Digitally Adjustable Display Sensor

Used with:
Water Source Heat Pumps (WSHP) - Sensor Part No. 910121754
SmartSource™ Units - Models GS & GT
Enfinity™ Units with MicroTech® III Controls - Models CCH, CCW;
VFC, VFW; LVC, LVW; MHC, MHW & VHC, VHF
Fan Coil Units (FCU) - Sensor Part No. 910113679, 910152148
 Models With MicroTech III Controls - 910113575

Contents
Overview .......................................... 2
Sensor buttons & dimensions. .......................... 2
Applications ............................................. 3
Sensor functions ......................................... 3
Mounting, Maintenance, Terminations .................. 4
Mounting .................................................. 4
Maintenance ............................................. 4
Terminations ............................................. 4
Initial Start-up, Display Descriptions ................. 6
Terminal descriptions .................................... 6
Initial start-up occupied sequence ..................... 6
Power fail start-up occupied sequence ............... 6
Display descriptions ..................................... 6
Adjusting the setpoint ................................... 6
Front Panel Button Operation .......................... 7
Occupied icon indicator ................................ 7
*OVERRIDE* on the display ............................. 7
Fan status & speed indicators .......................... 7
System mode “HEAT/COOL/AUTO/OFF/DHUM” indicators .... 7
*ALARM* on the display ................................ 7
*E-SAVE* word on the display ........................ 7
*SETPOINT* word on the display ..................... 7
*STATUS* word & dot on the display .......... 7
Front panel button operation ......................... 7
Optional Technician Adjustments ..................... 9
Optional technician adjustments ...................... 9
Diagnostics ............................................ 11
Specifications ......................................... 12
The display sensor is used in conjunction with the MicroTech III equipped units as described in the Application Section below. The same sensor is used for Water Source Heat Pump (WSHP) and for Fan Coil Units (FCU) with just a hardware jumper and menu change during configuration. The sensor has a digital display for Temperature, Humidity, Occupancy, Fan Speed, System Mode, Alarm, Setpoint and Status indication. Controls include six buttons for Setpoint, System Mode, Fan Speed, Occupied/Unoccupied Request, and Override Reset. (Figure 1).

**Sensor buttons & dimensions**

*Figure 1: Digital display sensor - Water Source Heat Pump P/N 910121754, Fan Coil P/N 910113679, 910113575, 910152148*
The display sensor can be used on the products shown in Table 1.

### Table 1: Product usage guide

<table>
<thead>
<tr>
<th>Units</th>
<th>Product</th>
<th>Models</th>
<th>Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water Source Heat Pumps</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horizontal</td>
<td>Enfinity™</td>
<td>W.CCH, CCW</td>
<td>MicroTech III Unit Controller</td>
</tr>
<tr>
<td>Vertical</td>
<td>W.VFC, VFW</td>
<td>W.VHC</td>
<td></td>
</tr>
<tr>
<td>Vertical Stacked</td>
<td>W.GHC</td>
<td>W.MHC, MHW</td>
<td></td>
</tr>
<tr>
<td>Console</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horizontal &amp; Vertical</td>
<td>SmartSource 1-Stage</td>
<td>W.GSH, GSV</td>
<td>MicroTech III SmartSource Unit Controller</td>
</tr>
<tr>
<td>Vertical</td>
<td>SmartSource 2-Stage</td>
<td>W.GTH, GTV</td>
<td></td>
</tr>
<tr>
<td>Fan Coils</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horizontal</td>
<td>ThinLine™</td>
<td>FC.H, FH.H</td>
<td>MicroTech III Unit Controller</td>
</tr>
<tr>
<td>Vertical</td>
<td></td>
<td>FC.V, FH.V</td>
<td></td>
</tr>
</tbody>
</table>

The display sensor for water source heat pump applications is shown in Table 2.

### Table 2: Water source heat pump application guide

| Units            | Product | Models                  | Applications                      | Water-side Econo-
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water Source Heat Pumps</strong></td>
<td></td>
<td></td>
<td>Stages</td>
<td>Smart Dehumidification</td>
</tr>
<tr>
<td>Horizontal</td>
<td>Enfinity</td>
<td>W.CCH, W.CCW</td>
<td>1 1</td>
<td>No</td>
</tr>
<tr>
<td>Vertical</td>
<td>W.VFC, W.VFW</td>
<td>W.VHC</td>
<td>1 1</td>
<td>No</td>
</tr>
<tr>
<td>Vertical Stacked</td>
<td>W.VHC</td>
<td></td>
<td>1 1</td>
<td>No</td>
</tr>
<tr>
<td>Console</td>
<td>W.MHC, W.MHW</td>
<td>W.MHC, MHW</td>
<td>1 1</td>
<td>No</td>
</tr>
<tr>
<td>Horizontal &amp; Vertical</td>
<td>SmartSource 1-Stage</td>
<td>W.GSH, GSV</td>
<td>3 4</td>
<td>Yes</td>
</tr>
<tr>
<td>Horizontal &amp; Vertical</td>
<td>SmartSource 2-Stage</td>
<td>W.GTH, W.GTV</td>
<td>3 4</td>
<td>Yes</td>
</tr>
<tr>
<td>Vertical</td>
<td>SmartSource Inverter</td>
<td>W.DFW</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

