Installation Manual





Trio 20 Poultry Controller

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Trio 20 Poultry Controller

Installation Manual

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Product Software: Version 8.3.13

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

Munters reserves the right to make alterations to specifications, quantities, dimensions etc. for production or other reasons, subsequent to publication. The information contained herein has been prepared by qualified experts within Munters. While we believe the information is accurate and complete, we make no warranty or representation for any particular purposes. The information is offered in good faith and with the understanding that any use of the units or accessories in breach of the directions and warnings in this document is at the sole discretion and risk of the user.

1.2 Introduction

Congratulations on your excellent choice of purchasing a Trio Poultry 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
- Française

2.1 English

- 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 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.
- 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.

2.1.2 ELECTRICAL GUIDELINES

- Munters strongly recommends that only panel mount controllers should be installed directly in an electrical closet.
- Placing this unit in proximity (2 meters/6.5 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 14 for details. These are vital to ensuring both personal safety and proper controller functioning.

2.1.3 GROUNDING SENSORS

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

2.1.4 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.

2.1.5 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



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

2.1.6 CHECKING THE CMOS RTC BATTERIES LEVEL

- Display Board Battery
- Main Board Battery

2.1.6.1 Display Board Battery

On the Trio Display Board (refer to Figure 9) 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 **[**7] 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.

2.1.6.2 Main Board Battery

On the Trio Main Board is a CMOS Battery. This battery is located behind the Scale Card (refer to Figure 7). 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.

2.1.7 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).

2.1.8 GROUNDING THE CONTROLLER

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

2.1.8.1 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.

2.1.8.2 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.

2.1.8.3 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.

2.1.8.4 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.

2.1.8.5 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).

2.1.8.6 Power Line Protection

The RPLP-1 provides lightning protection to the controllers. Refer to the RPLP-1 documentation for detailed wiring instructions. While no lightning protection is perfect, the RPLP-1 significantly enhances the reliability of built-in lightning protection. In addition, Munters recommends using an isolation transformer in front of the RPLP-1 to help block lightning and other transients.

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

An isolation transformer preceding the RPLP-1 provides significant additional protection against lightning.

2.2 Française

CAUTION La protection fournie par l'équipement peut être compromise si l'équipement est utilisé d'une façon non spécifiée par le fabricant !

CAUTION Il existe un risque d'explosion si la batterie au lithium est remplacée par un type incorrect. Remplacez la batterie uniquement par une batterie du même type et du même fabricant.

- Protection Contre la Corrosion
- Directives Électriques
- Raccord à la Terre (Sensores)
- Réduire les Interférences
- Filtrage
- Vérification du Niveau des Batteries CMOS RTC
- Précautions de Sécurité Détails
- Mise à la Terre Pour les Contrôleurs

2.2.1 PROTECTION CONTRE LA CORROSION

Pour éviter la corrosion des composants électriques:

- Installez les commandes électroniques dans une salle de commande ventilée séparée, à l'abri des températures extrêmes et des environnements sales. Placer les commandes de façon à ce que les opérateurs puissent facilement les utiliser et lire les indicateurs et les affichages.
- Gardez le contrôleur fermé à tout moment lorsqu'il y a de la poubelle ou un passage dans le bâtiment. Dans les situations nécessitant une maintenance ou des réparations, fermez le contrôleur lorsque vous avez terminé le travail.
- Après avoir acheminé les câbles à travers les ouvertures, scellez les trous avec un produit d'étanchéité au silicone. Si vous utilisez un mastic de silicone avec durcissement à l'acide acétique, maintenez le contrôleur ouvert et ventilé jusqu'à ce qu'il durcisse. Sinon, l'acide acétique attaquera les composants métalliques, y compris les circuits.
- Lors du raccordement de capteurs à des câbles plus longs, assurez-vous que le raccordement est étanche. Utilisez une gaine thermorétractable adhésive (qualité marine) pour réaliser des connexions étanches.
- Utilisez un câblage blindé pour les signaux de faible niveau. Pour les câbles enterrés (d'un bâtiment à l'autre), utilisez des câbles remplis de gel de haute qualité, imperméables à l'humidité.

2.2.2 DIRECTIVES ÉLECTRIQUES

- Munters recommande vivement que seuls les contrôleurs montés sur panneau soient installés directement dans une armoire électrique.
- Placer cette unité à proximité (2 mètres/6,5 pieds maximum) de tout appareil électrique transmettant 10 ampères ou plus de courant peut entraîner de graves interférences de signal.

• Consulter les consignes données dans Précautions de Sécurité - Détails, page 18 papour plus de détails. Elles sont essentielles pour garantir à la fois la sécurité personnelle et le bon fonctionnement du contrôleur.

2.2.3 RACCORD À LA TERRE (SENSORES)

• Chaque appareil à faible puissance (numérique, analogique ou de communication) doit être équipé d'un câble blindé raccordé à la barrette de mise à la terre de l'unité.

2.2.4 RÉDUIRE LES INTERFÉRENCES

- Maintenez les câbles basse tension séparés des câbles haute tension. Il doit y avoir au moins un mètre entre le capteur et les câbles électriques.
- Maintenez le contrôleur aussi loin que possible du boîtier lourd de contacteur et des autres sources d'interférences électriques.
- Ne connectez les protections des fils de communication, allant d'une maison à une autre aux deux extrémités. Connectez-les à une seule extrémité uniquement. La connexion aux deux extrémités peut entraîner la circulation de courants dans la boucle de terre, et risquer ainsi de réduire la fiabilité.
- La connexion COM pour les communications n'est pas le fil blindé. Les fils COM, RX et TX doivent être connectés les uns aux autres au niveau de tous les contrôleurs.

2.2.5 FILTRAGE

Si cette installation comprend un onduleur pour entraîner des ventilateurs à vitesse variable, RLD, RVS-2 ou tout autre dispositif qui commute un courant électrique élevé, installez un filtre EMI devant l'appareil. Reportez-vous à la documentation de l'appareil.

- Que le blindage du câble entre l'appareil et tout moteur est conforme aux normes industrielles
- Mise à la terre correcte du châssis de l'appareil et du câble d'alimentation du moteur
- Mise à la terre correcte du fil blindé du câble basse tension
- Que les câbles du contrôleur et de l'appareil sont conservés dans des conduits ou faisceaux de câbles séparés



Illustration 2: Emplacement de l'onduleur

1. Contrôleur

- 2. Dispositif de courant électrique élevé
- 3. Placez le contrôleur à au moins 50 centimètres de l'appareil

2.2.6 VÉRIFICATION DU NIVEAU DES BATTERIES CMOS RTC

- Display Board Battery
- Main Board Battery

2.2.6.1 Batterie du Tableau d'Affichage

Sur le tableau d'affichage Trio (voir Figure X) se trouve une batterie CMOS. Cette batterie CMOS permet à l'horloge à temps réel du CPU de fonctionner lorsque l'alimentation est coupée.

Vérifiez la batterie une fois par an. La sortie doit être de 2,7 volts (minimum). Le personnel autorisé ne doit remplacer la batterie que si la puissance est inférieure au niveau minimum requis ou tous les cinq ans. Utilisez uniquement une batterie RENATA-CR2450N.

Si la puissance de la batterie CMOS est inférieure au minimum requis, une icône 🗾

apparaît sur l'écran tactile et sur l'application TrioAir.

ATTENTION Si la puissance de la batterie CMOS est inférieure au minimum requis, l'utilisateur devra, en cas de panne de courant, réinitialiser l'heure et la date lorsque l'alimentation sera rétablie.

2.2.6.2 Batterie de la Carte Mère

Une batterie CMOS se trouve sur la carte mère Trio. Cette batterie est située derrière la carte de balance (voir Figure X). Cette batterie CMOS permet à l'horloge à temps réel de la carte mère de fonctionner lorsque l'alimentation est coupée.

Évitez de tester cette batterie. Si la puissance de la batterie CMOS est inférieure au minimum requis, Trio envoie une alarme à tous les contacts de la liste. Dans ce cas, un technicien agréé doit remplacer la batterie par une batterie RENATA-CR2450N uniquement.

ATTENTION Si la puissance de la batterie CMOS est inférieure au minimum requis, l'utilisateur devra, en cas de panne de courant, réinitialiser l'heure et la date lorsque l'alimentation sera rétablie.

Avertissement : Il est très important de réinitialiser la date au jour requis.

2.2.7 PRÉCAUTIONS DE SÉCURITÉ - DÉTAILS

NOTE Catégorie d'installation (catégorie de surtension) II

- L'alimentation électrique du contrôleur doit être protégée par un disjoncteur de 10 A.
- Tous les raccordements électriques doivent être conformes au National Electrical Code (NEC)

2.2.8 MISE À LA TERRE POUR LES CONTRÔLEURS

- Piquets de Prise de Terre
- Fil de Garde
- Colliers de Mise à la Terre
- Quels Elements Doivent etre mis a la Terre?
- Protection Parafoudre
- Protection de Ligne Électrique

2.2.8.1 Piquets de Prise de Terre

Les piquets de prise de terre sont utilisés pour connecter efficacement le système à la terre, lorsque le courant peut être dissipé dans le sol.

1. Matériel: Les piquets de prise de terre doivent être plaqués cuivre ou en acier galvanisé.

2. Diamètre: Minimum 12,5/20,3 cm, de préférence 7,6/10,16 cm. Généralement, plus le diamètre du piquet est gros, moindre sera sa résistance à la circulation du courant.

3. Longueur: Au minimum 2,5 mètres, de préférence 3 mètres. Un piquet de prise de terre plus long atteindra un sol avec une humidité plus élevée. Des sols humides portent beaucoup mieux le courant que des sols plus secs.

4. Mise à la terre unique: Il est essentiel qu'il n'y ait qu'un seul emplacement de mise à la terre auquel un piquet ou une série de piquets sont connectés les uns aux autres à l'aide d'un fil de garde.

5. Des piquets de prise de terre indépendants augmenteraient le risque de courant, provenant par exemple d'un éclair, dissipé par un piquet et réintégrant le système par un piquet adjacent.

6. Emplacement: Prêt du panneau de panneau du disjoncteur principal et dans un sol humide. Par exemple, dans une zone qui est habituellement humide provenant de précipitation, ou un point bas où l'eau est drainée. Assurez-vous que la zone est bien protégée des dommages pouvant être causés par des tondeuses à gazon, des tracteurs, etc.

7. Installation du piquet: Enfoncez le piquet dans le sol jusqu'à ce qu'il reste 10 cm au dessus du niveau du sol. S'il est impossible d'enfoncer le piquet à une profondeur correcte, vous pouvez poser le piquet horizontalement, 80 cm en dessous du niveau du sol.

