ReadyEdge

Installation and Operation Manual

MORNINGSTAR INTEGRATEDSERIES

Model: RE-1

MS-003839 v1 12/25

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Safety Information

This manual contains important safety, installation, operating, and maintenance instructions for the ReadyEdge. For safety purposes, these instructions must be followed during installation, operation, and maintenance of the ReadyEdge device.

The following symbols are used throughout this manual to indicate potentially dangerous conditions or mark important safety instructions:

> ***WARNING**: Indicates a potentially hazardous condition. Exercise extreme caution when undertaking this task.*

> ***CAUTION**: This indicates a critical procedure for the safe and proper operation of the ReadyEdge.*

> ***NOTE**: Indicates a procedure or function that is important to the safe and proper operation of the ReadyEdge.*

- Read all of the instructions and cautions in the manual before installation.
- Disconnect all sources of power from the device before installing or adjusting the ReadyEdge.
- There are no fuses or disconnects inside the ReadyEdge. Do NOT attempt to repair.

Installation Safety Precautions

The ReadyEdge must be installed by a qualified technician, following the electrical regulations of the country of installation.

Throughout the manual, NEC guidance is provided to meet general safety requirements and to inform of best installation practices. It is the installer's responsibility to ensure that the installation complies with all local safety and code requirements.

> **Warning: Shock Hazard**
> Only qualified personnel should complete installation and servicing, following the instructions in this manual. To reduce the risk of electrical shock, unless qualified to do so, do not perform any servicing to the ReadyEdge not specified in this Manual.

> **WARNING: Shock Hazard**
> Before wiring, verify that all system breakers and disconnect switches are in the OPEN/DISCONNECTED position, and that all fuses are removed from their holders.

> **WARNING: Shock Hazard**
> Read all the instructions and warnings in the manual before starting the installation. There are no user-serviceable parts in the ReadyEdge. Do not disassemble or attempt to repair.

- Mount the ReadyEdge indoors. Prevent exposure to the elements and do not allow water to enter the device.
- Use insulated tools when working with batteries.
- Avoid wearing jewelry during installation.
- Do not smoke near the battery bank.
- Use properly sized conductors and circuit interrupters.
- Power connections must remain tight to avoid excessive heating from a loose connection.
- Certified for use in negative ground or positive ground systems.

Informations de sécurité

Ce manuel contient des instructions importantes concernant la sécurité, l'installation, le fonctionnement et l'entretien du ReadyEdge. Pour des raisons de sécurité, ces instructions doivent être respectées lors de l'installation, du fonctionnement et de l'entretien de l'appareil ReadyEdge.

Les symboles suivants sont utilisés tout au long de ce manuel pour indiquer des conditions potentiellement dangereuses ou pour souligner des consignes de sécurité importantes :

⚠ **AVERTISSEMENT:** Indique une condition potentiellement dangereuse. Faites preuve d'une extrême prudence lors de l'exécution de cette tâche.

⚠ **ATTENTION:** Indique une procédure cruciale pour le fonctionnement sécuritaire et approprié du ReadyEdge.

☞ **REMARQUE:** Indique une procédure ou une fonction importante pour le fonctionnement sécuritaire et approprié du ReadyEdge.

- Lisez toutes les instructions et mises en garde du manuel avant l'installation.
- Débranchez toutes les sources d'alimentation de l'appareil avant d'installer ou d'ajuster le ReadyEdge.
- Il n'y a ni fusibles ni dispositifs de coupure à l'intérieur du ReadyEdge. Ne tentez PAS de le réparer.

Précautions de sécurité lors de l'installation

Le ReadyEdge doit être installé par un technicien qualifié, conformément aux règlements électriques du pays d'installation.

Tout au long du manuel, les directives NEC sont fournies pour répondre aux exigences générales de sécurité et pour informer des meilleures pratiques d'installation. Il incombe à l'installateur de s'assurer que l'installation respecte toutes les exigences locales en matière de sécurité et de codes.

⚠ **Avertissement: Risque de choc électrique**

Seul le personnel qualifié doit effectuer l'installation et l'entretien, en suivant les instructions de ce manuel. Pour réduire le risque de choc électrique, sauf si vous êtes qualifié, ne faites aucun entretien du ReadyEdge non spécifié dans ce manuel.

AVERTISSEMENT : Risque de choc électrique

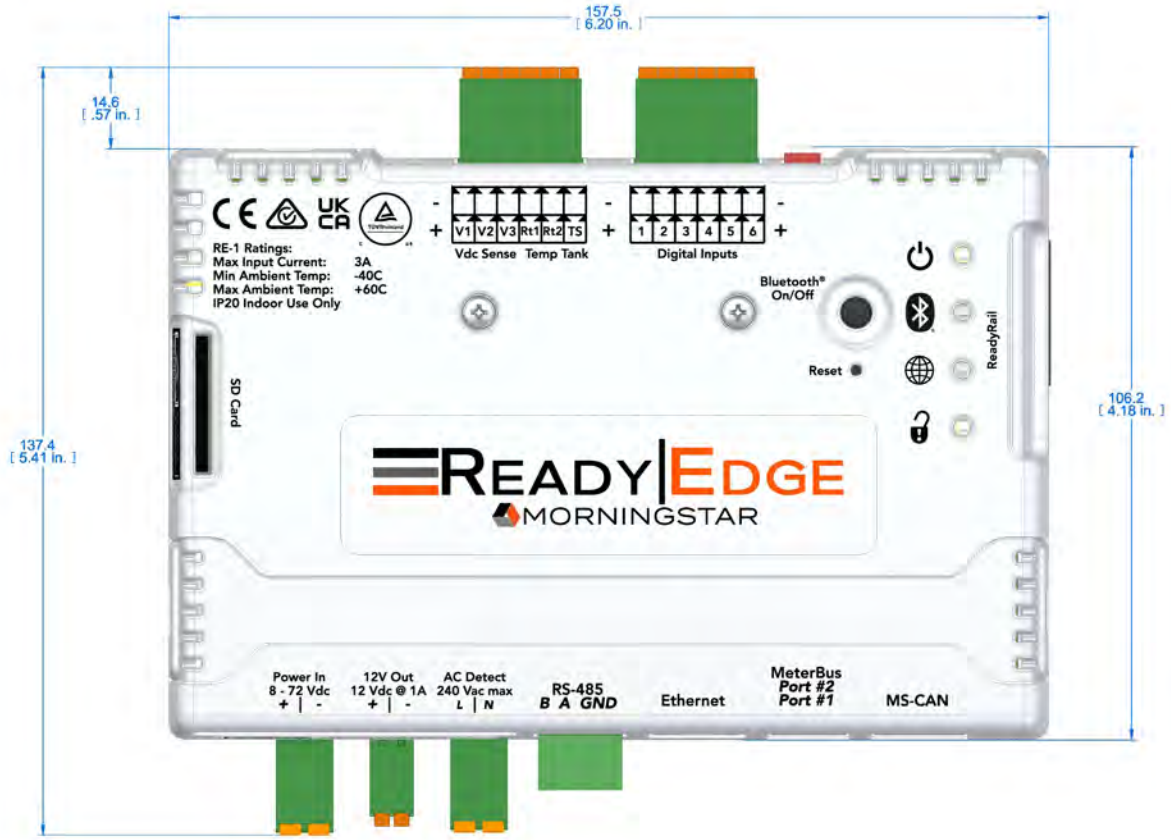
Avant de procéder au câblage, vérifiez que tous les disjoncteurs et interrupteurs de déconnexion du système sont en position OUVERT/DÉCONNECTÉ, et que tous les fusibles ont été retirés de leurs supports.

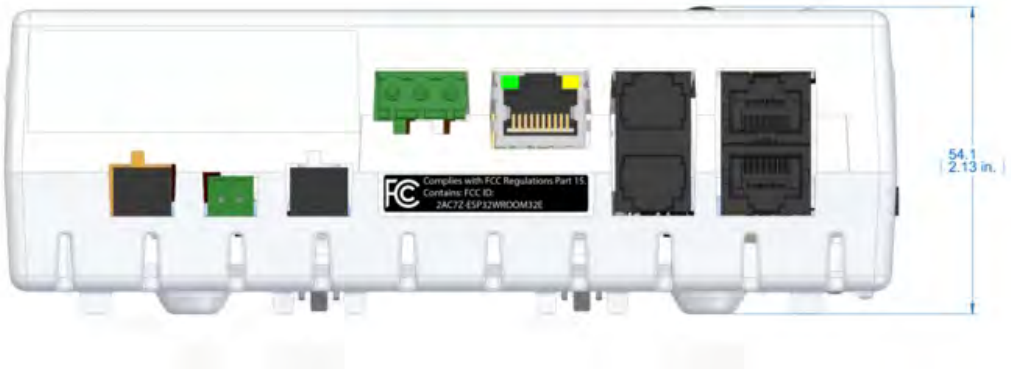
AVERTISSEMENT : Risque de choc électrique

Lisez toutes les instructions et avertissements du manuel avant de commencer l'installation. Le ReadyEdge ne contient aucune pièce réparable par l'utilisateur. Ne démontez pas et n'essayez pas de réparer.

- Installez le ReadyEdge à l'intérieur. Évitez l'exposition aux intempéries et ne laissez pas d'eau pénétrer dans l'appareil.
- Utilisez des outils isolés lorsque vous travaillez avec des batteries.
- Évitez de porter des bijoux pendant l'installation.
- Ne fumez pas à proximité de la banque de batteries.
- Utilisez des conducteurs et des dispositifs de protection de circuit de taille appropriée.
- Les connexions électriques doivent rester bien serrées pour éviter une surchauffe causée par une connexion lâche.
- Certifié pour une utilisation dans des systèmes à masse négative ou positive.

DIMENSIONS [millimeters (inches)]





1.1 General Information

Overview and Key Functionality

ReadyEdge shown with three optional ReadyBlocks connected

Thank you for choosing ReadyEdge, an intelligent system monitor and communication center for your solar energy system. The ReadyEdge functionality is optimized for both off-grid and hybrid solar power systems as follows:

1. **System Data Capture and Visibility**

   The essence of the ReadyEdge is its ability to interface with Morningstar products, summarize the system information, and make the information available locally and/or in the Morningstar Solar Connect cloud.

   - Network multiple Morningstar devices to a single ReadyEdge
   - Built-in LiveView web app provides a comprehensive interface for visibility and control via local networks
   - Compatibility with Morningstar Mobile App allows easy access to key system information using a mobile device
   - Open integrations with Modbus and Simple Network Messaging Protocol (SNMP) to tie into industrial networks
   - Works with Morningstar's Solar Connect cloud dashboard for system visibility online, anywhere in the world

2. **Battery Meter and Metrics**

Battery status and health are critical information for off-grid systems. ReadyEdge reports state-of-charge, energy trends, and other information for all battery chemistries.

- View battery voltage and energy trends
- Accurate SOC and energy balance measurement (ReadyShunt block required)
- Interface with Lithium battery management systems (BMS) to get visibility on critical parameters like SOC, SOH, and cell voltages (ReadyBMS block required)

3. **Manage Generators (AGS) and Other Auxiliary Charging Sources**

The ReadyEdge integrates smart management software that allows you to precisely define start and stop conditions for generators, fuel cells, AC battery chargers, and other charging sources.

