tekmar® - Wiring Brochure

tN4 Gateway 483

tN4

W483
03/10

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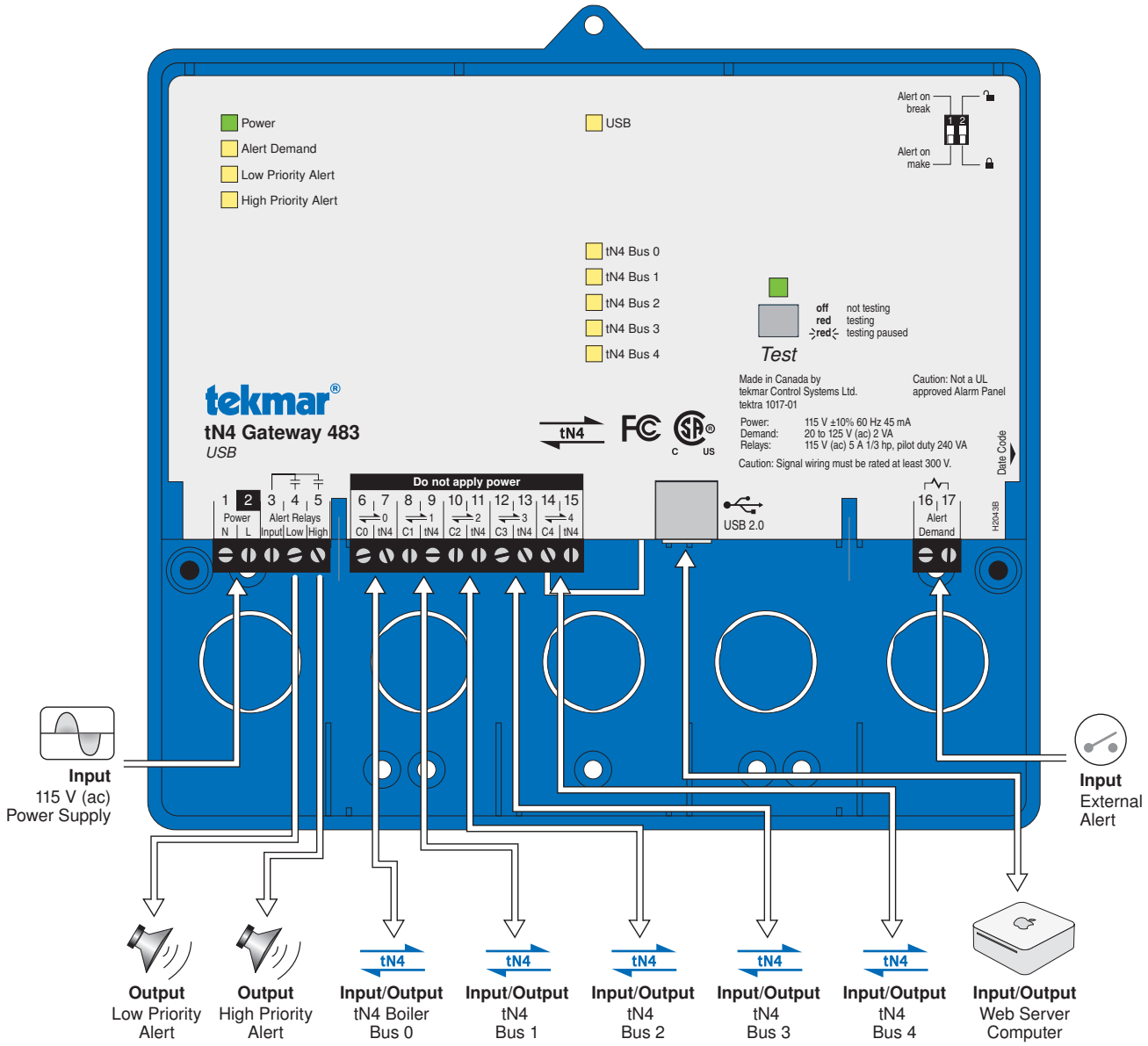
Choose controls to match application	Design your mechanical applications	Rough-in wiring instructions	Wiring and installation of specific control	Control settings and sequence of operation	Record settings & wiring details for future reference

Overview

The following wiring brochure provides instructions on how to install the tN4 Gateway together with the web server computer.



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Wiring Symbols

	Powered switch. 24-115 V (ac) power, switched output to valve, pump, etc.		**Do not apply power** to these terminals. Serious control damage will result.
	tekmarNet®4		Earth ground

Definitions

The following defined terms and symbols are used throughout this manual to bring attention to the presence of hazards of various risk levels, or to important information concerning the life of the product.

– Caution: Refer to accompanying documents

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INSTALLATION CATEGORY II

– Local level appliances

⚠ Caution ⚠

Improper installation and operation of this control could result in damage to the equipment and possibly even personal injury or death. It is your responsibility to ensure that this control is safely installed according to all applicable codes and standards. This electronic control is not intended for uses as a primary limit control. Other controls that are intended and certified as safety limits must be placed into the control circuit. Do not attempt to service the control. Refer to qualified personnel for servicing. Apart from any field replaceable fuse(s) there are no user serviceable parts. Attempting to do so voids warranty and could result in damage to the equipment and possibly even personal injury or death.

Choosing a Location

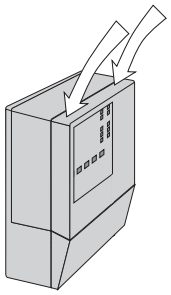
The location of the tN4 Gateway is important. To ensure proper wiring during rough in, select an appropriate location for the controls early in the construction process. Consider the following:

- Do not expose the tN4 Gateway to temperatures beyond 32 to 122°F (0 to 50°C).
- Keep dry. Avoid potential leakage onto the control.
- Relative humidity ≤ 92% to 104°F (40°C), down to 50% above 104°F (40°C).
- Provide adequate ventilation.
- Keep away from equipment, appliances or other sources of electrical interference.
- Mount the enclosure to a solid backing.
- Provide easy access for wiring and viewing.
- Mount approximately 5 feet (1.5 m) off the finished floor.
- Mount near the zone managers, reset modules, tN4 thermostats, tN4 setpoint controls, and mixing expansion modules. The total wire length of each tN4 bus cannot exceed 5000 feet.
- Each tN4 bus consists of a pair of wires (tN4 and C).
- The tN4 Gateway can accept up to 5 tN4 buses.
- Mount the tN4 Gateway within 16 feet (5m) of the web server computer to allow a single USB A-B cable to connect the two devices.

