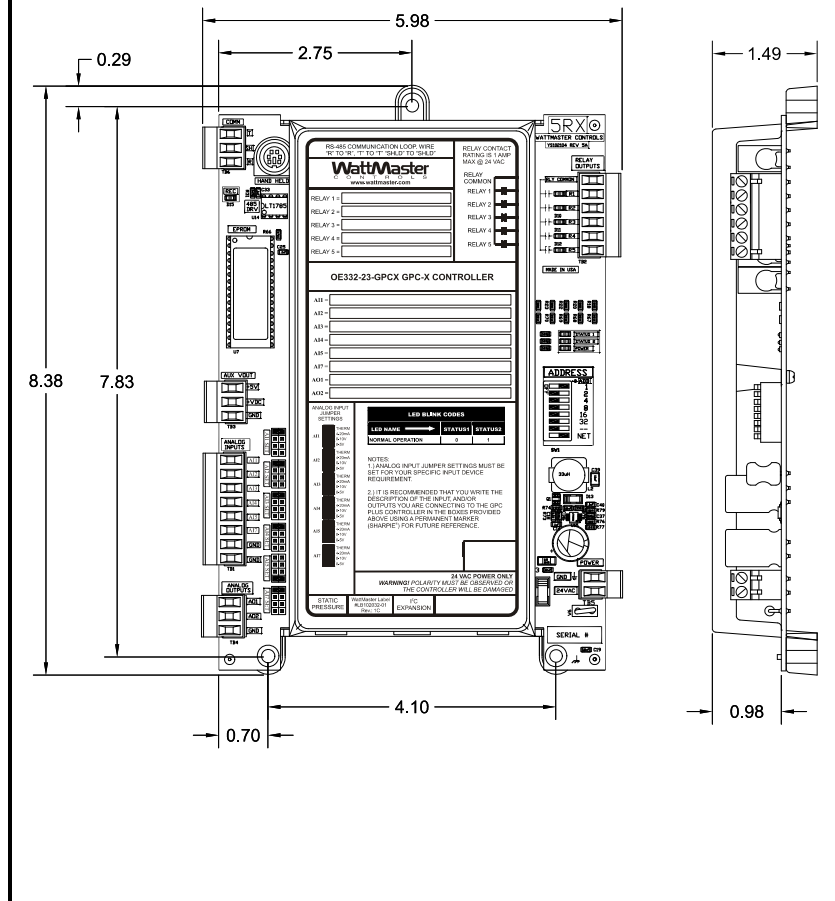


## Description

The OE332-23-GPCX GPC-X Controller is used for controlling equipment or processes that cannot be controlled using a standard HVAC controller. The Prism computer front end software is used to interface with the GPC-X controller functions. The GPC-X Controller provides the flexibility to control, schedule and/or monitor equipment such as unit heaters, exhaust fans, motorized louvers, and other mechanical equipment. The GPC-X has (6) configurable inputs which will accept signals from thermistor temperature sensors, 4-20mA or 0-5VDC or 0-10VDC transmitters or dry contact closures. The inputs are set for the desired input by means of a jumper bar. An additional modular input is provided for connection of an OE271 static pressure sensor. The GPC-X has (5) relay outputs for on/off control and (2) analog outputs. With the addition of the OE358-23-12R, 12 Relay Expansion Module, (4) additional relay outputs (of the 12 total relays on the module) are available for use with the GPC-X, providing for a maximum of (9) usable relay outputs total. The GPC-X also has (5) separate 2 event per day schedules, each with its own optimal start functions built in. In addition the GPC-X provides lead/lag start capabilities.



