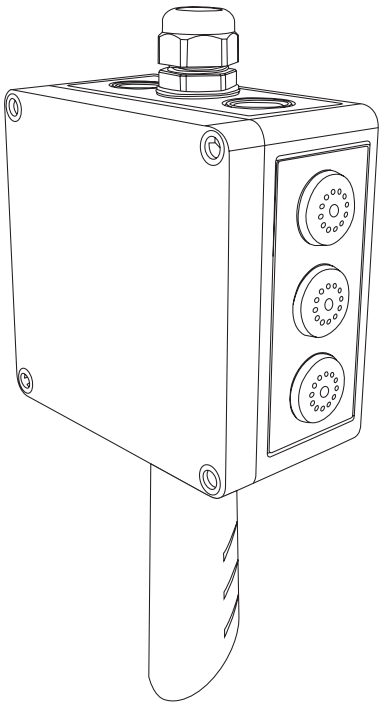
Horticulture Sensor

Installation Instructions



INTRODUCTION

The horticulture sensor series uses a highly accurate and reliable dual channel, Non-Dispersive Infrared (NDIR) sensor to monitor CO2, a precision thermistor to monitor temperature and a thermoset polymer based capacitance sensor to measure humidity levels combined with state-of-the-art digital linearization and temperature compensated circuitry. An adjustible relay output is included.

BEFORE INSTALLATION

Read these instructions carefully before installing and commissioning the horticulture sensor. Failure to follow these instructions may result in product damage. Do not use in an explosive or hazardous environment, with combustible or flammable gases, or as a safety or emergency stop device or in any other application where failure of the product could result in personal injury. Take electrostatic discharge precautions during installation and do not exceed the device specifications, as listed. Use 22 AWG shielded wiring for all connections and do not locate the device wires in the same conduit with wiring used to supply inductive loads such as motors. Make all connections in accordance with national and local codes.

MOUNTING

Remove the cover by using a standard or flat screwdriver to loosen the four screws as shown in Figure 1. As the screws are captive type, complete removal of the screw from the cover is not required. The horticulture sensor installs directly onto any wall or flat surface, or may hang from the ceiling via the wire through the cable gland on the top of the enclosure.

For wall mounting, select a suitable mounting area away from opening windows or any other disturbances. Mount the sensor directly to the wall using the four integrated mounting holes that are provided on each corner of the enclosure using a #10 size screw (not supplied). Ensure the cone on the bottom of the enclosure is pointing downwards. See Figure 2.

After the enclosure is securely mounted to the wall, feed the cable through the cable gland and tighten. See Figure 3.

Figure 1

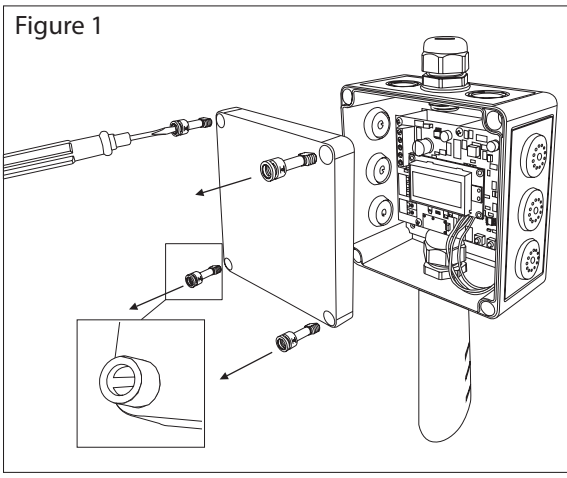
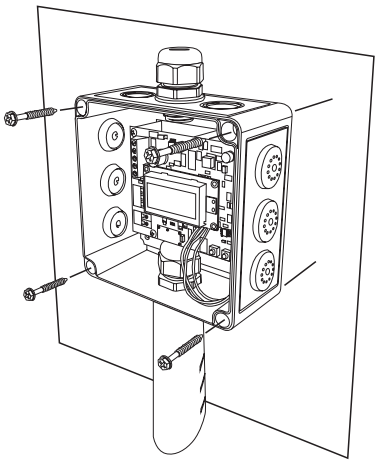


Figure 2



For a hanging style installation, feed the wire through the cable gland and tighten, allowing the enclosure to hang freely from the wire. See Figure 3.

Make wire connections as per the "Wiring" illustrations on Page 3. Once wiring and set up are complete, re-install cover and secure by tightening the four screws using a standard or flat screwdriver. See Figure 4.

