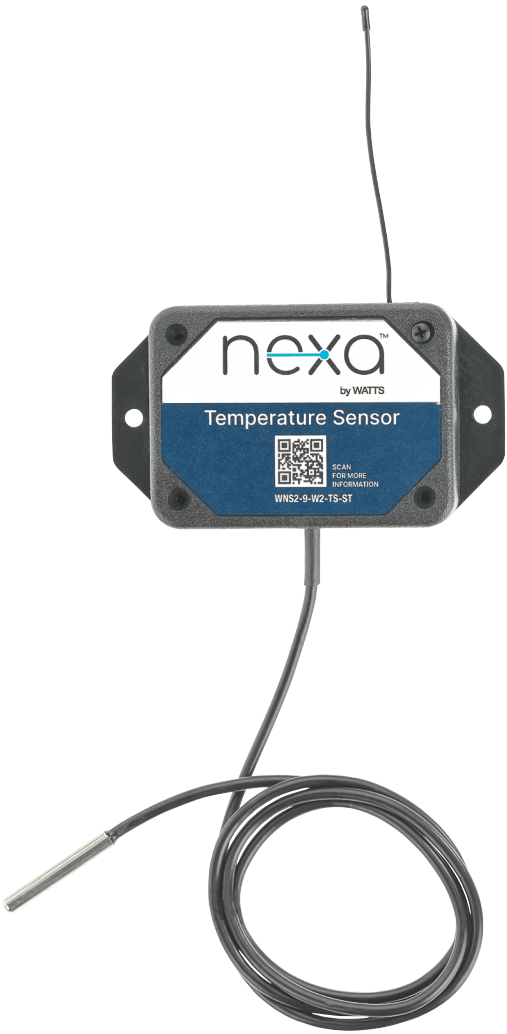
nexa™ by WATTS

User Guide

Temperature Sensor



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⚠ WARNING

Read this Manual BEFORE using this equipment.

Failure to read and follow all safety and use information can result in death, serious personal injury, property damage, or damage to the equipment.

Keep this Manual for future reference.

Nexa™ Temperature Sensor

Nexa Temperature Sensor measures the surface pipe temperature when affixed to a pipe, and also the ambient temperature changes in its environment. The sensor sends readings to the Nexa cloud platform in degrees Fahrenheit or Celsius based upon your configurations. If a temperature is detected outside of the range setting, Nexa sends an alert by text message or email.

Sensor Features

- An industry-leading 25-month NIST certification available on leaded temperature sensors Wireless range of 2,000+ feet through 18+ walls *
- Frequency-hopping Spread Spectrum (FHSS)
- Best-in-class interference immunity
- Best-in-class power management for longer battery life**
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + Advanced Encryption Standard (AES)-128 Cipher Block Chaining (CBC) for sensor data messages)
- Sensor capable of logging 2,000 to 4,000 readings if the gateway connection is lost (non-volatile flash, persists through the power cycle):

  10-minute heartbeats = ~22 days

  2-hour heartbeats = ~266 days
- Over-the-air updates (future-proof)

Applications

- Domestic hot water pipes, risers, and branches
- Cold water lines
- Boiler and chiller supply and return
- Ambient temperature
- Additional applications

* Actual range may vary depending on the environment.
** Battery life is determined by the sensor reporting frequency and other variables. Other power options are also available.

Installing the Sensor

Tools Required

Use these recommended tool for installations:

- Small Phillips screwdriver (for battery covers)
- Small Phillips screwdriver (to attach the enclosure to a wall)
- Double-sided Velcro or tape (commercial/industrial strength) to attach enclosures to walls
- Zip ties of varying lengths (Ties must be suitable for high temperature, industrial applications.)
- Other applicable safety equipment

Installing the Temperature Probe

Important: Take inventory of all sensors (all types) to be installed and record (1) sensor ID, (2) security code, (3) location. Do this before mounting the black electronics enclosure (IDs may be less visible once installed).

