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USER GUIDE

ELT

Produal

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ELSYS.se

Operating manual
ELT series

ELT2
ELT2i
ELT Lite
ELT Ultrasonic
ELT Ultrasonic 10m
ELT Ultrasnoic Snow



Address
Tvistevägen 48
90736 Umeå
Sweden

Webpage
www.elsys.se
www.elsys.se/shop

E-mail
support@elsys.se

AKRIBIS · www.akribis.info · contacto@akribis.info

Important Safety Information



Read this manual before attempting to install the device!

Failure to observe recommendations included in this manual may be dangerous or cause a violation of the law. The manufacturer, ElektronikSystem i Umeå AB will not be held responsible for any loss or damage resulting from not following the instructions of this operating manual.

- The device must not be dismantled or modified in any way.
- The device is not intended to be used as a reference sensor, and ElektronikSystem i Umeå AB will not be held liable for any damage which may result from inaccurate readings.
- The battery should be removed from the device if it is not to be used for an extended period. Otherwise, the battery might leak and damage the device. Never leave a discharged battery in the battery compartment.
- The device must never be subjected to shocks or impacts.
- To clean the device, wipe with a soft moistened cloth. Use another soft, dry cloth to wipe dry. Do not use any detergent or alcohol to clean the device.



Disposal note in accordance with Waste from Electrical and Electronic Equipment (WEEE) Directive 2012/19/EU

The device, as well as all the individual parts, must not be disposed of with household waste or industrial waste. You are obliged to dispose of the device at the end of its service life in accordance with the requirements of RoHS 2012/19/EU to protect the environment and to reduce waste through recycling. For additional information and how to carry out disposal, please contact the certified disposal service providers. The sensors contain a lithium battery, which must be disposed of separately.

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1 Product Information

1.1 Description

The ELT series of sensors are universal LoRaWAN® industrial sensors for both in- and outdoor use. The internal sensors measure, depending on model, temperature, humidity, atmospheric pressure, distance, and acceleration. The ELT series are also equipped with multi-purpose I/O for connection to external sensors and equipment.

The sensors are equipped with NFC (Near Field Communication) for easy configuration with an NFC-enabled smartphone.

1.2 ELT Series Attributes

Attribute	 ELT Lite	 ELT2i	 ELT2	 ELT Ultrasonic 5m	 ELT Ultrasonic 10m	 ELT Ultrasonic Snow
Temperature		✓	✓	✓	✓	✓
Humidity		✓	✓	✓	✓	✓
Atmospheric pressure		✓	✓	✓	✓	✓
Accelerometer		✓	✓	✓	✓	✓
Ultrasonic range (5m)				✓		
Ultrasonic range (10m)					✓	
Snow						✓
Multi-purpose I/O 1	✓	✓	✓			
Multi-purpose I/O 2		✓	✓			
Internal antenna		✓				
External antenna	✓		✓	✓	✓	✓
NFC	✓	✓	✓	✓	✓	✓

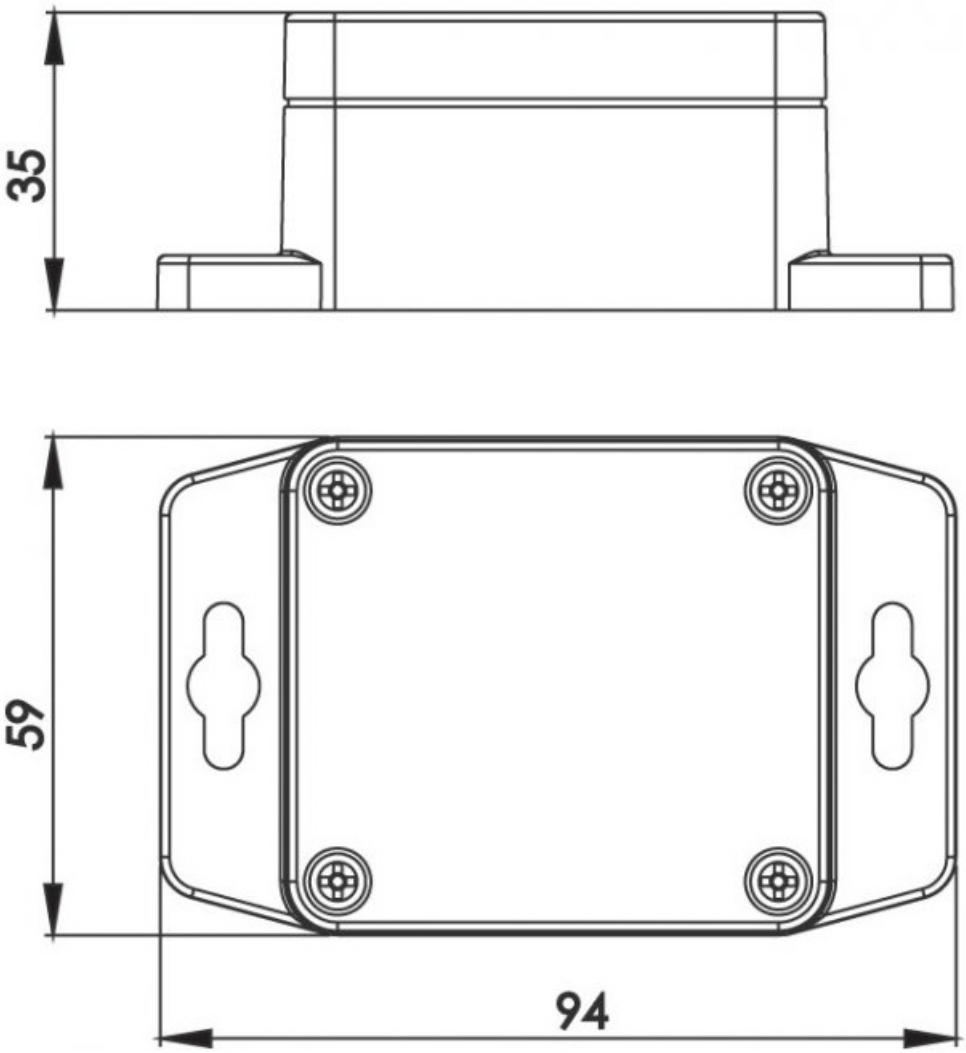
1 Product Information

1.3 Label

At the back of your device there is a label with an Aztec barcode containing DevEUI and sensor type.

1.4 Dimensions

Measurements are given in millimeters.



1 Product Information

1.5 Main features of the ELT Series

- Compatible with LoRaWAN® specification 1.0.3
- IP67-rated
- Measures ambient temperature[1]
- Measures ambient humidity[1]
- Measures atmospheric pressure[1]
- Measures acceleration[1]
- Measures distance[1]
- Multi-purpose I/O[2]
- Modular build with expandable functionality
- Can be connected to external sensors and meters
- Easy installation
- Easy configuration
- Battery-powered
- Long-range communication
- Configurable over NFC
- Configurable over the air
- Ten years of battery life[3]
- Supported channel plans: EU863-870, IN865, US902-928, AU915-928, AS923, KR920-923, HK923
- CE Approved and RoHS compliant

[1] Depending on model

[2] Number of multi-purpose I/O ports differ depending on model

[3] Depending on settings and environmental factors

2 Mounting Guidelines

2.1 Mounting Guidelines

Common mounting guidelines for ELT line of sensors:

- For best RF and measurement performance, make sure you mount the sensor with the antenna vertically. See installation in chapter 2.
- If external wiring is to be connected to the sensor and the sensor is to be placed in environments where it may get wet, consider water runoff and place the sensor with the cable gland placed vertically.
- Make sure that the sensor is not placed in direct sunlight, as the temperature reading from within the sensor case may be affected.

2.2 Ultrasonic and Snow

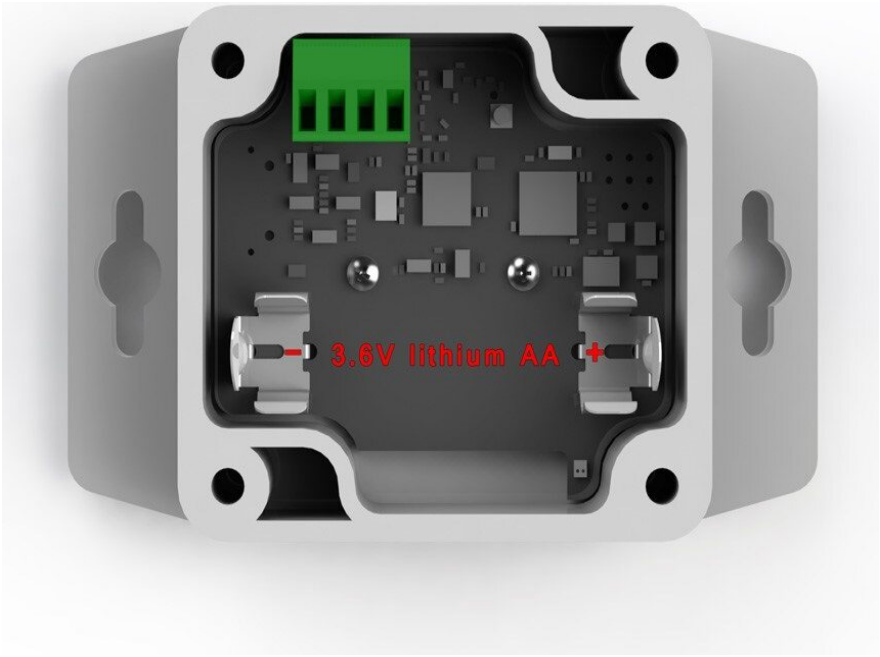
Place the sensor with the sonar nozzle pointed towards the surface that's to be measured. Make sure that there's a minimum of 30 cm clearance from the line to where the sonar module is pointed and the nearest object. Consider §6.5, §6.6 and §6.7 for more information.

