

SENSE-TH200

Temperature & RH Transmitter

User Manual



Item	Information
Measured Parameters	Temperature + Relative Humidity (combined T+RH sensor module)
Sensor Code	TRH / as per selected temperature-RH sensor variant
Product Platform	SENSE-TH200
Enclosure Type	WP - Weatherproof industrial enclosure
Document Type	User Manual
Document Revision	Rev. 1.0

Important: Read this complete manual before installation, commissioning, operation, calibration or servicing of the temperature and RH transmitter.

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1. INTRODUCTION

The SENSE-TH200 is an advanced weatherproof industrial temperature and relative humidity transmitter designed for continuous monitoring of ambient temperature and relative humidity in industrial and utility applications. The device combines temperature and RH sensing, local display, alarm annunciation, analog output, relay output, RS485 Modbus communication, Ethernet connectivity and cloud-ready IoT integration in one compact platform.

Unlike the SENSE-TH201 flameproof multi-sensor variant, the SENSE-TH200 weatherproof variant is intended for one temperature and RH sensor module only and shall not be used as a flameproof or explosion-proof device. It is suitable for weatherproof/non-flameproof industrial installations where the final site classification allows use of such enclosure type.

Application note: This manual copy is prepared specifically for the SENSE-TH200 temperature + relative humidity variant. Measurement range, accuracy, response time, calibration interval and environmental limits shall always be verified against the final approved sensor datasheet and factory calibration certificate.

2. PRODUCT OVERVIEW

The SENSE-TH200 combines temperature and relative humidity sensing, communication and cloud-ready architecture into a single weatherproof platform suitable for industrial temperature/RH monitoring and alarm indication applications.

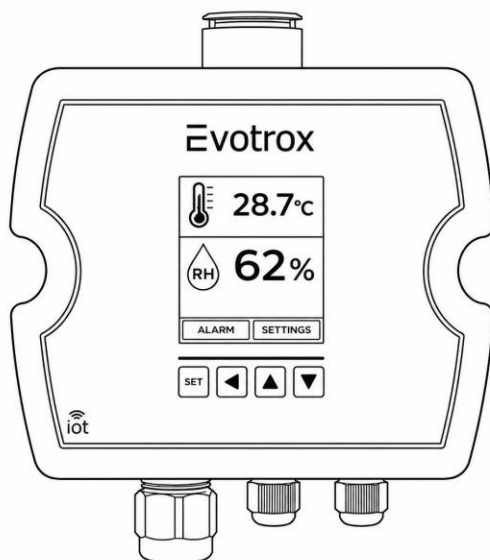


Figure 1: SENSE-TH200 Weatherproof Temperature & RH Sensor - Product Image

Product Area	Description
Temperature + RH Sensing	Supports one configured target temperature and RH sensor module in one unit.
Environmental Sensing	Temperature and relative humidity monitoring using combined sensor module.
Display	TFT LCD color display with keypad interface.
Communication	RS485 Modbus RTU and Ethernet Modbus TCP/IP support.
LAN Interface	Ethernet interface; PoE support depending on model variant.
IoT	MQTT(S), HTTP(S), Linked IoT SCADA integration.
Connectivity	Ethernet and Wi-Fi internet connectivity depending on model variant.
Enclosure	Weatherproof ABS industrial enclosure with IP-rated cable glands.

3. FEATURES

- Weatherproof industrial enclosure for non-flameproof industrial areas.
- Integrated condensation prevention support.
- Reverse polarity and incorrect wiring protection.
- Multiple industrial-grade filter variants available for any weather conditions.
- Specially Designed for Rough Environments & high humidity applications.
- 2.4" TFT LCD color display with touch keypad interface.
- RS485 Modbus RTU communication for PLC, DCS, BMS, SCADA and data logger integration.
- Modbus TCP/IP communication support through Ethernet interface.
- PoE (Power on Ethernet) support.
- Ethernet and Wi-Fi internet connectivity depending on model variant.
- Cloud protocol support: MQTT(S), HTTP(S).
- Default compatibility with Linked IoT SCADA platform.
- 4-20 mA analog output channels and relay output for external alarm or interlock.
- Local buzzer and top alarm indicator/lens for alarm annunciation.
- Continuous 24x7 monitoring operation.
- Compact enclosure suitable for wall/surface mounting.

4. APPLICATIONS

- Cold storage plants, cold rooms and refrigeration utility areas
- Compressor rooms, HVAC rooms and utility areas
- Warehouses, storage areas and process rooms where temperature/RH monitoring is required
- Boiler rooms, AHU rooms and industrial plant rooms
- Ventilation, HVAC and environmental alarm interlock systems
- Food, dairy and beverage processing plants
- Pharmaceutical warehouses and production utilities
- Water and wastewater treatment plants
- Industrial environmental monitoring panels
- SCADA, BMS, PLC and IoT-based environmental monitoring systems