**Note:** ¹With optional Boilerless controls

---

**Sensor functions**

**910152148, 910113575, 910113679, Fan-coil unit model:**

- Display sensor to show room Temperature, fan speed (AUTO/HIGH/MEDIUM/LOW), system mode (HEAT/COOL/AUTO/OFF), ALARM, Override and occupancy.

**Note:** 910113575 will not display a temperature value as this is measured using a unit-mounted return air sensor.

**910121754, Water source heat pump model:**

- Display sensor to show room Temperature, room humidity, fan speed (AUTO/OFF/DHUM), ALARM, Override and occupancy.
- De-humidification output contact has an adjustable setpoint and configurable deadband. This output operates automatically using the RH setpoint and deadband in the system "AUTO" mode or in the "DHUM" mode.
Mounting Location
Avoid mounting on outside walls or in direct sunlight.

Junction Box, (J-Box)
1. Pull the wire through the wall and out of the junction box, leaving about six inches free.
2. Pull the wire through the hole in the base plate.
3. Secure the back plate to the box using the #6-32 × 1/2 inch mounting screws provided.
4. Screw the plate firmly to the wall so the foam plate backing is compressed about 50%.
5. Terminate the unit according to the guidelines in the Termination section.
6. Attach Cover by latching it to the top of the base, rotating it down and snapping into place.
7. Secure the cover by backing out the lock-down screws using a 1/16" Allen wrench until it is flush with the bottom of the cover.

Figure 2: Junction box mounting (hardware is provided for both junction box and drywall installation.)

Drywall mounting
1. Place the base plate against the wall where you want to mount the sensor.
2. Mark out the two mounting holes where the unit will be attached to the wall. Drill a 3/16" hole in the center of each mounting hole and insert a drywall anchor into the holes.
3. Drill one 1/2" hole in the middle of the marked wiring through hole area.
4. Pull the wire through the wall and out the 1/2" hole, leaving about six inches free.
5. Pull the wire through the hole in the base plate.
6. Secure the base to the drywall anchors using the #6 × 1" mounting screws provided.
7. Screw the plate firmly to the wall so the foam plate backing is compressed about 50%.

8. Terminate the unit according to the guidelines in the Termination section.
9. Attach cover by latching it to the top of the base, rotating it down and snapping it into place.
10. Secure the cover by backing out the lock-down screws using a 1/16" Allen wrench until it is flush with the sides of the cover.

Note: in any wall-mount application, the wall temperature and the temperature of the air within the wall cavity can cause erroneous readings. The mixing of room air and air from within the wall cavity can lead to condensation, erroneous readings and sensor failure. To prevent these conditions, Daikin recommends sealing the conduit leading to the junction box with fiberglass.

Maintenance
Wipe the display as needed with a damp water only cotton cloth. Do not use any type of cleaner as it may damage the buttons or scratch the display. Do not paint.

Terminations
Daikin recommends using a twisted shielded pair of at least 22AWG for the power wire connections. The shield should be earth grounded only at the power source. Larger gauge wire may be required for long runs.

Figure 3: Sensor Circuit Board
**CAUTION**

Combination of power wiring (R, 5, DH) and analog (1, 2, 3, 4, and 6 to ground) wiring in a common cable may cause signal interference and must be avoided.

---

**Figure 4: SmartSource MicroTech III board to digital room temperature sensor wiring**

<table>
<thead>
<tr>
<th>SmartSource Board</th>
<th>MicroTech III Board</th>
<th>I/O Expansion Module</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal Block Label</td>
<td>TB2-1</td>
<td>TB1-1</td>
</tr>
<tr>
<td>Description</td>
<td>24VAC</td>
<td>Fan &amp; Unit Mode</td>
</tr>
<tr>
<td>Terminal Label</td>
<td>R</td>
<td>1</td>
</tr>
<tr>
<td>Typical Wiring</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 5: Fan-Coil MicroTech III board to digital room temperature sensor wiring**

<table>
<thead>
<tr>
<th>SmartSource Board</th>
<th>MicroTech III Board</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal Block Label</td>
<td>TB2-2</td>
</tr>
<tr>
<td>Description</td>
<td>24VAC</td>
</tr>
<tr>
<td>Terminal Label</td>
<td>24 VAC</td>
</tr>
<tr>
<td>Typical Wiring</td>
<td></td>
</tr>
</tbody>
</table>

---

All wiring must comply with the National Electric Code (NEC) and local codes. Do NOT run any of this device’s wiring in the same conduit as other AC power wiring. Tests show that fluctuating and inaccurate signal levels are possible when AC power wiring is present in the same conduit as the signal lines. If you are experiencing any of these difficulties, please contact your Daikin representative.