3 Installation

3.1 Installation

1. Remove the front lid.

2. Install the battery. The ELT requires one AA battery. The battery type is 3.6V Lithium Battery (ER14505).
   Caution: *Using batteries other than the ones provided may result in loss of performance, battery life, and also damage to the device. Dispose of properly observing environmental protection rules.*



3. Screw the lid in place with the four provided screws.

4. Use screws or double-sided tape to mount the sensor on a surface.

3.2 Service and Maintenance

No serviceable parts inside. If service is needed other than battery replacement, please contact your distributor.

4 Sensor Configuration

4.1 Sensor Configuration

All sensor settings can be configured via a smartphone application with NFC (Near Field Communication) or over the air via the network server and downlink data to the sensor. The sampling rate, spreading factor, encryption keys, port, and modes can be changed. All sensor settings can be locked from the server or NFC to make end-users unable to read or change settings on the sensor.

4.2 NFC Configuration

1. Download ELSYS “Sensor Settings” application from Google Play or App store and install it on a smart phone or tablet. The device must support NFC.
2. Enable NFC on the device and start the application.
3. Place your device on top of the NFC antenna on the sensor. Keep the two devices close to each other and don’t move them to get as good connectivity as possible.
4. Remove the device. Current settings will be displayed in the application.
5. Use the application to change any settings if needed.
6. Tap the device on top of the NFC antenna to transfer the new settings to the sensor. Make sure that the application confirms your new settings.
7. Wait for the sensor to reboot (1 sec), indicated by the LED flashing. Sensor settings have been updated. Always validate your settings by reading the NFC data after the sensor has restarted.



4.3 Over the Air Configuration

All settings may be configured over the air via your LoRaWAN® infrastructure. Please visit the support section on our webpage for more information regarding downlink protocol.

4.4 Application Parameters

All parameters for the “Sensor settings” application can be found in our settings document. Please visit the support section on our webpage for more information.

5 Sensor Behavior

5.1 Sensor Startup

1. When the sensor starts up it loads any configuration parameters written to the NFC chip. The sensor will then write all configuration parameters back to the NFC chip.
2. When the configuration is done the sensor tries to join the network if OTAA (Over the Air Activation) is enabled. Make sure that the sensor credentials (DevEUI, AppKey, JoinEUI) match the keys added in the server for activation of the device. The join procedure starts at spreading factor 7 with a join request every ~15 seconds. The sensor will gradually increase the time as well as the Spreading Factor between the following join requests until the join is successful. Every join request is indicated by a yellow LED blink.
3. After successful connection to a network, the sensor sends an uplink containing the sensor settings and enters sampling mode.

5.2 Sampling mode / Periodic measurement

The sensor makes periodic measurements according to the user configuration.

5.3 Scheduled Transmission

The sensor transmits data according to the user configuration. However, the configured sending interval can be overridden by network limitations. Due to this, the spreading factor and sending interval settings might result in longer intervals than intended.

5.4 LED Indication

The LED, located in the bottom right corner on the PCB, indicates different actions when the sensor is active.

LED Indicator	Action
Long Red blink, long Green blink	Sensor is starting up
Short Yellow Blink	LoRa Join Request Transmission
Short Green Blink	LoRa Uplink Transmission
Short Red Blink	Sensor failed to send an uplink. Common cause is duty cycle limits.

6 Internal sensors

The populated internal sensors in the ELT series differ between models according to the list below.

	ELT Lite	ELT2i	ELT2	ELT Ultrasonic 5m	ELT Ultrasonic 10m	ELT Ultrasonic Snow
Temperature		✓	✓	✓	✓	✓
Humidity		✓	✓	✓	✓	✓
Atmospheric pressure		✓	✓	✓	✓	✓
Accelerometer		✓	✓	✓	✓	✓
Ultrasonic range (5m)				✓		
Ultrasonic range (10m)					✓	
Ultrasonic snow range						✓
Multi-purpose I/O 1 (IN)	✓	✓	✓			
Multi-purpose I /O2 (I /O2)		✓	✓			

6.1 Temperature

Resolution	0.1 °C
Accuracy	0.2 °C typical, see figure 7

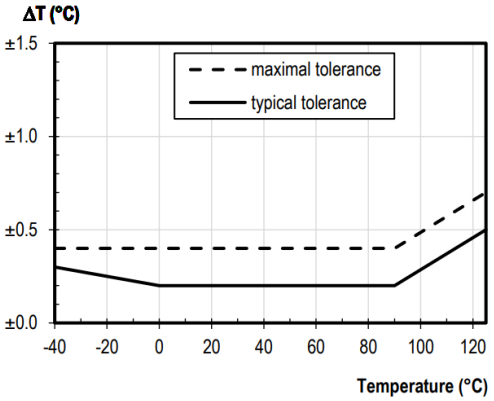


Figure 7. Temperature accuracy.

6.2 Humidity

Note that the internal sensor will react very slowly to external changes in humidity.The humidity sensor can be somewhat helped by equipping the ELT with a membrane if cable gland is not needed, but the response time will not be comparable to a sensor exposed to open air.

Resolution	1 % RH
Accuracy at 25 °C	±2 % RH, see figure 8

For accuracy of RH over temperature, see figure 9

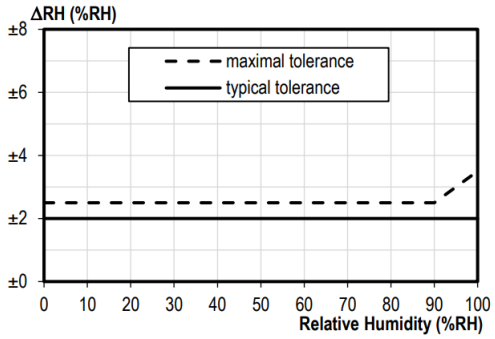


Figure 8. Tolerance of RH at 25°C.

6 Internal Sensors

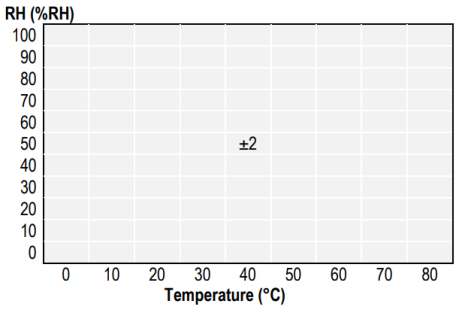


Figure 9. Typical tolerance of RH over T.

6.3 Atmospheric Pressure

Note that the ELT2 is equipped with a cable gland with a pressure membrane, which allows for atmospheric pressure reading while keeping its IP 67 rating.