5. TECHNICAL SPECIFICATIONS

5.1 ELECTRICAL AND FUNCTIONAL SPECIFICATIONS

Parameter	Specification
Sensor Technology	Capacitive Sensing
Measured Parameters	Temperature + Relative Humidity
Temperature Range	0 – 100 °C
Humidity Range	0 – 100 % RH
Temperature Accuracy	±0.3°C Typical
Humidity Accuracy	±2% RH Typical
Output Type	2 × 4–20mA
Display	TFT LCD color display
User Interface	Keypad for device configuration
Typical Power Supply	24 VDC
Power Supply Range	12 – 30 VDC
PoE	PoE support through Ethernet interface, depending on ordered variant
Additional Outputs	Relay Output
Communication	RS485 Modbus RTU, Ethernet Modbus TCP/IP
Cloud Protocols	MQTT(S), HTTP(S)
Internet Connectivity	Ethernet / Wi-Fi depending on model variant
Operating Temperature	-15°C to +50°C or as per final sensor datasheet
Storage Temperature	-10°C to +60°C or as per final sensor datasheet
Mounting	Wall / surface mount
Operation	Continuous 24x7 monitoring

5.2 ENCLOSURE AND MECHANICAL SPECIFICATIONS

Parameter	Specification
Enclosure	Weatherproof ABS industrial enclosure
Protection	IP-65
Material of Construction	ABS enclosure, silicone gasket, PC alarm lens, Nylon cable glands
Cable Entry	2 nos. IP-rated cable glands as shown in exploded view
Top Indicator	Red indicator / alarm lens on top side
Overall Dimensions	Width 144.1 mm x Height 160.0 mm x Depth 85.0 mm as shown in dimensional drawing
Mounting	Wall / surface mounting using suitable fasteners
Finish	Grey enclosure with front overlay and display window
Tolerance	All dimensions in millimeters; drawing tolerance to be verified from final mechanical drawing

Specification notes: Exact measurement range, accuracy, sensor life, response time, calibration interval and environmental limits depend on the selected temperature + RH sensor module and final factory configuration.

6. PRODUCT IMAGES AND MECHANICAL DRAWINGS

6.1 EXPLODED VIEW AND PARTS DESCRIPTION

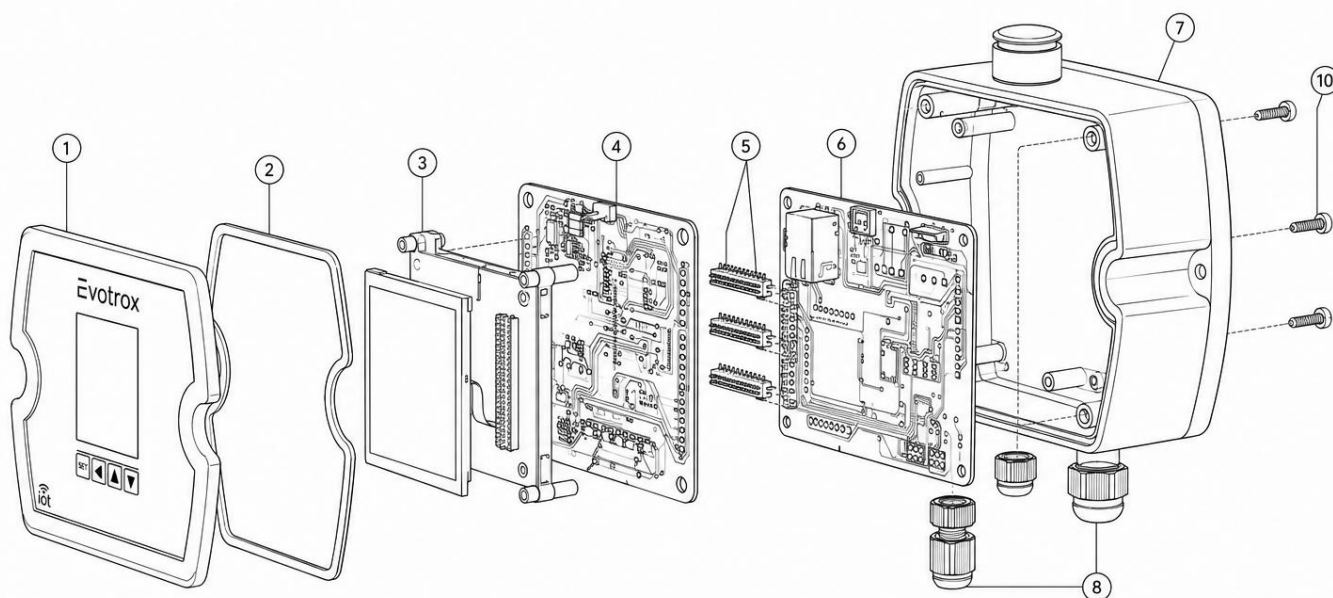


Figure 3: Exploded View and Parts Description

Item No.	Part Name	Description	Material	Qty.
1	Front Bezel	Front cover with display window and keypad	ABS	1
2	Gasket	Sealing gasket for front bezel	Silicone	1
3	TFT Display Module	Color TFT LCD display with connector	-	1
4	Front PCB (Display & Interface)	Main PCB for display and user interface	FR-4	1
5	Berg Strip Connectors	Board-to-board connectors for stacking	-	4
6	Rear PCB (Power & I/O)	PCB for power supply and I/O connections	FR-4	1
7	Back Housing	Rear enclosure with internal mounting bosses	ABS	1
8	Cable Glands (IP Rated)	Sealed cable entry glands	Nylon	3
9	Top Indicator / Alarm Lens	Red indicator / alarm lens	PC	1
10	Housing Screws	Stainless steel screws for enclosure assembly	Stainless Steel	4

