



Introduction

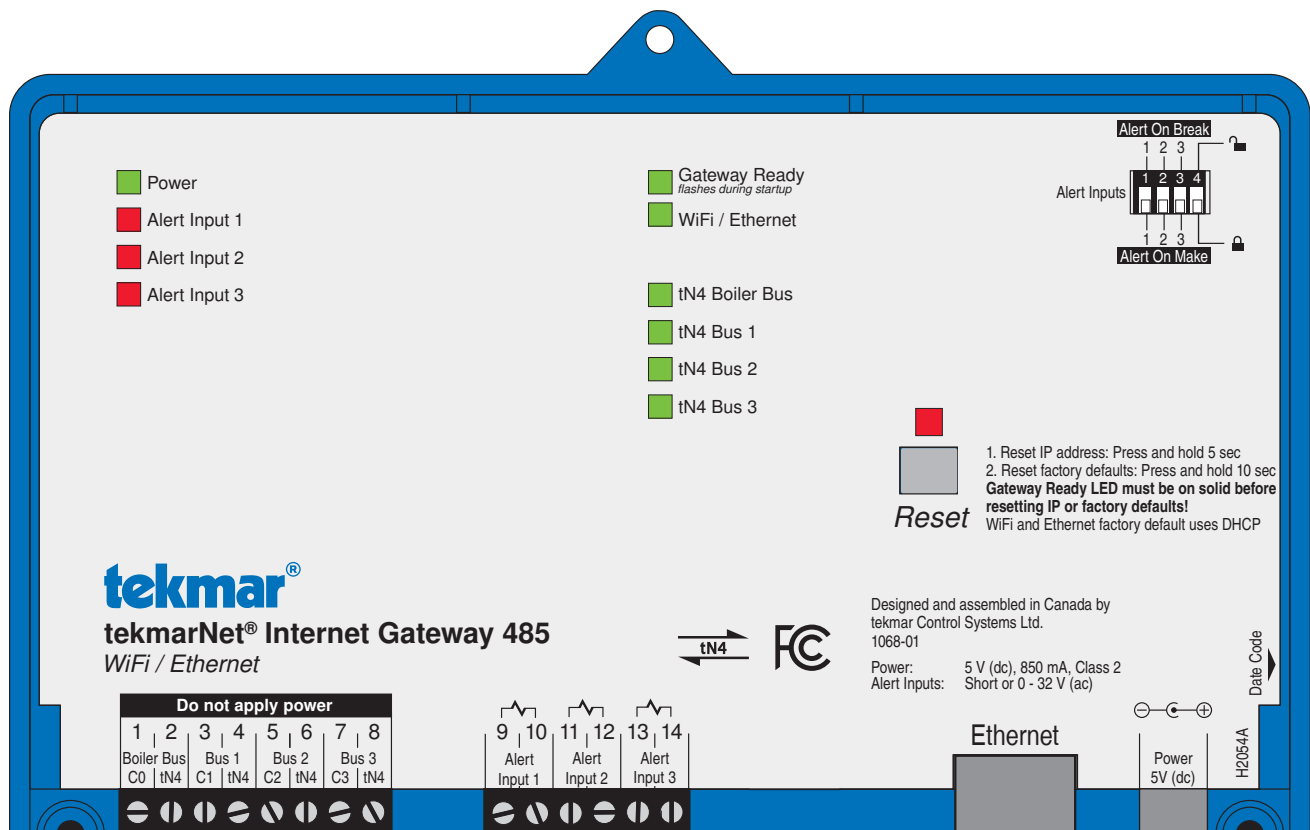
The tekmarNet® Internet Gateway 485 allows remote access to tekmarNet® compatible controls through a web browser, either over the Internet or through a local area network. Users can view and change settings for each thermostat, including: temperature, heat/cool/auto, fan operation, relative humidity, schedules, and the away scene. In addition, the boiler system temperatures, firing rate, run times, and pump status can be viewed. All system data can be graphed on a chart or be exported to a data file. The 485 can send daily or weekly status reports, as well as error and warning notifications, through e-mail. The 485 includes three alert inputs that can be used to monitor auxiliary equipment.

Features

- WiFi or Ethernet connection to Internet
- Built-in web server
- Compatible with computer and mobile phone web browsers
- View and adjust thermostat settings
- Monitor hot water system
- Supports multiple user accounts
- Graph and export system data
- Email notification of status and errors
- Error and warning history log
- Three alert inputs for equipment monitoring
- Software updates

Benefits

- Reduce energy consumption by remotely controlling and monitoring a building's HVAC system
- Notifications can be sent to a service contractor immediately if a problem occurs
- All data and information is stored locally on site
- Pay no monthly or annual fees



⚠ WARNING



Read this Manual BEFORE using this equipment.

Failure to read and follow all safety and use information can result in death, serious personal injury, property damage, or damage to the equipment.

Keep this Manual available for easy access by all users. Replacement Manuals are available at tekmarControls.com

Important Safety Information



This is a safety-alert symbol. The safety alert symbol is shown alone or used with a signal word (DANGER, WARNING, or CAUTION), a pictorial and/or a safety message to identify hazards.

When you see this symbol alone or with a signal word on your equipment or in this Manual, be alert to the potential for death or serious personal injury.



This pictorial alerts you to electricity, electrocution, and shock hazards.

⚠ WARNING

This symbol identifies hazards which, if not avoided, could result in death or serious injury.

⚠ CAUTION

This symbol identifies hazards which, if not avoided, could result in minor or moderate injury.

NOTICE

This symbol identifies practices, actions, or failure to act which could result in property damage or damage to the equipment.

⚠ WARNING

To avoid serious personal injury and damage to the equipment:

- Do not use unless you know the safe and proper operation of this equipment.
- Improper installation and operation of this control could result in damage to the equipment and possibly even personal injury or death.
- This electronic control is not intended for use as a primary limit control. Other controls that are intended and certified as safety limits must be placed into the control circuit.

NOTICE

- Do not attempt to service the control. There are no user serviceable parts inside the control. Attempting to do so voids warranty.
- It is your responsibility to ensure that this control is safely installed according to all applicable codes and standards. tekmar is not responsible for damages resulting from improper installation and/or maintenance.

⚠ WARNING

Installation must be performed by qualified persons, in accordance with local codes, ANSI/NFPA 70 (NEC Article 424) and CEC Part 1 Section 62 where applicable. Prior to installation, please consult the local codes in order to understand what is acceptable. To the extent this information is not consistent with local codes, the local codes should be followed. Please be aware local codes may require this product and/or the control to be installed by an electrician.

Table of Contents

Important Safety Information.....	2	Login to the 485.....	12
Installation.....	4	Router Setup.....	13
Preparation.....	4	485 Networking.....	14
Physical Dimensions.....	4	Dynamic DNS.....	15
Installation Location.....	5	User Interface.....	16
Before You Start.....	6	Web Page Configuration.....	16
Switch Settings.....	6	Using the Web Pages.....	19
Status Indicator LED.....	6	Troubleshooting.....	22
Reset Button.....	7	Trouble Reaching Login Page.....	22
Wiring.....	7	Trouble Viewing Web Pages.....	23
Wiring to a Thermostat Network.....	8	Technical Data.....	24
Wiring to a House Control 400, 401, 402, 403 or 406...	9	Limited Warranty and Product Return Procedure.....	24
Wiring to a Universal Reset Module 423.....	10		
Wiring to a Boiler Control 274 or 275.....	11		

Getting Started

Congratulations on the purchase of your new tekmarNet® Internet Gateway!

This manual covers the complete installation, programming and sequence of operation for this control. You will also find instruction on testing, commissioning, and troubleshooting the control and system that it operates.

Radio Frequency Interference

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Installation

Preparation

Contents

- tekmarNet® Internet Gateway 485
- Wall plug power supply
- 5' (1.5 m) Ethernet Cat5-E cable
- Screwdriver
- Installation and Operation Manual 485_D
- Quick Setup Guide 485_Q

Tools Required

- Phillips head screwdriver
- Needle-nose pliers
- Wire stripper

Materials Required

- 18 AWG LVT Solid Wire (Low Voltage Connections)
- 4 Wood screws
- Tablet or Laptop computer (during installation)

Networking Requirements

The 485 must be connected to a router or a network switch. An internet connection is required if access outside of the building is required. The router must support WiFi 802.11n, 2.4 GHz, WPA2 encryption.

Web Browsers

The 485 requires HTML5 compatible web browsers. This includes most modern web browsers.

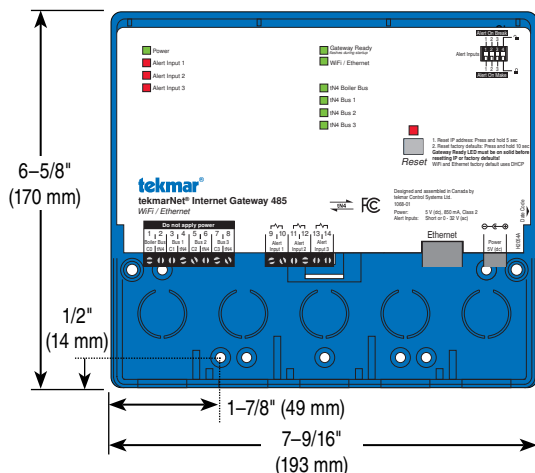
Compatibility

The 485 is compatible with the following tekmarNet® products manufactured during and after December 2014. Please contact tekmar customer service to check for compatibility of products manufactured prior to this date. The 485 software is designed to update. This allows the 485 to be compatible with newly released products not included in this list.

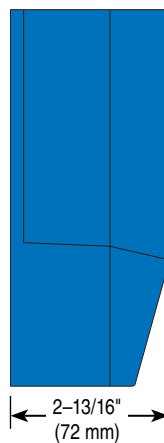
- tekmarNet®4 Timer 033
- tekmarNet®4 Setpoint Control 161, 162
- Boiler Control 274, 275, 284
- tN2 Wiring Center 313, 314
- tN4 Wiring Center 315, 316
- Zone Expansion Module 324, 325, 326
- Zone Manager 334, 335, 336, 337
- Power Manager 345, 346
- tN2 House Control 400, 401, 402, 403, 406
- Boiler Reset Control 420
- Mixing Reset Control 421
- Universal Reset Module 422, 423
- Mixing Expansion Module 440, 441, 444
- tN4 User Switch 479, 480, 481
- tekmarNet®2 Thermostat 527, 528, 529, 530
- tekmarNet®4 Thermostat 537, 538, 540
- tekmarNet®4 Thermostat 541, 542, 543, 544, 545, 546
- tekmarNet® Thermostat 532, 552, 553, 554, 557
- Snow Melt Control 654

Physical Dimensions

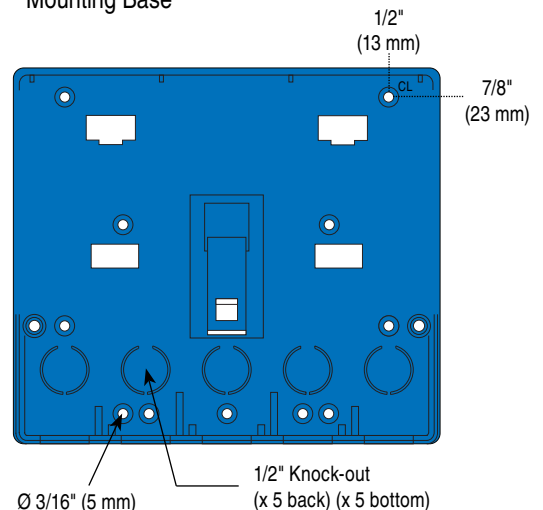
Front View



Side View



Mounting Base

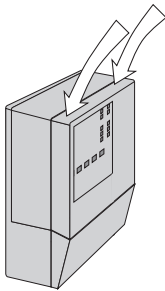


Installation Location

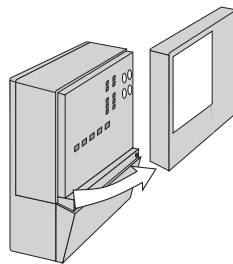
When choosing the location for the control, consider the following:

- Interior Wall.
- Keep dry. Avoid potential leakage onto the control.
- Relative Humidity less than 90%. Non-condensing environment.
- No exposure to extreme temperatures beyond 32 to 122°F (0 to 50°C).
- Away from equipment, appliances, or other sources of electrical interference.
- Easy access for wiring, viewing.
- Approximately 5 feet (1.5 m) off the finished floor.
- The maximum length of wire is 500 feet (150 m).
- Strip wire to 3/8" (10 mm) for all terminal connections.
- Use standard 8 conductor, 18 AWG wire.
- Ethernet cable maximum length is 328 feet (100 m).
- WiFi maximum distance is 100 feet (30 m) line of sight with no walls. Walls reduce WiFi range.

