Installation Instructions

CDUB - Symbio™ 800 Control Upgrade Kit

For UC800 AdaptiView™ Display

Model Number:	Used With:
CDUA, CVRE	UC800
CVHE, CVHF, CVHG, CVGF	UC800
HDWA, CVHM, CVHH	UC800

This document applies to service offering applications only.

Distribution/use of this document is limited to the Trane sales and service organization in support of Symbio 800 AdaptiView and is not intended for independent third party use or for use apart from the Symbio 800 AdaptiView display upgrade for UC800 AdaptiView display.

⚠ 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.

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SO-SVN038B-EN

Introduction

Read this manual thoroughly before operating or servicing this unit.

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.

The three types of advisories are defined as follows:

⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	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.
NOTICE	Indicates a situation that could result in equipment or property-damage only accidents.

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.**

⚠ WARNING

Cancer and Reproductive Harm!

This product can expose you to chemicals including lead and bisphenol A (BPA), which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Copyright

Trademarks

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Revision History

Updates to Wiring Diagram chapter.

Table of Contents

General Information

Other Required Manuals

This manual must be used with the following publications (or their most recent versions):

- *CenTraVac® Water-cooled Chillers Models CVHE, CVHF, and CVHG With Symbio™ Controls - Installation, Operation, and Maintenance* (CVHE-SVX005*-EN)[1]
- *AdaptiView™ Display with Symbio™ Controls CenTraVac® Water-Cooled Chillers - User Guide* (CTV-SVU004*-EN)[1]
- *Tracer® TU Service Tool For Water-Cooled CenTraVac® Chillers with Symbio™ Controls - Programming Guide* (CTV-SVP004*-EN)[1]
- *CenTraVac® Water-cooled Chillers with Symbio™ Controls Diagnostic Descriptions, Troubleshooting Tables, and Control Component Overview - Diagnostics Manual* (CTV-SVD005*-EN)[1]
- *Tracer® TU Service Tool - User Guide* (BAS-SVU047*-EN)[1]
- *Tracer Symbio Panel Upgrade - Programming Guide* (CVRF-SVP01*EN)

Required Tools

Normal service tools are required to perform the majority of the work. A service technician with a well stocked tool chest should have the right tools to perform the job.

In addition to the normal service tools and hardware, the following is a partial list of specific field supplied hardware/ software components and special tools that are also required to perform the display retrofit:

- An RS-232 male DB9 to female DB9 pin to pin serial cable to connect the DynaView to a PC or laptop computer.

  Note: *The cable must not be a null-modem cable. The cable must be less than 50 feet in length.*

  – The RadioShack® part number for the proper cable is 26-117B.
- Type A to Type B USB cable to connect the Symbio 800 controller to a PC or laptop computer.
- A PC or laptop computer equipped with the following:
  – TechView™ service software, version 12.1 or newer.
  – Tracer TU service software, version 2.02 or newer.
  – Rover™ service software (only required if the chiller is equipped with a LonTalk® Comm5 board).
- South pole magnet screwdriver (TOL01343).
- Electronics vacuum.

Field-Provided Material

Some field provided material will be required to perform the display retrofit. A list of material is provided here to help the technician to plan ahead and to avoid material shortages at the job site.

- Wire, red and green #16 AWG control wire - required to make the connections between the power supply and existing transformer.
- Wire connectors.
- Wire wrap or some other form of wire protection for areas that wiring runs may come into contact with sharp edges.
- Cable ties to help clean up wiring runs.

If the unit is located outside, a cover is required for the display.

- The Trane part number for this cover is COV03916.

1. *A copy of this manual is shipped with the upgrade kit.*

Introduction

Summary of UC800 Display Upgrade

- This manual provides instructions and describes the procedures required to upgrade a UC800 retrofit panel equipped CVRE, CDUA chiller.
- It also applies to the following production chillers with UC800 controls: HDWA, CVHE, CVHF, CDHE, CDHF, CDHG, CVGF, CVHM, CVHS, CVHL, CVHH or CDHH chiller to a Symbio™ display system.

In this manual are the following general topic areas:

- Check the configuration and setpoints in the AdaptiView display.
- Save the AdaptiView display configuration and setpoints.
- Shutdown power.
- Remove the UC800 controller and replace with Symbio 800 controller.
- Remove the old display and replace with new TD-12 display.
- Wiring connections to the new TD-12 display and the Symbio 800 controller.
- Before restoring system power.
- Restoring system power.
- Programming the Tracer Symbio display.

Model Number

For service purposes, Trane model CDUB Symbio™ 800 AdaptiView display upgrade packages are assigned a multiple character alphanumeric model number that precisely identifies each unit.

An explanation of the identification code that appears on the unit nameplate. Use of the service model number will enable the owner/operator, installing contractors, and service technicians to define the operation, components, and options for any specific unit.

Refer to the model number printed on the nameplate when ordering replacement parts or requesting service.

Model Number Descriptions

Digits 1, 2, 3 — Unit Function

CDU = Color, Display, Upgrade

Digit 4 — Development Sequence

B = Symbio™ 800 Chiller Controller

Digits 5 — Controls Upgrade[2]

1 = CH530 Simplex
2 = CH530 Duplex
3 = CH530 Gear Drive
4 = CH531
5 = UC800 CVRE
6 = UC800 CDUA
7 = UC800 CTV Simplex
8 = UC800 CTV Duplex
9 = UC800 ECTV
A = UC800 Agility
B = UC800 CVHS
C = UC800 CVHM

Digit 6 — Global Connector Kit

0 = No Global Connector Kit Option
A = With Global Connector Kit Option

Digits 7 — Chiller/Tower Water Flow Display

0 = No Chilled/Tower Water Flow Display
1 = Dual Pressure Sensors
2 = Flow Meter Customer Provided

Digit 8 — Solid State Oil Relay Control

0 = No Solid State Relay
A = Solid State Relay Only
B = Solid State Relay W/ELM01116
C = Solid State Relay W/ELM08119

Digits 9 — Tracer Interface Control Module

0 = Without Communication Module
2 = With Generic BAS
5 = LonTalk Communication

Digit 10, 11 — Design Sequence

AA = Symbio 800 Upgrade Release

Digit 12 — Heat Recovery/Auxiliary Condenser
0 = No
1 = Yes

Digit 13 — Air-Fi Operation

0 = No
1 = Yes

Digit 14 — Wi-Fi Operation

0 = No
1 = Yes

Digit 15 — LTE Operation

0 = No
1 = Yes

Digit 16 — NEMA 4 Communication Box

0 = Without Box
1 = Small Box
2 = Large Box

Digit 17 — Energy Meter Operation

0 = No
A = Energy Meter, 480V and Low
B = Energy Meter, 575V and 600V
C = Energy Meter, Medium Voltage, 100A CT
D = Energy Meter, Medium Voltage, 200A CT
E = Energy Meter, Medium Voltage, 400A CT

Digit 18 — Head Pressure Control

0 = No
1 = Yes

Digit 19 — Expansion Module

0 = No
1 = Expansion Module XM30
2 = Expansion Module XM32
3 = Expansion Module XM70
4 = Expansion Module XM30+XM32

2. *Digit 5 does not affect the kit contents. It is strictly for record keeping.*

Getting Started

To install an Symbio™ 800 AdaptiView display upgrade kit, the technician must have good knowledge of the Symbio 800 control systems. Training in Symbio 800 controls is highly recommended before beginning this upgrade.

Nameplate

A Symbio™ 800 AdaptiView display upgrade nameplate is included in the kit to be installed near the original nameplate on the control panel. Provide the model number and serial number information from the nameplate when making inquiries, ordering parts, or literature for the Symbio 800 AdaptiView display system.

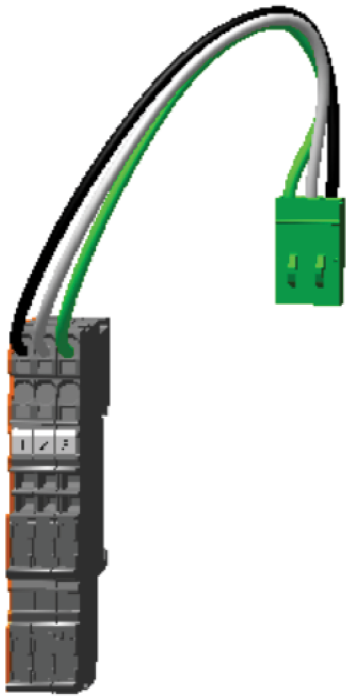
Symbio 800 AdaptiView Display Upgrade Kit Contents

Table 1. Basic bill of material for Symbio 800 control upgrade kit

Description	Qty.	Part Number[a]	Mnemonic Part Number[a]
Symbio AdaptiView color display (if new display ordered)	1	X13760359001	MOD03183
Symbio 800 controller	1	X13651678020	MOD02979
Harness; Modbus distribution	1	453730970001	WIR10397

[a] All part number information in this table is subject to change at any time.

Figure 1. Modbus distribution harness



⚠ WARNING

Hazardous Voltage w/Capacitors!

Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury.

Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. Verify with a CAT III or IV voltmeter rated per NFPA 70E that all capacitors have discharged.

Running the IPC Bus

All optional devices on the chiller must be connected to the IPC communication bus. Verify all devices are connected, using the correct cables, so no open plugs remain.

⚠ WARNING

Personal Protective Equipment (PPE) Required!

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- **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.**
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- **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.**

Table 2. Field installed LLIDs and cables shipped for various options

	DHVBIBRD04874	DAIOBRD04875	DPTTDR00734	CAB01146 branch M[(a)] to 2F 500 mm	CAB01147 branch M to 2F 1000 mm
Heat recovery / aux condenser	1	—	—	—	—
Chilled/tower water flow display, standard accuracy	—	—	4	—	2
Chilled/tower water flow display, high accuracy	—	1	—	—	—
Heat recovery / aux condenser water flow display, standard accuracy	—	—	2	—	1
Heat recovery / aux condenser water flow display, high accuracy	—	1	—	—	—

(a) The letters M and F represent male and female connectors.

Installation

Installation of UC800 Control

Check the Configuration and Setpoints in the AdaptView Display

Important: *Verify the UC800 firmware is upgraded to the most recent version before creating the chiller service report for conversion to Symbio. The conversion utility is only designed to work with the most recent version of UC800 firmware.*

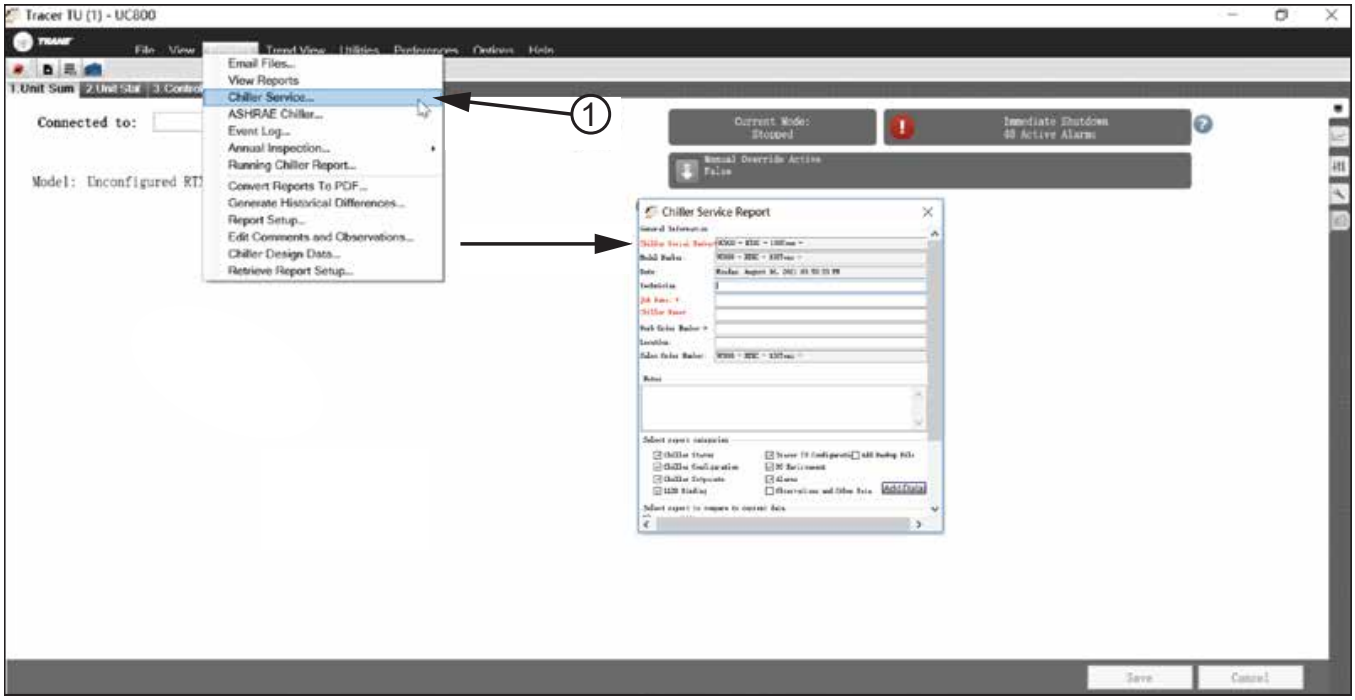
1. Check the current configuration of the AdaptView and confirm all settings are correct. Make any necessary changes.
2. Check all of the current chiller setpoints programmed into the AdaptView and confirm that they are all correct for the unit. Make any necessary changes.

