SAVANT

Multistat Smart Thermostat Quick Start Guide

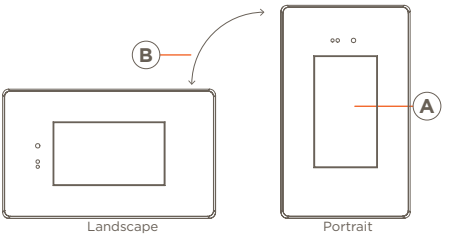
Box Contents

(1) Multistat Smart Thermostat (CLI-W220x-00)
(1) Installation Kit (075-1419-xx)
  (2) Drywall Anchors (039-0328-xx)
  (2) #6 x ¾ inch pan head screws (039-0329-xx)
  (1) GE Wireless Bluetooth Temperature Sensor (93129901)
  (2) Dolphin splice connectors (028-0581-xx)
(1) Sheet of Wire Labels (080-0096-xx)
(1) Product Regulatory Statement (009-1950-xx)
(1) Quick Start Guide (009-2428-xx, this document)

Specifications

Environmental				
Temperature	32° to 104° F (0° to 40° C)			
Humidity	10% to 90% RH (non-condensing)			
Dimensions and Weights				
	Height	Width	Depth	Weight
CLI-W220	4.95 in. (12.5 cm)	3.0 in. (7.6 cm)	.91 in. (2.3 cm)	.30 lb. (0.14 kg)
Shipping	7.0 in. (17.8 cm)	5.0 in. (12.7 cm)	2.0 in. (5.0 cm)	1.0 lb. (0.5 kg)
Power				
Input	24V AC (18V AC - 32V AC)			
Current Draw	150 mA RMS typical, 300 mA maximum			
Max Power	7.2 watts			
Cable Requirements				
Power	#18 AWG			
HVAC	#18 AWG - thermostat wire (solid)			
Remote 10k Sensor	#24 AWG - 500 feet (152 meters) max.			
Regulatory				
Safety and Emissions	FCC Part 15 Class B			
Contains FCC ID:	VPYLB1ZM			
Contains IC:	772C-LB1ZM			
RoHS	Compliant			
Standards				
Wireless	802.11 b/g/n (2.4 GHz / 5.0 GHz) ⚠ **IMPORTANT!** 802.11r fast roaming is not supported.			
Security	WPA1™, WPA2™, WPA1™ +WPA2™			
Minimum Supported Release				
Savant Software	da Vinci 10.6 and higher			

Front Panel



A **LCD Touchscreen** - The display is a multi-colored touchscreen LCD that includes various screens for viewing and configuring the HVAC system.

- One touch and swipe operation.
- Swipe right for local forecast (when enabled).

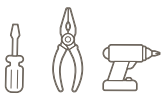
B Both landscape and portrait type installations are supported. During the power-up process, the thermostat will auto-detect its positioning and make the proper adjustments. Mount the backplate, as described below.

Portrait - Mount the backplate, so the terminal strip with the O, G, Y2, Y1, etc. are located towards the top. More information is available in the Install Thermostat Mounting Plate section.

Landscape - Mount the backplate, so the reference designators on the terminal strips can be read. If reference designators are upside down, rotate the thermostat 180°.

Getting Started

Savant recommends having the following tools available for installation:



- Pencil
- #2 Phillips screwdriver
- Small slotted screwdriver
- Drill with 5/32 inch drill bit
- Wire stripper
- Needle nose pliers
- Measuring Tape

⚠ **CAUTION!** When replacing an older thermostat that contains mercury in a sealed tube, do not discard it into the trash. Refer to **thermostat-recycle.org** or similar website for information on how to dispose of properly.

⚠ **IMPORTANT!** Savant requires the use of at least one external sensor. (See Remote Sensors for options).

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Remove Old Thermostat

1. Scroll through and record the current settings and schedules from the old thermostat.
2. Switch OFF power at either the breaker panel or the switch that controls the HVAC system.
3. Open the old thermostat and take a photo of the existing thermostat and wiring. The photo should reveal wire colors and terminal designations.
4. Using the top chart to the right, add a check to record which power wires are installed in the old thermostat. In addition, record the wire colors. Not all fields from the chart may be populated.
5. Remove each wire recorded and attach a label that matches the terminal designation from the old thermostat. It's important to label the wires according to the terminal designation and NOT the color of the wire.
6. Using the bottom chart to the right, add a check to record which HVAC signaling wires are installed in the old thermostat. In addition, record the wire colors.
7. Remove each wire recorded above and add a wire label to each.