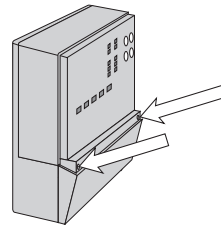
Mounting



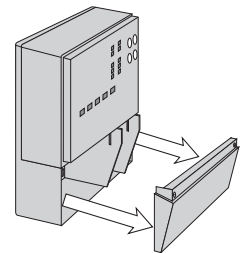
Press down at the fingertip grips on top of the front cover and pull out and down.



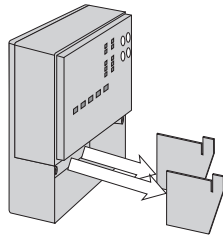
Lift the front cover up and away from the control.



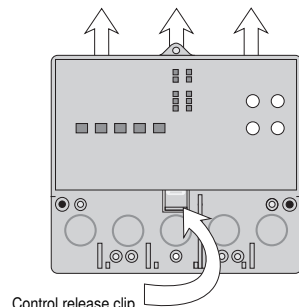
Loosen the screws at the front of the wiring cover.



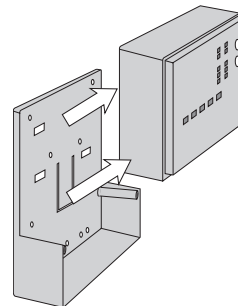
The wiring cover pulls straight out from the wiring chamber.



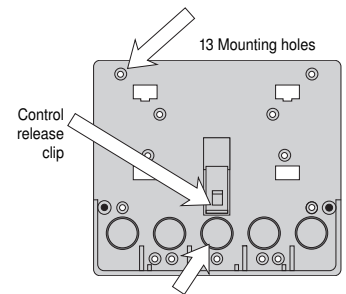
Remove the safety dividers from the wiring chamber by pulling them straight out of their grooves.



Press the control release clip on the base inside the wiring chamber and slide the control upwards.



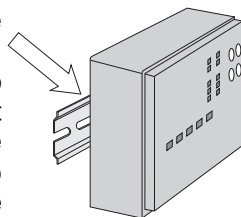
The control lifts up and away from the base.



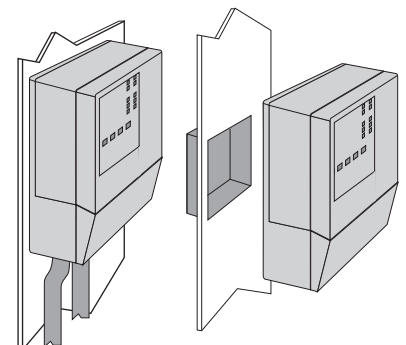
There are 10 conduit knock-outs at the back and bottom of the wiring chamber.

The base is ready for mounting.

The control can be mounted on a standard DIN rail. First remove the control from its base and then, using the hooks and spring clip on the back of the control, mount it onto the DIN rail. This will be a popular option for those who prefer to mount the control inside a larger electrical panel.



The wiring can enter the bottom or the back of the enclosure. Knock-outs provided in the base allow the wiring to be run in conduit up to the enclosure. The base also has holes that line up with the mounting holes of most common electrical boxes.



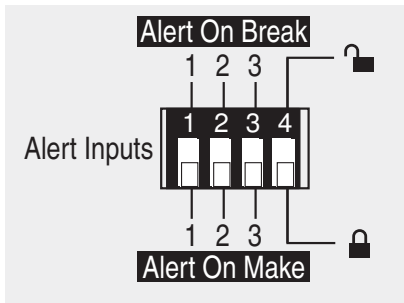
Before You Start

Before connecting the tekmarNet® Internet Gateway 485 to a tekmarNet® system, it is recommended that the system be fully completed, with no tekmarNet® thermostats or setpoint controls being added or removed at a later date. Also, each tekmarNet® thermostat and setpoint control device is automatically assigned a tekmarNet® address when connected to the system. It is recommended that each device be given a manual

address. This address should be written down together with the room location for future reference.

The gateway records the address of each tekmarNet® thermostat and setpoint control. For each address, the installer can name the room location and building area for each thermostat and setpoint control.

Switch Settings



Alert Inputs

The 485 has 3 alert inputs. Each alert input has a corresponding alert input switch setting.

Alert on Make

When set to Alert on Make, the 485 will trigger an email notification when the alert demand input has a contact closure or a voltage from 0 to 32 V (ac). The alert is cleared when the alert input has an open contact or the voltage is removed.

Alert on Break

When set to Alert on Break, the 485 will trigger an email notification when the alert input has an open contact. The alert is cleared when the alert input has a contact closure or a voltage from 0 to 32 V (ac) is applied.

Unlock / Lock

The Unlock / Lock switch allows the use of a factory default user ID and password for the 485 login web page.

When set to Unlock (switch setting in up position), the user ID is “installer” and the password is “tekmar”.

After logging in to the tekmarNet® gateway login web page, create personal accounts for yourself and your customer through the configuration page. Once the personal accounts are completed, the Unlock / Lock switch can be set to Lock. The default user ID and password are then no longer accepted.

Should the personal account user ID or passwords be forgotten, the Unlock / Lock switch can be set to Unlock and the default user ID and password can be used to create new personal accounts.

NOTICE

Once the tekmarNet® Gateway installation is complete, it is important that the switch setting be left in the Lock position in order to prevent unauthorized access.

Status Indicator LED

LEDs	On	Off
■ Power	Power is on	Power is off
■ Alert Input 1	Alert input 1 is present	Alert input 1 is not present
■ Alert Input 2	Alert input 2 is present	Alert input 2 is not present
■ Alert Input 3	Alert input 3 is present	Alert input 3 is not present
■ Gateway Ready	Web server operational	Web server is offline
■ WiFi / Ethernet	Communication to the router	No communication to the router
■ tN4 Boiler Bus	tN4 communication on the boiler bus	No tN4 communication on the boiler bus
■ tN4 Bus 1	tN4 communication on bus 1	No tN4 communication on bus 1
■ tN4 Bus 2	tN4 communication on bus 2	No tN4 communication on bus 2
■ tN4 Bus 3	tN4 communication on bus 3	No tN4 communication on bus 3

Reset Button

The Reset button has two operations based upon the length of time the button is held down. The "Gateway Ready" LED must be on in order for the reset to function.

Reset IP Settings

Press and hold the reset button for 5 seconds. The reset LED will turn red. The 485 defaults to use DHCP (automatic addressing) provided by the router. After resetting the IP to the factory default, the 485 restarts. It may take up to 5 minutes before web pages are available.

Reset Factory Defaults

Press and hold the reset button for 10 seconds. The 485 will erase all memory and all files will be reset to their factory defaults. It may take up to 5 minutes before web pages are available.

NOTICE

Do not disconnect power when resetting the IP address or resetting the factory defaults. This will result in permanent damage to the 485.

Wiring

⚠ WARNING



Disconnect all power before opening the control.

To prevent the risk of personal injury and/or death, make sure power is not applied to the product until it is fully installed and ready for final testing. All work must be done with power turned off to the circuit being worked on.

tekmarNet® Bus

The 485 includes four tekmarNet® bus inputs. The tN4 bus inputs allow communication between the 485 and the tekmarNet® system. Each tN4 bus on the tekmarNet® system must be wired to the tN4 bus inputs on the 485. The tN4 bus may be wired before or after the control is powered on and setup.



NOTICE

All available tN4 buses must be wired to the 485 whether or not there are thermostats connected to the bus.

Alert Inputs

The 485 includes three alert inputs. The alert inputs can be used to monitor heating equipment for problems such as:

- Low water cut off
- Heating oil or propane tank low tank level
- Loss of utility electrical power
- Boiler flame failure lockout



DIP Switch: Alert on Make

- Switch is normally open
- Alert is sent when switch is closed

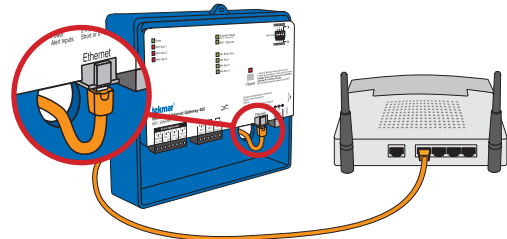


DIP Switch: Alert on Break

- Switch is normally closed
- Alert is sent when switch is opened

Ethernet

The 485 must be connected to a router during the initial installation. After setup has been completed, the 485 may be connected to a WiFi wireless network.