Save the AdaptView Configuration and Setpoints

Using Tracer TU on a PC or laptop computer.

Generate a Chiller Service report from the AdaptView with Level 4 active.

Figure 2. Tracer TU



⚠ WARNING

Hazardous Voltage and Equipment Damage!

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

CT terminals are referenced to neutral on the meter and may be at elevated voltages. Do not contact meter terminals while the unit is connected. Do not connect or short other circuits to the CT terminals.

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Verify that no power is present with a CAT III or IV voltmeter rated per NFPA 70E.

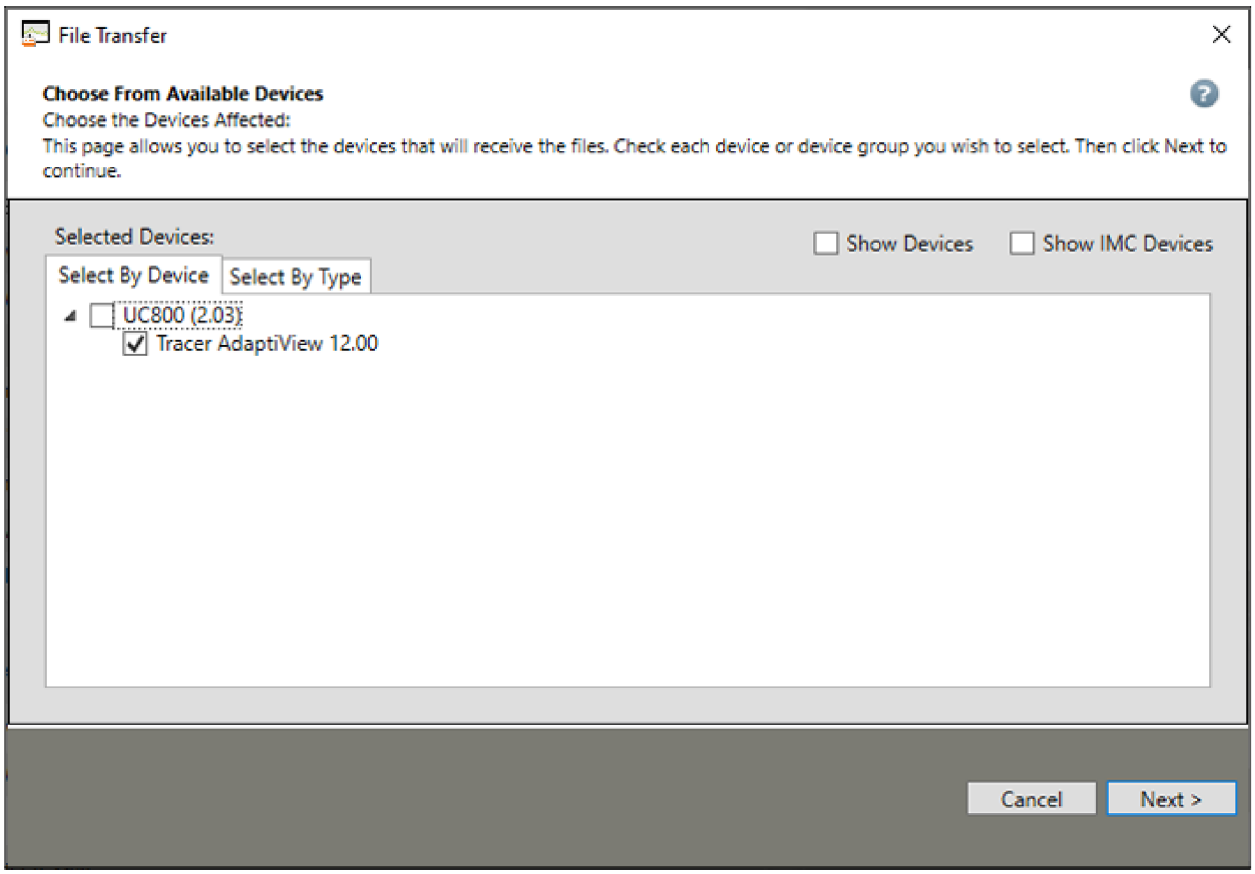
Upgrading Display Firmware

Important: *This firmware upgrade applies to existing, reused black frame AdaptiView displays. Gray frame displays are incompatible with Symbio and must be replaced with the new black frame display. Display firmware download must be done using a functional UC800 controller. If the existing UC800 controller is not functional, a substitute UC800 controller must be obtained. Download can not be done with a Symbio controller. Use of a Symbio controller will result in a loss of communication to the UC800, which cannot be restored.*

Upgrade the display firmware by completing the following steps.

1. Connect your laptop to the USB port on the UC800 or on the control panel.
2. Start Tracer® TU.
3. Click **Utilities** on top of TU and click **File Transfer Utility**.
4. Click **Yes** for the save file popup.
5. The File Transfer dialog box will appear. Deselect the UC800 and select the Tracer AdaptiView.
6. Click **Next**.

Figure 3. Tracer AdaptiView selection

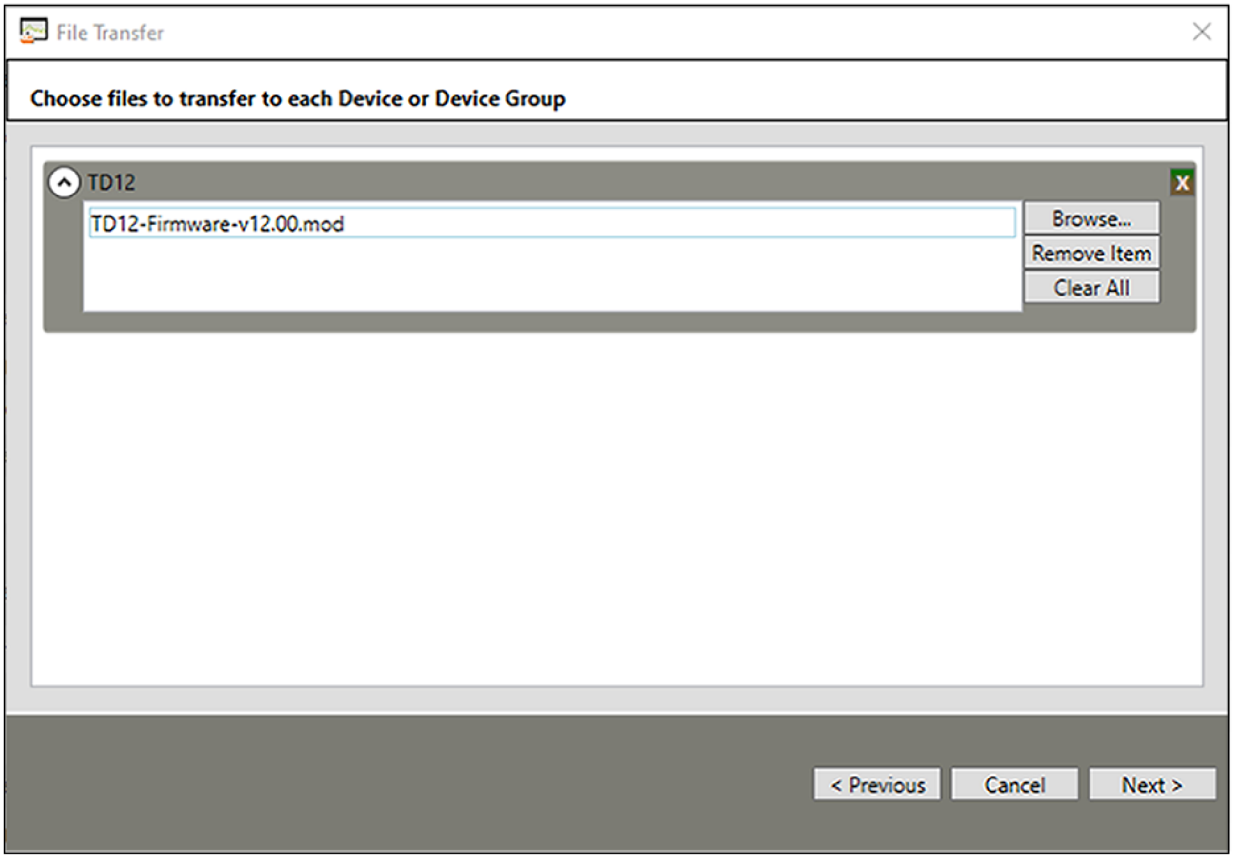


7. In the next dialog box, click Browse button and navigate to the display firmware file, then click Open to select the file and then click **Next**.

Notes:

