



# **GBD-X Controller**

## **General Information & Application Guide**

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# GBD-X Controller

## SS1029

**DESCRIPTION:** The GBD-X Controller has the ability to monitor up to 12 temperature sensors and broadcast the average of those sensors to a VCM or VCM-X controller. It also includes the ability to read CO<sub>2</sub> sensors and either average or find the highest reading to be broadcast to the same controllers. It also provides a 0-10 VDC proportional reset voltage on Analog Output #1 based on the level of CO<sub>2</sub> as it rises from an adjustable minimum setting to an adjustable maximum level.

Analog Output #2 provides a 10.0 VDC signal whenever the CO<sub>2</sub> is above the minimum setpoint.

Relay #1 is activated whenever the CO<sub>2</sub> rises above the minimum setting and de-activates when it falls 5 PPM below the setpoint.

Relay #2 is activated whenever the CO<sub>2</sub> rises above the maximum setting and de-activates when it falls 5 PPM below the setpoint.

**LIMITATIONS:** When using the GBD-X controller you must have the following minimum equipment installed on your controls system:

Single Loop System requires either a CommLink or a MiniLink to allow broadcasting to and from the GBD-X controller.

Multiple Loop Systems require both a CommLink and a MiniLink to allow broadcasting to and from the GBD-X controller.

Only 6 sensors can be connected to a single GBD-X controller. If more than 6 sensors are needed then a second GBD-X controller board for sensors 7 to 12, is required. The global analog broadcast channels are user selectable.

Celsius temperatures are not supported.

Only the VCM and VCM-X Controllers can read the CO<sub>2</sub> for IAQ operations.

Any VCM or VCM-X on a loop can have broadcast devices sending it data since the global receive channel is fixed at Global Analog #13 for temperature (if no space sensor installed) and #14 for CO<sub>2</sub> (if no sensor is installed).

**SOFTWARE:** PRISM II version 3.1.1 or higher is required to program and monitor the GBD-X controllers.

**APPLICATIONS: Up to 6 Space Temperature Sensors**

One GBD-X controller with up to 6 Space Temperature Sensors wired in. Set the GBD-X controller to broadcast on channel 13.

**7 to 12 Space Temperature Sensors**

Two GBD-X controllers with up to 6 Space Temperature Sensors wired in on each. Set one of the GBD-X controllers to broadcast on channel 13. Set this one to also receive on channel 23. Set the other GBD-X controller to broadcast on channel 23.

**Up to 6 CO<sub>2</sub> Sensors**

One GBD-X controller with up to 6 CO<sub>2</sub> Sensors wired in. Set the GBD-X controller to broadcast on channel 14.