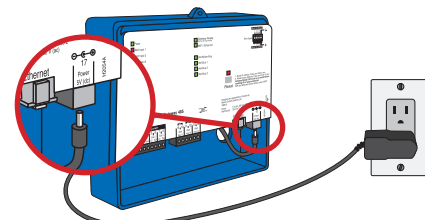


Power

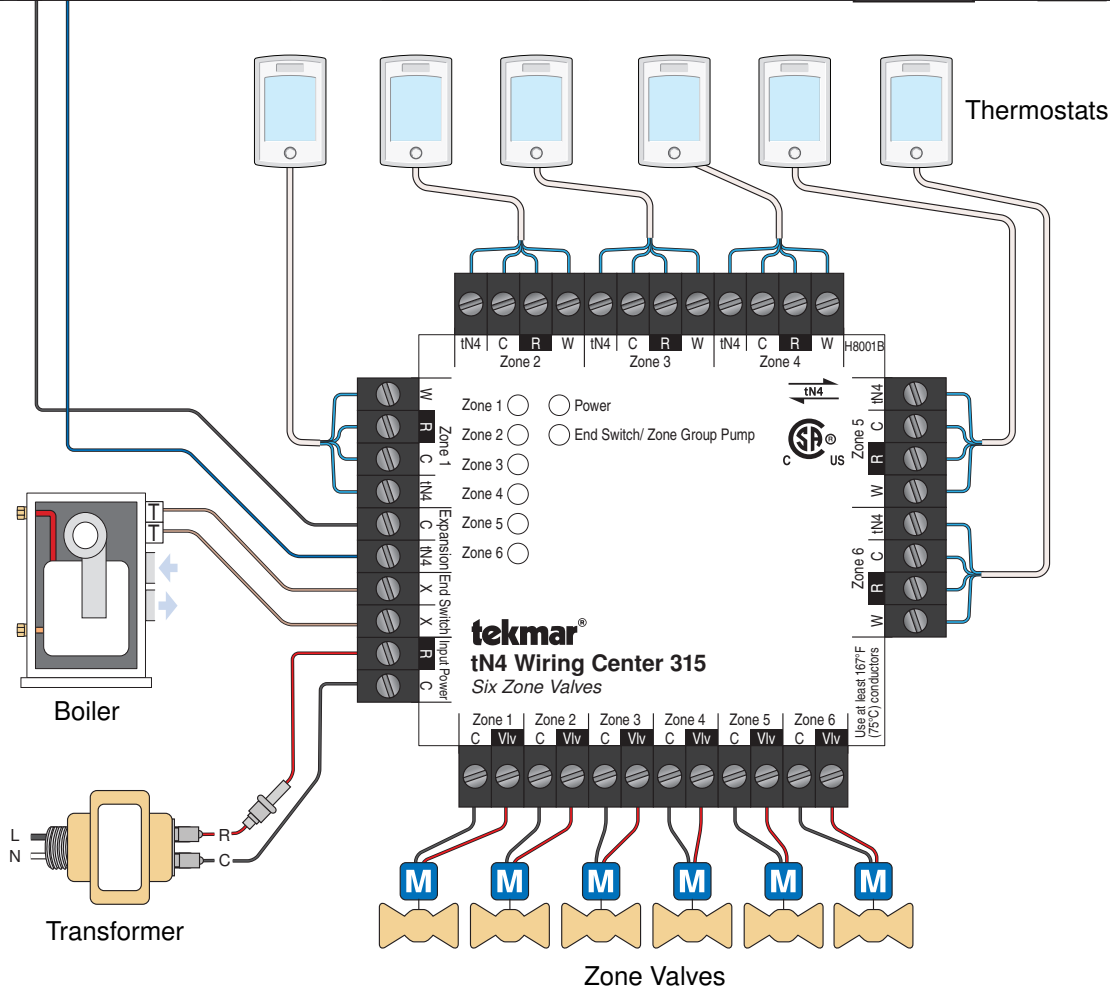
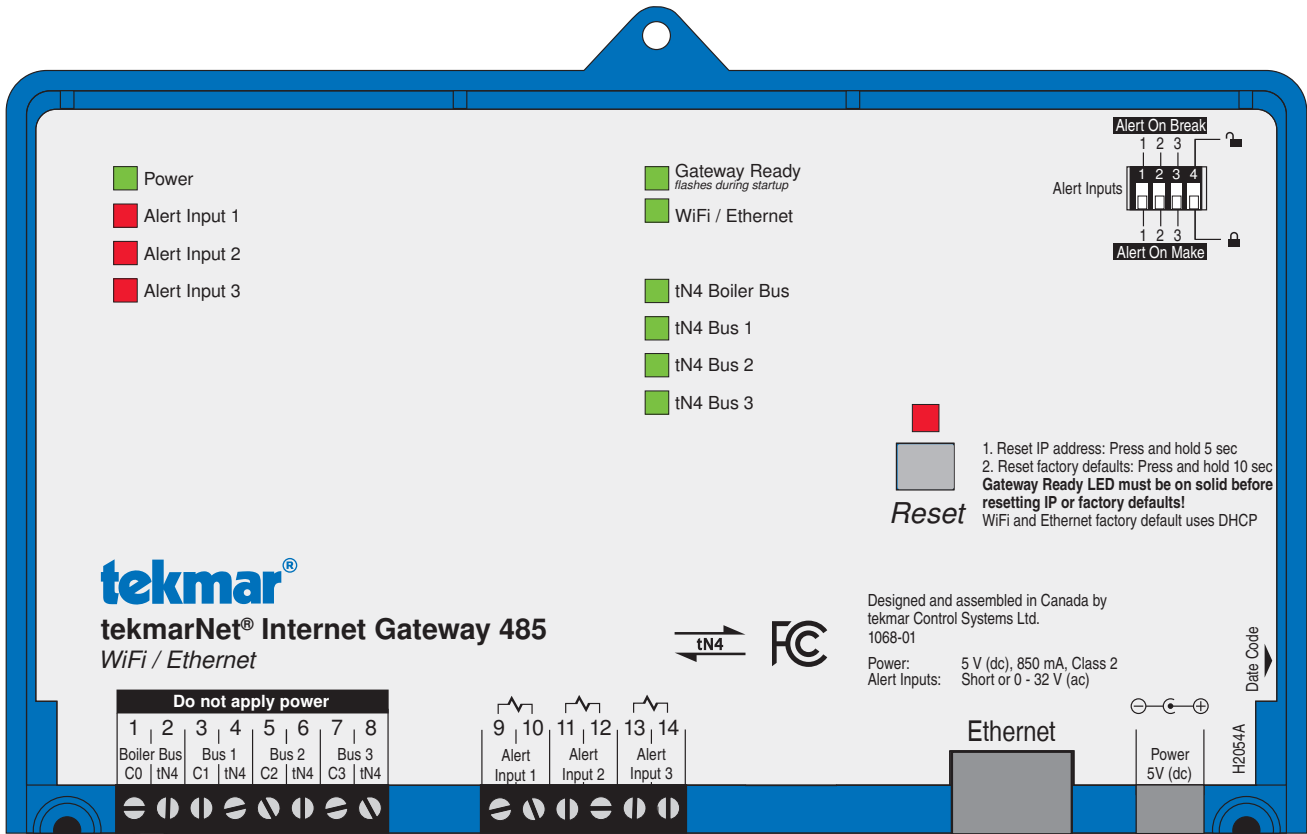
The 485 includes a wall plug power supply.

- Connect the small round end into the power receptacle on the 485.
- Plug the wall plug into a 120 V (ac) power receptacle.

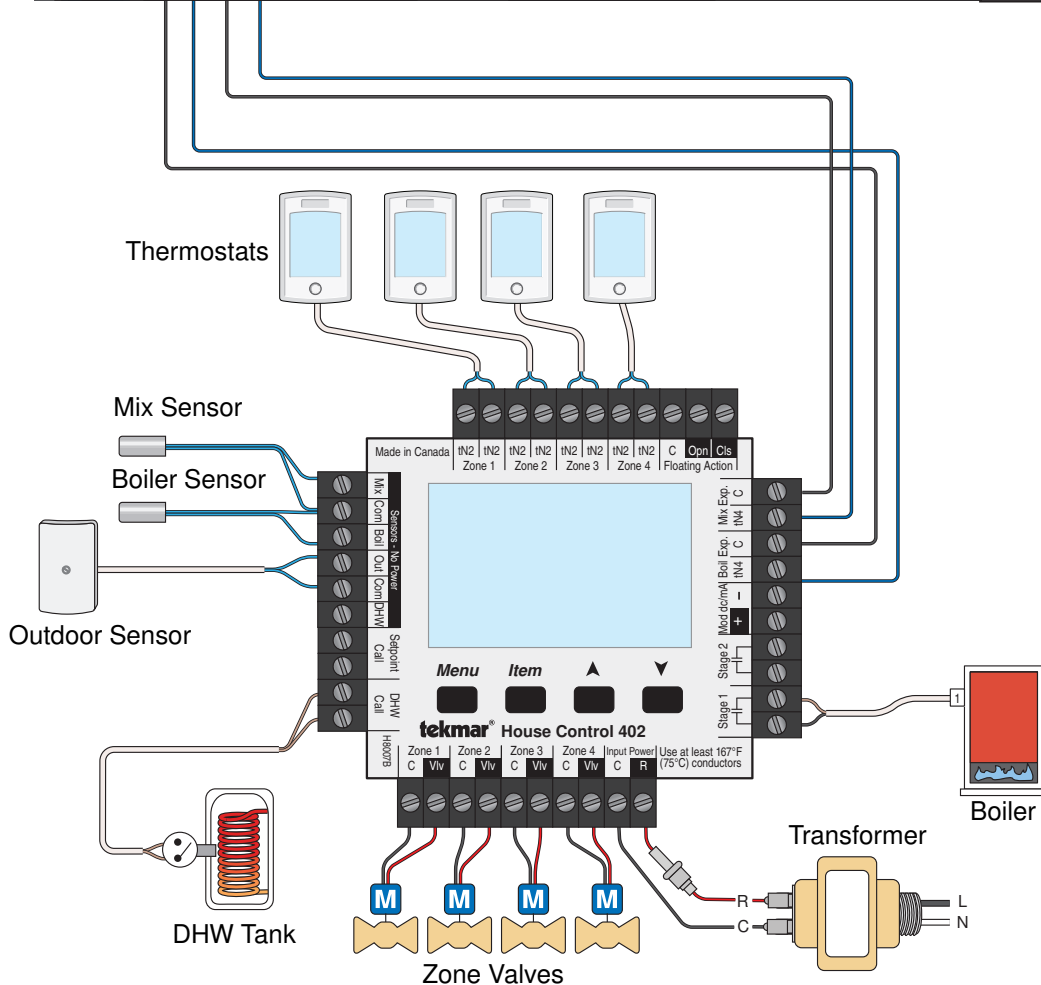
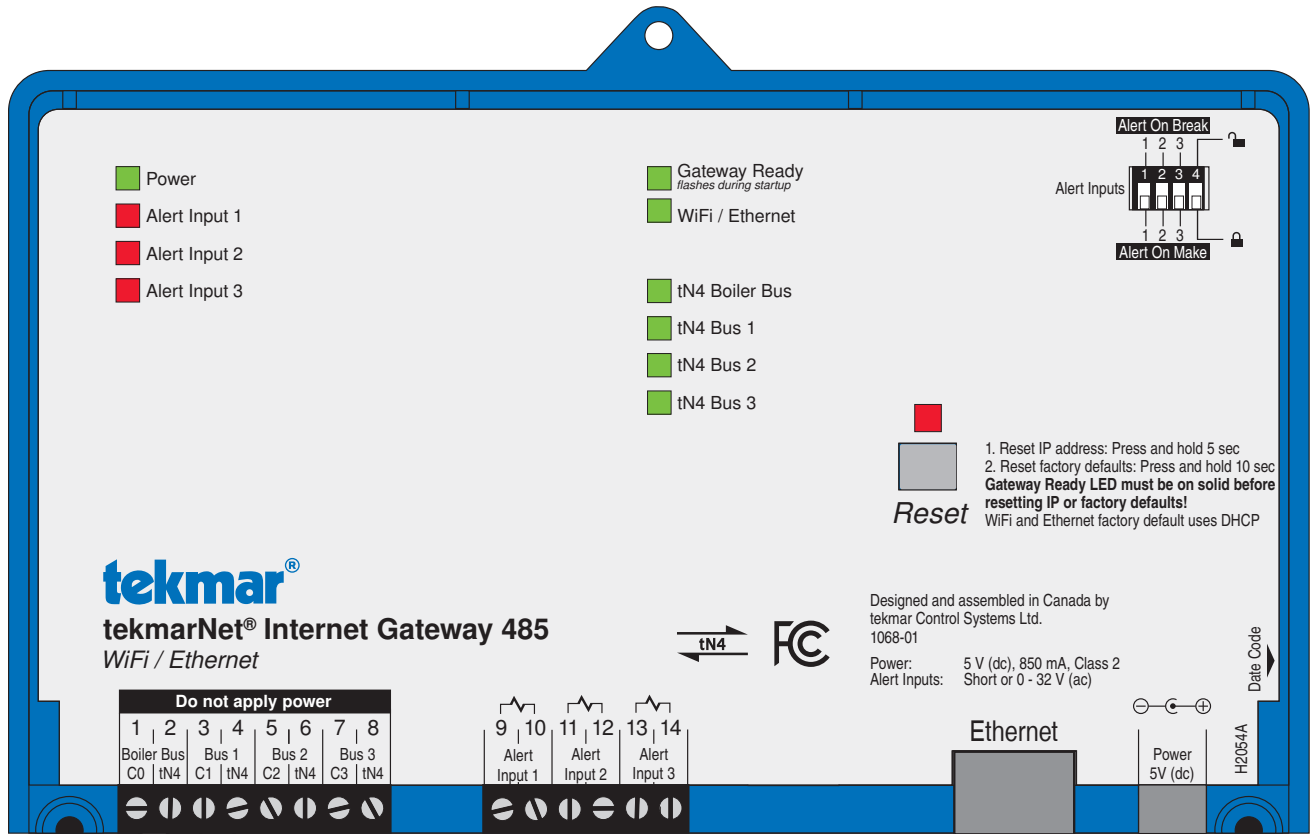
The Power status LED will be illuminated green.



