East Coast
METAL DISTRIBUTORS

Goodman SD Series Quick Start Guide

Agenda

- Equipment General Specifications
- Equipment Configurations
- Goodman GTST Thermostat
- Control Wiring Layout
- System Run Verification Test (Without Wi-Fi)
- System Setup – Goodman Installer App
- Common Settings to Adjust
- Refrigerant Charge Verification (Without Wi-Fi)
- Cloud Commissioning (Wi-Fi)

General Equipment Specifications

Service Valve Connections

1.5 – 2.0 TON	Liquid	3/8”
	Gas	3/4”
2.5 – 3.0 TON	Liquid	3/8”
	Gas	7/8”
3.5 – 5.0 TON	Liquid	3/8”
	Gas	7/8”

Standard Refrigerant Line Sizing*

1.5 – 3.0 TON	Liquid	3/8”
	Gas	3/4”
3.5 – 5.0 TON	Liquid	3/8”
	Gas	7/8”

Refrigerant Line Limits

Maximum Linear Length	100’
Maximum Equivalent Length	125’
Maximum Vertical Rise	90’
Maximum Vertical Drop	100’

* Alternate sizes may be used – please refer to Installation Manual for details

General Equipment Specifications

Electrical – 208|230 – 1 – 60Hz

ODU Size	MCA	MOP
1.5 Ton	14.6 A	15 A
2.0 Ton	18.8 A	20 A
2.5 Ton	23.9 A	25 A
3.0 Ton	23.9 A	25 A
3.5 Ton	34.4 A	35 A
4.0 Ton	34.4 A	35 A
5.0 Ton	36.2 A	40 A

Control Wire Specifications

GTST to Indoor Unit	125’
Indoor Unit to Outdoor Unit	250’
Distance Between Control Wire and High Voltage Wire	2” or More
Control Wire Size	18 AWG

Equipment Configurations

- AHVE Air Handlers – 208|230V
- Heat Strip Kits Available
- Multi-Positional – 4 Way
- Compatible with GSZS model Heat Pumps
- Compatible with GSXS model Air Conditioners

Equipment Configurations

- Cased Coils - Horizontal
- CHPE model series
- All Aluminum Evaporator Coil
- Only available in AC Matchups (GSXS models)
  - No Dual Fuel Currently
  - No HP Currently

Equipment Configurations

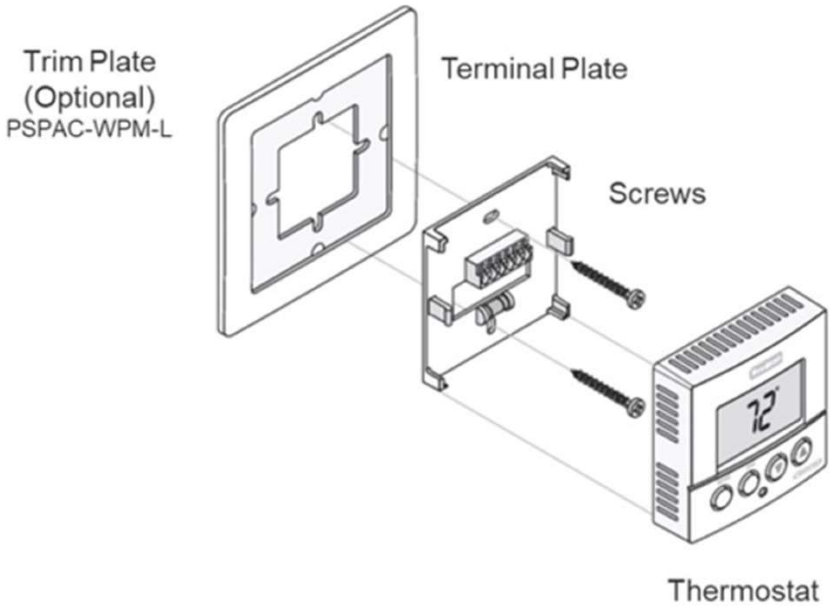
- Cased Coils - Vertical
- CAPE | CAPEA model series
- All Aluminum Evaporator Coil
- CAPE models are only available in AC matchups (GSXS models)
- CAPEA models are HP and Dual Fuel Compatible (GSZS models)

Goodman GTST Thermostat

- Compatible with all Goodman SD Model units
- Compact, non-intrusive design
- Wi-Fi enabled for use with the Goodman Home app for remote user control
- Voice Control by Amazon Alexa and Google Assistant

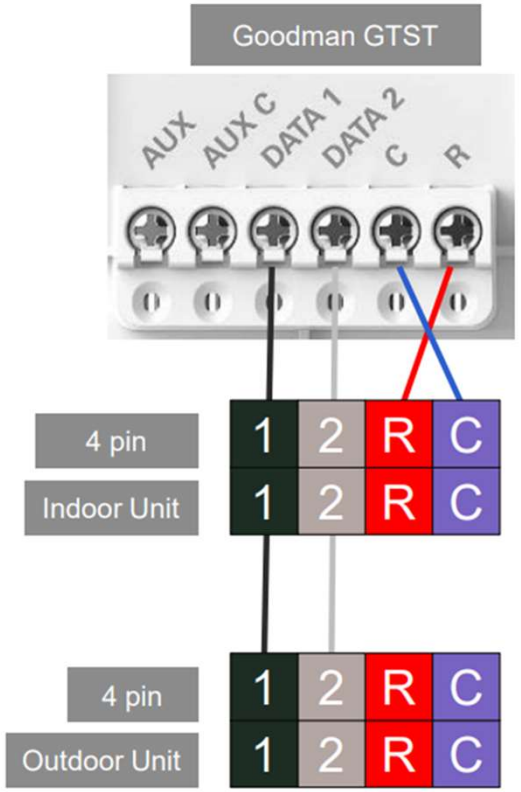
Goodman GTST Thermostat

- GTST Thermostat comes with a backplate level
- Install approximately 5’ from the floor
- Optional Trim Plate available
- Need a minimum of 4-wire control wire to install a Goodman SD – 18ga solid or stranded thermostat wire is acceptable