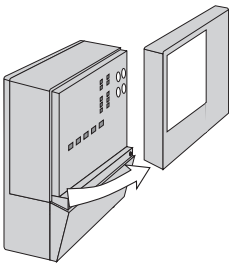
Typical web server computer requirements:

- Do not expose the web server computer to temperatures beyond 50 to 95°F (10 to 35°C).
- Relative humidity 5 to 95%, non-condensing.
- Maximum altitude 9842 feet (3000 m).
- Web server computer connects to Local Area Network (LAN) using Category 5 wire via 10/100/1000 BASE-T Gigabit Ethernet (RJ-45 connector). Maximum Category 5 wire length is 328 feet (100 m).
- Web sever computer connects to LAN using wireless Ethernet 802.11g networking standard.

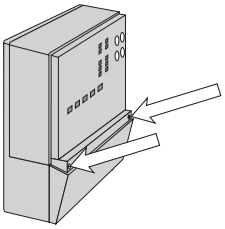
Mounting



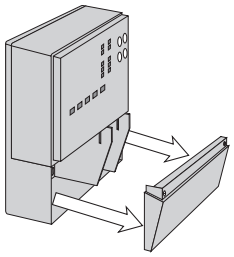
Press down at the fingertip grips on top of the front cover and pull out and down.



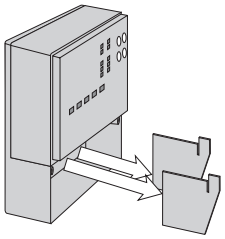
Lift the front cover up and away from the control.



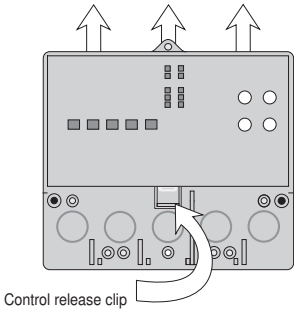
Loosen the screws at the front of the wiring cover.



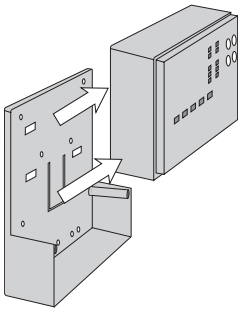
The wiring cover pulls straight out from the wiring chamber.



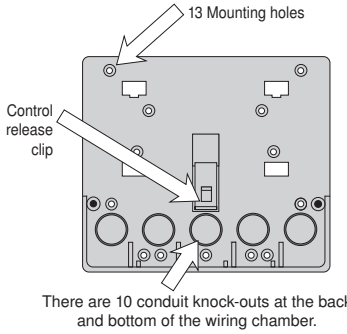
Remove the safety dividers from the wiring chamber by pulling them straight out of their grooves.



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

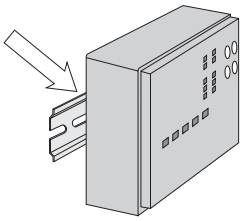


The control lifts up and away from the base.

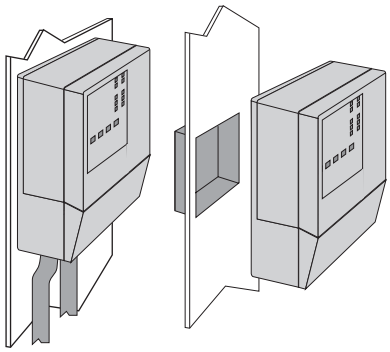


The base is ready for mounting.

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.