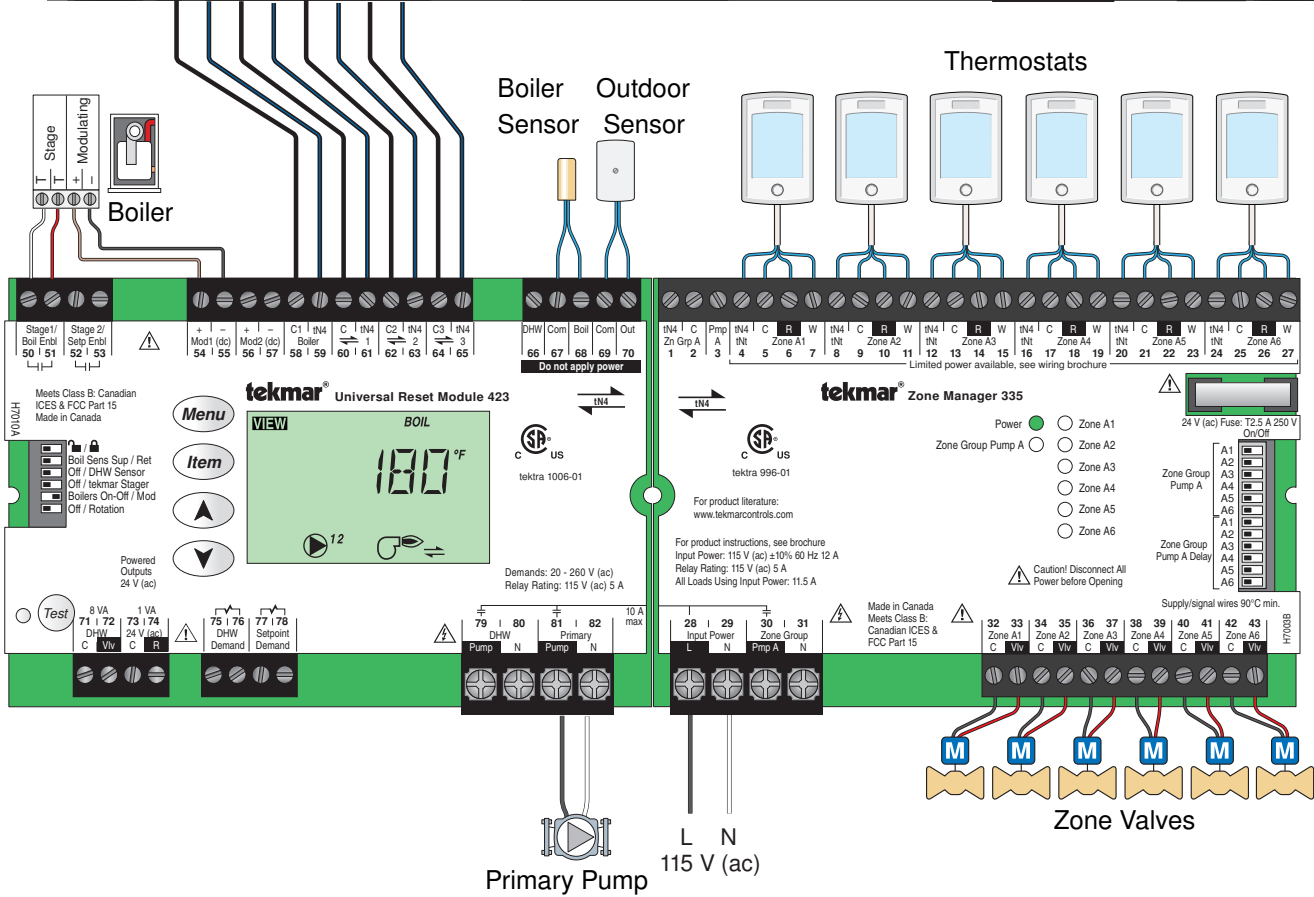
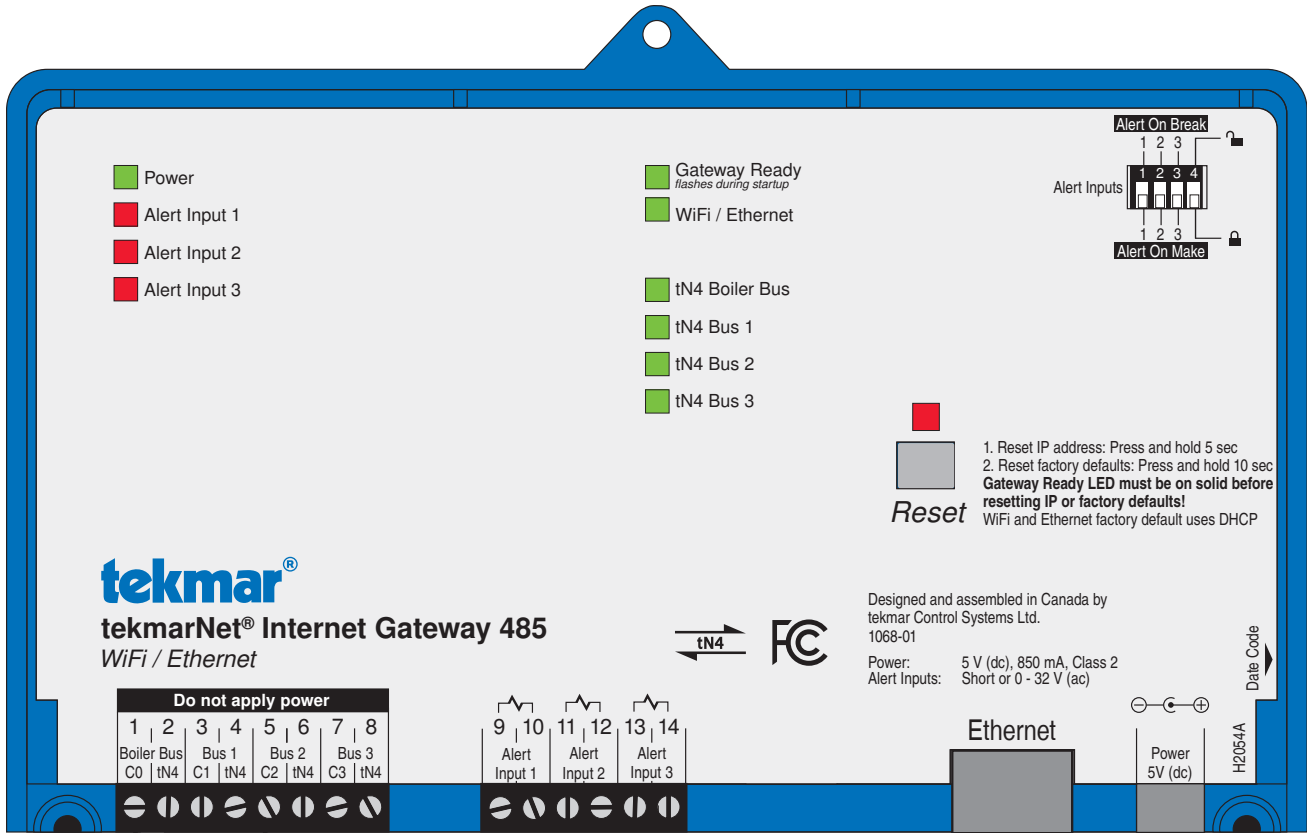
Wiring to a Thermostat Network



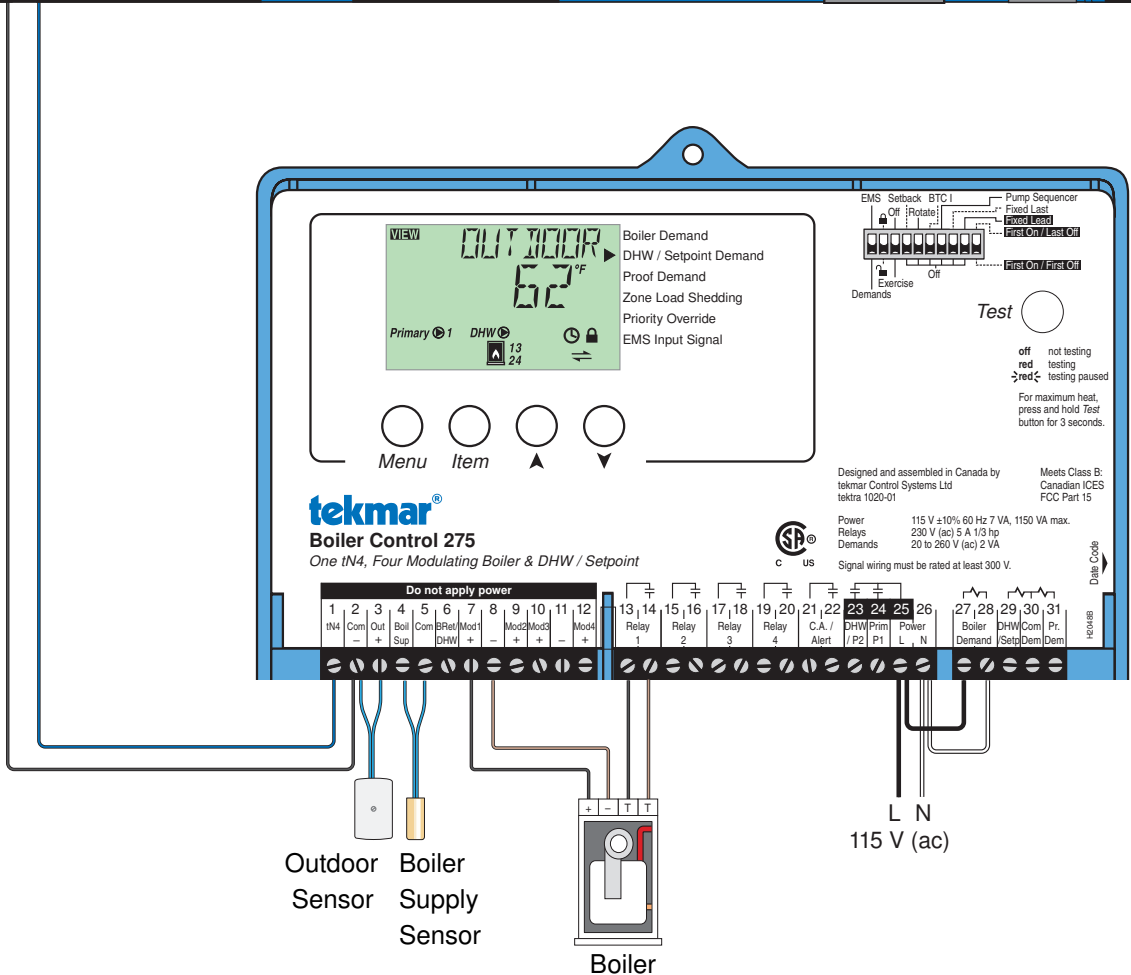
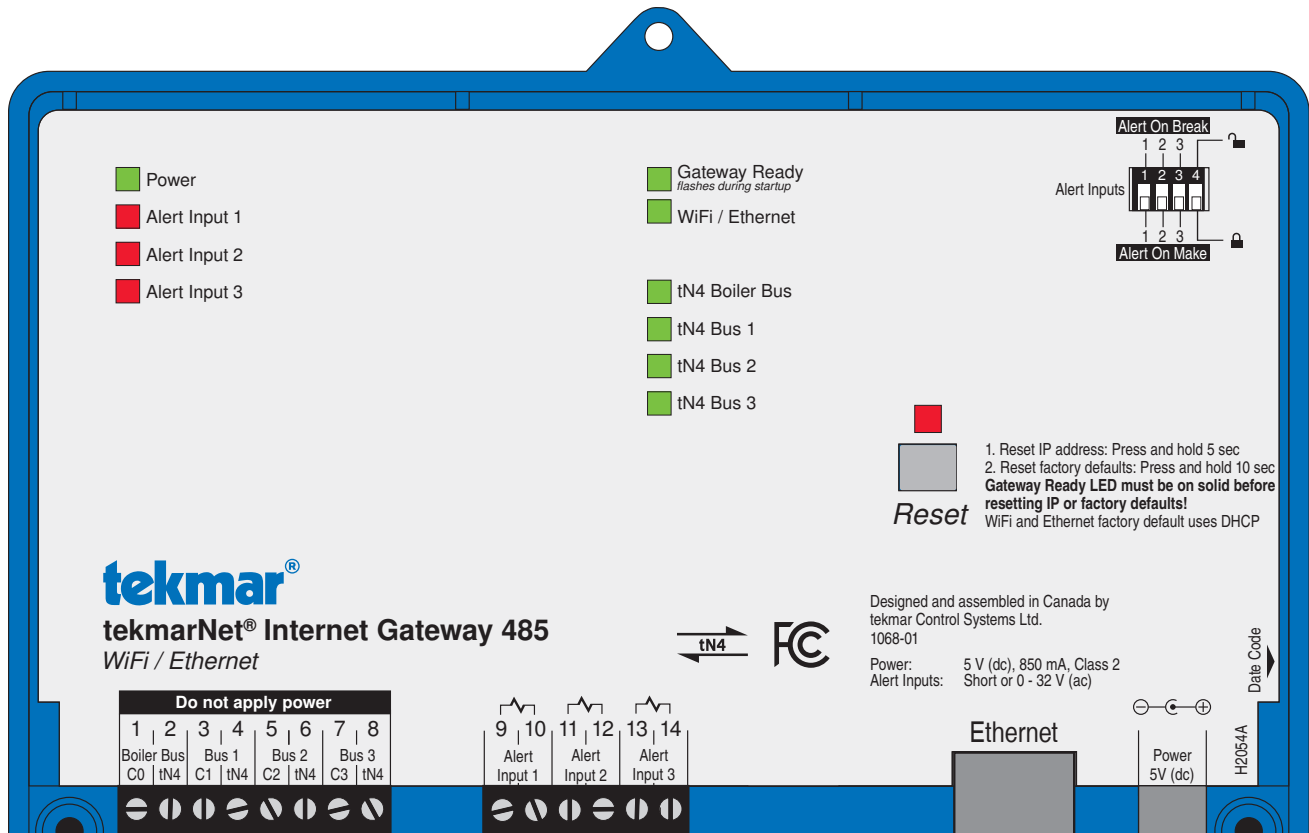
Wiring to a House Control 400, 401, 402, 403 or 406



