TEMPERATURE MONITORING SYSTEM
TS6

INSTALLATION GUIDE

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SENSeOR

www.senseor.com
SENSeOR SAS capital 44 082,25€ RCS Grasse 488 576 430 – APE 7120B
505, route des Lucioles – Navigator B – 06560 Valbonne Sophia Antipolis – France SIRET: 488 576 430 00042
Tel: +33(0)4 97 23 13 20 – Fax: +33(0)4 93 06 08 58 TVA/VAT: FR35 488 576 430

Content

Important notes 

This system is designed for professional use. Therefore SENSeOR will not carry any responsibility or liability for direct and consequential damages resulting from the use of it.

Carefully observe all safety and installation instructions below.

Install and operate this equipment only if it is in perfect condition and only in accordance with this manual. Do not use the equipment if it is damaged.

SENSeOR will refuse any liability for direct and consequential damages resulting from unauthorized modifications to any of the components of this system.

No part of this manual may be reproduced in any way without written authorization from SENSeOR. This manual is subject to change with prior notice.

1. Regulations (Radio-Frequency – Security – EMC)

This device is certified/has been granted approval per:

- FCC - PART 15.231-C (e)

This device complies with Part 15 of the FCC Rules. 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.

- IC - RSS-Gen (4)/RSS-210 (8)

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) This device may not cause interference, and (2) This device must accept any interference, including interference that may cause undesired operation of the device.
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'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

- Security: CEI 61010-1:2010
- Labelling: CE

Please operate this system only as per the instructions in this Installation Guide and with the components provided by SENSeOR in the system.

Do not use with other antennas. Please note that this device may exceed permissible RF power emission levels if used with high gain antennas. This may affect other devices within the transmission range.

SENSeOR will not hold any liability for violating country-specific regulations.

2. Safety Instructions

Read and understand all safety and operating instructions before installing and operating the device.

Handle with care when plugging in the power supply. The instrument is powered with low DC voltage as soon as plugged in.

Independently of the temperature indicated by the Graphic User Interface, be careful when working in high-temperature environments not to burn yourself.

For sensors TSA H16X-V, do not operate the sensors above the limits: 545kV – 5000A

Do not use the system below or above the operating temperature limits:

- Transceiver: -20°C, 70°C
  All operation tests have been passed for extended operation range over the range stated by security norm (5°C, 40°C).
- Transceiver antennas AN G050: -40°C, 165°C
- Sensors TSA H16X: -40°C, 165°C, TSA H16X-V: -40°C, 150°C

The sensors TSA H16X are designed to measure from -15°C to 165°C with a 2°C accuracy over the range.
The sensors TSA H16X-V are designed to measure from -15°C to 150°C with a 2°C accuracy over the range.
The transceiver is designed for use indoor.

Store this manual in a place that can be accessed at any time by any person operating this device.

3. Installation instructions

This system operates only with the sensors provided with the delivery.

Only use attachments, accessories and cables supplied by SENSeOR.

Use only replacement parts specified by SENSeOR.

Do not install or operate the system if any of the parts is damaged.

Do not open the transceiver or any other part, and use it only as per the instructions of this user guide. In case of failure, please return the equipment to SENSeOR.

System content

TS6
• 6 temperature sensors TSA H16X or TSA H16X-V and fixation (screws) • 1 transceiver HTR01-2AW with embedded firmware • 1 AC/DC power converter with cables • 1 transceiver antenna AN G050 with cable and fixation (SMA/SMB adapter, screws) • 1 USB/mini USB cable • 1 USB key (sensor data, documentation, software) • SENSeOR-UI for Windows • 1 system datasheet • 1 installation guide • 1 Quick Start guide • 1 GUI guide • 1 Modbus protocol documentation • 1 carrying case
OPTIONS
• 1 transceiver antenna AN G050 with cable and fixation (SMA/SMB adapter, screws) for optimized RF-link • Or 1 50 ohm load • LED & cable for local programmable alarm

The transceiver HTR01 is available in:

- 2AW: 2 Antennas, Wide-band, for interrogation of multiple sensors in areas under FCC/IC regulation

System installation

Estimated installation time for one system: < 30 minutes
Operator: 1

Please read the section “Important Notes” before commissioning the system.

1. Equipment list

Needed in addition to the content of the system carrying case:

- Screwdriver and electricity screwdriver
- PC with Windows & SENSeOR-UI installed for initialization (refer to related Guide)

2. Sensor installation

Each sensor is delivered ready-to-use (high-performance monopole antenna integrated).

Some residues of thermal paste may be present on the sensor without affecting its performance. Please refer to the related safety datasheet.

If necessary, screw the sensor on the metallic part where the measurement is made.

Avoid touching the metallic parts of the sensor so that body heat won’t affect the measurements.

Place the sensor on a metallic ground plane for proper operation of the monopole antenna.

3. Antenna installation

Connect the SMA/SMB adapter on each antenna cable and plug each antenna on the transceiver connectors.
Make sure the connectors are tightly plugged.

One antenna on “Ant_1A” is needed in TS6 for interrogation of six sensors in “free-air”.

