

USB Serial Interface Device for radio transmissions

INSTALLATION GUIDE



This guide covers all models of the USB interface device.
The ERUSB-S product family includes:

- ERUSB-SU USB interface with 902 MHz radio
- ERUSB-SC USB interface with 315 MHz radio
- ERUSB-SY USB interface with 868 MHz radio

The package includes the USB interface, a 1m (3 ft) cable, antenna straw (included with 315 MHz models only) and installation guide.

ERUSB-S Overview

Echoflex's ERUSB-S is a serial interface to EnOcean wireless devices. Powered via a connection to a USB port on any laptop or PC, the ERUSB-S becomes the interface to the wireless sensors and switches. Using PC based software, technicians, commissioning agents or engineers can monitor telegram traffic, troubleshoot reception problems and document radio activity.

The ERUSB-S comes with a USB cable for connection to laptops and computers.

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Using the ERUSB-S

The interface is powered through a USB port. The interface comes with a USB cable type A to type mini-B. Plug the USB cable's mini-B end into the ERUSB and the other end into a computers USB port.

If the computer does not have the correct driver files for the ERUSB, they can be downloaded at www.ftdichip.com/Drivers/VCP.htm.

Once the computer has recognized the ERUSB with the proper driver files, it will create a serial COM port. Launch the software application that you plan on using with the interface. Some available software packages include WiniEtel and DolphinView from the EnOcean Alliance.

Select the comport associated to the interface and click on the "connect" button. The interface will now be receiving any EnOcean telegrams transmitted within range of the interface.

The ERUSB-S can also be used to transmit EnOcean telegrams, either commands to embedded controllers or to override sensor or switch activity. This is very helpful when testing equipment for correct operation.

Installing Wireless Devices

Careful planning is needed when locating the receivers and transmitters based on the construction materials in the space and possibility of tenant's furniture disrupting the transmissions. Fire doors, elevator shafts, stairwells, storage areas and any large metal products create radio shadows and will disrupt wireless transmissions.

On floor-plan drawings, draw 80 feet (24m) diameter circles to identify optimal transmitter and controller locations. Refer to the table below for range considerations with building materials. Identifying trouble areas early and making adjustments either with layout or deployment of repeaters will dramatically ease the installation phase of any project.

Refer to the tables below for range considerations with building materials that reduce the radio signal power.

Material	Attenuation
Wood	0 - 10%
Plaster	0 - 10%
Glass	0 - 10%
Brick	5 - 35%
MDF	5 - 35%
Ferroconcrete	10 - 90%
Metal	90 - 100%
Aluminum	90 - 100%

Material	Radio Range-typical
Line of sight:	80' (24m) corridors
Line of sight:	150' (46m) open halls
Plasterboard:	80' (24m) through 3 walls
Brick:	33' (10m) through 1 wall
Ferro Concrete:	33' (10m) through 1 wall
Ceiling:	not recommended

**** IMPORTANT NOTES ON ENOCEAN RADIOS****

1.) When a receiver is in LEARN mode, the radio range can be reduced. It is strongly advised to perform all linking of remote transmitting devices to the receivers BEFORE the transmitters are installed.

2.) If the EnOcean radios experience excessive radio interference at their frequency (902, 315 or 868 MHz) from other sources, the radios effective receiving and transmitting range is reduced. This radio noise can be emitted from computers, monitors, lighting ballasts, ethernet appliances, other radios, any microprocessor based device.

Wireless System Layout Hints

- Avoid locating transmitters and receivers on the same wall.
- Avoid locating transmitters and receivers where the telegrams must penetrate walls at acute angles. This increases the material the telegram must pass through reducing the signal power.
- Avoid large metal obstructions as they create radio shadows. Place receivers in alternate locations to avoid the shadow or use repeaters to go around the obstacle.
- Do not locate receivers close to other high frequency transmitters.
- Leave at least 3' between the receiver and any other source of interference including, ballasts, LED drivers, computers, video equipment, Wi-Fi/LAN routers, GSM modems and monitors.
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Step 1: Site Survey

The easiest method to ensure a project installation proceeds with minimal in-field issues is to perform a site survey to get a real world view point of where the devices will be installed and what obstacles exist. This is also the step that most often gets overlooked. New tools are emerging that makes a site survey easier to perform with improved feedback to the team that is measurable and viewable.

