



network thermostat NT-485 NetX Modbus Translator Installation Guide

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network thermostat NT-485 NetX Modbus Translator



BEFORE YOU START

Please read the entire install manual. The NT-485 will need to be correctly wired and configured for proper operation.

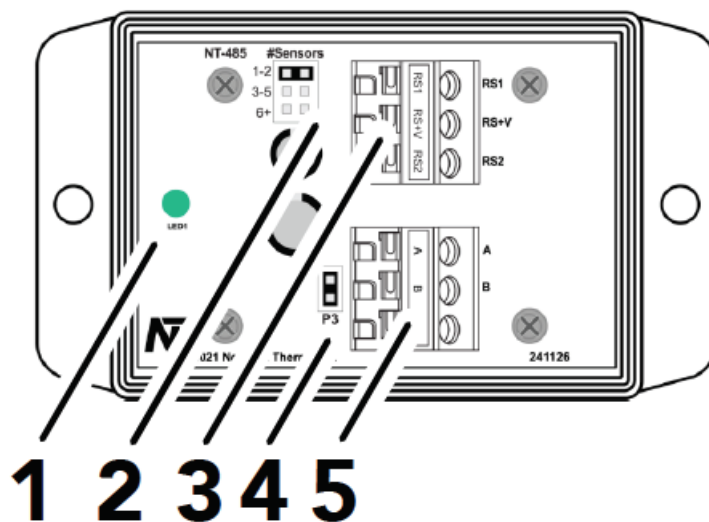
INTRODUCTION

The Network Thermostat NT-485 Modbus translator is designed to allow Modbus status and control of basic thermostat functions when connected to an X-series thermostat. The NT-485 resides on the wired Remote Sensor Bus (RSBus) along with the other NetX sensor types (such as the NT-URS). The Modbus MS/TP points are listed in the document "240319 NT-485 Modbus Points List".

WHAT IS IN THE BOX?

- (1) NT-485 Modbus Translator
- (2) 3/16 Drywall anchors
- (2) Mounting Screws
- (1) Installation Manual

NT-485 CALLOUT



1. Diagnostic LED
2. Number of Sensors Jumper
3. Wiring to Thermostat
4. 485 Termination
5. Wiring to BAS System (Modbus MS/TP)

MOUNTING LOCATIONS

For proper operation, the NT-485 must be mounted in an interior location.

HARDWIRE INSTALLATION

1. Install the X-Series thermostat according to the instruction manual supplied with it.
2. Install NT-485 in a convenient location for wiring access to both the X-Series thermostat and the BAS system.
3. Install RSBus cable (Red Arrow) from the thermostat to the NT-485 location. NT-URS sensors may be placed

before or after the NT-485. The maximum distance is 300ft. (90m).

Use CAT5 or CAT5e unshielded, or 1-Pair Twisted Shielded Cable with Drain and nominal capacitance of 12 pF/ft or less, such as Connect Air W221P-2003NT available from Network Thermostat.

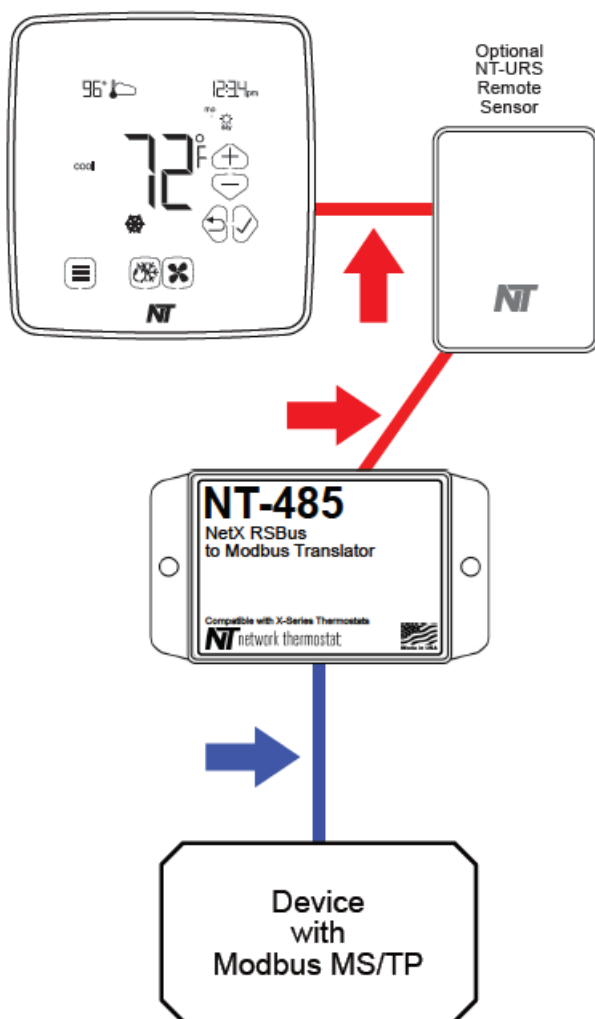
Use Riser-Rated or Plenum Rated cable as required by local code.