- Multiple methods for both start/stop signaling and feedback ensures broad compatibility
- Smart decision-making for complimentary operation with renewable energy sources
- Start and stop events, run time, and other metrics are recorded and reported

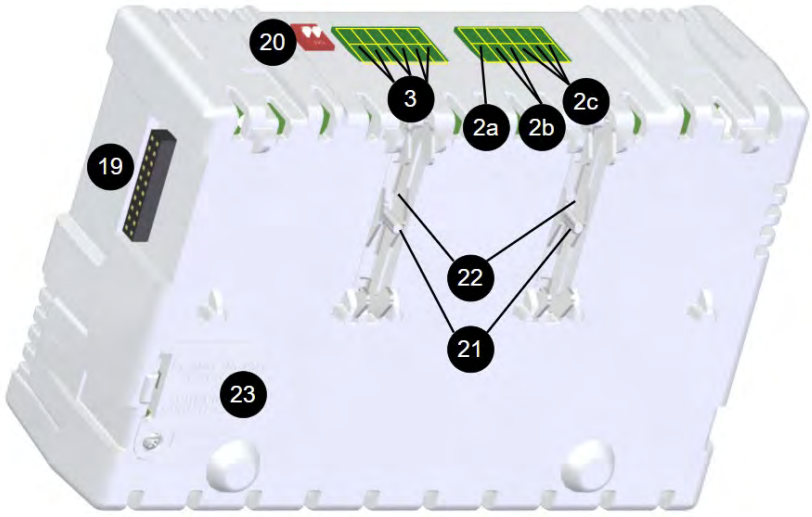
4. **Monitor Digital and Analog Inputs for Alarm Signaling and Reporting**

The ReadyEdge is purpose-built for the detection, measurement, and reporting of components and sensors commonly deployed in off-grid systems.

- Monitor theft loops, breaker positions, door switches, smoke/water detectors, fuel level sensors, temperatures, voltages, and more.
- Configure actions when alarms are triggered or measurements meet certain conditions
- View active and historical signal events locally or in the Morningstar Solar Connect cloud
- Assign unique names to each input for easy identification in the user interfaces

1.2 Product Features

Feature Call-outs



> *NOTE:* Power input, analog inputs, digital inputs, AC voltage detect, and EIA-485 ports are shown without termination plugs to simplify callout locations.

1. SD Card Slot - Future Use
2. Analog Measurement Connections
    1. DC Voltage inputs (3 total)
    2. Temperature Sensor inputs - RTS (2 total)
    3. Tank Sensor input (1 total)
3. Digital (Dry Contact) Inputs (6 total)
4. Bluetooth Radio On/Off Pushbutton
5. Status LED
6. Bluetooth LED

7. Morningstar Solar Connect status LED
8. Read-Only Mode LED
9. Factory Reset Button
10. Mounting Clamp Screws
11. ReadyEdge Power Input
12. 12 Volt / 1 Amp Output Port
13. AC Voltage Detection input Port
14. EIA-485 serial network Port
15. Ethernet Port for LAN/Internet connection.
16. MeterBus RJ-11 Port #1
17. MeterBus RJ-11 Port #2
18. MS-CAN In and Out Ports (interchangeable)
19. ReadyRail Connection
20. DIP Switches
21. Securing Screws
22. DIN Rail Clamps
23. Coin cell battery hatch

Key Specifications

- Suitable for 12V, 24V, and 48V nominal systems
- Communicates with up to (16) Morningstar devices, listed below. Any combination of devices allowed.
- Remote data monitoring with Morningstar Solar Connect included
- LiveView Web App
- Compatible with Morningstar Mobile App
- ReadyRail expansion system for relay dry contact signaling, battery metering, and Lithium battery management
- Integrated Clock (and network time protocol support) for precise time-based scheduling and reporting
- Fully electronic protections
- IP20 Rating (for use indoors)
- 5-year warranty (see Section 7.0)

1.3 Compatibility and Accessories

Morningstar Charge Controllers and Inverters

- ProStar
- ProStar MPPT
- SunSaver MPPT
- SureSine-300
- TriStar
- TriStar MPPT 150V
- Tristar MPPT 600V

ReadyBlocks

ReadyRelay (RB-Relay)

A snap-in ReadyBlock enabling signaling and load control via two dry contact relays. It features programmable logic support for load control, Automatic Generator Start-Stop, and other purposes.

ReadyShunt (RB-Shunt)

A snap-in ReadyBlock enabling intelligent battery monitoring including SOC calculation and energy in/out (Amp hours). Can also be used for current measurement of system sources, loads and more. Features two current measurement channels.

ReadyBMS (RB-BMS)

A snap-in ReadyBlock enabling full communications and control with most lithium battery BMS (Battery Management Systems). The block features both CAN and EIA-485 interfaces.

Other Accessories

Model #	Description	
HUB-1	MeterBus networking hub	Required when connecting (3) or more Morningstar devices to the ReadyEdge on a MeterBus network. The ReadyEdge supports up to (2) MeterBus devices natively without a hub.
MRC-1	MeterBus to EIA-485 Adapter	Converts a Morningstar device's MeterBus port to a standard EIA-485 interface.
Y-Cable	TriStar y-cable communication adapter	Connects TriStar PWM and TriStar-MPPT 30/45A models to MeterBus networks with Modbus communication
RTS	Remote Temperature Sensor	Connect to a ReadyEdge "Temperature Sensor Input" to monitor temperature(s) in and around the system

2.1 General Notes

Read through the entire installation section first before beginning installation.

CAUTION: Equipment Damage

When installing the ReadyEdge in an enclosure, ensure sufficient ventilation. Installation in a sealed enclosure may lead to overheating and a decreased product lifetime.

ATTENTION: Dommages à l'équipement

Lors de l'installation du ReadyEdge dans une enceinte, assurez-vous qu'il y a une ventilation suffisante. L'installation dans une enceinte scellée peut entraîner une surchauffe et une diminution de la durée de vie du produit.

- For indoor use only. Do not install in locations where water can enter the ReadyEdge.
- This equipment is not suitable for use in locations where children are likely to be present.
- Loose power connections and /or corroded wires may result in resistive connections that melt wire insulation, burn surrounding materials, or even cause fire. Ensure tight connections and use cable clamps to secure cables and prevent them from swaying in mobile applications.
- The ReadyEdge battery connection may be wired to one battery or a bank of batteries. The following instructions refer to a singular battery, but it is implied that the battery connection can be made to either one battery or a group of batteries in a battery bank.
- Ensure that the system battery maintains voltages between 8 and 72V.
- Up to 16 compatible devices can be connected to the ReadyEdge.

2.2 Items Included and Tools Required

In the Box

- Product Registration Card
- Device Claim Code Card
- Power Cable with ring terminals and inline fuse
- MS-CAN terminator
- Battery— CR 2032 Coin Cell, Preinstalled
- Ethernet Cable
- Two (2) MeterBus RJ-11 cables, 1 m length each
- EIA-485 Pluggable Connector 3-pos terminal block
- Input Power Pluggable Spring Clamp Terminal Block, 2-pin, 5.08 mm*
- AC Detect Pluggable Spring Clamp Terminal Block, 2-pin, 3.5 mm*
- Digital Inputs Pluggable Spring Clamp Terminal Block, 2x6-pin, 3.5 mm*
- Analog Inputs Pluggable Spring Clamp Terminal Block, 2x6-pin, 3.5 mm*
- Ferrite Choke: 205 OHM@100MHZ EMI
- Short DIN Rail 75 mm, for mounting the ReadyEdge without ReadyBlocks
- Long DIN Rail 225 mm, for mounting the ReadyEdge with ReadyBlocks
- DIN-rail Mounting Screws, Pack of Four (4)
- Two (2) DIN Clamp Screws, M3 X 50 mm (inserted through ReadyEdge case)

*Wire Size: #24-16 AWG / 0.2 - 1.3 mm²

Tools Needed - Not Included

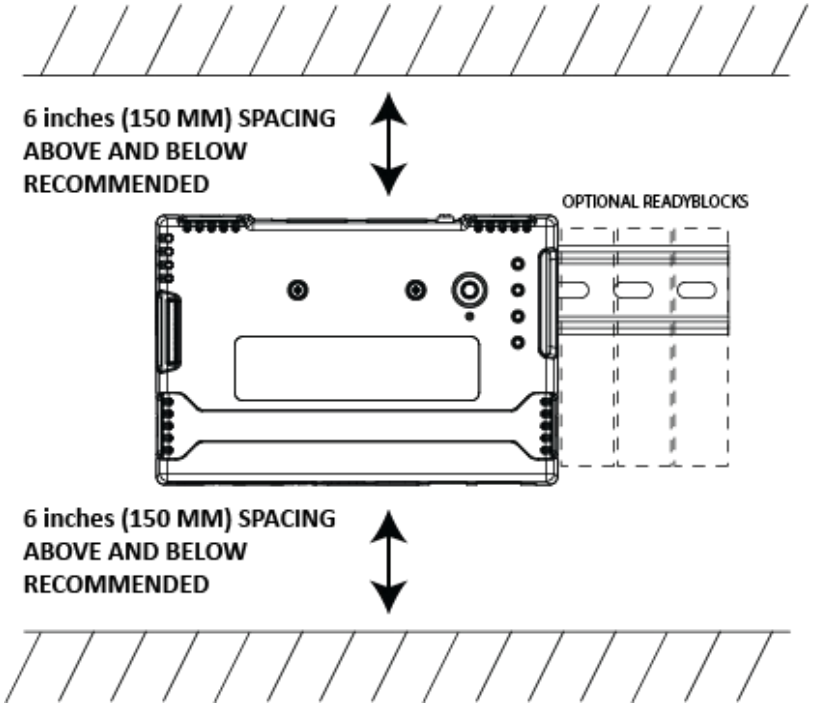
- Drill, 1/8”(3 mm) bit
- Phillips Screwdriver, #1 and #2
- Pencil
- Standard Screwdriver, 3/32” (2.5 mm)
- Digital Multimeter

2.3 Mounting ReadyEdge and ReadyBlocks

Step 1 - Choose a proper mounting location

Locate the ReadyEdge on a surface that is protected from direct sun, high temperatures, corrosive fumes, and water. Do not install in a confined area where battery gases can accumulate.

Step 2 - Ensure sufficient spacing



ReadyEdge Mounting Clearance

Before starting the installation, place the ReadyEdge on the surface where it will be mounted and determine where the wires will enter and exit.

NOTE: If ReadyBlock(s) will be connected to the ReadyEdge, make sure there is sufficient room to the right of the ReadyEdge for the complete assembly. The long DIN-rail 8.9 inches (225 mm) provides space for up to three (3) ReadyBlocks. The ReadyEdge can accommodate up to six ReadyBlocks. If installing more than (3) ReadyBlocks, use a section of 35mm DIN-rail that is at least 11.8 inches (300 mm) long - not included.

