-485 products that communicate with each other via radio signals.

5.3.5 Conditions for assembling

Make sure you have all the tools you need. Remove any obstacles from the environment to allow convenient access to the installation area.

5.3.6 Installation of LSP-STR-485

The product is designed for DIN rail mounting. This makes it easy to install in industrial environments.

1. Hook the lower part of the holder on the back of the product into the rail
2. Press the product onto the rail until the support snaps into place

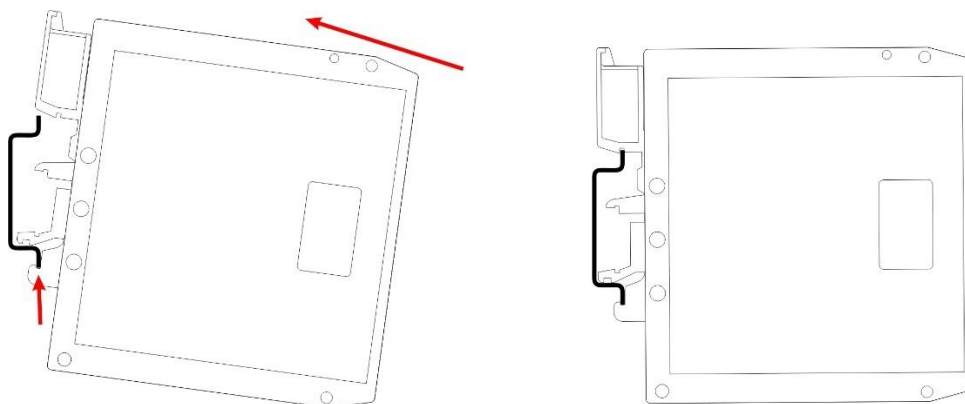


Figure 6 Mounting steps

5.3.6.1 Installation of the antenna

As the device comes with a SMA antenna connector, you simply need to twist on the antenna to the device using the connector's thread.

- Twist the antenna clockwise direction.

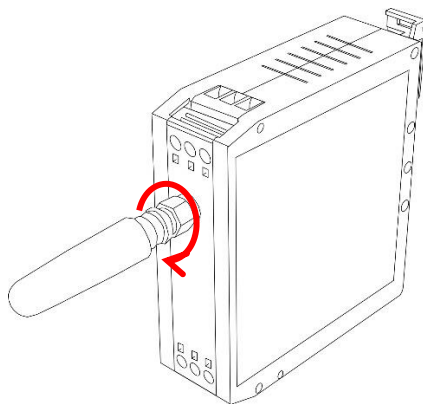


Figure 7 Connecting the antenna

5.3.7 Electrical installation

1. Connect the RS-485 communication line - Be sure that the communication line uses a twisted pair
2. Connect the Protecting Earth (PE) wire
3. Connect the Power Supply - For live (L) and neutral (N) lines, there is no problem if they are interchanged

Required tools:

- Flat head screwdriver – max 3mm wide

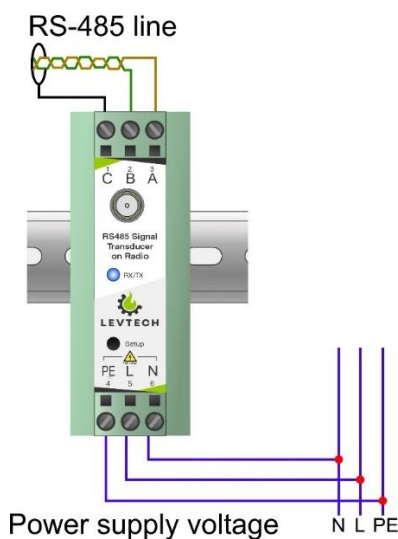


Figure 8 Electrical wiring

5.4 How to Commission the Product

To install a product, we need to know its intended use and the specific environment in which it will be installed. It is recommended that these adjustments are carried out by a technician. Before ordering a product, it is advisable to consult the manufacturer about the location of the installation to ensure proper operation.

5.4.1 How to connect the transducer to a laptop for configuration

HOW TO...