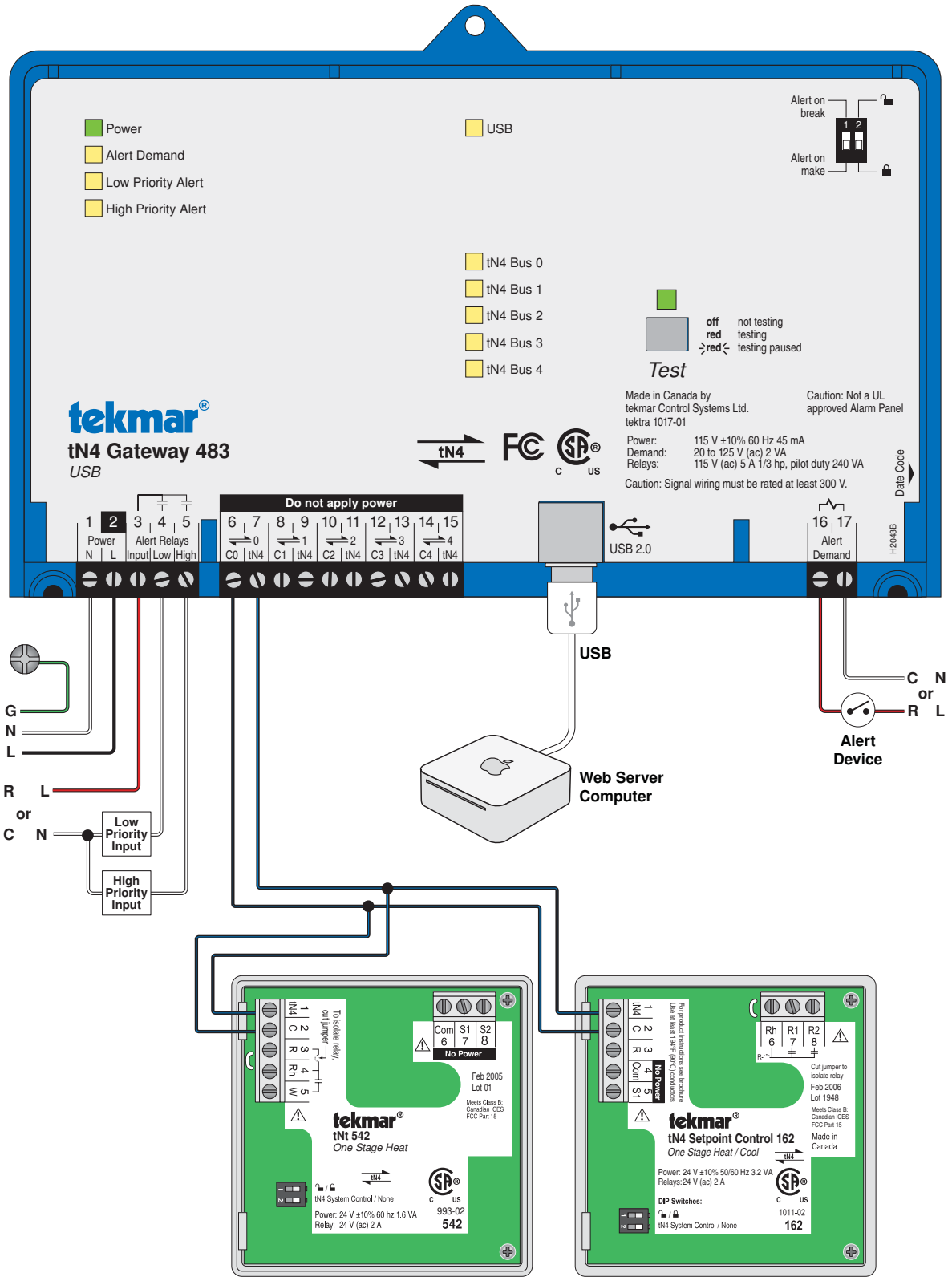


Electrical Drawings

⚠ The electrical drawing examples on the following pages show the 483 in common applications. These drawings have a brief explanation of what is being operated in each system. Choose the components in your system and use the drawings as a guide to aid in wiring your system. These are only concept drawings, not engineered drawings. They are not intended to describe a complete system nor any particular system. It is up to the system designer to determine the necessary components for and configuration of the particular system being designed including additional equipment isolation relays (for loads greater than the controls specified output ratings) and any safety devices which in the judgment of the designer are appropriate in order to properly size, configure and design that system and to ensure compliance with building and safety code requirements.

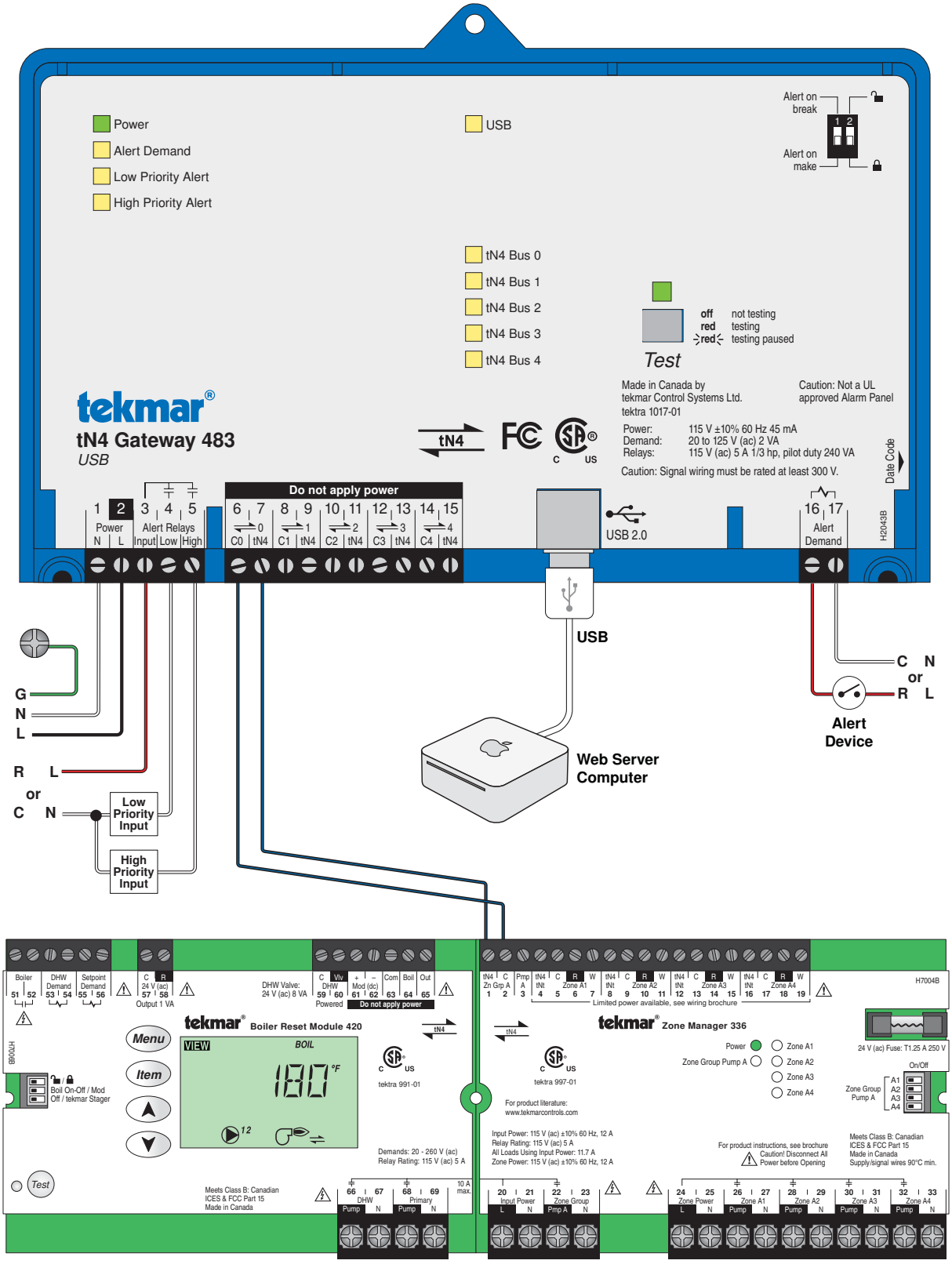
Description: tN4 network of thermostats and setpoint controls are connected to a 483.

Note: Systems consisting of only Thermostats and/or Setpoint Controls must all be connected to a single tN4 bus and is limited to a maximum of 24 Thermostats or Setpoint Controls.