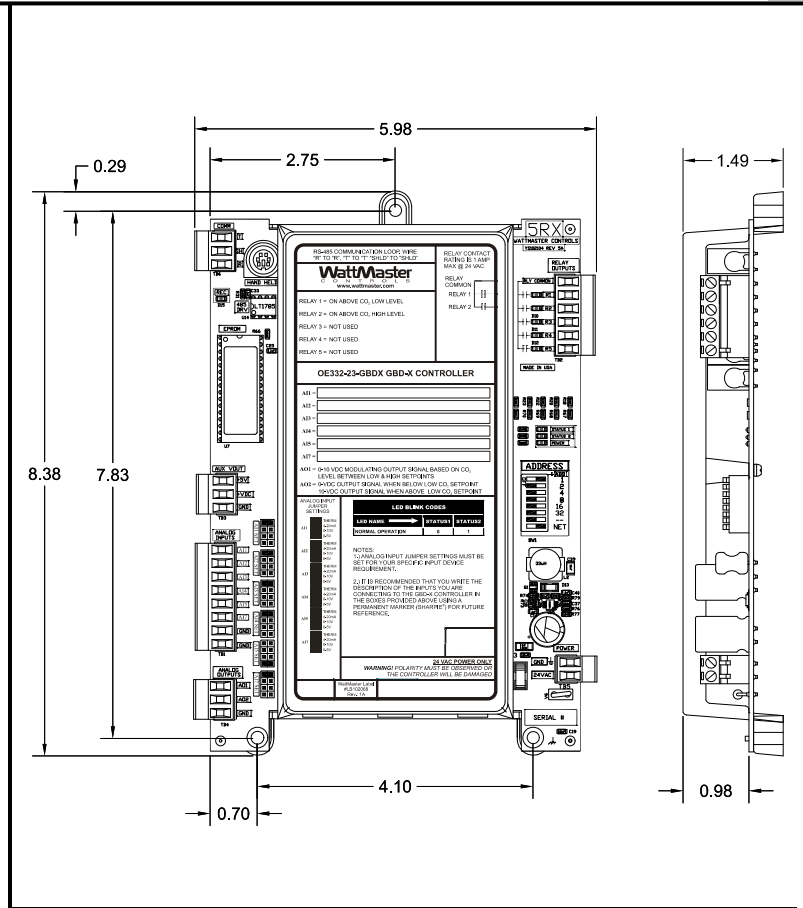
**7 to 12 CO<sub>2</sub> Sensors**

Two GBD-X controllers with up to 6 CO<sub>2</sub> Sensors wired in to each. Set one of the GBD-X controllers to broadcast on channel 14. Set this one to also receive on channel 24. Set the other GBD-X controller to broadcast on channel 24.

**CAUTION: You cannot mix Space Temperature Sensors with CO<sub>2</sub> Sensors on the same controller!**

## Description

The OE332-23-GBDX General Broadcast Device Controller provides a method of connecting up to a maximum of (6) Room Temperature Sensors so that they can then be averaged and globally broadcast to one VCM-X controller on a local loop. The GBD-X also includes the ability to read up to (6) Carbon Dioxide sensors and average or find the highest reading and then broadcast the reading to one VCM-X controller on a local loop. It also provides a 0-10 VDC proportional voltage output signal on Analog Output #1 of the GBD-X. The GBD-X calculates and varies this signal depending on the level of CO<sub>2</sub> in the space as it rises from an adjustable minimum setting to an adjustable maximum level. Also, if desired, Analog Output #2 can provide a 10.0 VDC fixed output signal whenever the CO<sub>2</sub> is above the minimum setpoint. In addition, Relay Output #1 activates whenever the CO<sub>2</sub> rises above the minimum setpoint and deactivates when it falls 5 PPM below the minimum setpoint. Relay Output #2 activates whenever the CO<sub>2</sub> rises above the maximum setpoint and deactivates when it falls 5 PPM below the maximum setpoint.



When more than (6) CO<sub>2</sub> or Temperature Sensors are to be used, a second GBD-X controller must be used and would then allow the use of from (7) to (12) Room Temperature Sensors or CO<sub>2</sub> Sensor inputs. Each GBD-X controller can be used for either temperature averaging or CO<sub>2</sub> averaging, but not both on the same GBD-X controller. When both are required at least (2) GBD-X controllers, one configured for CO<sub>2</sub> control and the other configured for Temperature averaging must be used. Either a CommLink or MiniLink PD must always be installed on the controls system when using the GBD-X Controller due to its broadcast requirements. A personal computer with Prism software installed is also required to program the GBD-X controller.

## Mounting

The GBD-X is provided with an integral plastic enclosure which provides mounting points for mounting inside of a control enclosure. It is recommended that the GBD-X be mounted in a control enclosure in the building equipment room. An optional factory control enclosure for the GBD-X is also available.

Technical Data		OE332-23-GBDX GBD-X Controller	
Power	24 Volt AC	Weight	1.5 lb.
Power Consumption	8 VA Maximum	Network Connection	RS-485
Operating Temp	10°F to 149°F	Protocol	HSI Open Protocol Token Passing
Operating Humidity	90% RH Non-Condensing	Communications	RS-485 - 9600 Baud
<b>Inputs Available</b>		<b>Outputs Available:</b>	
Types and Quantity of User Selectable Inputs	Type III-10kohm input (6)	AO1 Output	0-10 VDC Variable Signal
	4-20ma input (6)	AO2 Output	10 VDC Fixed Signal
	0-5 VDC (6)	R1 Output	Contact Closure
		R2 Output	Contact Closure
<b>Three Year Warranty</b>		<b>WattMaster reserves the right to change specifications without notice</b>	

Connect The GBD-X To The Same Local Communications Loop As The Controller That Will Be Receiving The GBD-X Broadcast

Communications Wire Must Be 2 Conductor Twisted Pair With Shield, Belden #82760 Or Equivalent. All Wiring Must Be Straight Through, R To R, T To T And SHLD To SHLD.