Required tools:

- Flat head screwdriver
- USB – RS-485 converter
- Laptop
- Installed Putty software

Steps:

1. Connect the **USB – RS-485 converter** to the **transmitter**

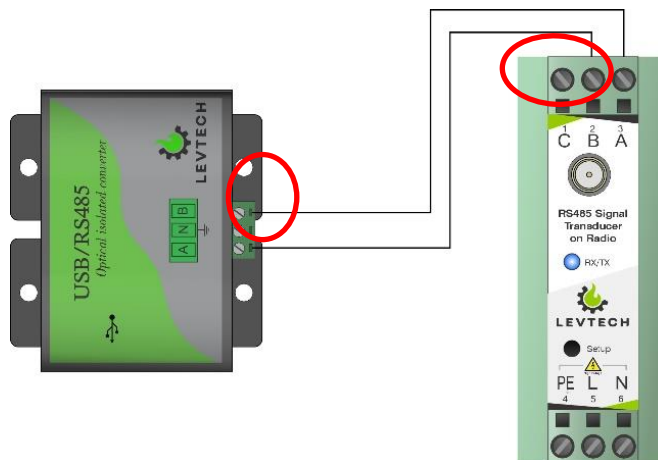


Figure 9 USB - RS-485 converter connected

2. Connect the power supply to the **transmitter**

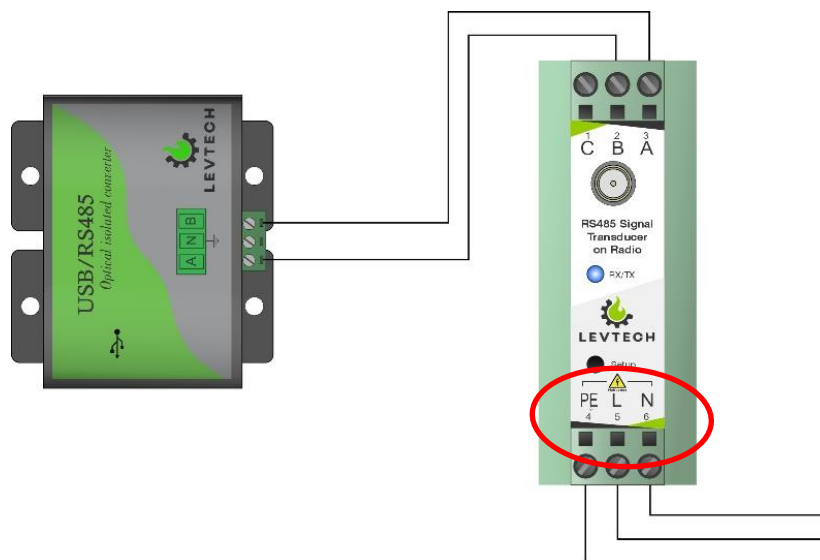


Figure 10 Transducer is powered

3. After connection press the **Setup button** for 2 seconds, until the LED turns red, to turn on the configuration mode – you can press with a pen or a small screwdriver