Common features of any tool used should be an indication of:

1. Radio telegram strength
2. Radio telegram validity
3. Indication of radio interference
4. Activation of repeater mode

There are several hand held devices that perform these functions with display methods varying from simple LEDs to LCD displays. The Echoflex ERUSB-S allows the laptop to become the site survey tool when used with a monitoring software package like EnOcean's DolphinView. Software and hardware that can accept and decode EnOcean telegrams can provide specific values for telegram strength and number of sub-telegrams received. A good rule-of-thumb to insure a quality installation is to use the following values at the receiver location:

Radio Signal Strength: average measured value for each transmitter.

5. Excellent => -40 to -50 dbm
6. Good = -50 to -60dbm
7. Moderate = -60 to -65 dbm
8. Minimal = -75 dbm

Sub-telegrams received: average received per transmission including repeated.

	Good	Mod.	Min.
PTM Switches (1BS)	>4	3	2
STM Sensors (4BS)	>3	2	2
TCM Devices	>3	2	2

Step 2: Installation troubleshooting

The same tools used in the site survey are useful in troubleshooting wireless installations. Each facility is different so it is difficult to state that there are any absolutes with any wireless technology. It is common that some level of trouble shooting is needed for each project.

Troubleshooting check list:

The most common problem is radio range; getting the transmitters data to the intended receiver. Use a hand held EnOcean radio telegram monitor or laptop to verify telegrams and radio signal strength.

If the transmitter is an energy harvesting device, does it have sufficient power?



If the transmitter supports a battery, you can add the battery temporarily while completing the commissioning and troubleshooting. Or, allow energy harvesting devices time to charge.

Is the receiver within range of the transmitter?



Review the tables on page 2 for radio attenuation through building materials. You may also add a repeater to extend radio range.

Is there a radio shadow or obstacle (metal piping, duct work, concrete walls/floors, elevator shaft, fire doors)?



Use a EPM300 as a temporary repeater placed between the transmitter and receiver to circumvent the obstacle. If reception improves, you will need to deploy a repeater permanently.

If reception is still poor, there may be radio interference from other sources at a similar frequency or harmonic of the radio. Insure the receiver is not within 2 feet of any emitter: light ballast, computer, ethernet appliance or microprocessor based device. Disconnect power to all other emitters. Power each separately, testing with your EnOcean devices each time to identify the emitter causing the interference. Relocating the EnOcean device or interference emitter should resolve this issue.

Repeaters:

When performing in field troubleshooting, a repeater should be available for temporary use. If a telegram is not being received with adequate signal strength or is received inconsistently, placing a repeater between the receiver and transmitter may correct the situation. Using a temporary repeater allows the installation team to test this solution before installing more equipment. All Echoflex controllers support repeating with no loss of functionality.

Data-logging:

PC based tools or hand helds that support data-logging are helpful for logging telegram traffic over longer periods of time. Use EnOcean DolphinView PC software downloaded from the EnOcean web site (www.enocean.com) to monitor and log telegram traffic.

Regulatory Statements

FCC Part 15.231 (315 and 902 MHz models only)

Contains FCC ID: SZV-STM300C or SZV-STMM300U

The enclosed device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

- (i.) this device may not cause harmful interference and
- (ii.) this device must accept any interference received, including interference that may cause undesired operation.



IC RSS-210: (315MHz and 902 MHz models only)

Contains: 5713A-STM300C or 5713A-STM300U

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Specifications subject to change without notice.

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