

LCD Touchscreen

HeatNet Online

Setup Instructions

Revision 1.02

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Introduction

HeatNet Online is an Internet (over Ethernet) connection between a HeatNet control and the Mestek HeatNet Online Web Server. Using this connection, the control board will periodically send messages containing all data to capture the current operational state of the boiler. If the boiler is a master, data for all its member boilers will also be sent.

The HeatNet Online server stores this information in a database. Users can login to the HeatNet Online Web Site (www.heatnet.net/heatnet-online.aspx) to view both present and historical data. The server also monitors the data in real time and will send out email alerts for faults, warnings, and other conditions that may require attention.

Network Requirements

A standard Ethernet drop (CAT5, CAT6, ...) terminated with an RJ-45 connector needs to be run into the boiler control enclosure. This Ethernet connection must provide internet access over an IPv4 Network with statically or Dynamically (DHCP) assigned IP addresses:

- IP Address
- Subnet Mask
- Default Gateway
- Primary and Secondary DNS Servers (at least 1 required)

HeatNet Online sends HTTP (XML) messages to the HeatNet Online Server. It uses a number of standard network ports including:

- HTTP/XML – port 80
- DNS - port 53
- NTP/SNTP – port 23

All traffic is outbound. No public IP Address, Dynamic DNS, special firewall rules, or port forwarding is needed.

If a network internet connection is not available or the building owner does not want anything connected to their network, wireless (cellular) routers are available; please contact the factory for more information.

Hardware

HeatNet V3 Controls with LCD Touch Screen Display

HeatNet Online is available on HeatNet LCD Touch Screen Displays with display firmware version 1.2-R5 or greater. The Ethernet network cable connects to the LCD Display Processor Board as shown in Figure 1.

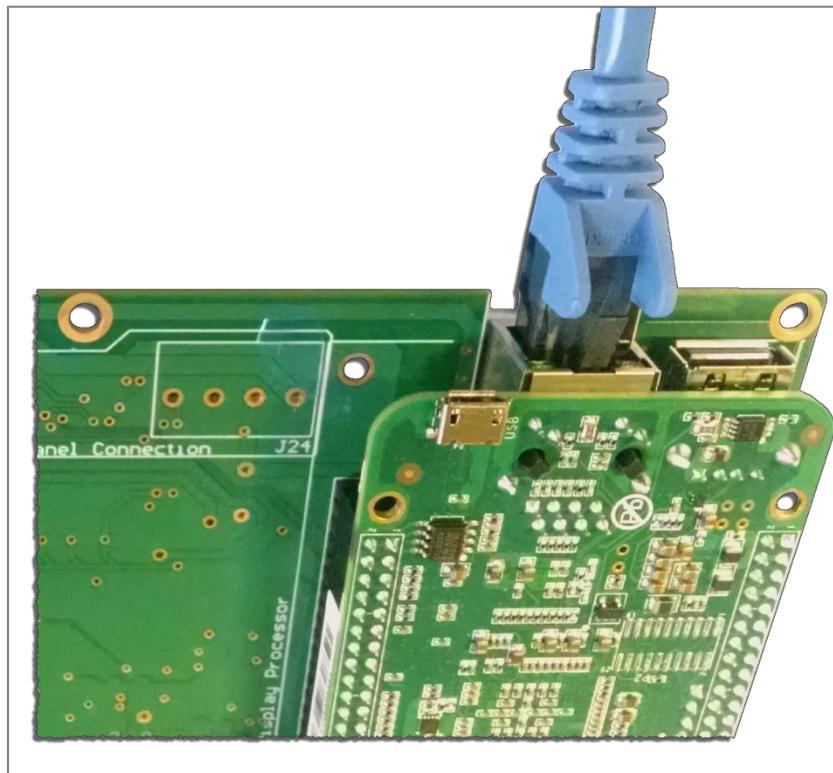


Figure 1 – HeatNet Online Network Cable Connection

The following products are currently supported:

- ATH KN6 – KN30 boilers require firmware version 3.49 (or higher).
- RBI Futera III, Fusion, and XLF and Flexcore series boilers require firmware version 3.39 (or higher).