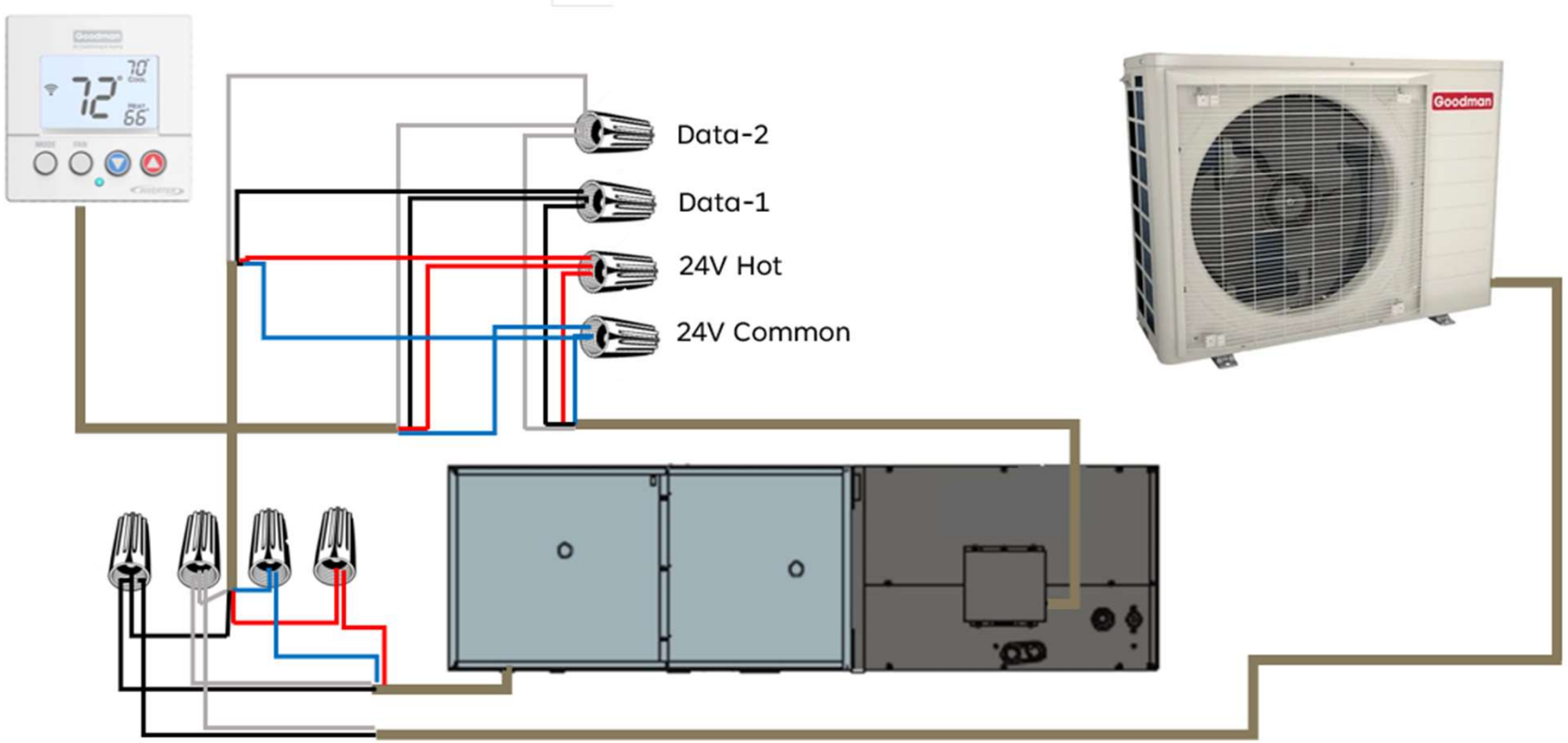


Control Wiring Layout

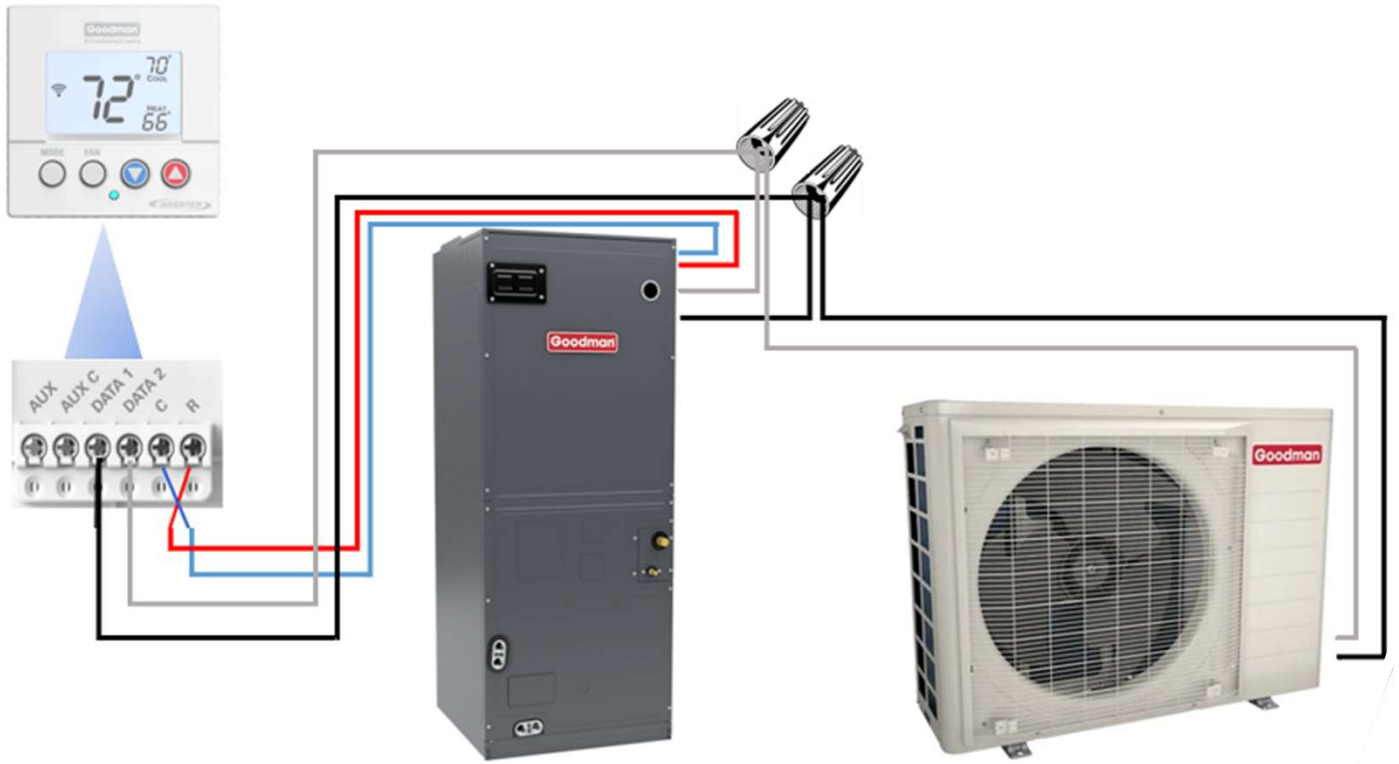
- The basic architecture of the control wiring is Data-1 and Data-2 transmitting information back/forth from the Thermostat to the Indoor unit and Outdoor unit
- Data-1 and Data-2 are polarity sensitive and must maintain the correct connections throughout the system
- 24VAC is only needed for the Thermostat and is not used for the Outdoor unit



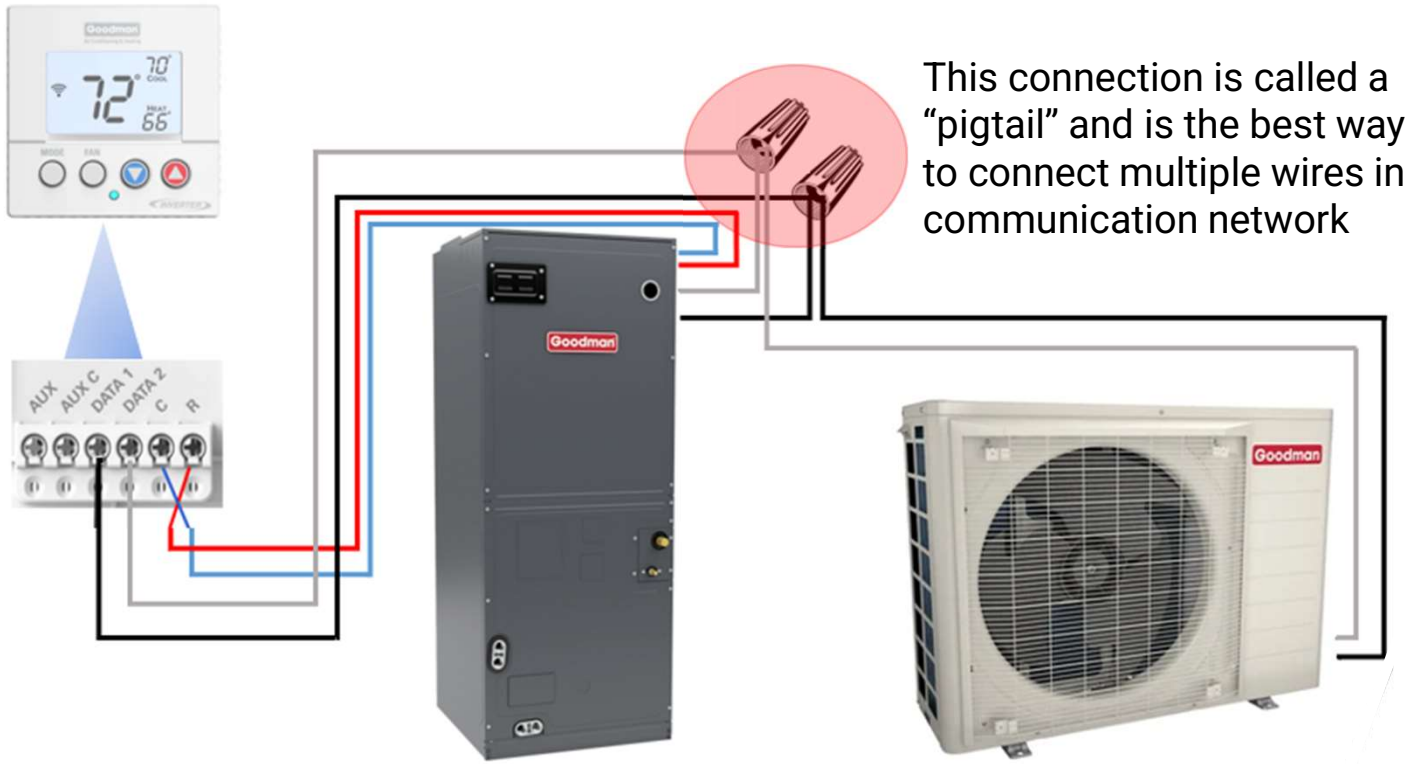
Control Wiring Layout – AC/Furnace



Control Wiring Layout – Heat Pump



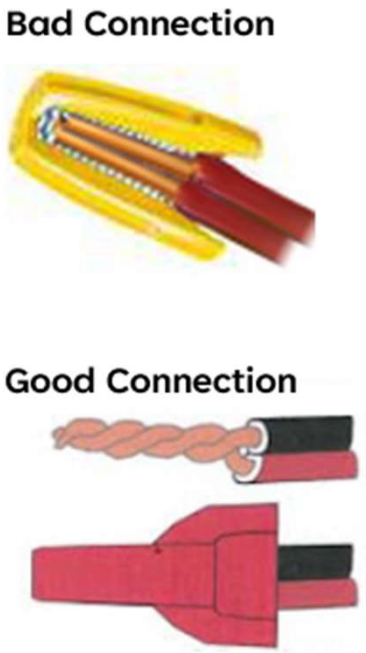
Control Wiring Layout – Heat Pump



This connection is called a “pigtail” and is the best way to connect multiple wires in a communication network

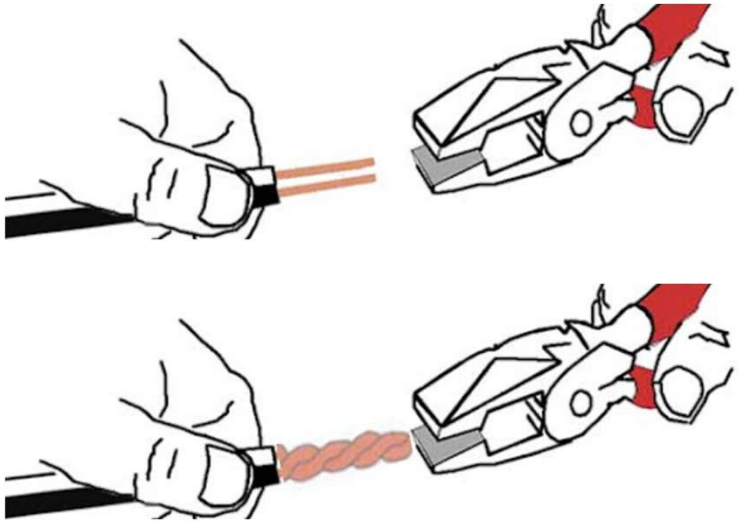
Control Wiring Layout – Wire Connections