Available Inputs For Connection of CO<sub>2</sub> Sensor 4-20mA Signal See Page 2 For Detailed CO<sub>2</sub> Sensor Wiring

Available 0-10 VDC Proportional Output Signal

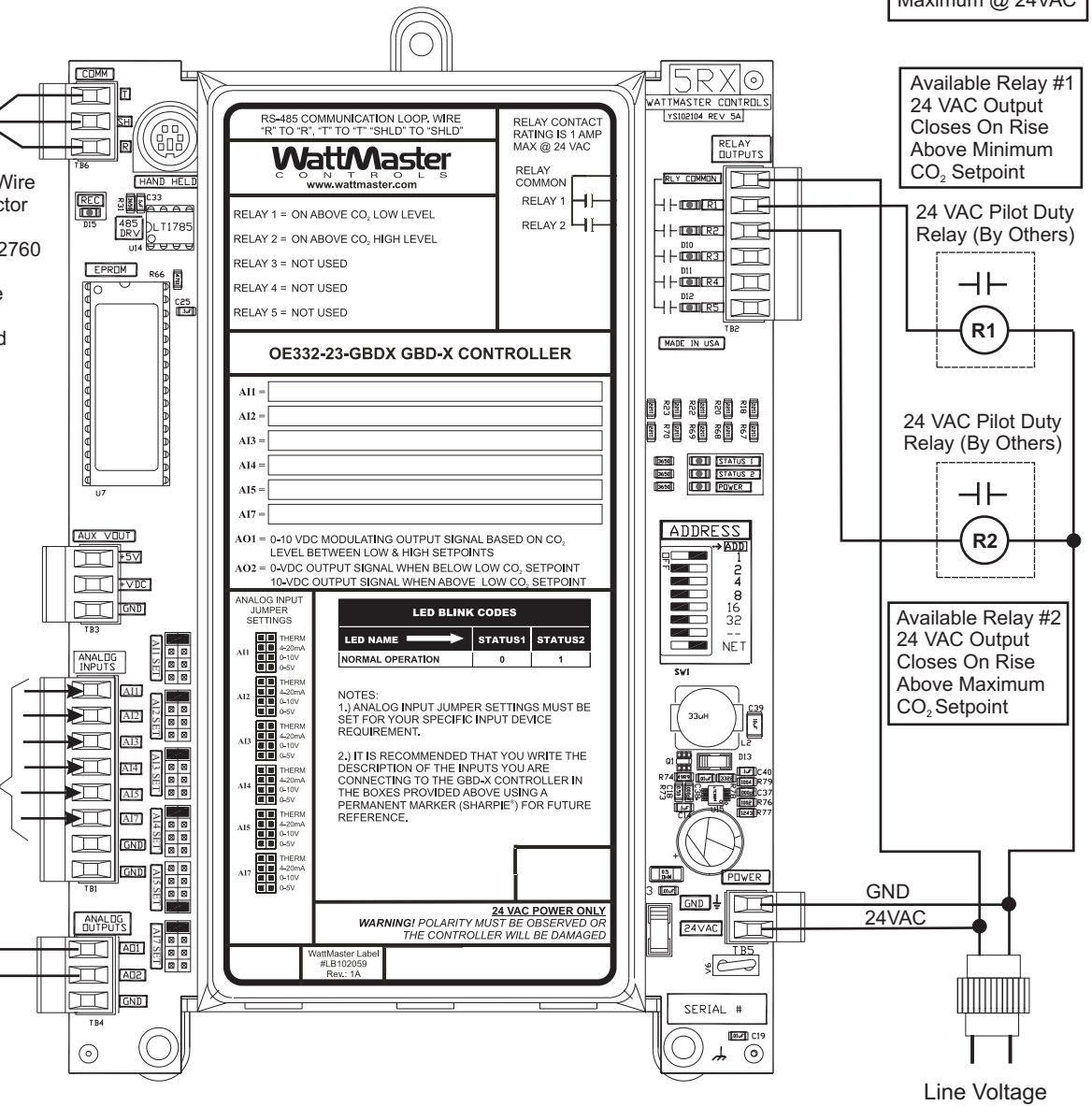
Available 10 VDC Fixed Output Signal

**Note:**  
All Relay Contacts Are N.O. & Rated For 1 Amps Maximum @ 24VAC

Available Relay #1  
24 VAC Output Closes On Rise Above Minimum CO<sub>2</sub> Setpoint

