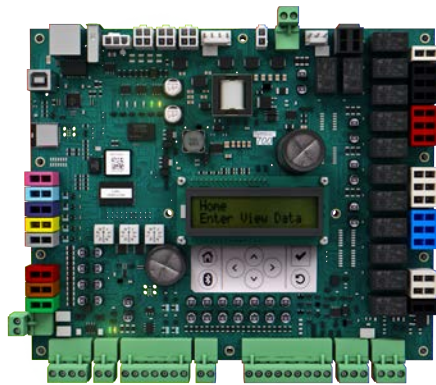


Installation Guide

# Split System Air Conditioners Odyssey™ with Symbio™ Controls R-454B

Wiring and Start-Up



## **▲ SAFETY WARNING**

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.

June 2024

**SS-SVN017A-EN**

## Warnings, Cautions, and Notices

Safety advisories appear throughout this manual as required. Your personal safety and the proper operation of this machine depend upon the strict observance of these precautions.

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The three types of advisories are defined as follows:



Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It could also be used to alert against unsafe practices.



Indicates a situation that could result in equipment or property-damage only accidents.

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## Important Environmental Concerns

Scientific research has shown that certain man-made chemicals can affect the earth's naturally occurring stratospheric ozone layer when released to the atmosphere. In particular, several of the identified chemicals that may affect the ozone layer are refrigerants that contain Chlorine, Fluorine and Carbon (CFCs) and those containing Hydrogen, Chlorine, Fluorine and Carbon (HCFCs). Not all refrigerants containing these compounds have the same potential impact to the environment. Trane advocates the responsible handling of all refrigerants.

## Important Responsible Refrigerant Practices

Trane believes that responsible refrigerant practices are important to the environment, our customers, and the air conditioning industry. All technicians who handle refrigerants must be certified according to local rules. For the USA, the Federal Clean Air Act (Section 608) sets forth the requirements for handling, reclaiming, recovering and recycling of certain refrigerants and the equipment that is used in these service procedures. In addition, some states or municipalities may have additional requirements that must also be adhered to for responsible management of refrigerants. Know the applicable laws and follow them.

### **WARNING**

#### **Proper Field Wiring and Grounding Required!**

**Failure to follow code could result in death or serious injury.**

**All field wiring MUST be performed by qualified personnel. Improperly installed and grounded field wiring poses FIRE and ELECTROCUTION hazards. To avoid these hazards, you MUST follow requirements for field wiring installation and grounding as described in NEC and your local/state/national electrical codes.**

## **⚠ WARNING**

### **Personal Protective Equipment (PPE) Required!**

Failure to wear proper PPE for the job being undertaken could result in death or serious injury. Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, **MUST** follow precautions in this manual and on the tags, stickers, and labels, as well as the instructions below:

- Before installing/servicing this unit, technicians **MUST** put on all PPE required for the work being undertaken (Examples; cut resistant gloves/sleeves, butyl gloves, safety glasses, hard hat/bump cap, fall protection, electrical PPE and arc flash clothing). **ALWAYS** refer to appropriate Safety Data Sheets (SDS) and OSHA guidelines for proper PPE.
- When working with or around hazardous chemicals, **ALWAYS** refer to the appropriate SDS and OSHA/GHS (Global Harmonized System of Classification and Labelling of Chemicals) guidelines for information on allowable personal exposure levels, proper respiratory protection and handling instructions.
- If there is a risk of energized electrical contact, arc, or flash, technicians **MUST** put on all PPE in accordance with OSHA, NFPA 70E, or other country-specific requirements for arc flash protection, **PRIOR** to servicing the unit. **NEVER PERFORM ANY SWITCHING, DISCONNECTING, OR VOLTAGE TESTING WITHOUT PROPER ELECTRICAL PPE AND ARC FLASH CLOTHING. ENSURE ELECTRICAL METERS AND EQUIPMENT ARE PROPERLY RATED FOR INTENDED VOLTAGE.**

## **⚠ WARNING**

### **Follow EHS Policies!**

Failure to follow instructions below could result in death or serious injury.

- All Trane personnel must follow the company's Environmental, Health and Safety (EHS) policies when performing work such as hot work, electrical, fall protection, lockout/tagout, refrigerant handling, etc. Where local regulations are more stringent than these policies, those regulations supersede these policies.
- Non-Trane personnel should always follow local regulations.

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# Overview

This guide provides instructions for the wiring of R-454B applications. For information regarding R-410A split system applications, please refer to SS-SVN016\*-EN.

The information in this guide is specifically applicable to Trane Odyssey air handling units that are paired with Trane Odyssey condensing units.

In most cases, Odyssey split system applications offer standard thermostat functionality with simplified field wiring. However, there are also full-featured options available for single zone VAV applications and installations with zone sensors. For more details, please refer to the table provided below.

**Table 1. Symbio 700/Odyssey standard and full featured options**

		2-Stage Thermostat	Full Featured
Type	Cooling Condenser	✓	✓
	Heat Pump	✓	✓
Thermostat or Zone Sensor	Thermostat Control	✓	✓
	Zone Sensor		✓
	Air-Fi Wireless		✓ <sup>(a) (b)</sup>
AHU Supply Fan Control	Constant Speed	✓	✓
	Two Speed	✓	✓
	Variable Speed		✓
Control Board License	Basic	✓	✓
	Advanced	✓ <sup>(c)</sup>	✓
BMS Communication	BACnet MS/TP		✓
	BACnet/IP		✓
	Air-Fi Wireless		✓ <sup>(b)</sup>
Installation Type	Retrofit	✓	✓
	New	✓	✓
Symbio Mobile App		✓	✓
Trane Connect Remote Access		✓ <sup>(d)</sup>	✓
R-454B (A2L) Mitigation		✓	✓
Evaporator Defrost Control		✓	✓
Input/Output Point Expansion		✓	✓
Custom Programming		✓	✓
Service Test Mode		✓ <sup>(e)</sup>	✓
Equipment Shutdown Input			✓
Heat Control in Defrost			✓
Demand Limit / Demand Shed			✓
Supply Air Tempering			✓

<sup>(a)</sup> Requires the Advanced controller license.

<sup>(b)</sup> Field applied option only.

<sup>(c)</sup> The thermostat/light applications can be accomplished with either the basic or advanced license, while the full featured applications require the advanced license.

<sup>(d)</sup> Requires network or cellular modem connection.

<sup>(e)</sup> Cooling stages only. Supply fan and heat stages must be overridden by other means.

# Standard Thermostat Functionality

For pairing applications where control is provided by the thermostat, wiring between the air handler and condenser is reduced to a single cable for both condenser cooling and heat pump applications. In these applications, the thermostat provides control of the split system. The Symbio™ 700 accepts the Y1, Y2 (optional), O (heat pump only), and Limit/Shed (compressor disable) inputs from the thermostat/AHU.

## Wiring Requirements

### Thermostat and Control Wire

**Table 2. Recommended thermostats and control wire size and length**

Wire Gauge	Maximum Wire Length
22	30 feet
20	50 feet
18	75 feet
16	125 feet
14	200 feet

## Condenser and Air Handler Pair Wiring Information

**Table 3. Model number descriptions**

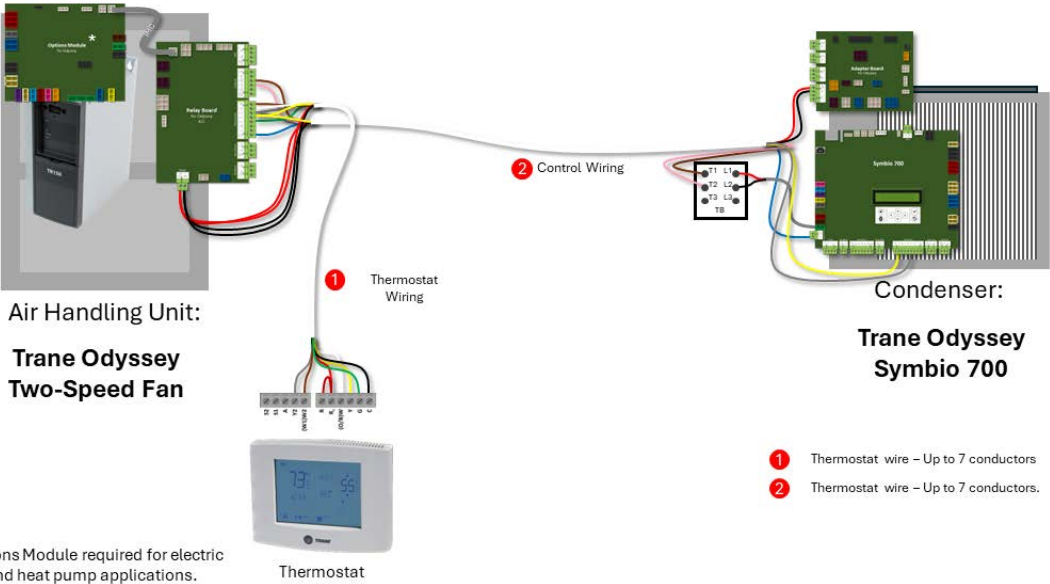
Symbio Air Handler
<p><b>Digit 15 — Controls</b></p> <p>C = 2-speed D = Single Zone VAV (not for use with 24V thermostat)</p>

**Table 4. Condenser and air handler pairing details — simplified thermostat wiring**

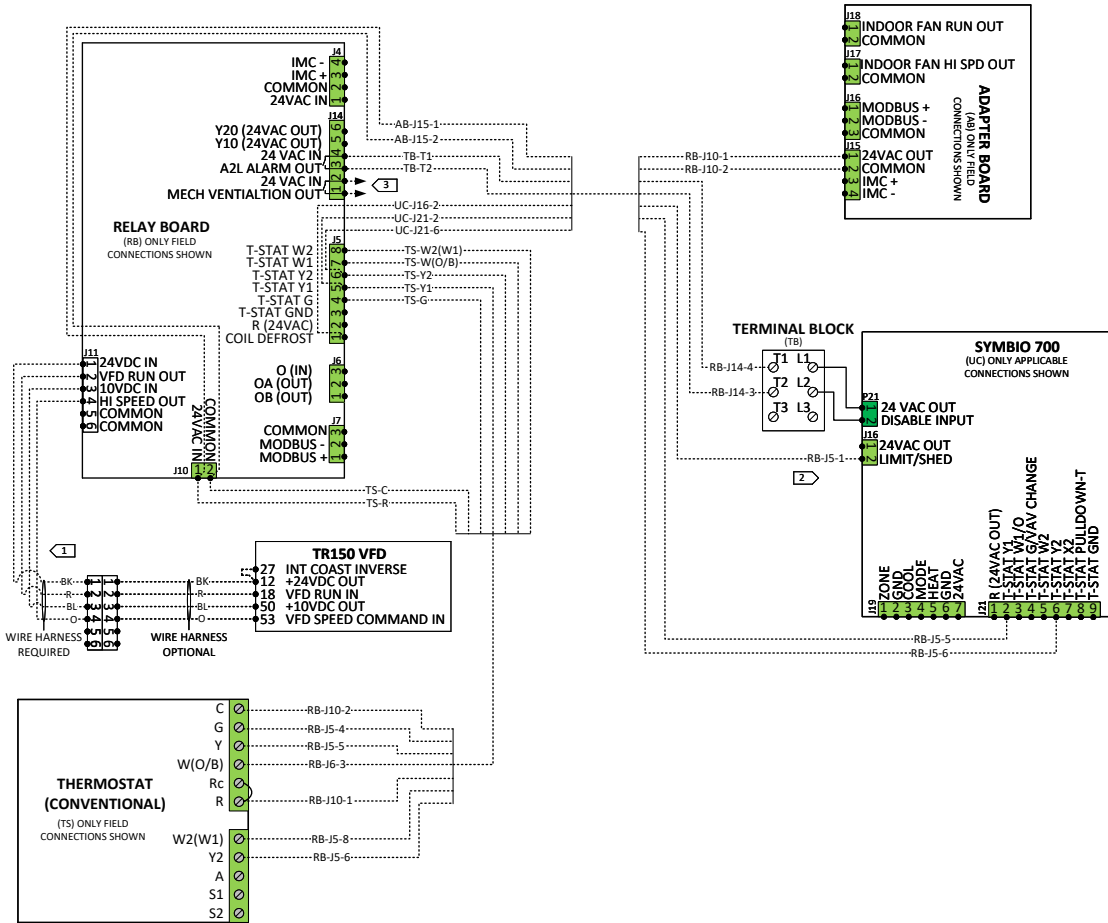
Condenser (model # digit)	Air Handler		Wiring Reference	Description
	Type	Supply Fan Type (model # digit)		
Odyssey Symbio (Digit 15 = S)	Odyssey Symbio	2-Speed Fan (Digit 15 = C)	Figure 1, p. 7	<p>The VFD harness and programming is factory installed in this scenario.</p> <p><b>Important:</b> Additional Symbio 700 setup is necessary for the simplified wiring.</p> <p>Control is provided by the thermostat, not the Symbio 700. Symbio 700 controls the cooling stages and heat pump reversing valve, when applicable.</p> <p>Electric heat will not operate in heat pump defrost mode.</p>
		Single Zone VAV (Digit 15 = D)	Figure 2, p. 9	<p>If the AHU was ordered as SZVAV, the unit MUST be converted for 2-speed operation to leverage the simplified thermostat wiring. Single Zone VAV operation requires the full featured wiring methods described later in this guide.</p> <p>Install the necessary harness to the VFD and reprogram the VFD accordingly.</p> <p><b>Important:</b> Additional Symbio 700 setup is necessary for the simplified wiring.</p> <p>Control is provided by the thermostat, not the Symbio 700. Symbio 700 controls the cooling stages and heat pump reversing valve, when applicable.</p> <p>Electric heat will not operate in heat pump defrost mode.</p>

### Pairing H for Condenser Cooling

Figure 1. Pairing H for condenser cooling thermostat control applications



\* Options Module required for electric heat and heat pump applications.