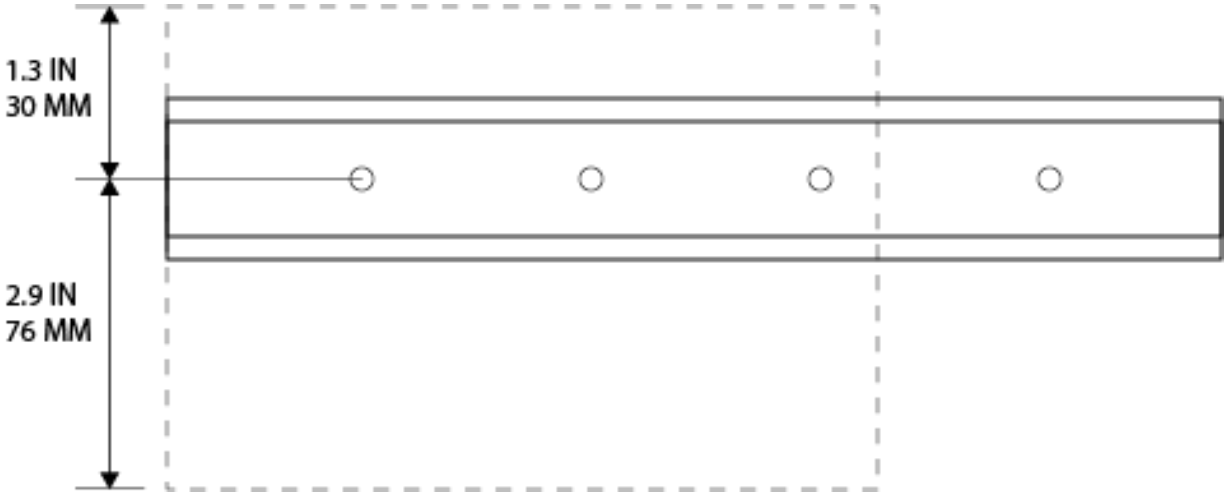
Verify there is sufficient space above and below the unit for entry and exit of wiring and communication cables .

Recommended Spacing

1. Six (6) inches / 150 mm above and below to provide sufficient wiring and cables bending room
2. No clearance necessary on either side. Other DIN mount devices may be mounted up against the ReadyEdge and Blocks on either side. However, it is recommended to leave one (1) inch / 25 mm on the right side to allow for ReadyBlocks removal and servicing.

These are recommended spacing requirements only. Site conditions may vary.

Step 3 - Secure the DIN rail to a mounting surface



DIN-rail Mounting - ReadyEdge Body Dimensions

a. Decide which DIN-rail length will be needed for the install (included in the box). Use the shorter 75mm DIN-rail if only the ReadyEdge unit will be mounted. Use the longer 225mm DIN-rail section if ReadyBlock(s) will also be installed. Now or in the future. Alternatively, the ReadyEdge may be mounted to any standard 35mm DIN rail.

b. Reference the dimensioned diagram above to determine the exact location of the DIN-rail. Be sure the DIN-rail is level and mark the DIN-rail mounting holes on the mounting surface using a pencil or marker.

c. Check that the DIN-rail mounting screws will not penetrate wires or other objects located on the opposite side of the surface before drilling. Using a 1/8” bit, drill pilot holes for each of the mounting screws where marked.

d. Secure the DIN-rail to the mounting surface with screws appropriate for the substrate

Step 4 - Mount the ReadyEdge to the DIN-rail

1. Fit the Clamps around the DIN Rail as shown in the diagram
2. Install the Mounting Clamp Screws
3. Tighten screws by turning clockwise to a max torque of 2 lb-in (0.23 N-m). This centers the ReadyEdge on the DIN rail and tightens the clamps

Step 5 - Mount Optional ReadyBlock(s)

The ReadyEdge can accommodate up to six ReadyBlocks. ReadyBlocks are connected on the right side of the ReadyEdge to the DIN Rail.

Install ReadyRail accessories by fitting the ReadyBlock to the DIN Rail and sliding it to the left to securely join the ReadyRail connector to the ReadyEdge. Install additional ReadyBlocks in the same manner as the first ReadyBlock.

NOTE: Only one BMS Block may be connected to a ReadyEdge.

ReadyEdge Mounting Diagram

Step 1: Power Wiring Connection

WARNING: Shock Hazard

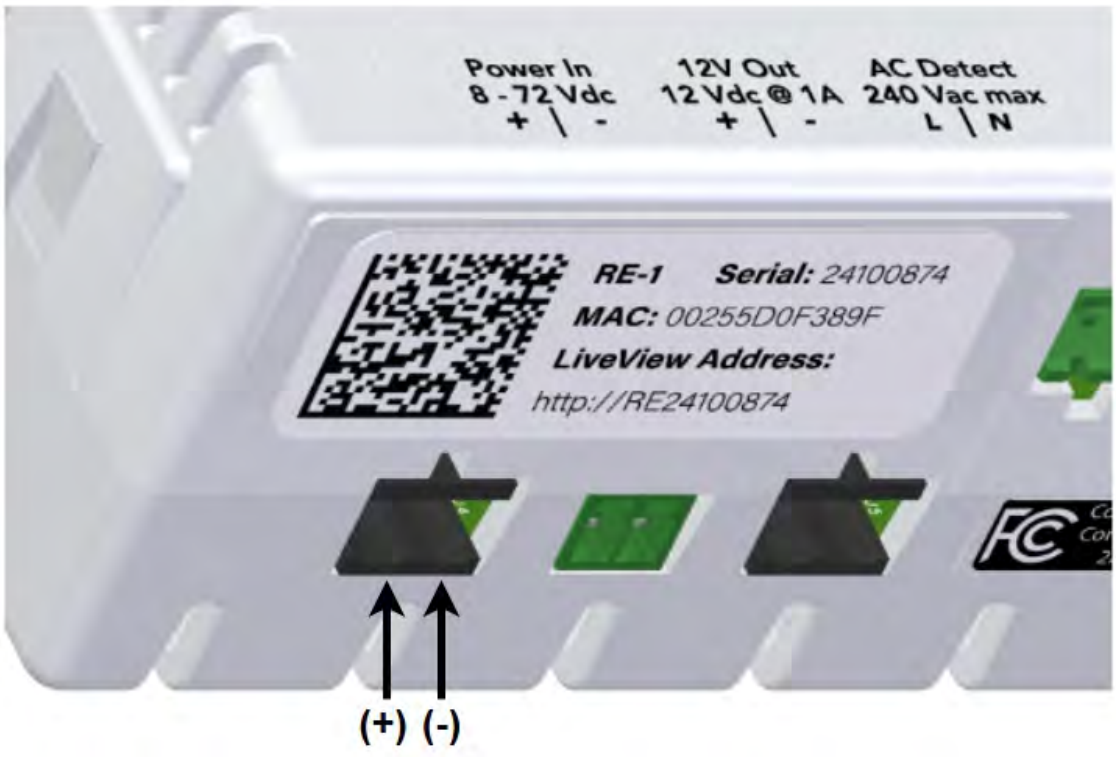
Before wiring, verify that all system breakers and disconnect switches are in the OPEN/DISCONNECTED position, and that all fuses are removed from their holders.
Do not apply power to the ReadyEdge until all wiring has been completed per these instructions.

AVERTISSEMENT : Risque de choc

Avant de faire le câblage, vérifiez que tous les disjoncteurs et interrupteurs de déconnexion du système sont en position OUVERT/DECONNECTÉE, et que tous les fusibles ont été retirés de leurs supports.
Ne pas appliquer l'alimentation au ReadyEdge jusqu'à ce que tout le câblage soit terminé conformément à ces instructions.

NOTE: GROUNDING *The power source for the ReadyEdge may be positive grounded, negative grounded, or floating.*

REMARQUE: MISE À LA TERRE La source d'alimentation pour le ReadyEdge peut être à la terre positive, à la terre négative ou flottante.



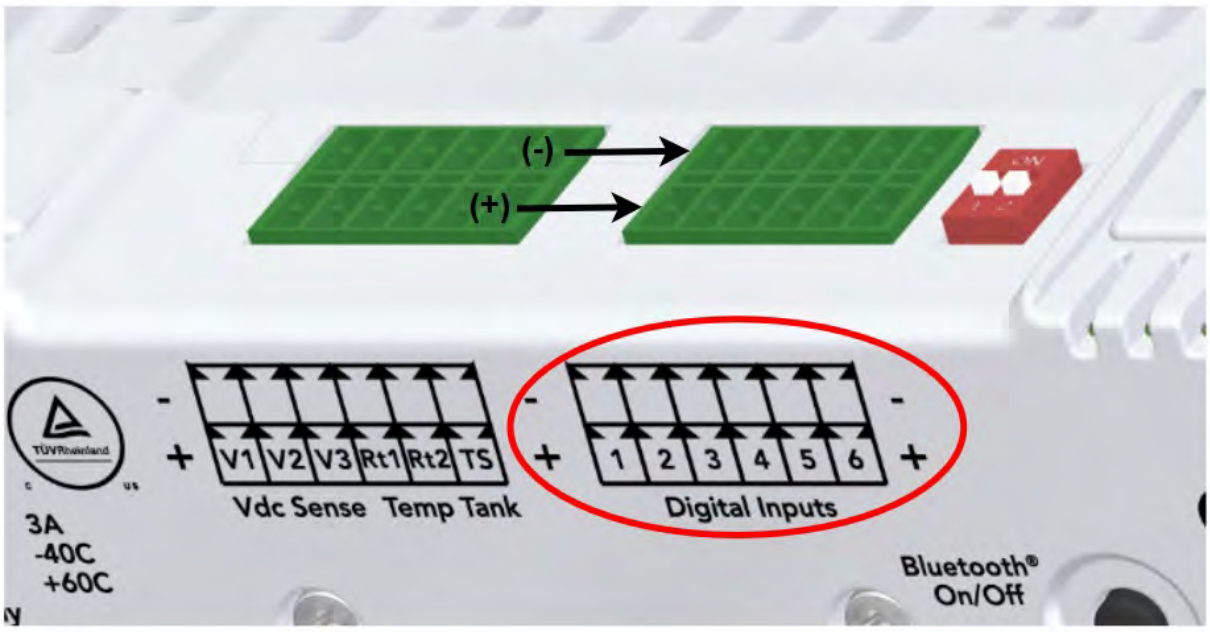
Power Input Connection location and polarity (termination plug not shown for clarity)

1. Use the included power cable with in-line fuse. **Be sure the fuse has been removed from the holder** before proceeding.

2. Connect the ring-terminal ends of the included power cable to the battery bank. The red wire is positive (+), the black wire is negative (-).
3. Connect the power cable terminal connectors to the ReadyEdge port labeled “Power In, 8-72 vdc (+/-)”. The polarity of the connection is shown in the diagram above.
4. The fuse will be inserted at a later step. Set it aside in a safe place for now.

Step 2: Connect Digital Inputs

> ⚠ ***CAUTION**: The grounding polarity of all Digital Inputs MUST match the grounding polarity of the ReadyEdge power source.*
>
> ⚠ ***ATTENTION**: La polarité de mise à la terre de toutes les entrées numériques DOIT correspondre à la pol arité de mise à la terre de la source d'alimentation ReadyEdge.*



Digital Inputs location and polarity (termination plug not shown for clarity)

The ReadyEdge has six (6) Digital Input connections for signal monitoring and triggering user defined alerts. Each input accepts a “dry contact” signal from a third party device. Example devices include:

- Door Sensors
- Theft Loops
- Smoke Detectors
- Mechanical Switches
- Circuit breaker open/close contacts
- Tank float switches
- Relay contacts (the relay coil activated by a DC or AC power source)
- Power supplies, fuel cells, and other devices with Alarm output dry contacts

Each Digital Input reports a “Yes” or “No” status corresponding to an open-circuit or short-circuit condition. Input status can be monitored, used as a variable for conditional logic, and for triggering Alarms. See 3.7.14 Alarms Configuration for more details.

