Installation and Operation Instructions

This manual covers the following models:
• WRT1 PTAC Wireless Remote Thermostat
• Base Module

<table>
<thead>
<tr>
<th>Description</th>
<th>Power Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas or Oil Heat</td>
<td>Battery Power</td>
</tr>
<tr>
<td>Electric Furnace</td>
<td>Hardwire (Common Wire)</td>
</tr>
<tr>
<td>Heat Pump (No Aux. or Emergency Heat)</td>
<td>Hardwire (Common Wire) with Battery Backup</td>
</tr>
<tr>
<td>Heat Pump (with Electric Aux.)</td>
<td></td>
</tr>
<tr>
<td>Heat Pump (with Gas Aux.)</td>
<td></td>
</tr>
<tr>
<td>Multi-stage Systems</td>
<td></td>
</tr>
<tr>
<td>Heat Only Systems</td>
<td></td>
</tr>
<tr>
<td>Heat Only Systems - Floor or Wall Furnaces</td>
<td></td>
</tr>
<tr>
<td>Cool Only Systems</td>
<td></td>
</tr>
<tr>
<td>High and Low Fan Speed</td>
<td></td>
</tr>
<tr>
<td>Millivolt</td>
<td></td>
</tr>
<tr>
<td>Emergency Heat</td>
<td></td>
</tr>
<tr>
<td>Conventional Single Stage Furnace</td>
<td></td>
</tr>
<tr>
<td>Geothermal</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table of Contents</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermostat Quick Reference</td>
<td>2</td>
</tr>
<tr>
<td>Thermostat Operation</td>
<td>3</td>
</tr>
<tr>
<td>Installation Tips</td>
<td>4</td>
</tr>
<tr>
<td>Base Module Tips</td>
<td>5</td>
</tr>
<tr>
<td>Thermostat Sub-base Installation</td>
<td>6</td>
</tr>
<tr>
<td>Base Module Sub-base Installation</td>
<td>7</td>
</tr>
<tr>
<td>Wiring</td>
<td>8-9</td>
</tr>
<tr>
<td>Technician Setup</td>
<td>10</td>
</tr>
<tr>
<td>Technician Setup Menu</td>
<td>11</td>
</tr>
<tr>
<td>Establishing Communication</td>
<td>12</td>
</tr>
<tr>
<td>Mount Thermostat &amp; Battery Installation</td>
<td>13</td>
</tr>
<tr>
<td>Specification &amp; Contact Information</td>
<td>14</td>
</tr>
</tbody>
</table>
Getting to know your thermostat

1. **LCD**
   - Indicates the current room temperature.
   - **Low Battery Indicator:** Replace batteries when indicator is shown.

2. **Fan Switch**

3. **System Switch**

4. **Setpoint Buttons**
   - +1 will appear in the display when the auxiliary heat is active.
   - Displays the user selectable setpoint temperature.

**Important:**
The low battery indicator is displayed when the AA battery power is low. If the user fails to replace the battery within 21 days, the thermostat display will only show the low battery indicator as a final warning before the thermostat becomes inoperable.
Easy to use controls

1 LCD Display:
See page 2 for details about this display read out.

2 Fan Switch:
AUTO will cycle the fan on only when the heating or cooling system is on. Select LOW or HIGH for the fan to run continuously at the selected speed.

3 System Switch:
Selects the operation mode of your HVAC system. Selecting HEAT turns on the heat mode. Selecting COOL turns on the air conditioning mode. Selecting OFF turns both heating and cooling off.

4 Temperature Setpoint Buttons:
Press the + or - buttons to select the desired room temperature.

Caution:
When the battery icon appears replace your AA batteries immediately. Failure to do so may result in your heating & cooling system becoming inoperable.

A Note About Two-Speed Fan:
When the fan switch is set to AUTO and the system is in HEAT or COOL, the thermostat will switch from LOW fan to HIGH fan when the ambient temperature is 2x swing away from setpoint. The thermostat will switch back to LOW fan at 1x swing away from setpoint.
Wall locations

The thermostat should be installed approximately 4 to 5 feet above the floor. Select an area with average temperature and good air circulation.