8. Dans le cas où le piquet risque d'être endommagé, par exemple, par des tondeuses à gazon ou des tracteurs, il peut être installé dans un trou, à une profondeur d'environ
20 cm pour que le piquet soit environ 10 cm en dessous du niveau du sol et 10 cm au dessus du niveau du trou.

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.

2.2.8.2 Fil de Garde

Le fil de garde est un fil cuivré long et épais qui connecte le panneau du disjoncteur principal au piquet de prise de terre.

1. Matériel: Les piquets de prise de terre doivent être plaqués cuivre ou en acier galvanisé.

2. Diamètre: Généralement un fil cuivré de 16 mm (de calibre no. 6) suffit. Si le fil doit parcourir plus de 7m, un fil de 20 mm (de calibre no.4) devrait être utilisé.

3. Longueur: Au minimum 2,5 mètre, de préférence 3 mètres. Un piquet de prise de terre plus long atteindra un sol avec une humidité plus élevée. Des sols humides portent beaucoup mieux le courant que des sols plus secs.

4. Le fil de garde devrait être protégé des dommages pouvant être provoqués par des tondeuses à gazon, des tracteurs, etc. Il devrait être enterré au moins à 15 cm sous le sol pour protection, et être inséré dans la maison aussi vite que possible. Il est important que le fil ne soit pas coupé, il devrait rester entier.

2.2.8.3 Colliers de Mise à la Terre

Des fils de gardes ne devraient pas simplement revêtir un piquet de prise de terre. Des colliers de mise à terre sont utilisés pour attacher un fil de garde au piquet de prise de terre. Le collier le plus ordinaire est un collier ocre. Assurez-vous que les colliers de mise à terre que vous sélectionnez sont adaptés à une utilisation à l'extérieur. N'utilisez pas de collier de serrage adapté pour des conduites d'eau intérieures ou colliers de serrage pour tuyaux flexibles pour rattacher le fil de garde.

2.2.8.4 Quels Elements Doivent etre mis a la Terre?

Tout équipement qui est ou pourrait être sous tension, même accidentellement, devrait être mis à la terre. Les objets qui pourraient être aléatoirement porteurs de la foudre y sont inclus. Des récits de foudre ont montré des cas imprévisibles.

Les circuits électriques devraient être câblés avec un conducteur à 3 fils, constitué d'un fil de garde, d'un fil conducteur neutre et d'un fil chaud. Le fil de garde devrait être rattaché nettement et sûrement aux dispositifs ou aux systèmes à mettre à la terre. L'autre extrémité du fil de garde devrait être rattachée au collecteur de terre sur le panneau principal.

2.2.8.5 Protection Parafoudre

En raison du risque de dommages causés par la foudre sur les appareils électroniques, Munters recommande d'installer une protection contre la foudre sur l'alimentation électrique et les bornes de communication (le cas échéant).

2.2.8.6 Protection de Ligne Électrique

Le RPLP-1 fournit une protection contre la foudre aux contrôleurs. Reportez-vous à la documentation RPLP-1 pour des instructions de câblage détaillées. Bien qu'aucune protection contre la foudre ne soit parfaite, le RPLP-1 améliore considérablement la fiabilité de la protection contre la foudre intégrée. De plus, Munters recommande d'utiliser un transformateur d'isolement devant le RPLP-1 pour aider à bloquer la foudre et d'autres transitoires.

Les parasurtenseurs communs offrent peu de protection supplémentaire et peuvent se déclencher inutilement.

Un transformateur d'isolement précédant le RPLP-1 offre une protection supplémentaire importante contre la foudre.

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.

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 RSU/RLED 2.0 Wiring Termination
- Pressure Sensor Hoses
- 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

- 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

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.

2. Hang the Trio on the bracket.

3.3 Board Layout



Figure 7: Main Board layout

1	Analog/digital ports	6	Dipswitches
2	Ground strip	7	Scale Card (option) (CMOS battery is under the card)
3	20 relays	8	Pressure Sensor
4	Alarm relay	9	Power Supply
5	Power ports		



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**.



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 (used for software upgrades)



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.

3.4 Wiring Diagrams

- High Voltage Relays
- Alarms and Power
- Internet Connection
- Analog Output Devices
- Digital Devices
- Analog Input Devices
- Trio RPS
- Bird Scale Card
- Silo Wiring
- RSU Wiring
- 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.



Figure 12: Relay wiring detailed view



Figure 13: Relay and port numbering

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.

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

3.4.4 ANALOG OUTPUT DEVICES

Trio supports analog control over a variety of devices.



Figure 16: Analog Output devices (examples)



Figure 17: Light Dimmer devices

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



Figure 18: Analog Device Wiring Schematic

3.4.5 DIGITAL DEVICES

Trio supports a variety of digital inputs.



Figure 19: Digital Input devices (example)

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



Figure 20: Digital Device Wiring Schematic

3.4.6 ANALOG INPUT DEVICES

- CO2 Sensor Wiring
- Temperature Sensor Wiring
- Humidity Sensor Wiring
- Potentiometer Wiring
- Ammonia Sensor Wiring
- Light Sensor Wiring

3.4.6.1 CO2 Sensor Wiring

Refer to the <u>CO2 Sensor Manual</u> for details on installing this unit.



Figure 21: CO2 Sensor Wiring

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.



Figure 22: 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

3.4.6.2 Temperature Sensor Wiring

Refer to the <u>RTS-2 Manual</u> for details on this sensor.



Figure 23: RTS Wiring



Figure 24: RTS Wiring Schematic

- Connect each RTS sensor to a:
 - T port
 - COM port
 - Grounding strip!
- Note:
 - \circ $\;$ 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.



Figure 25: RTS S Port Wiring

Number	Function
2	COM port (black wire)
3	S port (red wire)
RTS	Ports 4, 5, 6, 18, 19, 20 S Port RTS S Ports COM

Figure 26: RTS S Port Wiring Schematic

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



Figure 27: RHS+ Wiring



Figure 28: RHS Pro Wiring

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

•	12V DC 4, 9	Ports 5, 6, 18, 19, 20
RHS+/RHS Pro	 SPort	TRIO RPS
	сом	Ports

Figure 29: RHS+/Pro Sensor Wiring Schematic

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

3.4.6.4 Potentiometer Wiring



Figure 30: Potentiometer Wiring



Figure 31: 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!

3.4.6.5 Ammonia Sensor Wiring

Refer to the <u>Ammonia Sensor manual</u> for further information.



Figure 32: Ammonia Sensor Wiring

No.	Function
1	COM port (Green wire)
2	S port (Brown wire)
3	White wire
4	Phase (Brown wire)
5	Neutral (Blue wire)
6	18-30VDC (Red wire)
7	COM (Black wire)
8	20.3 kohm resistor (Note: The resistor comes supplied with the sensor but must be installed on-site)
9	Quick connector



Figure 33: Ammonia Wiring Schematic

- Connect an ammonia sensor to a:
 - S port. In the corresponding dipswitch, raise dipswitch 3 (analog input).
 - COM port.
 - Grounding strip!

3.4.6.6 Light Sensor Wiring

Refer to the <u>RLS Manual</u> for more information.



Figure 34: Light Sensor Wiring

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

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





3.4.7 TRIO RPS

Trio RPS serves as a second static pressure sensor for the Trio Controller. The following section details the installation. Trio supports up to two static pressure sensors, one built in and one external. Install the RPS in the second house.







Figure 37: RPS Wiring Schematic



Figure 38: Static pressure tubes

NOTE After installing the RPS, no Cold Start is required.

3.4.8 BIRD SCALE CARD

If you install a scale card, perform a cold start. Refer to the User Manual.



Figure 39: Scale Card wiring to Power Supply and Bird Scale

Number	Function
1	Black wire, -5V
2	Green wire, +5V
3	Red, Channel 1 - 6
4	White, Channel 1 - 6
5	СОМ

NOTE Connect each RBS-1 white and red wire to matching RSC ports; for example White Ch.1 and Red Ch. 1.



Figure 40: RSC Card to Silo Power Supply/RBS-1 Schematic

3.4.9 SILO WIRING

Wire the Trio to an RJB Junction Box and power supply. For details on how to wire the Junction Box to the load cells, refer to the RJB manual.



Figure 41: Scale Card Wiring to Power Supply and RJB-6

NOTE Connect each RJB-6 white and red wire to matching RSC ports; for example White Ch.1 and Red Ch. 1.

Number	Function
1	Black wire, -5V
2	Green wire, +5V
3	Red, Channel 1 - 6
4	White, Channel 1 - 6
5	СОМ



Figure 42: RSC Card to Silo Power Supply/RJB-6 Schematic

RJB Wire	RSC Ports	
Green	2, 5, 8 (Upper)	
Black	2, 5, 8 (Lower)	
White	3, 4, 6, 7, 9, 10 (Upper)	Note: Connect each RJB white and red wire to
Red	3, 4, 6, 7, 9, 10 (Lower)	matching ports. For example White Ch.1 and Red Ch.1

3.4.10 RSU WIRING

Refer to the <u>RSU Manual</u> for further information.



Figure 43: Trio – RSU Wiring

3.4.11 RLED 2.0 WIRING



Figure 44: Trio - RLED 2.0 Wiring



3.4.12 BATCH WEIGHING

- External Batch Bin Installation
- Electronic Batch Weighing Installation

3.4.12.1 External Batch Bin Installation

Map and define cross augers in Devices and Sensors. Refer to the Installation Manual.

Every time feed is placed into the batch weigher, Trio receives a pulse. Each pulse corresponds to a quantity of feed. The mix is generated by defining the quantities (meaning, the number of pulses) of different type of feed to be added.

Connect the batch counter to a digital input port.



1. In System > Devices and Sensor > Installation > Sensors, define one digital port as Batch Counter.



2. Define:

- Qty/Pulse: Define the quantity of feed per pulse (designate the quantity as metric or imperial; refer to the User Manual). This quantity must match the quantities defined in the external controller.
- Click Test to ensure that the Trio connection to the batch counter is operating.

NOTE When delivering feed via an external batch bin, no silo data (inventory) is provided.

3.4.12.2 Electronic Batch Weighing Installation

- Wiring and Mapping
- Batch Bin Calibration

3.4.12.2.1 Wiring and Mapping

Wire the scale card to the hopper.