Sensor

Digitally Adjustable Room Temperature Sensor (Part No. 910121754) / 910113679 / 910152148, 910113575
Terminal descriptions

*Note:* Refer to “Figure 3: Sensor Circuit Board” on page 4 for terminal locations

- **R:** 15 to 28VAC* (AC requires separate shielded wire) (Shield terminated at power source only)
- **DH:** Dehumidification Contact (Triac from R to DH @170mA, WSHP Only).
- **U:** Unoccupied Contact. (Terminal grounded when in Unoccupied, VDC only).
- **E:** System “Off” Indication. (Terminal grounded when in System “Off” mode, VDC only).
- **1:** Status Indicator Input from the MicoTech III Unit Controller. (5VDC).
- **2:** Output Signal, and Fan Mode System (0 to 5VDC). Output Signal, System Mode Select for FCU only, (0 to 5VDC).
- **3:** Output Signal, Setpoint Adjust from 55º to 95°F (default) or ±5º Configurable. (0 to 5VDC) See Setpoint Analog Range Tolerances. See Table 3.
- **4:** Output Signal, Room Temp Thermistor Sensor. (10K ATP Z curve, 10K-2).
- **5:** Ground or Neutral* (AC requires separate shielded wire). Common Reference for All Signal Terminals.
- **6:** Output Signal, Fan Speed Select for FCU only. (0 to 5VDC). Terminal 6 not used for WSHP units.

*Note:* The AC power wiring at terminals [R] & [5] should be run in a separate twisted shielded pair to avoid possible fluctuating and inaccurate signal levels induced into the other sensor signal wires.

This sensor AC power can be run in the same conduit with the sensor signal wire as long as it's run in twisted, shielded pair and terminated properly.

### Power fail start-up occupied sequence

On a power failure, the sensor retains its last known desired occupancy status in non-volatile memory. On restoration of power, the sensor restores its last known desired occupancy state from memory. The occupied icon will reflect this with a solid (occupied) or hollow (unoccupied) indication and terminal “U” will have voltage applied (occupied) or grounded (unoccupied). If the “STATUS/Dot” input on Terminal 1 from the controller matches this occupancy state then the occupied status icon will continue to be solid or hollow depending on the last known state. If the “STATUS/Dot” input on Terminal 1 from the controller is different from the sensor occupied state, then the occupied icon will flash the desired occupancy state every 8 seconds indicating to the user a mismatch of the desired occupied status and system occupied status at the controller.

### Display descriptions

#### Numerical display

The factory setting default numerical display (Figure 6) shows current temperature (°F or ºC) and toggles to humidity and setpoint display every 5 seconds.

*Figure 6: Sensor numerical display*

![Sensor numerical display](Image)

#### Adjusting the setpoint

(Temperature or humidity)

Whichever is displayed at the time, temperature or humidity:

- Push the or button, the displayed setpoint can be adjusted up or down.
- After an adjustment, the setpoint is displayed for 5 seconds. During the setpoint display push (System Mode Button) to switch between the temperature display or the humidity display.

*Push the or button, the displayed setpoint can be adjusted up or down. (See “Front Panel Button Operation” on page 7 for details.)*

The unit can also be programmed in the field to “Setpoint Only” display or Setpoint Lockout. See the “Optional Technician Adjustments” on page 9.

### Initial start-up occupied sequence

On initial installation power-up, the sensor is in “Occupied” mode with a solid occupied icon and DC voltage at terminal “U”. If the “STATUS/Dot” input on Terminal 1 from the controller indicates occupied (“ON” continuous), then the unit continues to stay “Occupied”. If the “STATUS/Dot” input on Terminal 1 from the controller indicates unoccupied (5 seconds “ON” then 5.5 seconds “OFF”), then the occupied icon will flash the desired occupancy state every 8 seconds, indicating to the user a mismatch of the desired occupied status and system occupied status at the controller.

### Setpoint analog range tolerance

#### Table 3: Setpoint analog range tolerance

<table>
<thead>
<tr>
<th>Terminal Analog Tolerance</th>
<th>55°F to 95°F Scale</th>
<th>-3°F to +3°F Scale</th>
<th>-5°F to +5°F Scale</th>
<th>Terminal 3 Analog Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>55°F (min.)</td>
<td>@-3°F (min.)</td>
<td>@-5°F (min.)</td>
<td>0.0 to 0.10 vdc</td>
<td></td>
</tr>
<tr>
<td>@65°F</td>
<td>@-1.5°F</td>
<td>@-2.5°F</td>
<td>1.3 to 1.42 vdc</td>
<td></td>
</tr>
<tr>
<td>@75°F</td>
<td>@0°F</td>
<td>@0°F</td>
<td>2.12 to 2.22 vdc</td>
<td></td>
</tr>
<tr>
<td>@85°F</td>
<td>@+1.5°F</td>
<td>@+2.5°F</td>
<td>2.58 to 2.63 vdc</td>
<td></td>
</tr>
<tr>
<td>@95°F (max.)</td>
<td>@+3°F (max.)</td>
<td>@+5°F (max.)</td>
<td>3.0 to 4.0 vdc</td>
<td></td>
</tr>
</tbody>
</table>