Figure 3

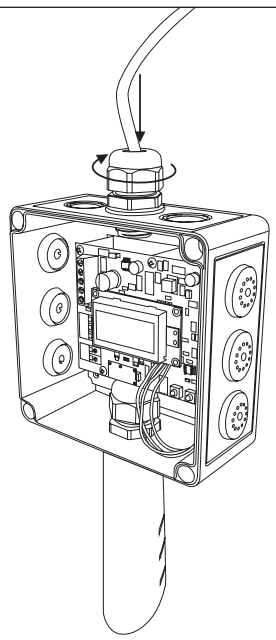
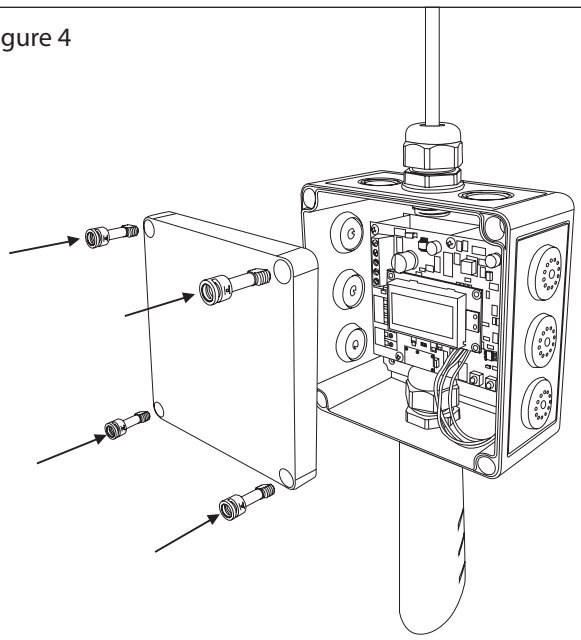


Figure 4



WIRING

- Deactivate the 24 Vac/dc power supply until all connections are made to the device to prevent electrical shock or equipment damage.
- Follow proper electrostatic discharge (ESD) handling procedures when installing the device or equipment damage may occur.
- Use 22 AWG wiring for all connections and do not locate the device wires in the same conduit with wiring used to supply inductive loads such as motors.
- Make all connections in accordance with national and local codes.

Connect the 24 Vac/dc power supply to the terminals labeled PWR +(power) and - (common) as shown in Figure 5. This device has a half-wave type power supply so use caution when wiring multiple devices so that the circuit ground point is the same on all devices and the controller. Use caution if 24 Vac power is used and one side of the transformer is earth-grounded. In general, the transformer should NOT be connected to earth ground when using devices with RS-485 network connections. The device is reverse voltage protected and will not operate if connected backwards. For End Of Line (EOL) device place termination resister jumper in ON position, for all other devices, place jumper in OFF position. See Figure 6.