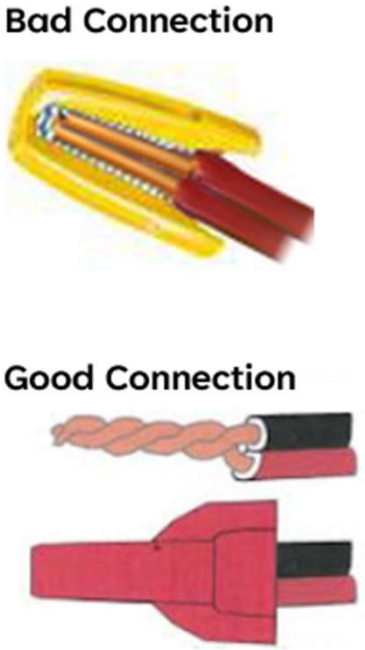
- Tight wire connections lead to a better pathway for electricity
- In communicating networks, we are not just passing electricity, but also data
- For data to accurately and reliably flow we need a good pathway that can be accomplished by ensuring any junctions of wire are done in the best way possible



Control Wiring Layout – Wire Connections

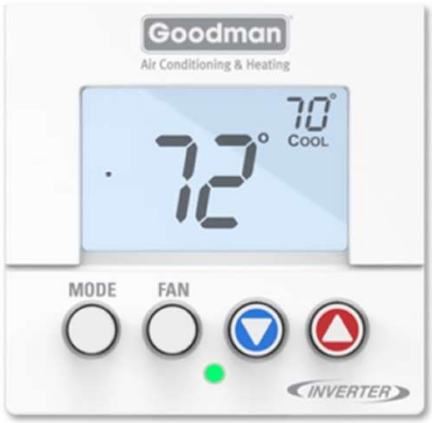
- When making connections with wire nuts, the wires should be twisted together prior to placing the wire nut over them





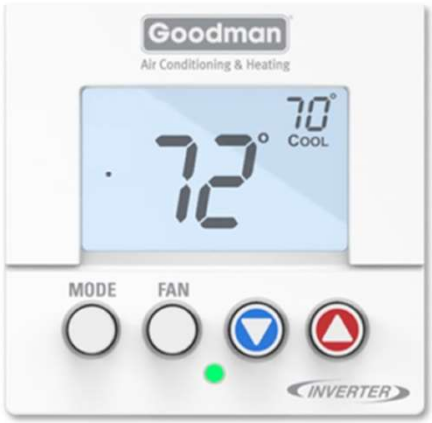
System Verification Test – Without Wi-Fi

- Apply power for 15 minutes
- On the GTST thermostat, press and hold MODE & FAN buttons at the same time for 5 seconds to enter the setup options
- Navigate to step 20 by pressing the MODE button
- Hold the FAN button for approximately 2 seconds to turn SYSTEM TEST “ON”



System Verification Test – Without Wi-Fi

- The display will cycle through the message, “System Test Running while testing
- The system test cannot be stopped once started. The test should take about 15 minutes to complete
- When the system test is complete the display will return to SYSTEM 20 “OFF” and the MODE button may be pressed to return to the main menu



System Setup – Goodman Installer App

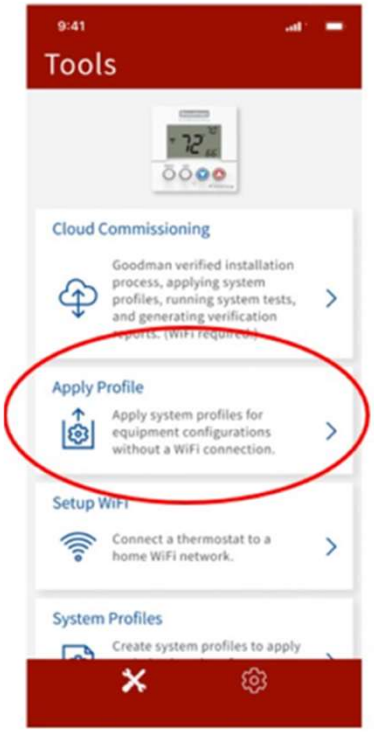
- Download the Goodman Installer App
- You do not need to create an account to login
- User ID and Password (case sensitive)
- User = Goodman
- Password = Dealer

Download on the App Store

ANDROID APP ON Google play

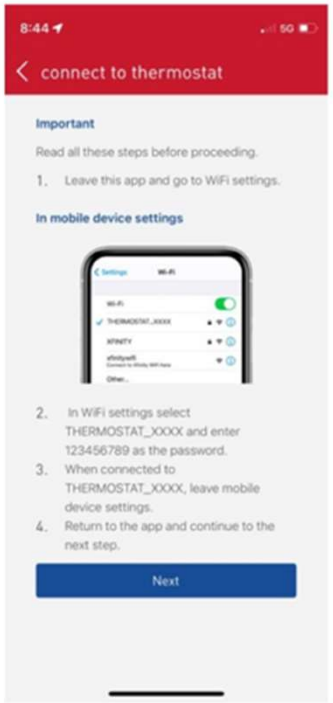
System Setup – Goodman Installer App

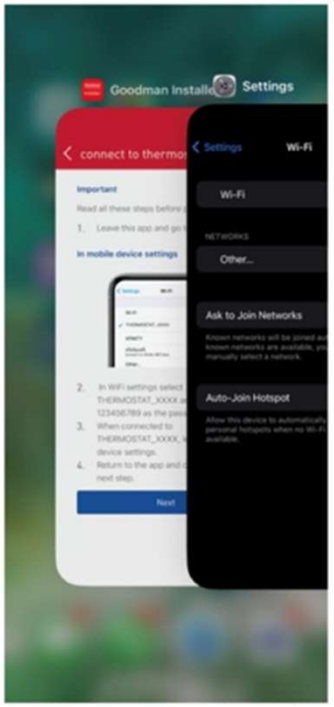
- The APPLY PROFILE menu option will walk you through connecting your smart device to the thermostat for configuration
- Press and hold the FAN button for 5 seconds to enter the WIRELESS SETUP menu
- Once WIRELESS SETUP appears on the screen, release the FAN button and press the COOLER button
- AP MODE ACTIVE should display on the screen; you are now ready to connect your device to the thermostat

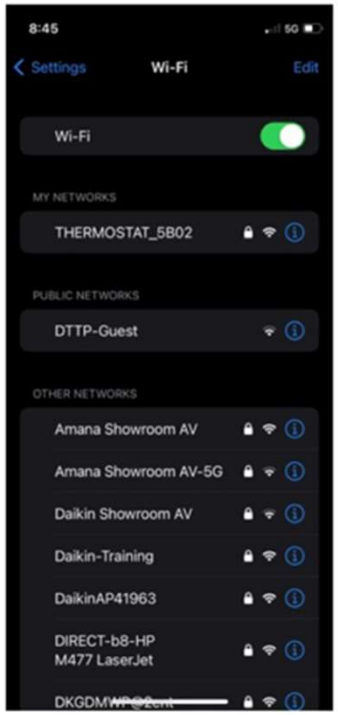


System Setup – Goodman Installer App

- The user will be prompted to open the smart device's Wi-Fi settings and connect to the thermostat
- Password = 123456789
- **NOTE:** The Goodman Installer app must remain open while accessing the smart device's Wi-Fi settings