24 VAC Pilot Duty Relay (By Others)

Available Relay #2  
24 VAC Output Closes On Rise Above Maximum CO<sub>2</sub> Setpoint



**OE332-23-GBDX  
GBD-X Device Wiring  
When Used For CO<sub>2</sub> Applications**

- Notes:**
- 1.) The GBD-X Can Either Be Used With CO<sub>2</sub> Sensors Or Space Temperature Sensors But Not Both On The Same GBD-X Controller. Up to 2 GBD Controllers Can Be Located On Each Local Loop.
  - 2.) 24 VAC Must Be Connected So That All Ground Wires Remain Common.
  - 3.) Set-up, Programming And Monitoring Of The GBD-X Controller Requires The Use Of A Personal Computer And Prism Software.
  - 4.) All Wiring To Be In Accordance With Local And National Electrical Codes And Specifications.

JOB NAME	
FILENAME	
OE332-23-GBDX-Wire1A.CDR	
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PAGE	DESCRIPTION:
1 of 5	OE332-23- GBDX Controller
	GBD-X Wiring

The Jumper For The Analog Input That Each CO<sub>2</sub> Sensor Is Connected To Must Be Set For 4-20mA As Shown For Proper Operation Of The GBD-X Controller.

Up to (6) CO<sub>2</sub> Sensors Can Be Used On The GBD-X. They Can Be Wired To AIN1, AIN2, AIN3, AIN4, AIN5 And AIN7 As Desired. Only 4-20mA CO<sub>2</sub> Sensor(s) May Be Used.

Typical Wiring Shown For Input AIN1. Wiring For Other Inputs Is Identical.

**Warning:**  
24 VAC Must Be Connected So That All Ground Wires Remain Common. Failure To Do So Will Result In Damage To The Controllers.

Jumper Can Be Set To 0-5 V Or 0-10 V For 4-20 mA Operation (Both Pins Covered Or 1 Pin) On Jumper Terminals J3