Configuring HeatNet Online

Step 1 - Network Settings

As discussed in the Network Requirements section, the network needs to be assigned an IP Address, Subnet Mask, Default Gateway, and DNS Server(s). These values can be assigned dynamically (DHCP – Dynamic Host Configuration Protocol) or statically.

DHCP is the easiest option and it can be used on any network with a DHCP server. Most Cable, DSL, and Wi-Fi routers have a built-in DHCP server. HeatNet Online will automatically request its network settings from the DHCP server. Statically assigned addresses typically require someone with networking expertise to properly configure and are beyond the scope of this document.

On installations with a commercial on-premises network (LAN), it will probably be necessary to contact the IT department to find out how they would like the network settings configured. It may also be necessary for them to open up the port(s) on the local switch to allow outbound traffic on this network drop.

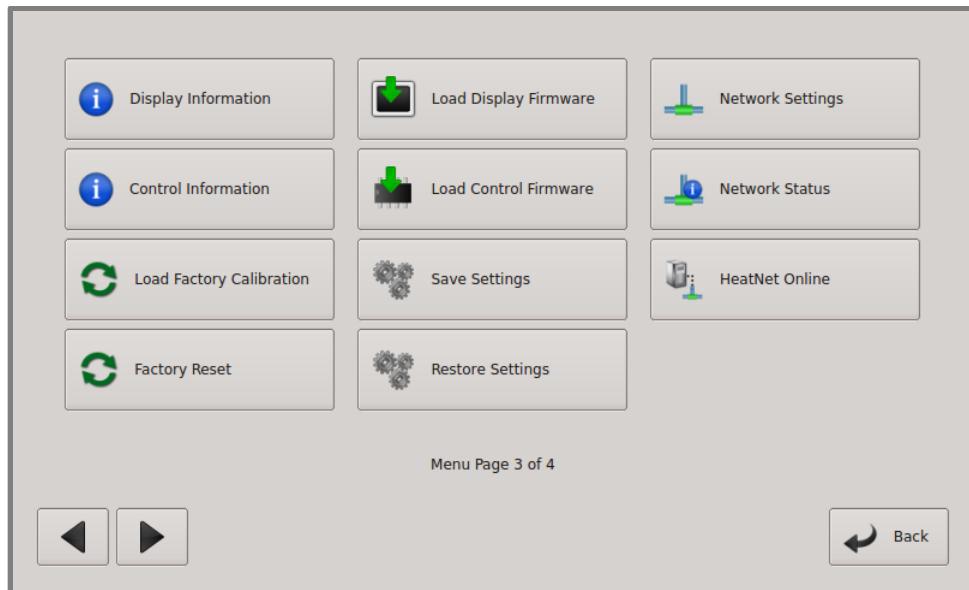


Figure 2 – Settings Menu

In the *Settings Menu* (Figure 2) select “*Network Settings*” to open the dialog shown in Figure 3.

The screenshot shows a 'Network Settings' dialog box with the following fields:

DHCP:	<input type="checkbox"/>
IPv4 Address:	172.16.0.110
Subnet Mask:	255.255.255.0
Default Gateway:	172.16.0.1
Primary DNS:	8.8.8.8
Secondary DNS:	8.8.4.4

At the bottom are three buttons: a 'Save' button with a checkmark icon, a 'Status' button with a network icon, and a 'Back' button with a back arrow icon.

Figure 3 - Network Settings

Check DHCP for dynamically assigned IP settings or enter the statically assigned settings. Click the save button to commit the changes. You will be asked if you would like to restart network services; the new settings will not take effect until Network services are restarted.

After the changes have been saved and network services have been restarted, click the *Status* button to open the *Network Status Dialog* shown in Figure 4 and verify the network setting changes have taken effect.

The screenshot shows a 'Network Status' dialog box displaying the following network configuration:

Interface:	eth0
Status:	Up
Carrier:	Yes
MAC:	44:37:E6:66:7F:F8
Address:	172.16.0.110
Subnet Mask:	255.255.255.0
Gateway:	172.16.0.1
DNS:	8.8.8.8 8.8.4.4

Below this, traffic statistics are shown:

	Packets	Errors
TX:	46373	2
RX:	4077101	6

At the bottom are three buttons: a 'Restart' button with a circular arrow icon, a 'Ping' button with a network icon, and a 'Back' button with a back arrow icon.