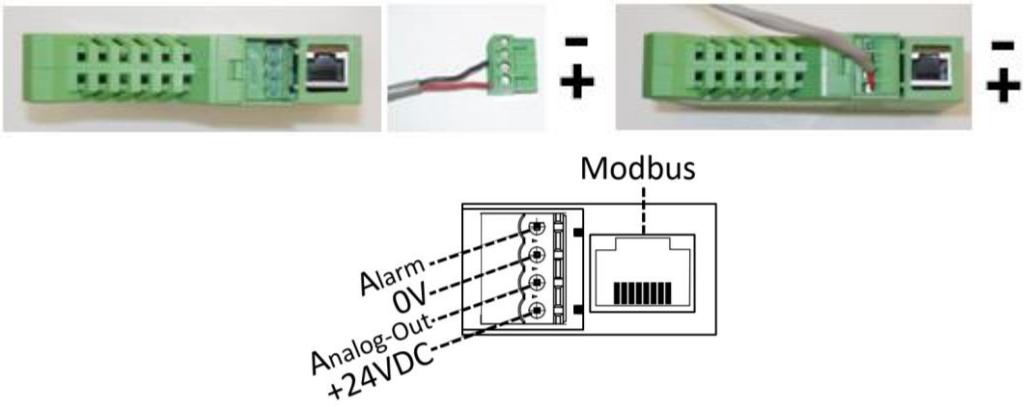
Two antennas on “Ant_1A” and “Ant_1B” are needed in TS6 for interrogation of six sensors in a metallic cavity.

Cover the antenna outputs unused with the provided 50 ohm loads.

Screw the antenna(s) on a metallic ground plane with the provided screws.

4. Transceiver installation

Connect the 2 power cables into the terminal with an electricity screwdriver.
Connect the terminal to the transceiver.



Slot the transceiver on the DIN rail if necessary.

Avoid touching the metallic parts of the sensors during the installation so that body heat won't affect the measurements.

The sensors must be placed sufficiently distant one from another (see sketch).

Transceiver antenna and sensor antenna must be parallel:

Remove hands and any metallic part at a minimum distance of 30 cm from the antennas before system commissioning.

If there are other SAW sensors in the room where the measurements are performed, make sure that they are placed at a distance of 5 meters or more in order to avoid any interference.

Do not let the computer be in "energy saving" mode (for example: by closing the screen of your laptop computer) while operating the equipment as this could stop the data transfer.

Disconnect the power supply before removing or touching the transceiver antenna.

System commissioning

Once the transceiver, the antennas, and the sensors are installed, the system is ready for commissioning.

1. First installation

Power the transceiver. A red LED flashes once the transceiver is powered.

If the LED doesn't light up, the transceiver is not powered, check the power source. If the LED doesn't flash, the transceiver doesn't operate correctly, unplug the power and plug it again.

Connect the transceiver to the PC with the provided USB/mini USB cable.

Initialization and commissioning of the system is made using SENSeOR-UI, the Graphic User Interface on a PC.

Please refer to the provided SENSeOR-UI User Guide (Quick Start).

For connection to a network via Modbus, once the system configuration is performed with the Graphic User Interface, plug-in the RJ45 cable to the transceiver to initiate the Modbus communication with the Gateway. Ping the registers 1001 to 1030 to enable measurement.

Please refer to the provided Modbus Protocol documentation.

2. System options

Please refer to the provided SENSeOR-UI User Guide to activate the system functions and options.

a. Local programmable alarm
b. Analog output (option)

Optimize your measurements!

1. Optimize the use of the sensor

The sensors TSA H16X and TSA H16X-V are designed for surface temperature measurement.

The sensitive element is the SAW temperature chip at the bottom of the sensor (5x5 mm ceramic packaged chip):

If you are using a reference sensor, make sure that the sensitive element of this sensor will be placed as close as possible to the SAW temperature chip, but not in contact with it.

For better results, it is recommended to attach the sensor to a metallic support using the 2 screws provided, with a torque of 100 cNm.

The sensor antenna and the transceiver antenna should be placed on metallic ground planes to optimize the interrogation distance. The sensor antenna must be parallel to the transceiver antenna.

In case of rotating parts, the requirement on the antenna position is needed only for a short period of time at each rotation. If necessary, please ask SENSeOR for a custom-design antenna for your specific application.

2. Minimize the temperature gradient (measured part/sensor)

The sensor should be in close contact with the object where temperature is being measured, without adding any mechanical stress on the sensor.

Note that the temperature gradient of the metallic ground plane where the sensor will be positioned will affect the measurements.

The use of thermal paste is recommended in order to reduce the temperature gradient between the object being measured and the sensor.

Direct contact of hands on the sensor (SAW temperature chip and metallic parts) should be avoided as this will increase or decrease the sensor temperature.

Other sensors are available and may be better fitted for your specific application.

HELP NEEDED?

See SENSeOR website for information: ***www.senseor.com***
Contact SENSeOR technical support: ***contact@senseor.com*** *or* ***+33(0)4 97 23 13 20***

SENSeOR
Navigator B, 505 route des Lucioles
06560 VALBONNE – SOPHIA ANTIPOLIS
France

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