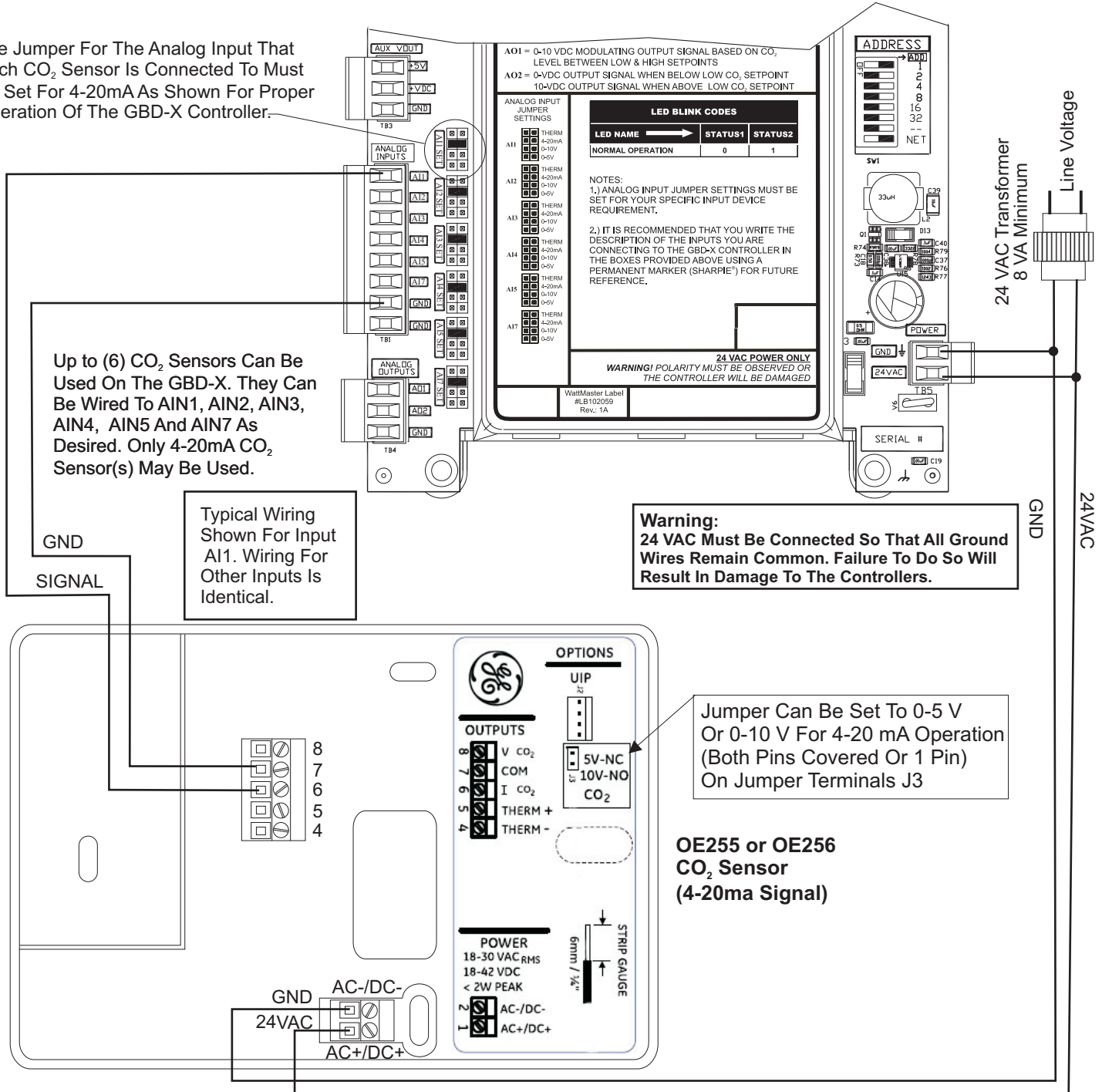
**OE255 or OE256  
CO<sub>2</sub> Sensor  
(4-20ma Signal)**

### OE332-23-GBDX GBD-X Device Wiring When Used For CO<sub>2</sub> Applications

**Notes:**

- 1.) The GBD-X Can Either Be Used With CO<sub>2</sub> Sensors Or Space Temperature Sensors But Not Both On The Same GBD-X Controller. Up to 2 GBD Controllers Can Be Located On Each Local Loop.
- 2.) 24 VAC Must Be Connected So That All Ground Wires Remain Common.
- 3.) Set-up, Programming And Monitoring Of The GBD-X Controller Requires The Use Of A Personal Computer And Prism Software.
- 4.) All Wiring To Be In Accordance With Local And National Electrical Codes And Specifications.

