

HeatNet Online Software Manual

Revision 1.30

July 2014



Introduction

HeatNet Online is an Internet (over Ethernet) connection between a HeatNet control board and the Mestek HeatNet Online Web Server. Using this connection, the control board will periodically (currently once each minute) send messages containing all available data capturing 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 all of 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 like when a boiler is no longer sending data or when a member boiler is no longer detected by the master.

Network Requirements

IPv4 Network with statically or Dynamically (DHCP) Assigned:

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

A standard Ethernet cable (CAT5, CAT6) terminated with an RJ-45 connector need to be run into the boiler control enclosure.

Outgoing Messages

The device needs the ability to send HTTP (XML) messages on port 80 to the HeatNet Online Server (heatnetido.mestek.com).

Hardware Installation

HeatNet R2.x Controls

HeatNet Online is available as a plugin module for HeatNet R2.x control boards. The module plugs into the U shaped slot named **U34**. Power should be turned off before installing the module. Once device is installed and configured (described in a later section), it can be plugged into the local network to start sending data to the HeatNet Online Web Server. The module, Modbus port, and USB port all share a common internal communications bus. When a HeatNet online module is used, the Modbus or USB ports cannot be used. The HeatNet Online module must be removed while performing firmware updates. The follow products are currently supported:

- Hydrotherm KN series boilers require firmware version 3.49 (or higher).
- RBI Futera III, Fusion, and XLF series boilers require firmware version 3.39 (or higher).



Figure 1 – Plugin HeatNet Online Module

HeatNet V3 Controls

HeatNet V3 boards have a built-in HeatNet Online module. A HeatNet Online firmware update, which can be easily done on site, is required. Once device is installed and configured (described in a later section), it can be plugged into the local network to start sending data to the HeatNet Online Web Server. Unlike R2.x controls, module does not share a common internal communications bus with any other device.

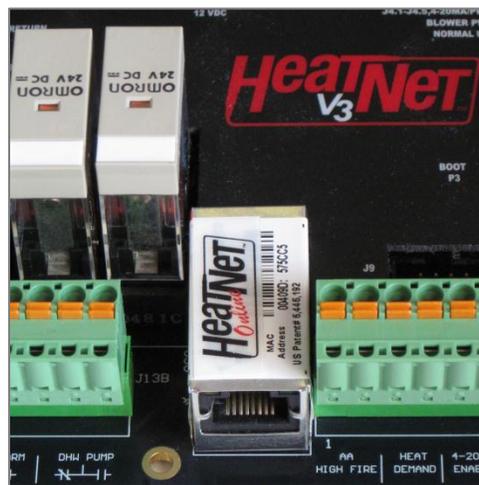


Figure 2 – HeatNet V3 Board with Built-in HeatNet Online

Configuring a HeatNet Online Device

- 1) Install the HeatNet Online Browser. This program is distributed in the HeatNet Online Software installation program available for download on the product Web site. Currently only Microsoft Windows XP, Vista, and 7 are supported. The software depends on several 32-bit components so it will be installed as a 32-bit program even on 64-bit operating systems.
- 2) Before attempting to connect, any firewall or antivirus software may need to be disabled. Firewalls and antivirus software will often limit Ethernet communications to specific applications or restrict communications on the “ports” used by the HeatNet Online Browser. At a minimum, it may be necessary to configure your firewall to allow the program to properly communicate with HeatNet Online devices. Please see Appendix B for further instructions.
- 3) Connect your computer or laptop directly to the HeatNet Online device using an Ethernet cable. The Ethernet port on the device is auto-sensing with auto MDI/MDIX so any cable will work; straight through or crossover.

The default (factory) IPv4 settings of the device are listed below. If the computer network adapter is configured for a different IP network or uses DHCP to automatically obtain an IP address, it will be necessary to change or assign a static IP to the computer on the device network. For example, you can use 192.168.1.31 with a subnet mask of 255.255.255.0. You cannot use the same IP address that the device is using. See

4) Appendix A for further instructions.

- IP Address: 192.168.1.30
- Subnet Mask: 255.255.255.0
- Default Gateway: 192.168.1.1
- DHCP (client): disabled

5) Start the HeatNet Online Browser. The device will appear in the **Devices** list on the left side of the screen (see Figure 3). Click the device to select it and the device settings will be displayed on the right side of the screen.

If you see a warning that the device is discoverable, but can't communicate using HTTP on any network, double check the network settings on your computer. If the network settings are correct, the device has already been configured on a different IP network. Use *Restore Network Settings* on the device menu (discussed in a later section) to return the device to its factory default settings.

6) Select the **Network Settings** tab. Enter the required network settings for your specific application. In many installations when the device is connected directly to a router or a small network, the device can be automatically configured (at start up) by checking the **DHCP** option. More advanced installations will require statically assigned addresses from your network administrator. Please see the HeatNet Online Browser – Network Settings section for a description of each setting. If any settings have been changed, press the **Save** button to write the changes to the device.

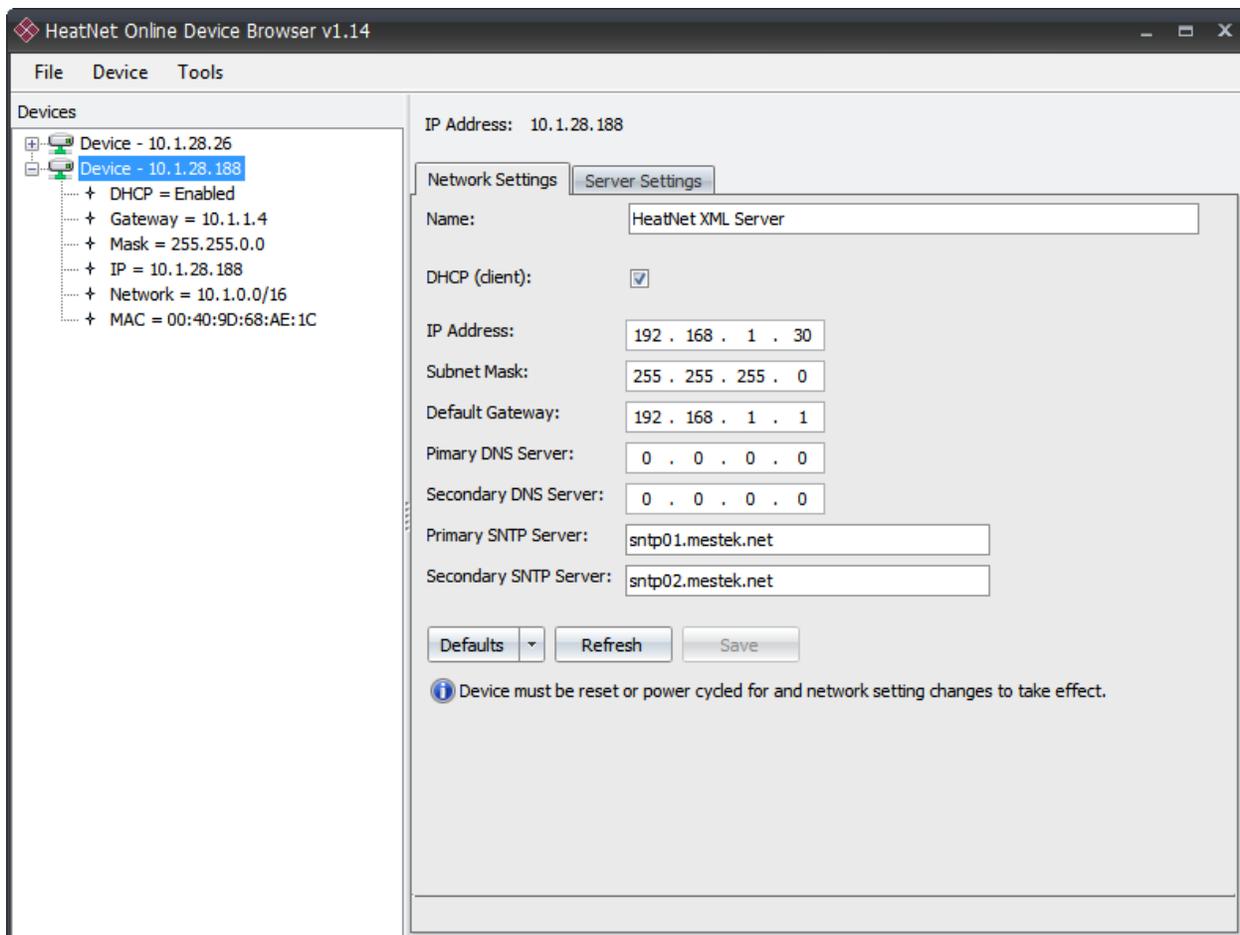


Figure 3 - HeatNet Online Browser

- 7) Select the **Server Settings** tab. Make sure the **Commissioned** checkbox is checked and select the correct time zone. Please see the HeatNet Online Browser – Server Settings section for a description of each setting. If either setting has been changed, press the **Save** button to write the changes to the device.
- 8) If any of the Network or Server settings have been changed, it is necessary to reset the device for the new settings to take effect. Select *Reset* on the *Device Menu* (see Figure 7) to reset the device. The device will be rediscovered. If the network settings have been changed, it may be necessary to change the network settings on your computer to the same IP network as the device to restore communications. Remember, you cannot use the same IP address that the device is using. If the device is configured to use DHCP, it will be necessary to plug the device and your computer into the local network and change the computer network settings to use DHCP.
- 9) Before leaving the installation, contact customer service to verify that the device is properly communicating with the HeatNet Online Web Server. You can also reference Appendix C to verify that the device is communicating with the HeatNet Online server and find possible solutions if it is not.