## Standard Thermostat Functionality

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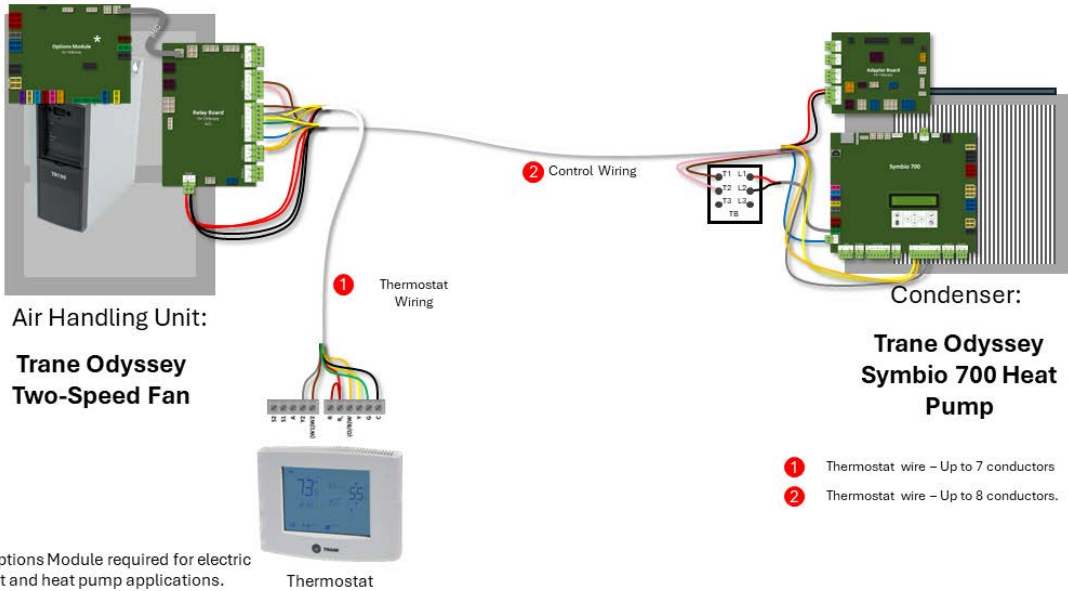
### Notes:

- *For Symbio Air Handlers SZVAV (Digit 15=D), wire harness WIR11487 will be required. Wire harness can be purchased from Trane Supply. Wiring harness WIR11494 is optional and is only needed to provide a pigtail for the VFD.*
- *If EDC switch in the Symbio Air Handler unit will be utilized for low evaporator compressor protection, connection between relay board (J5-1) and Symbio 700 (J16-2) will be required. Otherwise, this connection can be omitted.*
- *Use Mechanical Ventilation Output contacts (N.O.) to enable external ventilation system when required by the application. (Contact Rating: 24VAC/VDC, 2 AMPS).*

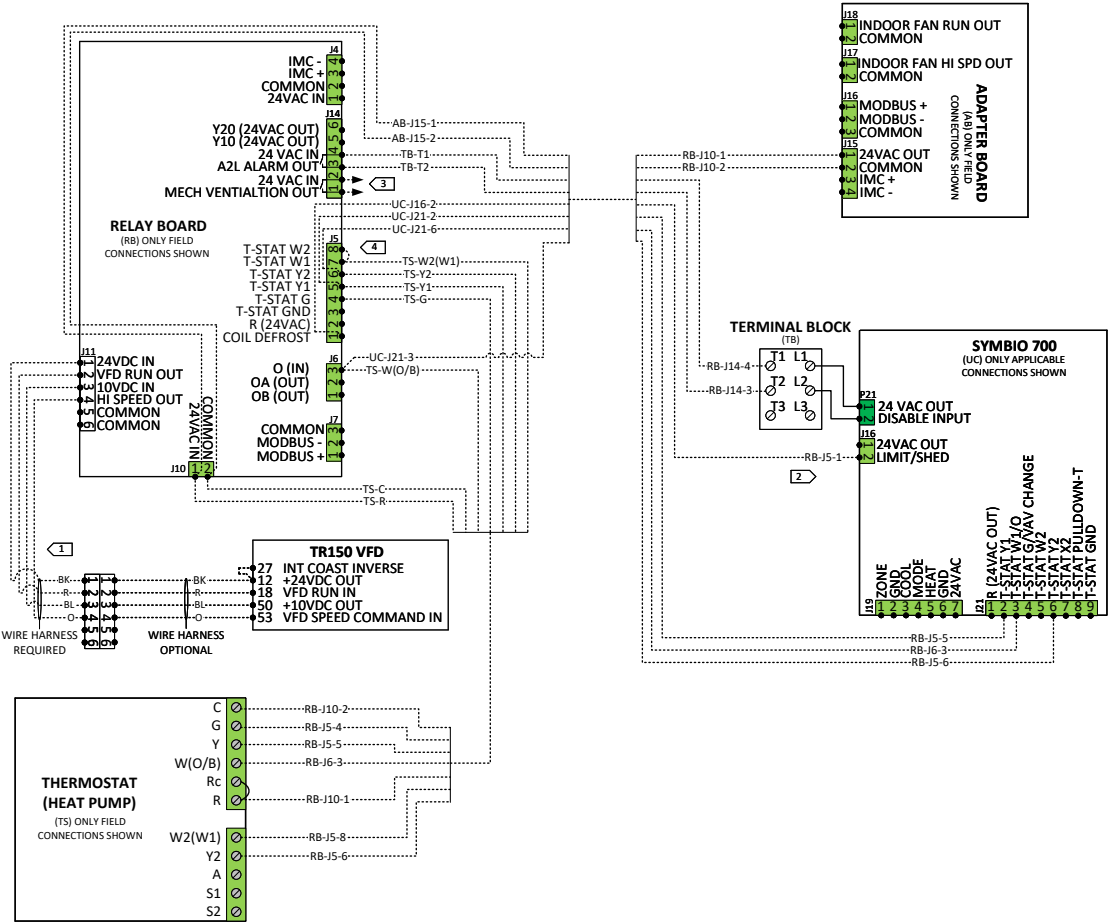


### Pairing H for Heat Pump Operation

Figure 2. Pairing H for heat pump thermostat control applications



\* Options Module required for electric heat and heat pump applications.



## Standard Thermostat Functionality

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### Notes:

- *For Symbio Air Handlers SZVAV (Digit 15=D), wire harness WIR11487 will be required. Wire harness can be purchased from Trane Supply. Wiring harness WIR11494 is optional and is only needed to provide a pigtail for the VFD.*
- *If EDC switch in the Symbio Air Handler unit will be utilized for low evaporator compressor protection, connection between relay board (J5-1) and Symbio 700 (J16-2) will be required. Otherwise, this connection can be omitted.*
- *Use Mechanical Ventilation Output contacts (N.O.) to enable external ventilation system when required by the application. (Contact Rating: 24VAC/VDC, 2 AMPS).*
- *If electric auxiliary heat is available, install jumper between W1 and W2 at the Relay Board. Thermostat auxiliary heat call W2(W1) will energize electric heat stages.*

### Air Handling Unit Modifications

If the Symbio Air Handling Unit was selected as Single Zone VAV (Digit 15=D) the following changes will be required:

1. Remove the existing wire harness from relay board P1 and VFD terminals 61, 68, and 69. This harness is not used with the Standard Thermostat Simplified Wiring Configuration.
2. Connect wiring harness WIR010183 and WIR010185 from relay board J11 to VFD terminals 12, 18, 50, and 53. Verify that jumper exists between VFD terminals 12 and 27.

The following parameters must also be updated in the TR150 VFD:

1. Change 3-15 from [11] Local Bus reference to [1] Analog Input 53.
2. Change 5-10 from [0] No Operation to [8] Start.
3. Change 5-12 from [0] No Operation to [2] Coast Inverse.
4. Change 8-01 from [2] Control Word Only to [0] Digital and Control Word.
5. Change 8-02 from [1] FC Port to [0] None.
6. Verify 4-12 is set to 25 HZ.
7. Verify 4-14 is set to 60 HZ.
8. Verify 6-10 is set to 0.07V.
9. Verify 6-11 is set to 10.00V.
10. Verify 6-14 is set to 25 HZ.
11. Verify 6-15 is set to 60 HZ.

If the Symbio air handling unit was selected for 2-speed operation (Digit 15=C), the necessary wiring and VFD setup steps were completed in the factory.

## Configure the Symbio 700 Controller

When using the Standard Thermostat Simplified Wiring Configuration, heating, cooling, and AHU supply fan control is provided by the thermostat and not the Symbio 700 controller. For this configuration to work as intended, the following parameters must be properly configured in the Symbio 700 Controller:

- 1. System Type: **CVZT**
- 2. Indoor Fan Type: **Single Speed<sup>(a)</sup>**
- If unit is Condenser Cooling:
  - 3. Primary Heating Source: **Not Installed<sup>(b)</sup>**
- If the unit is Heat Pump:
  - 3. Secondary Heating Source: **Not Installed**
  - 4. Outside Air: **Not Installed**
  - 5. Ventilation Override: **Not Installed**
  - 6. Alarm Indicator: **Not Installed**
  - 7. Space Controller: **Conventional TStat**
  - 8. Demand Management: **None**
  - 9. Humidity Sensor: **Not Installed**
  - 10. CO<sub>2</sub> Sensor: **Not Installed**
  - 11. Demand Controlled Ventilation: **Not Installed**
  - 12. Discharge Temperature Sensor: **Not Installed**

<sup>(a)</sup> AHU model number differences:

- If Digit 15=1, unit will operate as a Constant Volume unit.
- If Digit 15=C, unit will operate as a 2-Speed Airflow.
- If Digit 15=D, once changes listed under “Air Handler Unit Modifications” are completed, the unit will operate as a 2-Speed Airflow.

<sup>(b)</sup> If the Air Handler unit has electric heat, heat will be controlled by the Thermostat. Configure the Symbio 700 for primary heating source to “Not Installed” or, if unit is a Heat Pump, secondary Heating Source to “Not Installed”.

## Air Handler to Condenser Connections

Control wire – thermostat wire, up to eight conductors

**Table 5. Pairing H air handler to condenser wiring**

Con-ductor	Re-quired/Optional	Air Handler Con-nection	Condens-er Con-nection	Purpose	Detail
1	Required	RB-J10-1	AB-J15-1	24VAC	It is recommended that the air handler and condensing unit share low voltage power. If the air handler and condensing unit have separate low voltage power, these conductors can be omitted, but isolation relays are needed on the remaining control wire conductors.
2	Required	RB-J10-2	AB-J15-2	Ground	
3	Required	RB-J5-5	UC-J21-2	Y1	Cooling Stage 1
4	Optional	RB-J5-6	UC-J21-6	Y2	Cooling Stage 2, when applicable
5	Optional	RB-J5-1	UC-J16-2	Limit/Shed	Evaporator defrost (compressor disable)
6	Required	RB-J14-4	TB-T1	A2L Alarm 24VAC	A2L Alarm indication (compressor disable)
7	Required	RB-J14-3	TB-T2	A2L Alarm Output	

Table 5. Pairing H air handler to condenser wiring (continued)

Conductor	Required/Optional	Air Handler Connection	Condenser Connection	Purpose	Detail
8	Optional	RB-J6-3	UC-J21-3	W1/O	Heat pump reversing valve (heat pump applications only)

# Full-Featured Functionality

## Wiring Requirements

### Thermostat Control Wire

**Table 6. Recommended thermostat control wire size**

Wire Gauge	Maximum Wire Length
22	30 feet
20	50 feet
18	75 feet
16	125 feet
14	200 feet

### Zone Sensor Wire

**Table 7. Zone sensor module wiring**

Distance from Unit to Control	Recommended Wire Size
0–150 feet (0–45.7 meters)	22 gauge (0.33 mm <sup>2</sup> )
151–240 feet (46–73.1 meters)	20 gauge (0.5 mm <sup>2</sup> )

### Shielded Twisted Pair Cable

A shielded twisted pair cable is required for Symbio condenser installations where the indoor air handler is variable speed supply fan (VFD) and/or electric heat. See Air Handler and Condenser pairing information for more details regarding shield twisted pair cable installation requirements.

Trane Purple Wire is recommended when shielded twist pair cable is required (see the following table).

Part Number	Description
CAB01568	Cable, comlink cable with PVC jacket, 18/1 pr, stranded shield, 25PF plenum, 100 foot length
CAB01569	Cable, comlink cable with PVC jacket, 18/1 pr, stranded shield, 25PF plenum, 1,000 foot length

Alternate shield twisted pair cable can be used if it conforms to the following physical characteristics:

- Twisted pair (two-conductor) plus shield
- Characteristic impedance: 100 and 130 ohms
- Distributed capacitance between conductors: < 100 pF/m
- Distributed capacitance between conductor and shield: < 200 pF/m
- Foil or braided shield is acceptable
- Wire diameter: 22 to 18 AWG

## Condenser and Air Handler Pairings

**Table 8. Model number descriptions**

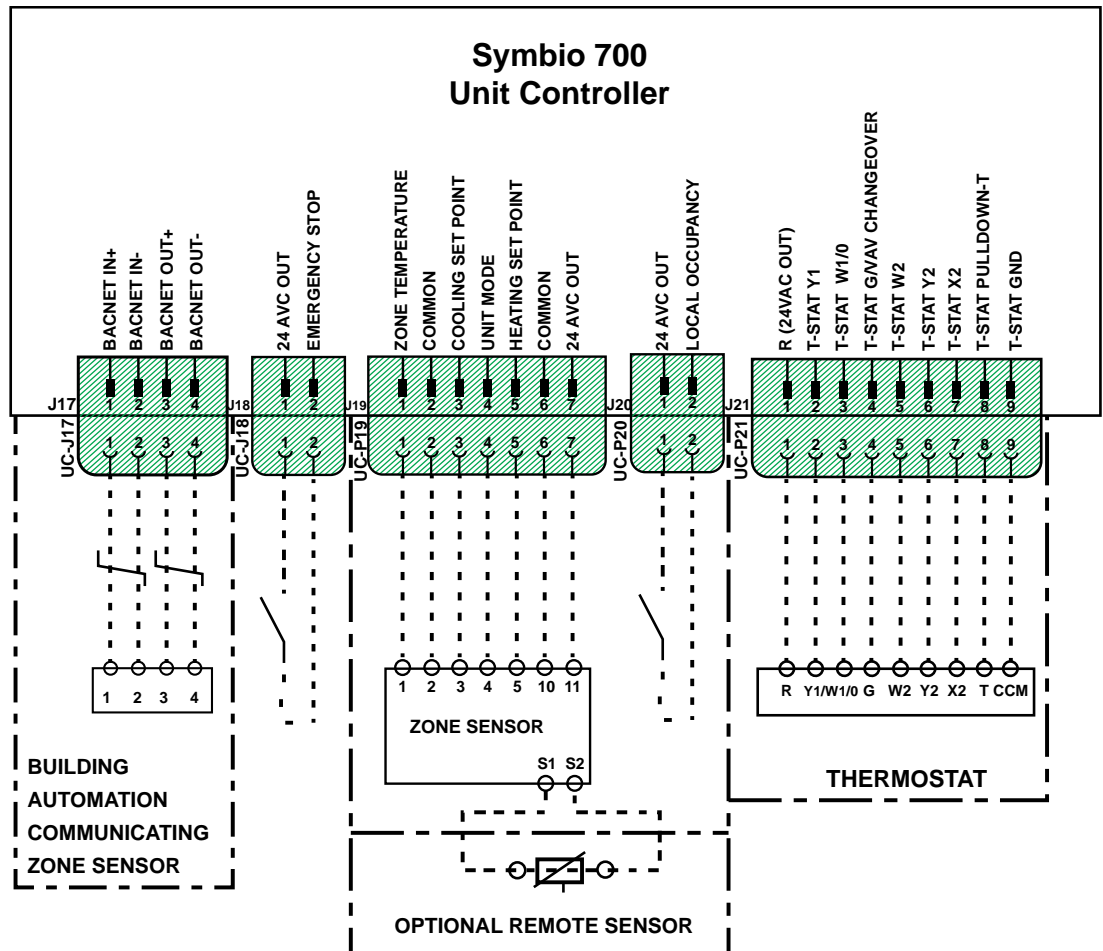
TWE Air Handler with Symbio
<p><b>Digit 15 — Controls</b></p> <p>1 = Constant Volume            C = 2-Speed            D = Single Zone VAV (Not for use with 24V thermostat)</p>

Table 9. Condenser and air handler pairing instructions

Condenser (model # digit)	Air Handler		Wiring Reference	Instructions
	Type	Supply Fan Type (model # digit)		
Odyssey Symbio (Digit 15 = S)	Odyssey Symbio	Constant Volume (Digit 15 = 1)	"Pairing A," p. 17	Install a shielded, twisted pair cable if the Air Handler has Electric Heat and/or requires Single Zone VAV operation (Trane IMC communication)
		2-Speed Fan (Digit 15 = C)	"Pairing H," p. 22	Pairing G, H, 1, and 2 will not have electric heat in defrost.  Pairing G, H, 1, and 2; electric heat will not operate if zone sensor installed, only with a thermostat  Install a shielded, twisted pair cable if the Air Handler has Electric Heat and/or requires Single Zone VAV operation (Trane IMC communication)
		Single Zone VAV (Digit 15 = D)		
Not for use with 24V thermostat			"Pairing B," p. 17	Install a shielded, twisted pair cable if the Air Handler has Electric Heat and/or requires Single Zone VAV operation (Trane IMC communication)  Install a shielded, twisted pair cable for Symbio Condenser control of the Air Handler supply fan VFD (Modbus communication)

## Thermostat and Zone Sensor Wiring

Figure 3. Thermostat or zone sensor wiring to Symbio 700 unit controller



Connect a thermostat or other zone control device to the Symbio 700 Unit Controller. [Figure 3, p. 15](#) provides wiring guidance for zone sensor BAYSENS135.

