

HEAT-TIMER®

Installation and Operation Manual

Multi-Sensor Input Gateway (MSIG)

With Temperature and Switch Inputs

FOR PLATINUM CONTROL



WARNING

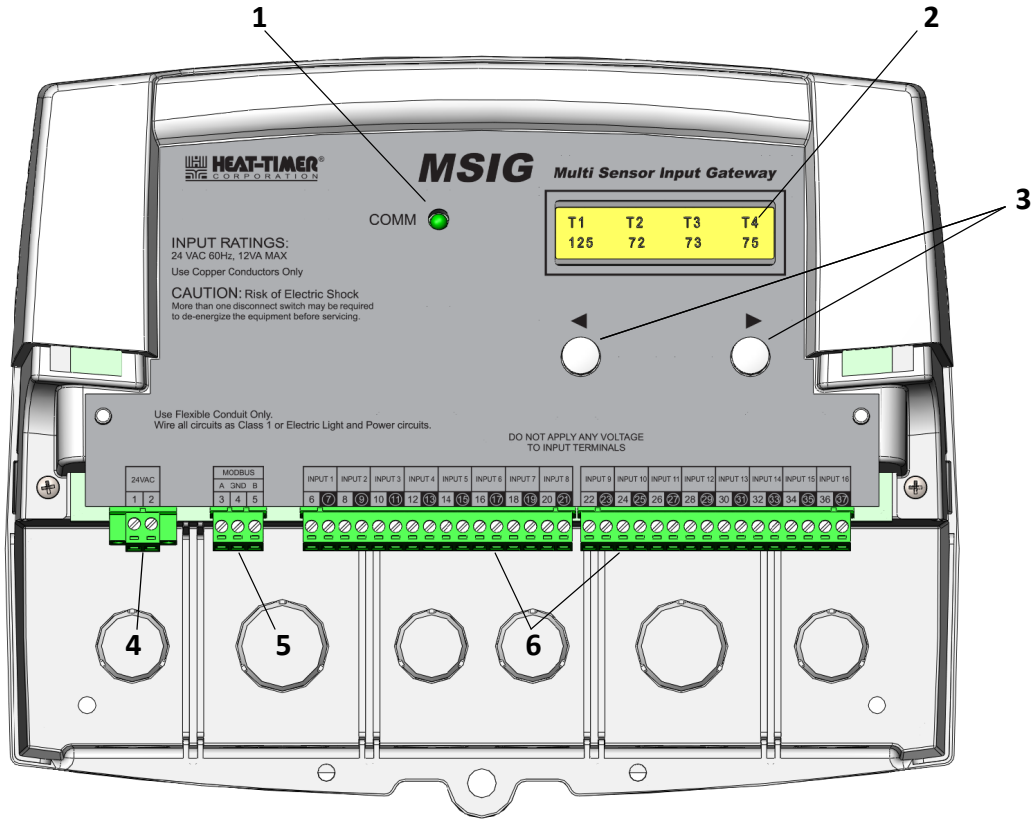
This Heat-Timer control is strictly an operating control; it should never be used as a primary limit or safety control. All equipment must have its own certified limit and safety controls required by local codes. The installer must verify proper operation and correct any safety problems prior to the installation of this Heat-Timer control.

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Controls, Indicators, and Connections

Figure 1: MSIG Controls, Indicators, and Connections



Item	Description	Item	Description
1	Communications Status Indicator When lit, indicates the Platinum Control is communicating with the MSIG.	4	24Vac Power Input Connection (Terminal 1 - Line, Terminal 2 - Neutral)
2	MSIG Display Displays the output reading for each sensor connected to the MSIG.	5	Platinum Control Network Connection (Terminal 3 - A, Terminal 4 - Ground, Terminal 5 - B)
3	Menu “Left” and “Right” Navigation Arrows Used to scroll through the sensor output readings.	6	Sensor Input Connections Connections for up to 16 temperature or switch sensors. Refer to Table 1 on page 8 for a list of supported sensors.