6.2-DIMENSIONAL DRAWING

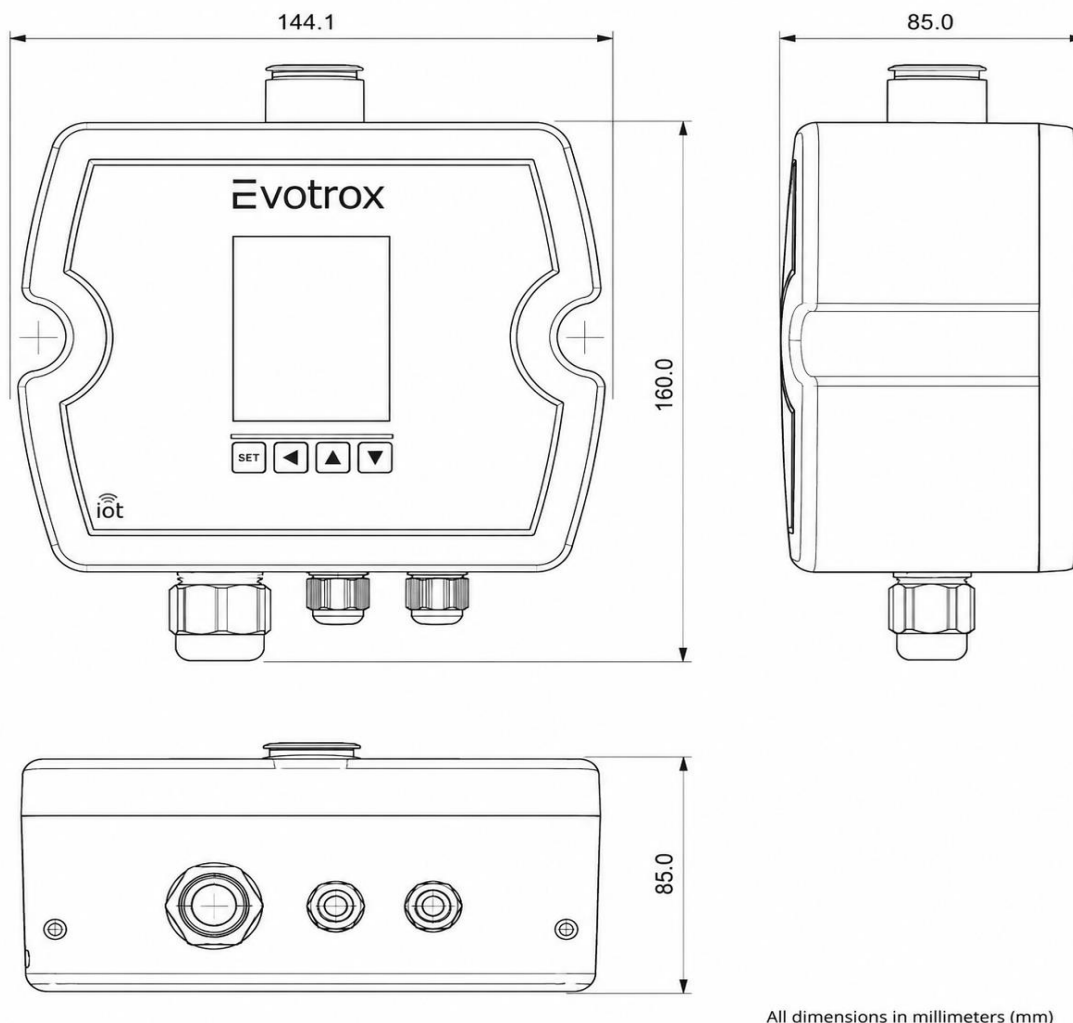


Figure 2: Dimensional Drawing with Front, Side and Bottom Views

7. SAFETY PRECAUTIONS

- Installation, wiring, commissioning and servicing shall be performed by qualified personnel only.
- Disconnect power before opening the enclosure or touching internal wiring.
- Do not open the enclosure in a wet, dusty or chemically exposed environment unless the device is isolated and properly protected.
- Do not replace the sensor while the device is powered.
- Ensure proper earthing and panel wiring as per site electrical standards.
- Do not install the transmitter where it can be exposed to direct flame, heavy water jet, corrosive liquid splash or mechanical damage unless additional protection is provided.
- Maintain calibration records periodically for safety and compliance traceability.
- Dispose expired or replaced sensors according to applicable environmental regulations.
- Do not use the transmitter as the only safety protection layer where local regulation requires redundant detection, emergency shutdown or certified safety system.
- Do not modify enclosure, cable entries, fasteners, PCB assembly, sensor module or sealing arrangements.
- Follow local industrial safety regulations, electrical codes and site safety procedures.