Figure 5

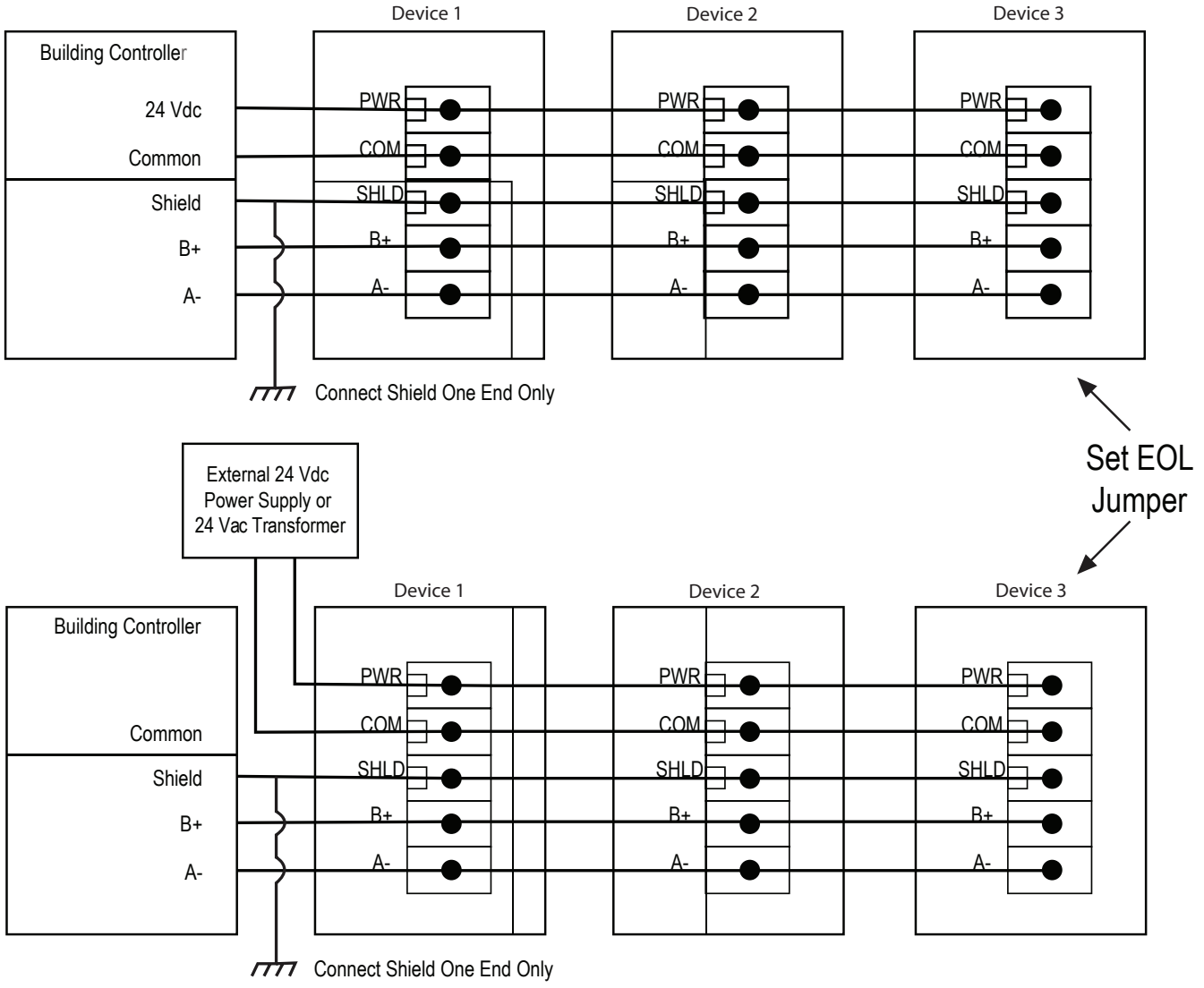
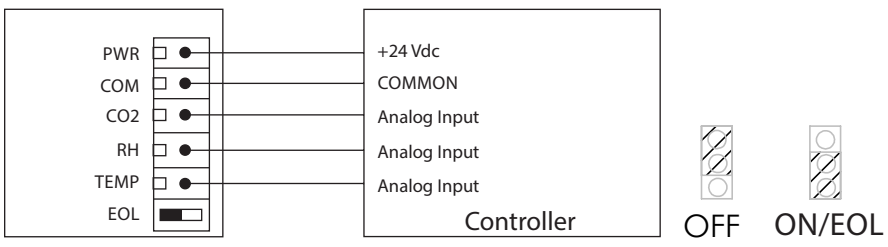
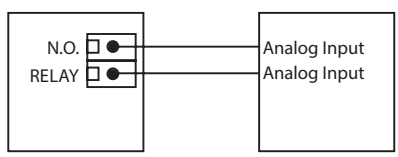


Figure 6



RELAY



USER MENU

The User Menu has several items as shown below. To enter the menu, press and release the <MENU> key while in normal operation. This will enter the User Menu step 1, pressing the <MENU> key a second time advances to step 2. Each press of the <MENU> key saves the selection and advances the menu item. The <ROLL> key is used to make changes to program variables by scrolling through the available options.

START-UP

On start-up, the LCD will indicate the software version number, the output signal type.

Version / 1.00

Modbus / Addr 01	or	BACnet® / MAC 03
BaudRate / 9600		BaudRate / 9600

OPERATION – GO3B BACnet® MODEL

In normal operation the device reads the CO2, RH, and temperature sensors and updates the object values accordingly. The LCD displays the sensor values as determined by the display mode object.

The setpoint scale can be configured via the menu. Various options are available such as temperature ranges in °C or °F, %RH values or ppm values. See the Setup Menu section for more details. Changing the scale in the menu will affect the BACnet® object and the LCD display of the setpoint values.