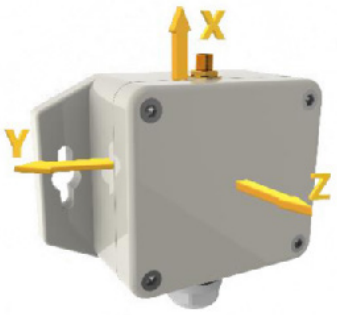
Atmospheric pressure

Range	260 - 1260 hPa
Accuracy	± 1 hPa

6.4 Accelerometer

The accelerometer sensor reports values of X, Y and Z direction, depending on the sensor orientation. The accelerometer can be configured to send triggered messages when the measured acceleration exceededs a threshold in any axis for a selected amount

Range	± 2.0 g
Sensitivity	16 mg/digit
Data rate	10 Hz



6 Internal Sensors

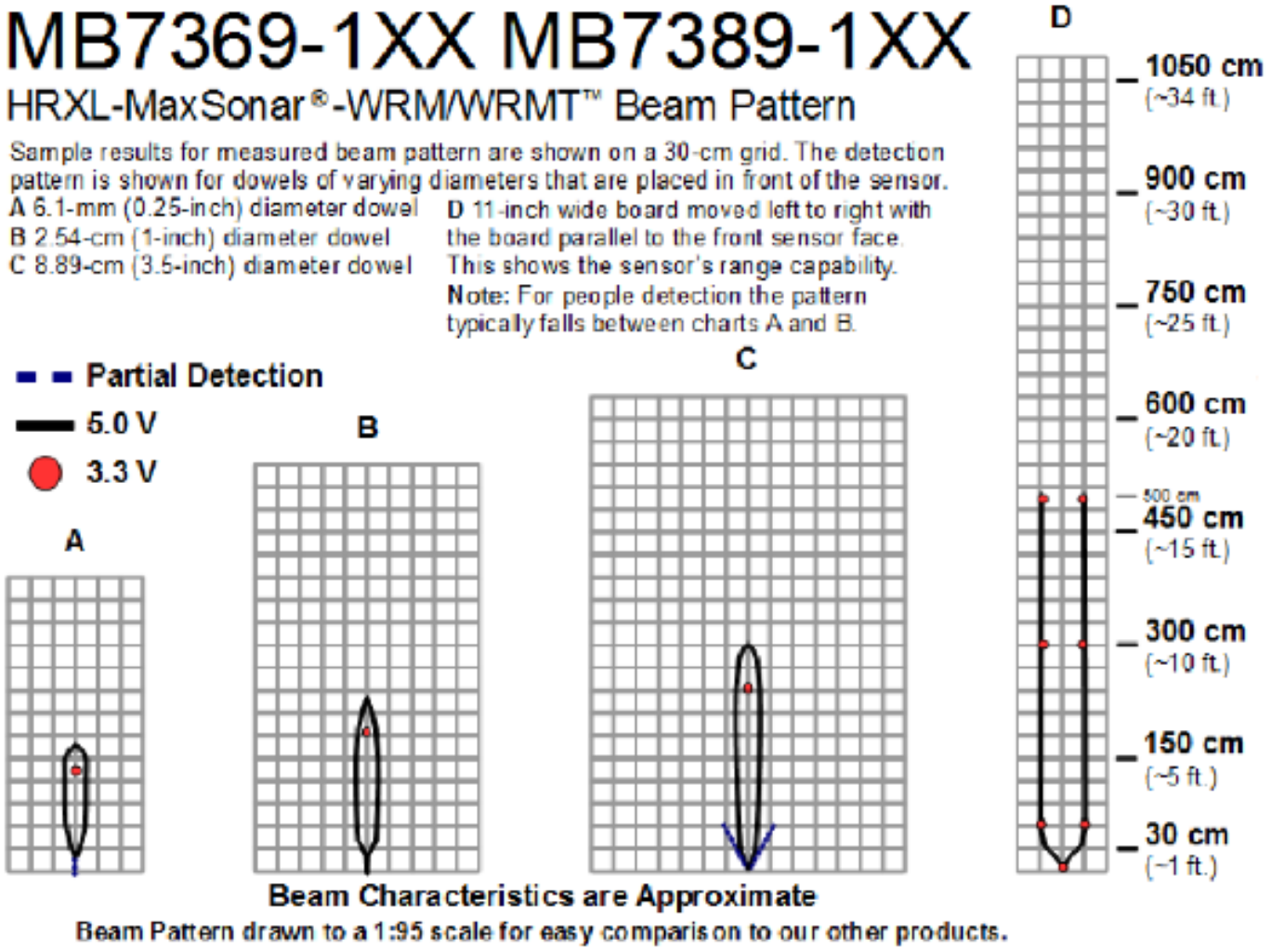
6.5 Ultrasonic 5m

The ultrasonic sensor is a Maxbotix MB7389.

Distance Range 30 cm – 500 cm

Targets closer than 30 cm will typically range as 30 cm.

Resolution: 1 mm



6 Internal Sensors

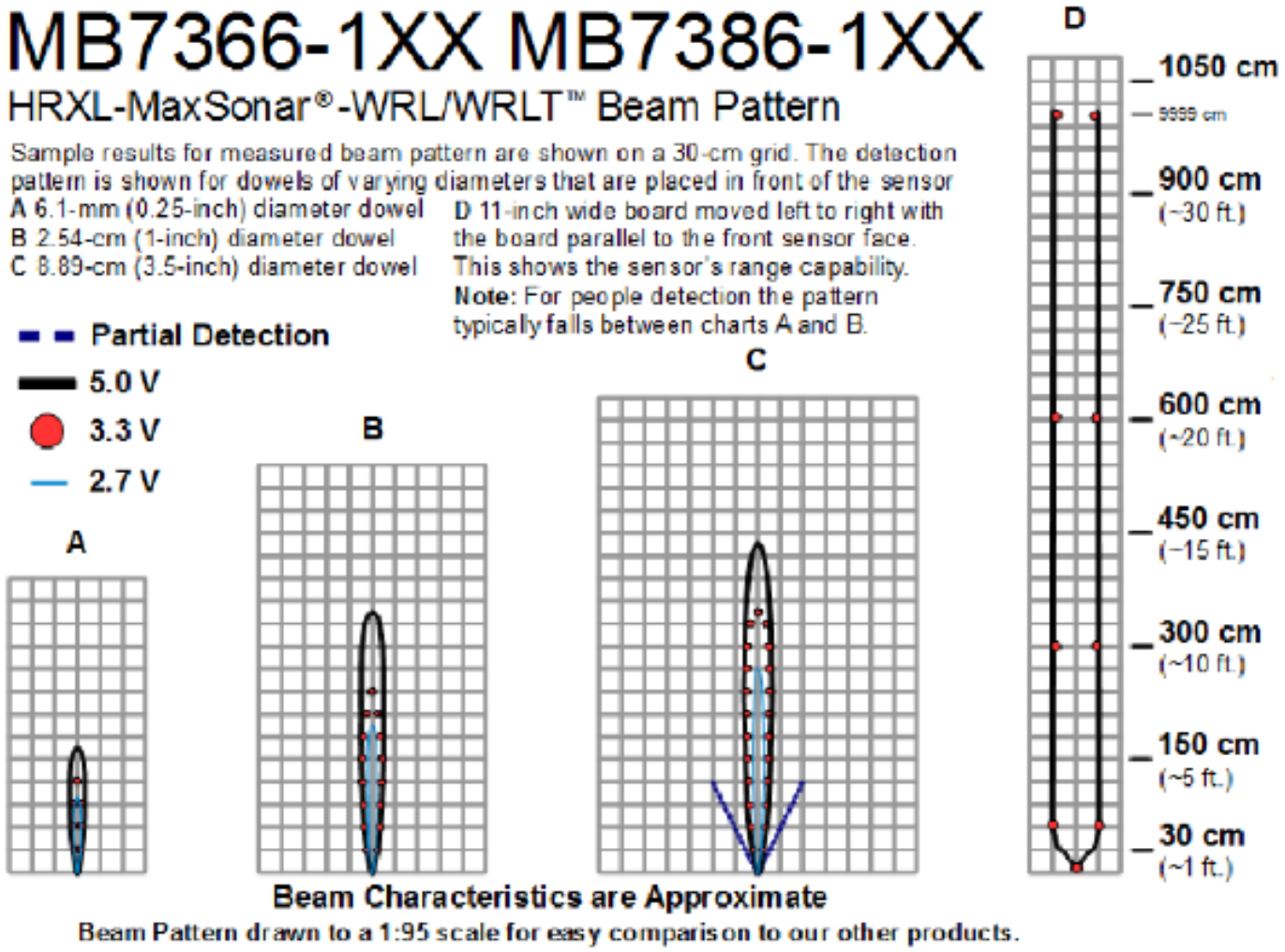
6.6 Ultrasonic 10m

The ultrasonic sensor is a Maxbotix MB7386

Distance Range: 30 cm – 1000 cm

Targets closer than 30 cm will typically range as 30 cm.