Specifications

Dimensions (W x H x D):11" x 9" x 3.75" (279.4mm x 228.6mm x 95.25mm)
Power Input:24Vac 60Hz
Power Consumption: 12VA (max.)
Operating Temperature Range: 20°F to 130°F (–7°C to 54.4°C)
Operating Humidity Range:20% to 80%
Communication Interface: 3-pin RS485
Sensor Inputs:Up to 16 Temperature or Switch Sensors
Temperature Sensor Ranges: –35°F to 250°F (–37.2°C to 121°C)
User Interface: Status Indicator (1 LED) Scroll Buttons (2) Alphanumeric Display (2 x 16)

Installation Instructions

This section provides the installation instructions for the MSIG.

The installation process consists of the following basic steps:

1. Selecting appropriate locations and mounting the device enclosure.
2. Configuring MSIG DIP switches and installing the Display Module.
3. Connecting power and communications wiring (sensor and network).
4. Performing an initial startup of the MSIG.

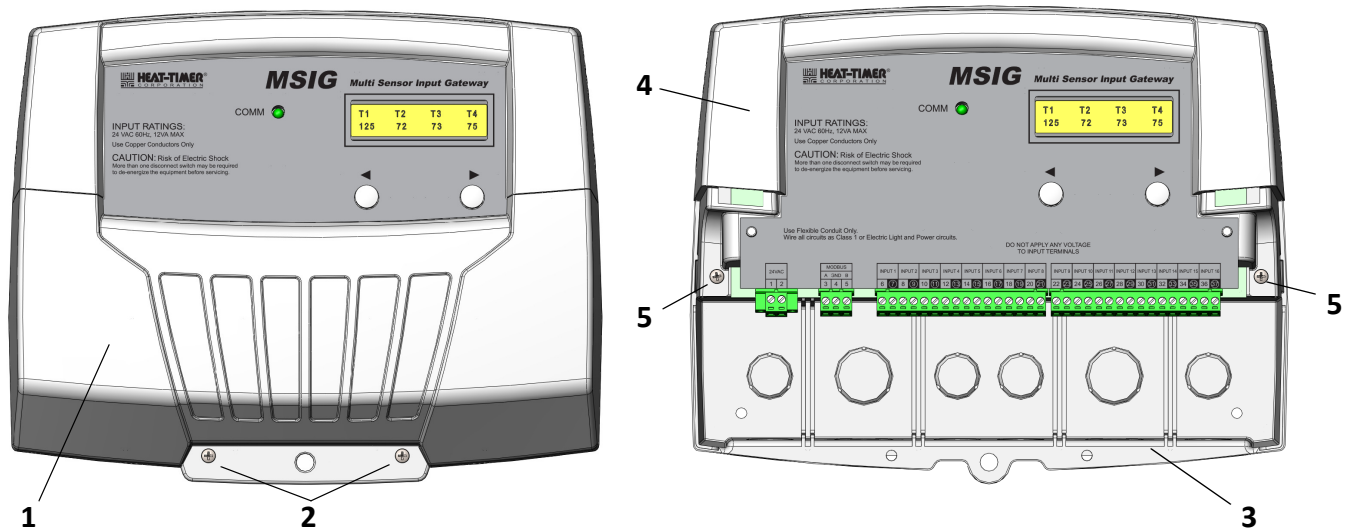
Required Materials (Not Supplied)

The following materials/tools are required for installation, but are not supplied:

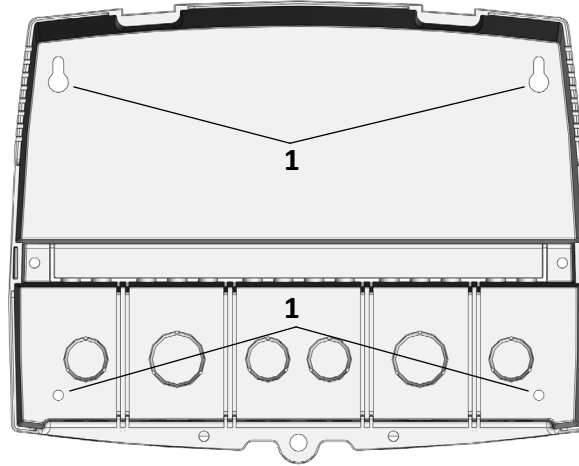
- General tool kit (screwdrivers, wire strippers, power drill, etc.)
- 18 AWG multi-conductor, shielded twisted-pair cable (Heat-Timer p/n 703001-01 or equivalent #18/2 cable) – used for the 24Vac MSIG to sensor interface
- 16 AWG multi-conductor, unshielded twisted-pair cable (Belden p/n 8471, 85102, or equivalent #16/2 cable) – used for the MSIG power wiring

