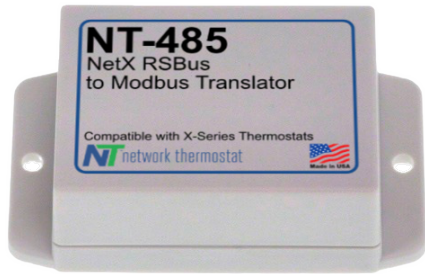


NetX™ NT-485 Modbus Translator

INSTALLATION MANUAL



WWW.NETWORKTHERMOSTAT.COM

TABLE OF CONTENTS

| | |
|--|---|
| BEFORE YOU START | 1 |
| WHAT IS IN THE BOX? | 1 |
| NT-485 CALLOUT | 1 |
| MOUNTING LOCATIONS | 1 |
| HARDWARE INSTALLATION | 1 |
| CABLE TERMINATIONS (TSTAT TO NT-485) | 1 |
| CABLE TERMINATIONS (NT-485 TO MODBUS) | 1 |
| RSBUS LOADING - JUMPER SETTINGS | 2 |
| X-SERIES THERMOSTAT SETUP FOR MODBUS | 2 |
| MODBUS ADDRESS SETTING | 2 |
| MODBUS COMMS CONFIGURATION | 2 |
| LED STATUS | 2 |
| ONE (1) YEAR LIMITED WARRANTY | 2 |
| SPECIFICATIONS | 2 |
| MODBUS POINTS LIST | 2 |

BEFORE YOU START

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

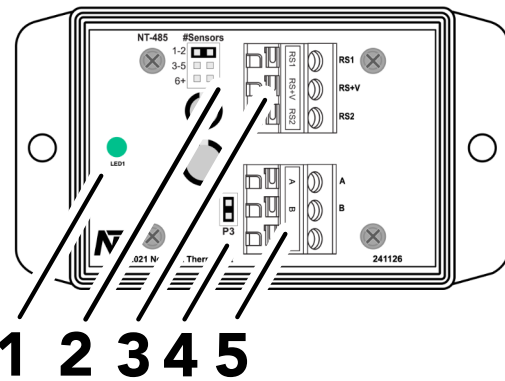
INTRODUCTION

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.

HARDWARE 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. Maximum distance is 300ft. (90m).

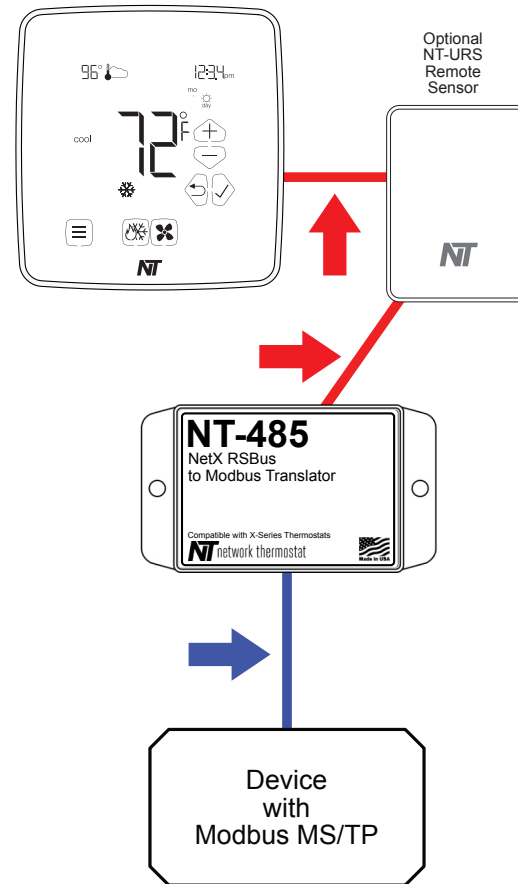
Use CAT5 or CAT5e unshielded, or 1-Pair Twisted Shielded Cable with Drain and nominal capacitance of 12 pF/ft or less, such as Connect Air W221P-2003NT available from Network Thermostat.

- 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

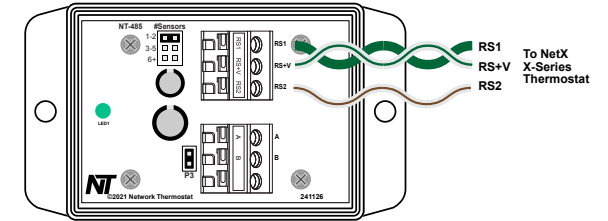
CAUTION: Disconnect power to the thermostat or remove thermostat faceplate before connecting either end of the cable.



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

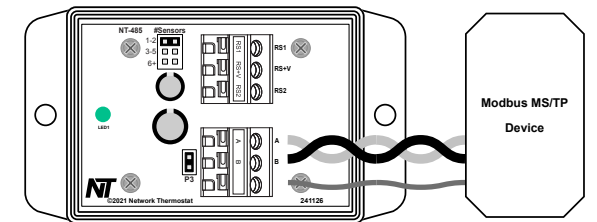
NOTE:
 Be careful with the wire color going to each terminal. The order of the terminals on the thermostat are not the same as the NT-485.

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.

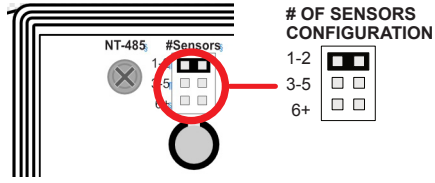


1-Pair Shielded cable color code: (W221P-2003NT)
 A (+) = White
 B (-) = Black
 GND (no label on terminal) = Drain wire (optional)

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 has 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.

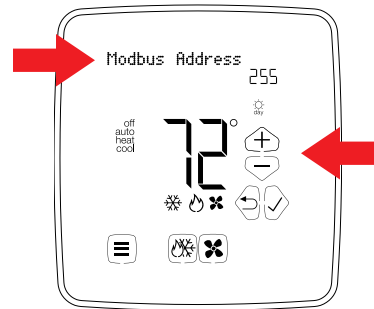
MODBUS ADDRESS SETTING

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 CONFIGURATION

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 manufacturers 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:

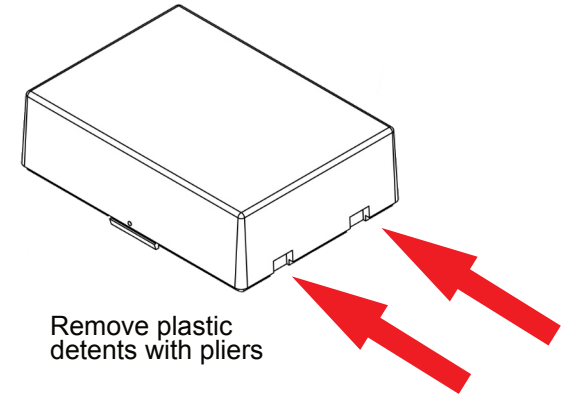
CAT5 or CAT5e unshielded, or 1-Pair Twisted Shielded Cable with Drain and nominal capacitance of 12pF/ft or less. Use riser or plenum jacket as required by local code.

Maximum 300ft Total Sensor Cable Length per Thermostat

MODBUS POINTS LIST

See Network Thermostat Document 240319

FINAL ASSEMBLY DIAGRAM



Remove plastic detents with pliers

