

ABB

User manual

ABB STX serial wireless temperature sensor

1. 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°C- 130°C
- Excellent accuracy
 - <1.0°C @-10°C...85°C
 - <2.0°C @-30°C...100°C
 - <2.5°C @ outside the range
- Support up to 3 measuring channels

◆ Self-powered

- Battery free
- 5A minimum active current

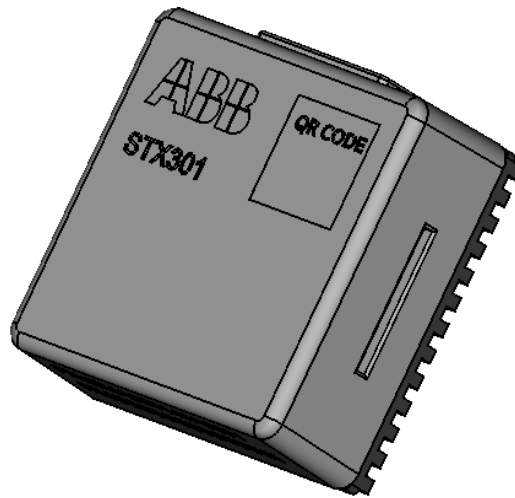
◆ Wireless

- IEEE802.15.4 at 2.4GHz
- Private protocol
- 100m maximum transmission distance
- Support OTA firmware update

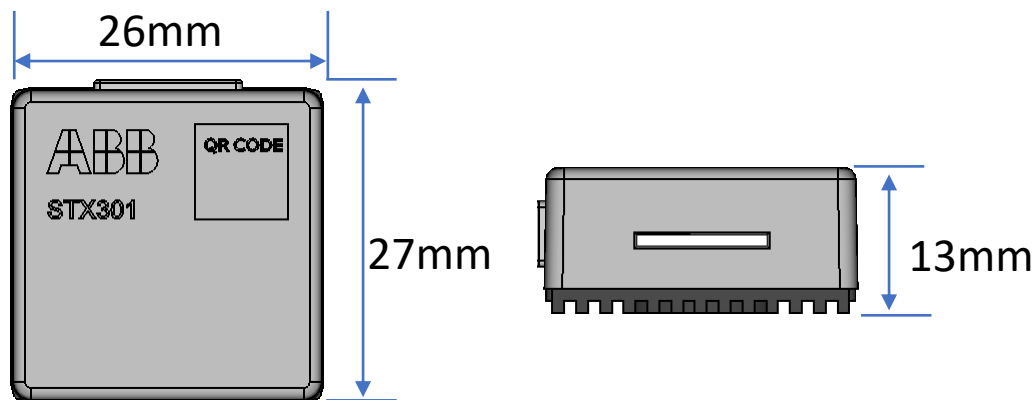
◆ Stronger and durable

- Tiny size: 26x26x13mm, 18g weight
- IP54 level
- Easy installation

2. Appearance and size



Appearance of product



Dimensions

3. Ordering information

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

4. Installation

4.1 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 is 7.2 meters.
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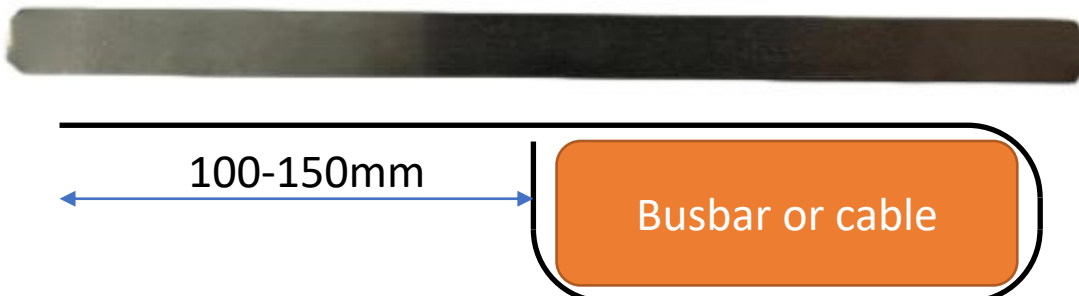
4.2 Check the tools