Important limitation: SENSE-TH200 is a weatherproof product. It is not a flameproof, explosion-proof or intrinsically safe product. Do not use it in hazardous classified areas unless the specific site classification and regulatory approval allow this enclosure type.

8. INSTALLATION GUIDELINES

- Install the transmitter where representative temperature and humidity conditions are required, considering plant layout, airflow pattern, ventilation and nearby heat/moisture sources.
- For temperature and RH monitoring, installation location shall be selected based on the actual room layout, airflow, door opening pattern, cooling/heating source and process requirement.
- Avoid dead air zones where the measured air may not represent the actual room condition.
- Avoid direct sunlight, heat sources and high vibration areas.
- Avoid direct air discharge from fans, evaporators, heaters or humidifiers unless that point is specifically intended for monitoring.
- Maintain service clearance around the transmitter for cable access, sensor replacement and calibration.
- Use suitable IP-rated cable glands and properly tighten cable entries to maintain weatherproof protection.
- Route cables downward or with drip loops where water ingress risk exists.
- Mount the transmitter firmly on a stable wall, frame or structure using suitable fasteners.
- Ensure enclosure cover, gasket and cable glands are properly fitted before energizing.

8.1 RECOMMENDED INSTALLATION CHECKS

- Confirm model, sensor type, output configuration and calibration details on the product label.
- Confirm power supply rating before applying power.
- Verify terminal wiring as per wiring diagram.
- Check relay logic and external alarm/interlock wiring.
- Verify RS485 polarity and device ID in multi-device network.
- Verify Ethernet IP address and PoE compatibility when LAN/PoE is used.
- Allow sensor stabilization time after first power-up or sensor replacement.
- Perform functional verification or functional test before handing over the system.
- Confirm enclosure gasket, cable gland tightness and wiring protection before commissioning.

8.2 TEMPERATURE AND RH MOUNTING LOCATION GUIDELINES

Installation Consideration	Recommended Detector Placement
Representative room condition	Install at a location that represents actual process/room condition and is not isolated from normal airflow.
Avoid direct influence	Avoid direct sunlight, water spray, condensation drops, heaters, evaporator outlet air and humidifier discharge unless specifically required.
Temperature + Relative Humidity	Select location according to room layout, airflow, door opening pattern, evaporator/fan placement and monitoring objective.

Installation note: Final sensor location should be validated by plant engineering team, HVAC/cold-chain consultant or authorized engineer.

9. WIRING AND ELECTRICAL CONNECTIONS

The device supports analog outputs, relay output, RS485 communication and Ethernet/cloud connectivity depending on configuration. All wiring must be carried out with power OFF and as per approved wiring diagram.

9.1 MAIN TERMINAL DETAILS

Terminal No.	Terminal Name	Description	Typical Use
1	24 VDC (+)	Power supply positive (+24 VDC)	24 VDC panel power supply positive
2	GND (-)	Power supply negative / 0 V / GND	Power supply negative / signal common
3	CH-1 / 4-20 Ma (T)	Analog output channel 1 (TEMPERATURE)	PLC / data logger / indicator analog input
4	CH-2 / 4-20 Ma (RH)	Analog output channel 2 (R. HUMIDITY)	Secondary monitoring input / spare as configured
5	Relay NO	Relay normally open contact	External alarm, hooter, exhaust or interlock
6	Relay C	Relay common contact	Relay common for external circuit
7	RS485 A	RS485 communication A (+)	Modbus RTU network
8	RS485 B	RS485 communication B (-)	Modbus RTU network