Wiring to a Universal Reset Module 423



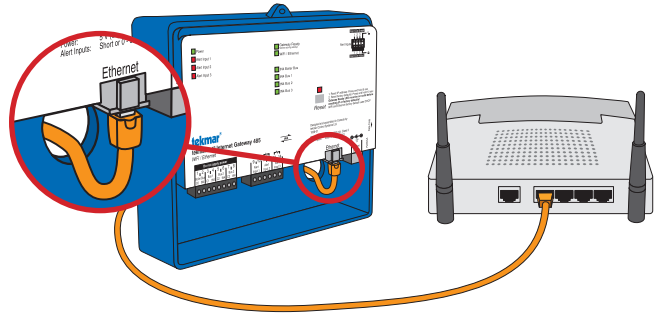
Wiring to a Boiler Control 274 or 275



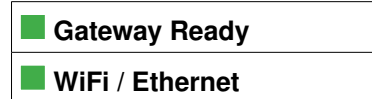
Login to the 485

Network and Power

Using the supplied Ethernet cable, plug the 485 into one of the LAN ports on a router. Then, using the supplied wall power supply, plug the small end into the 485 power jack. Lastly, connect the wall power supply into a wall power outlet.



When the power is first turned on, the 485 may take up to 5 minutes to start up. The web pages are available once the Gateway Ready and WiFi / Ethernet LEDs are on.



Web Address

On a computer, tablet, or phone connected to the Local Area Network (LAN), open a web browser.

In the web browser address bar, enter the following address:
http://tekmarginetway.local

The tekmar Gateway login page will appear.



NOTICE

Unicast routers do not support this method of locating the 485 on the network. In this case, login to the router's setup page and the router will list tekmarginetway as one of the devices on the network. Click this link or enter this IP address into the web browser to access the 485 login page.

Multiple Gateways

There may be cases where there are two or more gateways installed on the same LAN.

Gateway Startup Sequence	Web Address (on LAN only)
1st to start	tekmarginetway.local
2nd to start	tekmarginetway-2.local
3rd to start	tekmarginetway-3.local

Login

Make sure the Unlock / Lock switch is set to Unlock. This enables the use of the default login and password.

Now enter the default login and password.

- The default login is **installer**
- The default password is **tekmar**

After creating personalized user login accounts, it is highly recommended to set the Unlock / Lock switch to the Lock position to prevent unauthorized access.

Make sure to record your login and password for future reference.

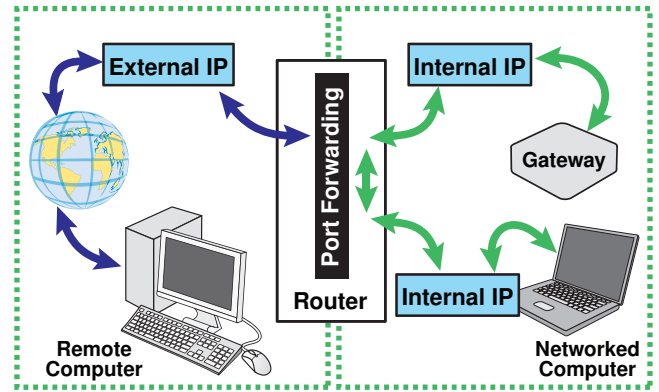


Router Setup

Router Overview

The 485 must be connected to a router. The router directs computer network traffic from one computing device to another. All the devices on the inside of a building form a Local Area Network (LAN). The router bridges the LAN to the internet and protects the LAN from unauthorized access from the internet using a firewall.

Most routers use a DHCP server that automatically assigns an IP address to a computer. These addresses are dynamic, which means that particular computer can be given a new IP address each time it is turned on. Since other computers must locate the 485 on the network, it is important that the 485 be given a static LAN IP address.



Login to Router Setup Page

These directions are provided as a guide to a typical router. If the router does not follow these setup steps contact the router manufacturer, router supplier or qualified IT technician for assistance.

First locate the router setup web page on the LAN. To do this follow these steps:

- Login to the 485 using a computer, tablet or smartphone.
- Click "Configuration".
- Click "Network". The 485 will list the router's IP address.
- Create a new tab on the web browser and enter the router's IP address into the web browser address bar. Two common router addresses are: 192.168.0.1 or 192.168.1.1

Configuration

Job Site General Areas Devices Scenes Users Email Alerts Software History Network

NOTICE

Apple Airport Extreme and Express routers require the AirPort Utility software program to setup the router. Follow the instructions: <http://www.apple.com/support/airport>

Login to the router using the router's username and password. Consult with the router's manual or check the router for a sticker to locate this information.



Router DHCP Settings

In the router settings, locate the DHCP settings. Set the DHCP IP range so that there are eight free IP addresses available. For example, if the router address is 192.168.0.1, then the DHCP range should be set to start at 192.168.0.10. This allows eight static IP addresses to be available (192.168.0.2 to 192.168.0.9). The router may need to restart when this setting is saved.

Router Port Forwarding

In the router settings, locate the router port forwarding rules. This feature can have other names depending on the manufacturer of the router. Other names include port address translation, network address translation (NAT) or applications and gaming.

- Name the port forwarding rule "tekmar".
- Open external TCP and UDP port 80.
- In some cases, internet service providers block port 80. In this case open external port 3000.
- Open internal TCP and UDP port 80.
- Enter the static LAN IP address of the 485 typically 192.168.0.2 or 192.168.1.2

485 Networking

485 Network Settings using WiFi (wireless)

NOTICE

- WPA2 encryption is required for WiFi connections. WEP and no encryption options are not supported by the 485.

First select the WiFi network

- Click the WiFi tab.
- Click the Network tab.
- Scan for available WiFi networks.
- Select a WiFi network, enter the WiFi password and press the Connect button

Secondly, setup the 485 to have a static IP address

- Click the TCP/IP tab.
- Set the DHCP setting to Disabled.
- Enter the static IP address. If the router address is 192.168.0.1 then the 485 IP can be set to 192.168.0.2.
- Enter the Subnet mask. Typically this is set to 255.255.255.0
- Enter the Router IP address. Check the router's manual for the router's default IP address.
- Press the Save button. This requires a reboot of the 485. Click OK.

NOTICE

- Do not setup Ethernet and WiFi to both have a static IP address at the same time. This may result in networking problems.
- After setup of WiFi, disconnect the Ethernet cable. Connection of both WiFi and Ethernet may result in networking problems.
- Power the router off, then power back on.

485 Network Settings using Ethernet (wired)

Setup the 485 to have a static IP address

- Click the Ethernet tab.
- Set the DHCP setting to Disabled.
- Enter the static IP address. If the router address is 192.168.0.1 then the 485 IP can be set to 192.168.0.2.
- Enter the Subnet mask. Typically this is set to 255.255.255.0
- Enter the Router IP address. Check the router's manual for the router's default IP address.
- Press the Save button. This requires a reboot of the 485. Click OK.

NOTICE

- Power the router off, then power back on.

Network - DNS and Port

- Click the DNS/Port tab.
- In the DNS1 field enter the IP address of the router.
- In the DNS2 field enter 208.67.222.222. This directs the 485 to use OpenDNS.com to resolve DNS searches on the Internet.
- For new installations, set the port number to 80.
- When replacing a Gateway 483, set the port number to 3000.
- Click the Save button. This requires a reboot of the 485. Click OK.

Configuration

Job Site General Areas Devices Scenes Users Email Alerts Software History Network

Network Configuration

Ethernet WiFi DNS/Port

Status Connected to TP-LINK_6CD356 on 192.168.0.101 (Please remove ethernet cable.)

Network TCP/IP

Network TP-LINK_6CD356

Password *****

Select a Network

- TP-LINK_6CD356
- tekmar-GUEST-02
- HP-Print-80-tekmar-GUEST-print

Connect Scan

Configuration

Job Site General Areas Devices Scenes Users Email Alerts Software History Network

Network Configuration

Ethernet WiFi DNS/Port

Status Disconnected

Network TCP/IP

DHCP Enabled Disabled

IP Address 192.168.0.2

Subnet Mask 255.255.255.0

Router 192.168.0.1

Configuration

Job Site General Areas Devices Scenes Users Email Alerts Software History Network

Network Configuration

Ethernet WiFi DNS/Port

DHCP Enabled Disabled

IP Address 192.168.0.2

Subnet Mask 255.255.255.0

Router 192.168.0.1

Configuration

Job Site General Areas Devices Scenes Users Email Alerts Software History Network

Network Configuration

Ethernet WiFi DNS/Port

DNS1 192.168.0.1

DNS2 208.67.222.222

Port 80

<- Previous Save

Dynamic DNS

Many Internet Service Providers (ISP) provide a static IP address with a business account. Residential accounts often have a dynamic IP address. If the ISP has provided a dynamic IP address, then a free dynamic DNS service is required. There are many free dynamic DNS services available. tekmar suggests to use a free service from NoIP.com.

- Go to the web site at <http://www.noip.com>
- Create an account by clicking on "Sign Up".

NOTICE

When creating a NoIP account an e-mail address is required to activate the account. The same e-mail account cannot be used again to create another NoIP account. Therefore, it is recommended to use the building owner's e-mail address. This requires the building owner to read the e-mail and click on the link to activate the NoIP service.

- Fill out a username, email address, password and hostname. The hostname is the web address that is used to access the gateway over the internet. Click "Free Sign Up".

All No-IP settings are now complete and you can logout of the No-IP web site.

Create Your No-IP Account

Username Email

Password Confirm Password

Hostname .ddns.net

Create my hostname later

Thinking about upgrading?

Upgrade to No-IP Enhanced for More Hostnames and Less Hassles.

	Enhanced DNS	Free DNS
Domain Choices	80+	1
Hostnames	25+	3
No Ads	✓	✗
No 30 Day Account Confirmation	✓	✗
Phone Support	✓	✗
	\$19.95 a year	\$0

Send me newsletters & special offers

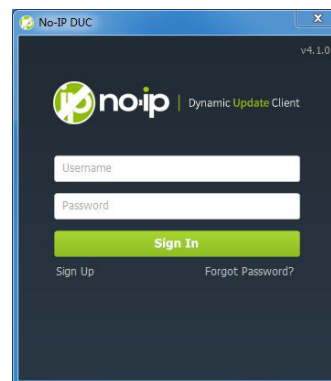
Usernames must be 6-15 characters long and only contain a-z,0-9,-, and _
Minimum of 6 characters.
Password Strength

Choose a hostname for your account.
You can change your hostname or add more later.