*The AC power wiring at terminals [R] & [5] should be run in a separate twisted shielded pair to avoid possible fluctuating and inaccurate signal levels induced into the other sensor signal wires.*
**Occupied icon indicator**

The Occupied Icon on the left side of the display indicates whether the room sensor is in the Occupied or Unoccupied Mode, (Figure 7).

- Solid is Occupied and Hollow is Unoccupied
- The sensor interprets the “Status” input code from the controller as
- The “HEAT/COOL/AUTO/OFF/DHUM” Mode Indicators on the bottom of the display describe each of the sensor’s modes.
- The mode is changed by pushing the System Mode button on the sensor. (Dhum is only used on WSHP units.)

**“OVERRIDE” on the display**

The “OVERRIDE” word indicator in the top left corner illuminates when the sensor is signalled by the “Status” input (Terminal 1).
- This is initiated from the Override/Reset Button at first and then confirmed from the “Status” input code which keeps the “OVERRIDE” indicator on.

**Fan status & speed indicators**

- “Fan & No Wavy Lines” indicate the fan is Off.
- “Fan & 2 Wavy Lines” indicate Low.
- “Fan & 3 Wavy Lines” indicate Medium.
- “Fan & 4 Wavy Lines” indicate High, and the word “AUTO” indicate fan Auto mode.

**System mode “HEAT/COOL/AUTO/OFF/DHUM” indicators**

The “HEAT/COOL/AUTO/OFF/DHUM” Mode Indicators on the bottom of the display describe each of the sensor’s modes. The mode is changed by pushing the System Mode button on the sensor. (Dhum is only used on WSHP units.)

**“ALARM” on the display**

The “ALARM” word indicator on top illuminates when the sensor interprets the “Status” input code from the controller as an alarm. See Table 4 on page 7.

**“E-SAVE” word on the display**

The “E-SAVE” word indicator on top illuminates when the sensor interprets the “Status” input code from the controller as Standby Mode (See Table 4 on page 7).

**“SETPOINT” word on the display**

The “Setpoint” word on top illuminates when the sensor is displaying the setpoint on the numerical display (Temperature or Humidity). When this “Setpoint” indicator is off, the numerical display shows the actual room temperature or humidity.

**“STATUS” word & dot on the display**

- The Status “Dot” on the display indicates the unit status or alarm condition. It is turned “On” and “Off” by interpreting the status input from the controller on terminal 1.
- Table 4 shows the alternating conditions and sensor status.

**Table 4: WSHP unit status input timing definition**

<table>
<thead>
<tr>
<th>Status Dot “ON” (+5 vdc) Time</th>
<th>Status Dot “OFF” (0 vdc) Time</th>
<th>WSHP Availability</th>
<th>Display Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 seconds</td>
<td>0.5 seconds</td>
<td>Controller Off (or Network “Wink” operation active)</td>
<td>“ALARM” On</td>
</tr>
<tr>
<td>0.0 seconds</td>
<td>Continuous</td>
<td>Unit running in Night Setback Override Mode or no power to the unit</td>
<td>“OVERRIDE” On</td>
</tr>
<tr>
<td>0.5 seconds</td>
<td>5.5 seconds</td>
<td>Unoccupied Mode</td>
<td>Hollow Occupied Icon</td>
</tr>
<tr>
<td>5.5 seconds</td>
<td>0.5 seconds</td>
<td>Standby Mode</td>
<td>“E-SAVE’ On</td>
</tr>
<tr>
<td>Continuous</td>
<td>0.0 seconds</td>
<td>Occupied Mode</td>
<td>Solid Occupied Icon</td>
</tr>
</tbody>
</table>