Wiring Instructions

1. Connect the sense wires from the device being monitored to a ReadyEdge Digital Input port.

   > ⚠ ***CAUTION:*** If one leg of the sense wires is grounded, the grounding polarity MUST match the grounding polarity of the ReadyEdge power source.
   >
   > ⚠ ***ATTENTION:*** *Si une branche des fils de détection est mise à la terre, la polarité de mise à la ter re DOIT correspondre à la polarité de mise à la terre de la source d'alimentation ReadyEdge.*

2. Insert the sense wires into the spring clamp terminal connector
3. Clamp the wires securely into place
4. Repeat for other devices
5. Insert the terminal block plug into the terminal socket on the ReadyEdge labeled “Digital Inputs”

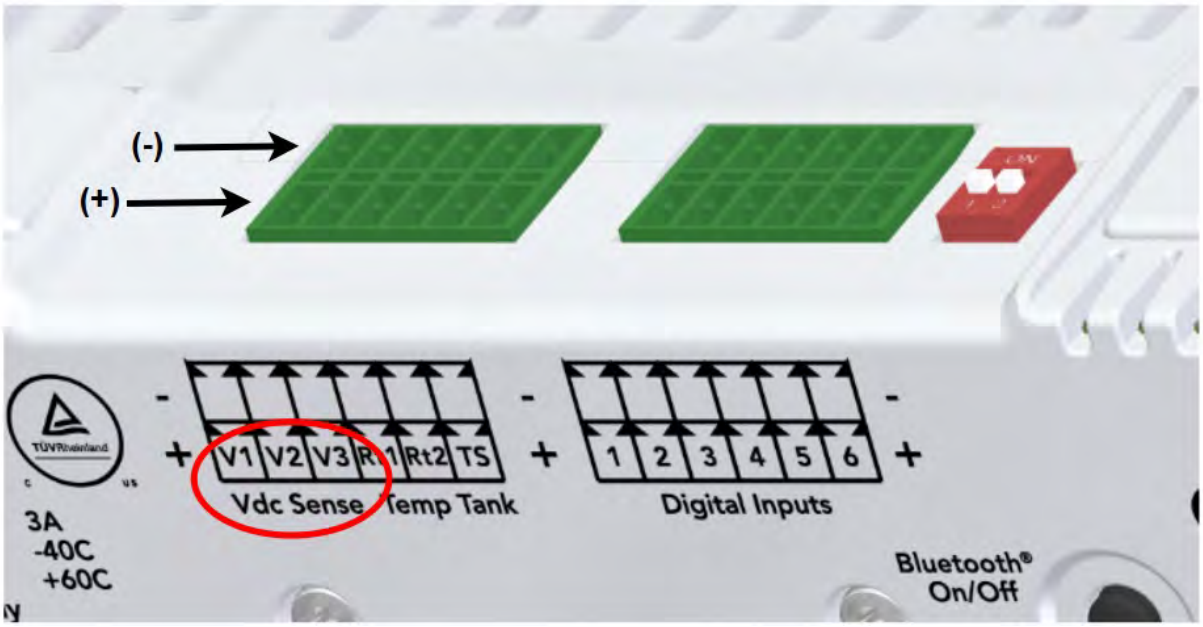
Step 3: Connect Analog Inputs

The ReadyEdge features a bank of analog signal inputs that can measure DC voltage, temperatures, and levels in a tank. The Analog Inputs port features a removable termination plug with spring-clamp terminals. It may be convenient to remove the plug, make the wiring connections, and then reinsert the plug in the location shown in the illustration above once all wiring connections have been made.

Vdc Sense - Up to (3) Inputs

> ⚠ ***CAUTION**: The grounding polarity of Vdc Sense inputs MUST match the grounding polarity of the ReadyEdge power input source.*

> ⚠ ***ATTENTION:** La polarité de mise à la terre des entrées Vdc Sense DOIT correspondre à la polarité de mise à la terre de la source d'alimentation ReadyEdge.*



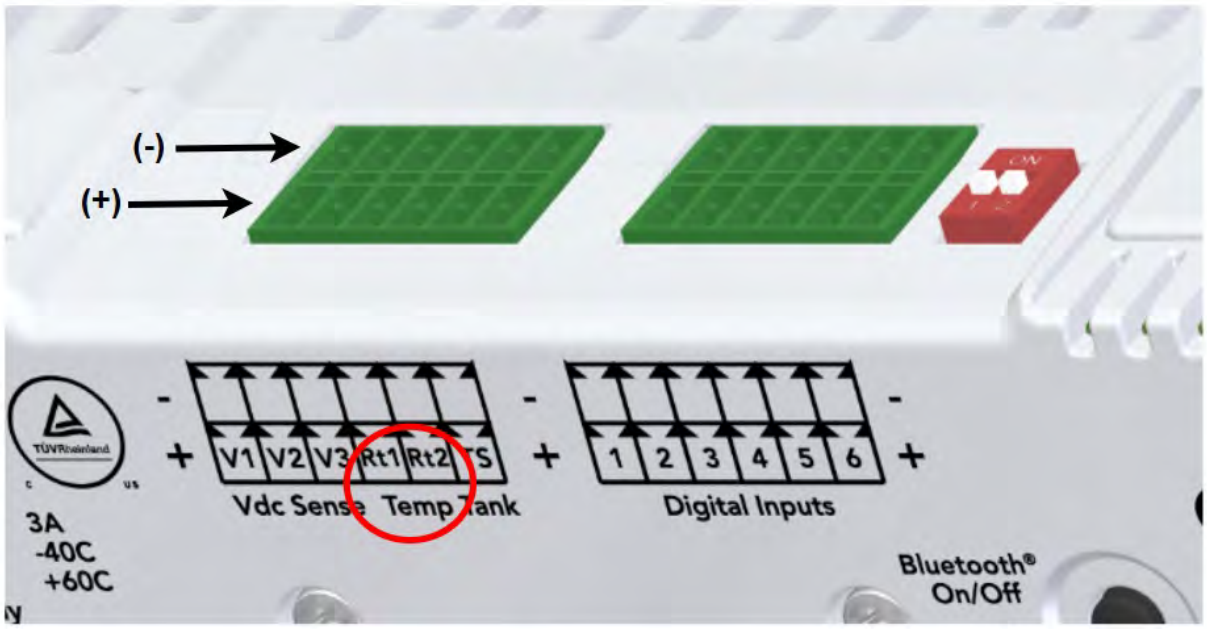
Vdc Sense measures voltage from DC sources such as batteries, DC power supplies, or other DC circuits.

The Vdc voltage measurement is a data input that the ReadyEdge can use for Load Control and Generator Feedback (confirming if the generator is on or not). The ReadyRelay ReadyBlock provides load control functionality. See Load Control Configuration for details.

Vdc Sense Value is displayed in the ”System” section of the LiveView page (“ReadyEdge” tab).

1. Connect the DC circuit to be measured to a Vdc Sense Analog input. Make sure the connection is made with correct polarity that matches the markings on the ReadyEdge as shown in the illustration above.
2. Ensure a sufficient amount of insulation has been stripped from the wires and the spring termination has securely clamped the wiring conductors.
3. Repeat for the other two Vdc inputs as needed.

Temperature Sensor - Up to (2) Inputs

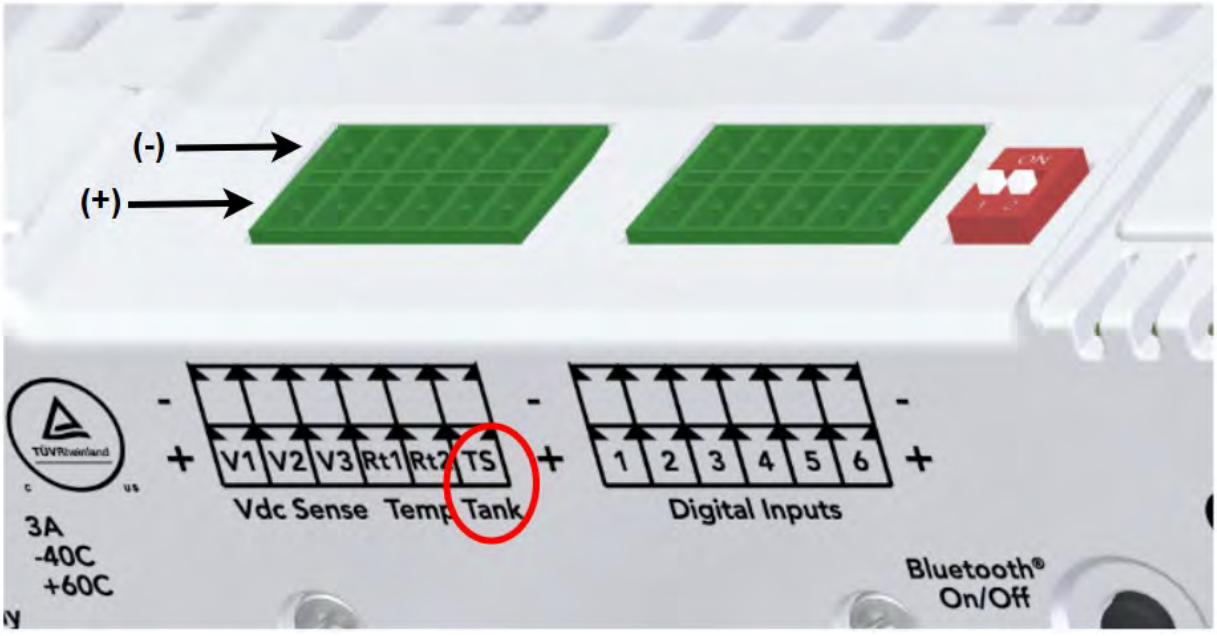


Measures up to (2) temperature(s) using Morningstar Remote Temperature Sensors (RTS).

The Temperature Sensor inputs can be used to monitor ambient temperature, battery bank temperature, or the temperature of any other device. The RTS can measure temperatures in the range of -30C to +80C.

1. Connect the RTS wires to the “Temp” terminal locations of the terminal plug. Note that the RTS does not have a polarity. Either wire can go to either + / - termination.
2. Ensure a sufficient amount of insulation has been stripped from the wires and the spring termination has securely clamped the wiring conductors.
3. Repeat for the second Temperature Sensor as needed.

Tank Sensor - (1) Input



Connect a resistive tank sensor that conforms to one of the following tank sensor standards:

Standard	Resistance @ 0%	Resistance @ 100%
SAE (N. America)	240 ohms	33 ohms
European	0 ohms	180 ohms

The Tank Sensor % Value is displayed in the “System” section of the LiveView page (“ReadyEdge” tab).

1. Connect the tank or water level sensor wires to the ReadyEdge Tank Sensor terminals. Make sure the polarity of the connection matches the tank sensor documentation.
2. Ensure a sufficient amount of insulation has been stripped from the wires and the spring termination has securely clamped the wiring conductors.

Complete this step by inserting the wired terminal block plug into the terminal socket on the ReadyEdge labeled “Analog Inputs”.