The HeatNet Online Browser

The HeatNet Online Browser program is used to configure the IP address and other settings necessary for a device to properly communicate over a network and the internet to the HeatNet Online web server. It also has several diagnostic tools to help aid in troubleshooting communication issues.

Discovered Devices List

Figure 4 shows the main screen of the Browser application. HeatNet Online devices connected to the same network are automatically discovered and displayed in the **Devices** list on the left side of the screen. In this example, the device was discovered on the same IP network and the device settings are displayed on the left side of the screen.

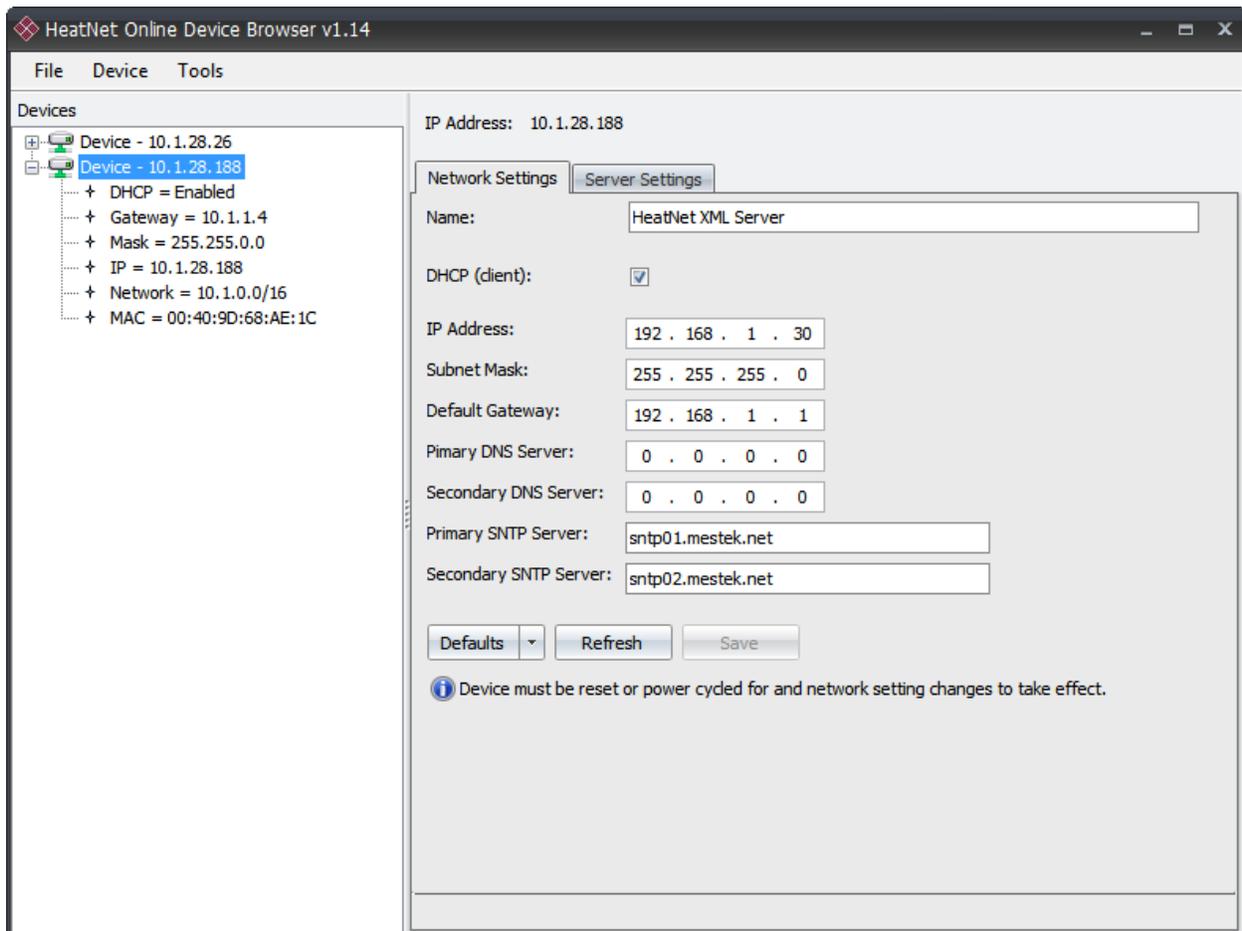


Figure 4 – Device Network Settings

Figure 5 shows a device that was discovered on the same physical network, but a different IP network. Several possible causes and solutions are listed on the right hand side of the screen.

If the computer is plugged directly into the device, the most likely solution is to set (or change) the static IP address of the computer. Please see

Appendix A for further instructions. If this has already been done, try to correct the problem by using the *Change Network Settings* or *Restore Network Settings* menu selections which are discussed in a later section.

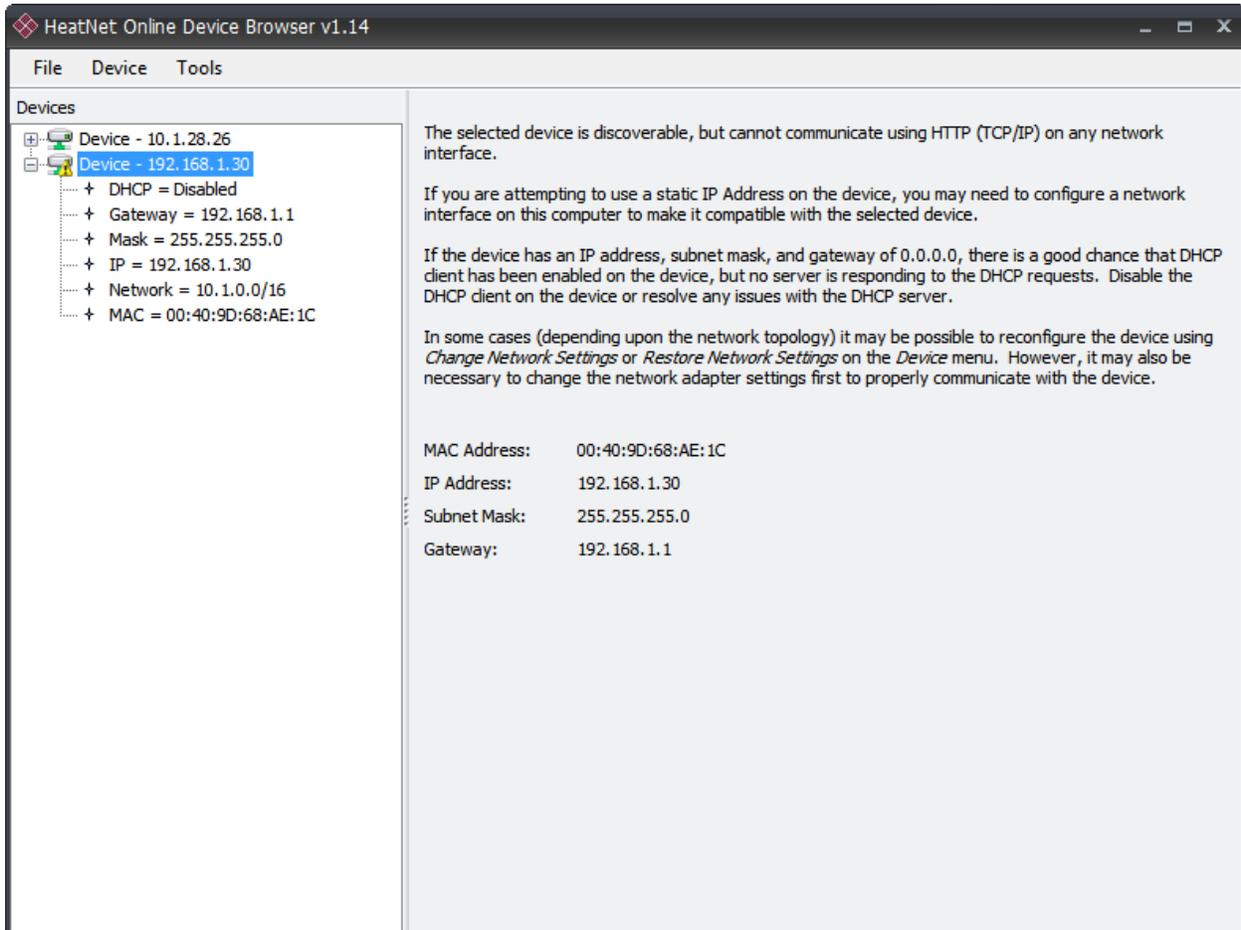


Figure 5 – Device communication warning.