Do not install thermostat in locations:
- Close to hot or cold air ducts
- That are in direct sunlight
- With an outside wall behind the thermostat
- In areas that do not require conditioning
- Where there are dead spots or drafts (in corners or behind doors)
- Where there might be concealed chimneys or pipes

Friedrich Tip

Pick an installation location that is easy for the user to access. The temperature of the location should be representative of the building.
Wireless Range

Range between the WRT1 and the base module is up to 100 feet with no obstructions and up to 50 feet through standard building materials. To optimize the range try placing the base unit higher if in a basement or further away from large metal objects.

The base module is designed to be mounted behind the front grille of a packaged terminal air conditioner (PTAC). Refer to Friedirch PTAC Installation and Operation Manual for instruction in removing the front grill. Check clearance to ensure the fit of front grille after base module installation. Ensure if mounting with screws that wires and lines are not damaged. See below for a few suggested options to mount the base module.

1. Front Mount: Inside PTAC Housing
2. Side Mount: Inside PTAC Housing

Friedrich Tip

Do not install the base module in locations:
- That are behind a chimney
- That require the signal to pass through significant metal or concrete blocks
- Where temperature could exceed 150°F
- Where rain or snow or extreme hot or cold is possible

Caution: Electrical Hazard
Failure to disconnect the power before beginning to install this product can cause electrical shock or equipment damage.
Caution: Electrical Hazard
Failure to disconnect the power before beginning to install this product can cause electrical shock or equipment damage.

Mercury Notice:
The WRT1 thermostat is mercury free. However, if the product you are replacing contains mercury, dispose of it properly. Your local waste management authority can give you instructions on recycling and proper disposal.

For vertical mount put one screw top and one screw bottom.

For horizontal mount put one screw left and one screw right.

Friedrich Tip

The thermostat can be hardwired to a 24V power supply, however, it is not required. Batteries should be checked annually if 24V power is not connected.
**Wiring Note:**
The base module is packaged with labeled thermostat wire. Wire appropriately into the PTAC board terminals.

**Note:**
The Thermostat and Base Module are “linked” for communication, at the factory. However, if for any reason the link has failed, use the process on page 12 to re-link the devices.

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**Note:**
The Base Module may be mounted using adhesive tape, such as double-sided tape or hook and loop strips when drilling is not practical. The Base Module must be hardwired (C and R terminals connected to 24V power).

**Connecting to a PTAC:**
When connecting the Base Module to a PTAC, refer to Friedrich PTAC Installation and Operation Manual for instructions to enable remote thermostat operation.
Wiring

1. If you are replacing a thermostat, make note of the terminal connections on the thermostat that is being replaced. In some cases the wiring connections will not be color coded. For example, the green wire may not be connected to the G terminal.

2. Loosen the terminal block screws. Insert wires then retighten terminal block screws.

**Warning:**
All components of the control system and the thermostat installation must conform to Class II circuits per the NEC Code.

**Wire specifications**
Use shielded or non-shielded 18 - 22 gauge thermostat wire.

Terminal Designations on Base Module

This thermostat is shipped from the factory to operate a conventional heating and cooling system. This thermostat will also operate a heat pump system. See the “heat pump” configuration step on page 9 of this manual to configure the thermostat for heat pump applications.

<table>
<thead>
<tr>
<th>Terminal</th>
<th>1 Heat 1 Cool Conventional System</th>
<th>1 Heat 1 Cool Heat Pump System</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>24 VAC Transformer power</td>
<td>24 VAC Transformer power</td>
</tr>
<tr>
<td>C</td>
<td>Transformer common</td>
<td>Transformer common</td>
</tr>
<tr>
<td>B</td>
<td>Energized in heating</td>
<td>Heat pump changeover valve</td>
</tr>
<tr>
<td>O</td>
<td>Energized in cooling</td>
<td>Energized in cooling</td>
</tr>
<tr>
<td>GL</td>
<td>Fan relay, Low</td>
<td>Fan relay, Low</td>
</tr>
<tr>
<td>GH</td>
<td>Fan relay, High</td>
<td>Fan relay, High</td>
</tr>
<tr>
<td>W</td>
<td>First stage of heat</td>
<td>Second stage of heat</td>
</tr>
<tr>
<td>Y</td>
<td>First stage of cool</td>
<td>First stage of heat &amp; cool</td>
</tr>
</tbody>
</table>