9.2 WIRING DIAGRAM AND TYPICAL SYSTEM CONNECTION

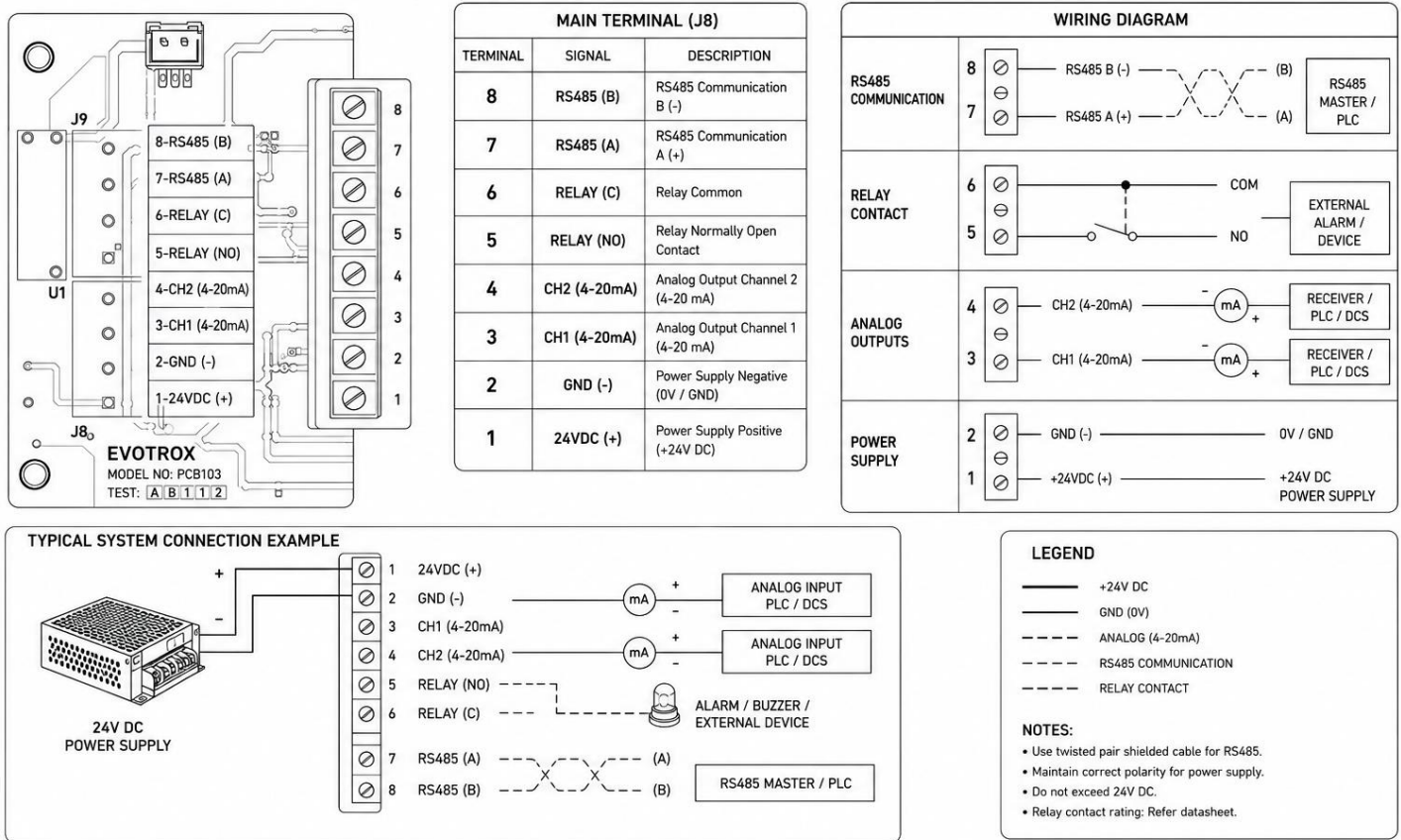


Figure 4: Main Terminal, Wiring Diagram and Typical System Connection

9.3 WIRING NOTES

- Terminal naming shall be verified with the final product label and approved wiring diagram before installation.
- Use shielded twisted pair cable for RS485 communication in industrial environments.
- Maintain correct polarity for power supply.
- Do not exceed rated supply voltage.
- Relay contact rating shall be verified from final product datasheet before connecting external load.
- For long RS485 networks, use proper cable routing, shielded twisted pair, common reference where required, end-of-line termination and unique device ID for each transmitter.
- For Ethernet/PoE installation, verify network switch/PoE injector rating, Ethernet cable quality and IP configuration.

10. OPERATING PRINCIPLE AND ALARM OPERATION

The temperature and RH sensor module generates an electrical response proportional to the measured parameter concentration. The controller processes the signal, compares it with configured alarm set values, operates visual indication, buzzer and relay output, displays warning/alarm conditions on the LCD and transmits data over RS485, Ethernet and IoT communication interfaces as per configuration.

10.1 ALARM LEVEL OPERATION

Level	Threshold	Display / LED	Buzzer / Relay
Normal	Below Level 1 set value	Normal / safe indication	OFF as configured
Warning	Above Level set value	Warning indication on display	Buzzer ON periodically / relay as configured
Display indication: Inside display, all types of warnings, configured Temperature/RH values and alarm levels will be shown as per device configuration.			

10.2 ALARM ACKNOWLEDGEMENT

The built-in buzzer can be acknowledged as per configured acknowledgement logic. Alarm acknowledgement silences or controls buzzer behavior only as configured; it shall not be treated as correction of abnormal temperature or humidity condition. Process condition and alarm indications must be monitored until values return within acceptable limits.

11. LED AND BUZZER INDICATIONS

LED / Indicator	Condition	Description
Power	Red	Power ON
Status	Flashing	RS485 communication OK
Status	Steady	RS485 error
Top Indicator / Alarm Lens	ON / Flashing	Alarm or warning indication as per configuration
Buzzer	ON / Periodic	Temperature/RH alarm, warning or fault as per configuration

12. COMMUNICATION PORTS

12.1 SERIAL PORT - RS485

The device can be connected to an RS485 port either in single-device mode or multi-device mode. In multi-device mode, each connected transmitter must have a unique device ID. User can change device ID from the configuration page.