4. Install Modbus cable (Blue Arrow) from the BAS System to the NT-485 location. Maximum distance is 300ft. (90m) While not required, the same cable type may be used.

Typically, a 1-Pair Twisted Shielded Cable with Drain and nominal capacitance of 12 pF/ft or less or advantageous for RS-485 networks.

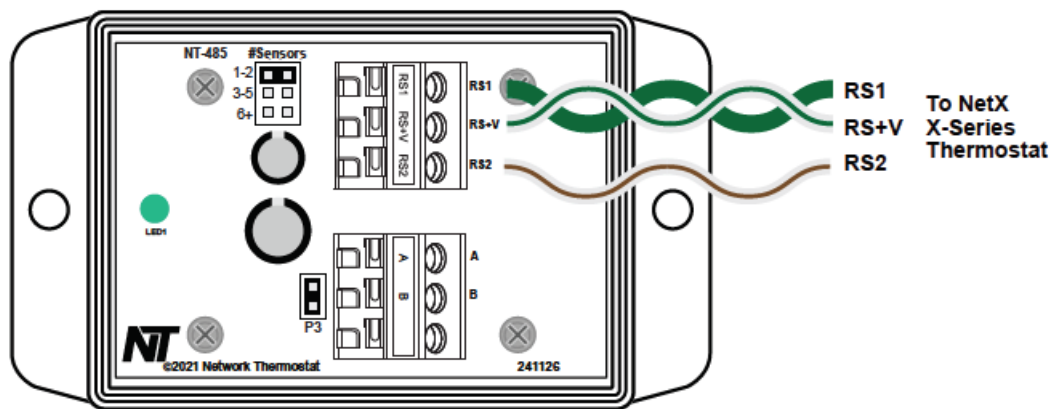
Use Riser-Rated or Plenum Rated cable as required by local code

CAUTION: Disconnect power to the thermostat or remove thermostat faceplate before connecting either end of the cable.



CABLE TERMINATIONS

THERMOSTAT TO NT-485



1. After mounting the thermostat and NT-485, run the sensor cable from the thermostat to the NT-485.
2. Strip 1/4 inch of insulation from three wires at the NT-485. Install the wires in the terminals using the table below.

Cat5/Cat5e cable color code:

RS+V = Green with White Stripe

RS2 = Brown with White Stripe

RS1 = Green

or

1-Pair Shielded cable color code: (W221P-2003NT)

RS+V = White

RS2 = Drain wire

RS1 = Black

NOTE:

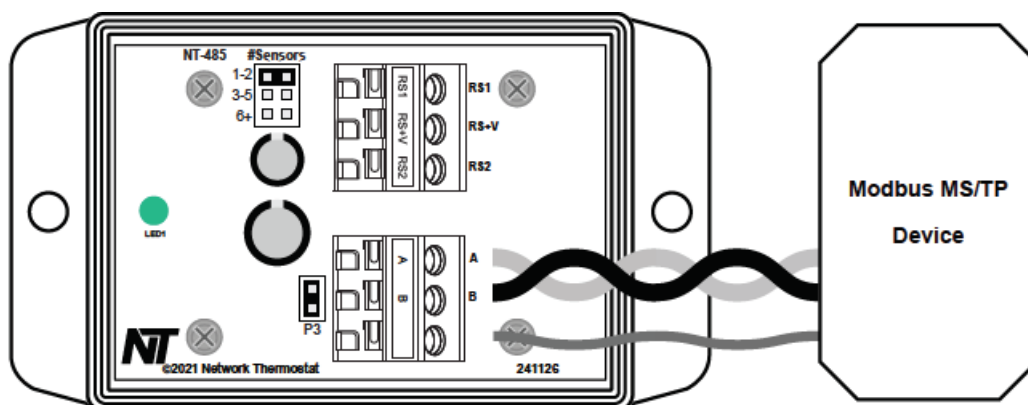
Be careful with the wire color going to each terminal. The order of the terminals on the thermostat are not the same as the NT-485.

3. Strip 1/4 inch of insulation from the same three wires and connect to the thermostat backplate terminals labeled RS1, RS2 and RS+V.

NT-485 TO MODBUS MS/TP

Run the Modbus cable from the NT-485 to the Modbus MS/TP device.

1. Strip 1/4 inch of insulation from the 1-pair conductors at each end of the cable. Install the wires in the terminals using the table below.