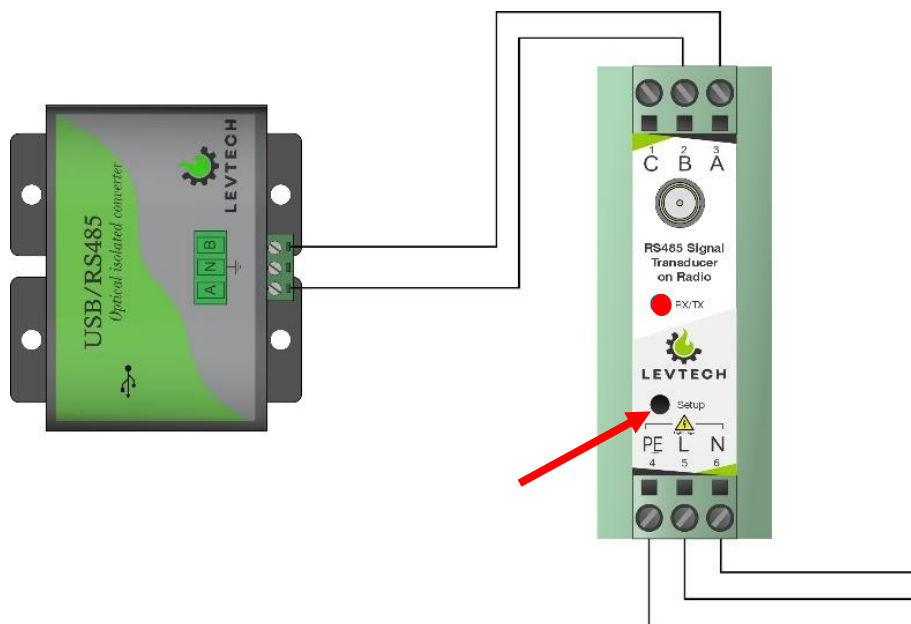


Figure 11 Press the setup button

4. Connect the **USB – RS-485 converter**'s USB port to the **laptop**

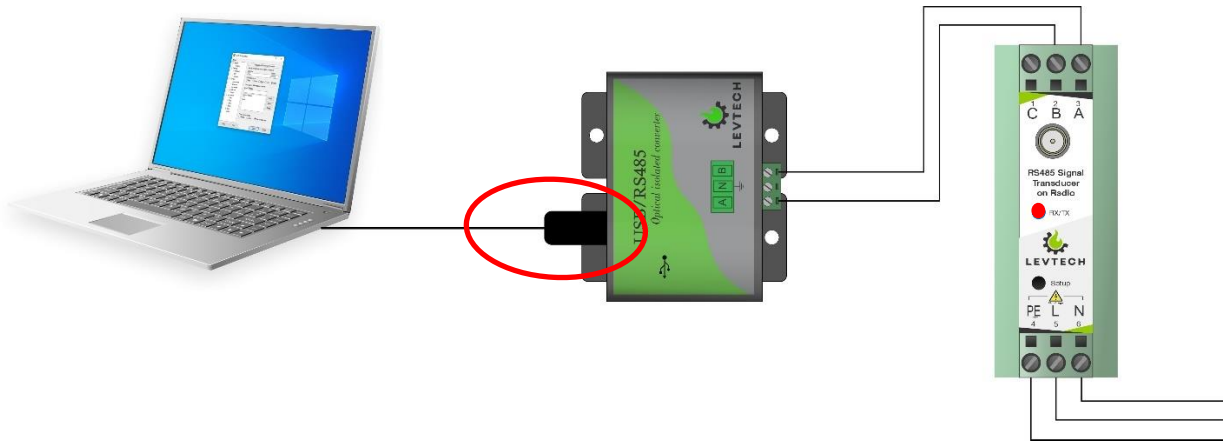


Figure 12 Connect the RS485 converter to the laptop

5.4.2 How to configure Putty software

HOW TO...

