



Symbio® Controls

Controls Technical Update 2024



Session Outline



Symbio® Across the Portfolio

- Alignment to the Equipment Portfolio

Symbio 210/210e

- Ring Topology

Symbio 400B

- Feature Overview

Symbio 700

- Feature Overview/Refresh
- Service App
- Upgrades and Migrations Update/Resources

Symbio 800

- Migration
- Applications
- Progress

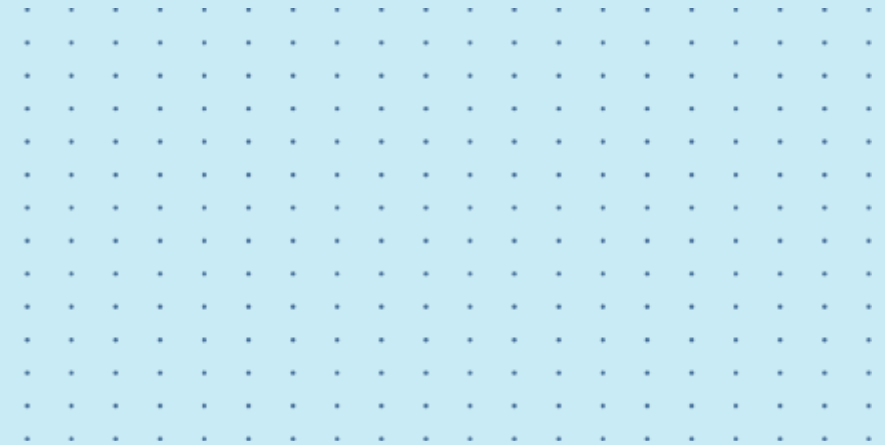


Please add questions to the chat throughout the presentation, we'll address both live Q&A and chat questions at the end of the presentation.

Note: Symbio 500 will be discussed in its own presentation following this presentation



Portfolio Updates

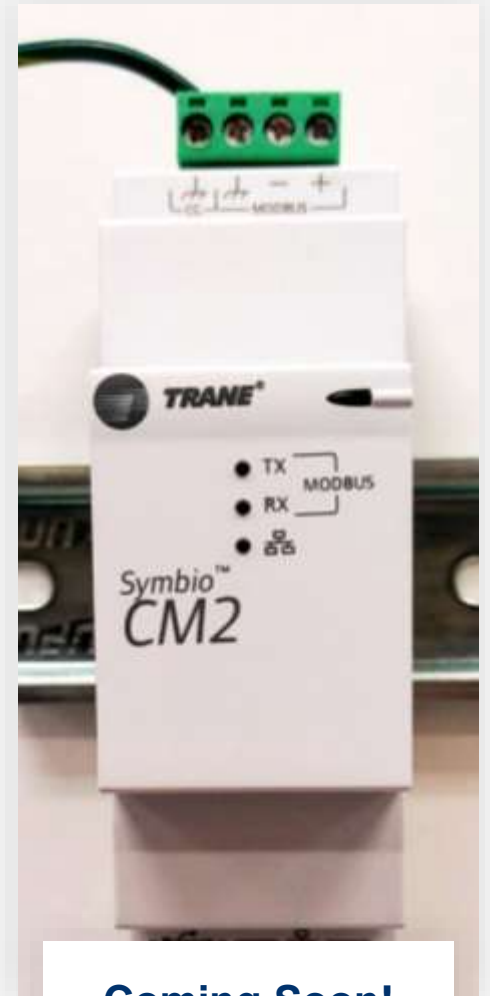


Symbio[®] Communication Module (CM2)



- New hardware extends the capabilities of Symbio 400B/500
- Key product features:
 - Provides a second IP connection
 - Enables Modbus RTU client capability
- More details in the Symbio 500 presentation

Product Documentation will be landed on the [Symbio 500 Hub Page](#)
(Work in progress)



Coming Soon!

Symbio® Across the Trane Equipment Portfolio



Chillers

- CenTraVac® / Series S / Agility
- Ascend / Sintesis / Optimus / Air Cooled
- CGAM
- Cold Generator Scroll / Thermafit / Minimod / TCAA – 2024-2025



Large Unitary

- IntelliPak® Rooftop Units
- RA Large Splits



Light Unitary

- Foundation Rooftop Units
- Precedent® Rooftop Units
- Voyager® 3 Rooftop Units*
- Odyssey™ Split Systems
- Axiom™ Rooftop WSHP



Air Handlers

- Performance Climate Changer™ Air Handlers
- Sourced products



Terminal Units

- WTU (UV, BC, FC)
- WSHP
- Fan coil & unit ventilator
- Blower coil
- Heat pumps
- VAV boxes dual duct



VariTrane® Terminal Units

- Single duct



Symbio 800



User Interface:
AdaptiView, Symbio UI and Tracer TU



User Interface:
TD7, Symbio UI and Tracer TU

Symbio 700



User Interface:
Mobile app, onboard display and Tracer TU

Symbio 500



User Interface:
Symbio UI, TD7 and Tracer TU,

TCPA & TCFS: Symbio 800
CSAA & PSCA: Symbio 500

Symbio 400B & 500



User Interface:
Symbio UI, TD7 on Symbio 500 only and Tracer TU

Implemented in 2023

Symbio 210/210e



User Interface:
Symbio UI and Tracer TU

* Voyager 3 is “technically” Large Unitary but will use a Symbio 700 controller.