1-Pair Shielded cable color code: (W221P-2003NT)

A (+) = White

B (-) = Black

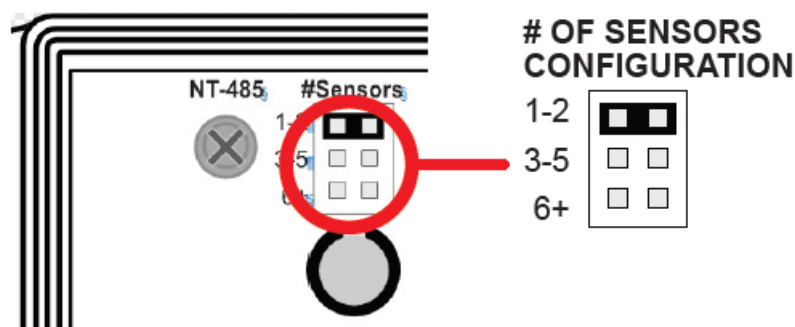
GND (no label on terminal) = Drain wire (optional)

2. Connect the wires to the appropriate terminals on both ends for Modbus MS/TP communications.

RSBUS LOADING – JUMPER SETTINGS

The RSBus allows multiple devices/sensors to be connected on the bus. The NT-485 counts as one of those devices.

Therefore, the #Sensors jumper must be set appropriately for reliable communications between the thermostat and the remote devices/sensors.



Set the jumper to match the total number of sensors directly connected to the thermostat; 1-2, 3-5, or 6+ sensors.

IMPORTANT: Do Not Count The Additional NT-URS Sensors Used For Indoor Averaging.

Sensor Counting Example 1:

You are connecting an NT-485, an NT-URS (INDOOR) sensor, an NT-URS (OUTDOOR) sensor, and an NT-URS (AUX1) sensor. The sensor count is 4 and the correct jumper configuration is the middle jumper 3-5.

SENSOR TYPE CONFIGURATION

Sensor Counting Example 2:

You are connecting an NT-485 and six (6) NT-URS (INDOOR) sensors (Averaged). The sensor count is 2 and the correct jumper configuration is the top jumper 1-2.

Sensor Counting Example 3:

You are connecting an NT-485, an NT-URS (INDOOR) sensor, an NT-URS (OUTDOOR) sensor, an NT-URS (AUX1), an NT-URS (AUX2) sensor, an NT-URS (Water Leak) sensor. The sensor count is 6 and the correct jumper configuration is the bottom jumper 6+.

X-SERIES THERMOSTAT SETUP FOR MODBUS

The X-Series thermostat has a dot matrix display at the top of the touchscreen. The touchscreen can be used for determining if the NT-485 is connected to the thermostat, and for setting the NT-485 Modbus address.

1. Reattach the X-Series thermostat faceplate after cable connections are completed and verified. (See your thermostat installation manual for instructions.)
2. After power-up, it will take up to 1 minute for the X-Series thermostat to initially find and communicate with the NT-485 on the RSBus.

When communications have been established, the dot matrix will display:

Modbus Active for 5 seconds and then return to normal functionality.

3. Each time the thermostat communicates with the NT-485, the GREEN LED will blink. This indicates normal

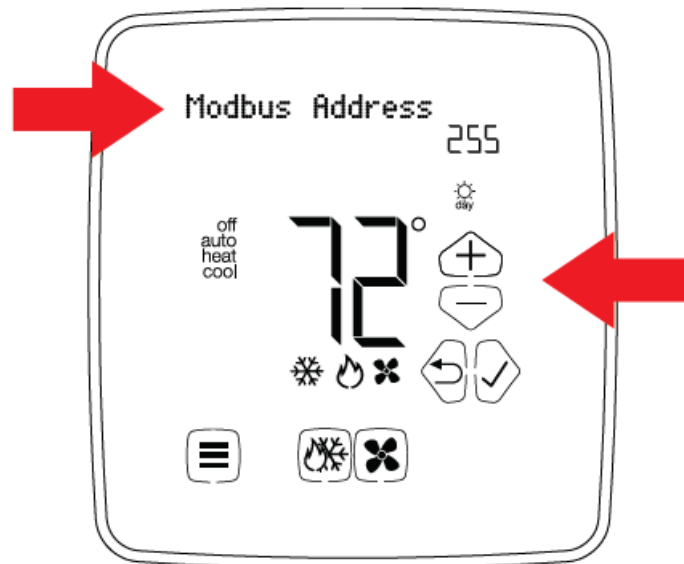
connection between the thermostat and the NT-485.

MODBUS ADDRESS SETTING

1. To set the Modbus address from the touchscreen, press the Menu button in the lower-left corner of the screen and hold for 5 seconds and then release.

The thermostat will now be in the Installer Menu.

Navigate to the Modbus Address menu section, and use the + and – buttons to set the address, then tap the to save.



