ABB STX Serial Wireless Temperature Sensor User Manual

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ABB

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Product Overview

The ABB STX serial wireless temperature sensor is a self-powered smart sensor designed to continuously monitor the temperature of critical connections by harvesting electromagnetic energy around power transmission conductors. The sensor wirelessly transmits data to the concentrator, which is then stored in ABB Ability local or cloud-based solutions to enable different digital services. This product is a key data source in ABB's monitoring and diagnostic solutions.

Product Features

- Self-powered wireless smart sensor
- Harvests electromagnetic energy to power itself
- Continuously monitors temperature of critical connections
- Wirelessly transmits data to the concentrator
- Stored data in ABB Ability local or cloud-based solutions
- Wide measurable range: -40°C to 130°C
- Excellent accuracy

Product Usage Instructions

1. Install the ABB STX serial wireless temperature sensor around the power transmission conductor.
2. The sensor will continuously monitor the temperature of critical connections and wirelessly transmit data to the concentrator.
3. The concentrator will store the data in ABB Ability local or cloud-based solutions.
4. To access the data, log in to ABB Ability and navigate to the appropriate section.
5. The measurable range of the sensor is -40°C to 130°C. If the temperature goes outside of this range, the sensor may not function properly.
6. If you have any questions or concerns about product usage, please refer to the user manual or contact ABB customer support for assistance.

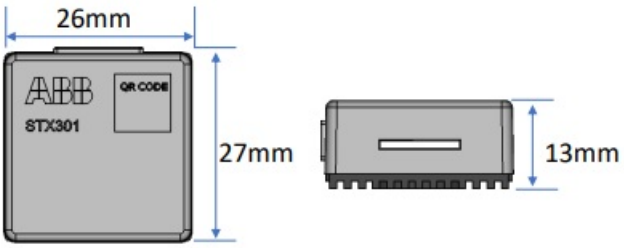
Overview

ABB STX serial products are the key data source in ABB’s monitoring and diagnostic solutions. This self-powered wireless smart sensor harvests the electromagnetic energy around power transmission conductor, continuously monitors the temperature of critical connections and wirelessly transmits to the concentrator. Eventually, the data will be stored in ABB Ability local or cloud-base solutions to enable a variety of different digital services.

- High performances
- ■ Wide measurable range -40℃- 130℃
- Excellent accuracy
  - <1.0℃ @-10℃…85℃
  - <2.0℃ @-30℃…100℃
  - <2.5℃@ outside the range
- Support up to 3 measuring channels
- Self-powered
- Battery free
- 5A minimum active current
- Wireless
- IEEE802.15.4 at 2.4GHz
- Private protocol
- 100m maximum transmission distance
- Support OTA firmware update
- Stronger and durable
- Tiny size: 26x26x13mm, 18g weight
- IP54 level
- Easy installation

Appearance and size

Appearance of product



Dimensions

Ordering information

Type	Mode	Protocol
STX301	Standalone	ABB Private
STX303	External	ABB Private
STX311	Standalone	ZIGBEE Green Power
STX313	External	ZIGBEE Green Power

Installation

Check the delivery of materials

Standalone mode		
Part	**Description**	**Quantity**
	STX301 thermal sensor	3
	Metal buckle	4

External mode		
Part	**Description**	**Quantity**
	STX303 thermal sensor	1
	Metal buckle	2
	External probe cable	1

	***Notice!*** The ferromagnetic ribbon shall be ordered separately, it’s total length i s 7.2 meters.

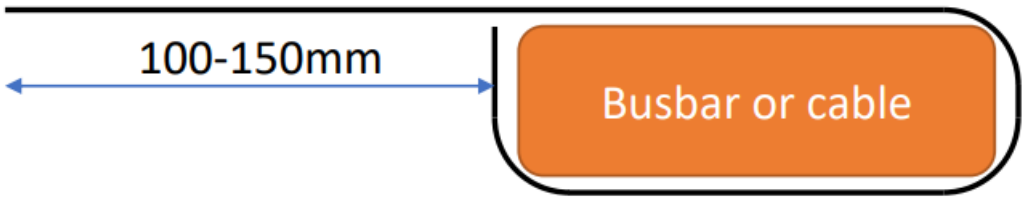
Check the tools

Tools	Type	Usage
	Metal scissor	Cut off and shape the ferromagnetic ribbon
	Manual tensioner	Bind the sensor
	Long nose plier	Shape the tail of ferromagnetic ribbon
	Gloves	Protect the hands

