1.0 Overview
Underfloor heating is becoming an increasingly popular means to provide heat for a living space throughout much of the
world. A company called Heatmiser has controls that can be used in many countries to control underfloor heating systems.
This application note describes how to integrate HomeWorks QS systems with compatible Heatmiser controls for control of
underfloor heating systems.

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2.0 Heatmiser Introduction

Heatmiser is a company specializing in the design and manufacture of underfloor heating controls as well as mobile applications. Lutron has collaborated with Heatmiser to offer simple integration with many of their controls and HomeWorks QS systems via TCP/IP protocol.

2.1 Features when Integrating Heatmiser with a HomeWorks QS System

<table>
<thead>
<tr>
<th>Heatmiser Integration Capabilities</th>
<th>Supported?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controls and triggers</td>
<td></td>
</tr>
<tr>
<td>Palladiom thermostat</td>
<td>Yes</td>
</tr>
<tr>
<td>seeTouch keypad</td>
<td>Yes</td>
</tr>
<tr>
<td>Radio Powr Savr sensors</td>
<td>Yes</td>
</tr>
<tr>
<td>Timeclock</td>
<td>Yes</td>
</tr>
<tr>
<td>Lutron Connect app</td>
<td>Yes</td>
</tr>
<tr>
<td>Operating mode control</td>
<td></td>
</tr>
<tr>
<td>Heat</td>
<td>Yes</td>
</tr>
<tr>
<td>Cool</td>
<td>n/a</td>
</tr>
<tr>
<td>Auto</td>
<td>Yes (always goes to Heat)</td>
</tr>
<tr>
<td>Off</td>
<td>Yes</td>
</tr>
<tr>
<td>Emergency heat</td>
<td>n/a</td>
</tr>
<tr>
<td>Advanced programming</td>
<td></td>
</tr>
<tr>
<td>Green mode</td>
<td>No</td>
</tr>
<tr>
<td>Conditional logic based on Heatmiser settings</td>
<td>Yes</td>
</tr>
<tr>
<td>Heatmiser specific</td>
<td>Frost mode</td>
</tr>
</tbody>
</table>

2.2 Connecting Heatmiser controls to a HomeWorks QS System

The RS485 to Ethernet converter must be connected to the same Local Area Network (LAN) that the HomeWorks QS processor resides on. The baud rate of the RS485 to Ethernet converter needs to be set to 4800 Baud.
2.0 Heatmiser Introduction (continued)

2.3 Implementing Heatmiser Controls into a HomeWorks QS Database

2.3.1 Adding HVAC Zones to a HomeWorks QS Database
To add an HVAC zone to the database, go to the **design** tab of the HomeWorks QS software and use the drop-down menu to select **loads**. Next, find the **HVAC Zones** tab on the right side of the screen.

![Add HVAC Zone](image)

Click **Add load** at the bottom of the screen.

For each HVAC zone added, provide a **Zone Name** and select **Operating Modes**. Unchecked modes will be hidden when using the Lutron Connect app. It is important to check only the modes that are necessary so the app is simpler for the end user. Choosing a user friendly zone name is important for the same reason.

**Note:** Heatmiser controls only work with off and heat modes and do not support fan modes.

![HVAC Zone Table](image)
2.0 Heatmiser Introduction (continued)

2.3 Implementing Heatmiser Controls into a HomeWorks QS Database (continued)

2.3.2 Adding a Heatmiser Control to a HomeWorks QS Database

To add a Heatmiser control to the database, go to the design tab of the software and use the drop-down menu to select equipment. Next, find the 3rd Party HVAC device in your toolbox and click the plus sign to add the device.

Note: The default toolbox does not contain this device by default, so it is necessary to edit or create a toolbox to include the 3rd party HVAC device.

Once the 3rd party HVAC control has been added to the Equipment Locations area, provide a name for the HVAC control and select HeatMiser RS485 models as the Manufacturer.

