Internal

Trio 20 Green Climate Controller

# Installation Manual

# Trio 20 Green

## Climate Controller

P/N: 116931

Munters

# Trio 20 Green Controller

## Installation Manual

Rev 1.0, 02/2026

Product Software: Version 10.6

This manual for use and maintenance is an integral part of the apparatus together with the attached technical documentation.

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# 1 Introduction

## 1.1 Disclaimer

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## 1.2 Introduction

Congratulations on your excellent choice of purchasing a Trio Green Controller!

In order to realize the full benefit from this product it is important that it is installed, commissioned and operated correctly. Before installation or using the controller, this manual should be studied carefully. It is also recommended that it is kept safely for future reference. The manual is intended as a reference for installation, commissioning and day-to-day operation of the Munters Controllers.

## 1.3 Notes

Date of release: Jan 2020

Munters cannot guarantee to inform users about the changes or to distribute new manuals to them.

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# 2 Precautions

*CAUTION* *Protection provided by the equipment can be impaired if the equipment is used in a manner not specified by the manufacturer!*

*CAUTION* *There is a risk of explosion if the lithium battery is replaced with an incorrect type. Replace the battery using the same type and manufacturer only.*

- English
-

## 2.1 English

- Infrastructure Protection and Backup
- Protection Against Corrosion
- Electrical Guidelines
- Grounding Sensors
- Reducing Interference
- Filtering
- Checking the CMOS RTC Batteries Level
- Safety Precautions - Details
- Grounding the Controller

### 2.1.1 INFRASTRUCTURE PROTECTION AND BACKUP

- RPLP Power Line Protection
- RIT-50 Isolated Transformer
- Controller Backup

#### 2.1.1.1 RPLP Power Line Protection

Munters strongly recommends installing an RPLP-1 to provide lightning protection to the controllers as well as reducing noise.. While no lightning protection is perfect, the RPLP-1 significantly enhances the reliability of built-in lightning protection. Refer to the RPLP-1 documentation for detailed wiring instructions and specifications.

*NOTE Common surge protectors provide little additional protection and may trip unnecessarily.*

- RPLP1-V1 (115 Volt): P/N: 960-17-00002
- RPLP1-V2 (230 Volt): P/N: 960-17-00001

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#### 2.1.1.2 RIT-50 Isolated Transformer

Electronic controllers can be damaged by disturbances in the power supply. Examples of disturbances include:

- Lightning strikes
- Power line spikes

To protect your controllers from these phenomena, Munters strongly recommends installing a RIT-50 Isolated Transformer to each Trio controller. RIT-50 stabilizes incoming power, preventing spikes (very short (microseconds to milliseconds), sharp changes (positive or negative) in voltage). In addition, RIT-50 defends the controller against power surges or lighting strikes that run through a power line. Refer to the RIT-50 documentation for detailed wiring instructions and specifications.

- RIT50-POU-230V-TO-230V-50VA or 115V-TO-115V-25VA P/N: 922-02-00001

***CAUTION*** *Munters cannot take responsibility for damage to controllers in installations that do not include the RIT-50 and RPLP.*

#### 2.1.1.3 Controller Backup

Munters strongly recommends that all controllers have a backup controller that operates during a primary controller failure or during extreme temperatures. The backup ensures animal survival in cases of extreme temperatures or power disruptions. The backup controller comes into play when:

- A general controller failure occurs, in this case the controller functions at the current operating temperature.
- House temperatures readings are higher than what is set for the thermostat.

In both situations, the backup controller sends out alarms and/or takes over basic operations.

Munters provides two different backup systems:

- USA/Canada: RBU-27 and RDT-5
- EMEA/Asia: RBU-5

### 2.1.2 PROTECTION AGAINST CORROSION

**To prevent against corrosion of electrical components:**

- Installation location: Install electronic controls in a separate ventilated control room that is protected from extreme temperatures and dirty environments. Place the controls so that the operators can conveniently use the control and read indicators and displays.
- Keep the Trio closed at all times when a litter or passel is present in the building. In situations where maintenance or repairs are required, close the controller when you finish the work.
- After running the cables through the knockouts, seal the holes with a silicon sealant. If you use silicon sealant with acetic acid cure, keep the controller open and ventilated until cured. Otherwise, the acetic acid will attack metal components, including circuitry.
- When splicing sensors to longer wires, ensure that the splice is **waterproof**. Use adhesive lined heat shrink (marine grade) to make waterproof connections.

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- Use shielded wiring for low level signals. For buried wiring (building to building runs) use high grade jell filled cables that are impervious to moisture.

### 2.1.3 Electrical Guidelines

- Munters strongly recommends that only panel mount controllers should be installed directly in an electrical closet.
- Placing this unit in proximity (50 centimeters/1.5 feet or less) to any electrical device that transmits 10 amps or more of current can result in severe signal interference.
- Review the guidelines given in Safety Precautions - Details, page 13 for details. These are vital to ensuring both personal safety and proper controller functioning.

### 2.1.4 Grounding Sensors

- Every low power device (digital, analog, or communication) must have a shield cable connected to the unit ground strip.

### 2.1.5 Reducing Interference

- Avoid mixing high voltage wiring with sensor and low voltage wiring.
- Keep the controller as far as possible from heavy contactor boxes and other sources of electrical interference.
- Do not connect communication wire shields, which go from one house to another at both ends. Connect them at one end only. Connection at both ends can cause ground loop currents to flow, which reduce reliability.
- The COM connection for communications is not the shield wire. The COM, RX and TX wires must connect to each other at all controllers.

### 2.1.6 Filtering

If this installation includes a power inverter to drive variable speed fans, RLD, RVS-2, or any device that switches high electrical current, install an EMI filter in front of the device. Refer to the inverter documentation.

Any device that transmits high levels of electrical current can cause severe electrical and electromagnetic interference. Therefore, when employing these devices, it is critical that you carefully follow the manufacturer's installation instructions.

In particular verify:

- That the cable shielding between the device and any motor meets industry standards
- Proper grounding of the device’s chassis and motor power cable
- Proper grounding of low voltage cable shield wire
- That the controller and device cables are kept in separate conduits or wire bundles

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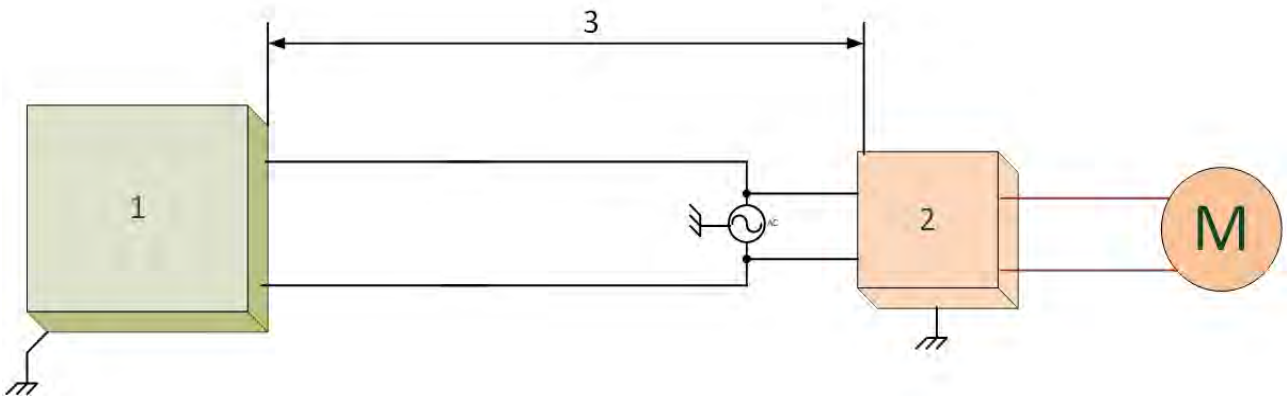


*Figure 1: Device Placement*

1. Controller
2. High electrical current device
3. Place the controller at least 50 centimeters/1.5 feet from the device

### 2.1.7 CHECKING THE CMOS RTC BATTERIES LEVEL

- Display Board Battery
- Main Board Battery

#### 2.1.7.1 Display Board Battery

On the Trio Display Board (refer to Figure 7: Main Board layout) is a CMOS Battery. This CMOS battery keeps the CPU's real-time clock running when the power is off.

Check the battery once a year. The output must be 2.7 volts (minimum). Authorized personnel only must replace the battery if the output is below the minimum required level or every five years. Use a RENATA-CR2450N battery only.

If the CMOS battery output is below the required minimum, an icon appears on the touch screen and on the TrioAir app.

***CAUTION*** *If the CMOS battery output is below the required minimum, in the event of a power failure the user will have to reset the time and date when power is reapplied.*

#### 2.1.7.2 Main Board Battery

On the Trio Main Board is a CMOS Battery. This battery is located behind the Scale Card (refer to Figure 7: Main Board layout). This CMOS battery keeps the board's real-time clock running when the power is off.

Do not test this battery. If the CMOS battery output is below the required minimum, Trio sends an alarm to everyone on the contact list. In this event, an authorized technician must replace the battery with a RENATA-CR2450N battery only.

***CAUTION*** *If the CMOS battery output is below the required minimum, in the event of a power failure the user will have to reset the time and date when power is reapplied.*

***Warning: It is very important to reset the growth date to the required day.***

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### 2.1.8 SAFETY PRECAUTIONS – DETAILS

CAUTION *These units must be installed by an authorized electrician. Disconnect the power to avoid electrical shock and damage.*

*NOTE Installation Category (Over voltage Category) II*

- The power supply to the controller should be protected by a 10 amp circuit breaker.
- All electrical connections should comply with National Electrical code (NEC).

### 2.1.9 GROUNDING THE CONTROLLER

- Ground Rods
- Ground Wire
- Ground Clamps
- What Should Be Grounded?
- Lightening Protection

#### 2.1.9.1 Ground Rods

Ground rods are used to efficiently connect the system to earth where current may be dissipated in the soil.

1. Material: Ground rods should be copper clad or galvanized steel.

2. Diameter: Minimum 5/8", preferably 3/4". Generally the larger the rod diameter, the lower it's resistance to current flow.

3. Length: Minimum 2.5 meters (8 feet), preferably 3-meter (10-foot). A longer ground rod will reach a soil with higher moisture content. Moist soil carries current much better than drier soil.

4. Single grounding: It is important that there is only one grounding location where a rod or series of rods are connected to each other using a ground wire.

5. Independent ground rods will increase the risk of current, from a lightning strike for example, being dissipated through one rod and reentering the system through an adjacent rod.

6. Location: Close to the main circuit breaker panel and in moist soil. For example in an area that is usually wet from a drip or a low spot where water drains. Make sure the area is well protected from damage by lawnmowers, tractors, etc.'.

7. Rod installation: Drive the rod into the earth until about 10 cm (4 inches) is left above grade. If it is impossible to drive the rod to the proper depth, it is acceptable to lay the rod horizontally, 80 cm (2.5 feet) below grade.

8. In case the rod is exposed to damage, for example by lawnmowers or tractors it can be installed in a hole, about 20 cm (8 inches) deep so that the rod is about 10 cm under grade and 10 cm above hole level.

*NOTE The National Electric Code (NEC) mandates two ground rods unless you can show less than 10 ohms resistance with one rod.*

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### 2.1.9.2 Ground Wire

The ground wire is a large copper wire that connects the main circuit breaker panel to the ground rod.

1. Material: Ground rods should be copper clad or galvanized steel.
2. Diameter: Typically, 16 mm (6-gauge) copper wire is sufficient. If the wire run is greater than 20 feet, 20 mm (4-gauge) wire should be used.
3. Length: Minimum 2.5 meters (8 feet), preferably 3-meter (10-foot). A longer ground rod will reach a soil with higher moisture content. Moist soil carries current much better than drier soil.
4. The ground wire should be protected from damage by lawnmowers, tractors, etc. It should be buried at a minimum of 15 cm (6 inches) under grade for protection and enter the house as soon as possible. It is important that the wire not be cut; it should remain continuous.

### 2.1.9.3 Ground Clamps

Ground wires should not be merely wrapped around a ground rod. Ground clamps are used to attach a ground wire to a ground rod. The most common clamp is known as an acorn clamp. Make sure the ground clamps you select are rated for outdoor use. Do not use pipe clamps rated for inside water lines or hose clamps to attach the ground wire.

### 2.1.9.4 What Should Be Grounded?

Any equipment that is or could become energized, even accidentally, should be grounded. Current from lightning, strikes objects in a random fashion. Accounts of lightning strikes reveal scenarios most of us could not predict.

Electric circuits should be wired with a 3-wire conductor consisting of hot, neutral, and grounding wires. The grounding wire should be attached cleanly and securely to devices or systems to be grounded. The other end of the grounding wire should be attached to the ground bus on the main panel.

### 2.1.9.5 Lightening Protection

Because of the potential for lightning damage to electronic devices, Munters recommends supplying lightning protection on both the power supply and the communication terminals (if used).

*NOTE Catégorie d'installation (catégorie de surtension) II*

*NOTE Le National Electric Code (NEC) a comme impératif l'utilisation de deux piquets de prise de terre, à moins que vous puissiez montrer que la résistance est inférieure à 10 ohms avec un piquet.*

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## 2.3 Locking the Trio

Ensure that the units remains locked to prevent unauthorized access to internal components.

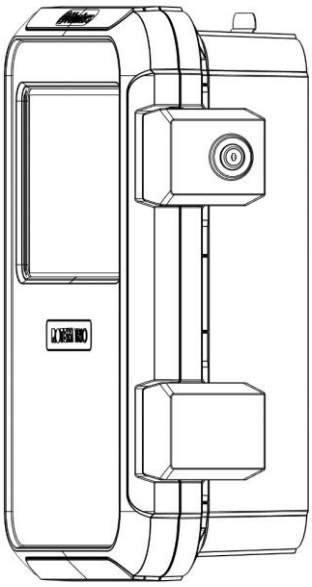

*Figure 3: Trio Lock*

## 2.4 Product Symbols

The following labels appear on your controller:

: Caution! Hazardous voltage

: Caution: Refer to the manual

: Main Protective Earthing Terminal

***CAUTION*** *IF THE UNIT IS USED IN A MANNER NOT SPECIFIED BY THE MANUFACTURER, THE PROTECTION PROVIDED BY THE EQUIPMENT MAY BE IMPAIRED.*

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# 3 Unit Installation

The following sections detail how to mount and wire the Trio.

*NOTE Munters recommends that a trained technician perform the following operations.*

- What Comes in the Package
- Mounting the Unit
- Board Layout
- Wiring Diagrams
- Trio – RLED 2.0 Wiring Termination
- SIM Card Configuration
- Tech Support/Wi-Fi

## 3.1 What Comes in the Package

- One Trio unit
- One hanging bracket and screws
- Two keys
- RTS-2 sensors (number depending on order)

## 3.2 Mounting the Unit

- Knockouts
- Hanging the Unit

### 3.2.1 KNOCKOUTS

1. At the bottom the Trio are knockouts used to route the low and high voltage cables.

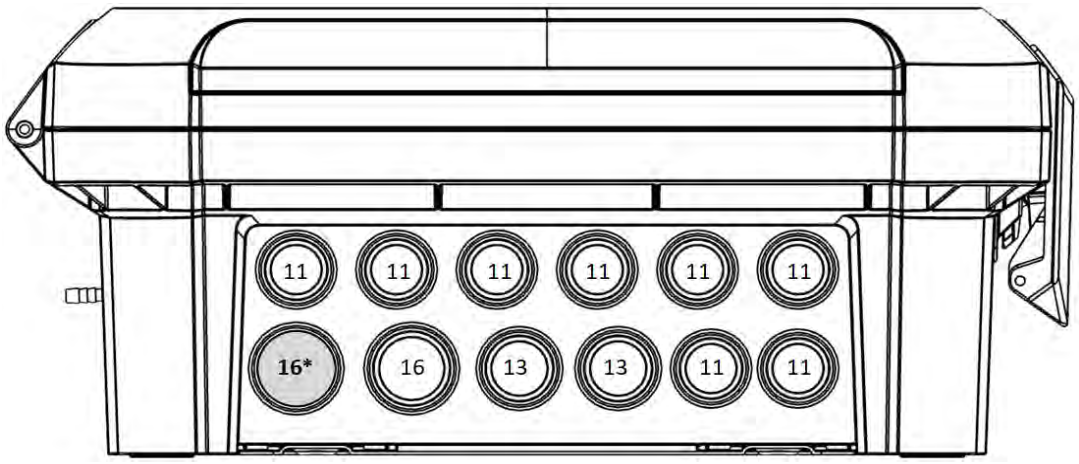


*Figure 4: Trio Knockouts and PG Size*

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- Using a screwdriver and a hammer, gently apply pressure to the knockouts.
- Only open up the holes that you require.
- Munters recommends removing the knockouts before mounting the unit.
- 16*: Use this knockout for the Ethernet cable.

2. Place the required cables through the cable holders at the bottom of the unit.

***CAUTION*** *Run low voltage cables through one knockout and high voltage relay cables through a separate knockout. Do not place them in the same knockout!*

3. Close the Trio enclosure lid carefully and tightly. Use RTV silicon or equivalent sealant to seal the cable holders.

***CAUTION*** *Munters strongly recommends that you seal all entry spots with RTV silicon. Failure to do so can lead to damage to the unit.*

4. After installation is completed, operate the Trio for a few hours and re- check for proper operation.

### 3.2.2 HANGING THE UNIT

1. Attach the bracket to the wall (customer supplies the screws).

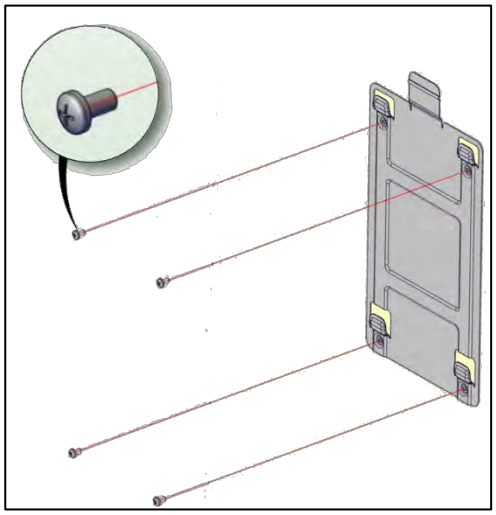

*Figure 5: Hanging the Bracket*

2. Hang the Trio on the bracket.

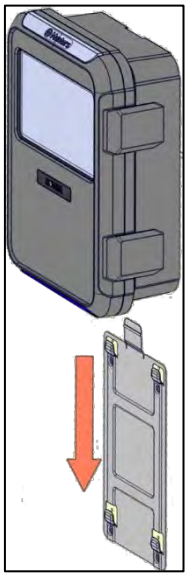

*Figure 6: Hanging the Unit*

3. Close the TRIO enclosure lid carefully and tightly. Use RTV silicon or equivalent sealant to seal the cable holders.

***CAUTION*** *Munters strongly recommends that you seal all entry spots with RTV silicon. Failure to do so can lead to damage to the unit.*

4. After installation is completed, operate the TRIO for a few hours and re- check for proper operation.

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## 3.3 Board Layout

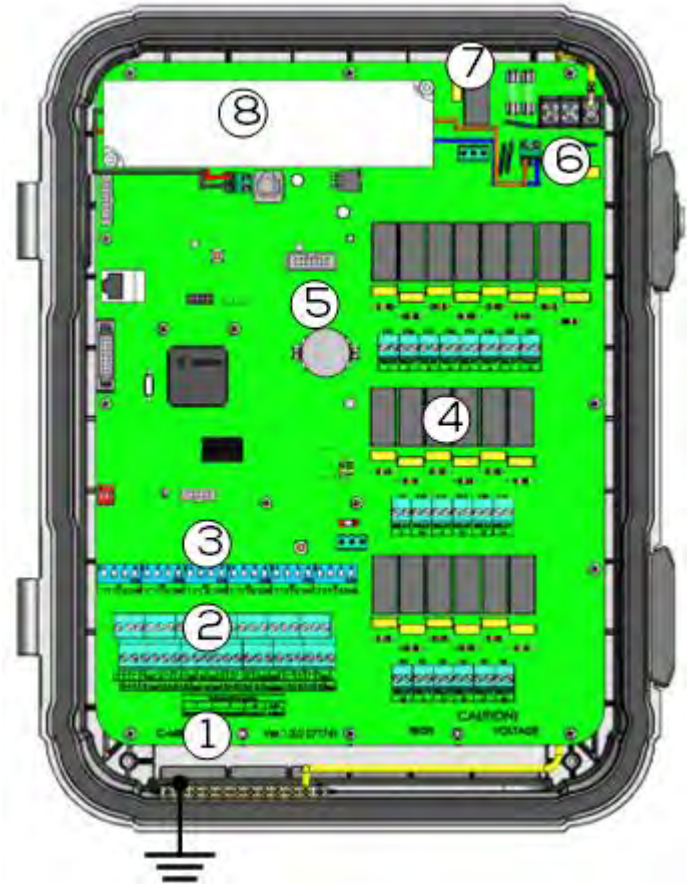


*Figure 7: Main Board layout*

| | | | |
|---|---|---|---|
| 1 | Ground strip | 5 | 3V battery |
| 2 | Analog/digital ports | 6 | Power ports |
| 3 | Dipswitches | 7 | Alarm relay |
| 4 | 20 relays | 8 | Power supply |

*Figure 8: Dipswitches, expanded*

- One dipswitch only in each set is raised.
- Only raise a dipswitch if a device is wired to an S port.

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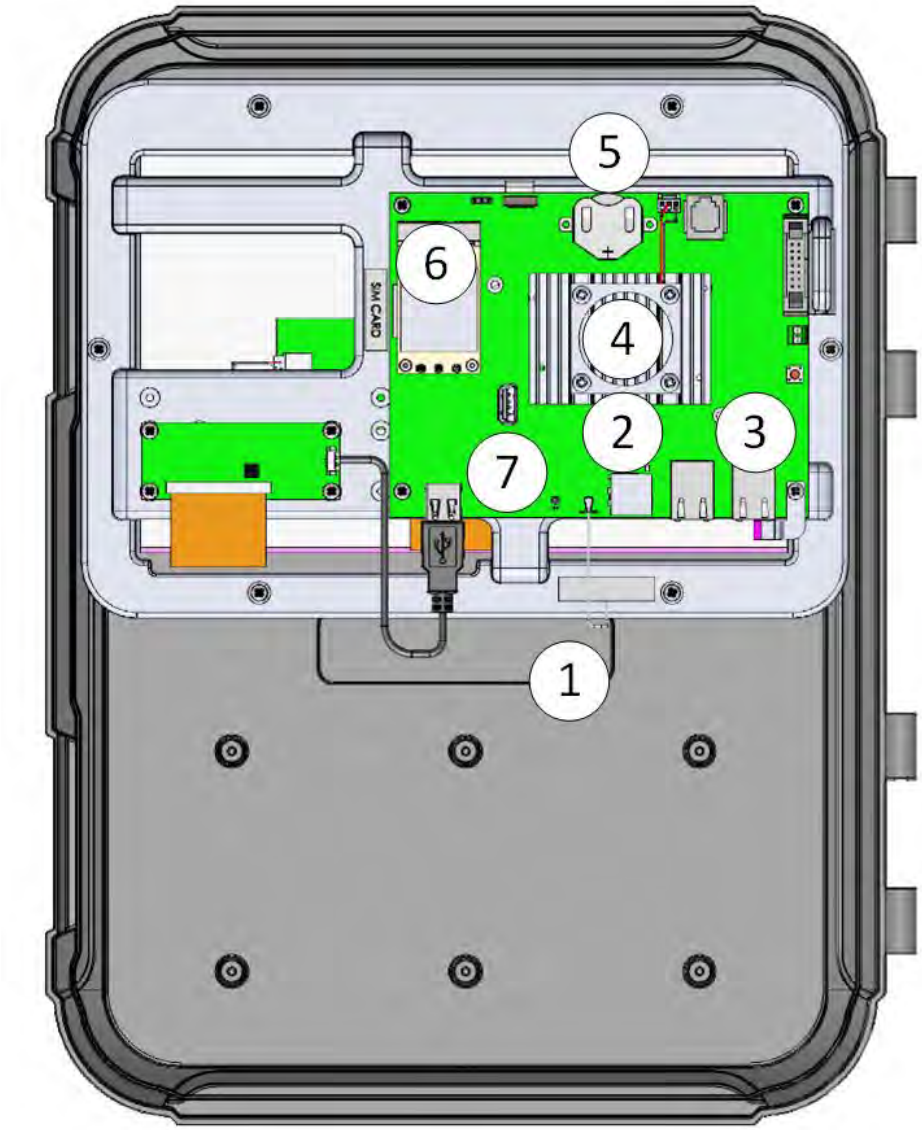


*Figure 9: Display Board layout, Display Card Version 1.1.0*

| | |
|---|---|
| 1 | Wireless antenna |
| 2 | SD Ports |
| 3 | Ethernet Port |
| 4 | Heat Sink |
| 5 | 3V Battery |
| 6 | Modem |
| 7 | USB Port |

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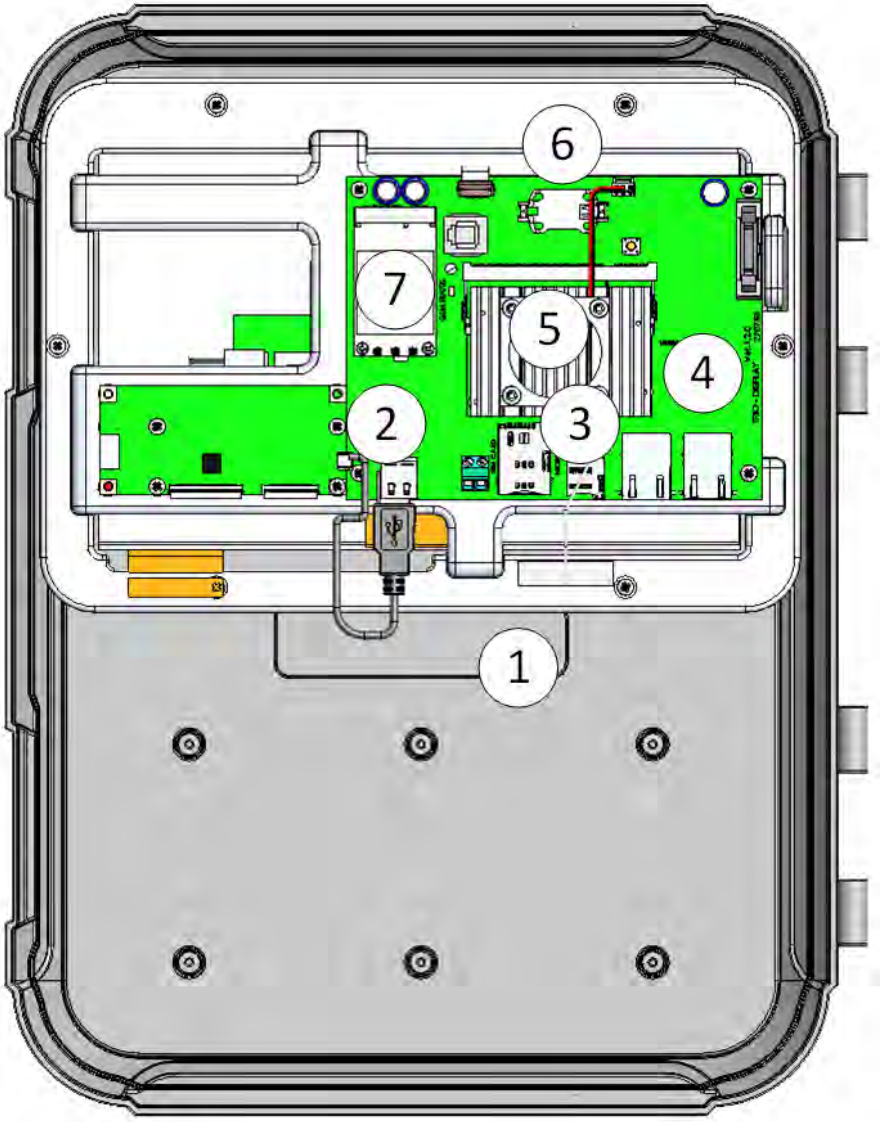


*Figure 10: Display Board layout, Display Card Version 1.0.4*

| | |
|---|---|
| 1 | Wireless antenna |
| 2 | SIM Port |
| 3 | SD Ports |
| 4 | Ethernet Port |
| 5 | Heat Sink |
| 6 | 3V Battery |
| 7 | Modem |

*NOTE There is no functional difference between Versions 1.0.4 and 1.1.0. All future versions will support both cards.*

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## 3.4 Wiring Diagrams

- High Voltage Relays
- Alarms and Power
- Internet Connection
- Analog Output Devices
- Digital Devices
- Analog Input Devices
- RLED 2.0 Wiring

*NOTE After physically installing and connecting the external input/output devices, perform a Cold Start (System › General Settings › About › Reset Factory Default). Map the devices after the Cold Start.*

### 3.4.1 HIGH VOLTAGE RELAYS

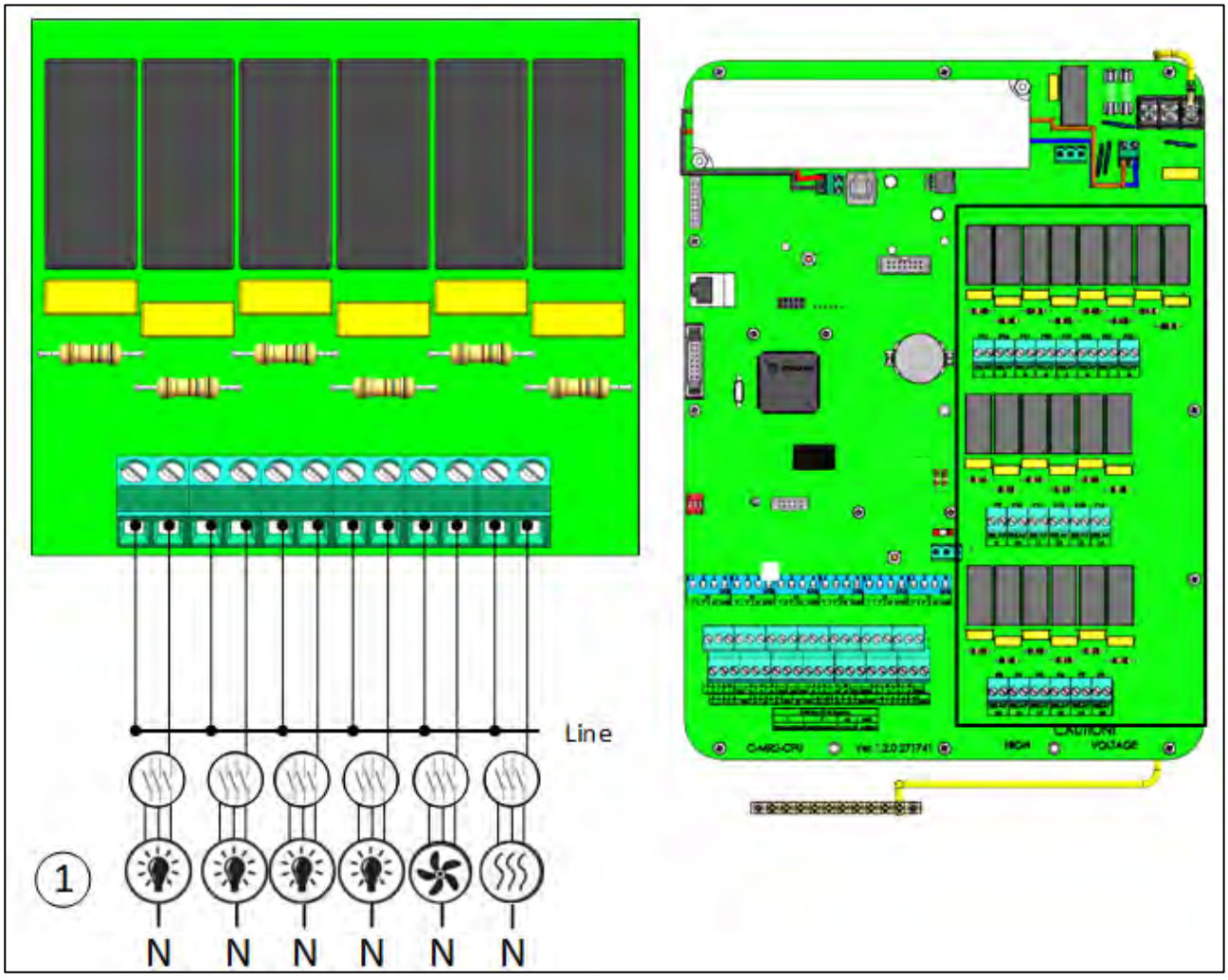


*Figure 11: High voltage devices (examples)*

| | |
|---|---|
| 1 | Example of devices |

*NOTE The relays control motors and heating devices via contactors, not directly.*

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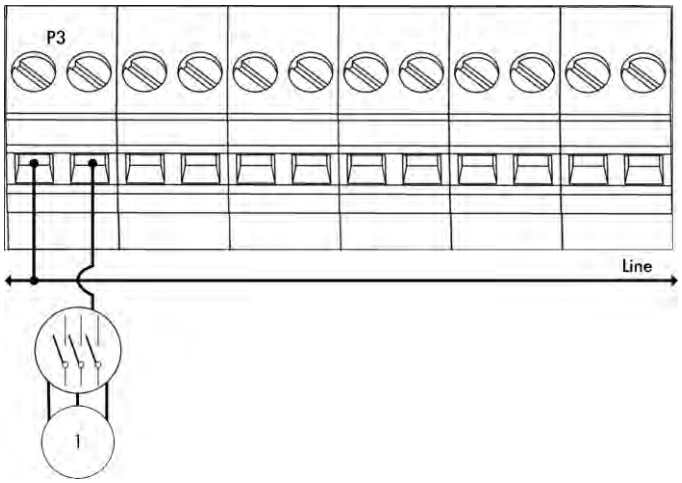


*Figure 12: Relay wiring detailed view*

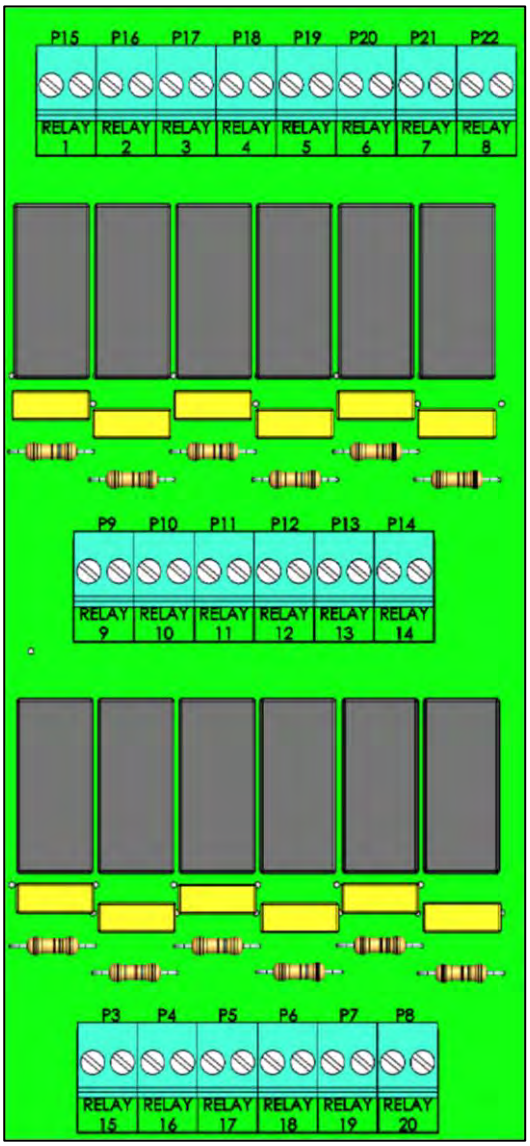


*Figure 13: Relay and port numbering*

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### 3.4.2 ALARMS AND POWER

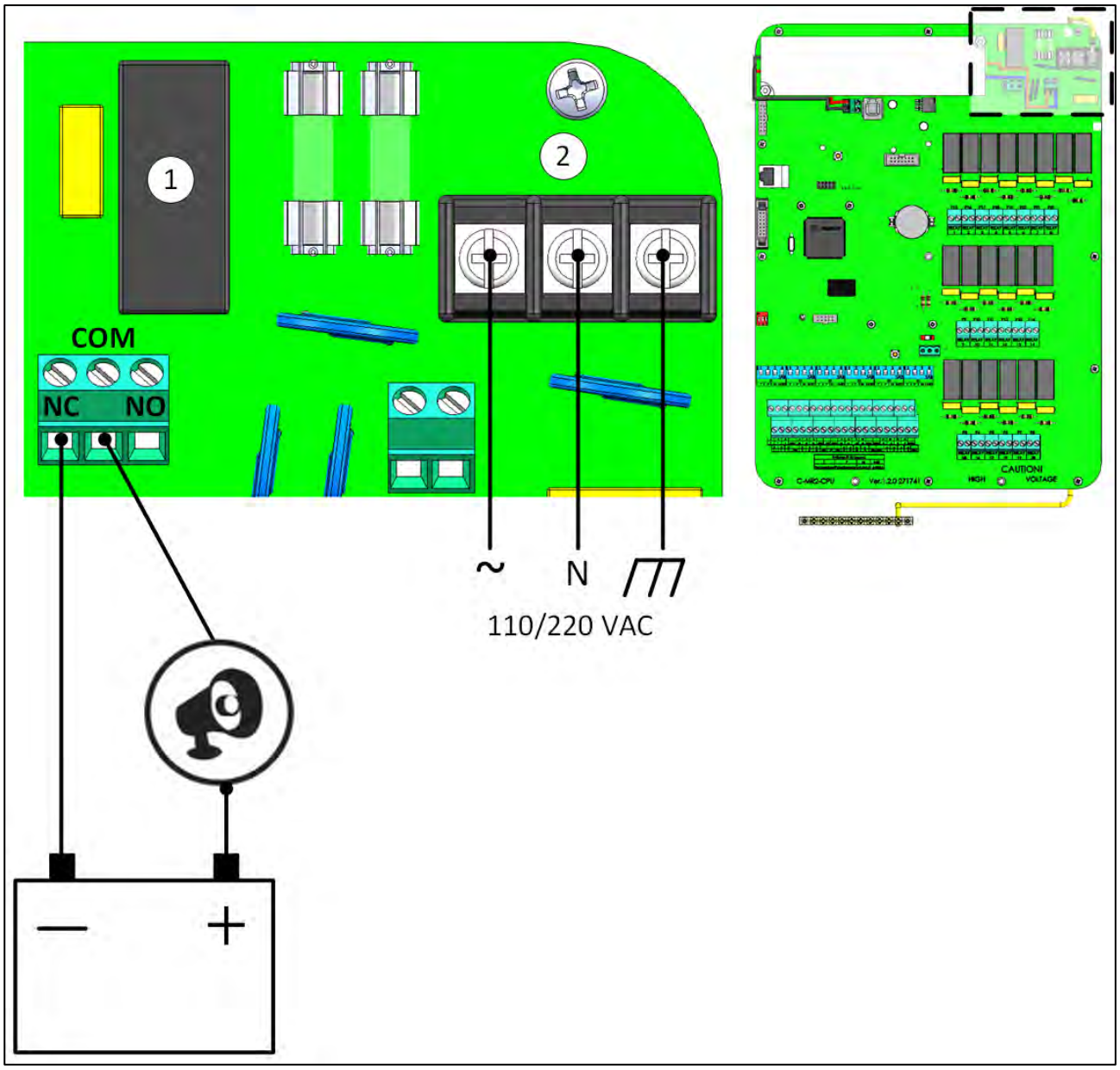


*Figure 14: Alarm relay and power ports*

| | |
|---|---|
| 1 | Alarm relay |
| 2 | Power ports |

- Connect the light or siren device to the alarm relay.

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### 3.4.3 INTERNET CONNECTION

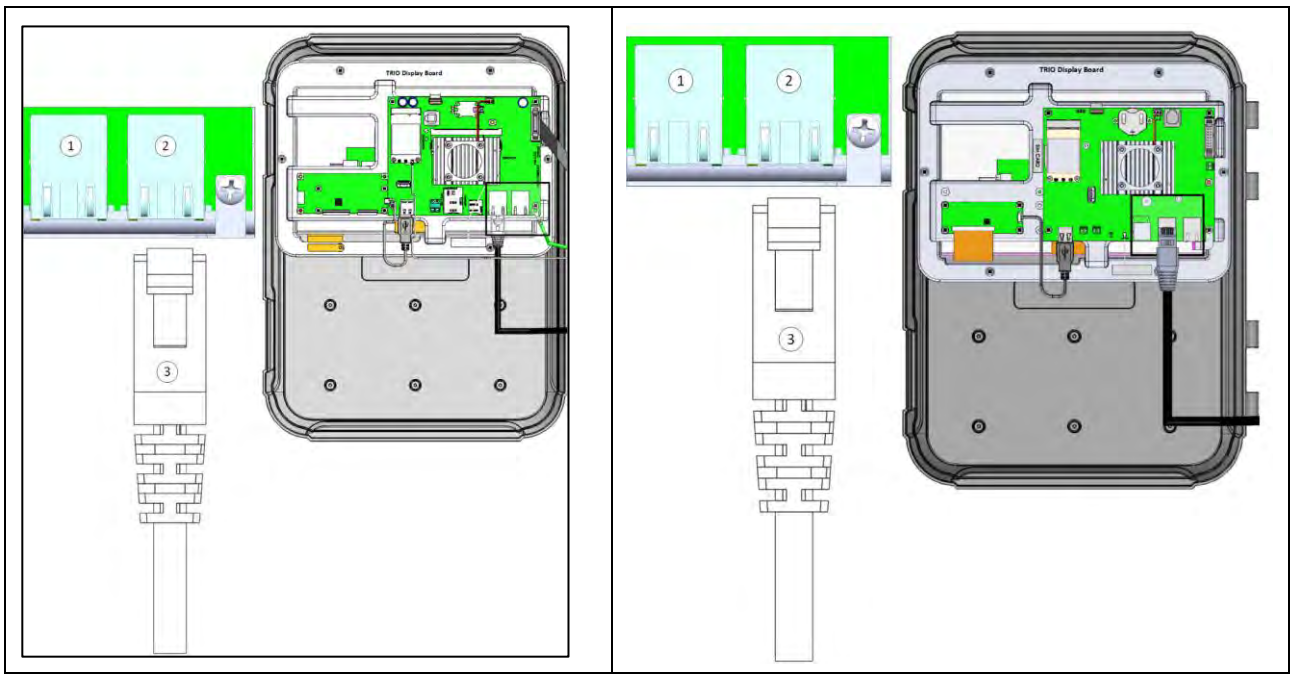


*Figure 15: Ethernet port, Display Card Versions 1.0.4 and 1.1.0*

***CAUTION*** *Connect the internet cable to port 2. Do not connect the cable to port 1.*

| | |
|---|---|
| 1 | Internal port (do not use this port) |
| 2 | Ethernet port |
| 3 | RJ-45 cable |

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### 3.4.4 ANALOG OUTPUT DEVICES

Trio supports analog control over a variety of devices.

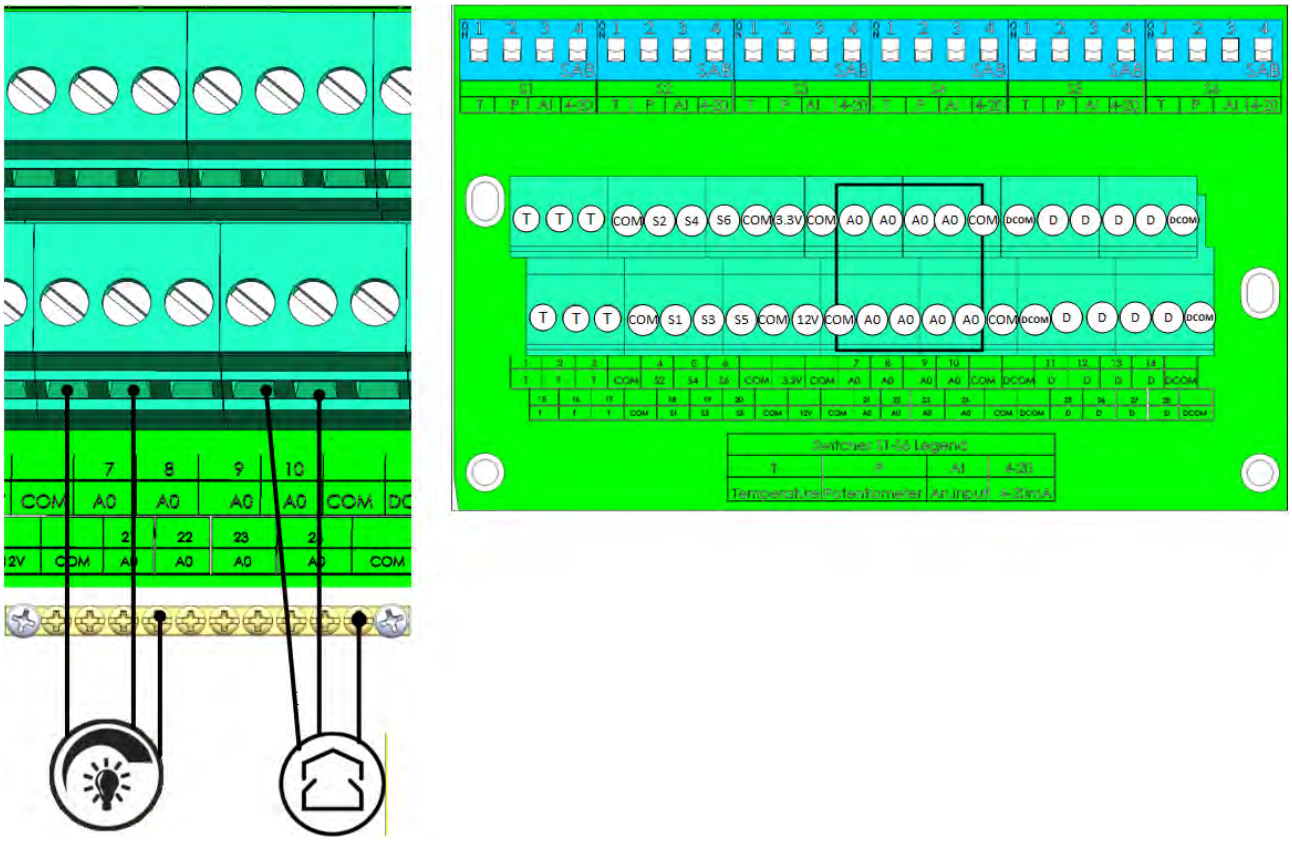


*Figure 16: Analog Output devices (examples) curtain/variable light icon*

- Connect analog output devices to an AO and a COM port. **Ground these devices!**

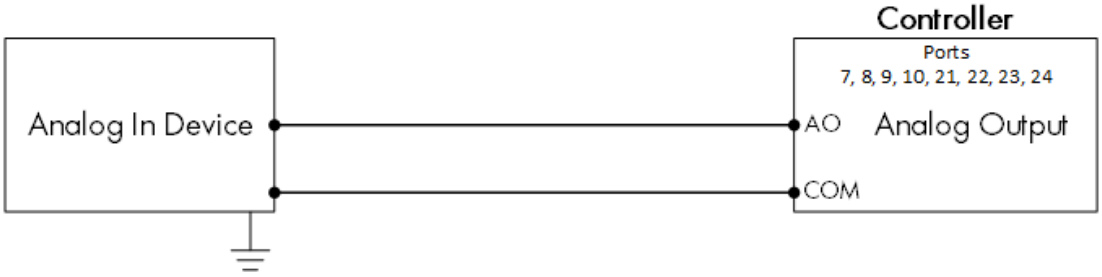


*Figure 17: Analog Device Wiring Schematic*

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### 3.4.5 DIGITAL DEVICES

Trio supports a variety of digital inputs.