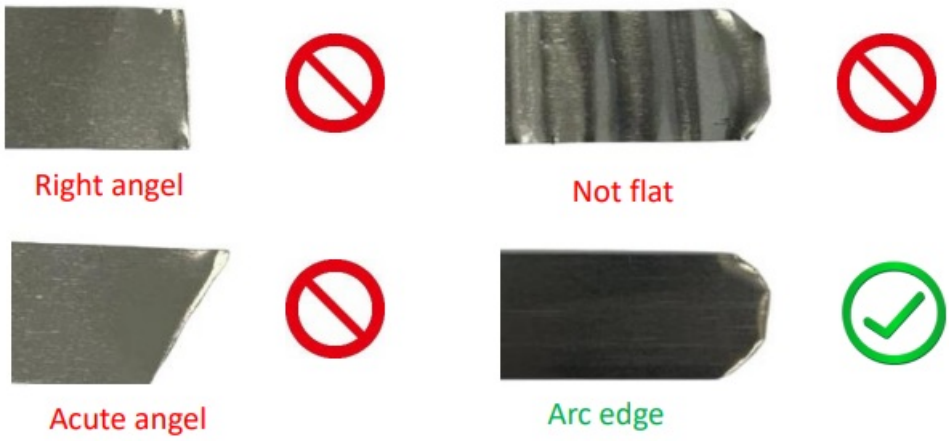
Start installation

Sensor boy

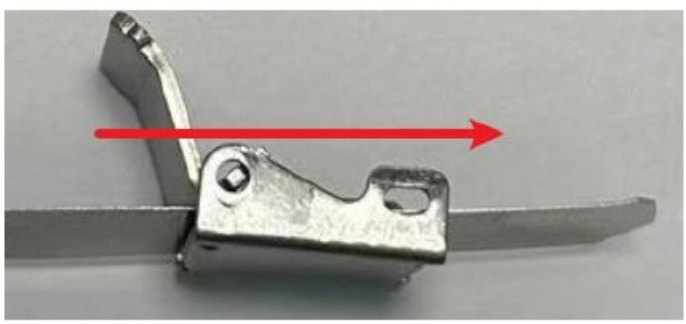
1. Use the scissor to cut off the ferromagnetic ribbon, the length should be 100-150mm longer than the surface perimeter of the measured conductor or cable.

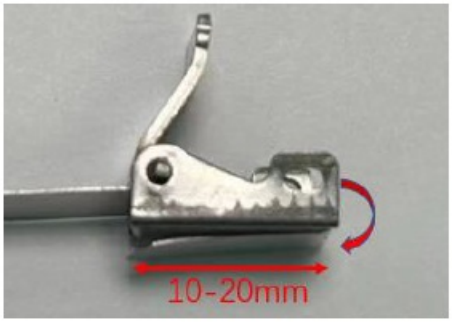


2. Cut two edges of ferromagnetic ribbon to an arc, to make it safer.

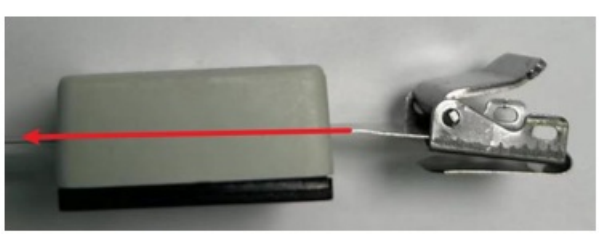


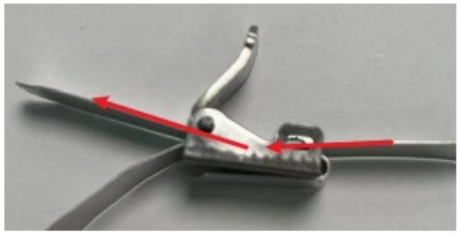
3. Put the ribbon through the metal buckle from one end, then bend it's extremity with an angle at 90° longer than 10mm.