Figure 4 - Network Status

1. **Interface** – Should always be eth0.
2. **Status** – State of networking services.
 - a. Up – Networking services are running.

- b. Down – Networking services are not running. Try clicking *Restart* to restart networking services. If that does not work, a reboot (power cycle) may be required.
- 3. **Carrier** – Indicates that a network connection has been detected.
 - a. Yes – An Ethernet network connection (cable) has been detected.
 - b. No – A network connection has not been detected. Check the Ethernet cable, make sure the plug is fully inserted into the Ethernet jack, and verify that the port is enabled (active) on the local switch. If the carrier is still not detected, try rebooting (power cycle). If none of these solutions work, use a laptop to verify that the network drop is working properly and an internet connection is available. If the laptop internet connection works, please contact the factory for further assistance.
- 4. **MAC Address** – The physical address of the network interface on the display. This may be useful to the local IT department if they want to implement MAC address filtering, DHCP assignment based on the MAC address, or network configuration that requires the MAC address.
- 5. **Address** – The statically or dynamically (DHCP) assigned IPv4 address.
- 6. **Subnet Mask** – The statically or dynamically (DHCP) assigned IPv4 subnet mask. The Subnet Mask is used to divide the Address into a network address and a host address. If either is incorrect, the network connection may not work.
- 7. **Gateway** – The statically or dynamically (DHCP) assigned IPv4 default gateway. The display will send requests to any IP address that is not on its local network to the default gateway. This means all external internet requests will be sent to this address. If this address is not correct, the display will not be able to send data to the HeatNet Online Web Server or SNTP Servers. It will also not be able to communicate with DNS servers (see below) that are not on the local network.
- 8. **DNS** - The statically or dynamically (DHCP) assigned IPv4 DNS servers. Domain Name Servers (DNS) are used to resolve (lookup) the IP address for a URL. For instance, currently www.mestek.com resolves 72.11.218.60. If the DNS servers are not correct, the display will not be able to resolve the IP address for the HeatNet Online Web Server or SNTP Servers.
- 9. **TX/RX** – Shows the number of Ethernet packets transmitted (TX), received (RX), and the associated error count. Useful for detecting and troubleshooting network communication issues.

This dialog can also be used to manually restart Network services or open the Network Ping dialog used to test the network connection by sending a ping request other devices.

Step 2 – HeatNet Online Settings

In the *Settings Menu* (Figure 2) select “HeatNet Online Settings” to open the dialog shown in Figure 5.

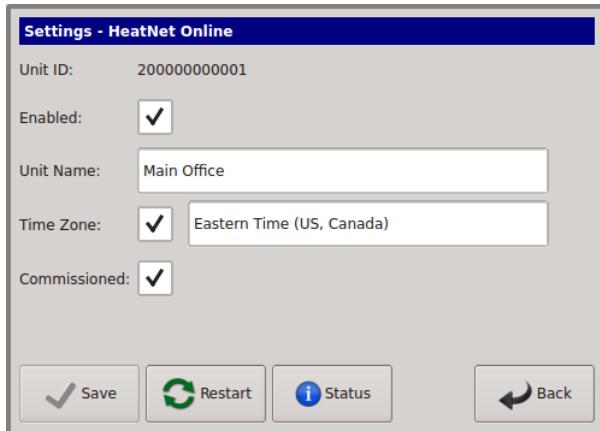


Figure 5 - HeatNet Online Settings

1. Check “Enabled” to activate HeatNet Online services.
2. Enter a “Unit Name” (optional) to give the system an easily identifiable name. It can be used to help identify the unit that you are configuring. This value is not currently sent to the server, but may be in the future.
3. Check “Time Zone” and select the appropriate time zone. When HeatNet Online services are enabled, the SNTP (Simple Network Time Protocol) service will keep the display and control time clocks properly synchronized to UTC. This setting will synchronize them to a specific time zone.
4. Check “Commissioned” to start periodically sending data to the HeatNet Online Web Server.
5. Click the “Save” button to save the changes. The HeatNet Online service will be restarted to apply the new settings.

Step 3 – Verify Operation

Click the “Status” button on the *HeatNet Online Settings* dialog to open the *HeatNet Online Status* dialog shown in Figure 6.