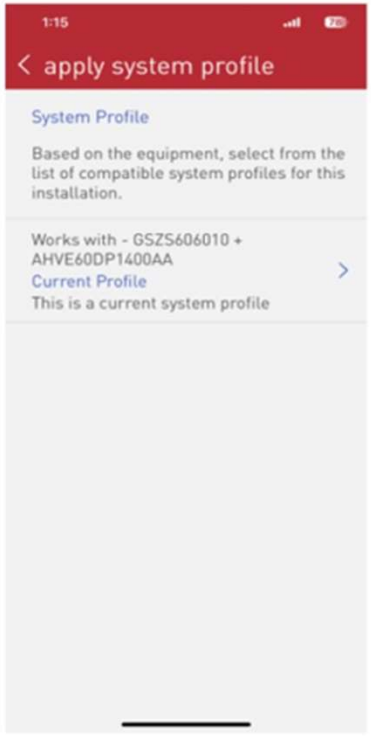


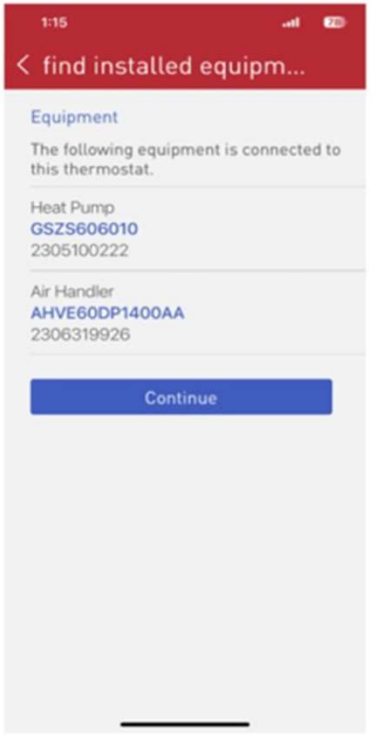




System Setup – Goodman Installer App

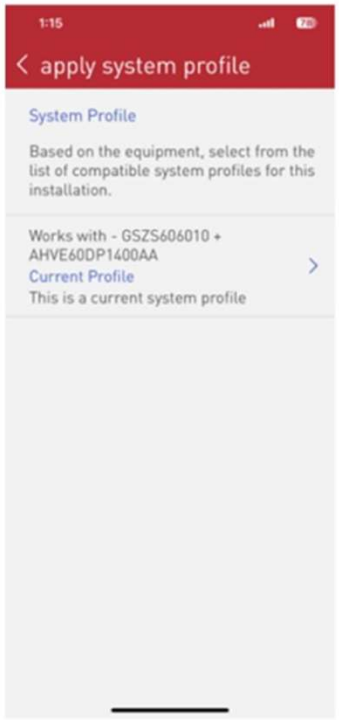
- A list of the connected equipment will be populated once equipment settings are detected
- Verify that all installed equipment is being detected before proceeding
- Pressing CONTINUE will allow for thermostat profile options to be viewed

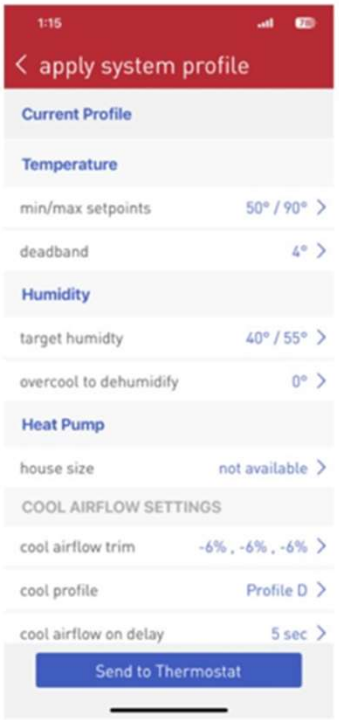


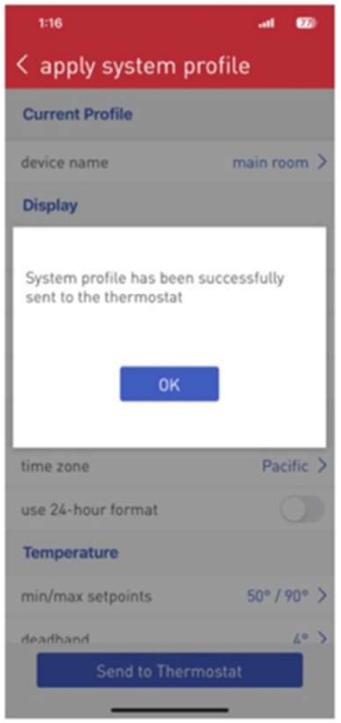


System Setup – Goodman Installer App

- You may select and/or modify any profile to send to the GTST thermostat
- Profile settings are displayed in a scrollable list
- Edits are only saved when the button SEND to THERMOSTAT is tapped





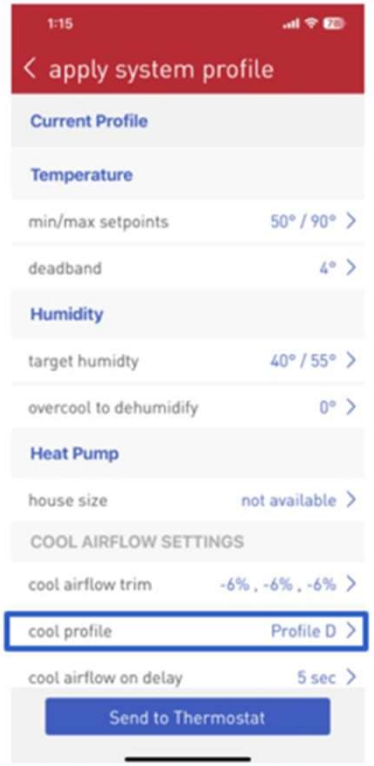


Common Settings to Adjust

- Cool airflow trim and Heat airflow trim
- The airflow may be changed at high, intermediate, and low compressor speed
- Airflow may be adjusted from -15% to +15% for each of the 3 compressor speed ranges
- Default is 0%, 0%, 0%

Common Settings to Adjust

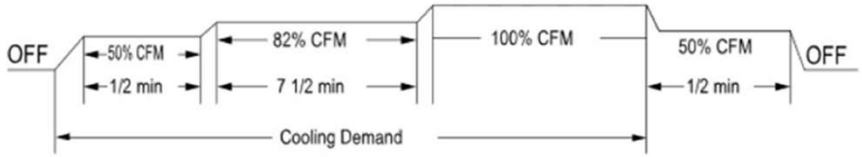
- Cool profile
- Several custom ramping profiles for the ECM blower motor are offered for cooling
- These profiles are designed to potentially enhance cooling performance and increase comfort level
- 4 profiles are available: A | B | C | D
  - Profile D is the default



Common Settings to Adjust

- **NOTE:** Please be mindful that reducing airflow to "super-cool" and evaporator may lead to cooling the cabinet of the equipment itself. If this happens in a humid environment, such as a crawl space, it may result in cabinet sweating

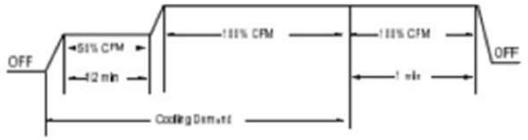
D **Profile D** (default) ramps up to 50% of the demand for 1/2 minute, then ramps to 82% of the full cooling demand airflow and operates there for approximately 7 1/2 minutes. The motor then steps up to the full demand airflow. Profile D has a 1/2 minute at 50% airflow OFF delay.



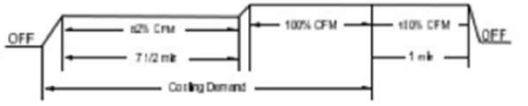
- ECMD Recommendation – Profile A

A **Profile A** provides only an OFF delay of one (1) minute at 100% of the cooling demand airflow.

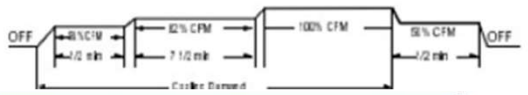
B **Profile B** ramps up to full cooling demand airflow by first stepping up to 50% of the full demand for 30 seconds. The motor then ramps to 100% of the required airflow. A one (1) minute OFF delay at 100% of the cooling airflow.



C **Profile C** ramps up to 82% of the full cooling demand airflow and operates there for approximately 7 1/2 minutes. The motor then steps up to the full demand airflow. Profile C also has a one (1) minute 100% OFF delay.



D **Profile D** (default) ramps up to 50% of the demand for 1/2 minute, then ramps to 82% of the full cooling demand airflow and operates there for approximately 7 1/2 minutes. The motor then steps up to the full demand airflow. Profile D has a 1/2 minute at 50% airflow OFF delay.



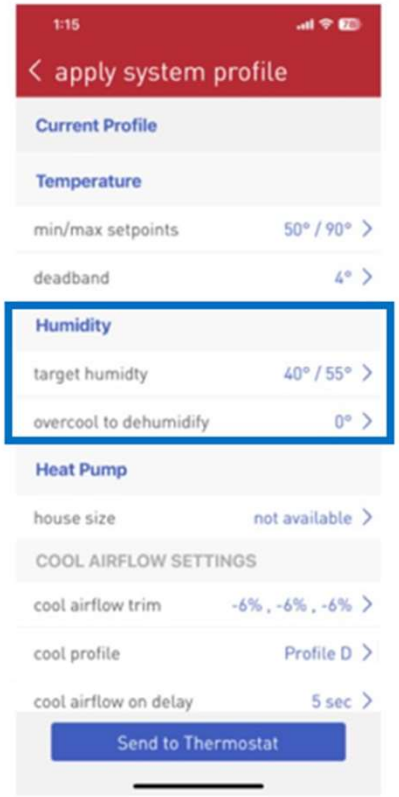
Common Settings to Adjust

- Dehumidification Settings

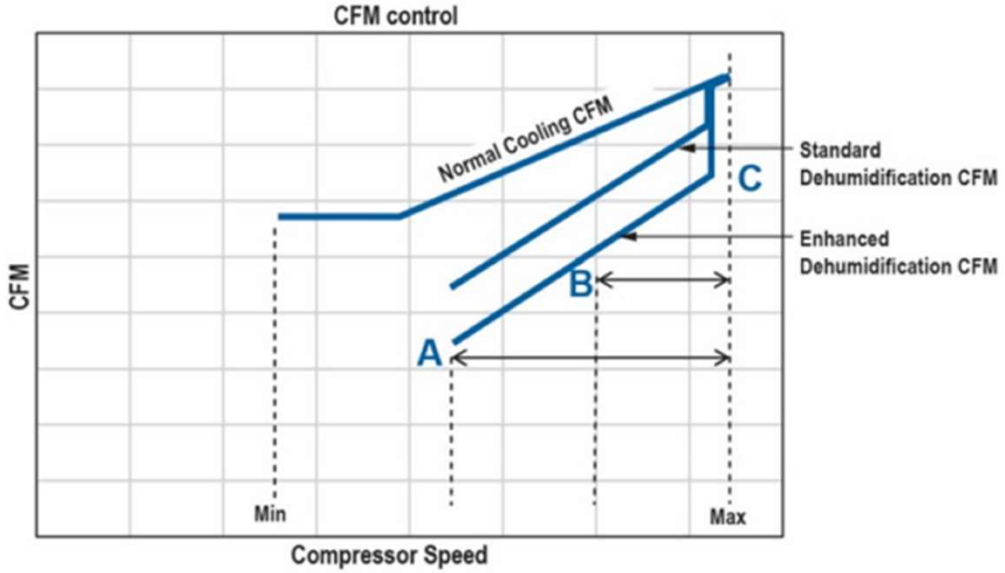
- Dehumidification is engaged whenever a cooling demand is present, and humidity levels are above the target level

