Operating Manual
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ERS Interact series LoRa

LoRaWAN Wireless sensor

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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 only intended for indoor use. Do not expose it to moisture.

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 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 Directive 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.

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1. Description

The ERS Interact LoRa series of sensors are universal LoRaWAN® indoor climate sensors with a 2.13" E-paper display showing real-time sensor data. The Interact series includes up to three configurable touch buttons. These buttons can be assigned to different functions, and the display can be adapted for different applications. The Interact series are battery-powered devices and are designed to be wall mounted. The sensors are equipped with NFC (Near Field Communication) for easy configuration with an NFC-enabled smartphone.

1.1 Interact Series Attributes

	ERS Interact Lite Comfort	**ERS Interact Lite Flex**
2.13" display	x	x
NFC	x	x
Temp	x	x
Hum	x	x
Touch buttons	2 used / 1 unused	3 Programmable
Configuration	Comfort	Customized

1.2 Label

The barcode is of type Aztec and contains DevEUI and sensor type.

This label is located at the back of your device.

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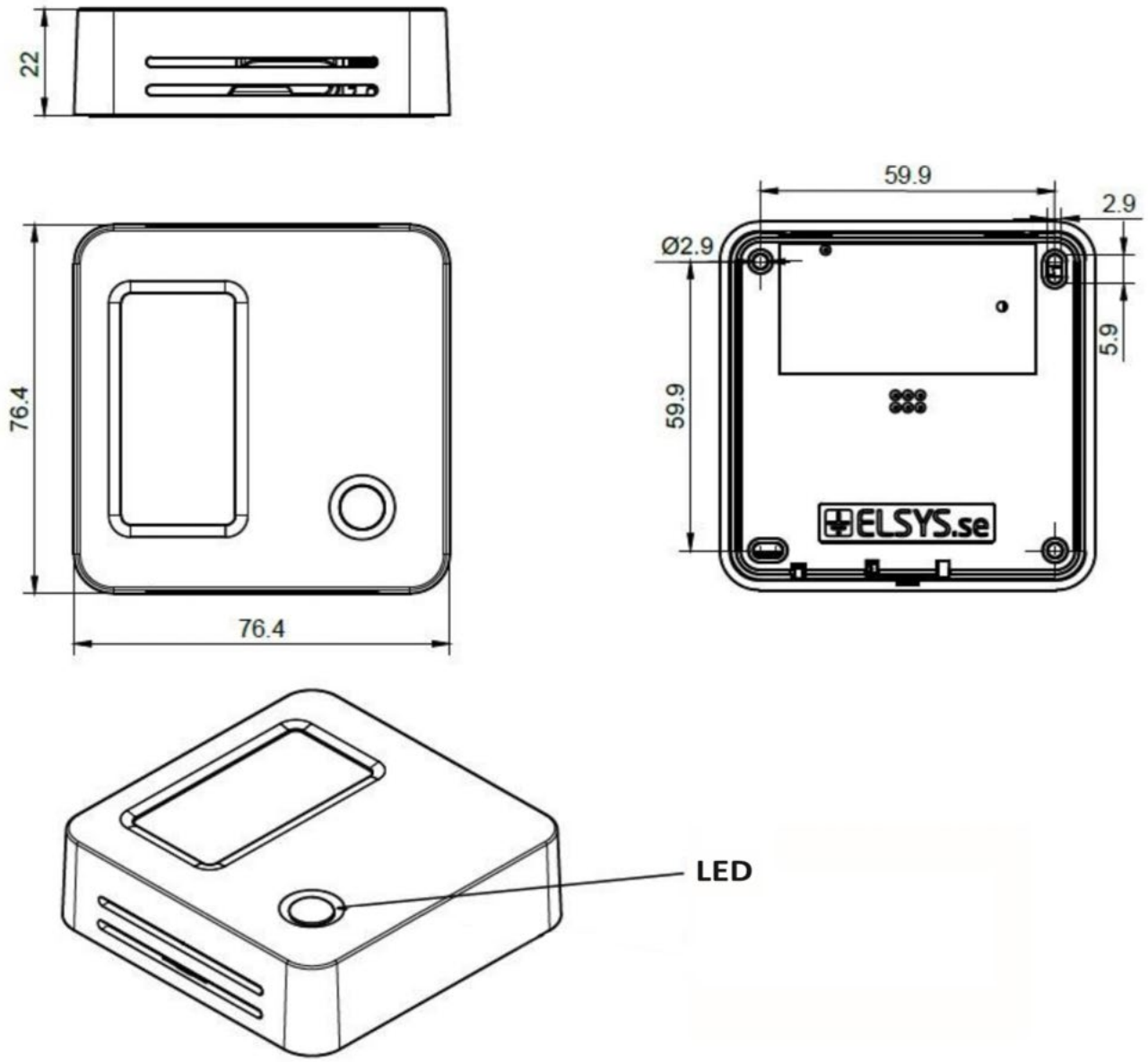
1.3 Dimensions