Upgrading to Enhanced DNS now will save you time and money later.
For more information on the Enhanced DNS upgrade, hover over the name for an explanation of the feature.
If you have chosen an Enhanced domain, but wish to sign up for a No-IP Free account, please choose the no-ip.biz domain option above.
By submitting this form I agree to the **terms of service** and that I will only create one free account.

Download and install the No-IP update client on a computer or router that shares the same Local Area Network as the 485.

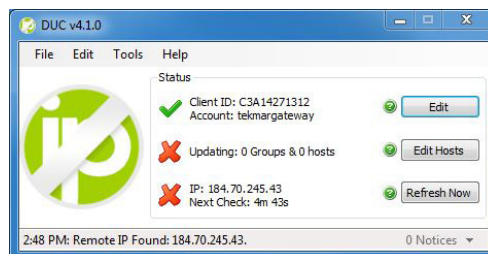
- Download the No-IP Dynamic DNS Update Client software at <http://www.no-ip.com/download>
- Follow the steps to install the No-IP DUC software.
- When the No-IP DUC window appears, enter the no-ip.com username and password.



From any computer connected to the Internet, start a web browser and enter the dynamic DNS hostname chosen and press enter. An example would be:

<http://gateway485.ddns.net>

The gateway login page will appear. Bookmark this address in the web browser to allow quick and easy access to the gateway while on the Internet.



User Interface

Web Page Configuration

Configuration

The 485 requires information to be entered about the heating, cooling, ventilation and air conditioning (HVAC) system.

To enter this information, click "Configuration".

The screenshot shows the 'Gateway' web page. At the top, there is a navigation menu with 'Home', 'Temperatures', 'Scenes', 'Schedules', 'System Details', and 'Graphs'. A 'logout' button and an 'installer configuration' badge are also visible. The main content area is divided into two sections. On the left, there is a 'Status' section with the following data: Current Scene: Normal, System Status: OK. Below this is a 'Current Conditions' section: Outdoor: 12 °F, Warmest Room: 77 °F, Coldest Room: 77 °F. The bottom section is 'Last 24 Hours': Outdoor Min: 12 °F, Outdoor Max: 12 °F, Average Boiler Plant Output: 100%. On the right, there is a large photo of a building with the 'tekmar' logo. Below the photo is a caption: 'Upload your site photo in the configuration section'.

Configuration - Job Site Information

The Job Site page contains a summary of the building's location, the building owner or manager and the installing heating contractor. This allows for support should the HVAC system need service work. A photo of the building can be uploaded to personalize the home page for the user.

The screenshot shows the 'Configuration' page with the 'Job Site' tab selected. The page is divided into three main sections: 'Owner', 'Location', and 'Contractor'. The 'Owner' section has input fields for Owner, Telephone, Email, and a 'New Image' field with a 'Browse...' button. Below this is a 'Current image' section showing a photo of the building. The 'Location' section has input fields for Name, Street address, City, State, Zip code, and Country. The 'Contractor' section has input fields for Contractor name, Contractor telephone, and Contractor email.

Configuration - General Settings

The 485 supports different temperature and time formats. Select the units desired by the building owners:

- Temperature units in either Fahrenheit or Celsius
- 12 or 24 hour time format
- Time zone

The 485 synchronizes its time clock from the internet. If the 485 is connected to a LAN but is unable to reach the internet, the 485 will continue to use the time set at the factory.

The screenshot shows the 'Configuration' page with the 'General' tab selected. The 'Display Settings' section is visible, containing the following settings: Temperature Units: F (dropdown), Clock Type: 12 hour (dropdown), Current Network Time: Tuesday - September 9, 2014 11:27:03am, Current Time Zone: PDT, and Time Zone: Canada - Pacific (dropdown).

Configuration - Areas

An area is a group of rooms that are near to one another. A floor or wing is an example of an area. Enter up to 12 areas that thermostats can belong to.

The screenshot shows the 'Configuration' page with the 'Areas' tab selected. The 'Building Area Names' section is visible, showing a list of 12 areas (Area 1 through Area 12) with corresponding input fields for each area name.

Configuration - Devices

Each thermostat can be given a room name. Each thermostat is listed using its tekmarNet® address. Locate the address on each thermostat display and enter the room name. Assign an area name to the thermostat using the drop-down menu.

Configuration
[Job Site](#) [General](#) [Areas](#) [Devices](#) [Scenes](#) [Users](#) [Email](#) [Alerts](#) [Software](#) [History](#) [Network](#)

Thermostat Setup

Address	Thermostat Location Name	Area
1:01	<input type="text" value="Master Bathroom"/>	<input type="text" value=""/>
3:02	<input type="text" value="Living Room"/>	<input type="text" value=""/>
3:03	<input type="text" value="Master Bedroom"/>	<input type="text" value=""/>
3:06	<input type="text" value="Bathroom"/>	<input type="text" value=""/>
3:19	<input type="text" value="Kitchen"/>	<input type="text" value=""/>
3:24	<input type="text" value="Bedroom"/>	<input type="text" value=""/>

Configuration - Scenes and Setpoint Enable

Scenes are building wide overrides that allow the user to change the building temperature from comfort to economy operation. The tekmarNet® system can operate in one of eight scenes. Each scene can be given a custom name and each scene can be selected whether or not it is visible to the user.

Configuration
[Job Site](#) [General](#) [Areas](#) [Devices](#) [Scenes](#) [Users](#) [Email](#) [Alerts](#) [Software](#) [History](#) [Network](#)

Scene Setup

Scene	Name	Visible to User?
Permanent Scene 1	<input type="text" value="Normal"/>	<input checked="" type="checkbox"/>
Permanent Scene 2 - Away	<input type="text" value="Away"/>	<input checked="" type="checkbox"/>
Permanent Scene 3 - Unoccupied	<input type="text" value="Unoccupied"/>	<input checked="" type="checkbox"/>
Permanent Scene 4	<input type="text" value="Perm Scene 4"/>	<input type="checkbox"/>
Permanent Scene 5	<input type="text" value="Perm Scene 5"/>	<input type="checkbox"/>
Temporary Scene 6 - Occupied (3hr)	<input type="text" value="Temp Scene 7"/>	<input type="checkbox"/>
Temporary Scene 7 (4hr)	<input type="text" value="Temp Scene 8"/>	<input type="checkbox"/>

The Setpoint Enable is used to activate or disable a setpoint or snow melt control. This can be used to remotely activate snow melt systems, hot tubs, and patio heaters.

Setpoint Enable Setup

Group Id	Name	Visible to User?
1	<input type="text" value="Setpoint Enable 1"/>	<input type="checkbox"/>
2	<input type="text" value="Setpoint Enable 2"/>	<input type="checkbox"/>
3	<input type="text" value="Setpoint Enable 3"/>	<input type="checkbox"/>
4	<input type="text" value="Setpoint Enable 4"/>	<input type="checkbox"/>
5	<input type="text" value="Setpoint Enable 5"/>	<input type="checkbox"/>
6	<input type="text" value="Setpoint Enable 6"/>	<input type="checkbox"/>
7	<input type="text" value="Setpoint Enable 7"/>	<input type="checkbox"/>
8	<input type="text" value="Setpoint Enable 8"/>	<input type="checkbox"/>
9	<input type="text" value="Setpoint Enable 9"/>	<input type="checkbox"/>
10	<input type="text" value="Setpoint Enable 10"/>	<input type="checkbox"/>
11	<input type="text" value="Setpoint Enable 11"/>	<input type="checkbox"/>
12	<input type="text" value="Setpoint Enable 12"/>	<input type="checkbox"/>

Configuration - Users

Click on New User to create a login for each person that will have access to the 485.

For each login account, select the access level that the person has to the 485. The installer access level allows access to all of the 485 web pages. The user access level only allows access to the Home, Temperatures, and Scene web pages. This access is recommended for the average home owner.

Provide the account with a name, login name, email address and password. Click 'Add User' to create the account.

The login and password are case sensitive. The login must be at least 3 characters and the password must be at least 4 characters.

Configuration
[Job Site](#) [General](#) [Areas](#) [Devices](#) [Scenes](#) [Users](#) [Email](#) [Alerts](#) [Software](#) [History](#) [Network](#)

Users

#	Access Level*	Name	Login*	Email	Password*	(confirm)*	Options
1	<input type="text" value="Installer"/>	<input type="text" value="Demo"/>	<input type="text" value="demo"/>	<input type="text" value=""/>	<input type="text" value=""/>	<input type="text" value=""/>	<input type="button" value="Delete"/>
2	<input type="text" value="Select Level"/>	<input type="text" value=""/>	<input type="text" value=""/>	<input type="text" value=""/>	<input type="text" value=""/>	<input type="text" value=""/>	<input type="button" value="Add User"/>

User to be Added

Configuration - Email

In order to send email to user accounts, the 485 must connect to a mail server. Gmail & Hotmail accounts require a user name and password. Some Internet service providers (ISP's) only require the SMTP server address, others will require additional settings.

Contact your ISP to determine the following advanced email settings:

- SMTP Server Address
- SMTP Server Port
- Email account user name
- Email account password
- HELO domain
- Authentication mode Plain, Login or CRAM MD5
- If TLS / SSL is used

Once the email server settings have been entered, click Save & Continue. Clicking the test button sends a test message to the email account. Please note the test button does not save the password or email settings.

Configuration
Job Site General Areas Devices Scenes Users **Email** Alerts Software History Network

Email Provider

Gmail
 Hotmail
 Other ISP (Basic)
 Other ISP (Advanced)

GMail address (name@provider.com)
 Password

<- Previous Save & Continue Next >

NOTICE

Sending emails requires that the DNS settings be entered on the configuration - network page. Emails will not send if the DNS field is left empty or are incorrect.

Configuration - Alerts

The Alerts page provides a form for a short message to be included in a notification email whenever an Alert Input is activated.

Room hot and cold warning thresholds can be set on the Alerts page. Should the temperature exceed the hot room setting or fall below the cold room setting, an email can be sent.

The following items can be selected to notify individual users when they occur:

- Alert inputs - sent immediately
- Hot room warning - sent each hour on the hour
- Cold room warning - sent each hour on the hour
- Error messages - sent each hour on the hour
- Daily status reports - sent each day at midnight
- Weekly status reports - sent each Sunday at midnight

Configuration
Job Site General Areas Devices Scenes Users Email **Alerts** Software History Network

Alert Settings

External Alert 1 Demand Message: Event 1 has occurred.

External Alert 2 Demand Message: Event 2 has occurred.

External Alert 3 Demand Message: Event 3 has occurred.

Hot room warning threshold: °F

Cold room warning threshold: °F

Alert Recipients

User	External Alert 1 Demand	External Alert 2 Demand	External Alert 3 Demand	Hot room warning	Cold room warning	Error messages	Daily status reports	Weekly status reports
Demo	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Configuration - Software Update

The 485 software can be updated. Click the Update Software button to check if new software is available.

Configuration
Job Site General Areas Devices Scenes Users Email Alerts **Software** History Network

Software Information

Software Build: J1237A
 Software Version: 579
 Software Update: [Update Software](#)

Configuration - History

All error and warning messages are stored in a list and are timestamped. Individual error or warning messages can be cleared by the user.

