

GridNavigator

Smart Thermostat

Installation Instructions

GridNavigator

200 Varick Street, #508

New York, NY 10014

www.GridNavigator.com

Model Number: GN-BR-001



Description

The GridNavigator Smart Thermostat is a commercial device with a high-definition glass touch-screen display. Its simple programming and intuitive display make it easy for facility managers and tenants to use. A local override limits user changes, ensuring the most energy savings.

The Smart Thermostat can synchronize operations across multiple HVAC units. Connection to GridNavigator's integrated EMS system allows synchronization across entire portfolios.

Specifications

General	
Power Requirements	20-30 volts AC; 50/60 Hz Class 2, 24 volts AC Nominal 2.4 VA not including relay loads
Output Relays Rating	2.5 A continuous/6.0 A surge <100 ms; 30 volts AC, Class 2
Recommended Wire Size	18 AWG at 100 ft./20AWG at 20 ft.
Ambient Operating Conditions	0°— 55°C (32°— 131°F) 5%-90% RH non-condensing
Ambient Storage Conditions	-40°— 65°C (-40°— 150°F) 5%-90% RH non-condensing
Measurement Range	0°— 117°F 5%-90% RH
Control Range	41°— 89°F
Display Resolution	1°F / 1% RH
Setpoint Resolution	1°F
Control Hysteresis	1°F (actual) / 2°F (display)
Minimum Deadband	3°F between heating and cooling (Auto-change)
Minimum Operation Time	ON— no minimum OFF — 3 minutes (Heat and Cool) (fixed)
Clock Retention	>48 hours
Communications	2.4 GHz FHSS, 125 mW output (+21 dBm)
Dimensions	5.0" x 6.0" x 1.5"

Precautions

- **IMPORTANT:** The GridNavigator Smart Thermostat is intended for 24-volt AC applications only! Please ensure that the system into which it is installed is 24 VAC. Only a qualified individual knowledgeable in HVAC systems should install this thermostat
- The installer should read all instructions and understand them before attempting to install the thermostat. Keep these instructions for reference after installation.

Installation

Follow these steps to ensure proper installation and operation of the switch dimmer.

1. Thermostat Placement

- Select a position on a wall to install the thermostat where:
 - a. the display is easy to reach and read
 - b. the room temperature is constant and not likely to fluctuate—
 - i. away from heating or cooling sources
 - ii. away from direct sunlight
 - iii. away from drafts and heat sources such as incandescent lights
 - iv. on an interior rather than exterior wall

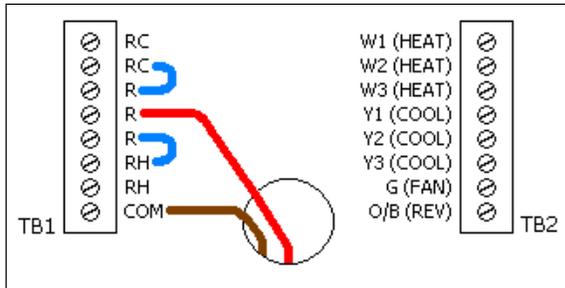
2. Installing the Thermostat

The installation and wiring of the GridNavigator Smart Thermostat depends on the system into which the thermostat is going to operate. Select the system that matches your installation and follow the directions for the correct wiring.

A. Single Transformer in the System

In those systems where there is only one 24-volt AC transformer for both heating and cooling, only R in Figure 1 will be connected. The thermostat comes with jumpers connecting R with RC and RH as the default configuration. Some systems may have split power where heating and cooling are powered by separate transformers. In that case, RH and RC are connected to their respective power source. One jumper should remain between either RH or RC to R to power the thermostat, and the common (return side) from the RH or RC transformer that will power the R connection should be connected to "COM." See Fig. 1 below and Fig. 7 for all connections.

Fig. 1: Power Wiring with a Single Transformer in the System

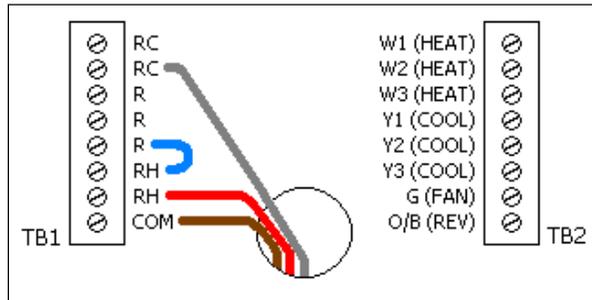


RED = HVAC 24V "hot"
BROWN = HVAC 24V "common" or "return"
BLUE = Jumper Wire

B. Separate Heating and Cooling Transformers

Figure 2 shows the wiring configuration for a system with power wiring having separate heating and cooling transformers.