1. Temperature sensors can be installed on the outside surface of any size pipe.
2. For exposed pipe, complete the following:
   a. Ensure the surface is clean, and free from debris or material that may impede accuracy.
   b. Secure stainless temperature probe to pipe to ensure flush contact for best accuracy.
   c. Use zip ties (daisy chain for larger diameter pipes), adjustable clamps, industrial strength tape for securing placement.

      Note: When using industrial, high temperature zip ties, use one zip tie to attach the probe to the surface, and another zip tie to secure the cable. This helps maintain proper orientation of the probe.
3. For insulated pipe, complete the following:
   a. Remove an isolated section of insulation in desired location, secure sensor, and re-insulate if required.
   b. Use a zip tie on the outside of the insulation, just above sensor, to improve sensor/pipe contact.

      Note: In some cases, the sensor probe can be installed under the insulation, but the installer must ensure good contact with the pipe.
   c. Check temperature reading on the Nexa app to confirm good contact has been made, or contact your Customer Success Manager for assistance.

Installing the Enclosure

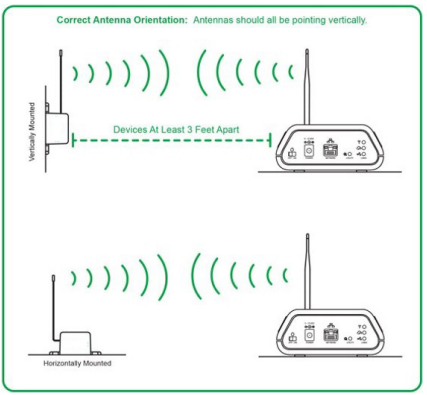
Sensor and Gateway Distance

The strength of the signal between a sensor and a gateway can vary depending on the antenna equipped. Sensors that transmit long distances can sometimes have more difficulty up close. The nearer the sensor to the gateway depending on the strength of the signal, the more garbled the signal can be. An analogy: A person standing next to a loud speaker will be able to hear an announcement but may not be able to understand it. After moving away from the loud speaker, the person will be able to both hear and understand the announcement.

Sensors need at least 3 feet between them and the gateways for effective close transmission. This distance is particularly important during setup when the sensors are trying to connect initially with the gateway. The sensors actively scan to contact the gateway the moment the battery is inserted or the sensor turned on.

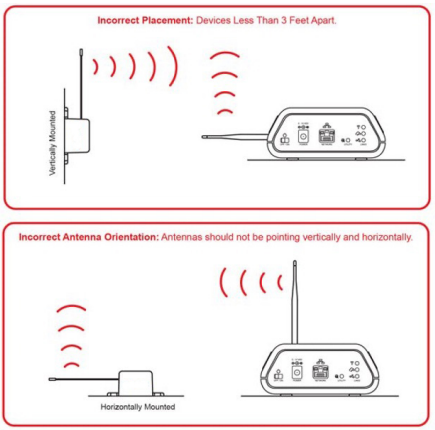
Correct Antenna Orientation

The antennas must all point vertically. Avoid pointing the antennas both vertically and horizontally in a mixed orientation.



Incorrect Antenna Orientation

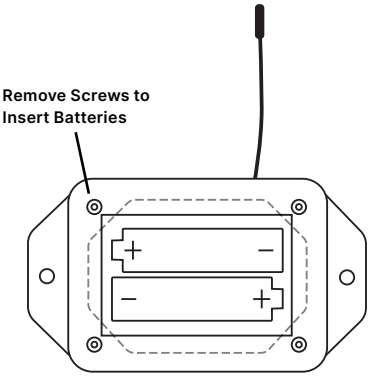
Avoid mounting sensors high and wireless gateways low. The devices need to be at least 3 feet apart but not on completely different planes. Also, avoid positioning sensors or gateways on the floor.



Install the Batteries

Be sure the Nexa Dual Gateway or Ethernet Gateway is set up before you install the included AA batteries into the transceiver box. When the transceiver is powered on, it automatically attempts to pair with the nearest gateway.