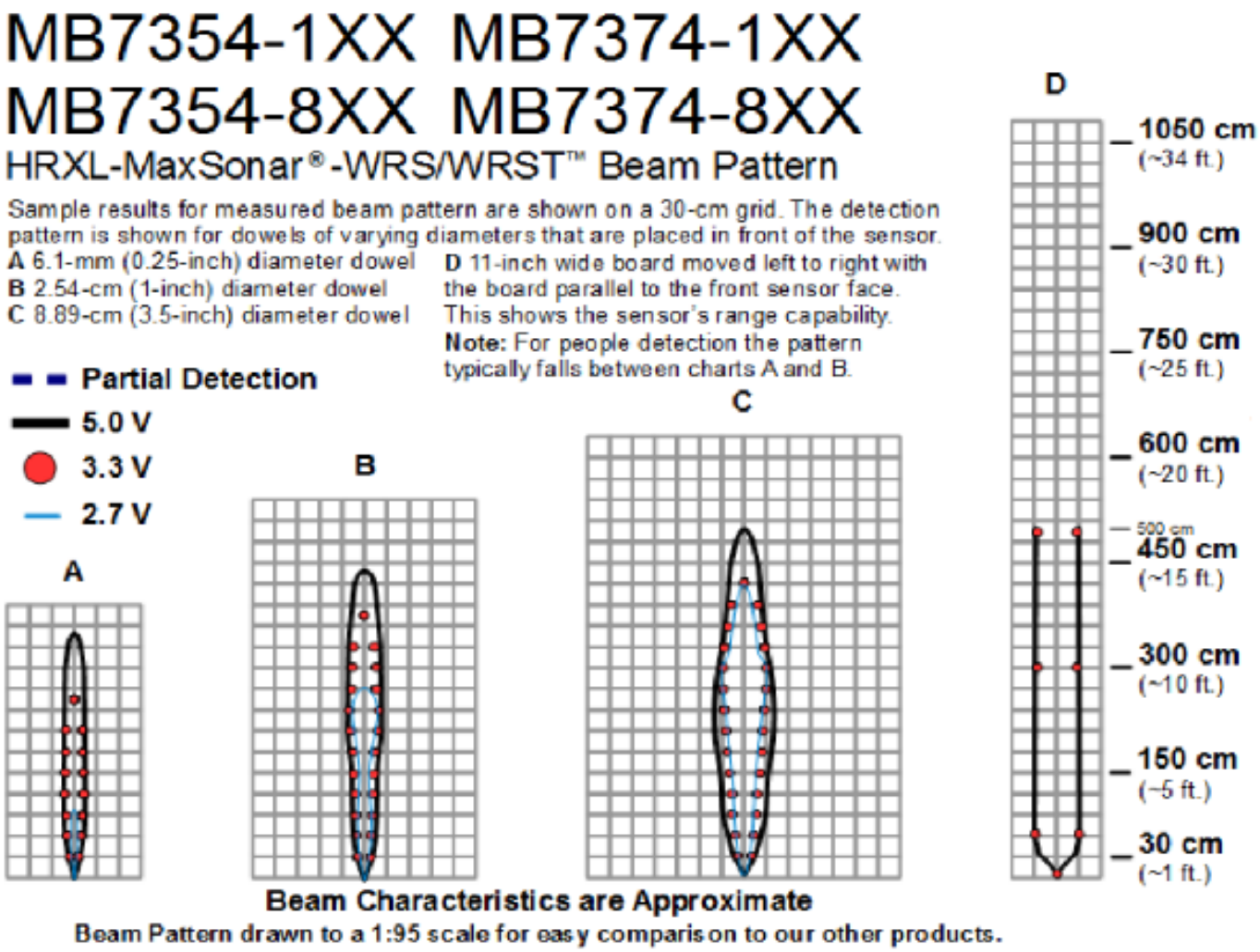
Resolution: 1 mm



6 Internal Sensors

6.7 Ultrasonic Snow

The ultrasonic sensor is a Maxbotix MB7374
The sensor is tuned for measuring against snow.
Distance Range: 50 cm – 500 cm



7 External Sensors

The ELT series of sensors can be connected to a wide array of external sensors, equipment, and modules. All connections to external gear are made available through the terminal block located on the top left of the circuit board inside the ELT. Available connections on the terminal block are power, ground and either one or two multi-purpose I/O-ports depending on the ELT variant.

7.1 General External Sensor Parameters

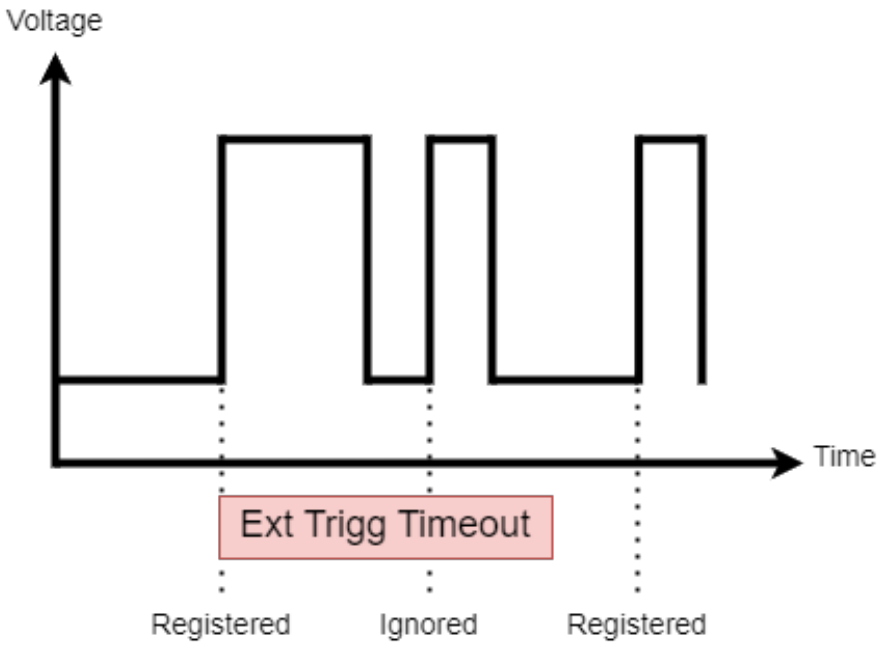
All of the following settings can be set using NFC and our app Sensor Settings or via a LoRaWAN downlink to the device.

External Sensor: Sets the external sensor type.

External Period: The external period sets how often the external sensor data is to be reported as a multiple of the sensors send period. Ensure that the external sensor send period is set to a non-zero value for the sensor to send external sensor data, including non-periodic data, as the default value is 0.

External Startup Time: The time in milliseconds between B+ power is applied to the external sensor is sampled. Set the External Startup Time to 1000000 or greater to make the B+ output always on. The function of this parameter may change depending on the external sensor parameter, consult the following sections for details.

External Trigger Timeout: The amount of time in milliseconds from a trigger event to when a new trigger is allowed. The External Trigger Timeout is used in the Pulse and Switch modes.



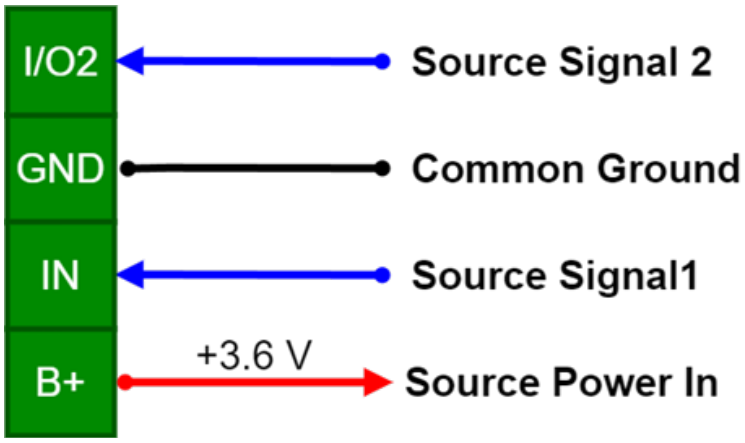
7 External Sensors

7.2 Power Output

The ELT sensors can power external sensors and modules using the B+ output on the terminal block. The output is controlled by the External Startup Time parameter. Set the External Startup Time to 1000000 or greater to make the B+ output always on.

In some modes, a default startup time is applied by the sensor. In these modes, only External Startup Time values greater than the default startup time are applied.

The B+ output voltage is not regulated, it is directly tied to the + pole of the battery.



Default Startup Times	ms
Temperature Probe DS18B20	1000
Temperature Probe DS18B20 + Switch	1000
PT1000 (ADC Module)	200
Load cell (ADC Module)	200
Dual PT1000 (Dual PT1000 Module)	200
SLT5006	1000

7 External Sensors

7.3 Analog Input

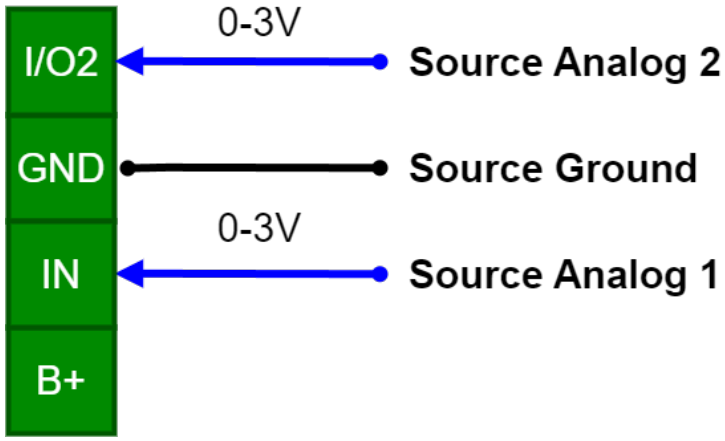
With the analog input modes set as external sensor type the sensor will wake up on main time base and measure the voltage at the input.