1. Check the recently connected USB's **COM port** number in the **device manager**

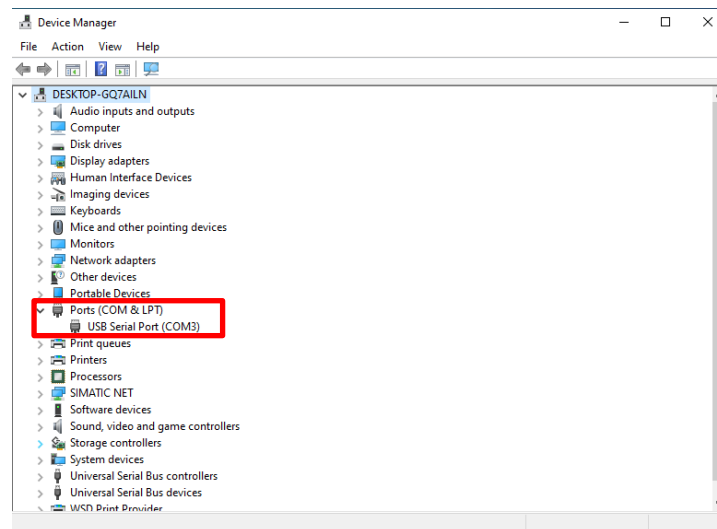


Figure 13 Device manager COM port check

2. Open the **Putty** software on the **laptop**

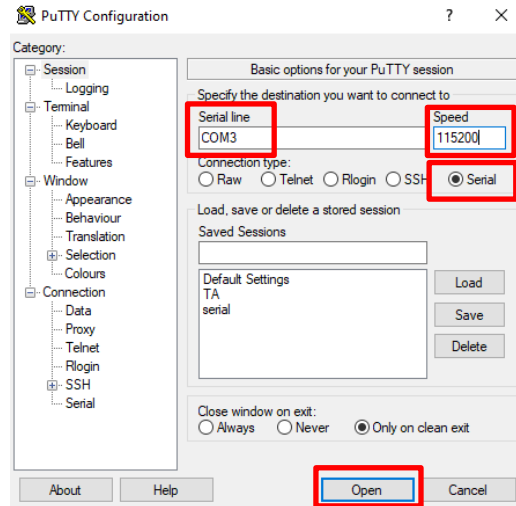


Figure 14 Putty software configuration

3. Configure the connection parameters

- Select **Serial**
- Type the COM port number
- Set the Speed to 115200

4. Click **Open**

5.4.3 How to setup transducer's settings using Putty

HOW TO...

As the Putty serial window opened, the **Setup** menu appears, go through the settings

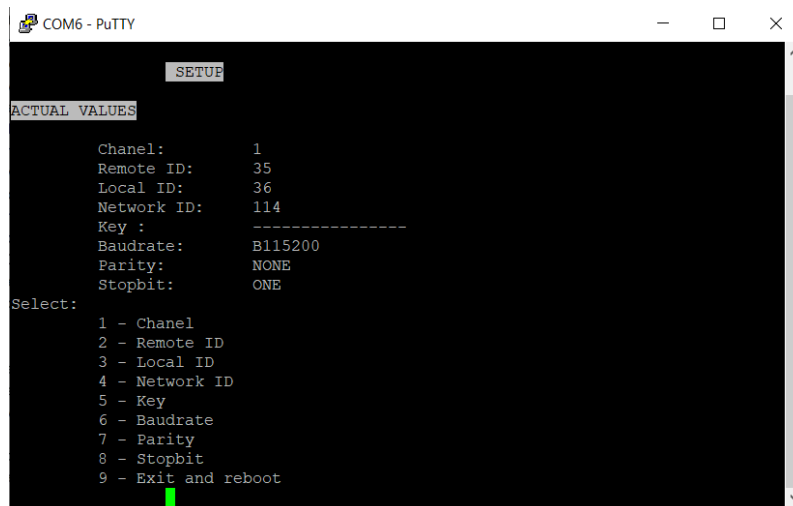


Figure 15 Transducer Setup main menu

To change the parameters values from the list, type the number of the parameter then press Enter

5.4.3.1 How to change values (general steps)

1. In the main menu, type the number of the parameter
2. Press **Enter**
3. Modify the value by typing the number of the options
4. Press **Enter**
5. Confirm the selection by typing **Y** or Cancel with **N** or **C**

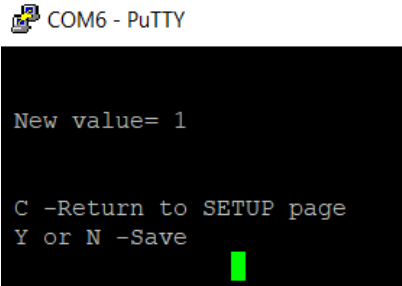


Figure 16 Confirming menu

6. Press **Enter**

5.4.3.2 Exit from the configuration mode

1. Get in the main menu
2. Type 9 – Exit and reboot
3. Press Enter – the status LED changes to Blue

5.4.3.3 Change channel

1. Enter the number 1 in the main menu
2. Choose a channel from 1 to 3 and type in

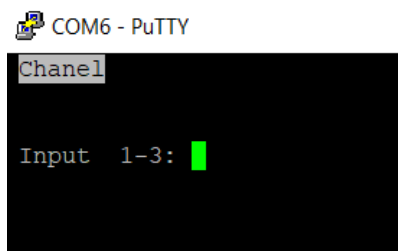


Figure 17 Changing the communicational Channel

3. Press Enter
4. Confirm the selection or cancel it

For communication to work, the communicating devices must be on the same channel.

5.4.3.4 *Change remote ID*

1. Enter number 2 in the main menu
2. Type in a Remote ID between 1-255

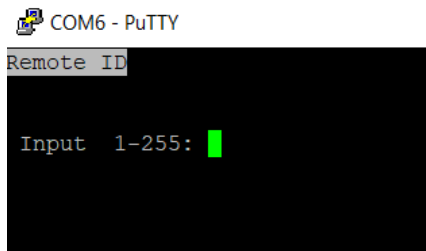


Figure 18 Changing the Remote ID

3. Press Enter
4. Confirm or cancel

The Remote ID must be the same as on the other device's Local ID!