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

4.3 Start installation

4.3.1 Sensor boy

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



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



Right angel



Not flat

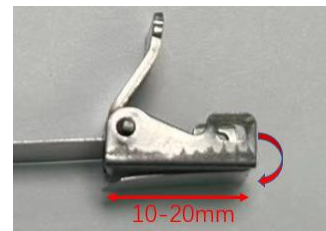
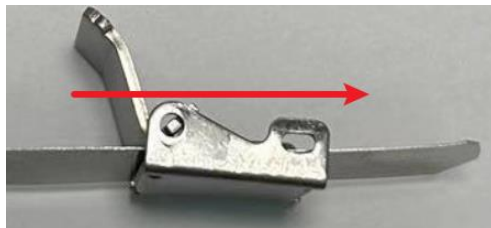


Acute angel

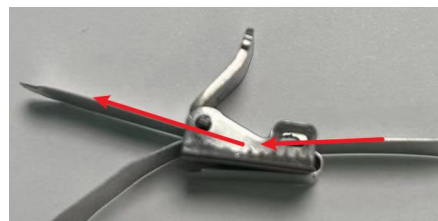
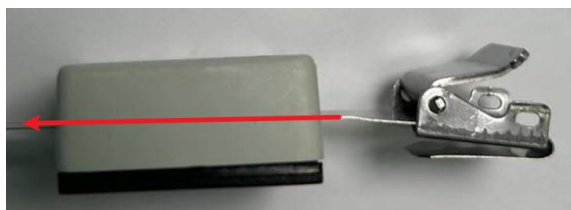


Arc edge

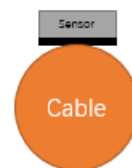
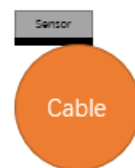
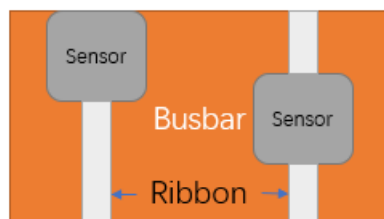
- ③ Put the ribbon through the metal buckle from one end, then bend it's extremity with an angle at 90° longer than 10mm.



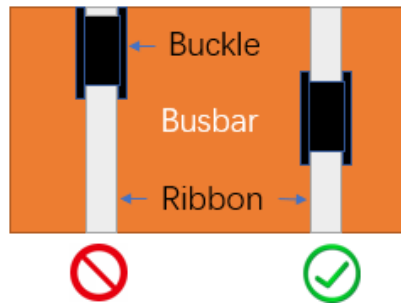
- ④ The ribbon goes through the sensor, ties it to the measured conductor or cable.



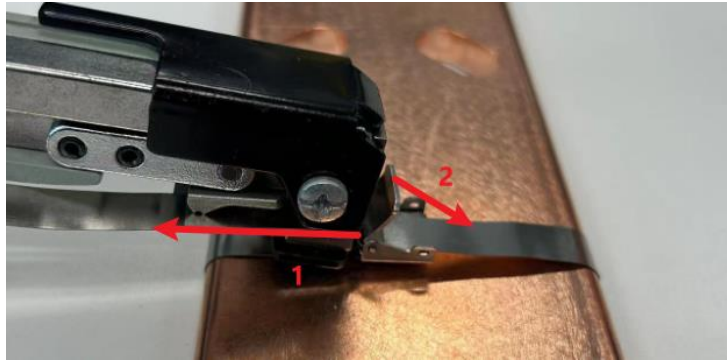
The position of sensor shall be in the middle of conductor, meanwhile the thermistor shall be at the closest position of the connection.



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 of ribbon with metal scissor



- ⑦ Roll up the tail



4.3.2 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



5. Cautions and notices



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

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

6. 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)

7. Revision history

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