Mounting the MSIG Enclosure

1. Select an appropriate location to mount the MSIG. The location must meet the following minimum requirements:
 - The location should be within 6 feet (1.8 meters) of the Heat-Timer Platinum Control.
 - **NOTE:** This is the recommended distance. The MSIG can be located up to 500 feet (152.4 meters) from the Platinum Control.
 - The mounting surface should be flat and sufficiently wide and strong enough to hold the device.
 - **DO NOT** mount the device in a location where it will be exposed to extreme heat, cold, humidity, or moisture.
2. Remove the Enclosure Wiring Cover (1) by removing the two lower screws (2) holding it to the base (3), and then remove the Display Module (4) by removing the two middle screws (5) holding it to the base.



- Position the Enclosure base in the desired location, and then secure the base in place using four screws (provided) through the mounting holes (1) on the back of the Enclosure base.



- Continue to “Configuring and Installing the MSIG Display Module” on page 6 when the enclosure has been mounted.

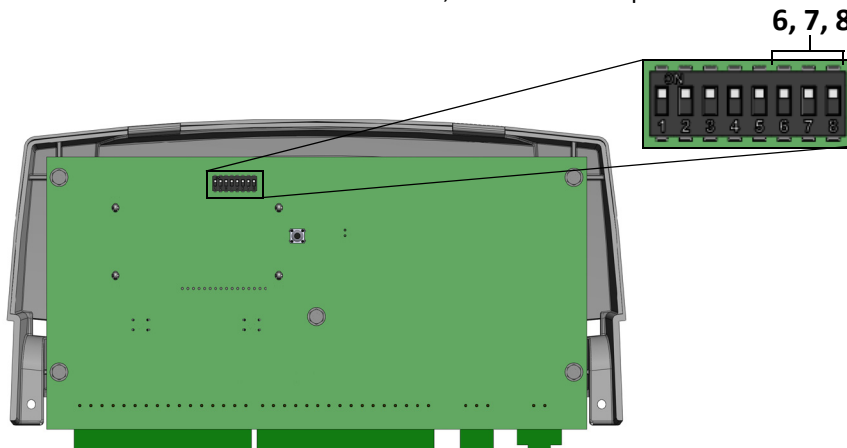
Configuring and Installing the MSIG Display Module

Each MSIG must have a unique address in order to communicate with the Platinum Control. This address is set using DIP switch 6, 7, and 8 located on the rear of the MSIG Display Module.

NOTE: The DIP switch factory default setting is all switches “OFF” (address 247).

- If only one MSIG is installed, there is no need to change the address setting. Continue to the next step to install the Display Module. If more than one MSIG is installed, configure the address DIP switches for each MSIG using the table below.

NOTE: If two MSIGs have the same address, communication problems will occur.



DIP Switch			Address
6	7	8	
ON	ON	OFF	241
ON	OFF	ON	242
ON	OFF	OFF	243
OFF	ON	ON	244
OFF	ON	OFF	245
OFF	OFF	ON	246
OFF	OFF	OFF	247

- Position the Display Module into the base and secure it in place using the middle screws removed in Step 2 above.

NOTE: Do not replace the Enclosure Wiring Cover until all wiring is completed.

- Continue to “Mounting the MSIG Transformer” on page 6.

Mounting the MSIG Transformer

- Select an appropriate location to mount the 120V/24V transformer. The location must meet the following minimum requirements:
 - The location must be near the MSIG.
 - The mounting surface should be flat and strong enough to hold the weight of the device.
 - DO NOT mount the device in a location where it will be exposed to extreme heat, cold, humidity, or moisture.
- Secure the transformer to the mounting surface using two screws (not supplied).