Terminal Designations on WRT1 Master Thermostat

<table>
<thead>
<tr>
<th>Terminal</th>
<th>1 Heat 1 Cool Conventional System</th>
<th>1 Heat 1 Cool Heat Pump System</th>
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<tr>
<td>R</td>
<td>24 VAC Transformer power</td>
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</tr>
<tr>
<td>C</td>
<td>Transformer common</td>
<td>Transformer common</td>
</tr>
</tbody>
</table>

Connecting to a PTAC:
When connecting the Base Module to a PTAC, refer to the Friedrich PTAC or Vert-I-PAK® Installation and Operation Manual to enable remote thermostat operation.
1. Power supply
2. Jumper (not supplied) to connect GL and GH terminals
3. The thermostat must be set to O or B to match the changeover valve, O is cool changeover valve, B is heat changeover valve.
4. The Aux Heat Relay is energized as the second stage of heat.

**Note:**
In Friedrich PTAC units with single speed fan operation, a jumper (not supplied) should be installed between GL and GH.

**Friedrich PTAC and Vert-I-PAK**
**Heat Pump system: 2 speed fan**
TECHNICIAN SETUP

1. Fahrenheit/Celsius Display

Select F or C with the jumper pin on the back of the thermostat.

**Important:**
The RESET button must be pressed after changing any switch or jumper pin setting. Batteries must be installed for this operation.

2. Compressor Short Cycle Delay

The compressor short cycle delay protects the compressor from “short cycling”. This feature will not allow the compressor to be turned on for 5 minutes after it was last turned off.

Using the jumper on the back of the thermostat, selecting **ON** will not allow the compressor to be turned on for 5 minutes after the last time the compressor was on. Selecting **OFF** will remove this delay.

3. Electric Setup

**Electric:** The thermostat operation switch should be put in the **ELEC** position. This setting allows the thermostat to operate the fan when the fan relay is connected to the **G** terminal. Friedrich PTAC units will require ELEC fan relay.
This thermostat has 3 different setup configurations. To setup the thermostat for your particular application:

1. Set the thermostat system switch to OFF.
2. Press and hold [-] and [+] together for 3 seconds. This 3 second delay is designed so that users do not accidentally access installer settings.

3. Configure the installer options as desired using the table below.

   Use [−] and [+] to change settings.
   Tap [−] and [+] together to move to the next step.

**NOTE:** When you want to exit Tech Setup options, move the system switch to HEAT or COOL.

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**Tech Setup Options**

<table>
<thead>
<tr>
<th>Room Temperature Calibration</th>
<th>Change Over Valve Selection</th>
<th>Heat Pump</th>
<th>Heating Temperature Setpoint Limit</th>
<th>Cooling Temperature Setpoint Limit</th>
<th>Link Establish</th>
<th>Cooling Swing (SYSTEM COOL)</th>
<th>Heating Swing (SYSTEM HEAT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>This feature allows the installer to change the calibration of the room temperature display. For example, if the thermostat reads 70° and you would like it to read 72°, then select +2.</td>
<td>Select 0 for a changeover valve that energizes in cooling. Select b for a changeover valve that energizes in heating.</td>
<td>When turned on, the thermostat will operate a heat pump. Y will be first stage of heat &amp; cool, W will be second stage heat.</td>
<td>This feature allows you to set a maximum heat setpoint value. The setpoint temperature cannot be raised above this value.</td>
<td>This feature allows you to set a minimum cool setpoint value. The setpoint temperature cannot be lowered below this value.</td>
<td>This step is used to connect WRT1 to Base Module. Refer to page 12 for connection instructions.</td>
<td>The swing setting, often called &quot;cycle rate,&quot; &quot;differential&quot; or &quot;anticipation&quot; is adjustable. A smaller swing setting will cause more frequent cycles and a larger swing setting will cause fewer cycles.</td>
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</tr>
</tbody>
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**LCD Will Show**