If the sensor has I/O2 the sensor will sample both inputs.

The reported value will be the voltage in mV. It can be set to measure two voltage ranges, 0-3 V or 0 – 10V, a mode where the ELT powers the source to be read is also available. Note that values for unconnected Analog inputs are undefined, meaning any number in the ADC may be reported for that channel. If a defined value is desired for unconnected inputs, connect a short jumper between the input and GND, which will result in the channel value being 0.

7.3.1 Analog Input 0-3 V

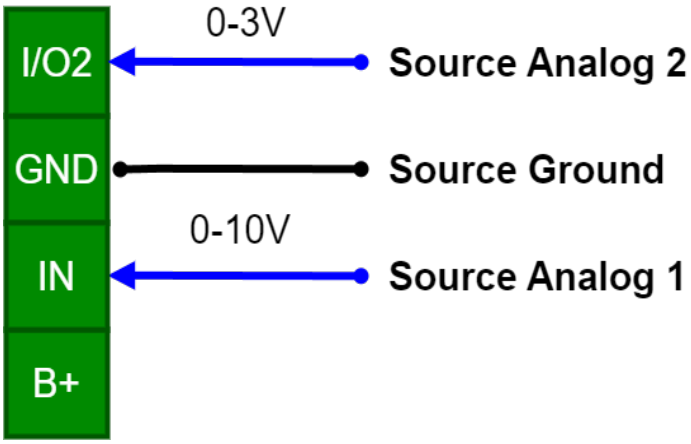
Connect positive lead to IN and negative lead to GND on the terminal of the ELT. If the sensor has I/O2, a second source may be connected with the positive lead connected to I/O2 and negative lead to GND. The input impedance is approximately 50 kΩ.



7 External sensors

7.3.2 Analog Input 0-10 V

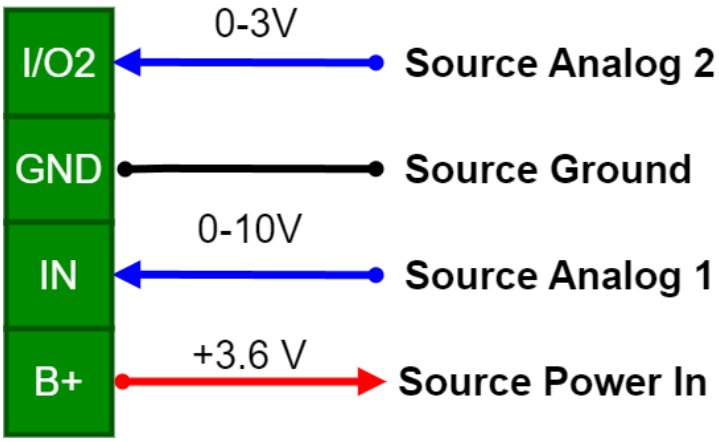
Connect positive lead to IN and negative lead to GND on the terminal of the ELT. The input impedance is approximately 6.5kΩ on the IN terminal. If the sensor has I/O2, a second source may be connected with the positive lead connected to I/O2 and negative lead to GND. I/O2 is in 0-3 V range in this mode with an input impedance of approximately 50 kΩ.



7.3.3 Powered Input 0-10 V

Power to an external sensor can be applied on the B+ terminal if needed. This power is applied before sampling of the sensor with a time set with the parameter "External Startup Time".

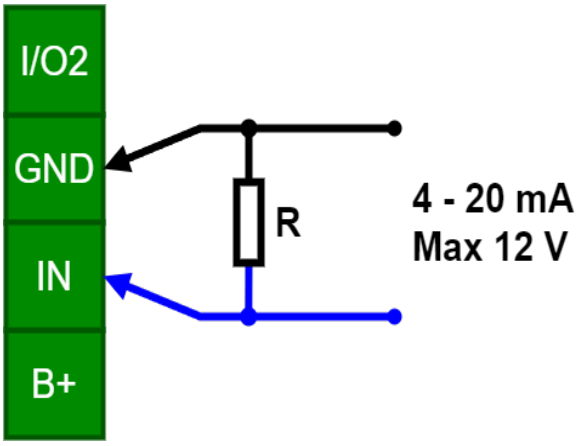
Note: the B+ output voltage is not regulated, it is the battery positive voltage.



7 External sensors

7.3.4 20 mA Input

Select one of the Analog Input modes (See 7.3.1 and 7.3.2), connect a resistor (R) in parallel to the input, between IN and GND. Convert the voltage to current using Ohm's law, U=R*I. For full range use a 150 Ω resistor in 3 V mode and a 536 Ω resistor in 10 V mode.



7.4 Pulse Count

With any of the pulse counting modes set as external sensor type, the sensor will be continuously sampling the input. The external trigger timeout is used in all pulse modes (see 7.1 for details).

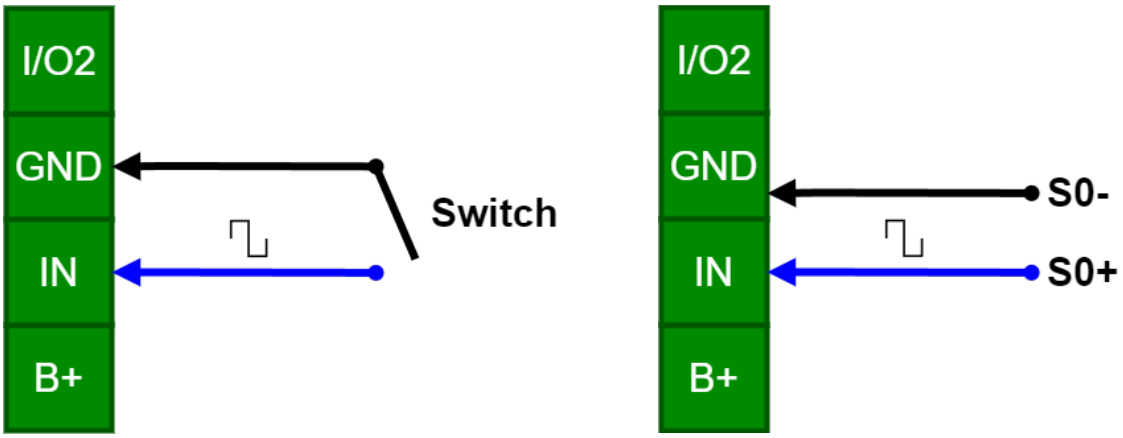
The voltage needs to be as close as possible to the internal sensor voltage to register as a pulse. The pulse input modes will work with both passive switches and active outputs.

There are two ways of counting. In normal counting the sensor will report the number of pulses registered since the last uplink. In absolute count mode, the sensor will keep the number of pulses so the reported value will be the number of pulses registered since the device was started. In absolute count mode the sensor will keep the pulse count. The pulse count will be kept if the sensor resets. The pulse count can only be reset/changed by sending a downlink command to the sensor.

7 External sensors

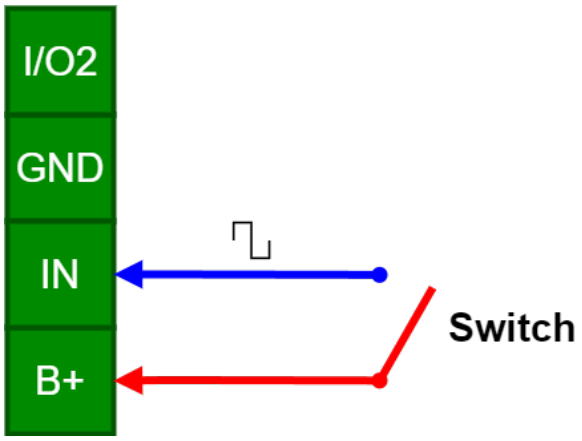
7.4.1 Pulse Input Pull-up & Pulse Input Pull-up Absolute Count

Connect positive lead to IN and negative lead to GND on the terminal of the ELT. If connected to an S0 output, connect the S0- lead to GND and S0+ lead to IN. The ELT will count all falling edges of the input signal. The ELT input is internally pulled up by approximately 50k Ω.