Network Settings

The *Network Settings* tab is used to configure all of IPv4 settings needed for the device to properly communicate on the network. After any IP settings have been changed, it is necessary to reset the device for the new setting to take effect. This can be done by selecting *Reset* on the *Device Menu* or by power cycling the device.

Name: The name assigned to this device (up to 32 characters). This value is used only to help identify this device on the network after it has been installed.

DHCP (client): Enables DHCP client mode. If this box is checked, the device will attempt to obtain its IP settings from a DHCP server. If a DHCP server is not available, the static settings (below) will be used.

IP Address: The static IP address.

Subnet Mask: The static subnet mask.

Default Gateway: The static default gateway.

Primary DNS Server: The static primary DNS (Domain Name System) server. DNS servers are required so that the device can properly resolve the URL of the HeatNet Web Server.

Secondary DNS Server: The static secondary DNS (Domain Name System) server.

Primary SNTP Server: The static primary SNTP (Simple Network Time Protocol) server. SNTP servers are required so that the device can maintain an accurate time. This is especially important through periods of lost power because there is no battery backup.

Secondary SNTP Server: The static secondary SNTP (Simple Network Time Protocol) server.

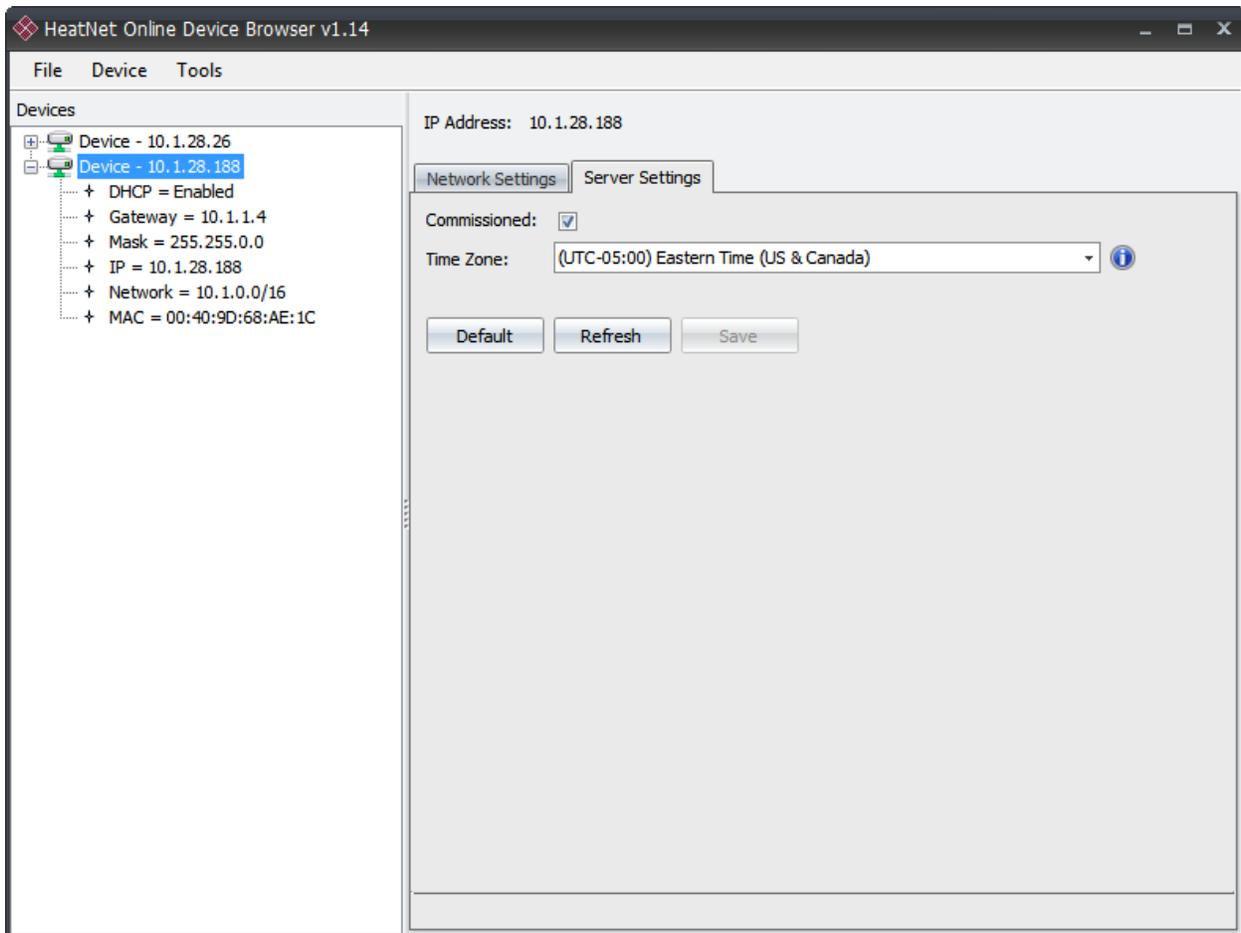


Figure 6 – Device Server Settings

Server Settings

The *Server Settings* tab is used to configure web server related settings.

Commissioned: Enables HeatNet Online communication. If this box is checked, the device will start sending messages to the HeatNet Online web server.

Time Zone: Sets the time zone in which the device is installed. The device uses the SNTP servers (see *Network Settings*) to keep its clock synchronized to UTC (Coordinated Universal Time). It uses this time and the **Time Zone** to keep the HeatNet control clock synchronized with the current Local Time.

Device Menu

When a device is discovered and selected there are a number of additional actions that can be performed using the *Device Menu* (shown in Figure 7).

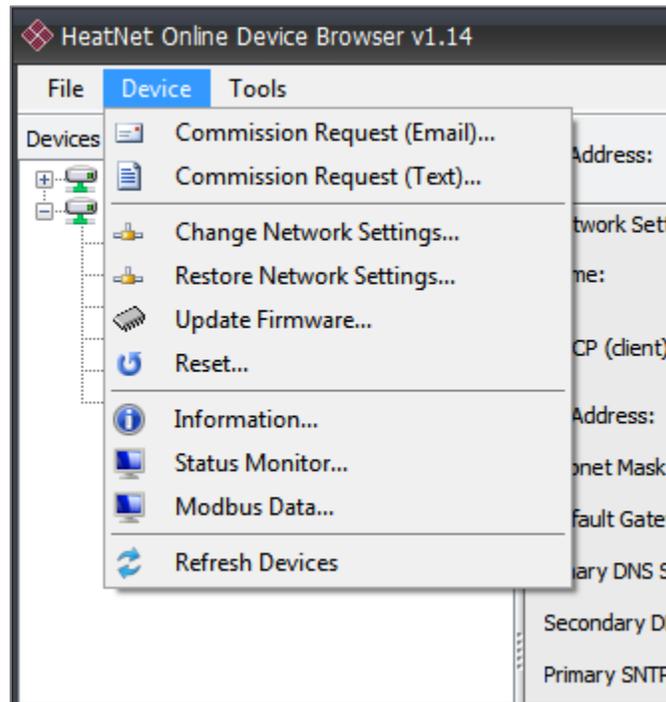


Figure 7 – The Device Menu

Commission Request (Email)

The *Commission Request (Email)* menu selection generates an email using the Windows Messaging Application Programming Interface (MAPI). The email contains information needed by the HeatNet Online support team to help commission a new HeatNet Online installation. Fill in the “To” address, add any additional information, and send. If you don’t have a MAPI compatible email client installed (for instance if you only use web mail) or you are having problems, please use *Commission Request (Text)* menu selection.

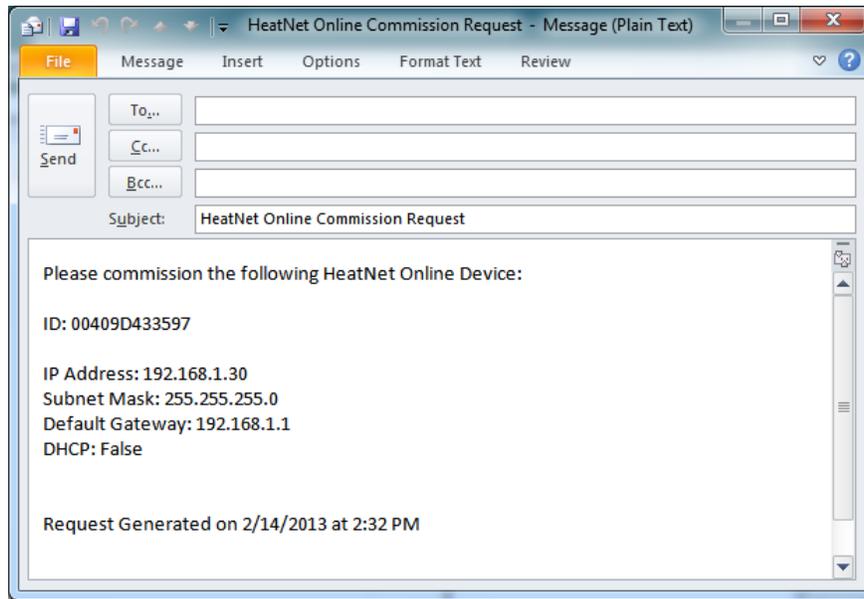


Figure 8 - Commission Request Email

Commission Request (Text)

The *Commission Request (Text)* menu selection opens a dialog that contains information needed by the HeatNet Online support team to help commission a new HeatNet Online installation. Press the **Copy** button to copy the information to the clipboard. The information can then be pasted into an email or other document.