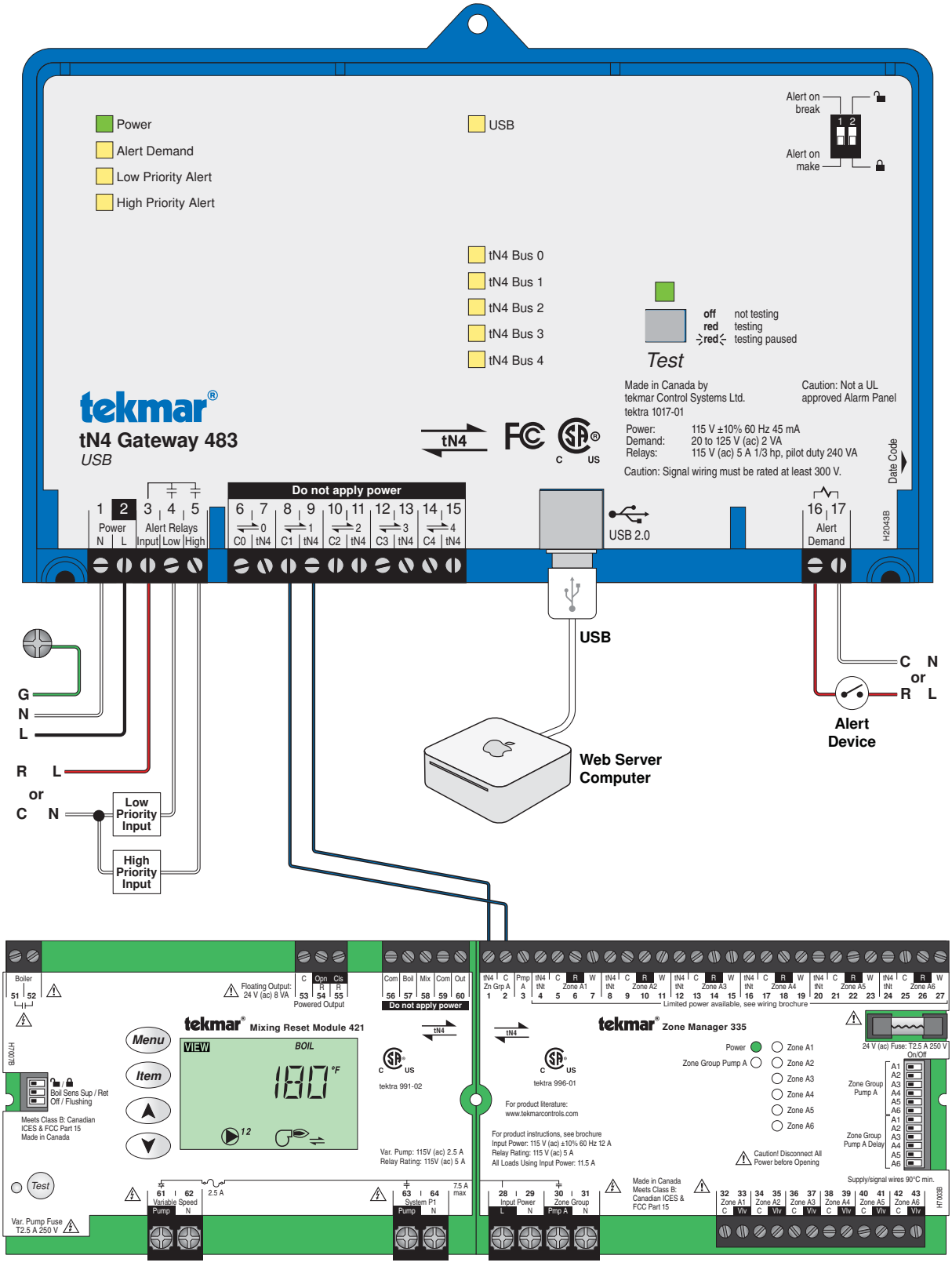
Refer to Thermostat and Setpoint Control wiring brochures for complete wiring schematic.

Description: A 420 and 336 are connected to a 483.



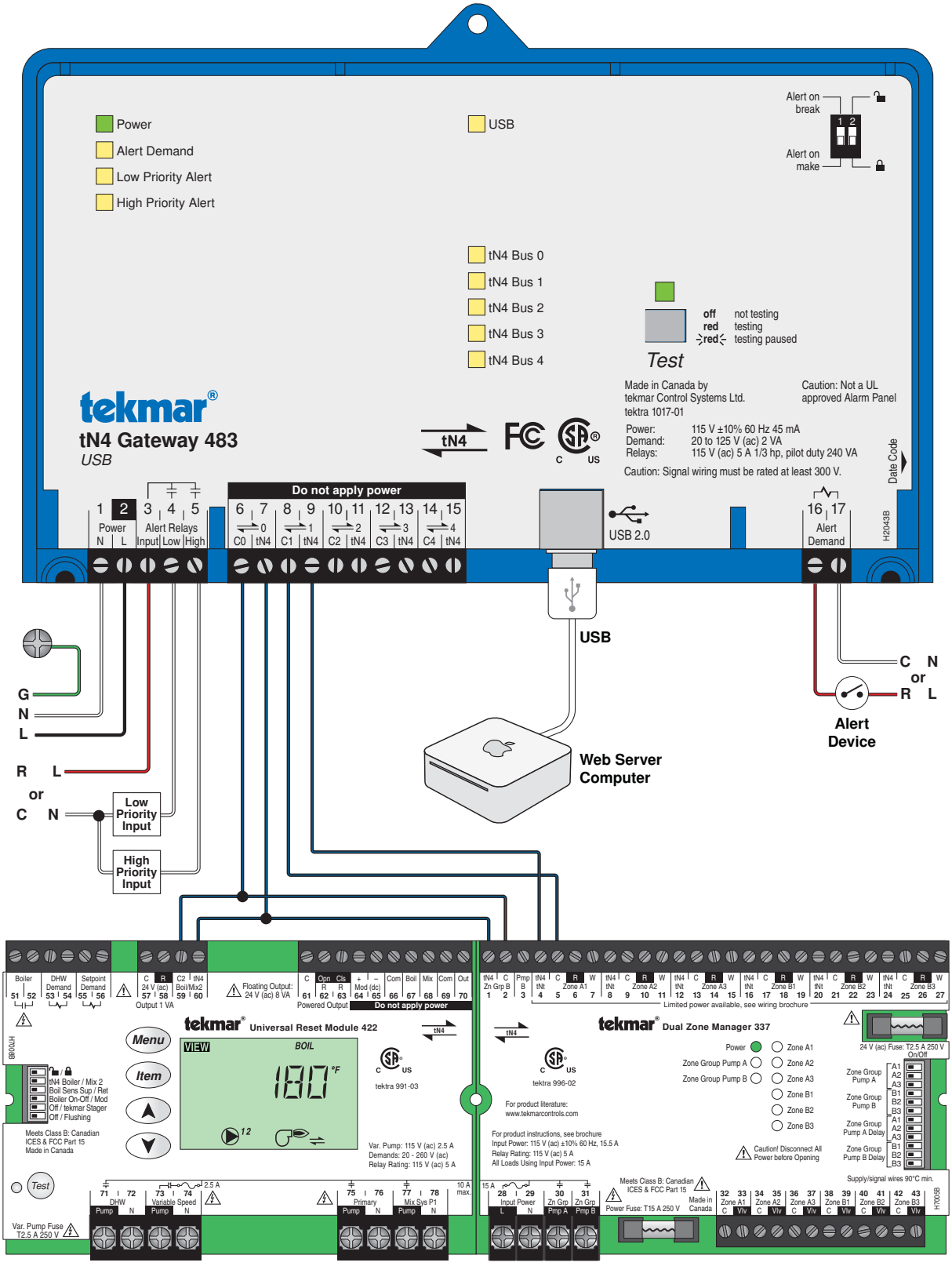
Refer to W420 and W336 wiring brochures for complete wiring schematic.