7.4.2 Pulse Input Pull-down & Pulse Input Pull-down Absolute Count

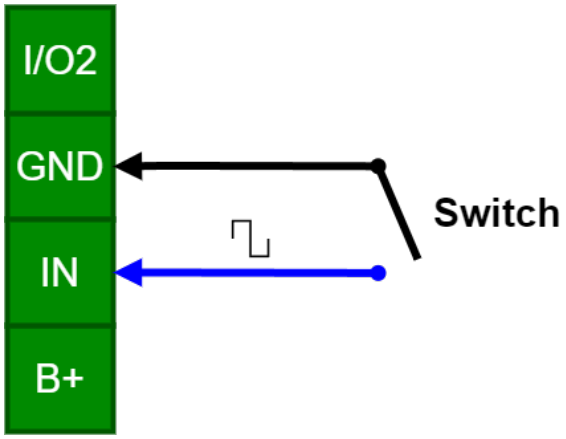
Connect positive lead to B+ and negative lead to IN on the terminal of the ELT. Set the ON-time parameter to 10 000 000 ms to make the B+ output always activated. The ELT will count all rising edges of the input signal. The ELT input is internally pulled down by approximately 50k Ω.



7 External sensors

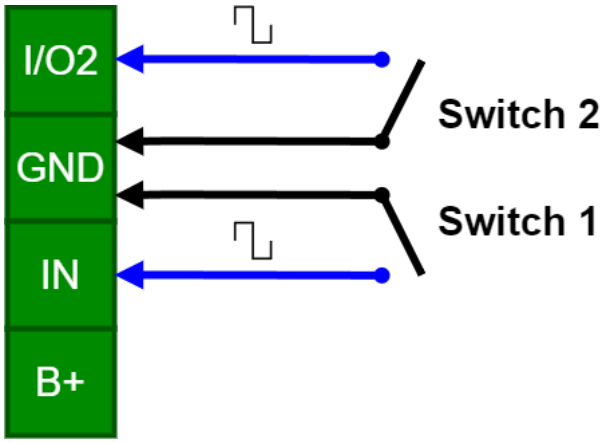
7.4.3 Pulse Input no Pull-up/down & Pulse Input no pull-up/down Absolut Count

Connect positive lead to IN and the negative lead to GND on the terminal of the ELT. The ELT will count all edges, positive and negative, of the input signal. The ELT input has no input pull up/down resistance in this mode. This requires the input signal to be driven both high and low by the external sensor. The voltage needs to be as close as possible to the internal sensor voltage in order to register as a pulse.



7.4.4 Pulse Input Pull-up, 2 channels

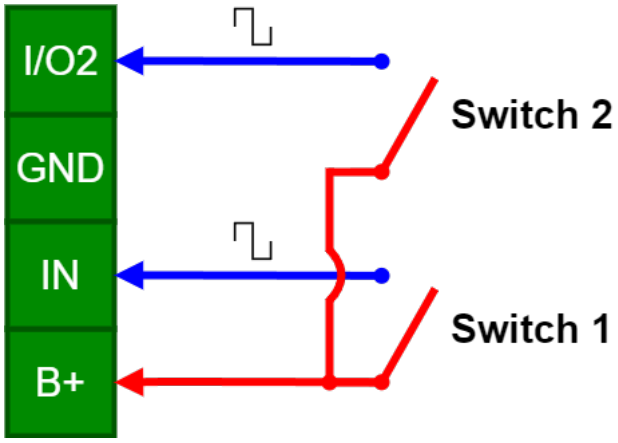
Connect positive lead 1 to IN and positive lead 2 to I/O2, and negative lead(s) to GND on the terminal of the ELT. The pulse count of the channels will be reported separately. The ELT input is internally pulled up by approximately 50k Ω.



7 External sensors

7.4.5 Pulse Input Pull-down, 2 channels

Connect positive lead 1 and 2 to B+, negative lead 1 to IN and negative lead lead 2 to I/O2. Set the ON-time parameter to 10 000 000 ms to make the B+ output always activated. The pulse count of the channels will be reported separately. The ELT input is internally pulled down by approximately 50k Ω.

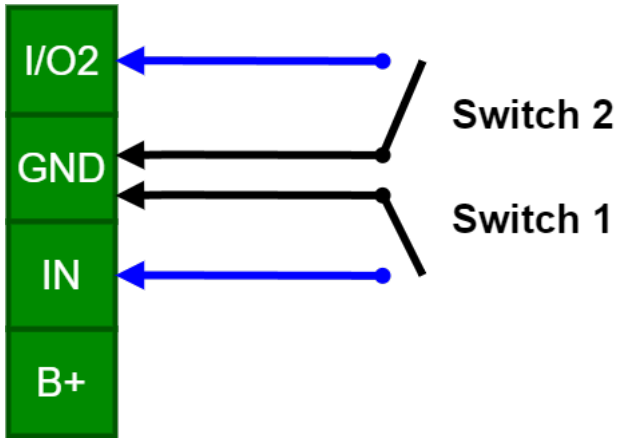


7.5 Switch Input

When set to a switch input mode, the sensor will apply digital logic to the input(s), with 0 used for the normal switch state and 1 for the active switch state. The switch state will be read by the sensor applying a voltage to IN and (when applicable) I/O2 using a 50k Ω pull up resistor. The inputs are debounced using the standard external trigger timout, except for the Level Switch mode (see. 7.5.4)

7.5.1 Switch Input (Normally Open)

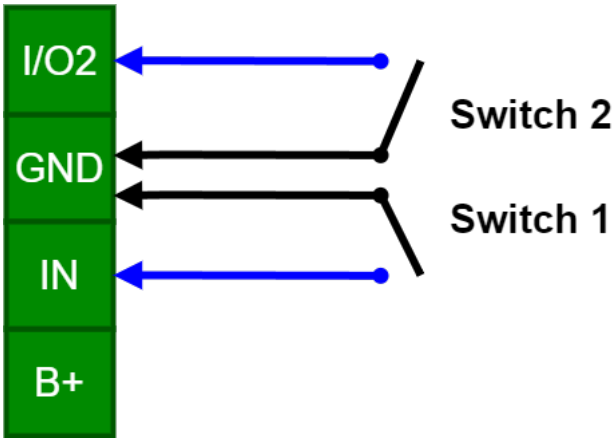
Connect the switch leads to IN and GND. If the sensor has I/O2 two switches may be used in parallel, connect the second switch leads to I/O2 and GND. The sensor will send triggered messages when the switch closes as well as periodically, containing the current state of the switches. The reported values will be 1 for closed and 0 for open.



7 External sensors

7.5.2 Switch Input (Normally Open), Dual Edge Trigger

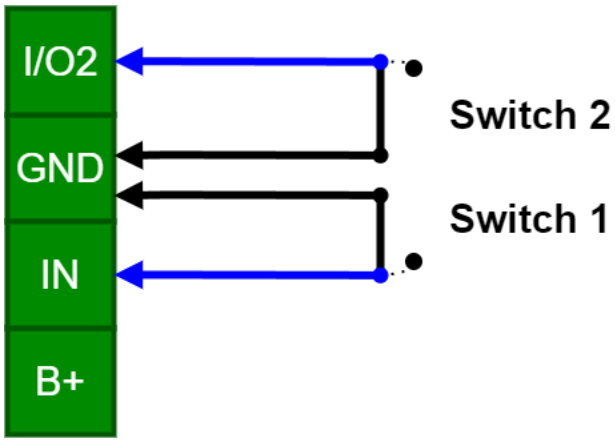
Connect the switch leads to IN and GND. If the sensor has I/O2 two switches may be used in parallel, connect the second switch leads to I/O2 and GND. The sensor will send triggered messages when the switch opens or closes as well as periodically, containing the current state of the switches. The reported values will be 1 for closed and 0 for open.



7.5.3 Switch Input (Normally Closed)

Note: Requires firmware version 2.4.6 or later.

When set to switch NC the sensor will wake up every 10 seconds and apply voltage to the IN and (if applicable) I/O2 ports with pull-up resistors to test if the circuit is closed. An uplink will be sent if the switch opens or closes as well as periodically, containing the current state of the switches. If the sensor has I/O2 two switches may be used in parallel, connect the second switch leads to I/O2 and GND. The reported values will be 0 for closed and 1 for open.