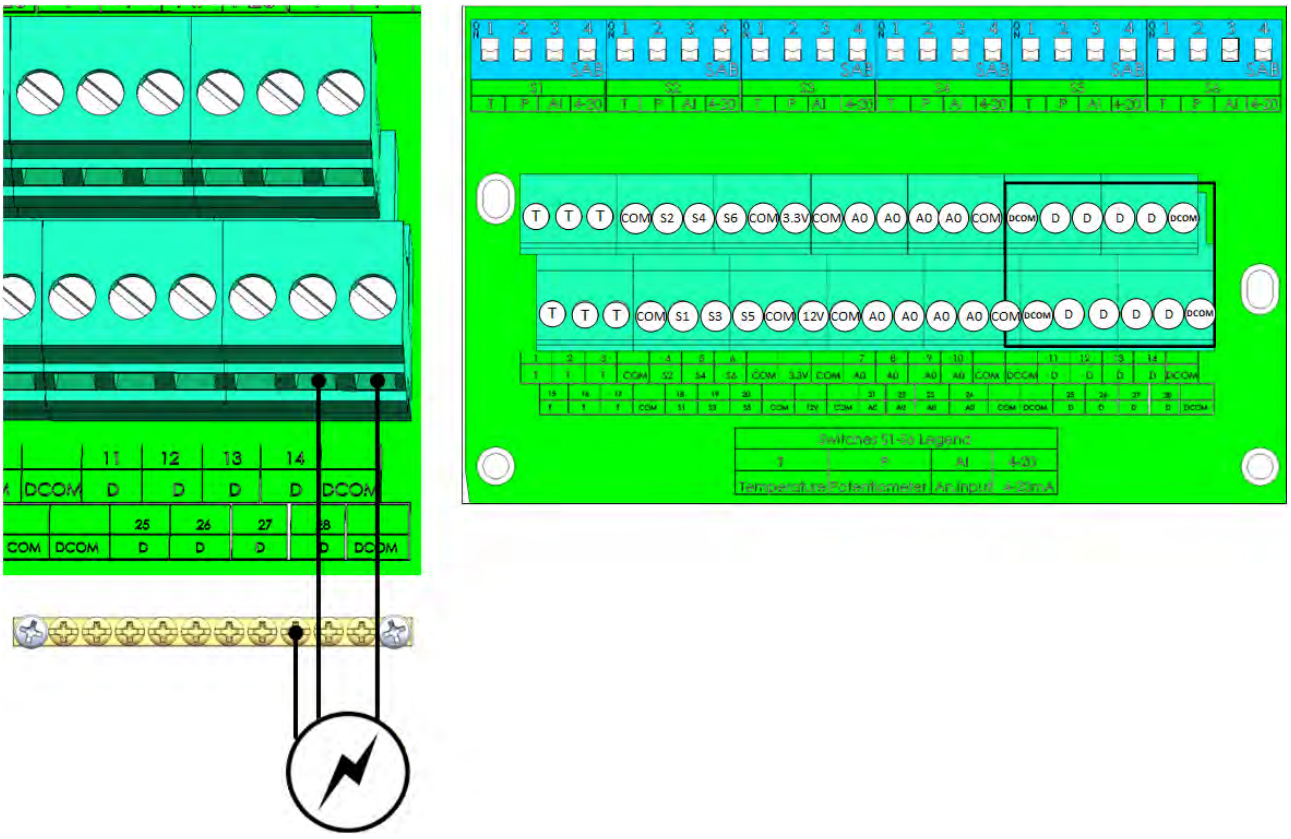


*Figure 18: Digital Input devices (example)*

- Connect digital devices to a D port and a DCOM port. Ground these devices!

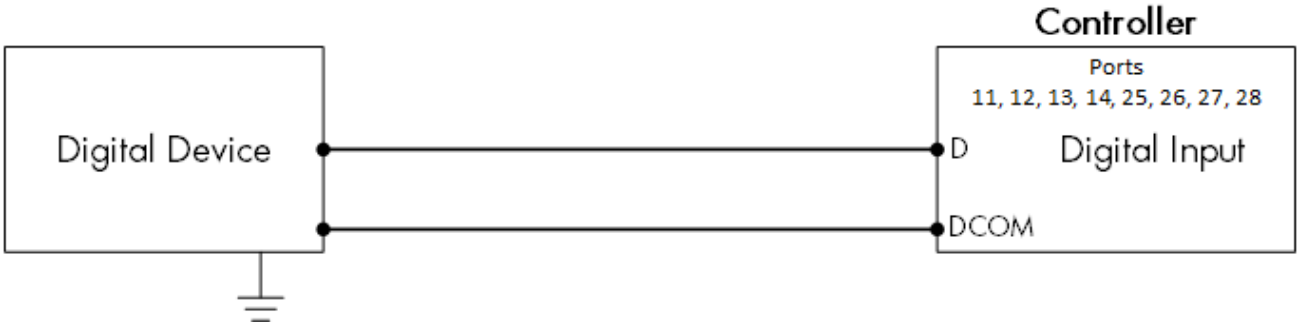


*Figure 19: Digital Device Wiring Schematic*

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### 3.4.6 Analog Input Devices

- Green Box Wiring
- CO2 Sensor Wiring
- Temperature Sensor Wiring
- Humidity Sensor Wiring
- Potentiometer Wiring
- Light Sensor Wiring

#### 3.4.6.1 Green Box Wiring

Refer to the Green Box Manual for details on this sensor. The following illustration shows how to wire the Trio to the Green Box Connection Box.

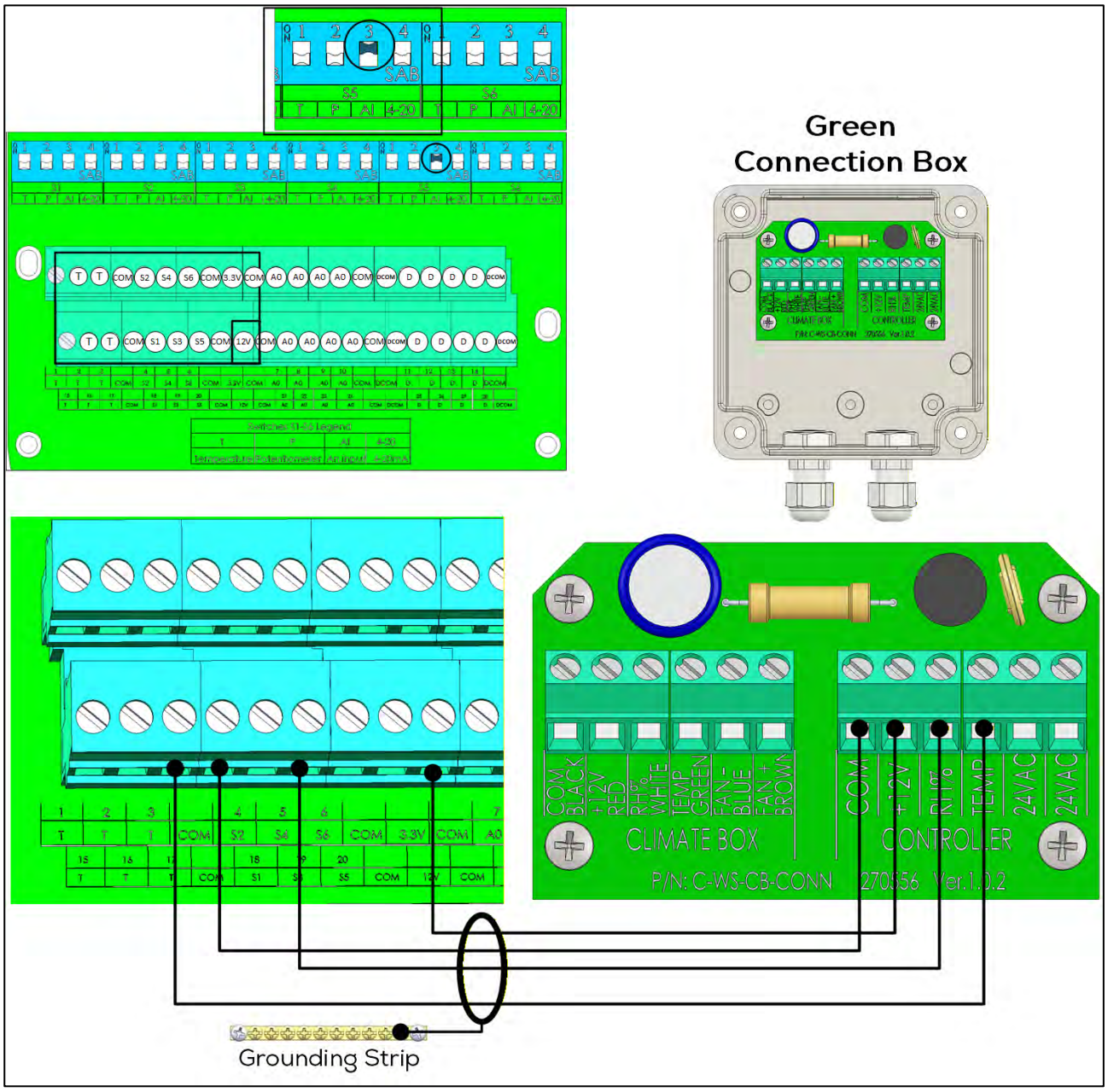


*Figure 20: Green Box Connection Box Wiring*

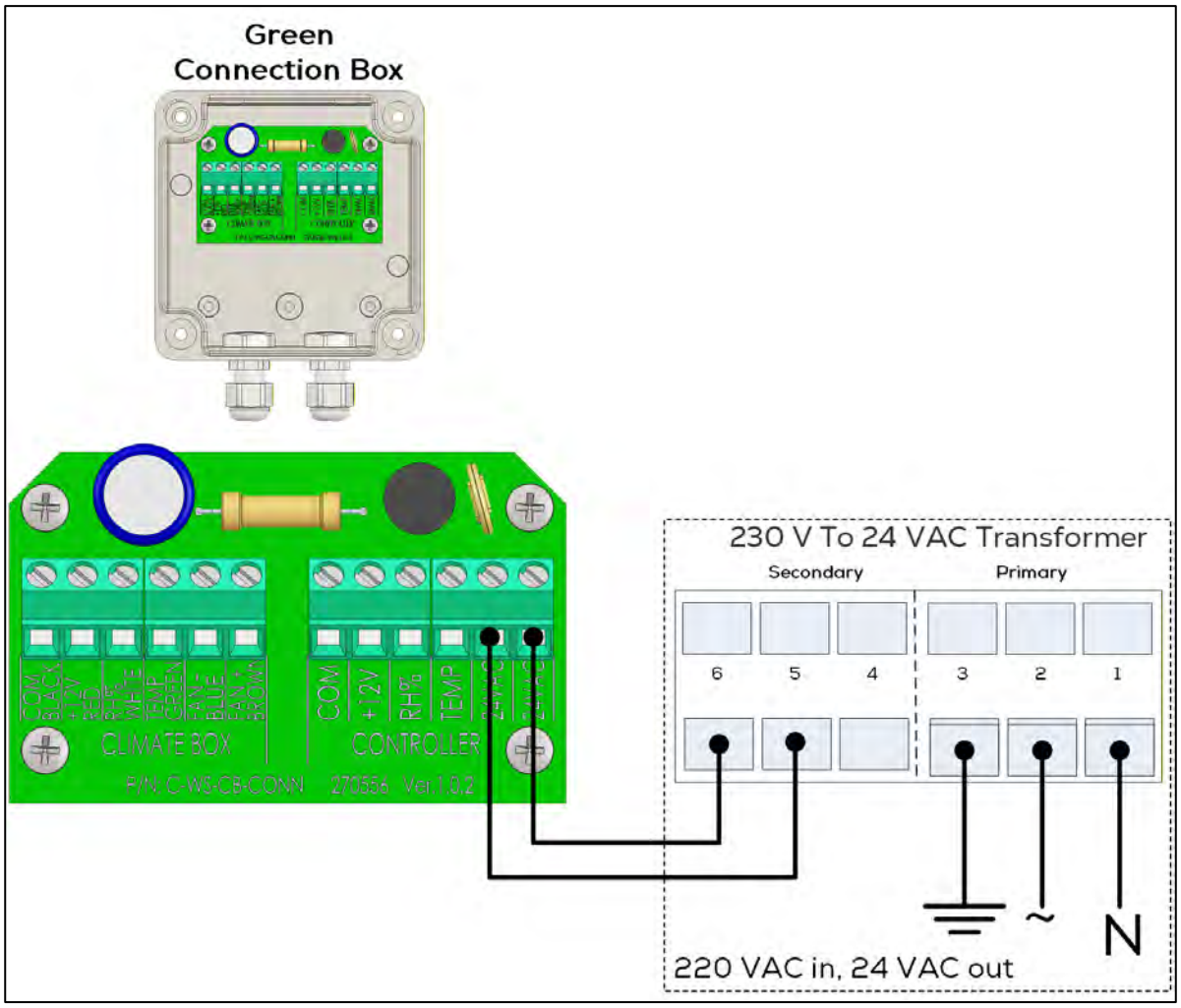


*Figure 21: Green Box Power*

Transformer P/N: 960-99-00159 TRIO GREEN - Remote I/O and Scales 230 V To 24 VAC Transformer

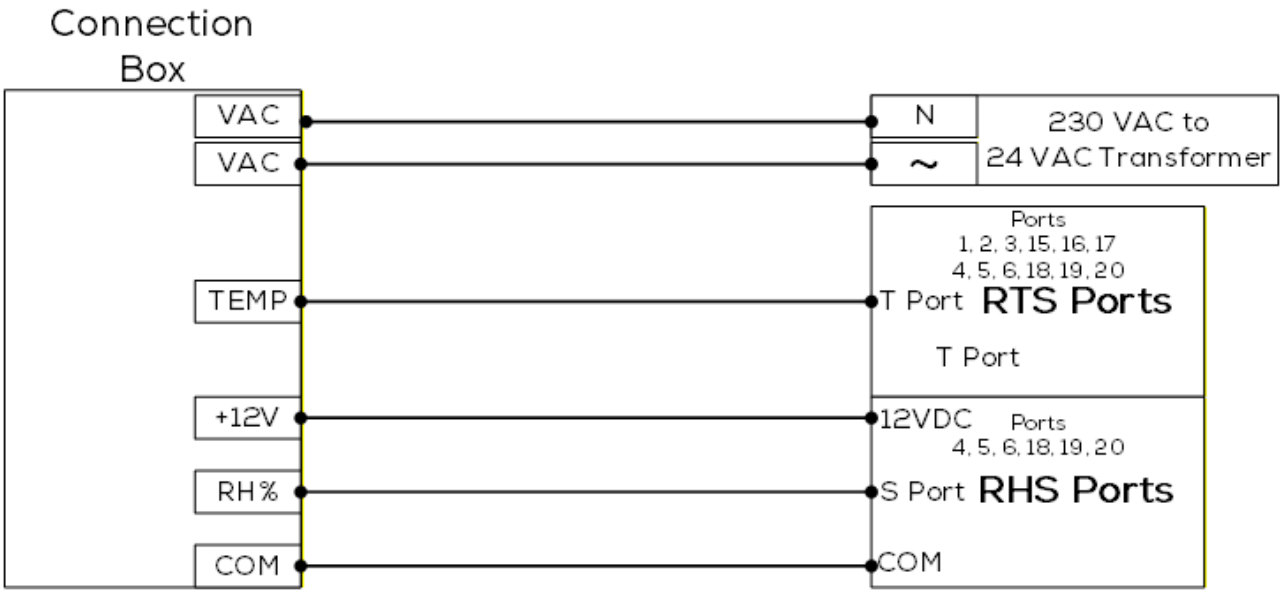


*Figure 22: Connection Box Wiring Schematic*

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- Connect the Connection Box to a:
  - Temperature sensor: T port or S Port
  - RH sensor: S Port
  - +12 V Port
  - COM port
  - Grounding strip!

### 3.4.6.2 CO2 Sensor Wiring

Refer to the CO2 Sensor Manual for details on installing this unit.

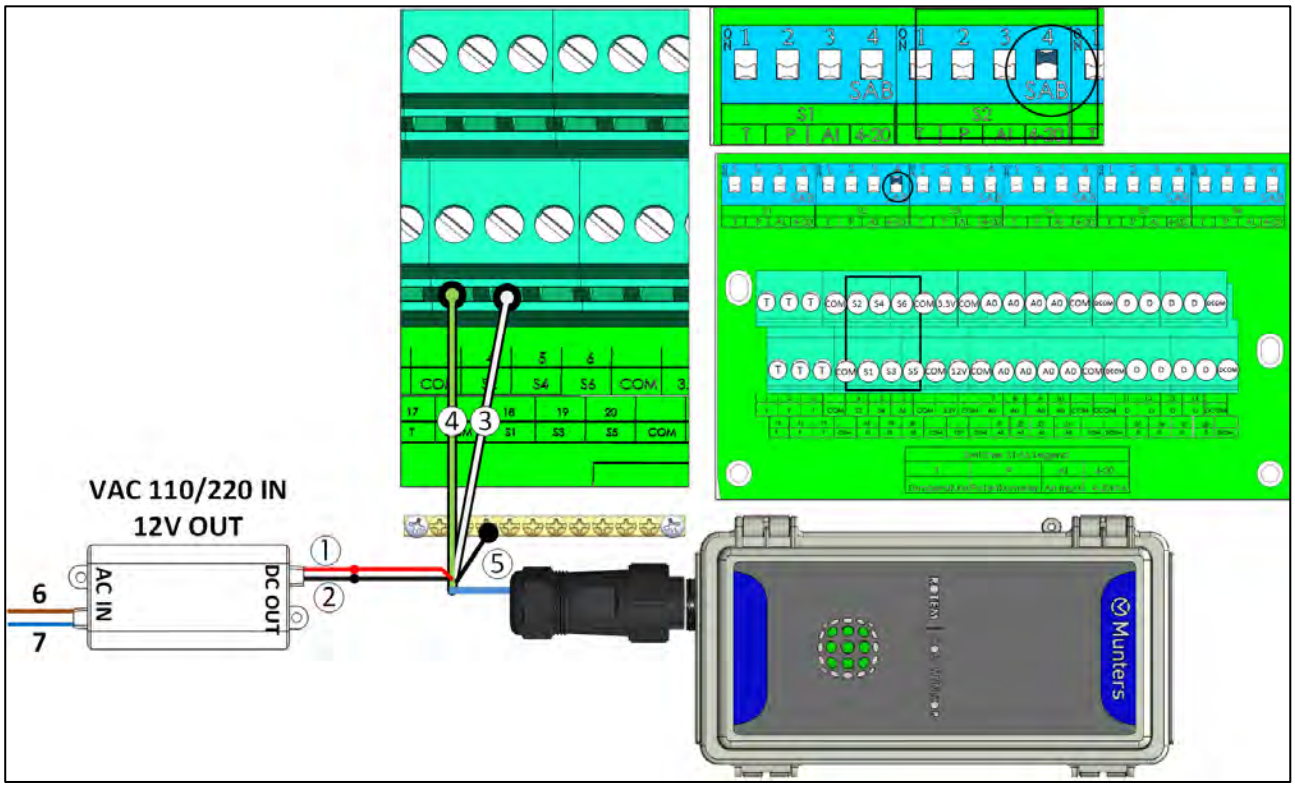


*Figure 23: CO2 Sensor Wiring (P/N: 913-03-XXXXX)*

| Number | Function |
|---|---|
| 1 | Red wire: +12V |
| 2 | Black wire: -12V (Sig COM) |
| 3 | S port |
| 4 | COM port |
| 5 | Shield wire |
| Power Supply | |
| 6 | Brown wire: phase |
| 7 | Blue wire: neutral |

*CAUTION* *Connect the shield to the safety ground.*

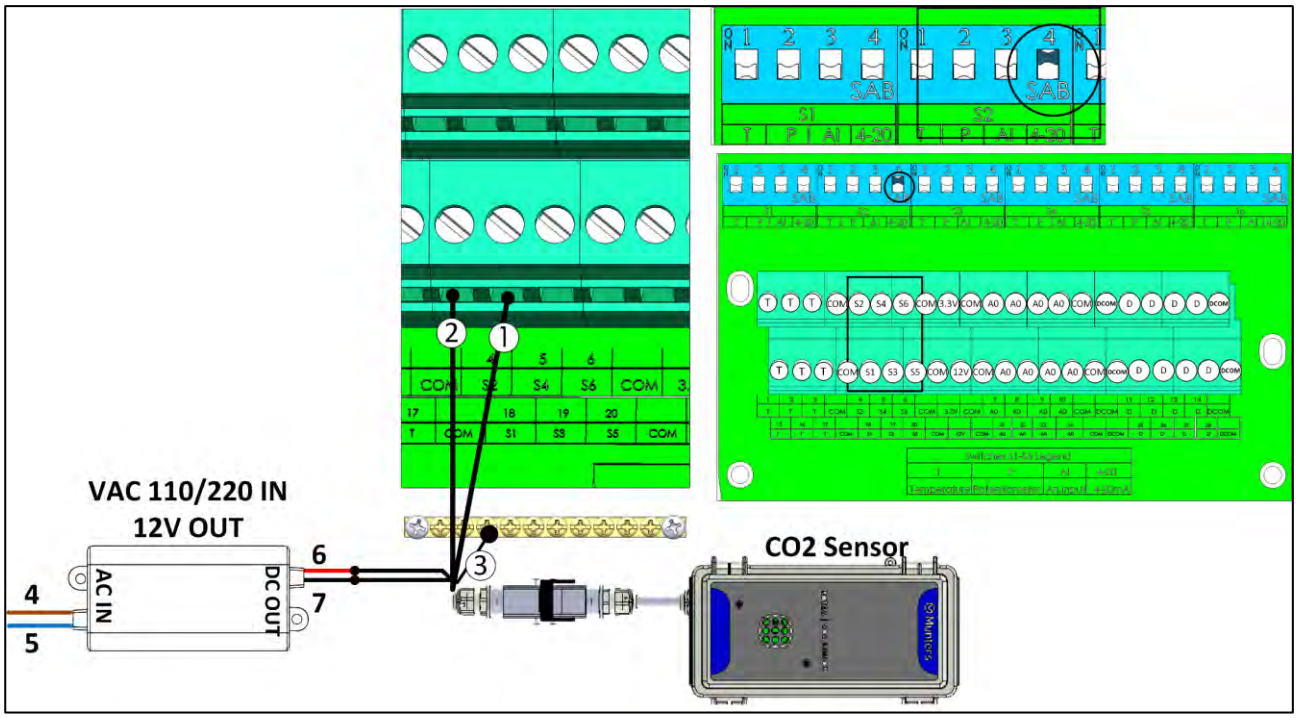


*Figure 24: CO2 Sensor Wiring (P/N: 960-14-10007)*

| Number | Function |
|---|---|
| 1 | S port |
| 2 | COM port |
| 3 | Shield wire |
| Power Supply | |
| 4 | COM port  Brown wire: phase |
| 5 | Shield wire  Blue wire: neutral |
| 6 | Red wire: +12V |
| 7 | Black wire: -12V  (Sig COM) |

*CAUTION  Connect the shield to the safety ground.*

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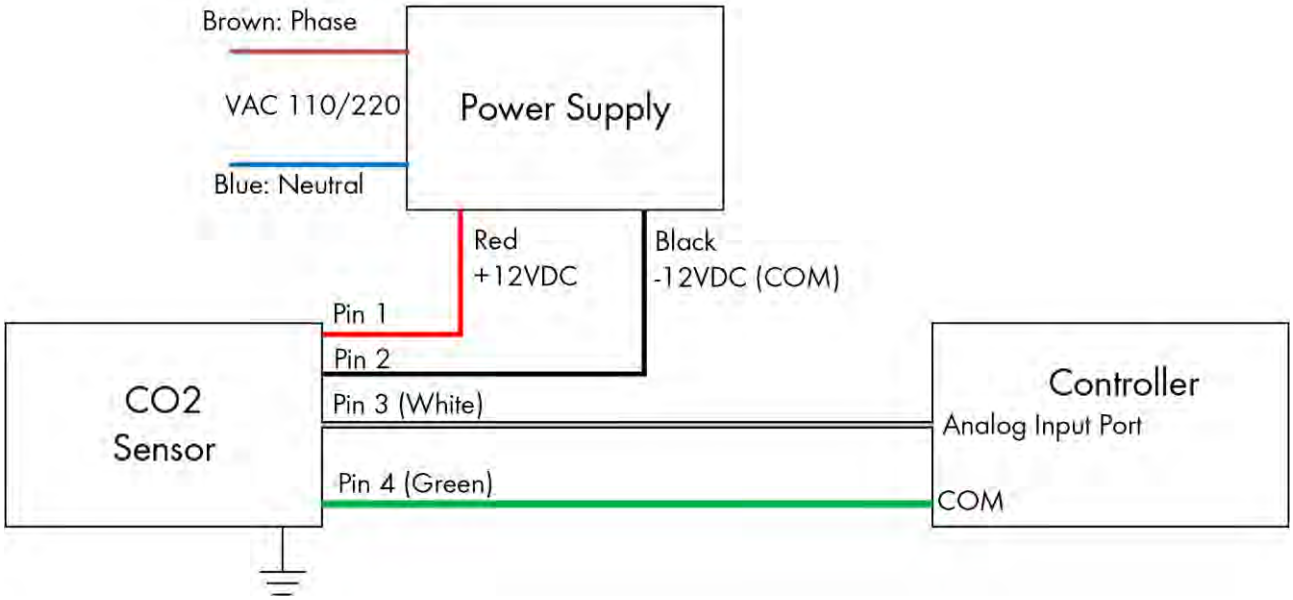


*Figure 25: CO2 Sensor Wiring Schematic*

- Connect the CO2 device to:
  - Controller:
    - S port. In the corresponding dipswitch, raise dipswitch 4 (4-20 mA).
    - COM port
    - Grounding strip!
  - Power supply
    - +12V
    - -12V

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### 3.4.6.3 Temperature Sensor Wiring

Refer to the RTS-2 Manual for details on this sensor.

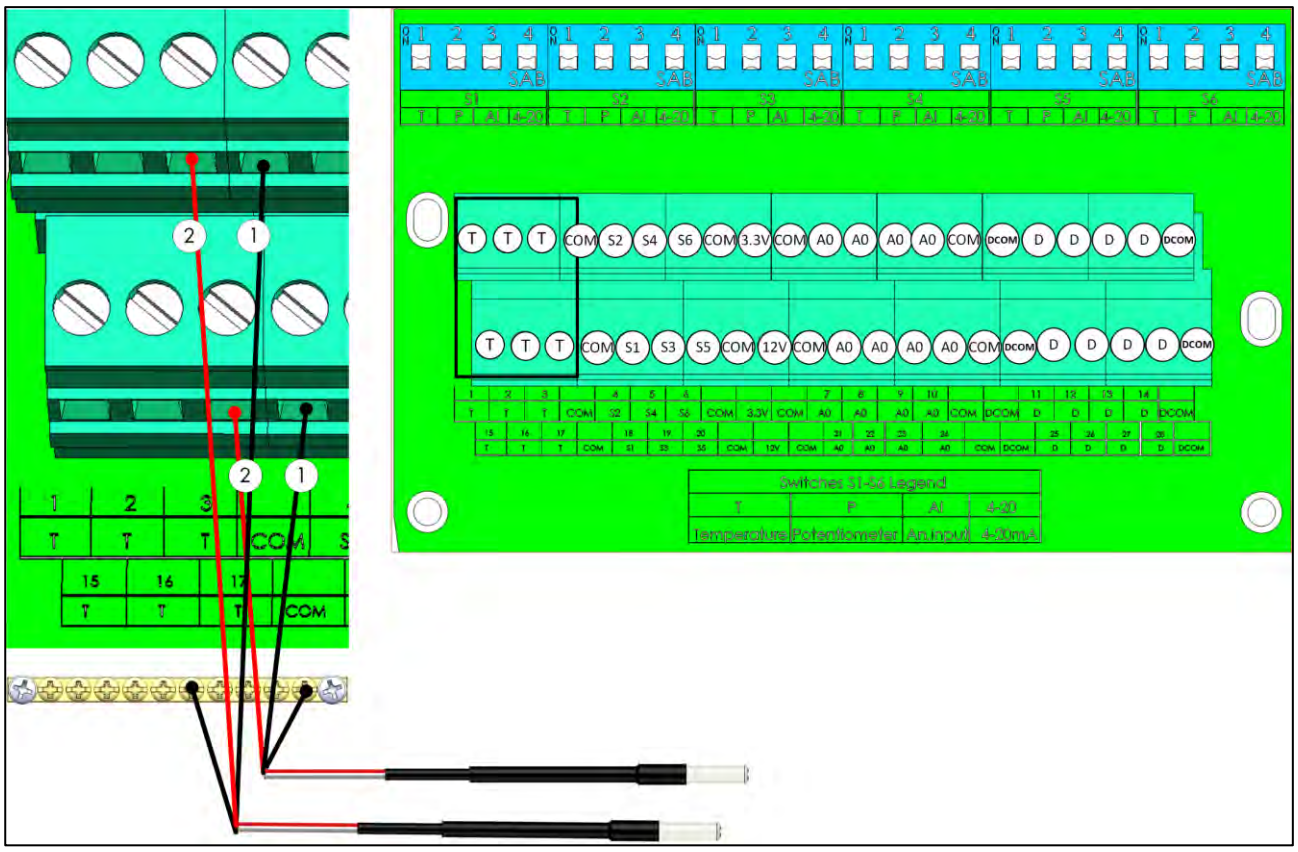


*Figure 26: RTS Wiring*

| Number | Function |
|---|---|
| 1 | COM port (black wire) |
| 2 | T port (red wire) |

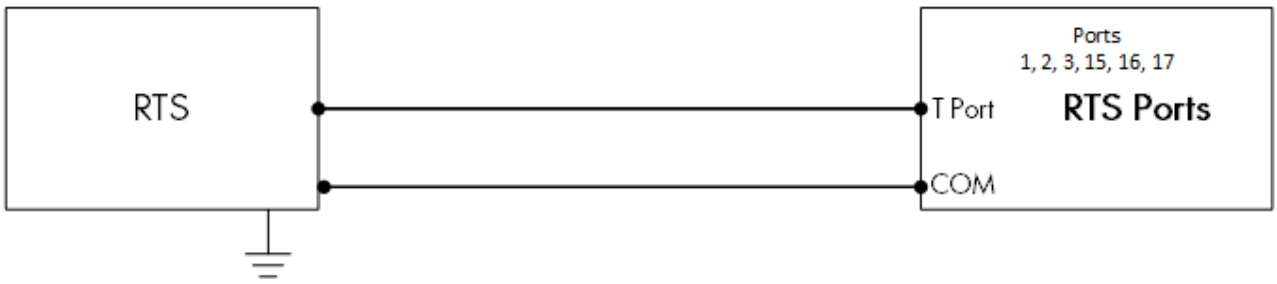


*Figure 27: RTS Wiring Schematic*

- Connect each RTS sensor to a:
  - T port
  - COM port
  - Grounding strip!
- Note:
  - Wire all designated T ports before wiring the RTS sensors to the S ports.
  - Connect the black wire to a COM port, not a DCOM port.

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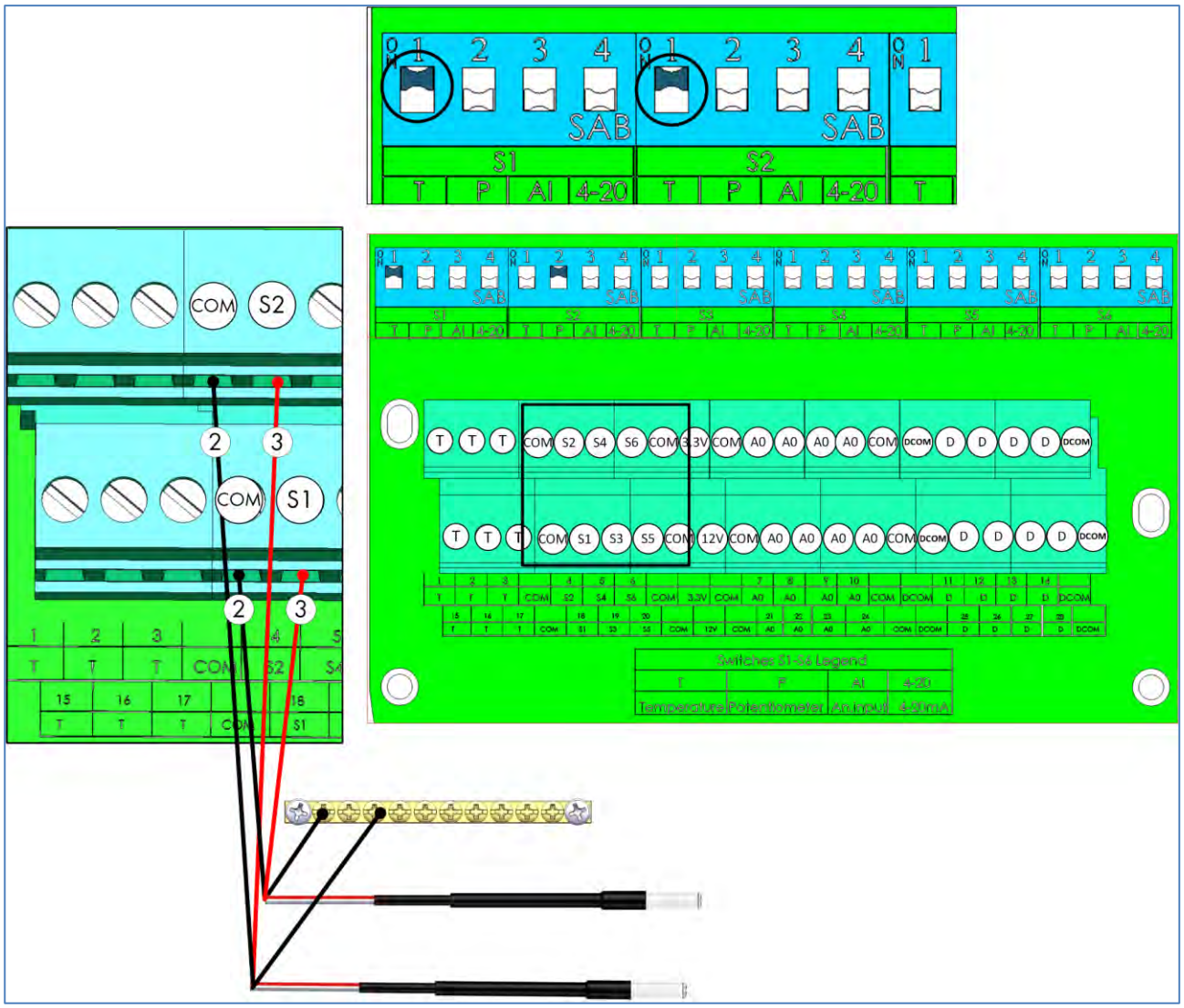


*Figure 28: RTS S Port Wiring*

| Number | Function |
|---|---|
| 2 | COM port (black wire) |
| 3 | S port (red wire) |

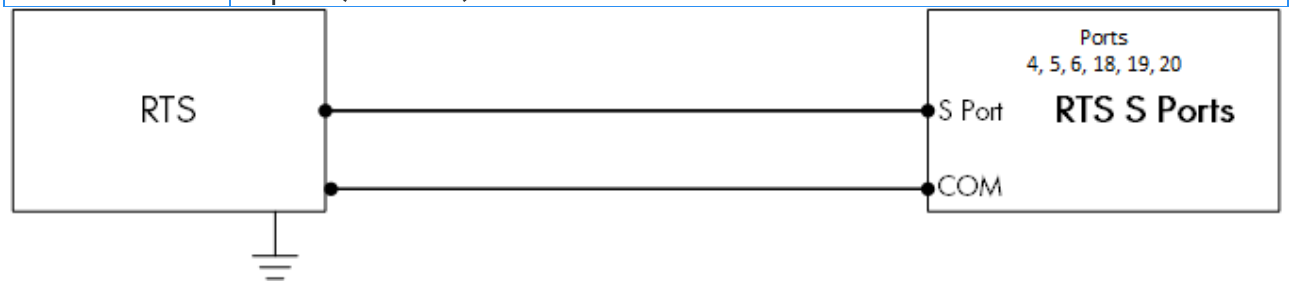


*Figure 29: RTS S Port Wiring Schematic*

- Connect each RTS sensor to a:
  - S port. In the corresponding dipswitch, raise dipswitch 1 (temp)
  - COM port
  - Grounding strip!
- Note:
  - Wire all designated T ports before wiring the RTS sensors to the S ports.
  - Connect the black wire to a COM port, not a DCOM port.

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### 3.4.6.4Humidity Sensor Wiring

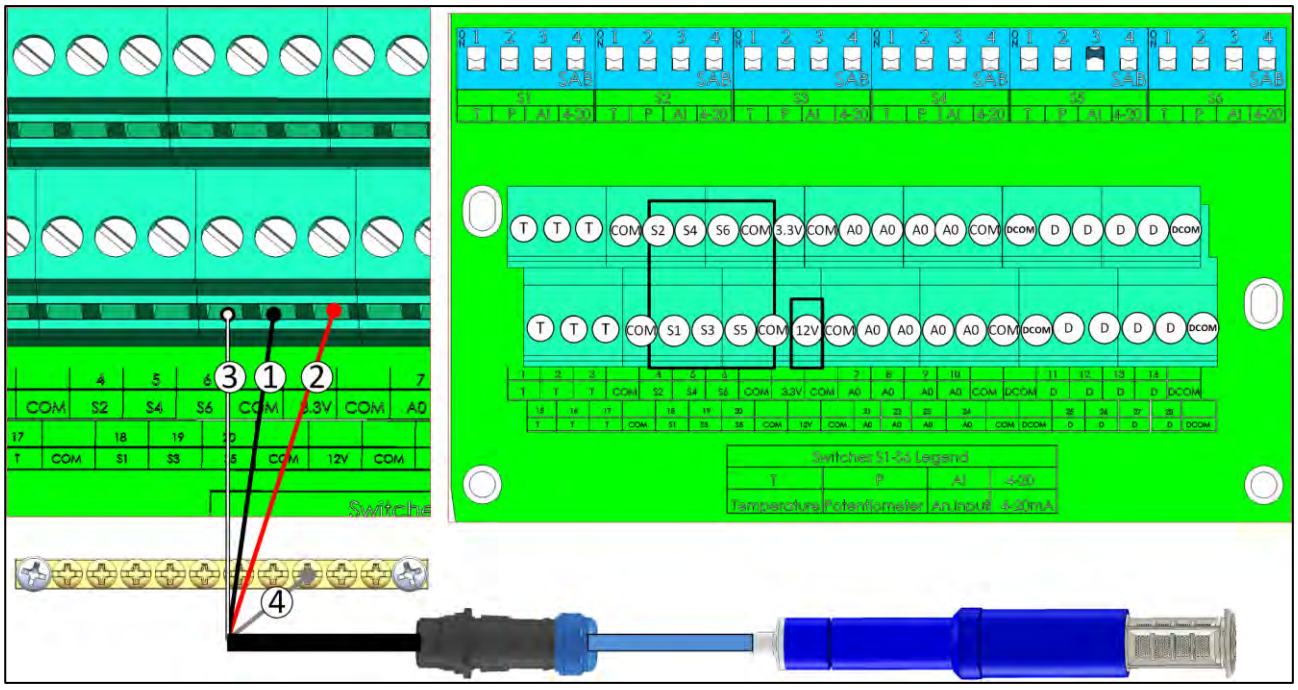


*Figure 30: RHS+ Wiring*

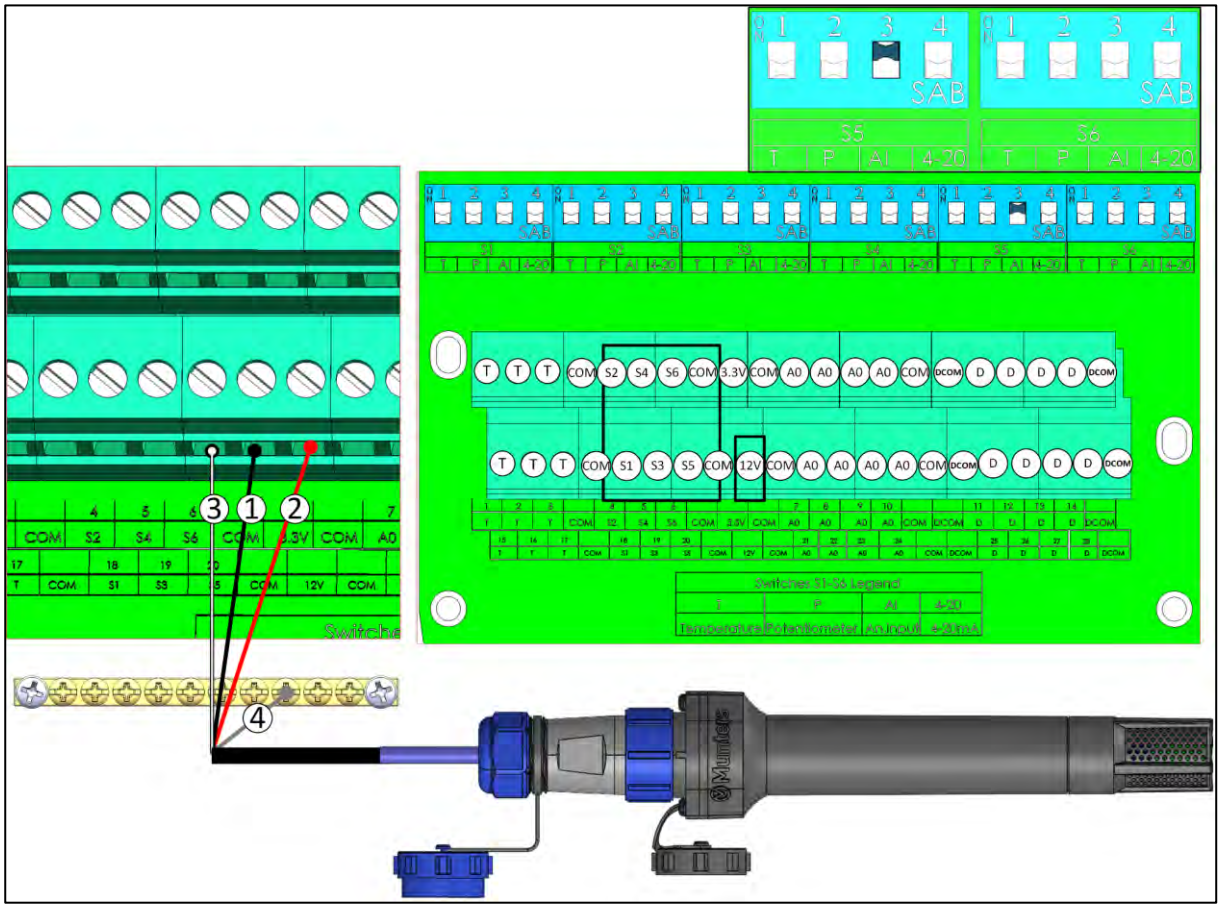


*Figure 31: RHS Pro Wiring*

| Number | Function |
|---|---|
| 1 | COM port (black wire) |
| 2 | 12V (red wire) |
| 3 | S port (white wire) |
| 4 | Shield wire |

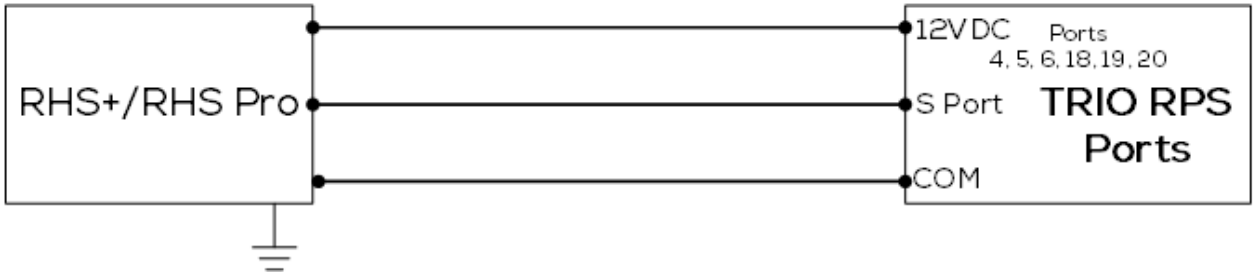


*Figure 32: RHS+/Pro Sensor Wiring Schematic*

- Connect each RHS+/Pro sensor to a:
  - S port. In the corresponding dipswitch, raise dipswitch 3 (analog input).
  - COM port.
  - 12VDC port.
  - Grounding strip!

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### 3.4.6.5 Potentiometer Wiring

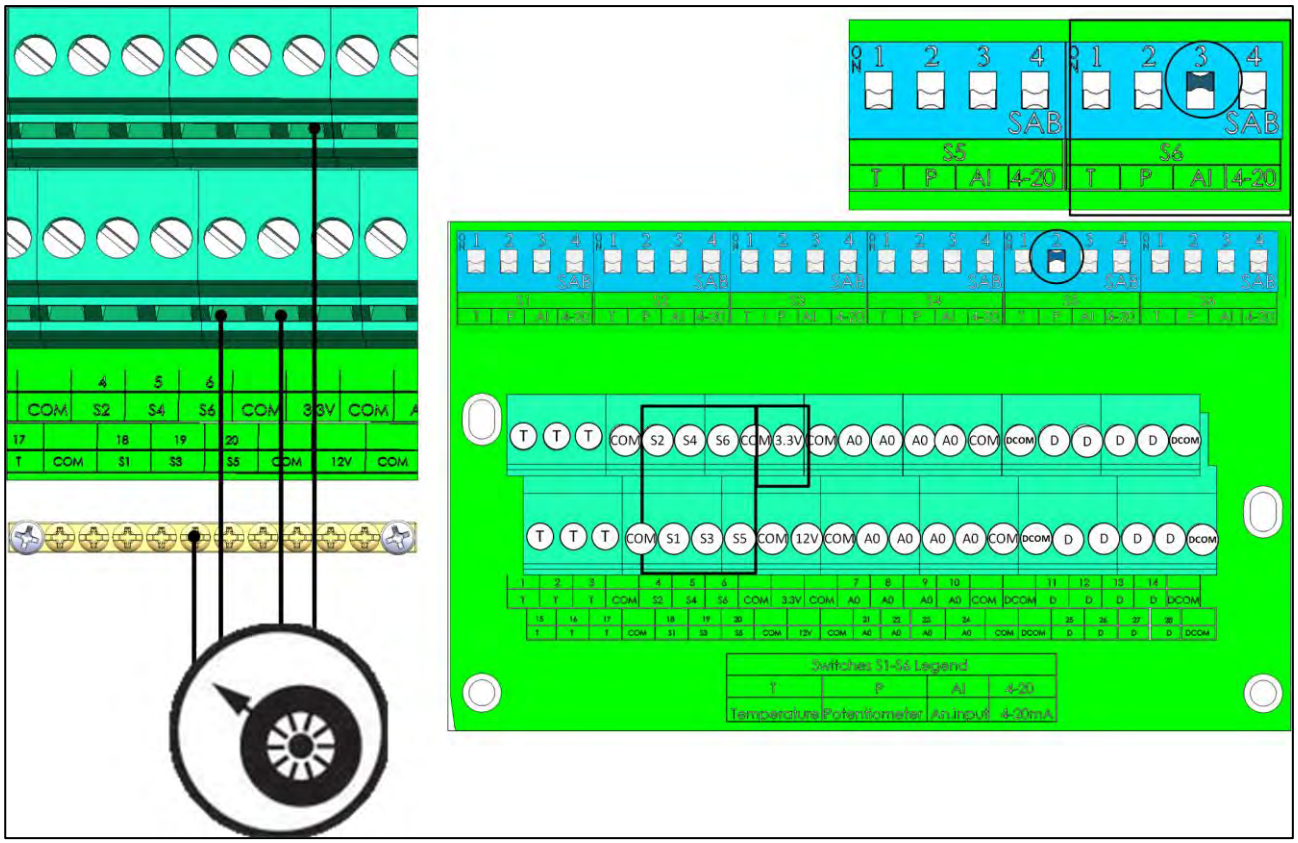


*Figure 33: Potentiometer Wiring*

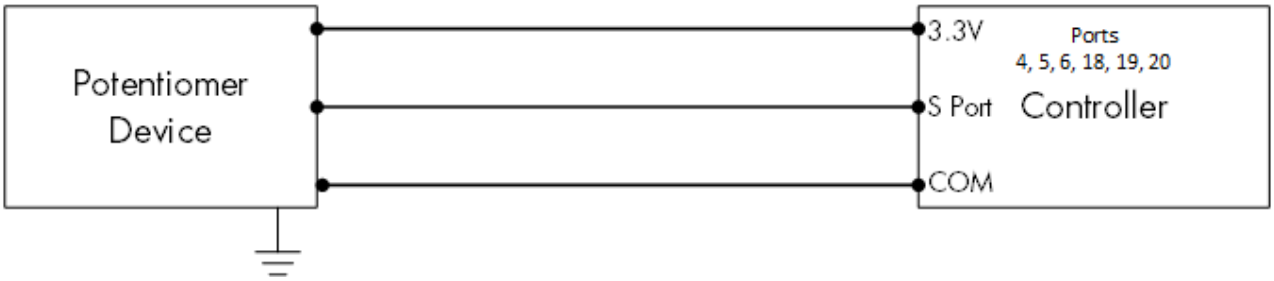


*Figure 34: Potentiometer Wiring Schematic*

- Connect each potentiometer to a:
  - S port. In the corresponding dipswitch, raise dipswitch 2 (potentiometer).
  - COM port.
  - 3.3V port.
  - Grounding strip!