Description: A 421 and 335 are connected to a 483.



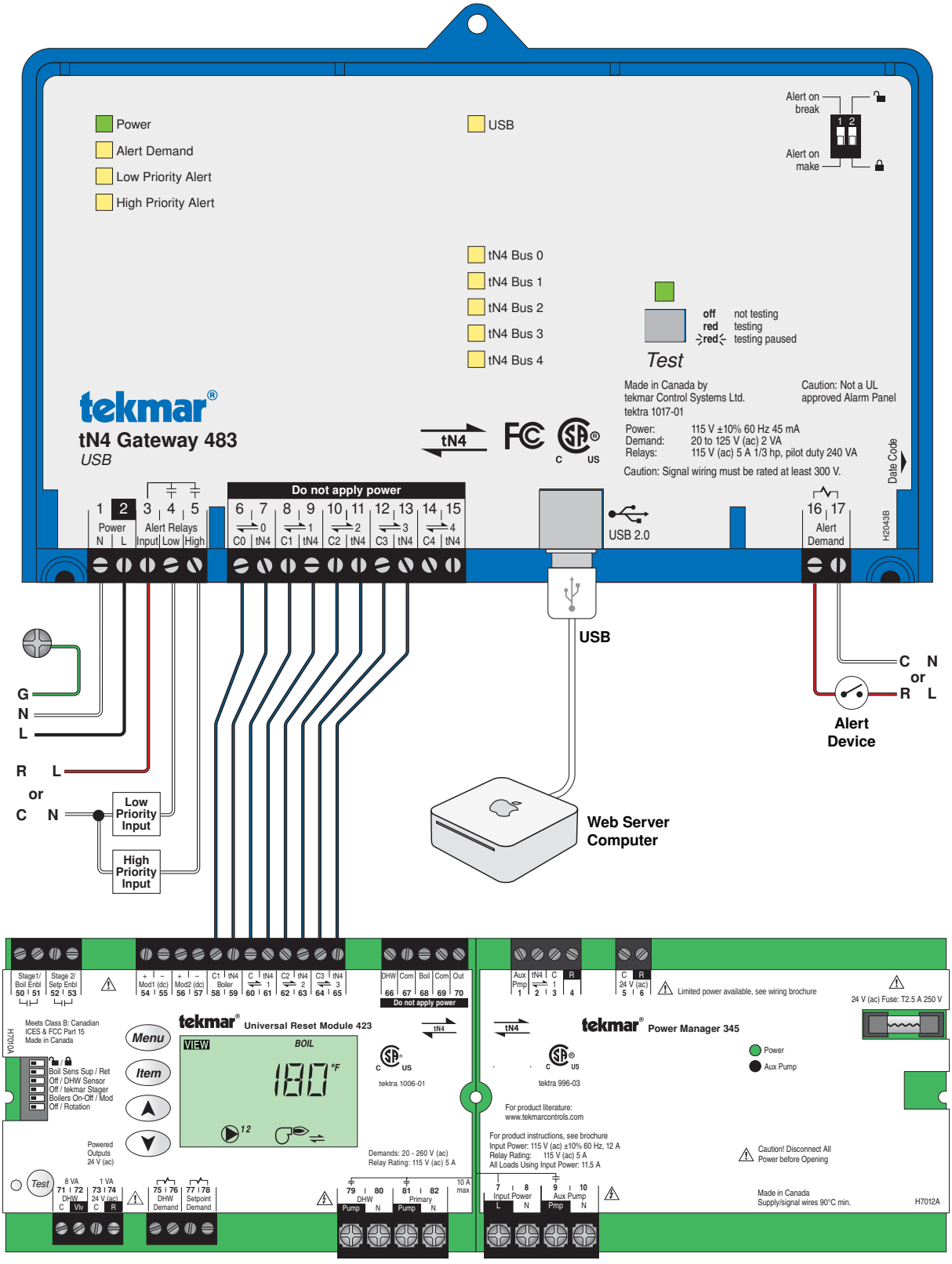
Refer to W421 and W335 wiring brochures for complete wiring schematic.

Description: A 422 and 337 are connected to a 483.



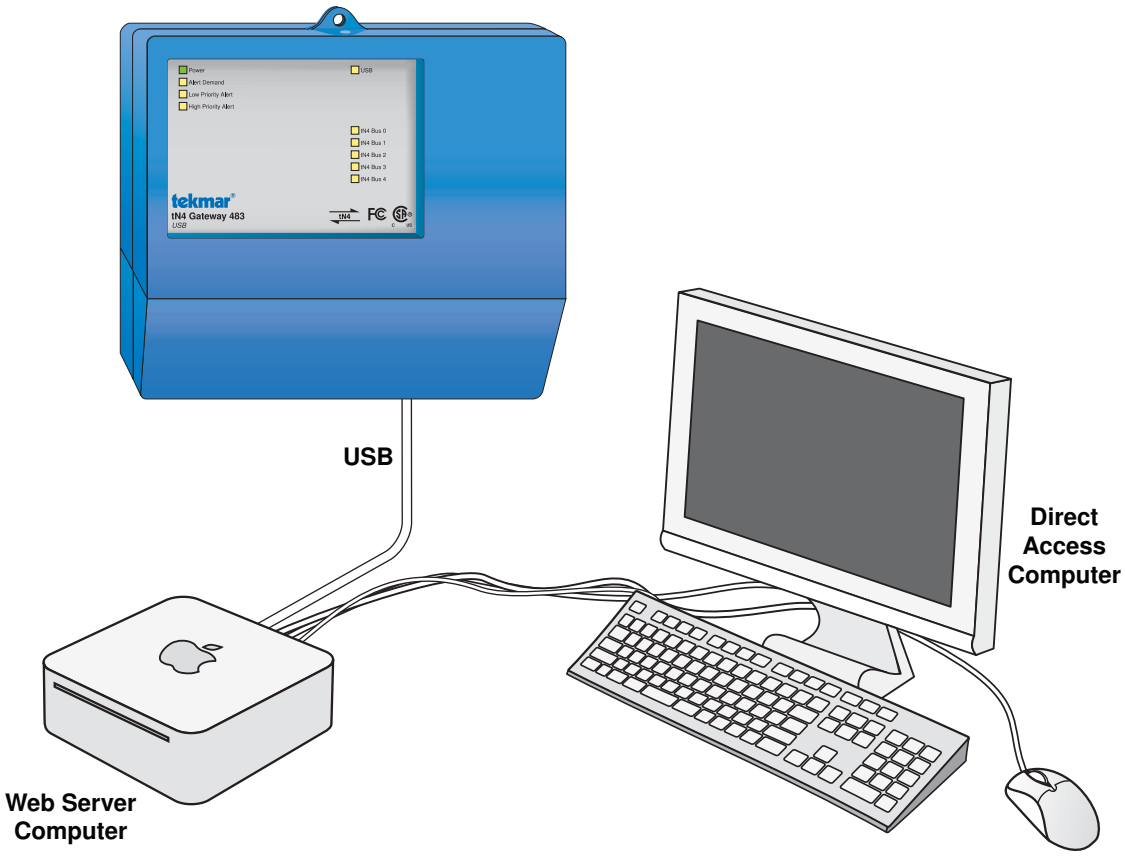
Refer to W422 and W337 wiring brochures for complete wiring schematic.