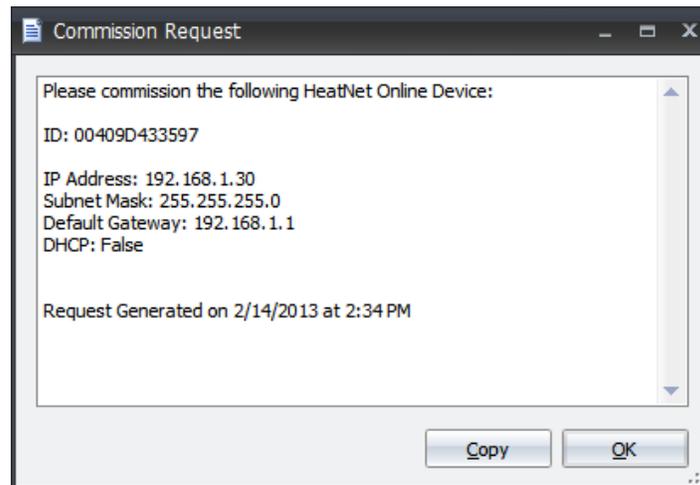


Figure 9 - Commission Request Text

Change Network Settings

The *Change Network Settings* menu selection opens the *Set Device IP Settings Dialog* shown in Figure 10. This dialog provides an alternate way to change the IP settings of a device. Often, even when the device is on a different IP network, it is still possible to change the basic IP

settings using this method because different network message protocol is used. Enter the desired IP settings and press the **OK** button. Factory default values can be entered by pressing the **Defaults** button.

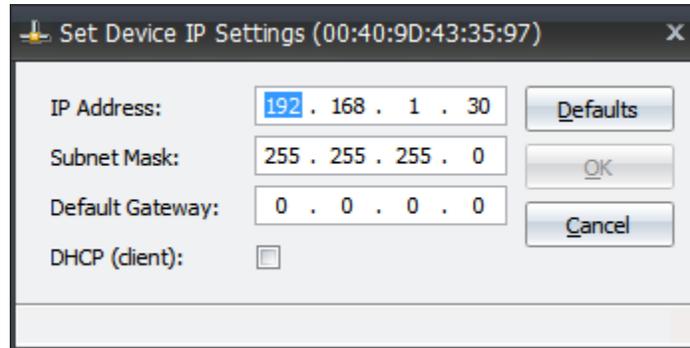


Figure 10 – Set IP Settings Dialog

Restore Network Settings

The *Restore Network Settings* menu selection restores the network settings to factory default values. Even when the device is on a different IP network, it is still possible to restore the network settings using this method because different message protocol is used.

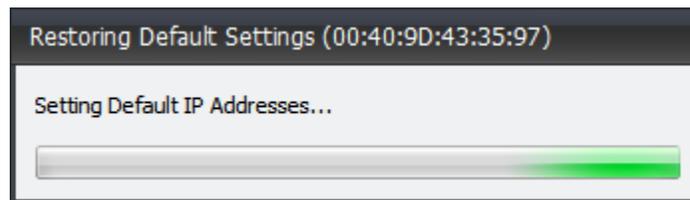


Figure 11 – Restoring Default IP Settings

Update Firmware

The *Update Firmware* menu selection opens the *Update Firmware Dialog* (see Figure 12) which is used to download new firmware into the device. Select a valid HeatNet Online Firmware file (.hnf) and press the **Update** button. Progress will be displayed at the bottom of the dialog and the device will be automatically reset at the end of the update.

NOTE: Firmware Updates should only be done when plugged directly into the HeatNet Online Module using an Ethernet cable (no router, hub, switch or other network connections). Power MUST not be removed from the module (or HeatNet control) until the firmware update is fully complete. After the firmware file is uploaded, it will take the module several seconds to save the file. Within a minute, the module should automatically reboot. While it is rebooting the Ethernet lights will stop blinking for a few seconds. When the unit shows up in the list of discovered devices, check the version by selecting *Information* on the *Device* menu.

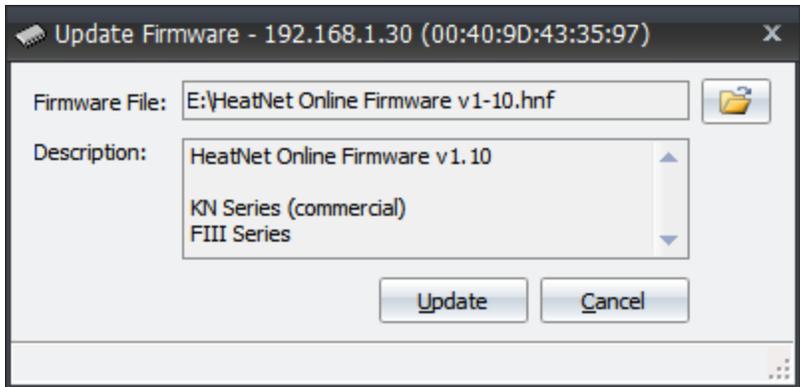


Figure 12 – Updating Firmware

Reset

The *Reset* menu selection resets (reboots) the selected device. You will be prompted to confirm.

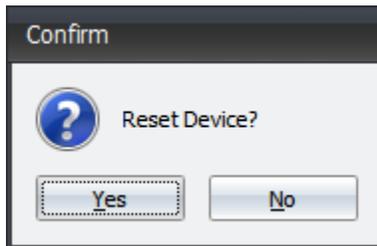


Figure 13 - Reset Device

Information

The *Information* menu selection displays some basic firmware information about the selected device. It is most often used to verify or check the firmware product and version.

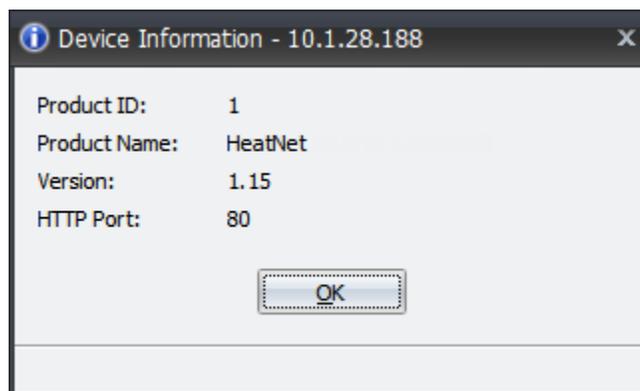


Figure 14 - Device Information

Status Monitor

The *Status Monitor* menu selection opens the *Device Status Monitor Dialog* shown in Figure 15. This dialog can be used to help troubleshoot and diagnose network and other operational issues. It will display diagnostic messages that are output by device.

For configuration purposes it is generally recommended that the computer is connected directly to the device. The downside of a direct connection is that a commissioned device cannot attempt to communicate with the HeatNet Online server. When using the Status Monitor it is often useful to have the computer and the device plugged into the same local network so that communications with the server can also be monitored. If an external Internet routable IP address is properly configured, it is even possible to monitor the device remotely over the Internet.

These messages are held in an 8192 character queue which will discard any messages once it becomes full so it may be necessary to power cycle or reset the device to capture all messages over a on period of time. The **Save** button can be used to write the captured messages to a file.