## Mounting

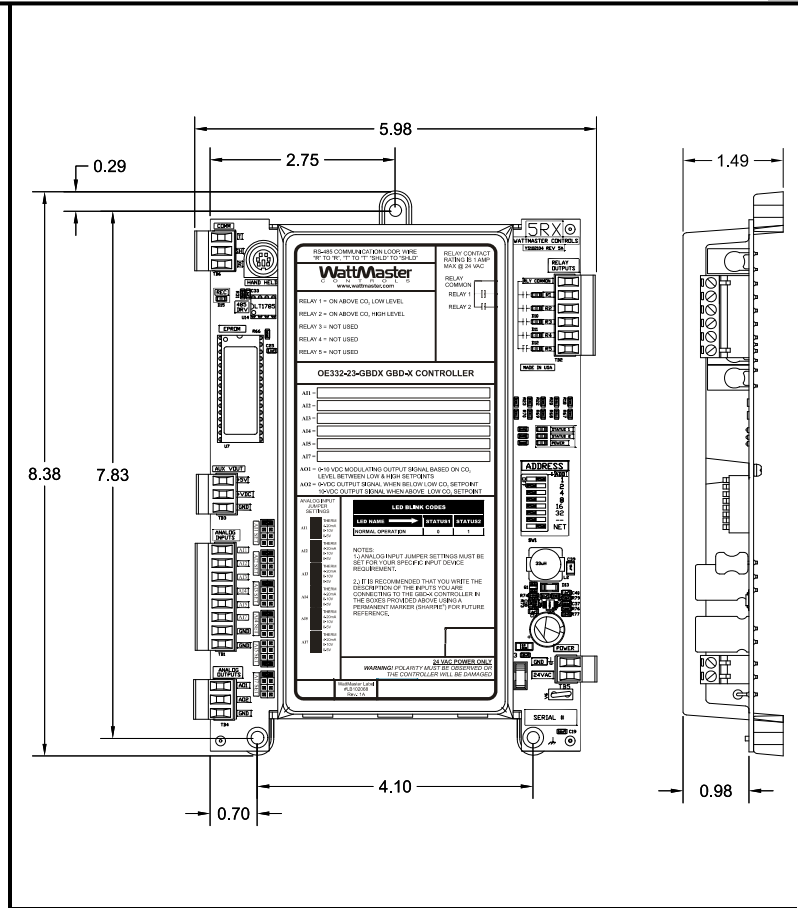
The GPC-X is provided with an integral plastic enclosure which provides mounting points for mounting inside of a control enclosure. It is recommended that the GPC-X be mounted in a control enclosure in the building equipment room. An optional factory control enclosure for the GPC-X is also available.

Technical Data		OE332-23-GPCX GPC-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:</b>		<b>Outputs:</b>	
Types of Allowed Inputs	Type III-10kohm sensors	Total Relay Qty. On Board	5
	4-20ma	Total Relay Qty. Available With Optional Expansion Board	9
	0-5VDC & 0-10VDC	Relay Power Rating	(2 Amp @ 24 VAC)
	N.O. or N.C. Binary Contact	Analog Output Qty.	2
Total Inputs Available	7	Analog Output Signal	0-10 VDC
Static Pressure Inputs	1 (Modular )	Optimal Start Schedules	(5) Total - (1) for Each Schedule
Configurable Inputs	6	Lead Lag Scheduling	(1) Output can be Configured
Schedules Available	(5) 2 Event per day	<b>WattMaster reserves the right to change specifications without notice</b>	
<b>Three Year Warranty</b>			

### Description

The OE332-23-GBDX General Broadcast Device Controller provides a method of connecting up to a maximum of (6) Thermistor 10 K Ohm Room Temperature Sensors (OE210, OE211, OE212, and OE213) 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) CO<sub>2</sub> Sensors—4-20 ma (OE255 and OE256) and/or 0-5VDC (by others)— 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 can be connected to the VCM-X 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. Up to a combined (16) additional GBD-X controllers can be daisy-chained together for a total of (18) GBD-X controllers on one loop. 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 or the System Manager Touch Screen 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.

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 (one of the 3 options at right)	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>	

## Description

The OE268 Over-voltage Module is designed to protect against higher than normal incoming control voltages that exceed the normal 24VAC +/-10%. WattMaster recommends the use of the OE268 Over-voltage Module anytime the measured voltage to the controller is above 27 VAC. The circuitry contained on the OE268 Over-voltage Module will safely limit the AC control voltages being supplied to the devices connected to it.

The OE268 Over-voltage Module is specifically designed to work with and protect the following products. The groups or items listed below on each line, require that you use (1) OE268 Over-voltage Module to power that group or item.