Step 4: 12 Volt Power Out Wiring

CAUTION: Equipment Malfunction

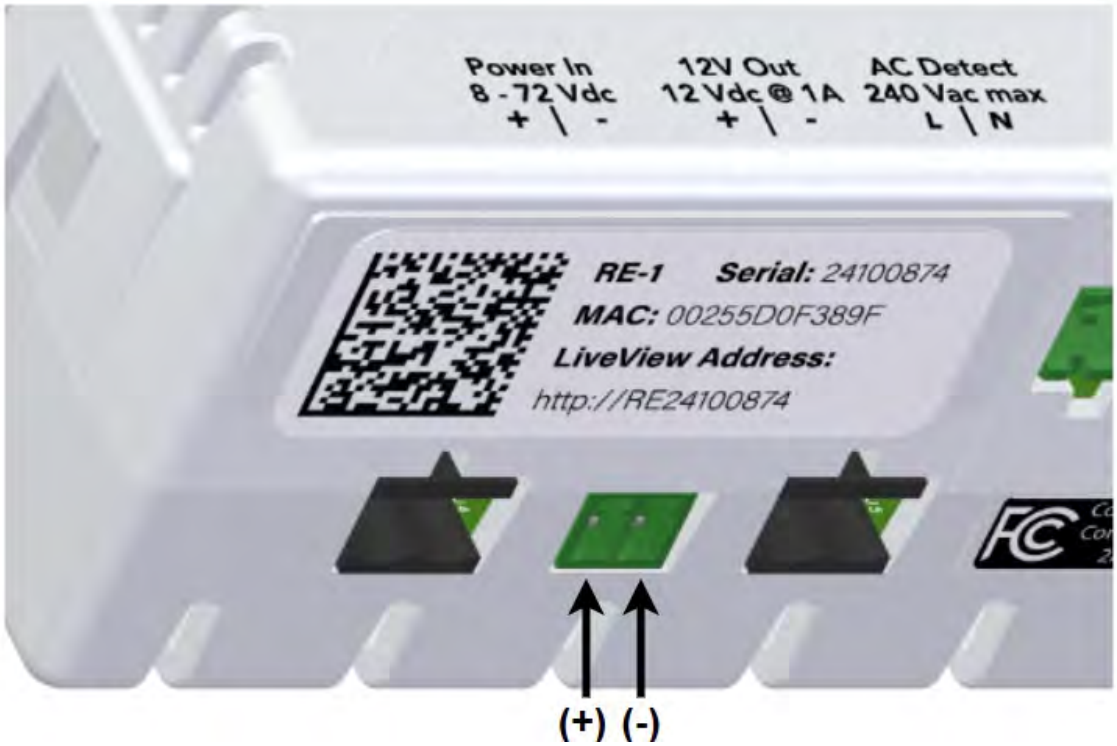
12 Volt Power Output is switched in the positive leg. If the ReadyEdge input power source is positive grounded, the 12 Volt Power Out circuit must not be grounded.

ATTENTION: Panne d'équipement

La sortie de puissance 12 volts est commutée sur la borne positive. Si la source d'alimentation d'entrée ReadyEdge est mise à la terre positive, le circuit de sortie 12 volts ne doit pas être mis à la terre.

***NOTE**: The 12 Volt Power Out is designed to provide power for specific applications as noted in this section. It should not be used to power load circuits where surges, current in-rush, or over-currents are possible. These conditions will result in nuisance tripping of protections and loss of power to the load(s).*

***REMARQUE:** La sortie 12 volts est conçue pour fournir de l'énergie pour des applications spécifiques comme indiqué dans cette section. Elle ne doit pas être utilisée pour alimenter des circuits de charge où des surtensions, des appels de courant ou des surintensités sont possibles. Ces conditions entraîneront des déclenchements intempestifs des protections et une perte de puissance vers la(les) charge(s).*



12 V Power Out Port

The 12 V Power Out port features a removable termination plug with compression screw terminals. It may be convenient to remove the plug, make the wiring connections, and then reinsert the plug in the location shown in the illustration above. The output port provides a 12 Volt power supply at a maximum of 1 Amp.

Wiring Instructions by Application

1. Power an EIA-485 network - Refer to Step 9B: Connecting Devices Using EIA-485 network
2. Signaling a generator to start/stop - Refer to Step 7: Automatic Generator Start (AGS) Wiring Examples
3. Driving a 12 Volt dc relay coil to switch larger DC or AC loads
    a. Connect the 12V Out ± wires to the relay coil terminations. The relay coil must be nominal 12 Vdc. Observe correct polarity.

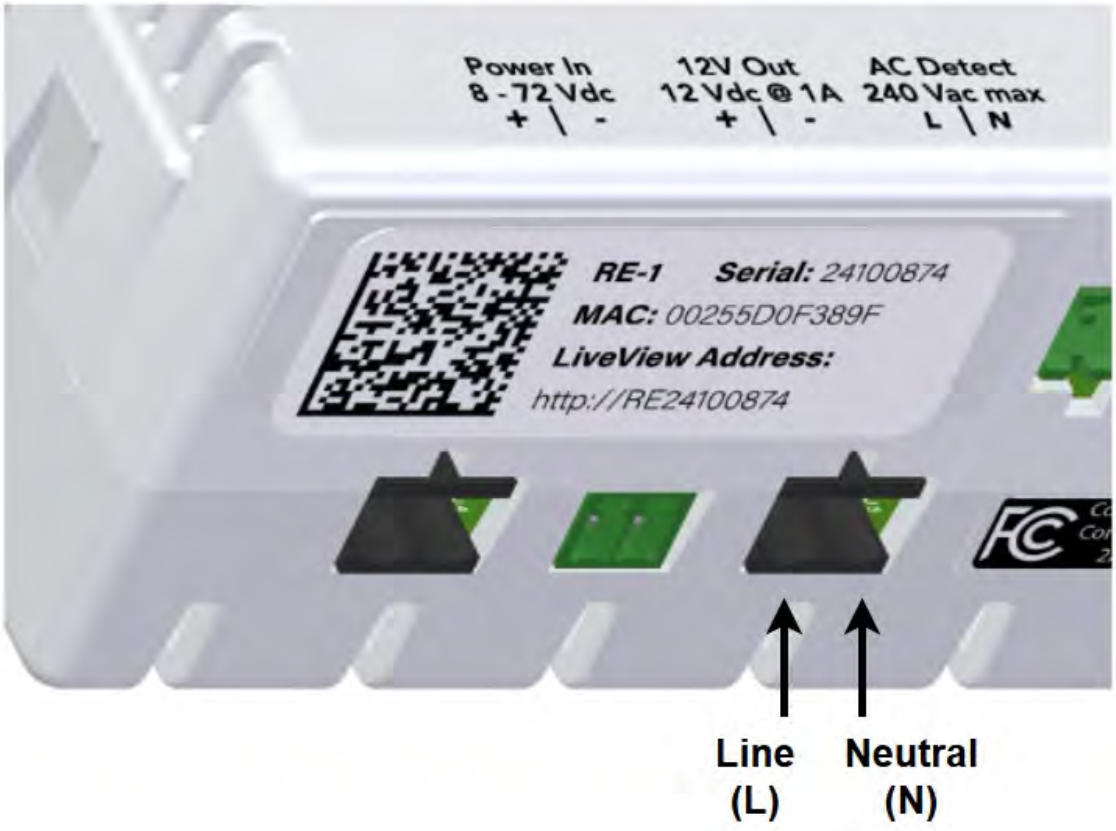
Step 5: AC Detect Input Wiring

WARNING: Shock Hazard

DO NOT CONNECT LIVE AC WIRING. ENSURE AC POWER IS DISCONNECTED AT THE SOURCE. VERIFY AC POWER IS DISCONNECTED WITH A MULTIMETER BEFORE PROCEEDING WITH THESE INSTRUCTIONS.

AVERTISSEMENT : Risque de choc électrique

NE PAS CONNECTER DE CÂBLAGE CA SOUS TENSION. ASSUREZ-VOUS QUE L'ALIMENTATION CA EST DÉCONNECTÉE À LA SOURCE. VÉRIFIEZ QUE L'ALIMENTATION CA EST DÉCONNECTÉE AVEC UN MULTIMÈTRE AVANT DE SUIVRE CES INSTRUCTIONS.



AC Detect Terminal

The AC Detect Function is designed to detect whether AC voltage is present on the connected circuit or not. This feature reports a simple Yes/No value in LiveView and other user interfaces. It does not report a precise voltage or frequency measurement, but instead determines if the AC source is in a valid range according to the following criteria:

- AC Voltage between ~40 Vac to 300 Vac
- AC Frequency > 30 Hz

Use this feature for the following:

- Monitor the presence of AC voltage from a generator, grid or inverter.
- Confirm that the generator start command successfully started the system generator.
- Detect the presence or absence of AC grid or inverter AC voltage, then take certain actions
- Turn on and off Relays with the ReadyRelay (typically for loads) when AC voltage is detected.

The AC Detect Port can accept up to 240 Vac RMS (300 Vac peak) and uses spring clamps for wiring.

Wiring Instructions

WARNING: Fire Hazard

WHEN CONNECTING THE AC DETECT WIRES, INSTALL A 5 AMP FUSE IN THE UNGROUNDED AC WIRE, WITHIN SIX INCHES (150 MM) OF THE AC SOURCE TERMINAL CONNECTION.

AVERTISSEMENT : Risque d'incendie

LORS DE LA CONNEXION DES FILS DE DÉTECTION CA, INSTALLEZ UN FUSIBLE DE 5 AMPÈRES DANS LE FIL CA NON MIS À LA TERRE, À MOINS DE SIX POUCES (150 MM) DE LA BORNE DE CONNEXION DE LA SOURCE CA.

1. Connect the Neutral and Line AC wires from the AC power circuit to the corresponding connections on the AC Detect terminal block according to the markings on the product.
2. Ensure a sufficient amount of insulation has been stripped from the wires and the spring termination has securely clamped the wiring conductors.

Step 6: ReadyBlock(s) Wiring

WARNING: EQUIPMENT MALFUNCTION OR DAMAGE
Do not install or remove a ReadyBlock while host device is powered ON. Always power OFF the ReadyEdge device before working on ReadyBlock wiring.

AVERTISSEMENT : DÉFAILLANCE OU DOMMAGES DE L'ÉQUIPEMENT
N'installez pas ou ne retirez pas un ReadyBlock pendant que l'appareil hôte est sous tension. Coupez toujours l'alimentation de l'appareil ReadyEdge avant de travailler sur le câblage du ReadyBlock.