1	White wire	5	Blue wire
2	Green wire	6	Brown wire
3	Red wire	7	Trio relay ports
4	Black wire		

1. In System > Devices and Sensors > Installation > Scale, designate one scale port as Batch Weigher.

Batch W	/eigher 1
Bin Capacity	50 Kg
CALI	BRATE
TE	EST

2. Define:

- Bin Capacity: Define the batch bin's capacity. Refer to the User Manual to define the units as imperial or metric. This parameter is used to determine the gain (refer to Calibration). This quantity is not related to the actual batch quantity.
- Clicking Test shows the following values:
 - Measured weight
 - Real time A/D
 - Error status
- Calibrate the weigher. Refer to Batch Bin Calibration, page 56.

NOTE Once the bin capacity is defined, any change will require recalibrating the batch weigher.

3. In System > Devices & Sensors > Installation > Scales define up to three relays as Silos.

	Silo 1
Storage Capacity	0 Kg
	TEST

4. Define:

• Storage Capacity: Define the capacity of the silo mapped to this auger (Silo Auger 1 – Silo 1, etc.).

NOTE This parameter is hidden when Silo Weight is used to manage the feed inventory.

5. In System > Devices & Sensors > Installation, define up to three relays as Silo Augers.

Silo A	uger 3
Default Output	Normally Open
Feed Per Minute	0 Kg
Silo Capacity	0 Kg
KWh	0
Т	EST

- 6. Define:
 - Default Output: Define the relay's default state, normally open or normally closed.
 - Feed Per Minute: Define the amount of feed per minute that the silo auger sends to the batch weigher.

• Silo Capacity: Enter the silo's capacity in kilograms or pounds. The controller uses this value to manage the silo inventory.

7. In System > Devices & Sensors > Installation, define one digital port as Batch Hopper Limit. This sensor (placed in the bin) stops feed delivery when the feed level reaches the sensor.

Batch Hopper Limit 1	
Active State	Open
	rest

8. Define the Active State.

- Open: The circuit is open when the sensor is activated.
- Closed: The circuit is closed when the sensor is activated.

9. In System > Devices and Sensors > Installation, define one relay as Batch Release Valve. This relay opens the batch bin, releasing mixed feed into a hopper.

Batch Val	Release Ive 1
Default Output	Normally Open
Sec. to close Valve	10
	EST

10. Define:

- Default Output: Normally open or normally close.
- Seconds to close Valve: Define the amount of time required for the release valve to go from opened to closed. Range: 0 – 255. Default 10.
- Test checks the relay functionality.

NOTE Testing stops the weigher process.

3.4.12.2.2 Batch Bin Calibration

1. On the Batch Weigher sensor screen, click Calibrate.

Batch Weigher 1
Enable Mode
Bin Capacity 50 Kg
Sensor is not calibrated
CALIBRATE
TEST

2. In the following screen, enter the bin capacity (the weight of the bin when empty, shown in the previous screen). Click **Next**.



CAUTION When you press Next, the batch weigher bin opens and any feed in the weigher spills out!

3. In the following screen, place a weight (between 1 – 10 kilograms/2 – 22 pounds) and enter the gain. Click Next.



The following screen appears.



3.5 Trio - RSU/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 and the final device in the chain is more than 50 meters/165 feet. Trio and Trio Expansion come with a switch to enable termination; an external resistor must be installed on the RSU communication card. Termination may not be required in shorter installations.



Figure 45: Termination Sample Topologies



Figure 46: Termination Switch



Figure 47: RLED 2 Termination Wiring

3.6 Pressure Sensor Hoses



Figure 48: Static pressure hoses

3.7 Tech Support/Wi-Fi

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

¢	DAY TIM 25 11:3	E House 1 32	
Gene	ral Settings \rightarrow Network		
0	□	-∕∕-	Manage
(î•	Support ID	1601671987	
	Munters ID	George	

• Click Manage.

¢	DAY TIME 1 15:47	House 1	
Gene	ral Settings $ ightarrow$ Network $ ightarrow$ Ma	nage	
0	Ethernet		
0	IP Address	10.16.1.24	
	MAC	70:06:92:a0:01:d4	
(î•	WI-FI		
	Network	Turned Off	MANAGE
()	IP Address	N/A	
	MAC	N/A	

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

4 TrioAir

TrioAir is the Munters (desktop and cellphone) app that gives users remote access to their controllers. Trio Controllers are connected directly to the internet via a standard modem. Trio Air is the application used to manage your controllers via the web. In addition to seamless access to your Trio Controllers, Trio Air 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 Trio Air and adding controllers to the system. For more information, refer to the <u>Munters Zendesk.</u>

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
- <u>Cellphone App</u>

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

- <u>Google Play</u>
- <u>Apple Store</u>

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.

⊗ Munters	
	⊗ Munters
Email Address Tenseil Address Des waxman@muniters.com Password 	
FOROT PASSWORD? Don't have an account? <u>Sign up now</u>	Scalable Solutions Munters SaaS scales to your farms exact needs, whether you are a small operation or an industrial complex.

- 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.

⊗ Munters		
	⊕ CREATE NEW FARM	
	Welcome Ben Last. This is your TrioAir application, use the main explorer menu to navigate through your farms and controllers. • CREATE NEW FARM	

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, the following Welcome Screen appears.

• Access r and control your farm re eal-time.	motely		Manage Data Access your farm data.
s ights data-driven insights nee d decisions.	ded to make		Remote Control TrioAir enables remote control over your controllers in multiple manners.
	r and control your farm re eal-time. sights e data-driven insights nee ed decisions.	r and control your farm remotely eal-time. sights e data-driven insights needed to make ed decisions.	r and control your farm remotely eal-time. sights e data-driven insights needed to make ed decisions.

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

1842220	To begin the registration pre	ocess, follow the instructions below.
	Note: You must have a TrioAir accou	nt to start this process.
	1. On your smartphone or deskto	op, log into TrioAir.
	2. Using a smartphone: -Or-	Using a desktop:
	Scan the QR code.	Go to Farm Settings > Add New Device.
2M58L796		Enter the code manually.

2. Follow the instructions on the page. You will need to:

- \circ Select the farm (if there is more than one) to which this Trio is to be added
- Agree to the Terms of Use.

NOTE For more details on the on-line registration process, click <u>here</u>.

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



4.4 Offline Registration

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

Welcome To Trio Controller!



Before using your Trio, please register the controller with TrioAir.

Registration enables access to the following features:



1. Click Offline Registration. The following screen appears.

	To begin the registration	process, follow the instructions below.
	1. On your smartphone or de	sktop, log into TrioAir.
	2. Using a smartphone: -C Scan the QR code.)r- Using a desktop: Go to Farm Settings > Add New Device.
P2M58L796		Enter the code manually.
	3. Follow the on-line instructi	ons.

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

5 Trio 20 Specifications

- Trio 20 Specifications
- External Device Specifications

5.1 Trio 20 Specifications

Description	Specification
Input Power Voltage	• 100 – 240 VAC
	• 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 of 100,000 switching operat	above current levels provides between 50,000 – ions.
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
	 Expansion – RS-485: 115 Kbps, 8 bit, even parity
	NOTE Refer to Appendix F: , page 183 for more information.
Operating and Storage Temperature Range	-10° to +50° C (+14° to +125° F)
Environmental	• Altitude: -400 m to 2000 m
Specifications	Relative Humidity: 20% - 70%
	 Main supply voltage fluctuation up to 10%
	Overvoltage category II
	• PD: 2
Enclosure	Water and dust tight
	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
	 600 volt insulation

Certification FC CB CE	Description	Specification		
	Certification		CB	CE

- 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 11). 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)
Total	34

Device type	Maximum Number of Devices	Number of Relay Devices	Number of Analog Devices
Cooling	2	2	N/A
Heaters	6	6	6
High Heaters	6	6	6
Inlets	4	4	4
Outlets	1	N/A	1
Tunnel Doors/Curtains	4	4	4
Fans Exhaust/Tunnel	20	20	8
Stir Fan	2	2	2
Lights	4	4	4
Timer	5	5	N/A
Auger	2	2	N/A
Feeder	4	4	N/A

Table 2: Output Devices

As Relay	20	20	N/A
As Analog Out	8	NA	8
Alarm	1	1	N/A

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
Ammonia Sensors	1	N/A
Pressure Sensors	1	N/A
Potentiometers	4	N/A
Bird Weighing	4	N/A
Silo Weighing	3	N/A
Feed Weighing	1	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
Feeder Line Sensors	N/A	4
Feed Weighing by Pulse	N/A	2

Table 4: Other Devices

Device type	Number
RSU-2 Remote Scale Unit	2
RLED Light Dimmer	2

NOTE Refer to Appendix A: External Devices (Previous Versions), page 117 to view details on the input/output capacity of previous versions.

6 Using the Trio Touch Screen

	и тіме 08:58 Ro	om 1 ↔
¢		Go back to the previous screen
		View the Main menus
		Choose language
1	格	Network settings
<u></u>		View alarms
3		Go back to the main screen
•••		Settings icon
/		Edit parameters
Settings		Function settings
₽ Testing		Function test
F		Replace the dashboard battery with a RENATA-CR2450N battery.
١		Click this icon to delete data stored on that page.

Phone App	
≡ ⊗Munters 🕬	Click the circle containing the user name to edit personal preferences such as the language, units, name, and more.
Send To All	When a Trio 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.

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
- Mapping Sensors
- Mapping Devices
- Mapping the Weighing Devices
- Trio RPS
- Testing Devices

7.1 Using the Mapping Screen

After wiring devices to the Trio, 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 X				
(+) (-) <th>TIME 16:29</th> <th>House 1</th> <th></th> <th></th>	TIME 16:29	House 1		
Devices & Sensors				CANCEL SAVE
Devices Sensors Alarm			5 6 7	8 Pressure
Auger Cooling	SCALE >	9 10 11 12	13 14	Ļ Alarm
Fan Feeder		15 16 17 18	19 20	
Heater				
Inlet Light Outlet	1 2 3 15 16 17	4 5 6 7 18 19 20 21	8 9 10 1 [*] 22 23 24	1 12 13 14 25 26 27 28
Click Devi	ices to maj	p cooling devices,	heaters, inlets	, fans, stir fans,

timers, tunnel doors, outlets, or the alarm relay.

Click Sensors to map auxiliary inputs, sensors (humidity, pressure,

temperature, CO2, ammonia), water meter, and potentiometers.

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

€	DAY 0	TIME 16:41	House 1	
Devices &	Sensors			CANCEL
Devices	Sensors		1 2 3 4	5 6 7 8 3
Alarm				Pressure
Auger			9 10 11 12	13 14
Cooling		SCALE >		Alarm
Fan				19 20
Feeder				
 Heater 	0/4			
Inlet		1 2 3	4 5 6 7	8 9 10 11 12 13 14
Light		15 16 17	18 19 20 21	22 23 24 25 26 27 28
Outlet				

- 4. Click on the relays and/or ports that you wired to heaters.
 - \circ $\;$ Trio automatically numbers the devices.
 - Trio 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.