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### 3.4.6.6 Light Sensor Wiring

Refer to the RLS Manual for more information.

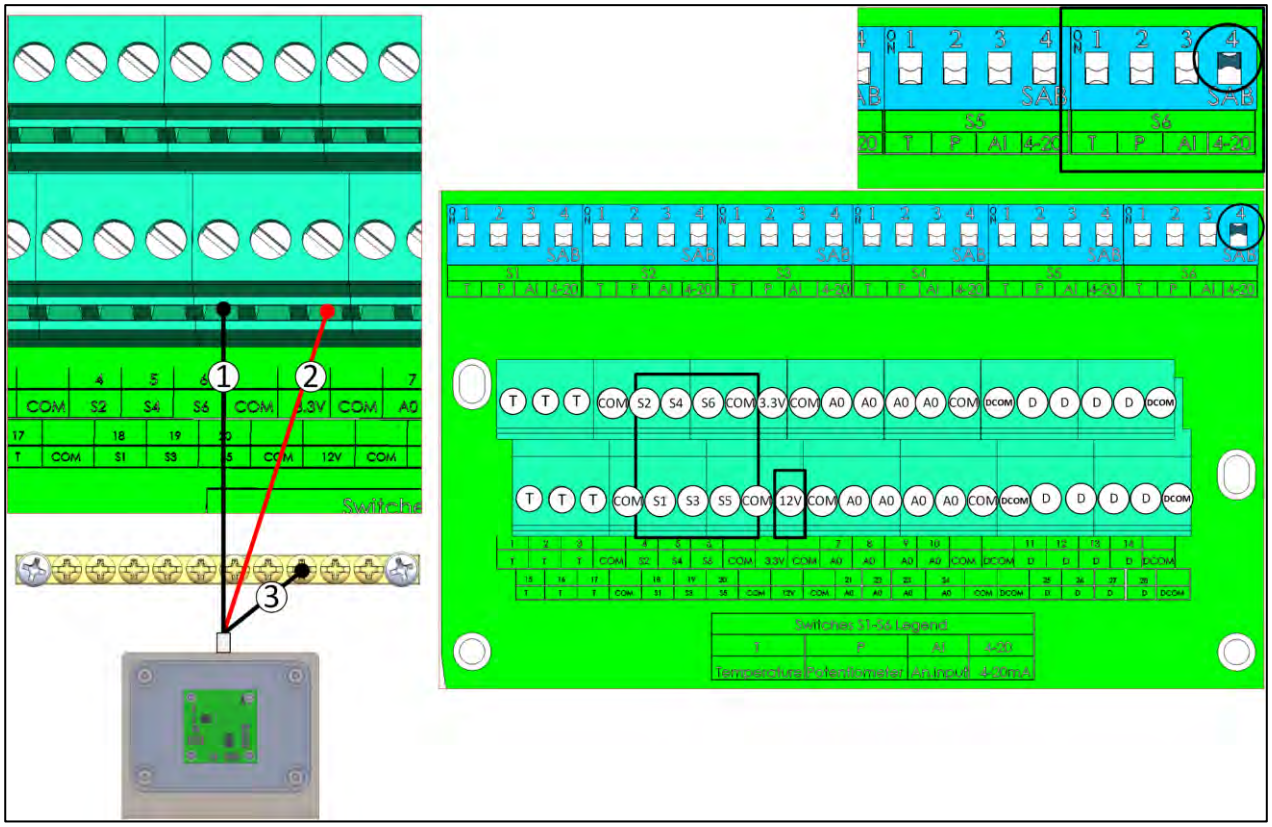


*Figure 35: Light Sensor Wiring*

| Number | Function |
|---|---|
| 1 | S port (black wire) |
| 2 | 12V (red wire) |
| 3 | Shield wire |

- Connect each RLS sensor to a:
  - S port. In the corresponding dipswitch, raise dipswitch 4 (4 -20 mA).
  - 12VDC port.
  - Grounding strip!

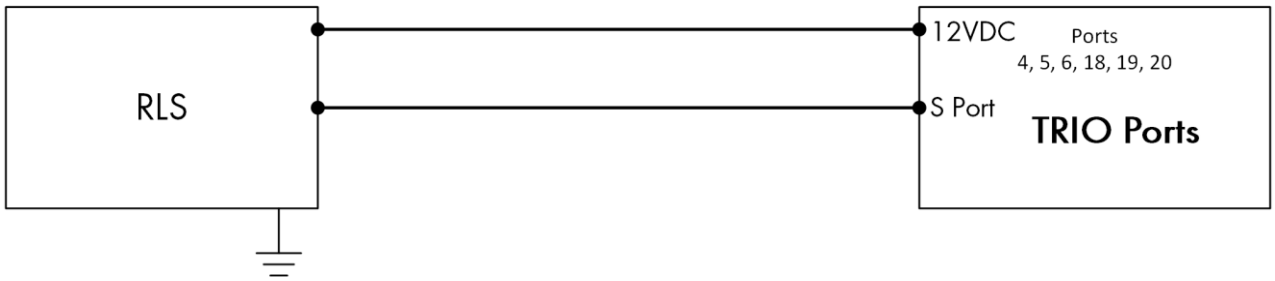


*Figure 36: RLS Wiring Schematic*

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### 3.4.7 RLED 2.0 WIRING

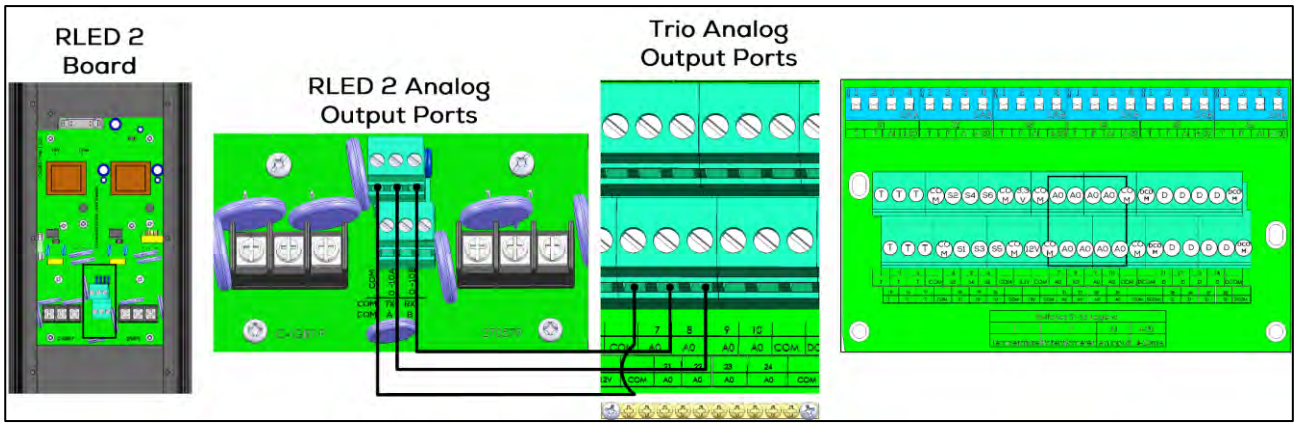


*Figure 37: Trio – RLED 2.0 Wiring*

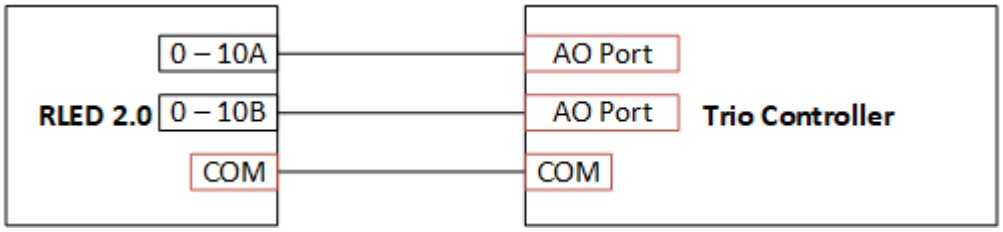


*Figure 38: Trio – RLED 2.0 Schematic*

## 3.5 Trio – RLED 2.0 Wiring Termination

Termination, installing or enabling 120-ohm termination resistors at the beginning and end units of a chain, ensures reliable communication in RS-485 infrastructures.

Termination is recommended when the distance between Trio 20 and the final device in the chain is more than 100 meters/320 feet. Trio 20 and Trio Expansion come with a switch to enable termination; an external resistor must be installed on the RLED 2 communication card. Termination may not be required in shorter installations.

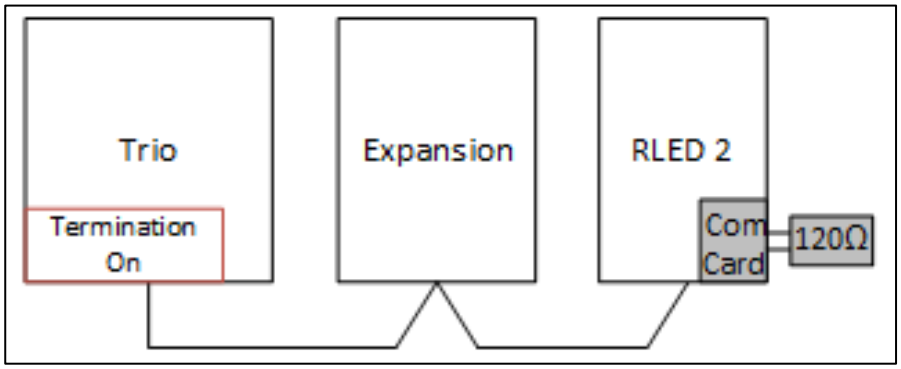


*Figure 39: Termination Sample Topologies*

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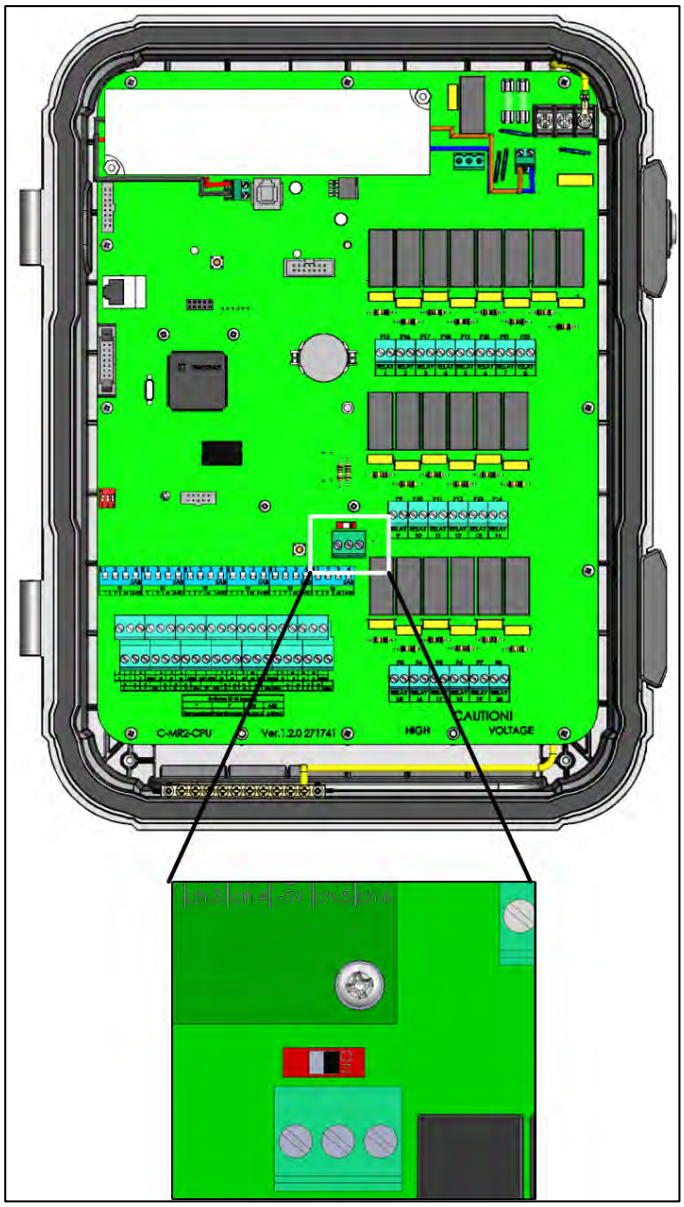


*Figure 40: Termination Switch*

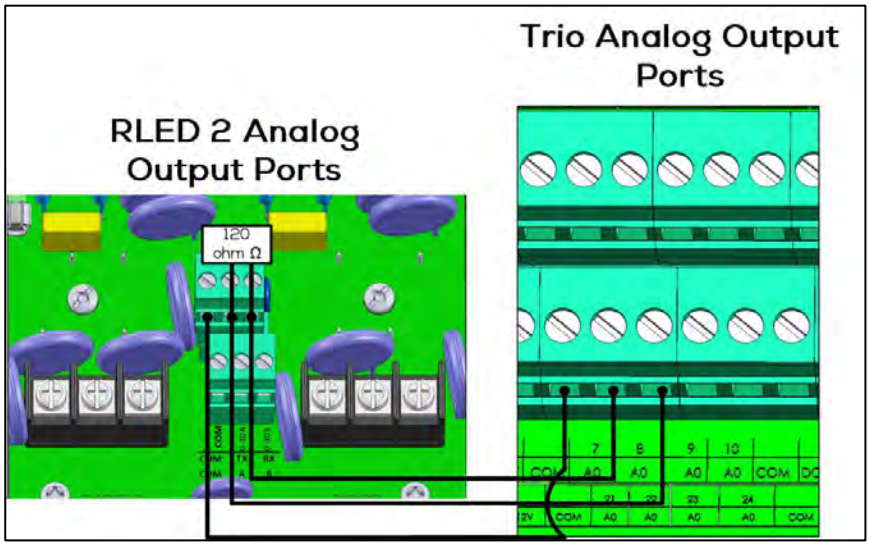


*Figure 41: RLED 2 Termination Wiring*

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## 3.6 SIM Card Configuration

Trio 20 units come equipped with a modem (including a SIM card and antenna). As an option, a unit can come without a modem.

- The Trio modem's SIM card is a global SIM. No configuration is required because the SIM will find the relevant ISP.
- The connection to the Cloud is prioritized: 1) LAN 2) Wi-Fi 3) Cell-modem. The cell-modem connection is active only if the LAN or Wi-Fi are not available.

The SIM card supports three levels of connectivity to the TrioAir application:

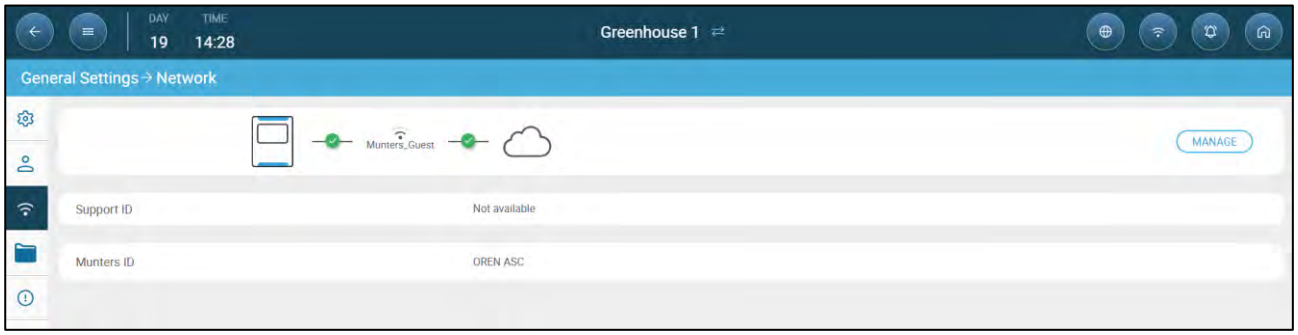
- Free: Users subscribed to TrioAir's free plan can register the unit for free. No data plan is required.
- Alarms: Users subscribed to the TrioAir alarm function receive alarms in real-time.
- Data plan: Users can subscribe to the TrioAir Premium access plan, enabling modem access to the TrioAir cloud.

***CAUTION*** *By default, the cell modem is enabled.*

## 3.7 Tech Support/Wi-Fi

To view your unit's network information go to System › General Settings › Network .

You will need this information when speaking with technical support.




- Click Manage.

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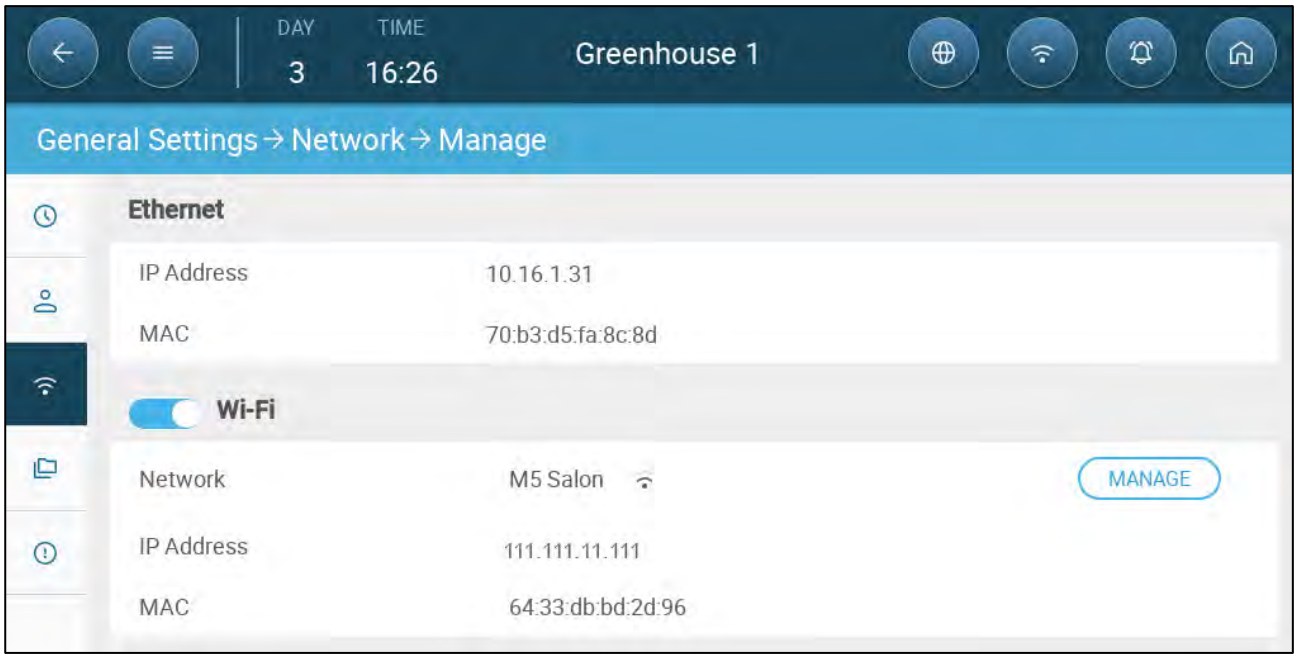


- Ethernet fields are read-only information.
- Enable Wi-Fi if required.

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# 4 TrioAir

TrioAir is the Munters (desktop and cellphone) app that gives users remote access to their controllers. Trio 20 Green Controllers are connected directly to the internet via a standard modem. TrioAir is the application used to manage your controllers via the web. In addition to seamless access to your Trio 20 Green Controllers, TrioAir also offers:

- Remote control and configuration
- Centralized dashboard used to easily compare farms and their controllers.
- Real-time alarms and notifications
- Various levels of access control

There are four basic steps in setting up TrioAir.

- Access the App
- Sign Up
- Creating and Managing a Farm
- Adding Controllers to Farms

The following sections give basic information on signing up for TrioAir and adding controllers to the system. For more information, refer to the Munters Zendesk.

## 4.1 Access the App

The first step in using TrioAir is to access the application, either on your PC or your cellphone.

- Desktop App
- Cellphone App

Users wanting to use TrioAir on their computer, go to https://www.trioair.net. Alternatively, you can download the app to your smart phone here:

- Google Play
- Apple Store

## 4.2 Sign Up

In using TrioAir, the first step for any user is to create an account. Once this is done, you can be invited to join farms or create your own farms. The creation process is fairly standard and should be familiar for anyone who has ever created an account for any application.

Note: Munters recommends using Google Chrome.

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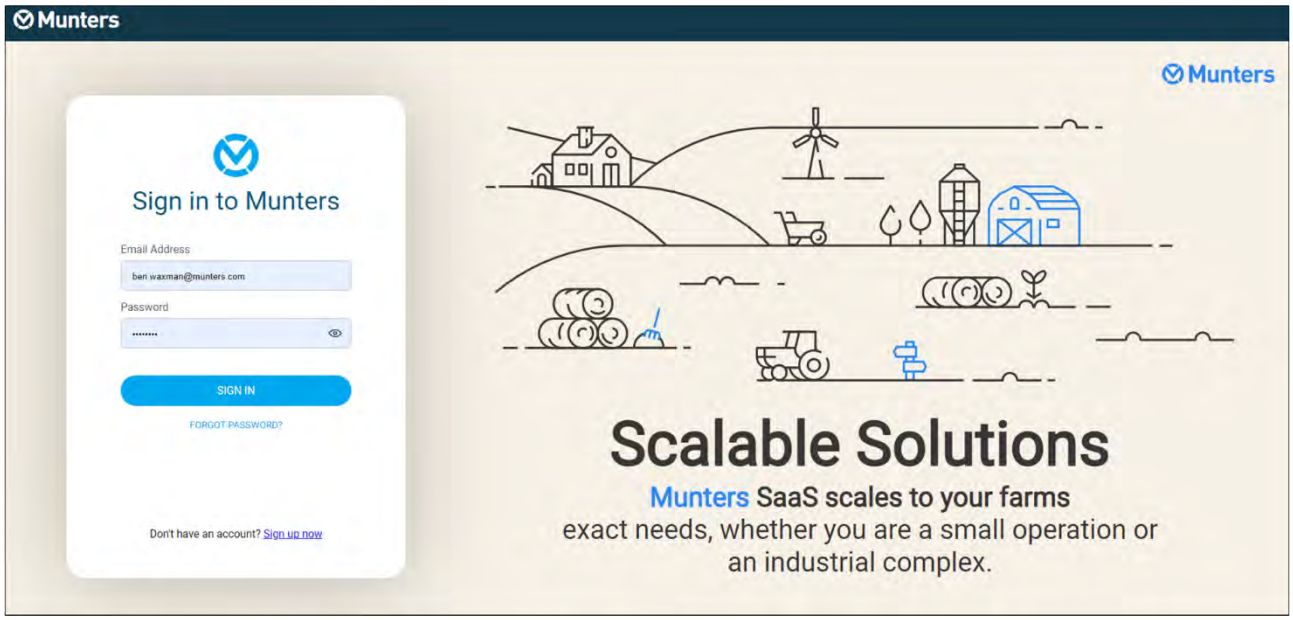
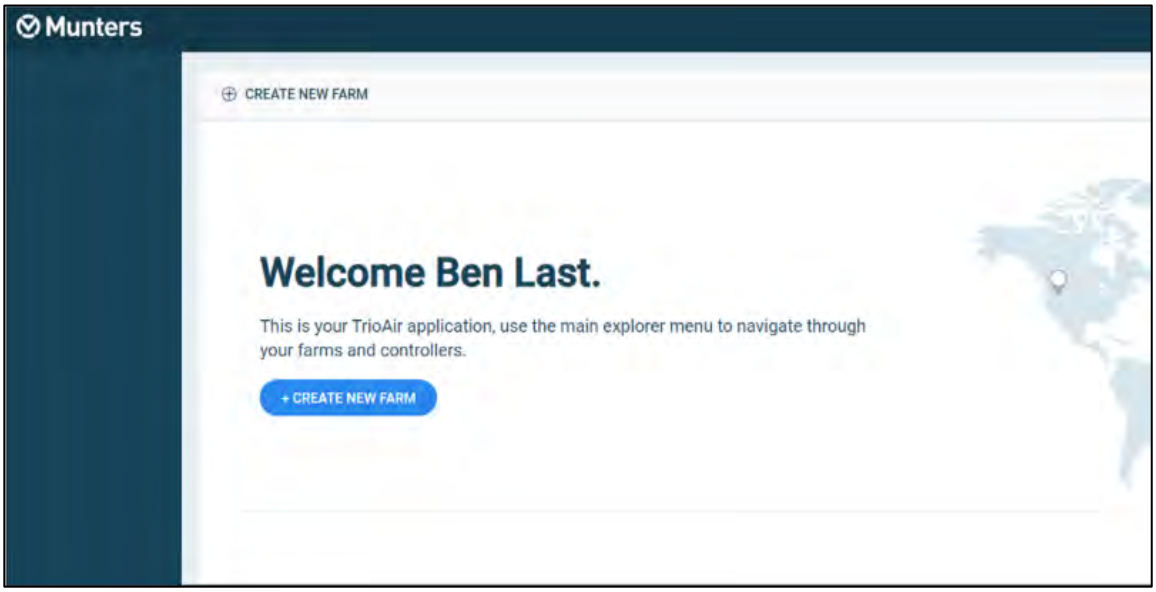



1. Click Sign up now.
2. Enter an email address.
3. Follow the online instructions.
4. Once these steps are completed, an account is created.




## 4.3 Adding a Controller to a Farm During Installation

*NOTE The following procedure requires that the Trio be connected to the internet. If the unit is offline, refer to Offline Registration.*

The first time that a user power ups a Trio 20, the following Welcome Screen appears.

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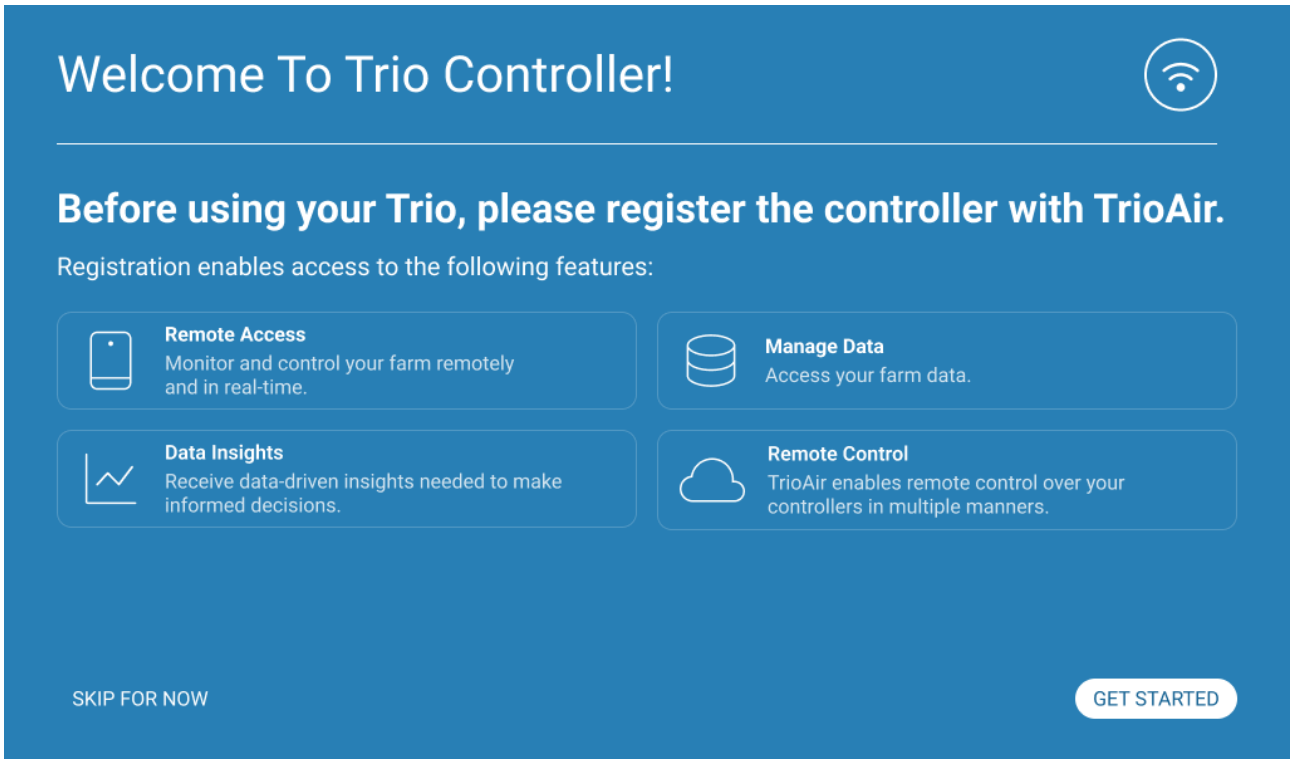
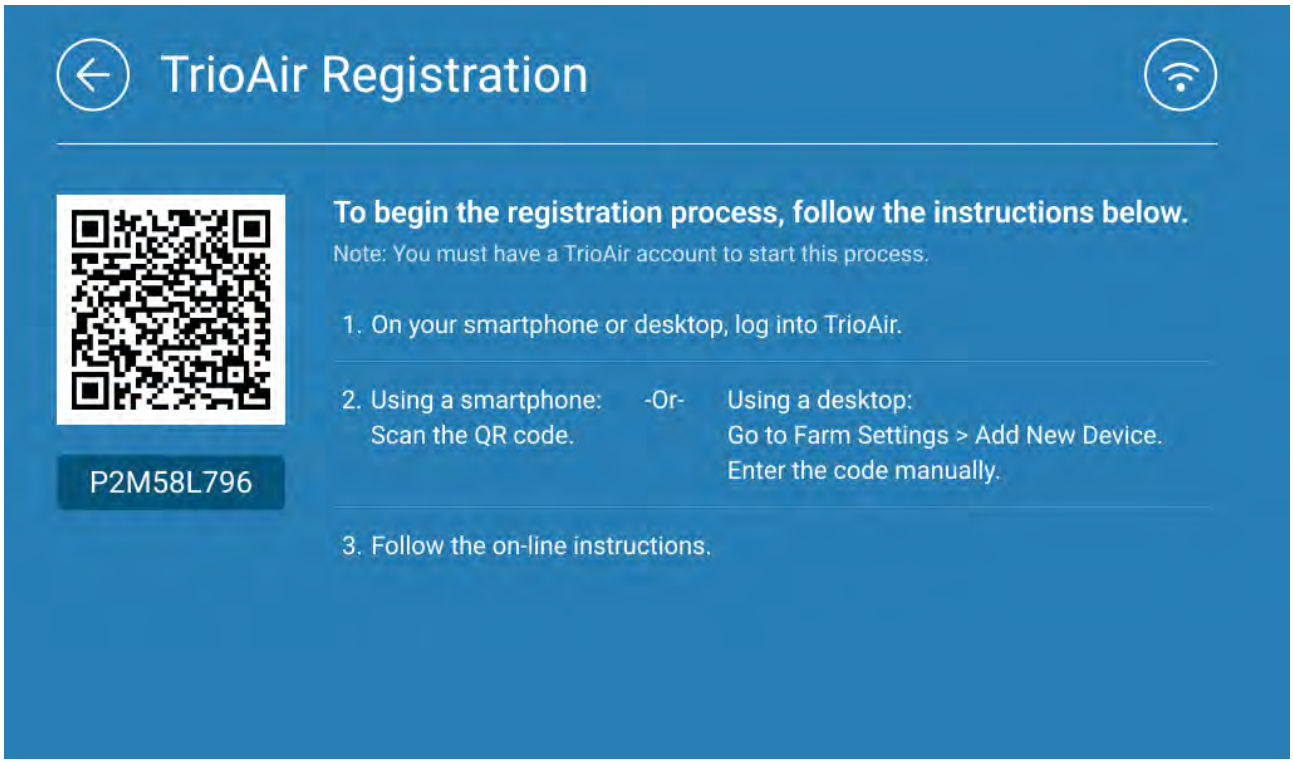



1. Click Get Started. (If you do not want to register the unit at this time, click Skip For Now). The following screen appears.




2. Follow the instructions on the page. You will need to:
   - Select the farm (if there is more than one) to which this Trio 20 is to be added
   - Agree to the Terms of Use.

*NOTE For more details on the on-line registration process, click here.*

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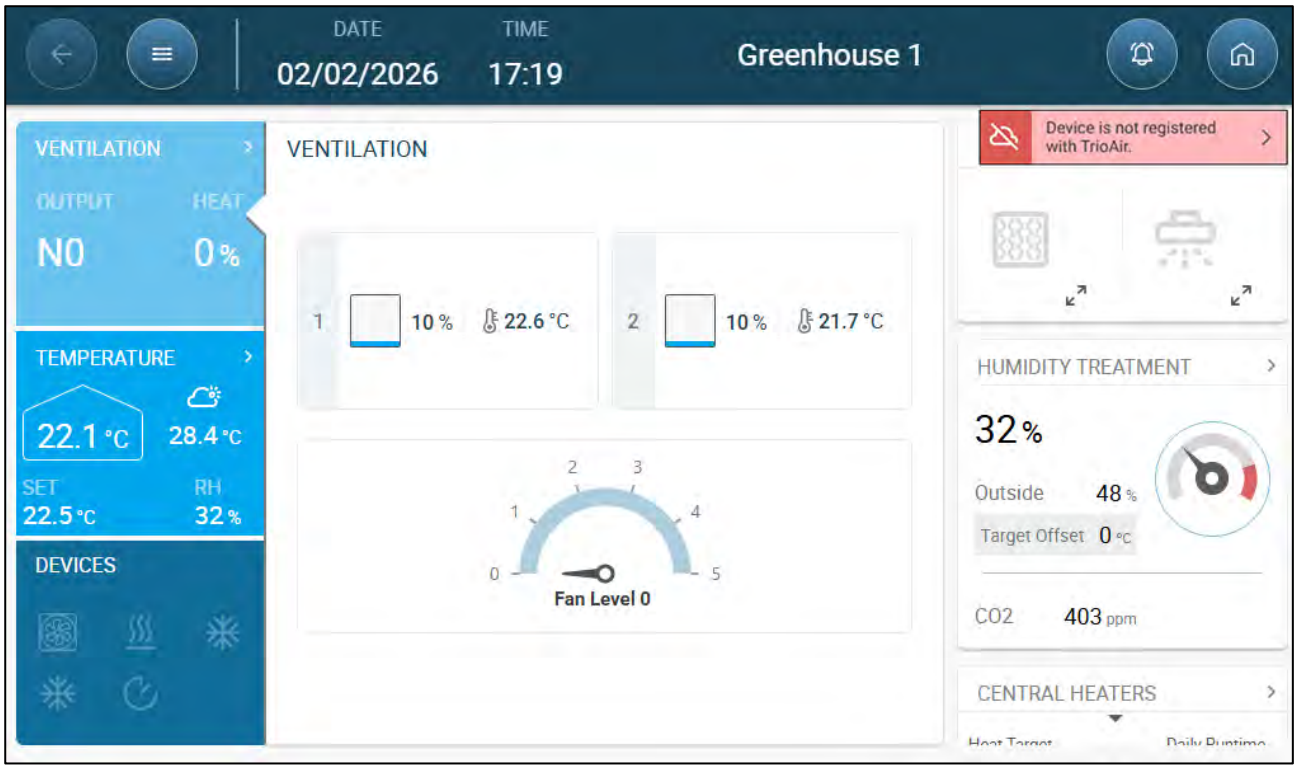
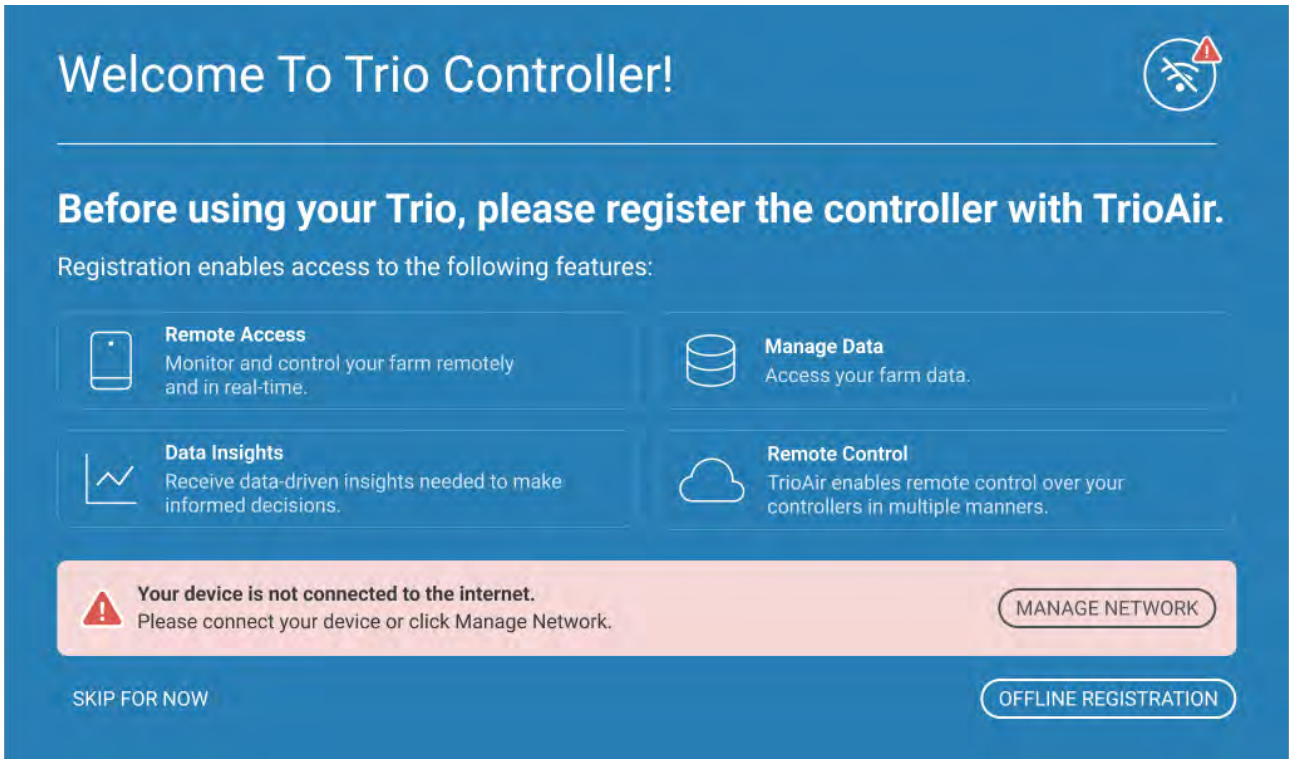
*NOTE If you do not want to register the unit at this time click* ***Skip For Now.*** *The Trio 20 Dashboard shows that the unit is not registered. Click that message to register the Trio 20.*




## 4.4 Offline Registration

If the Trio 20 unit is off-line, that status appears on the registration screen.




1. Click **Offline Registration**. The following screen appears.

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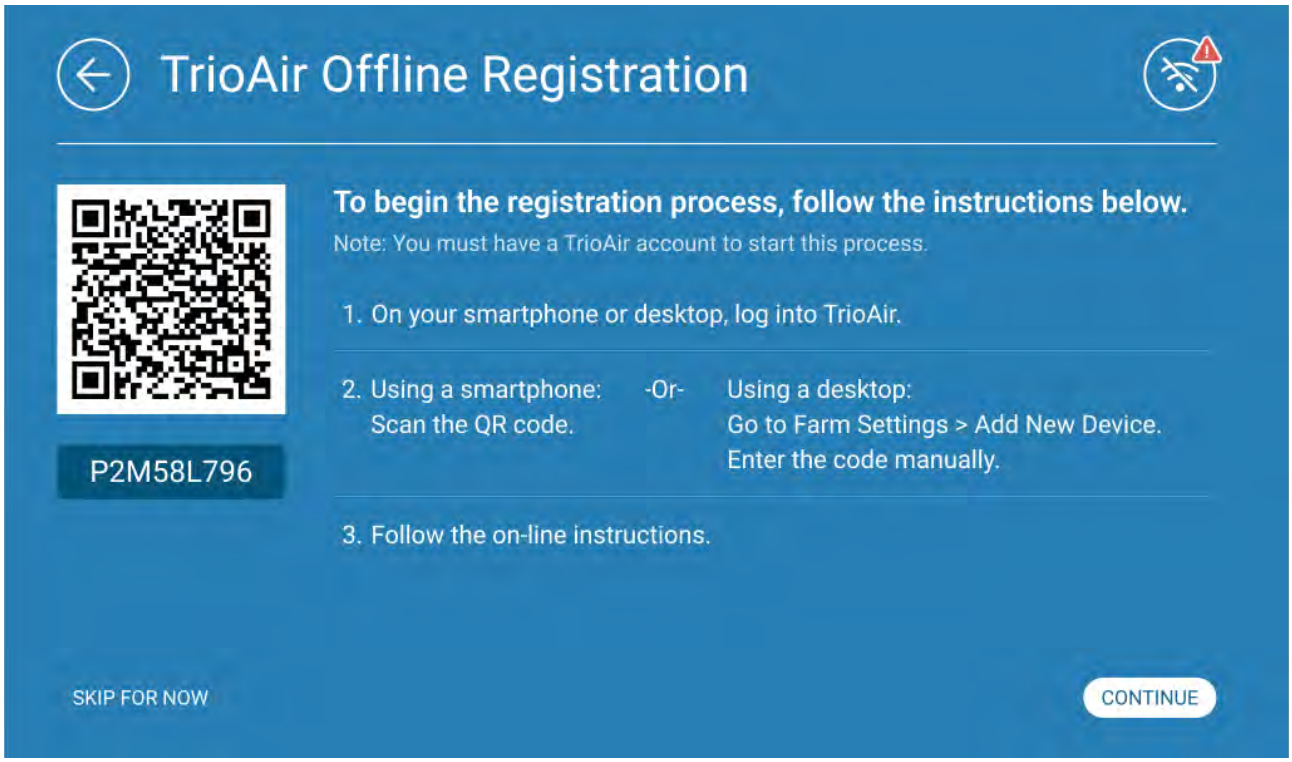


2. Click **Continue**. Follow the online instructions.

*NOTE For more details on how to register the Trio 20 while offline, click here.*

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# 5 Specifications

- Trio 20 Green Specifications
- External Device Specifications

## 5.1 Trio 20 Green Specifications

| Description | Specification |
|---|---|
| Input Power Voltage | • 100 – 240 VAC<br>• 50/60 Hz |
| Input AC Power | 0.35A (at full load) |
| Relay Rating | 15A |
| Relays | 1 Amp. Up to 70% of the relays can operate at any given time. |
| *NOTE Running relays at the above current levels provides between 50,000 – 100,000 switching operations.* | |
| Analog Inputs | 0 – 3.3 Volts |
| Analog Output | 0 - 10 Volts; maximum load: 20 mA |
| Digital Inputs | 3.3 Volts, 1.5 mA, dry contact |
| Communication | • LAN – Standard 10/100 BaseT<br>• Expansion – RS-485: 115 Kbps, 8 bit, even parity<br>Refer to Appendix E: Ethernet Requirements, page 137 for more information. |
| Operating and Storage Temperature Range | • -10° to +50° C (+14° to +125° F) |
| Environmental Specifications | • Altitude: -400 m to 2000 m<br>• Relative Humidity: 20% - 70%<br>• Main supply voltage fluctuation up to 5%<br>• Overvoltage category II<br>• PD: 2 |
| Enclosure | • Water and dust tight<br>• Indoor use only |
| Dimensions (H/W/D) | 403 x 324 x 141 mm/16 x 13 x 5.6 inches |
| Fuses | Fuse F2 & F4 on PS card: 3.15A, 250V |
| Power Cable | • Copper, 3-wires Phase, Neutral, Ground, 18 AWG minimum<br>• 600V insulation |

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- **Disconnection device/overcurrent protection**: In the building installation, use a certified 2-pole circuit breaker rated 10A, certified in accordance with the IEC standard 60947-2 (in the US and Canada use a Listed Brach Circuit protective circuit breaker). This step is required to provide overcurrent protection and mains disconnection. The circuit breaker must be easily accessible and marked as the controller disconnect device.
- **Main Supply Voltage**: Permanently connect the controller to the mains in accordance with the relevant national code. Provide fixed wiring inside a flexible conduit. Relays must be suitably protected against overcurrent, using a circuit breaker rated at 10A.
- **Keep the controller closed and locked (refer to Locking the Trio, page 9). Only authorized personnel should open and close the unit.**

## 5.2 External Device Specifications

*Table 1: Summary*

| I/O type | Qty |
|---|---|
| Analogue Output | 8 |
| Analugue Input | 6 |
| Digital Input | 8 |
| Temperature Sensors | 12 maximum (6 dedicated, 6 optional) |

*Table 2: Output Devices*

| Device type | Maximum Number of Devices | Number of Relay Devices | Number of Analog Devices |
|---|---|---|---|
| Cooling | 2 | 2 | N/A |
| Sprinkler | 1 | 1 | N/A |
| Heaters | 6 | 6 | 6 |
| High Heaters | 6 | 6 | 6 |
| Outlets | 1 | N/A | 1 |
| Curtains | 4 | 4 | 4 |
| Fans Exhaust | 20 | 20 | 8 |
| Stir Fan | 2 | 2 | 2 |
| Lights | 4 | 4 | 4 |
| Timer | 5 | 5 | N/A |
| Auger | 2 | 2 | N/A |
| As Relay | 20 | 20 | N/A |
| As Analog Out | 8 | NA | 8 |
| Alarm | 1 | 1 | N/A |

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*Table 3: Sensors*

| Device type | Analog Sensors | Digital Sensors |
|---|---|---|
| Temperature Sensors | 12 | N/A |
| Humidity Sensors | 2 | N/A |
| Outside Humidity Sensor | 1 | N/A |
| CO2 Sensors | 1 | N/A |
| Pressure Sensors | 1 | N/A |
| Potentiometers | 4 | N/A |
| Lux Meter (light intensity) | 1 | N/A |
| Water Meters | N/A | 4 |
| Gas Meters | N/A | 3 |
| Power Meter | N/A | 2 |
| Auxiliary Input | N/A | 4 |
| Auger Sensor | N/A | 2 |

*Table 4: Other Devices*

| Device type | Number |
|---|---|
| RLED Light Dimmer | 2 |

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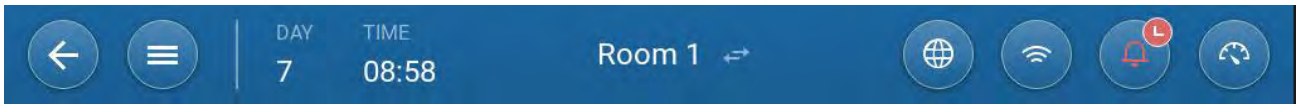
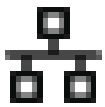
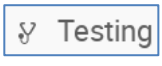
# 6 Using the Trio 20 Touch Screen




| | |
|---|---|
| | Go back to the previous screen |
| | View the Main menus |
| | Choose language |
|  | Network settings |
| | View alarms |
| | Go back to the main screen |
| | Settings icon |
| | Edit parameters |
| | Function settings |
|  | Function test |
| | Replace the dashboard battery with a **RENATA-CR2450N** battery. |
| | Click this icon to delete data stored on that page. |

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| Phone App | |
|---|---|
| | Click the circle containing the user name to edit personal preferences such as the language, units, name, and more. |
| | When a Trio 20 controls two or more rooms or there are two or more houses on a farm, Send to All enables editing certain select functions in more than one room or house. Edit the setting, click Send to All, and select the required Trios. The select rooms' or houses' settings are updated. Note: Send to All does not appear on every screen. |

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# 7 Mapping and Defining the Input Output Devices

*NOTE Munters recommends that a trained technician perform the following operations.*

- Using the Mapping Screen
- Editing the Relays and Sensors
- Defining Sensors
- Mapping Devices
- Testing Devices

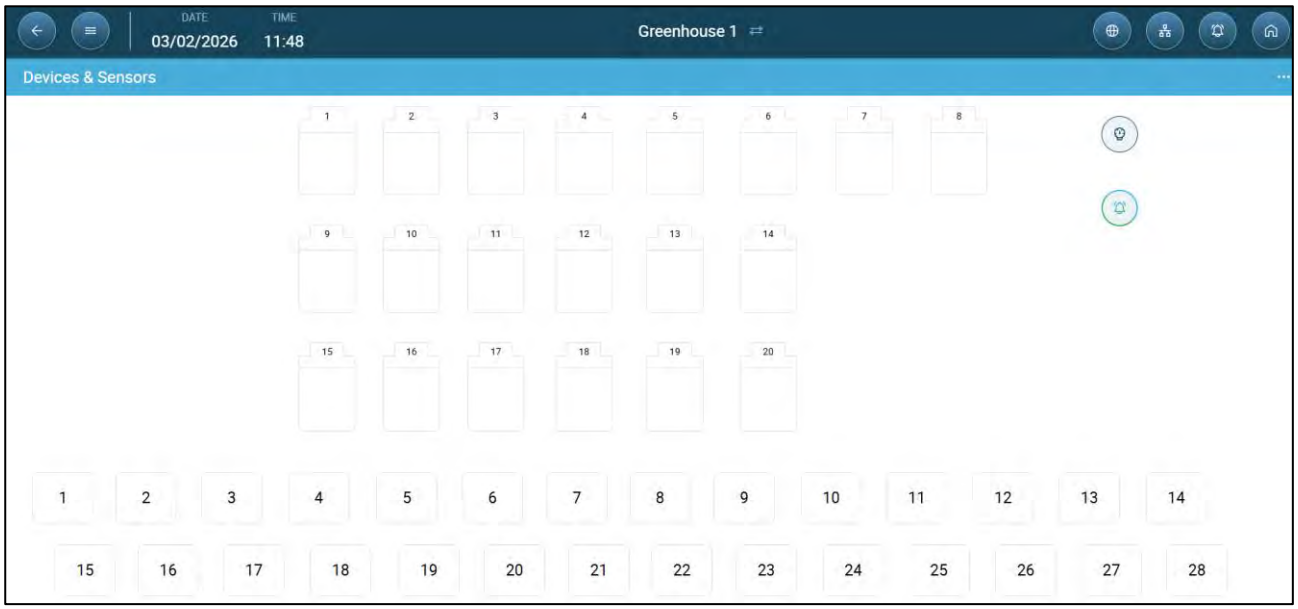
## 7.1 Using the Mapping Screen

After wiring devices to the Trio 20, each device must be mapped and then defined. Mapping and defining devices enables the system software to control each device's functionality.