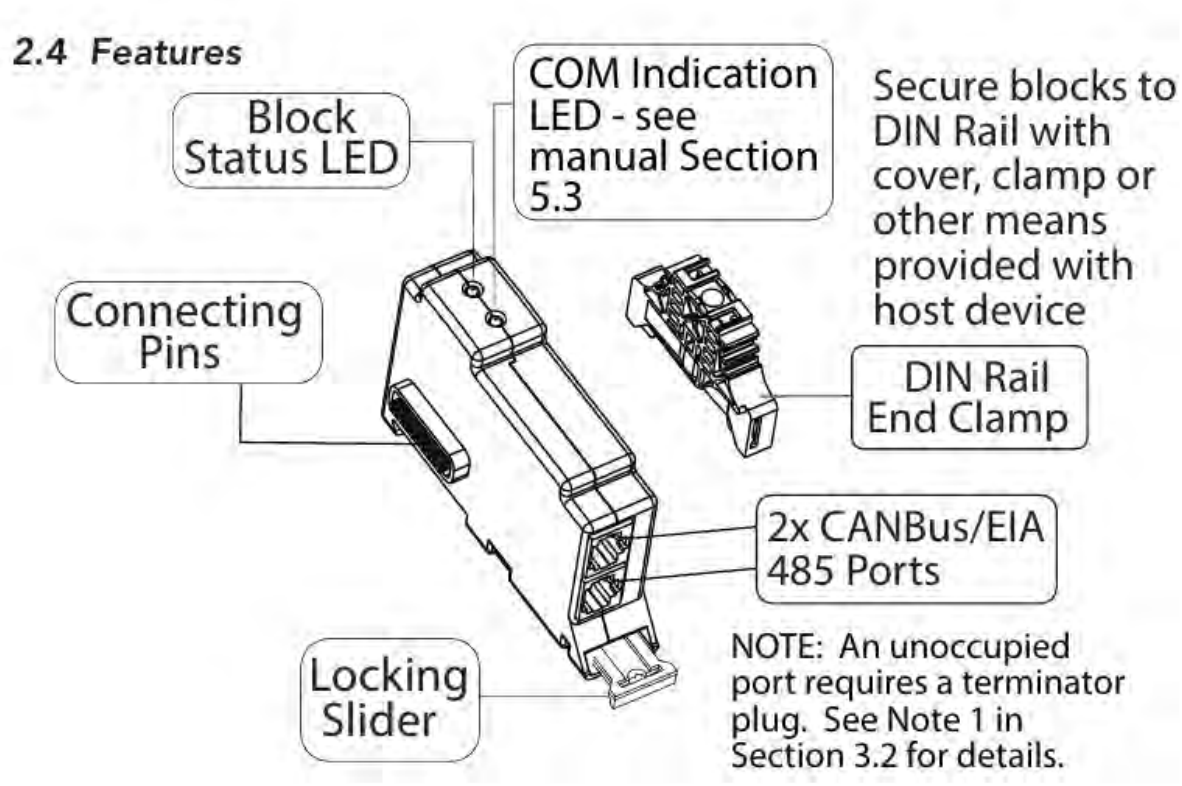
ReadyBMS

The ReadyBMS Block is wired to the battery or battery bank.

For CANBus-enabled batteries, use an 8-conductor straight-through RJ-45 cable (provided), and attach one end to one of the RJ-45 ports on the BMS Block - see Figure below. Attach the other end to a CANBus port on the BMS battery. All supported batteries conform to CAN pin configuration.

NOTE:
If the BMS Block is used with the only controller in the system, or it is at the end of a CANBus Network, the BMS Block CANBus-RJ-45 port not connected to the BMS-battery will require installation of a terminator plug (120 Ohm terminator resistor installed across the CANL and CANH wires).
A BMS Block communications terminator plug is included - see Figure 2-1 in Features Section 2.4. For any BMS-battery side CANBus termination requirement, refer to your third-party BMS-battery manufacturer's documentation.

NOTE:
For parallel battery configurations, refer to the BMS-battery manufacturer's documentation on how to connect the battery bank to the BMS Block.



ReadyBMS Features

ReadyRelay

WARNING: Shock Hazard
Disconnect all power sources to the host and all other connected devices before working with ReadyRelay wiring. Do not install or remove a ReadyRelay while the host device is powered ON.

AVERTISSEMENT : Risque de choc électrique
Déconnectez toutes les sources d'alimentation de l'hôte et de tous les autres appareils connectés avant de travailler sur le câblage du ReadyRelay. N'installez pas ou ne retirez pas un ReadyRelay pendant que l'appareil hôte est sous tension.

WARNING: Shock Hazard
Wire sizing and load overcurrent protection devices must conform to NEC or other jurisdictional requirements.

AVERTISSEMENT : Risque de choc électrique
La taille du câblage et les dispositifs de protection contre les surintensités doivent être conformes aux exigences du NEC ou d'autres réglementations compétentes.

CAUTION: Equipment Damage
Incorrect installation or configuration may result in damage to the generator and/or other system components.

PRUDENCE : Dommages à l'équipement
Une installation ou une configuration incorrecte peut entraîner des dommages au générateur et/ou à d'autres composants du système.

CAUTION:
External Source Control, e.g., generator control should only be configured and installed by experienced electrical professionals.

PRUDENCE :
Le contrôle de source externe, par exemple le contrôle du générateur, ne doit être configuré et installé que par des professionnels électriciens expérimentés.

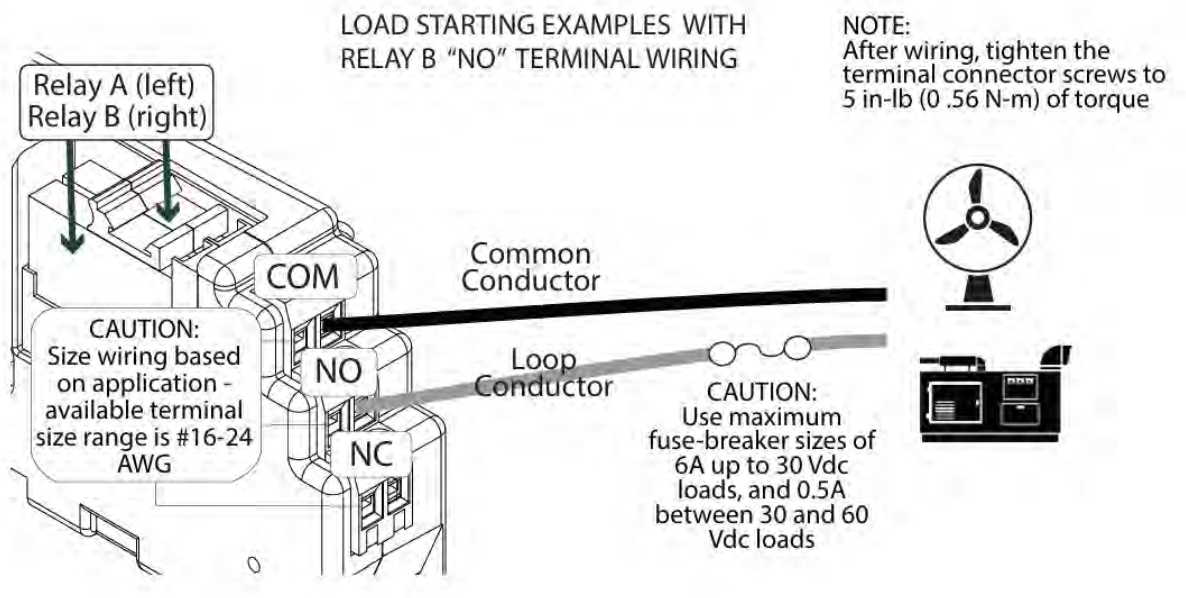
CAUTION: Equipment Damage
Incorrect installation or configuration may result in damage to the generator and/or other system components.

PRUDENCE : Dommages à l'équipement
Une installation ou une configuration incorrecte peut entraîner des dommages au générateur et/ou à d'autres composants du système.

Relay contact terminals can be wired to a generator starting circuit, vent fan, communications equipment, larger relays for power switching, buzzer or trouble light (no auxiliary devices included). After wiring, tighten the terminal connector screws to 5 in-lbs. (0.56 N-m) of torque.

Automatic Generator Start-Stop (AGS)

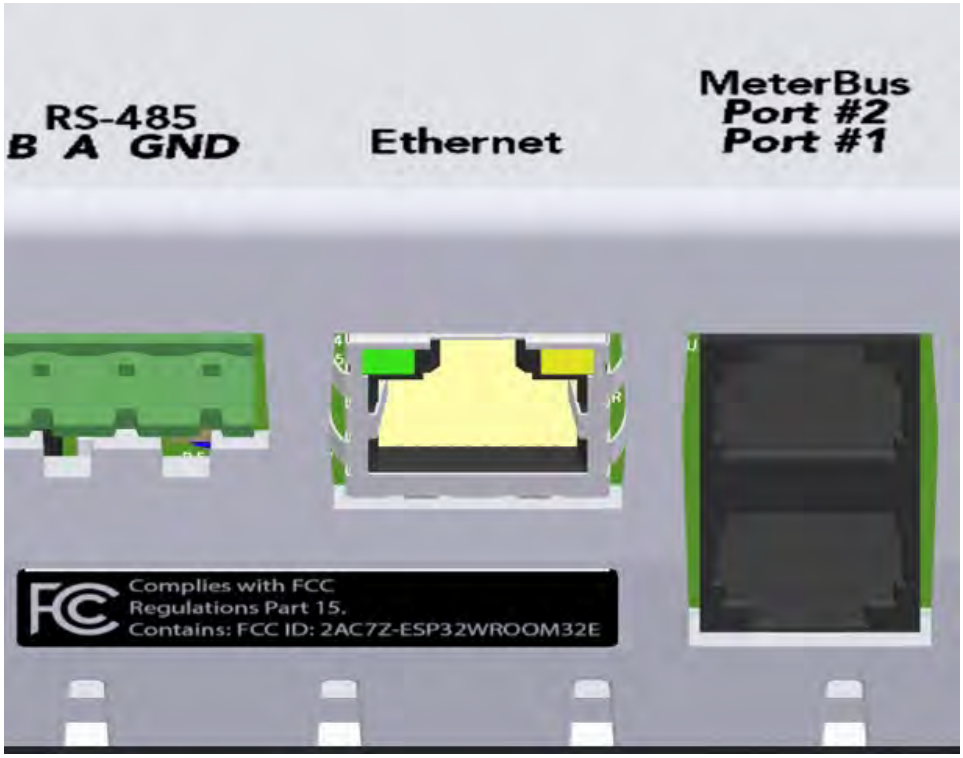
The generator must be an electric-start model with an automatic choke. It is recommended that the generator have a two-wire start capability. Consult the generator manufacturer's AutoStart instructions for two-wire start generators. A two-wire starting generator generally automates the cranking and starting routine. The Relay Common and Normally Open (NO) terminals can be wired to perform a two-wire generator star, as shown in the figure below.



Step 7: Automatic Generator Start (AGS) Wiring

Refer the the AGS Setup and Configuration guide for complete instructions.

Step 8: Ethernet Connection



Ethernet Port

Option 1: Connect to Your Local Area Network (LAN)

1. Connect the ReadyEdge Ethernet port to the local network router using the included Ethernet cable or any standard Ethernet cable.
2. Your network should automatically connect to the network once the ReadyEdge is powered on (the last step of 2.0 Installation).

The ReadyEdge Ethernet mode is configured for DHCP by default and will automatically attempt to obtain an IP address from your network host once it is powered on and connected to a network. A successful Ethernet connection is required to configure the ReadyEdge system settings and access device data using the LiveView web app. If the ReadyEdge does not receive a DHCP-assigned IP address from a network host it will attempt to use its default static IP address of xxx.xxx.x.x.

Option 2: Connect Directly to a PC (less common)

Alternatively, the ReadyEdge can be connected directly to a PC over Ethernet for initial setup if no network access is available. Please refer to our Morningstar Product Connectivity Manual for additional instructions on connecting Ethernet enabled Morningstar devices directly to a PC or to local area networks.

Step 9: Connecting Morningstar Products

Compatible Morningstar products can be connected to the ReadyEdge using MeterBus and/or EIA-485 serial network. In some scenarios a communications hub or adapter may be needed. Table 2.4.9 below lists all compatible products along with the recommended network and adapter(s) for different connection scenarios.