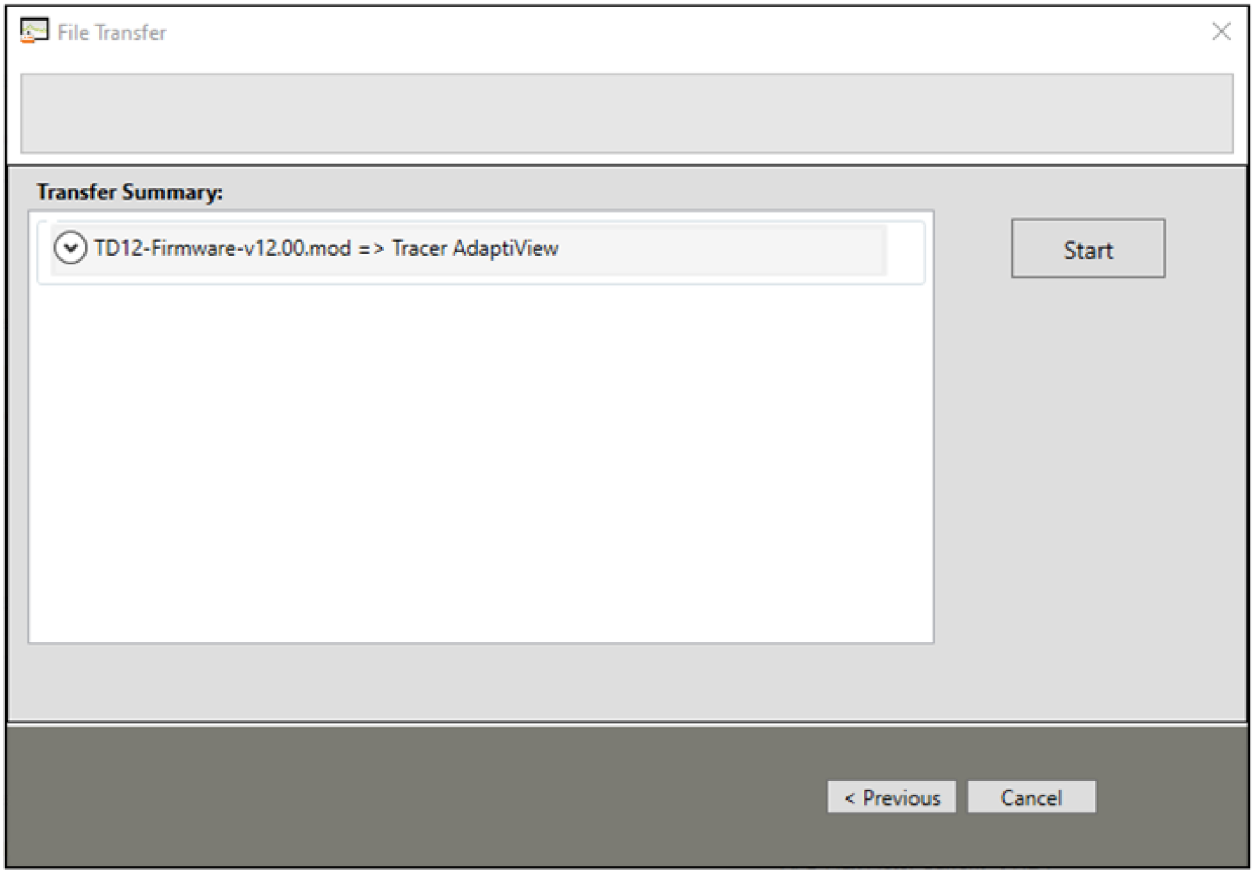
- *Obtain TD display firmware from the Trane Commercial Downloads page, Symbio™ 800 section.*
- *Recommended firmware location: C:\ProgramData\Trane\Tracer TU\Firmware\TD-12*

Figure 4. Display firmware file navigation



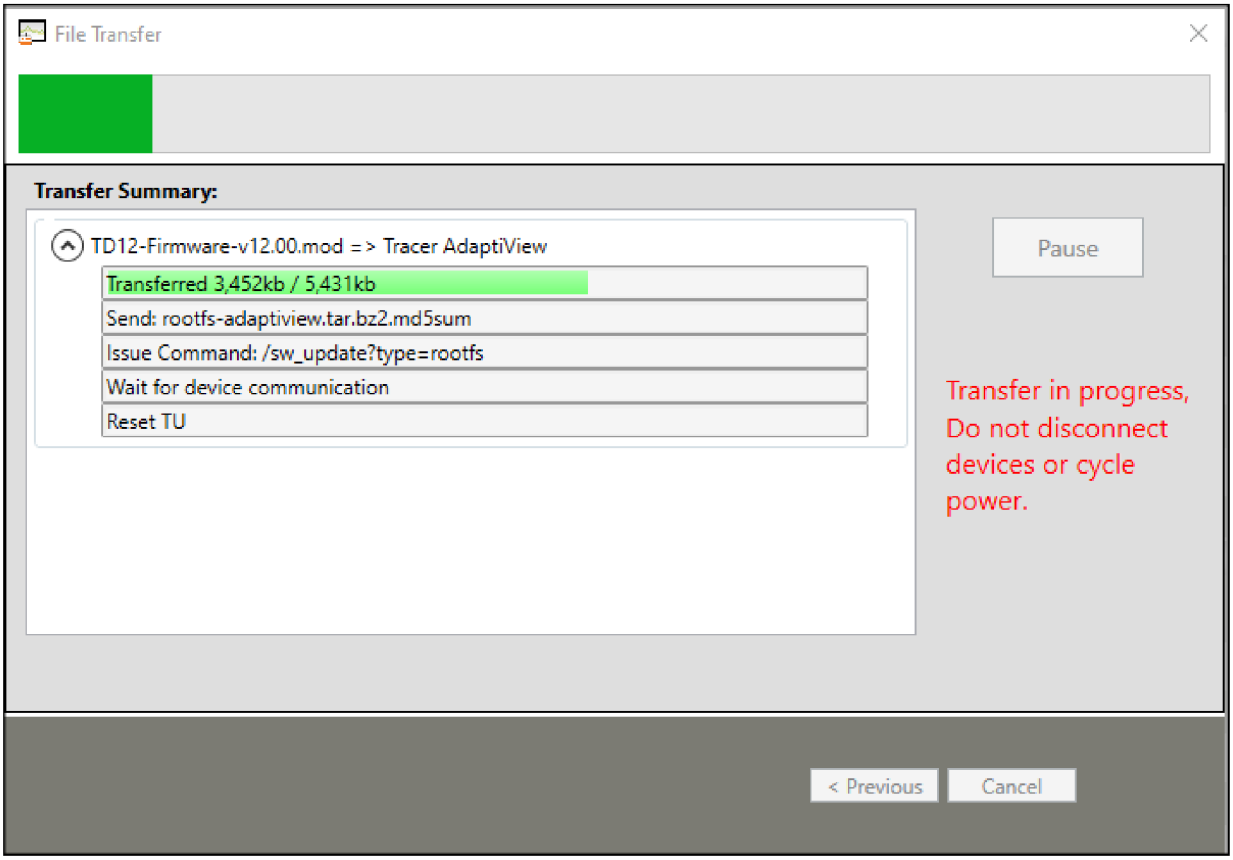
8. Click **Start** to begin the firmware download process.

Figure 5. Start button



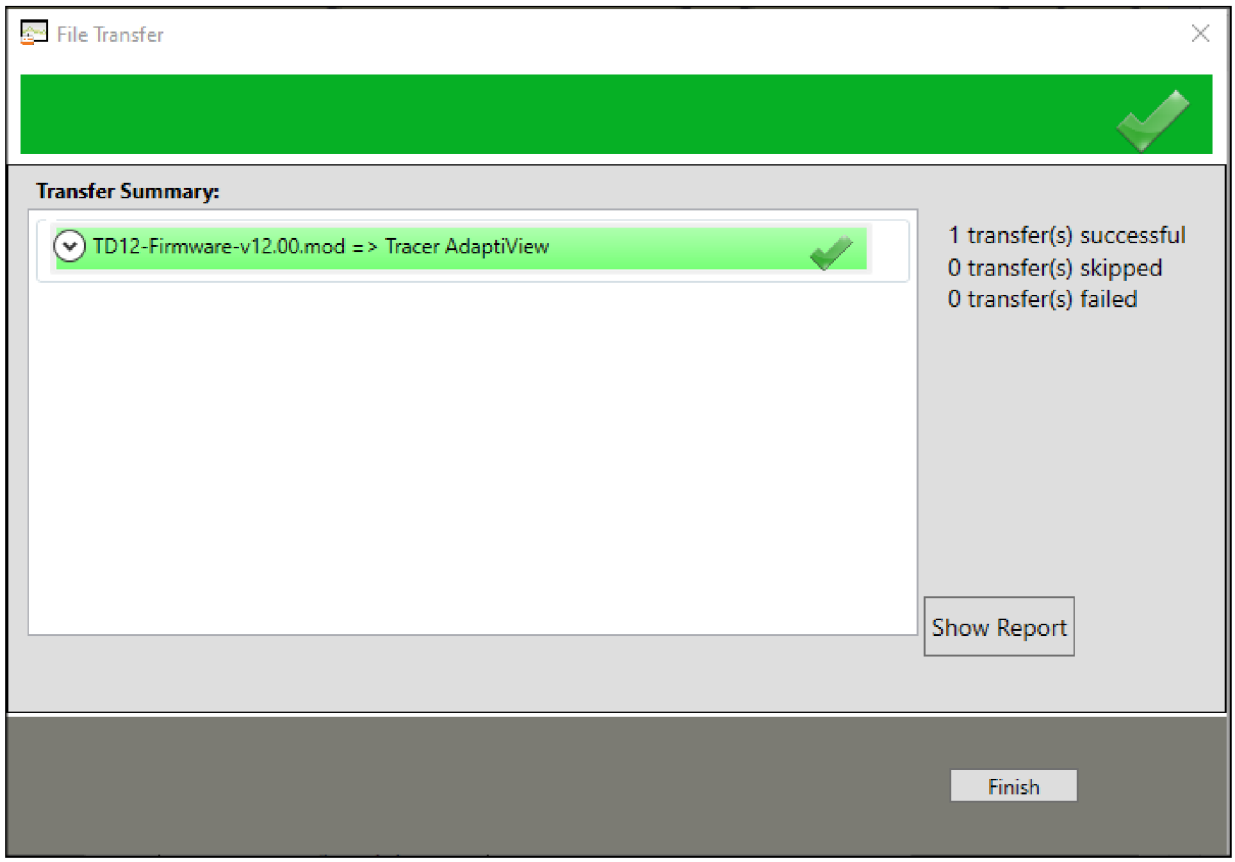
9. The following dialog box will display the progress of the firmware download process.

Figure 6. Firmware download process



10. Click **Finish** when the file transfer process completes.

Figure 7. Firmware download process complete

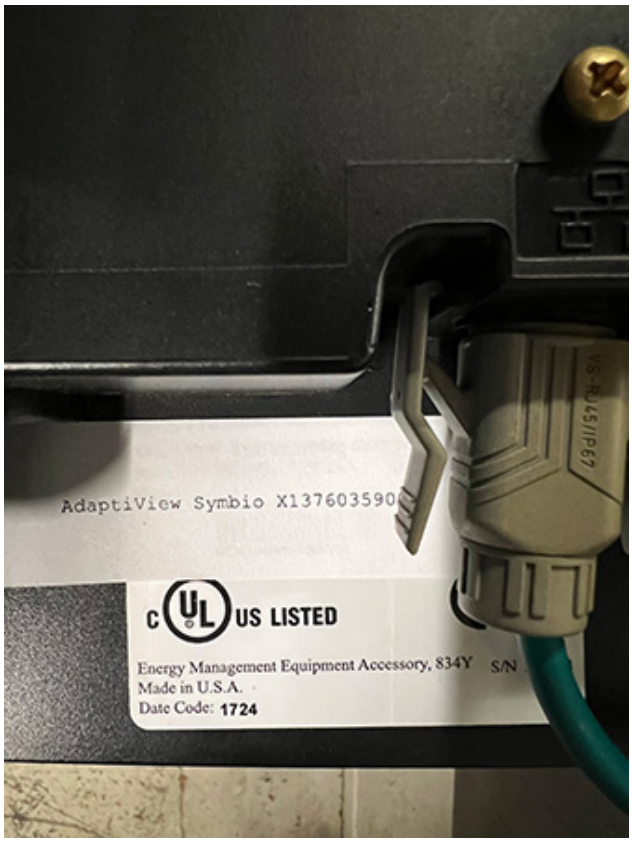


Update the Display Original X-Code to Symbio Display X-Code

When the display firmware is upgraded, revise the display part x-code to X13760359001 in order to avoid future confusion when ordering replacement parts.

In order to do this, print the correct x-code on the 2nd page of the CDUB nameplate. Cut this from the name plate and put it on the back of the display. If there is an x-code on the display back, cover it with the new x-code number.

Figure 8. AdaptiView Symbio x-code



Shutdown Power

1. Using lock out tag out safety procedures, shutdown the chillers main power.
2. Open all starter and control panel disconnect switches and secure them in the open position.
3. Confirm the power is off to the chiller control panel.