**Notes:**

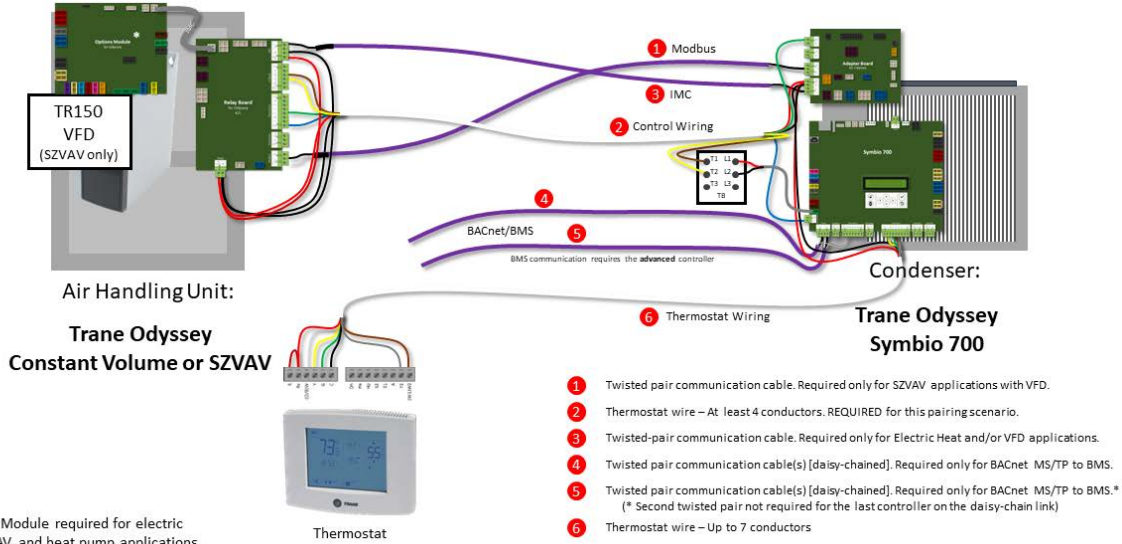
- *Symbio controls do not support BAYSENS109 and BAYSENS110 sensor LED indicators.*
- *Symbio 700, J21-1 (R), is current limited. Alternately, thermostat 24VAC power can be connected at Adapter Board (AB) J15-1.*



# Condenser and Air Handler Pair Wiring Information

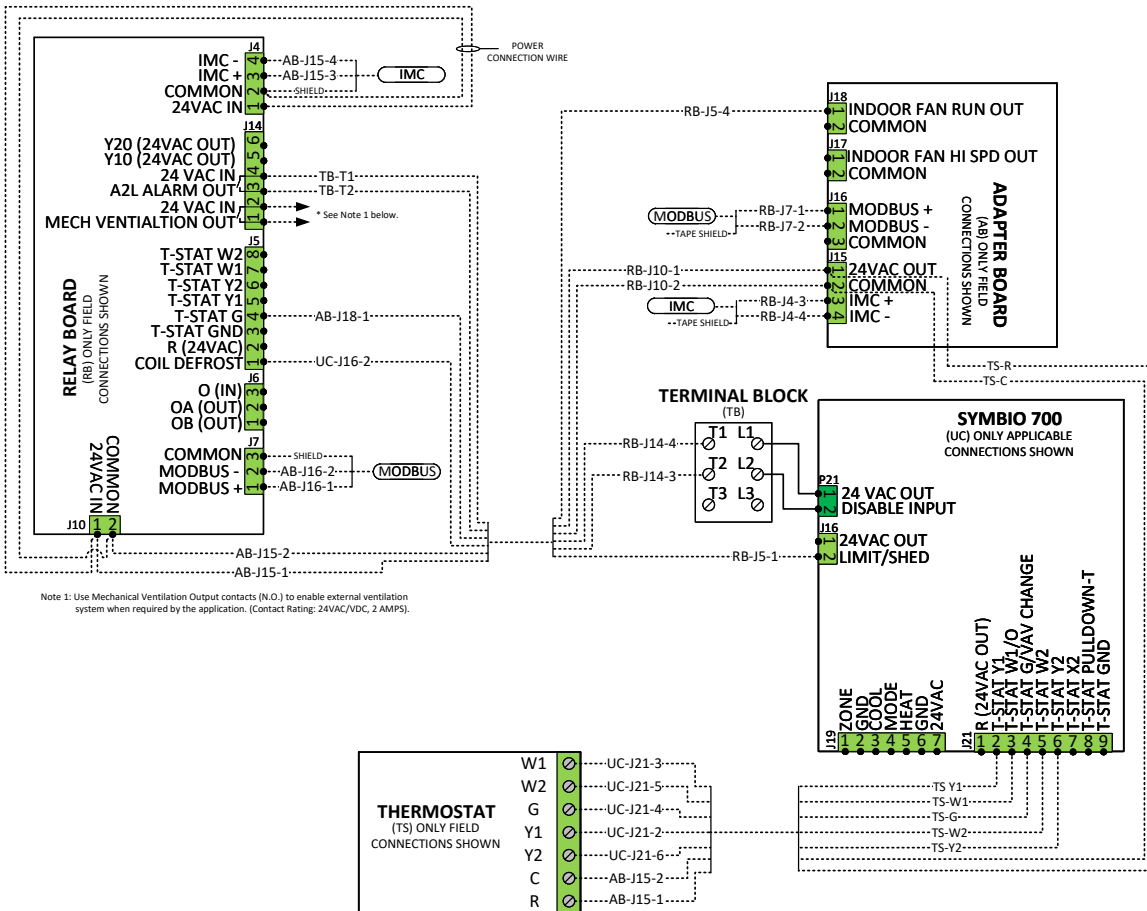
## Pairing A or B

Figure 4. Pairing A or B thermostat for Symbio condenser to Symbio air handler constant Volume or SZVAV



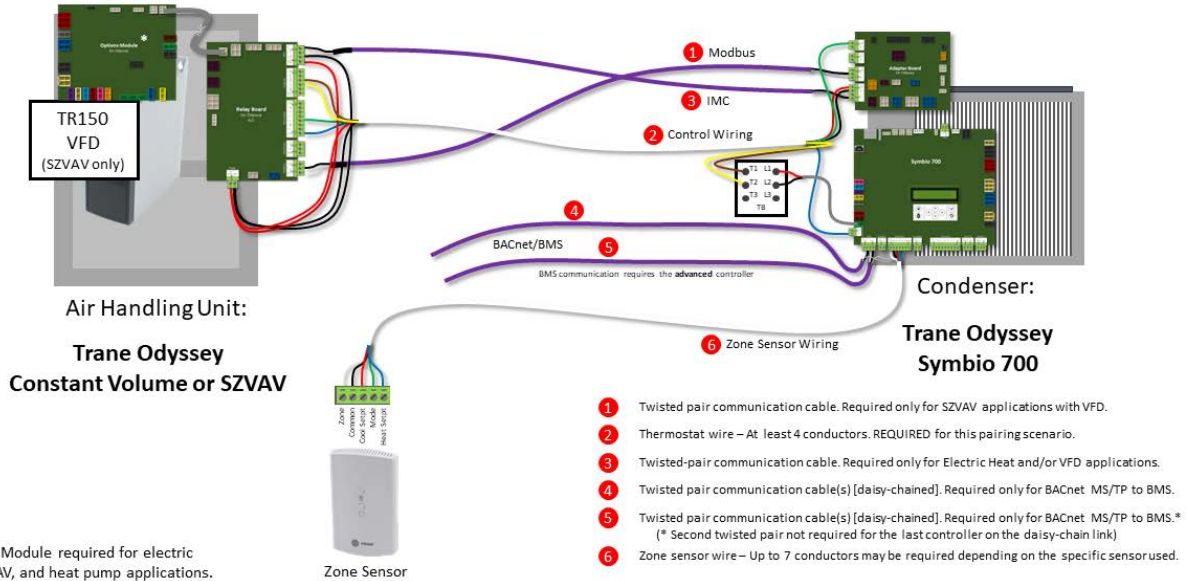
- 1 Twisted pair communication cable. Required only for SZVAV applications with VFD.
- 2 Thermostat wire – At least 4 conductors. REQUIRED for this pairing scenario.
- 3 Twisted pair communication cable. Required only for Electric Heat and/or VFD applications.
- 4 Twisted pair communication cable(s) [daisy-chained]. Required only for BACnet/MS/TP to BMS.
- 5 Twisted pair communication cable(s) [daisy-chained]. Required only for BACnet/MS/TP to BMS.\*  
(\* Second twisted pair not required for the last controller on the daisy-chain link)
- 6 Thermostat wire – Up to 7 conductors

\* Options Module required for electric heat, SZVAV, and heat pump applications.



# Full-Featured Functionality

Figure 5. Pairing A or B zone sensor for Symbio condenser to Symbio air handler constant Volume or SZVAV



\* Options Module required for electric heat, SZVAV, and heat pump applications.

