

Section 2.7

Ground Source Heat Pumps

The Network System supports up to two ground source heat pumps (GSHPs) in a single or two-tank installation. The system controls a 0-10V three-way valve for system switchover between heating and cooling. The Network System also supports a single boiler to backup the GSHPs or to boost the heating system if needed.

This section covers the following topics.

- Enabling GSHPs
- Configuring multiple heat pumps
- Enabling boiler backup or boost
- Configuring multiple tanks (hot and cold)
- Setting up off-peak tank charge
- Adjusting tank setpoints
- Using GSHP settings

Before proceeding, make sure the following steps are complete:

- ❑ All Uponor Configuration Tool (UCT) software (A9090000) components are installed (**Section 1.5**).
- ❑ The computer is correctly connected to the Network System (**Section 1.6**).
- ❑ The installer is familiar with using UCT elements (**Section 1.7**).

 **Important:** Remember to save all changes to flash memory. Changes not saved to flash will be lost if the Primary Equipment Control (PEC) (A9012000) loses power. See **Section 5.1: Save to and Load from Flash**.

Enabling GSHPs

Before configuring GSHPs, the installer must indicate to the Network System that GSHPs are available and will be the primary source of hydronic (water) heating. When this option is checked, boiler ports one through four (for two units) on the PEC will be used to control the GSHP units and can no longer be used for boilers.

Refer to the following steps to enable the GSHP option.

1. From the **Main Menu**, click on the **Ground Source Heat Pumps** button shown in **Figure 2.7-1** to display the Ground Source Heat Pumps (GSHPs) screen shown in **Figure 2.7-2**.