Configuration
Job Site General Areas Devices Scenes Users Email Alerts Software **History** Network

Events (1)

Last Received	Status	Event	Time Created	Description	All	None
Thu, Sep 04, 15:36:45, 2014	Cleared	IN4 Bus communications error	Thu, Sep 04, 15:36:45, 2014	Address: 1 MSTR1: Unknown error detail 0x00, 9 31, 0x00, 0x00.	<input type="checkbox"/>	<input type="checkbox"/>

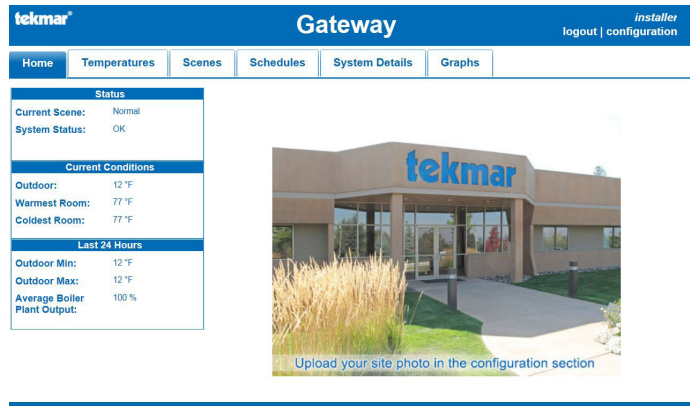
All | None

Using the Web Pages

Home Page

The Home page shows a photograph of the building and a summary of the heating system including:

- Scene
- Error messages present
- Outdoor air temperature
- Warmest and coldest room temperatures
- Outdoor highs and lows
- Boiler plant output averaged over the last 24 hours



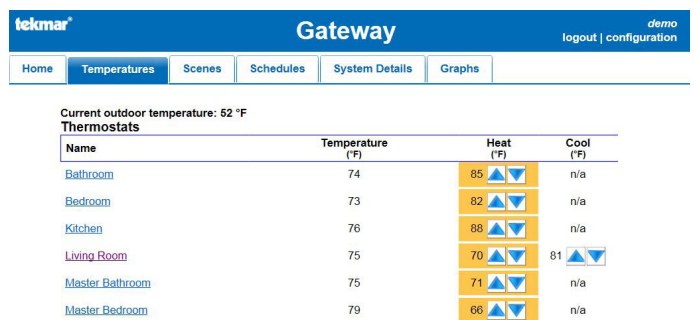
Temperatures Page

The Temperatures page lists all thermostat's temperature measurement and the current heating and cooling setting. In addition, setpoint controls and snow melt controls are also listed. Click the up or down buttons to adjust the temperature.

The heat setting automatically increases the cooling setting if adjusted within 3°F (1.5°C) of the cooling setting. Likewise, the cooling setting automatically decreases the heating setting if adjusted within 3°F (1.5°C) of the heating setting. This prevents cycling between heating and cooling on the thermostat. An orange box indicates that the thermostat is heating and a blue box indicates that the thermostat is cooling.

Loading...

The Temperatures page shows "Loading..." instead of the thermostat temperature while the 485 is downloading the thermostat settings. This only occurs when the 485 is powered on for the first time and can take up to 5 to 10 minutes per thermostat depending on the tekmarNet® network activity.



Temperatures - Individual Thermostat

Click on the thermostat name to access the individual thermostat or setpoint control settings.

The current temperature, relative humidity, scene and schedule status are shown.

The mode can be set to Auto, Heat, Cool, or Off. The options available are determined by the thermostat model.

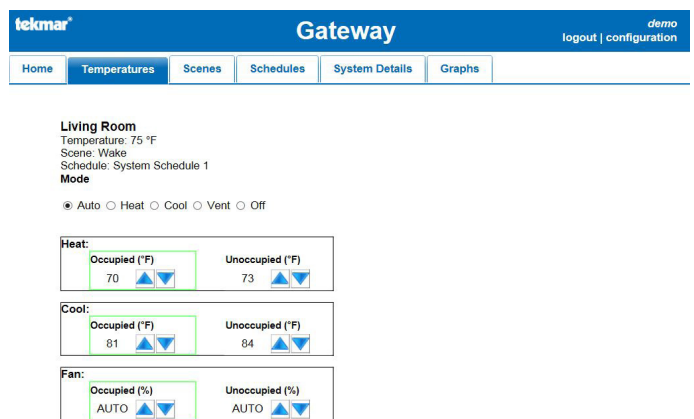
The Heat setpoints are available when mode is set to Heat or Auto.

The Cool setpoints are available when mode is set to Cool or Auto.

The Fan settings are available when a fan is available on the thermostat.

The Heat, Cool, and Fan may have multiple settings depending if a setback schedule is used on the thermostat. If no schedule is used then only the Occupied setting is available. If a two event schedule is used, then the Occupied and Unoccupied settings are available. If a four event schedule is used, then the Wake, Unoccupied, Occupied, and Sleep settings are available.

A green box around a setting indicates the current schedule event of the device.



Scenes Page

The Scenes page allows the user to select the scene for the building. For example, the scene could be set to Normal while the building is occupied, and then set to Away while the building occupants are away on vacation.

The setpoint enable allows hot tubs, patio heating and snow melt systems to be remotely activated. Setpoint controls that are using the setpoint device enable feature can be activated or placed in standby operation using the scenes page. Click on the Active button to have the setpoint control operate at the Occupied temperature setting. Click the Standby button to have the setpoint control operate at the standby setting. The standby temperature setting is set by the application mode configured on the setpoint control.

Scenes - Scene Details

The Scenes Details lists the response of each thermostat in a particular scene. Adjustability of each scene is dependant on the particular thermostat model and how the thermostat is configured. Consult the thermostat installation and operation manual for detailed information.

Building Area	Name	Responds as follows:
	Bathroom	Wake
	Bedroom	Wake
	Kitchen	Wake
	Living Room	Wake
	Master Bathroom	Wake
	Master Bedroom	Wake

Schedule Page

The Schedule page lists the schedules on the tekmarNet® system, the location of the schedule master thermostat, and the thermostats that are members of this schedule. Thermostats that have their own programmable schedule which are not shared are listed as "zone".

Schedule/Type	Master	Member Zones
System Schedule 1	Kitchen	Living Room Master Bedroom Bedroom

Schedule - Schedule Details

On the Schedules pages, click the schedule name to access the schedule settings.

For each schedule event time, enter the time for the event to start, rounded to the nearest ten minutes.

Click on the Upload Times button to send the settings to the thermostat.

System Details Page

The System Details page provides information on the hot water heating system. Details such as the presence of a heat demand signal, boiler and mix target temperatures, actual boiler and mix temperatures and boiler and mix percent output levels are shown in detail.

Device	Status	Parameter	Value
Boiler - Boiler Bus	- No Zones On	Boiler Temperature	70 °F
		Boiler Return	---
		Boiler Target	131 °F
		Boiler Output	0 %
		Primary Pump	On
Mix 1 - Bus 1	- No Zones On	Mix 1 Temperature	75 °F
		Mix 1 Return	---
		Mix 1 Target	99 °F
		Mix 1 Output	0 %

System Details - Device Inventory

The Device Inventory page lists the tekmarNet® address of each device in the tekmarNet® system, the area name, the thermostat or setpoint control name, the product model number, product name and description, and the software version.

In some cases, a device may have been connected to a tekmarNet® bus and then removed. Click the Forget button to remove the device from the database. If the device is still on the tekmarNet® bus, the gateway will automatically detect and add the device to the database.

If a device shows "Loading..." on the Temperatures page for several hours, then the device may no longer be installed on the system or the database may have been corrupted. Select the device on the device inventory page and click the Forget Selected button to remove it from the database.

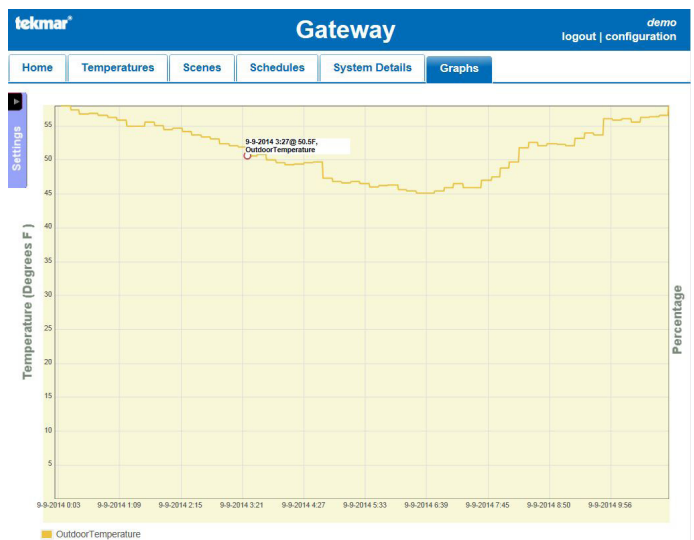
tekmar® Gateway demo logout configuration					
Home Temperatures Scenes Schedules System Details Graphs					
Address	Area	Name	Product Description	Software Version	All None
1.01	Master Bathroom	552 Thermostat - One Stage Heat	J1213 R	<input type="checkbox"/>	
1.MSTR	n/a	423 Reset Control - Four (N4, Boiler, DHW & Setpoint)	J1147 I	<input type="checkbox"/>	
3.02	Living Room	540 Thermostat - One Stage Heat, One Stage Cool, One Fan	J1163 E	<input type="checkbox"/>	
3.03	Master Bedroom	538 Thermostat - One Stage Heat	J1162 F	<input type="checkbox"/>	
3.06	Bathroom	528 Thermostat - One Stage Heat (N2)	J1181 C	<input type="checkbox"/>	
3.19	Kitchen	542 Thermostat - One Stage Heat	J1116 M	<input type="checkbox"/>	
3.24	Bedroom	529 Thermostat - Two Stage Heat (N2)	J1208 D	<input type="checkbox"/>	
3.MSTR	n/a	423 Reset Control - Four (N4, Boiler, DHW & Setpoint)	J1147 I	<input type="checkbox"/>	

All | None
Forget Selected

Graphs Page

The 485 captures and logs data at a 15 second interval and stores data for up to 13 months. The data can then be graphed or exported to compare the previous year's data with the current year's data. The following data is available:

- Outdoor temperature
- Room temperature
- Heating and cooling temperature setpoints
- Relative humidity
- Relative humidity setpoints
- Floor temperature
- Floor setpoint
- Boiler temperature
- Boiler target
- Boiler percent output (firing rate)
- Boiler demand
- Mixing temperature
- Mixing target
- Mixing demand
- Heat pump tank temperature
- Snow melt operational status
- Snow melt sensor wet or dry status



The 'Graph Controls' panel includes the following settings:

- From:** 2014 September 9 0:00
- To:** 2014 September 9 11:00
- Temperature Range:** Auto Scale (0 to 50 °F)
- Outdoor Temperature**
- Water Temperatures**
 - Mix 1: Supply Target % Output
 - Mix 3: Supply Target % Output
- Snow Melt Zones**
 - Room Temperatures Room Targets
 - Floor Temperatures Floor Targets Humidity
- Master Bathroom
- Living Room
- Master Bedroom
- Bathroom
- Kitchen
- Bedroom