OPERATION – GO3M MODBUS MODEL

In normal operation the device reads the CO2, RH, and temperature sensors and updates the register values accordingly. The setpoint units may be changed as described in the menu section.

SETUP

Press and release the <MENU> key to enter the SETUP menu

Address Setup

1. For Modbus device only

Modbus Addr 01	Use <ROLL> to select a unique slave address from 1-255. The default Modbus slave address is 1. Hold <ROLL> for 1 second to increment quickly.

For BACnet® device only

BACnet MAC 01	Use <ROLL> to select a unique slave address from 0-127. The default BACnet® slave address is 1. Hold <ROLL> for 1 second to increment quickly.

Press <MENU> to save and advance.

2.BaudRate

BaudRate 9600	Use <ROLL> to select a BaudRate of 9600, 19200, 38400, 57600, 76800, or 115200. The default Modbus BaudRate is 9600.

Press <MENU> to save and advance.

Modbus Device Only

3. Parity

Modbus Parity N	Use <ROLL> to select a parity value of N (none), O (odd), or E (even). The factory default Modbus parity bit is N (none).

Press <MENU> to save and advance.

4. Stop Bits

ModBus Stop 1	Use <ROLL> to toggle the stop bits between 1 and 2. The Modbus stop bits is 1.

Press <MENU> to save and advance.

Modbus Device Only (continued)

5. CRC Value

ModBus CRC A001

Use <ROLL> to set the CRC value to A001 (CRC-16 reverse), 1021 (CITT), 8005 (CRC-16), 8408 (CITT reverse). The default CRC polynomial is 0xA001.

Press <MENU> to save and advance.

6. Delay

ModBus Del MIN

Use <ROLL> to change the value from MIN (minimum) to 50, 100, 150, 200, 250, 300, or 350ms. The factory default slave response delay is minimum (minimum delay means just more than 3.5 character time delays, 4ms for 9600 baud rate, for example).

Press <MENU> to save and advance.

Calibration

7.

Calibrat 0 PPM

This item is used for 0 ppm gas calibration and is explained in the *Calibration* section.

Press <MENU> to save and advance.

8.

Calibrat 1000 PPM

This item is used for 1000 ppm gas calibration and is explained in the *Calibration* section.

Press <MENU> to save and advance.

9.

Calibrat 20000 PPM

This item is used for 20,000 ppm gas calibration and is explained in the *Calibration* section.

Press <MENU> to save and advance.

10. Backlight

BackLite Auto

Use <ROLL> to enable, disable, or set to auto the LCD backlight. When enabled the LCD backlight is always on, when disabled it never lights and if it is set to Auto it lights for a period of 30 seconds whenever a key is pressed. The factory default is Auto.

Press <MENU> to save and advance.

11. Exit

Menu Exit

Press <MENU> or <ROLL> to edit the menu and return to normal operation.

SPECIFICATIONS

General Specifications

Power Supply	20-28 Vac/dc (non-isolated half-wave rectified)
Consumption	73 mA max @ 24 Vdc, 124 mA max @ 24 Vac with all options
Protection Circuitry	Reverse voltage protected, overvoltage protected
Operating Conditions	0 to 50°C (32 to 122°F), 0 to 95 %RH non-condensing
Wiring Connections	Screw terminal block (14 to 22 AWG)
Sensor Coverage Area	100 m_2 (1000 ft_2) typical
Enclosure	Wall mount enclosure, 130 mm W x 130 mm H x 75mm D (5.12" x 5.12" x 2.95")

CO2 Signal

Measurement Type	Dual Channel Non-Dispersive Infrared (NDIR), diffusion sampling
Measurement Range	0-20,000 ppm
Standard Accuracy	75 ppm or 10% of reading (whichever is higher)
Temperature Dependence	0.2 %FS per °C
Stability	< 5 %FS over life of sensor (15 years typical)
Pressure Dependence	0.13 % of reading per mm Hg
Altitude Correction	Programmable from 0-5000 ft via Modbus or BACnet®
Response Time	< 2 minutes for 90% step change typical
Warm-up Time	< 2 minutes

Interface

Hardware	2-wire RS-485
Software	Native Modbus MS/TP protocol, Native BACnet® MS/TP protocol
Baud Rate	Locally set to 9600, 19200, 38400, 57600, 76800, or 115200
Slave Address Range	Locally set to Modbus − 1-255 (factory default is 1), BACnet® − 1-127 (factory default is 1)