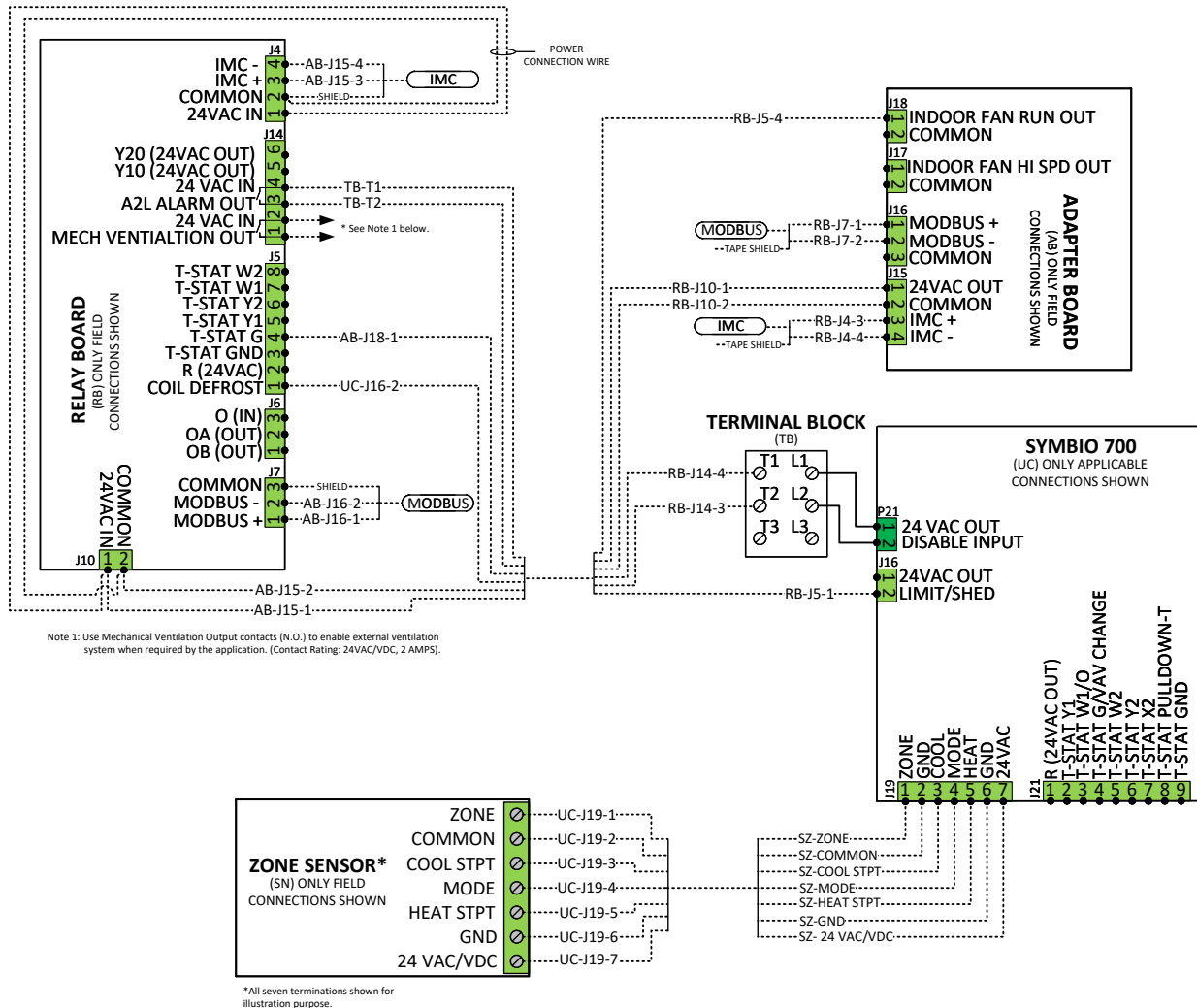
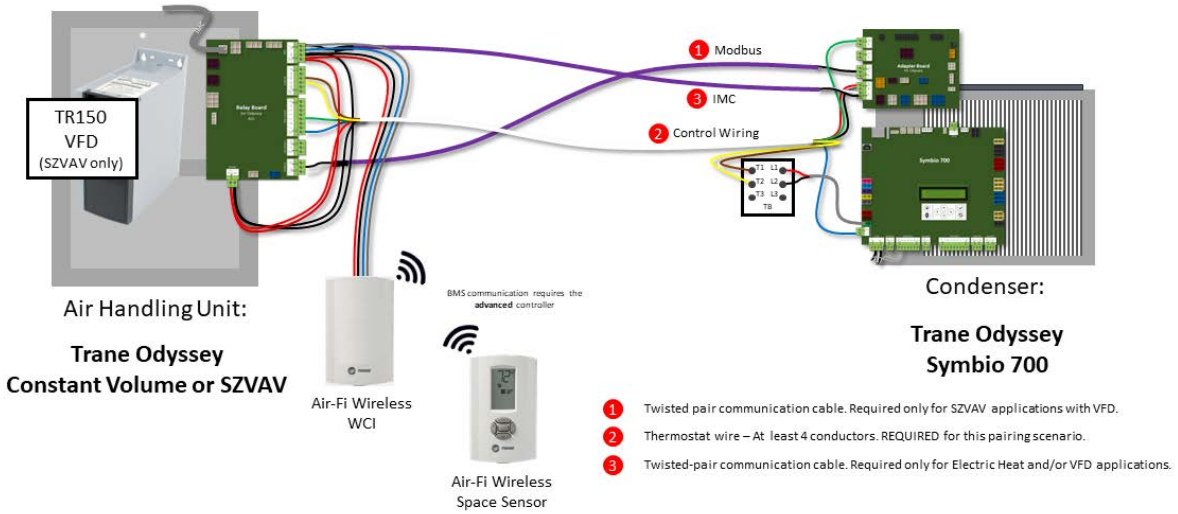
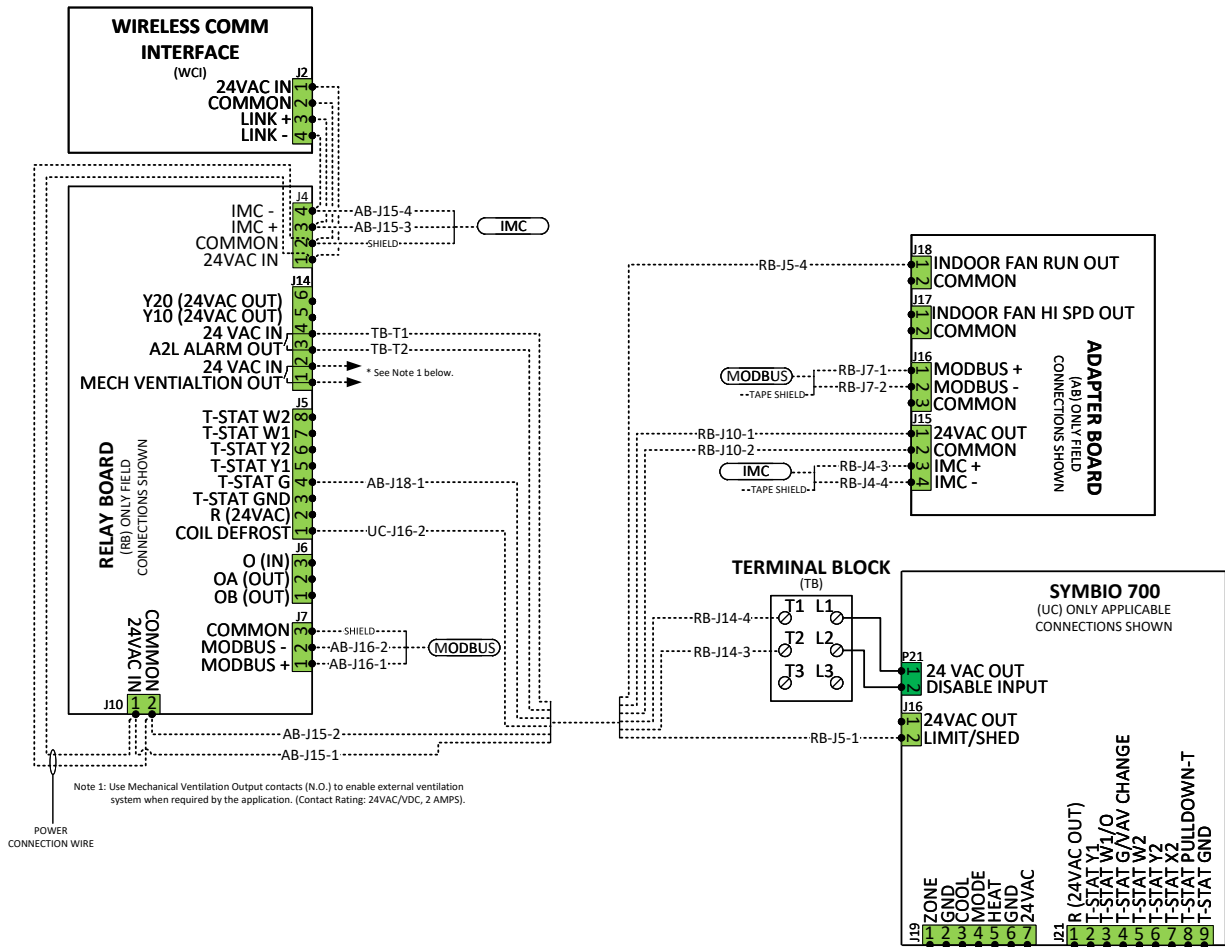


Figure 6. Pairing A or B Air-Fi Wireless for Symbio condenser to Symbio air handler constant Volume or SZVAV



- 1 Twisted pair communication cable. Required only for SZVAV applications with VFD.
- 2 Thermostat wire – At least 4 conductors. REQUIRED for this pairing scenario.
- 3 Twisted-pair communication cable. Required only for Electric Heat and/or VFD applications.

\* Options Module required for electric heat, SZVAV, and heat pump applications.



### Zone Sensor or Thermostat Connections

See “[Thermostat and Zone Sensor Wiring](#),” p. 15 for details on how to connect a zone sensor to J19 or thermostat to J21 on the Symbio 700 in the air handler. For SZVAV applications a space temperature sensor is required. Using a thermostat on a SZVAV air handler will result in two speed fan operation.

See “[Symbio Service and Installation Mobile Application](#),” p. 27 for details on how to use the Symbio Service and Installation Mobile App to verify that configuration for space controller on the Symbio 700 matches the desired zone sensor or thermostat application.

### Configure the Symbio 700 Controller

For applications with a zone sensor and where SZVAV or VVZT is required, use only the first configuration. For applications with a thermostat, either configuration will result in the same multi-speed manner.

For Variable Volume Zone Temperature (VVZT or formerly known as SZVAV) operation set the configuration as follows:

- System Type = **VVZT**
- Space Controller = Conventional Thermostat, Single Setpoint Zone sensor, or Dual Setpoint Zone Sensor
- Froststat = Installed
- Discharge Temperature Sensor = Installed Field installed electric heat only
- TTA condenser:
  - Primary Heating Source = Electric
  - Primary Heating Stages = 1 or 2 (depending on electric heat kit stages)
- TWA condenser:
  - Secondary Heating Source = Electric
  - Secondary Heating Stages = 1 or 2 (depending on electric heat kit stages)

For Multi-speed fan operation set the configuration as follows:

- System Type = **CVZT**
- Indoor Fan Type = Multi Speed
- Space Controller = Conventional Thermostat, Single Setpoint Zone sensor, or Dual Setpoint Zone Sensor
- Froststat = Installed
- Discharge Temperature Sensor = Installed or not installed
- Field installed electric heat only
- TTA condenser:
  - Primary Heating Source = Electric
  - Primary Heating Stages = 1 or 2 (depending on electric heat kit stages)
- TWA condenser:
  - Secondary Heating Source = Electric
  - Secondary Heating Stages = 1 or 2 (depending on electric heat kit stages)

**Air Handler to Condenser Connections**  
**Control Wire — Thermostat style wire up to six conductors**

**Table 10. Pairing A or B air handler to condenser wiring**

Cond.	Required /Optional	Air Handler Connection	Condenser Connection	Purpose	Instructions
1	Required	(RB) J10-1	(AB) J15-1	24VAC	It is recommended that the air handler and condensing unit share low voltage power. If the air handler and condensing unit have separate low voltage power, these conductors can be omitted, but isolation relays are needed on the remaining control wire conductors.
2	Required	(RB) J10-2	(AB) J15-2	Ground	
3	Required	(RB) J5-4	(AB) J18-1	Supply fan	Command the constant volume indoor fan to run or will interlock a variable speed fan with the electric heat.
4	Optional	(RB) J5-1	(UC) J16-2	EDC	This conductor is optional and is only needed if compressor protection at low evaporator temperatures is desired. Reference page 28 for details on how to use the Symbio Service and Installation Mobile Application to set the configuration for Demand Management to Demand Limit, and in Settings change Cooling Demand Limit Capacity Enable Setpoint to 0%.
5	Required for A2L	(RB) J14-3	TB-T2	A2L Indication	This input is used to initiate the A2L response to disable cooling and initiate fan and ventilation sequences accordingly.
6	Required for A2L	(RB) J14-4	TB-T1	A2L Indication	

**Shielded Twisted Pair Cable — up to two cables**

**Table 11. Pairing A or B twisted pair cable wiring**

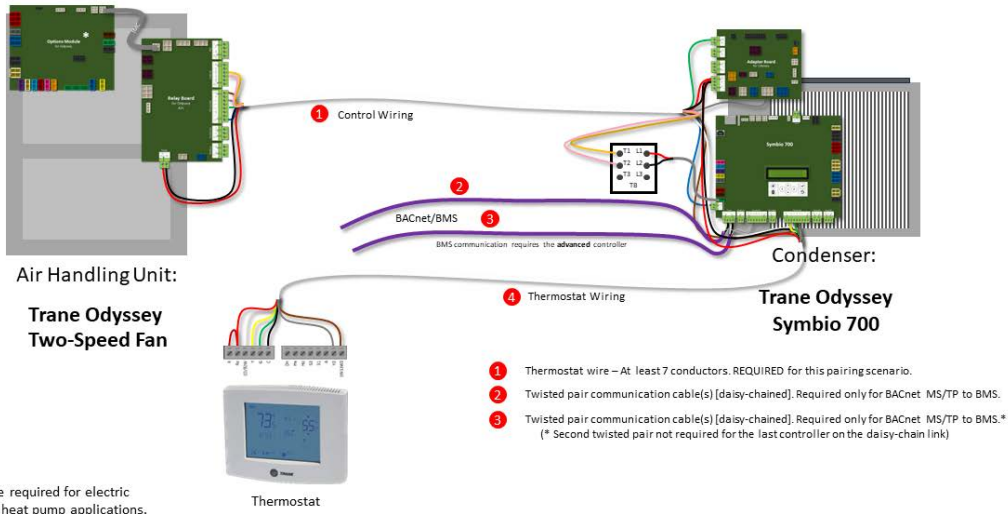
Cable	Required/ Optional	Air Handler Connection	Condenser Connection	Purpose	Instructions
1	Optional <sup>(a)</sup>	(RB) J4-3	(AB) J15-3	Electric Heat and/or VFD (IMC +)	
		(RB) J4-4	(AB) J15-4	Electric Heat and/or VFD (IMC -)	
		(RB) J4-3	No connect	Shield	Connect shield only at condenser to ground terminal. At air handler, tape shield back onto cable.
2	Optional <sup>(b)</sup>	(RB) J7-1	(AB) J16-1	Modbus +	
		(RB) J7-2	(AB) J16-2	Modbus -	
		(RB) J7-3	No connect	Shield	Connect shield only at condenser to ground terminal. At air handler, tape shield back onto cable.

<sup>(a)</sup> Required if Options Module installed for electric heat operation and/or SZVAV application.

<sup>(b)</sup> Required if air handler has a VFD for SZVAV application. Use the Symbio Service and Installation Mobile App to verify that configuration for system type is set to VVZT.

## Pairing H

Figure 7. Pairing H thermostat for Symbio condenser to Symbio air handler constant two speed



\* Options Module required for electric heat, SZVAV, and heat pump applications.