Buttons: Graph, CSV Export

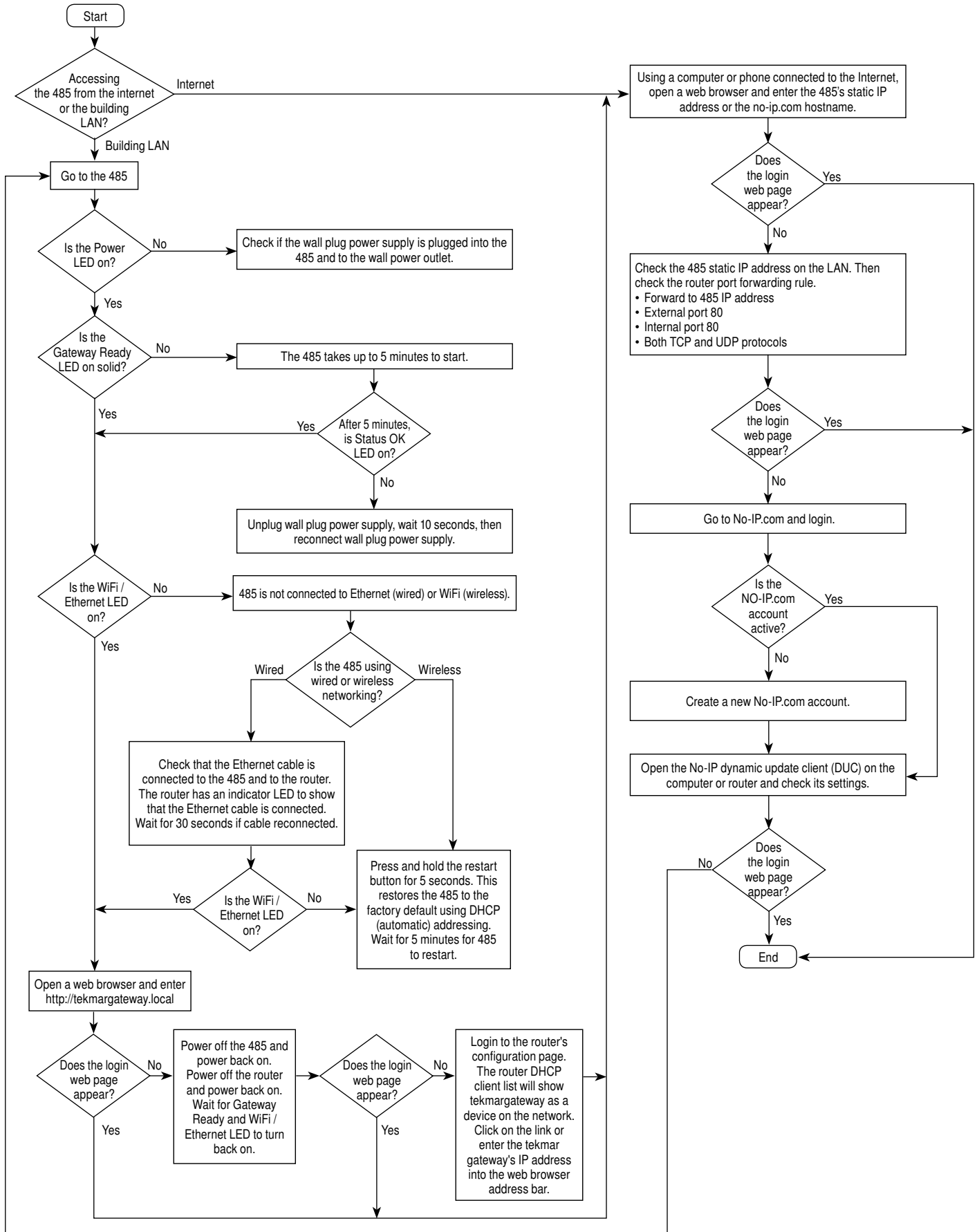
Graphs - Exporting Data

Instead of graphing data, the 485 supports the export of data to a Comma Separated Value (CSV) document format that can be opened by most spreadsheet programs. The maximum number of data points that can be exported is 1024.

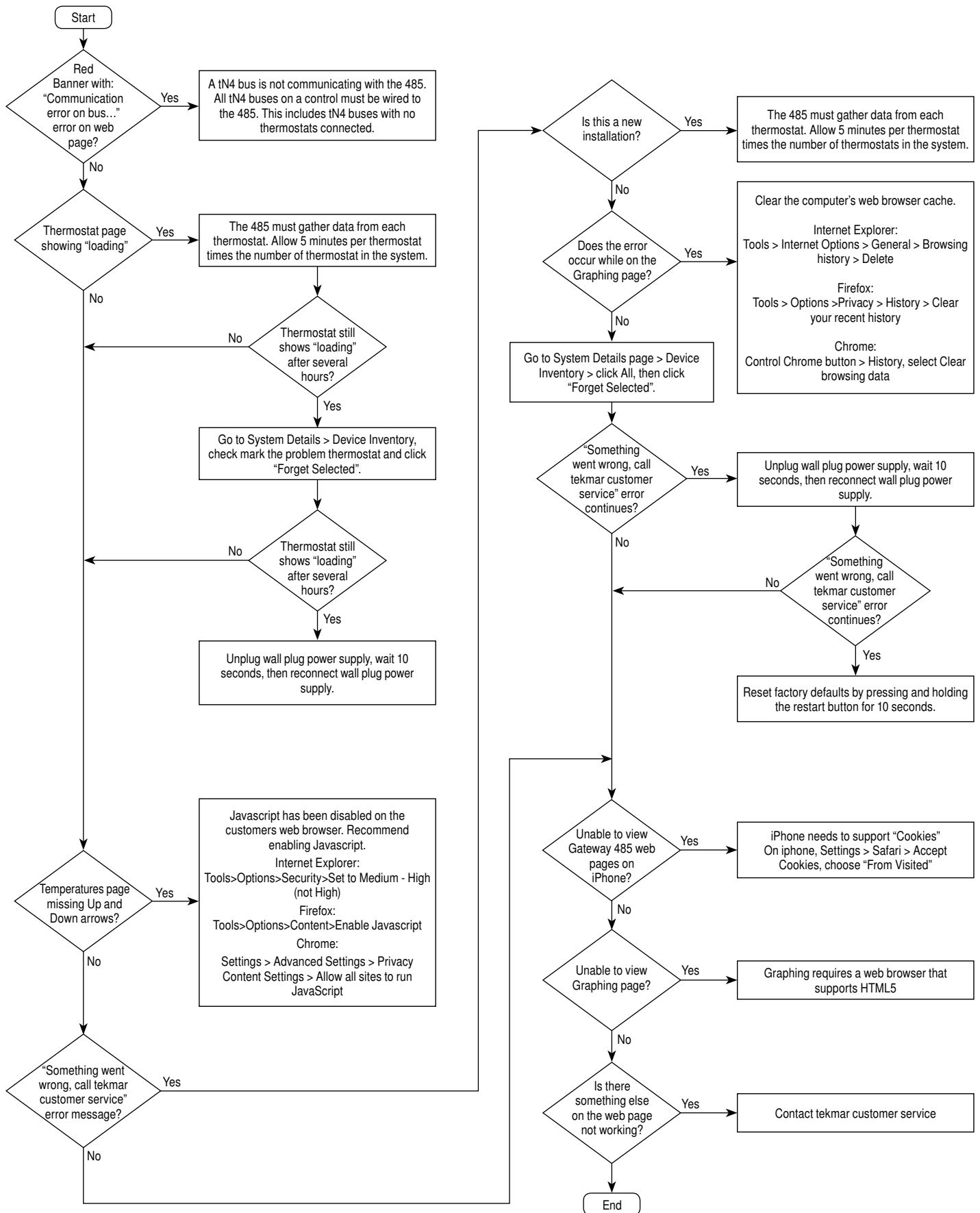
	A	B	C
1	Date/Time	Room 1_02	Room 2_01
2	Tue Mar 25 08:00:00 -0700 2014	72.3	74.9
3	Tue Mar 25 08:00:15 -0700 2014	72.3	74.9
4	Tue Mar 25 08:00:30 -0700 2014	72.3	74.9
5	Tue Mar 25 08:00:45 -0700 2014	72.3	74.9

Troubleshooting

Trouble Reaching Login Page



Trouble Viewing Web Pages



Technical Data

tekmarNet® Internet Gateway 485 WiFi / Ethernet	
Literature	485_C, 485_D, 485_Q, 485_B
Control	Microprocessor control. This is not a safety (limit) control
Packaged weight	2.9 lb. (1300 g)
Dimensions	6-5/8" H x 7-9/16" W x 2-13/16" D (170 x 193 x 72 mm)
Enclosure	Blue PVC plastic, NEMA type 1
Approvals	Class B: ICES & FCC Part 15
Ambient conditions	Indoor use only, 32 to 122°F (0 to 50°C), RH maximum 90%, non-condensing
Power supply	5 V (dc) regulated, 1 A, Class 2, FCC certified
Alert inputs	Short, 0 - 32 V (ac)
Ethernet	10/100 BASE-T
WiFi	802.11n, 2.4 GHz, WPA2 encryption
Warranty	Limited 3 Year

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. For more information: www.watts.com/prop65

Limited Warranty and Product Return Procedure

Limited Warranty *The liability of tekmar under this warranty is limited. The Purchaser, by taking receipt of any tekmar product ("Product"), acknowledges the terms of the Limited Warranty in effect at the time of such Product sale and acknowledges that it has read and understands same.*

The tekmar Limited Warranty to the Purchaser on the Products sold hereunder is a manufacturer's pass-through warranty which the Purchaser is authorized to pass through to its customers. Under the Limited Warranty, each tekmar Product is warranted against defects in workmanship and materials if the Product is installed and used in compliance with tekmar's instructions, ordinary wear and tear excepted. The pass-through warranty period is for a period of twenty-four (24) months from the production date if the Product is not installed during that period, or twelve (12) months from the documented date of installation if installed within twenty-four (24) months from the production date.

The liability of tekmar under the Limited Warranty shall be limited to, at tekmar's sole discretion: the cost of parts and labor provided by tekmar to repair defects in materials and/or workmanship of the defective product; or to the exchange of the defective product for a warranty replacement product; or to the granting of credit limited to the original cost of the defective product, and such repair, exchange or credit shall be the sole remedy available from tekmar, and, without limiting the foregoing in any way, tekmar is not responsible, in contract, tort or strict product liability, for any other losses, costs, expenses, inconveniences, or damages, whether direct, indirect, special, secondary, incidental or consequential, arising from ownership or use of the product, or from defects in workmanship or materials, including any liability for fundamental breach of contract.

The pass-through Limited Warranty applies only to those defective Products returned to tekmar during the warranty period. This Limited Warranty does not cover the cost of the parts or labor to remove or transport the defective Product, or to reinstall the repaired or replacement Product, all such costs and expenses being subject to Purchaser's agreement and warranty with its customers.

Any representations or warranties about the Products made by Purchaser to its customers which are different from or in excess of the tekmar Limited Warranty are the Purchaser's sole responsibility and obligation. Purchaser shall indemnify and hold tekmar harmless from and against any and all claims, liabilities and damages of any kind or nature which arise out of or are related to any such representations or warranties by Purchaser to its customers.

The pass-through Limited Warranty does not apply if the returned Product has been damaged by negligence by persons other than tekmar, accident, fire, Act of God, abuse or misuse; or has been damaged by modifications, alterations or attachments made subsequent to purchase which have not been authorized by tekmar; or if the Product was not installed in compliance with tekmar's instructions and/or the local codes and ordinances; or if due to defective installation of the Product; or if the Product was not used in compliance with tekmar's instructions.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, WHICH THE GOVERNING LAW ALLOWS PARTIES TO CONTRACTUALLY EXCLUDE, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, DURABILITY OR DESCRIPTION OF THE PRODUCT, ITS NON-INFRINGEMENT OF ANY RELEVANT PATENTS OR TRADEMARKS, AND ITS COMPLIANCE WITH OR NON-VIOLATION OF ANY APPLICABLE ENVIRONMENTAL, HEALTH OR SAFETY LEGISLATION; THE TERM OF ANY OTHER WARRANTY NOT HEREBY CONTRACTUALLY EXCLUDED IS LIMITED SUCH THAT IT SHALL NOT EXTEND BEYOND TWENTY-FOUR (24) MONTHS FROM THE PRODUCTION DATE, TO THE EXTENT THAT SUCH LIMITATION IS ALLOWED BY THE GOVERNING LAW.

Product Warranty Return Procedure All Products that are believed to have defects in workmanship or materials must be returned, together with a written description of the defect, to the tekmar Representative assigned to the territory in which such Product is located. If tekmar receives an inquiry from someone other than a tekmar Representative, including an inquiry from Purchaser (if not a tekmar Representative) or Purchaser's customers, regarding a potential warranty claim, tekmar's sole obligation shall be to provide the address and other contact information regarding the appropriate Representative.



tekmar Control Systems Ltd., A Watts Water Technologies Company. Head Office: 5100 Silver Star Road, Vernon, B.C. Canada V1B 3K4, 250-545-7749, Fax. 250-984-0815 Web Site: tekmarControls.com