- The dehumidification mode may be adjusted between 4 profiles that control the speed of the compressor in conjunction with the speed of the indoor blower

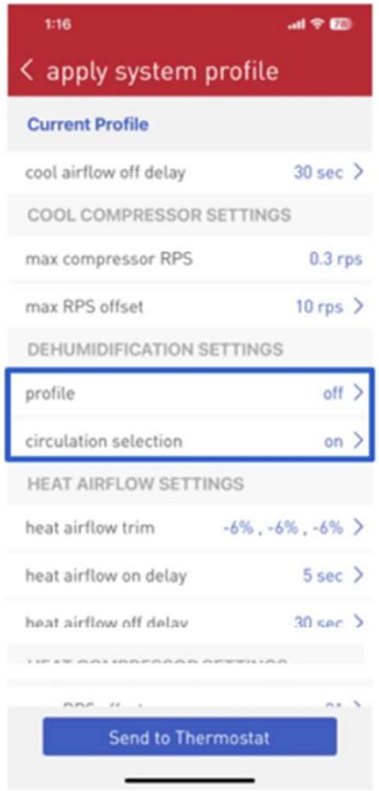
- If the room temperature is 2°F higher than the set temperature, the priority will switch from dehumidification to room temperature control



Common Settings to Adjust



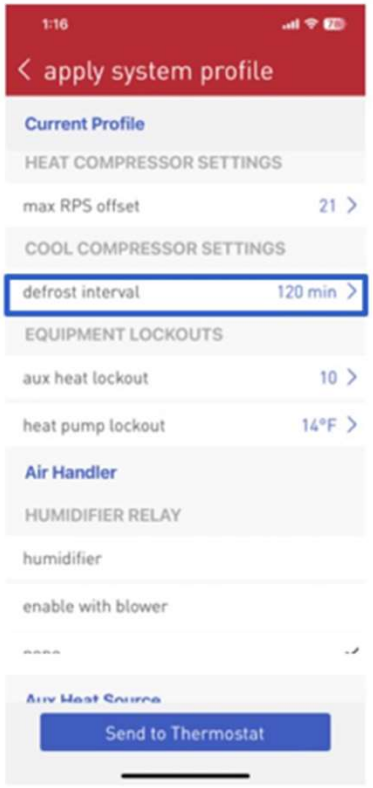
Dehumidification Levels			
STANDARD	A	B	C
Improves dehum by lowering airflow	Max dehum with wide compressor and airflow range	Moderate dehum with reduced compressor and airflow range	Min dehum, compressor fixed at 100%, airflow @70%



Common Settings to Adjust

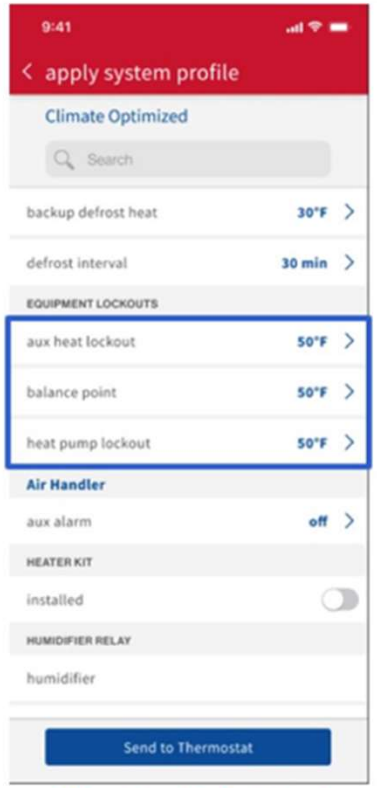
- Defrost Settings

- Defrost heat – You can select the outdoor temperature for backup heat strips to activate during defrost (at or below 30°F – 65°F or Always ON / Always OFF
- If backup strips are locked out, the indoor blower will cycle to 0-cfm during defrost to prevent any cold blow of airflow
- Defrost interval – Every 30, 60, 90, or 120 minutes, the unit will check for defrost
- This initial time interval selection will work in conjunction with Intelligent Defrost that continually monitors the length of each defrost cycle and shortens/lengthen the time interval for the next defrost cycle based on whether the previous cycle was +/- 5 minutes in duration



Common Settings to Adjust

- Heat Pump Settings
- Backup sources of heat (gas or electric strip) may be locked out based on outdoor temperature
- Backup heat may only engage above the lockout temperature if the space temperature is approximately 4°F lower than the setpoint or if the demand for heat is between 110%-200%
- For Dual Fuel operation only, you may select to prioritize efficiency which will create a hard lockout for furnace operation above the balance point

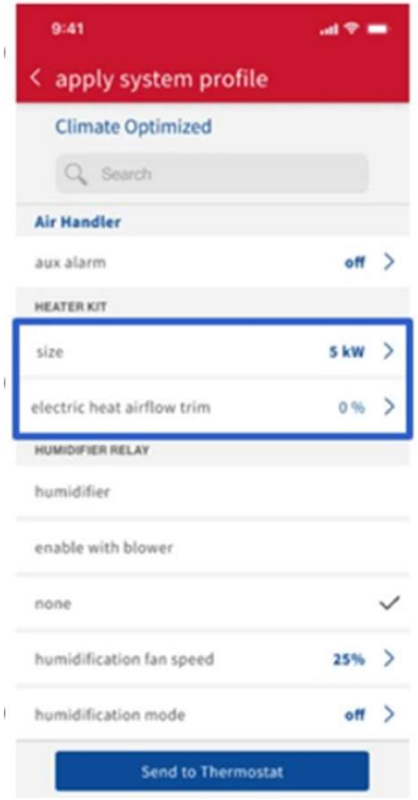


Electric Strip Heat

Dual Fuel

Common Settings to Adjust

- Heater Kit
- It is important to set the capacity of the electric heater at two locations:
- The Goodman Installer app
- The AHVE air handler dip switches



Function	Function	DIP Switch Settings Switch 9 (S9)	Switch 10 (S10)	Switch 11 (S11)	Switch 12 (S12)
Heater Kit Selection	NO Heater Kit	OFF*	OFF*	OFF*	OFF*
	First Valid Heater Kit	ON	ON	ON	ON
	Second Valid Heater Kit	ON	ON	ON	OFF
	Third Valid Heater Kit	ON	ON	OFF	ON
	Fourth Valid Heater Kit	ON	ON	OFF	OFF
	Fifth Valid Heater Kit	ON	OFF	ON	ON
	Sixth Valid Heater Kit	ON	OFF	ON	OFF
	Seventh Valid Heater Kit	ON	OFF	OFF	ON

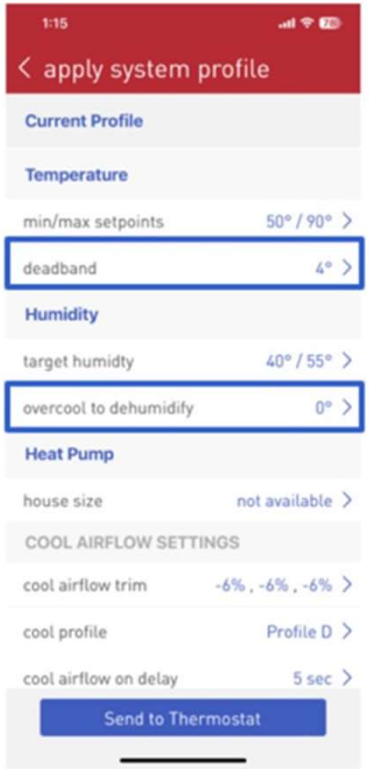
DIP Switch Setting	Model AHVE24BP1400	AHVE36CP1400	AHVE42CP1400	AHVE48DP1400	AHVE60DP1400
First Valid Heater Kit	3	3/5	3/5	3/5	3/5
Second Valid Heater Kit	5	6	6	6	6
Third Valid Heater Kit	6	8	8	8	8
Fourth Valid Heater Kit	8	10	10	10	10
Fifth Valid Heater Kit	10	15	15	15	15
Sixth Valid Heater Kit		19	19	20	20
Seventh Valid Heater Kit					25

Common Settings to Adjust

- Deadband/Overcool

- Deadband is the difference allowed between a cooling setpoint and a heating setpoint when in the AUTO mode
- ECMD recommendation is a Deadband of 2°F

- Overcool is a feature that allows for the unit to cool below the setpoint if there is a demand for dehumidification; this feature only works in conjunction with a target humidity setting
- The Overcool value may be set at 0°F – 3°F