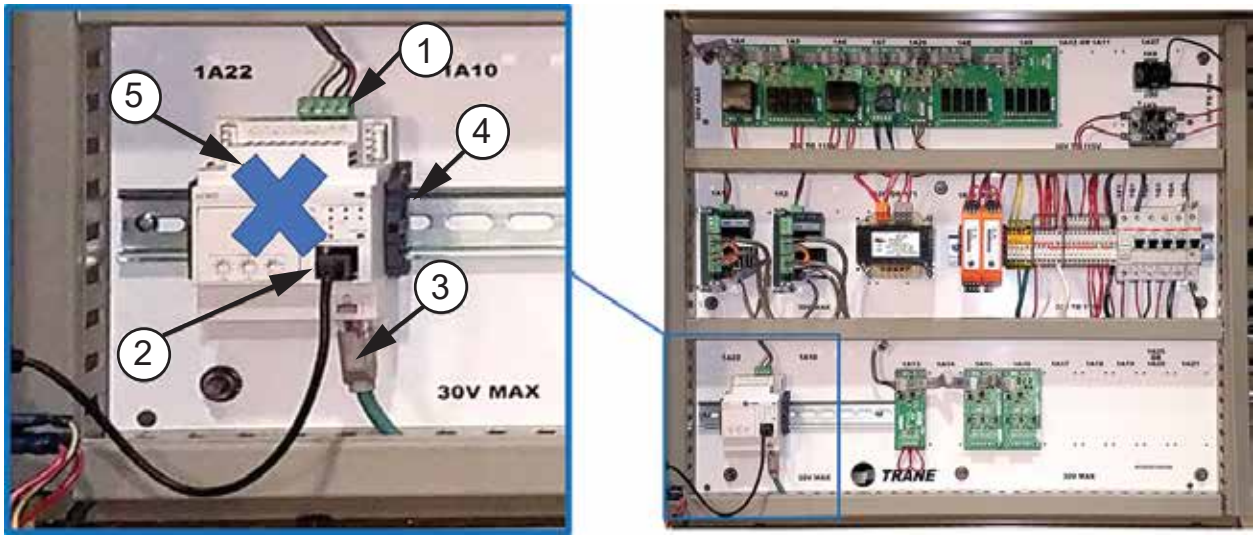
Remove the Existing UC800 controller and Install New Symbio 800 Controller

Remove Existing UC800 Controller in Panel

Note: *UC800 controller is mounted on the door in CDUA chiller retrofit panel.*

1. Unplug the terminal of IPC communication harness.
2. Unplug the USB terminal of USB cable.
3. Unplug the RJ45 terminal of ethernet cable.
4. Loosen the screw of din rail end stop.
5. Remove UC800.

Figure 9. Remove existing UC800 controller in panel



Install New Symbio 800 Controller in Panel

Note: *Symbio 800 controller should be mounted on the door in CDUA and CVRE chiller retrofit panel.*

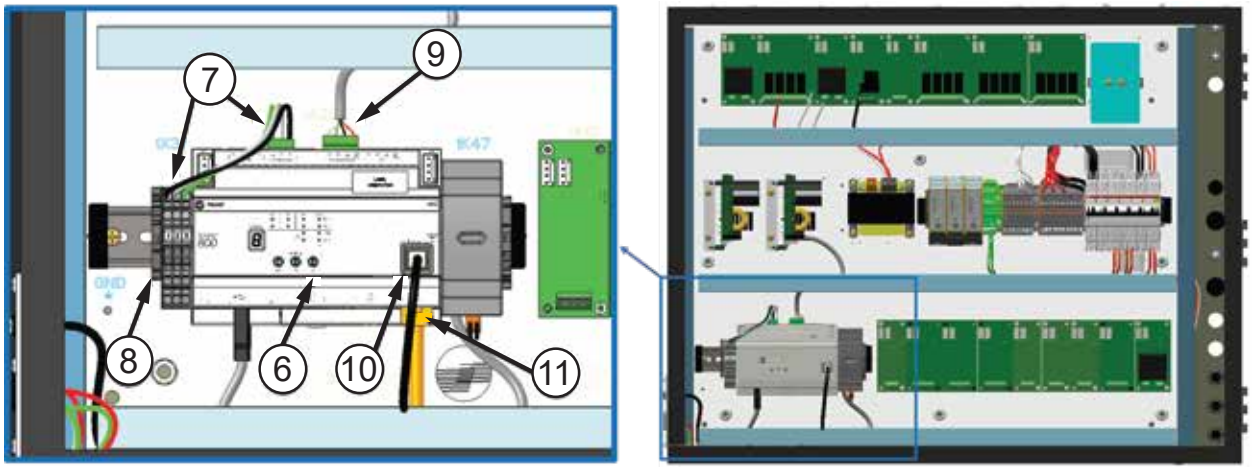
1. Mount Symbio 800 controller on the din rail.
2. Mount Modbus distribution harness terminal close to Symbio left and plug the harness terminal to the Symbio 800 P2 connector.

Note: *This harness is not required in CVHM retrofit panel.*

3. Tighten the screw of din rail end stop.
4. Plug the terminal of IPC communication harness to Symbio 800 P3 connector.
5. Plug the terminal of USB cable to Symbio USB connector.

6. Plug the terminal of ethernet cable to Symbio 800 RJ45 No2 connector.

Figure 10. Install new Symbio 800 controller in panel



Remove the Existing Display and Install New Display (When Required)

Remove Existing Display in Unit

1. Unplug the terminal of IPC communication harness.
2. Unplug the terminal of ethernet cable.
3. Loose screw of display to arm, remove existing display.

Install New Display Unit

1. Replace new display, tighten the screw of display to arm.
2. Plug the terminal of IPC communication harness.
3. Plug the terminal of ethernet cable.

Figure 11. Remove existing display and install new display

Solid State Oil Heater Relay Installation

Note: *This procedure does not apply to new chillers operating with R-514A refrigerant. Chillers with R-514A refrigerant have solid-state relay for heater control installed and configured by the factory.*

Relay RLY02909 is provided for upgrading chillers with R-123 refrigerant. This relay will operate with a 120V 15mA signal. It will safely and quickly switch 120V loads up to 25 amps. The oil heater amp draw is 6.25 amps at 120V, which is well within the capacity of RLY02909.

Mounting Location

The RLY02909 must be mounted directly onto a flat steel face of the control panel, either on a side wall of the enclosure, or on the back-plane panel. The mounting surface acts as a heat sink for the relay, so the relay should be securely bolted to the mounting surface.

Note: *Instructions included with the relay may require removal of paint from the mounting surface, and the use of a heat conductive paste between the relay and the mounting surface. Trane lab testing indicates that these additional steps are not needed for the low 6 or 7 amp draw that our heater will apply to the relay. Securely mounting the relay to any steel surface in the control panel is adequate for the application.*

Installation

Note: *Use 12ga wire.*

1. At quad relay output LLID 1A5 in the unit control panel, disconnect wire 42A from terminal 7.
2. Connect wire 42A to RLY02909 terminal 2.
3. Install a wire between LLID 1A5 terminal 7 and RLY02909 terminal 3.
4. Install a wire from RLY02909 terminal 4 and a common terminal (1X1-17 is typical).
5. Install a wire from a 120V source terminal (1X1-10 is typical) downstream of breaker 1Q4, to RLY02909 terminal 1.

Figure 12. Installed solid state relay

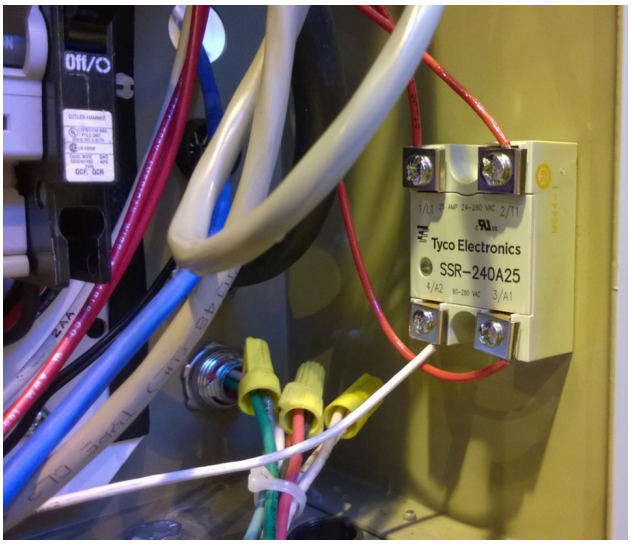
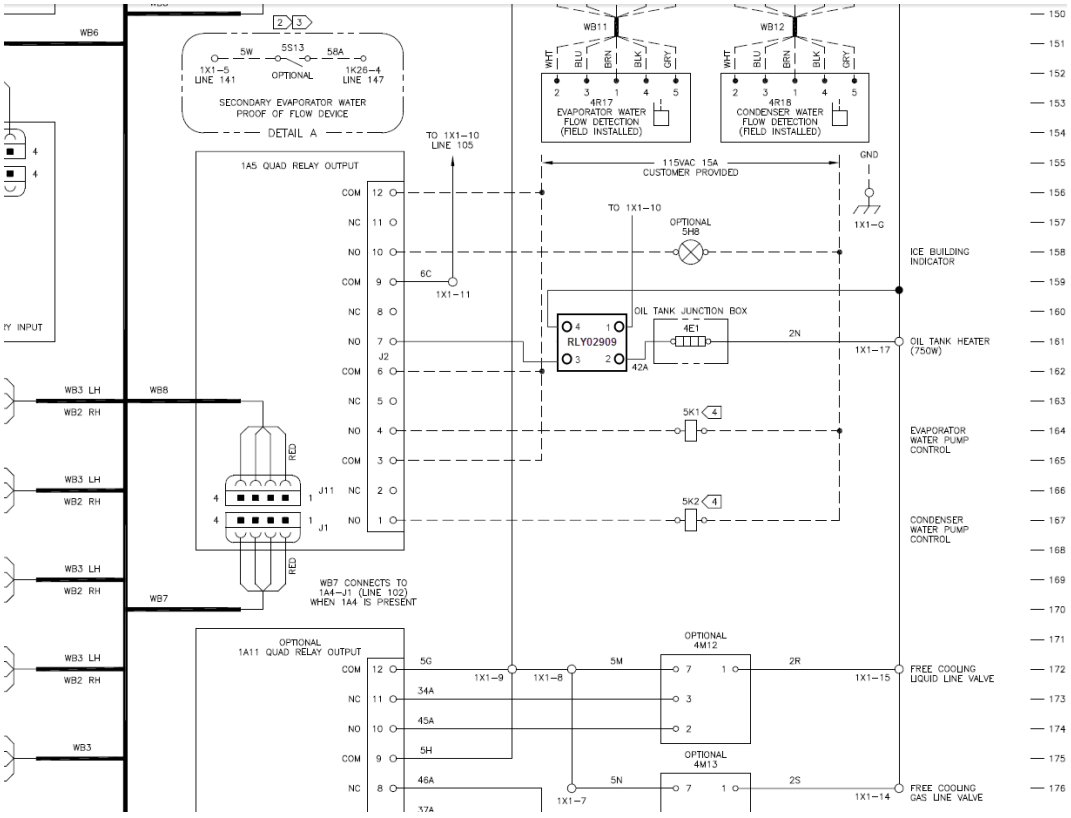


Figure 13. Completed schematic



Installation of Options

LON Option

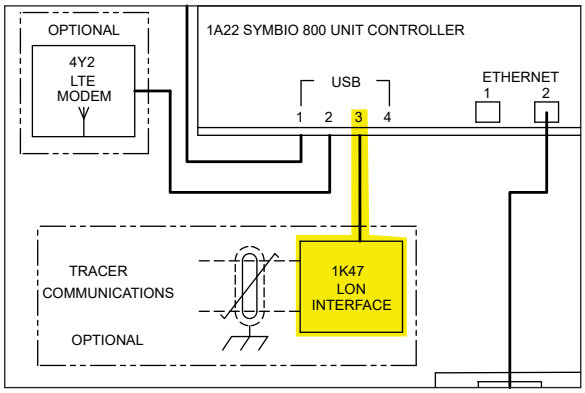
The Symbio™ 800 system will use a U60 LON module through the USB connection instead of the LCI-C LLID.