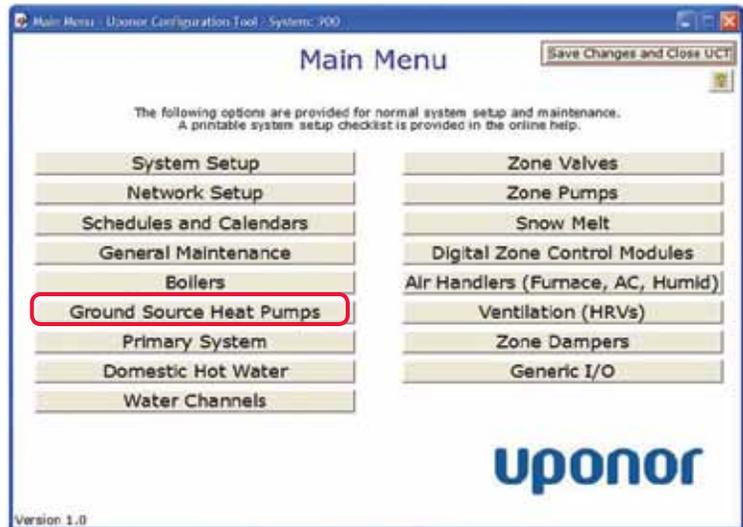


Figure 2.7-1: Main Menu Screen

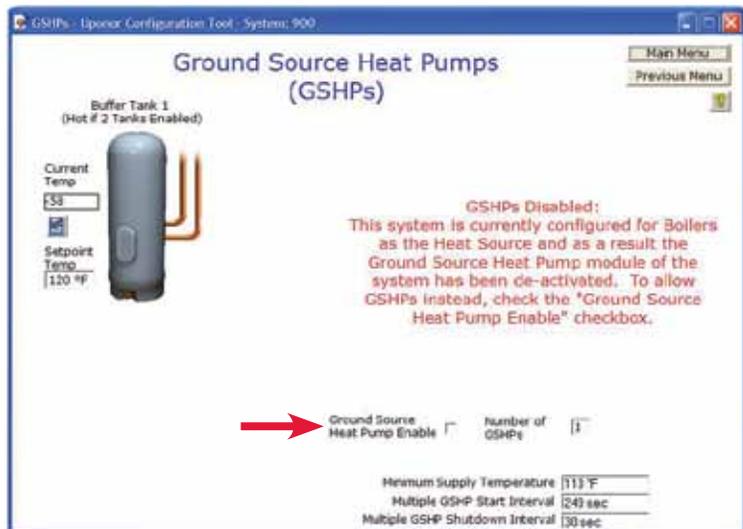


Figure 2.7-2: Ground Source Heat Pumps Screen

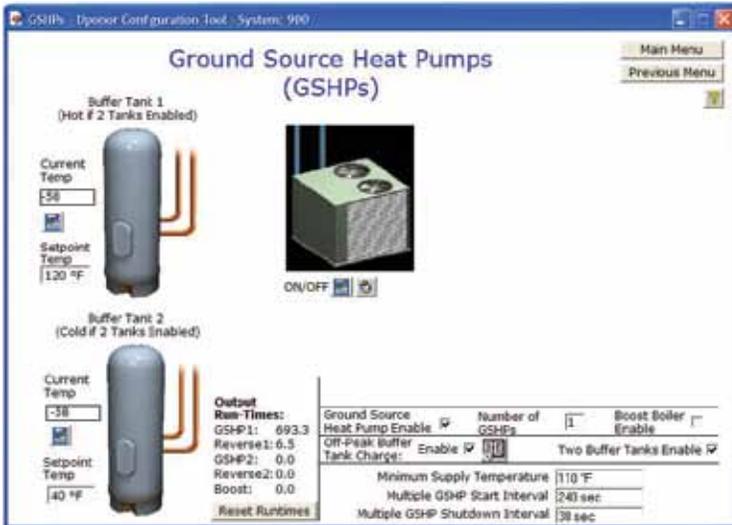


Figure 2.7-3: Ground Source Heat Pump Enabled Screen

2. Click on the Ground Source Heat Pump Enable checkbox to display graphics shown in **Figure 2.7-3**.

Configuring Multiple Heat Pumps

The Network System supports up to two, single-stage units to provide heating and cooling water. If two units are setup, the control will bring on the second unit based on the time delay for the start interval (more information below) and will rotate the units to keep their runtime equal.

With the GSHP option enabled, the default is a single pump. To setup the system for two GSHPs, enter "2" in the Number of GSHPs field. A second unit will display on the Ground Source Heat Pumps screen; see **Figure 2.7-4**.

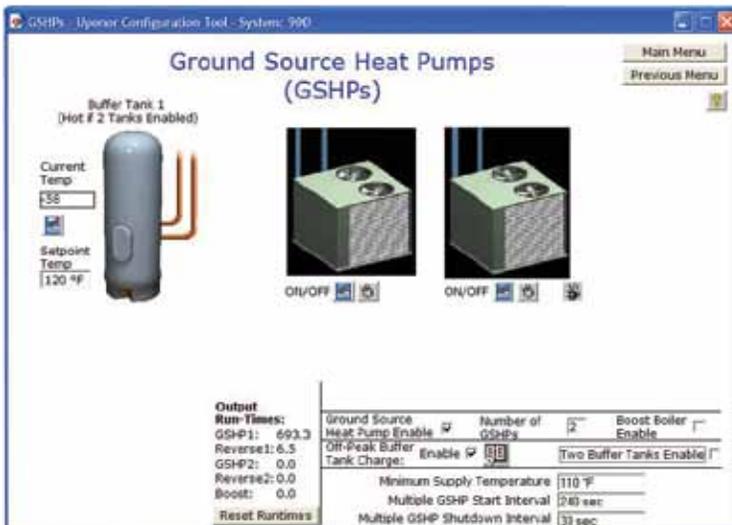


Figure 2.7-4: Screen with Two Ground Source Heat Pumps Enabled

Enabling Boiler Backup or Boost

The Network System supports a single boiler to supplement the GSHP unit(s). Supplemental heat may be needed when the outdoor temperature falls and the GSHP can no longer meet the temperature requirements. Off-peak electrical conditions may also generate a need for boiler backup. The backup boiler will always connect to port five of the PEC, using a Boiler Relay, On-Off (A9012010).

To enable the boiler backup feature, click on the Boost Boiler Enable checkbox. A new graphic for the boiler will display; see **Figure 2.7-5**.

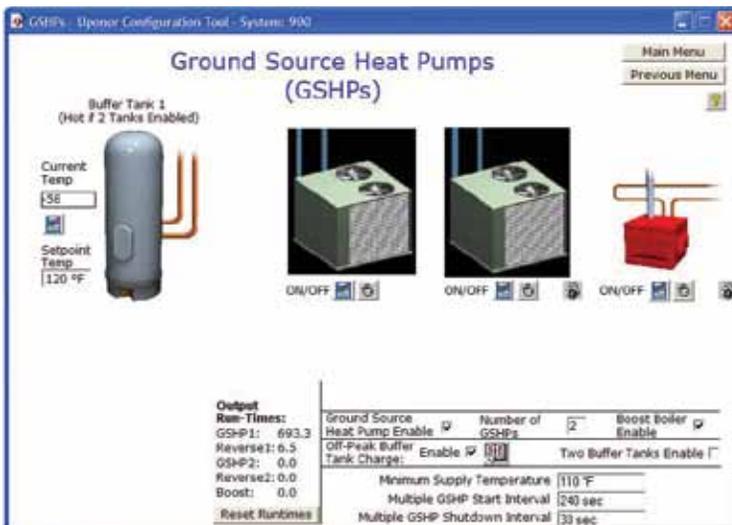


Figure 2.7-5: Boost Boiler Enabled Screen

Configuring Multiple Tanks (hot and cold)

GSHP piping configuration will support one or two tanks. The Network System default is a single tank.