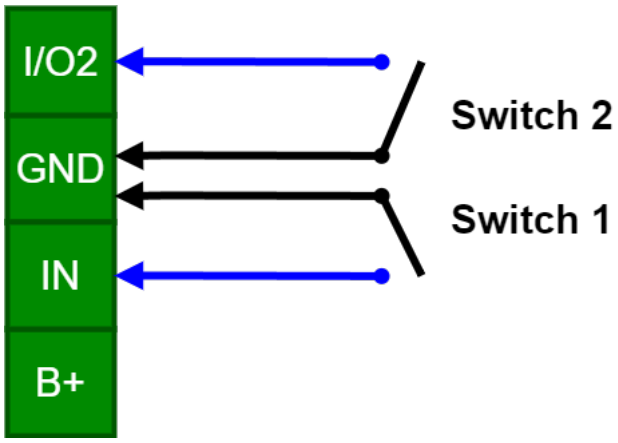


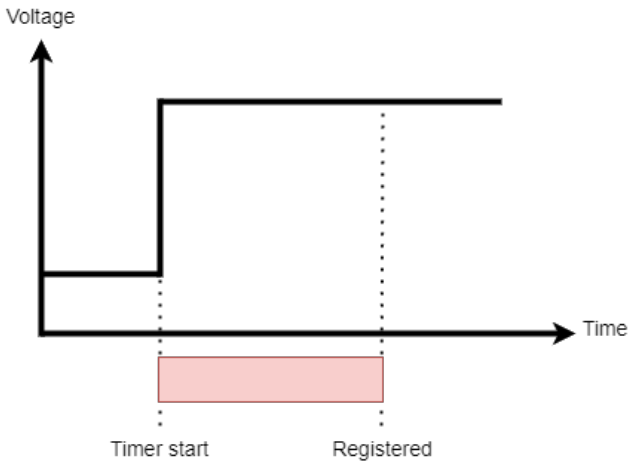
7 External sensors

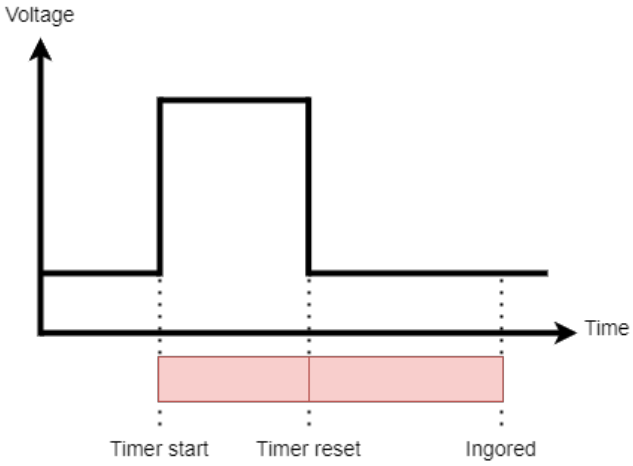
7.5.4 Switch Input (Normally Open), Level

Note: Requires firmware version 2.4.6 or later.

Connect the switch leads to IN and GND. If the sensor has I/O2, two switches may be used in parallel. Connect the second switch leads to I/O2 and GND. The Switch Input Level mode uses a different debounce logic. The debounce timer will be reset on every edge of the switch input(s) and the input(s) will be read once the timer runs out. Triggered messages will be reported on both edges, and the input(s) will be reported periodically. The reported values will be 1 for closed and 0 for open.





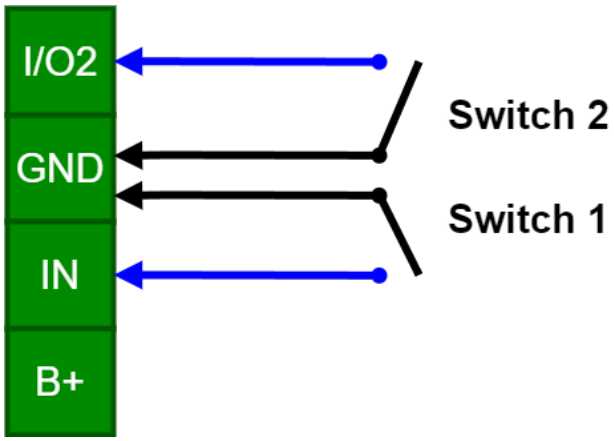


7 External sensors

7.5.5 Switch Input, Door

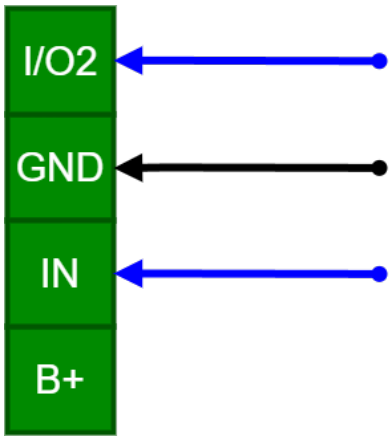
Note: Requires firmware version 2.4.6 or later.

Connect the switch leads to IN and GND, if applicable connect a second switch to I/O2 and GND. When set to Switch Input Door, the sensor will send a triggered message containing the current state of the switch when the switch is opened or closed, then wait for a user-selectable amount time, then send a message containing the number of openings/closings that has occurred during the wait. In this mode, the "External Startup Time" parameter sets the wait time in milliseconds. Debounce may be used and is set using the "External Trigger Timeout" parameter. The reported values will be 1 for closed and 0 for open.



7.6 Digital Input

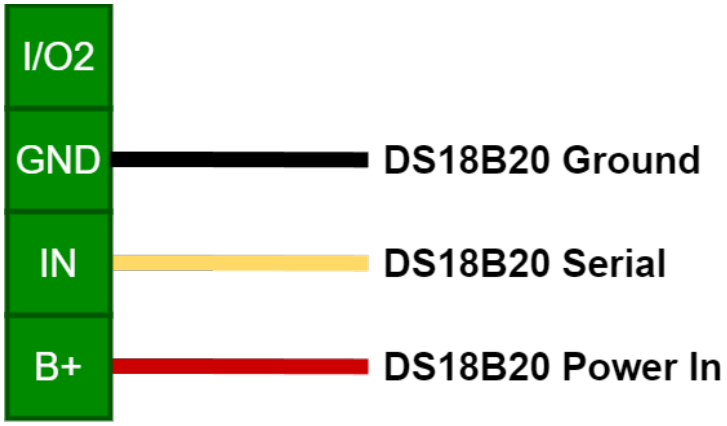
Connect the positive leads to IN and I/O2 and the negative lead to GND. The sensor will read external voltage provided by the external source and report '0' or '1'. The input will be periodically sampled and reported.



7 External sensors

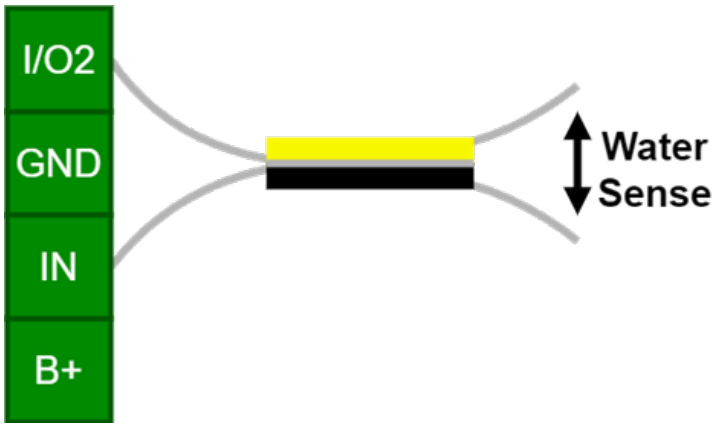
7.7 Temperature Probe DS18B20

The ELT is compatible with DS18B20 1-wire temperature probes. When connected to the ELT the probes will be set to 12-bit-mode. Six DS18B20 can be connected to the same ELT at once (ELT lite supports one DS18B20). The first probe temperature will be reported as “External Temperature 1” and all other probes will be reported as “External Temperature 2”. Connect the black lead(s) to GND, the yellow lead(s) to IN and red lead(s) to B+



7.8 Water leak

The water leak mode measures conductivity between two wires which can be used to detect water and moisture. The reported values are 0-255 where higher values means higher conductivity. Note that longer water leak cables have a higher base conductivity, this needs to be measured after the cables have been installed and an appropriate alarm level will need to be set in the backend system. Connect the unshielded wires to IN and I/O2, make sure they aren’t touching each other as that will result in the sensor always measuring maximum conductance.

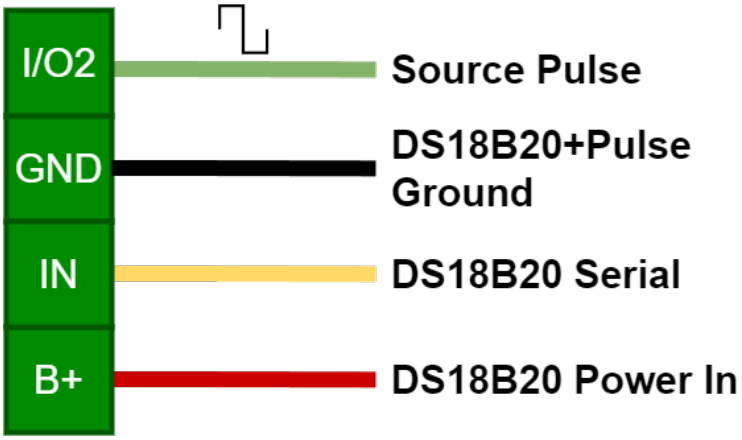


Picture is for illustrative purposes only. The water sense leads does not need to extend the black and yellow wires.