Description: A 423 and 345 are connected to a 483.

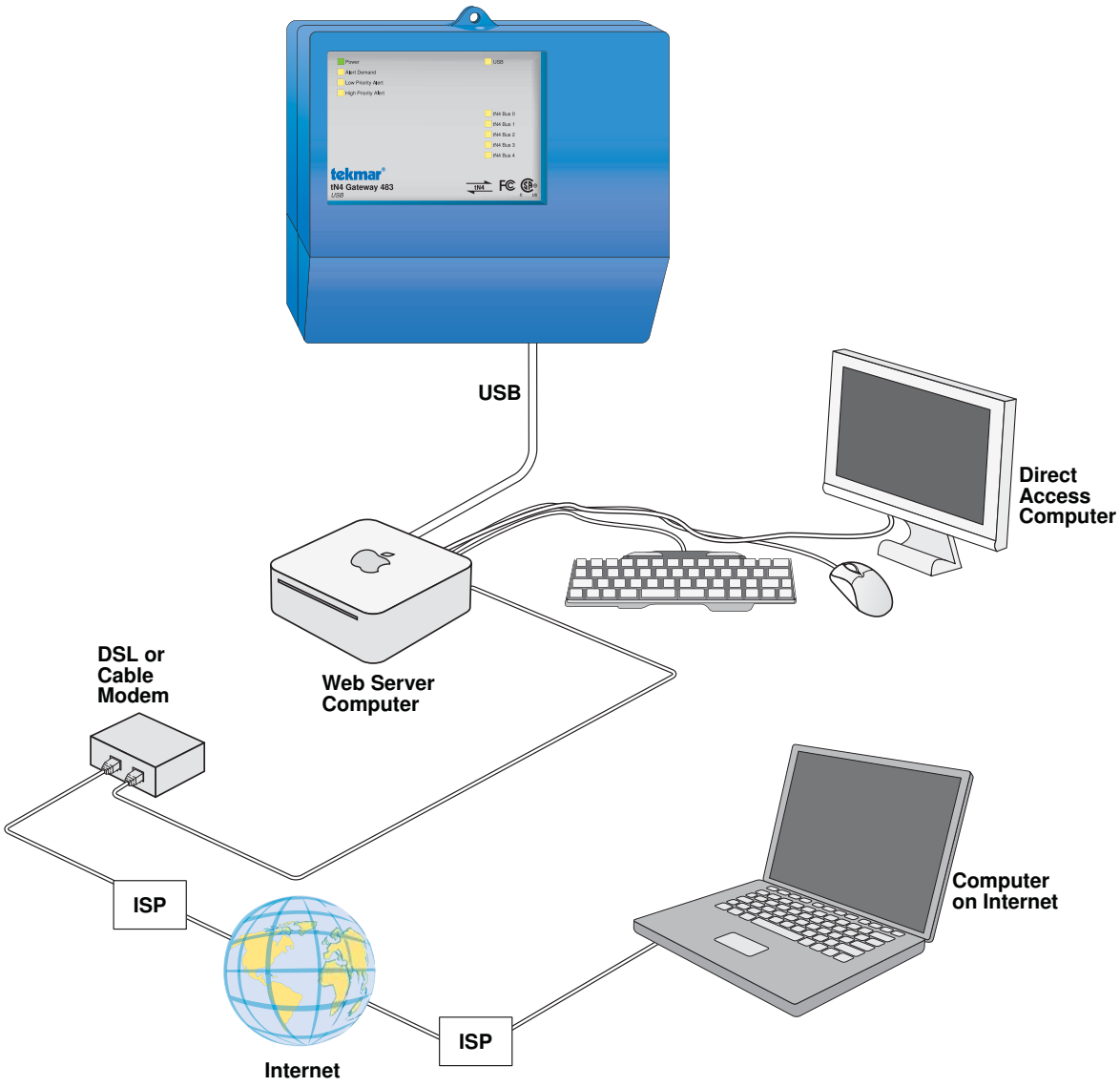


Refer to W423 and W345 wiring brochures for complete wiring schematic.