**Table 5: Fan Coil (FCU) unit status input timing definition**

<table>
<thead>
<tr>
<th>Status Dot “ON” (+5 vdc) Time</th>
<th>Status Dot “OFF” (0 vdc) Time</th>
<th>Fan Coil Availability</th>
<th>Display Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3 seconds</td>
<td>0.3 seconds</td>
<td>Alarm Active</td>
<td>“ALARM” On</td>
</tr>
<tr>
<td>0.0 seconds</td>
<td>Continuous</td>
<td>Unit running in Night Setback Override Mode or no power to the unit</td>
<td>“OVERRIDE” On</td>
</tr>
<tr>
<td>0.5 seconds</td>
<td>5.5 seconds</td>
<td>Unoccupied Mode</td>
<td>Hollow Occupied Icon</td>
</tr>
<tr>
<td>5.5 seconds</td>
<td>0.5 seconds</td>
<td>Standby Mode</td>
<td>“E-SAVE’ On</td>
</tr>
<tr>
<td>Continuous</td>
<td>0.0 seconds</td>
<td>Occupied Mode</td>
<td>Solid Occupied Icon</td>
</tr>
<tr>
<td>3.0 seconds</td>
<td>3.0 seconds</td>
<td>Calibration Mode/ Network Wink</td>
<td>No Change</td>
</tr>
</tbody>
</table>

**Front panel button operation**

**System mode indication (FCU only)**

**“HEAT/COOL/AUTO/OFF”**

The “HEAT/COOL/AUTO/OFF” Mode Indicators on the bottom of the display show the mode status of the sensor and are changed by pushing the System Mode button.
- “HEAT” on the display means the unit will only provide heating.
- “COOL” on the display means the unit will only provide cooling.
- “AUTO” on the display means the unit switches automatically to provide cooling or heating.
- “Off” on the display means the unit will not provide cooling, heating or fan operation.
There should always be one indicator “ON” unless the sensor has no power or has a problem. The System Mode Analog Output voltage on Terminal 6 will change based on the system mode.

Fan speed indication (FCU only)

“AUTO/HIGH/MEDIUM/LOW”
The Fan Speed Indicators on the display show the fan speed status (AUTO/HIGH/MEDIUM/LOW) and are changed by pushing the Fan Mode button.
- “Fan & 4 Wavy Lines & AUTO” - the fan stages up or down automatically depending on the demand for HEAT/COOL.
- “Fan & 4 Wavy Lines” - the fan runs continuously at high speed regardless of the system mode setting of HEAT/COOL/AUTO.
- “Fan & 3 Wavy Lines” - the fan runs continuously at medium speed regardless of the system mode setting of HEAT/COOL/AUTO.
- “Fan & 2 Wavy Lines” - the fan runs continuously at low speed regardless of the system mode setting of HEAT/COOL/AUTO.
- “Fan & No Wavy Lines” - Indicates the fan is Off.

System mode indication (WSHP only)

“HEAT/COOL/AUTO/OFF/DHUM”
The “HEAT/COOL/AUTO/OFF/DHUM” Mode Indicators on the display show the mode status of the sensor and are changed by pushing the System Mode button.
- “HEAT” on the display means the unit will only provide heating.
- “COOL” on the display means unit will only provide cooling.
- “AUTO” on the display means the unit can switch automatically to provide cooling or heating or dehumidification.
- “OFF” on the display means the unit will not provide cooling, heating, dehumidification or fan operation (“E” terminal goes Low).
- “DHUM” on the display means that only dehumidification will operate.

Fan indication (WSHP only)

“AUTO/ON”
The Fan Indicators on the left side of the display show the fan status (AUTO/ON) of the sensor and are changed by pushing the Fan Mode button.

Override/Reset button (timed override & alarm reset)
When the “Override/Reset” Button is pressed, the thermistor sensor is shorted. If held for more than 3 seconds but less than 11 seconds, it puts the controller into a timed Occupied Override (the time is set by the controller). If the unit is in alarm, then holding the “Override/Reset” Button for more than 11 seconds will clear all alarms in the controller but only if the cause of the alarm has already returned to its non-alarm condition. Some alarms will not reset from the digital room sensor.

Occupied button (occupied/ unoccupied request)
Note: Terminal “U” opens HI to source power on power-up “Occupied”
When the “Occupancy” Button is pushed, the current “Occupied” or “Unoccupied” status of the sensor will be toggled to the opposite condition for 20 seconds. Both the display and “U” terminal output reflect the new status during the 20 seconds. If a confirmation signal is received from the controller into the Status Input terminal “1” within 20 seconds, then the new occupancy condition remains; otherwise the “U” terminal will return to the original state and the “Occupied” Icon will flash the desired occupancy state every 8 seconds.

Up & down setpoint buttons (temp or humidity)
Press the Setpoint “Up/Down” Buttons once to enter the Setpoint Adjustment Mode. View the display to see whether the unit is in Temperature or Humidity Setpoint mode. If needed, press the “System Mode” Button once to toggle to the desired Setpoint. The current setpoint value will display for 5 seconds. When the “Up/Down” Buttons are pressed in this mode, the temperature or humidity setpoint will change in one degree or percent (%) increments. It will only change within the temperature setpoint range that was ordered (or the setpoint range that was set via the Program Mode).

The humidity setpoint is always between 40% to 90%. After 5 seconds of no buttons being pushed, the sensor will go into the standard display mode.
System mode button (FCU has HEAT/COOL/AUTO/OFF) or (WSHP has HEAT/COOL/AUTO/OFF/DHUM) When the “System” Button is pushed, the unit switches between system modes.