Image: Constraint of the second sec	тіме 16:49	House 1	
Devices & Sensors			CANCEL
Devices Sensors		1 2 3 4	5 6 7 8
C02			Image: Weight of the second se
Feeder Active		9 10 11 12	13 14
Humidity	SCALE >		Alarm
Light Sensor		15 16 17 18	19 20
Outside Temperature			အု အု
Potentiometers			
Pressure	1 2 3	4 5 6 <u> 2</u>	9 10 11 12 13 14
Temperature	15 16 17	18 19 20 21	22 23 24 25 26 27 28
Water Meter			

6. After mapping all installed devices, click SAVE.

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, an error symbol appears on the designated analog port.

	TIME 16:55	House 1	
Devices & Sensors			CANCEL
Devices Sensors Alarm		1 2 3 5	6 7 8 Pressure
Auger		9 10 11 12 13	
Cooling	SCALE >		Alarm
Fan		15 16 17 18 19	20
Feeder	-		
Inlet			
Light			9 10 11 12 13 14
Outlet	15 16 17		2 23 24 25 26 27 28

7.2 Editing the Relays and Sensors

1. On the Device and Sensors screen, click a relay or sensor.



- 3. Edit the parameter(s).
- 4. Click Save.

7.3 Mapping Sensors

- Enabling/Disabling Analog Input Sensors
- Temperature Sensors
- Defining the Ammonia Sensor
- Defining the CO2 Sensor
- Defining the Humidity Sensors
- Defining the Water Meter Sensors
- Defining the Gas Meter Sensors
- Defining the Light Sensor
- Defining the Auger Active Sensors
- Defining the Feeder Active Sensors

7.3.1 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.

Outside Ten	nperature 1	
Enable Mode		
Offset	0.0	٥F

3. On the dashboard, a disabled sensor is marked.

	TIME 11:44	House 1	•	# ⁽²⁾
Devices & Sensors				
	3 4 8 1 2	5 6 7 8 3 1	•	Outside Temperature 1
9 <u>555</u> 1 2	11 12	13 14	(Ţ)	Offset 0 °C
(17 (2) 2	19 20		
1 2 1 4 5 15 16 5 RH 19	6 😭 (1 20 21	$ \begin{array}{c} $		TEST

7.3.2 TEMPERATURE SENSORS

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

7.3.2.1 Defining the Temperature Sensors

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

Temp	perature 1	- 0)utside
Offset	0 °F	Iem	perature 1
Location	Front	Offset	0°F
\bigcirc	TEST	C	TEST

- Define:
 - $\circ~$ Offset: This is an optional correction for the temperature sensor. Range: -10° C to +10° C
 - Enabled: enable/disable the sensor.
 - Location: Designate the area in the room where the sensor is located (front/back/center).
- The temperature reading shows the measured temperature, including the offset.

7.3.2.2 Mapping the Temperature Sensors

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

- Tunnel temperature: Select a sensor or a group of sensors to determine the tunnel temperature readings or select if the tunnel runs according to the average temperature reading.
- 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 > Temperature Definition.

Image: Constraint of the second sec	тіме 16:39	House 1		
Temperature Definition	ו			P
Device	Avg.	Temperatur	e Sensors	Outside
Full House		1	3	
Cooling 1	\bigcirc			
Timer 1		1		
Timer 2				\bigcirc
Timer 3		2		

- 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.

7.3.2.3 Enabling a Weather Station

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

K	DAY TIME 1 19:42	House 1	
Contr	ol Strategy \rightarrow Weather Station		/ · · · · · · · · · · · · · · · · · · ·
Û	Recieve Ouside Temp. Broadcast	Enabled	

3. Enable Receive Outside Temp. Broadcast.

7.3.3 DEFINING THE AMMONIA SENSOR

Define one analog input port as an ammonia sensor (refer to Using the Mapping Screen, page 72).



- Offset: This is an optional correction for the ammonia sensor. Range: -10 to +10 ppm
- Enable Mode: Enable/disable the sensor.

7.3.4 DEFINING THE CO2 SENSOR

Define one analog input port as a CO2 port (refer to Using the Mapping Screen, page 72).

	CO2 1
Offset	0 ppm
C	TEST

- Define:
 - Offset: This is an optional correction for the CO2 sensor. Range: -500 to +500 ppm
 - Enable Mode: Enables/disables the sensor.

7.3.5 DEFINING THE HUMIDITY SENSORS

Define (refer to Using the Mapping Screen, page 72):

- 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.

	Humidity 2
Offset	0
	TEST

- Define:
 - $\circ~$ Offset: This is an optional correction for the humidity sensor. Range: -10 to +10%

7.3.6 DEFINING THE WATER METER SENSORS

Define up to four (4) digital input ports as a water meter (refer to Using the Mapping Screen, page 72).

Water	Meter 1	Define:
Y/Pulse eter Input	0.3 G Drinking Water	 Quan/Pulse: Set the water meter's water flow per pulse. Range: 0.0 to 99.9 (unit depends on the General Settings > User.) Meter input: Chose drinking water or cooling
	EST	

7.3.7 DEFINING THE GAS METER SENSORS

Define up to three digital input ports as a gas meter (refer to Using the Mapping Screen, page 72).

Gas Meter 1		
QTY/Pulse	0.3 G	
Т	EST	

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

7.3.8 DEFINING THE POWER METER SENSORS

Define up to two digital input ports as a power meter (refer to Using the Mapping Screen, page 72).



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.

7.3.9 DEFINING THE LIGHT SENSOR

Define one analog ports as a light sensor.(refer to Using the Mapping Screen, page 72)



- Define:
 - Enable Mode: Enable/disable the sensor.

7.3.10 DEFINING THE AUGER ACTIVE SENSORS

Cross Auger Active 1
Active State Open Quantity Per Minute0 Kg

Define up to two digital ports as auger active.

7.3.11 DEFINING THE FEEDER ACTIVE SENSORS

Define up to four digital input ports as feeder active.

7.4 Mapping Devices

- Defining the Fans
- Defining the Stir Fan
- Heating Devices
- Defining the Cooling Devices
- Potentiometers, Inlets, Tunnel Doors, Outlets

- Defining the Same As Relays
- Defining the Same As Analog Ports
- Defining the Timers
- Defining the Auxiliary Input
- Lighting Devices
- Feeding Devices
- Fail Safe Devices

7.4.1 DEFINING THE FANS

The following sections detail how to configure fans.

NOTE These settings should be configured by a technician familiar with the fan and inlet/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 72).

- On-Off Fans
- 0 10 Volt Fans

7.4.1.1 On-Off Fans

Fan 1		
Capacity	0 M3/h	
KWh	0	
Reverse Relay Output		
TE	ST	

- Define:
 - 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

Fan 3			
Min. Voltage (V)	0.0		
Max. Voltage (V)	10.0		
Min. Capacity	1,000 M3/h		
Max. Capacity	5,000 M3/h		
KWh	0.0		
Boost Time (sec.)	5		
80.0	TEST		

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

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 72).
 - On Off Stir Fan
 - 0 10 Volt Stir Fan

7.4.2.1 On Off Stir Fan

Stir Fan 1		
KWh	0	
Reverse Relay Output		
Т	EST	

- 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

Stir Fan 1

Min. Voltage (V)0 Max. Voltage (V)10 KWh 0 TEST

- Define:
 - Minimum/Maximum Voltage: Enter the minimal and maximal voltage used to calibrate the fan speed. 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 HEATING DEVICES

- Define up to six relays and/or analogue output ports as heaters (refer to Using the Mapping Screen, page 72).
 - Defining the On/Off Heaters
 - Defining the Variable Heaters
 - Defining the High Heaters

7.4.3.1 Defining the On/Off Heaters

Heater 2		
KWh	0	
Reverse Relay Output		
Ignition Time (sec.)	0	
TEST	\supset	

- 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.
- Test checks the relay functionality.

7.4.3.2 Defining the Variable Heaters

Heater 3		
Min. Voltage (V)	0	
Max. Voltage (V)	10	
KWh	0	
TEST	\supset	

- 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 72).

Heat High 1		
Reverse Relay Output		
TE	ST	

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

7.4.4 DEFINING THE COOLING DEVICES

Define up to two relays as cooling devices (refer to Using the Mapping Screen, page 72).



- 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 POTENTIOMETERS, INLETS, TUNNEL DOORS, OUTLETS

- Mapping the Potentiometers
- Defining the Inlets/Tunnel Doors
- Defining the Outlet

7.4.5.1 Mapping the Potentiometers

Define up to four analogue ports as potentiometers (refer to Using the Mapping Screen, page 72).

As an option, potentiometers enable exact positioning of relay-controlled inlets\tunnel doors when calibrating. If:

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

opening and closing times are used to calibrate the inlets/tunnel doors.

Potentiometer 1
TEST

• Enable/disable the potentiometer.

7.4.5.2 Defining the Inlets/Tunnel Doors

Define up to four relays or analog output ports as inlets or tunnel doors (each device requires two relays or one analogue port) (refer to Using the Mapping Screen, page 72).

nle	t 2
n	By Time
Time	60
ne	60
ST	

- For relay-controllers devices, define:
 - Position: Define how the inlet opening is controlled:
 - By time
 - Potentiometer (relay-controlled inlets or tunnel doors only). Map each inlet/tunnel door 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 inlet. 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 inlets/tunnel doors positioned by a potentiometer. Potentiometer-controlled calibration only.
- 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 inlet.

7.4.5.2.1 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 inlets go through several opening and closing cycles.

In order to calibrate an inlet/vent/tunnel door using a potentiometer (refer Potentiometers, Inlets, Tunnel Doors, Outlets, page 89 for details):

- Install and map a potentiometer.
- Define the relay-controlled inlet/vent/tunnel door 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.

7.4.5.2.2 Calibrating the Inlets/Tunnel Door

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

Only one inlet or tunnel 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 🛞 .

¢	DAY TIME 0 14:19	House 1	
Cor	trol Strategy \rightarrow Ventilation		
\$	Inlets		
8	Inlets Position Inlets Auto Calibration	By Level	
X	Power Up Calibration (By Opening)		
ŀ	Tunnel Doors		
	Tunnel Doors Position	By Level	
2	Tunnel Doors Auto Calibration		
٥	Active Hours Number Of Movements	24 Hours 99	
Ċ	Power Up Calibration (By Opening)		

2. Click

- 3. Define:
 - Inlets/Tunnel Position: Refer to the User Manual.
 - Auto Calibration: If enabled, the inlet or tunnel 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 inlet/tunnel door automatically calibrates.
- Power Up Calibration: Enable this function to have the inlet/tunnel 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.