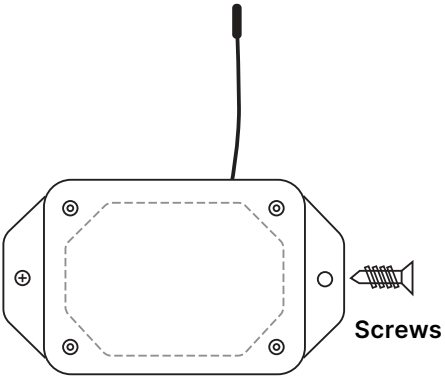
Use a #1 Phillips screwdriver to detach the cover of the transceiver box. Install the AA batteries as marked and reattach the cover. Use replacement screws provided in the kit accessory, as necessary.



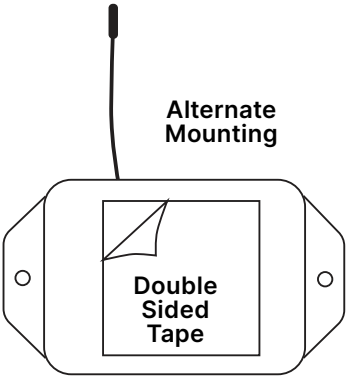
Mount the Enclosure

Nexa sensors feature mounting flanges and can be attached to most surfaces using the included mounting screws or double-sided tape. Observe these recommendations for installation.

- Attach the radio transmitter onto the wall or another flat, stationary surface.Use double-sided tape, screws, or other method of fastening.
- Ensure the cable connecting the probe to the radio transmitter is tucked away and unlikely to be knocked out of place.



Front of Enclosure



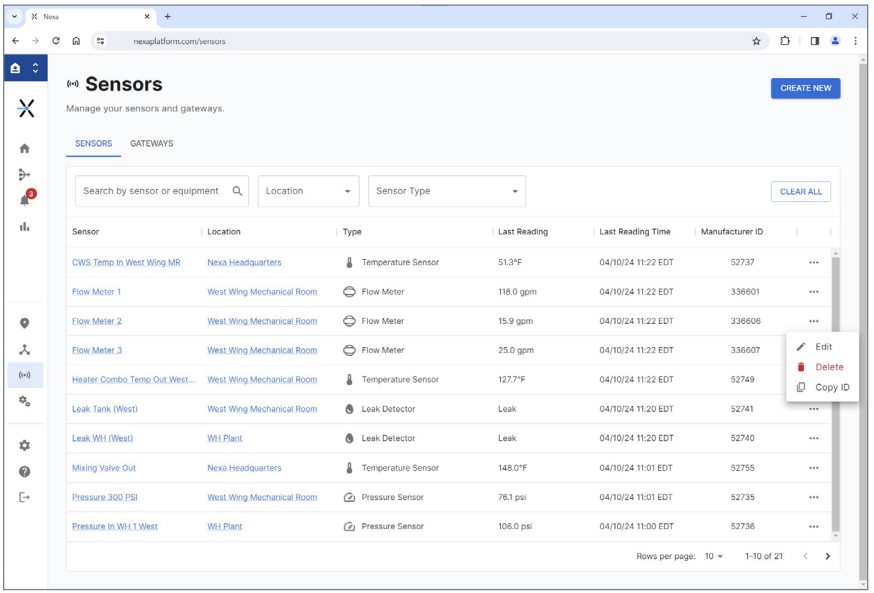
Back of Enclosure

Connecting to Nexa

Now that your gateway(s) and sensors have been successfully installed, you need to contact your dedicated Customer Success Manager (CSM) to register you and your team on the Nexa platform. Your CSM connects your system data to the cloud, creates a system map, sets alerts, and assumes responsibility for fully onboarding your team, providing visibility and generating valuable insights.

To complete the registration, your Customer Success Manager will need some important information. Every gateway and sensor has a unique identification number (ID) and security code (SC) located on the side of the communications enclosure. Record and relay that information along with the precise location and related equipment within the facility. Those location names are how you will be able to identify critical data for each sensor within the Nexa platform.

As shown here, for each sensor registered on the platform, the record includes sensor name, sensor location, sensor type, last sensor reading, last reading time, and manufacturer ID. Tap the 3-dot menu on the right end of a row to edit or delete the sensor record or to copy the ID.