Connecting the Wiring

This section covers:

- Connecting the power input wiring to the MSIG.
- Connecting the sensors.
- Connecting the MSIG Modbus network wiring.

Power Input Wiring

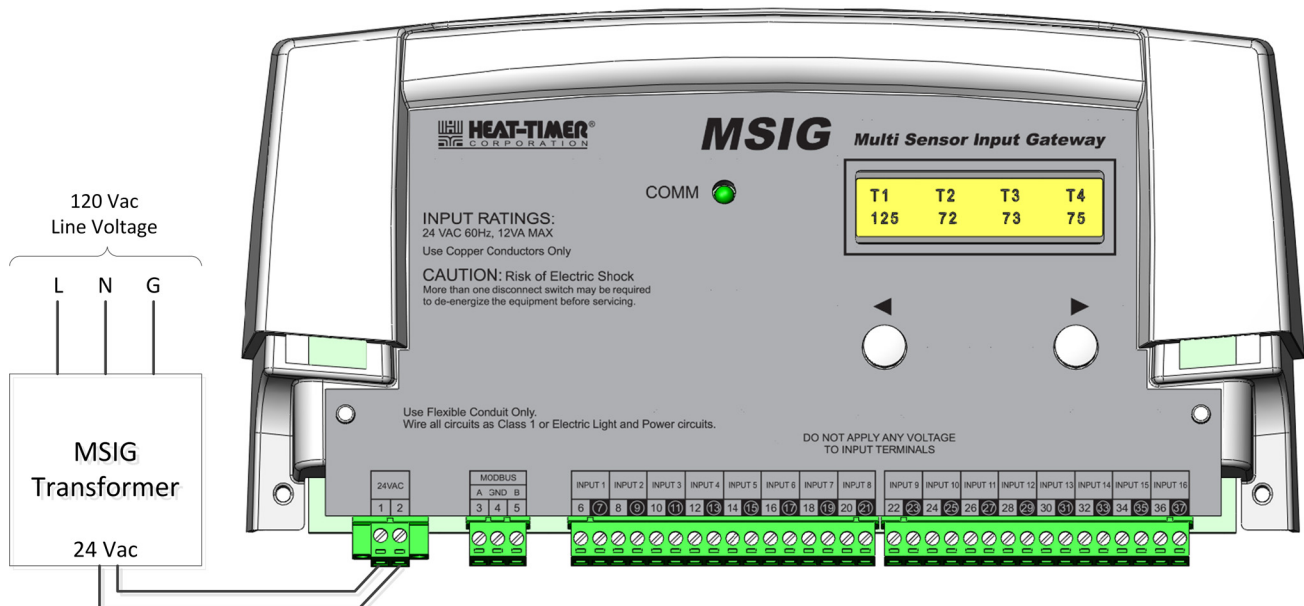
WARNING

ELECTRICAL SHOCK HAZARD! For your safety, to avoid the risk of electric shock, disconnect electrical power to the device before servicing or making any electrical connections. **DO NOT** re-connect electrical power until **ALL** wiring to the MSIG is completed. Failure to do so may result in severe personal injury or death.

1. De-energize the circuit that will provide power to the MSIG transformer by turning off the appropriate circuit breaker.
2. Connect the two black wires from the transformer to the incoming Line and Neutral 120Vac input power supply.
NOTE: The input power wires must be N.E.C. Class 1.
3. Connect ground wiring to the transformer. **DO NOT** use the Neutral line as the earth ground!
4. Run the 24Vac power wiring from the low-voltage side of the transformer (marked “24Vac”) through the left-most knockout located on the bottom of the MSIG enclosure.
5. Connect the power wiring from the transformer to the 24Vac Power Input Connection on the MSIG.

NOTE: Use 16 AWG multi-conductor, unshielded twisted-pair cable (Belden p/n 8471, 85102, or equivalent #16/2 cable).

- Connect the hot line to terminal 1.
- Connect the neutral line to terminal 2.