NOTE: The Modbus address may also be set over Modbus communications

MODBUS COMMS CONFIGURATIONS

BAUD RATE: 9600
DATA BITS: 8
PARITY: EVEN
STOP BITS: 1

LED STATUS

The NT-485 includes a Diagnostic LED that can help you troubleshoot your installation and sensor operation.

LED Off:

LED OFF indicates no power to the NT-485. Check wiring between the NT-485 and the thermostat for problems. Fix as necessary.

LED On Solid During Power-Up:

On power-up, the LED will turn on solid until the NT-485 successfully communicates with the thermostat.

LED Blink:

The LED will blink during communications with the thermostat; approximately every 15 seconds.

ONE (1) YEAR LIMITED WARRANTY

Network Thermostat™ warrants to the original purchaser that this product will be free from defects in workmanship and materials for a period of one year from the date of purchase with proof of purchase.

Warranty Limitations

This warranty begins on the date of purchase.

Warranty is Void if:

- The date code or serial number is defaced or removed.
- The product has a defect or damage due to product alteration, connection to an improper electrical supply, shipping and handling, accident, fire, flood, lightning or other conditions beyond the control of the manufacturer.
- The product is not installed according to the manufacturer's instructions and specifications.

Owner's Responsibility

- Provide proof of purchase.
- Provide normal care and maintenance.
- Pay for freight, labor and travel.
- Return any defective product.
- In no event shall the manufacturer be liable for incidental or consequential damages.

This warranty gives you specific legal rights and you may have others which vary by state and/or province. For example, some states and/or provinces do not allow the exclusion or limitation of incidental or consequential damages, so this exclusion may not apply to you. The manufacturer's continuing commitment to quality products may require a change in specifications without notice.

SPECIFICATIONS

Rated Voltage:

20V to 30VAC, 24VAC nominal

Modbus Communications Settings:

Baud: 9600

Data Bits: 8

Parity: Even

Stop Bits: 1

Terminations:

RSBus: RS1 – Data, RS+V – Power, RS2 – Return

Modbus: A, B, GND (optional)

#Sensors: 1-2, 3-5, 6+ Sensors

Dimensions:

3.6"H x 2.0"W x 1.2"D (90.4mm x 51mm x 30mm)

Approved Cable Types:

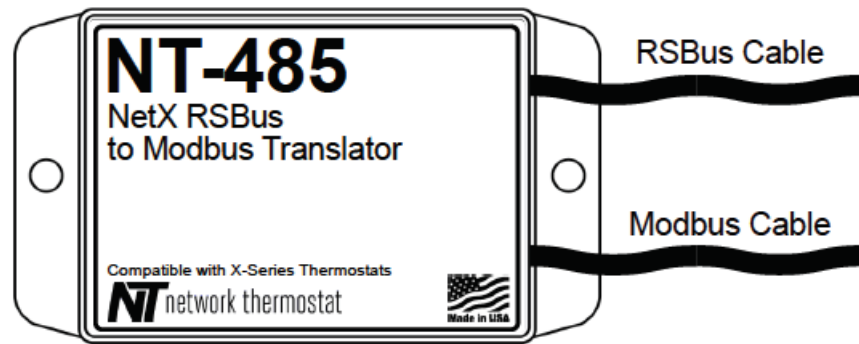
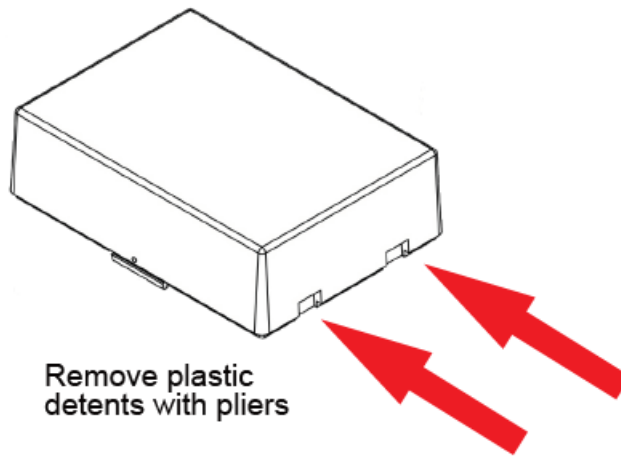
CAT5 or CAT5e unshielded, or 1-Pair Twisted Shielded Cable with Drain and nominal capacitance of 12pF/ft or less. Use riser or plenum jacket as required by local code.

Maximum 300ft Total Sensor Cable Length per Thermostat

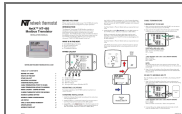
MODBUS POINTS LIST

See Network Thermostat Document 240319

FINAL ASSEMBLY DIAGRAM



Documents / Resources



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NT-485, NetX Modbus Translator