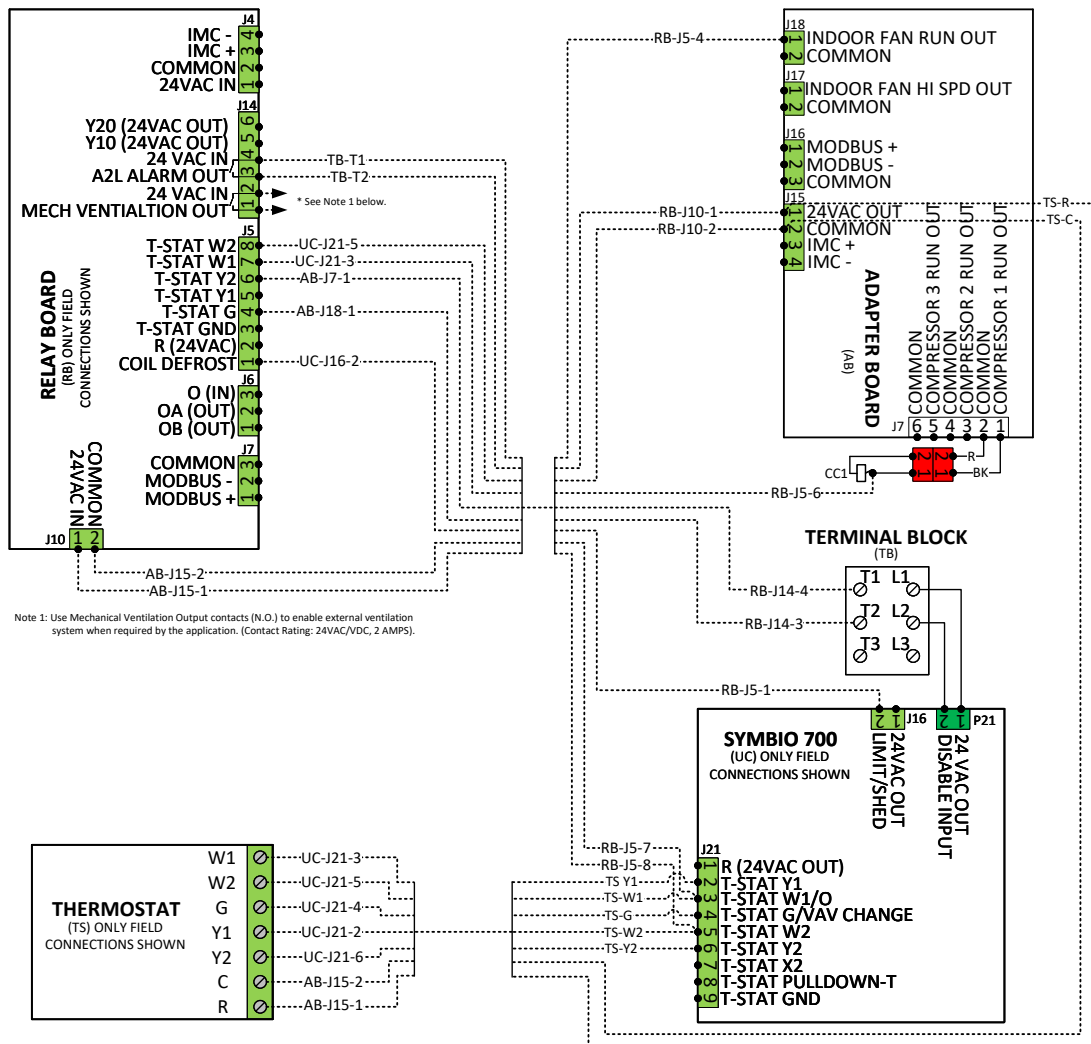
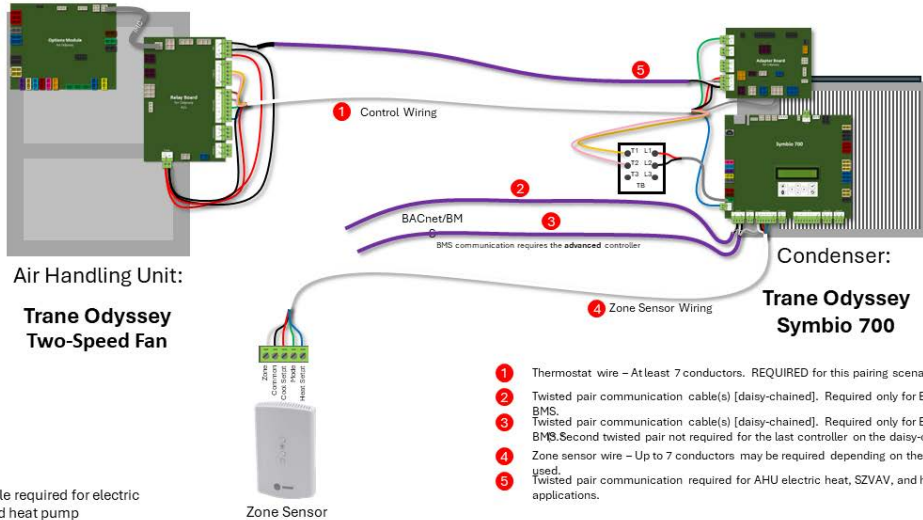
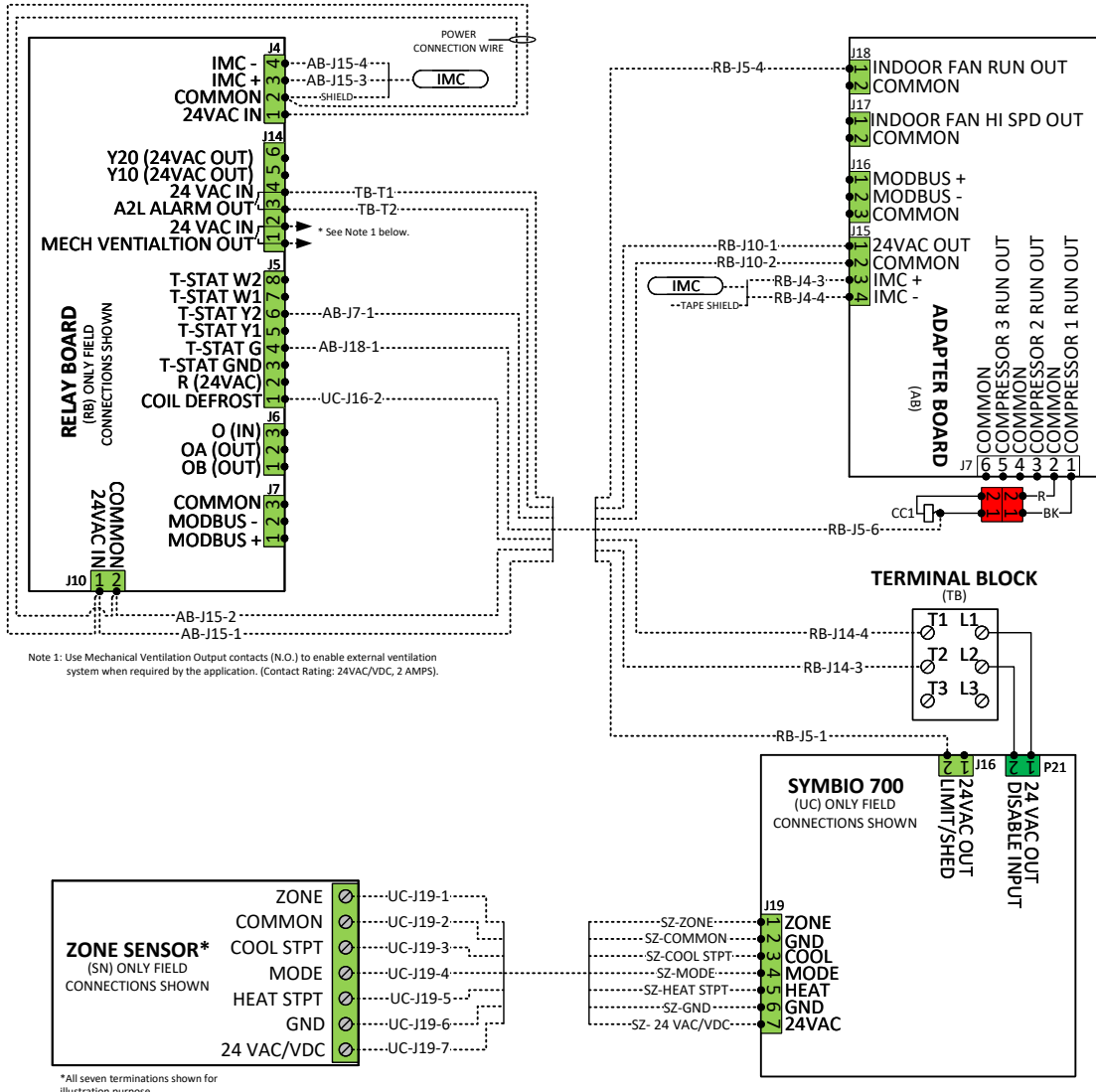


Figure 8. Pairing H zone sensor for Symbio condenser to Symbio air handler constant two speed



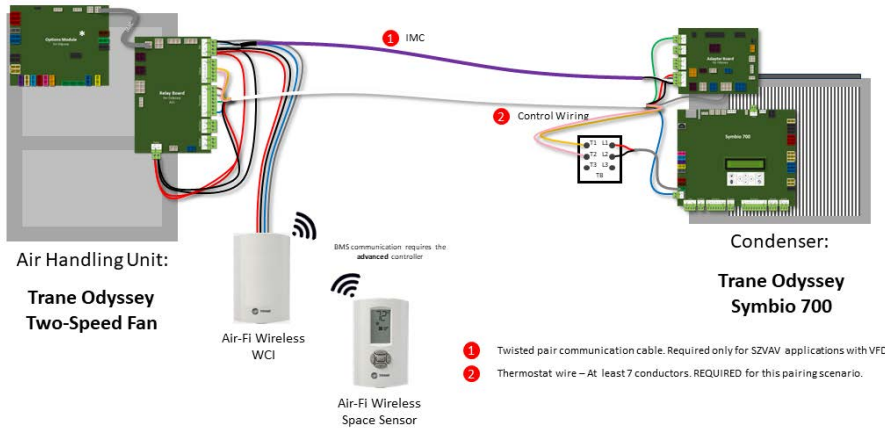
- 1 Thermostat wire – At least 7 conductors. REQUIRED for this pairing scenario.
- 2 Twisted pair communication cable(s) [daisy-chained]. Required only for BACnet MS/TP to BMS.
- 3 Twisted pair communication cable(s) [daisy-chained]. Required only for BACnet MS/TP to BMS. Second twisted pair not required for the last controller on the daisy-chain link
- 4 Zone sensor wire – Up to 7 conductors may be required depending on the specific sensor used.
- 5 Twisted pair communication required for AHU electric heat, SZVAV, and heat pump applications.

\* Options Module required for electric heat, SZVAV, and heat pump applications.

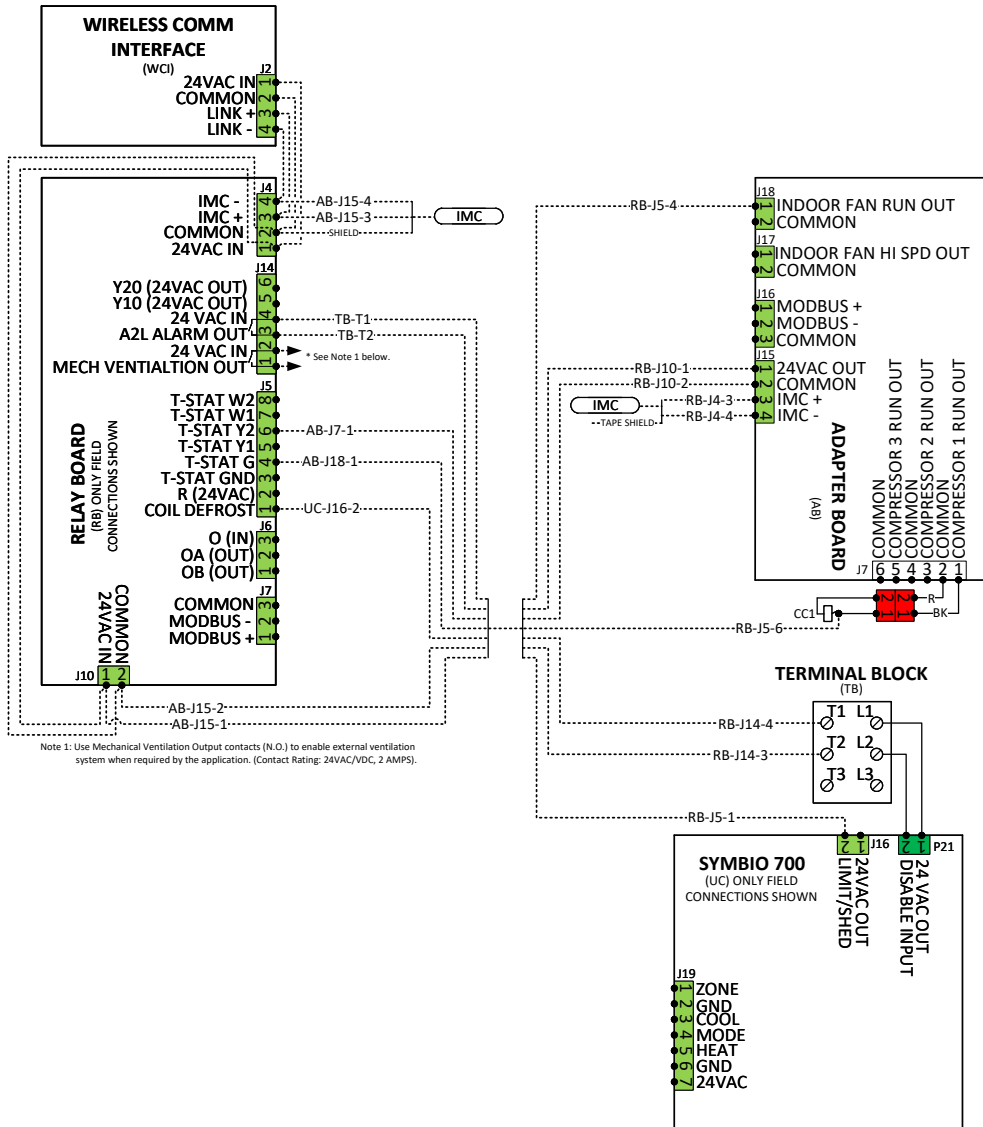


# Full-Featured Functionality

Figure 9. Pairing H Air-Fi Wireless for Symbio condenser to Symbio air handler constant two speed



\* Options Module required for electric heat, SZVAV, and heat pump applications.





## Thermostat or Sensor Connections

See “[Thermostat and Zone Sensor Wiring](#),” p. 15 for details on how to connect a zone sensor to J19 or thermostat to J21 on the Symbio 700 in the air handler.

See “[Symbio Service and Installation Mobile Application](#),” p. 27 for details on how to use the Symbio Service and Installation Mobile App to verify that configuration for space controller on the Symbio 700 matches the desired zone sensor or thermostat application.

## Air Handler to Condenser Connections

### Control wire — Thermostat style wire up to nine conductors

**Table 12. Pairing H air handler to condenser wiring**

Cond.	Required/ Optional	Air Handler Connection	Condenser Connection	Purpose	Instructions
1	Required	(RB) J10-1	(AB) J15-1	24VAC	It is recommended that the air handler and condensing unit share low voltage power. If the air handler and condensing unit have separate low voltage power, these conductors can be omitted, but isolation relays are needed on the remaining control wire conductors.
2	Required	(RB) J10-2	(AB) J15-2	Ground	
3	Required	(RB) J5-4	(AB) J18-1	Supply fan	Command the indoor fan to low speed.
4	Required	(RB) J5-6	See (a) (b) (c) (d) (e)	Supply fan	
5	Optional	(RB) J5-7	(UC) J21-3	Electric heat	Commands first stage of electric heat (if installed). See “ <a href="#">Symbio Service and Installation Mobile Application</a> ,” p. 27 for details on how to use the Symbio Service and Installation Mobile App. Set Primary Heating Source to Not Installed or a diagnostic for Options Module Communication Fail will be active. The Symbio 700 will still command the Indoor Fan on with a W1 or W2 call from the thermostat.
6	Optional	(RB) J5-8	(UC) J21-5	Electric heat	Commands second stage of electric heat (if installed).
7	Optional	(RB) J5-1	(UC) J16-2	EDC	If the EDC switch in the air handler will be utilized for low evaporator compressor protection, use the Symbio Service and Installation Mobile Application to edit the following: <ul style="list-style-type: none"> <li>Edit Configuration: set Demand Management to Demand Limit</li> <li>Edit Settings: Refrigeration set Cooling Demand Limit Capacity Enable Setpoint to 0%</li> </ul>
8	Required for A2L	(RB) J14-3	TB-T2	A2L Indication	This input is used to initiate the A2L response to disable cooling and initiate fan and ventilation sequences accordingly.
9	Required for A2L	(RB) J14-4	TB-T1	A2L Indication	

- (a) Depending on the size of the condensing unit and the space reference, the termination on the Adapter Board will vary for the high-speed fan command. This conductor will always terminate on Relay Board J5-6.
- (b) If the condensing unit only has one compressor, splice the connection into Adapter Board J7-1. This will command the indoor fan to high speed when compressor contactor 1 (CC1) is energized.
- (c) If the condensing unit has two compressors, splice the connection into Adapter Board J7-3. This will command the indoor fan to high speed when compressor contactor 2 (CC2) is energized.
- (d) If the condensing unit has two compressors and you are using a thermostat for a space reference, connect to the Y2 output from the thermostat. This will command the indoor fan to high speed when a call for second stage of cooling is initiated. There is a chance of both compressors running with the fan on low speed if the thermostat removes the Y2 call before the minimum compressor on timer has expired.
- (e) If the condensing unit is a 10 or 20 ton version, splice the connection into Adapter Board J12-1. This will command the indoor fan to high speed when both compressors are fully loaded.