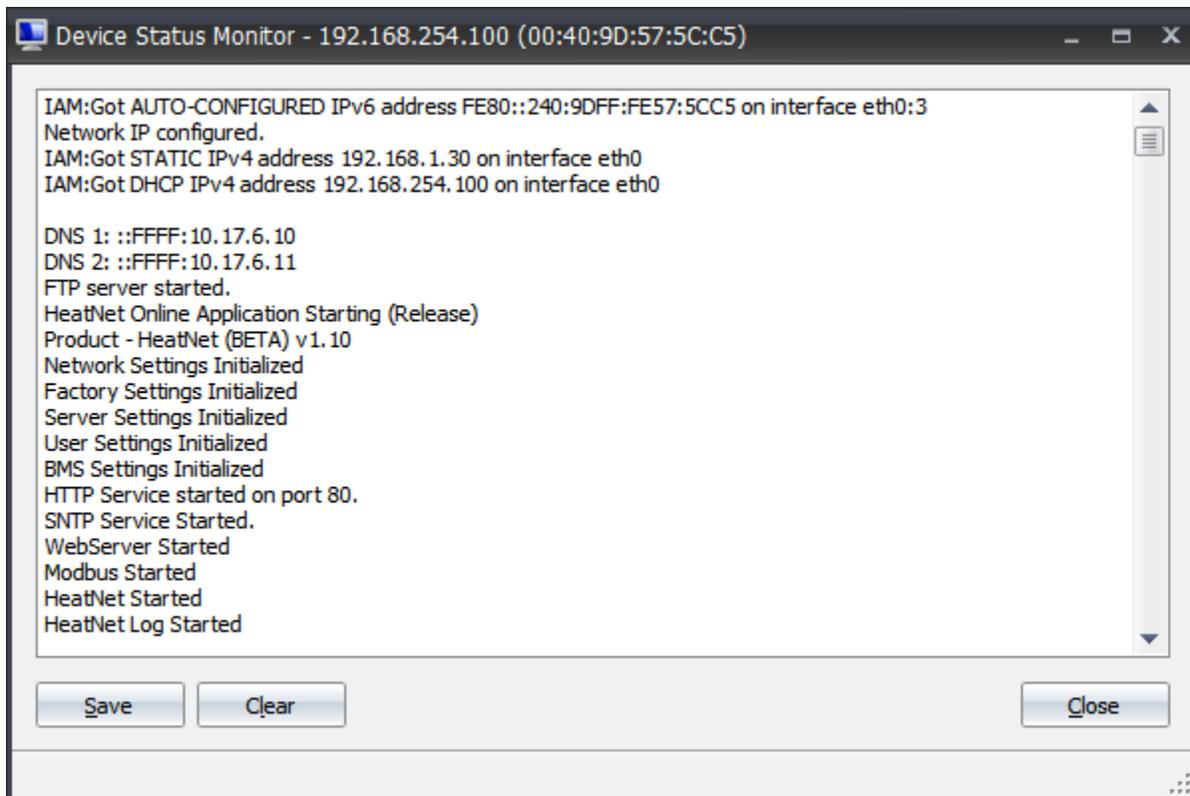


Figure 15 – Device Status Monitor

Modbus Data

The *Modbus Data* menu selection opens the *Modbus Data Dialog* shown in Figure 16. This dialog can be used to verify that all Modbus data is being read from the HeatNet control

correctly. Press the Read button to load the current values of the specified registers. The default **Min. Address** = 0 and **Max. Address** = 65535 will load all registers. These can be changed to check a specific range.

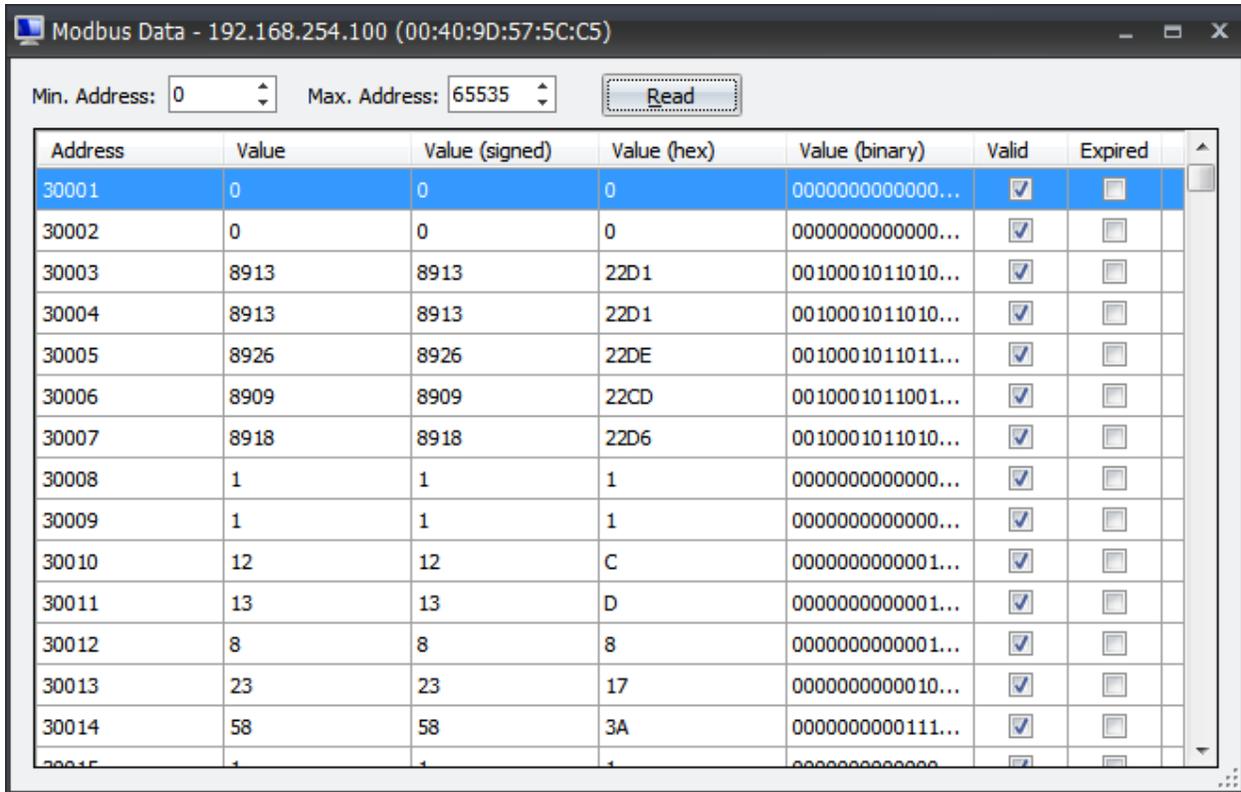


Figure 16 – Modbus Data Dialog

Tools Menu

The tools menu contains various utilities not specifically related to any device.

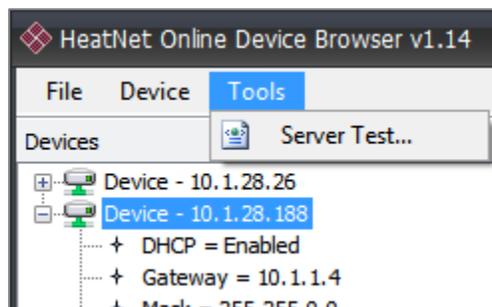


Figure 17 - Tools Menu

Server Test

The Web Service Test will check the ability to communicate with the HeatNet Online Web Server from the local network. To properly test communication with the Web Service, you

MUST be connected to the same local network as the HeatNet Online Device(s). Figure 18 show the results of a successful test.

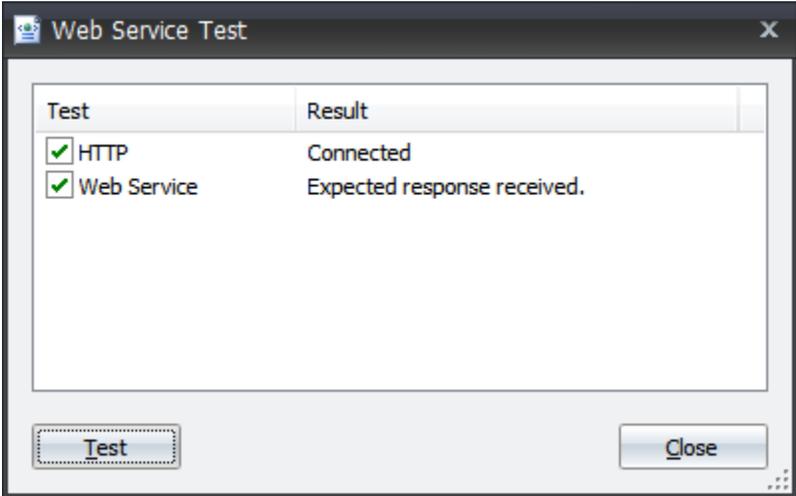
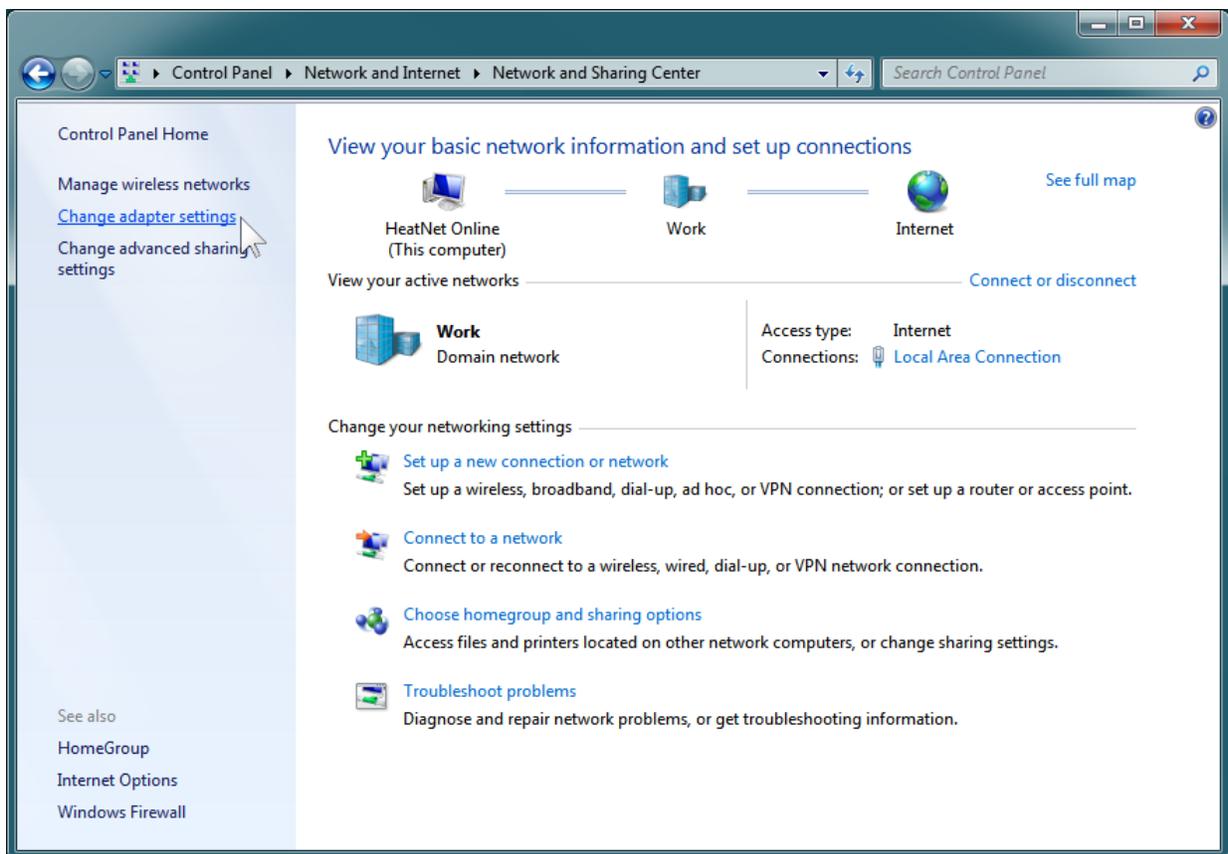