- VCM Controller and a 2 or 4 Slot Expansion Base Board
- GPC Plus Controller and a 2 Slot Expansion Base Board
- GBD Controller
- MODGAS or MODGASII Controller
- MHGRV, MHGRVII or MHGRVIII Controller

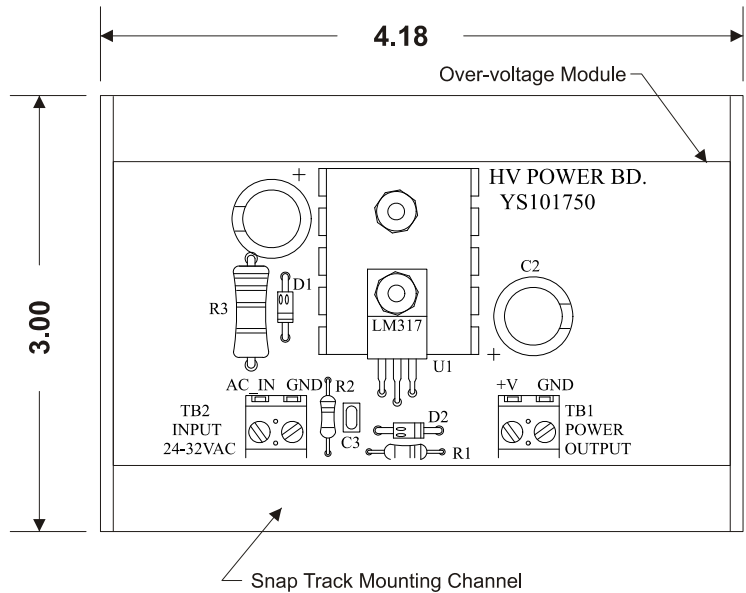
## Mounting

The OE268 Over-voltage Module is supplied mounted in a plastic Snap Track channel. Carefully remove the module from the Snap Track by sliding it out of the Snap Track channel. Mount the Snap Track to the control panel or enclosure base using one of the supplied sheet metal screws to secure it through the pre-drilled hole in the Snap Track channel. If desired, the second supplied screw can be used to further secure the Snap Track by drilling a second hole and using it to fasten the Snap Track. Carefully slide the Over-voltage Module back into the Snap Track Channel to complete the mounting procedure.

## Wiring

**Warning:** Correct Polarity must be observed on all wiring connections or damage to the controller and/or the OE268 may result. Wire sizes, types and wiring practices used should conform to all applicable national & local electric code requirements.

- First remove the power from the 24 VAC control transformer supplying the controller's low voltage power.
- Connect the TB2 "Power Input" terminal labeled "AC IN" to the 24VAC control supply voltage
- Connect the TB2 "Power Input" terminal labeled "GND" to the 24VAC "common or GND"
- Connect the TB1 "Power Output" terminal "+V" to the controller's "24 VAC" power input terminal
- Connect the TB1 "Power Output" terminal "GND" to the controller's "GND" power input terminal
- Reconnect the power to the control transformer and observe controller for correct operation.



Technical Data		OE268 Over-voltage Module	
Input Voltage	22 to 32 VAC	Power Consumption	Less Than 2 Watts
Output Voltage	30 VDC Nominal	Wiring Connections	Terminal Blocks
Operating Temperature	-30°F to +150° F	Operating Humidity	5-95% RH Non-Condensing
One Year Warranty		WattMaster reserves the right to change specifications without notice	