TIP! Wrap wires around a pencil or similar to prevent the wires from falling back into the wall

8. Remove old thermostat from wall.

Terminal		Wire Color
	R	
	C	
	RC	

Terminal		Wire Color
	O	
	G	
	Y2	
	Y1	
	W2	
	W1	

HELPFUL! Additional information on the terminal designators and how to wire the thermostat into different types of HVAC systems is available in the **Multistat Smart Thermostat Deployment Guide** (009-1959-xx) available on the Savant Customer Community.

Location and Mounting Overview

For new installations or when relocating the thermostat, follow the guidelines below:

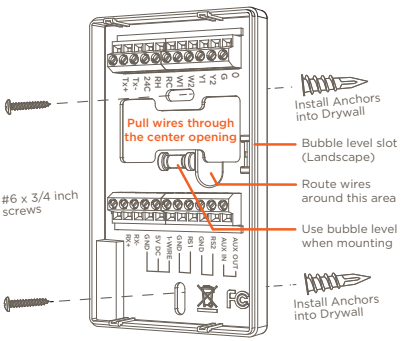
- Locate thermostat on an inside wall away from windows and doors to reduce the exposure to drafts or direct sunlight.
- Do not locate where air circulation is poor such as in a corner or behind a door.
- Install away from any heating conditions such as near a radiator register, vent, or fireplace.
- To adhere to ADA requirements, install thermostat 48 - 54 inches (1.22 - 1.37 meters) above the floor.
- Height requirements can be adjusted upward to 60 inches (1.5 meters) if ADA requirements are not mandatory.
- The thermostat does not need to be level to operate correctly. Leveling the thermostat is for aesthetics only.
- Thermostat can be oriented in either a portrait or landscape layout.

Install Thermostat Mounting Plate

9. Grasp the mounting plate half of thermostat in one hand, and the LCD screen half in the other.

TIP! Grasp the bottom of the thermostat, which is the end opposite the proximity sensor.

10. Pull the two halves apart and, at the same time, gently rock the front and back halves back and forth until they separate.
11. Position the mounting plate onto the wall. Using a pencil, mark the two mounting holes onto the wall (See image).
    - Use the bubble level in the center of the mounting plate to level when mounting using a portrait layout.
    - When mounting using a landscape layout, remove the bubble level by pushing it out through the rear of the mounting plate and reinstall it into the bubble level slot on the right side of the center cutout. See the diagram to the right.
12. With a #2 Phillips screwdriver, screw the wall anchor into the wall on each mark made. A 5/32 inch hole can be pre-drilled to make it easier when screwing the anchor to the wall. Wall anchors are not required with installs that have a sub wall to fasten to.
13. Pull the existing wires through the center cutout in the mounting plate.
14. Screw the mounting plate to the wall using the supplied screws.



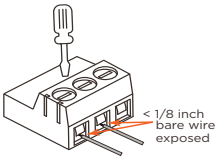
IMPORTANT! As indicated in the diagram above, route the thermostat wires around the wiring keepout. When the two halves of the thermostat are snapped together the component that rests in that indented area could be damaged.

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Making Connections

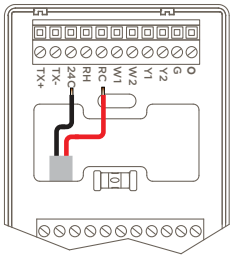
When making connections, follow the guidelines set below to ensure a safe and secure connection.

1. With a small slotted screwdriver, turn the screws in the connector counterclockwise (CCW) until the silver crimps open enough to slide the wire(s) into the square slots.
2. Strip back insulation on each wire to 1/4 inch and insert the stripped wire into the proper connection.
3. Turn screws clockwise (CW) until the crimps tighten around each wire. Gently tug on each wire to verify they are secure.



Connect Power - One Transformer used to power the HVAC system

The CLI-W220x does not run on batteries and requires a separate power source to operate. To power the thermostat, voltage must be applied between the RC and 24C terminals. When replacing an existing thermostat, if the power wires removed from the old thermostat were from the R and C terminals, use the diagram below to make the connections.