$\begin{array}{c c} \leftarrow & \blacksquare & DAY & TIME \\ \hline 0 & 16:09 & House 1 \end{array} $	
Devices & Sensors	
	Tunnel Door 1
	Position By Pot. 1
	Auto Calib.
9 10 11 12 13 14	Power-up Calib.
Alarm	Open Time 60 (sec.)
15 16 17 18 19 20	Close Time 60 (sec.)
	Open Relay Normally Normal Open State
1 2 3 4 5 🕅 7 8 9 10 11 12 13 14	Close Relay Normally Normal Open State CALIBRATE
15 16 17 18 19 20 21 22 23 24 25 26 27 28	

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

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

7.4.5.3 Defining the Outlet

Define one analog output port as an outlet (refer to Using the Mapping Screen, page 72).



- Define:
 - Min./Max Voltage: Define the voltage in the analogue output port that corresponds to the 0% and 100% output, respectively.
 - Open/Close Time: Enter the amount of time required to fully open or fully close the inlet.

7.4.6 DEFINING THE SAME AS RELAYS

Define up to 20 relays as Same as Relay (refer to Using the Mapping Screen, page 72).

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

Same As Relay -		
	-	
Related Channel	0	
KWh	0	
Reverse Relay Output		
\subset	TEST	

- 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.

7.4.7 DEFINING THE SAME AS ANALOG PORTS

Define up to eight relays as Same as Analog Ports (refer to Using the Mapping Screen, page 72).

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.



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

7.4.8 DEFINING THE TIMERS

Define up to five relays as timers (refer to Using the Mapping Screen, page 72).



- 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.

7.4.9 DEFINING THE AUXILIARY INPUT

Define up to four digital inputs as auxiliary inputs (refer to Using the Mapping Screen, page 72).

Auxilia	ry Input 1	٠	Defi	ine:
Active State	Open		0	Operation: Define the relay mode.

7.4.10LIGHTING 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 72). 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

Light 2			
Reverse Relay Output			
Ţ	EST		

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

7.4.10.2 Defining the Variable LIGHTS

Light 2		
Min. Voltage (V)	0	
Max. Voltage (V)	10	
TEST		

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

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.

1. Go to Devices & Sensors.



2. Click RLED.

(+) (+) <th>y time 08:54</th> <th>House 1</th> <th></th>	y time 08:54	House 1	
Devices & Sensors			
EACK >			Light 1
	() A Q 1	RLED B Q 2	

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

7.4.11 FEEDING DEVICES

Setting up a feed system requires auger relays and sensors, and feeder relays and sensors. Define:

- Auger and feed relays to control the auger/feeder lines.
- Auger digital sensors to detect auger overtime issues: silo is empty, feed lines are stuck, or other mechanical issue.
 - Auger 1 is automatically associated with Augur Active Sensor 1. Auger 2 is automatically associated with Augur Active Sensor 2.
 - Feeder 1 active is associated to feeder 1 relay, feeder 2 active to feeder 2 relay, etc.
- Defining the Auger Relays
- Defining the Feeder Relays

7.4.11.1 Defining the Auger Relays

Define up to two relays as augers.

Cross Auger 1		
KWh	0	
Reverse Relay Output		
	EST	

- 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.

7.4.11.2 Defining the Feeder Relays

Define up to four relays as feeders (refer to Using the Mapping Screen, page 72).

	-
Fee	der 1
KWh	0
Reverse Relay Output	
Т	EST

- 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.

7.4.12 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.

Fail Safe 2	• Define:
Reverse Relay Output	 Reverse Relay Output: Define the relay mode as Closed.
TEST	

7.5 Mapping the Weighing Devices

- Defining the Silos
- Defining BinTrac Silos
- Defining the Bird Scales
- Defining the RSU

7.5.1 DEFINING THE SILOS

- Mapping the Silo Scales
- Configuring the Silo Scale
- Testing the Silo

7.5.1.1 Mapping the Silo Scales

Trio can support up to three silo scales.

This function requires a scale card.

1. On the Devices & Sensors screen, click Silo. The Scale icon turns brown.

Image: Constraint of the second sec	тіме 17:14	House 125	
Devices & Sensors			CANCEL
Devices Sensors			6 7 8
Ammonia			Pressure
Auger Active		9 10 11 12 13	14
Bird Scale	SCALE >		Alarm
C02		-15 -16 -17 -18 -19	20
Feeder Active			
Gas Meter			
Humidity	1 2 3	4 5 6 7 8	9 10
Power Meter			23 24 25 26 27 28
 Silo 0 / 3 			

- 2. Click the Scale icon.
- 3. Select up to three channels and click Save.

Image: Control of the second	тіме 13:36	House 1	
Devices & Sensors			CANCEL
Devices Sensors			SCALE CARD
Feeder Active			1 2 3 4 5 6
Humidity			
Light Sensor	К ВАСК		
Outside Temperature			
Potentiometer			
Pressure			
✓ Silo 2/2			
Temperature			
Water Meter			

4. Click on each channel.

Silo 1			
Enable Mode			
Storage Capacity0 Kg			
Sensor is not calibrated			
CALIBRATE			
TEST			

5. Define:

- Enable Mode: Enable/disable the channel.
- Storage Capacity: Define the quantity of feed that each silo can contain.
- Calibrate: Refer to the next section.

7.5.1.2 Configuring the Silo Scale

The following procedure details how to "zero out" the Trio silo scales. Zeroing out is way to ensure that the unit's A2D number is accurate (shown in the Silo Icon; 430 in the picture below). To summarize the procedure:

• The user enters the correct amount of feed in the silo while calibrating the silo scale. In the Silo management screen, the user enters "0" (zero). Trio then defines the current A2D signal to be the A2D signal for an empty bin.

Silo 1				
Storage Capacity	0 Kg			
Sensor is not calibrated CALIBRATE TEST				

< ■	DAY O	тіме 16:43	House 1	
Devices & Sens	ors			CANCEL
Devices Sen	nsors			SCALE CARD
Humidity				
Light Sensor				
Outside Temperature		< васк		
Potentiometer				
Power Meter				
Pressure				
🗸 Silo	2/2			
Temperature				
Water Meter				

- 1. Define each silo's storage capacity.
- 2. Click on the silo icon and click **Calibrate**. The following screen appears:

Silo 1 Calibration
Choose load cell manufacture
OTHER

3. Click Other. The following screen appears:

Silo 1 Calibration
Load the silo with a precise amount of feed.
Note! The quantity must be at least 100Kg.
CANCEL CONTINUE

4. Fill up the silo with a known amount of feed. Munters recommends either a truck filling or a minimum of 500 kilograms.

5. Enter the amount of feed in the silo and press Continue.

Silo 3 Calibration
Fill up the silo with precise amount of feed
Note! amount has to be above 100 Kg.
BACK CONTINUE

The following screen should appear.

libration Succeeded			
		DONE	
	libration Succeeded	libration Succeeded	libration Succeeded

6. Go to Flock > Silo Management.



7. Click and change the feed weight to 0.



8. Click Save.

The Trio now displays an accurate A2D number on the silo icon screen.

Silo 1			
Enable Mode			
Storage Capacity	1,000 Kg		
C			
469			

7.5.1.3 Testing the Silo

1. After calibrating the silo, go to the Silo relay.

Silo 1		
Storage Capacity	0 Kg	
CA	ALIBRATE	

2. Click Test.

Silo 1 Test			
	O Kg		
	A2D 2,500		
		ок	

3. Place a known weight in the silo.

Silo 1 Test		
	500 kg	
	A2D 3,504	
		ок

The weight should appear on the screen and the A2D level should rise.

7.5.2 DEFINING BINTRAC SILOS

TRIO can support up to three BinTrac silo scales.

This function requires a scale card.

1. On the Devices & Sensors screen, click **Silo**. The Scale icon turns brown. Click the icon.

	ау тіме 0 12:35	House 8	
Devices & Sensors	S		CANCEL SAVE
		SCALE CARD	BinTrac
< BACK			6
	RSU: 1 2	2 RSU B A	B
		BinTrac A B C D 2 1	

2. Define the ports as BinTrac. No parameter definitions required.

7.5.3 DEFINING THE BIRD SCALES

- Mapping the Bird Scales
- Calibrating the Bird Scales
- Testing the Bird Scale

Trio can support up to four bird scales.

7.5.3.1 Mapping the Bird Scales

Install a scale card.

1. On the Devices & Sensors screen, click **Bird Scale**. The Scale icon turns brown.

← =) DAY 1	TIME 17:25	House 1		
Devices & S	ensors				CANCEL SAVE
Devices	Sensors			h [5] [6] [7]	8 0
Ammonia					Pressure
Cross Auger Active			9 10 11 12	13 14	
Auxiliary Input		SCALE >			Alarm
 Bird Scale 	0/4		-15 -16 -17 -19	19 - 20 -	
C02				19 20	
Feeder Active					
Gas Meter		1 2	4 5 6	8 9 10	11 12 13 14
Humidity					
Light Sensor					23 20 21 28

- 2. Click the Scale icon.
- 3. Define up to four channels as scales and click **Save**.
| (+) (+) <th>TIME
House 1
12:43</th> <th></th> | TIME
House 1
12:43 | |
|---|--------------------------|-------------|
| Devices & Sensors | | CANCEL SAVE |
| Devices Sensors | | SCALE CARD |
| Ammonia | | |
| Cross Auger Active | | |
| Auxiliary Input | K BACK | |
| Bird Scale 2 / 4 | | |
| C02 | | |
| Feeder Active | | |
| Gas Meter | | |
| Humidity | | |
| Light Sensor | | |

4. Verify that each channel is enabled.

7.5.3.2 Calibrating the Bird Scales

1. Click on a bird scale icon and click **Calibrate**. The following screen appears:

Bird Scale 1 Calibration		
Zero the scale:		
Make sure the platform is	empty and stable bef	ore you continue
		Kg
	CANCEL	ZERO

2. Remove everything from the scale and press **Zero**. In the following screen enter the weight being used to calibrate the scale; minimum is 1.0 kilogram. Click **Next**.

CAUTION The scale must be free of any objects before pressing Next!

Bird Scale 1 Calibration			
Enter the weight being used to calibrate the	Range	1.000 -	- 50.000
scale	1	2	3
Caution: Do not place the weight on the scale yet!	4	5	6
	7	8	9
- 1.5 κg +	-	0	•
	En	ter	X
CANCEL		NEXT	

3. Place a known weight on the scale (1.5 kilograms in the below example) and press Next.



The following screen should appear:

Bird Scale 1 Calibration	
Your bird scale is ready to use.	
	DONE

7.5.3.3 Testing the Bird Scale



1. Click Test.

Bird Scale 1 Test		~
R 3	O kg	
	A2D 2,553	
		EXIT

2. Place a known weight on the bird scale.

Bird Scale 1 Test		
3	1.5 _{кg}	
	A2D 6,218	
	EXIT	

The result should be fairly close to the true weight.