7 External sensors

7.9 Temperature Probe Digital DS18B20 + Switch Normally Open

The digital temperature probe (§8.4) can be combined with switch normally open (§8.3.3) in parallel. Connect the DS18B20 according to §8.4 and the switch negative lead to GND and positive lead to I/O2.

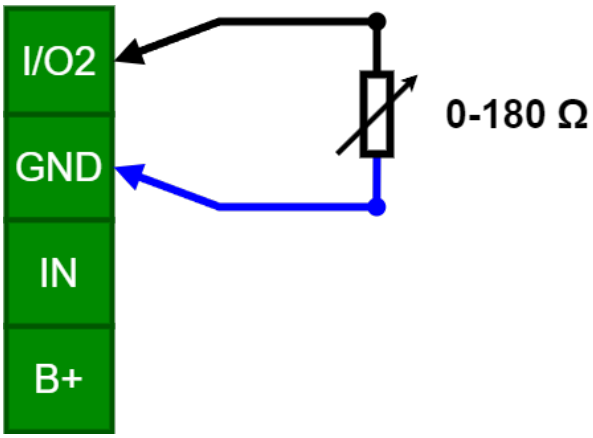


7.10 Sender Unit (0-180 Ohm)

Note: Requires firmware version 2.4.6 or later.

Connect the sender unit leads to GND and I/O2. The ELT will internally pull up an 180 ohm resistor and measure the voltage divided by the internal pull up and and the external sender resistance using the ADC. The reported value will be the ADC read in mV (V_{ADC}). To get the resistance of the sender (R), use the following formula:

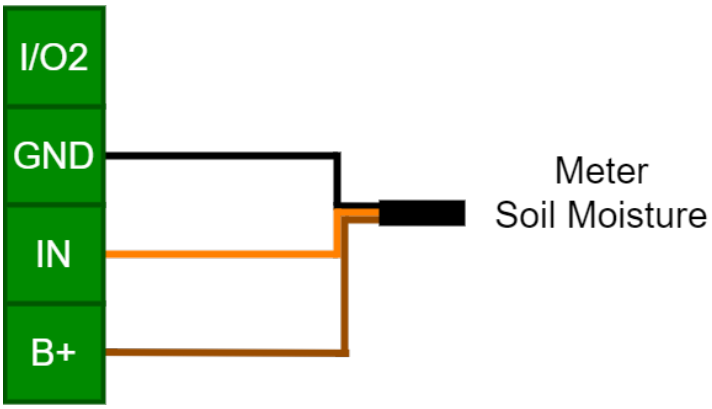
$$R = \frac{V_{ADC} * 180}{(V_{DD} - V_{ADc})}$$



7 External sensors

7.11 Soil Moisture Meter Teros12

Connect the black lead to GND, orange lead to IN and brown lead to B+. In the application “Sensor settings”, please follow these instructions: For Teros 10, ECH2O 10HS, and ECH2O EC-5 – select “Meter Soil sensor (analog)”. For Teros 11, Teros 12, and ECH2O 5TE – select “Meter Soil sensor (digital)”.

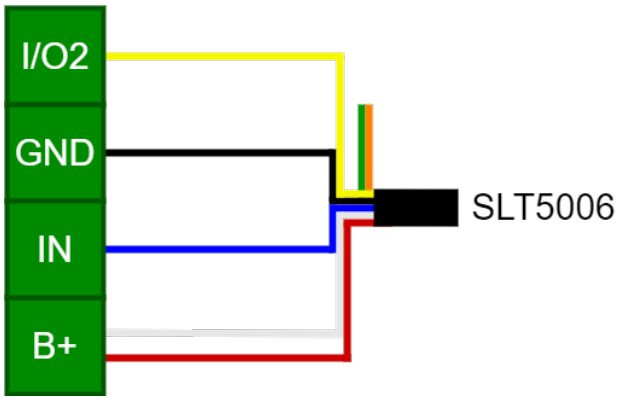


7.12 Soil Moisture MuRata SLT5006

Note: Requires firmware version 2.4.6 or later.

The SLT5006 is a digital soil moisture sensor that measures electrical conductivity, moisture water content and temperature.Connect yellow lead to I/O2, black lead to GND, blue lead to IN, and red and white leads to B+, leave green and orange leads disconnected.

Values are reported as
Volumetric water content: Pulse 1
Electrical conductivity (pore): Pulse 2
Electrical conductivity (bulk): Pulse 2 abs
To get actual electrical conductivity, multiply the reported value by 0.001



8 Modules

8. Modules

ELSYS provides modules for the ELT2 that fit in the terminal block and expands the functionality of the ELT. Available modules are:

EXT Module: When the EXT Module is installed, the ELT-2 can be externally powered and be used as a LoRaWAN class C or a class A device. Add this to the ELT-2 to control external sensors such as lighting or actuators/relays. It can also be set to output 0-10V voltage.

ADC Module: ADC Module is intended for connecting PT1000 platinum sensors or to be used as a general-purpose bridge amplifier. Install the ADC Module in the ELT-2 to be able to measure temperatures with PT1000 or connect a load cell bridge.

Dual PT-1000 Module: An alternate ADC module designed for two PT1000 temperature probes to be connected simultaneously. *Note: Requires firmware version 2.4.6 or later.*

Step-up Module: The Step-up module is a boost converter for the ELT-2. It boosts the internal battery voltage to 5V at the connector, making it suitable for powering sensors with a supply voltage demand of 5V. The I/O connections are unaffected.

9 Device Specifications

9. Device Specifications

Dimensions	94 x 95 x 35 mm
Weight	60g / 97g (with battery inserted) 70 - 95 g including batteries
Enclosure	Polycarbonate
IP Rating	IP67
Mounting	Screws/Adhesive tape
Recommended installation height	Wall: 1.6 m
Usage Environment	Indoor/Outdoor
Temperature	-40 to 60 °C (85 °C with external power supply)
Operating Voltage	3.6 V DC
Battery Type	AA 14505 (3.6V Li-SOCI2)
Battery Life	Up to 10 years (Depending on settings and environmental factors)
Wireless Technology	LoRaWAN® 1.0.3
Wireless Security	LoRaWAN® End-to-End encryption (AES-CTR), Data Integrity Protection (AES-CMAC)
LoRaWAN® Device Type	Can be configured as class A. B or C end device
Supported LoRaWAN® regions	EU868, IN865, US915, AU915, AS923, HK923, KR923
Supported LoRaWAN® features	OTAA, ABP, ADR, Adaptive Channel Setup
Link Budget	137dB (SF7) to 151 dB (SF12)
RF Transmit Power	Max 14 dBm EIRP
EU Directives Compliance	RED 2014/53/EU, RoHS 2011/65/EU, WEEE 2012/19/EU

10 Sensor Payload format

10. Sensor Payload format

The device uses the standard ELSYS payload format. Please see the specified document on our webpage.

11 Regulations

11.1 Legal Notices

All information, including, but not limited to, information regarding the features, functionality, and/or other product specification, are subject to change without notice. ELSYS reserves all rights to revise or update its products, software, or documentation without any obligation to notify any individual or entity. ELSYS and ELSYS logo are trademarks of ElektronikSystem i Umeå AB. All other brands and product names referred to herein are trademarks of their respective holders.

11.2 Federal Communication Commission Interference Statement (Pending. Estimated 24/04/01)

Notice

This device complies with Part 15 of the FCC Rules and with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

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

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

(1) l'appareil ne doit pas produire de brouillage, et
(2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Radiofrequency radiation exposure Information:

This equipment complies with FCC and Innovation, Science and Economic Development radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Informations sur l'exposition aux rayonnements radiofrequences:

Cet équipement est conforme à la réglementation de la FCC et aux limites d'exposition aux rayonnements définies par Innovation, Sciences et Développement économique pour un environnement non contrôlé. Cet équipement doit être installé et utilisé à une distance minimale de 20 cm entre le radiateur et votre corps. Cet émetteur ne doit pas être co-localisé ou fonctionner en conjonction avec une autre antenne ou un autre émetteur.

11 Regulations

FCC ID
2ANX3-ELT01

IC ID
26904-ELT01

Note

Changes or modifications made to this equipment not expressly approved by ElektronikSystem i Umeå AB may void the FCC authorization to operate this equipment.

Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

11.3 Declaration of Conformity

Hereby, ElektronikSystem i Umeå AB declares that the radio equipment type "Radio communication devices for low-speed data R&TTE Class 1" is in compliance with Directive 2014/53/EU, Directive 2011/65/EU and Directive 2012/19/EU.

The full text of the EU declaration of conformity is available at: https://www.elsys.se/link/eu-doc

12 Revision History

Revision	Description	Date
1.0	ELT Series operating manual created	2024-02-27