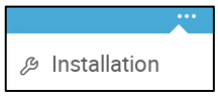
***CAUTION*** *Mapping MUST match the physical wiring! An error message appears if the physical device is not wired to the relay or port as defined on the mapping screen.*

**To map the devices:**

1. Go to System › Device and Sensors.




This screen displays the relays and analog/digital ports. At this point all, icons are undefined.

2. Click 

.

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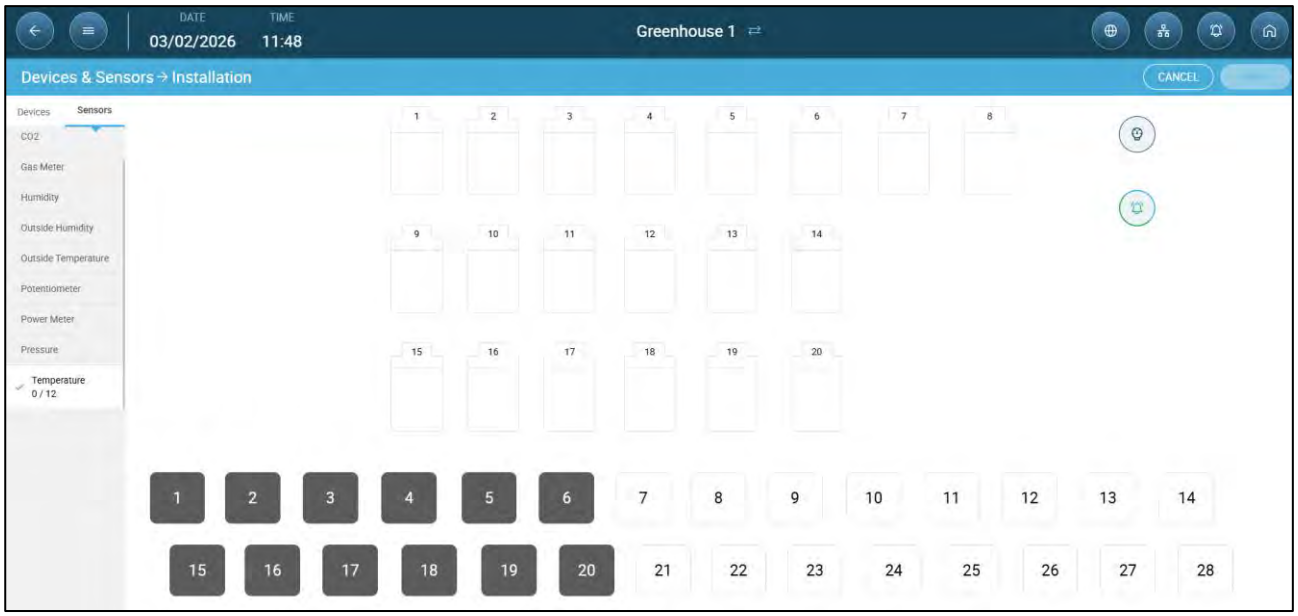
- Click Sensors to map auxiliary inputs, sensors (humidity, pressure, temperature, CO2), water meter, and potentiometers.
- Click Devices to map cooling devices, heaters, curtains, fans, stir fans, timers, outlets, or the alarm relay.

3. Under Devices or Sensors, click the type of device that you want to map. In the following example, Temperature is selected. The screen displays the relays and ports that can be defined as temperature sensors.




4. Click on the relays and/or ports that you wired to heaters.
    - Trio 20 automatically numbers the devices.
    - Trio 20 enables selecting up to the maximum number of each device.
    - Devices having opening and closing relays require mapping of both relays.
5. Repeat steps 3 and 4 four all the connected devices.
6. After mapping all installed devices, click **Save**.

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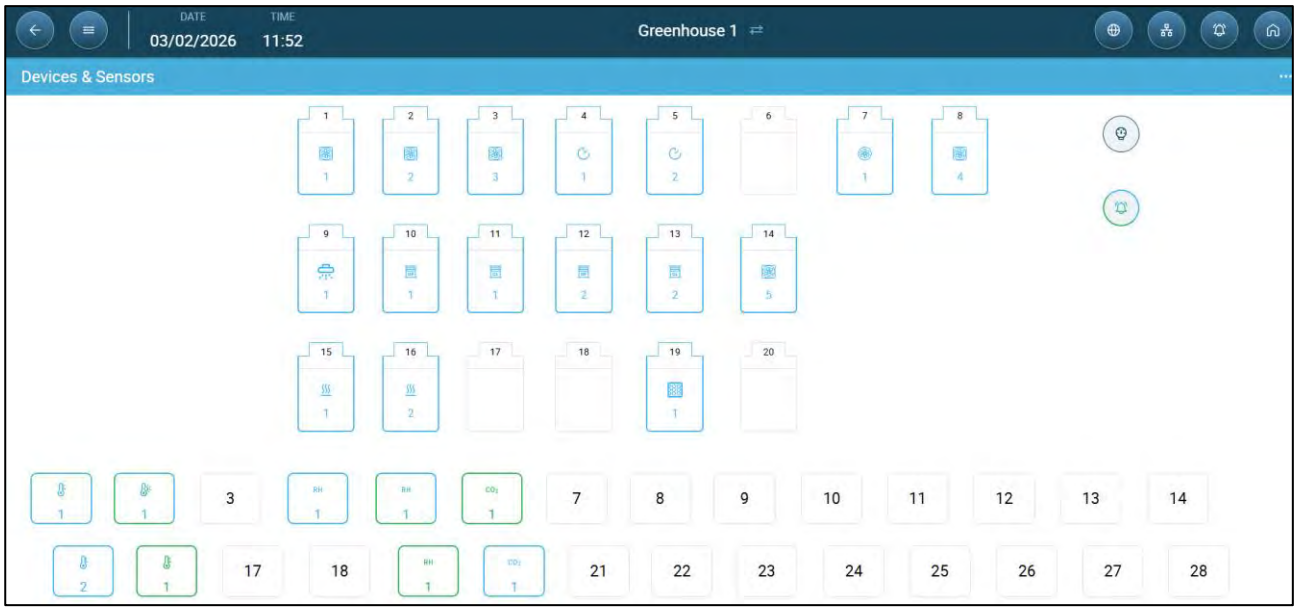
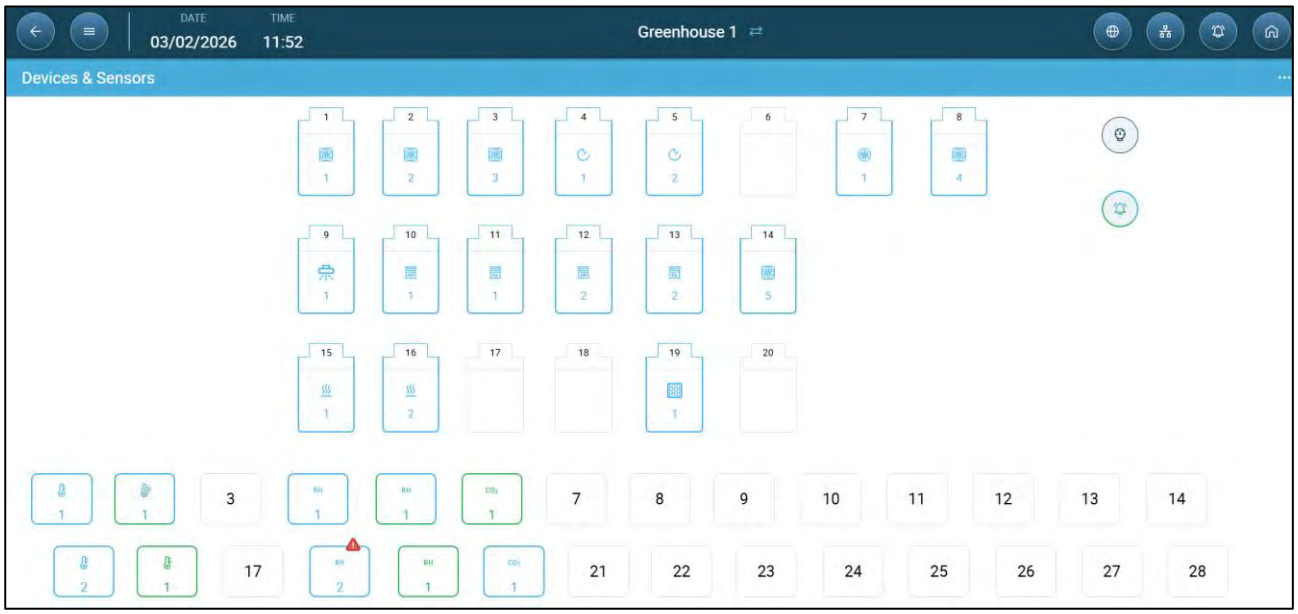



*NOTE To un-map a device, click on the required device and hold the icon down.*

*NOTE If you map a sensor that is not physically connected to the Trio 20, an error symbol appears on the designated analog port.*




## 7.2 Editing the Relays and Sensors

1. On the Device and Sensors screen, click a relay or sensor.
2. Go to the device and click edit .
3. Edit the parameter(s).
4. Click Save.

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## 7.3 Defining Sensors

- Defining Analog Sensor
- Defining Digital Sensors

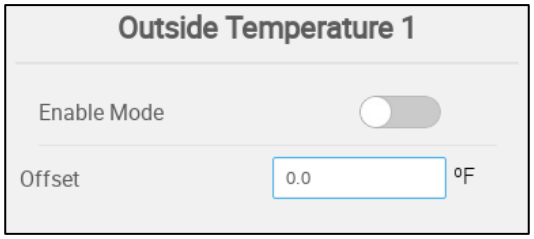
### 7.3.1 DEFINING ANALOG SENSOR

- Enabling/Disabling Analog Input Sensors
- Temperature Sensors
- Defining the CO2 Sensor
- Defining the Humidity Sensors

#### 7.3.1.1 Enabling/Disabling Analog Input Sensors

By default, when the user maps an analog input sensor, the sensor is enabled. To disable a sensor:

1. Go to the device and click edit .
2. Move the enable mode icon to off and click Save.



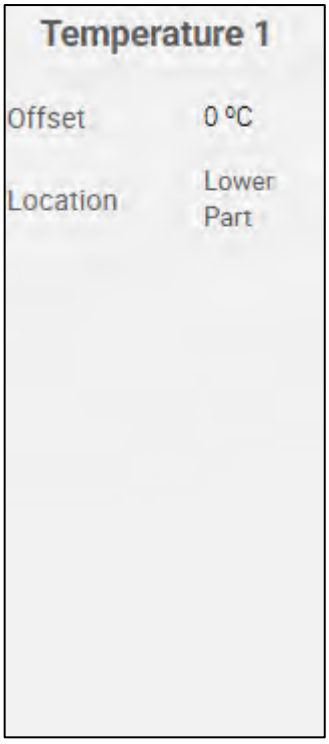

3. On the dashboard, a disabled sensor is marked (outside RHS in the screen below).

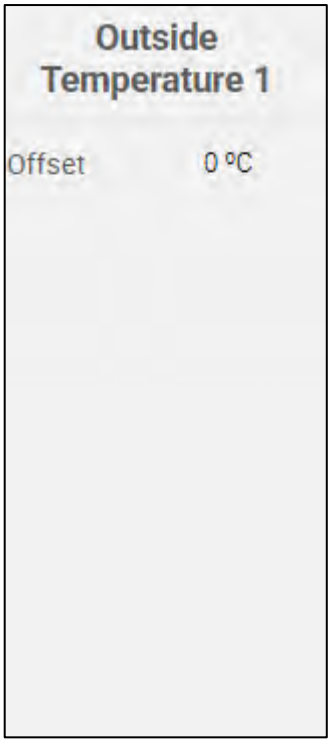
### 7.3.1.2 Temperature Sensors

- Defining the Temperature Sensors
- Mapping the Temperature Sensors
- Enabling a Weather Station

#### 7.3.1.2.1 Defining the Temperature Sensors

➲ Define up to 12 analog input ports as temperature sensors (and one port as an outside temperature sensor).




- Define:
  - Offset: This is an optional correction for the temperature sensor. Range: -10° C to +10° C
  - Location: Designate the area in the room where the sensor is located (lower part/higher part).

#### 7.3.1.2.2 Mapping the Temperature Sensors

Calculating the temperature data, Trio 20 takes the following into consideration:

- Average temperature: Data from multiple sensors can be averaged. If a sensor fails, the sensor's data is removed from any calculations.
- Device temperature: A sensor (or sensors) can be mapped to a specific device.
- Outside temperature: The temperature sensor defined as an outside temperature is not included in any average calculation.

Map specific temperature sensors to specific devices.

- Go to System › Equipment Mapping › Temperature Definition.

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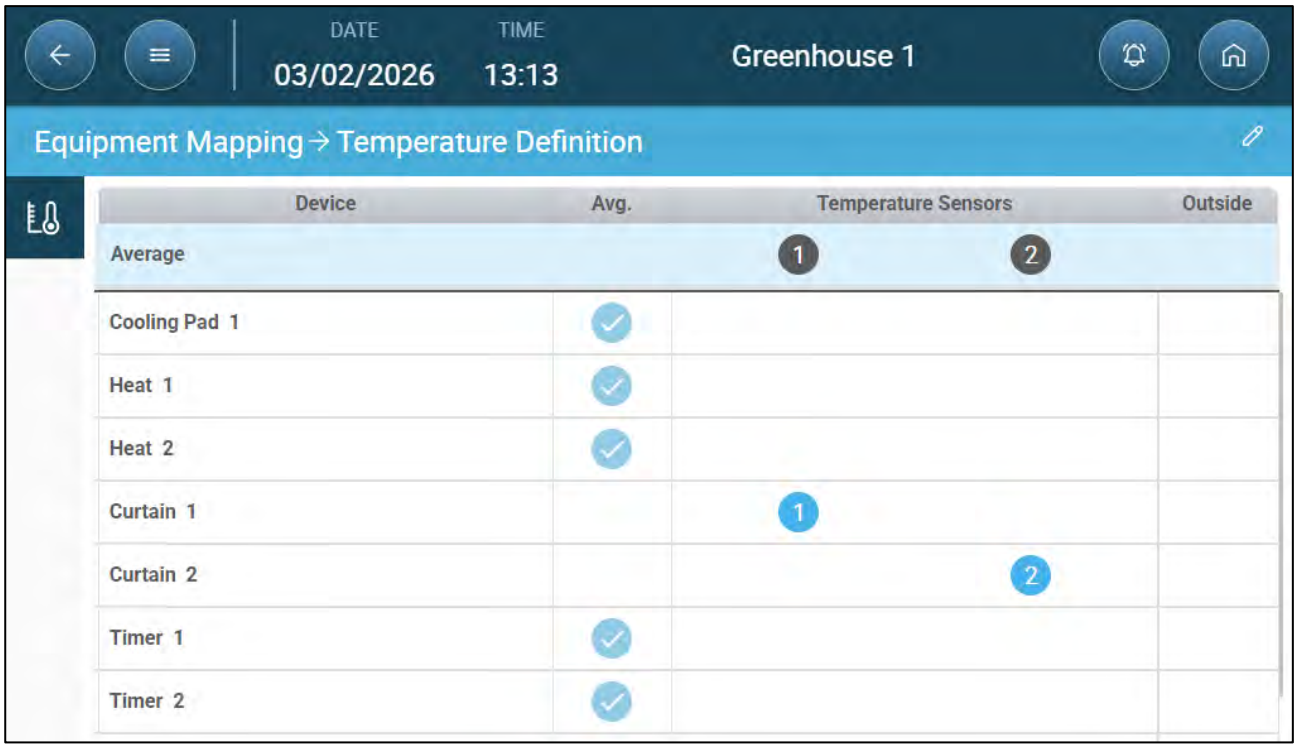



- Map the sensors to devices.
  - Define which sensors are used to calculate the average temperature.
  - If an outside temperature sensor is enabled, map timers to it (if required).

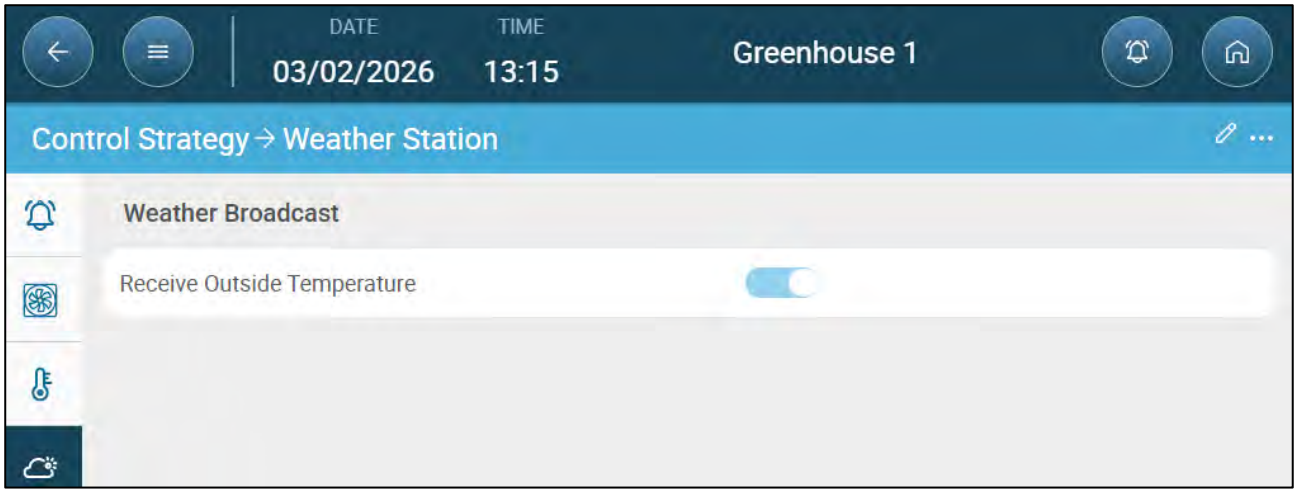
*NOTE Uninstalling a device in the Relay Layout, Analog Output or TRIAC tables removes the device from this screen.*

#### 7.3.1.2.3 Enabling a Weather Station

To say costs on temperature sensors, one outdoor temperature sensor can provide data to the entire Trio 20 network.

*NOTE Install and map one outdoor sensor only.*

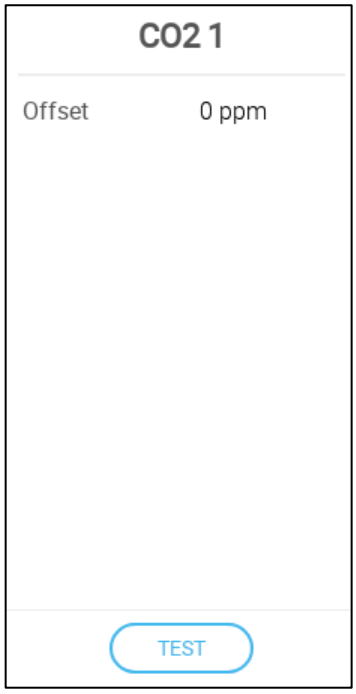
1. In System › Device and Sensors, define one sensor as Outside Temperature.
2. Go to System › Control Strategy › Weather Station .




3. Enable Receive Outside Temp. Broadcast.

### 7.3.1.3 Defining the CO2 Sensor

➲ Define one analog input port as a CO2 port (refer to Using the Mapping Screen, page 52).

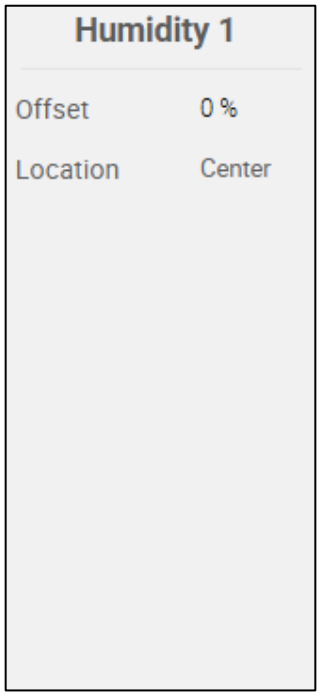


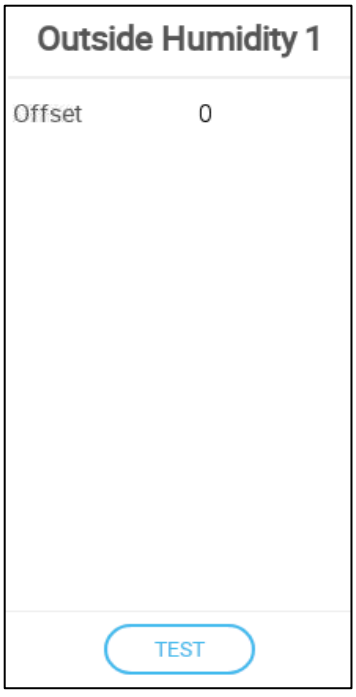

- Define:
  - Offset: This is an optional correction for the CO2 sensor. Range: -500 to +500 ppm

### 7.3.1.4 Defining the Humidity Sensors

➲ Define (refer to Using the Mapping Screen, page 52):

- One or two analog input ports as a humidity sensor
- One analog input port as an outside humidity sensor. The outside humidity is used to collect data, not to adjust climate control.




- Define:

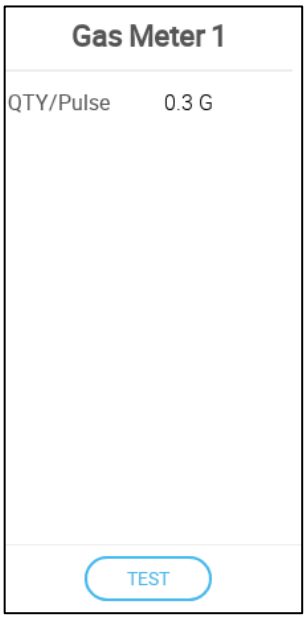
- Offset: This is an optional correction for the humidity sensor. Range: -10 to +10%
- Location: Define the sensor's location (front/center/back/ceiling).

### 7.3.2 DEFINING DIGITAL SENSORS

- Defining the Gas Meter Sensors
- Defining the Power Meter Sensors
- Defining the Auxiliary Input

#### 7.3.2.1 Defining the Gas Meter Sensors

➲ Define up to three digital input ports as a gas meter (refer to Using the Mapping Screen, page 52).




- Define:
  - Quan/Pulse: Set the gas meter's flow per pulse. Range: 0.0 to 999 (unit depends on the General Settings › User).

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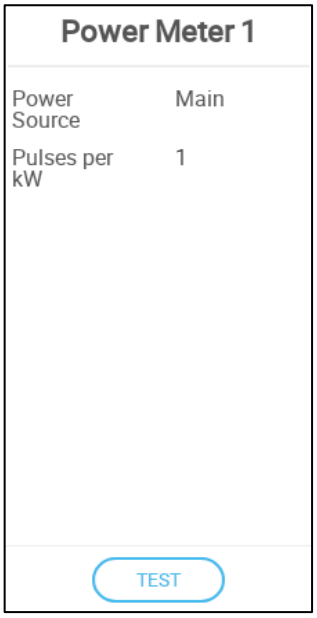
### 7.3.2.2 Defining the Power Meter Sensors

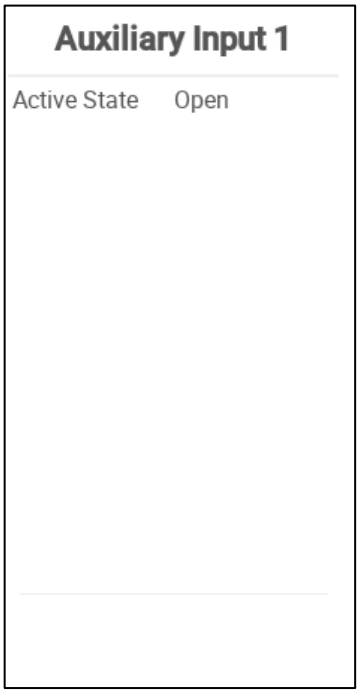
➲ Define up to two digital input ports as a power meter (refer to Using the Mapping Screen, page 52).




- Define:
  - Power Source:
    - Main: Power meter measures the amount of electricity used by the system.
    - Heat: Power meter measures the amount of electricity used by the heaters.
  - Pulses kW: Set the number of pulses per kilowatt. Range: 1 to 1000.

### 7.3.2.3 Defining the Auxiliary Input

➲ Define up to four digital inputs as auxiliary inputs (refer to Using the Mapping Screen, page 52).




- Define:
  - Operation: Define the relay mode.

## 7.4 Mapping Devices

- Defining the Fans
- Defining the Stir Fan
- Heating Devices
- Defining the Cooling Devices
- Defining the Sprinkler
- Potentiometers and Curtains
- Defining the Same As Relays
- Defining the Same As Analog Ports
- Defining the Timers
- Lighting Devices
- Fail Safe Devices

### 7.4.1 DEFINING THE FANS

The following sections detail how to configure fan relays.

*NOTE These settings should be configured by a technician familiar with the curtain specifications.*

Fan air capacity defines how much air is provided when the fans run at full speed. These numbers are used to calculate minimum air requirements.

➲ In General Settings › User define the measurement unit.

➲ Define up to 20 relays or analog output ports as On/Off or 0 – 10 V fans, respectively (refer to Using the Mapping Screen, page 52).

- On-Off Fans
- 0 – 10 Volt Fans

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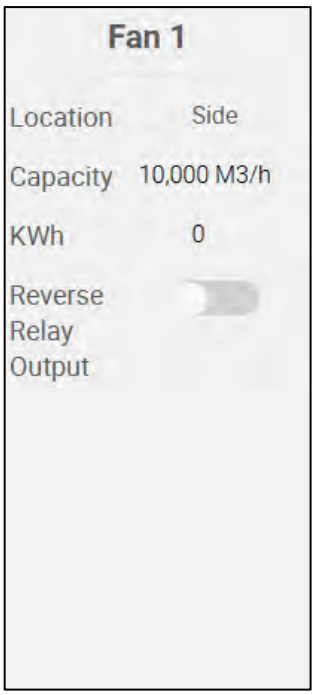
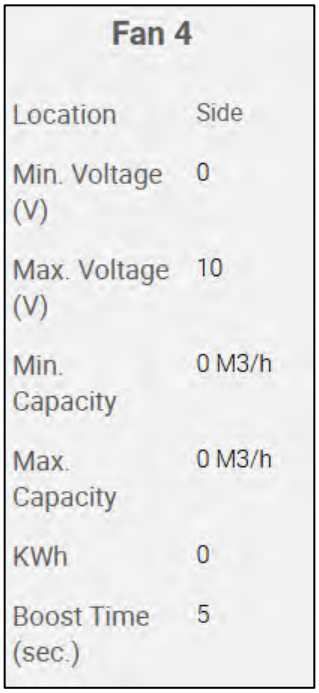
### 7.4.1.1 On-Off Fans




- Define:
  - Location: Select Side/Tunnel/Chimney.
  - Capacity: Enter the fan capacity.
  - KWh: This field displays the amount of kilowatts used. Read-only.
  - Reverse Relay Output: Select if the relay is normally open or normally close.

### 7.4.1.2 0 – 10 Volt Fans




- Define:
  - Location: Select Side/Tunnel/Chimney.
  - Minimum/Maximum Voltage: Enter the minimal and maximal voltage used to calibrate the fan speed.
  - Minimum/Maximum Capacity: Enter the fan's minimum and maximum capacity. These numbers are used to calculate the curve between these points.
  - KWh: This field displays the amount of kilowatts used. Read-only.
  - Boost Time: During this amount of time, the controller applies full power to the fan motor (100%). Boosting the speed is done to open shutters or extend the motor life. In addition, some types of motors have a minimum starting speed.

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### 7.4.2 DEFINING THE STIR FAN

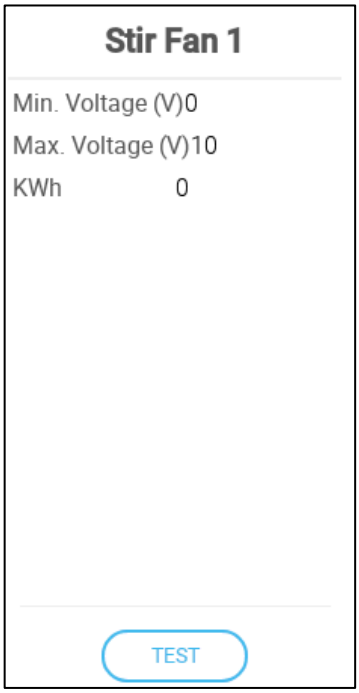
➲ Define up to two relays or ports as a stir fan (refer to Using the Mapping Screen, page 52).

- On Off Stir Fan
- 0 – 10 Volt Stir Fan

#### 7.4.2.1 On Off Stir Fan

- Define:
  - KWh: This field displays the amount of kilowatts used. Read-only
  - Reverse Relay Output: Select if the relay is normally open or normally close.

#### 7.4.2.2 0 – 10 Volt Stir Fan




- Define:
  - Minimum/Maximum Voltage: Enter the minimal and maximal voltage used to calibrate the fan speed.
  - KWh: This field displays the amount of kilowatts used. Read-only.

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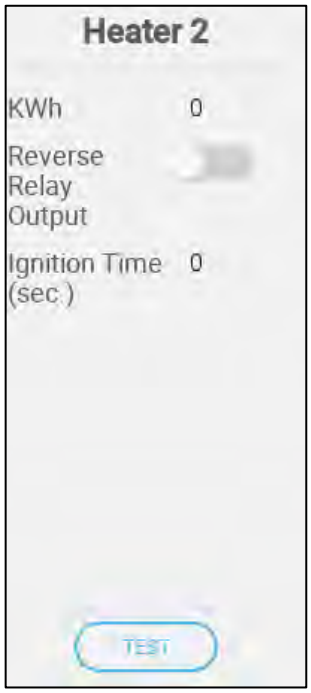
### 7.4.3 HEATING DEVICES

➲ Define up to six relays and/or analogue output ports as heaters (refer to Using the Mapping Screen, page 52).

- Defining the On/Off Heaters
- Defining the Variable Heaters
- Defining the High Heaters

#### 7.4.3.1 Defining the On/Off Heaters




- Define:
  - KWh: This field displays the amount of kilowatts used. Read-only
  - Reverse Relay Output: Enable this function for Normally Closed Relays.
  - Ignition Time (sec.): Define the delay time between when the heater is turned on and when the gas is ignited.

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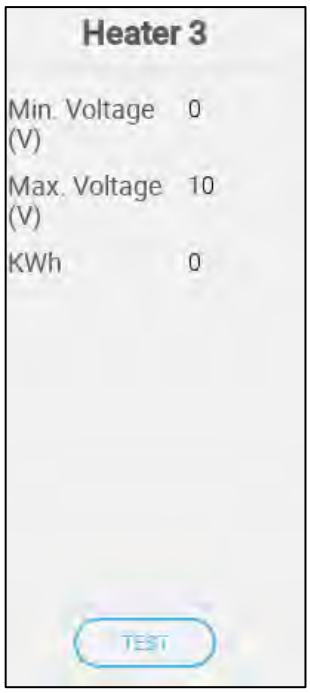
### 7.4.3.2 Defining the Variable Heaters

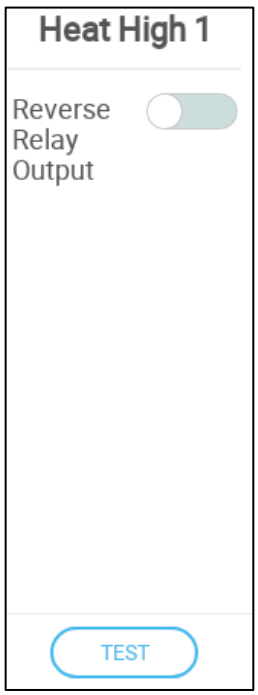



- Define:
  - Min./Max Voltage: Define the voltage in the analogue output port that corresponds to the 0% and 100% output, respectively. For example, if the minimum voltage is set to 2V and the maximum to 8V the controller applies the calculated 0-100% output over a 2V-8V signal.
  - KWh: This field displays the amount of kilowatts used. Read-only.

### 7.4.3.3 Defining the High Heaters

High heaters work in conjunction with relay heaters. High heater 1 works with heater 1, high heater 3 works with heater 3, and so on. If there is no corresponding heater to a high heater, the latter does not function. For example, if there are three heaters and four high heaters, high heater 4 does not function.

➲ Define up to six relays as high heaters (refer to Using the Mapping Screen, page 52).




- Define:
  - Reverse Relay Output: Enable this function for Normally Closed Relays.

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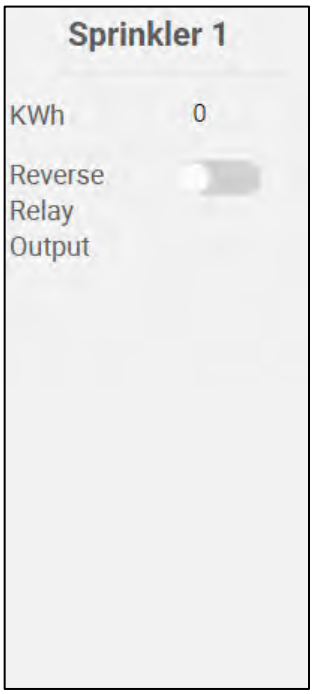
### 7.4.4 DEFINING THE COOLING DEVICES

➲ Define up to two relays as cooling devices (refer to Using the Mapping Screen, page 52).

- Define:
  - KWh: This field displays the amount of kilowatts used. Read-only.
  - Reverse Relay Output: Enable this function for Normally Closed Relays.

### 7.4.5 DEFINING THE SPRINKLER

➲ Define one relay as a sprinkler (refer to Using the Mapping Screen, page 52).




- Define:
  - KWh: This field displays the amount of kilowatts used. Read-only.
  - Reverse Relay Output: Enable this function for Normally Closed Relays.

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## 7.4.6 POTENTIOMETERS AND CURTAINS

- Mapping the Potentiometers
- Defining the Curtains

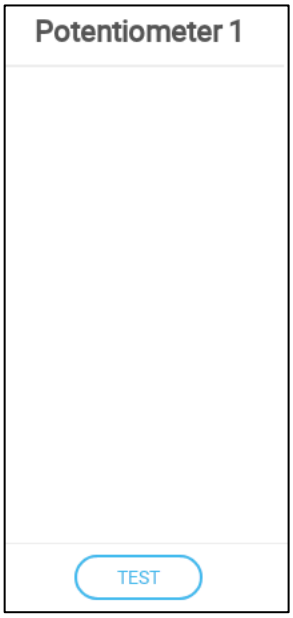
### 7.4.6.1 Mapping the Potentiometers

➲ Define up to four analogue ports as potentiometers (refer to Using the Mapping Screen, page 52).

As an option, potentiometers enable exact positioning of relay-controlled curtains when calibrating. If:

- potentiometers are not employed or
- there is a potentiometer failure

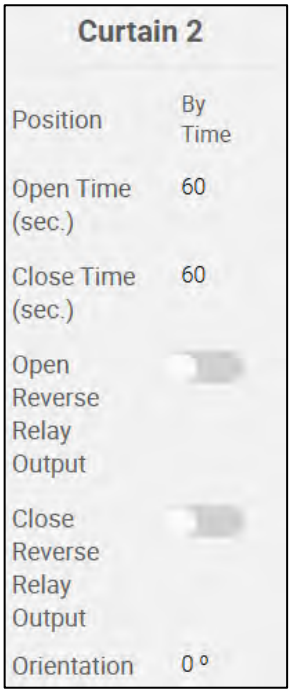
opening and closing times are used to calibrate the curtains.

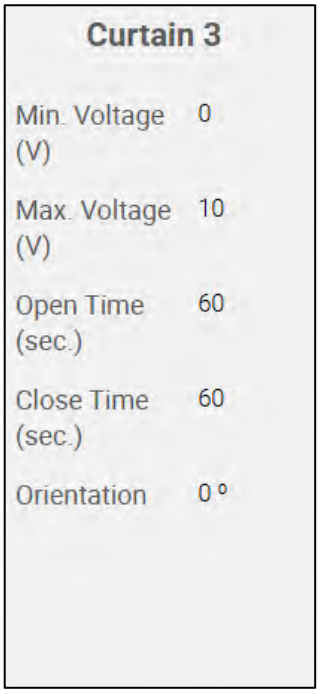



- Enable/disable the potentiometer.

### 7.4.6.2 Defining the Curtains

➲ Define up to four relays or analog output ports as curtains (each device requires two relays or one analogue port) (refer to Using the Mapping Screen, page 52).




- For relay-controllers devices, define:
  - Position: Define how the curtain opening is controlled:
    - By time
    - Potentiometer (relay-controlled curtains only). Map each curtain to a potentiometer. This option appears only if potentiometers are mapped.
  - Open/Close Time: Measure and enter the amount of time required to fully open or fully close the curtain. These parameters are only enabled when Position/By Time is selected.
  - Open/Close Reverse Relay Output: Enable this function for Normally Closed Relays.
  - Calibrate: Manually calibrate curtain positioned by a potentiometer. Potentiometer-controlled calibration only.
  - Orientation: Define the curtain direction the curtain faces (in degrees) with 0° representing the north. Range: 0° -360°. Default: 0

| Orientation | Degree range |
|---|---|
| N | 340° - 360° |
| NE | 21° - 69° |
| E | 70° - 110° |
| SE | 111° - 159° |
| S | 160° - 200° |
| SW | 201° - 249° |
| W | 250° - 290° |
| NW | 291° - 339° |

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- For 0 – 10V controlled devices, define:
  - Min./Max Voltage: Define the voltage in the analogue output port that corresponds to the 0% and 100% output, respectively.
  - Open/Close Time: Measure and enter the amount of time required to fully open or fully close the curtain.

#### 7.4.6.2.1 Potentiometer Calibration

If used, a potentiometer can control the opening and closing with a high degree of precision. When there is no potentiometer, positioning accuracy tends to degrade after the curtains go through several opening and closing cycles.

In order to calibrate an curtain using a potentiometer (refer to XX, page 66 for details):

- Install and map a potentiometer.
- Define the relay-controlled curtain that the potentiometer controls. (Analog controlled devices don't require a potentiometer.)
- Calibrate the potentiometer. Calibration must be successful.

In for any reason potentiometer calibration does not function:

- calibration is by time (auto and/or at power up). Time calibration does not fail.
- A potentiometer alarm is generated (if alarms are enabled) . The alarm must be reset to enable potentiometer calibration to function.

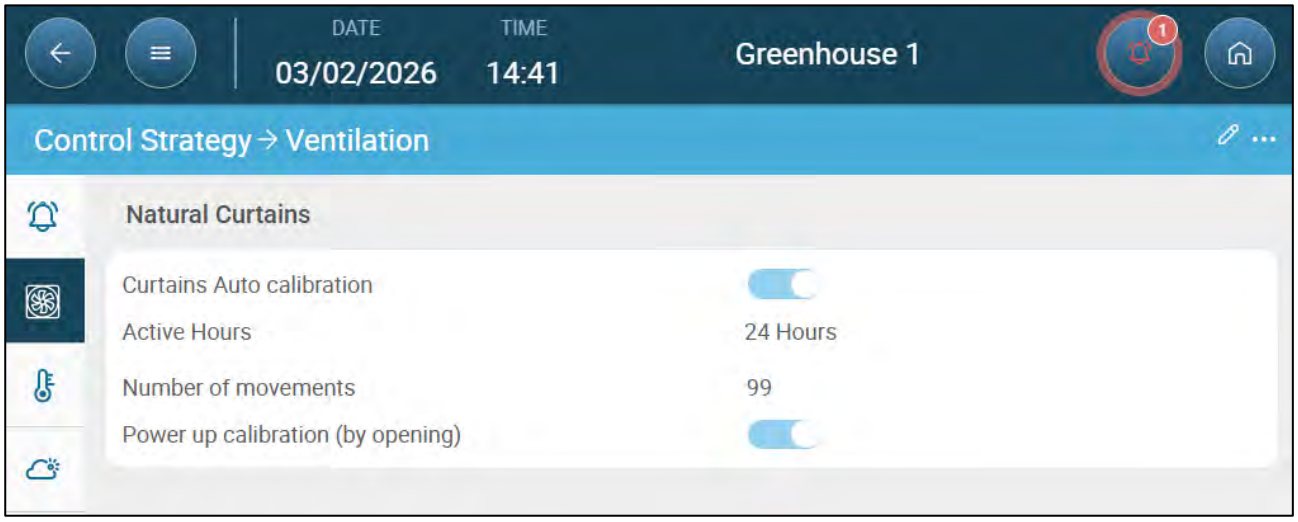
#### 7.4.6.2.2 Calibrating the Curtain

During installation, the user enables auto-calibration or power up calibration in digital output (relay) curtains. Calibration automatically takes place after the number of curtain movements equals the number of movements required to start calibration or at Trio 20 power up.

Only one curtain can be calibrated at a time.

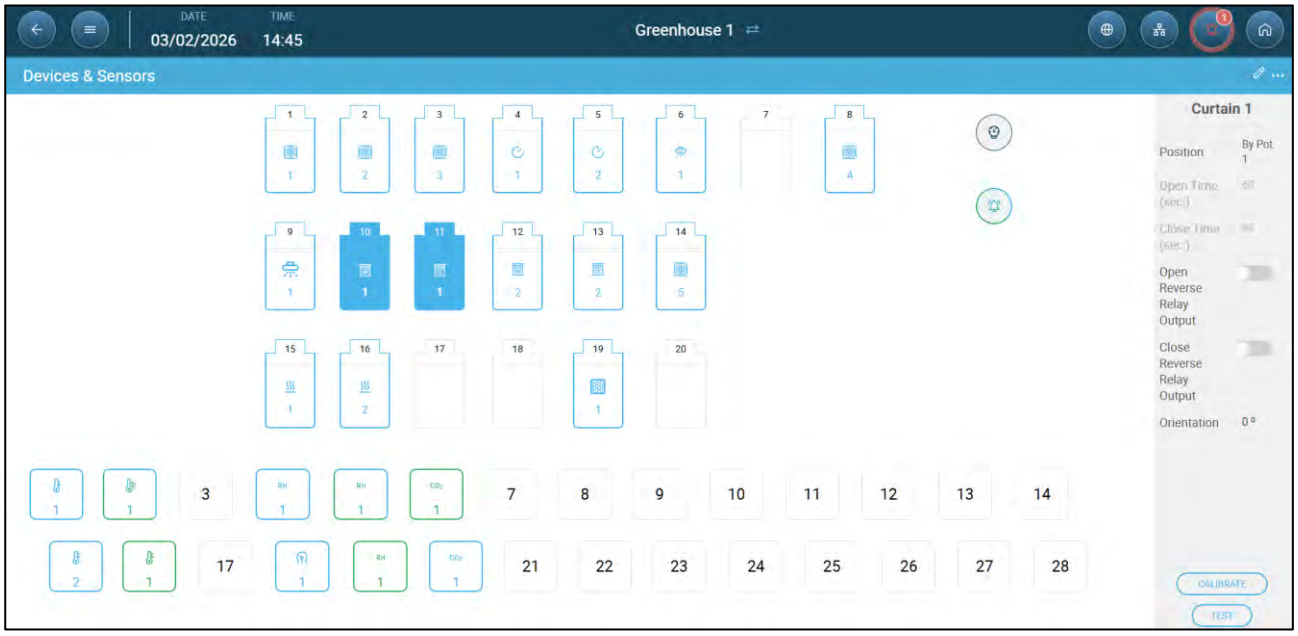
- Relay open occurs when the target position is 100%.
- Relay close occurs when the target position is 0%.

1. Go to System › Control Strategy › Ventilation .



2. Click .
3. Define:
    - Auto Calibration: If enabled, the curtain automatically recalibrates itself.
        - Select 24 hours a day or define a specific time frame.
        - Number of Movements: Define up the number of steps (number of movements) after which the curtain automatically calibrates.
    - Power Up Calibration: Enable this function to have the curtain recalibrate itself each time power is applied.

- **Potentiometer-controlled calibration failure**: If calibration fails (during auto or power up calibration) in a potentiometer-controlled calibration, an error symbol appears in the Devices and Sensor screen.




In this situation, click **Calibrate** to run the Calibration Wizard. If the calibration fails again, check:

- Potentiometer wiring
- Potentiometer
- Curtains' opening and closing position. There must be a minumum distance between the two, equivalent to 300 A2D points.

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### 7.4.7 DEFINING THE SAME AS RELAYS

➲ Define up to 20 relays as Same as Relay (refer to Using the Mapping Screen, page 52).