1. Install the U60 LON module (MOD02977) on the DIN rail on the door. Put it at the left side of Symbio 800.
2. Connect the U60 LON module to the Symbio 800 by a USB cable (provided by the module). This cable can connect to any of the four USB ports under the Symbio 800 controller.
3. Connect the U60 LON module to the BAS by shield cable and terminal. The terminal is provided by the module.

Figure 14. LON

LON wiring, ref. 50712795, 50712799, 50712802, 50712805 or 50712806 depend on different unit. For details, see Table 3, p. 31.

Figure 15. LON wiring



Communication Option

Symbio 800 system supports up to 3 wireless interfaces at same time, these are,

- Wi-Fi mobile APP for BAS interface
- Air-Fi BACnet via Zigbee for component interface
- LTE 4G modem interface for remote communications.

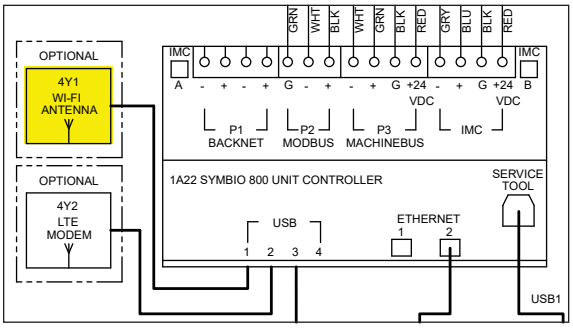
Wi-Fi Installation

See *Trane® Wi-Fi Module Installation Instructions* (BAS-SVN042*-EN) for more information. Mounting and wiring of Wi-Fi module (MOD03122).

1. Drill a 1.36-inch hole on the top of polycarbonate box.
2. Securely fasten the Wi-Fi module by gasket and nut which provided with the module.
3. Connect the Wi-Fi module to Symbio™ 800 by a USB cable.
4. Plug the USB MICRO-B side to the bottom of the Wi-Fi module and USB-A side to any one of the four USB ports under the Symbio 800 controller.

Note: *Wi-Fi wiring, ref. 50712795, 50712799, 50712802, 50712805 or 50712806 depend on different unit. For details, see Table 3, p. 31.*

Figure 16. Wi-Fi wiring



Air-Fi Installation

See *Air-Fi® Wireless System Installation, Operation, and Maintenance* (BAS-SVX40*-EN) for more information. Mounting and wiring of Air-Fi module (0185-0424-0100).

1. Drill 0.87-inch hole on the top of polycarbonate box and align this hole with thread hole on the module.
2. Securely fasten the Air-Fi® module with a M4 screw.
3. Connect the Air-Fi module to Symbio™ 800 with a Modbus® cable.
4. Remove the cover of the module, connect 4 wires cable into 4 hosing connector and plug in the Air-Fi module.
5. Connect other side of the cable into two hosing connector and plug in the IMC terminal on the Symbio 800 controller.

Figure 17. Air-Fi connecting wiring harness

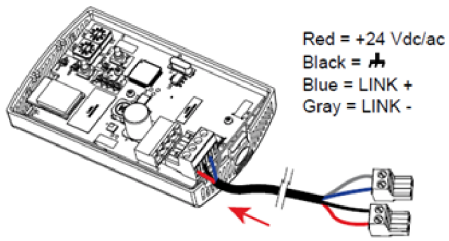
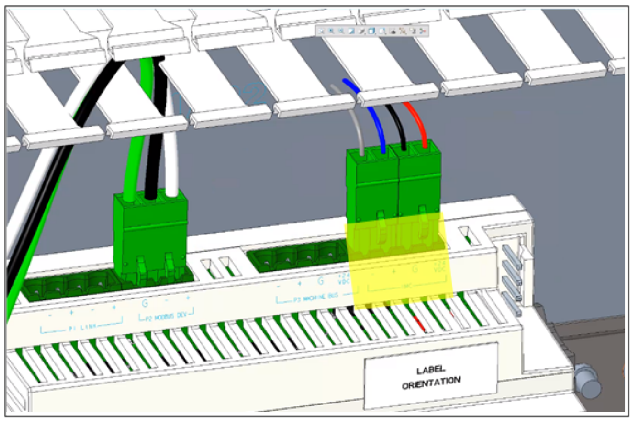
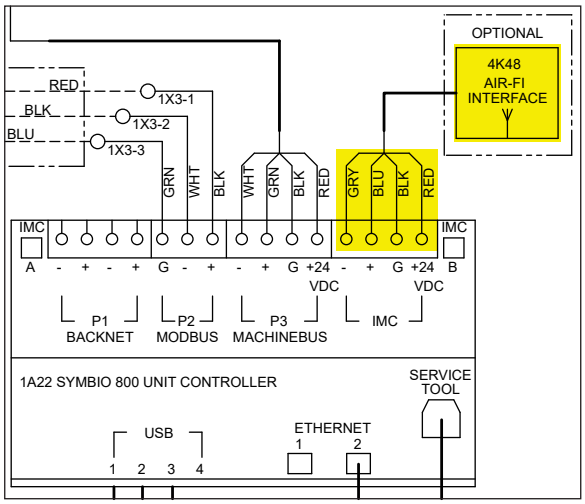


Figure 18. Air-Fi terminals



Note: *Air-Fi wiring, ref. 50712795, 50712799, 50712802, 50712805 or 50712806 depend on different unit. For details, see Table 3, p. 31.*

Figure 19. Air-Fi terminals wiring



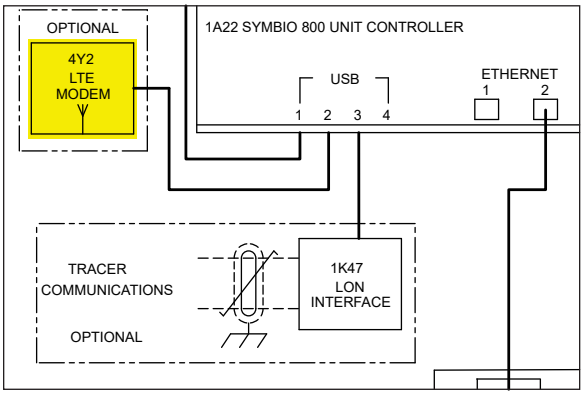
LTE Modem Installation

Modem part is MOD03184, MODULE; CELLULABLE USB 2.9 METER CABLE. See provided literature for setup and operation details.

1. Drill 1.36-inch hole on the top of polycarbonate box.
2. Securely fasten the LTE modem by gasket and nut provided with the modem.
3. Connect the LTE modem to Symbio™ 800 with the ship-with USB cable.
4. Plug USB MICRO-B side to the bottom of the LTE modem and USB-A side to any one of the four USB ports under the Symbio 800 controller.

Note: *LTE Modem wiring, ref. 50712795, 50712799, 50712802, 50712805 or 50712806 depend on different unit. For details, see Table 3, p. 31.*

Figure 20. LTE modem wiring



Communication Device Mounting

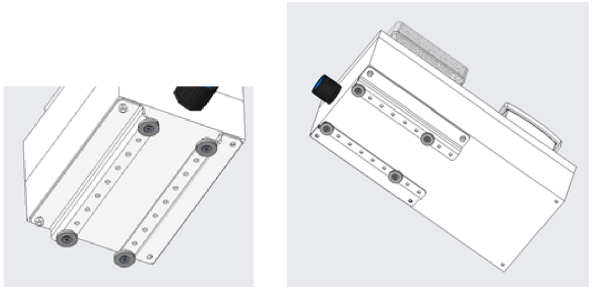
These devices are intended to be mounted on polycarbonate boxes. There are two installation approaches,

- Each device is mounted independently on a small box (0185-0426-0100).
- Multiple devices are mounted on a large box (0185-0427-0100).

All devices connect Symbio 800 by standard USB or Modbus cable.

- For installation, field drill a 1.09-inch hole on side of box for a snap bushing.
- This bush can be replaced as field straight connector and conduit (3/4-inch size) as NEMA 4 applications.
- The boxes have magnets for flexible attachment to the Symbio panel.

Figure 21. Communication device mounting



The single box is 7-inches long x 5-inches wide x 5-inches tall.

Figure 22. Single box (LTE, Air-Fi and Wi-Fi)

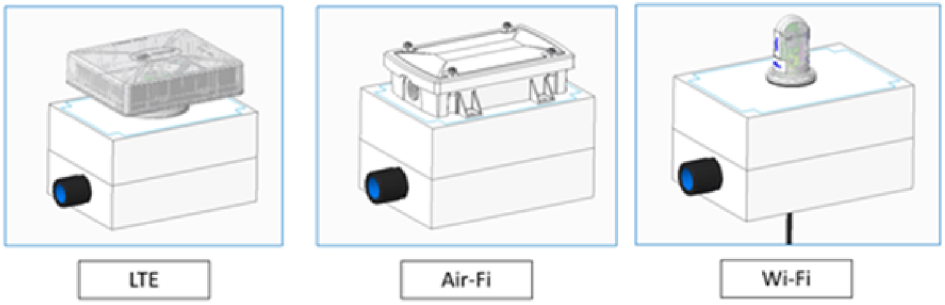
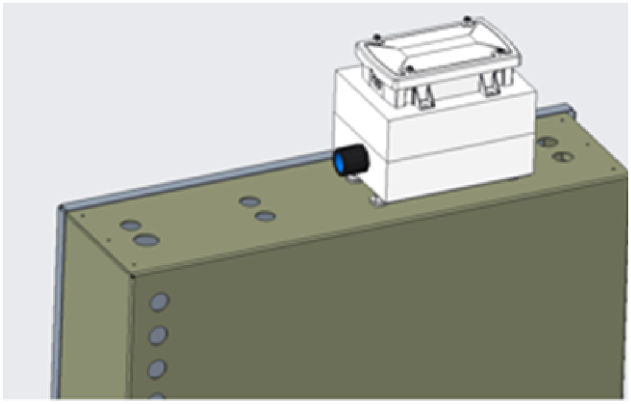
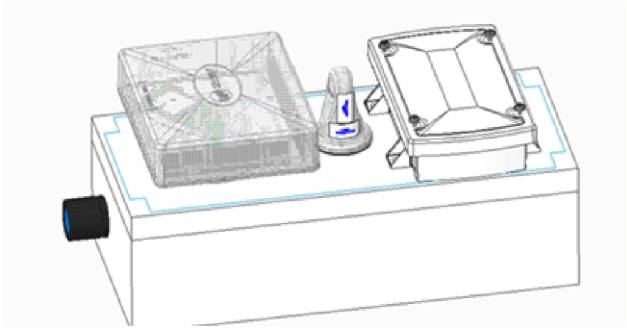


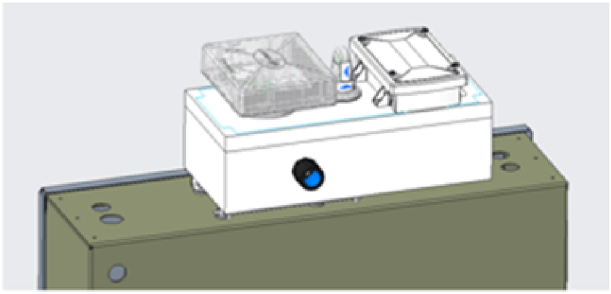
Figure 23. Box mounting

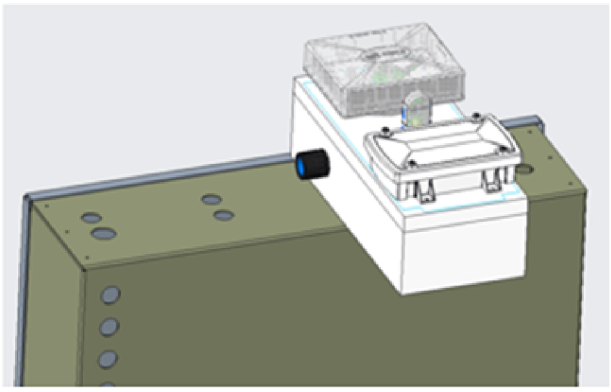


The triple box is 15.5-inches long x 6-inches wide x 4-inches tall.