Refrigerant Charge Verification – No Wi-Fi

- Calculating Refrigerant Charge
- The outdoor unit is shipped with a predetermined factory charge level
- For the best charging calculation, the new or existing line set length and diameter must be measured
- Charging tables are provided in the I/O based on indoor coil, line set length, and diameter

Refrigerant Charge Verification – No Wi-Fi

- I/O Charging Chart Example
- Column A = Total Refrigerant Charge
- Column C = Additional Refrigerant Charge to be added
- Bold = Factory Charge

AC	Total/Additional refrigerant (oz.)																			
	1.5 ton												2.0 ton							
Indoor Unit type	CAPEA, AHVE																			
Liquid Pipe Diameter(inch)	1/4"				5/16"				3/8"				5/16"				3/8"			
Suction Pipe Diameter(inch)	5/8"		3/4"		5/8"		3/4"		5/8"		3/4"		5/8"		3/4"		5/8"		3/4"	
Actual Line Set Length(ft.)	(A)	(C)	(A)	(C)	(A)	(C)	(A)	(C)	(A)	(C)	(A)	(C)	(A)	(C)	(A)	(C)	(A)	(C)	(A)	(C)
15 or less	n/a		n/a		n/a		n/a		n/a		**76**	0	n/a		n/a		n/a		**76**	0
20							76	0	77	1	79	3			78	2	77	1	79	3
25			77	1	76	0	78	2	80	4	82	6	78	2	80	4	80	4	82	6
30			78	2	77	1	80	4	83	7	85	9	79	3	82	6	83	7	85	9
35			79	3	79	3	82	6	85	9	88	12	81	5	84	8	85	9	88	12
40	77	1	81	5	80	4	84	8	88	12	92	16	82	6	86	10	88	12	92	16
45	78	2	82	6	82	6	86	10	91	15	95	19	84	8	88	12	91	15	95	19
50	78	2	83	7	83	7	88	12	93	17	98	22	85	9	89	13	93	17	98	22
55	79	3	84	8	85	9	89	13	96	20	101	25	87	11	91	15	96	20	101	25
60	80	4	85	9	86	10	91	15	99	23	104	28	88	12	93	17	99	23	104	28
65	81	5	86	10	88	12	93	17	101	25	107	31	90	14	95	19	101	25	107	31
70	81	5	87	11	89	13	95	19	104	28	110	34	91	15	97	21	104	28	110	34
75	82	6	88	12	91	15	97	21	107	31	113	37					107	31	113	37
80	83	7	90	14	92	16	99	23	109	33	116	40					109	33	116	40
85	83	7	91	15	94	18	101	25	112	36	119	43	n/a		n/a		112	36	119	43
90	84	8	92	16	95	19	103	27	115	39	123	47					115	39	123	47
95	85	9	93	17	97	21	105	29	117	41	126	50					117	41	126	50
100	85	9	94	18	98	22	107	31	120	44	129	53					120	44	129	53

Refrigerant Charge Verification – No Wi-Fi

- Charge Verification

- The thermostat must be set to the cooling mode and given a large cooling demand; recommend setting the cooling setpoint to approximately 50°F to run maximum cooling

- The unit must be allowed to run for 15-20 minutes to establish a full 100% capacity

- If the outdoor ambient is between 65°F and 105°F and the unit is operating at 100%, the chart shown will provide the correct sub-cooling values | Target Superheat is 9°F in cooling mode

GSXS6S & GSZS6S	
Unit Size	Sub-cooling
1.5 TON	10 ± 1°F
2 TON	12 ± 1°F
2.5 TON	14 ± 1°F
3 TON	15 ± 1°F
3.5 TON	8 ± 1°F
4 TON	9 ± 1°F
5 TON	9 ± 1°F

GSXS60	
Unit Size	Sub-cooling
1.5 TON	10 ± 1°F
2 TON	12 ± 1°F
2.5 TON	14 ± 1°F
3 TON	13 ± 1°F
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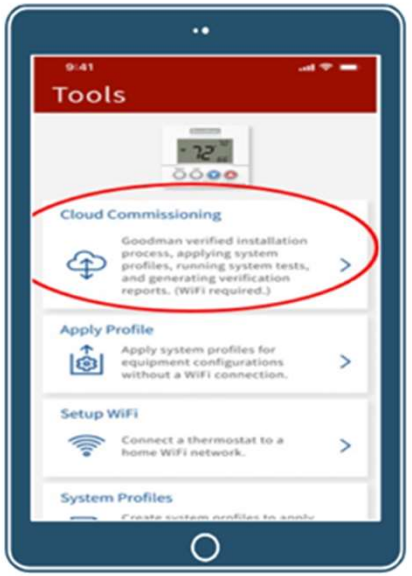
Cloud Commissioning – With Wi-Fi

- Download the Goodman Installer App

- You do not need to create an account to login
- User ID and Password (case sensitive)
- User = Goodman
- Password = Dealer

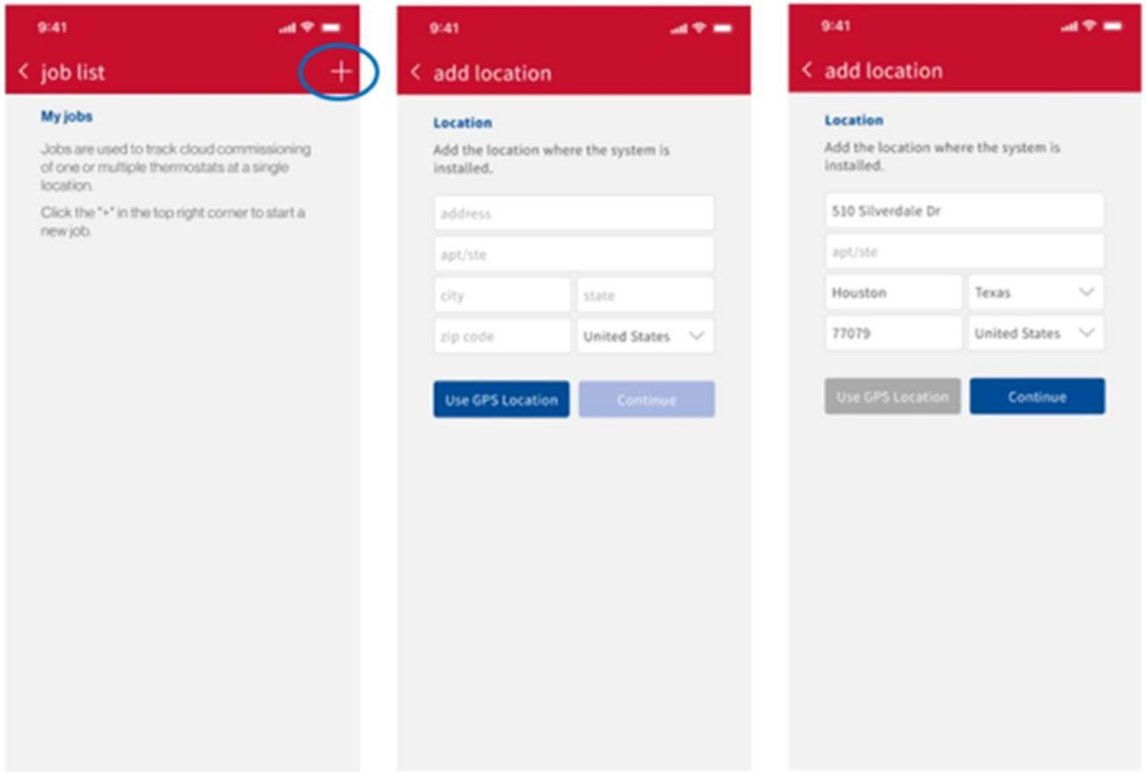


Download on the App Store

ANDROID APP ON Google play

Cloud Commissioning – With Wi-Fi

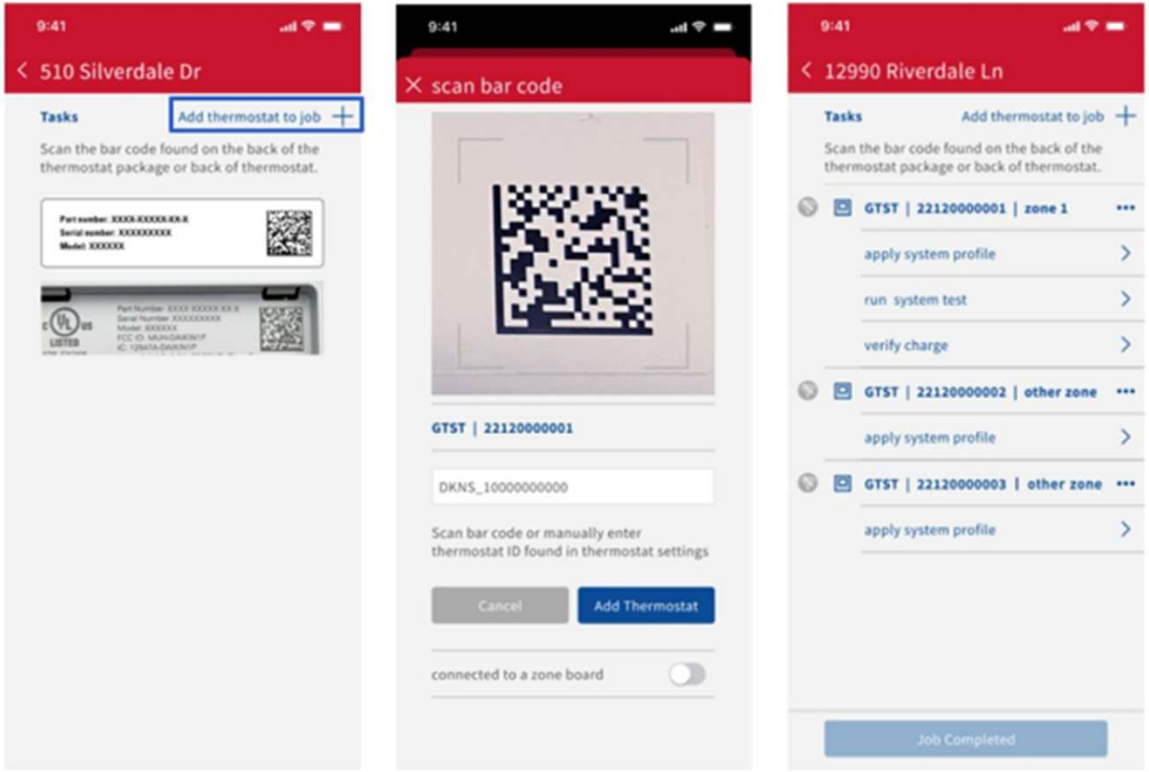
- Every job needs the location details
- Click on the “+” sign to add location details and continue
- The user may use their GPS location to automatically fill in the address