WARNING

ELECTRICAL SHOCK HAZARD! For your safety, to avoid the risk of electric shock, **DO NOT** re-connect electrical power until **ALL** wiring to the MSIG is completed. Failure to do so may result in severe personal injury or death.

Sensor Wiring

The following types of sensors can be connected to the MSIG:

- **Temperature Sensors** – Use only Heat-Timer Gold sensors. Sensor wires may be extended up to 500 feet (152.4 meters). Use shielded twisted-pair cable (Belden 8760 or equivalent).
- **Switch Sensors** – Must be Dry Contact only. DO NOT place voltage across the Switch sensor input terminals.

The MSIG can accept temperature and switch inputs from any of the sensor types listed in Table 1.

Table 1: MSIG Supported Sensor Types

Part #	Type	Name	Size
904001-00	Space	Room Space Sensor in plastic enclosure to be wall mounted	--
904220-00	Temperature	Immersion Sensor to be inserted in a 3/8" ID well (HT #904011 or equivalent)	--
904220-00	Temperature	Heating System Sensor Strap On	--
904220-00	Outdoor	Outdoor weatherhead	--
904250-00	Temperature	Brass Tube Sensor 3/8" diameter by 1.5" long	3/8"D x 1.5"
904022-00	Temperature	UV, Corrosion, and Moisture Resistant Sensor	--
904112-00	Temperature	Stainless Steel Sensor with Tapered Tip 1/4" x 6"	--
904021-00	Temperature	Stainless Steel Sensor with Round tip 1/4" x 6"	--
904060-01	Switch	Float (Sump Pit) Assembly with 1" Clamp - provides Dry Contact closure	1"
904060-00	Switch	Float (Sump Pit) Assembly with 1.5" - provides Dry Contact closure	1.5"
904060-02	Switch	Float (Sump Pit) Assembly with 2" - provides Dry Contact closure	2"

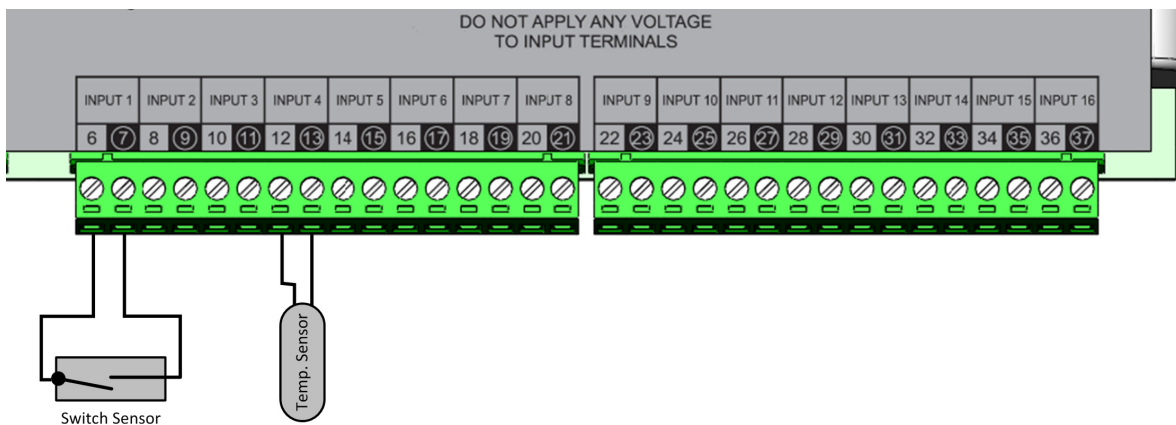
1. Run the sensor wires through a knockout located on the bottom of the MSIG enclosure.



CAUTION

Sensor wires must enter the enclosure through a different knockout than any Class 1 voltage wiring.

NOTE: Temperature sensors have no polarity. DO NOT ground the shield at the sensor, but DO connect at the MSIG using one of the terminals marked with an "O".



Modbus RS485 Wiring

The MSIG Modbus wiring can be connected directly to the Platinum Control, or can daisy chain from the MSIG to an MSI Hub that is connected to the Platinum Control.