Unit Control Feature Comparison

Part 1



	Symbio® 210	Symbio 400B (Factory Only)	Symbio 500	UC600	Symbio 700 (Factory Only)	Symbio 800
Trane® Connect™			Working On It		✓	✓
BACnet/IP – Daisy	✓ 210e		✓			
BACnet/IP – Star	✓ 210e	✓ Using the CM2 Module	✓	✓	✓	✓
BACnet/IP – Ring	✓ 210e with Ring Manager		✓ With Ring Manager			
LonTalk					✓	✓
Modbus (Server)		✓ Modbus RTU or TCP/IP (TCP/IP using the CM2)	✓ Both RTU or TCP/IP		✓ RTU or TCP/IP	✓ RTU or TCP/IP
Modbus (Client)		✓ Modbus RTU Using the CM2 Module	✓ Modbus RTU Using the CM2 Module			✓ Modbus RTU
Symbio UI	✓	✓	✓			✓
Mobile App					✓	✓ Coming Soon for IPAK and Chillers

Unit Control Feature Comparison

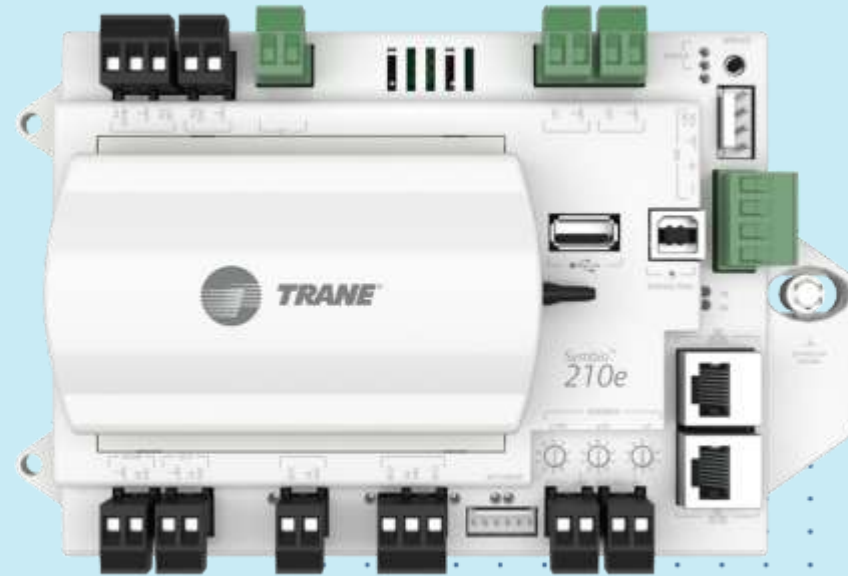
Part 2



	Symbio® 210	Symbio 400B (Factory Only)	Symbio 500	UC600	Symbio 700 (Factory Only)	Symbio 800
Onboard Scheduling			✓	✓	✓	✓
HW Terminations	13	23	23	19	39 (Factory Only)	0
Expansion Points	44	32	110	101	8	500
Onboard Display					✓	
Touchscreen Display		✓ Using the CM2 Module	✓ TD7	✓		✓ TD12
USB-A Port Accessories Support (Optional)	Available for Future Implementation	CM2	Wi-Fi Module CM2		LON Module LTE Cell Module	Wi-Fi Module LON Module LTE Cell Module
UUKL-Compliant		Future Evaluation	Future Evaluation	✓		Future Evaluation
Power	AC	AC	AC	AC	AC	DC / PM014

Symbio[®] 210e

New feature enhancements



Symbio® 210/210e Unit Control Features



	Symbio 210	Symbio 210e
BACnet Protocol Selection	Just for BACnet MS/TP	Just for BACnet/IP
BACnet Air-Fi	✓	✓
Trane® Connect™		
BACnet/IP – Daisy		✓
BACnet/IP – Star		✓
BACnet/IP – Ring		✓ With Ring Manager
LonTalk		
Modbus (Server)		
Modbus (Client)		
Symbio UI	✓	✓
Mobile App		

	Symbio 210	Symbio 210e
Onboard Scheduling		
HW Terminations	13	13
Expansion Points	44	44
Onboard Display		
Touch Screen Display		
USB-A Port Accessories Support (Optional)	Available for Future Implementation	Available for Future Implementation
UUKL-Compliant		
Power	AC	AC

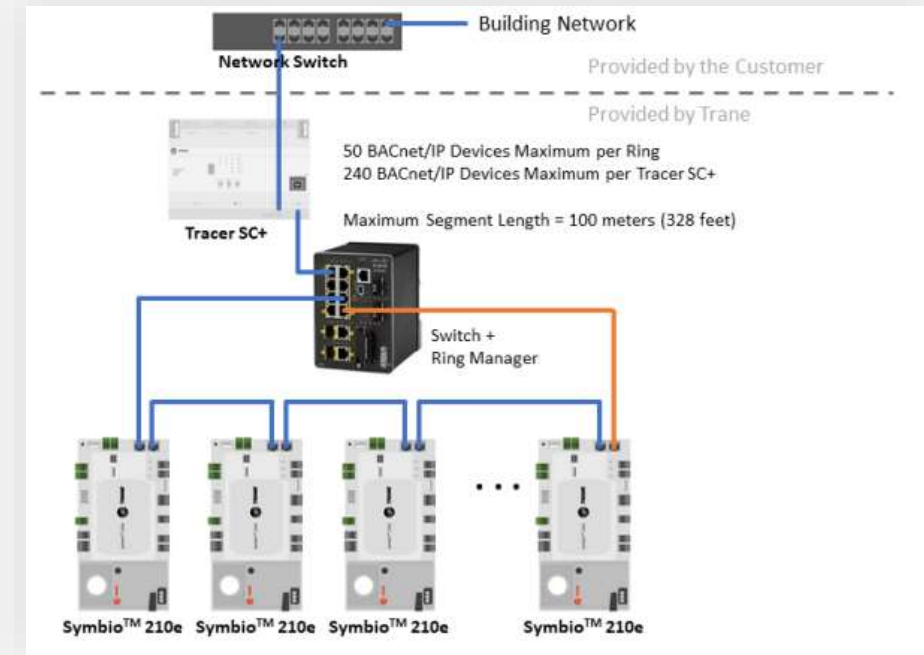
Symbio[®] 210e



- Ring topology is available
- Requires a Ring Manager
- Only applies to Symbio 210e and Symbio 500