A single tank installation is typically used for single-mode operation; however, it can be used for both heating and cooling. Yet, using a single tank for both modes will cause delay and inefficiency. Be aware that the Network System will complete a heating call before switching to cooling (and vice versa) when using a single tank for both heating and cooling.

A two-tank system — with one tank for heating, one for cooling and a diverting valve to switch between the tanks — offers greater efficiency.

To set up the two-tank option, click on the Two Buffer Tanks Enable checkbox. A new graphic for the second boiler will display; see **Figure 2.7-6**.

Setting up Off-peak Tank Charge

In some areas, users may be able to take advantage of off-peak electrical rates. At certain times of the day, the GSHPs should not run. During these times, heating is setback or the backup boiler provides hot-water heating. (See the **Enabling Boiler Backup or Boost section**).

To setup the off-peak option, click on the Off Peak Buffer Tank Charge checkbox. A new graphic for a schedule will display; see **Figure 2.7-7**.

Note: A schedule for off-peak tank charging must be set for this option to work correctly. See **Section 2.17: Schedules and Calendars** for additional information.

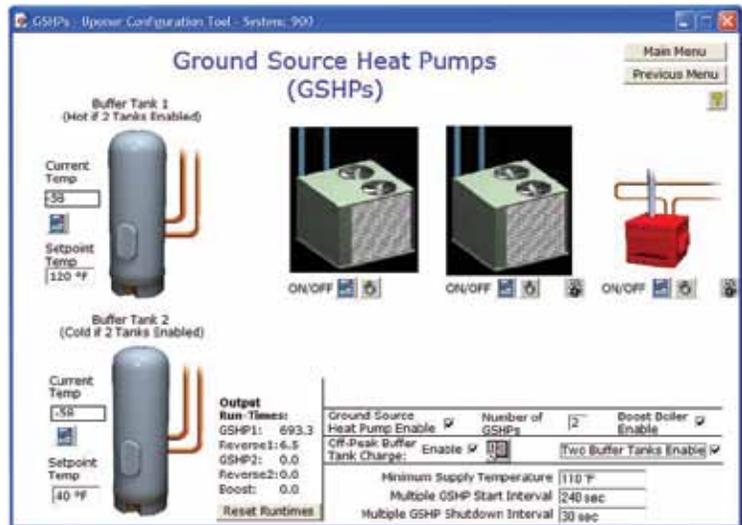


Figure 2.7-6: Two Tanks Enabled Screen

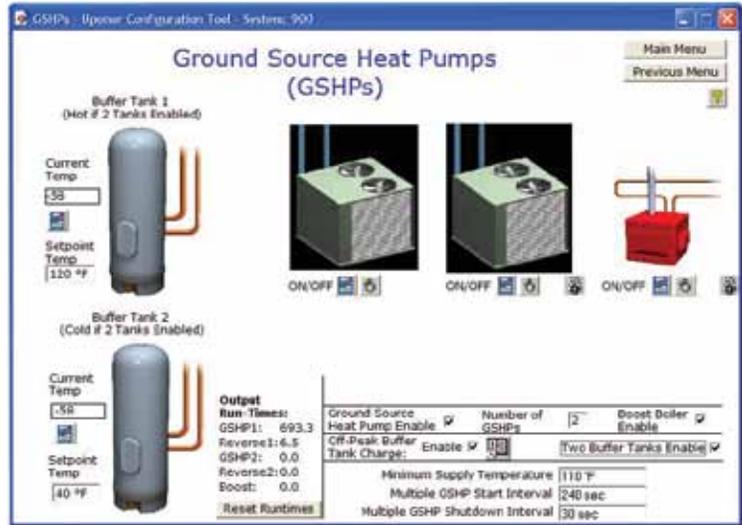


Figure 2.7-6: Two Tanks Enabled Screen

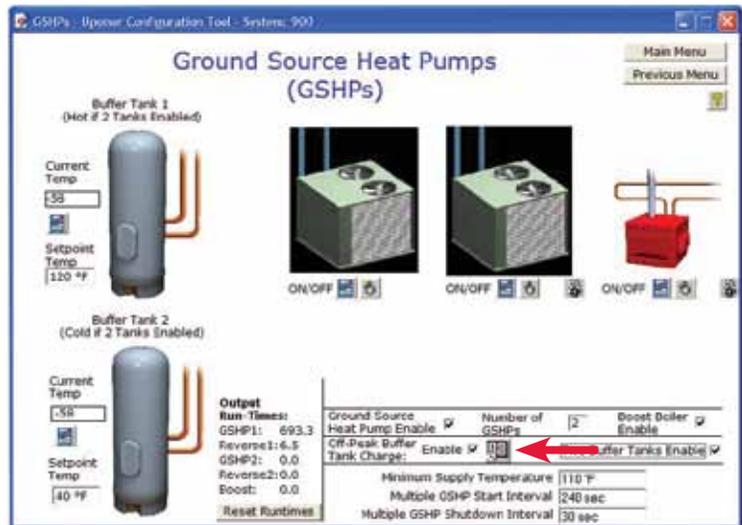


Figure 2.7-7: Off-peak Tank Charge Enabled Screen

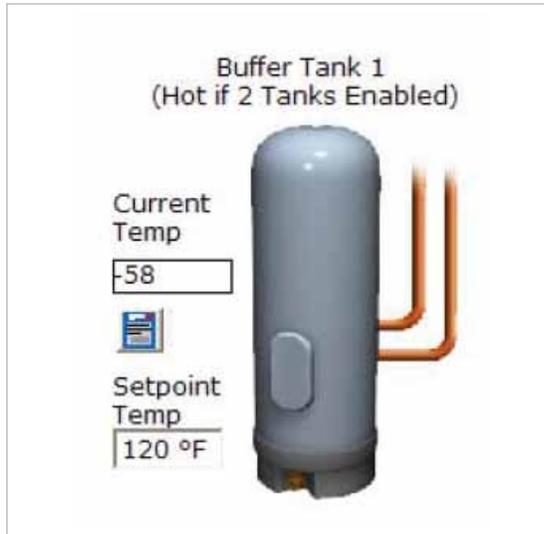


Figure 2.7-8: Tank Setpoint