**Description**

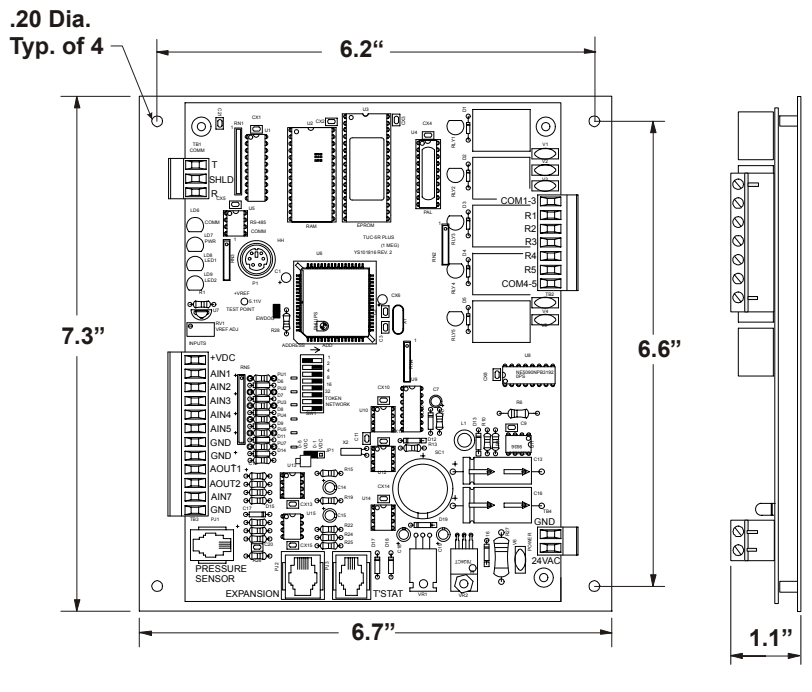
The OE331-21-KWH (Kilowatt Hour) Module provides the ability to record and display KW usage and to limit demand on your control system. Using the Prism Graphical Computer Front End, a status screen displays current demand, yesterday's demand, and the peak demand values and times for both. Historical logs from the previous month and the current month are also available and can be downloaded for archiving via the PRISM software interface. A running total of power consumption is also displayed on the status screen. This value can be manually reset at any time allowing the user to monitor overall power consumption over long periods of time.

Analog Input #2 on the KWH Module monitors all incoming contact closures from a KW pulse meter (usually provided by the utility company) and times them to generate the current KW Demand. A user adjustable setpoint is provided to define what each pulse represents in Kilowatts Per Hour. A Demand Factoring Constant is also provided if it appears that contact bounce may be affecting the operation. The Demand Factor is simply the number of times to average the current demand reading to create the final Demand Reading. It is normally left at a value of '1' unless a problem is encountered.

Two additional setpoints are provided for the EMS Demand Limiting Broadcast. A Limit Setpoint and a Proportional Reset Range are provided so that the user can adjust when to begin shedding demand and how rapidly this occurs. Any controllers equipped to "hear" this broadcast begin spreading their heating and cooling setpoints proportionally until the maximum EMS Adjustment limit is reached. This value is also user adjustable for each individual controller so that the rate at which demand is shed can be optimally configured for special cases where not all zones can tolerate a large change in temperature.

**Mounting**

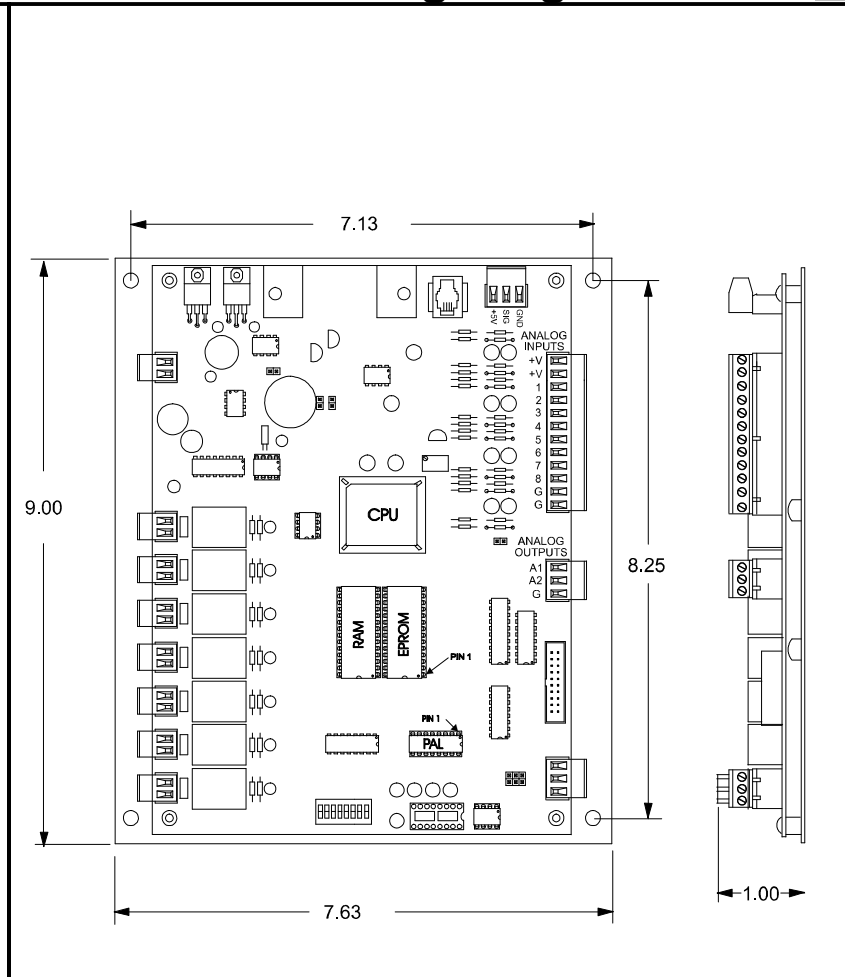
The KWH Module is provided with an integral backplate for mounting inside of a control enclosure. It is recommended that the KWH Module be mounted in a control enclosure in the building equipment room. An optional factory control enclosure for the KWH Module is available.