Learn More:

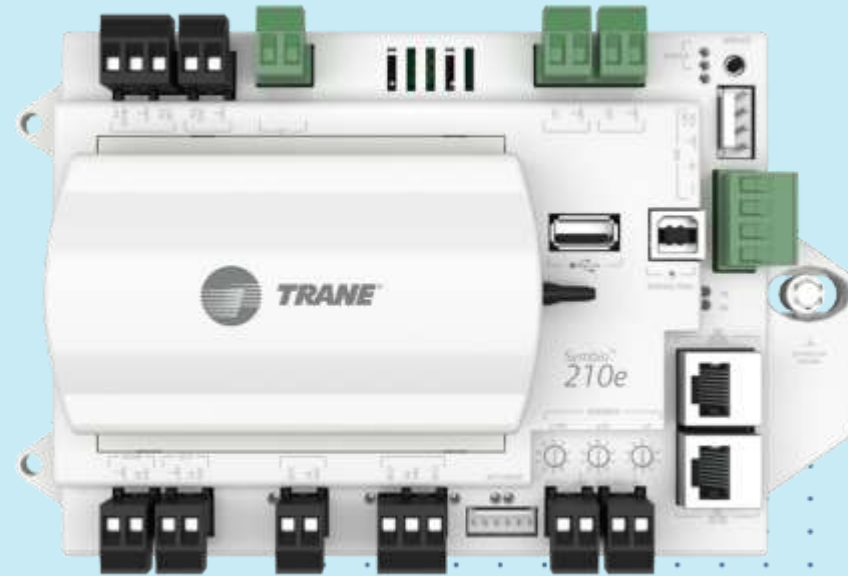
- [BACnet/IP Application Guide](#)
- [Symbio 210 Hub Page](#)



Note: The latest firmware (V. 2.10.0024) is available for Symbio 210 controllers: [Internal Site](#), [External Site](#)

Questions?

Symbio® 210e



Symbio[®] 400B

New Release: UC400-B functionality
with Symbio platform value



Symbio® 400B/500 Unit Control Features



	Symbio 400B (Factory only)	Symbio 500
Trane® Connect™		Working On It
BACnet/IP – Daisy		✓
BACnet/IP – Star	✓ Using the CM2 Module	✓
BACnet/IP – Ring		✓ With Ring Manager
LonTalk		
Modbus (Server)	✓ Modbus RTU or TCP/IP (TCP/IP Using the CM2)	✓ Both RTU or TCP/IP
Modbus (Client)	✓ Modbus RTU Using the CM2 Module	✓ Modbus RTU Using the CM2 Module
Symbio UI	✓	✓
Mobile App		

	Symbio 400B (Factory only)	Symbio 500
Onboard Scheduling		✓
HW Terminations	23	23
Expansion Points	32	110
Onboard Display		
TD7 Display		✓
USB-A Port Accessories Support (Optional)	CM2	Wi-Fi Module CM2
UUKL-Compliant	Future Evaluation	Future Evaluation
Power	AC	AC

Symbio® 400B



- Factory-mounted on fan coil, blower coil, unit vent and some WSHP units
- Drop-in replacement for UC400-B
- Backups and config files from a UC400-B can be applied directly to a Symbio 400B
- Identical equipment sequence carryover
- Supports field-applied CM2 communication module
 - BACnet/IP or TD7 Display
 - Modbus RTU Client

Learn More:

- [Blower Coil, Fan Coil and Unit Ventilator IOM](#)
- [WSHP IOM](#)
- [Symbio 400B Hub Page](#)



Questions?

Symbio® 400B



Symbio[®] 700

The new controller for all
light unitary equipment



Symbio® 700 Unit Control Features



	Symbio 700 (Factory Only)
Trane® Connect™	✓
BACnet/IP – Daisy	
BACnet/IP – Star	✓
BACnet/IP – Ring	
LonTalk	✓
Modbus (Server)	✓ Both RTU or TCP/IP
Modbus (Client)	
Symbio UI	
Mobile App	✓

	Symbio 700 (Factory Only)
Onboard Scheduling	✓
HW Terminations	39 (Factory Only)
Expansion Points	8
Onboard Display	✓
TD7 Display	
USB-A Port Accessories Support (Optional)	LON Module LTE Cell Module
UUKL-Compliant	
Power	AC

Light Unitary Controller Migration



Equipment Lineup and Roadmap



Mid 2020

2H 2022

1H 2023

Late 2024/Early 2025

Odyssey® Light Commercial Split System	6-25 Tons Precedent® Rooftop Units	Voyager® 3 Rooftop Units	Axiom™ Rooftop Water Source Heat Pump	3-5 Tons Precedent® Rooftop Units	15-25 Tons Foundation® Units
					
Legacy Controller: ReliaTel or Electromechanical Symbio Controller: Symbio® 700	Legacy Controller: ReliaTel Symbio Controller: Symbio 700	Legacy Controller: ReliaTel Symbio Controller: Symbio 700	Legacy Controller: ReliaTel Symbio Controller: Symbio 700	Legacy Controller: ReliaTel Symbio Controller: Symbio 700	Legacy Controller: Electromechanical Symbio Controller: Symbio 700

COMPLIANCE ASSURED • US Department of Energy (DOE)
2023 Efficiency Regulations • 81% gas furnace efficiency