5.4.3.5 *Change Local ID*

1. Enter number 3 in the main menu
2. Type in a Local ID between 1-254

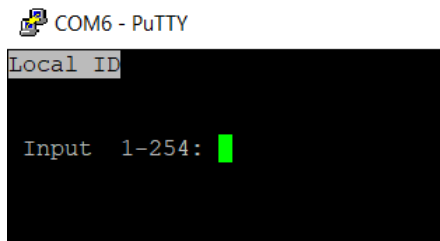


Figure 19 Changing the Local ID

3. Press Enter
4. Confirm or cancel

The Local ID must be the same as on the other device's Remote ID!

5.4.3.6 *Change Network ID*

1. Enter number 4 in the main menu
2. Type in a Network ID between 1-254

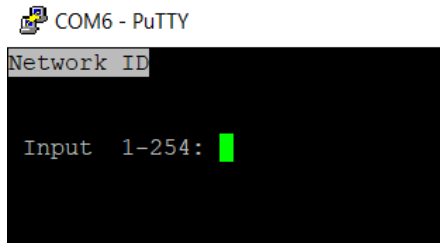


Figure 20 Changing the Network ID

3. Press Enter
4. Confirm or cancel

5.4.3.7 Add a key

1. Enter number 5 in the main menu
2. Type in a key, maximum 16 characters

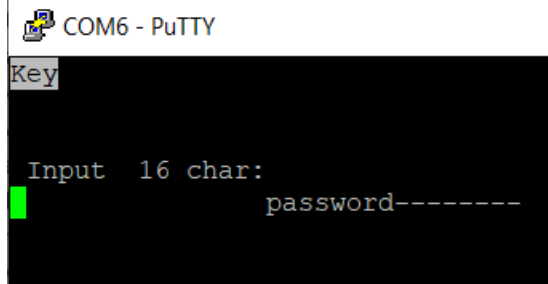


Figure 21 Adding a Key

3. Press Enter
4. Confirm or cancel

The key must be set on both devices.

5.4.3.8 Change Baudrate

1. Enter number 6 in the main menu
2. Type the desired Baudrate's number

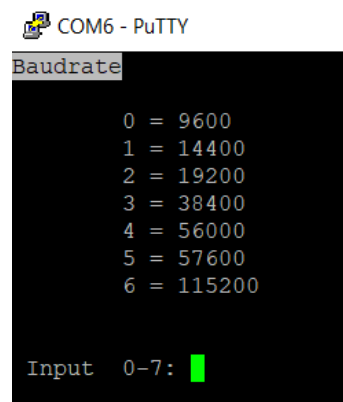


Figure 22 Change Baudrate

3. Press Enter
4. Confirm or cancel

The Baudrate should be at least as high as that of the devices operating on the installed line. It can be a higher value.

5.4.3.9 Change parity

1. Enter number 7 in the main menu
2. Type in the number of the desired parity

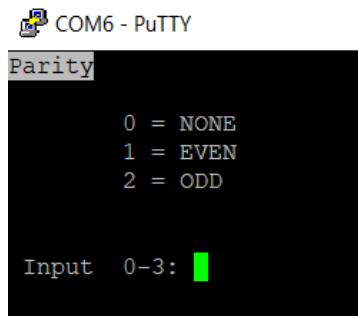


Figure 23 Change Parity

3. Press Enter
4. Confirm or cancel

The Parity should match the Parity on the line.

5.4.3.10 Change Stopbit

5. Enter number 8 in the main menu
6. Type in the number of the desired Stopbit

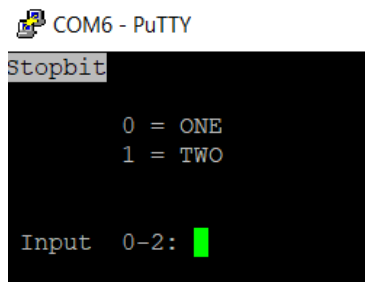


Figure 24 Change Stopbit

7. Press Enter
8. Confirm or cancel

The Stopbit should match the Stopbit on the line.

6 Operation

6.1 How to use the product

In order to use the product, both products must be configured correctly. Both remote and local. In addition, the positioning of the antennas should be as optimal as possible, so that communication can work without data loss.