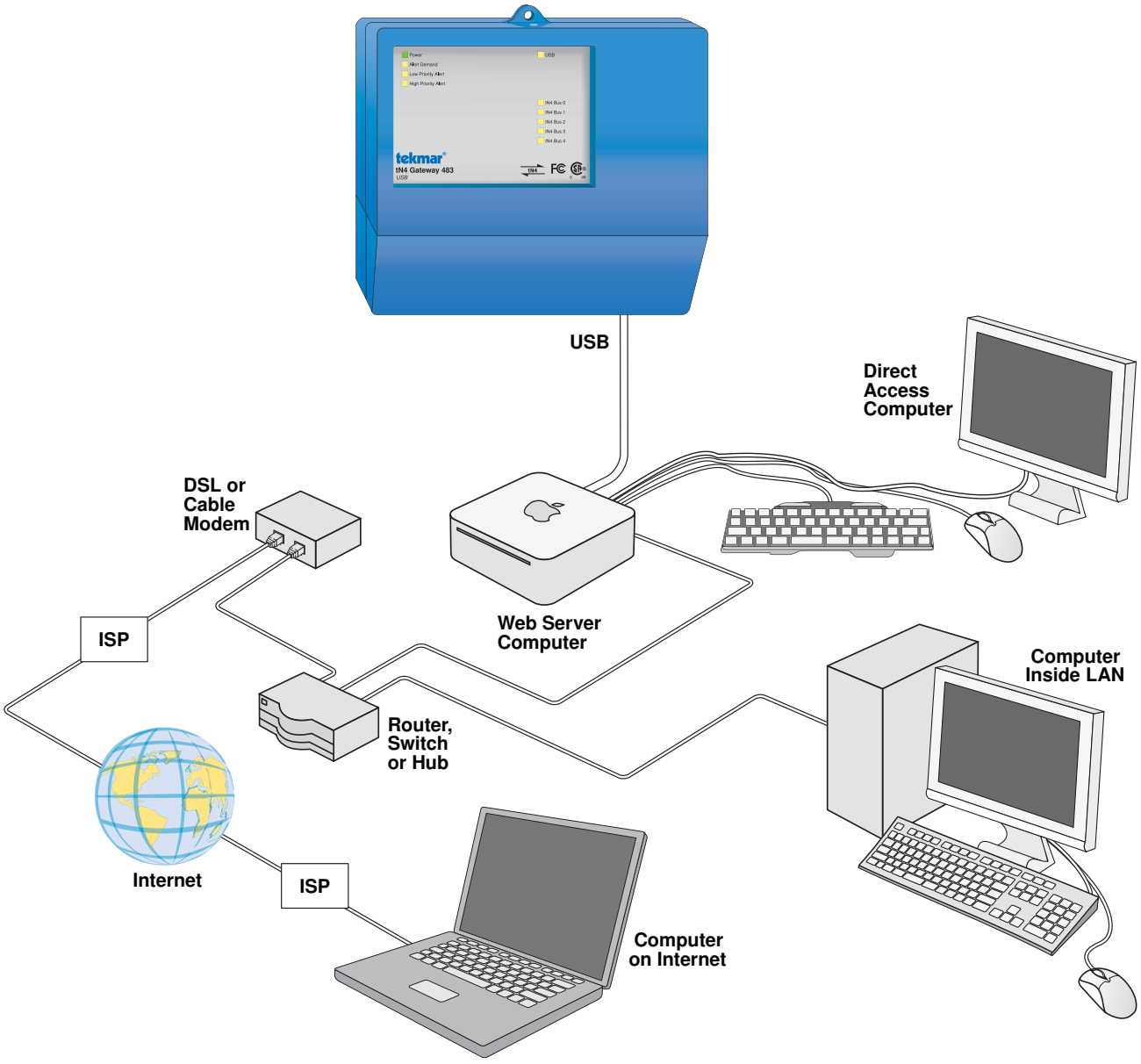
Description: Direct Access



Description: Direct High Speed Internet Access



Description: Routered High Speed Internet Access



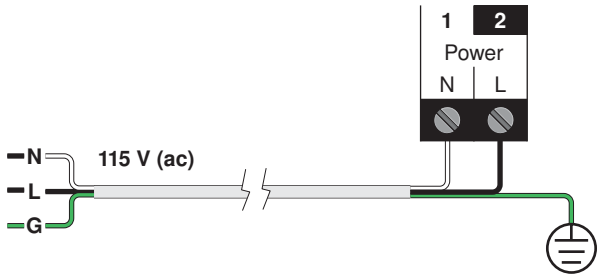
Wiring the tN4 Gateway — *Terminals 1-17*

This section explains how to wire individual devices to the tN4 Gateway. For step-by-step wiring, refer to the terminal number on the right of the page.

- Before wiring ensure all power is turned off and take all necessary precautions.
- Install the supplied wiring compartment barriers by sliding them into the grooves provided to isolate the low and high voltage wiring.
- Refer to the current and voltage ratings at the back of this brochure before connecting devices to this control.
- All wires must be rated at least 300 V.
- High voltage wires should be 14 AWG conductors.
- Low voltage wires should be 18 AWG conductors.
- Strip all wiring to a length of 3/8 in. or 10 mm for all terminals.
- Only qualified personnel should attempt installation of the tN4 Gateway.

⚠ Power Requirements — *Terminals 1-2*

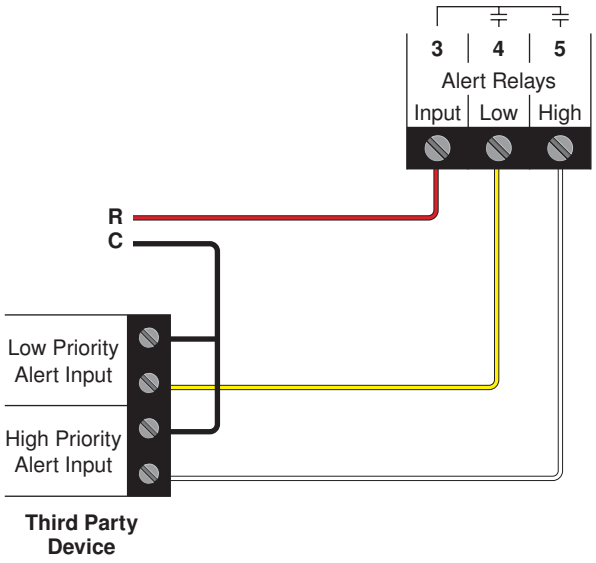
- Provide a 15 A circuit for the power.
- An approved circuit breaker or power disconnect that de-energizes the high voltage wiring should be located near the tN4 Gateway, and marked as the 115 V (ac) power disconnect for this device.
- 115 V (ac) high voltage power supply circuits must be protected by 15 A maximum overcurrent protection.
- Connect 115 V (ac) hot (L) to terminal 2.
- Connect 115 V (ac) neutral (N) to terminal 1.
- Connect the ground wire to one of the ground screws provided in the wiring chamber.



⚠ Alert Relay Outputs — *Terminals 3-5*

The 483 has two Alert Relay outputs to connect to a third party device such as a security system or telephone dial out device. The two relays are able to provide two alert levels: low priority and high priority.

- The Alert Relays require a minimum of 0.1 A of current in order to keep the contacts functioning properly.
- Connect a power source hot wire to the Alert Relay terminal 3.
- Connect the Alert Relay Low priority terminal 4 to the low priority alert input on the third party device.
- Connect the Alert Relay High priority terminal 5 to the high priority alert input on the third party device.
- Connect the power source common to the common on the third party device.



tN4 Bus Inputs

Terminals 6 - 15

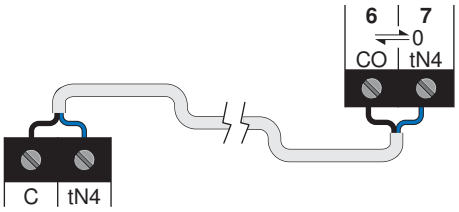
The tN4 Gateway includes five tN4 buses:

- tN4 Bus 0 (terminals 6 and 7)
- tN4 Bus 1 (terminals 8 and 9)
- tN4 Bus 2 (terminals 10 and 11)
- tN4 Bus 3 (terminals 12 and 13)
- tN4 Bus 4 (terminals 14 and 15)

Each tN4 bus consists of a tN4 terminal as well as a C terminal.