Compatible Product	(1) Product Connected	(2) Products Connected	(3 to 16) Products Connected
ProStar PWM (all models)	MeterBus direct connection	MeterBus direct connection	MeterBus + HUB-1
ProStar-MPPT (all models)	MeterBus direct connection	MeterBus direct connection	MeterBus + HUB-1
SunSaver-MPPT	MeterBus direct connection	MeterBus direct connection	MeterBus + HUB-1
SureSine-300 Classic (all models)	MeterBus direct connection	MeterBus direct connection	MeterBus + HUB-1
TriStar PWM (all models)	EIA-485 + RSC-1 adapter[1]	EIA-485 + RSC-1 adapter[1]	EIA-485 + RSC-1 adapter
TriStar-MPPT-30	EIA-485 + RSC-1 adapter[1]	EIA-485 + RSC-1 adapter[1]	EIA-485 + RSC-1 adapter
TriStar-MPPT-45	EIA-485 + RSC-1 adapter[1]	EIA-485 + RSC-1 adapter[1]	EIA-485 + RSC-1 adapter
TriStar-MPPT-60	EIA-485 direct connection	EIA-485 direct connection	EIA-485 direct connection
TriStar-MPPT-60-600V	EIA-485 direct connection	EIA-485 direct connection	EIA-485 direct connection

Table 2.4.9 Recommended Method of Connection for Compatible Products

(1) TriStar and TriStar-MPPT 30/45 models may also be connected via MeterBus using the Y-cable adapter (not included).

☞ ***NOTE**: A Y-cable adapter CANNOT be used in combination with HUB-1 for MeterBus networks. Always use EIA-485 bus to network three(3) or more TriStar and Tristar-MPPT controllers.*

Step 9A: Connecting 1 or 2 Products Using MeterBus

NOTE: Make COM connections with no power applied.

ATTENTION: Effectuez les connexions COM sans alimentation appliquée.

Direct Connection Method

Connect up to two products (Connected Products) to the ReadyEdge using the MeterBus RJ-11 cables included in the box.

1. Insert the plug on one end of a MeterBus cable (included) into ***MeterBus Port #1*** on the ReadyEdge.
2. Insert the plug on the other end of the RJ-11 cable into the MeterBus port of the Connected Product.
3. *IMPORTANT:* Change the DIP switch setting on the Connected Product to enable MODBUS serial protocol via the MeterBus port. The ReadyEdge cannot communicate with the Connected Product without MODBUS comms enabled!

Connected Product	DIP Switch to Enable MODBUS communication
ProStar	N/A - Protocol Auto-detect
ProStar-MPPT	DIP 8 → ON
SunSaver-MPPT	DIP 4 → ON
SureSine Classic Inverter	DIP 4 → ON

4. *OPTIONAL:* The ReadyEdge can only modify the Custom Settings of a Connected Product. If the Connect Product is configured to use one of the standard/non-custom settings, any changes to product settings made via ReadyEdge will not impact the product's operation. If you want to have the ability to modify operational settings, be sure to configure the product's DIP switch settings to "Custom" as follows:

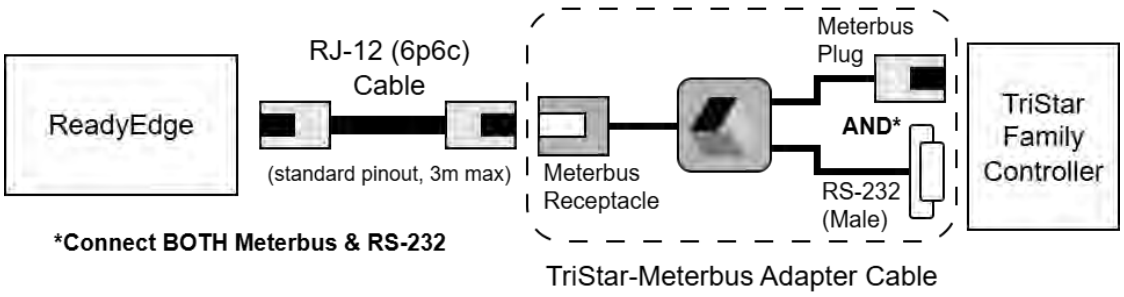
Connected Product	"Custom" DIP Switch Settings
ProStar	DIPs 4,5,6 → ON position
ProStar-MPPT	DIPs 4,5,6 → ON position
SunSaver-MPPT	DIP 1 → ON (Custom Charge settings)** DIP 2→ ON (Custom Load settings)
SureSine Classic Inverter	N/A - no custom settings support

** *Keep the Battery Select jumper inserted. The ReadyEdge can only modify the "Gel" battery configuration.*

***CAUTION**: Make sure the custom settings are correctly configured for the system battery charging and load control requirements.*

5. Repeat steps 1-4 if you have a second Controller, connecting the MeterBus cable to ***MeterBus Port #2*** on the ReadyEdge.

Connection(s) Using the TriStar-Meterbus Adapter Cable



TriStar-Meterbus Adapter Cable to ReadyEdge Wiring (cable sold separately)

1. Insert the plug on one end of a MeterBus cable (included) into ***MeterBus Port #1*** on the ReadyEdge.
2. Insert the plug on the other end of the RJ-11 cable into the MeterBus Receptacle of the Adapter Cable.
3. Connect BOTH the MeterBus plug and RS-232 plug from the Adapter Cable into the TriStar family controller.
4. *Optional:* Change the DIP switches to CUSTOM setting on the Connected Product. This will enable the ReadyEdge to use and modify the Connected Product's custom settings. You may choose to use one of the "standard" / non-customer DIP switch settings, but the Connected Product configuration cannot be modified by the ReadyEdge.
5. Repeat steps 1-4 if you have a second Controller, connecting the MeterBus cable to ***MeterBus Port #2*** on the ReadyEdge.

Connected Product	"Custom" DIP Switch Settings
TriStar	DIPs 4,5,6 → ON position
TriStar-MPPT	DIPs 4,5,6 → ON position

⚠ ***CAUTION****: Make sure the custom settings are correctly configured for the system battery charging and load control requirements.*

Need to Connect 3 or More Products via MeterBus?

Refer to Appendix A: MeterBus Connections - 3 or More Products

Step 9B: Connecting Devices Using EIA-485 network

Using EIA-485 versus MeterBus Port for Device Connections

For systems with TriStars, the EIA-485 port is the best choice for controller connection. This would be a Modbus over MeterBus connection, and this port can also support many third-party devices.

For other ReadyEdge-compatible devices, MeterBus is the best connection. For more than 3 devices, MeterBus with a MeterHub is the best configuration.

Compatible Charge Controllers and Inverters:

TriStar:

TriStar MPPT 600V

TriStar MPPT 150V (60A)

Tristar (60A)

> Note:
> TriStar and TriStar MPPT (30A and 45A models) require EIA-485/RS-232 Adapter (RSC-1) for EIA-485. See the image for 24V/48V Tristar Below.

Other Devices:

For the following devices, connection using the EIA-485 port requires the MRC-1, MeterBus to EIA-485 adapter.

SunSaver MPPT

ProStar MPPT

ProStar

SureSine 300

EIA-485 Controller Wiring

> **NOTE:**
> All devices on the RS-485 and MODBUS over MeterBus networks must be programmed with a unique MODBUS address. The ReadyEdge should pre-program these addresses, but with third-party devices, you may need to use LiveView to specify these addresses.

1. Connect A, B, and Gnd wires to the EIA-485 network
2. Connect A, B, and Gnd wires to the connected device, or if applicable, the adapter, and then connect the adapter to the device using a serial cable. (See Adapter Manual for specific instructions.)

3. For devices that require additional power, you can connect wires from the 12V out port to the wires from the EIA-485 Port.
4. See connected device manuals for further EIA-485 wiring and installation instructions

> Note:
> If you connection to the EIA-485 Port is not working, try switching the A and B Wires.

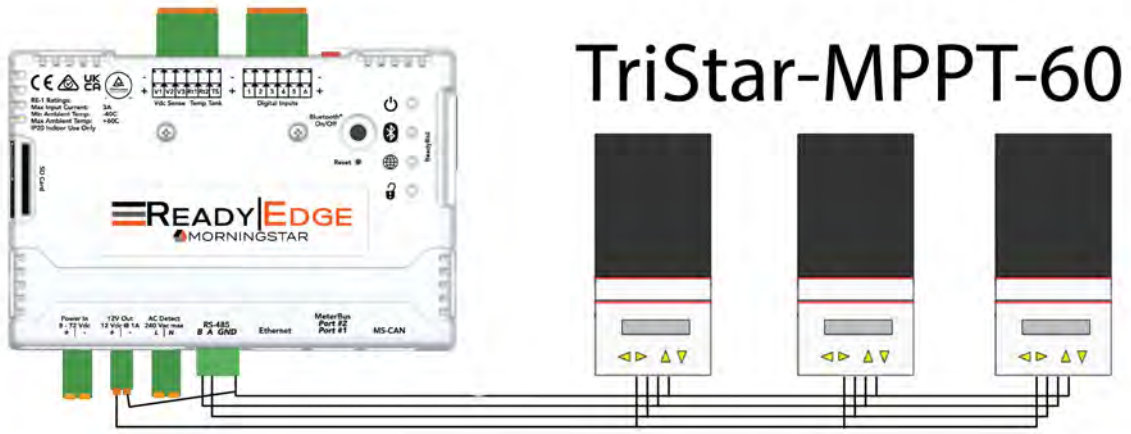
Networks requiring power can get power using an external source. The source voltage must be between 8-16 Vdc. For 12-volt systems, the network can be powered directly from the system battery or the 12V power out. For 24, 36, and 48-volt systems, use a DC-DC converter.

For Accessory wiring, see the accessory product manual.

> **NOTE**:
> Termination resistors may be required to prevent interference from reflected signals. If required, install termination resistors at both ends of the data bus across Data A and Data B to match the characteristic impedance of the communication cables (120Ω for EIA-485 single twisted pair, 100Ω for Category 5 Ethernet).

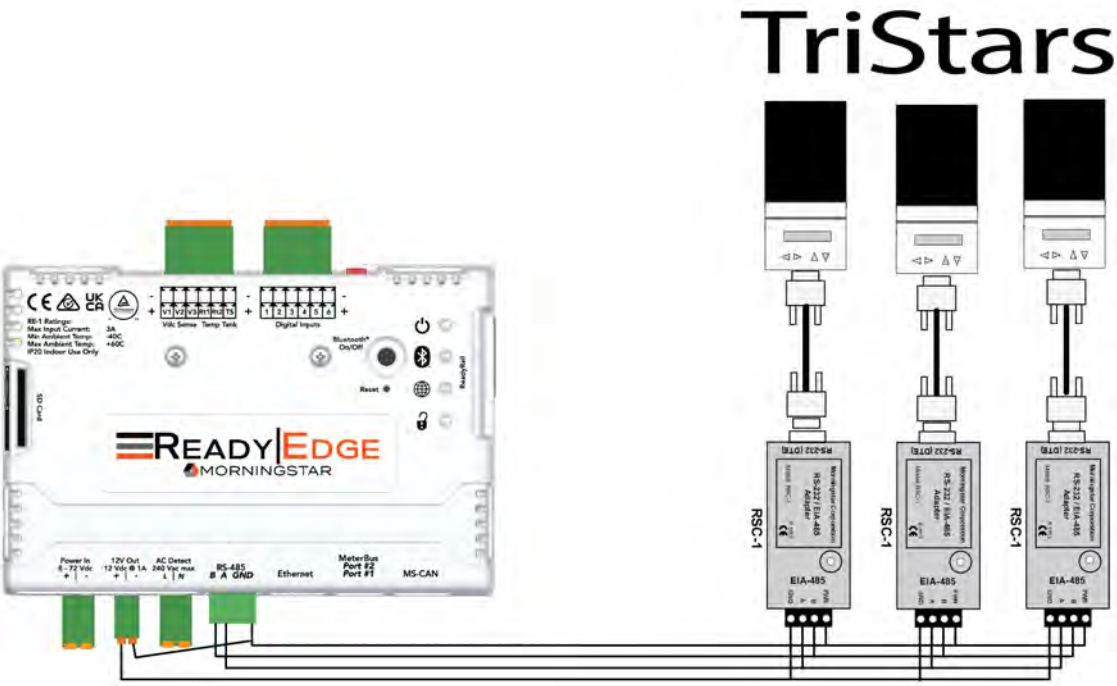
Examples

Example of three TriStar 60A or 600V connected to ReadyEdge



Configuration for three Tristar MPPT 60 A Models connected to the ReadyEdge using the EIA-485 Port. The TriStar MPPT (60 A) and TriStar 600V require power to function. Connecting to the 12V Out port is necessary.