Parameter	Default Value
Protocol	Modbus RTU
Slave ID	1
Baud Rate	9600
Bit	8
Stop Bit	1
Parity	None

12.2 ETHERNET (LAN / POE)

The transmitter may be equipped with an Ethernet interface supporting Modbus TCP/IP communication. The device operates as a Modbus TCP slave and can be connected to SCADA systems, PLCs, BMS, IoT gateways and industrial Ethernet networks.

- Modbus TCP/IP communication
- Power over Ethernet (PoE) support depending on model variant
- Single cable for power and data when PoE is used
- Suitable for LAN-based monitoring systems
- Supports integration with SCADA, PLC, BMS and IoT platforms
- Multiple devices can operate on the same Ethernet network using unique IP addresses

PoE note: Ensure the connected network switch or PoE injector supports the required PoE standard before powering the device through Ethernet.

13. MODBUS RTU / TCP-IP ADDRESS LIST

13.1 PROTOCOL TYPE

Serial protocol: Modbus RTU slave over RS485. Ethernet protocol: Modbus TCP/IP slave over LAN interface.

Address	Access Type	Function Code	Description	Use
30001	READ	04	Read input register	To read all channel sensor data
40001	READ + WRITE	03 + 06	Read/write holding registers	To read or write all setting parameters