Note: A value of -58°F (-50°C) in the Current Temp field means the Network System is not reading a sensor or the tank sensor is not properly connected. The GSHPs will not operate until the issue is resolved.

Using GSHP Settings

Several additional settings can be adjusted to fine tune the operation of the GSHPs. These fields are shown in **Figure 2.7-9** and described below.

Minimum Supply Temperature — This setting is the minimum desired temperature required for boiler operation if Boost Boiler Enable is selected.

Multiple GSHP Start Interval — This setting is only used when the system has two GSHPs. The value is the time period between GSHP starts. If the first GSHP has not delivered the desired water temperature after the period of time specified by the start interval, the second unit will start.

Multiple GSHP Shutdown Interval — This setting is only used when the system has two GSHPs. The value is the amount of time between the shutdown of one GSHP and the Network System evaluation of the need to stop the other GSHP. If the maximum primary-loop supply water temperature is exceeded, both GSHPs will stop.

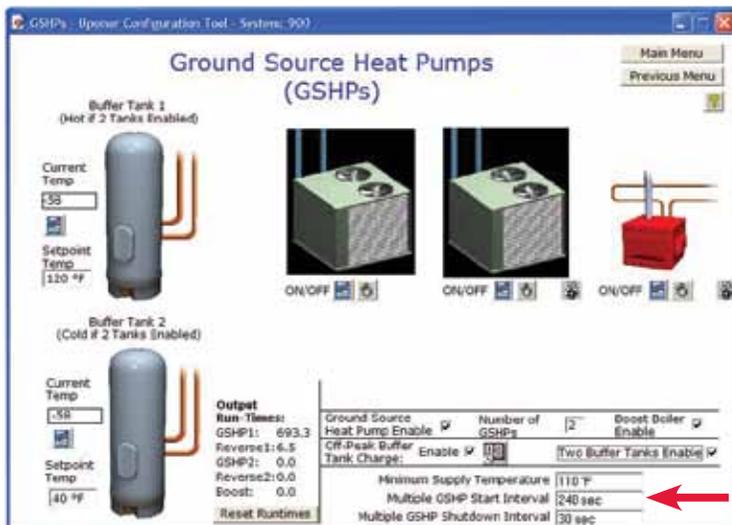


Figure 2.7-9: Ground Source Heat Pumps Settings Screen

Adjusting Tank Setpoints

The user must set heating and cooling setpoints for each tank. For heating, the GSHP will shut down until the tank temperature has dropped to 9°F (5°C) below the setpoint. For cooling, the GSHP will shut down until the tank temperature rises to 9°F (5°C) above the cooling setpoint.

To change a tank setpoint, enter a new value in the Setpoint Temp field; see **Figure 2.7-8**.

The new value will initially display in pink text, but change to black when accepted by the PEC.