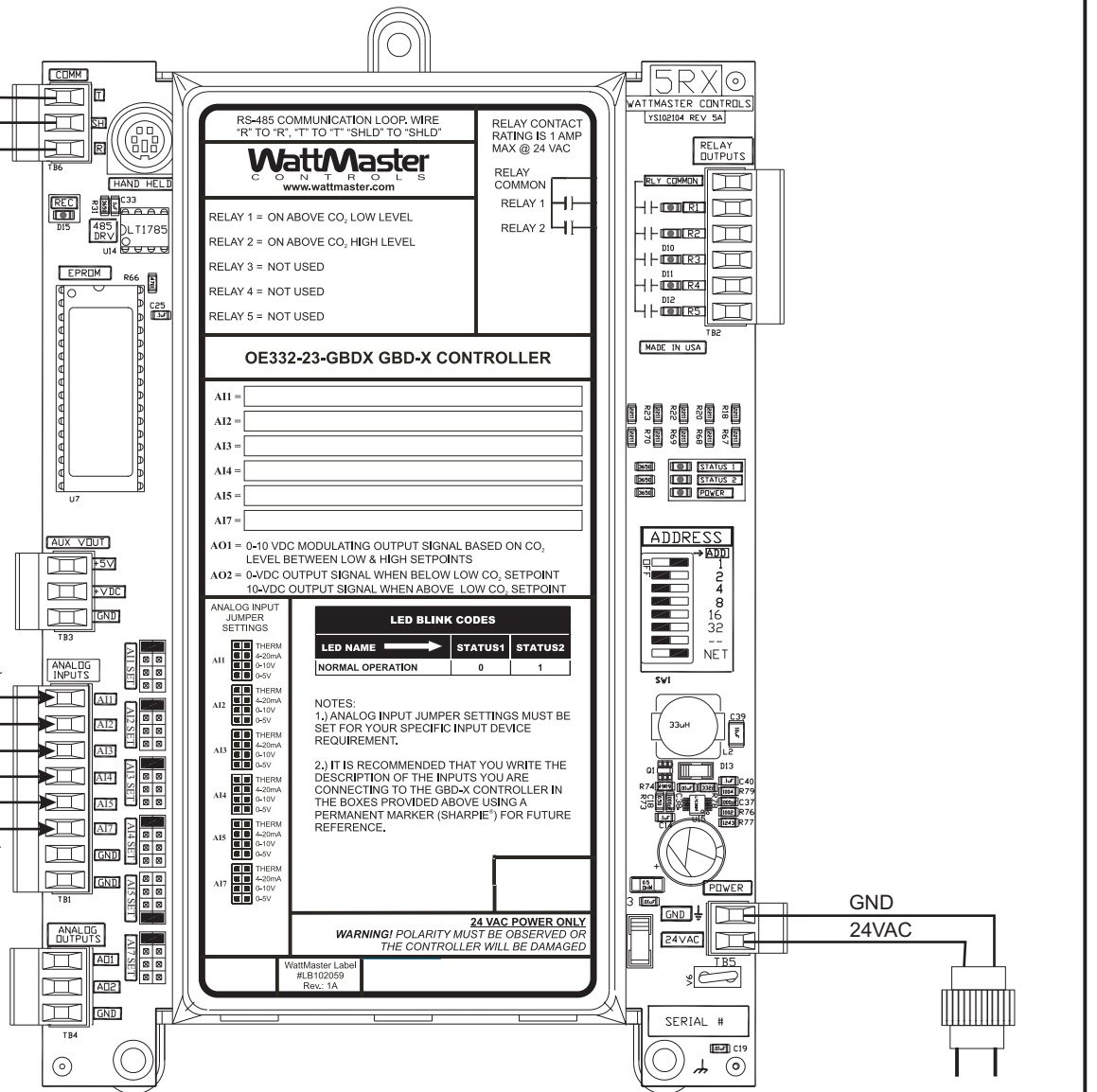
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2 of 5	OE332-23- GBDX Controller
GBD-X Wiring	



Connect The GBD-X To The Same Local Communications Loop As The Controller That Will Be Receiving the GBD-X Broadcast

Communications Wire Must Be 2 Conductor Twisted Pair With Shield, Belden #82760 Or Equivalent. All Wiring Must Be Straight Through, R To R, T To T And SHLD To SHLD.

Available Inputs For Connection of Space Temperature Sensors. See Page 4 For Detailed Space Temperature Sensor Wiring