Figure 18 - Web Service Test

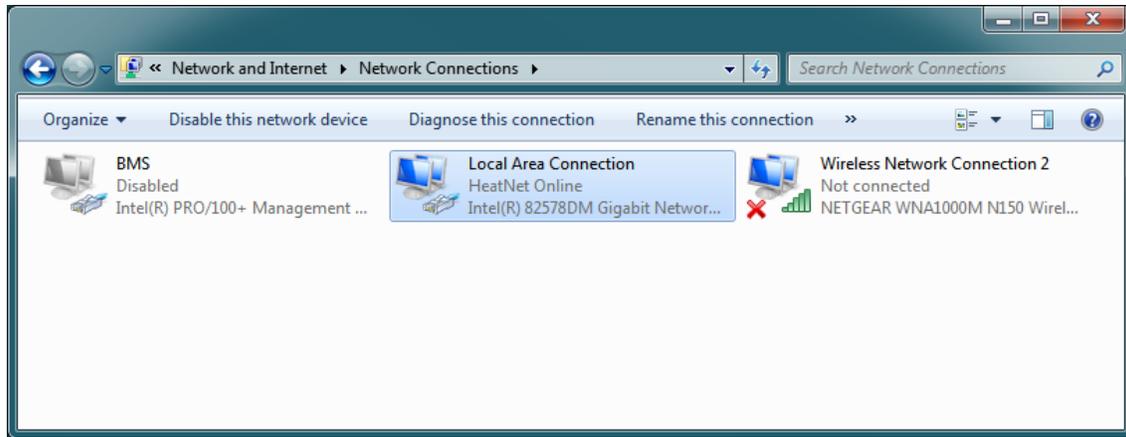
Appendix A: Changing IPv4 Network Settings

The HeatNet Online Browser communicates with HeatNet Online devices using the IPv4 over Ethernet. In order to communicate, the computer IPv4 settings (on the connected network adapter) must be compatible with the device. The following instructions describe how to configure Microsoft Windows 7 IPv4 settings. Different versions of Windows will have similar procedures.

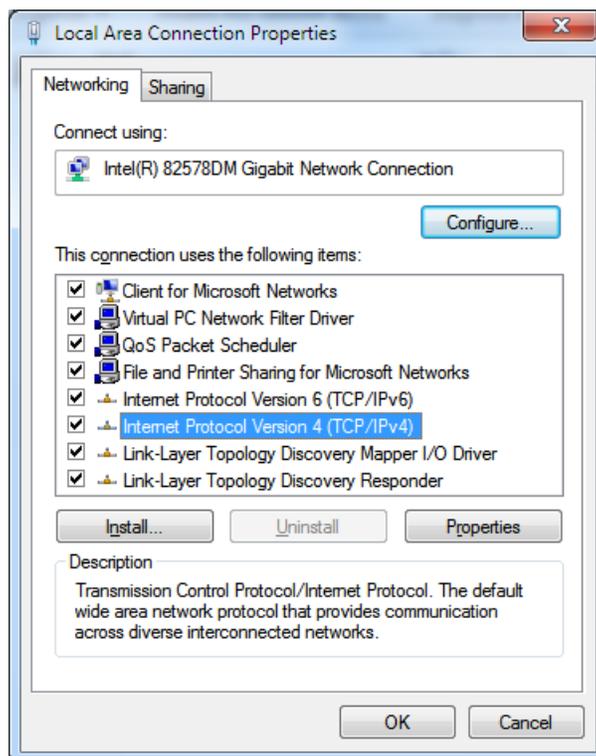
1. Open the Network and Sharing Center by clicking the **Start** button, and then clicking **Control Panel**. In the search box (upper right), type **network**, and then click **Network and Sharing Center**.



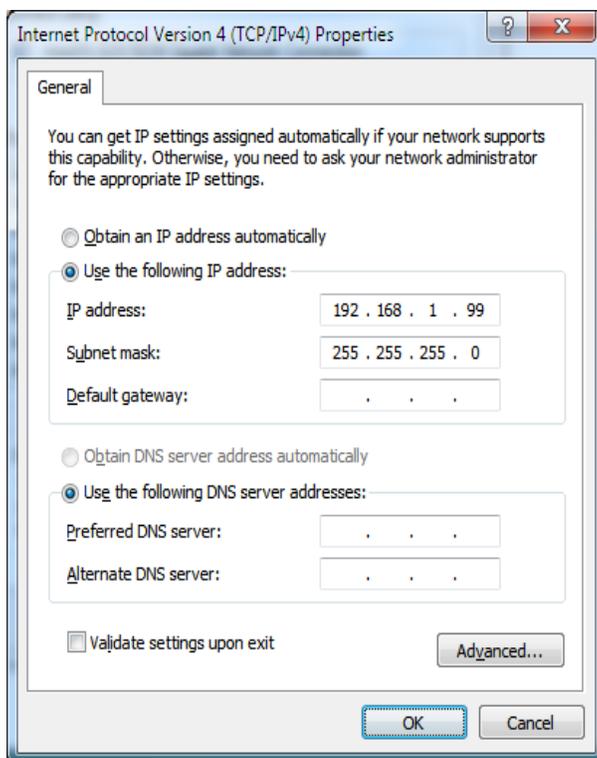
2. In the left pane, click **Change adapter settings**.



3. Right click on desired network connection (typically Local Area Connection) and choose properties.



4. Select Internet Protocol Version 4 (TCP/IP) and press the properties button.



5. Enter the desired **IP address**, **Subnet mask** and any other required parameters. A formal discussion on IPv4 addresses and subnetting is beyond the scope of this manual. There are many good internet resources. However, in many cases, when you are plugged directly into a HeatNet Online Device, you can add (or subtract 1) to the last number of the devices **IP address** enter the same **Subnet mask** and to make the computer's IP settings compatible with the device. You cannot use the same IP address that the device is using. For example:

If the device has the following settings

IP Address: 192.168.1.30 (default)

Subnet Mask: 255.255.255.0 (default)