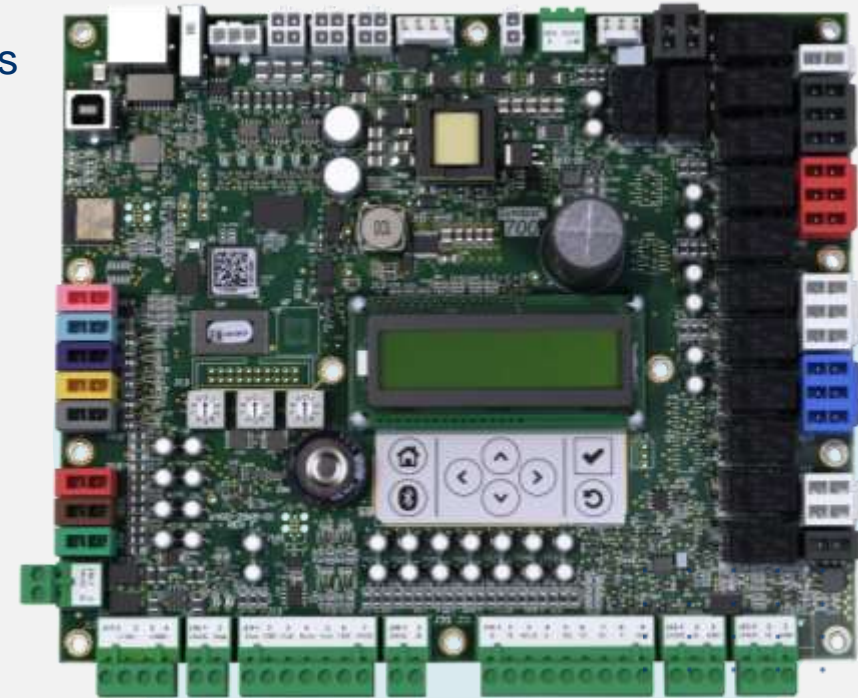
Smaller-tonnage Precedent units with ReliaTel will remain in production through 2024

Symbio® 700 Architecture

Main board



- Symbio 700 board with 2 x 16 display
- Like ReliaTel®, board works in concert with Symbio Options Modules
- Green Phoenix connectors are field wiring
- Colored connectors are factory connections that help reduce errors
 - Color-coded wiring and keyed connectors reduce errors
- USB (types A and B) and ethernet are in the upper left corner
- BAS communications: (Advanced version only)
 - BACnet/IP
 - Wired only (doesn't support the Trane Wi-Fi Module)
 - BACnet MS/TP
 - Modbus TCP/IP
 - Modbus RTU
 - BAS Communications available via communications modules
 - Air-Fi Wireless (requires WCI module)
 - LON (requires U-60 module)
 - Built-in support of programmable BACnet zone sensor for all equipment models



Learn More:

- [Visit the Symbio 700 Hub Page](#)

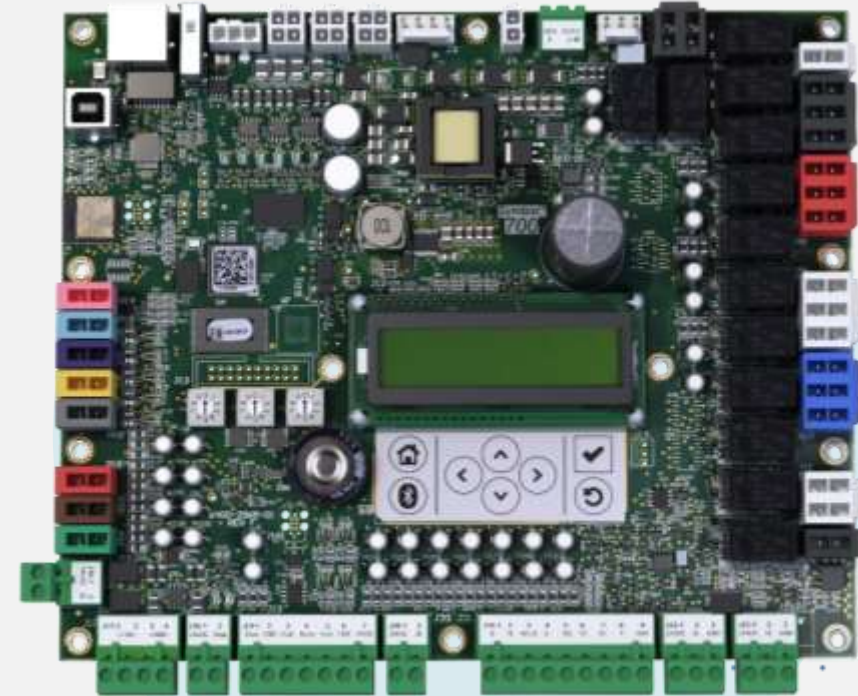


Symbio® 700 Architecture

Factory-installed modules



- Symbio 700 main board
- Options modules
 - The Symbio 700 extends its control capabilities using options modules
 - Options modules are installed, wired and tested in the unit when ordered from the factory
 - The modules can also be field installed
 - Options modules are differentiated by address setting
 - Updating the Symbio 700 firmware will automatically update all connected options modules
- Adapter board
 - Present on every unit
 - Wire harness management
- Gas heat module(s)
- XM Module(s) – for custom TGP2



Learn More:

- [Visit the Symbio 700 Hub Page](#)
- [Symbio 700 User Guide](#)