- CA 0
- CD 0
- HU OF
- HE 90
- CL 45
- LE 08
- 08

**Adjustment Options**

- You can adjust the room temperature display to read -4°F to +4°F above or below the factory calibrated reading.
- 0 for cooling changeover valve
- b for heating changeover valve
- ON configures the thermostat for heat pump systems.
- OFF configures the thermostat for non-heat pump systems.
- 45.0 °F - 90.0 °F
- 45.0 °F - 90.0 °F
- NA
- The cooling swing setting is adjustable from ±0.2°F to ±2°F. For example: A swing setting of 0.5°F will turn the cooling on at approximately 0.5°F above the setpoint and turn the cooling off at approximately 0.5°F below the setpoint.
- The heating swing setting is adjustable from ±0.2°F to ±2°F. For example: A swing setting of 0.5°F will turn the heating on at approximately 0.5°F below the setpoint and turn the heating off at approximately 0.5°F above the setpoint.

**Factory Default Settings**

- 0 °F
- 0
- OFF
- 90 °F
- 45.0 °F
- NA
- 0.8 °F
- 0.8 °F

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* Select OFF on HU configuration for Friedrich models with the following suffix: A, B, C, D or E

**The second stage will turn on at 2x the swing setting. The second stage will turn off when 1x the swing is reached. For example, if the swing setting is 0.8°F for heating and the thermostat is set at 70°F, the first stage will turn on at approximately 69.2°F. The second stage will turn on at 68.4°F. The second stage will turn off at 69.2°F and the first will turn off at 70.8°F.
Establishing Communication between WRT1 and the Base Module

The thermostat and base module come factory linked out of the box. If however, communication is lost, follow this easy Two Step process to re-establish the communicaiton link.

1. Press and hold the base module Learn button for 3 seconds. The Blue LED will flash when ready to receive initial signal from WRT1. (Base module must be powered by 24V. Blue LED will be continuously on when 24V power is present.)

2. Set the thermostat system switch to OFF. Press and hold [−] and [+] for 3 seconds. Tap [−] and [+] together until LE is displayed. Press and hold [+] until LE flashes 3 times, the Blue LED on the base module will stop flashing after communication has been established between base module and WRT1.

**Note:**
The Blue LED on the base module will be on when power is present. The Blue LED will flash 3 times every time it receives a signal from WRT1. When a relay is on the corresponding LED relay indicator will be on.

**Note:**
If the base module does not receive a signal from the WRT1 for 15 minutes it will turn off all relays until communication is reestablished. The Blue LED on the base module will also turn off to show communication has been lost.

**Important:**
DO NOT hold the [+] button when LE is displayed after Step 2, above has been completed. This will break the communication link and the base module button will need to be pressed again to reestablish communication.
Mount Thermostat

Align the 4 tabs on the subbase with corresponding slots on the back of the thermostat, then push gently until the thermostat snaps in place.

Battery Installation

Battery installation is optional if thermostat is hardwired.
- R & C terminal connected to 24 VAC, Class II power

Insert 2 AA Alkaline batteries (included).
Specifications

**WRT1 Thermostat**

- The display range of temperature: 41°F to 95°F (5°C to 35°C)
- The control range of temperature: 44°F to 90°F (7°C to 32°C)
- Load rating: 1 amp per terminal, 1.5 amp maximum all terminals combined
- Display accuracy: ± 1°F (± 17.2°C)
- Swing (cycle rate or differential): Heating is adjustable from 0.2°F to 2.0°F (-17.67°C to -16.67°C)
  Cool is adjustable from 0.2°F to 2.0°F (-17.67°C to -16.67°C)
- Power source: 18 to 30 VAC, NEC Class II, 50/60 Hz for hardwire (common wire)
  Battery power from 2 AA Alkaline batteries
- Operating ambient: 32°F to +105°F (0°C to +41°C)
- Operating humidity: 90% non-condensing maximum
- Dimensions of thermostat: 4.7”W x 4.4”H x 1.1”D
- Radio transmission frequency: 916 MHz

**Base Module**

- Load rating: 1 amp per terminal, 1.5 amp maximum all terminals combined
- Power source: 18 to 30 VAC, NEC Class II, 50/60 Hz
- Operating ambient: 32°F to +150°F (0°C to +65°C)
- Operating humidity: 90% non-condensing maximum

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