Fan mode button (FCU has AUTO/HIGH/MEDIUM/LOW/OFF) (WSHP has AUTO/ON) When the “Fan” Button is pushed, the fan speed changes in order from one speed to another.

Optional technician adjustments

Note: The sensor setup is factory set per your order. Setup adjustments are not required

The unit is shipped ready to install per the order and does not require any special setup or programming.

The following Program Menu Changes are available if the installer decides to change the factory settings.

The Setpoint Up/Down Buttons and Occupancy Button are used in the Programming Mode to make Menu changes and selection.

Set-up jumper (J50) configuration

(Factory set per order)

CAUTION
Turn off power to the unit before reconfiguring the F/C or MDL jumper settings. Damage to the sensor board can occur if jumpers are moved while there is power to the unit and sensor.

Program mode menu pages:

(Display required)

Note: Both J50 "F/C" and J50 "MDL" jumpers must be configured first before entering the program “PRG” mode.

Entering program mode and making changes

1. Install the J50 "PRG" jumper onto both pins with power turned on to enter Program Mode.
2. Press the Up/Down Buttons to advance to the desired program parameter from P1 through P14 (Parameters described below).
3. Press the Occupancy Button to select the specific program parameter to change.
4. Change the parameter value as described in the Mode Menus section below. (Usually with the Up/Down Button)
5. Press the Occupancy Button again to set the selected parameter.
6. Press the Up/Down Buttons to proceed to the next parameter (as in Step 2 above).
7. When done making changes, remove the J50 “PRG” jumper (and place over one pin). This action will end the Programming Mode and store all the values. The sensor is now in the Run Mode.

Program mode menu pages

P1 Setpoint Mode (Factory set to temperature value “S1”. J50 °F/°C must be set before entering the program “PRG” mode).

• S1 – “UP/DOWN” to select setpoint to absolute temperature setpoint value. Actual setpoint value set in P4 and P5. Example: 55°F (13°C) to 95°F (35°C).

• S2 – “UP/DOWN” to select setpoint to relative temperature setpoint value of ±5°F (±2.8°C).

• S3 – “UP/DOWN” to select setpoint to relative temperature setpoint value of ±3.0°F (±1.67°C) for Enfinity systems.

P2 Temperature Offset (Factory set to zero).

• “UP” to increase offset up to +2.

• “DOWN” to decrease offset down to -2.

P3 Humidity Offset (Factory set to zero).

• “UP” to increase offset up to +5

• “DOWN” to decrease offset down to -5.

P4 Setpoint Low Range (Factory set to 55°F or 13°C depending on J50 °F/C setting).

P1 in S1 Mode: Adjustment range 55 to 65°F or 13 to 18°C.

• “UP” to increase the low setpoint range up to 65°F or 18°C.

• “DOWN” to decrease the low setpoint range down to 55°F or 13°C.

Figure 8: J50 Jumper

Label description setting

PRG Program Mode or Run Mode Menu below. Program Mode = Jumper installed for Program Mode (See Program Run Mode = Jumper removed for Run Mode (Place jumper on one pin only).

F/C °C Indication or °F Indication °C = Jumper installed for °C . °F = Jumper removed for °F Indication (Place jumper on one pin only). 910152148, 910113575

MDL Sets the Model FCU or WSHP 91013679 = Jumper removed for FCU (Default for units ordered as FCU).

910121754 = Jumper installed for WSHP (Default for units ordered as WSHP).
P1 in S2 Mode: No adjustment. Factory set to -5°F (-2.8°C).
P1 in S3 Mode: No adjustment. Factory set to -3°F (-1.6°C) for Enfinity systems.
P5 Setpoint High Range (Factory set to 95°F or 35°C depending on J50-°F/°C setting).
P1 in S1 Mode: Adjustment range 85 to 95°F or 29 to 35°C.
  • “UP” to increase the high setpoint range up to 95°F or 35°C.
  • “DOWN” to decrease the high setpoint range down to 85°F or 29°C.
P1 in S2 Mode: No adjustment. Factory set to 5°F (2.8°C).
P1 in S3 Mode: No adjustment. Factory set to 3°F (1.6°C) for Enfinity systems.
P6 Fan Lock Mode (Factory set to Unlocked “Unl”)
  • “UP/DOWN” to set Fan Lock mode. Choose from list below:

<table>
<thead>
<tr>
<th>Model</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Models</td>
<td>Unl</td>
<td>Enables fan to be controlled by the Sensor Fan button</td>
</tr>
<tr>
<td>WSHP Models</td>
<td>FA</td>
<td>Locks fan to the Fan Auto position (No Sensor Fan button control)</td>
</tr>
<tr>
<td>FCU Models</td>
<td>FH</td>
<td>Locks fan to the Fan High speed position (No Sensor Fan button control)</td>
</tr>
<tr>
<td>FCU Models</td>
<td>Fd</td>
<td>Locks fan to the Fan Medium speed position (No Sensor Fan button control)</td>
</tr>
<tr>
<td>FCU Models</td>
<td>FL</td>
<td>Locks fan to the Fan Low speed position (No Sensor Fan button control)</td>
</tr>
<tr>
<td>FCU Models</td>
<td>Fo</td>
<td>Locks fan to the Fan Off position (No Sensor Fan button control)</td>
</tr>
</tbody>
</table>

P7 System Lock Mode (Factory set to Unlocked “Unl”)
  • “UP/DOWN” to set System Lock mode. Choose from list below:

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unl</td>
<td>Enables System to be controlled by the Sensor System Mode button.</td>
</tr>
<tr>
<td>UH</td>
<td>Locks System to the Heat mode (No Sensor System button control).</td>
</tr>
<tr>
<td>UC</td>
<td>Locks System to the Cool mode (No Sensor System button control).</td>
</tr>
<tr>
<td>UA</td>
<td>Locks System to the Auto mode (No Sensor System button control).</td>
</tr>
<tr>
<td>UO</td>
<td>Locks System to the Off mode (No Sensor System button control).</td>
</tr>
<tr>
<td>Ud</td>
<td>Locks System to the Dhum mode (No Sensor System button control).</td>
</tr>
</tbody>
</table>

P8 Display Resolution (Factory set to ±0.5 resolution, “0.5”).
  0.1 “UP/DOWN” to set resolution to ±0.1, (Rounds up at .05).
  0.5 “UP/DOWN” to set resolution to ±0.5, (Rounds up at .08).
  1 “UP/DOWN” to set resolution to ±1.0, (Rounds up at .5).
P9 Dehumidification Dead band (DB) (Factory set to 2%, (WSHP Only).
  2 “UP/DOWN” to set Dead band at 2% (On at setpoint SP, Off at SP-DB).
  3 “UP/DOWN” to set Dead band at 3% (On at setpoint SP, Off at SP-DB).
  4 “UP/DOWN” to set Dead band at 4% (On at setpoint SP, Off at SP-DB).
  5 “UP/DOWN” to set Dead band at 5% (On at setpoint SP, Off at SP-DB).
P10 Display Mode (Factory set to #16 for WSHP units, factory set to #4 or #3 for FCU Units).
  • “UP/DOWN” to set display mode.

Note:
  1. Selections in P11 will impact Menu P10).
  2. After changing P11 option, remove PRG jumper on J50 to exit programming mode and refresh options.

P11 Setpoint Button Lockout (Factory set to “0”): Temp. & Humidity Setpoint Enabled.
  0 Both Temperature & Humidity Setpoints are enabled (No Setpoint lockout, WSHP Units Only).
  1 Humidity Setpoint Only is Enabled (Temperature setpoint is locked out, WSHP Units Only).
  2 Temperature Setpoint Only is Enabled (Humidity setpoint is locked out).
  3 Both Temperature & Humidity Setpoints are Disabled (Full Setpoint lockout).
P12  Dehumidification Enable/Disable
   nOH  Dehumidification is Disabled (Factory default for FCU Units).
   HuA  Dehumidification is Enabled (Factory default for WSHP Units).

P13  Occupancy Button Enable/Disable (Factory set to enabled “ObE”).
     ObE  Occupancy Button Enabled (Factory default)
     Obd  Occupancy Button Disabled

P14  Firmware Version - XXX.X

P15  For Units with a BACnet or LonWorks Communications Module
     Setpoint Calibration Offset (Factory set to “0”).
     • “UP” to increase offset up to +100 will raise the MicroTech III perceived set point from the sensor.
     • “DOWN” to decrease offset down to -100. This will lower the MicroTech III perceived set point from the sensor.

Calibrate the displayed set point to the set point value sent to the MicroTech III as follows:
1. Set the digital room sensor displayed set point to 90° F.
2. Observe the local set point via the BAS/EMS connected by the BACnet or LonWorks Communications Module.
3. Adjust the Configuration Menu P15 on the sensor until the local set point and the displayed set point are equal.

P15  For Units without a BACnet or LonWorks Communications Module
     Setpoint Calibration Offset (Factory set to “0”).
     • “UP” to increase offset up to +100 will raise the MicroTech III perceived set point from the sensor.
     • “DOWN” to decrease offset down to -100. This will lower the MicroTech III perceived set point from the sensor.

The Setpoint Calibration Offset can be calculated using the following formula:

\[
\text{ROUND} [(\text{Controller Vdd} / \text{Sensor Vdd})\times1000]-1000
\]

Example:
Given: Controller Vdd = 5.15VDC
Sensor Vdd = 4.95 VDC
The programmed Calibration Offset would be 
\[
\text{[(5.15/4.95)\times1000]} -1000 = 40
\]

Diagnostics
Problem & possible solution

No display
• Check the power connections and power voltage level
• Replace unit if power is okay.