Figure 24. Triple box







Water Flow Measurement Options

Standard Accuracy Option

Water flow is determined by measuring pressure drop across heat exchanger using water pressure transducer

LLIDs. Standard flow measurement transducers can be ordered for condense, evaporator, and auxiliary/heat recovery heat exchangers. The standard accuracy part is (0185-3475-0100). Two transducers (0185-3475-0100) are provided per heat exchanger.

1. Field connect by male to two female 1000 mm supplied branch cable (CAB01147) which provided in package.

Figure 25. Standard accuracy package

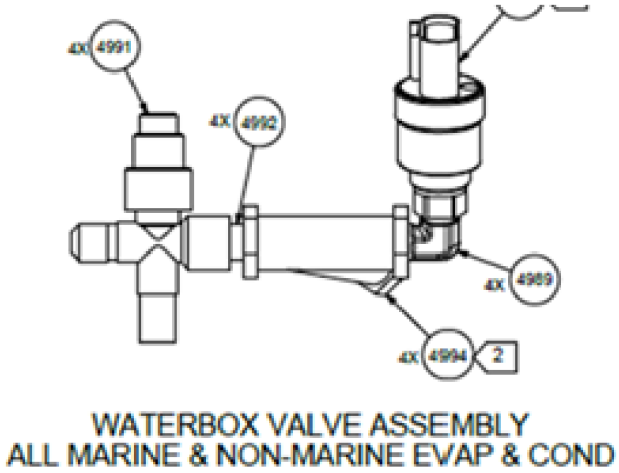
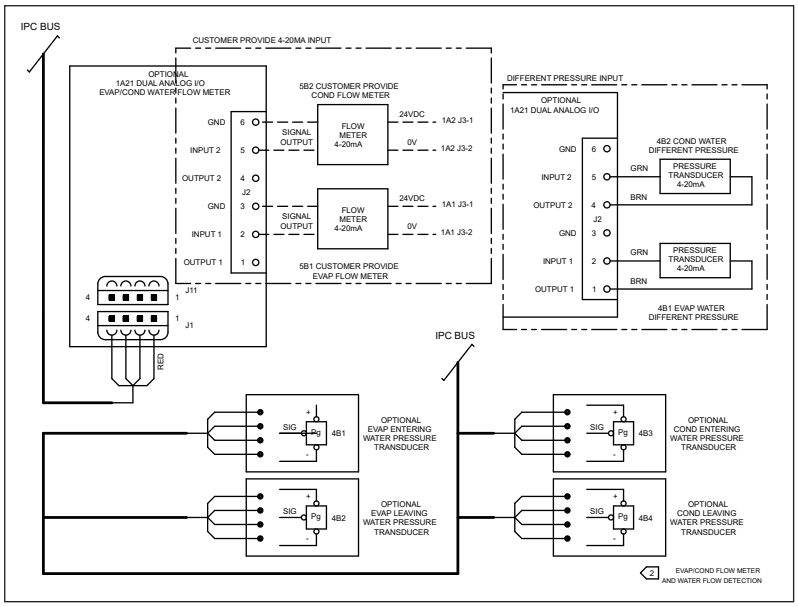


Figure 26. Schematic of flow meter option



High Accuracy, Customer Meter Option

The high accuracy customer meter option provides an analog input/output LLID to monitor a customer provided high accuracy meter 0-10 Vdc or 4 – 20 mA outputs. (Rosemont, etc.) This option allows monitoring of condenser, evaporator flow and auxiliary heat exchangers.

Install needed DAIO LLID(s) (BRD04875) in CVRF control panel

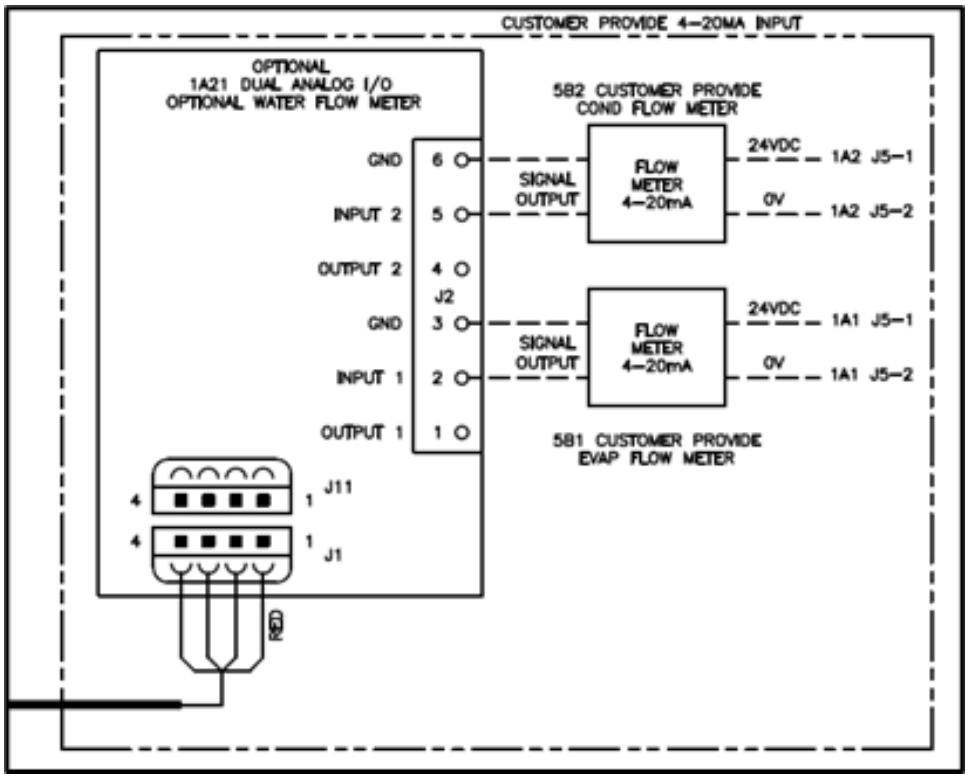
2. Mount transducers on the entering and leaving side water box locations with the transducer facing upwards and connect to unit control buss.
3. After system is filled, loosen the transducer in its threaded fitting.
4. Crack the isolation valve until water starts dripping from threads.
5. Close the valve and re-tighten the transducer, and re-open the valve for use.

Note: *Standard accuracy flow meter wiring, ref. 50712795, 50712799, 50712802, 50712805 or 50712806 depend on different unit. For details, see* *Table 3, p. 31**.*

1. LLID (1A21) is needed for EVAP and COND water flow. Connect flow meter wires to 1A21-J2-1 and 1A21-J2-1 for EVAP, 1A21-J2-4 and 1A21-J2-5 for COND.
2. LLID (1A28) is needed for HR Aux/COND water flow. Connect flow meter wires 1A28-J2-1 and 1A28-J2-1 for HR flow or Aux COND.

Note: *High accuracy, customer meter flow meter wiring, ref. 50712795, 50712799, 50712802, 50712805 or 50712806 depend on different unit. For details, see* *Table 3, p. 31**.*

Figure 27. Schematic of high accuracy meter option

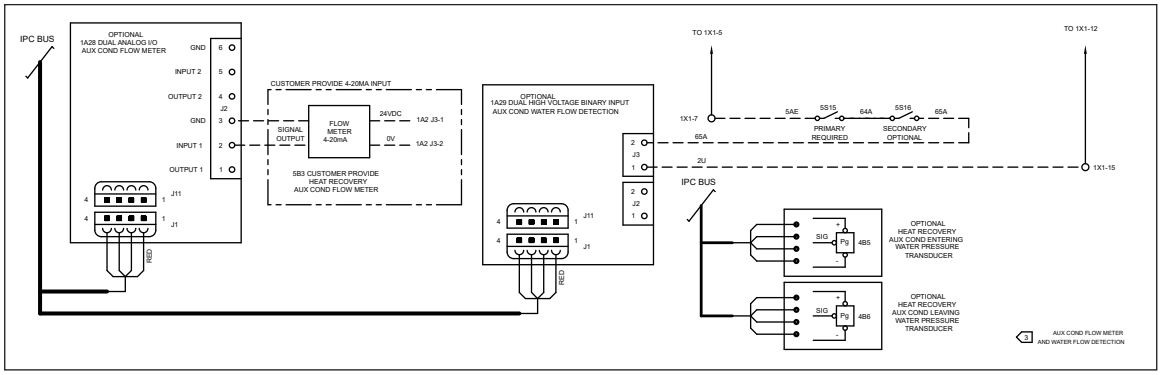


Heat Recovery/Aux COND Option

When heat recovery/Aux COND option is selected, a DHVBI LLID (BRD04874) is required.

Note: *As 1A29, heat recovery/Aux COND flow switch wiring, ref. ref. 50712795, 50712799, 50712802, 50712805 or 50712806 depend on different unit. For details, see* *Table 3, p. 31**.*

Figure 28. Schematic of heat recovery/AUX cond option



Energy Meter Option

The Trane energy meter provides high accuracy data of power, volts and amps to Symbio™ 800 controls. All data measured by the meter is communicated via Modbus® to the unit control system. See *Energy Meter For CTV Symbio™ 800 Upgrade Systems Installation Instructions* (BAS-SVN224*-EN) for detailed information.

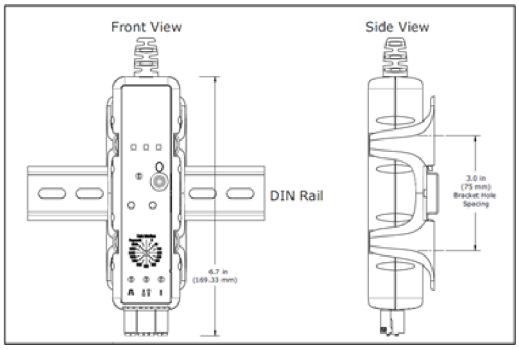
Note: *This option does not apply to HDWA and CVHM production.*

Figure 29. Energy meter

Figure 30. Rogowski CTs

The meter is connected to line voltage of up to 480 volts and should be mounted within the starter cabinet. It is provided with a mounting bracket that can be mounted on the DIN rail or directly on the cabinet wall.

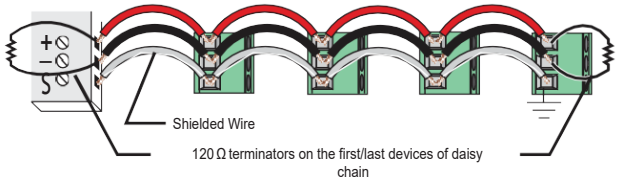
Figure 31. Mount the energy meter with strap tunnel on the rail



The meter is connected to Modbus communications and is self-powered by the unit voltage potential inputs. Review meter literature for setup and operation details.

Modbus communications is by shielded 14 – 26 AWG cable from meter to Symbio module. Install 120 OHM resistors at first and last modules on Modbus daisy chain.

Figure 32. Shielded cable



The communications wiring will be terminated at the Modbus distribution terminal (1X3) beside Symbio 800 using the three poles connector which provide in energy meter kits.