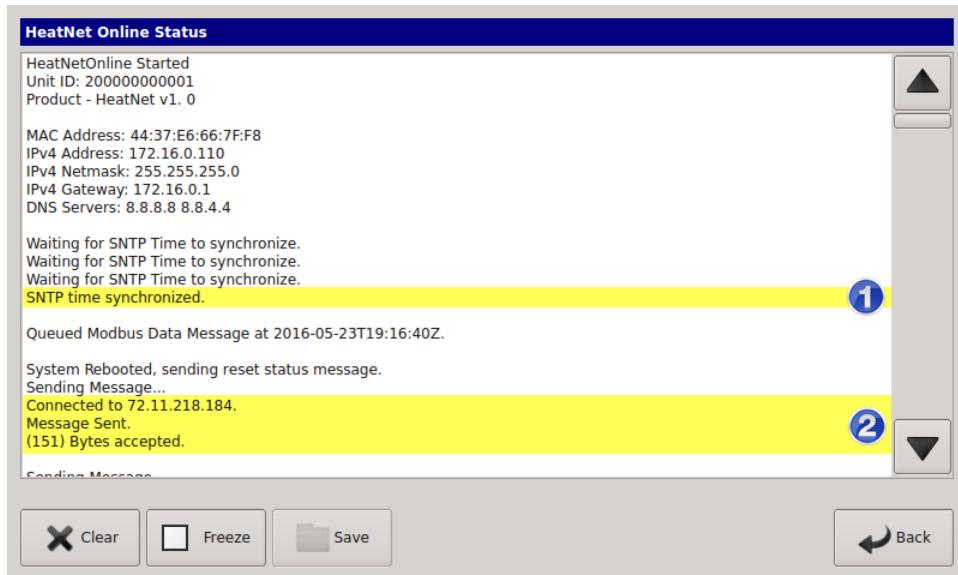


Figure 6 - HeatNet Online Status

This dialog is used to monitor the operational status of HeatNet Online services. Under normal operation, you should see output similar to what is shown. The most important messages to look for are:

SNTP Time Synchronized. (1)

This means that an SNTP (NTP) time server was successfully contacted and the time is properly synchronized to UTC (GMT).

Connected to xxx.xxx.xxx.xxx. (2)

Connected to xxx.xxx.xxx.xxx

Message Sent. (2)

(xxx) Bytes Accepted. (2)

This sequence of messages indicates that data was successfully delivered to the HeatNet Online Web Server.

If you do not see these messages or there are other errors indicated, please read the Troubleshooting section below and see Appendix A for some common status error examples.

If everything is operating correctly, contact Tech Services to set up the system on the HeatNet Online Web site and create user accounts.

Troubleshooting

1 - Check the Network Settings

In many cases, network issues are caused by mistyped or incorrect network settings. Open the *Network Settings Dialog* (Figure 3) and verify the settings. If any corrections are made, network services MUST be restarted to apply the changes.

2 - Check the Network Status

Open the *Network Status Dialog* (Figure 4). Verify the following:

- Status=Up
- Carrier=Yes
- Network Addresses should NOT be 0.0.0.0 or blank. If you are using statically assigned IP addresses, the network addresses should match the values in Network Settings.
- TX/RX packet counters changing with only a small number of errors.

If any of these items is not correct, try the following:

- 1) Restarting network services (*Restart* button).
- 2) Power cycling the boiler.
- 3) If you are using dynamically assigned IP addresses (DHCP) and any of the addresses are 0.0.0.0 or blank, there are DHCP server issues, contact the local IT department.
- 4) Check the network drop using a laptop configured with the same network settings.
Make sure all other network connections (Wi-Fi, cellular, etc.) are disabled. Open a web browser and try a few internet sites. If the connection is NOT working, contact the local IT department to check the network drop, local switch, etc.

3 - Check the Network Connection

On the *Network Status Dialog* shown in Figure 4, press the *Ping* button to open the *Ping Dialog* shown in Figure 7. This dialog will help test the ability to communicate with important devices on the network.