Select the model number of Heatmiser RS485 control being integrated into the HomeWorks QS system.

Continued on next page...
2.0 Heatmiser Introduction (continued)

2.3 Implementing Heatmiser Controls into a HomeWorks QS Database (continued)

2.3.2 Adding a Heatmiser Control to a HomeWorks QS Database (continued)

To configure the Output tab, assign the HVAC zone by clicking Assign... and enter the UID for the thermostat.

The UID for a RS485 wired Heatmiser control is a two digit number and is set up using the applicable Heatmiser manual at www.heatmiser.com/en/heatmiser-manuals. Up to 32 UIDs can be assigned to one 3rd party HVAC control. For example, address 1 of 32 would be entered as “01” into the HomeWorks QS software. When more than 32 UIDs are required, a second 3rd party HVAC control must be added to the system and another RS485 to Ethernet converter must be used.

Under the Controller Settings tab, enter the IP Address of the RS485 to Ethernet converter into the Address field and ensure that the Port Number is correct (varies based on the RS485 to Ethernet converter). A Username and Password is not usually necessary because raw TCP is being used to communicate with the Heatmiser, not Telnet. The network settings are configured in the RS485 to Ethernet converter.

2.3.3 Link Assigning Heatmiser Controls to Processor Ethernet Connections

Heatmiser controls communicate with the HomeWorks QS processor by sending RS485 communication through an RS485 to Ethernet converter. As a result, the Heatmiser control appears as a network device to the HomeWorks QS processor and must then be assigned to an Ethernet connection on one of the 16 possible processors.

To assign a Heatmiser control to an Ethernet connection, first select link assignment from the design tab drop down menu. Click Ethernet under the processor to which the Heatmiser control is to be assigned.

Continued on next page...
2.0 Heatmiser Introduction (continued)

2.3 Implementing Heatmiser Controls into a HomeWorks QS Database (continued)

2.3.3 Link Assigning Heatmiser Controls to Processor Ethernet Connections (continued)

Select **Ethernet Devices** from the **Show** filter on the **Assignable Items:** window on the right side of the screen.

Check the box for the zone that you would like to assign to an Ethernet connection and it will appear in the list of assigned Ethernet devices in the lower right corner of the software.

The **IP Address** and **Port** numbers are the numbers used by the RS485 to Ethernet converter. If the converter communicates using the application layer protocol of Telnet, the converter would have a **Username** and **Password** that the processor would require in order to send outbound strings of communication.

Each 3rd party HVAC interface counts as 1 outbound connection in the HomeWorks QS system.

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</thead>
<tbody>
<tr>
<td>7.0 and newer</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>Manual, link assignment</td>
</tr>
<tr>
<td>Before 7.0</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>Automatic, round-robin</td>
</tr>
</tbody>
</table>

To disable Home Control+ remote access check the box next to **Disable Home Control+ Remote Access** located:

a. Either under **Ethernet** for the first processor on the **Design > Link Assignment** screen:

b. Or under the **Home Control+ Remote Access** field on the **Activate > Processors** screen:

Lutron does not recommend using the Home Connect+ app for new or upgraded installations. The Connect app offers enhanced capability and is recommended for new and upgraded installations. See Lutron Application Note #649 at www.lutron.com for additional information on the Connect app.

Continued on next page...
2.0 Heatmiser Introduction (continued)

2.3 Implementing Heatmiser Controls into a HomeWorks QS Database (continued)

2.3.4 Using Heatmiser Controls with a Palladiom Thermostat (version 11.0 and newer)

The final step is to assign any Palladiom thermostats that will be used to also control the setpoints and modes.

The Palladiom Thermostat is a QS wired link device which can act as a remote thermostat control for Heatmiser controls. It takes one address of the 99 available on a QS link and there can be up to 32 Palladiom thermostats per QS link. When using a Palladiom thermostat with Heatmiser equipment, the sensor within the Palladiom thermostat is not used by the system. The Palladiom thermostat is available in HomeWorks QS software version 11.0 or newer.