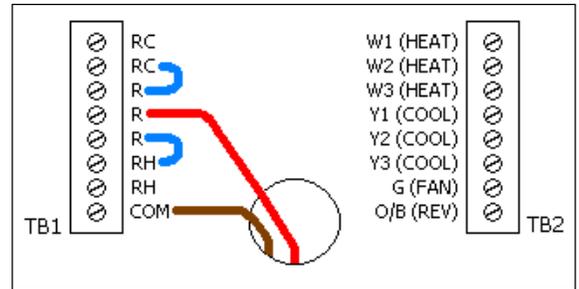
Fig. 2: Power Wiring with Separate Heating and Cooling Transformers



RED = HVAC 24V "hot" from heating system
GRAY = HVAC 24V "hot" from cooling system
BROWN = HVAC 24V "common" or "return" from heating system
BLUE = Jumper Wire

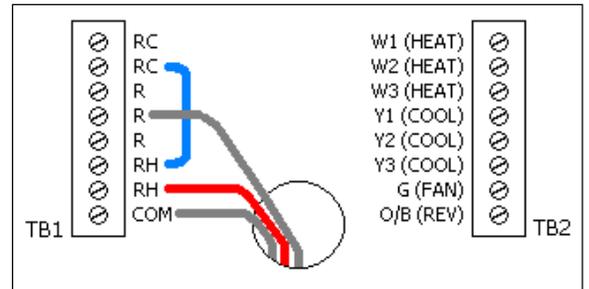
Older HVAC systems may not have this connection available. It is required for the Thermostat to be powered. If this connection is not available, either new wiring will need to be installed to bring common to the Thermostat, or an external 24VAC wall transformer can be used to power the Thermostat electronics. Figure 3 shows the power connection when HVAC common is available; and Figure 4 shows the power connection when HVAC is not available.

Fig. 3: Power Connection When HVAC Common Is Available



RED = 24V "hot" from heating system
GRAY = HVAC 24V "hot" from cooling system
BROWN = HVAC 24V "common" or "return" from heating system
BLUE = Jumper Wire

Fig.4: Power Connection When HVAC Common Is NOT Available



RED = HVAC 24VAC "hot"
GRAY = 24VAC Wall Transformer (non-polarized)
BLUE = Jumper Wire

3. Connecting a New Thermostat to the RF Network
 The Thermostat comes from the factory pre-initialized to connect to the GridNavigator RF Network. Normally, this is an automatic function, without any need for the user to do anything. Once the thermostat has connected into the Network, the RF Signal Level Bars will no longer be all gray and will indicate the relative Signal Level from the RF Bridge it is communicating with in the Network. Once connected, the Configuration and System Info Screen should indicate a device address of something other than the pre-initialized address of 00:000.

4. Connecting a Previously Installed Thermostat to the RF Network

If the thermostat had been previously installed in another Network or connected to a different RF Bridge within the same Network, the thermostat will need to be re-initialized. The Thermostat may be re-initialized via a special command over the network, or it may be done manually. To manually initialize, the thermostat case must be opened to access the SW1 button. Figure 5 below shows the pressure points on the Smart Thermostat to use for opening the case.