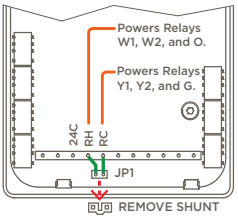


RC - Connect the wire removed from the R terminal of the old thermostat to the RC terminal. On new installations, connect the wire from the 24V AC HVAC transformer to the RC terminal.

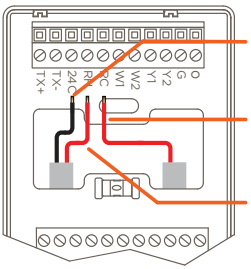
24C - Connect the wire removed from the C (common) terminal of the old thermostat to the 24C terminal. On new installations, connect the common wire from the 24V AC HVAC transformer to the 24C terminal.

Connect Power - Two Transformers used to power the HVAC system

When an HVAC system uses separate power sources (two transformers) to run the heating and cooling HVAC systems, the HVAC system contains three power wires (R, C, and RC). Adjustments to accommodate the separate power sources are described below.



Jumper shunt JP1 on the thermostat's PCB board connects the RH and RC terminals. Each thermostat shipped from the factory comes with this jumper shunt installed. With the shunt installed, one transformer, wired as described in the previous section, is needed. Remove the jumper shunt when the HVAC system contains separate transformers and make the connections described in the section below.



RH - Supplies power to the relays connected to terminals W1, W2, and O.

RC - Supplies power to the relays connected to terminals Y1, Y2, and G. RC terminal is also used to power the thermostat.

24C - Common terminal. The common wire from the HVAC system is required for thermostat to run.

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HVAC Wiring

Use the table below when making connections between the thermostat and an HVAC system. The type of HVAC system installed determines which wires are connected and in some installations, the power wires are the only wires required.

O	Relay to control changeover valve on a Heat Pump
G	Fan Relay
Y2	Relay for control of 2nd stage cooling
Y1	Relay for control of 1st stage cooling
W2	Relay for control of 2nd stage heating
W1	Relay for control of 1st stage heating

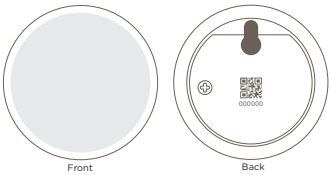
HELPFUL!

- Refer to the Making Connections section above to ensure a safe and secure connection is made.
- Additional information on the terminal designators and how to wire the thermostat into different types of HVAC systems is available in the **Multistat Smart Thermostat Deployment Guide** located on the Savant Customer Community.

Remote Sensors

GE Wireless Bluetooth Temperature Sensor

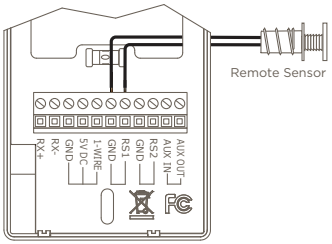
Included in the box is an external Bluetooth Low Energy (BLE) temperature flush mount wireless sensor. This sensor is used in place of an internal temperature sensor, allowing for optimal sensor placement to achieve more accurate temperature readings. The sensor must be placed within Bluetooth range of the thermostat, up to 25 feet in open air. Note that signal interference or material obstruction may reduce this effective range.



- See the GE Wireless Bluetooth Temperature Sensor (93129901) QRG (009-2091-xx) for more information on this sensor.
- The GE Wireless Bluetooth Temperature Sensor may be installed with a screw and anchor into a wall, or with the provided adhesive strip. If using the adhesive strip, record the 6-digit pin number on the back. This number will be used during app configuration.
- Up to six (6) GE Wireless Bluetooth Temperatures Sensors can be connected to a CLI-W220 at a time.

Optional 10K Type Sensors

The CLI-W220x includes two thermistor ports labeled RS1 and RS2 for 10KΩ type temperature sensors. Like the Bluetooth temperature sensor described above, this sensor can replace the onboard temperature sensor or can be used to calculate an average reading of the temperature in a room or space. The 10K sensors do NOT observe any polarity. Refer to the diagram below when making connections for 10K type sensors or thermistors.