Symbio® 700

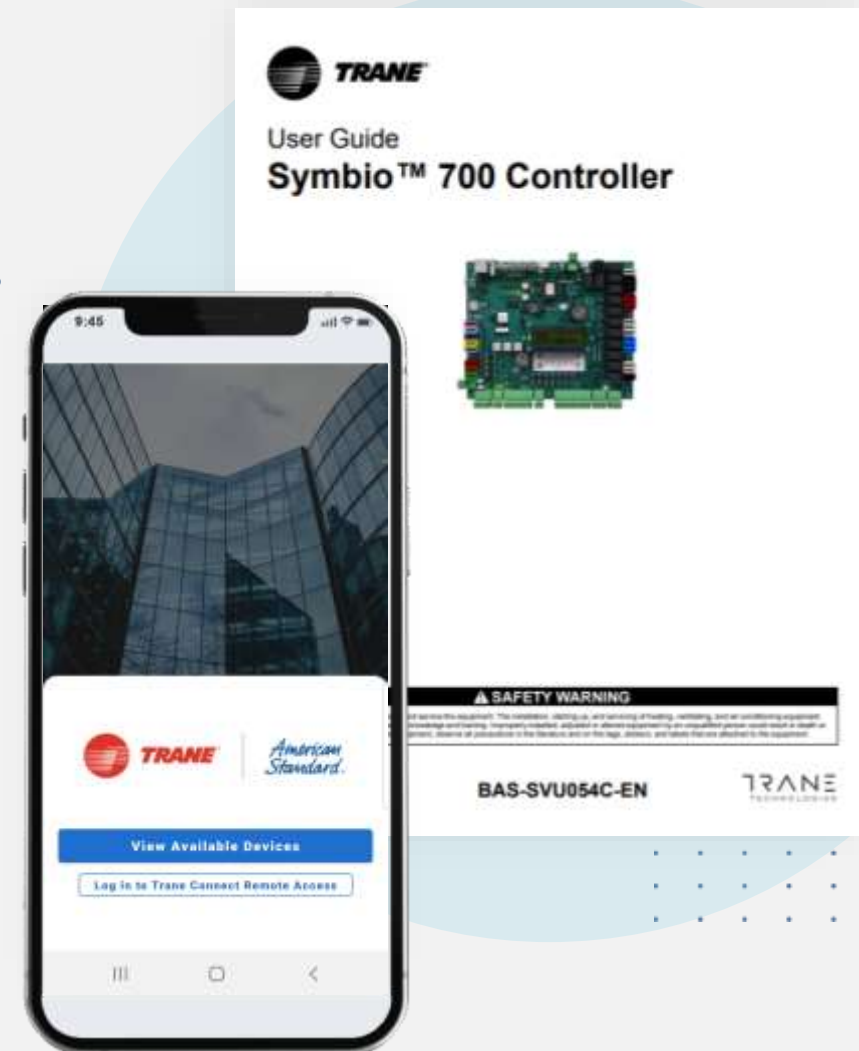
Symbio Service & Installation App



- Symbio Service & Installation App Overview
 - Connects via Bluetooth to the Symbio 700
 - Free download on iOS and Android devices
 - Primary Symbio 700 service and configuration tool for contractors
 - Trane Technicians can utilize Tracer TU or the app
 - [Tutorial Videos on YouTube](#)
- [Contractor Training Webinar](#)
 - First delivered December 5-7, 2023
 - Available in LMS through July 2024
 - More sessions coming throughout 2024 – watch for announcements

Learn More:

- [Visit the Symbio 700 Hub Page](#)
- [Symbio 700 User Guide](#)



Symbio® 700

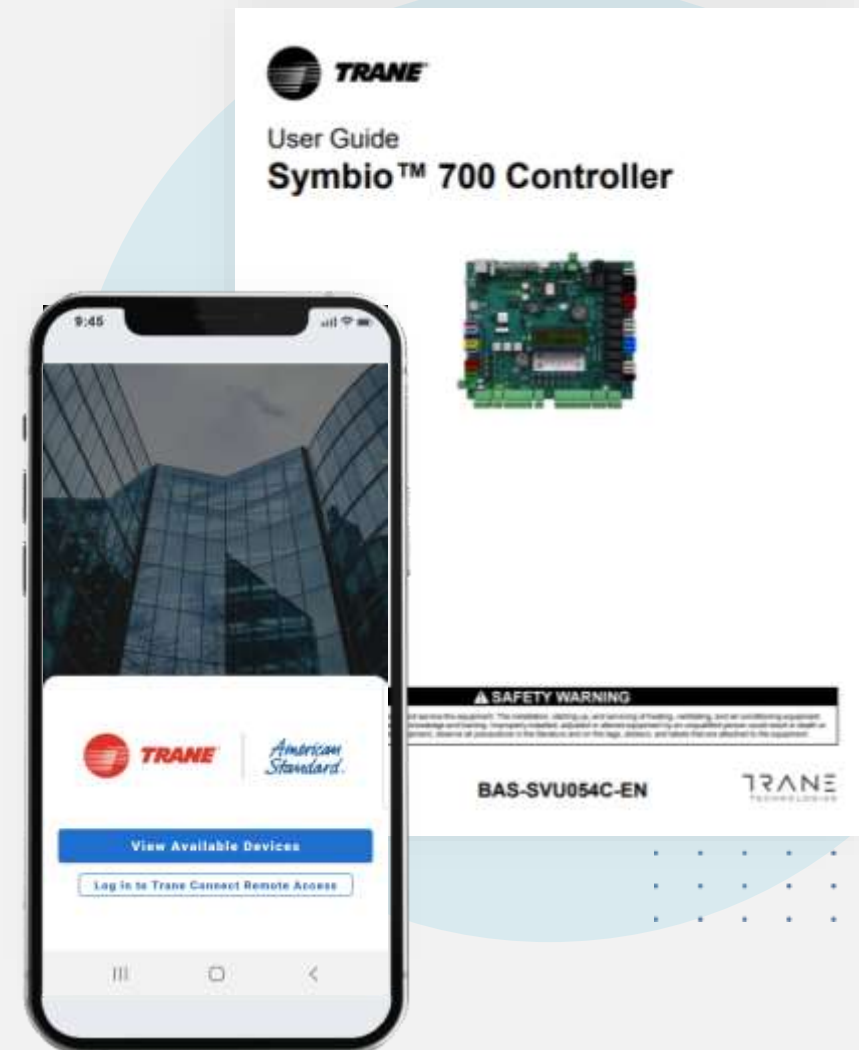
Symbio Service & Installation App



- Symbio Service & Installation App functionality
 - Status and overrides
 - Alarms
 - Save & restore database
 - Protocol configuration
 - Change unit configuration
 - Service test mode
 - Upgrade firmware
 - View and export data logs
 - Trane Connect setup
 - **Update License – new in February 2024**
 - Access to Trane Support – new in February 2024