Fig.5: Opening the Smart Thermostat Case

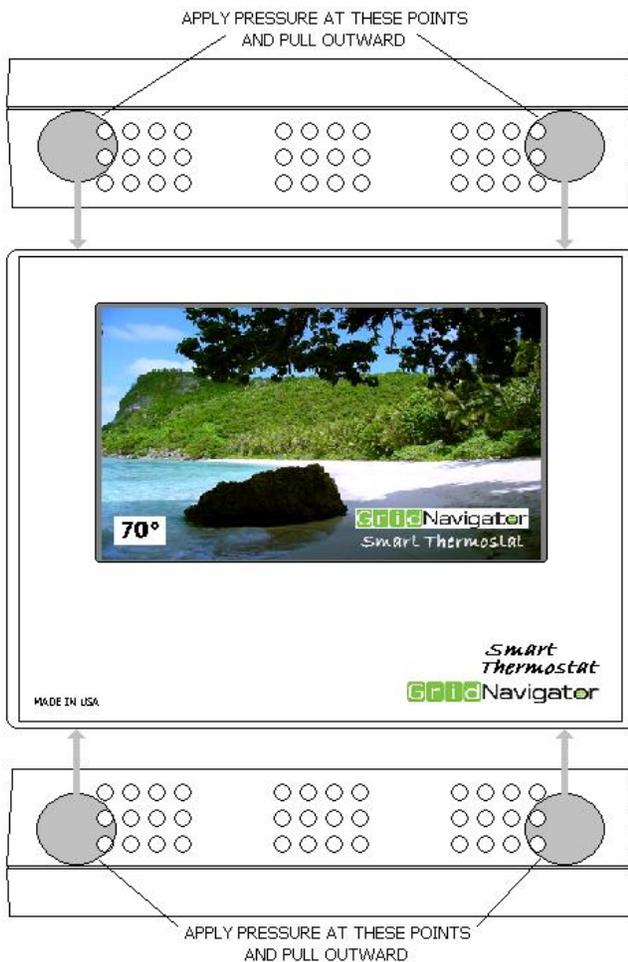
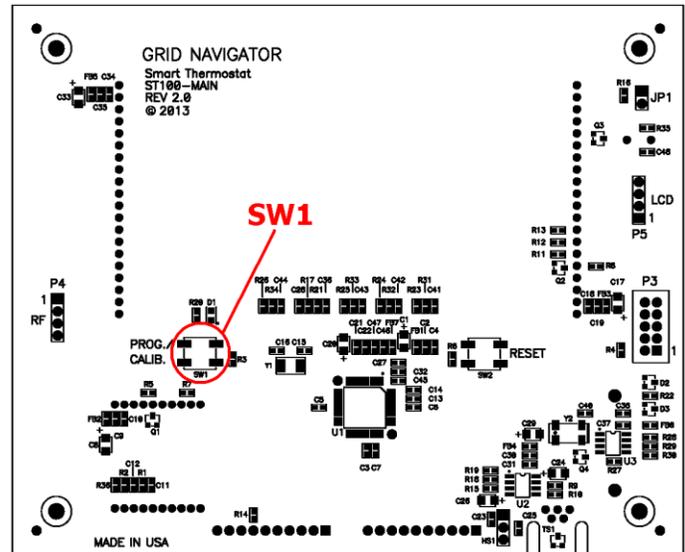


Figure 6 shows the location of the SW1 button. Depress and hold the SW1 Button on the Main Circuit Board while pressing and releasing the "Message" Button on the Main Screen. A second or two after releasing the "Message" Button, SW1 button may be released. This will then initialize the thermostat to the factory default setting in order to allow a connection with a new Network or Bridge. Once the thermostat has been reset, it will connect automatically to the Network.

Fig.6: Location of the SW1 Button on the Main Circuit Board



5. Mounting Instructions

Mounting template? Screw holes in base?

6. Configuring the Smart Thermostat

The installer must configure certain settings during the installation procedure by accessing the Configuration and Information Screen. This screen *IS NOT* meant to be an end-user accessible screen. It is only to be accessed during installation or for diagnostic testing by a qualified individual. To enter this screen, open the thermostat case as shown in Figure 5. Load the screen by depressing and holding the **SW1** button on the Main Circuit Board while pressing the **Setup** Button on the Main Screen. After the screen loads, the **SW1** button may be released. Pressing the **Back** Button returns the user to the Main Screen.

On the screen, select the appropriate settings for the heating and cooling system as described below.

- **Furnace and Heat Pump Buttons:** select either **Heat Pump** or **Furn.** for the type of heating in the system.
- **RV (Reversing Valve) Buttons:** if selecting **Heat Pump** for the type of heating, then select the polarity of the Reversing Valve. If the Reversing Valve needs to be energized for Cooling (the default and most common configuration), then select **RV On Cool**. If the Reversing Valve needs to be energized for Heating, such as the

case for Rheem and Ruud brand Heat Pumps, then select **RV On Heat**.

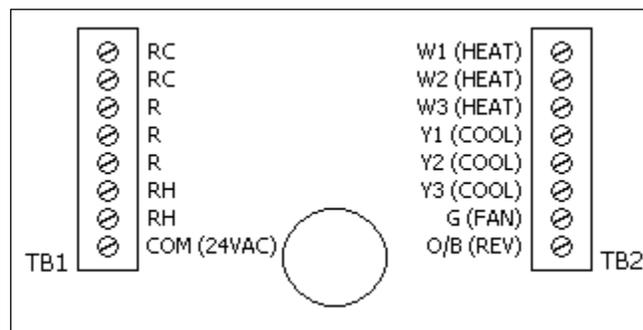
- **Fan Control Button:** If it is desired that the Thermostat to control the Fan at all times, select **Fan Cont.** With Furnace heat, if the Thermostat is not to control the Fan during heating, then de-select **Fan Cont.** When **Fan Cont.** is de-selected, the Thermostat continues to control the Fan during Cooling and it has no effect if **Heat Pump** was selected as the type of heat.
- **Fast Response Button:** The default for the Thermostat is use a time-based method to engage additional stages of heating or cooling, regardless of the differential between the Set-point and the actual temperature. If it is desired to engage the additional stages immediately, based on a temperature differential of 3 or more degrees, then select **Fast Resp.**

7. Operation and Fault Codes

Consult the *Grid Navigator Smart Thermostat User Manual* for information about operating the thermostat. Problems that arise in the installation, initialization, or operation can be identified by fault codes. The Fault Byte is included in the data packet returned to the server when it requests a reading. All Faults are cleared after every reading request. The Fault Byte, displayed in hexadecimal format (two-digit), also appears on the Message Screen after a power-up if there is a Fault to report.