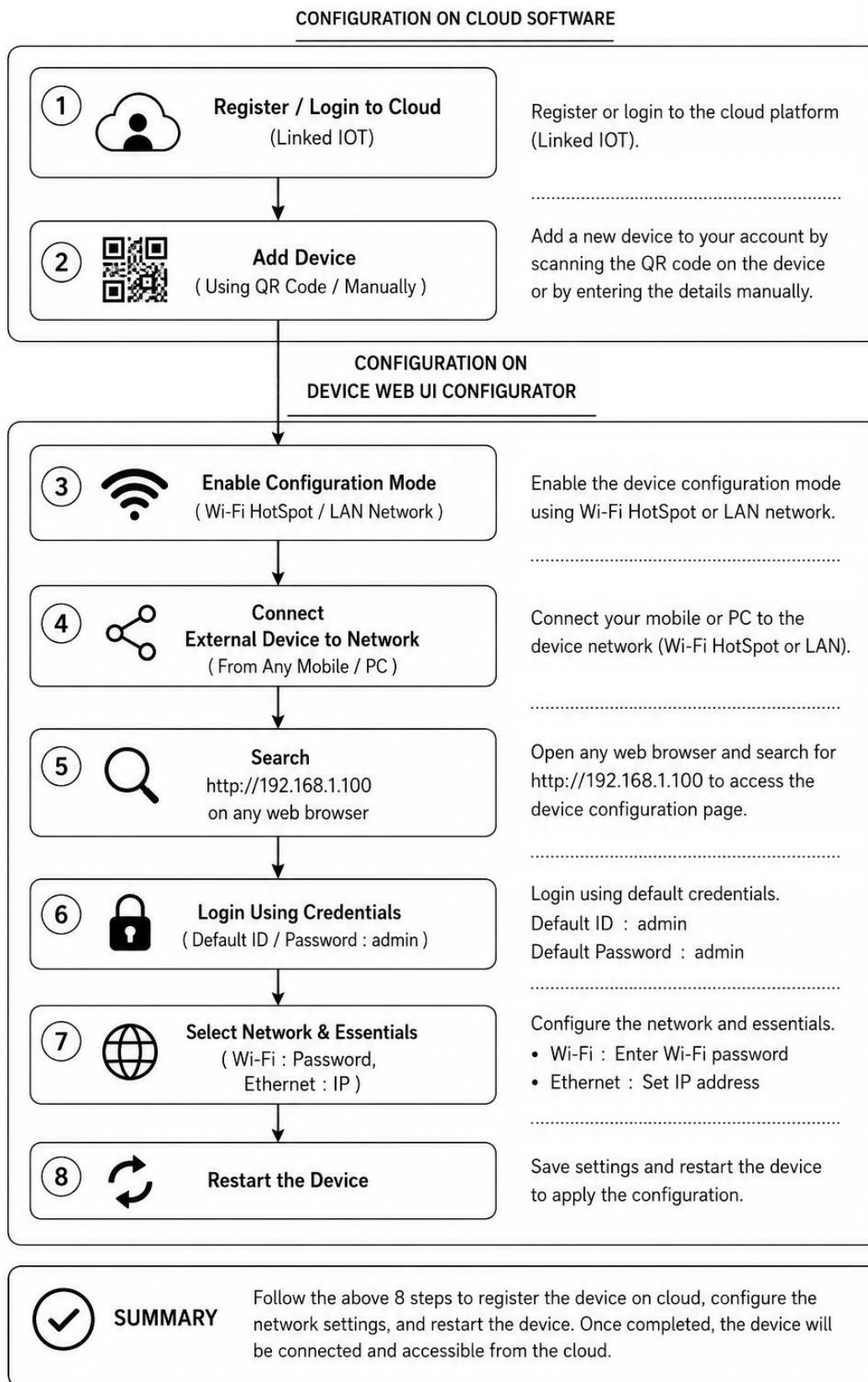
13.2 PARAMETER ADDRESS DETAILS

Sr. No.	Address	Parameter	Low	High
1	40001	Alarm set value	0	65535
2	40002	Alarm mode	0	1
3	40003	Alarm hysteresis	0	65535
4	40004	Level 2 set value	0	65535
5	40005	Level 3 set value	0	65535
6	40006	Level hysteresis	0	65535
7	40007	Timer hour	0	255
8	40008	Timer minute	0	59
9	40009	Buzzer mode	0	1
10	40010	Offset	0	65535
11	40011	Zero	0	65535
12	40012	Span	0	65535
13	40013	4 mA count	0	1000
14	40014	20 mA count	0	1000
15	40015	Analog output mode	0	2
16	40016	Acknowledgement	0	1

Communication note: For long RS485 networks, use proper cable routing, shielded twisted pair, common reference where required, end-of-line termination and unique device ID for each transmitter.

14. CLOUD-DEVICE INTERFACE / IOT CONFIGURATION

The device supports cloud connectivity through the Linked IoT platform, enabling remote monitoring, alarm notifications, data logging, analytics and device management from anywhere.



14.1 STEPS TO CONNECT DEVICE

Cloud APP / Software

- Step-1 Register or login to Linked IoT cloud platform.
 Step-2 Add a new device using QR code or manual details.

Field Device

- Step-3 Enable device configuration mode from settings.
 Step-4 Connect mobile or PC to the device network using Wi-Fi Hotspot or LAN.
 Step-5 Open browser and search <http://192.168.1.100> to access device configuration page.
 Step-6 Login using default credentials. Default ID: admin. Default Password: admin.
 Step-7 Select network and essential settings: Wi-Fi password or Ethernet IP settings.
 Step-8 Save settings and restart the device to apply configuration.

14.2 PREREQUISITES

- The device variant must support IoT functionality.
- A stable Internet connection is available.
- A valid Linked IoT user account is available.
- The device is installed and powered correctly.

14.3 CLOUD CREDENTIALS

Access Type	Link
Web Portal	www.linkediot.com/login
Android Application	https://play.google.com/store/apps/details?id=com.linkediot
iOS Application	https://apps.apple.com/us/app/linkediot

14.4 NETWORK CONFIGURATION OPTIONS

Mode	Configuration Details
Wi-Fi Mode	Select available Wi-Fi network; enter Wi-Fi password; configure network priority.
Ethernet Mode	DHCP or static IP configuration; IP address; subnet mask; gateway; DNS server.
Cellular Mode (GSM)	APN settings; SIM configuration; network priority selection, depending on model variant.

14.5 NETWORK PRIORITY MANAGEMENT

When multiple communication interfaces are available, the device can automatically select the preferred network according to the configured priority sequence. This feature supports reliable cloud communication by switching to an available network when the primary connection becomes unavailable.

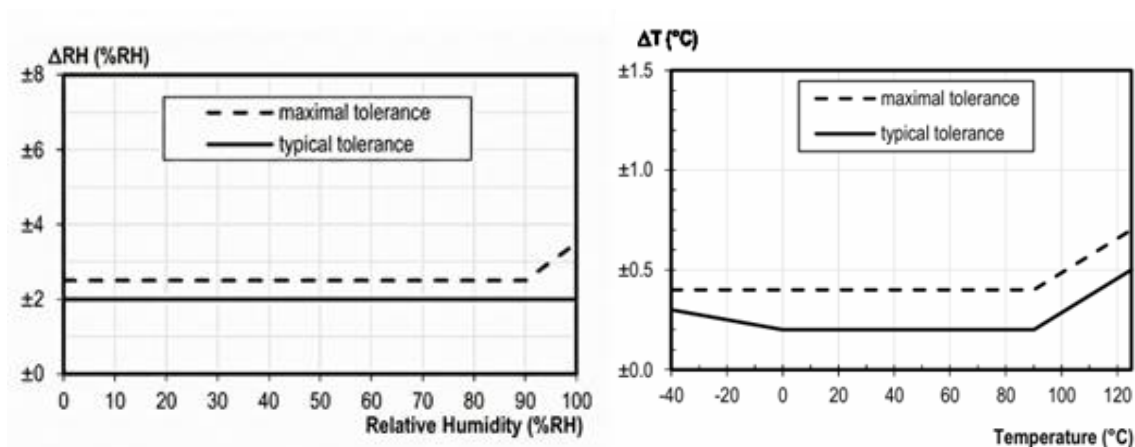
14.6 IMPORTANT NOTES

- Use a dedicated configuration network when accessing the Web UI Configurator.
- Ensure Internet connectivity is available on the selected communication interface.
- Change the default administrator password after commissioning for improved security.
- Network configuration parameters can be modified at any time through the Web UI Configurator.
- Successful cloud connection status can be verified from the device display and Linked IoT platform dashboard.