No temperature signal
• Be sure the termination and wiring is correct and the controller is set up properly. Make sure the “Override/Reset” button is not stuck down.
• Replace unit if all checks are okay.

Override/Reset not working
• Measure the resistance to ground at the sensor output terminal (Term. 4). When pushing the Override Button, it should show a short. If not, replace the sensor.

No fan voltage signal
• Be sure the termination and wiring is correct and the controller is set up properly.
• Replace unit if all checks are okay.

No system voltage signal
• Be sure the termination and wiring is correct and the controller is set up properly.
• Replace unit if all checks are okay.

Dehumidification not working
• Adjust the System Mode to DHUM and check terminal DH for voltage.
• Change the RH setpoint above and below the ambient RH to prove the output contact.
• Replace unit if it still doesn’t work.

Occupied not working
• Verify that this terminal is in a powered circuit. Measure the voltage to ground at the occupied terminal (U). When pushing the Occupied Button (<2 secs), it should read close to 0 volts. When you lift the button it should read high volts.
• Replace unit if it still doesn’t work.

“Err” shown on the screen
• This indicates that the temperature and humidity sensing element has failed.

FAN key does not change fan mode
• Check to verify FAN is not locked out in Programming Mode Menu Page P6.

MODE key does not change system mode
• Check to verify Mode is not locked out in Programming Mode Menu Page P7.

Up or Down key does not change setpoints
• Check to verify Set points are not locked out in Programming Mode Menu Page P11.

Solid Man goes away after 20 seconds
• Occupancy Request was not acknowledged by Main controller, check wiring of Status Signal from controller.
**Supply voltage**
AC Hot: (R) 7 to 28VAC, 24VAC nominal, 0.17VA
GND/Neutral: (S) Sensor common reference ground.

**Sensor**
Temperature: 10K-2 Thermistor, ±0.36°F (±0.2°C)
Humidity: 2% Accuracy from 20 to 80%, Capacitive.

**Outputs**
Unoccupied: (U), Unoccupied = Digital low to ground (Same ground as power source), 100mA @5VDC max.
Dehumidify: (DH) = Dehumidify = Voltage output (same as supply voltage), 170mA max.
System Off: (E), System Off = Digital low to ground (Same ground as power source), 100mA @5VDC max.
Fan Speed: (2 or 6), Analog, 0 to 5 VDC.
System Mode: (2), Analog, 0 to 5 VDC.
Setpoint: (3), Analog, 0 to 5 VDC.
Temperature: (4), Analog, thermistor resistance.

**Sensor controls**
Setpoint: 2 Up/Down buttons
System: 1 button to cycle between Heat/Cool/Auto/Off/Dhum
Fan: 1 button to cycle between Auto/High/On.
Occupied: 1 button to check and request change in Occupancy Status.
Override/Reset: 1 button to request timed occupancy override and reset alarms.
Inputs: (1), Controller alarm & system status, 5VDC max.
Termination: 10 Terminals, 16 to 22 AWG.
Mounting: Standard 2” × 4” J-Box or Drywall

**Field setup jumper J50**
PRG: Program Mode, On = Program, Off = Run.
F/C: Display Mode, On = °C, Off = °F.
MDL: MODEL, On = WSHP, Off = FCU.

**Display**
LCD
Overall size: 2.04"W × 1.33"H.
Main Digits: ±999.9 Digits @0.6"H
Resolution: ±0.5 displayed value, 0.1 for offset adjust
Main Value: Temp, Humidity & Setpoint, toggling every 5 sec.
Eng. Units: °F, °C, %RH.
Fan: Auto/High/Medium/Low.
Occupied Icon: Hollow = Unoccupied, Solid = Occupied.
Function: Override, Alarm, E-Save, Setpoint

**Field configuration menu**
*(Requires J50 PRG jumper to be “On”)*
Offset: Temp or Humidity display, ±2°F (±1.0°C) and ±5% RH.
Setpoint range: Default 55°F to 95°F (13°C to 35°C), ±3°F (±1.6°C) or ±5°F (±3°C). Adjustable between 55°F to 95°F, ±3°F (±1.6°C) or ±5.0°F (±2.8°C).
Fan Lock-in: Any fan speed or off can be locked in System Lock-in. Any system mode can be locked in
Resolution: Main display can be default .5, or .1 or 1.0 (°F, °C or %).
Display Mode: Temp only, RH only, Setpoint only or any combination.
Dhum DB: Dehumidify Dead Band adjust, 2% default.

**Enclosure material**
ABS Plastic, UL94V-0.

**Ambient**
32°F to 122°F (0°C to 50°C), 0 to 95%RH, Non-condensing.

**Agency**
Restriction of the use of certain Hazardous Substances (RoHS).