## Symbio 700 Configuration and Settings

See “[Symbio Service and Installation Mobile Application](#),” p. 27 for details on editing equipment configuration. Review and edit the following:

- **Indoor Fan Type:** When connecting the Symbio Condenser to an electromechanical air handler with two-speed fan operation, ensure that the Symbio 700 UC indoor fan type configuration is set to “Single Speed” selection. The air handler relay board will switch the fan speeds based on the compressor operation / thermostat call.
- **Primary Heating Source:** If the air handler has electric heat and controlled by a thermostat, configure the Symbio 700 controller for primary heating source to “Not Installed”. Otherwise a Diagnostic for Options Module Comm Fail will be active. The Symbio 700 will still turn the indoor fan on with a W1 or W2 call. If the air handler has electric heat and controlled by a Zone Sensor or a Wireless Air-Fi Sensor, configure primary heating source and heating stages to match the equipment.

# Symbio Service and Installation Mobile Application

The Symbio Service and Installation mobile app provides advanced configuration, setup, status updates, alarms, and service capabilities for the Symbio 700 controller via Bluetooth connection.

The Symbio 700 can connect to mobile devices that support BLE version 4.2 and higher. Only one connection is allowed at a time to prevent another user from connecting to the system while it is already in use. If a connection is lost, whether accidental or purposeful, a timer is used to prevent the controller from being locked by a user that does not disconnect the controller in a preferred manner.

The Symbio Installation and Service tool is required to view and edit the following:

- Equipment configuration
- Historical alarms
- Firmware updates
- Backup and restore
- Building Automation System configuration

For more detailed information on the Symbio Service and Installation Mobile Application, refer to the Quick Start Guide for Symbio Service and Installation - BAS-SVN043\*-EN.

## Download Mobile App

To download the Symbio Service & Installation mobile app:

1. Access the Apple App Store or Google Play store by scanning the QR code below or clicking one of the download links.



- [Apple download link](#)
  - [Google Play \(Android\) download link](#)
2. Navigate to the Apple App Store or Google Play Store on your mobile device.
  3. Search for **Trane Symbio** to locate the Symbio Service & Installation app.
  4. Download and install the app.

**Figure 10. Symbio Service & Installation app**



## Connecting to the Symbio 700

### Required Tools

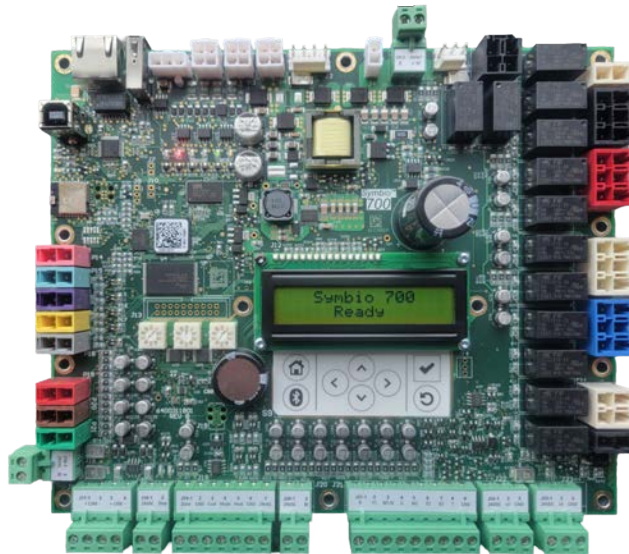
- 5/16 inch nut driver tool for panel removal


- Smart devices supported:
  - iPhone®
  - Android™
- Trane Symbio Service Installation mobile app


## Connecting to the Symbio 700 Controller

1. Enable **Bluetooth®** on your smart device.
2. Access the Symbio™ 700 controller in the low voltage portion of the equipment.

**Figure 11. Symbio 700 controller**

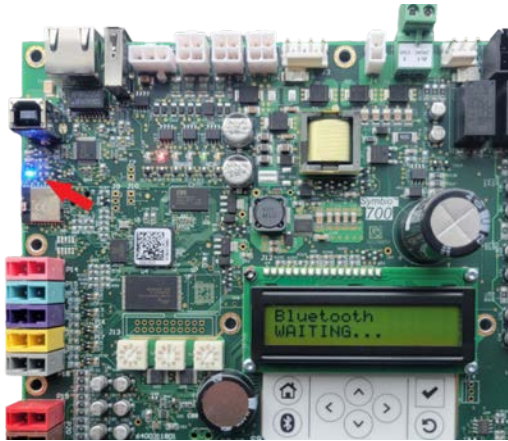


3. Press  on the Symbio 700 keyboard/display to turn on Bluetooth.
4. Confirm the status of Bluetooth communications.

	Blue LED	Display	Description
Press for On/Off	Off	NOT CONNECTED	Bluetooth Off
	Blinking	WAITING...	Bluetooth On — Not Paired
	On Solid	CONNECTED	Bluetooth On — Connected/ Paired

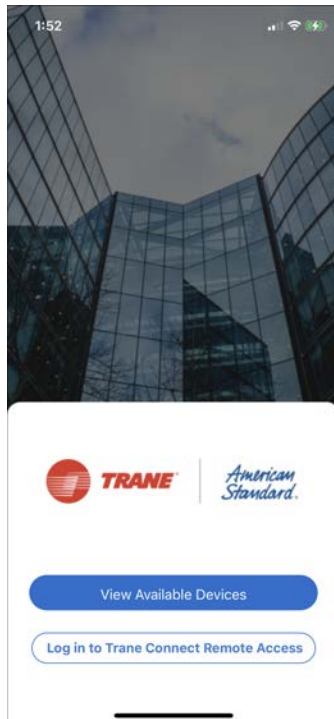
<sup>1</sup> The Bluetooth® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. and any use of such marks by the company is under license.

Figure 12. Symbio 700 Bluetooth status



5. Start the mobile app on your smart device.

Figure 13. Login screen

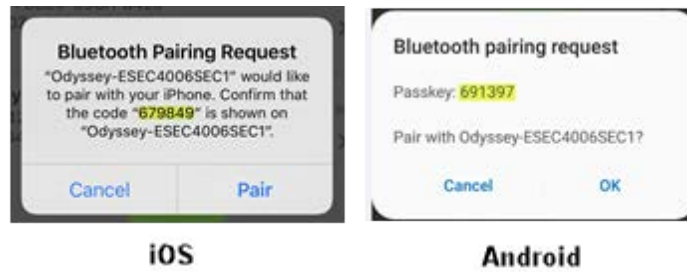



6. On the login screen, press **View Available Devices** in the lower portion of the screen. Or Trane personnel can login using their Trane Connect user name and password.
7. On the Unit List page, select the Symbio 700 controller to pair with. If the controller is not listed, press the refresh arrow in the upper right-hand corner of the screen.

**Note:** *If a Symbio 700 is not the original Symbio controller as shipped with the equipment, the Bluetooth equipment list will list the controller serial number, instead of the equipment serial number.*

8. When prompted, pair the app to the Symbio 700 controller. A popup message displays a 6-digit random number. The same number is shown on the display of the Symbio 700 controller until the pairing is complete, allowing the user to confirm connection to the intended controller.

**Figure 14. Bluetooth pairing**



9. Press  on the Symbio 700 on-board keyboard/display to complete the pairing.

When the LED light is a solid blue and the display reads Bluetooth Connected, the Bluetooth pairing and connection is complete.

## Troubleshooting

Issue	Description
Smart device requirements not met	<ul style="list-style-type: none"> <li>Apple iPhone ( iOS V10; iPhone 6 or later required)</li> <li>Android ( V5.0 Lollipop or later; a device with Bluetooth V4.2 or later required)</li> </ul> <p><i>Note: It is not possible to check what Bluetooth connectivity version is installed on an Android device, as it does not appear in Settings.</i></p>
Multiple users attempting to connect to the controller via Bluetooth	Only one user can connect to the Symbio 700 controller via Bluetooth. If the blue light is solid, another user is connected to the controller.
Device outside of Bluetooth range limits	Bluetooth has physical range limitations. A user can lose connectivity if too far away from the controller and will need to re-access connectivity from the Units List page.
Exceeded limit of equipment pairings	The app only allows 10 saved pairings per device. Android devices will auto delete the oldest pairing. If auto delete fails, you can manually delete pairings. iOS users must manually delete pairings through Settings.
Smart device unpaired or disconnected from controller	<ul style="list-style-type: none"> <li>Pressing the Bluetooth button on the controller while connected will disconnect the controller from the smart device.</li> <li>Cycling power to the controller, a firmware update, or a restore/start controller will disconnect the Bluetooth connection.</li> <li>Equipment shutdown will disconnect the Bluetooth connection.</li> </ul>

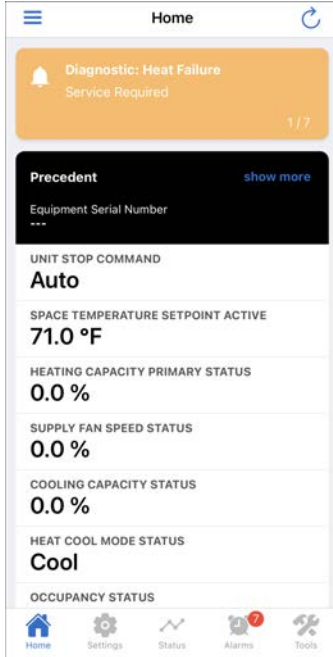
## Navigation

The Symbio Service & Installation app allows users to view and edit equipment settings. Each page is represented by an icon at the bottom of the screen.

## Home

On the home screen, select the tools icon at the bottom of the screen to navigate to the **Settings** screen.

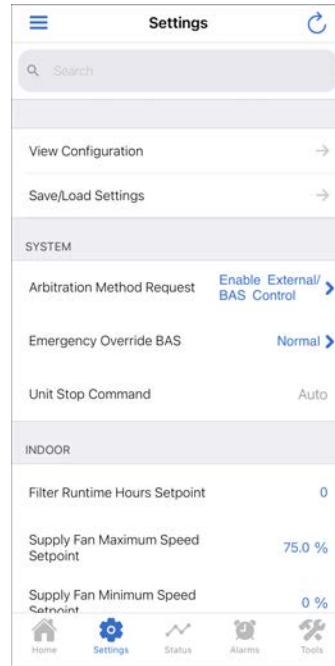
Figure 15. Home screen



## Settings

The Settings screen allows users to set up equipment. Users can set the default value for many setpoints and modes. Edit any setting by selecting the blue text.

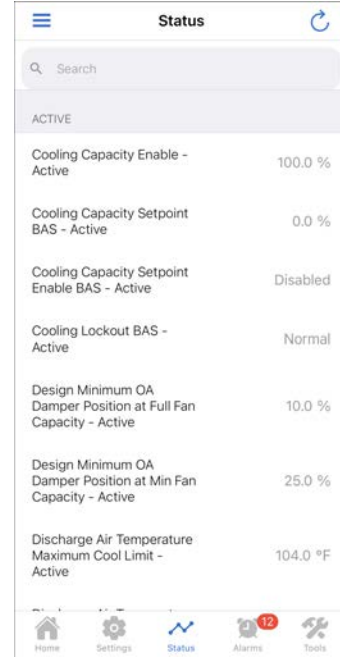
Figure 16. Settings screen



## Status

The Status screen displays all information available in the Symbio 700. Some information can be overridden by selecting the blue text.

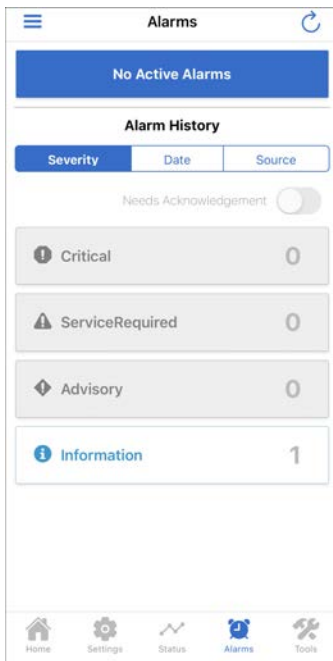
Figure 17. Status screen



## Alarms

The Alarms screen displays all active and historic BACnet alarms that are available on the equipment.

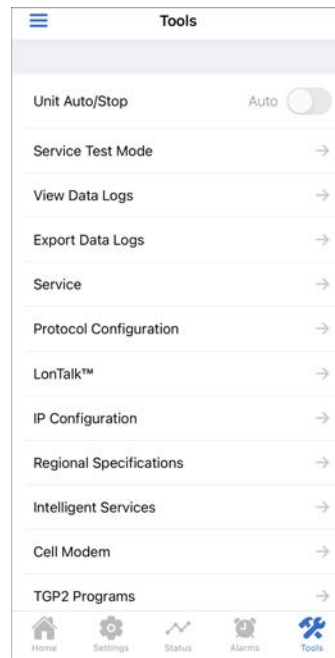
Figure 18. Alarms screen



## Tools

The Tools screen provides access to common procedures for the equipment.

Figure 19. Tools screen

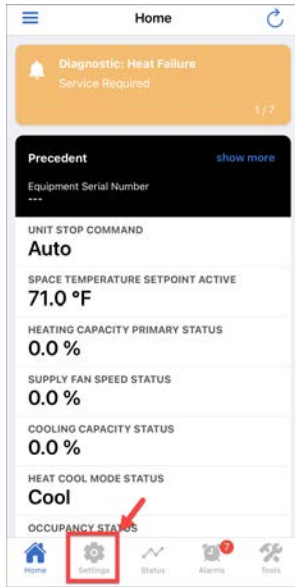


## Editing Equipment Configuration

Depending on how the split system condenser and air handler are paired, adjusting the equipment configuration may be required for proper operation. To edit the equipment configuration:

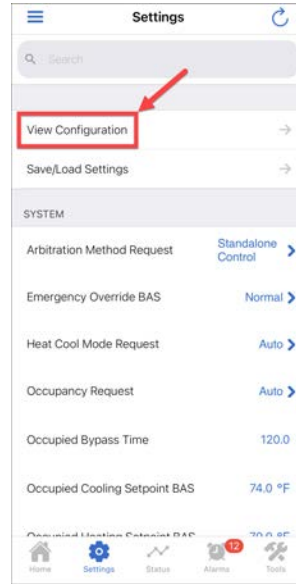
1. On the home screen, select the tools icon at the bottom of the screen to navigate to the **Settings** screen.