Click **Assign...** under the **Assigned Devices** field.

Then click **Assign** for the Palladiom thermostat that will control the zone.

The name of the Palladiom thermostat will now be visible in the **Assigned Devices** field.

Continued on next page...
2.0 Heatmiser Introduction (continued)

2.3 Implementing Heatmiser Controls into a HomeWorks QS Database (continued)

2.3.5 Changing Setpoints and Modes from Keypad Buttons, CCIs, Sensors, or Timeclock Events

The first step, as with any keypad button or CCI, would be to select the Program Type, Button Type, and LED Logic: for the button.

Once the button has been configured, select HVAC Zones from the Assignable Items drop down menu. Find the zone to add to the button and hover the cursor over the checkbox to the right of the zone name. In the window that appears, select the parameters that need to change based on the button press. Temperature setpoint, schedule status, and operating mode can be adjusted from keypad button presses.

Continued on next page...
2.0 Heatmiser Introduction (continued)

2.3 Implementing Heatmiser Controls into a HomeWorks QS Database (continued)

2.3.5 Changing Setpoints and Modes from Keypad Buttons, CCIs, Sensors, or Timeclock Events (continued)

To program an occupancy or vacancy sensor to control a Heatmiser device, be sure to select **occupancy** from the **program** tab drop down menu and then select the sensor that is to be programmed.

Temperature setpoint, schedule status, and operating mode can be adjusted from sensors.

Continued on next page...
2.0 Heatmiser Introduction (continued)

2.3 Implementing Heatmiser Controls into a HomeWorks QS Database (continued)

2.3.5 Changing Setpoints and Modes from Keypad Buttons, CCIs, Sensors, or Timeclock Events (continued)

To program a timeclock event to control a Heatmiser device, select timeclocks from the program tab drop down menu.

Create a new timeclock event, give it a name, and select desired days of the week and time of the event. On the right side of the screen, select the Program Type and the HVAC Zones to be affected by the event. Timeclock events can be used to adjust temperature setpoint, schedule status, and operating mode.

Continued on next page...
2.0 Heatmiser Introduction (continued)

2.3 Implementing Heatmiser Controls into a HomeWorks QS Database (continued)

2.3.6 Programming 7 Day Schedules

The HomeWorks QS software can be used to create 7 day schedules which allow for automatic control of HVAC setpoints, up to 4 times per day, with the aim of maximizing energy efficiency and comfort. Programmed schedules are executed on a zone by zone basis although copying schedules from one zone to another is allowed to facilitate faster programming.

To program an HVAC schedule to control a Heatmiser zone, select thermostat from the program tab drop down menu.

Next, select the desired HVAC zone.

On the right side of the screen, there will be the option to edit an existing schedule or to click “+” to add a new schedule. Each zone can have 1 schedule run per day for a maximum of 7 independent schedules per zone. There can be up to a maximum of 4 events that are triggered at fixed times throughout the schedule.

Schedules for each HVAC zone in the system are programmed independently. If two or more zones have the exact same scheduling requirements, copying/pasting of schedules is allowed to increase programming efficiency. To copy a schedule from one zone to another, right click the name of the HVAC Zone that contains the schedule to be copied. Click Copy Schedules Ctrl+C. Click the HVAC Zone to be programmed and click Paste Schedules Ctrl+V to copy the schedule to that zone.

Note: When coping schedules, only single setpoint schedules can be copied to other single setpoint zones and only dual setpoint schedules can be copied to other dual setpoint zones.
2.0 Heatmiser Introduction (continued)

2.3 Implementing Heatmiser Controls into a HomeWorks QS Database (continued)

2.3.7 Frost Mode Implementation

Frost mode is used primarily when the residents are away on vacation where the thermostat setpoints are set just above the level where the pipes would freeze. The purpose is to save energy and not have the equipment run as frequently when the residents are away from the home for an extended period of time. The typical setpoint for frost mode would be between 5 °C to 7 °C.