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1.4 Main features of the ERS Interact Series

- Compatible with LoRaWAN® specification 1.0.4
- Presents real-time data on a 2.1" e-paper display
- Measures ambient temperature
- Measures ambient humidity
- Three configurable buttons
- Configurable Interface
- Instant interaction between buttons and interface
- Interface updates via downlink
- Easy installation
- Easy configuration
- May be installed on a wall or any (non-metallic) surface
- Battery-powered
- Long-range communication
- Configurable over NFC
- Configurable over the air
- Ten years of battery life*****
- Supported channel plans: EU863-870, IN865, US915, AU915-928, AS923, KR920
- CE Approved and RoHS compliant

***** *Depending on settings and environmental factors*

2. Mounting Guidelines

Common mounting guidelines for ERS Interact Series of sensors:

- Place the sensor in an open space on the wall, with an installation height of 1.6 meters.
- For best RF and measurement performance, make sure you mount the sensor with the ventilation openings vertically. See installation in chapter 3.
- Make sure that the sensor is not placed in direct sunlight, close to heating vents, near windows, air ventilation where it may measure values that are not representative of the rest of the room.

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3. Installation Instruction

1. Remove the back panel of the sensor by gently prying the tab with a small screwdriver. Take care not to damage any internal components.

2. Install the batteries. The ERS Interact series LoRa requires one or two AA batteries. The battery type is 3.6V Lithium Battery (ER14505). You can use one battery, but it's recommended that you use two for best performance and battery life.

   Use battery slot A if only one battery is used. The unit starts immediately when a battery is inserted.

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3. Mount the back panel securely to the wall with at least 2 appropriate screws, using some of the four mounting holes.

   Alternatively, attach the sensor with double sided adhesive tape.

4. Attach the sensor part by hinging it on the back panel.

   Upon starting, the device loads a default touch sensitivity configuration, making the buttons ready to use without calibration.

   The device continuously monitors environmental conditions and automatically calibrates the touch sensitivity if drift outside of normal operating conditions is detected.

   The touch sensitivity may be affected if the device is moved or modified after having been installed for some time.

3.1 Service and Maintenance

There are no serviceable parts inside. If service is needed other than battery replacement, please get in touch with your distributor

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4. 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.

4.1 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 sensor to connect with the NFC antenna. Keep the two devices close to each other and don't move them to get as good connectivity as possible.
4. 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 send the new settings to the sensor. Make sure that the application confirms your new settings.
7. Wait for the sensor to reboot (1-5 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. See the "Help" section in the application for more information.

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4.2 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 the downlink protocol.

4.3 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. LED Indication

All devices feature an RGB-LED Indicator in the bottom right corner of the front.
The LED is used to indicate status and events.

LED Indicator	Action
Red/Green Sequence	Sensor is starting up
Short orange blink	LoRa Join Request Transmission
Short green	LoRa Uplink Transmission
Short red blink	Sensor failed to send uplink
Long blue blink	Sensor has loaded new configuration from NFC or via LoRa downlink

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6. Display

The ERS Interact Series LoRa sensors have a 2.13" E-paper display, which keeps the onscreen information even if the sensor is unpowered. The display will have four different modes depending on the current state of the sensor.

Factory mode: If the sensor has not yet started, see Figure 6.1.

Join mode: When the sensor is trying to join the network Figure 6.2.

Standard mode: During normal operation, the layout and values presented on the screen will depend on the configuration.

Low Battery mode: If the sensor detects that the battery voltage is getting close to the limit of operation, the sensor will set the screen to display information that the battery needs to be replaced. It will not recover from this mode until the batteries are replaced Figure 6.3.