FAQs/Troubleshooting

Who should I reach out to in case of any issues?
Reach out to your dedicated Nexa Customer Success Manager, who can then directly assist or connect you with the right resource to resolve the issue.

What if my gateway is not all green?
- Ensure that the gateway is in an area with strong cellular signal.
- Perform a reset on the gateway by performing the following steps:
  - Power off the gateway.
  - Press and hold the Utility button for 20 seconds (keep holding while powering on).
  - After the start-up test, in which the LEDs all flash alternating red and green, release the button.
  - Press and hold the Utility button for 15 seconds or so until the LEDs go dark from top to bottom. A restart of the gateway follows.

What if some parts are missing?
Reach out to your dedicated Nexa Customer Success Manager, who can then ship out any missing or replacement parts to you.

What if my sensor won't connect?
- Contact your dedicated Nexa Customer Success Manager for support.
- Sensors may not connect because the distance from gateway is too great (particularly if signal is obstructed by barriers), or because of issues with a specific sensor. Follow the specification for distance and location area. If further assistance is needed, your Nexa Customer Success Manager will work with you to diagnose the root cause and develop a solution.
- If gateway signal is too weak, you may need to deploy an additional gateway closer to the sensor to ensure more consistent signal.
- If a specific sensor has issues, the Nexa team will ship a replacement sensor to you. Depending on the complexity of the installation, the Nexa team can remotely support you to replace the sensor, or schedule a service visit for the Nexa team to replace the sensor.

What if I put a device in the wrong location?
- Contact your Nexa Customer Success Manager, and share the device ID, current location, and intended location.
- With the preceding information, the Customer Success Manager will then update the location on the Nexa platform for you.

What if I want to add more sensors?
Reach out to your dedicated Nexa Customer Success Manager, who will work with you to confirm additional sensor counts, pricing, install logistics, and other aspects of your configuration.

What if my sensor is reading the wrong temperature?
The temperature sensor comes pre-calibrated, but there may be reasons why the measured temperature is not as expected.
- If you use an infrared sensor to check surface black body temperature or have another temperature sensor in your system, ensure that they have been recently calibrated.
- The probe measures the surface of the pipe and is affected by ambient temperatures, especially if there is air movement. Place under piping insulation or insulate separately to minimize this effect.
- Ensure that the length of the probe is in the same orientation as the pipe to maximize surface contact. Use two zip ties: one to manage the black cord, and the other to manage the metal probe.

Security Protocols

Data security and integrity are paramount at Nexa. Each layer of the system is secured using encryption and protocols designed to protect customer data and information. The system consists of sensor(s), gateway(s), and Nexa software. One or more sensors communicate with Nexa software through a gateway.

Sensor to Gateway

Sensor and gateway radio modules are purpose-built devices with proprietary unreadable firmware, which means the sensor cannot be physically hacked or re-purposed for malicious purposes. This adds a strong level of inherent security even before considering encryption. Data transmission between the sensor and the gateway are secured using Encrypt-RF Security (Diffie-Hellman Key Exchange+ AES-128 CBC for sensor data messages). Beyond the encryption, data transmissions are also structurally verified and CRC checked before passing up to Nexa or down to the sensor. This ensures the integrity of the data.

Gateway to Nexa

Data transmissions between the gateway and Nexa software are secured using 256-bit, high-level encryption.

Nexa

Access is granted through the Nexa user interface, or an Application Programming Interface (API) safeguarded by 256-bit Transport Layer Security (TLS 1.2) encryption. TLS is a blanket of protection to encrypt all data exchanged between Nexa and you.

Certifications

United States FCC

This equipment has been tested and found to comply with the limits for a Class B digital devices, 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 instruction manual, 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 of 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.

⚠ WARNING

Changes or modifications not expressly approved by Nexa will void the user's authority to operate the equipment.