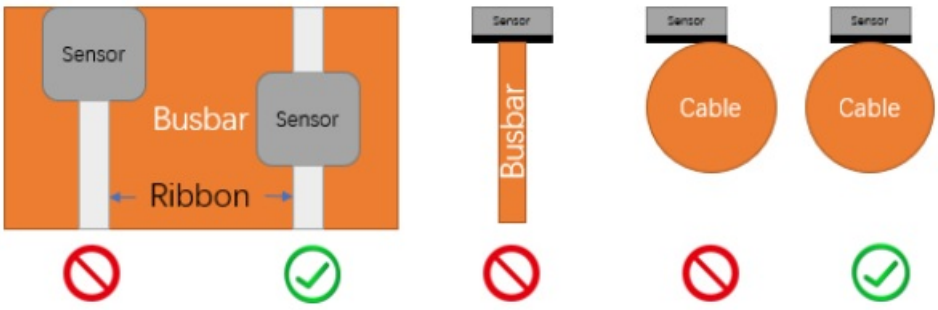


4. The ribbon goes through the sensor, ties it to the measured conductor or cable.

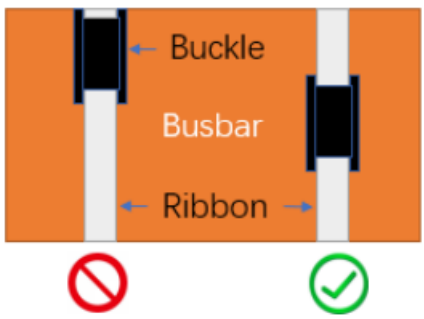




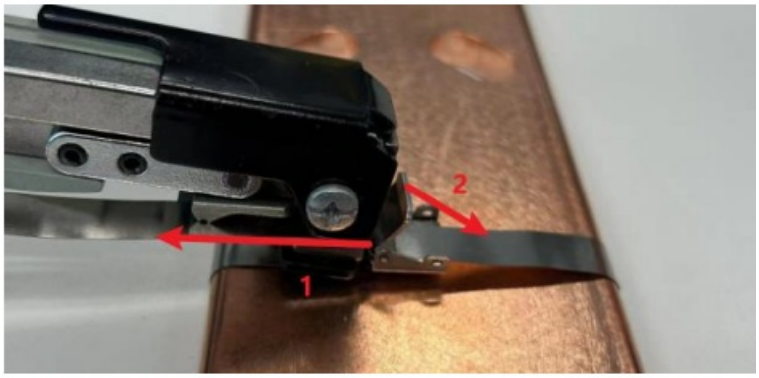
- The position of sensor shall be in the middle of conductor, meanwhile the thermistor shall be at the closest position of the connection.



- To improve insulation level, the metal buckle also shall be installed in the middle position of busbar.



5. The head of manual tensioner must hold against the buckle then tense the ferromagnetic ribbon, make sure that the sensor is tied on measured conductor tightly. Finally, press the metal buckle.



6. Cut off the remaining ribbon with metal scissors


7. Roll up the tail


External probe (only for STX303 & STX313)

1. There are two methods to install the ring terminals, as below.


Fixed by bolt


Bound by metal cable tie

2. Open the rubber cover and then insert the connector of cable into sensor body

Cautions and notices

Failure to follow these instructions can result in death or injury.

	² **Turn off all power supplying this product before working on** ² **The operator must be qualified electrical personnel** ² **Replace all devices, doors and covers before turning on the power**
	² **As the surface of the conductor or cable could be very hot, do not perform any operati ons when the temperature of this part is above than 50°C**
	² **As the metallic parts are very sharp and thin, please check your individual protection. Gloves must be required** ² **Follow the guide to use tools during the installation**

FCC Notice

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
2. this device must accept any interference received, including interference that may cause undesired operation.

NOTE: 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.

Caution: The user is cautioned that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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

Technical datasheet

Measurement characteristics and communication

- **Description** Value
- **Measuring temperature range** -40…130°C
- **Accuracy within ambient air temperature for operation** <1.0°C @-10°C…85°C <2.0°C @-30°C…100°C <2.5°C outside the range
- **Transmission cycle** 12…60s
- **Power emission** +5 dBm
- **Maximum communication distance (in free field unobstructed)** 100m
- **Number of channels** 16 (ZIGBEE Green Power) 60 (ABB Private protocol)
- **Operation frequency** 2403 MHz…2480 MHz

Power supply

- **Description** Value
- **Minimum active current** 5A
- **Voltage limit of the active part** 40.5 kV
- **Current limit of the active part** 5000 A
- **Withstand voltage level (50hz,1 min)** 2 kV(only for external probe)
- **Rated frequency** 50/60 Hz

Environmental conditions

- **Description** Value

- **Ambient air temperature for operation** -40…105°C
- **Environment humidity** 20…95%, non-condensing
- **Atmospheric pressure** 86…106 kPa
- **Operating altitude** 0…5000 m
- **Transport and storage temperature range** -40…70°C

EMC compliance

- **Description** Reference
- **EMC directive** 2014/30/EU
- **Standard** EN 301489-1 EN 301489-17

Radio equipment conformance

- **Description** Reference
- **RE directive** 2014/53/EU
- **standard** EN 300328

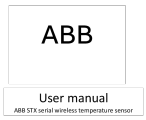
Electromagnetic compatibility tests

- **Description** Level
- **Electrostatic discharge** 4 KV (Contact) 8 KV (Air)
- **Radiated Emissions** Class A (30MHz…1GHz)
- **Radiated Immunity** 3 V/m (80MHz…6GHz)
- **Electrical fast transient/burst immunity** 4 kV 5 kHz & 100 kHz
- **Resistance to conducted disturbances** 10 V (0.15…80 MHz)
- **Power frequency magnetic field immunity** 300 A/m Pulse 30 A/m Continue
- **Pulse magnetic field immunity** 1000 A/m Pulls
- **Damped oscillatory magnetic field immunity** 100 A/m (0.1 & 1 MHz)
- **Damped oscillatory wave immunity** 2.5 kV (CM-100 kHz&1 MHz) 1 kV (DM-100 kHz & 1 MHz)

Revision history

Date	Revision	Changes
28-Mar-2023	A.1	Draft
07-Apr-2023	A.2	First release

Documents / Resources

	**ABB STX Serial Wireless Temperature Sensor** [pdf] User Manual STX3XX, 2BAJ6-STX3XX, 2BAJ6STX3XX, STX, STX Serial Wireless Temperature Sensor, Serial Wireless Temperature Sensor, Wireless Temperature Sensor, Temperature Sensor