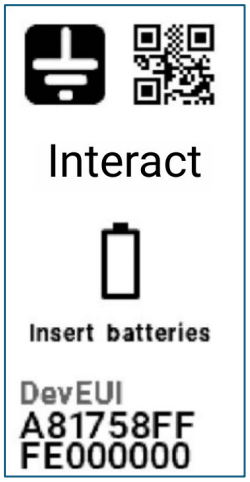

Figure 6.1

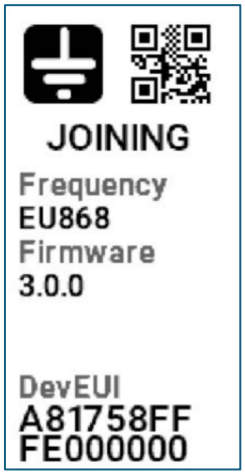

Figure 6.2

Figure 6.3

6.1 Display Updates

The display has different update types depending on what triggers the update.

User button input - Fast refresh time: When the user presses a button, the display performs a fast update immediately. Fast refreshes are only made to the area of the display that contains the information that is to be updated. Multiple successive fast refreshes may leave some temporary ghosting on the display.

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Post user button input – Medium refresh time: 7 seconds after user has pressed the button and one or multiple fast refreshes are made, the device performs a refresh to mitigate the ghosting that may appear.
Periodic updates – Slow refresh time: When the device performs periodic updates according to the configuration, slow refreshes are made.

7. Touch Buttons

The device has capacitive touch areas that are used as buttons. The touch button feature is enabled by a touch controller that sits just under the casing. The touch areas are indicated by the prints on the casing.

7.1 Using the Touch Buttons

The touch buttons enter a “pressed” state when the user places a finger on the casing in one of the three areas. The user needs to remove the finger in order for the button to be pressed again. The touch buttons utilize a queue, meaning that the user can press the buttons faster than the display is able to update with new information, while retaining the button presses.

Pressing and holding the button does not continue to trigger the button function.

7.2 Touch Calibration

The touch controller continuously checks for environmental drift that can affect the touch sensitivity. If drift is detected, the touch controller is recalibrated automatically. Recalibration is performed during runtime on the next periodic update after drift has been detected.

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8 Data reporting

The sensor can report data in two ways: periodically or by trigger.

Periodic reports are sent at the configured reporting interval and contain the regular sensor data, such as measured climate values.

Triggered reports are sent when a configured event occurs, such as a button-controlled value being changed by the user. Triggered reports may be sent after a short configurable delay, allowing multiple quick changes to be combined into one report.

8.1 Touch Button Reporting

Values that can be changed using the buttons may be configured for reporting. These values can be included in periodic reports and/or sent as triggered reports when changed by the user.

The payload type used for each button-controlled value is configurable. Detailed configuration options are described in the separate application note or appendix.

8.2 Sensor Sampling

Sampling of the internal sensors of the devices are made periodically based on a main "tick" set in seconds, that's configurable using the Timebase parameter.

Parameter	**Unit**
Timebase	Seconds

Sensor sampling is configured as a multiple of the Timebase, and each sensor type has its own parameter.

Parameter	**Unit**
Temperature period	Multiple of Timebase
Humidity period	Multiple of Timebase
Display period	Multiple of Timebase
Button period	Multiple of Timebase
Battery period	Multiple of Timebase

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Data is sent to the selected destination as decided by the send period parameter which is a multiple of the Timebase.

Parameter	Unit
Send Period	Multiple of Timebase

8.3 Adaptive Send Rate

ELSYS LoRa devices feature adaptive send rate (ASR), which changes the way sampling and sending data works. When ASR is enabled, the period parameter functions change to threshold multiples, the internal sensors are sampled on every "tick" of the Timebase, and data is reported if the [threshold * multiple] are exceeded.

Parameter	Hysteresis threshold base value
Temperature period (Threshold multiple)	0.1 °C
Humidity period (Threshold multiple)	2 % RH
Battery period (Threshold multiple)	25 mV

The send period parameter function also changes when ASR is activated and functions as a threshold for how many "ticks" can pass without any sensor threshold being exceeded before the sensor sends data.

8.4 Data Queue

The queue function allows the sensor to save uplink data, and when activated, periodic uplinks will consist of the whole queue content instead of just a single uplink. The queue can be used to enable less frequent uplinks while retaining a higher amount of data points, or to regain missed data.

The queue can store up to 10 samples depending on user configuration. The queue can also be configured to add a report to the queue with indexes attached, letting you know the relative time of the samples.

The queue can be configured to clear once sent, or to keep the stored samples, overwriting the oldest sample for each sampling cycle.

Note that depending on the data amount and device Spreading Factor, the queue content (payload) may be truncated due to airtime constraints.