Cloud Commissioning – With Wi-Fi

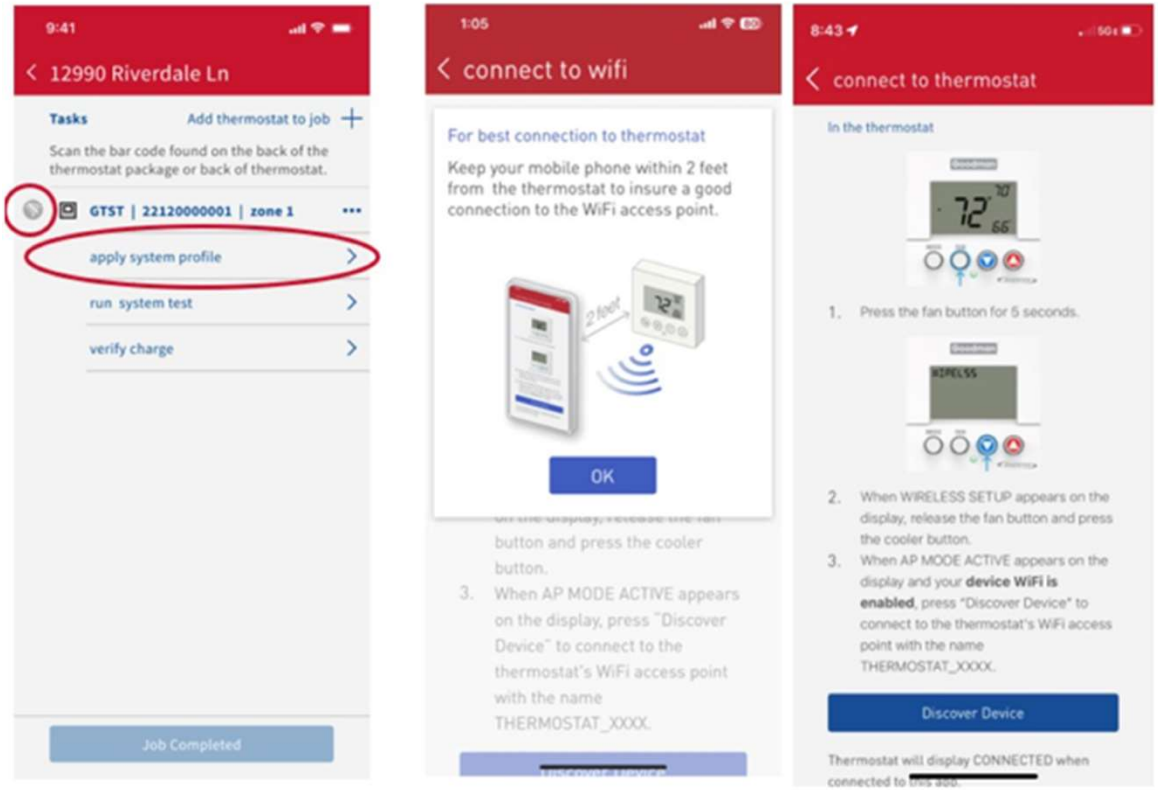
- Add a thermostat by tapping on “+” in the top right corner

- The GTST 2D barcode must be scanned or the thermostat DKNS# manually entered
- The 2D bar code is found on the terminal subbase
- The DKNS# is found by navigating through the thermostat menus



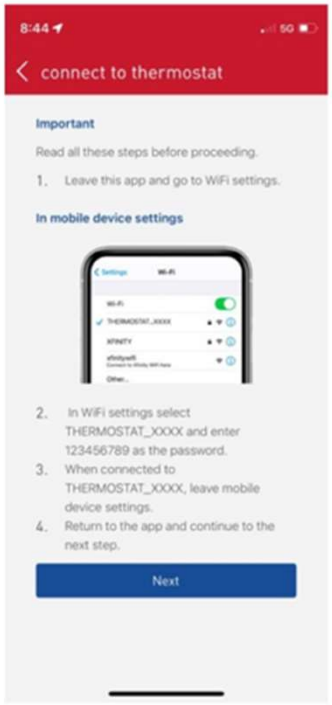
Cloud Commissioning – With Wi-Fi

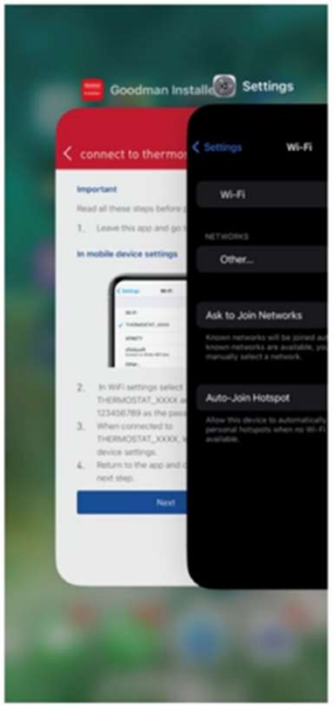
- On selection of any task, internet connection will need to be verified before continuing
- If the Wi-Fi icon is grey, the system is not connected to Wi-Fi
- To connect to Wi-Fi, click on “apply system profile” and follow the system prompts to activate the “Wireless Setup/AP Mode”

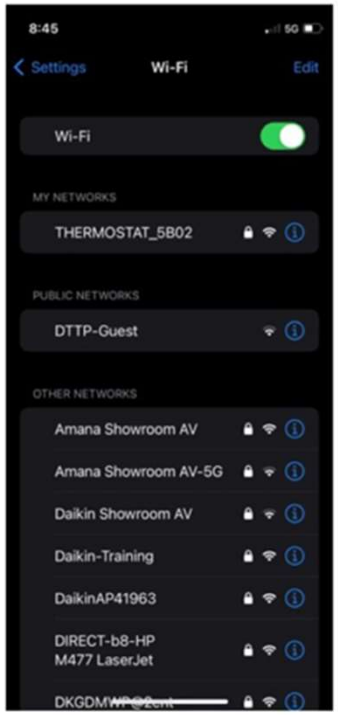


Cloud Commissioning – With Wi-Fi

- The user will be prompted to open the smart device's Wi-Fi settings and connect to the thermostat
- Password = 123456789
- **NOTE:** The Goodman Installer app must remain open while accessing the smart device's Wi-Fi settings