You can use

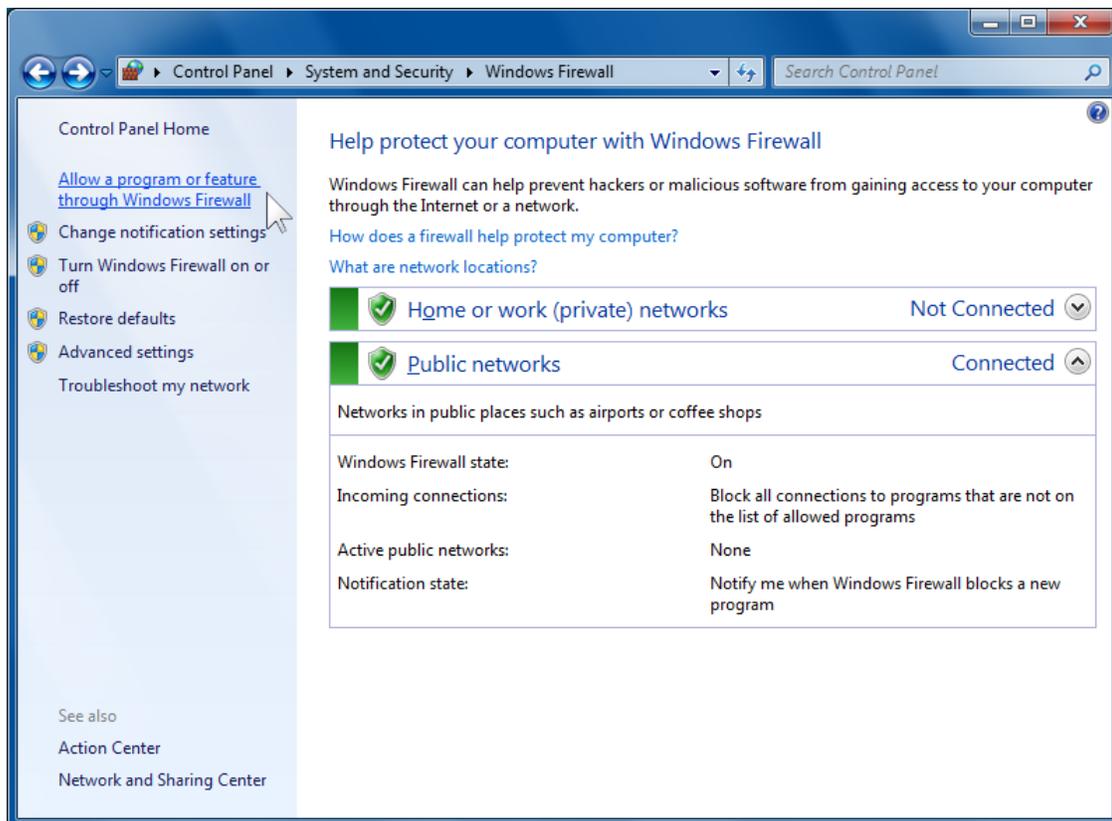
IP Address: 192.168.1.31 (or 192.168.1.30)

Subnet Mask: 255.255.255.0

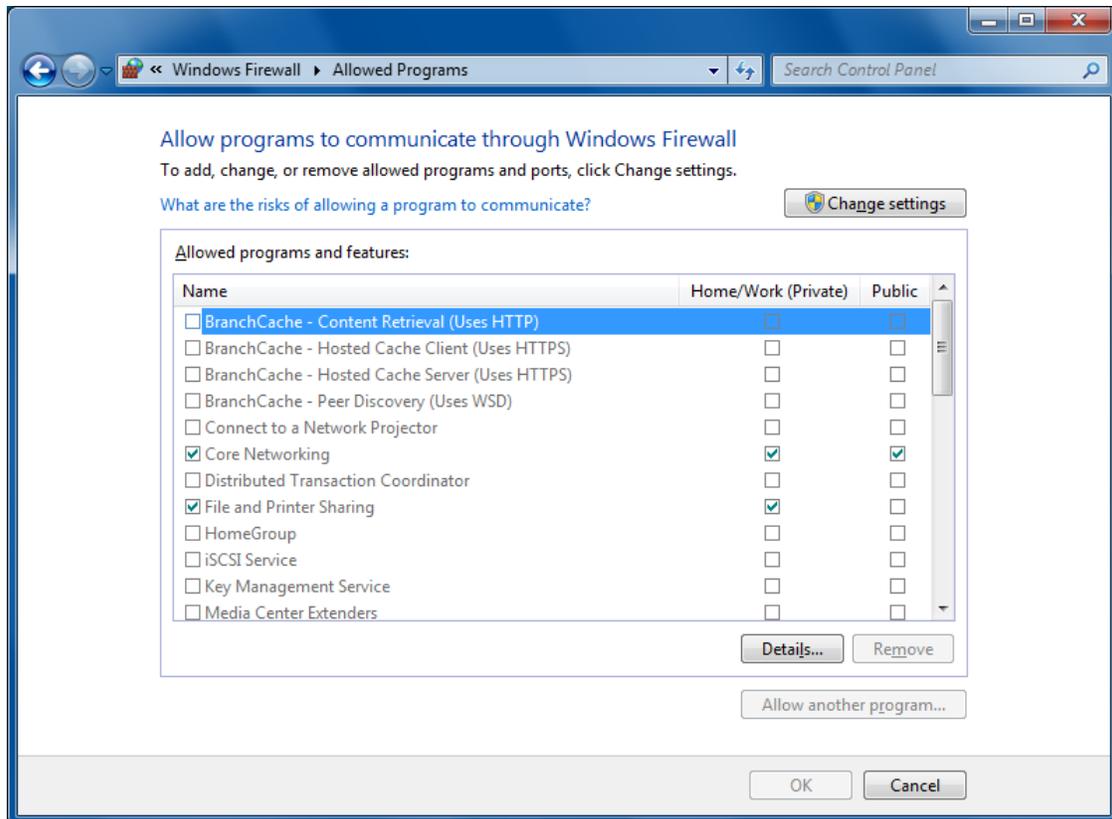
Appendix B: Changing Firewall Settings

The HeatNet Online Browser Program communicates on ports 80, 1024, and 2362 using the UDP, TCP, and HTTP protocols. Often there is a firewall in place that limits communication on ports these ports and protocols to specific applications. The following instructions describe how to configure the Microsoft Windows 7 Firewall to allow the **HeatNet Online Brower** to communicate through the firewall. It is also possible for your computer may have a different firewall in place and it must be similarly configured. In some cases it is also possible to temporarily disable the firewall which may be the easiest solution.

1. Open Windows Firewall by clicking the **Start** button, and then clicking **Control Panel**. In the search box (upper right), type **firewall**, and then click **Windows Firewall**.

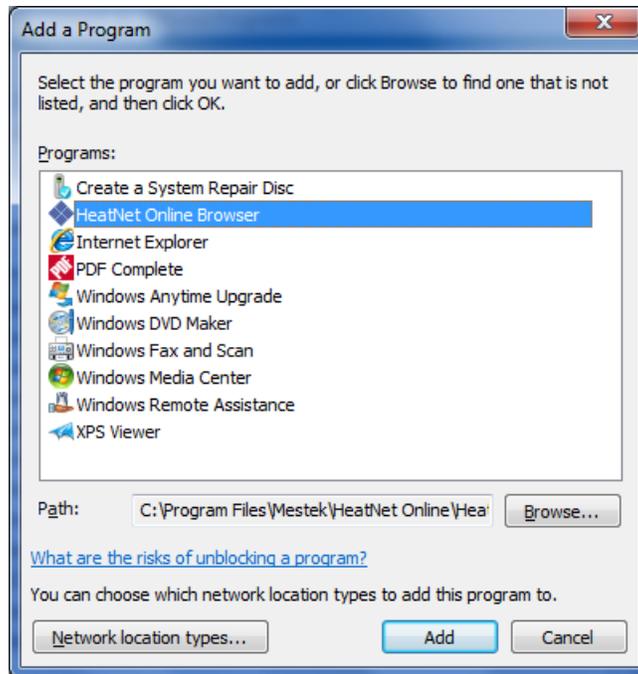


2. In the left pane, click **Allow a program of feature through Windows Firewall**.



3. Click the **Change Settings** button. If you are prompted for an administrator password or confirmation, type the password or provide confirmation.

4. If the **HeatNet Online Browser** program is not listed, press the **Allow another program** button to open the **Add a Program** dialog. If the **HeatNet Online Browser** is listed, select it and press the **Add** button. If it is not listed, press the “Browse” button and navigate to the HeatNetOnlineBrowser.exe program which should be installed in either “C:\ProgramFiles\Mestek\HeatNet Online” (32-bit systems) or “C:\ProgramFiles (x86)\Mestek\HeatNet Online” (64-bit systems).



5. Select the check box next to the **HeatNet Online Browser** program and select the network locations that you want to allow communication.
6. Click the **OK** button to save the changes.

Appendix C: Network Testing and Troubleshooting

The primary network testing and troubleshooting tool is the *Device Status Monitor* which was briefly described in an earlier section. Start by rebooting the HeatNet Online Module. When the module shows back up in the *Device List* select it and choose *Status Monitor* on the *Device Menu*. The following figures show sample status monitor output and highlight some of the important messages.