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Queue Parameter	Value
Size	0-10
Purge	No (keep queue contents) Yes (clear queue each uplink)
Offset	No (index not added to payload) Yes (index added to payload)

8.5 Payload

All data is sent using the ELSYS Payload format, refer to ELSYS Application Note "ELSYS uplink payload description".

8.6 Sample and Send Setup Examples

Setup for single sample send every 30 minutes, ASR off

Parameter	Value
Timebase (seconds)	1800
Sensor(s) period (multiple)	1
Send period (multiple)	1

Setup for sample every 10 minutes and sending data every hour, ASR off

Parameter	Value
Timebase (seconds)	600
Sensor(s) period (multiple)	1
Send period (multiple)	6

Setup for sample every 15 minutes with ASR, temp hysteresis 0.5 °C, humidity hysteresis 6% RH and maximum time of 1 hour between sending data.

Parameter	Value
Timebase (seconds)	600
Temperature period (Threshold multiple)	5
Send period (multiple)	6

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9. Customizable Button and Display Feature

The ERS Interact series is designed with flexibility and customization in mind. Three touch buttons with selectable functionality, custom casing prints for the buttons, a configurable interactive interface, multiple configurable report types and interface updates via downlink commands make the ERS Interact highly adaptable.

The device includes three configurable touch buttons and a customizable display interface. Depending on the application, the buttons can be assigned different functions, such as changing a value, toggling a state, selecting a step, switching between views, or activating a temporary function while pressed.

Button-controlled values can be shown directly on the display and, when configured, reported through the device's payload. The display interface can also be customized using visual elements such as text, icons, shapes, internal sensor values, and reactive elements that change according to the current button state or selected value.

Both the button behavior and the visual interface may be updated after deployment using supported configuration methods, including downlinks where applicable. This allows the device to be adapted to different applications without changing the hardware.

ELSYS can customize the button engravings on demand based on selected button configuration.

For detailed information about available button functions, reported values, interface elements, downlink configuration, and application-specific setup, refer to ELSYS Application Note “Interact Series Flex Configuration Guide”.

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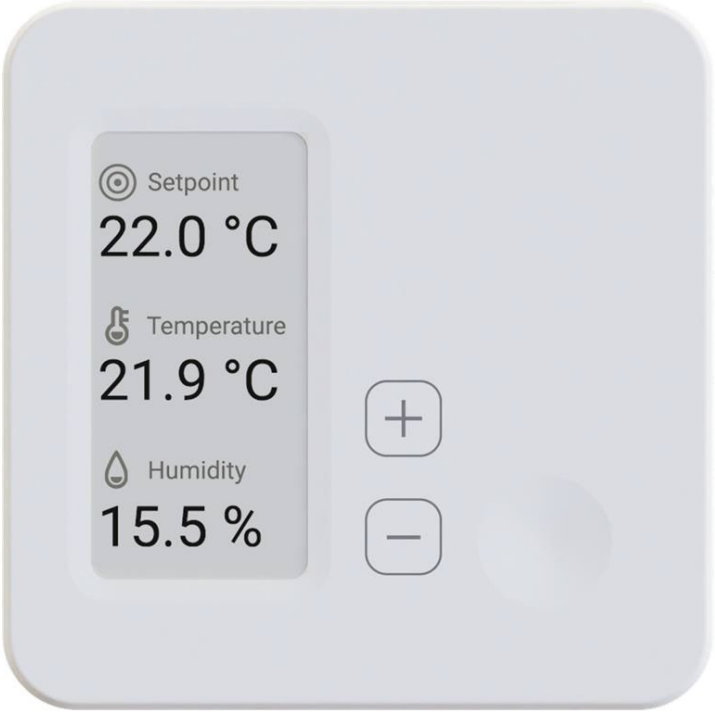
10. Comfort



The ERS Interact Lite Comfort LoRa is provided in a standard thermostat configuration. The device measures temperature and humidity and allows users to adjust a desired temperature setpoint using two touch buttons. Temperature, humidity, and setpoint values are presented on the integrated display.