NOTE: The MSIG Modbus wiring must not exceed 500 feet (152.4 meters). Use 18 AWG 3-conductor, twisted-pair cable (not supplied).

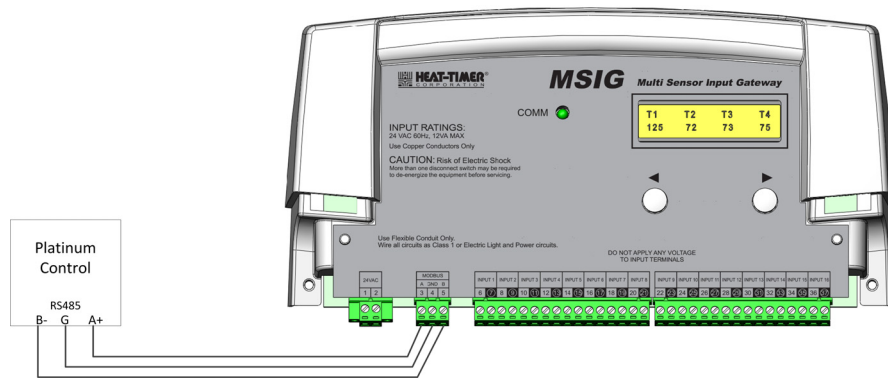
1. Run the Modbus wiring through a knockout located on the bottom of the MSIG enclosure.



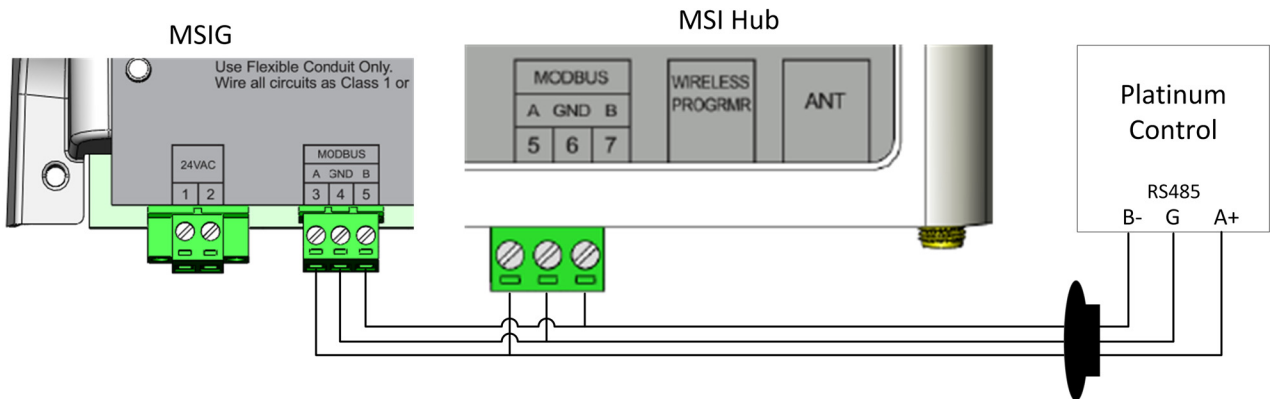
CAUTION

Modbus wires must enter the enclosure through a different knockout than any Class 1 voltage wiring.

2. Connect the wires to the MSIG Modbus connector (terminals 3, 4, and 5).
3. Complete the Modbus wiring using one of the following methods:
 - **Connect the MSIG directly to the Platinum Control**
 - a. Run the wires through a knockout on the Platinum Control.
 - b. Connect the wires to the green RS485 connector located on the Communications Board as follows:
 - MSIG Modbus terminal 3 (A) to the “A” terminal on the Platinum Control RS485 connector.
 - MSIG Modbus terminal 4 (GND) to the “G” terminal on the Platinum Control RS485 connector.
 - MSIG Modbus terminal 5 (B) to the “B” terminal on the Platinum Control RS485 connector.