Figure 33. Modbus distribution terminal

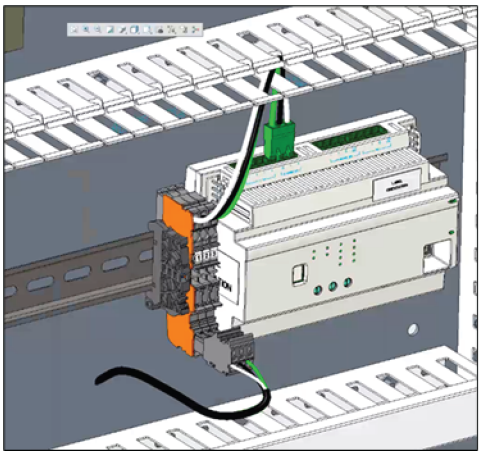
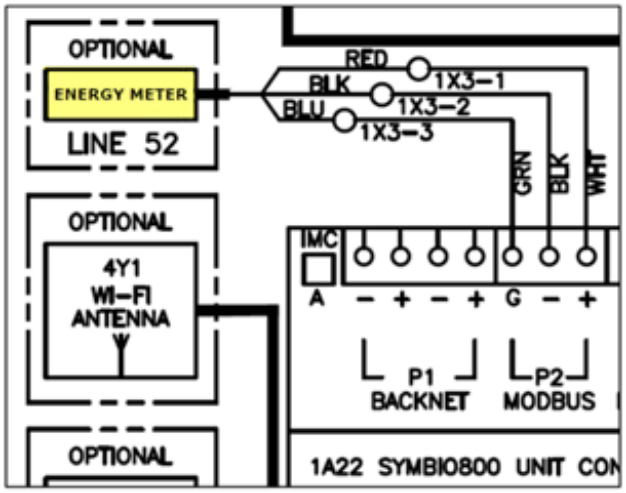


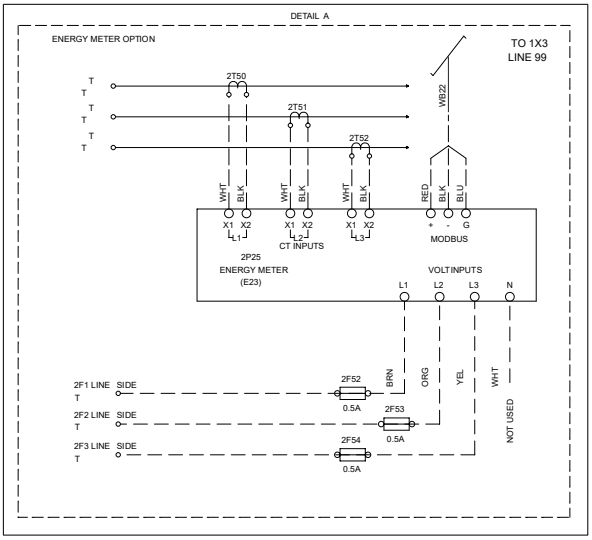
Figure 34. Communication wiring, ref. 50712792



480 Volts and Lower Installations

- POTENTIAL INPUT – Install provided fused inputs to line voltage per schematic.
- CURRENT INPUT – Install provided Rogowski CTs per schematic.

Figure 35. 480V energy meter wiring, ref. 50712756



Expansion Module Option

CDUB retrofit panel reserve place of expansion module beside Symbio™ 800 controller.

- There are few configurations that depend on I/O requirements and din rail length.
- Din rail in the CDUB panel space is 13.9-inches. One XM32 or two XM30 can be added.
- If XM70 is selected, a 20-inch din rail is required, in 0185-3495-0100. For detailed I/O information, see 50712794.

Note: *This option is only applied for CDUA, CVRE aftermarket retrofit panel.*

Figure 36. XM32 expansion module mounting

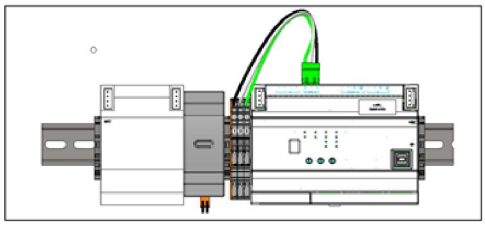


Figure 37. Two XM30 expansion module mounting

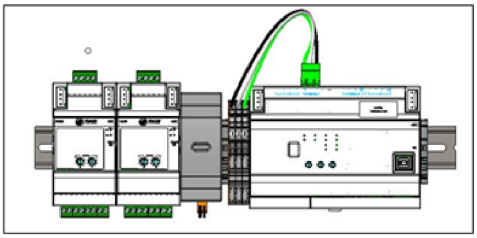
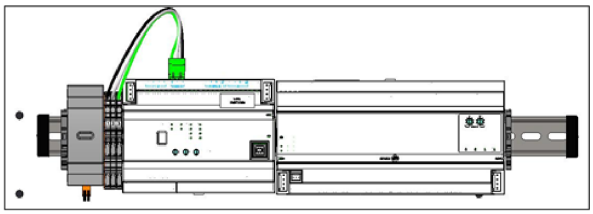


Figure 38. XM70 expansion module mounting



Start-Up

⚠ CAUTION

Safety Hazard!

Failure to follow these instructions could result in minor or moderate injury or could result in equipment or property damage.

Do not restore system power without completing all of the tasks specified within the installation section.

NOTICE

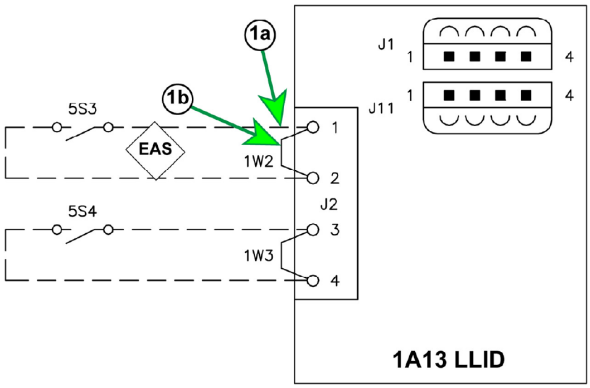
Equipment Damage!

Failure to follow instructions below could result in equipment damage.

System power must be restored before the Tracer AdaptiView can be programmed. Disable the control circuit that allows an automatic unit start before reenergizing the system. Startup cannot be stopped on an unprogrammed display unit.

1. To prevent an unexpected chiller start-up when system power is first restored, follow the steps below.
   a. If the chiller is equipped with an external Auto Stop button, disconnect the wire from terminal J2-1 on the 1A13 LLID.
   b. If the chiller is not equipped with an external Auto Stop button, disconnect the factory installed jumper wire end from terminal J2-1 on the 1A13 LLID.

Figure 39. Preventing unexpected chiller start up before restoring system power



Note: *EAS = External Auto Stop circuit.*

2. Perform a final inspection of the control panel enclosure before restoring system power.
   a. Remove any tools and use a shop vacuum to remove any dirt or debris that may have been created during the installation process.
   b. Confirm that all upgrade kit wiring has been correctly routed and that all terminal connections have been properly made.
   c. Inspect the rest of the electrical wiring and components within the enclosure to ensure that no wiring connections were accidentally loosened or disconnected during the kit installation process.
   d. Close and latch the control panel door.

Restoring System Power

⚠ CAUTION

Safety Hazard!

Failure to follow these instructions could result in minor or moderate injury or could result in equipment or property damage.

Do not restore system power without completing all of the tasks specified within the installation section.

1. Remove all lockout/tagout devices used at the power supply panels for the chiller equipment.
2. Warn all personnel in the area that system power is about to be restored.
3. Energize the system according to all applicable standard safety procedures.

Programming

Programming the Symbio 800 AdaptiView

Note: *For more information regarding the use of the Tracer TU service tool, installation, operation and programming of the Symbio™ 800 controller, operation of the control system, and a guide to the diagnostics and troubleshooting of the control system, refer to the following manuals (or their most recent versions):*

- *Tracer® TU Service Tool - User Guide* (BAS-SVU047*-EN)
- *Tracer® TU Service Tool For Water-Cooled CenTraVac™ Chillers with Symbio™ Controls - Programming Guide* (CTV-SVP004*-EN)
- *CenTraVac® Water-cooled Chillers Models CVHE, CVHF, and CVHG With Symbio™ Controls - Installation, Operation, and Maintenance* (CVHE-SVX005*-EN)
- *Programming Guide Symbio™ Panel Upgrade - Programming Guide* (SO-SVP002*-EN)
- *AdaptiView™ Display with Symbio™ Controls CenTraVac® Water-Cooled Chillers- User Guide* (CTV-SVU004*-EN)
- *CenTraVac® Water-cooled Chillers with Symbio™ Controls Diagnostic Descriptions, Troubleshooting Tables, and Control Component Overview - Diagnostics Manual* (CTV-SVD005*-EN)

NOTICE

Equipment Damage!

Failure to follow instructions below could result in equipment damage during service of a Tracer AdaptiView control system.

Use separate AC power sources at all times when operating a Symbio 800 controller in combination with a laptop computer running Tracer TU service tool. Never use a laptop running only on internal battery power while it is connected to a Symbio 800 controller. If the laptop battery dies or malfunctions during the connection, the controller's electronic files could become corrupted. This may make the Symbio 800 completely inoperable, prevent it from accepting new programming, and require replacement of the controller. Damage caused in this way is not covered under warranty.

1. Power the technician laptop using a working AC power adapter.
2. Connect the computer with the Tracer® TU service tool software to the service port of the Symbio™ 800 controller with a USB type A/B cable.
3. Open Tracer TU.
4. Upgrade controller firmware as follows:
   a. In the Utilities menu, select **File Transfer Utility**.
   b. In the File Transfer dialog box, select **Symbio 800 controller**, and click **Next**.
   c. Browse to the firmware file and click **Next**.
   d. Click **Start**.
   e. When upgrade is complete, click **Finish**.

Figure 40. Application software download

5. Follow the instructions below while also referring to Figure 41, p. 28 and Figure 42, p. 28.
   a. Click the **Equipment Utility** tab (the wrench symbol on the right-hand side of the screen).
   b. Click the **5. Configuration** tab.
   c. Click the **Open File** button on the bottom of the **5. Configuration** screen.
   d. Browse to the location of the Chiller Service Report file saved from the UC800 display at the start of upgrade kit installation, highlight it, and then click **Open**.
6. After completing all of Step 5., Tracer TU's **5. Configuration** tab screen should now be populated with the values from the Chiller Service Report.
7. Verify the configuration and then click **Save**.

a. Clicking **Save** sends the values from this Chiller Service Report directly to the Tracer Symbio 800 controller.

Figure 41. Navigating within the equipment utility configuration tab in Tracer TU

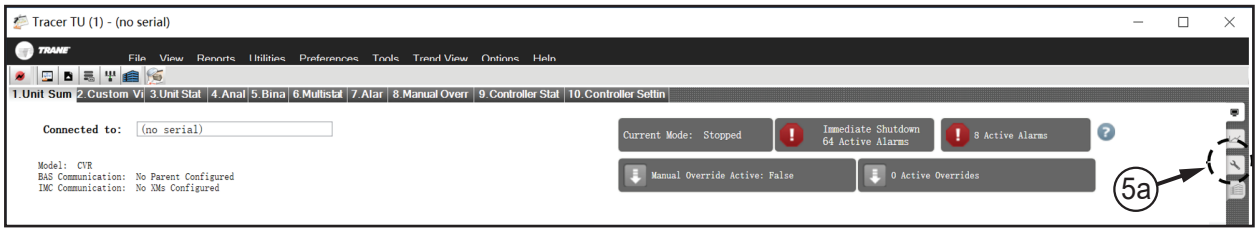
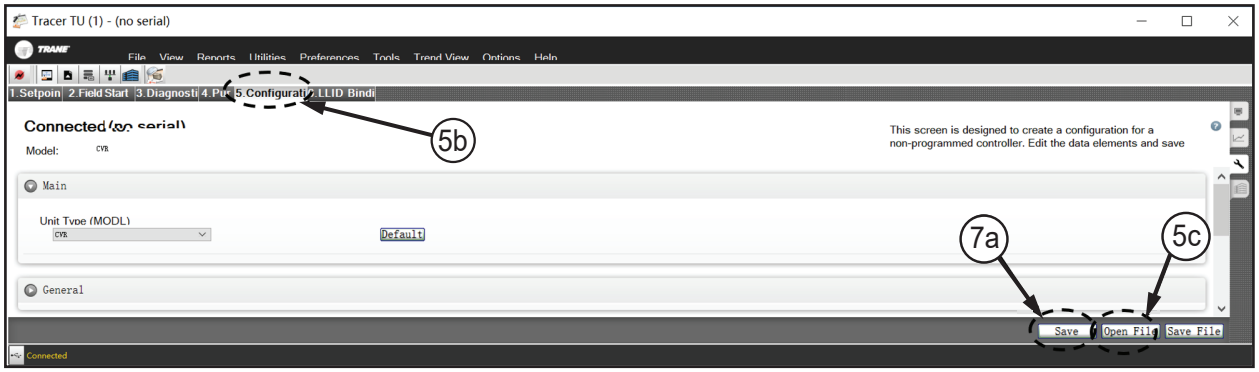
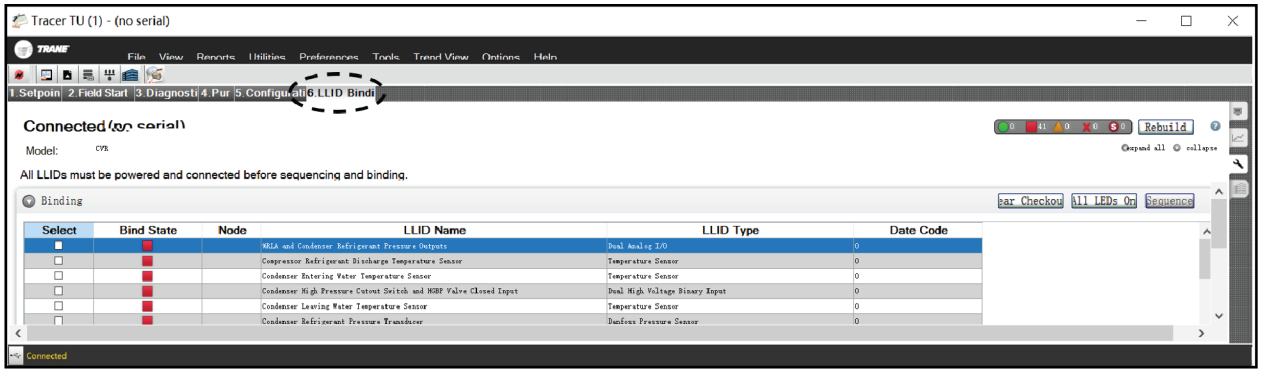