LCD Display

Resolution	1 ppm CO2, 1 %RH, 0.1°C (0.1°F)
Size	35 mm W x 15 mm H (1.4" W x 0.6" H) alpha-numeric 2 line x 8 characters
Backlight	Enable or disable via keypad

Temperature Signal

Sensing Element	10K thermistor, ±0.2°C (±0.4°F)
Range	0 to 35°C (32 to 95°F) or 0 to 50°C (32 to 122°F) selectable via keypad
Resolution	0.1°C

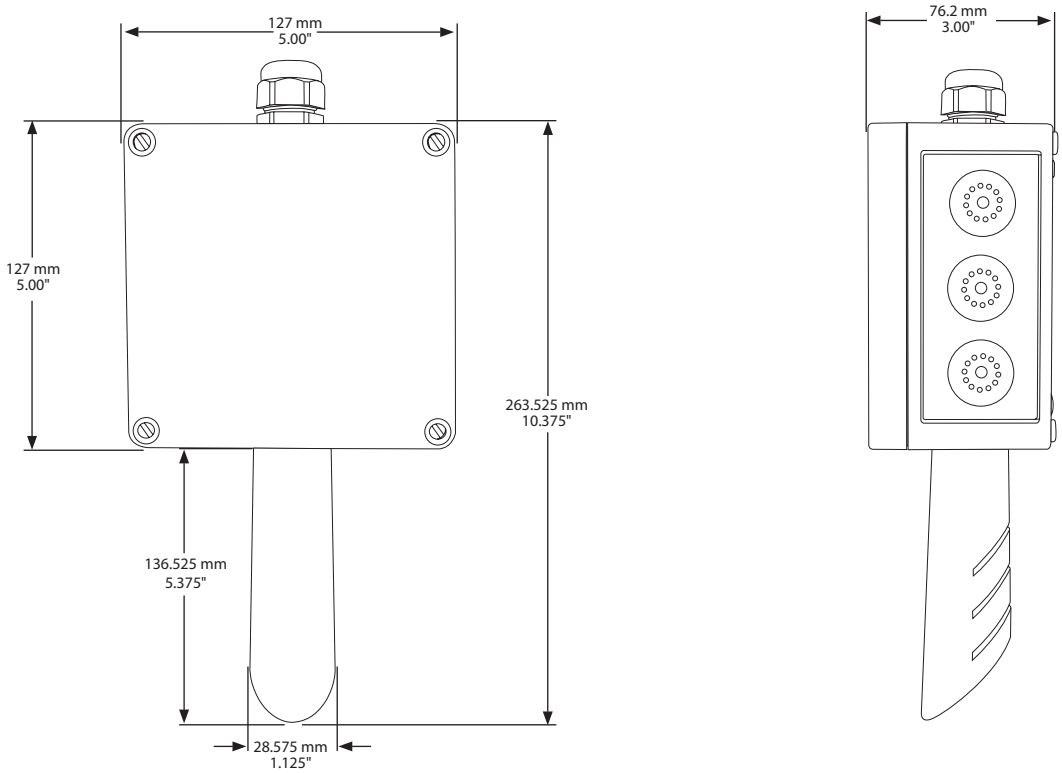
RH Signal

Sensor	Thermoset polymer based capacitive
Accuracy	±2 %RH
Range	0 to 100 %RH, non- condensing
Resolution	2 %RH
Hysteresis	±3 %RH
Response Time	15 seconds typical
Stability	±1.2 %RH typical @ 50 %RH in 5 years

Optional Relay Output

Contact Ratings	Form A contact (N.O.), 2 Amps @ 140 Vac, 2 Amps @ 30 Vdc
Relay Trip Point	Programmable 500 to 15000 ppm via BACnet® or Modbus
Relay Hysteresis	Programmable 25 to 500 ppm via BACnet® or Modbus

DIMENSIONS



NETWORK SETUP GUIDE

The network setup guide describes the implementation of the BACnet® for Modbus protocol. It is intended to assist control system programmers who may need to add support to their systems to communicate with this device.

BACnet® and Modbus setup guide downloads are available online.

BACnet® PROTOCOL

http://downloads.greystoneenergy.com/Website%20Documents/GO3/SG-GO3BACnet-01-01.pdf

MODBUS PROTOCOL

http://downloads.greystoneenergy.com/Website%20Documents/GO3/SG-GO3Modbus-01-01.pdf

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