6.1.1 Operational environment

Its operation is strongly influenced by the environment. The range is affected by all obstacles, but also by the position of the products in relation to each other. It is important to take this into account when deciding where to mount the equipment.

Using external antennas can help to increase the range.

6.1.2 Operation

Following the steps below, the device is easy to operate:

1. Commission the 2 products
2. Set up near each other to test them
3. Connect between an RS-485 line
4. Power them up
5. Check if they are communicating – the **Status LED** blinking blue-red
6. Set up to their final application
7. Check the operation

6.1.3 Starting the product's operation

To start, simply connect the power supply to the device, or turn on the fuse which powers the product.

6.1.4 Stopping the product's operation

To stop the operation, cut off the power from the device, or turn off the fuse which powers the product.

6.2 What to Do in Emergency and Exceptional Situations

6.2.1 Emergency Situation

In case of an emergency situation:

1. Break the fuse of the product or the main fuse
2. Eliminate the symptoms
3. Contact with a specialist to identify the root cause

6.3 Protection and Security

6.3.1 Data protection

Since the product transmits data, this can be valuable. To protect your data, we have built in a special key that encrypts the data to be sent and decrypts it on the other side.

To protect your data, set a key. Let's check this paragraph: [Add a key](#).

7 Maintenance

⚠ WARNING

The LSP-STR-485 shall only be maintained by a qualified and trained person.

7.1 How to Maintain the Product

This product requires no special maintenance if used and installed as described. Nevertheless, check the ventilation holes of the product at least annually.

To clean the ventilation holes:

- Cut off the current from the device
- Wipe the product with a slightly damp cloth
- Make sure that the ventilation openings are not blocked

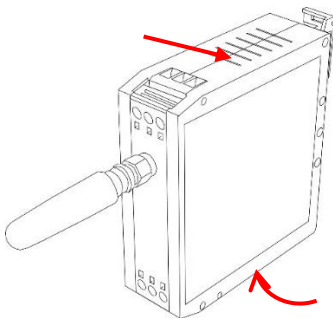


Figure 25 Ventillation holes on the product

8 Troubleshooting and repair

8.1 How to Identify and Solve Problems

8.1.1 Troubleshooting and repair by non-skilled persons

⚠ WARNING

The following troubleshooting can be performed by non-skilled persons, but they should take extra care to ensure that the device is not live while they are performing the troubleshooting. Cut off the current from the device first!

Error	Cause	Solution
The device does not start	No power supply	Look for loose wires and check the fuses
No communication between 2 products	Incorrect configuration	See 5.4.3

	Interference in the radio signal	Check whether this new product has been installed recently, and if so, remove it and check the operation of this product.
	Some kind of physical obstacle has been installed in the way of radio communication.	Remove the obstacle
The device does not enter configuration mode	There was a problem with Setup button	Try to push a little harder. If it does not work, contact the manufacturer.

8.2 Frequently Asked Questions

Q: - *What is the communication range?*

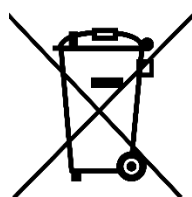
A: **Very environment-dependent. In open terrain, where there are no obstacles between the two devices, it can be orders of magnitude higher than in an indoor or urban use. Consult the manufacturer before purchasing.**

Q: - *Can the range be increased?*

A: **Could be. Using external larger antennas. Please consult the manufacturer.**

9 Disposal

9.1 Disposal of electronic components



The symbol on the product, the accessories or packaging indicates that this device must not be treated as unsorted municipal waste, but must be collected separately! Dispose of the device via a collection point for the recycling of waste electrical and electronic equipment if you live within the EU and in other European countries that operate separate collection systems for waste electrical and electronic equipment. By disposing of the device in the proper manner, you help to avoid possible hazards for the environment and public health that could otherwise be caused by improper treatment of waste equipment. The recycling of materials contributes to the conservation of natural resources. Therefore, do not dispose of your old electrical and electronic equipment with the unsorted municipal waste.

9.2 Disposal of packaging waste

The packaging is made of environmentally friendly materials, which may be disposed through your local recycling facilities. By disposing of the packaging and packaging waste in the proper manner, you help to avoid possible hazards for the environment and public health. The symbol on the packaging indicates that the packaging is made of PAP.