Learn More:

- [Visit the Symbio 700 Hub Page](#)
- [Symbio 700 User Guide](#)



Symbio® 700 New Licensing Feature

New feature

- Starting in Q2 2024, Symbio 700 Advanced License will be available for purchase through Service Part Store (p/n: FRW00001)
- New license eliminates board replacement for Basic to Advanced updates
- Symbio Service & Installation App (February release) and onboard display (v5.00.0010) fully support this upcoming feature
- New part numbers will replace current parts
 - Eliminating X part number for advanced board
 - New service parts will be available: MODTBD and MODTBD
- Tracer TU support coming soon



	X Part Number	Service Part Number
Symbio 700 Basic	X13651735002	MODTBD
Symbio 700 Advanced	---	MODTBD
Symbio 700 Adv. License	---	FRW00001

Learn More:

- [Symbio 700: Basic vs. Advanced Hub Article](#)



Symbio® 700 New Licensing Feature

Use cases and workflow



Upgrading a Basic version to an Advanced version

- Acquire a Symbio 700 Advanced License through Trane Parts
- Parts will send new license file and installation instructions through email
- Using the mobile app or the onboard display, follow instructions and update controller license (external USB storage device is required when using the onboard display)

Replacing a failed Symbio 700 controller

- Trane Parts will request failed Symbio 700 Controller serial number
- Trane Parts will look up serial number and, if applicable, will “move” the license from failed controller to new Symbio 700
- When replacing an existing board, new unit **must be configured**
 - **Best Practice:** If possible, backup the original controller and transfer the backup to the new controller
 - Without a backup, the controller needs to be fully configured manually
 - The backup file can be created/restored from a USB thumb drive using the mobile app or the onboard display

Feature	Basic Controller	Advanced Controller
Troubleshooting	Active alarms Event log ⁽¹⁾ Export trends	Active alarms Event log ⁽¹⁾ Export trends
BAS Communication	Not Available	BACnet over Zigbee (Air-Fi) BACnet MS/TP BACnet IP Modbus RTU Modbus TCP LonTalk
TGP2 and Expansion Module Support	Not Available	Up to 8 additional I/O via XM30 or XM32, requires Tracer TU to configure
Remote Connectivity	Remote access and monitoring, providing troubleshooting support without a site visit via TraneConnect	Remote access and monitoring, providing troubleshooting support without a site visit via TraneConnect

Note 1: Available in Tracer TU and Symbio Service and Installation App; not available via local user interface.

Learn More:

- [Symbio 700: Basic vs. Advanced Hub Article](#)



Symbio® 700 FAQs



What are Basic and Advanced?

- Two controller types
 - Basic does not support Communication or TGP2

How do you select the board in TSA?

- Packaged units default to Advanced, split systems require a choice
- Factory-installed per equipment selections in Trane Select Assist

How do I know what version of the controller I have?

- Mobile app shows license type on home page
- Onboard display now shows license type while booting (released on firmware V5.00.0010)

How do I update Symbio 700 firmware?

- Tracer® TU via File Transfer with firmware located on your PC
- Symbio Service & Installation Mobile App and a USB stick containing the firmware

Feature	Basic Controller	Advanced Controller
Troubleshooting	Active alarms Event log ⁽¹⁾ Export trends	Active alarms Event log ⁽¹⁾ Export trends
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Note 1: Available in Tracer TU and Symbio Service and Installation App; not available via local user interface.



Learn More:

- [Symbio 700: Basic vs. Advanced Hub Article](#)



Symbio® 700 FAQs

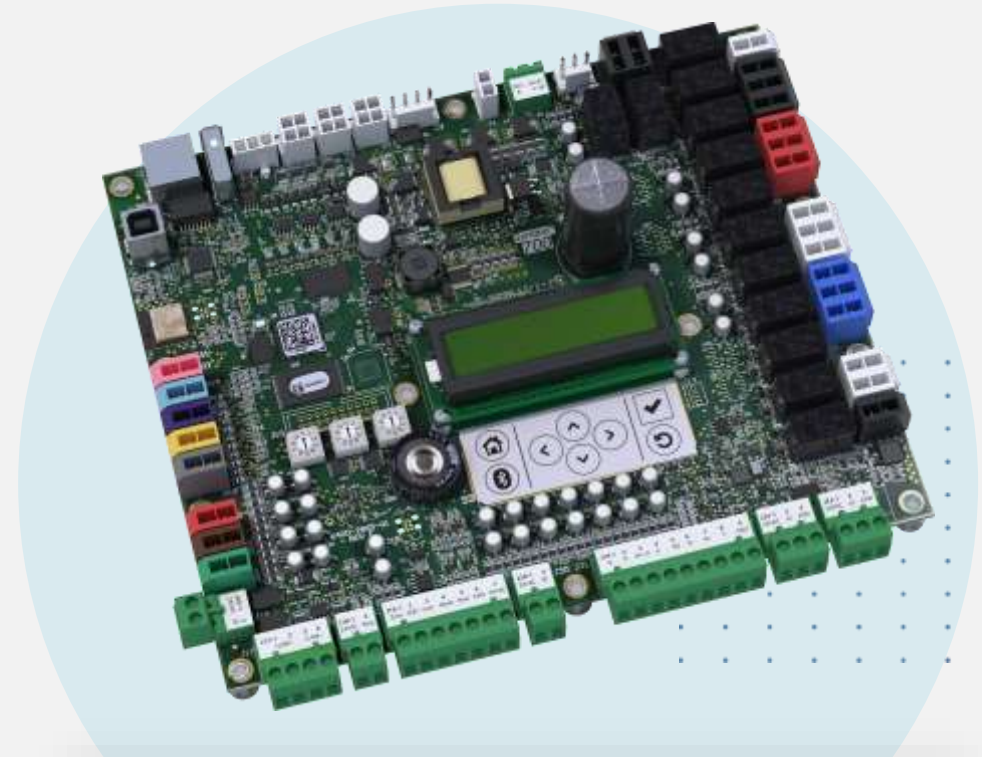


How do I configure the Symbio 700 controller?