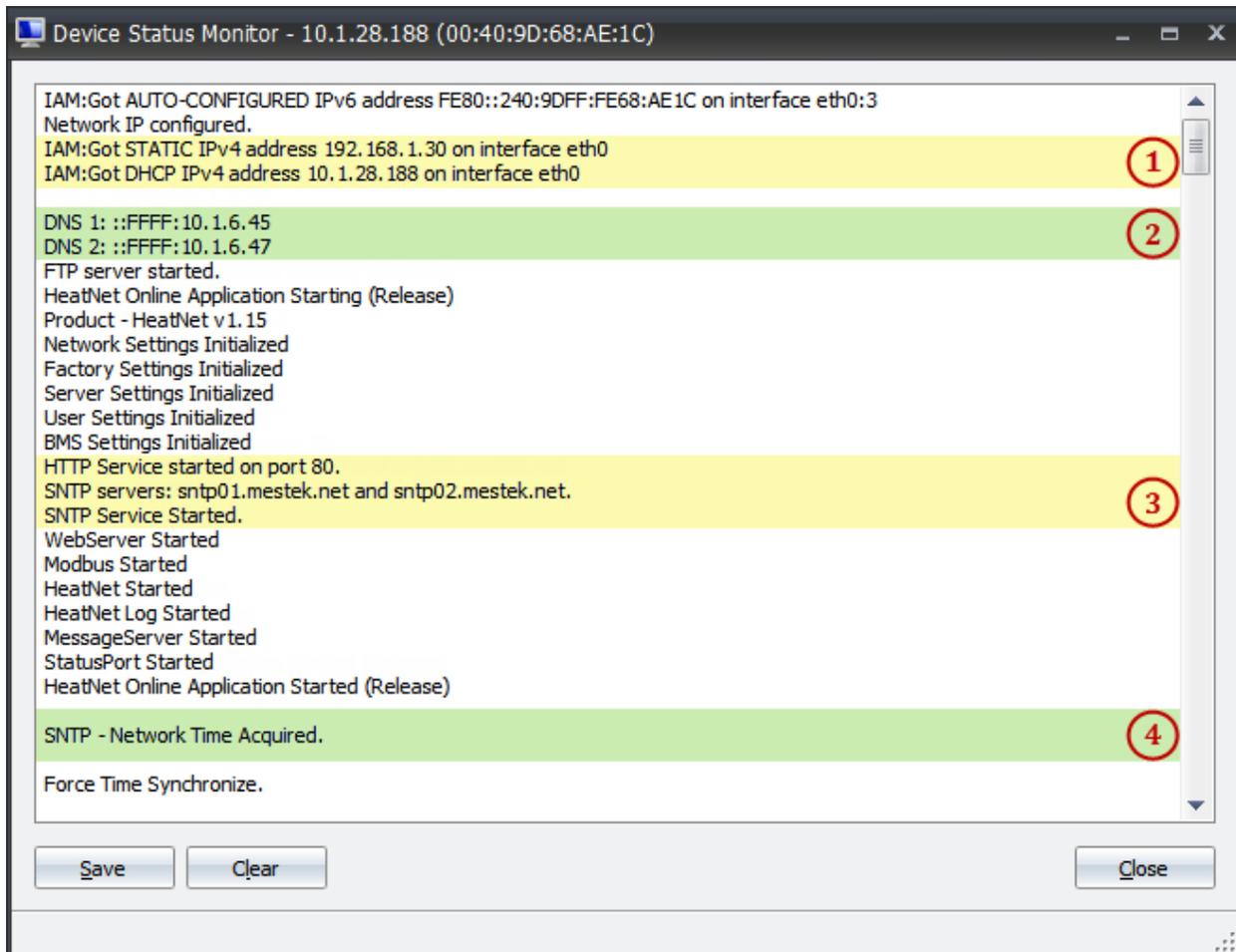


Figure 19 - Status Monitor (Page 1)

- 1) Static and DHCP addresses – A static address will always “acquired” from the *Network Settings*. If DHCP client is enabled (in *Network Settings*), then a DHCP address should also be acquired. If DHCP client is enabled and the device has not acquired a DHCP address, there is a problem communicating with the network DHCP server.
- 2) DNS Server addresses – This represents the DNS (Domain Name System) servers being used. If a static IP is being used, it will be the static DNS Servers (in *Network Settings*) if DHCP is enabled, it should be the DNS servers used by the local network.
- 3) HTTP and SNTP services – The HTTP should always be on port 80. The SNTP servers are the servers configured in *Network Settings*.

- 4) SNTP Time Acquired – This message will appear after the device has successfully synchronized to the SNTP time servers.

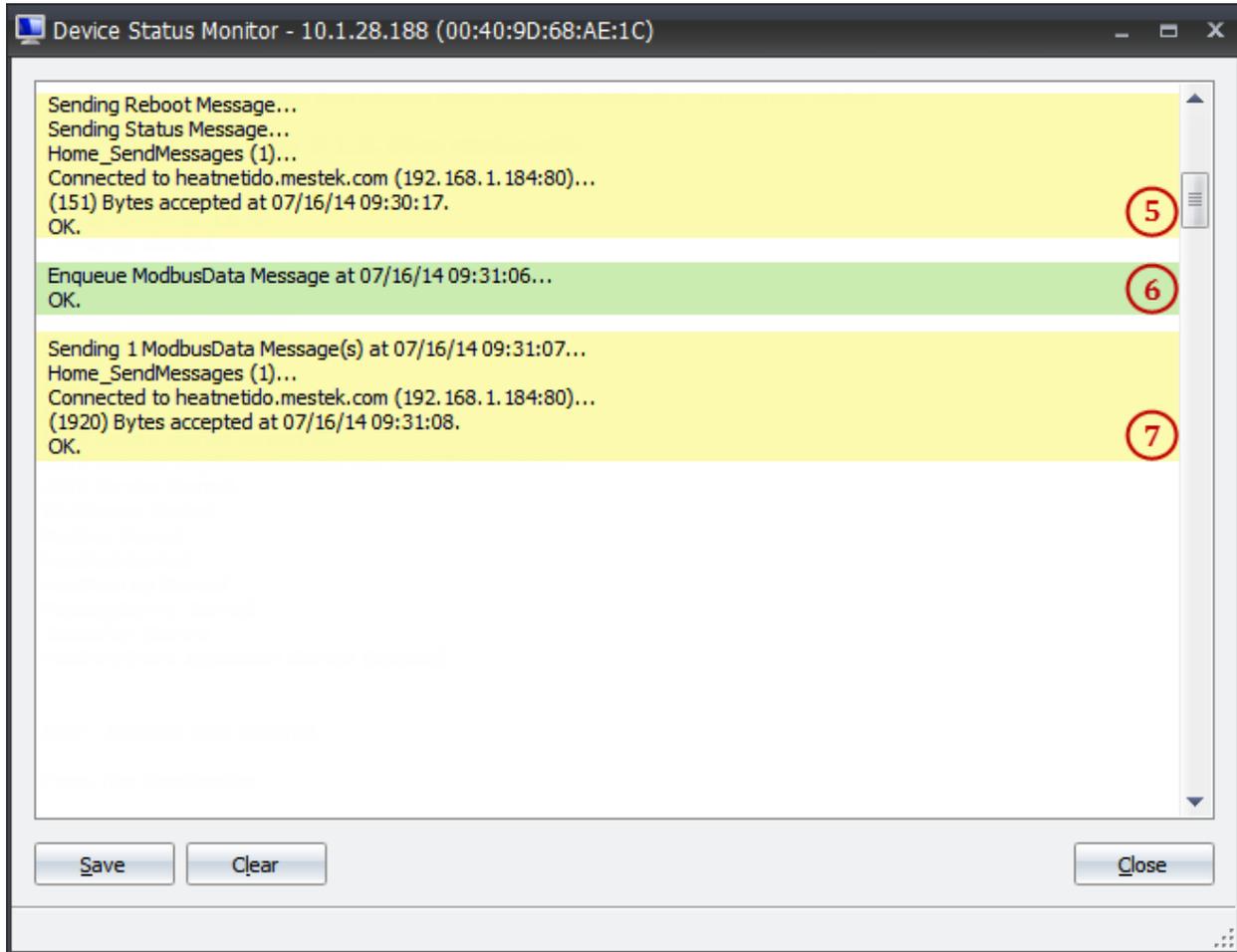


Figure 20 - Device Status Monitor (Page 2)

- 5) Sending Reboot Message – The first message sent to the server when the device starts is a Reboot Status message.

You should see “Connected to heatnetido.mestek.com...” and “(XXX) Bytes accepted at <the local time on the device>”. If the “Connected...” message is not displayed, there is a local network issue. Possible causes are that the DNS servers are incorrect or something may be blocking outgoing traffic to the internet. Try using *Server Test* on the *Tools Menu* to see if a computer can successfully connect to the HeatNet Online Web Server on the same local network. If it cannot, something is preventing network traffic from reaching the internet, contact the local network administrator.

If the “(XXX) Bytes accepted...” is not displayed, there may be a HeatNet Online Web Server problem, please contact technical support. If the “(XXX) Bytes accepted...” is displayed, but the time is “1/1/70 00:00:00”, the device has not been able to

synchronize to the SNTP servers. If the time is not "1/1/70 00:00:00", but is not correct, there time zone (in *Server Settings*) may not be correct.

- 6) Enqueue ModbusData - This message indicates that a snapshot of the current data has been captured and placed in the queue for transmission to the HeatNet Online Web Server. If this message is not displayed, the commissioned indicator (in *Server Settings*) may not be set.
- 7) Sending ModbusData Message – This message indicates that the device is attempting to send a ModbusData message that has been placed in the queue (see 6 above).

You should see "Connected to heatnetido.mestek.com..." and "(XXX) Bytes accepted at <the local time on the device>". If the "Connected..." message is not displayed, there is a local network issue. Possible causes are that the DNS servers are incorrect or something may be blocking outgoing traffic to the internet.

If the "(XXX) Bytes accepted..." is not displayed, there may be a HeatNet Online Web Server problem, please contact technical support. If the "(XXX) Bytes accepted..." is displayed, but the time is "1/1/70 00:00:00", the device has not been able to synchronize to the SNTP servers. If the time is not "1/1/70 00:00:00", but is not correct, there time zone (in *Server Settings*) may not be correct.