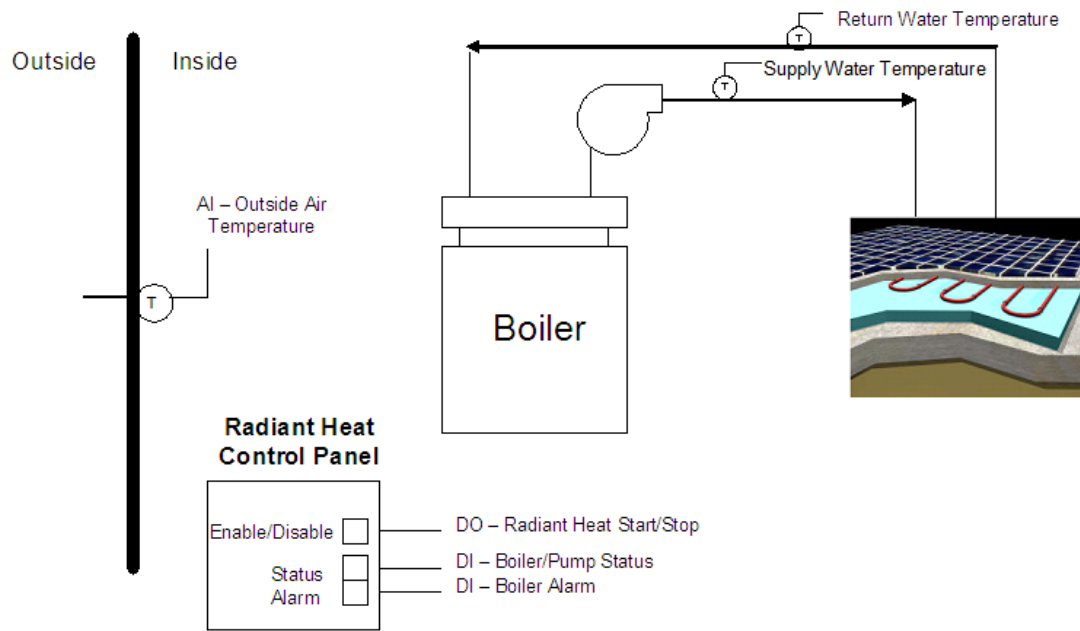


# Application Note 3010

## IO and Radiant Heat



**Figure 1.** CITY MULTI® and In-Floor Radiant Heat Control

Note: Boiler and pump to be enabled/disabled via interlock with the radiant heat system control panel.

**Table 1.** List of Controls Points for Radiant Heat

| Point Description        | Digital Output | Digital Input | Analog Input | Schedule | Trend | Display | High Limit | Low Limit | Abnormality |
|--------------------------|----------------|---------------|--------------|----------|-------|---------|------------|-----------|-------------|
| Radiant Heat Start/Stop  | X              |               |              |          |       | X       |            |           |             |
| Boiler Status            |                | X             |              |          |       | X       |            |           |             |
| Boiler Alarm             |                | X             |              |          | X     | X       |            |           | X           |
| Pump Status              |                | X             |              |          |       |         |            |           |             |
| Outside Air Temperature  |                |               | X            |          | X     | X       |            |           |             |
| Supply Water Temperature |                |               | X            |          | X     | X       | X          | X         |             |

## **Sequence of Operation**

The CITY MULTI® Controls Network shall start/stop the radiant heat source based on the outside temperature to provide heat via a radiant heating system.

The CITY MULTI® indoor units shall be enabled to actively heat the space with the radiant heat source when needed due to fluctuations in space temperature and/or owners override. Figure 1 displays the CITY MULTI® and In-Floor Radiant Heat Control.

Users shall be capable of manually overriding the radiant heat source start/stop point via the AE-200 Centralized Controller display, the AE-200/AE-50/EW-50 Centralized Controller's Web Browser, or via Initial Settings Tool.

The outside air temperature, supply water and return water temperatures shall be monitored, displayed, and trended via the AE-200/AE-50/EW-50 Centralized Controller's Web Browser or via Initial Settings Tool as denoted in Table 1.

The CITY MULTI® Controls Network shall also monitor the operating status for the boiler and pump; it shall also provide an alarm status for the boiler.

## **Required Equipment**

The Digital Input/Digital Output (DIDO) and the Analog Input (AI) controllers used in conjunction with an AE-200/AE-50/EW-50 can monitor and control third-party equipment.

### **DIDO Controller**

The DIDO controller has 2 channels. A channel consists of 1 DO for start/stop control, 1 DI for status monitoring and 1 DI for alarm input. Each channel will have 1 graphic displayed on the AE-200 Centralized Controller's display, the AE-200/AE-50/EW-50 Centralized Controllers Web Browser, or via Initial Settings Tool.

#### **Channel (2 per DIDO Controller)**

DO – Start/Stop

DI – Status

DI – Alarm

The DIDO Controller requires a 24 VDC power supply (PAC-SC51KUA). A 24 VDC interposing relay (RIBMU2C-Dual 24 VDC Relay) is required.

### **AI Controller**

The AI controller has 2 inputs for monitoring and trending temperature and/or humidity. Each input can have a user-defined high and low limit to allow for alarms to be generated should the temperature or humidity exceed these limits. Each analog input requires a 0-10 VDC, 4-20 mA or 1-5 VDC signal from a field-supplied temperature or humidity sensor. Historical measurement data can be displayed on the AE-200/AE-50/EW-50 Centralized Controller's Web Browser or Initial Settings Tool.

Temperature and/or humidity trending can be done via the AE-200/AE-50/EW-50 Web Browser, or via Initial Settings Tool.

The AI Controller requires a 24 VDC power supply (PAC-SC51KUA)

Notes:

1. Not all inputs and outputs listed maybe available on third-party equipment.
2. Additional field-supplied devices maybe required to provide inputs and outputs listed.
3. DIDO and AI controllers are not available for fire and life safety control.
4. DIDO and AI controllers are not supported by the BACnet™ and LonWorks® interfaces.
5. The AI Controller is not supported by the TC-24 Centralized Controller.