- All units come configured, commissioned and tested from the factory
- When field accessories (i.e., economizer) or modifications are needed:
 - Tracer TU
 - Symbio Service & Installation Mobile App
 - Onboard 2 x 16 display

How do I configure set points in the Symbio 700 controller?

- All set points are adjusted with TU or mobile app and stored in memory
- With Symbio 700, ReliaTel-style potentiometers are not used



Backup your Symbio 700 Controllers!

Backups and Settings

Key differences



Backups

- Contains all facts about the unit
 - Includes the Configuration, XM Module setup, TGP2 programming and the Factory Default File, Model Number, Device ID, etc.
- These should be used only for controller replacement
- A backup from a Basic board can be applied to an Advanced board
 - Note: Applying a backup from an Advanced board to a Basic board does not make the Basic board Advanced



Settings

- Contains setpoints
- Ability to transfer settings from unit to unit via the Symbio® Service & Installation App
- The Symbio Service & Installation App can create settings file and load settings
- Useful when setting up similar units on a common jobsite
 - Example: A national chain store where thirteen of the same 25-ton units are used

Service Test Mode and Data Logs



Service Test Mode

- Service Test Mode steps are made with the Symbio® Service & Installation Mobile App
- No longer use the ReliaTel® method of manually shorting two terminals together to step the equipment through the modes
- Tracer TU can turn on service test mode by overriding the Service Test State Request multistate value point



Data Logs (aka Trends)

- Many Data Logs are created automatically based on unit configuration
- Data Logs have 50,000 points trending at 10-second intervals (over 5 days)
- Data Logs can be viewed in the Symbio Service & Installation app or exported to a USB drive
 - Up to 4 Data Logs can be viewed simultaneously in the app
- Data Logs can be created, managed, charted and viewed from Tracer TU

Using XM Modules and TGP2



- Up to two optional XM30 and/or XM32 modules can be installed
 - A total of 8 XM points allowed
 - Tracer® TU can be used to write TGP2 programs
 - Advanced Symbio® 700 only
- Examples of when TGP2 should be used:
 - External heat (great example as Symbio 700 does not support hydronic heat)
 - Modulating hydronic heat
 - Modulating electric heat
 - Duct heater
 - External energy recovery devices (great example as Symbio 700 does not support energy recovery)
 - Dehumidification (good example)
 - Control discharge air reheat setpoint
- What TGP2 cannot do:
 - Directly take control of compressor(s) and supply air fan(s) outputs
 - Best practice is to use the existing points to limit ranges, ensuring all factory safeties still exist and are applied



Upgrades and Migrations Using Symbio[®] 700



Learn More:

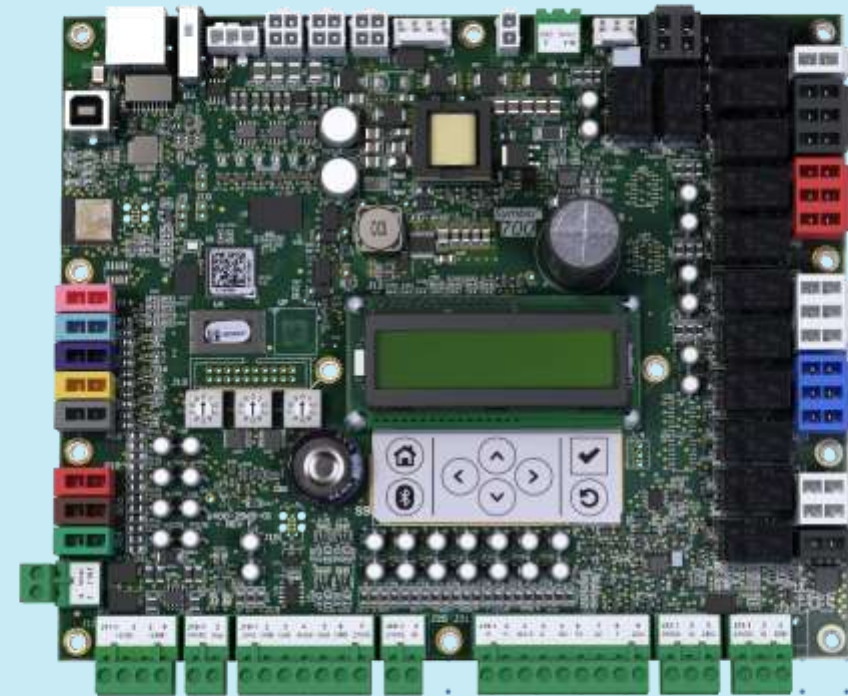
- [Integrating Symbio 700 into Existing Systems](#)
- [Precedent Next Gen Customer Presentation](#)
- [What RTUs Are Supported with Tracker and CCP?](#)
- [Controls Upgrades – Airside Migration Path](#)



- When a RTU is replaced, you need to consider the BAS
- Symbio 700-based Odyssey[™] / Precedent[®] / Voyager[®] 3 not always a simple drop-in replacement for older ReliaTel[®] RTUs
- Considerations:
 - Symbio 700 constant volume zone temp based units have multi-speed fans only
 - There is no Comm3 or Comm4 option
 - Many older generation RTUs could be communicating to a Tracker/CCP or Tracer Summit[®] BCU or SC+ w/ BMTB Comm3/4 bridge
 - TCIs (Comm3/Comm4) are not compatible with the new RTUs
 - Symbio RTU does support LonTalk but will not install into Tracker BMTKs
- Multiple upgrade and migration paths exist, depending on installation
 - Several resources available and are continually updated

Questions?