Savant offers a range of 10KΩ type sensors that are compatible with the CLI-W220x, including:

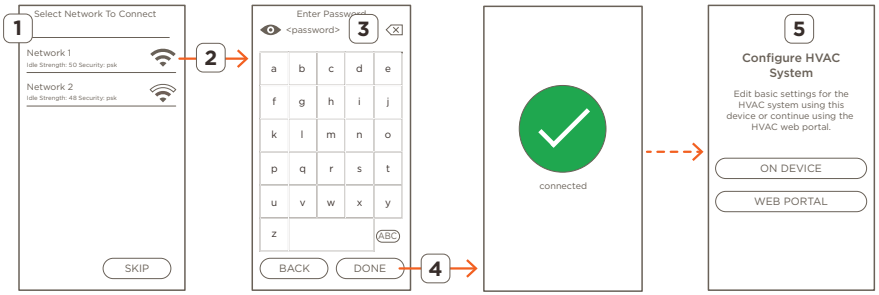
- SST-TEMP1-xx Flush Mount Remote Sensor (QRG: 009-0800-xx)
- CLI-THFM1-xx Temperature/Humidity Sensor QRG: 009-1064-xx)
- SST-OTEMP-xx Outdoor Remote Sensor (QRG: 009-0989-xx)
- CLI-PLEN1R/C-xx Plenum Sensor (QRG: 009-1096-xx)
- CLI-SLAB1-xx SLAB Sensor (QRG: 009-1097-xx)

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Connect to a Network

How to connect or on-board the thermostat to the local Wi-Fi® network from the on-screen menu is described below.

1. Apply power to the thermostat. Verify the **Select Network To Connect** screen opens. All local networks will be listed.
2. Select a network to add the thermostat to that network.
3. Enter the password for the network using the on-screen keyboards.
4. Select **DONE** when complete. The thermostat will verify the password credentials and connect to the network.
5. The **Configure HVAC System** screen opens once the thermostat connects to the network. The option to configure basic HVAC system settings begins here. The **Multistat Smart Thermostat Deployment Guide** contains information on configuring a basic HVAC system using the ON DEVICE setup windows available from the thermostat's LCD.



- Select the SKIP button to bypass the onboarding process and go directly to the Configure HVAC System screens. From here, the basic settings for the HVAC system settings can be established before onboarding the thermostat (**Note:** The onboarding process can be skipped if no Wi-Fi network is available).
- Select the eye icon (👁) to display the password characters.
- Select the keyboard character icon (ABC) to change the characters displayed in the Enter Password screen.
- Use one of the two methods described below to configure the HVAC system into the thermostat.
  - **DEVICE** - Use the thermostat's on-screen menus to configure the HVAC system settings.
  - **WEB PORTAL** - Enter the IP Address of the thermostat, log on to the Web Portal, and use the menus in the web UI to configure the HVAC system settings.

Factory Reset

⚠ **IMPORTANT!** Performing a factory reset wipes the configuration and removes the assigned IP address of the thermostat. The thermostat will need to be provisioned to the network again.

Reset via Web GUI

1. Open and log into the web portal. Refer to **Multistat Smart Thermostat Programming Guide**.
2. Select **Actions > Reset to Defaults** from the configuration screen that opens.
3. Read the Reset to Defaults alert window and select **Confirm** if you agree.
4. After about a 10 second delay, the thermostat will reboot. Once the reboot is complete, the thermostat screen will open to the **Select Network To Connect** screen. Select the appropriate network and provision the thermostat to that network.

Reset via Touchscreen

1. Select the **Mode** icon from the Main screen of the thermostat.
   NOTE: This may be labeled as OFF, Heat, Cool or AUTO.
2. Swipe left twice to access the **Network** screen and select **Reset Config**.
3. After about a 10 second delay, the thermostat will reboot. Once the reboot is complete, the thermostat screen will open to the Select Network To Connect. Select the appropriate network to provision the thermostat to that network.