7.5.4 DEFINING THE RSU

The following section details how to define up to two RSU units connected to the Trio (optional). For detailed information on using the RSU, refer to the product manual.

Swire the RSU to the Trio as shown in Figure 43, page 49.

- 1. Reset the Trio, as shown in General Settings > About.
- 2. Go to Device & Sensors > Installation > Scale.

Image: Constraint of the second sec	тіме 12:35	House 8		
Devices & Sensors				* /
		SCALE CARD		Bird Scale 1
< BACK			vices	Enable Sensor ON
		RSU-2 1 RSU-2 A B A B	2	
				▲ Sensor is not calibrated
				CALIBRATE
				TEST

- 3. Click the RSU icon.
- 4. Click Calibrate.

Follow the instructions given in Configuring the Silo Scale, page 102.

7.6 Trio RPS

The following section details how to configure the RPS device.

- Defining the Sensor
- Static Pressure Calibration

7.6.1 DEFINING THE SENSOR

- 1. Go to System > Devices & Sensors.
- 2. Click _____. The Devices & Sensor screen appears.

Sensors

- 3. Click
- 4. Click Pressure.

5. Define an analog input port as the pressure sensor. In the following screen, ports 5 is defined as the pressure sensor.

Devices & Sensors	CANCEL SAVE
Devices Sensors	
Auxiliary Input	$\begin{array}{c c} & & & \\ \hline & & \\ 2 \\ \hline & \\ 2 \\ \hline \end{array} \end{array} \begin{array}{c} & & \\ \hline & \\ 1 \\ \hline \end{array} \end{array} \begin{array}{c} & & \\ \hline & \\ 1 \\ \hline \end{array} \end{array} \begin{array}{c} & & \\ \hline & \\ 1 \\ \hline \end{array} \end{array} \begin{array}{c} & & \\ \hline & \\ 1 \\ \hline \end{array} \end{array} \begin{array}{c} & & \\ \hline & \\ 1 \\ \hline \end{array} \end{array} \begin{array}{c} & & \\ \hline & \\ 1 \\ \hline \end{array} \end{array}$
Humidity	Pressure 694 6104 6114 6124 6134 6144
 Pressure 	
Temperature	<u></u> Alarm
Water Meter	
Potentiometers	
Ammonia	$ \begin{bmatrix} \bullet \\ \bullet$
C02	
Outside Temperature	15 16 17 18 19 20 21 22 23 24 25 26 27 28

6. Go to Climate > Static Pressure and define the parameters.

7.6.2 STATIC PRESSURE CALIBRATION

CAUTION The Static Pressure sensor is factory calibrated. Only calibrate the sensor if you have reason to believe that they are producing inaccurate results.

The Static Pressure should be 0 when there is no ventilation and the house is closed. When the controller A/D counts is 100, this means that there is zero (0) static pressure.

- **NOTE:** Run the controller for a few hours so that the temperature in the box becomes stable and only then calibrate.
- *CAUTION* DO NOT blow the air into the hose to see if the pressure changes! The sensor is sensitive and blowing air can cause irreparable damage.

To calibrate the Static Pressure Sensor:

- 1. Disconnect the air hoses.
- 2. Go to System > Device & Sensors > Pressure.



3. Click Calibrate.

Pressure 1 Calibration	
<pre></pre>	
Disconnect the air hoses	from the controller to zero the pressure.
(BACK CALIBRATE

- 4. If the A/D count is 100 +/- 30 (70 to 130), click Calibrate.
- 5. If the A/D count is less than 70 or greater than 130:
 - a. Check for blocked air hoses or wind interference.
 - b. Open the Trio. On the Main Board, find the Static Pressure Sensor.



c. Adjust the zero pressure reading to approximately 100 by turning the calibration screw.

d. When the A/D count is within the permitted range, press Calibrate.

7.7 Testing Devices

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

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

Fan 2 Test Testing is active. This relay's control is disabled.	Fan 3 Test
ON OFF	CANCEL START TESTING
STOP TESTING	

• Relay devices: Click Test > On to ensure that the device turns on.

Cross Auger 1 Testing		
	ON	
		STOP TESTING

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

Fan 2 Testing		
	0 v	
		max +
		STOP TESTING

• 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.

Temperature 6 Testing	Humidity 2 Testing
A2D 500	Detected short circuit
Value 22.6°	68
STOP TESTING	A2D 633
	ОК

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



8 Appendix A: External Devices (Previous Versions)

The following section details the relays and analog/digital ports found in previous software versions.

Device type	Maximum Number of Devices	Number of Relay Devices	Number of Analog Devices
Cooling	2	2	N/A
Heaters	6	6	6
Inlets	2	2	2
Outlets	1	N/A	1
Tunnel Doors/Curtains	2	2	2
Fans Exhaust/Tunnel	20	20	8
Stir Fan	2	1	1
Lights	4	4	4
Timer	5	5	N/A
Auger	2	2	N/A
Feeder	4	4	N/A
Lighting	4	4	N/A
As Relay	30	30	N/A
As Analog Out	8	NA	8
Alarm	1	1	N/A

Table 5: Trio 20 Poultry STD - Version 5

Device type	Analog Sensors	Digital Sensors
Temperature Sensors	12	N/A
Humidity Sensors	2	N/A
Outside Humidity		N/A
Sensor	1	
CO2 Sensors	1	N/A
Ammonia Sensors	1	N/A
Pressure Sensors	2	N/A
Potentiometers	4	N/A
Bird Weighing	4	N/A
Silo Weighing	2	N/A
Lux Meter (light		N/A
intensity)	1	
Water Meters	N/A	4
Gas Meters	N/A	3
Aux. Input	N/A	4
Auger Sensor	N/A	2
Feeder Line Sensor	N/A	4

Table 6: Trio 20 Poultry STD - Version 4

	Output			Measureme	ents
Name	Total	Relay	0-10V	Analog	Digital
Cooling	2	2			
Heaters	6	6	6		
Inlets	2	2	2		
Outlets	1	NA	1		
Tunnel Doors/Curtains	2	2	2		
Fans Exhaust/Tunnel	20	20	8		
Stir Fan	1	1	1		
Timer	5	5			
Auger	2	2			
Feeder	4	4			
Lighting	4	4	4		
As Relay	30	30	NA		
As Analog Output	8	NA	8		
Alarm	1	1			
Temperature Sensors				12	
Humidity Sensors IN				1	
CO2 Sensors				1	
Ammonia Sensors				1	

	Output		Measurements		
Pressure Sensors				1	
Potentiometers				4	
Power Meter				2	
Gas Meter				2	
Lux Meter				1	
Bird Weighing				2	
Silo Weighing				2	
Water Meters					1
Aux. Input					4
Auger Sensor					2
Feeder Line Sensor					4

Table 7: Trio 20 Poultry STD - Version 3

	Output		Measurements		
Name	Total	Relay	0-10V	Analog	Digital
Cooling	2	2			
Heaters	4	4	4		
Inlets	2	2	2		
Outlets	1	NA	1		
Tunnel Doors/Curtains	2	2	2		
Fans Exhaust/Tunnel	12	12	8		
Stir Fan	1	1	1		
Timer	5	5			
Auger	2	2			
Feeder	4	4			
Lighting	4	4	4		
As Relay	20	20	NA		
As Analog Output	8	NA	8		
Alarm	1	1			
Temperature Sensors				12	
Humidity Sensors IN				1	
CO2 Sensors				1	
Ammonia Sensors				1	
Pressure Sensors				1	
Potentiometers				4	
Power Meter				Х	
Gas Meter				Х	
Lux Meter				1	
Bird Weighing				2	
Silo Weighing				2	

	Output		Measurements		
Water Meters					1
Aux. Input					4
Auger Sensor					2
Feeder Line Sensor					4

9 Appendix B: Service Manual

- Maintenance
- Trouble Shooting
- Spare Parts

9.1 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:
 - the Trio is installed in an environment with high humidity, ammonia content, or some other destructive agent.
 - 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.





9.2 Trouble Shooting

- Internet
- Electronic Components

9.2.1 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.
- 3. Verify that the unit is powered.

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



9.2.2 ELECTRONIC COMPONENTS

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

Solution: Open the Trio 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 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.

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.

9.3 Spare Parts

- Preliminary Information
- Trio Minimal Spare Parts
- Trio 20 Door Card Spare Parts
- •

• D5	CABLE GSM 40cm M.SMA-UFL (SP-490008)	MPN: 940-99- 00036
		DPN:

- Trio 20 Main Container Spare Parts
- Additional Options
- Cards

9.3.1 PRELIMINARY INFORMATION

	Trio 20
Container	Α
Door Cards	В
Main Container Cards	С
Cables and Harnesses	D
MPN	Munters Part Number
DPN	Distributor Part Number

9.3.2 TRIO MINIMAL SPARE PARTS

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

9.3.2.1 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

9.3.2.2 Chinese Customers

P/N	Description
940-99-00002	TRIO-20 LCD KIT (DISPLAY + LVDS CARD + USB CABLE) (SP-250061)
940-99-00157	TOUCH MODULE FOR TRIO LCD 10.1" (250061)VT101C-KC17-B07A VITEK (SP-250064)
940-99-00003	TRIO-20 MAI, CPU
940-99-00164	TRIO-POU-CN- DISPLAY IMX8 CARD WITH HEATSINK AND FAN
940-99-00166	TRIO-POU-CN- DISPLAY IMX8 CARD WITH HEATSINK AND FAN & ANTENNA WIFI

9.3.3 TRIO 20 CONTAINER SPARE PARTS





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	MPN: 940-99-00001	OR
	MUNTERS + PART BLUE	DPN:	
A2.2	Trio PANEL PLASTIC PART RED RAL 3020 NO	MPN: 940-99-00045	
	LOGO (SP-207138)	DPN:	
A3.1	ONE / ONE PRO - LATCH GENERAL LOCK	MPN: 900-99-00217	
	PLASTIC PART + LOCK FOR LATCH	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	MPN: 940-99-00020	
	(EXTRUSION PROCESS) (SP-204079)	DPN:	
A6	MID-RANGE MAIN GASKET V1.0.0 (SP-207122)	MPN: 940-99-00021	
		DPN:	