Figure 20. Home screen



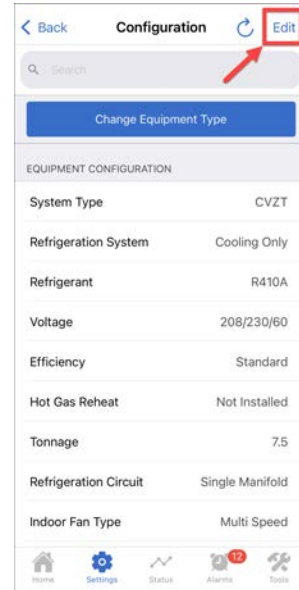
2. Select **View Configuration**.

Figure 21. View configuration screen



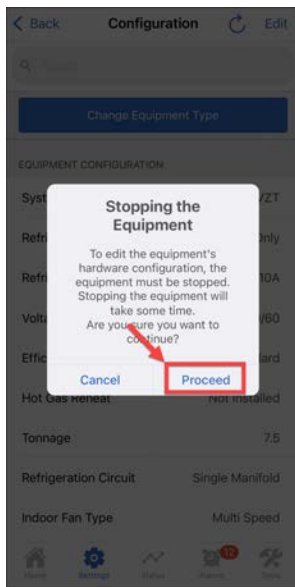
3. Select **Edit**.

Figure 22. Edit configuration screen



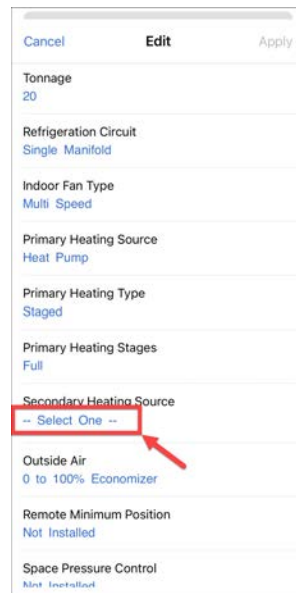
4. The equipment must be stopped to edit the configuration. Press **Proceed** to stop the equipment.

Figure 23. Stopping the equipment screen



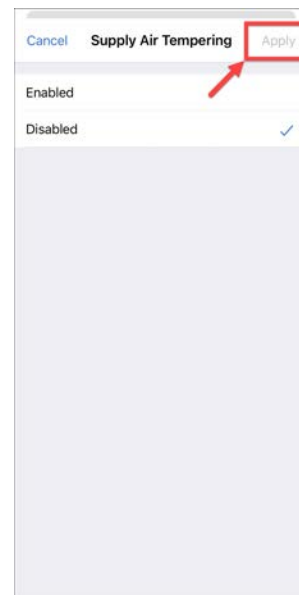
5. On the **Edit** screen, scroll to the option that needs to be edited. To edit an option, select the option.

Figure 24. Edit configuration screen



6. Select the desired option. Then select **Apply** to save the setting change.

Figure 25. Edit configuration screen





## Viewing Alarms

To verify proper equipment operation and to help troubleshoot, the Symbio Service & Installation app allows users to view equipment alarms. Depending how the Symbio 700 is licensed, these views may be slightly different from what is shown.

1. On the Home screen, swipe left or right at the top of the page to view active alarms.

2. Select the Alarm icon to view more information on historical and active alarms.

3. Tap to sort the Alarm history by Severity, Date, or Source.

Figure 26. Home screen

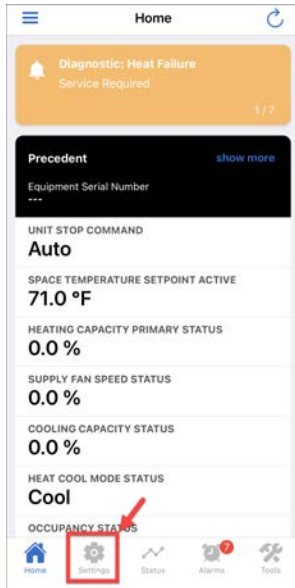


Figure 27. Home screen

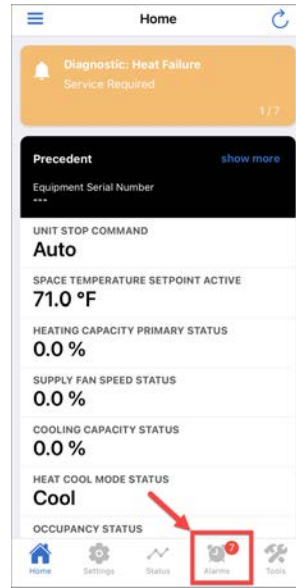
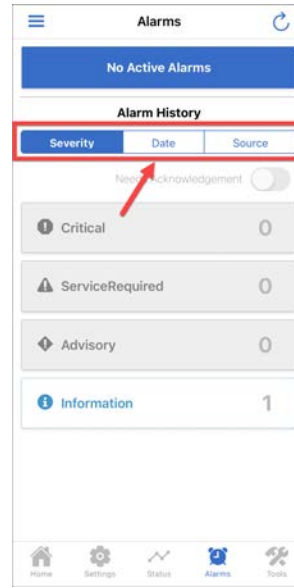


Figure 28. Alarm history screen



4. Select a group to view more details about the alarms.

5. Select the Active alarms button to view more details about active alarms on the equipment.

Figure 29. Alarm history screen

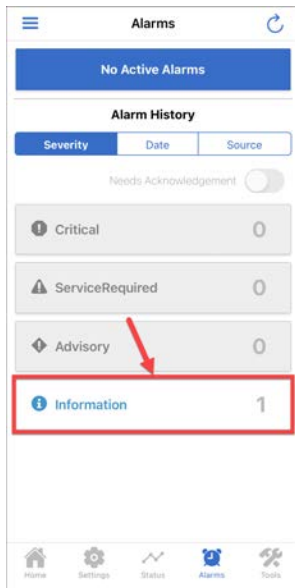
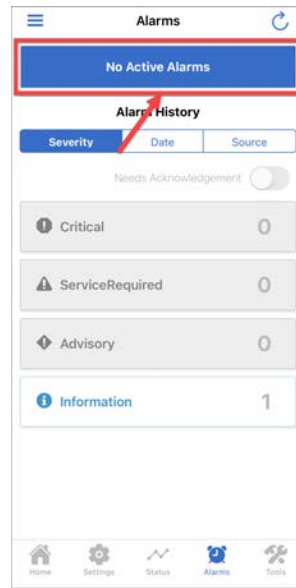


Figure 30. Active alarms screen

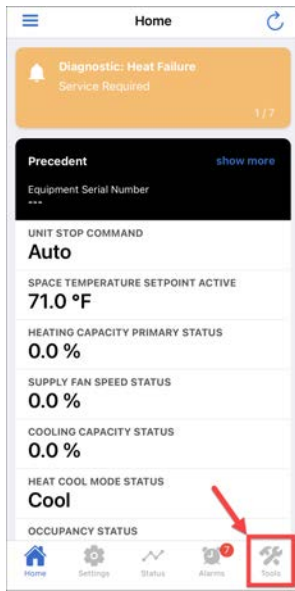


## Service Test Mode

Service Test Mode provides the ability to energize the various components of the system, either to support general system startup tasks or to support troubleshooting. Below are the steps to initiate Service Test Mode. For detailed information on how each Service Test State is interpreted based on the equipment configuration, refer to the Symbio 700 Odyssey Controls Application Guide (ACC-APG001\*-EN).

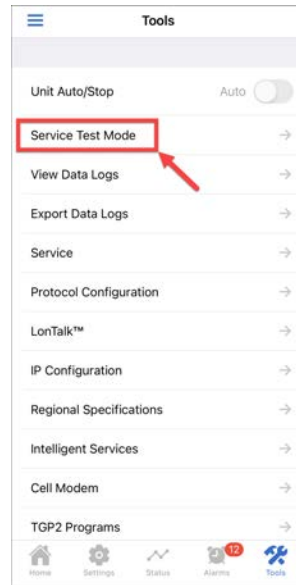
1. On the home screen, select the tools icon at the bottom of the screen to navigate to the **Settings** screen.

Figure 31. Home screen



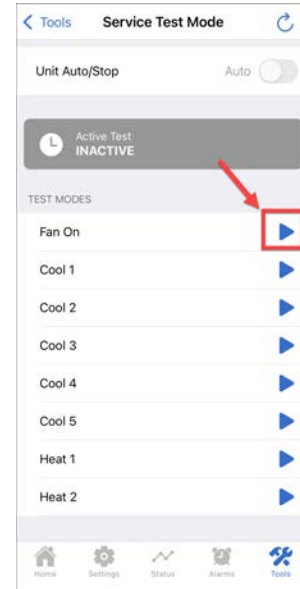
2. Select **Service Test Mode**.

Figure 32. Tools screen



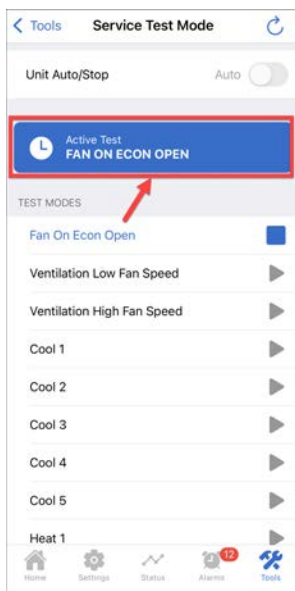
3. Select any of the blue play icons to initiate that test mode.

Figure 33. Service test mode screen



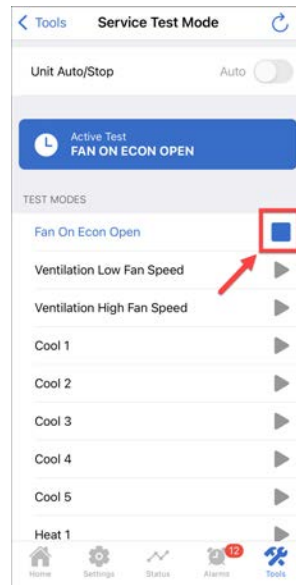
4. When a test is active, the status indicates active test mode.

Figure 34. Active service test mode screen



5. To exist Service Test Mode, click the stop icon next to the active test mode. Active test modes time out after the Service Test Timeout timer (60 minutes default) expires or power is cycled to the controller.

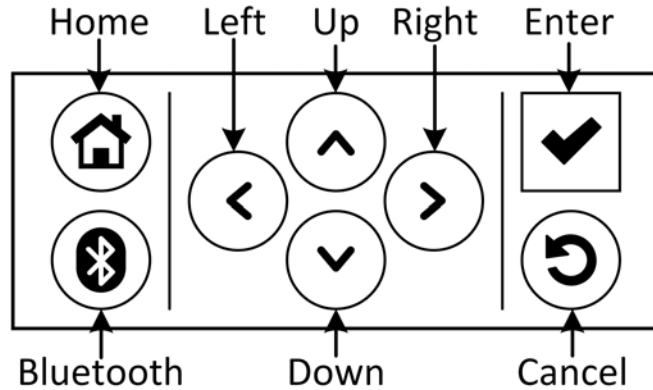
Figure 35. Active service test mode screen







# Symbio 700 User Interface

The Symbio 700 controller provides a 2 X 16 backlit LCD display on the middle of the controller. The onboard user interface includes a Bluetooth pair button to pair with the Symbio 700 controller for use with the Symbio Service & Installation mobile app.

**Figure 36. User interface keypad**



**Table 13. User interface buttons**

Button	Description
Up/down	Allow the user to scroll the menus and submenus.
Left/right	Allow the user to scroll between values for editable items.
	<ul style="list-style-type: none"> <li>Allows user to drill down into a component of the menu tree.</li> <li>Confirm data changes on writable data. When data is editable, the data point's least significant digit flashes with a cursor. If the data has multiple editable digits, the user scrolls the cursor left and right to choose the editable digit. Once the editing is complete, the data is not changed and propagated through the controller until the <b>Enter</b> button is tapped.</li> </ul>
	Tap to exit all submenus and return to the Home screen.
	Tap to go to the Bluetooth menu and initiate the Bluetooth device pairing sequence.
	Tap to return to the previous menu level.

The interface provides an intuitive menu structure: alarms, status, service, settings, and utilities. Configuration of the unit is accomplished under the utilities menu item. A complete list of functions is outlined in the Symbio 700 User Guide - BAS-SVU054\*-EN.