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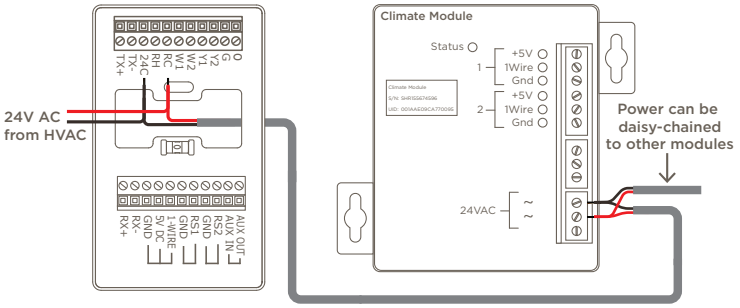
Climate Modules

Savant offers a family of Climate Modules. These climate modules expand the capabilities of the thermostat. The modules available are as follows:

- **CLI-1WIRE2** - Adds up to four 1-wire smart sensors to the system.
- **CLI-10K4IN** - Adds up to four 10KΩ type temperature sensors to the system.
- **CLI-AUX3** - Adds up to three additional auxiliary relays to the system.
- **CLI-REL1AUX1** - Adds a set of climate relays (W1, W2, Y1, Y2, G, O) and one auxiliary relay to the system.
- **CLI-PTAC1K1** - Adds relays W1, W2, Y1, Y2, G, O for use with a PTAC and one 10KΩ temperature sensor to the system.

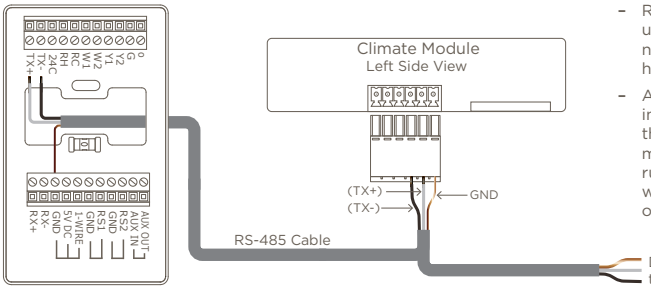
Connect Power To Climate Modules

Savant climate modules require 24V AC for power. The 24V AC used to power the thermostat can also power the climate modules. The diagram below displays the power connections between the thermostat and a climate module.



Connect RS-485 To Climate Modules

Savant climate modules communicate with the thermostat over RS-485. The diagram below shows the required connections.



HELPFUL!

- RS-485 wiring must be connected using a daisy-chained fashion. Do not install the RS-485 wires in a home run type topology.
- A 120Ω terminating resistor installed between TX+ and TX- on the last climate module in the chain may be required on longer wire runs. Adding a terminating resistor will prevent stability issues that can occur with longer wire runs.

HELPFUL

For more information on each module, see the following guides on the Savant Customer Community.

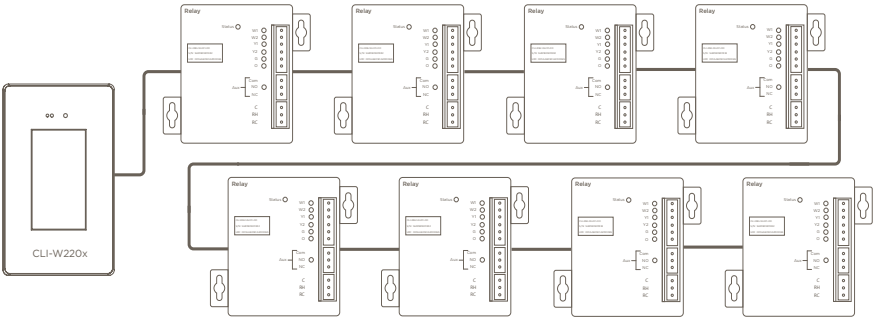
- (009-1829-xx) - Sensor Module with Two 1-Wire Sensor Interfaces [CLI-WIRE2] - QRG
- (009-1798-xx) - Sensor Module with Four 10K Thermistor Inputs [CLI-10K4IN] - QRG
- (009-1799-xx) - Relay Module with Three Aux Relays [CLI-AUX3] - QRG
- (009-1806-xx) - Relay Module for PTAC with one 6-port Climate Relay and One 10K Thermistor [CLI-PTAC1K1] - QRG
- (009-1805-xx) - Relay Module with one 6-port Climate Relay and One Aux Relay [CLI-REL1AUX1] - QRG
- (009-1959-xx) - Multistat Smart Thermostat Deployment and User Guide

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Example 1:

Example 1 shows eight CLI-REL1AUX1 relay modules. Each module uses the HVAC signaling outputs to control a separate zone.