Technical Data		OE331-21-KWH KWH Module	
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>Input</b>		<b>Output</b>	
<b>Location</b>	<b>Type</b>	<b>Location</b>	<b>Type</b>
AIN2	Dry Contact Closure KW Pulse Meter (By Others)	RS-485 Communications Loop	EMS Demand Limiting Broadcast
<b>Three Year Warranty</b>		WattMaster reserves the right to change specifications without notice	

**Description**

The OE310-21-LP Lighting Controller allows an Orion Control System to also control the building lighting systems along with the HVAC system. The Lighting Controller is provided with 7 schedules, each providing 2 start/stop events per day and 14 start/stop holiday events. Lighting Controller schedules are designed to operate from a starting time, a contact closure or a percentage light level as sensed by a (0-1.5kohm, 0-100%) light level sensor, thus providing maximum lighting control flexibility. As an example, a lighting schedule could be programmed to allow the lighting circuit to come on at dusk, based on a light sensor and then turned off at a given time during the night based on a time schedule. With the Lighting Controller, lighting schedules may be overridden to "on" with a user provided pushbutton. This pushbutton is wired to the analog input that corresponds to the schedule number, on the Lighting Controller. Schedule override time periods are programmed from the Orion Prism program. Lighting Controller output relays may be configured for continuous ON mode during the occupied schedule or a short pulse when the schedule starts and another short pulse when the schedule ends. Pulsed output requires an optional Expansion Relay Board and a GE™ RR-7 or RR-9 or equivalent lighting relay. The Lighting Controller may be connected to any local loop at any point on the Orion system. Orion Prism computer front end software is used to interface with the Lighting Panel Controller functions. The Lighting Controller cannot be programmed through the System Manager operator interface.



Pulsed output requires an optional Expansion Relay Board and a GE™ RR-7 or RR-9 or equivalent lighting relay. The Lighting Controller may be connected to any local loop at any point on the Orion system. Orion Prism computer front end software is used to interface with the Lighting Panel Controller functions. The Lighting Controller cannot be programmed through the System Manager operator interface.

**Mounting**

The Lighting Controller is provided with an integral backplate for mounting inside of a control enclosure. It is recommended that Lighting Controller be mounted in the in a control enclosure in the building equipment room. An optional factory control enclosure for the Lighting Controller is available.

Technical Data		OE310-21-GPC GPC-17 Controller	
Power	24 Volt AC	Weight	1.5 lb.
Power Consumption	10 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:</b>		<b>Outputs:</b>	
Types Allowed	Pushbutton Override Connected to Analog Input #8 (N.O. Binary Contact by Others) All Schedules May be Programmed to Follow or Not Follow the Override	Type Provided	Continuous Contact Closure or Start Pulse and Stop Pulse for Each of the 7 Schedules (N.O. Binary Contact)
Total Inputs Available	1	Relay Power Rating	2 Amp @ 24 VAC
<b>Three Year Warranty</b>		Total Outputs Available	7
WattMaster reserves the right to change specifications without notice			