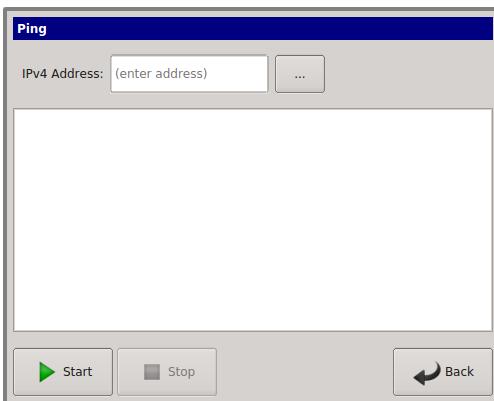


Figure 7 - Network Ping Dialog

Click the “...” button next to open a list of addresses. You should see the same names, but the actual IP addresses for the *Default Gateway* and *DNS Servers* will probably be different.

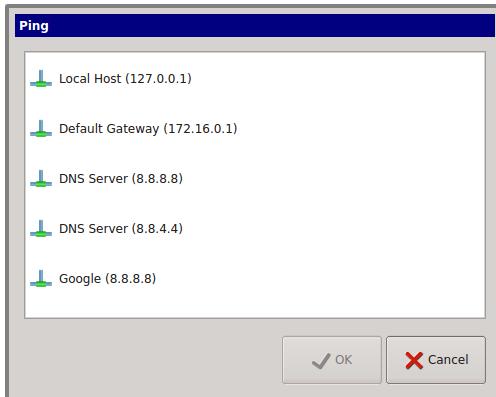


Figure 8 - Ping Address List

1. **Local Host** – Tests the network interface. If this address fails, contact Technical Services.
2. **Default Gateway** – If this address fails, contact the local IT department. It is possible that the device at this address is configured not to respond to ping requests.
3. **DNS Servers** – If either of these addresses fail, contact the local IT department. It is possible that the device(s) at these addresses are configured not to respond to ping requests.
4. **Google** – This is a Google public DNS server address. It tests connection to the internet. If this address fails, contact the local IT department. It is possible that this network is configured to “block” ping requests.

4 – Contact Technical Services

If you are still having problems after trying everything above, please contact Technical Services for assistance.

Appendix A - Common HeatNet Online Status Error Examples

Invalid Default Gateway (with valid DNS Servers)

In this example, the Default Gateway was set to an invalid address. Note that because the DNS Servers are on the same local network, they are reachable and addresses can be resolved. If the DNS Servers were NOT on the same local network, you would see “Unable to resolve...” errors like shown in the next example. When the Default Gateway is incorrect, the display cannot communicate with any devices that are not on the same local network (IP Address and Netmask). In this example, it is unable to communicate with the SNTP and HeatNet Online Servers.

```
HeatNetOnline Started
Unit ID: 200000000001
Product - HeatNet v1. 0

MAC Address: 44:37:E6:66:7F:F8
IPv4 Address: 172.16.0.110
IPv4 Netmask: 255.255.255.0
IPv4 Gateway: 172.16.1.1
DNS Servers: 8.8.8.8 8.8.4.4

Waiting for SNTP Time to synchronize.
Waiting for SNTP Time to synchronize.
...
SNTP time NOT synchronized.

Queued Modbus Data Message at 1970-01-01T07:26:40Z.

Sending Message...
Unable to connect to heatnetido.mestek.com - 72.11.218.184:80
...error 5 - Socket operation timed out

...
```

Invalid DNS Servers (with valid Default Gateway)

In this example, the DNS Servers were set to invalid addresses. The first step in communicating with either the SNTP or HeatNet Online server is to resolve the URL (convert the server name to an address). If the DNS servers are invalid (or cannot be reached), a resolve error will occur.

```
HeatNetOnline Started
Unit ID: 200000000001
Product - HeatNet v1. 0

MAC Address: 44:37:E6:66:7F:F8
IPv4 Address: 172.16.0.110
IPv4 Netmask: 255.255.255.0
IPv4 Gateway: 172.16.0.1
DNS Servers: 8.8.8.80 8.8.4.40

Waiting for SNTP Time to synchronize.
Unable to resolve SNTP server: sntp01.mestek.net.

...
Waiting for SNTP Time to synchronize.
Unable to resolve SNTP server: sntp01.mestek.net.
```

SNTP time has failed!
Queued Status Message (4) at 1970-01-01T07:30:07Z.
Unable to resolve SNTP server: sntp02.mestek.net.
...