This function enables defining a relay to operate using the parameters defined for another relay. A relay can be tied to any other relay.

- Define:
  - Related: Define which relay number to follow. Range: 1 – 20
  - KWh: This field displays the amount of kilowatts used. Read-only.
  - Reverse Relay Output: Select if the relay is normally open or normally close.

### 7.4.8 DEFINING THE SAME AS ANALOG PORTS

➲ Define up to eight relays as Same as Analog Ports (refer to Using the Mapping Screen, page 52).

This function enables defining a relay to operate using the parameters defined for a corresponding analog port. Relays can be mapped to eight specific ports only.

- Define:
  - Related Chanel: Define which port number to follow.
  - KWh: This field displays the amount of kilowatts used. Read-only.
  - Reverse Relay Output: Select if the relay is normally open or normally close.

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| Port Number | Related Channel |
|---|---|
| 7 | 1 |
| 8 | 2 |
| 9 | 3 |
| 10 | 4 |
| 21 | 5 |
| 22 | 6 |
| 23 | 7 |
| 24 | 8 |

### 7.4.9 DEFINING THE TIMERS

➲ Define up to five relays as timers (refer to Using the Mapping Screen, page 52).

- Define:
  - KWh: This field displays the amount of kilowatts used. Read-only.
  - Reverse Relay Output: Select if the relay is normally open or normally close.

## 7.4.10 LIGHTING DEVICES

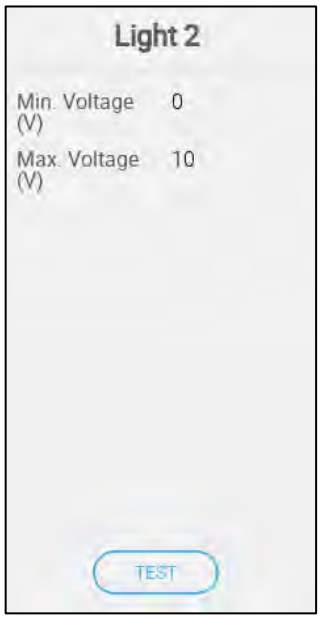
➲ Define up to four relays or analog ports as light relays and one sensor as a light sensor (refer to Using the Mapping Screen, page 52). In addition, Version 8.3.X supports the RLED 2.0 Light Dimmer.

- Defining the On/Off Lights
- Defining the Variable Lights
- Defining the RLED 2.0

### 7.4.10.1 Defining the On/Off LIGHTS

- Define:
  - Reverse Relay Output: Select if the relay is normally open or normally close.

### 7.4.10.2 Defining the Variable LIGHTS




- Define:
  - Minimum/Maximum Voltage: Enter the minimal and maximal voltage used to calibrate the light intensity.

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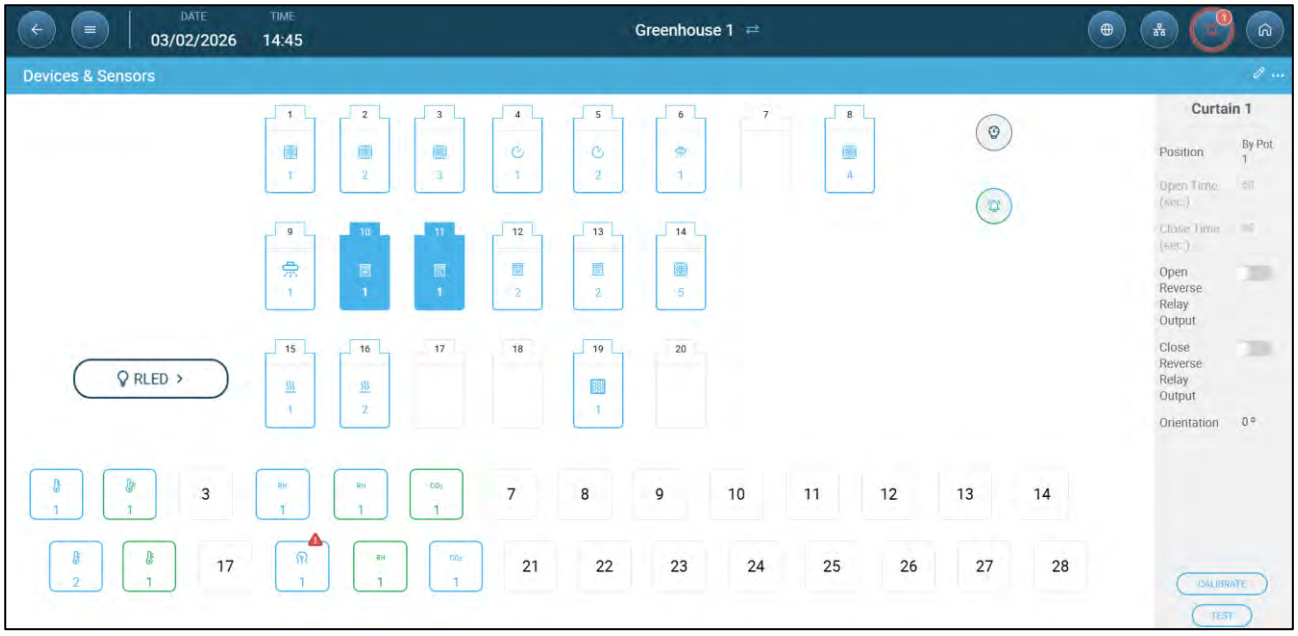
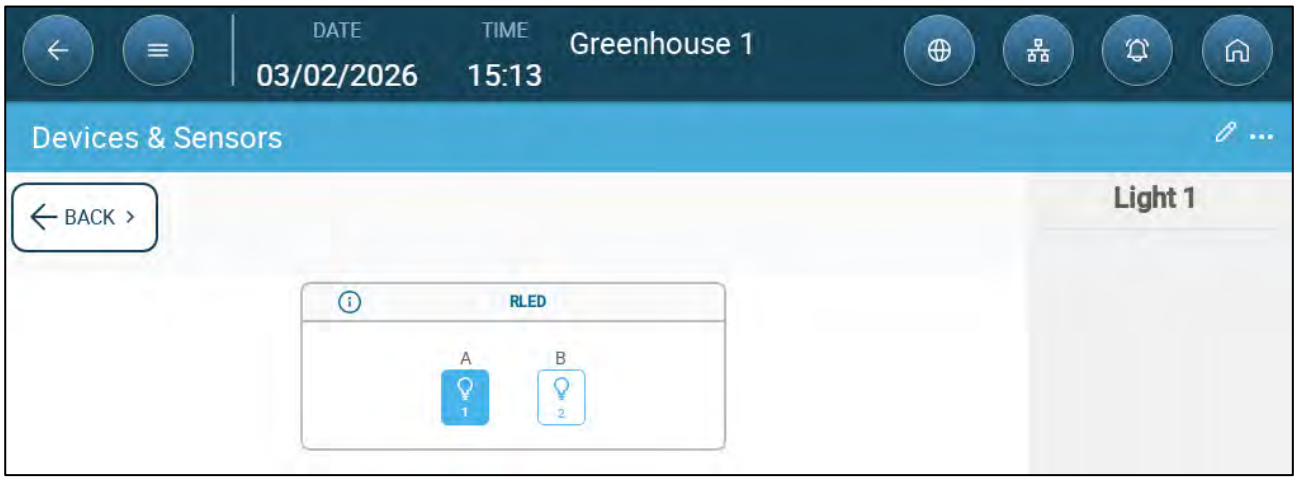
### 7.4.10.3 Defining the RLED 2.0

➲ The RLED icon does not appear unless an RLED 2.0 is connected to a Trio 20.

1. Go to Devices & Sensors.




2. Click RLED.




3. Select one RLED 2.0 channel.
4. Select the relays or ports. The RLED 2.0 will control those lights.

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### 7.4.11 FAIL SAFE DEVICES

The Fail Safe function defines extreme conditions that activate dedicated failsafe relays. These relays activate external devices used to deal with the condition.

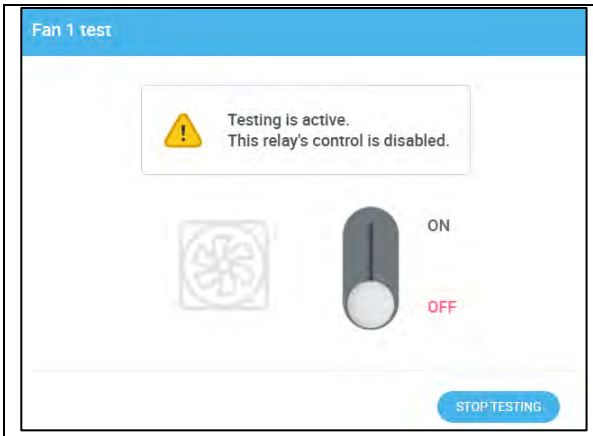
➲ Define up to four relays as fail safe relays.

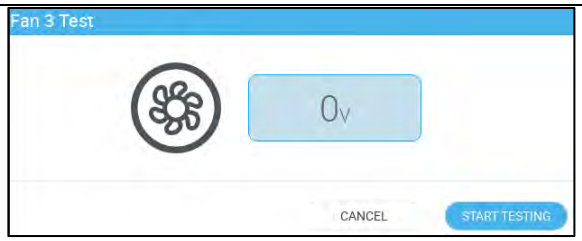
- Define:
  - Reverse Relay Output: Define the relay mode as Closed.

## 7.5 Testing Devices

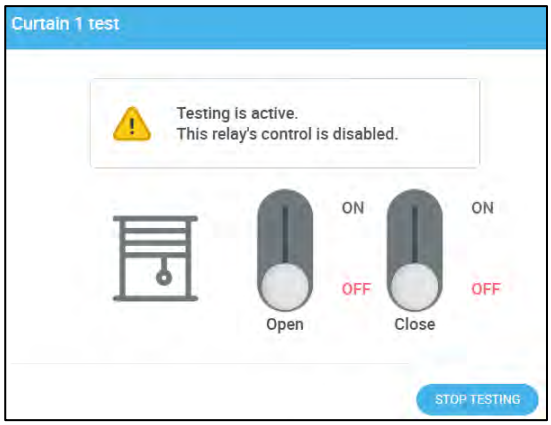
After mapping a device, Trio 20 provides a testing function that enables checking the device's performance.

- Fans: Click Test to test the fan's response.

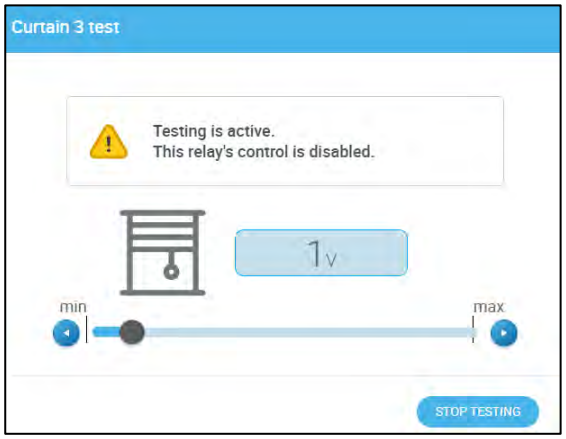


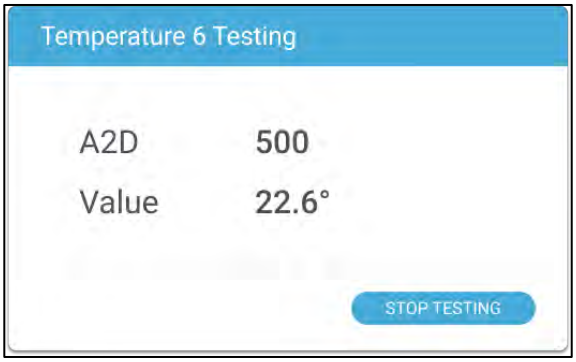

- Relay devices: Click Test › On to ensure that the device turns on.

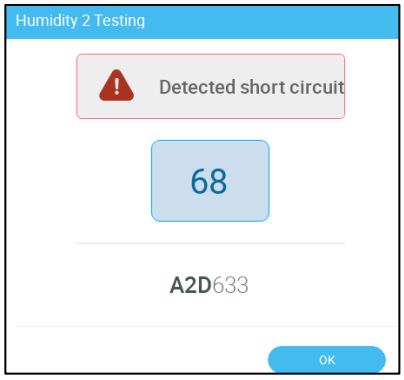



- Analog output devices: Click Test and move the voltage scale to ensure that the device operates at the proper minimum and maximum voltage levels.




- Analog input devices: Click Test to view the current input results and A2D value. The test function also displays an error message when the input signal is weak or non-existent.




    - Acceptable ranges:
        - RTS-2: 200 – 600.
- Digital input devices: Click Test to view the current circuit status (signal close or signal open).

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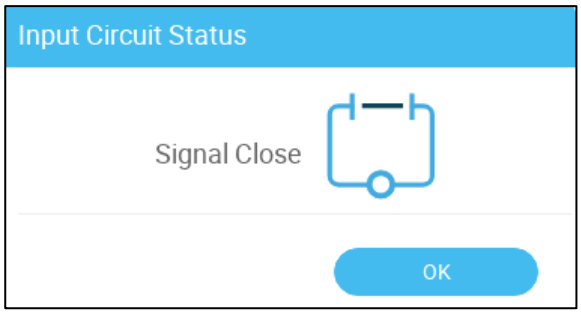


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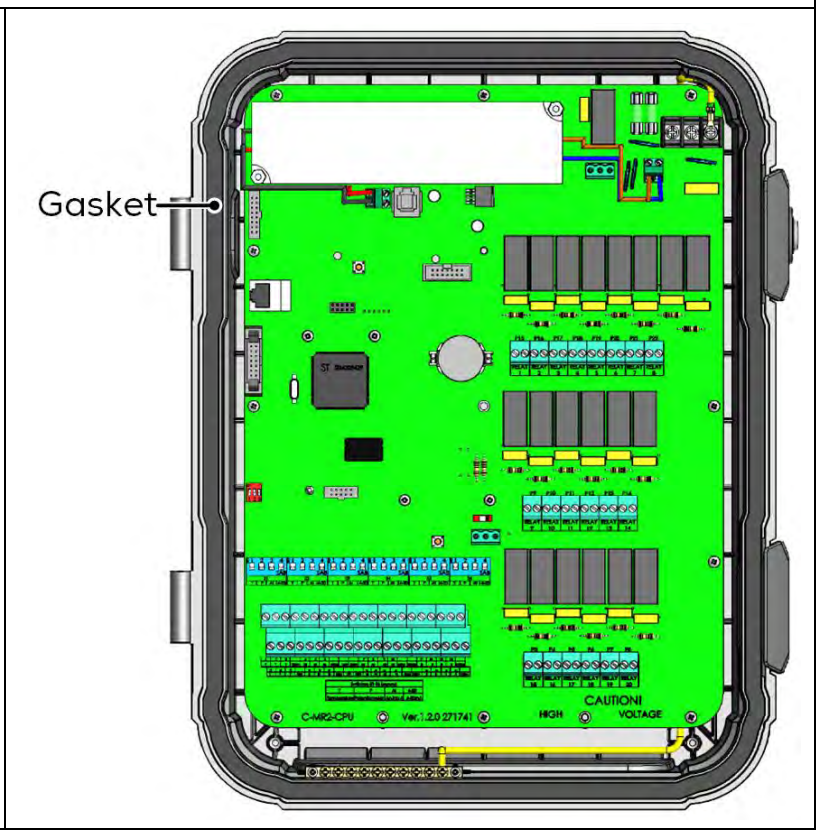
# 8 Appendix A: Service Manual

- Maintenance
- Trouble Shooting
- Spare Parts

## 8.1 Maintenance

Perform the following steps to maintain your unit.

| | |
|---|---|
| • Checking the Battery Level: Check the battery once a year. The output must be 2.7 volts (minimum). Authorized personnel only must replace the battery if the output is below the minimum required level or every five years. | |
| • Visually inspect your unit once a year. Make sure that there are no signs of corrosion or residue on the PCBs. If these issues appear, it means that: | |
| o the Trio 20 is installed in an environment with high humidity, ammonia content, or some other destructive agent. | |
| o There is a lack of (silicon) sealing or that the sealing has degraded. | |
| • Make sure that the silicon seal around the PGs installed in the knockouts is not cracked. | |
| • Check that the gasket is not cracked. |  |

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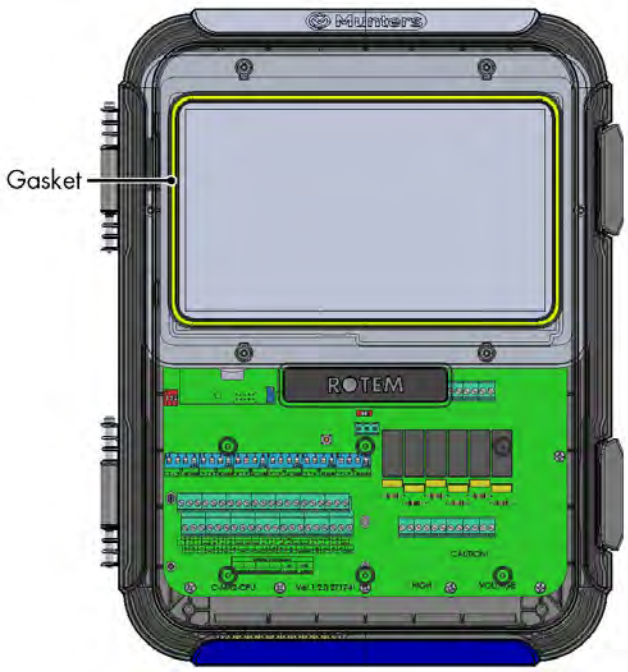
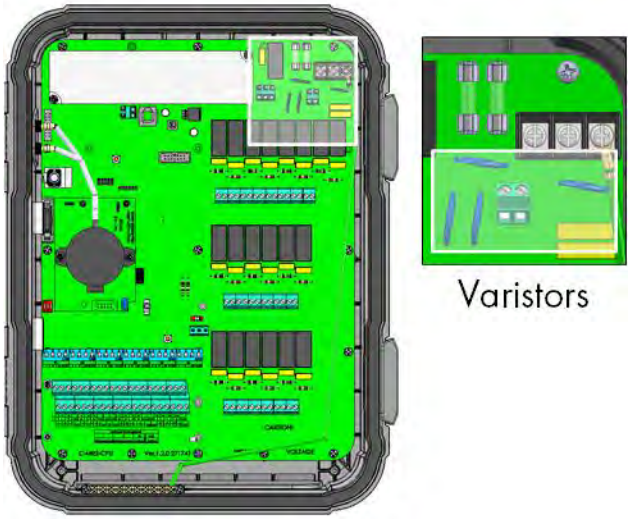
<table>
<tr><td>

- Check that the gasket around the touch screen is not cracked.

</td><td> 
</td></tr>
<tr><td>

- Look for any signs of burns or browning around the varistors.

</td><td> 
</td></tr>
<tr><td colspan="2">

- Inspect the shield wiring and main grounding cable; ensure that they are properly connected to the proper ports.

</td></tr>
</table>

## 8.2 Trouble Shooting

- Internet
- Electronic Components

### 8.2.1 INTERNET

The following section describes how to trouble shoot internet problems. In the event that there is no internet connection:

1. Go to System › General Settings › Network Screen. Verify that there is an IP address.
2. Check the cable connections between the switch and the Trio 20.
3. Verify that the unit is powered.

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*NOTE If there is no internet connection, the Main Menu Internet icon is marked.*

### 8.2.2 ELECTRONIC COMPONENTS

**Problem:** The touch screen doesn't turn on up after applying 115/230VAC.

**Solution:** Open the Trio 20 door and:

1. Check main 115/230VAC 3A fuse F2.
    - If required, replace fuse.
2. Check the 12V terminal voltage (COM & 12V).
    - If there is no voltage, there is a problem with the Switched Power Supply. Replace the power supply.
3. Verify that the 5V and 3.3V indicative LEDs of the I/O power board are lit.
4. Verify that the flat cable connecting the I/O board and the display board is in place.
5. Verify that the Green Status LED is flashing.
6. On the Trio 20 display board, verify that the:
    - RED Status LED is flashing
    - Display's flat cable is firmly hooked up to its connector.

**Problem:** The screen doesn't reflect changes made in the analog inputs.

**Solution:**

1. Verify that the position of Dip Switch (S1-S6) corresponds with the relevant analog input.
2. Verify that the analog input terminals' mapping corresponds to the actual wiring.
3. Check that the terminal wire connection of Analog Input of interest coincides with the analog input chosen on the touch screen.

**Problem:** The screen doesn't reflect the changes in digital inputs.

**Solution:** Verify that the digital input terminals' mapping corresponds to the actual wiring.

**Problem:** The Alarm Relay doesn't operate.

**Solution:** Check fuse F4.

- By default, alarm relay contacts "NO-COM" should be closed.

**Problem:** The analog output voltage doesn't correspond to the voltage defined on the corresponding analog output terminal.

**Solution:** Check the load value. The maximum analog output load is 15 mA.

**Problem:** An analog output terminal has no output voltage.

**Solution:** Verify that the analog output terminals' mapping corresponds to the actual wiring.

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**Problem:** The display screen appears but does not respond to any touch.

**Solution:** Check the USB cable between the touch screen card and the Trio display card.

**Problem:** There is no 3.3V output for to power the potentiometer(s).

**Solution:** There is a PPTC fuse F1 on the 3.3V line. Disconnect the potentiometers and using a DVM, check the resistance on the terminal between the 12V output and common ground (COM). The reading should indicate an open circuit.

- If not, the line is damaged.

**Problem:** The end user doesn't see changes in the data tables.

**Solution:**

1. Check the Internet cable, going from RJ-45 connector (marked as Ethernet-2). Verify that the connector's LEDs are flashing.
2. Check the Internet cable, going from the power card to the Trio display's card RJ-45 connector (marked as Ethernet-1). Verify that the connector's LEDs are flashing.

## 8.3 Spare Parts

- Preliminary Information
- Trio 20 Minimal Spare Parts
- Trio 20 Door Card Spare Parts
- Trio 20 Main Container Spare Parts
- Additional Options
- Cards

### 8.3.1 PRELIMINARY INFORMATION

| | Trio 20 |
|---|---|
| Container | A |
| Door Cards | B |
| Main Container Cards | C |
| Cables and Harnesses | D |
| MPN | Munters Part Number |
| DPN | Distributor Part Number |

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### 8.3.2 TRIO 20 MINIMAL SPARE PARTS

Munters Israel recommends that managers of farms equipped with Trio 20 Green Controllers keep (as a minimum stock) the following spare parts on hand. Doing so simplifies maintenance and repairs of the Trio units.

#### 8.3.2.1 Global Customers

| P/N | Description |
|---|---|
| 940-99-00002 | TRIO-20 LCD KIT (DISPLAY + LVDS CARD + USB CABLE) (SP-250061) |
| 940-99-00003 | TRIO-20 CPU (TRIO 20-MAIN) |
| 940-99-00004 | TRIO 20 DISPLAY CARD (TRIO-DISPLAY) |
| 940-99-00008 | TRIO 20-POU-SOM VARISCITE CARD WITH HEATSINK AND FAN |
| 940-99-00034 | TRIO 20-POU-DISPLAY CARD AND SOM VARISCITE CARD WITH HEATSINK AND FAN |
| 940-99-00040 | TRIO 20-PIG-EN-SOM VARISCITE CARD WITH HEATSINK AND FAN |
| 940-99-00041 | TRIO 20-PIG-EN-DISPLAY CARD AND SOM VARISCITE CARD WITH HEATSINK AND FAN |

#### 8.3.2.2 Chinese Customers

| P/N | Description |
|---|---|
| 940-99-00002 | TRIO-20 LCD KIT (DISPLAY + LVDS CARD + USB CABLE) (SP-250061) |
| 940-99-00003 | TRIO-20 CPU (TRIO 20-MAIN) |
| 940-99-00004 | TRIO 20 DISPLAY CARD (TRIO-DISPLAY) |
| 940-99-00032 | TRIO 20-POU-CN-DISPLAY CARD AND SOM VARISCITE CARD WITH HEATSINK AND FAN |
| 940-99-00042 | TRIO 20-PIG-CN-SOM VARISCITE CARD WITH HEATSINK AND FAN |
| 940-99-00043 | TRIO 20-PIG-CN-DISPLAY CARD AND SOM VARISCITE CARD WITH HEATSINK AND FAN |
| 940-99-00044 | TRIO 20-POU-CN-SOM VARISCITE CARD WITH HEATSINK AND FAN |

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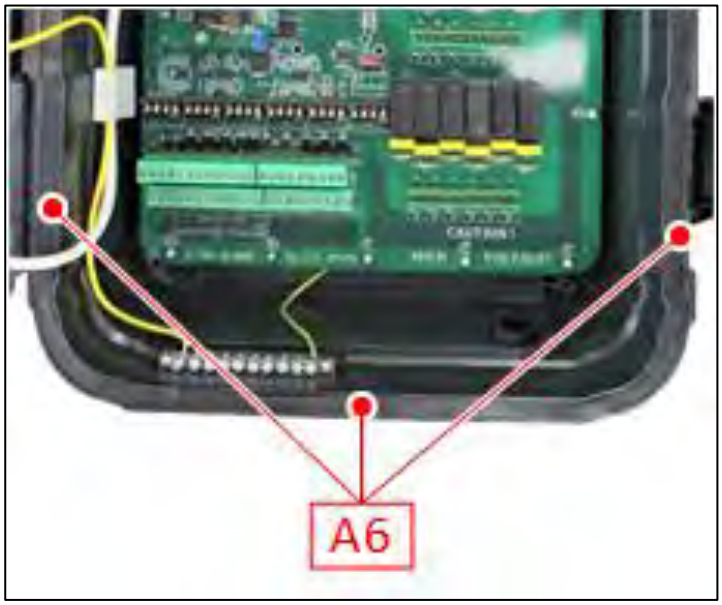
### 8.3.3 TRIO 20 CONTAINER SPARE PARTS

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| ID No. | Description | Catalog Number | Note |
|---|---|---|---|
| A1.1 | TRIO-20 FRONT DOOR TOUCH PLASTIC PART | MPN: 940-99-00005 | |
| | | DPN: | |
| A1.2 | TRIO-20 PLASTIC BOX BASE (SP – 207124) | MPN: 940-99-00112 | |
| | | DPN: | |
| A1.3 | TRIO HINGE PLASTIC PIN V1.0.0 (SP-207128) | MPN: 940-99-00019 | |
| | | DPN: | |
| A2.1 | TRIO-20 PANEL PLASTIC PART BLUE LOGO MUNTERS + PART BLUE | MPN: 940-99-00001 | OR |
| | | DPN: | |
| A2.2 | TRIO PANEL PLASTIC PART RED RAL 3020 NO LOGO (SP-207138) | MPN: 940-99-00045 | |
| | | DPN: | |
| A3.1 | ONE / ONE PRO - LATCH GENERAL LOCK PLASTIC PART + LOCK FOR LATCH | MPN: 900-99-00217 | |
| | | DPN: | |
| A3.2 | GENERAL PLASTIC LATCH | MPN: 900-99-00216 | |
| | | DPN: | |
| A4 | TRIO-20 LCD HOLDER V1.0.0 (SP-207125) | MPN: 940-99-00024 | |
| | | DPN: | |
| A5 | P4 SCREEN GASKET SILICONE 35 SHORE 75CM (EXTRUSION PROCESS) (SP-204079) | MPN: 940-99-00020 | |
| | | DPN: | |
| A6 | MID-RANGE MAIN GASKET V1.0.0 (SP-207122) | MPN: 940-99-00021 | |
| | | DPN: | |

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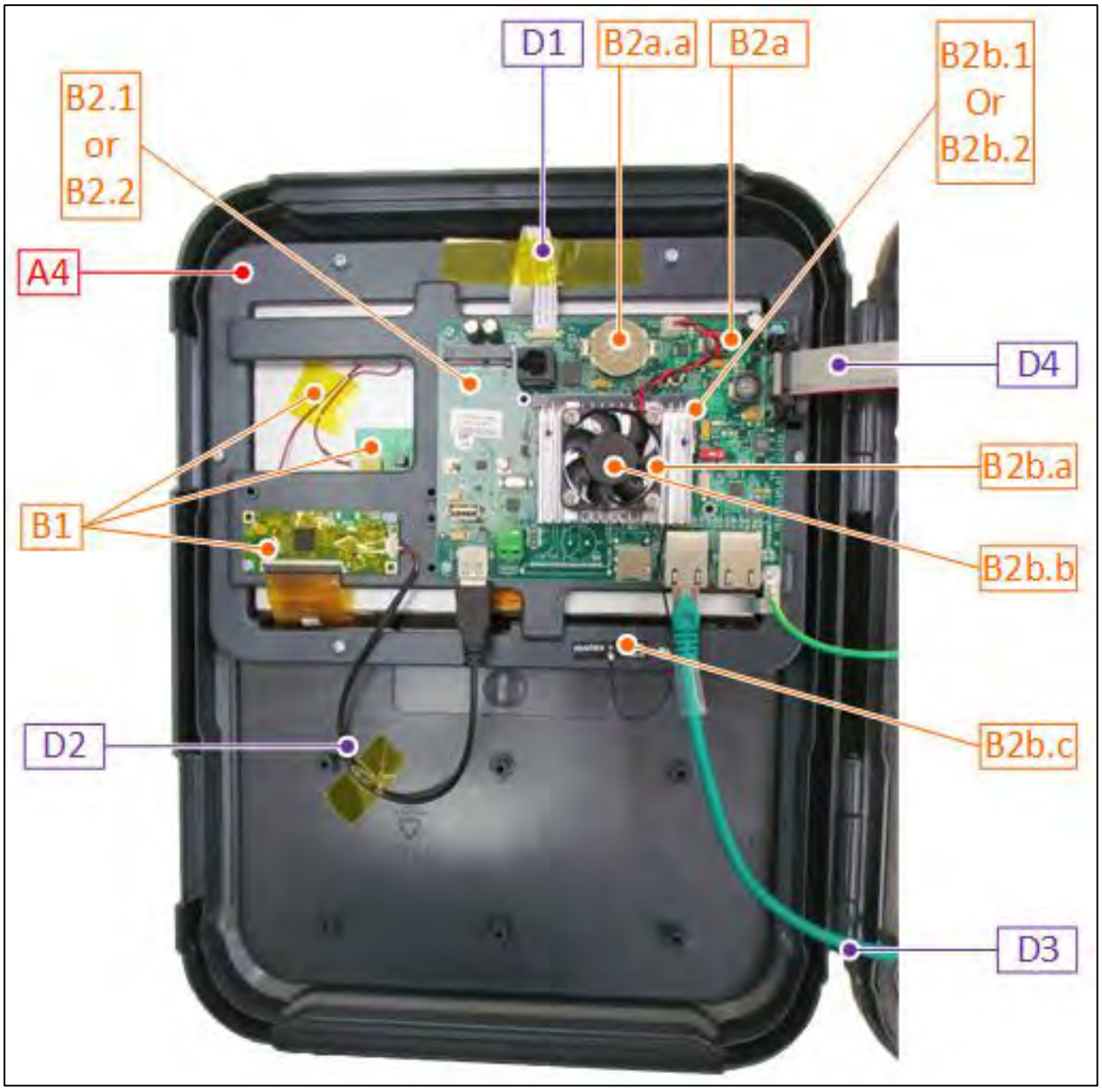
### 8.3.4 TRIO 20 DOOR CARD SPARE PARTS




© Munters AB, 2020

| ID No. | Description | Catalog Number | Note |
|---|---|---|---|
| B1 | TRIO-20 LCD KIT (DISPLAY + LVDS CARD), [+ USB CABLE *] | MPN: 940-99-00002 | |
| | | DPN: | |
| B2.1 | TRIO 20 -POU- DISPLAY CARD AND SOM VARISCITE CARD WITH HEATSINK AND FAN | MPN: 940-99-00034 | OR |
| | | DPN: | |
| B2.2 | TRIO 20 -POU-CN- DISPLAY CARD AND SOM VARISCITE CARD WITH HEATSINK AND FAN | MPN: 940-99-00032 | CHINA ONLY |
| | | DPN: | |
| B2a | TRIO 20 DISPLAY CARD (Trio-DISPLAY) | MPN: 940-99-00004 | |
| | | DPN: | |
| B2a.a | BAT COIN 3V FOR SOCKET(SP-450009) | MPN: 999-99-00386 | |
| | | DPN: | |
| B2b.1 | TRIO 20 -POU- SOM VARISCITE CARD WITH HEATSINK AND FAN | MPN: 940-99-00008 | OR |
| | | DPN: | |
| B2b.2 | TRIO 20 -POU-CN- SOM VARISCITE CARD WITH HEATSINK AND FAN | MPN: 940-99-00044 | CHINA ONLY |
| | | DPN: | |
| B2b.a | TRIO 20 HEATSINK AND FAN FOR SOM CARD | MPN: 940-99-00026 | |
| | | DPN: | |
| B2b.b | FAN FOR Trio SOM CARD (SP-204152) | MPN: 940-99-00025 | |
| | | DPN: | |
| B2b.c | TRIO 20 ANTENNA WIFI MOLEX 15cm CABLE U.FL/I-PEX MHF 2.4GHz 2.8dBi 50ohm (SP-491009) | MPN: 940-99-00035 | |
| | | DPN: | |

| ID No. | Description | Catalog Number |
|---|---|---|
| D1 | VIDEO FLAT CABLE 0.02” (0.50 mm) Type 1,152.4 mm | MPN: 940-99-00012 |
| | | DPN: |
| D2 | USB CABLE FOR Vitek\Ampire DISPLAY (SP-140672) | MPN: 940-99-00027 |
| | | DPN: |
| D3 | NETWORK CABLE RJ485 (8 WIRES, 0.5 METERS) | MPN: 940-99-00011 |
| | | DPN: |
| D4 | FLAT FF14P 25CM F”D›_V1.0.0 (SP-141161) | MPN: 999-99-00457 |
| | | DPN: |

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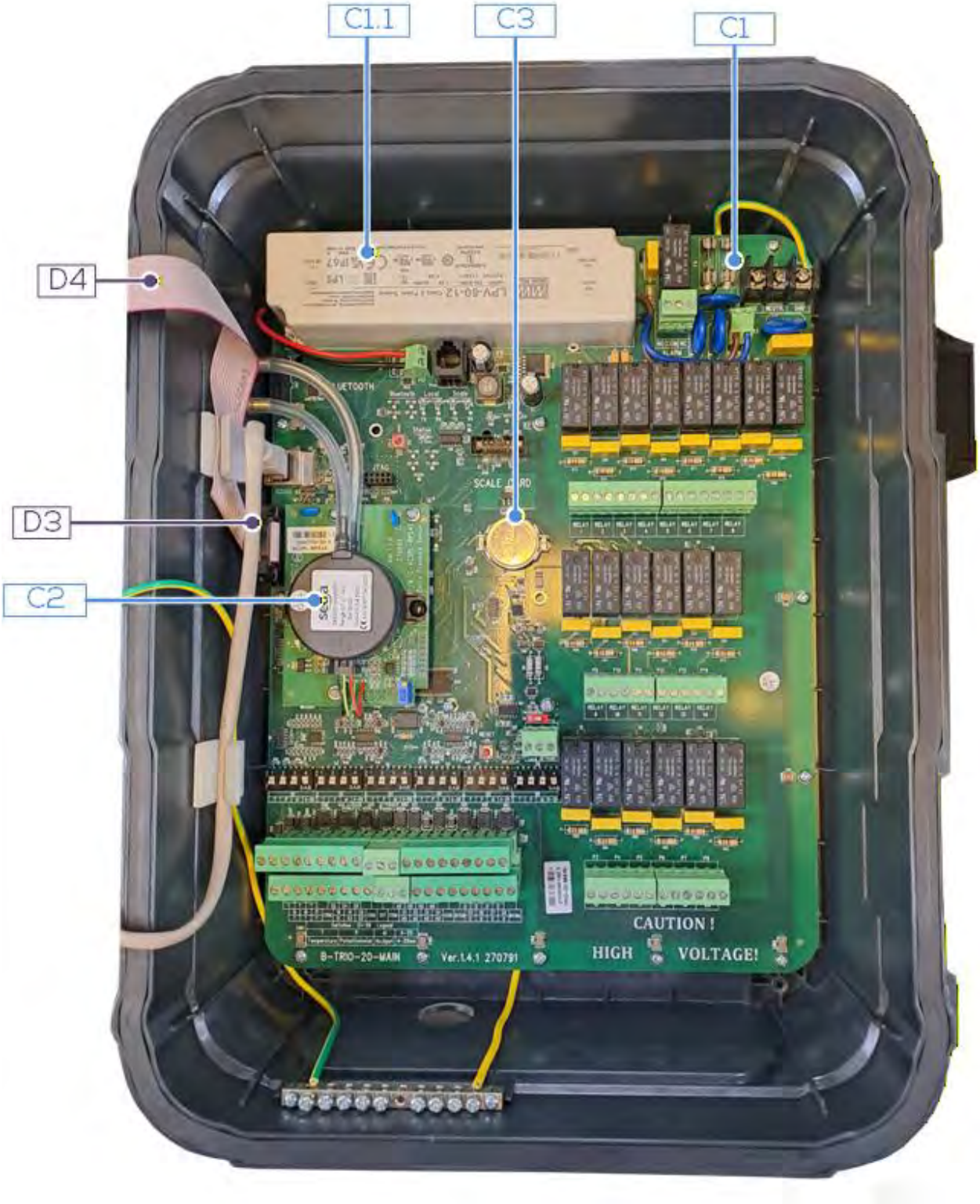
### 8.3.5 TRIO 20 MAIN CONTAINER SPARE PARTS

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| ID No. | Description | Catalog Number |
|---|---|---|
| C1 | TRIO-20 MAIN CARD (Trio-20 MAIN) | MPN: 940-99-00003 |
| | | DPN: |
| C1.1 | SWPS LPV-60-12 MEAN WELL 100-240V 12V 60W (SP-370193) | MPN: 900-99-00264 |
| | | DPN: |
| C2 | STATIC PRESSURE SET - AC3G / SE / PL / TRIO - POU (WITH EXTERNAL TUBE) | MPN: 901-99-00025 |
| | | DPN: |
| C3 | BAT COIN 3V FOR SOCKET(SP-450009) | MPN: 999-99-00386 |
| | | DPN: |

### 8.3.6 ADDITIONAL OPTIONS

| ID No. | Description | Catalog Number |
|---|---|---|
| ADO 1 | TEMPERATURE SENSOR BLACK-RTS-2-POU | MPN: 918-01-00001 |
| | | DPN: |
| ADO 2 | HUMIDITY SENSOR-RHS-POU-ROT-SE-10PL | MPN: 917-02-00003 |
| | | DPN: |
| ADO 3 | STATIC PRESSURE SET - AC3G/SE/PL/TRIO - POU | MPN: 901-99-00025 |
| | | DPN: |
| ADO 3.a | TUBES AND FILTERS FOR RPS (NO RPS CARD) | MPN: 999-99-00503 |
| | | DPN: |
| ADO 4 | CO2-GRH-EN-MUR | MPN: 960-14-10007 |
| | | DPN: |
| ADO 5 | LIGHT SENSOR-RLS-1-POU | MPN: 928-01-00001 |
| | | DPN: |

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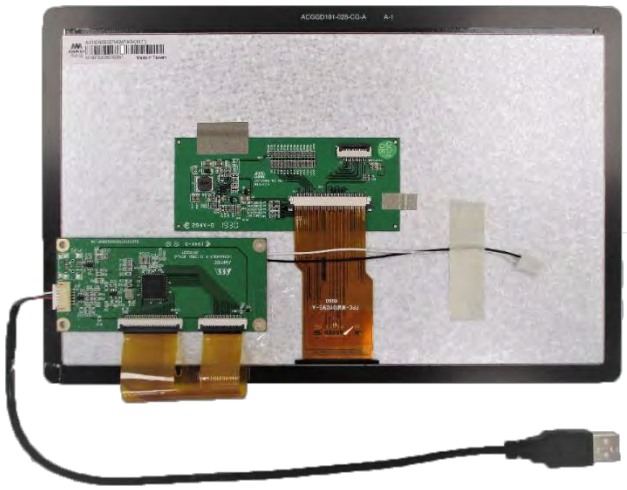
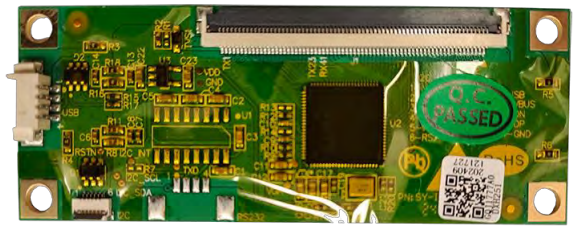
## 8.3.7 CARDS

- Door Cards
- Main Container Cards

### 8.3.7.1 Door Cards

| Card | Description | Catalog Number |
|---|---|---|
|  | 250061: LCD TFT 10.1' VT101C-KC17-B07A Vitek<br>Or<br>AM-1024600O2TMQW-TA0H Ampire<br>Or<br>TWS2101RBTV20C APEX | 940-99-00002 |
|  | 250064: TOUCH MODULE FOR TRIO LCD 10.1" (250061)VT101C-KC17-B07A VITEK | 940-99-00157 |
| | 140672: USB CABLE FOR Vitek\Ampire DISPLAY | 940-99-00027 |
| | 208027:TRIO-DISPLAY PC BOARD IMX8 NEXCOM | 940-99-00163 |

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| Card | Description | Catalog Number |
|---|---|---|
| | FAN 12V 0.62W 7000RPM 8CFM (SP-240201) | 940-99-00177 |
| | 491009: ANTENNA WIFI MOLEX 15cm CABLE U.FL/I-PEX MHF 2.4GHz 2.8dBi 50ohm/YF0026AA Quectel | 940-99-00035 |
| | 490099: QUECTEL GLOBAL LTE CELL MOD EM W/O SIM SOCKET-EG21GGB-MINIPCIE | 904-99-00106 |
| | 221011: TRIO CELL MODEM GLOBAL SIM | 904-99-00118 |

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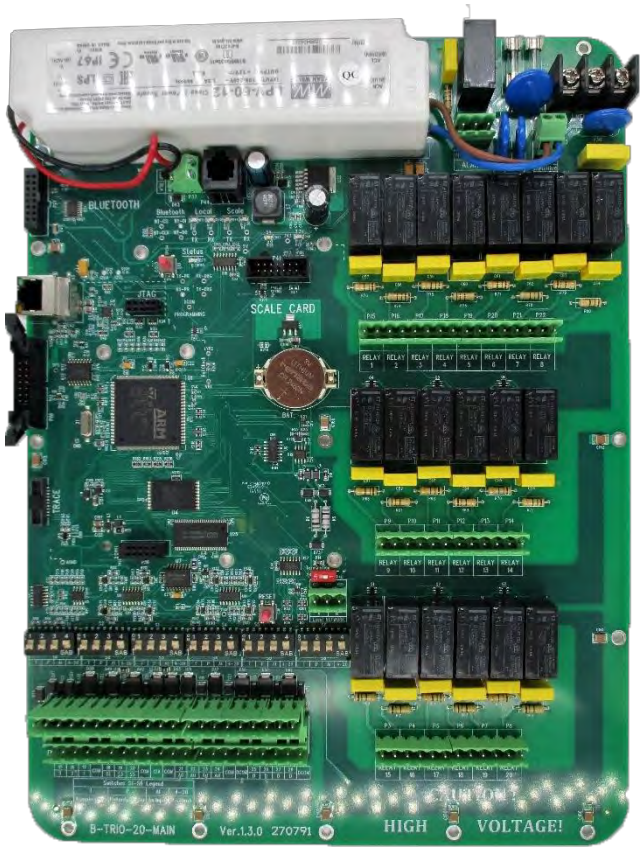
## 8.3.7.2 Main Container Cards

| Card | Description | Catalog Number |
|---|---|---|
|  | R-TRIO-20-MAIN: MUNTERS ROTEM MIDDLE RANGE 2 CPU | 940-99-00003 |
| | 370193: SWPS LPV-60-12 Mean Well 100-240V 12V 60W | 900-99-00264 |
| | STATIC PRESSURE SET - AC3G/SE/PL/TRIO -POU | 901-99-00025 |

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| Card | Description | Catalog Number |
|---|---|---|
| | TUBES AND FILTERS FOR RPS (NO RPS CARD) | 999-99-00503 |
| | ANTENNA 699-2690MHz 3.2dBi 50OHM MAGNETIC 2G/3G/4G (SP-491010) | 940-99-00039 |

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# 9 Appendix B: Trio Expansion

- Introduction
- Expansion 10
- Expansion 20
- Mapping Devices in Expansion
- Expansion Specifications
- Expansion Spare Parts

## 9.1 Introduction

- Observe all the safety rules given in Precautions, page 9.
- Install the unit according to the instructions given in Unit Installation, page 16.