Symbio® 700

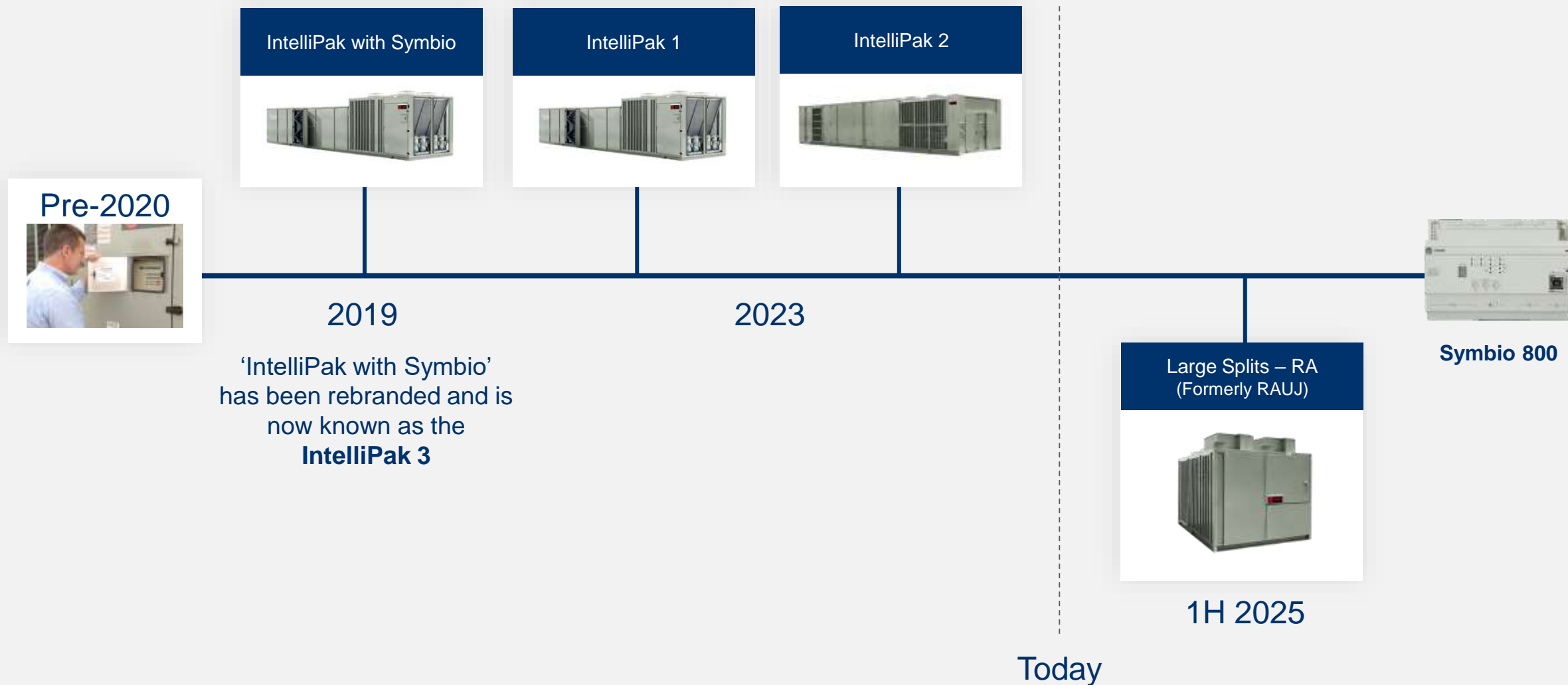


Symbio[®] 800

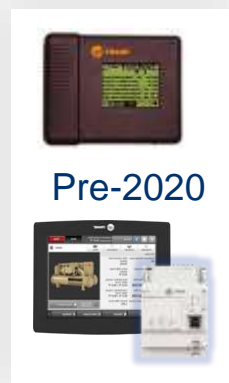
Continued progress converting the
applied equipment portfolio



Symbio® 800 IntelliPak® Implementation Progress



Symbio® 800 Chiller Progress



Pre-2020

Air Cooled Centrifugal	Air Cooled Rotary	Air Cooled Scroll
GVAF	RTXC/RTXE/RTXG ACRB (RTAE,ACRA) RTAF RTMG RTAG	CGAX/CXAX ACS/ACX (CGAF,CXAF,CGAX,CXAX) CGAM Multi-pipe
HSWA (HSWB) Agility (HDWA) Simplex & Duplex GVWF	RTHD RTWD/RTUD RTWF/RTSF RTHF	CGWF(CXWF, CCUF)
Water Cooled Centrifugal	Water Cooled Rotary	Water Cooled Scroll

Today



In Progress

**Thermafit /
Minimod / TCAA**
(formerly Arctic Chillers)



Legacy Controller:
Danfoss Adaptive Logic
Symbio Controller:
Symbio 800

Symbio® 800 Chiller Migration



- TU tool to aid in conversion
 - Reads CH530 Kestrelview Report
 - Reads UC800 Configuration File
 - Converts to Symbio 800
- Not all chillers have this YET
 - Only on Simplex/Duplex
- Symbio 800 point instances are different than legacy
 - Trane BAS has no issues
 - 3rd party BAS will require updating
 - Some points have changed polarity or type
 - Different arbitrations



Pre-2020



Learn More:

- [Tracer Communications Options for Symbio Chiller Upgrades](#)



Other Topics

Reference the Hub to learn more about these topics



- Recycle points
- In- and out-of-service
- Setpoint control
- Arbitration
- IPAK Diagnostics tool



Questions?

Symbio[®] 800