⚠ WARNING

RF Exposure. To satisfy FCC RF exposure requirements for mobile transmitting devices, the antenna used for this transmitter must not be co-located in conjunction with any antenna or transmitter. Additionally, a separation distance of 8.7 in. (22 cm) or more should be maintained between this device and persons during device operation.

Nexa and Nexa Sensors

This equipment complies with the radiation exposure limits prescribed for an uncontrolled environment for fixed and mobile use conditions. This equipment should be installed and operated with a minimum distance of 9 in. (23 cm) between the radiator and the body of the user or nearby persons.

Approved Antennas

All Nexa sensors contain FCC ID: ZTL-G2SC1. The devices have been designed to operate with any one of the approved antennas (listed below), having a maximum gain of 14 dBi. Antennas having a gain greater than 14 dBi are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

- Xianzi XQZ-900E (5 dBi Dipole Omnidirectional)
- HyperLink HG908U-PRO (8 dBi Fiberglass Omnidirectional)
- HyperLink HG8909P (9 dBd Flat Panel Antenna)
- HyperLink HG914YE-NF (14 dBd Yagi)
- Specialized Manufacturing MC-ANT-20/4.0C (1 dBi 4" whip)

Canada (IC)

English

Under Industry Canada regulations, this radio transmittermay only operate using an antenna of a type and maximum(or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that necessary for successful communication.

The radio transmitters (IC: 9794A-RFSC1, IC: 9794A-G2SC1, IC: 4160a-CNN0301, IC: 5131A-CE910DUAL, IC: 5131A-HE910NA, IC: 5131A-GE910 and IC: 8595A2AGQN4NNN) have been approved by Industry Canada to operate with the antenna types listed on the previous page with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

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.

Français

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la Puissance Isotrope Rayonnée Èquivalente (P.I.R.È) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Le présent émetteurs radio (IC: 9794A-RFSC1, IC: 9794A-G2SC1, IC: 4160a-CNN0301, IC: 5131A-CE910DUAL, IC: 5131A-HE910NA, IC: 5131A-GE910 et IC: 8595A2AGQN4NNN) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne figurant sur la page précédente et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

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, méme si le brouillage est susceptible d'en compromettre le fonctionnement.

⚠ WARNING

RF Exposure. To satisfy IC RF exposure requirements for mobile transmitting devices, the antenna used for this transmitter must not be co-located in conjunction with any antenna or transmitter. Additionally, a separation distance of 12.6 in. (32.1 cm) or more should be maintained between this device and persons during device operation.

Limited Warranty: Watts Regulator Co. (the "Company") warrants each product to be free from defects in material and workmanship under normal usage for a period of one year from the date of original shipment. In the event of such defects within the warranty period, the Company will, at its option, replace or recondition the product without charge.

THE WARRANTY SET FORTH HEREIN IS GIVEN EXPRESSLY AND IS THE ONLY WARRANTY GIVEN BY THE COMPANY WITH RESPECT TO THE PRODUCT. THE COMPANY MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED. THE COMPANY HEREBY SPECIFICALLY DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

The remedy described in the first paragraph of this warranty shall constitute the sole and exclusive remedy for breach of warranty, and the Company shall not be responsible for any incidental, special or consequential damages, including without limitation, lost profits or the cost of repairing or replacing other property which is damaged if this product does not work properly, other costs resulting from labor charges, delays, vandalism, negligence, fouling caused by foreign material, damage from adverse water conditions, chemical, or any other circumstances over which the Company has no control. This warranty shall be invalidated by any abuse, misuse, misapplication, improper installation or improper maintenance or alteration of the product.

Some States do not allow limitations on how long an implied warranty lasts, and some States do not allow the exclusion or limitation of incidental or consequential damages. Therefore the above limitations may not apply to you. This Limited Warranty gives you specific legal rights, and you may have other rights that vary from State to State. You should consult applicable state laws to determine your rights. **SSO FAR AS IS CONSISTENT WITH APPLICABLE STATE LAW, ANY IMPLIED WARRANTIES THAT MAY NOT BE DISCLAIMED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO ONE YEAR FROM THE DATE OF ORIGINAL SHIPMENT.**

nexa™

by WATTS

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