## 9.2 Expansion 10

- Expansion Layout
- TRIO 20 Green to TRIO 10 Expansion Wiring
- High Voltage Relays
- Power

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### 9.2.1 EXPANSION LAYOUT

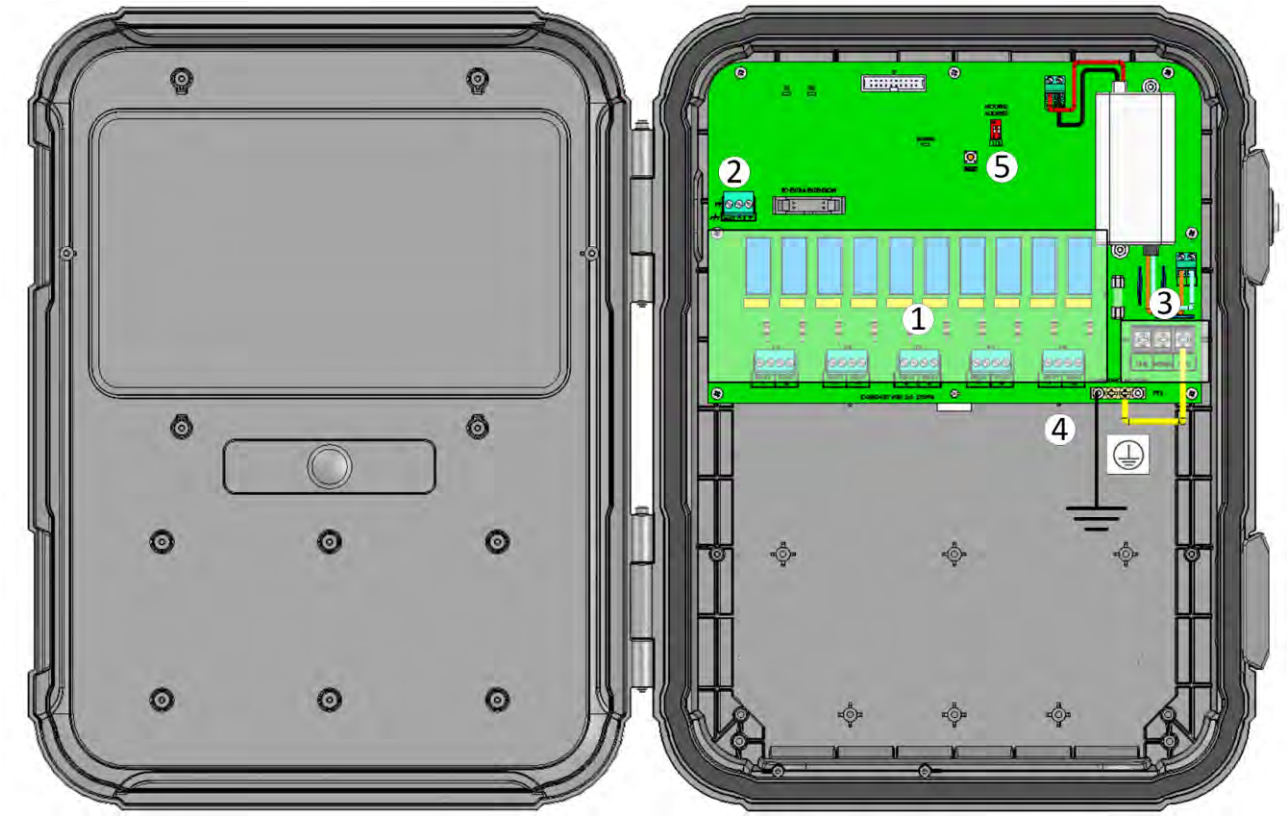


*Figure 42: Board layout*

| | |
|---|---|
| 1 | 10 relays |
| 2 | RS-485 ports |
| 3 | Power ports |
| 4 | Ground strip |
| 5 | Address dipswitch (refer to Address, page 101) |

### 9.2.2 TRIO 20 GREEN TO TRIO 10 EXPANSION WIRING

Connecting the Trio 20 to its Expansion Unit consists of three steps:

- Wiring
- Address
- Restart

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### 9.2.2.1 Wiring

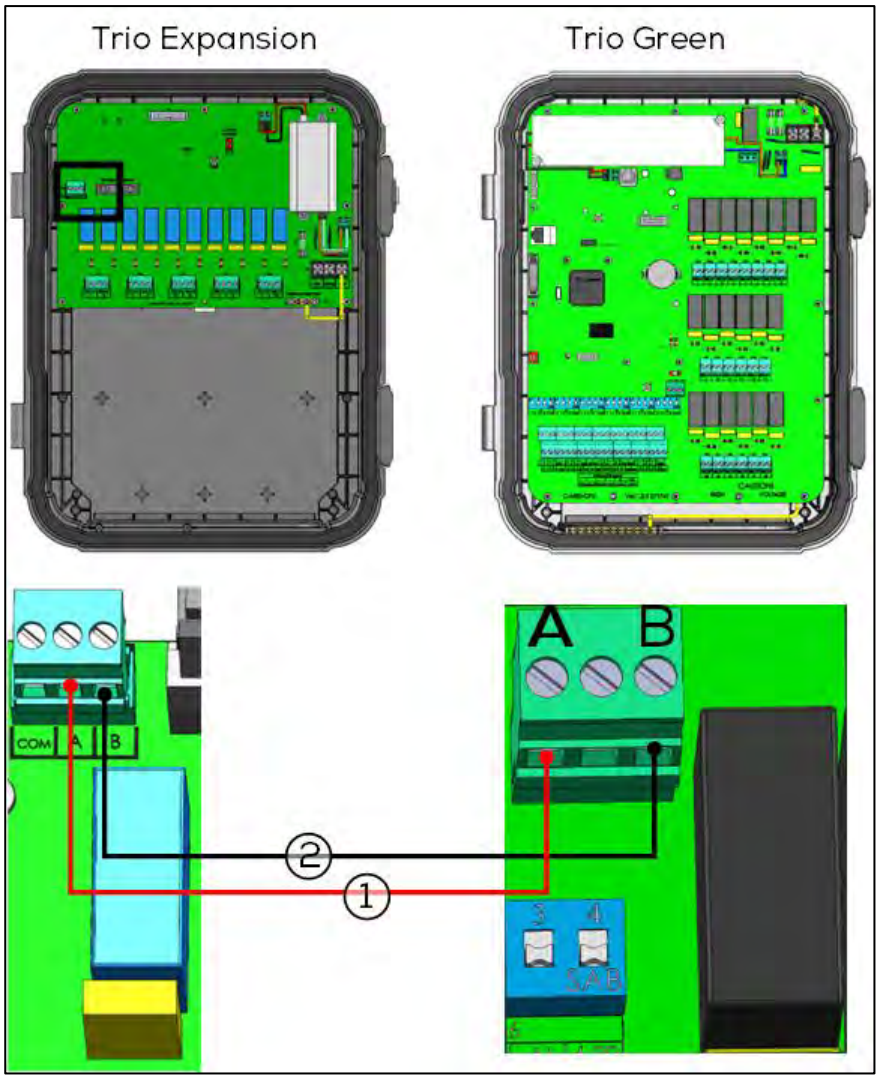


*Figure 43: Wiring diagram*

- The cable between the controller and the expansion unit should be a 4 wire twisted shielded cable (22 or 24 AWG).
- 1 – red wire
- 2 – black wire

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### 9.2.2.2 Address

The Trio 20 can support one expansion unit. Verify that both dipswitches in the Modbus Address are set to ON.

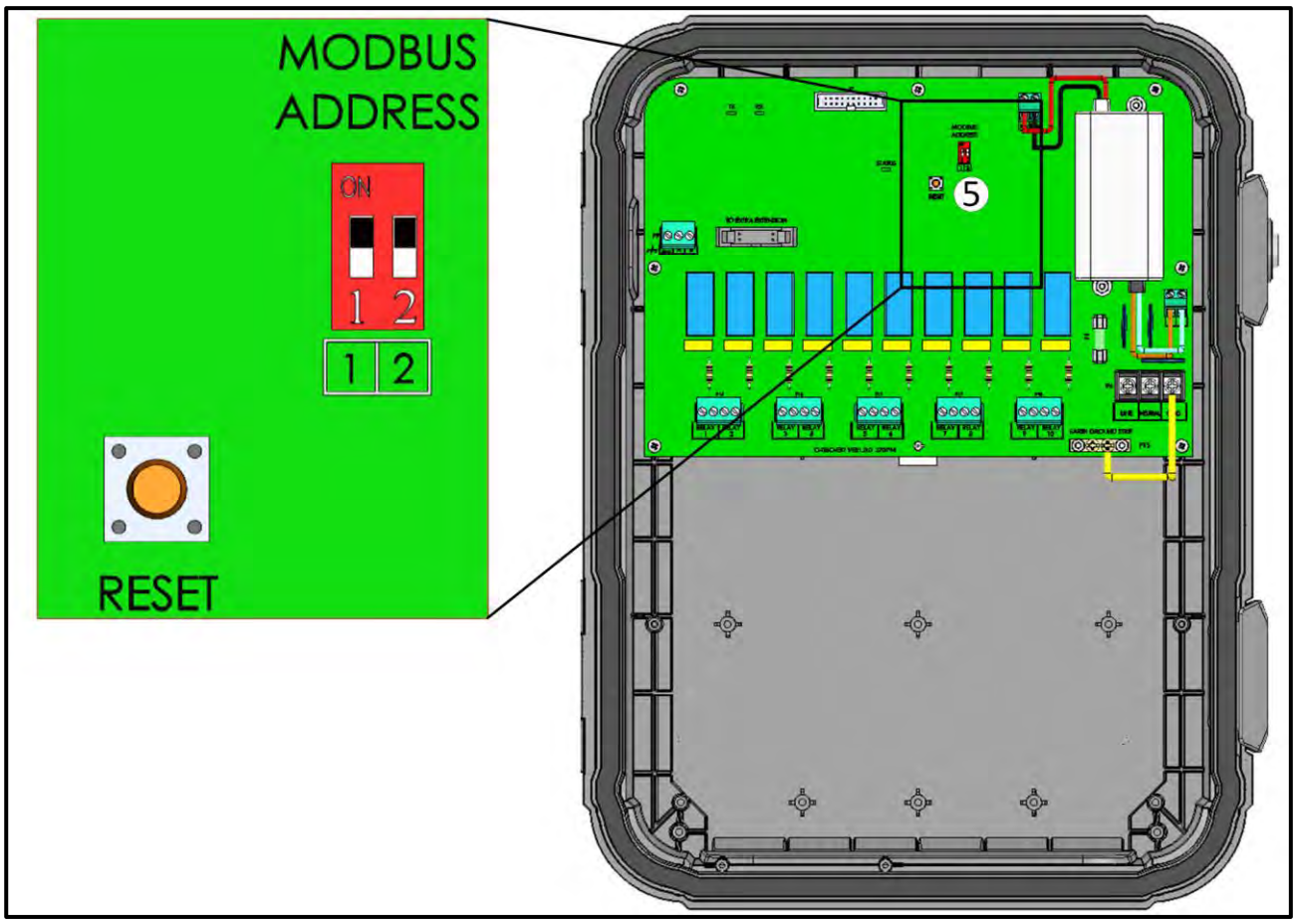


*Figure 44: Expansion Address*

### 9.2.2.3 Restart

After connecting the units and verifying the Modbus address, reset the factory settings.

1. Go to System › General Settings › .
2. Click

.
3. Follow the on-line instructions. You have the option of backing up the settings. Refer to the User Manual for more information.

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### 9.2.3 HIGH VOLTAGE RELAYS

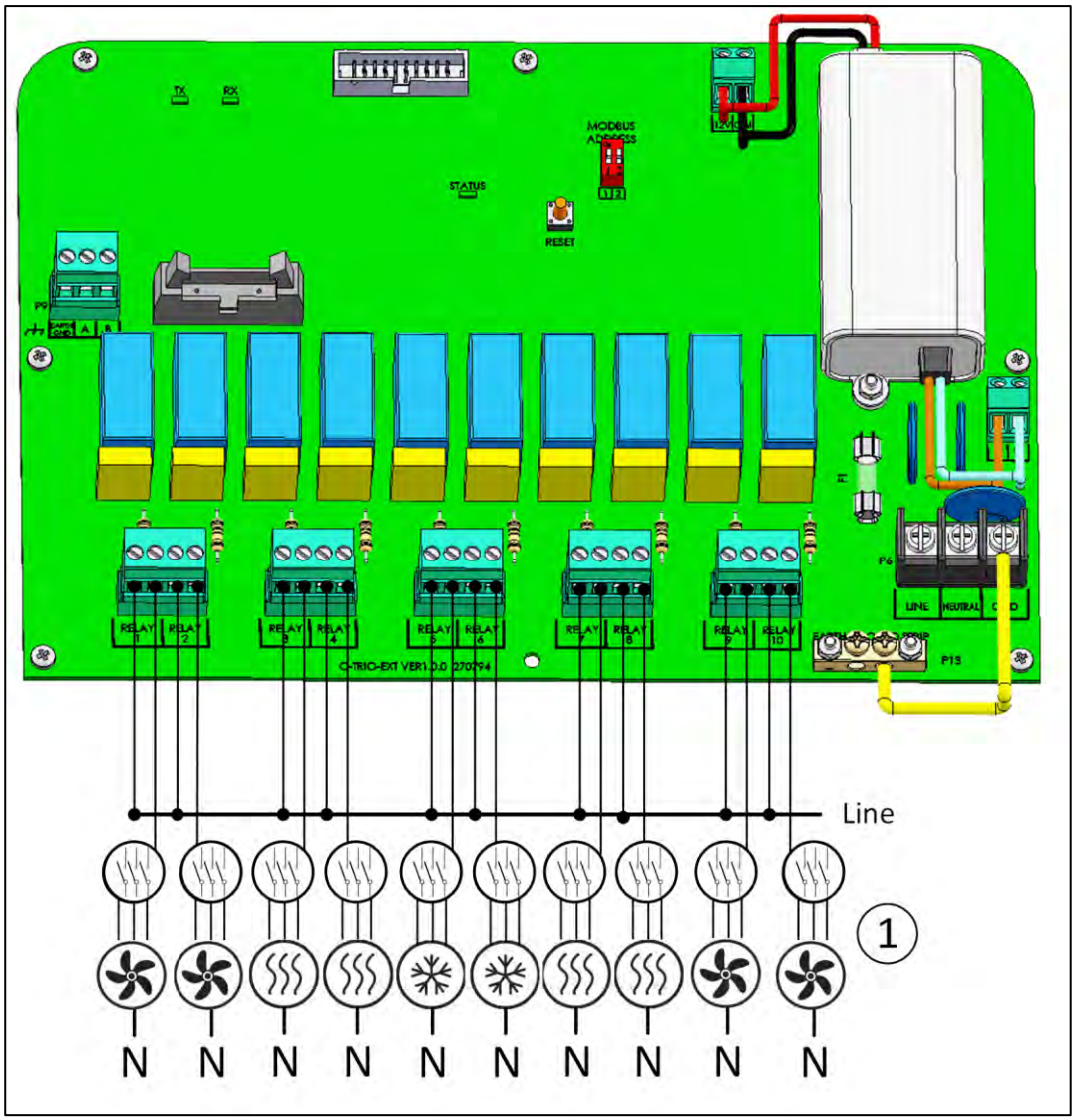


*Figure 45: High voltage devices (examples)*

| | |
|---|---|
| 1 | Example of devices |

*NOTE The relays control motors and heating devices via contactors, not directly.*

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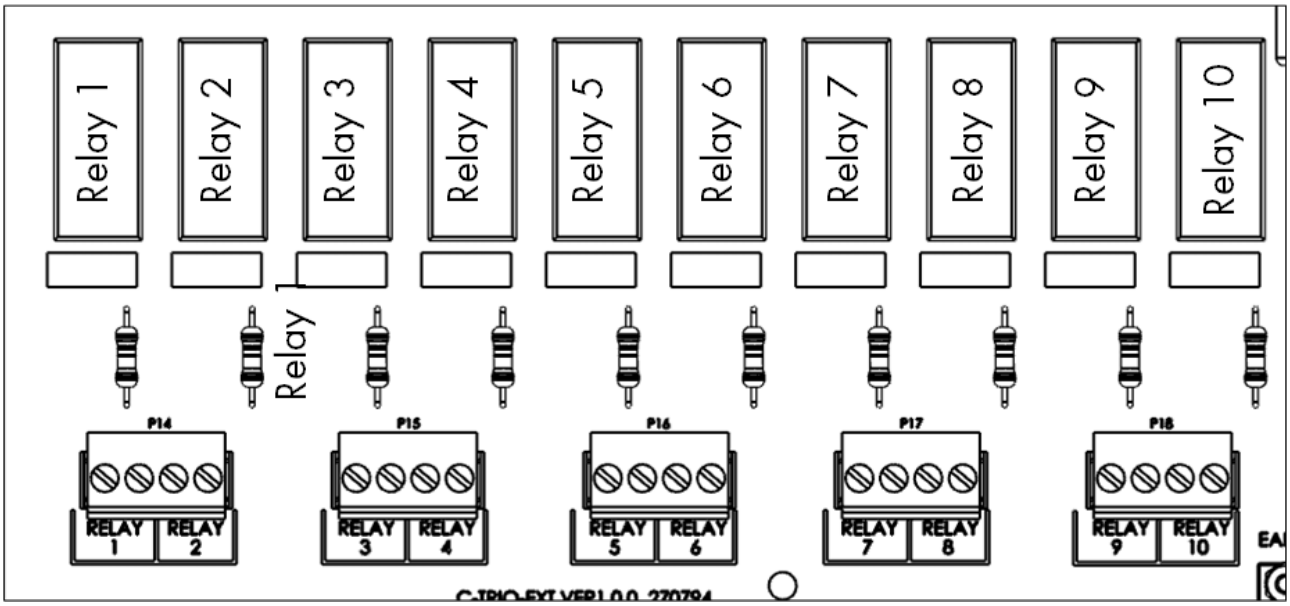


*Figure 46: Relay and port numbering*

### 9.2.4 POWER

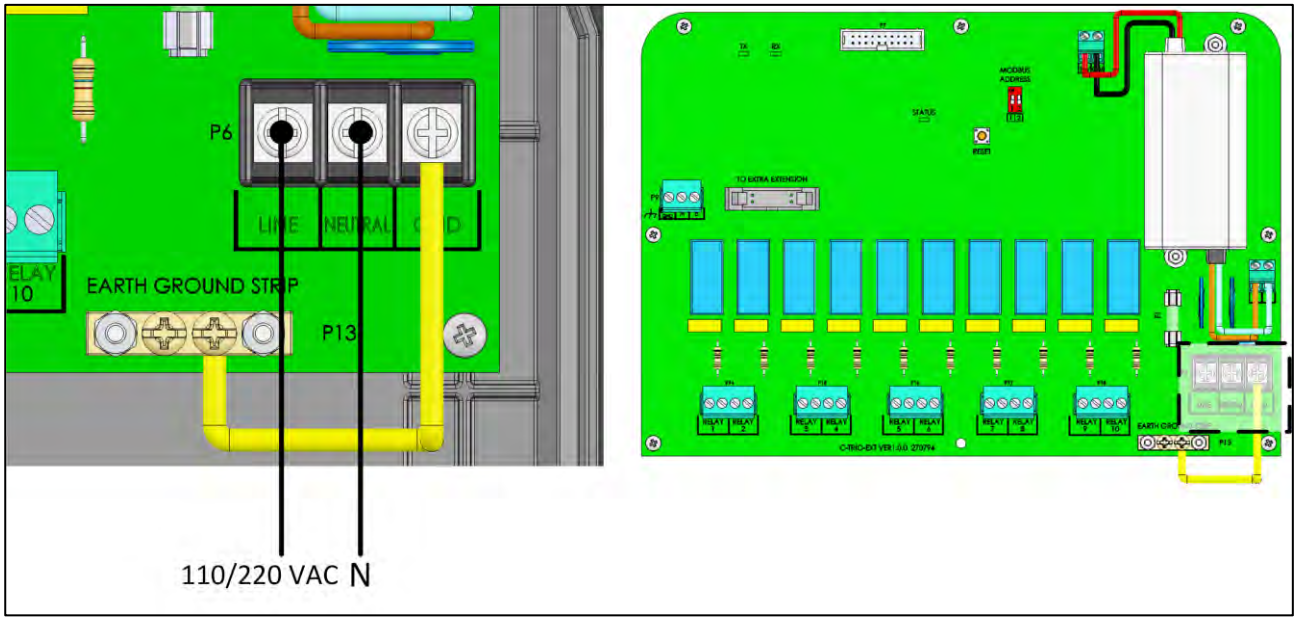


*Figure 47: Power ports*

## 9.3 Expansion 20

- Expansion Layout
- Expansion Wiring Diagrams
- High Voltage Relays
- Power

### 9.3.1 Expansion Layout

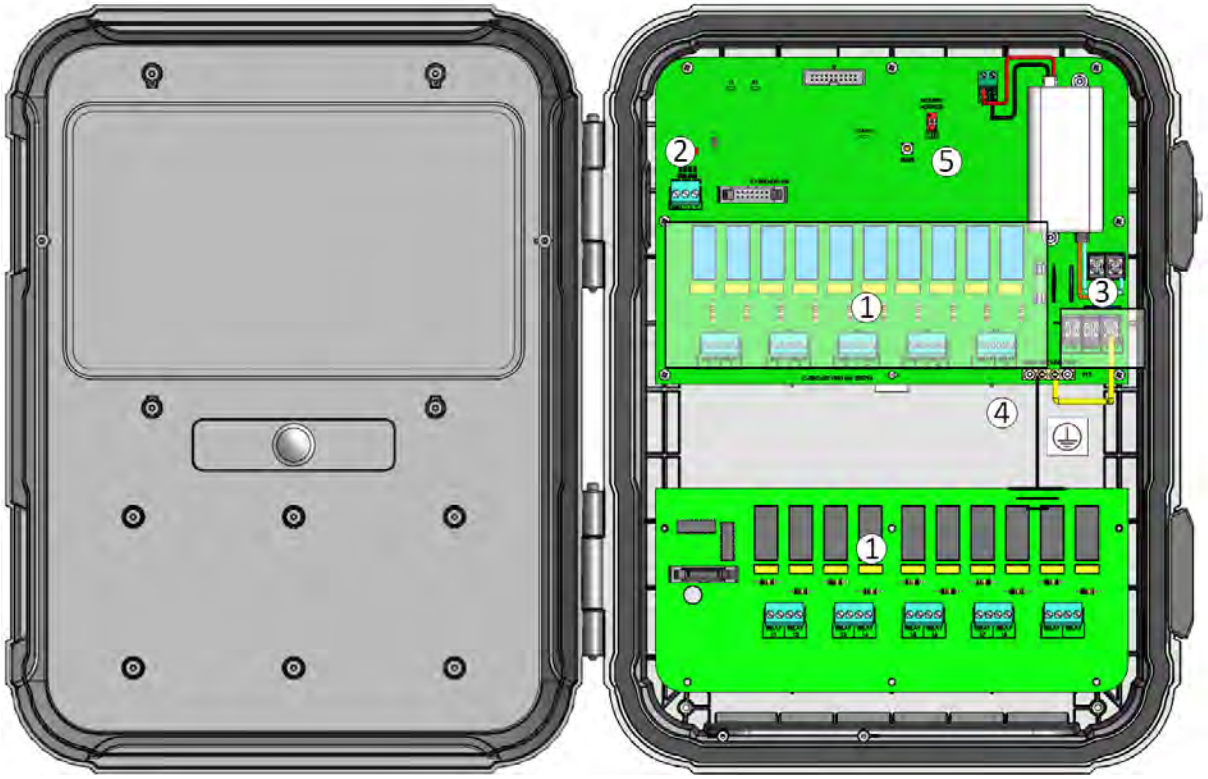


*Figure 48: Board layout*

| | |
|---|---|
| 1 | 20 relays |
| 2 | RS-485 ports |
| 3 | Power ports |
| 4 | Ground strip |
| 5 | Address dipswitch (refer to Address, page 101) |

### 9.3.2 Expansion Wiring Diagrams

Connecting the Trio 20 to its Expansion Unit consists of three steps:

- Wiring
- Address
- Restart

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### 9.3.2.1 Wiring

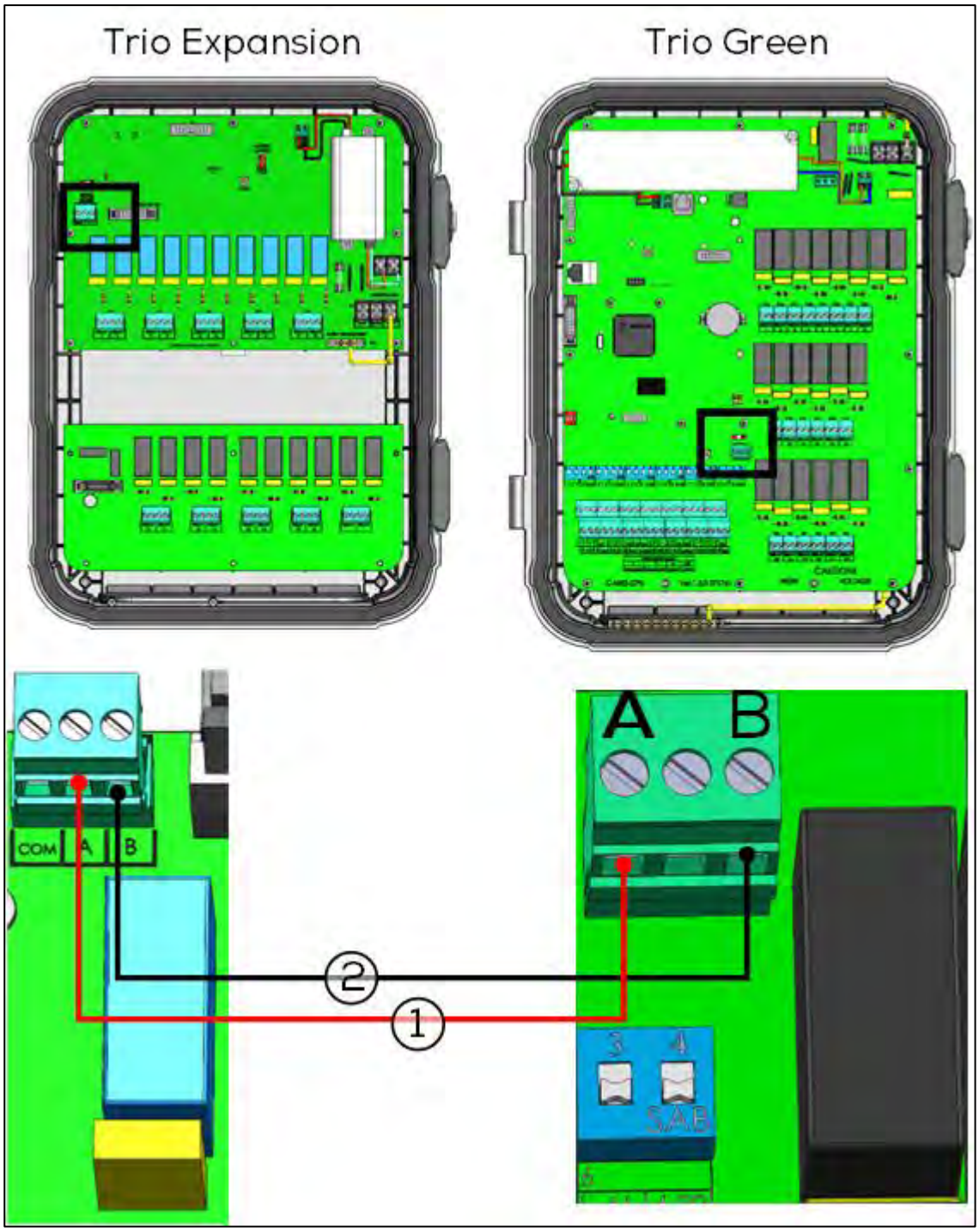


*Figure 49: Wiring diagram*

- The cable between the controller and the expansion unit should be a 4 wire twisted shielded cable (22 or 24 AWG).
- 1 – red wire
- 2 – black wire

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### 9.3.2.2 Address

The Trio 20 can support one expansion unit. Verify that both dipswitches in the Modbus Address are set to ON.

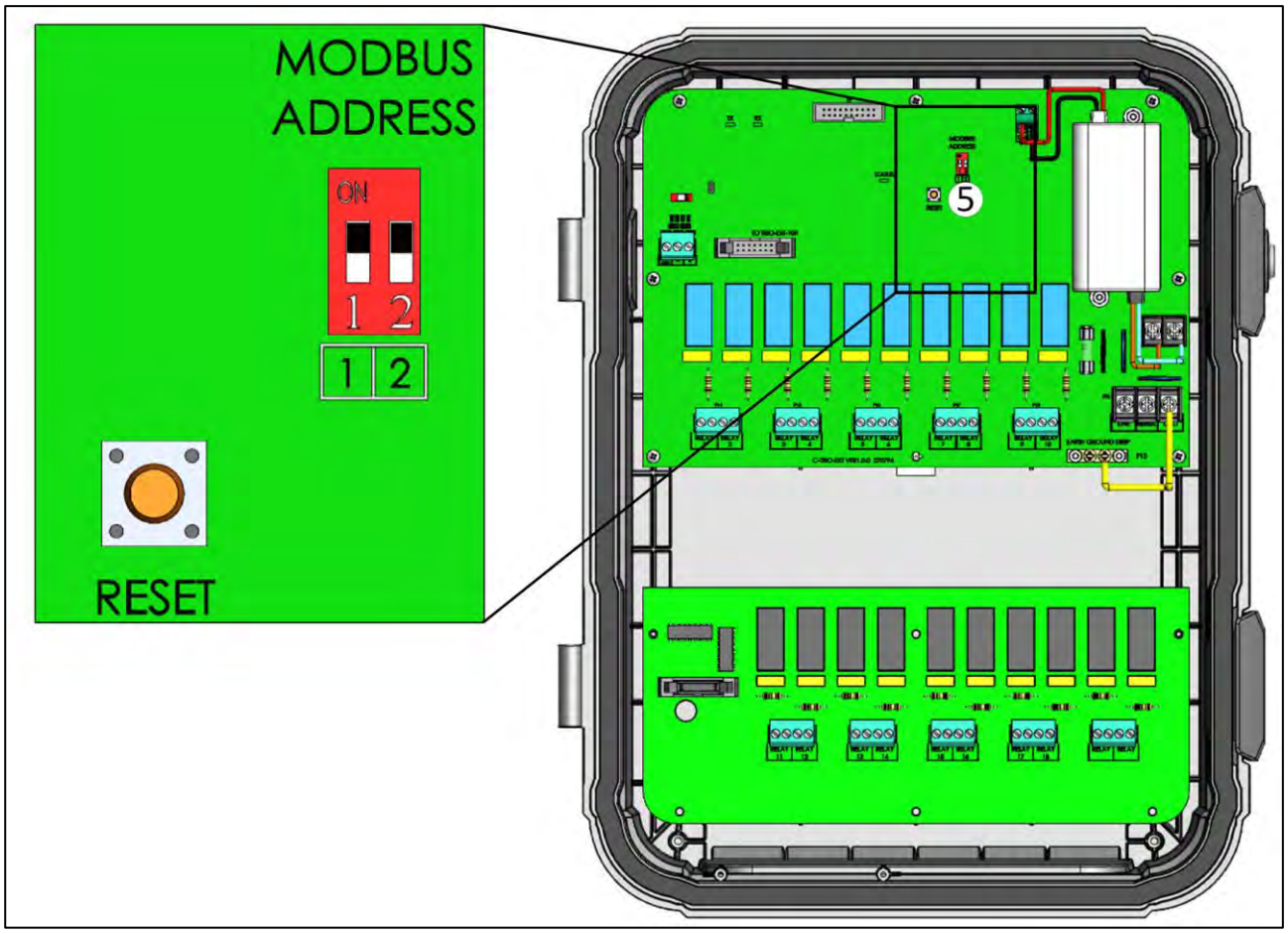


*Figure 50: Expansion Address*

### 9.3.2.3 Restart

After connecting the units and verifying the Modbus address, reset the factory settings.

1. Go to System › General Settings › .
2. Click

.
3. Follow the on-line instructions. You have the option of backing up the settings. Refer to the User Manual for more information.

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### 9.3.3 HIGH VOLTAGE RELAYS

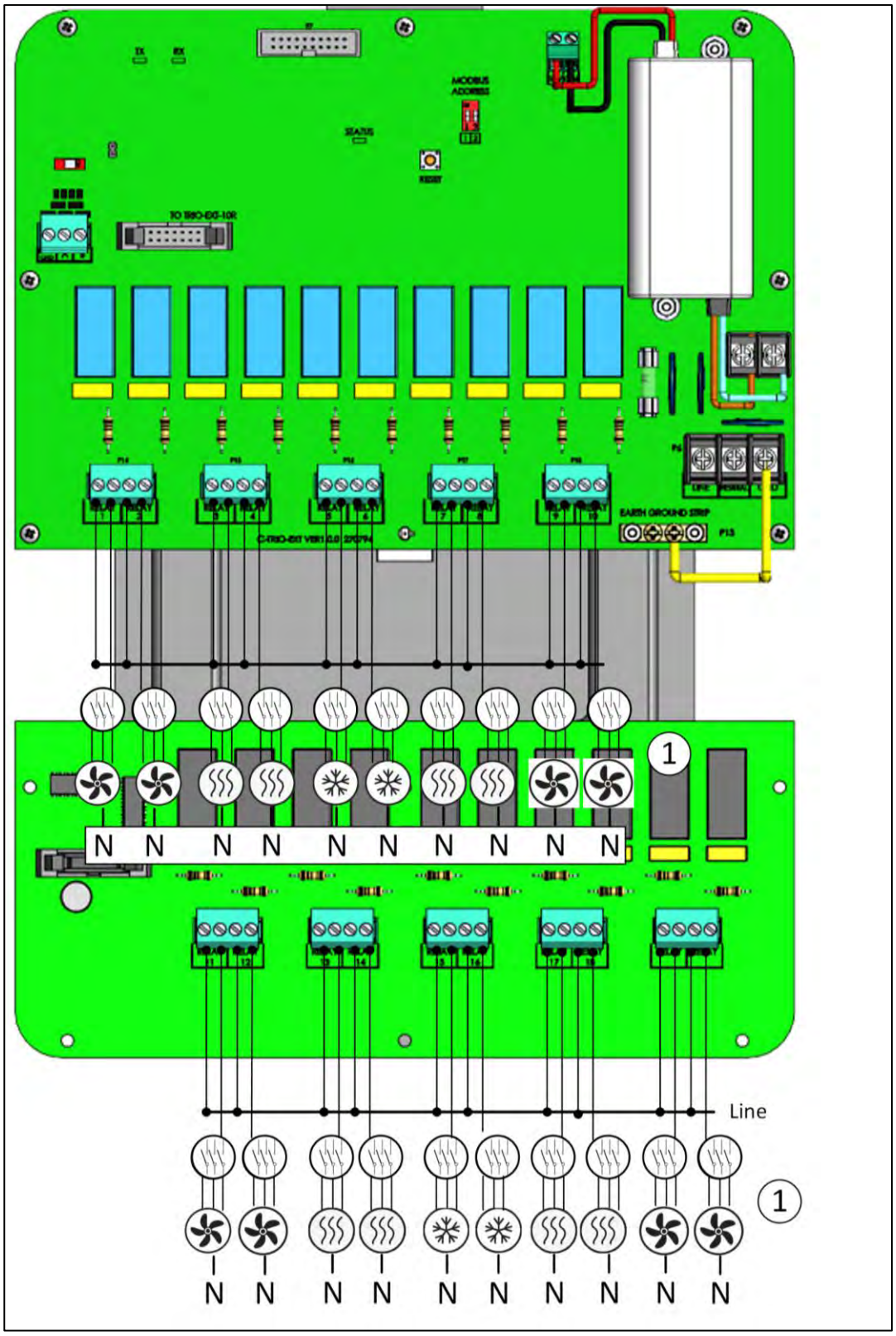


*Figure 51: High voltage devices (examples)*

| | |
|---|---|
| 1 | Example of devices |

*NOTE The relays control motors and heating devices via contactors, not directly.*

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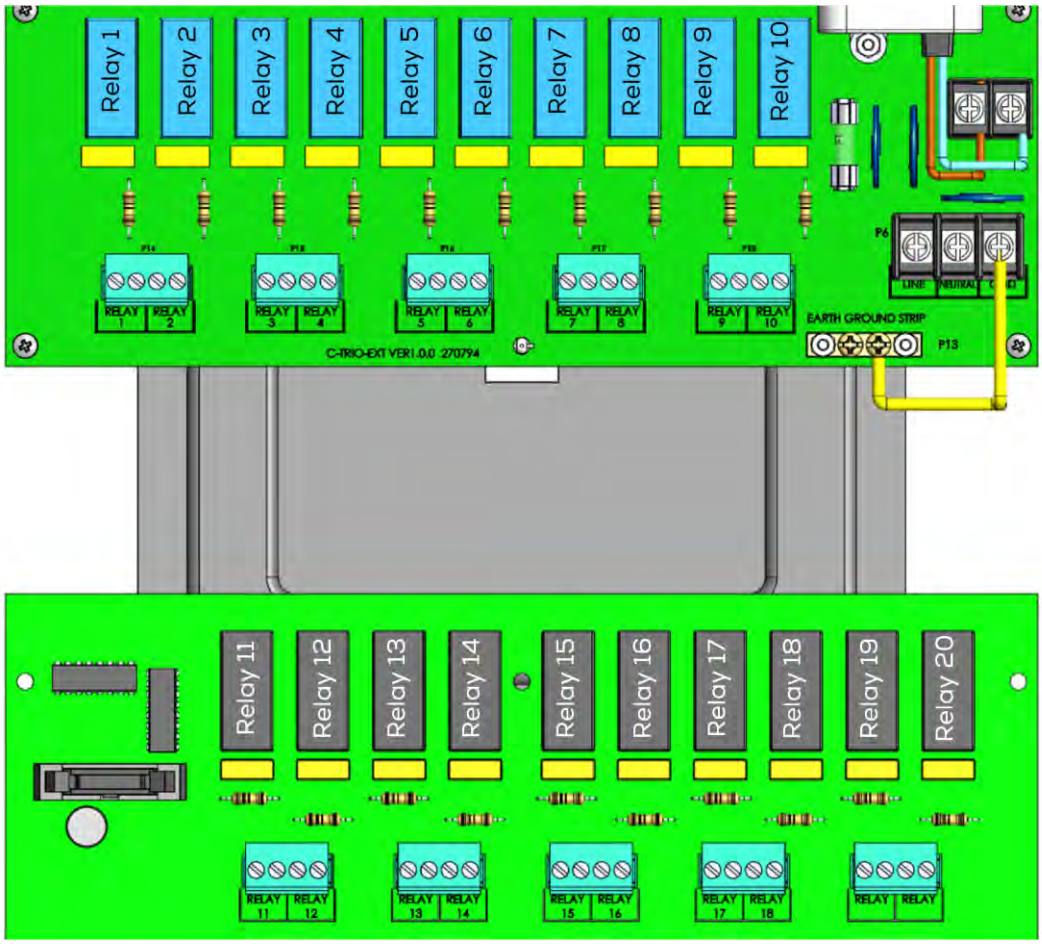


*Figure 52: Relay and port numbering*

## 9.3.4 POWER

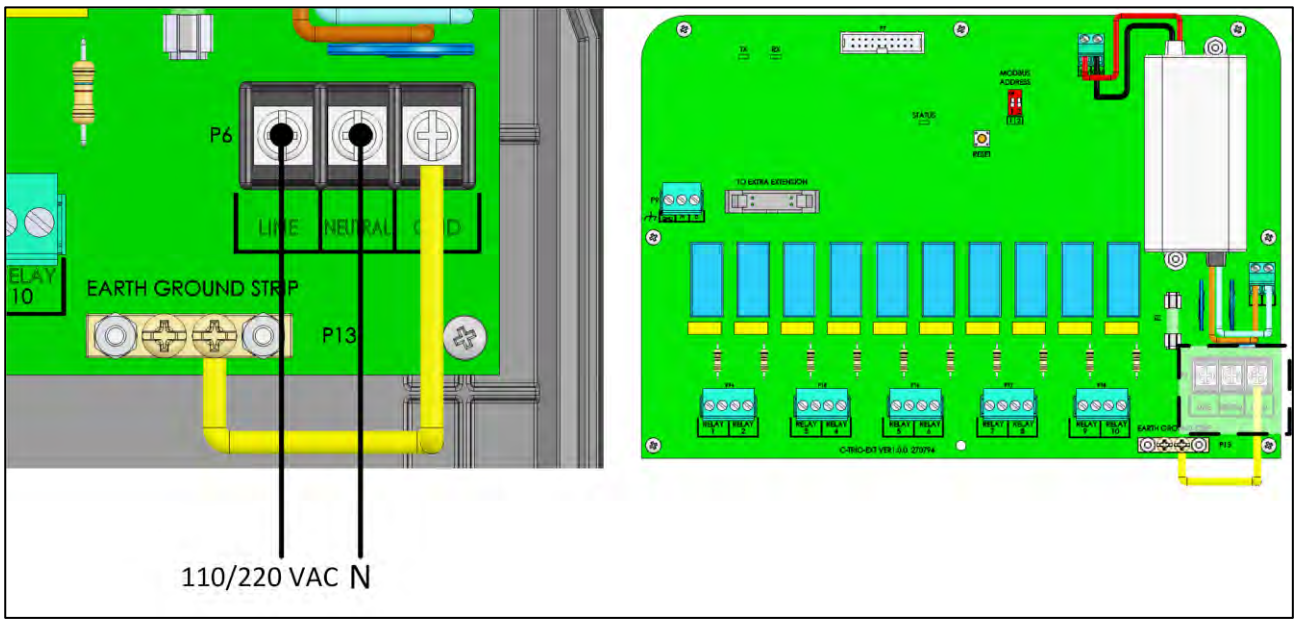


*Figure 53: Power ports*

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## 9.4 Mapping Devices in Expansion

- Install and wire the Expansion unit to the Trio 20 Green and to the external devices before beginning.
- After wiring the Expansion unit to Trio 20 Green, go to System › General Settings › Info and click

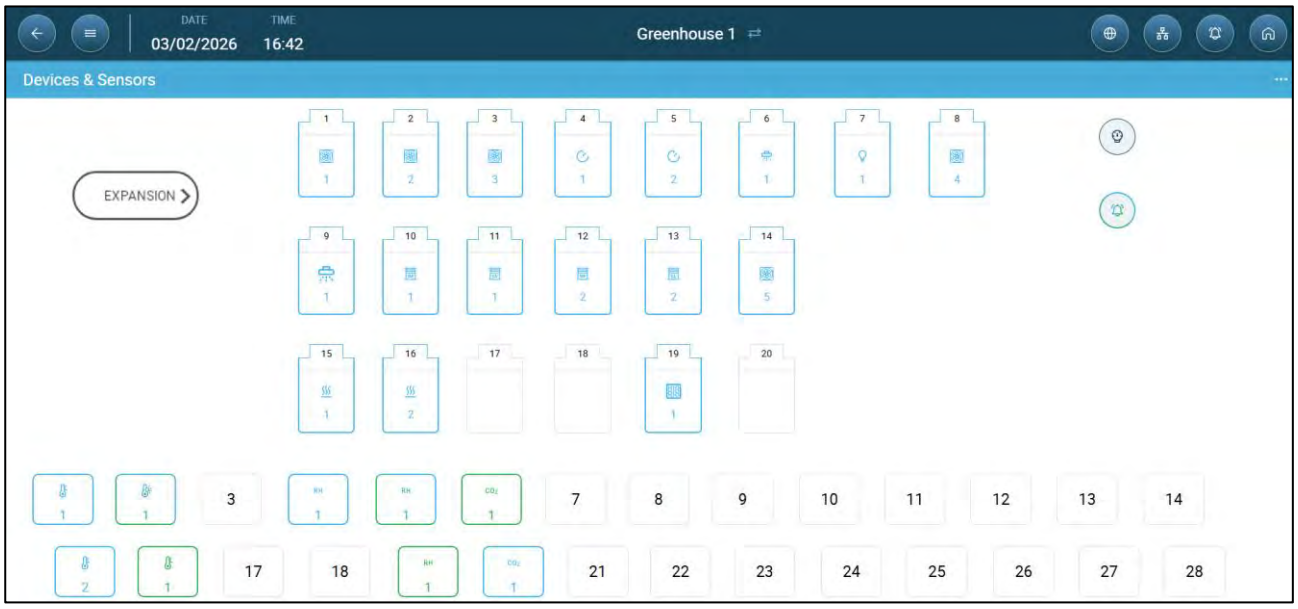
. Follow the online instructions. Trio 20 Green will not recognize the Expansion until this step is performed.

After wiring devices to the Trio Expansion Unit, each device must be mapped and then defined. Mapping and defining devices enables the system software to control each device's functionality.

***CAUTION*** *Mapping MUST match the physical wiring! An error message appears if the physical device is not wired to the relay or port as defined on the mapping screen.*

**To map the devices:**

1. Go to System › Device & Sensors.




2. Click **Expansion**.

*Figure 54 Expansion 20 Expansion Screen*

3. Map the devices as detailed in the Trio manual. (refer to Using the Mapping Screen, page 52) for more information.
4. Click I to get information on the Expansion Card.