**OE332-23-GBDX**

**GBD-X Device Wiring**

**When Used For Space Temperature Sensor Applications**

**Notes:**

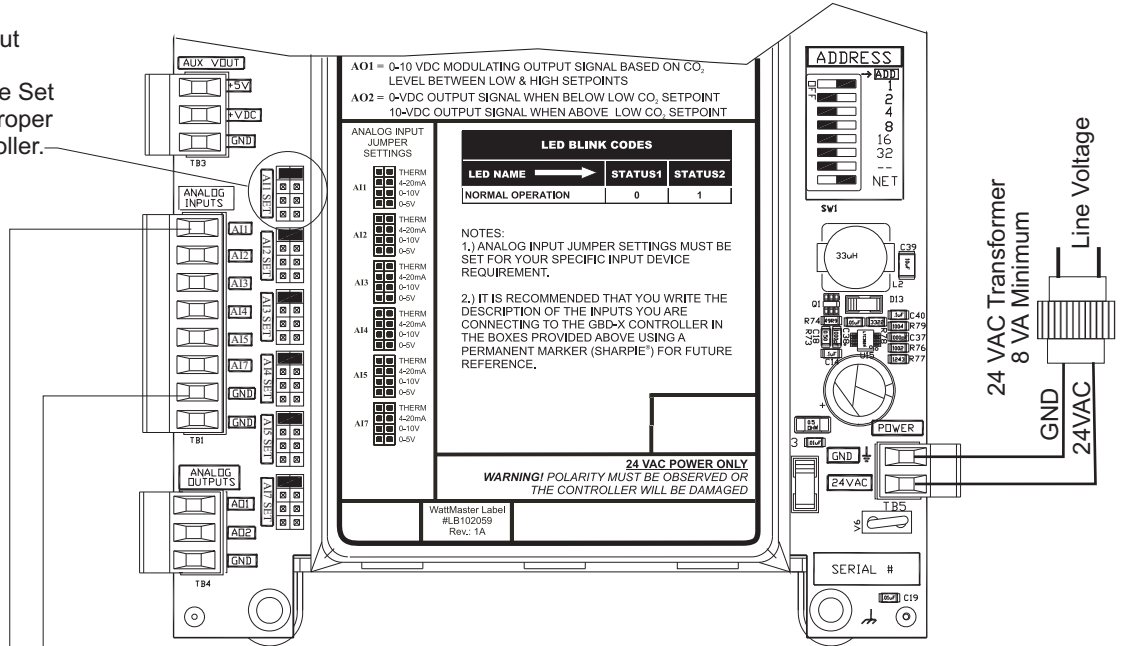
- 1.) The GBD-X Can Either Be Used With CO2 Sensors Or Space Temperature Sensors But Not Both On The Same GBD-X Controller. Up to 2 GBD Controllers Can Be Located On Each Local Loop.
- 2.) 24 VAC Must Be Connected So That All Ground Wires Remain Common.
- 3.) Set-up, Programming And Monitoring Of The GBD-X Controller Requires The Use Of A Personal Computer And Prism Software.
- 4.) All Wiring To Be In Accordance With Local And National Electrical Codes And Specifications.

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3 of 5	OE332-23- GBDX Controller
	GBD-X Wiring

Line Voltage  
24 VAC Transformer  
8 VA Minimum

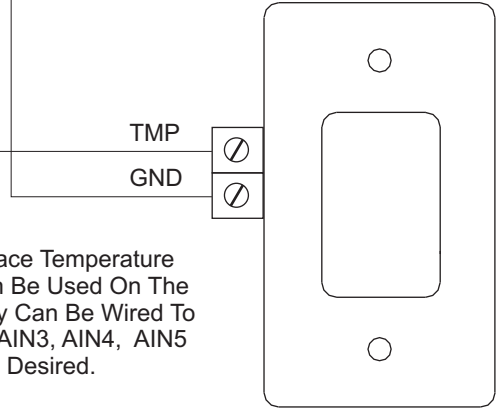
The Jumper For The Analog Input That Each Space Temperature Sensor Is Connected To Must Be Set For Thermistor As Shown For Proper Operation Of The GBD-X Controller.

Typical Wiring Shown For Input AI1. Wiring For Other Inputs Is Identical.



**Warning:**  
 24 VAC Must Be Connected So That All Ground Wires Remain Common. Failure To Do So Will Result In Damage To The Controllers.

**OE210 Space Temperature Sensor**



Up to (6) Space Temperature Sensors Can Be Used On The GBD-X. They Can Be Wired To AIN1, AIN2, AIN3, AIN4, AIN5 And AIN7 As Desired.

**OE331-21-AVG  
 GBD Device Wiring  
 When Used For Space Temperature Sensor Averaging Applications**

- Notes:**
- 1.) The GBD-X Can Either Be Used With CO2 Sensors Or Space Temperature Sensors But Not Both On The Same GBD-X Controller. Up to 2 GBD Controllers Can Be Located On Each Local Loop.
  - 2.) 24 VAC Must Be Connected So That All Ground Wires Remain Common.
  - 3.) Set-up, Programming And Monitoring Of The GBD-X Controller Requires The Use Of A Personal Computer And Prism Software.
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GBD-X Wiring	







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