



## OUTSIDE HUMIDITY /TEMPERATURE NETWORK SENSOR NTOA Series

The NTOA Series outside RH/temperature network sensor uses a highly accurate and reliable Thermoset Polymer based capacitance humidity sensor and curve-matched NTC thermistor temperature sensor together with embedded BACnet® or Modbus communication to provide the most efficient monitoring and control solution.

The device connects to an RS-485 MS/TP network to offer a single-point solution for control of indoor air comfort.

The NTOA Series is provided in a hinged, gasketed weather-proof ABS enclosure that allows for ease of installation and protection from the elements.



### SPECIFICATION:

#### General Specifications:

Power Supply .....	<b>BACnet®:</b> 24 Vac/dc ± 10% (non-isolated half-wave rectified) <b>Modbus:</b> 15 - 30 Vac/dc (non-isolated half-wave rectified)
Consumption .....	<b>BACnet®:</b> 25 mA max @ 24 Vdc <b>Modbus:</b> 10 mA max @ 24 Vdc
Protection Circuitry.....	Reverse voltage and over voltage protected
Operation Conditions .....	-40 - 50 °C (-40 - 122 °F), 0-95% RH, non-condensing
Wiring Connections.....	Screw terminal block (14 to 22 AWG)
Enclosure .....	ABS, UL94-5VB - IP65 (NEMA 4X)
Enclosure Dimensions .....	145 W x 100 H x 64 D mm (5.7" x 3.95" x 2.5")
Probe.....	20 mm (0.8") long x 28 mm (1.1") diameter PVC hub with mesh filter

#### Relative Humidity:

Sensing Element.....	Thermoset polymer based capacitive
Accuracy .....	± 2% RH
Range.....	0 - 100% RH
Resolution .....	0.1% RH
Hysteresis .....	± 1.5% RH
Response Time .....	15 seconds typical
Stability .....	± 1.2% RH typical @ 50% RH in 5 years

#### Temperature:

Sensing Element.....	20KΩ NTC thermistor
Accuracy .....	±0.2 °C (±0.4 °F) curve matched
Range.....	-40 - 50 °C (-40 - 122 °F)
Resolution.....	0.1 °C/°F

#### BACnet® Communications Interface:

Hardware .....	2-wire RS-485
Software.....	Native BACnet® MS/TP protocol
Baud Rate .....	9600, 19200, 38400 or 76800 Auto-detect
Network Address Range .....	Locally set to 0-127

#### Modbus Communications Interface:

Hardware .....	2-wire RS-485
Software.....	Native Modbus MS/TP protocol (RTU)
Baud Rate .....	38400
Network Address Range .....	Locally set to 1-255
Parity.....	None
Stop Bits .....	1
CRC .....	A001 (CRC-16 reverse)

\* Modbus parameters may be factory customized

#### PART NUMBER SELECTED

#### PRODUCT SELECTION INFORMATION:

MODEL	Product Description
NTOA	Outside Humidity/Temperature Network Sensor

CODE	Communications Output
BAC	BACnet®
MOD	Modbus

Greystone Energy Systems, Inc. reserves the right to make design modifications without prior notice.

#### BACnet® COMMUNICATION

BACnet® is a data communication protocol for building automation and control networks. The sensor communicates on a standard 2-wire RS-485 MS/TP network designed to run at speeds from 9600 to 76800 baud over twisted pair wiring.

BACnet® is a registered trademark of ASHRAE. ASHRAE does not endorse, approve or test products for compliance with ASHRAE standards. Compliance of BACnet® listed products to the requirements of ASHRAE Standard 135 is the responsibility of BACnet® International (BI). BTL is a registered trademark of BI.