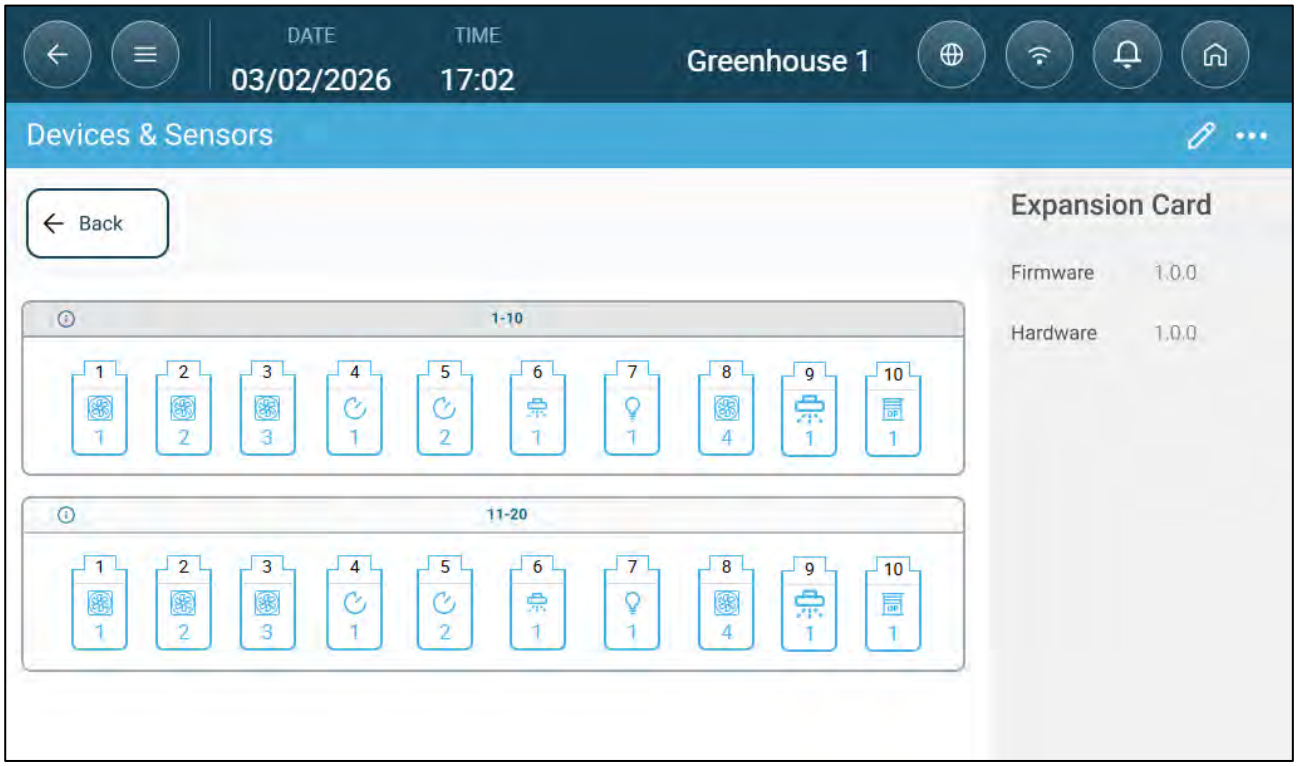



*Figure 55: Expansion 20 Information*

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## 9.5 Expansion Specifications

- Expansion 10 Specifications
- Expansion 20 Specifications
- Expansion Specification Details

### 9.5.1 EXPANSION 10 SPECIFICATIONS

| Parameter | Specifications |
|---|---|
| Input Power Voltage | 110 - 240 VAC, 50/60 Hz |
| Input AC Power | 0.3A |
| Relays dry contacts rating | 0.2A @ 230Vac |
| Maximum number of relays operating simultaneously | 10 |
| *Note: Running relays at the above current levels provides between 50,000 – 100,000 switching operations.* | |
| Communication | RS-485: 115 Kbps, 8 bit, even parity |
| Operating Temperature Range | -10° to +50° C (+14° to +125° F) |
| Storage Temperature Range | -20° to +80° C (-4° to +176° F) |
| Environmental Specifications | • Altitude: -400 m to 2000 m<br>• Relative Humidity: 20% - 90%<br>• Main supply voltage fluctuation up to +10 - 20%<br>• Overvoltage category II<br>• Pollution Degree: PD2 |
| Enclosure | • Water and dust tight<br>• Indoor use only |
| Dimensions (H/W/D) | 403 x 324 x 141 mm/16 x 13 x 5.6 inches |
| Fuses | Fuse F2 on PS card: 3.15A, 250V |
| Power Cable | • Copper, 3-wires Phase, Neutral, Ground, 18 AWG minimum<br>• 600V Insulation |
| Certification | |

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### 9.5.2 EXPANSION 20 SPECIFICATIONS

| Parameter | Specifications |
|---|---|
| Input Power Voltage | 115/230 VAC, 50/60 Hz |
| Input AC Power | 500 mA |
| Maximum number of relays operating simultaneously | 15 |
| *Note: Running relays at the above current levels provides between 50,000 – 100,000 switching operations.* | |
| Communication | RS-485: 115 Kbps, 8 bit, even parity |
| Operating Temperature Range | -10° to +50° C (+14° to +125° F) |
| Storage Temperature Range | -20° to +80° C (-4° to +176° F) |
| Environmental Specifications | • Altitude: -400 m to 2000 m<br>• Relative Humidity: 20% - 90%<br>• Main supply voltage fluctuation up to +10 - 20%<br>• Overvoltage category II<br>• PD: 2 |
| Enclosure | • IP: 52<br>• Indoor use only |
| Dimensions (H/W/D) | 403 x 324 x 141 mm/16 x 13 x 5.6 inches |
| Fuses | Fuse F2 on PS card: 3.15A, 250V |
| Certification | |

### 9.5.3 EXPANSION SPECIFICATION DETAILS

- **Disconnection device/overcurrent protection**: In the building installation, use a certified 2-pole circuit breaker rated 10A, certified in accordance with the IEC standard 60947-2 (in the US and Canada use a Listed Brach Circuit protective circuit breaker). This step is required to provide overcurrent protection and mains disconnection. The circuit breaker must be easily accessible and marked as the controller disconnect device.
- **Main Supply Voltage**: Permanently connect the controller to the mains in accordance with the relevant national code. Provide fixed wiring inside a flexible conduit. Relays must be suitably protected against overcurrent, using a circuit breaker rated at 10A.
- **Keep the units closed and locked. Only authorized personnel should open and close the units.**

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## 9.6 Expansion Spare Parts

- Preliminary Information
- Trio Expansion 10 Spare Parts
- Trio Expansion 20 Spare Parts
- Additional OptionsCards

### 9.6.1 PRELIMINARY INFORMATION

| | TRIO EXP 10 | TRIO EXP 20 |
|---|---|---|
| Container | A | C |
| Main Container Cards | B | D |
| Cables and Harnesses | N/A | E |
| MPN | Munters Part Number | |
| DPN | Distributor Part Number | |

### 9.6.2 TRIO EXPANSION 10 SPARE PARTS

- Trio Expansion 10 Container Spare Parts
- Trio Expansion 10 Main Container Spare Parts

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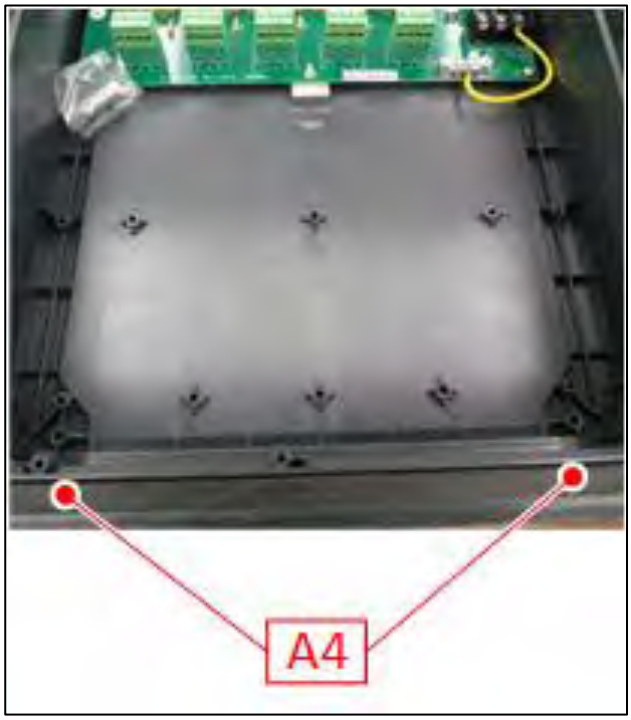
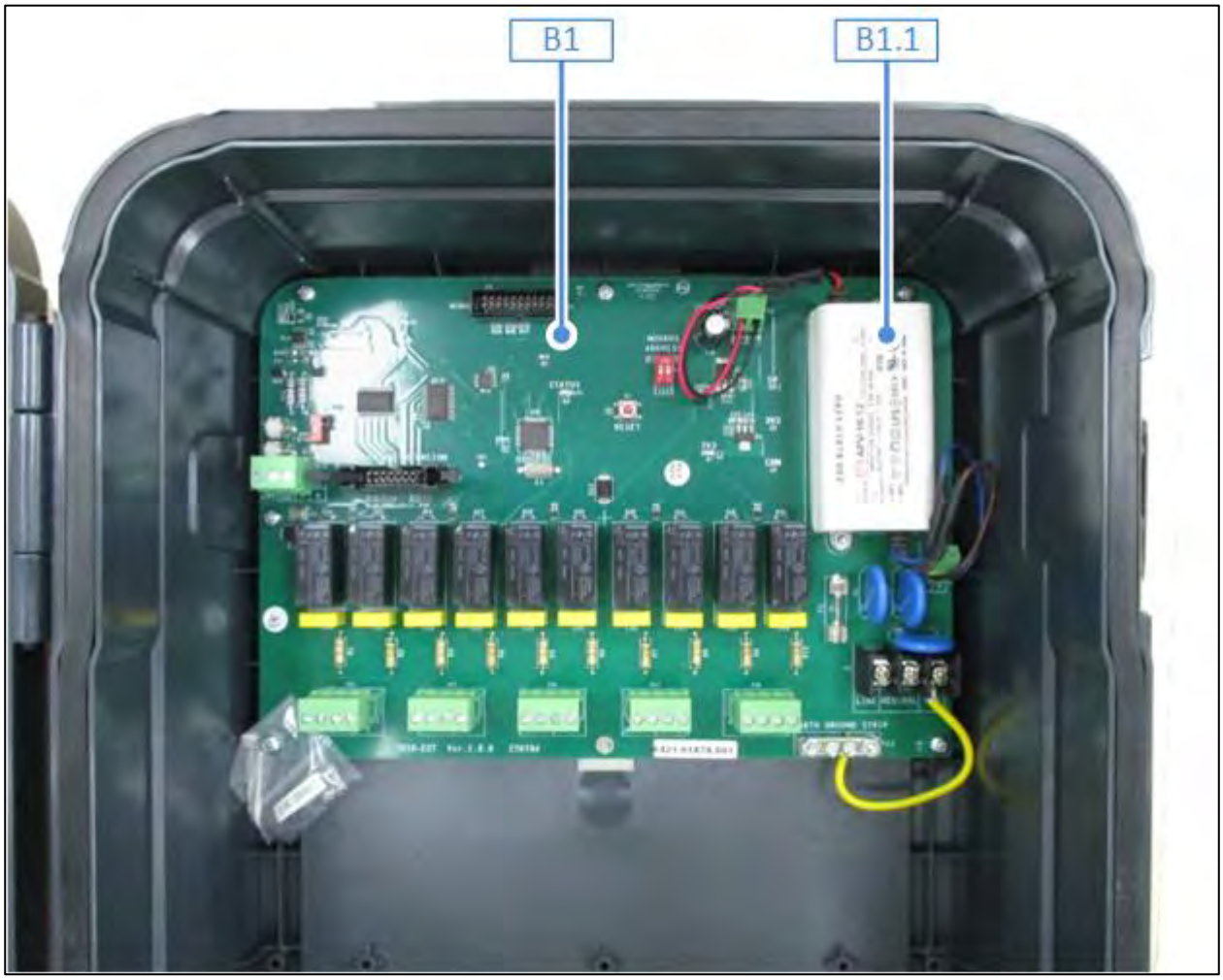
### 9.6.2.1 Trio Expansion 10 Container Spare Parts




© Munters AB, 2020

| ID No. | Description | Catalog Number | Note |
|---|---|---|---|
| A1.1 | TRIO FRONT DOOR EXP PLASTIC PART V1.0.0 (SP: 207129) | MPN: 940-99-00028 | |
| | | DPN: | |
| A1.2 | TRIO-20 PLASTIC BOX BASE (SP: 207124) | MPN: 940-99-00112 | |
| | | DPN: | |
| A1.3 | TRIO HINGE PLASTIC PIN V1.0.0 (SP-207128) | MPN: 940-99-00019 | |
| | | DPN: | |
| A2.1 | TRIO-20 PANEL PLASTIC PART BLUE LOGO MUNTERS + PART BLUE | MPN: 940-99-00001 | OR |
| | | DPN: | |
| A2.2 | TRIO PANEL PLASTIC PART RED RAL 3020 NO LOGO (SP-207138) | MPN: 940-99-00045 | |
| | | DPN: | |
| A3.1 | GENERAL PLASTIC LATCH | MPN: 900-99-00216 | |
| | | DPN: | |
| A3.2 | ONE/ONE PRO LATCH GENERAL LOCK PLASTIC PART + LOCK FOR LATCH | MPN: 900-99-00217 | |
| | | DPN: | |
| A4 | MID-RANGE MAIN GASKET V1.0.0 (SP-207122) | MPN: 940-99-00021 | |
| | | DPN: | |

## 9.6.2.2 Trio Expansion 10 Main Container Spare Parts

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| ID No. | Description | Catalog Number |
|---|---|---|
| B1 | TRIO-EXP 10 CARD (SP: R-TRIO-EXP10) | MPN: 940-99-00029 |
| | | DPN: |
| B1.1 | SWPS APV-16-12 Mean Well 115V/230V 12V 16W (SP: 370153) | MPN: 999-99-00338 |
| | | DPN: |

### 9.6.3 TRIO EXPANSION 20 SPARE PARTS

- Trio Expansion 20 Container Spare Parts
- Trio Expansion 20 Main Container Spare Parts

#### 9.6.3.1 Trio Expansion 20 Container Spare Parts

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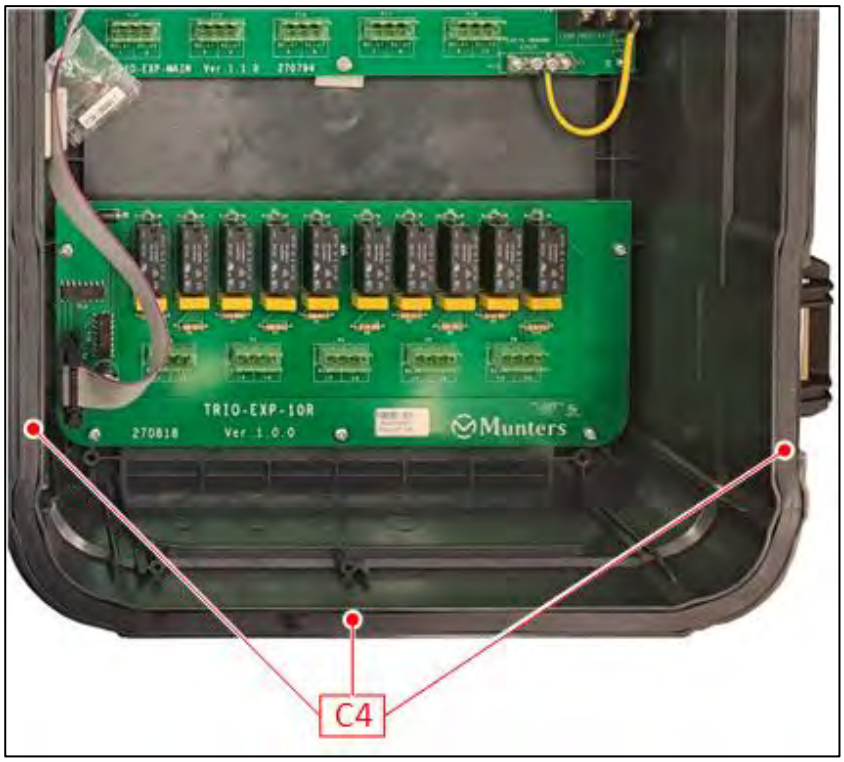


| ID No. | Description | Catalog Number | Note |
|---|---|---|---|
| C1.1 | TRIO FRONT DOOR EXP PLASTIC PART V1.0.0 (SP: 207129) | MPN: 940-99-00028<br>DPN: | |
| C1.2 | TRIO-20 PLASTIC BOX BASE (SP: 207124) | MPN: 940-99-00112<br>DPN: | |
| C1.3 | TRIO HINGE PLASTIC PIN V1.0.0 (SP-207128) | MPN: 940-99-00019<br>DPN: | |
| C2.1 | TRIO-20 PANEL PLASTIC PART BLUE LOGO MUNTERS + PART BLUE | MPN: 940-99-00001<br>DPN: | OR |
| C2.2 | TRIO PANEL PLASTIC PART RED RAL 3020 NO LOGO (SP-207138) | MPN: 940-99-00045<br>DPN: | |
| C3.1 | GENERAL PLASTIC LATCH | MPN: 900-99-00216<br>DPN: | |
| C3.2 | ONE/ONE PRO LATCH GENERAL LOCK PLASTIC PART + LOCK FOR LATCH | MPN: 900-99-00217<br>DPN: | |
| C4 | MID-RANGE MAIN GASKET V1.0.0 (SP-207122) | MPN: 940-99-00021<br>DPN: | |

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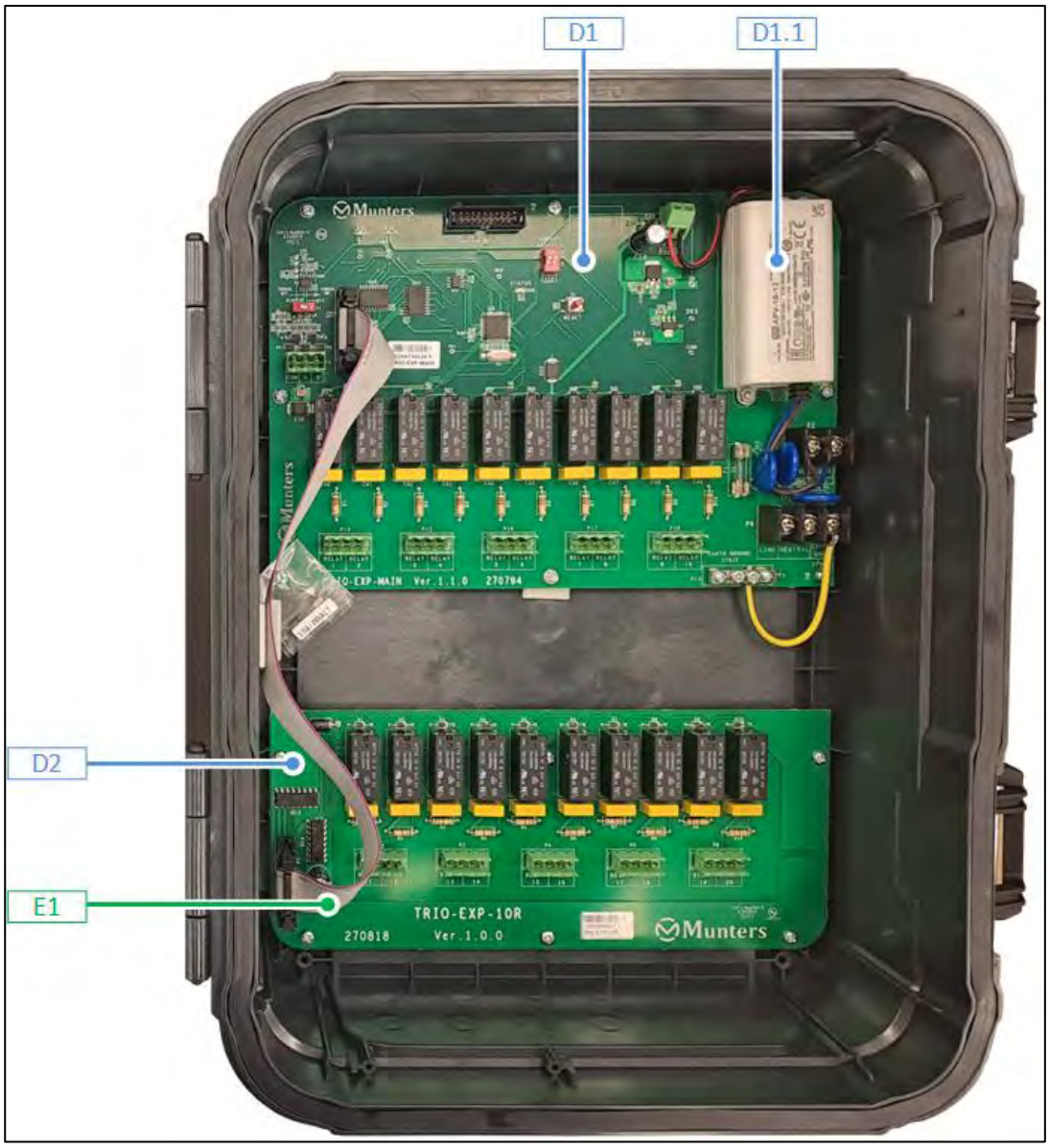
## 9.6.3.2 Trio Expansion 20 Main Container Spare Parts




| ID No. | Description | Catalog Number |
|---|---|---|
| D1 | TRIO-EXP 10 CARD (SP: R-TRIO-EXP10) | MPN: 940-99-00029 |
| | | DPN: |
| D1.1 | SWPS APV-16-12 Mean Well 115V/230V 12V 16W (SP: 370153) | MPN: 999-99-00338 |
| | | DPN: |
| D2 | TRIO EXP 10 RELAY ADDIT CARD (TRIO-EXP-10R) | MPN: 940-99-00159 |
| | | DPN: |

| ID No. | Description | Catalog Number |
|---|---|---|
| E1 | FLAT FF14P 34cm (TRIO EXP)<F"D_F"D> (SP-141201) | MPN: 940-99-00168 |
| | | DPN: |

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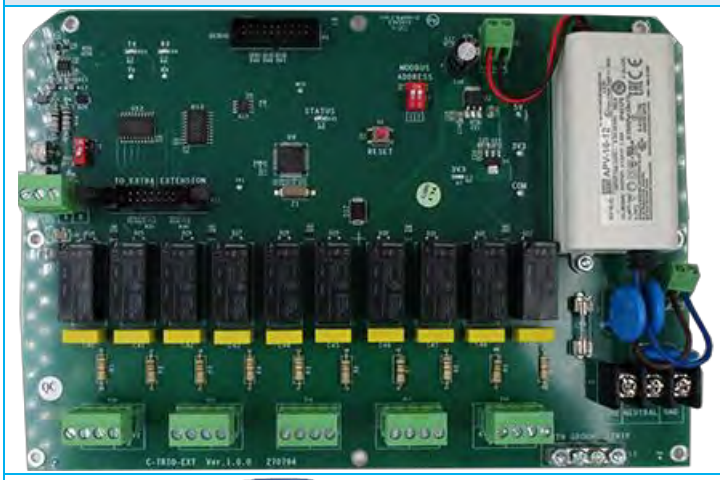
## 9.6.4 Additional Options

| ID No. | Description | Catalog Number |
|---|---|---|
| ADO 1 | Trio Expansion: 10 Relays To 20 Relays Upgrade Kit | MPN: 940-99-00169 |
| | | DPN: |

## 9.6.5 Cards

| Card | Catalog | Catalog Number |
|---|---|---|
|  | R-TRIO-EXP10: TRIO EXP 10 CARD | 940-99-00029 |
| | 370153: SWPS APV-16-12 Mean Well 115V/230V 12V 16W | 999-99-00338 |
| | R-TRIO-EXP-10R: CARD EXP RLY ADDIT 10 TRIO | 940-99-00159 |

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# 10 Appendix C: Trio 20 Cell Modem Installation

This document details how to install and configure a cell modem in a Trio 20 unit lacking this device.

- Prerequisites
- Installation

## 10.1 Prerequisites

- Supported Devices
- Required Software
- Internet Access

### 10.1.1 Supported Devices

Trio Display Card Version 1.1.0 or above supports the modem.

- Order: 940-99-00049 Trio GLOBAL LTE CELL MODEM & EXTERNAL ANTENNA.
- For Trio Display Board versions 1.0 or lower, contact Customer Success.

*Figure 56: SIM 940-99-00049 Front and Back*

### 10.1.2 Required Software

Trio cell modem requires the following software installations:

- Image Version 1.5.  Consult with a Munters technician on how to install the image.
- Software Version 5.0 or higher.  Upgrade this software via the Trio Software Upgrade screen.

### 10.1.3 Internet Access

Trio 20 has a priority system for internet access:

1. LAN connection
2. WIFI
3. Cell modem

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If a LAN connection is available, Trio 20 automatically connects to the web via the LAN only, even if the unit supports WIFI or a cell modem connection.  If there is no LAN, Trio 20 uses WIFI. Trio 20 will only use the cell modem when the first two options are not available.

## 10.2 Installation

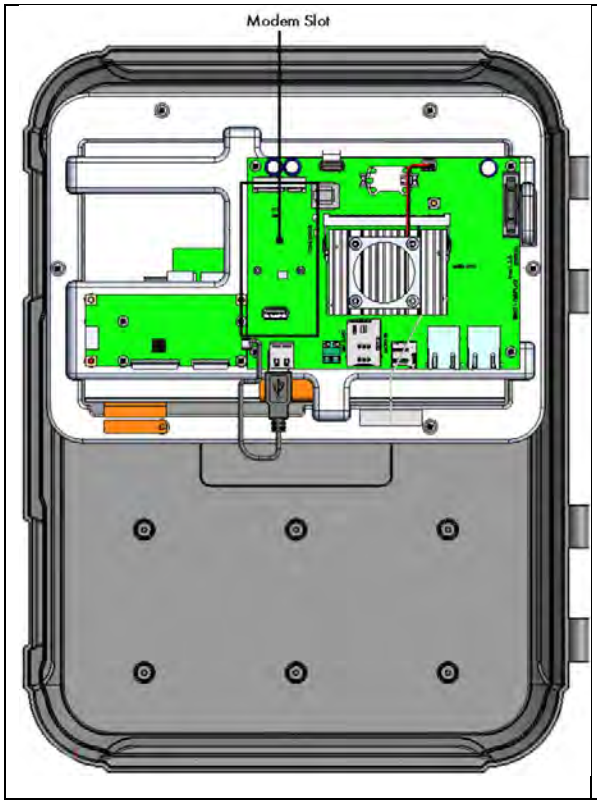
- Physical Installation
- Configuration

### 10.2.1 PHYSICAL INSTALLATION

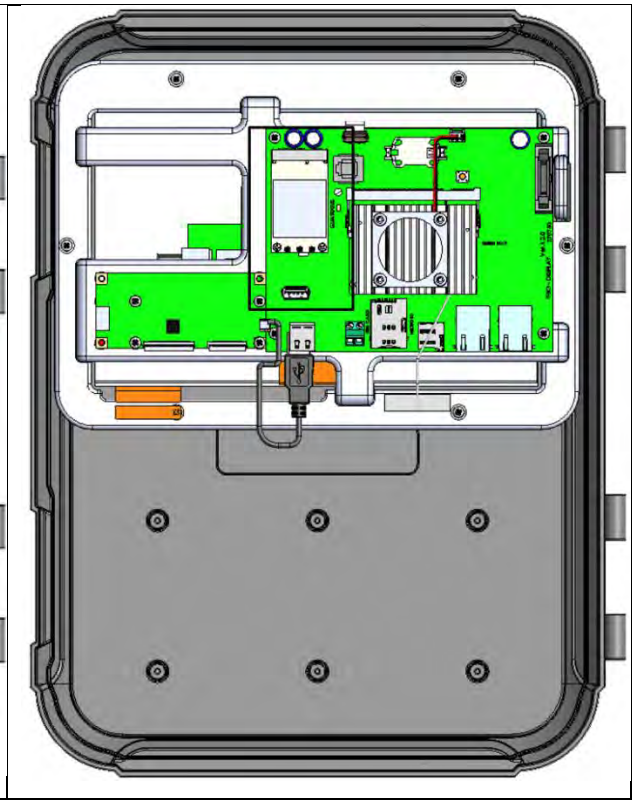
- Modem and SIM Card
- Driilling

#### 10.2.1.1Modem and SIM Card

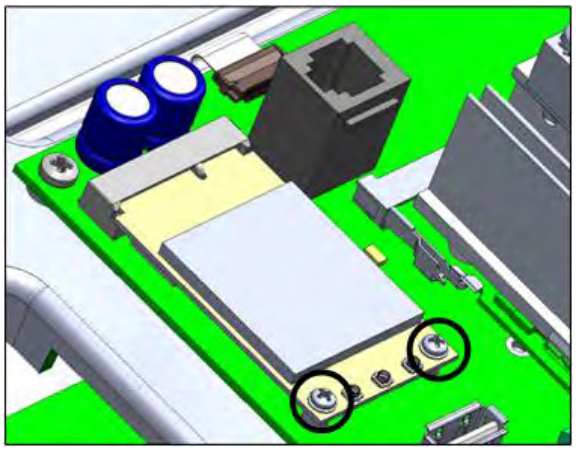
1. Locate the designated spot for the modem.



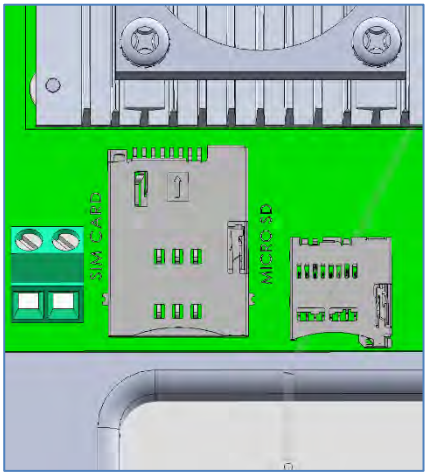

2. Insert the modem into the connector and secure it using the two screws supplied.



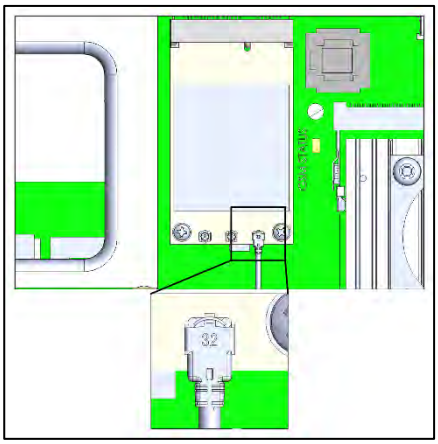
© Munters AB, 2020



3. Insert the SIM card into the SIM port.




4. Gently press the cable connector onto the modem.



5. Thread the modem cable to the connector as shown below.

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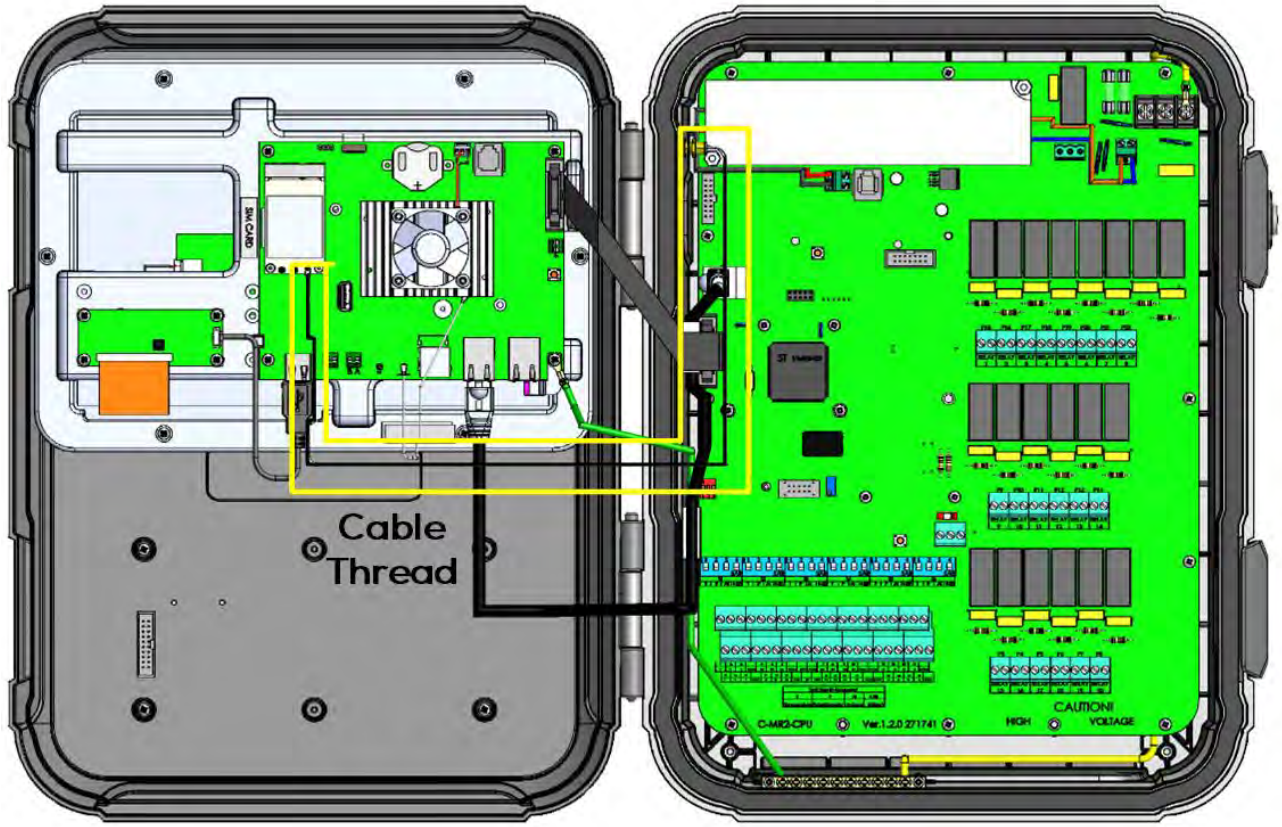


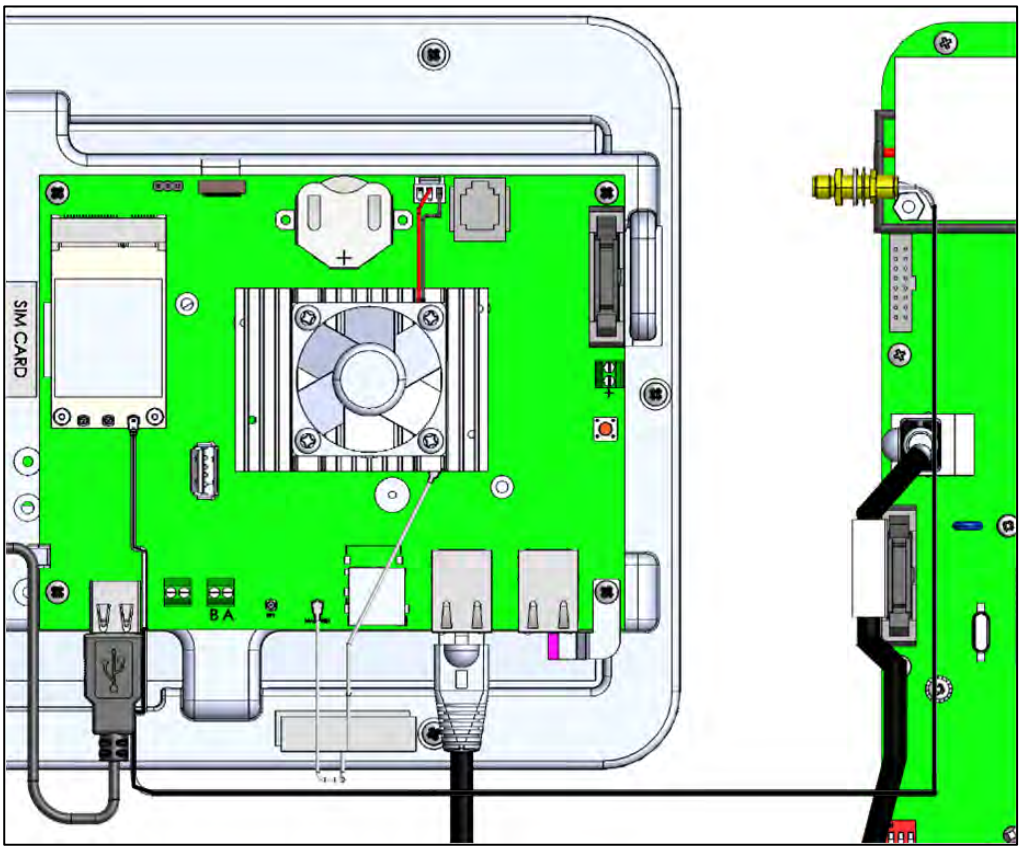


6. Remove the plug in the spot designated for the SMA connector.

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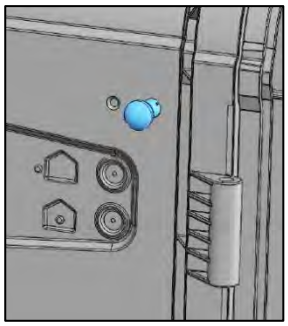
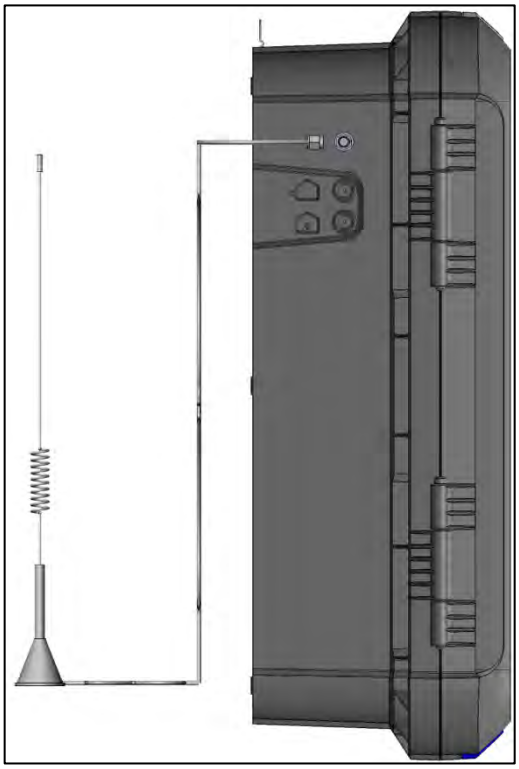
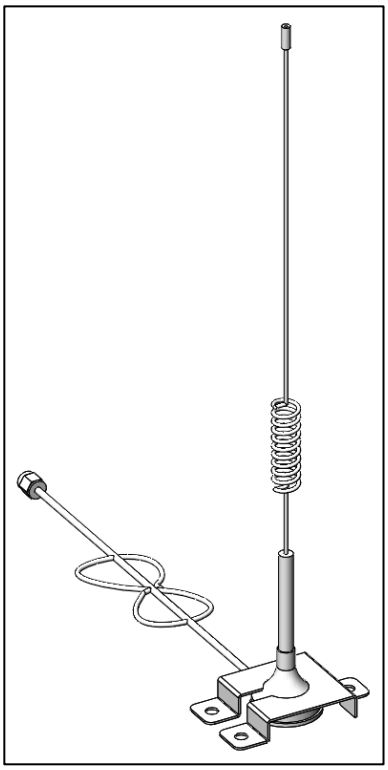


7. Remove the sealing cap and attach the antenna. (For older units, refer to the next section.)



8. Secure the antenna using the brace provided.



### 10.2.1.2 Driilling

In the event that the Trio 20 unit was shipped before 08/2022, a hole must be drilled for the SMA connector.

1. Drill a **6.5-millimeter hole** in the spot shown below.

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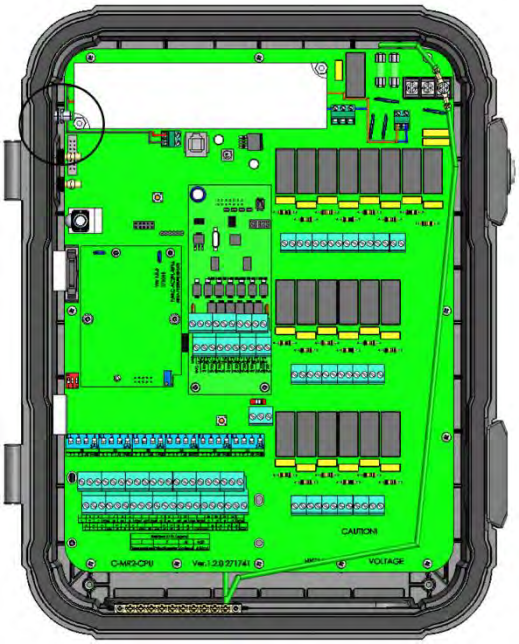
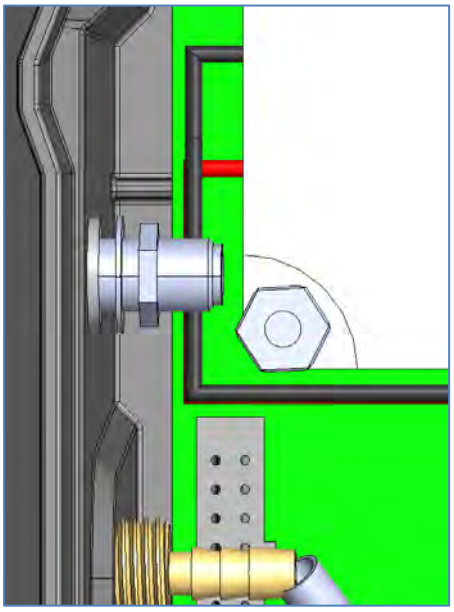
2. Insert and secure the SMA connector.





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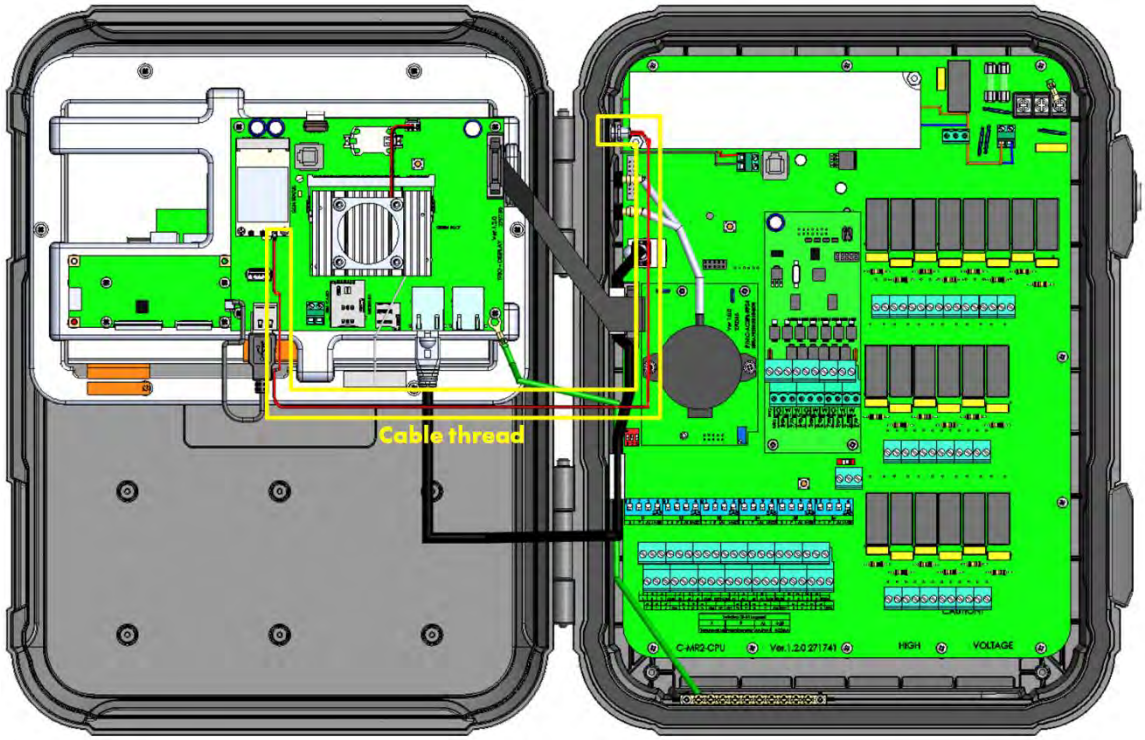
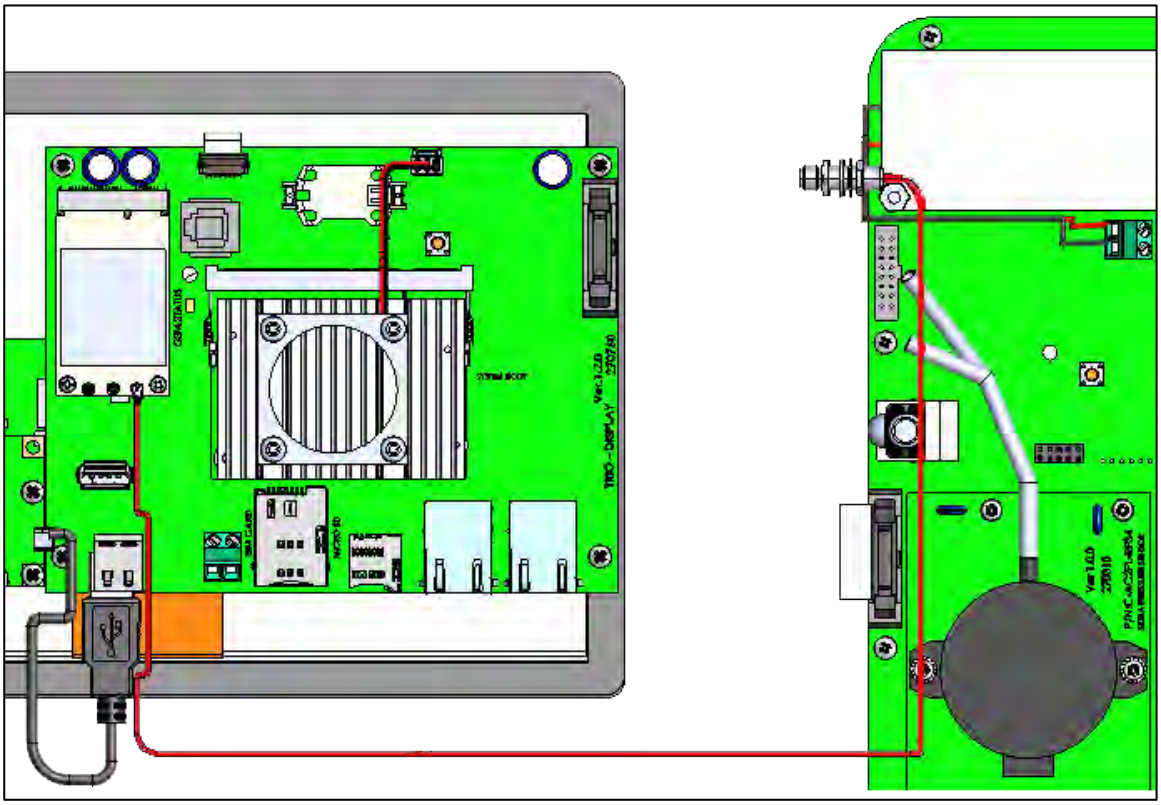
3. Thread the modem cable to the connector as shown below.



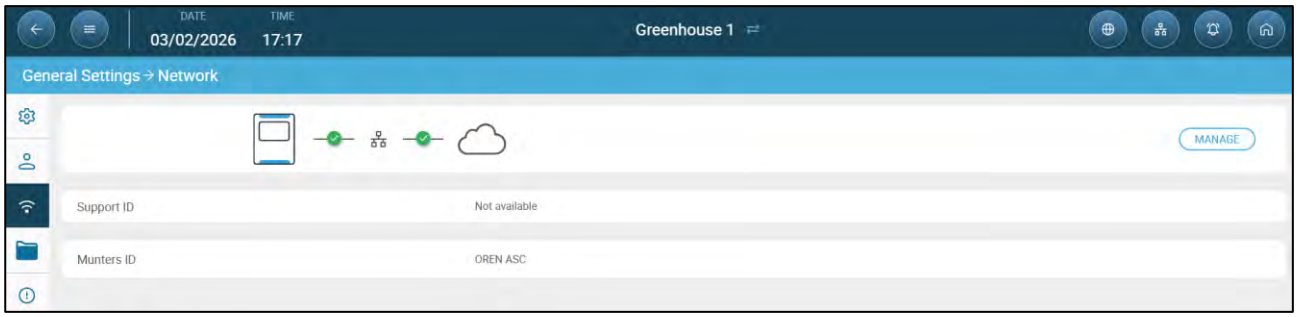



## 10.2.2 CONFIGURATION

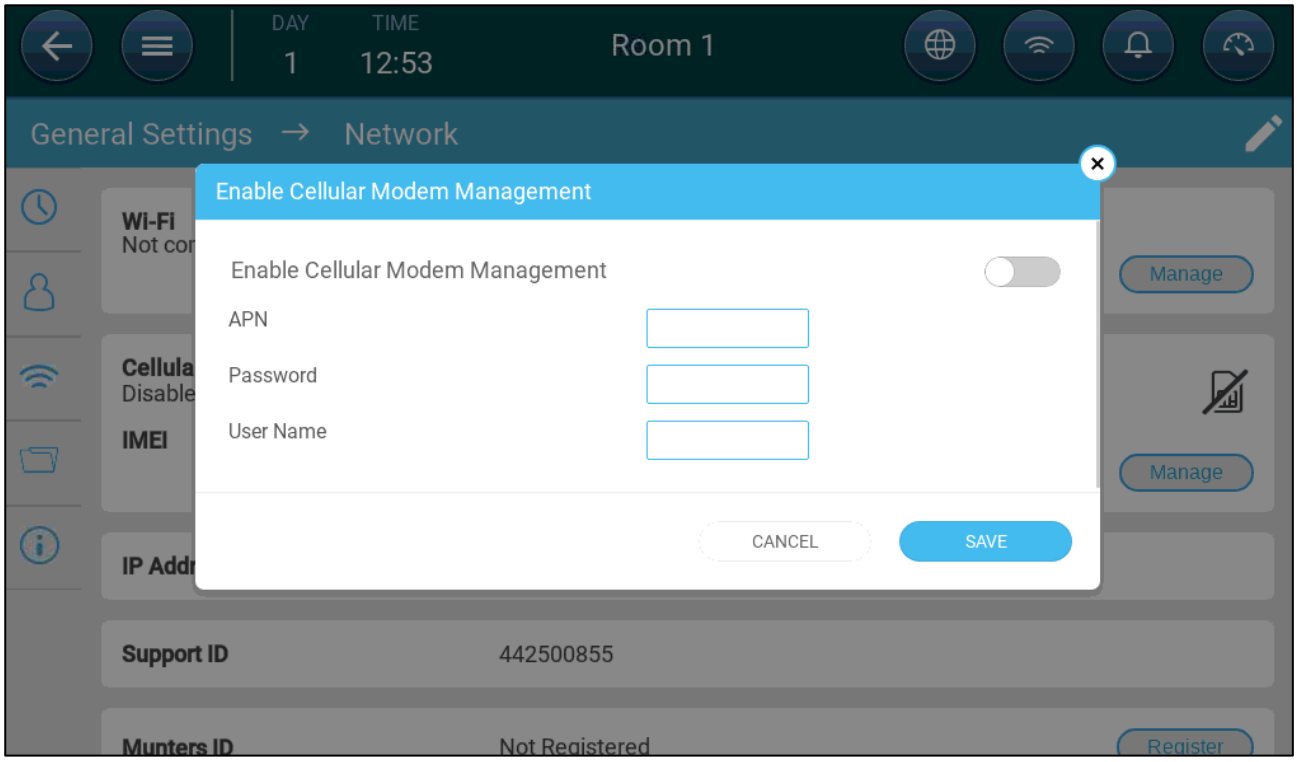
*NOTE The cellular Modem function appears only if a modem is installed with a working SIM card.*

To configure the cell modem:

1. Go to System > General Settings > Network.




2. Under Cellular Modem, click Manage.




3. Under Cellular Modem, click Manage.
4. Final steps:
    a. Enable the modem.
    b. Using data provided by your service provider, enter the data in the fields.
    c. Click Save.