The HomeWorks QS system directly supports heat and off modes. The HomeWorks QS system does not directly support frost mode like Heatmiser controls. There is a way to simulate frost mode with the HomeWorks QS system through the programming of a keypad to change the setpoints of the zone(s) to a level equivalent to that of frost mode.

To set up frost mode, use a keypad button press to change the setpoint(s) of the zone(s) to the typical frost mode level. Select the keypad to be programmed from under the devices section of the program tab. Name one of the buttons “Frost Mode” or “Frost”. This could also be part of a button called “Vacation” which would set the frost mode as well as enable vacation mode and other desired vacation functions. Set the Button Type: and LED Logic: next. In this case, a Toggle button with Scene LED logic will be used.

Select the Heatmiser zone that is to be programmed to the button and enter the target setpoint between 5 °C to 7 °C for the Press On function. Set the schedule status to Hold.

Continued on next page...
2.0 Heatmiser Introduction (continued)

2.3 Implementing Heatmiser Controls into a HomeWorks QS Database (continued)

2.3.7 Frost Mode Implementation (continued)

For the Off Level function, have the button adjust the target setpoint back to a comfortable temperature (e.g., 21 °C). Set the schedule status to Run.

If the setpoint cannot be adjusted below 10 °C, change the minimum setpoint to 5 °C for each Heatmiser zone to have this feature. To do this, go to the design tab and finding the thermostats under Equipment. Select the thermostat and click Properties. Minimum Setpoint must be between 5 °C to 21 °C and Maximum Setpoint must be between 27 °C to 45 °C.
3.0 Frequently Asked Questions (FAQs)

What are the typical forms of underfloor heating?
Typically, underfloor heating is performed one of two ways: using an electric heating element or liquid flowing through a closed loop of pipe from a furnace (hydronic). The liquid flowing through the pipes of the hydronic system is a combination of water and an anti-freeze.

Is the Heatmiser Neo app supported for integration with HomeWorks QS systems?
Presently, the Heatmiser Neo app is not a supported control platform. Lutron is continuously innovating and expanding integration capabilities thus leaving the door open for future integration possibilities with software like the Heatmiser Neo app.

4.0 Appendix A – RS485 Heatmiser System Diagram Example
5.0 Appendix B – Discontinued Wi-Fi Heatmiser Thermostats

5.1 Connecting Heatmiser Wi-Fi Controls to the HomeWorks QS System

Wi-Fi Heatmiser controls must all be connected to the same LAN where the HomeWorks QS processor(s) reside(s).

5.2 Implementing Heatmiser Wi-Fi Controls into a HomeWorks QS Database

5.2.1 Heatmiser Wi-Fi Thermostat Settings in a HomeWorks QS Database

On the **Output** tab for the Wi-Fi thermostat, enter the PIN of the Heatmiser control into the **UID** field. The unique four digit PIN for Wi-Fi Heatmiser controls is configured in the Heatmiser Wi-Fi Setup Utility located at https://www.heatmiser.com/en/download/70/wifi-stat-setup-utility/5154/win.zip. This is done while the Heatmiser control is connected to the computer over the network or by directly configuring the .txt file seen when connecting the Heatmiser control directly to the computer.

**Note:** In the HomeWorks QS software, only one Wi-Fi Heatmiser control UID/PIN is allowed per 3rd party HVAC control.

Setup of the Wi-Fi Heatmiser network settings is handled by this Heatmiser Wi-Fi Setup Utility.

Under the **Controller Settings** tab, enter the IP Address of the Wi-Fi Heatmiser control into the **Address** field and ensure that the **Port Number** is correct (Wi-Fi devices use 8068). A **Username** and **Password** is not typically necessary because raw TCP is being used to communicate with the Heatmiser control, not Telnet. The network settings are configured in the Heatmiser Wi-Fi Setup Utility.