Figure 37. Symbio 700 menu

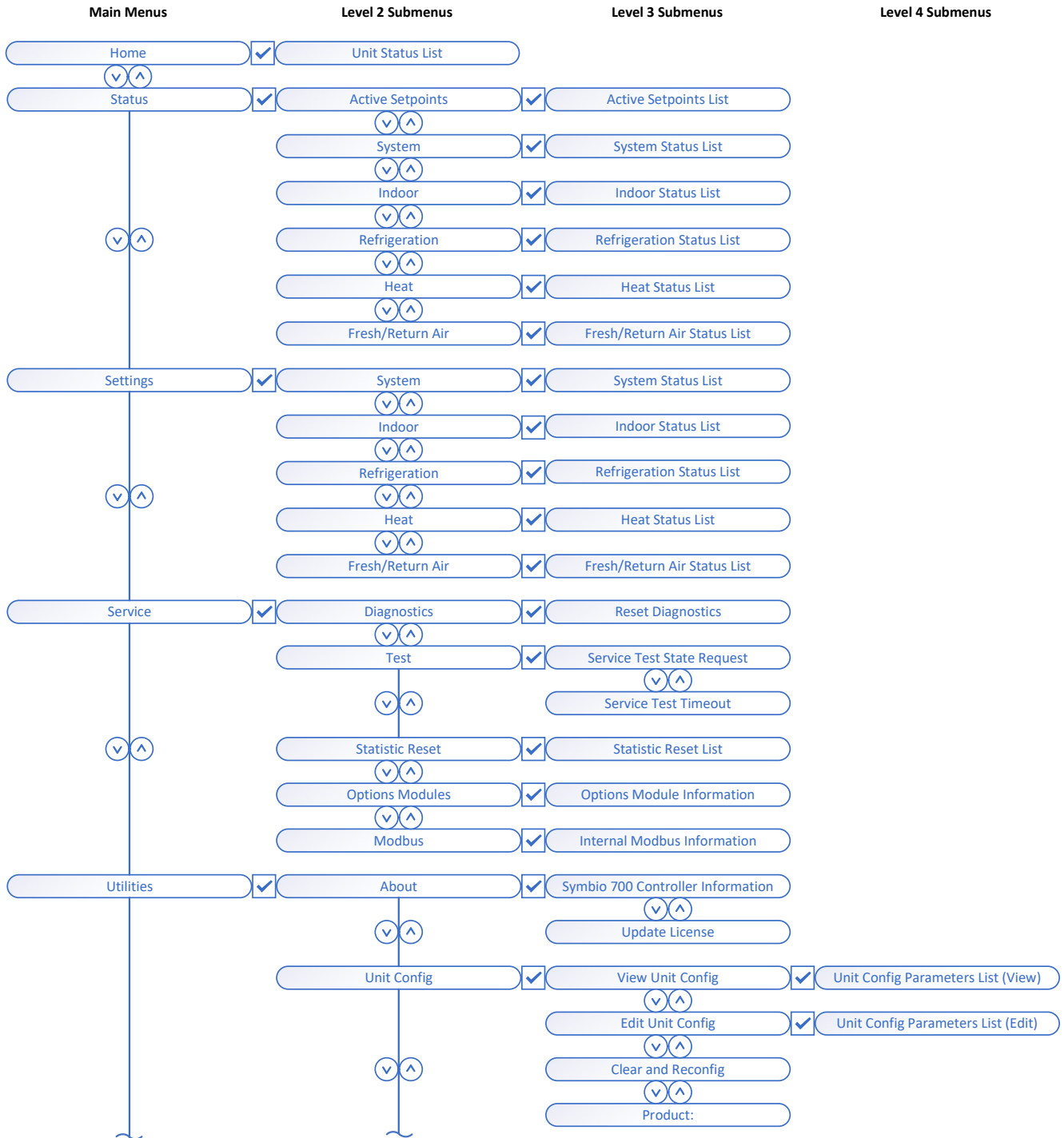
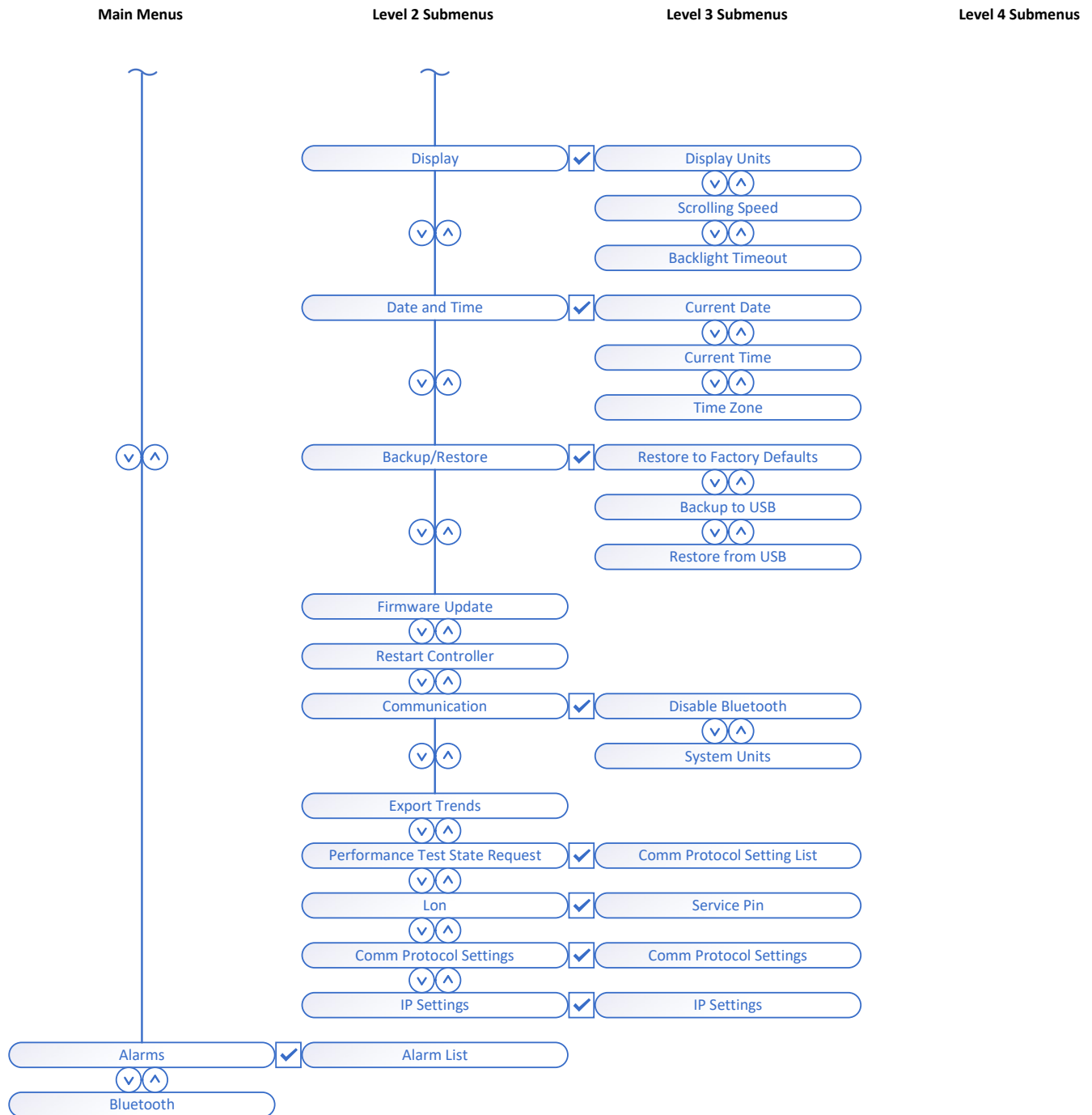


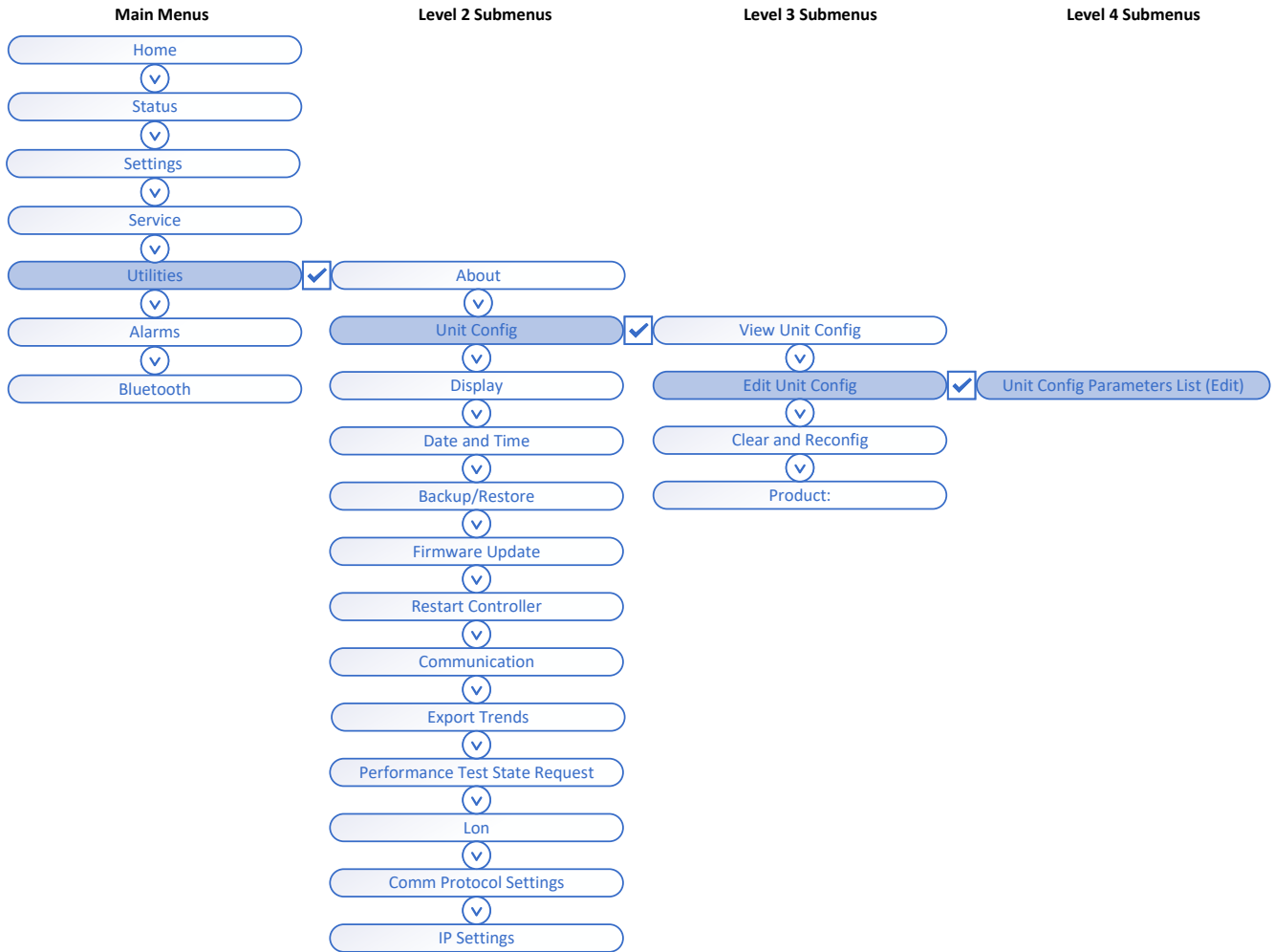
Figure 38. Symbio 700 menu (continued)



## Editing Equipment Configuration

To edit the configuration of the equipment using the onboard display navigate to the **Edit Configuration Settings** submenu. The figure below shows the path to the edit configuration submenu. Use the enter button to advance to submenus and the up and down arrow buttons to scroll through menus.

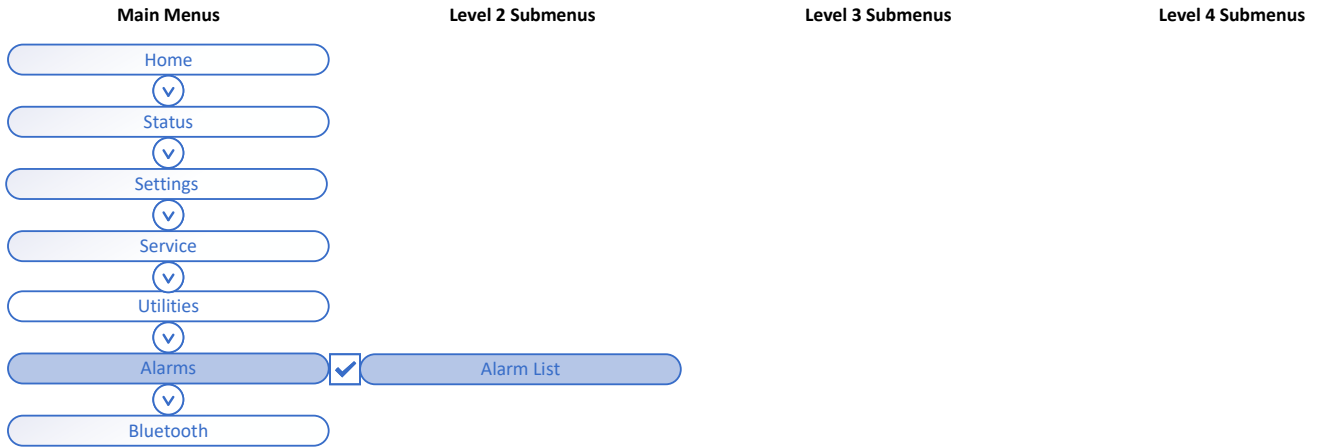
Figure 39. Symbio 700 utilities menu



## Viewing Alarms

To view equipment alarms using the onboard display navigate to the Alarm List submenu. The figure below shows the path to the Alarm List submenu. Use the enter button to advance to submenus and the up and down arrow buttons to scroll through menus.

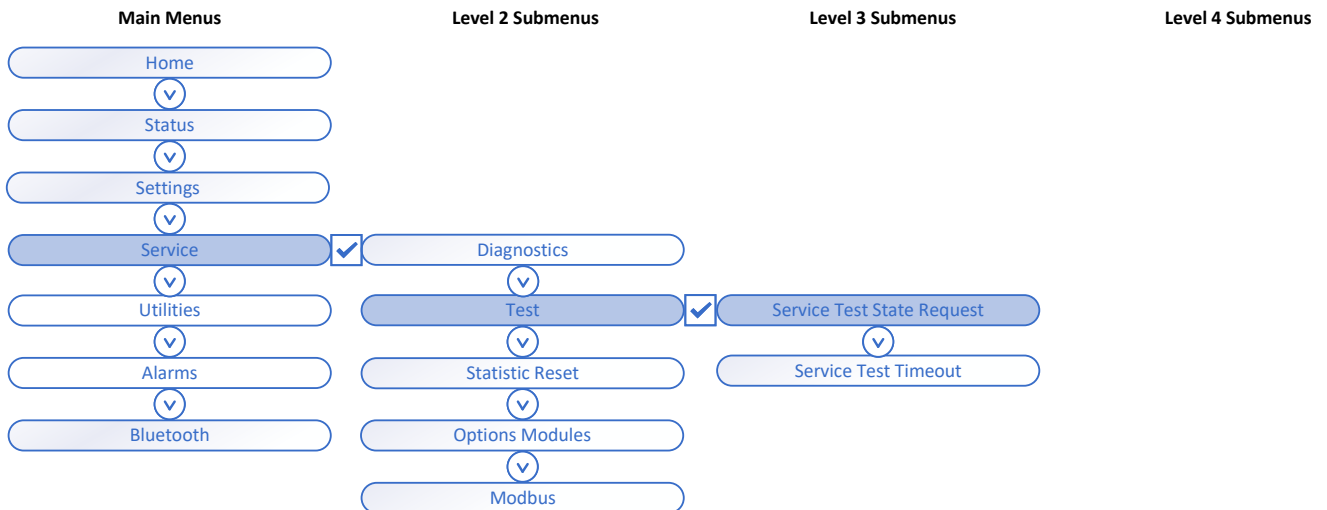
Figure 40. Symbio 700 alarms menu



## Service Test Mode

To put the equipment into Service Test Mode, use the onboard display navigate to the Test Modes submenu. The figure below shows the path to the Test Modes submenu. Use the enter button to advance to submenus and the up and down arrow buttons to scroll through menus.

Figure 41. Symbio 700 service test mode menu



# More Information and Technical Support

Trane Light Commercial Help Center



Trane Split Systems











Trane and American Standard create comfortable, energy efficient indoor environments for commercial and residential applications. For more information, please visit [trane.com](http://trane.com) or [americanstandardair.com](http://americanstandardair.com).

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