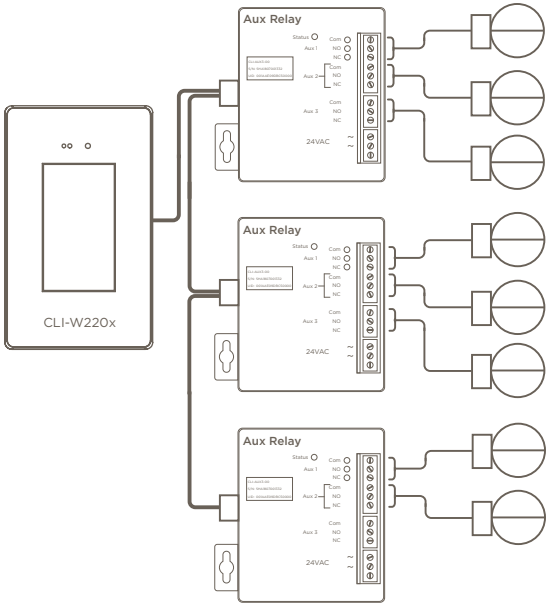
- Any combination of CLI-REL1AUX1 and CLI-PTAC1K1 modules that equal eight zones is acceptable.
- Any number of sensor type modules can be added once the eight zones are established. Modules such as the CLI-1WIRE2 and CLI-10K4IN) do not affect the maximum.



Example 2:

The diagram below shows 3 Aux Relay modules with each relay output controlling a separate damper. Each damper is considered a different zone. Therefore, the maximum number of 8 zones is reached.

- Any combination of CLI-AUX3 and CLI-REL1AUX1 modules that equal 8 dampers/zones is acceptable.
- Once the 8 zones are established, any number of sensor modules (CLI-1WIRE2, CLI-10K4IN) can be added. Those modules do not affect the maximum.
- Use the diagram for reference only. Refer to the QRG's for the CLI-REL1AUX1 or CLI-AUX3 module for information on wiring a vent damper.



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Frequently Asked Questions:

Does the CLI-W220x require batteries?

No, the CLI-W220x requires 24V AC that is typically available from a transformer or similar in the HVAC system. If the thermostat getting replaced does not include a common (C) wire, a separate wire must be run from the HVAC system to the Savant thermostat.

How does CLI-W220x get software updates?

The thermostat periodically receives Over The Air (OTA) updates automatically from the Savant Cloud. To obtain the update, the CLI-W220x must be connected to a local network that has WAN access, and be configured in a Savant system.

Will CLI-W220x still work if the Wi-Fi connection is lost?

Yes, most thermostat functions still work when not connected to Wi-Fi. However, features such as schedules and OTA updates that require a network connection will not.

My thermostat was received damaged. What should I do?

If the thermostat was purchased through a contractor or retailer, contact the contractor or retailer to return it. If thermostat was purchased from the Savant Store, contact Savant through the **Savant Customer Community**.

Are both Fahrenheit and Celsius supported?

Yes

Does the thermostat support humidity?

Yes, humidity can be monitored by one of the following:

- The included GE Bluetooth Temperature Sensor (93129901)
- An optional remote 1-wire combination temperature smart sensor is available from the Savant Store (CLI-THFM1)

Is the thermostat a single or dual setpoint thermostat?

Both. The thermostat can function as either a single or dual setpoint thermostat. To do this, select the correct profile from Blueprint and select the right mode (dual or single setpoint) from the thermostat's on-screen menus. For additional information on the Blueprint configuration, see the Multistat Smart Thermostat Deployment Guide available on the Savant Community.

Does the thermostat support Scheduling?

Scheduling is set up only via the Savant Pro App Climate service.

Can I configure the thermostat to calculate an average humidity reading if I have both the Bluetooth sensor and wired remote smart sensor (CLI-THFM1) connected?

Yes, When configured through the web UI, the user decides which sensors to use and whether to take the average.

What are the maximum number of climate modules that can be connected to a CLI-W220x?

There is no fixed maximum number of modules. Instead, the max quantity of modules is determined by the number of zones. Each thermostat supports a maximum of 8 zones. How a user gets to those eight zones can vary. See Example 1 and Example 2 for reference.

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