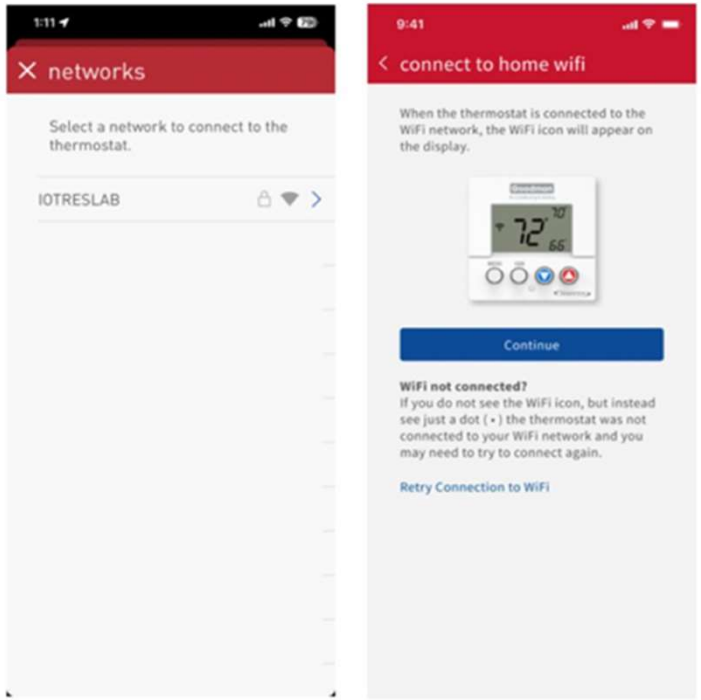






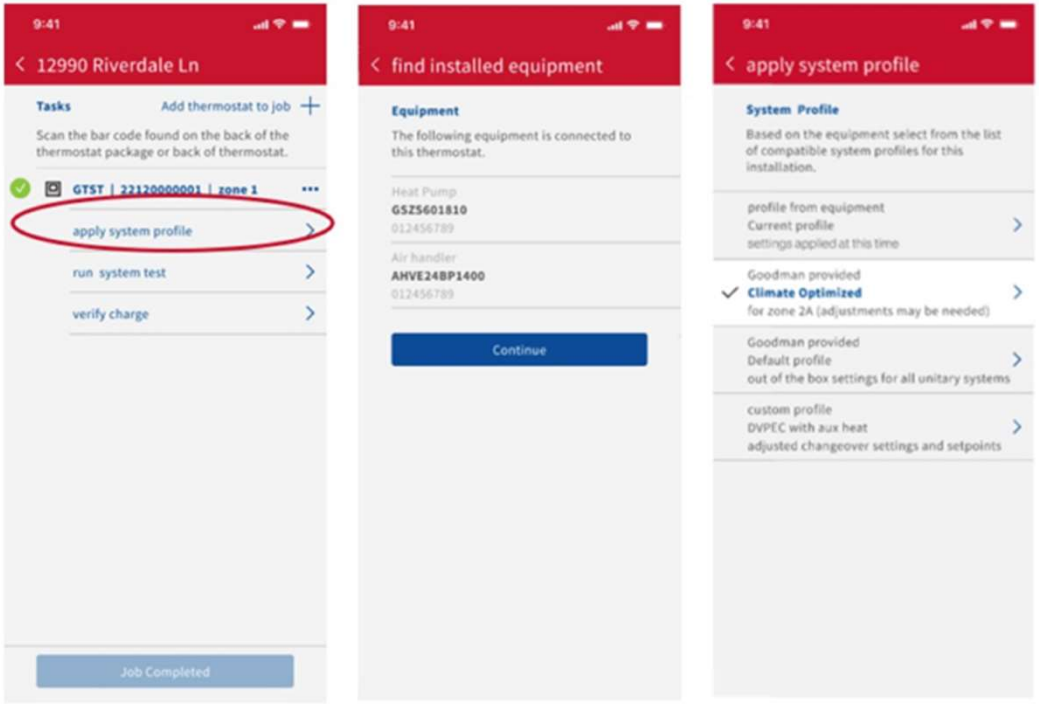
Cloud Commissioning – With Wi-Fi

- Connecting to Home Wi-Fi
- Once connected to the thermostat, following the “Cloud Commissioning” process, the user can connect to a local Wi-Fi network
- Wi-Fi network must be password protected



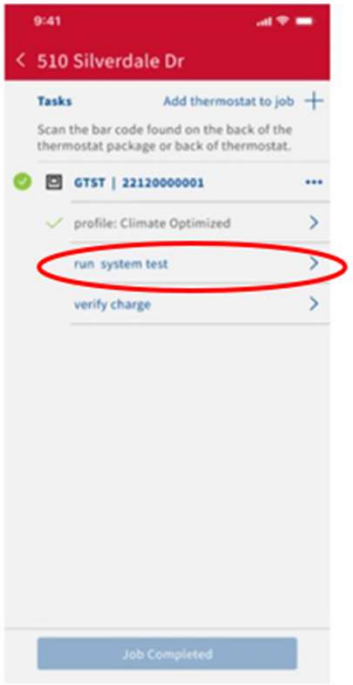
Cloud Commissioning – With Wi-Fi

- A list of the connected equipment will be populated once connected to Wi-Fi
- Verify the equipment listed, then continue to view thermostat profile options
- You may select and/or modify any profile to send to the thermostat



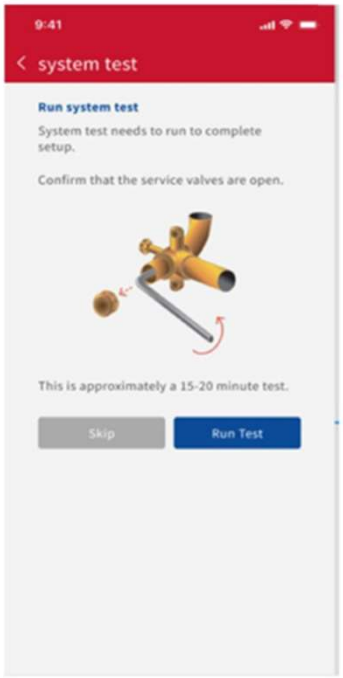
Cloud Commissioning – With Wi-Fi

- “Running System Test” will prompt the user to calculate the charge before running the test
- Be prepared to have the total line set length as well as the pipe diameters to calculate additional refrigerant charge needed
- You will be prompted to input the amount of refrigerant added



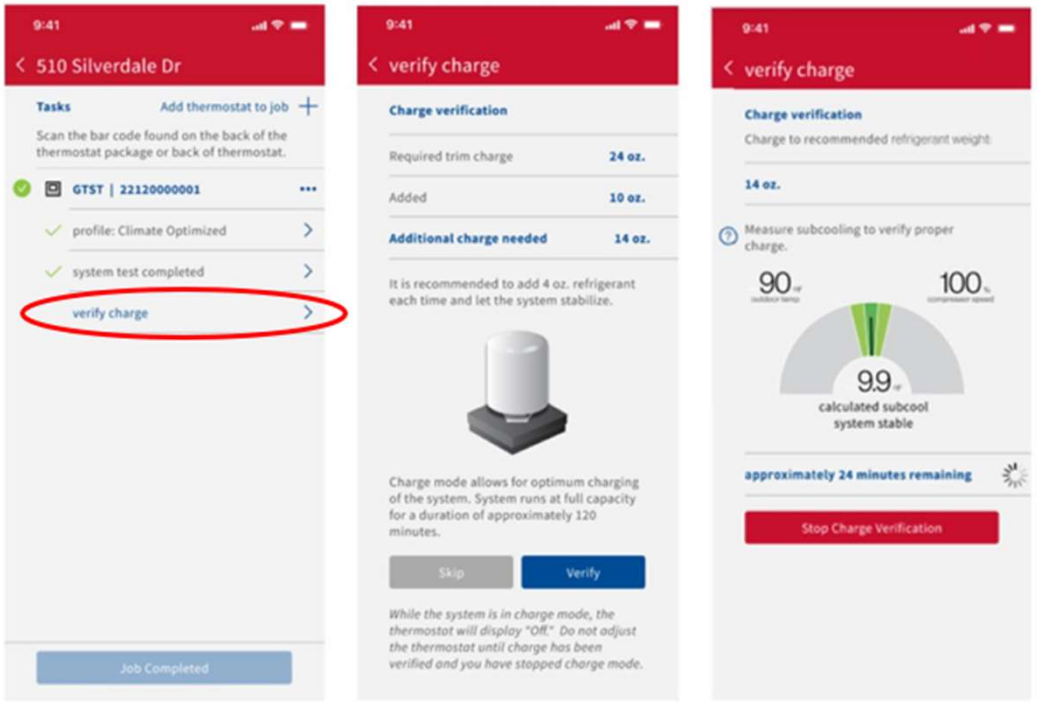
Cloud Commissioning – With Wi-Fi

- Verify service valves are open
- Tap “Run Test”
- User may leave the screen while test is running and return as needed
- System test is required
- If the test has not been completed an error code “11” will be displayed at the outdoor PCB
- Error code “11” will clear once the test is complete



Cloud Commissioning – With Wi-Fi

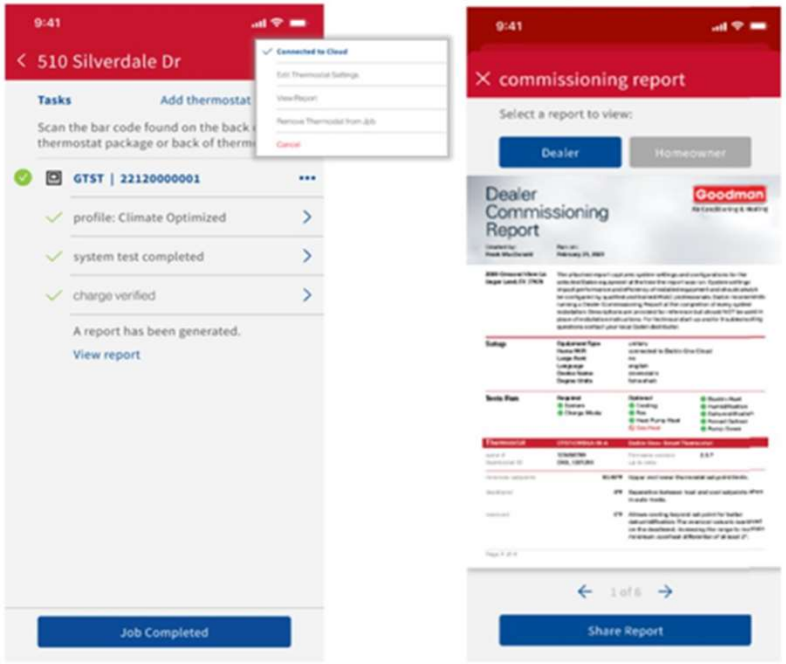
- Charge verification allows for optimum charging of the system
- Once the system stabilizes and is running at full speed, the calculated sub-cooling will be displayed
- Stopping the verification will generate a report



Cloud Commissioning – With Wi-Fi

- Complete Setup

- After all steps are complete, the user will be able to share a commissioning report before completing the job



East Coast

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