9.3.4 TRIO 20 DOOR CARD SPARE PARTS



ID No.	Description	Catalog Number	
B1	TRIO-20 LCD KIT (DISPLAY + LVDS CARD), [+	MPN: 940-99-00002	
	USB CABLE *]	DPN:	
B1a	TOUCH MODULE FOR TRIO LCD 10.1" (250061)	MPN: 940-99-00157	
	VT101C-KC17-B07A VITEK (SP-250064)	DPN:	
B2	TRIO-POU-EN- DISPLAY CARD WITH	MPN: 940-99-00163	
	HEATSINK AND FAN	DPN:	
B2a	BAT COIN 3V FOR SOCKET (SP-450009)	MPN: 999-99-00386	
		DPN:	
B2b	FAN 12V 0.62W 7000RPM 8CFM (SP-240201)	MPN: 940-99-00177	
		DPN:	
B2c	TRIO 20 ANTENNA WIFI MOLEX 15cm CABLE	MPN: 940-99-00035	
	U.FL/I-PEX MHF 2.4GHz 2.8dBi 50ohm (SP- 491009)	DPN:	
B3.1	GLOBAL LTE CELL MODEM W/O SIM SOCKET-	MPN: 904-99-00106	
	EG21GGB-MINIPCIE (SP-490099)	DPN:	
B3.2	Trio Cell Modem Global SIM (SP-221011)	MPN: 904-99-00118	
		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:
D5	CABLE GSM 40cm M.SMA-UFL (SP-490008)	MPN: 940-99-00036
		DPN:

9.3.5 TRIO 20 MAIN CONTAINER SPARE PARTS





ID No.	Description	Catalog Number	Note
C1	Trio-20 MAIN CARD (Trio-20 MAIN)	MPN: 940-99-00003	
		DPN:	
C1.1	SWPS LPV-60-12 Mean Well 100-240V 12V	MPN: 900-99-00264	
	60W (SP-370193)	DPN:	
C2	STATIC PRESSURE SET - AC3G / SE / PL /	MPN: 901-99-00025	
	Trio - POU (WITH EXTERNAL TUBE)	DPN:	
C3.1 Trio 20 SCALE CARD 2SCL (Trio-RSC-2		MPN: 940-99-00013	OR
		DPN:	
C3.2	Trio 20 SCALE CARD 2SCL (Trio-RSC-6)	MPN: 940-99-00014	
		DPN:	
C5	ANTENNA 699-2690MHz 3.2dBi 500HM	MPN: 940-99-00039	
	2G/3G/4G (SP-491010)	DPN:	



ID No.	Description	Catalog Number
C4	BAT COIN 3V FOR SOCKET(SP-450009)	MPN: 999-99-00386
		DPN:

9.3.6 ADDITIONAL OPTIONS

ADO 1	TEMPERATURE SENSOR BLACK-RTS-2-	MPN: 918-01-00001	
	POU	DPN:	
ADO2.1a	RHS10 HUMIDITY SENSING TIP SE (SP-	MPN: 917-99-00214	For
	RHS10-TIP-SE)	DPN:	+/SE
			Sensor
ADO2.2	HUMIDITY SENSOR-RHS-PRO-POU-PLS	MPN: 917-04-10002	-
		DPN:	
ADO2.2a	HUMIDITY SENSOR PRO TIP - (RHS-PRO-	MPN: 917-99-00002	
	TIP)	DPN:	
ADO 3	TRIO GLOBAL LTE CELL MODEM &	MPN: 940-99-00049	
	EXTERNAL ANTENNA SET	DPN:	
ADO 4	STATIC PRESSURE SET -	MPN: 901-99-00025	
	AC3G/SE/PL/TRIO - POU	DPN:	
ADO 4.a	TUBES AND FILTERS FOR RPS (NO RPS CARD)	MPN: 999-99-00503	
		DPN:	
ADO 5.1 TRIO 20 SCALE CARD 2SCL WITH 230V		MPN: 940-99-00015	OR
	POWER SUPPLY	DPN:	
ADO 5.2	TRIO 20 SCALE CARD 6SCL WITH 230V	MPN: 940-99-00016	OR
	POWER SUPPLY	DPN:	
ADO 5.3	TRIO 20 SCALE CARD 2SCL WITH 115V	MPN: 940-99-00017	OR
	POWER SUPPLY	DPN:	
ADO 5.4	TRIO 20 SCALE CARD 6SCL WITH 115V	MPN: 940-99-00018	
	POWER SUPPLY	DPN:	
ADO 6.1	CO2-POU-EN-MUR	MPN: 919-03-10001	OR
		DPN:	
ADO 6.2	CO2-POU-EN-NRO	MPN: 919-01-20002	
		DPN:	
ADO 7	AMMONIA-POU-MUN	MPN: 929-01-00002	
		DPN:	
ADO 8	LIGHT SENSOR-RLS-1-40LUX-POU	MPN: 928-01-00002	

9.3.7 CARDS

- Door Cards
- Main Container Cards
- Door Set

9.3.7.1 Door Cards

Card	Description	Catalog Number
	250061: LCD TFT 10.1' VT101C-KC17- B07A Vitek	940-99-00002
	Or AM- 102460002TMQW- TAOH Ampire Or TWS2101RBTV20C APEX	
	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

Card	Description	Catalog Number
	208027:TRIO- DISPLAY PC BOARD IMX8 NEXCOM	940-99-00163
C STATION INTERNAL DESTINATION CONTRACTOR DESTINATION CONTRACTOR DESTINATION CONTRACTOR DESTINATION CONTRACTOR DESTINATION CONTRACTOR DESTINATION CONTRACTOR DESTINATION CONTRACTOR DESTINATION CONTRACTOR DES	FAN 12V 0.62W 7000RPM 8CFM (SP-240201)	940-99-00177
1461193	491009: ANTENNA WIFI MOLEX 15cm CABLE U.FL/I-PEX MHF 2.4GHz 2.8dBi 50ohm/YF0026AA Quectel	940-99-00035
Image: Construction of the state of the	490099: QUECTEL GLOBAL LTE CELL MOD EM W/O SIM SOCKET-EG21GGB- MINIPCIE	904-99-00106
WEBBING Streamlining global data connectivity Webbingsolutions.com	221011: TRIO CELL MODEM GLOBAL SIM	904-99-00118

9.3.7.2 Main Container Cards

Card	Description	Catalog Number
	R-TRIO-20-MAIN: MUNTERS ROTEM MIDDLE RANGE 2 CPU	940-99-00003
AR BLAN WILL AR BLAN WILL BLAN WILL BLA	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

Card	Description	Catalog Number
	TUBES AND FILTERS FOR RPS (NO RPS CARD)	999-99-00503
	R-TRIO-RSC-2: TRIO 20 SCALE CARD 2CH	940-99-00013
	R-TRIO-RSC-6: TRIO 20 SCALE CARD 6CH	940-99-00014
	ANTENNA 699- 2690MHz 3.2dBi 500HM MAGNETIC 2G/3G/4G (SP-491010)	940-99-00039

9.3.7.3 Door Set

Card	Description	Catalog Number
	TRIO-20 COMPLETE DOOR SET	940-99-00133

9.3.7.4 Main Container Cards

Card	Description	Catalog Number
	R-Trio-20-MAIN: MUNTERS ROTEM MIDDLE RANGE 2 CPU	940-99-00003

Card	Description	Catalog Number
ALION AL	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
	TUBES AND FILTERS FOR RPS (NO RPS CARD)	999-99-00503
	R-Trio-RSC-2: Trio 20 SCALE CARD 2CH	940-99-00013
	R-Trio-RSC-6: Trio 20 SCALE CARD 6CH	940-99-00014

10 Appendix C: TRIO Expansion

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

10.1 Introduction

- Observe all the safety rules given in Precautions, page 11.
- Install the unit according to the instructions given in Unit Installation, page 22.

10.2 Expansion 10

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

10.2.1 EXPANSION LAYOUT



Figure 49: Board layout

1	10 relays
2	RS-485 ports
3	Power ports
4	Ground strip
5	Address dipswitch (refer to Address, page 148)

WARNING! The power ports are protected by a removable cover. Before beginning any wiring, disconnect the power supply!

10.2.2 TRIO TO TRIO 10 EXPANSION WIRING

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

- Wiring
- Address
- Restart





Figure 50: 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
 - 3: COM wire. Caution: Do not connect this wire to a DCOM port.

10.2.2.2 Address

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



Figure 51: Expansion Address

10.2.2.3 Restart

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



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

10.2.3 HIGH VOLTAGE RELAYS



Figure 52: High voltage devices (examples)

Example of devices

1

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


Figure 53: Relay and port numbering



Figure 54: Power ports

10.3 Expansion 20

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

10.3.1 EXPANSION LAYOUT



Figure 55: Board layout

1	20 relays
2	RS-485 ports
3	Power ports
4	Ground strip
5	Address dipswitch (refer to Address, page 148)

WARNING! The power ports are protected by a removable cover. Before beginning any wiring, disconnect the power supply!

10.3.2 EXPANSION WIRING DIAGRAMS

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

- Wiring
- Address
- Restart





Figure 56: 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

10.3.2.2 Address

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



Figure 57: Expansion Address

10.3.2.3 Restart

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



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

10.3.3 HIGH VOLTAGE RELAYS



Figure 58: High voltage devices (examples)

1 Example of devices





Figure 59: Relay and port numbering



Figure 60: Power ports

Relay 1

10.4 Mapping Devices in Expansion

- Install and wire the Expansion unit to the TRIO and to the external devices before beginning.
- After wiring the Expansion unit to TRIO, go to System > General Settings > Info

Reset

and click

Follow the online instructions.

TRIO 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 and Sensors.

Devices & Ser	isors		/ ···
		F	an 1
	$\begin{array}{c} \textcircled{\begin{tabular}{c} \hline \hline$	Capacity KWh	17,000 M3/h 0.0
SCALE >	9 10 11 12 13 14 Alarm	Operation	Normally Open
	15 16 17 18 19 20		
2 3	4 5 6 2 2 9 10 11 12 13 14		
16 17	18 19 20 3 1 23 24 25 26 27 28	😵 on	TEST

2. Click Expansion.

	Fan 1
Capacity	17,000 M3/h
C BACK Operation	n Normally Open

3. Map the devices as detailed in the TRIO manual. (refer to Using the Mapping Screen, page 72) for more information.

10.5 Expansion Specifications

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

10.5.1 EXPANSION 10 SPECIFICATIONS

Parameter	Specifications
Input Power Voltage	115/230 VAC, 50/60 Hz
Input AC Power	0.2A
Maximum number of relays operating simultaneously	10
Note: Running relays at the o 100,000 switching operat	above current levels provides between 50,000 – ions.
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	• Altitude: -400 m to 2000 m
Specifications	• Relative Humidity: 20% - 90%
	 Main supply voltage fluctuation up to +10 - 20%
	Overvoltage category II
Enclosure	Water and dust tight
	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 600 volt insulation
Certification	FC CB · CE

10.5.2 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 o 100,000 switching operat	above current levels provides between 50,000 – ions.		
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 Relative Humidity: 20% - 90% Main supply voltage fluctuation up to +10 - 20% Overvoltage category II PD: 2 		
Enclosure	IP: 52Indoor 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 600 volt insulation 		
Certification	$\mathbf{FC} \mathbf{CB} \cdot \mathbf{CE}$		

10.5.3 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.