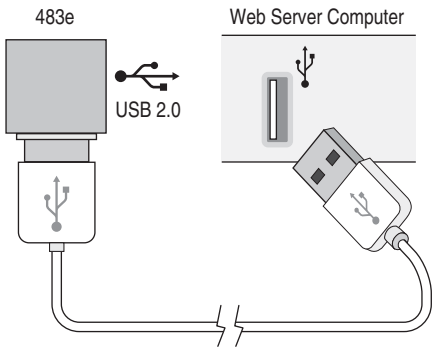
Polarity is important.

Connect each tN4 bus on the system to a tN4 bus input on the 483. The tN4 bus order on the 483 is not critical; however, it is recommended to connect them to the 483 in the same order in order to avoid confusion during troubleshooting.



USB Port

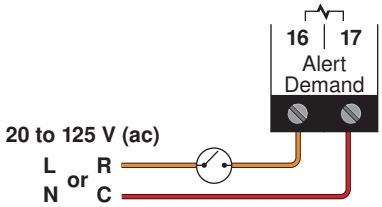
Plug the USB cable into the USB port on the gateway. Plug the other end of the USB cable into the USB port on the web server computer.



⚠ Alert Demand Input

Terminals 16-17

The 483 includes an Alert Demand input. To generate an Alert Demand a voltage between 20 and 125 V (ac) must be applied across the Alert Demand terminals (16 and 17).



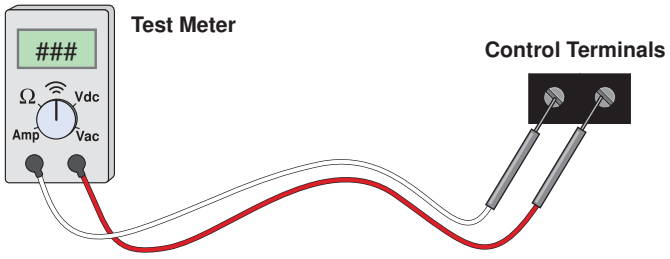
Troubleshooting the Wiring

⚠ General

The following tests are to be performed using standard testing practices and procedures and should only be carried out by properly trained and experienced persons.

A good quality electrical test meter, capable of reading from at least 0-300 V (ac), 0-30 V (dc), 0-2,000,000 Ohms, and testing for continuity is essential to properly test the wiring and sensors.

For an explanation on the use of the Test Button, the 'Test' sequence or any error messages, refer to the Data Brochure.



Testing the Control

Testing the Power

1. Remove the front and wiring covers from the control.
2. Use an electrical test meter to measure (ac) voltage between the Power N and L terminals (1 and 2). The reading should be 115 V (ac) + / – 10%. The Power LED should be on.
3. If power is not present the Power LED will be off. Check the circuit(s) that supply power to the Power N and L terminals (1 and 2).

Testing the Alert Relays

1. Remove the front and wiring covers from the control.
2. Press the “Test” button.
3. The Low Priority Relay LED will turn on and the corresponding relay contact will close. Measure for continuity on terminals 3 and 4 using an electrical meter.
4. The High Priority Relay LED will turn on and the corresponding relay contact will close. Measure for continuity on terminals 3 and 5 using an electrical meter.

Testing the tN4 Buses

1. Remove the front and wiring covers from the control.
2. There are a total of five tN4 buses (tN4 and C). The corresponding tN4 LED will be on if there is communication on the tN4 bus.
3. If there is no communication on a tN4 bus that is supposed to have communication, there may an open or short circuit. An open or short circuit will be indicated as a bus error on any tN4 thermostats, tN4 setpoint controls, and tN4 system controls.
4. To test for short circuits:

- Disconnect the tN4 bus wires on both ends.
- Install wire nuts on each wire on one end to ensure the wire ends are not touching.
- Measure for continuity using an electrical meter.
- If continuity is present, there is a short circuit fault along the wires. It is recommended to replace the tN4 bus wires.

5. To test for open circuits:

- Disconnect the tN4 bus wires on one end and connect them together.
- Disconnect the tN4 bus wires on the other end.
- Use an electrical meter to measure for continuity.
- If there is no continuity, there is an open circuit fault along the wires. It is recommended to replace the tN4 bus wires.

Testing the USB Port

Once the USB cable is plugged into the 483 and into the web server computer, and the web server computer is on, the USB LED will turn on.

Testing the Alert Demand

1. Remove the front and wiring covers from the control.
2. Use an electrical test meter to measure (ac) voltage between the Alert Demand terminals (16 and 17).

- When the demand device is on, a voltage between 20 and 125 V (ac) should be measured between terminals and the Alert Demand LED will be on.
- When the demand device is off, less than 5 V (ac) should be measured between the terminals and the Alert Demand LED will be off.

Notes

Technical Data

tN4 Gateway 483; *USB*	
Control	Microprocessor PID control; This is **not a safety (limit) control**
Packaged weight	3.6 lb. (1600 g)
Dimensions	6-5/8” H x 7-9/16” W x 2-13/16” D (170 x 193 x 72 mm)
Approvals	CSA C US, meets ICES & FCC regulations for EMI / RFI
Ambient conditions	Indoor use only, 32 to 122°F (0 to 50°C), 9842 feet (3000 m) maximum altitude
Power Supply	115 V, 60 Hz, 45 mA
Relays	115 V (ac) 5 A 1/3 hp, pilot duty 240 VA
Demand	20 to 125 V (ac) 2 VA
This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.	

The installer must ensure that this control and its wiring are isolated and / or shielded from strong sources of electromagnetic noise. Conversely, this Class B digital apparatus complies with Part 15 of the FCC Rules and meets all requirements of the Canadian Interference-Causing Equipment Regulations. However, if this control does cause harmful interference to radio or television reception, which is determined by turning the control off and on, the user is encouraged to try to correct the interference by re-orientating or relocating the receiving antenna, relocating the receiver with respect to this control, and / or connecting the control to a different circuit from that to which the receiver is connected.

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

tekmar® Control Systems

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