- **Connect the MSIG to an MSI Hub (that is connected to the Platinum Control)**
 - a. Run the wires through a knockout on the MSI Hub.
 - b. Connect the wires from the MSIG to the MSI Hub as follows:
 - MSIG Modbus terminal 3 (A) to the MSI Hub Modbus Terminal 5 (A).
 - MSIG Modbus terminal 4 (GND) to the MSI Hub Modbus Terminal 6 (GND).
 - MSIG Modbus terminal 5 (B) to the MSI Hub Modbus Terminal 7 (B).



4. After all wiring to the MSIG is complete, replace the MSIG enclosure wiring cover and secure it in place with two screws.

Startup Instructions

Use the following steps to perform an initial startup of the MSIG.

1. Energize the circuit that supplies power to the MSIG.
2. Observe the COMM LED and the MSIG display.
 - The COMM LED should be lit, indicating communications with the Platinum Control.
 - Sensor status should be shown on the MSIG display.

Detailed Operation

Control Theory

The Multi-Sensor Input Gateway (MSIG) is used with any Heat-Timer Remote Communication Internet control. The MSIG simplifies the wiring and reduces the cost of individual sensors.

The network can terminate in any of the following controls which have been equipped with the Internet Communications package:

- MPC
- MPCQ
- HWR
- HWRQ
- SRC
- Multi-MOD

Troubleshooting

Symptom	Possible Cause	Recommended Action
No display on the MSIG.	No power to the device.	Verify power is connected to the MSIG and the circuit is energized.
	Faulty MSIG.	Replace the MSIG.
COMM LED not lit.	No communication with the Platinum Control.	Verify that both the MSIG and Platinum Control are powered-on.
		Verify RS485 wiring is connected and undamaged.
Some sensors not displayed on the MSIG.	Faulty sensors/wiring.	Verify the sensors are functioning properly and all sensor wiring to the MSIG are connected and undamaged.
	More than one MSIG has the same address.	Verify each MSIG on the network has a unique address.
No sensors displayed on the MSIG.	More than one MSIG has the same address.	Verify each MSIG on the network has a unique address.
	Faulty MSIG.	Replace the MSIG.

Sensor Information

Installation Address: _____

MSIG ID: _____

<u>Channel:</u>	<u>Sensor Name:</u>	<u>Location:</u>
Input 1	_____	_____
Input 2	_____	_____
Input 3	_____	_____
Input 4	_____	_____
Input 5	_____	_____
Input 6	_____	_____
Input 7	_____	_____
Input 8	_____	_____
Input 9	_____	_____
Input 10	_____	_____
Input 11	_____	_____
Input 12	_____	_____
Input 13	_____	_____
Input 14	_____	_____
Input 15	_____	_____
Input 16	_____	_____

Notes

Notes

WARRANTY

WARRANTIES AND LIMITATIONS OF LIABILITY AND DAMAGE: Heat-Timer Corporation warrants that it will replace, or at its option, repair any Heat-Timer Corporation manufactured product or part thereof which is found to be defective in material workmanship within one year from the date of installation only if the warranty registration has been properly filled out and returned within 30 days of the date of installation. Damages to the product or part thereof due to misuse, abuse, improper installation by others or caused by power failure, power surges, fire, flood or lightning are not covered by this warranty. Any service, repairs, modifications or alterations to the product not expressly authorized by Heat-Timer Corporation will invalidate the warranty. Batteries are not included in this warranty. This warranty applies only to the original user and is not assignable or transferable. Heat-Timer Corporation shall not be responsible for any maladjustments of any control installed by Heat-Timer Corporation. It is the user's responsibility to adjust the settings of the control to provide the proper amount of heat or cooling required in the premises and for proper operation of the heating or cooling system. Heat-Timer Corporation shall not be required to make any changes to any building systems, including but not limited to the heating system, boilers or electrical power system, that is required for proper operation of any controls or other equipment installed by Heat-Timer Corporation or any contractor. Third Party products and services are not covered by this Heat-Timer Corporation warranty and Heat-Timer Corporation makes no representations or warranties on behalf of such third parties. Any warranty on such products or services is from the supplier, manufacturer, or licensor of the product or service. See separate Terms and Conditions of Internet Control Management System ("ICMS") services, including warranties and limitations of liability and damages, for ICMS services.

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