10.6 Expansion Spare Parts

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

10.6.1 PRELIMINARY INFORMATION

	TRIO EXP 10	TRIO EXP 20
Container	А	С
Main Container Cards	В	D
Cables and Harnesses	N/A	E
MPN	Munters Part Number	
DPN Distributor Part Number		

10.6.2 TRIO EXPANSION 10 SPARE PARTS

- Trio Expansion 10 Container Spare Parts
- •

D5	CABLE GSM 40cm M.SMA-UFL (SP-490008)	MPN: 940-99-00036
		DPN:

• Trio 20 Main Container Spare Parts



Α4

10.6.2.1 Trio Expansion 10 Container Spare Parts

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

10.6.2.2 Trio Expansion 10 Main Container Spare Parts



ID No.	Description	Order 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	MPN: 999-99-00338
	(SP: 370153)	DPN:

10.6.3 TRIO EXPANSION 20 SPARE PARTS

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

10.6.3.1 Trio Expansion 20 Container Spare Parts





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



10.6.3.2 Trio Expansion 20 Main Container Spare Parts

ID No.	Description	Order Catalog Number
D1	TRIO-EXP 10 CARD (SP: R-TRIO-EXP10)	MPN: 940-99-00029
		DPN:
D1.1	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	Order Catalog Number
E1	FLAT FF14P 34cm (TRIO EXP) <f"d_f"d> (SP-141201)</f"d_f"d>	MPN: 940-99-00168
		DPN:

10.6.4 ADDITIONAL OPTIONS

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

10.6.5 CARDS

Card	Description	Munters Ordering Number
	R-TRIO-EXP10: TRIO EXP 10 CARD	940-99-00029
A CONTRACTOR AND A CONT	370153: SWPS APV-16-12 Mean Well 115V/230V 12V 16W	999-99-00338
R R R R R R R R R R R R R R	R-TRIO-EXP- 10R: CARD EXP RLY ADDIT 10 TRIO	940-99-00159

11Appendix D: Trio Cell Modem Installation

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

- Prerequisites
- Installation

11.1 Prerequisites

- Supported Devices
- Required Software
- Internet Access

11.1.1 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.

•	
8	
6090 - 126	SS3
AINIPCI	<u></u>
LEFA - NUPC	
EC21-EC21-	0



Figure 61: SIM 940-99-00049 Front and Back

11.1.2 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.

11.1.3 INTERNET ACCESS

Trio has a priority system for internet access:

- 1. LAN connection
- 2. Wi-Fi
- 3. Cell modem

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

11.2 Installation

- Physical Installation
- Configuration

11.2.1 PHYSICAL INSTALLATION

- Modem and SIM Card
- Driilling

11.2.1.1 Modem 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.





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.



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



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.



11.2.1.2 Driilling

In the event that the Trio 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.



2. Insert and secure the SMA connector.







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

11.2.2 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.

¢	Image: Day Im	TIME 12:53	Room 1	
Gene	ral Settings \rightarrow	Network		*
<u>ی</u> ک	Wi-Fi Not connected			Manage
()	Cellular Modem Disabled			
	IMEI			Manage
i	IP Address		10.16.1.124	
	Support ID		442500855	
	Munters ID		Not Registered	Reaister

2. Under Cellular Modem, click Manage.

÷		DAY	TIME 12:53	Rooi	m 1		Ú 😢
Gene	ral Sett	ings →	Network				。 //
\bigcirc	Wi-Fi	Enable Cellu	ılar Modem Man	agement			
8	Not cor	Enable Cel APN	lular Modem Ma	anagement			Manage
(()	Cellula Disable	Password					
	IMEI	User Name					Manage
i	IP Addr				CANCEL	SAVE	
	Suppor	t ID		442500855			
	Munter	rs ID		Not Reaistered			Register

- 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.

÷		DAY 1	TIME 12:56	Ro	oom 1		
Gene	ral Sett	ings \rightarrow N	letwork				· /
\bigcirc	Wi-Fi	Enable Cellula	r Modem Man	agement			
8	Not cor	Enable Cellul	lar Modem Ma	nagement			Manage
		APN			internet.t-mobile		
(((Cellula Disable	Password			•••••		
	IMEI	User Name			john smith		Manage
(i)	IP Addr				CANCE	SAVE	
	Suppor	t ID		442500855			

(example only!)

12 Appendix E: Panel Mount Installation

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

- Trio Panel Mount Installation
- Trio Expansion Panel Mount Installation

12.1 Trio Panel Mount Installation

The Trio 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

12.1.1 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.

12.1.2 PANELS





Figure 62: Trio CPU Panel, Front View

Figure 63: Trio CPU Panel, Rear View



Figure 64: Trio Relay Panel, Front View

12.1.3 PANEL DIMENSIONS

Distances are in millimetres.



Figure 65: Front Panel Depth Dimensions



Figure 66: Rear Panel Dimensions



Figure 67: Rear Panel Depth Dimensions

12.1.4 MOUNTING THE PANELS



Figure 68: 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.

12.1.5 PANEL CABLES



Figure 69: Panel Mount, Open Closet (sizes are not to scale)

- Connect the flat cable and internet cable as shown above.
- Mount the Trio 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/metal equipment.
- Any inverter must be at least 50 centimetres 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.

12.1.6 POWERING AND ALARMS

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



Figure 70: Alarm relay and power ports

1	Alarm relay
2	Power ports

12.1.7 GROUNDING



Figure 71: Grounding

CAUTION The unit must be grounded at all times!

12.2 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

12.2.1 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.

12.2.2 PANELS



Figure 72: Trio Expansion 10 Relay Panel, Front View



Figure 73: Trio Expansion 20 Relay Panel, Front View

12.2.3 PANEL DIMENSIONS

Distances are in millimetres.



Figure 74: Expansion Rear Panel Dimensions



Figure 75: Rear Panel Depth Dimensions

12.2.4PANEL EXPANSION WIRING

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

- Wiring
- Address
- Restart





Figure 76: 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
12.2.4.2 Address

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



Figure 77: Panel Expansion Address

12.2.4.3 Restart

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



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

12.2.5 POWER



Figure 78: Power ports

13 Appendix F: IT Setup Guide

The following information is intended for the IT specialist/ISP personnel setting up the internet network between the Communicator 2.0 and Trio Controllers.

- IT Setup
- Subnet Setup
- Wi-Fi
- LAN Cable Information
- Typical Setups

13.1 IT Setup

• Communicator 2.0 and Trio controllers must be on same subnet LAN.

WARNING! In order to ensure continual communication, the Communicator 2.0 and Trio LAN must be an independent dedicated subnet.

- Employ a standard home router, using the default settings, and all devices on the same router.
- On the local network, Communicator 2.0 and Trio must have same the subnet mask (subnet mask must be 255.255.255.0.
- Three first sections of the Communicator 2.0 and Trio IP address must have the same numbers (for example 192.168.1.x).
- Network must be IPv4.

NOTE Munters recommends have a dedicated subnet for the Communicator 2.0/Trio network.

- The local network can employ a firewall on condition that the following ports are open:
 - Zero-configuration networking (zeroconf)
- RabbitMQ

- MQTT
- 15672
- 4200
- UDP port 1900
- 5355

- AMQPT
- 1883
- UDP port 5353
- TCP port 3689
- 1883 MQTT
- Communicator 2.0 has a built-in firewall; all outgoing ports are closed. Incoming ports 8- and 443 are open.

13.2 Subnet Setup

To create a subnet within an industrial network that uses its own DHCP server with the range 192.168.1.1 - 192.168.1.255 or 192.168.2.1 - 192.168.2.255, you need networking equipment capable of isolating and managing traffic.

- Required Equipment
- Procedure

CAUTION Only Communicator 2.0 for Trio and Trio Controllers can be part of this subnet.

13.2.1 REQUIRED EQUIPMENT

- Router or Layer 3 Switch:
 - Capable of creating and managing subnets
 - Allows routing between subnets if required
 - Example: Cisco ISR, Ubiquiti EdgeRouter, or MikroTik
- Managed Switch (Optional):
 - If you need to segment traffic further with VLANs
 - Example: Cisco Catalyst, TP-Link JetStream, or similar
- DHCP Server or Router with DHCP Capabilities:
 - Configure a separate DHCP scope for the new subnet
 - Many modern routers support multiple DHCP scopes
- Firewall (Optional, for added security):
 - To enforce rules between the industrial network and the new subnet

13.2.2 PROCEDURE

- 1. Define the Subnet:
 - Choose a new IP range (e.g., 192.168.2.0/24)
- 2. Set Up the Router:
 - a. Configure a new interface or sub-interface for the new subnet
 - b. Assign an IP address (e.g., 192.168.2.1) to this interface
- 3. Configure DHCP for the New Subnet:
 - On the router or a dedicated DHCP server, set a DHCP scope (e.g., 192.168.2.2 - 192.168.2.254)
- 4. Isolate Traffic:
 - a. Ensure the industrial network (192.168.1.0/24) and the new subnet (e.g., 192.168.2.0/24) are isolated
 - b. Use VLANs or routing rules to control traffic flow
- 5. Connect Devices:
 - Connect devices in the new subnet to the appropriate port on the router/switch

13.3 Wi-Fi

Munters strongly recommends against using Wi-Fi as the internet network. Anyone wanting to use a Wi-Fi network should consult with his IT specialist.

13.4 LAN Cable Information

- Wire/Optical Ethernet Infrastructure Basics
- Trio Connectivity: 100/1000 GBPS Ethernet Switch

13.4.1 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. If the DHCP takes too long (over 3 minutes) to assign IP addresses to controls, it may cause lost communication alarms when controls reset.
- 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
 - \circ 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.

13.4.2 TRIO CONNECTIVITY: 100/1000 GBPS 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.

13.5 Typical Setups



Figure 79: Typical Poultry Installation 1



Figure 80: Typical Poultry Installation 2



Figure 81: Typical Swine Installation

14 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, (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;

- 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 <u>Munters office.</u>