Figure 42. Location of the equipment utility tab in Tracer TU



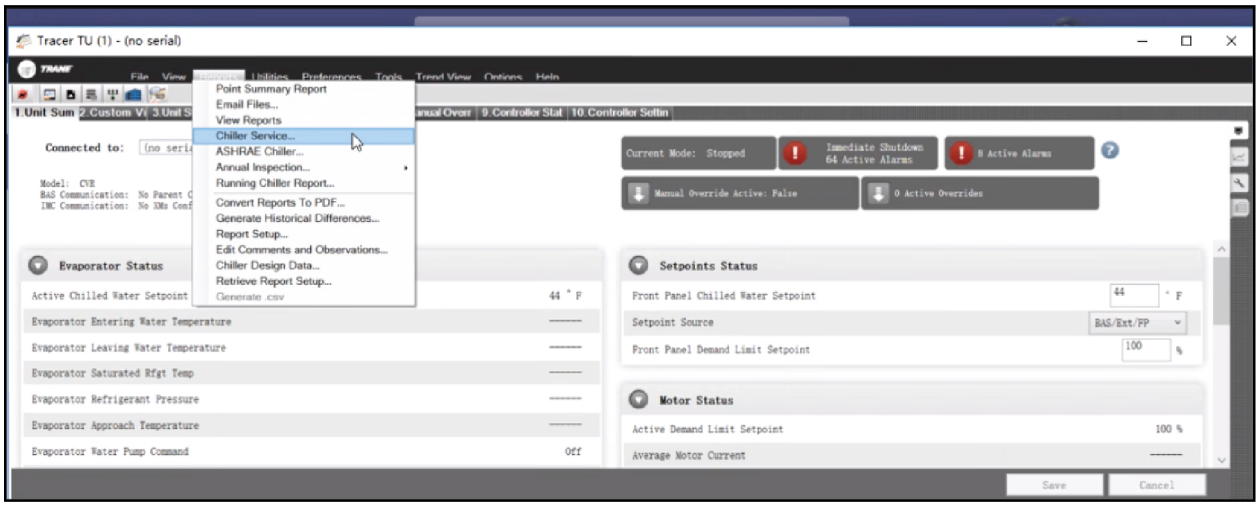
8. After the configuration is saved, Tracer TU will automatically proceed to LLID Binding view. Check to see if any of the listed devices need to be bound, indicated by a red box. If the quad relay LLID was installed, it will have to be bound now.

Figure 43. Binding view of quad relay LLID



9. Once all LLIDs are bound, verify settings in the Service Setpoints and Field Start–up tabs are correct.
10. In Tracer® TU, save a copy of the **Chiller Service Report**. From the **Reports** drop-down menu, select and open **Chiller Service Report** (see Figure 44, p. 29).

Figure 44. Chiller service report (Tracer TU)



11. Save the current chiller configuration in the existing firmware version in the Symbio 800.

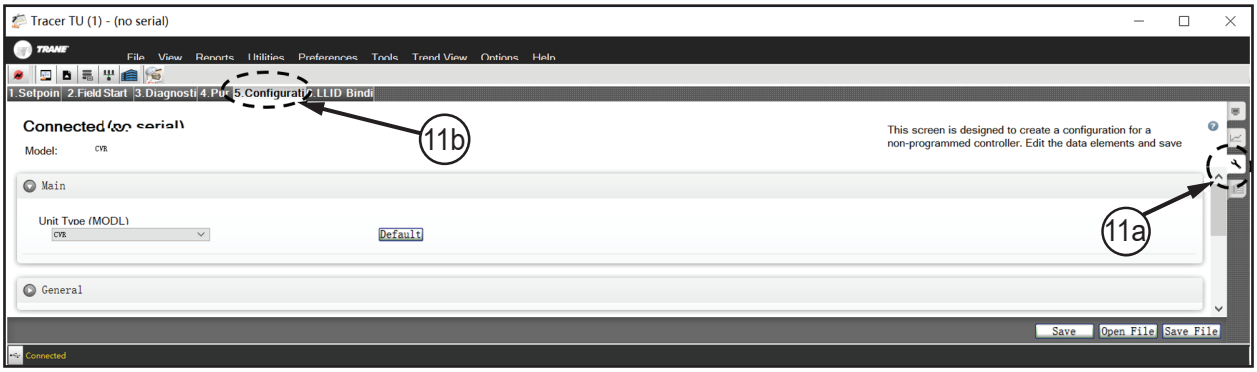
    Note: *This step produces backup configuration data in the case the Symbio 800 configuration becomes corrupt.*

    a. Access the **Equipment Utilities** section of Tracer TU by clicking the wrench symbol on the right-hand side of the screen.

    b. Click the **Configuration** tab (see Figure 45, p. 29)

    c. At the bottom of the screen, click the **Save File** button (not shown in Figure 45, p. 29)

Figure 45. Chiller configuration (Tracer TU, simplex chiller shown)



    d. In the **Browse for Folder** window, click **Make New Folder**.

    A folder will be created with the name **New Folder**. The path to the folder will be:

    C:\Programs\Trane\Tracer TU\Program\Plugins \UCDataBaseDAL\New Folder

    e. Select the **New Folder** file.

    f. Click the **OK**.

    The chiller configuration file will now be saved in the **New Folder**.

Start-Up

1. When the programming is completed and saved, shut down power to the control panel and disconnect the USB cable from the door of the control panel.
2. Reconnect the wire removed from the J2-1 on the 1A13 LLID.
3. Restore power to the control panel.

   The chiller is now ready for normal start-up and checkout procedures.

Contact Trane Global Parts Technical Services with any additional questions.

Wiring Diagrams

Notes:

- *All of the schematic wiring diagrams displayed within this section of the installation manual are proprietary. These diagrams shall not be copied or their contents disclosed to outside parties without the written consent of Trane.*
- *The following hazard notifications apply to all of the electrical circuits depicted in each of the schematic wiring diagrams included within this section of the installation manual.*

⚠ WARNING

Hazardous Voltage w/Capacitors!

Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury.

Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. Verify with a CAT III or IV voltmeter rated per NFPA 70E that all capacitors have discharged.

⚠ 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.

NOTICE

Use Copper Conductors Only!

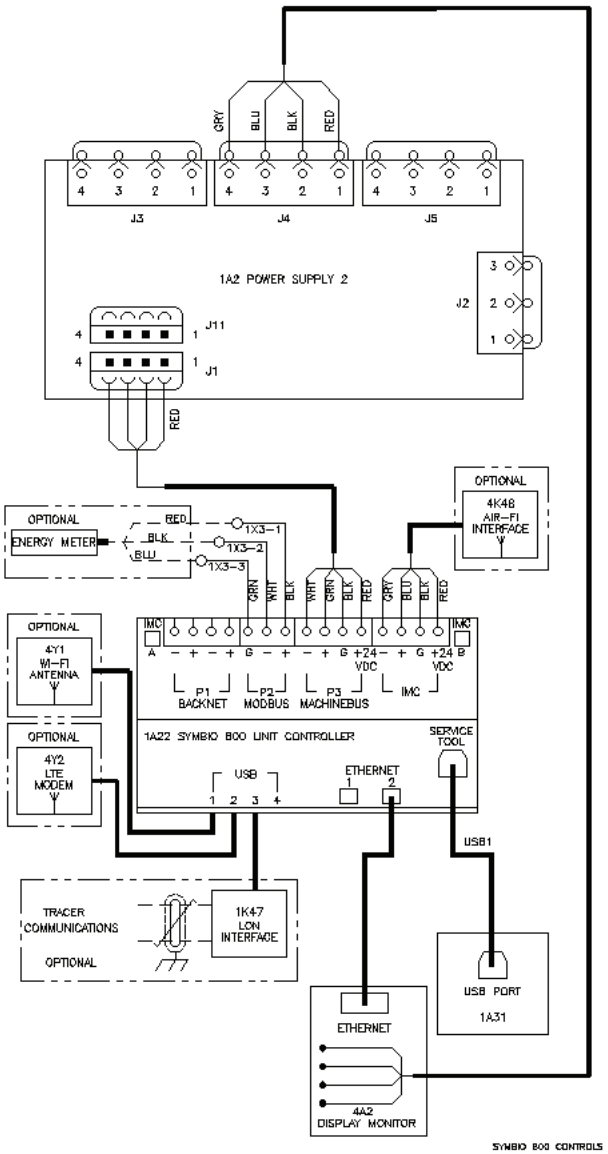
Failure to use copper conductors could result in equipment damage as the equipment was not designed or qualified to accept other types of conductors.

Table 3. Package and diagram matrix

Description	CADE	Upgrade Kit	Literature	Diagram
UC800-CDUA	CDUA	018534960100 and 018535010100	5071-2800	5071-2795 5071-2794
UC800-CVRE	CVRE	018534960100 and 018535020100	5071-2801	5071-2799 5071-2794
UC800-CTV-SIM	SIMP	018534960100 and 018535040100	5071-2808	5071-2805
UC800-CTV-DUP	DUPL	018534960100 and 018535040100	5071-2808	5071-2805
UC800-CVHS	CVHS	018534960100 and 018535040100	5071-2808	5071-2805
UC800-CVHM	CVHM	018534960100 and 018535040100	5071-2808	5071-2805
UC800-AGILITY	HDWA	018534960100 and 018535040100	5071-2807	5071-2802
UC800-ECTV	ECTV	018534960100 and 018535050100	5071-2809	5071-2806

Note: See referenced diagram drawings for specific configuration.

Figure 46. Full schematic wiring diagram for a standard Symbio 800 AdaptiView upgrade kit



Note: *This is a representative example of the full schematic wiring diagram for a standard Symbio™ 800 AdaptiView™ upgrade kit.*

Notes

Trane - by Trane Technologies (NYSE: TT), a global innovator - creates comfortable, energy efficient indoor environments for commercial and residential applications. For more information, please visit trane.com or tranetechnologies.com.

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