Note: On the Message Screen, Bit 7 of the Byte will always be 0, since this is only displayed following a power-up and reporting it would be redundant. If all tests have passed, then there will be no Fault Code—only the message that all tests have passed.

Fig.7: Identification of Smart Thermostat Connections



RC – 24VAC “hot” side of HVAC transformer for cooling

R– 24VAC “hot” side of HVAC transformer (thermostat power)

RH– 24VAC “hot” side of HVAC transformer for heating

COM – 24VAC “common” or “return” side of HVAC transformer (thermostat power)

W1– First stage heat connection for a furnace; also first stage supplemental heat for a heat pump

W2– Second stage heat connection for a furnace; also second stage supplemental heat for a heat pump

W3 – Third stage heat connection for a furnace.

Y1– First stage compressor connection. Connect first stage air conditioner or heat pump here.

Y2– Second stage compressor connection. Connect second stage air conditioner or heat pump here.

Y3 – Third stage compressor connection. Connect third stage air conditioner or heat pump here.

G– Fan connection

O/B – Heat pump reversing valve connection. Heat/cool polarity is user-defined in the configuration menu. The default setting is energized for cooling.

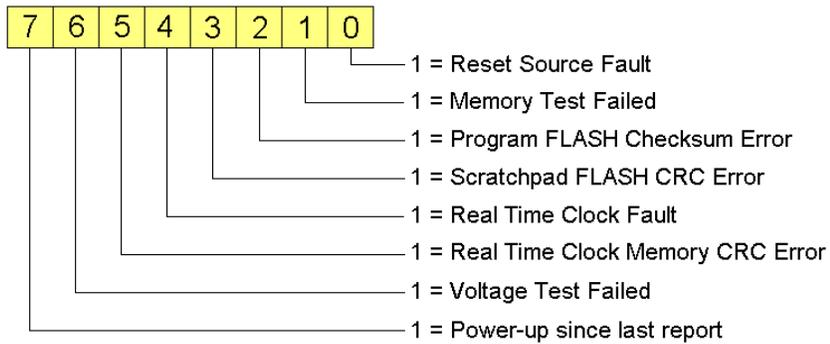
Fault Code Matrix

FAULT	FIRST DIGIT															
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
REAL TIME CLOCK FAULT		X		X		X		X		X		X		X		X
REAL TIME CLOCK CRC			X	X			X	X			X	X			X	X
VOLTAGE TEST FAILED					X	X	X	X					X	X	X	X
POWER-UP*									*	*	*	*	*	*	*	*

FAULT	SECOND DIGIT															
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
RESET SOURCE FAULT		X		X		X		X		X		X		X		X
MEMORY TEST FAILED			X	X			X	X			X	X			X	X
FLASH CHECKSUM					X	X	X	X					X	X	X	X
SCRATCHPAD FLASH CRC									X	X	X	X	X	X	X	X

* NOTE: Power-up is not reported as a Fault on the Message Screen.

Reading Request Fault Byte:



WARRANTY

All products sold by GRID NAVIGATOR are guaranteed against defects in material and workmanship for a period of one year from the date of shipment. GRID NAVIGATOR responsibility is limited to repair, replacement, or refund, any of which may be selected by GRID NAVIGATOR at its sole discretion. GRID NAVIGATOR reserves the right to substitute functionally equivalent new or serviceable used parts.

This warranty covers only defects arising under normal use and does not include malfunctions or failures resulting from: misuse, neglect, improper application, improper installation, water damage, acts of nature, lightning, or repairs by anyone other than GRID NAVIGATOR.

Except as set forth herein, GRID NAVIGATOR makes no warranties, expressed or implied, and GRID NAVIGATOR disclaims and negates all other warranties, including without limitation, implied warranties of merchantability and fitness for a particular purpose. Some states or jurisdictions do not allow limitations on implied warranties, so these limitations may not apply to you.

Limitation of Liability:

In no event shall GRID NAVIGATOR be liable for any indirect, special, incidental, or consequential damages. Some states or jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion or limitation may not apply to you.

Regulatory Compliances

Contains: Wireless Antenna FCC ID: KQL-RM024 Antenna
IC: 2268C-RM024

The enclosed device complies with Part 15 of the FCC Rules and Industry Canada License Exempt RSS Standard(s). Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does not cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna
- Increase the separation between the equipment and the receiver
- Connect the equipment to an outlet on a circuit that is different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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