10.1 Configuration

Below is the ELSYS factory configuration for the ERS Interact Lite Comfort

10.1.1 Button Configuration

Button	Casing Engraving	Function
Top	None	None
Middle	+	Increase setpoint
Bottom	-	Decrease setpoint

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10.1.2 Setpoint configuration

Function	Value
Step size (setpoint increase amount)	5 (0.5°C)
Maximum user selectable value	250 (25.0°C)
Minimum user selectable value	180 (18.0°C)
Setpoint report handle	Setpoint
Button report type	Periodic only

10.1.2 Data reporting

Function	Value
Timebase	600 seconds
Display period	1
Temperature/humidity period	1
Button period	1
Queue	1
Queue purge	On
Queue offset	Off

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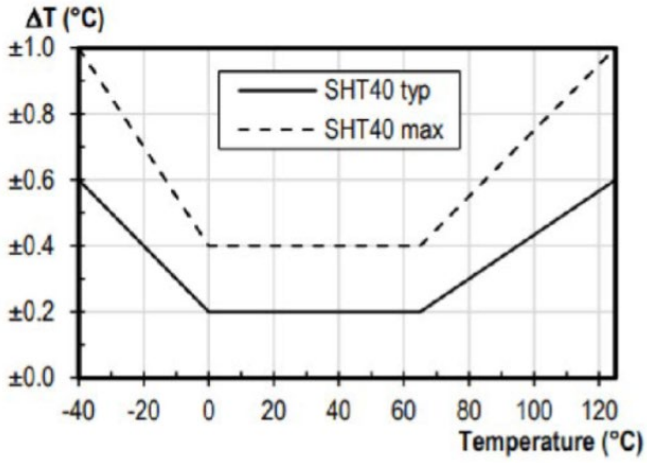
11. Internal Sensors

The populated internal sensors in the ERS Interact LoRa series differ between models according to the table below

11.1 Temperature

Resolution: 0.1 °C

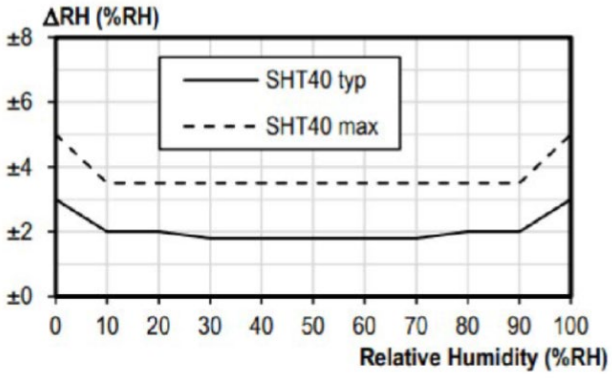
Accuracy: 0.2 °C typical, see figure

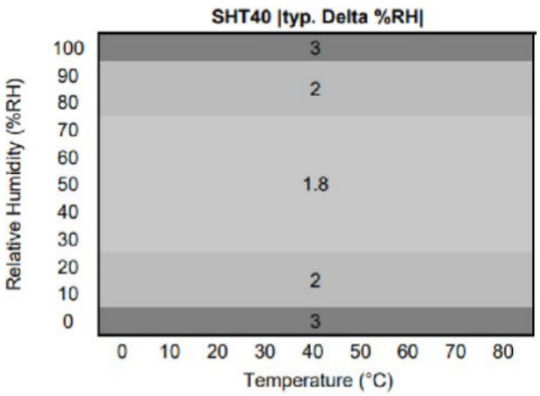


11.1.1 Temperature Parameters

Parameter	Description
Temperature/humidity period	Temperature/Humidity sensor sampling period

11.2 Humidity





11.2.2 Humidity Parameters

Humidity has no configurable parameters on its own; sample period is shared with temperature.

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12. Specifications

Dimensions	76,2 x 76,2 x 22,5 mm
Weight	53 – 60 g excluding batteries 70 – 95 g including batteries
Enclosure	Plastic, PC/ABS
IP Rating	IP30
Mounting	Screws/Adhesive tape
Recommended installation height	Wall: 1.6 m
Usage enviroment	Indoor
Operating conditions	0 to 50 °C 0 to 85 % RH (non-condensing)
Operating voltage	3.6 V DC
Battery type	AA 14505 Li-$SOCl_2$
Battery life	Up to 10 years (Depending on settings, and enviromental factors)
Wireless technology	LoRaWAN® 1.0.4, Regional Parameters RP2 - 1.0.3
Wireless security	LoRaWAN® End-to-End encryption (AES-CTR), Data Integrity Protection (AES-CMAC)
LoRaWAN® device type	Class A end device
Supported LoRaWAN® regions	EU868, IN865, US915, AU915, AS923, KR920
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

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13. Legal Notices

ll 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 torevise 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.

13.1 Federal Communications Commission Interference Statement

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.

FCC ID

2ANX3-ERSD1

IC ID

26904-ERSD1

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.

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13.2 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

14. Revision history

Revision	Description	Date
1.0	Interact Series Operating Manual created	2026-06-01

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