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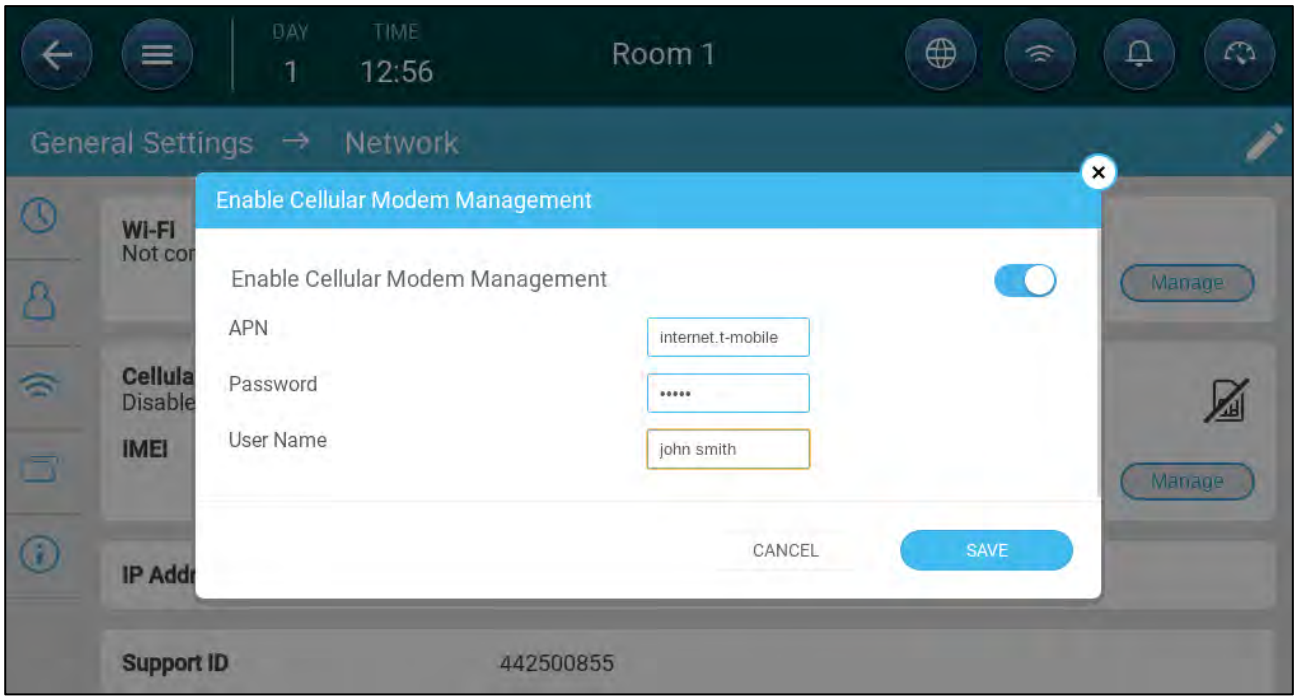


*(example only!)*

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# 11Appendix D: Panel Mount Installation

The following section details the Trio 20 Panel Mount and Trio Expansion Panel Mount installation.

- Trio 20 Panel Mount Installation
- **Trio Expansion Panel Mount Installation**

## 11.1 Trio 20 Panel Mount Installation

The Trio 20 Panel Mount consists of two elements, connected by flat ribbons and internet cable:

- Front panel (CPU panel)
- Rear panel (relay / card panel)

- Precautions
- Panels
- Panel Dimensions
- Mounting the Panels
- Panel Cables
- Powering and Alarms
- Grounding

### 11.1.1 PRECAUTIONS

Ensure the following:

- The setup meets electrical, mechanical and fire enclosure requirements.
- Clearance and creepage distances are maintained.
- Grounding meets industry standards.
- Ambient temperatures do not go above product requirements (50° C).
- If this unit is installed in an electrical closet, ensure that no contactors are in that closet. Placing this unit in proximity to contactors results in severe signal interference.

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### 11.1.2 PANELS

*Figure 57: Trio CPU Panel, Front View*

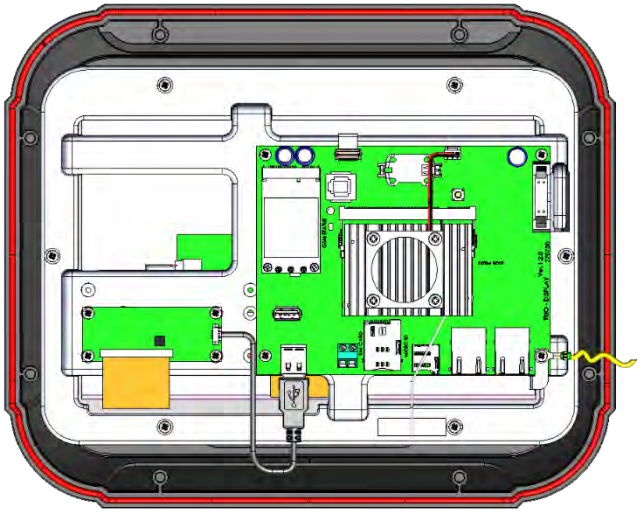

*Figure 58: Trio CPU Panel, Rear View*

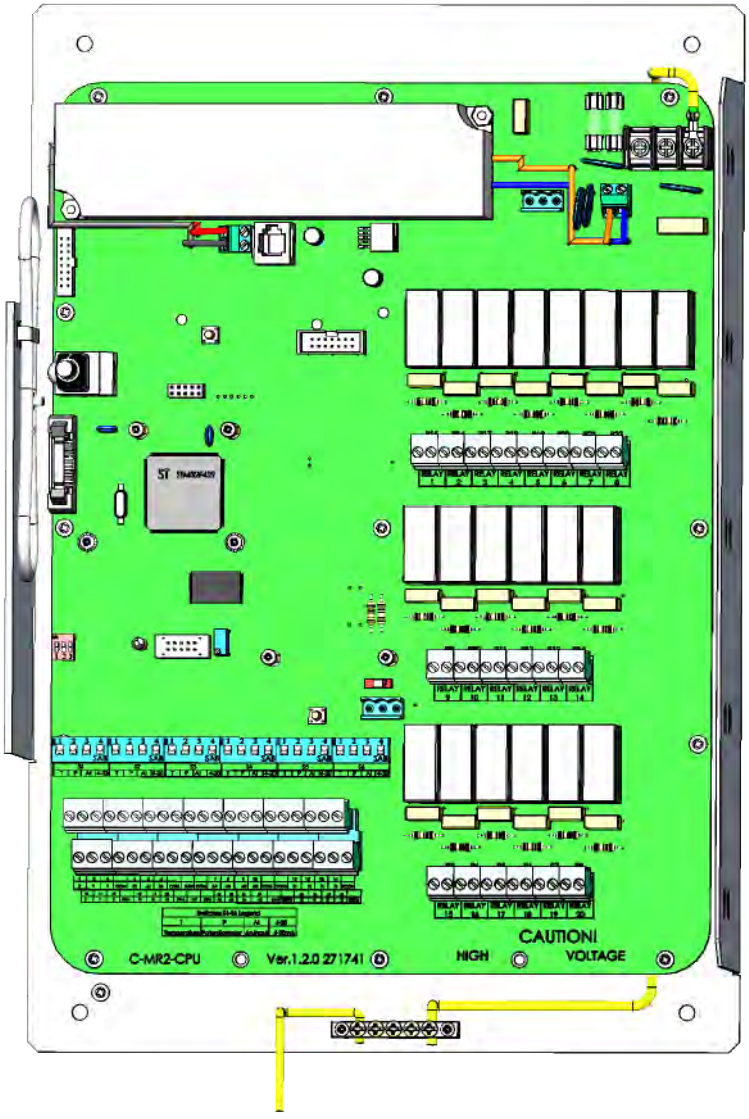


*Figure 59: Trio Relay Panel, Front View*

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### 11.1.3 PANEL DIMENSIONS

Distances are in millimetres.

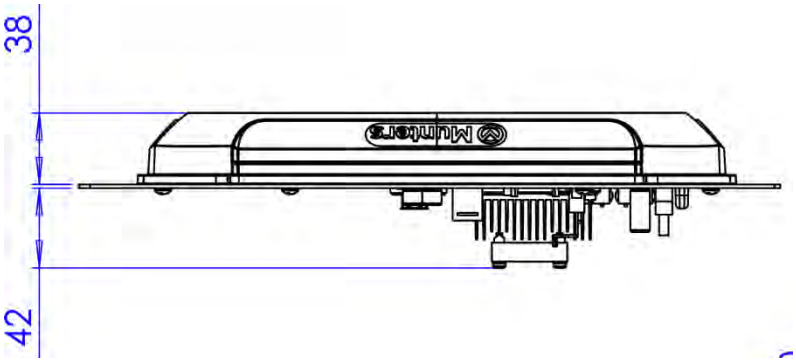


*Figure 60: Front Panel Depth Dimensions*

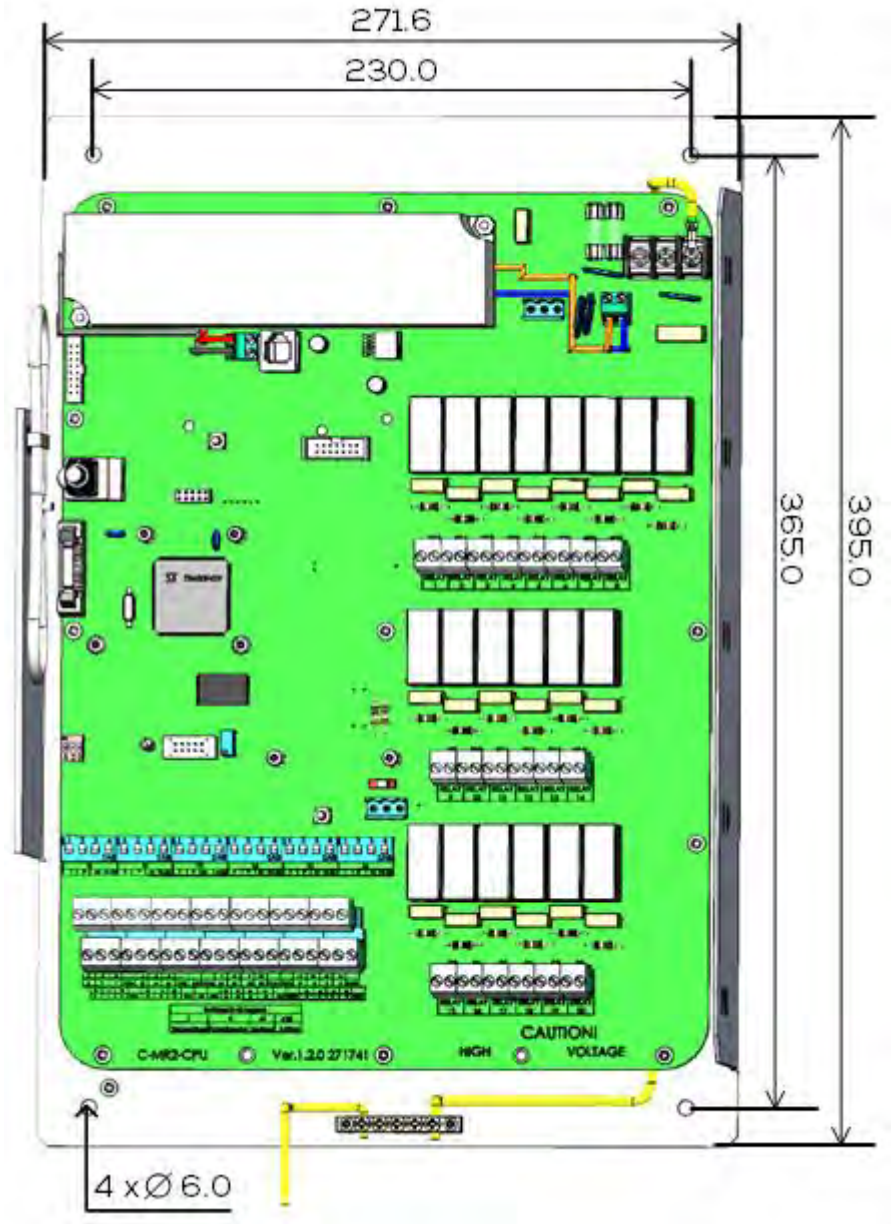


*Figure 61: Rear Panel Dimensions*

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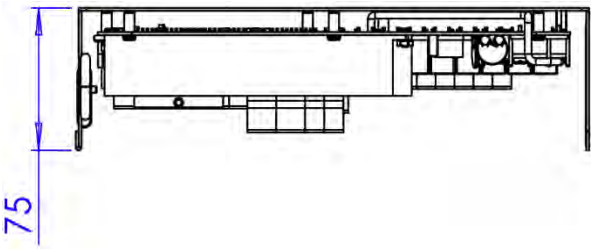


*Figure 62: Rear Panel  Depth Dimensions*

### 11.1.4 MOUNTING THE PANELS

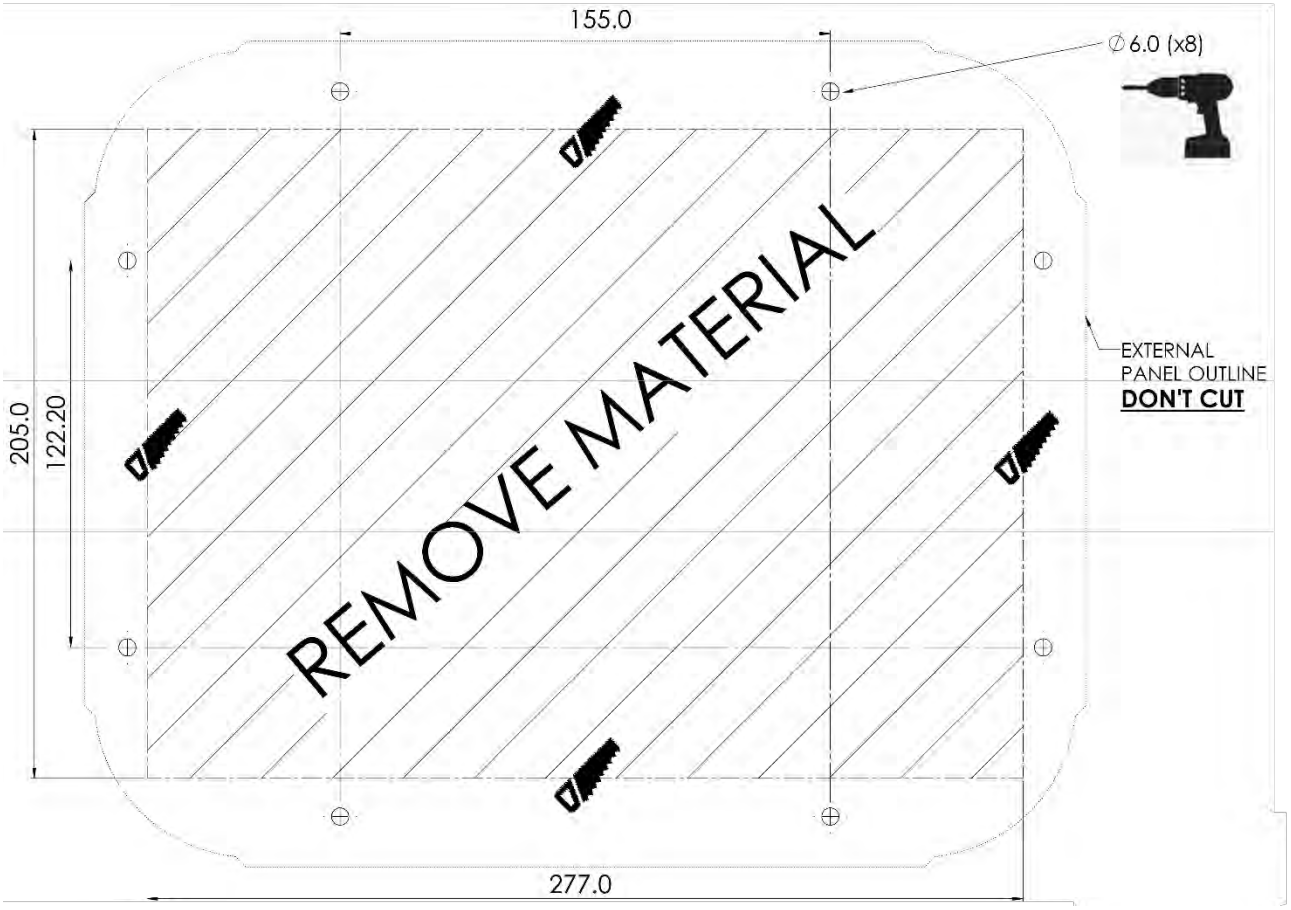


*Figure 63: Panel Cutting and Drilling Dimensions (millimeters)*

- Drill eight holes as indicated above.
- Using the dimensions shown, cut out a space into which the CPU Front Door is placed.

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### 11.1.5 PANEL CABLES

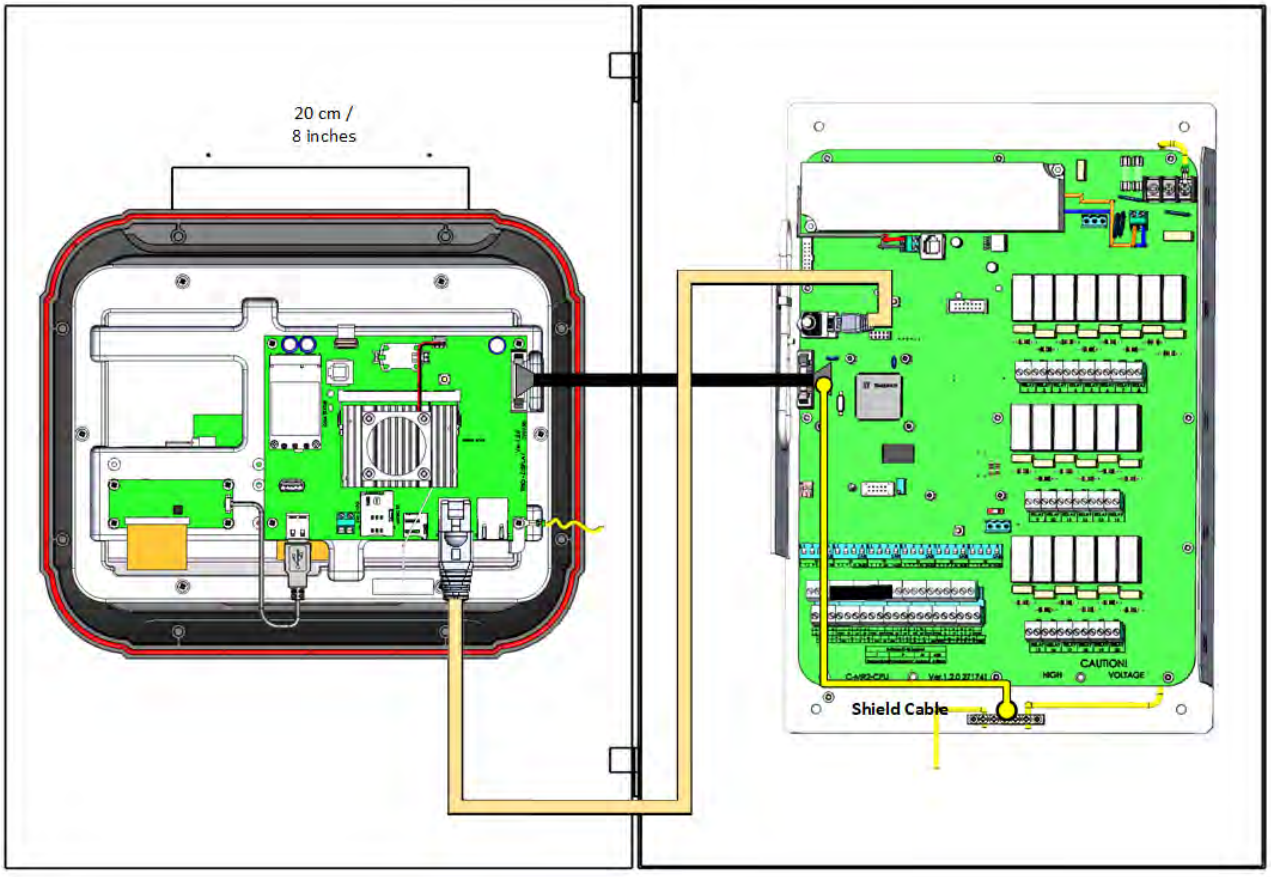


*Figure 64: Panel Mount, Open Closet (sizes are not to scale)*

- Connect the flat cable and internet cable as shown above.
- Mount the Trio 20 Panel Front Door on the left door (hinge on left side).
- The distance between the Front Door and the Rear Panel must be less than one (1) meter!
- Make sure that there is at least 20 cm/8 inches between the Trio relay plate and any power contactors or other metal equipment.
- Any inverter must be at least five meters away from the controller.
- To prevent signal disruption, do not run sensor wiring via the DIN rails.
- Do not run power wires through the area of the Trio relay plate.

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### 11.1.6 POWERING AND ALARMS

- Connect the light or siren device to the alarm relay.

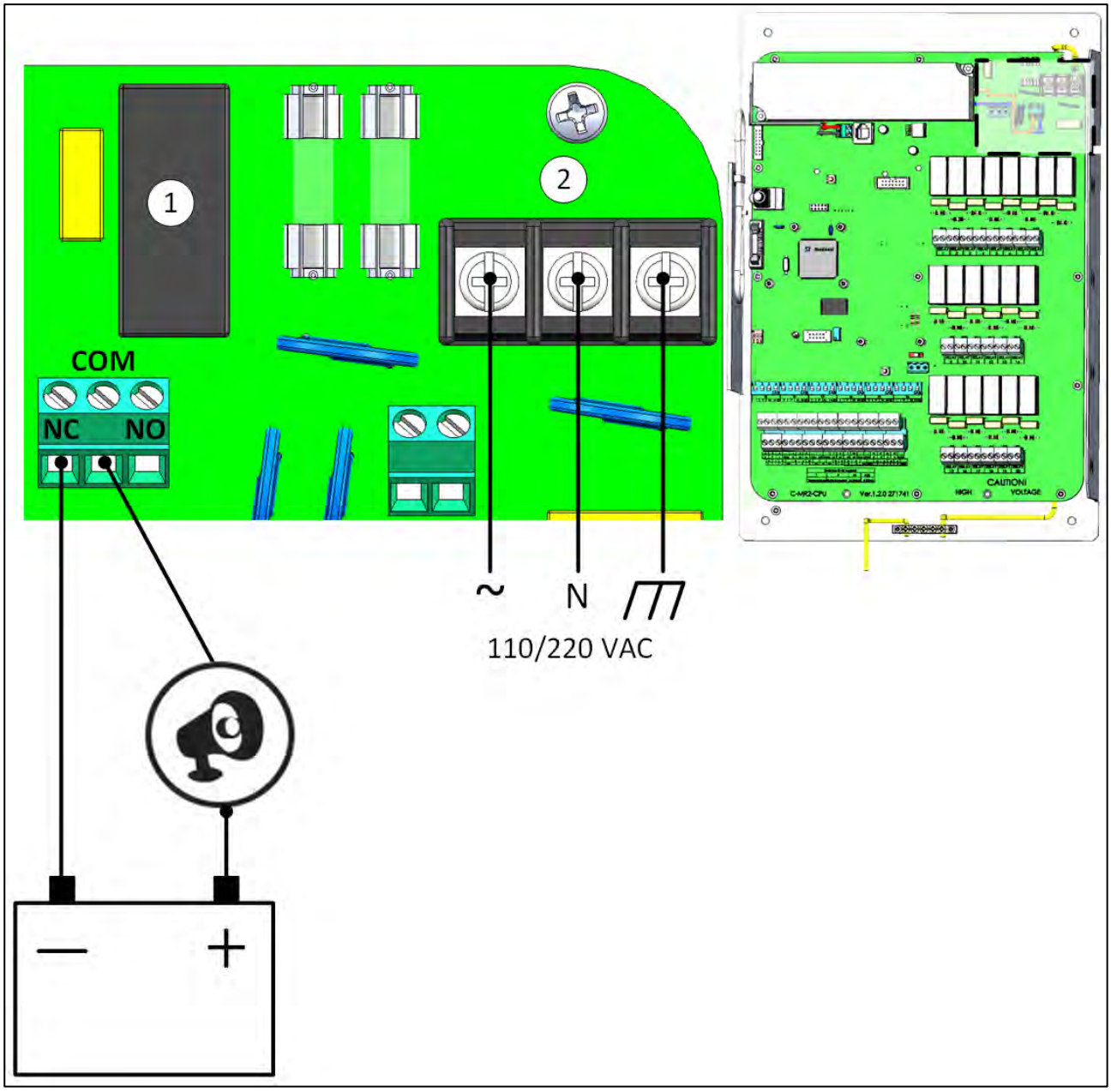


*Figure 65: Alarm relay and power ports*

| | |
|---|---|
| 1 | Alarm relay |
| 2 | Power ports |

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### 11.1.7 GROUNDING

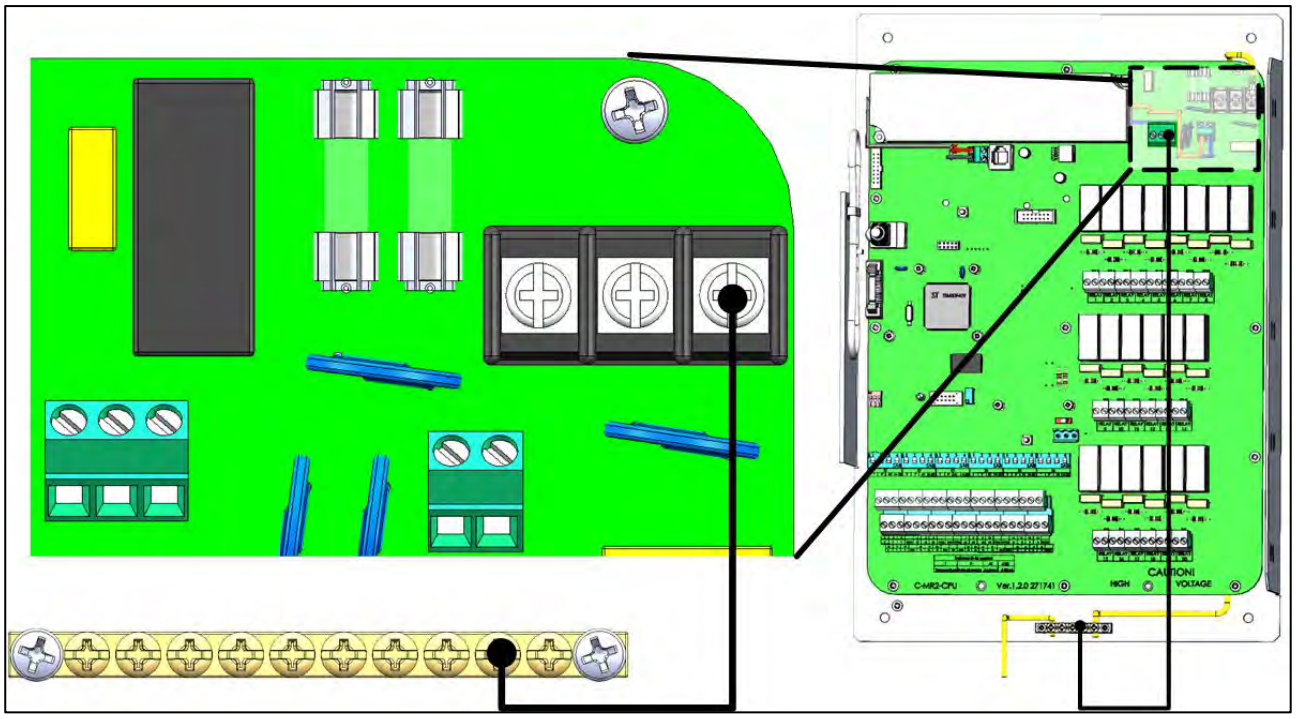

*Figure 66: Grounding*

*CAUTION The unit must be grounded at all times!*

## 11.2 Trio Expansion Panel Mount Installation

The Trio Expansion Panel Mount) consists of two elements, connected by flat ribbons and internet cable:

Trio Expansion Panel supports 10 or 20 relays.

- 10 relays: P/N 940-10-10001
- 20 relays: P/N 940-10-10002

- Precautions
- Panels
- Panel Dimensions
- Panel Expansion Wiring

### 11.2.1 PRECAUTIONS

Ensure the following:

- The setup meets electrical, mechanical and fire enclosure requirements.
- Clearance and creepage distances are maintained.
- Grounding meets industry standards.
- Ambient temperatures do not go above product requirements (50° C).
- Ensure that no contactors are in that closet. Placing this unit in proximity to contactors results in severe signal interference.

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### 11.2.2 PANELS

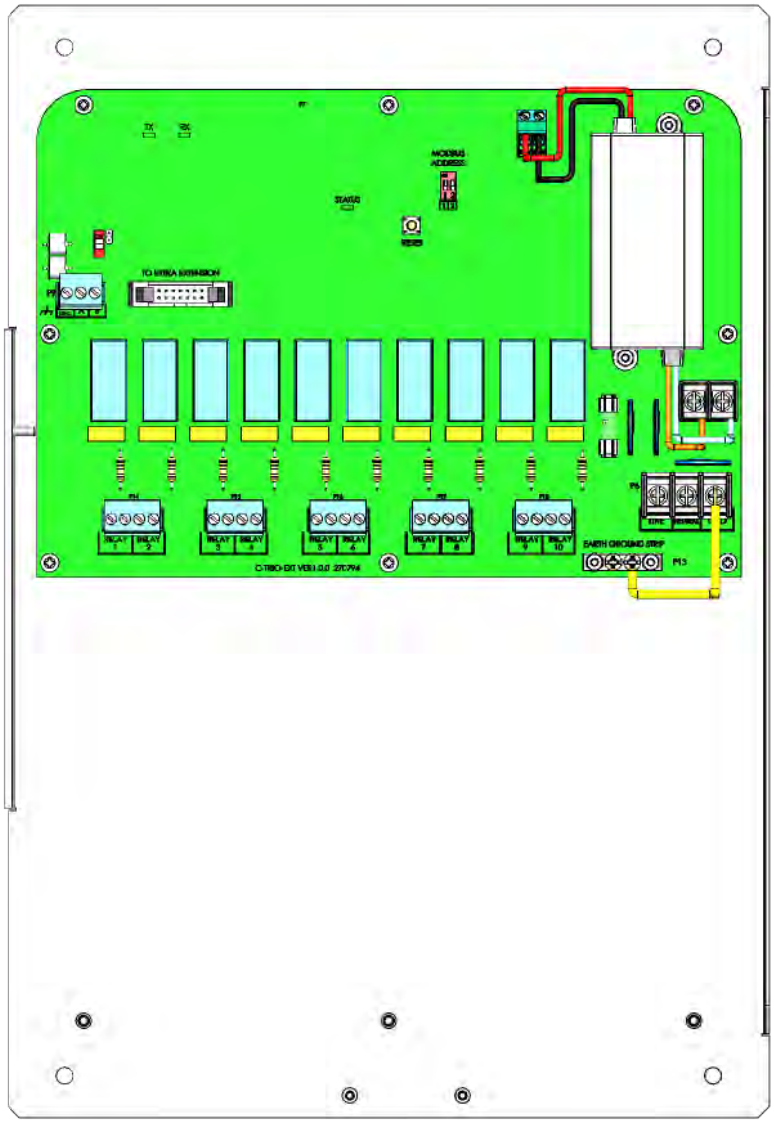

*Figure 67: Trio Expansion 10 Relay Panel, Front View*

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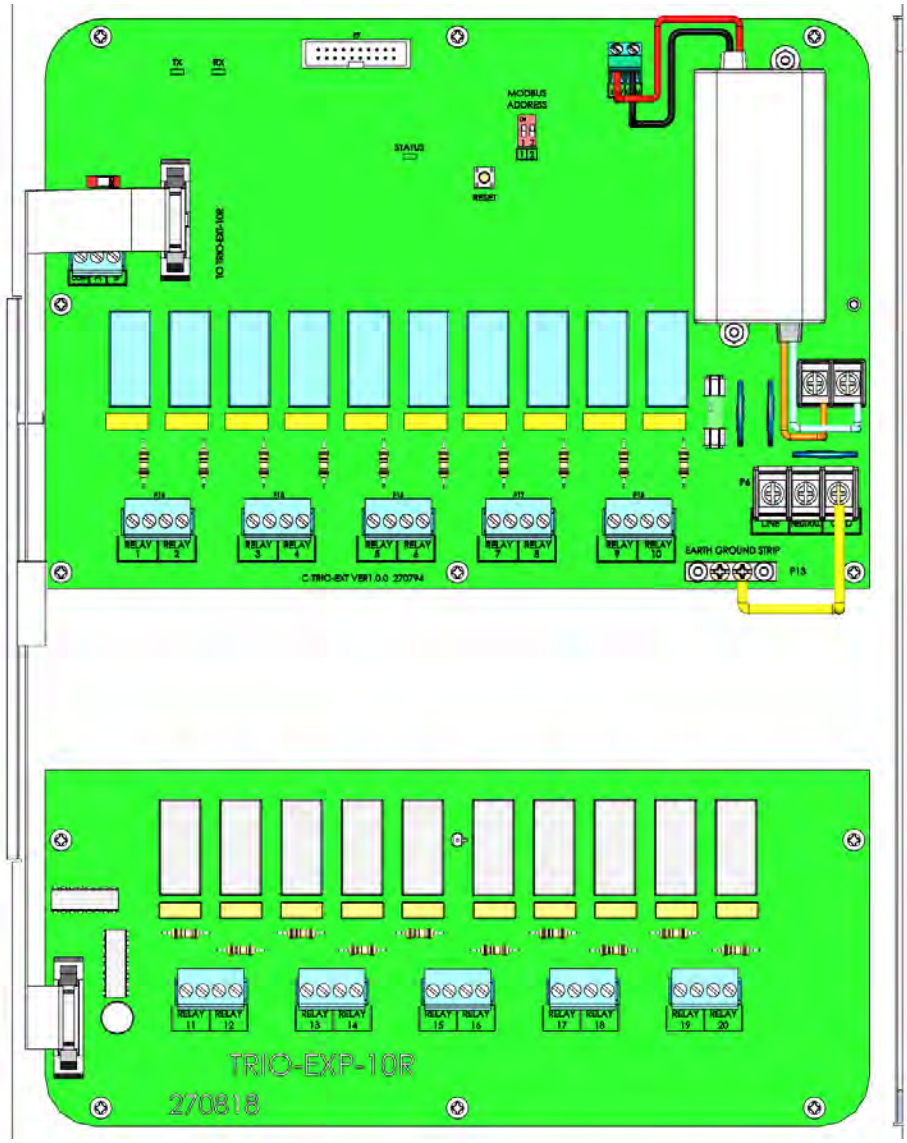


*Figure 68: Trio Expansion 20 Relay Panel, Front View*

© Munters AB, 2020

### 11.2.3 PANEL DIMENSIONS

Distances are in millimetres.

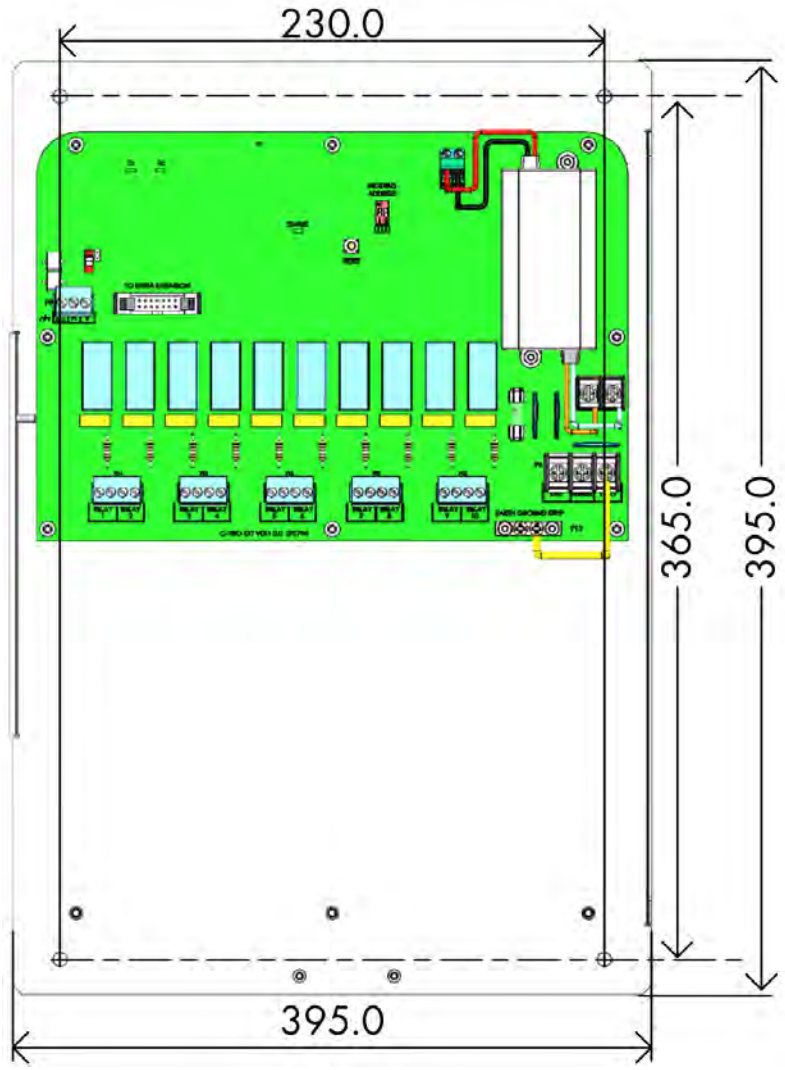


*Figure 69: Expansion Rear Panel Dimensions*

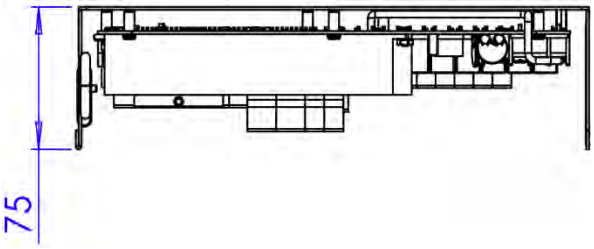


*Figure 70: Rear Panel  Depth Dimensions*

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### 11.2.4 Panel Expansion Wiring

Connecting the Trio to its Expansion Unit consists of three steps:

- Wiring
- Address
- Restart

#### 11.2.4.1Wiring

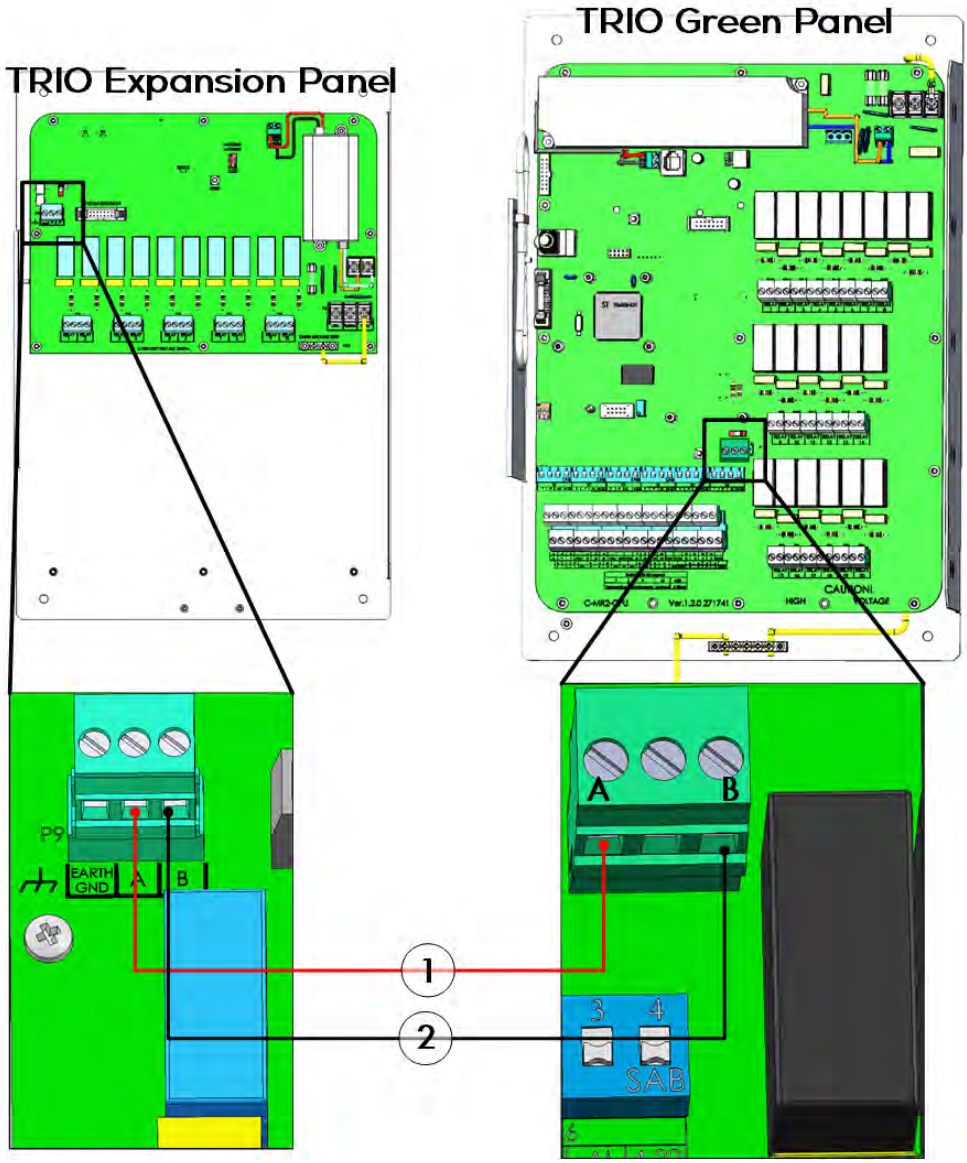


*Figure 71: Panel Mount/Expansion Panel Mount Wiring*

- The cable between the controller and the expansion unit should be a 4-wire twisted shielded cable (22 or 24 AWG).
- 1 – red wire
- 2 – black wire

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### 11.2.4.2 Address

The Trio Panel can support one expansion unit. Verify that both dipswitches in the Modbus Address are set to ON.

*Figure 72: Panel Expansion Address*

### 11.2.4.3 Restart

After connecting the units and verifying the Modbus address, reset the factory settings.

1. Go to System › General Settings › .
2. Click

.
3. Follow the on-line instructions. You have the option of backing up the settings. Refer to the User Manual for more information.

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### 11.2.5 POWER

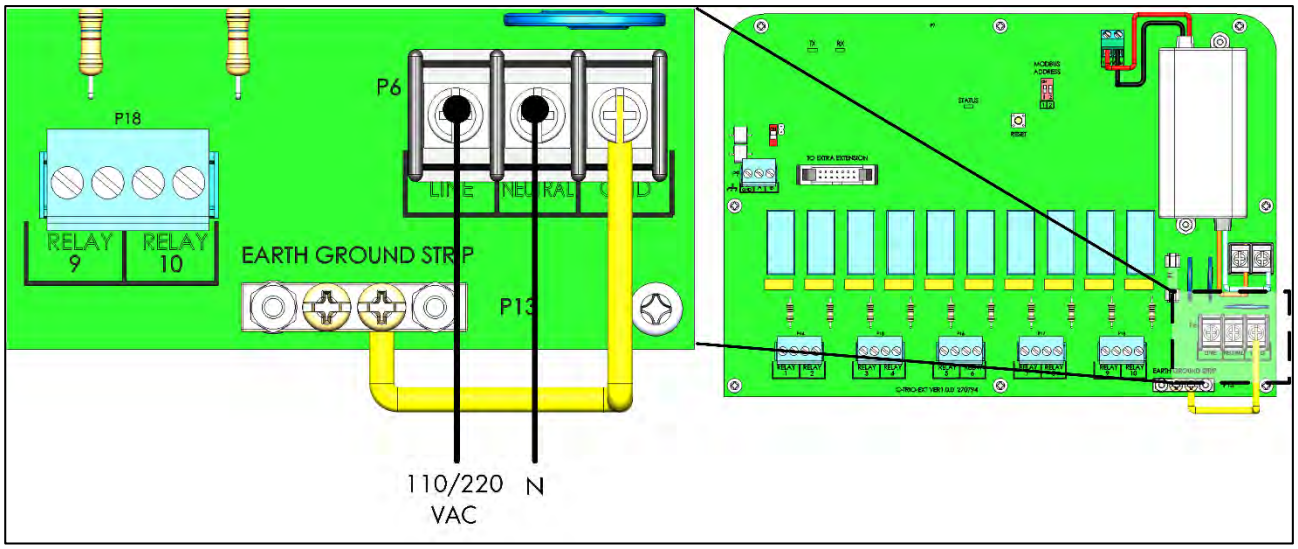


*Figure 73: Power ports*

# 12 Appendix E: Ethernet Requirements

## 12.1 Wire/Optical Ethernet Infrastructure Basics

- Wire Ethernet 1100/1000 BaseT Copper
  - Media – CAT5E or CAT6 Cable with maximum segment length of 100 meters
- Optical Ethernet 1000Base-X Optical
  - 1000Base-SX Media – Short Haul multi-mode optic fiber (MMF) with maximum segment length of 220 meters (62.5/125µm type) or 550 meters (50/125µm type)
  - 1000Base-LX Media – Long Haul single-mode optic fiber (SMF) with maximum segment length of 10000 meters
- Connectivity
  - Connectivity is Point-to-Point using 100/1000 Switches
  - Low latency network
- Equipment
  - Wire Switch serves for Ethernet switching over wire connectivity
    - Could be with preinstalled specific Optic Transceiver (short or long haul)
    - Could be with the SFP port, serving for pluggable SFP Optic Transceiver
  - SFP Transceiver pluggable device serving to transmit data over optic fiber
    - 1000Base-SX SFP serves for multi-mode optic fiber (MMF) of 62.5/125µm type or 50/125µm type
    - 1000Base-LX SFP serves for single-mode optic fiber (SMF)
  - Media Converters server for converting from optics to wire and vice versa. This is used for segments over 100 meters / 330 feet.

## 12.2 Trio Connectivity: 100/1000Gbps Ethernet Switch

- The switch is wired to the router and modem to access the Internet.
- Switches can be wired to each other by Ethernet cables, each one splitting off to other devices.
- Gigabit switches support 100 and 1,000 Mbps.

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# 13 Warranty

Warranty and technical assistance

Munters products are designed and built to provide reliable and satisfactory performance but cannot be guaranteed free of faults; although they are reliable products they can develop unforeseenable defects and the user must take this into account and arrange adequate emergency or alarm systems if failure to operate could cause damage to the articles for which the Munters plant was required: if this is not done, the user is fully responsible for the damage which they could suffer.

Munters extends this limited warranty to the first purchaser and guarantees its products to be free from defects originating in manufacture or materials for one year from the date of delivery, provided that suitable transport, storage, installation and maintenance terms are complied with. The warranty does not apply if the products have been repaired without express authorisation from Munters, or repaired in such a way that, in Munters' judgement, their performance and reliability have been impaired, or incorrectly installed, or subjected to improper use. The user accepts total responsibility for incorrect use of the products.

The warranty on products from outside suppliers fitted to Trio 20 Green, (for example antennas, power supplies, cables, etc.) is limited to the conditions stated by the supplier: all claims must be made in writing within eight days of the discovery of the defect and within 12 months of the delivery of the defective product. Munters has thirty days from the date of receipt in which to take action, and has the right to examine the product at the customer's premises or at its own plant (carriage cost to be borne by the customer).

Munters at its sole discretion has the option of replacing or repairing, free of charge, products which it considers defective, and will arrange for their despatch back to the customer carriage paid. In the case of faulty parts of small commercial value which are widely available (such as bolts, etc.) for urgent despatch, where the cost of carriage would exceed the value of the parts, Munters may authorise the customer exclusively to purchase the replacement parts locally; Munters will reimburse the value of the product at its cost price.

Munters will not be liable for costs incurred in demounting the defective part, or the time required to travel to site and the associated travel costs. No agent, employee or dealer is authorised to give any further guarantees or to accept any other liability on Munters' behalf in connection with other Munters products, except in writing with the signature of one of the Company's Managers.

WARNING: In the interests of improving the quality of its products and services, Munters reserves the right at any time and without prior notice to alter the specifications in this manual.

The liability of the manufacturer Munters ceases in the event of:

- dismantling the safety devices;
- use of unauthorised materials;

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- inadequate maintenance;
- use of non-original spare parts and accessories.

Barring specific contractual terms, the following are directly at the user's expense:

- preparing installation sites;
- providing an electricity supply (including the protective equipotential bonding (PE) conductor, in accordance with CEI EN 60204-1, paragraph 8.2), for correctly connecting the equipment to the mains electricity supply;
- providing ancillary services appropriate to the requirements of the plant on the basis of the information supplied with regard to installation;
- tools and consumables required for fitting and installation;
- lubricants necessary for commissioning and maintenance.

It is mandatory to purchase and use only original spare parts or those recommended by the manufacturer.

Dismantling and assembly must be performed by qualified technicians and according to the manufacturer's instructions.

The use of non-original spare parts or incorrect assembly exonerates the manufacturer from all liability.

Requests for technical assistance and spare parts can be made directly to the nearest Munters office.

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