#### MODBUS COMMUNICATION

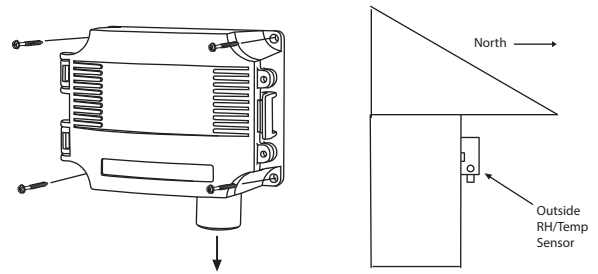
Modbus is a network protocol for industrial manufacturing environments. The sensor communicates on a standard Modbus network using the RTU (Remote Terminal Unit) transmission mode. The hardware interface is RS-485.

## TYPICAL INSTALLATION:

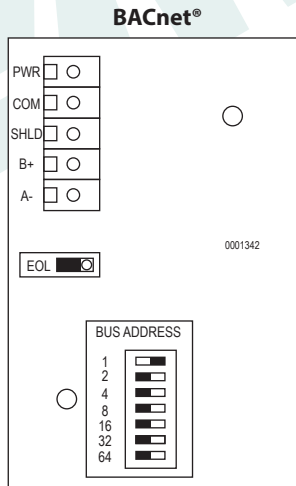
For complete installation and wiring details, please refer to the product installation instructions.

The NTOA should be mounted on an outside North facing wall, under the eaves which will provide protection from direct sunlight and wind.

The NTOA can be mounted directly to buildings wall face using the four provided mounting holes. There is a 0.85" hole for conduit connection.



## PCB/WIRING INFORMATION

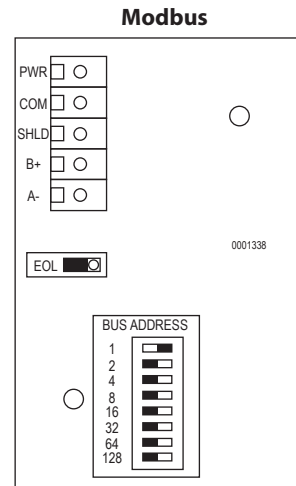


### Terminal

PWR  
COM  
SHLD  
B +  
A -

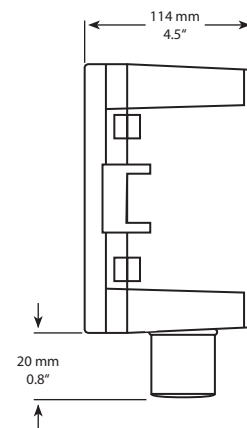
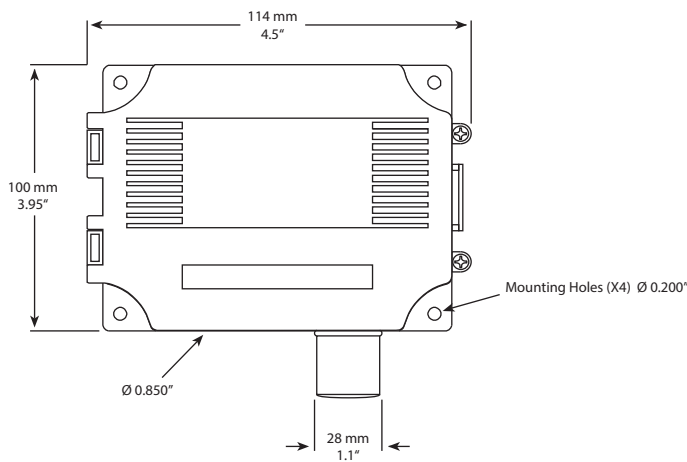
### Function

24 Vac/dc of controller or power supply  
To GND or COMMON of controller  
To communications bus shield  
To + of communications bus  
To - of communications bus



### Modbus

## DIMENSIONS:



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**RoHS**  
COMPLIANT



*Greystone Energy Systems Inc. is one of North America's largest ISO registered manufacturers of HVAC/R sensors and transmitters for Building Automation Management Systems. We have conscientiously established a worldwide reputation as an industry leader by maintaining leading-edge design technology, prompt technical support, and a commitment to on-time deliveries. We take pride in our Quality Management System which is ISO 9001 certified, assuring our customers of consistent product reliability.*

GREYSTONE HAS AN ISO 9001 REGISTERED QUALITY SYSTEM