15. SENSING INFORMATION - TEMPERATURE & RH SENSOR MODULE

Item	Information
Measured Parameters	Temperature + Relative Humidity
Sensor Code	TRH
Sensor Type	Combined temperature + relative humidity sensor module
Application	Industrial temperature and relative humidity monitoring

The following graphs represent the typical and maximum tolerance behavior of the sensing element across the specified operating Temperature and Relative Humidity ranges. These characteristics help evaluate sensor stability and expected performance under varying environmental conditions.



The humidity tolerance graph illustrates the expected sensor deviation across the full Relative Humidity operating range. Typical tolerance remains stable through most of the operating region, while maximum tolerance may increase slightly under extremely high humidity conditions.

The temperature tolerance graph represents the typical and maximum sensor deviation across the specified temperature range. Sensor stability is maintained through standard operating conditions, with slight tolerance variation possible at extreme temperature limits.

- The combined T+RH sensor module is designed for industrial temperature and relative humidity monitoring applications.
- Digital measurement output for temperature and relative humidity.
- Combined monitoring of temperature and RH in one sensor module.
- Suitable for continuous environmental monitoring applications.
- Typical response time: 120-150 seconds.
- Recommended temperature compensation for high accuracy applications.

16. ORDERING INFORMATION

16.1 Ordering format: SENSE - TH200 - F1 - I1

Code Segment	Meaning
SENSE	Product Family
TH200	Product Model
F1	Filter Category
I1	Expansion Card

16.2 FILTER VARIANTS

Code	Filter Type	Working Area	Protection
F1	SS Mesh	Normal factory air	Dust protection, fast response
F2	SS Sintered	Dusty industrial areas	Strong dust protection
F3	PTFE Membrane	Outdoor / condensation	Blocks liquid water
F4	PTFE + AC Membrane	Chemical vapors	Protects from chemicals

Note: If no filter option is specified during ordering, standard F1 filter variant will be supplied by default.

16.3 NETWORK VARIANTS

Code	Module Type	Description
I1	WAN Card for Internet	Used to connect device to internet for Remote Applications
L1	LAN Card for Local Network	Used to connect device to local network for PLC / Scada Applications

Note: If no filter option is specified during ordering, standard F1 filter variant will be supplied by default.

17. MAINTENANCE AND PERIODIC CHECKS

- Clean enclosure using soft dry cloth only.
- Inspect cable glands periodically.
- Verify sensor response periodically.
- Perform periodic verification using approved temperature/RH reference instruments.
- Check relay operation and external alarm/interlock operation periodically.
- Verify RS485 communication, Ethernet communication and data logging where applicable.
- Maintain calibration, functional verification and sensor replacement records.
- Inspect enclosure gasket, cable gland tightness, top indicator lens, display window and physical damage periodically.

18. TROUBLESHOOTING

Issue	Possible Cause	Recommended Action
No power indication	Power supply not available, wrong polarity or loose terminal	Verify 24 VDC supply, polarity and wiring.
Status LED steady / RS485 error	Incorrect RS485 wiring, wrong baud setting or duplicate device ID	Check RS485 A/B polarity, device ID, network wiring and master settings.
Ethernet / PoE not working	PoE injector/switch issue, IP conflict or cable/network fault	Verify PoE source, Ethernet cable, IP settings, network switch and configuration.
Cloud connection not established	Internet not available, wrong network settings or device not added to cloud	Verify network configuration, Internet access, Linked IoT account and device registration.
Analog output not correct	Output calibration mismatch or wiring issue	Perform 4-20 mA output calibration and check loop wiring.
Frequent alarm without actual temperature/RH abnormality	Wrong set value, sensor drift, condensation, direct airflow, heat source or environmental issue	Check set values, perform zero/span check and inspect installation location.
No response during functional verification	Expired sensor, blocked sensing path or incorrect reference method	Inspect sensor opening/filter, verify reference instrument and replace/calibrate sensor if required.
Relay not operating	Alarm threshold not reached, relay wiring issue or wrong relay logic	Check level set values, relay contacts and external circuit.
Water ingress / moisture inside enclosure	Loose cable gland, damaged gasket or incorrect installation orientation	Isolate power, dry and inspect unit, replace gasket/gland if required and reinstall with proper sealing.

19. LEGAL NOTICE AND DISCLAIMER

Specifications are subject to change without prior notice. The user is responsible for ensuring proper installation, commissioning, operation and maintenance according to local industrial safety regulations, electrical codes and site safety procedures.

This product is intended to assist in temperature and relative humidity monitoring and alarm generation. It does not replace statutory process safety systems, validated environmental monitoring procedures, emergency response procedures or operator training where such systems are required by applicable regulation or site policy.

Sensor performance depends on installation location, airflow, calibration condition, sensor age, condensation exposure, dust/chemical exposure and maintenance practices. Periodic functional testing and calibration are essential for reliable operation.

SENSE-TH200 is a weatherproof product. It is not a flameproof, explosion-proof or intrinsically safe product. Any hazardous area or safety-critical usage shall be verified against site classification, product certification and applicable local regulations before installation.

20. CONTACT INFORMATION

Company	Details
Brand	EVOTROX
Location	Ahmedabad, Gujarat, India
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Website	www.evotrox.com