Example of three Tristar 24V/48V connected to the ReadyEdge



Configuration for three 24V/48V TriStars (TS-45) connected to the ReadyEdge using the EIA-485 Port. If the Tristar were 12V versions, you would be able to power the RSC-1 using the connected Tristar, and the 12V power out port could be used in other ways.

Step 10: Power-Up and Verification

See 1.2 Product Features to reference LED type and location

After the ReadyEdge has been installed, the unit with connect with Ethernet and LiveView after connecting the power supply. See Power In Battery Connections for more information. If there are no faults or alarms, on start-up the status LED will flash green once, and then all LEDs will light green simultaneously for three seconds. Next, the ReadyEdge will automatically begin searching for valid Morningstar Devices.

Major LED Indications	
Status LED (Top LED)	
Green-solid	No Local or Remote faults
Green-flashing	Recovery Firmware Update
Red-solid (heartbeat)	Active ReadyEdge Fault
Red-flashing	Active Remote (Connected Morningstar Device) Fault
Bluetooth LED	
Unlit	OFF
Blue-solid	Bluetooth Enabled
IOT Connectivity	
Unlit	Not Connected
Green-solid	Cloud Connected
Ethernet Connectivity	
	Ethernet power and network activity
Read Only Mode*	
Green-solid	Read-Only Mode OFF - Ethernet writes enabled
Red-solid	Read-Only Mode ON - Ethernet writes disabled

NOTE: The ReadyEdge is shipped with Read Only Mode off, indicated by a green light on the 4th LED (unlock icon). Ready Only mode must remain disabled to configure the ReadyEdge in LiveView. Read Only Mode is controlled by DIP Switch 1.

Proceed to 3.0 Configuration to adjust settings and finish setup.

3.1 Default Configuration & Factory Reset Information

The ReadyEdge is programmed with a default configuration out of the box for up to two devices connected through MeterBus.

No further configuration is needed if these settings are sufficient.

Sections 3.2 - 3.5 detail the user interfaces and how to connect to each.

Skip to section 4.0 Operation to learn more about ReadyEdge features and functionality.

Restore Default Settings

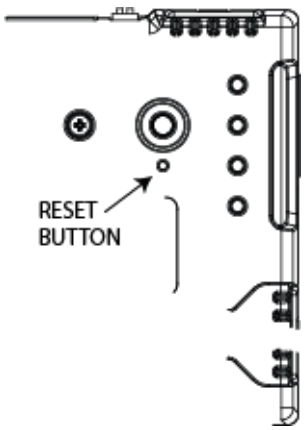
If there is a need to return to default configuration, there are two options.

Restore Default Communication Settings Only

Locate the small gray button labeled reset to the left of the LED Indications. This will only reset communication settings back to default.

Restore All Default Settings with a Factory Reset

Locate the small gray button labeled reset to the left of the LED Indications. Press and hold for 10 seconds.



Reset Button Location

3.2 User Interfaces Overview

ReadyEdge supports (3) different user interfaces. Each interface serves a different need as shown in Table 3.2 below. The LiveView web app provides access to all settings and is the primary interface for configuration.

User Interface	Purpose	Method of Access
LiveView Web App	• Local access to data • Adjust all settings • Software updates	Ethernet connection
Morningstar Mobile App	• Local access to data • Enable and configure the connection to Morningstar Solar Connect remote data service • Adjust basic settings • Software updates	Bluetooth & Mobile Device
Morningstar Solar Connect	• Remote access to data • Software updates	Internet/Cloud

Table 3.2 ReadyEdge Interfaces

Additional Interfaces

Morningstar's MSView PC software may also be used with ReadyEdge using serial EIA-485 network. See Appendix C: Connecting with MSView for more information

3.3 Accessing LiveView Web App

LiveView Web App is the primary interface used to configure the ReadyEdge. If the ReadyEdge was connected to a LAN router that is configured for DHCP, the ReadyEdge network settings should automatically be assigned when powered up and the unit should automatically connect to the network.

Connecting to LiveView on a Local Area Network (LAN)

Option 1: Mobile Device and QR Code

1. Scan the QR code on the serial label with a mobile device
2. The URL should load LiveView on your mobile device web browser. The mobile device must be connected to the same local network as the ReadyEdge.

LiveView webpages are context-aware and will properly format to the device's screen size.

Option 2: Use the NetBIOS name

1. Every ReadyEdge has a unique NetBIOS name as follows:

   "re" + serial number

   For example, if the ReadyEdge serial number is 09501234, then the unit's NetBios name is: "re09501234"
   You can also find the NetBIOS name on the serial label

2. Enter the ReadyEdge NetBIOS name into the address bar of a web browser (the computer must be on the same local network as the ReadyEdge). In the example above, the web address is: http://re09501234.

LiveView webpages are context-aware and will properly format to the device's screen size.

> **NOTE:** The IP address assignment will change after some period of time on most DHCP networks. The NetBIOS address is a static Morningstar Device identifier, and will always point to the Morningstar Device regardless of IP address assigned.

3.4 Connect using Morningstar Mobile App

> **NOTE:** The Morningstar Mobile App provides limited access to real time data and configuration settings. LiveView is the primary interface for ReadyEdge configuration at this time.

Morningstar Mobile is an app available for use with Android or iOS devices, and can be downloaded to a mobile device from either the Google Play Store (Android) or the Apple App Store (IOS).

Step 1: Download the App For Your Mobile Device

Android Devices

https://play.google.com/store/apps/details?id=com.morningstar.android

Apple iOS Devices

https://apps.apple.com/us/app/morningstar-mobile/id1638164491

Step 2: Enable Bluetooth® Radio

Bluetooth® must be enabled in the Network Setup menu in LiveView. See 3.7.4 LiveView: Network Configuration for instructions

Step 3: Discover and Connect with the ReadyEdge

Open the App on your mobile device. The app will immediately begin scanning for all compatible Morningstar products with Bluetooth® turned on. Choose your ReadyEdge from the device list and tap “Connect”.

Solar Connect Overview

Select Morningstar products support the use of the Morningstar Solar Connect™ cloud dashboard. Though Solar Connect, you can:

- Monitor the real-time health of your Solar Connect enabled devices
- Collect and view historical operational data for your devices

> ☞ ***NOTE**: Solar Connect is regularly updated with new capabilities to make managing your device fleet easier and more efficient.*

Solar Connect is currently available for the following products:

- ReadyEdge
- (coming soon) GenStar MPPT

3.6 Installer Access

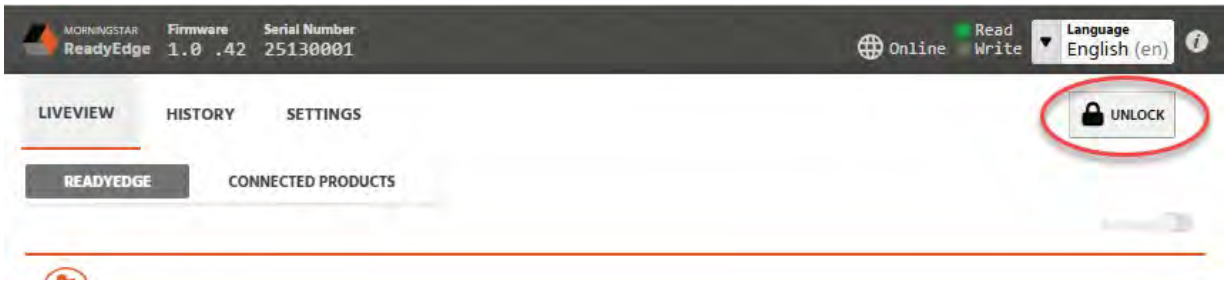
Enabling Installer Access in Morningstar Mobile App

Not implemented at this time.

Enabling Installer Access in LiveView

LiveView Installer Access provides access to settings configuration, Commands, and firmware update options for the ReadyEdge, Connected Products, and any ReadyBlocks attached to the ReadyRail.

> ***NOTE**: LiveView will prompt for an Administrative password the first time the webpage is loaded. The Lock/Unlock buttons will not be visible until a password is established.*



Installer Access not enabled

Step 1

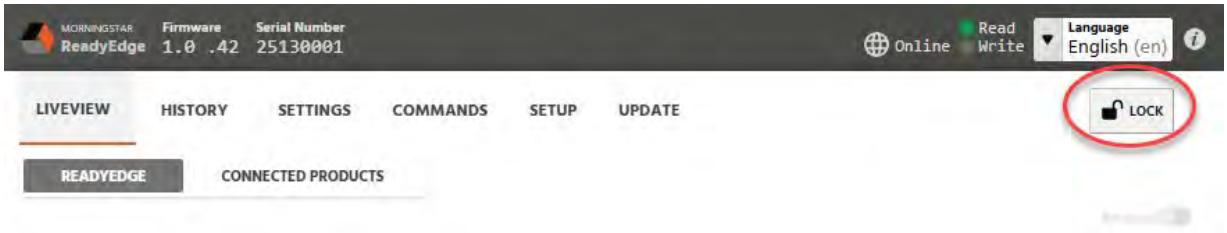
Click the Unlock button shown in the screenshot above

Step 2

Enter the Administrative password you created when LiveView was first loaded and click “OK”

Step 3

If successful, the menu header should now include Commands, Setup, and Update menu items. The Installer Access will show an unlocked icon as shown in the screenshot below.



Installer Access enabled

3.7 Update Firmware

Update the ReadyEdge firmware to the latest version before proceeding with configuration. This will ensure the latest functionality.

Method 1: Morningstar Mobile App - Easiest Method

Step 1: Follow the instructions in 3.4 Connect using Morningstar Mobile App

Step 2: Upon first pairing and connection to the ReadyEdge, the App will alert you if a newer version of firmware is available.

Step 3: Confirm to update to the latest firmware

Method 2: Use LiveView Web App

Step 1: Download and unzip the latest ReadyEdge firmware file from Morningstar's Support website at: http://www.morningstarcorp.com/support/. Note the file location on your computer.

Step 1: Follow the instructions in 3.3 Accessing LiveView Web App

Step 3: Follow the instructions in 3.6 Installer Access. If an installer password has not yet been created, you will be prompted to enter a new password before proceeding. Navigate to the Update tab under the Setup menu.

Step 4: Click the "Choose a File" and select the folder / download location of the *.msc file downloaded from Morningstar's website.

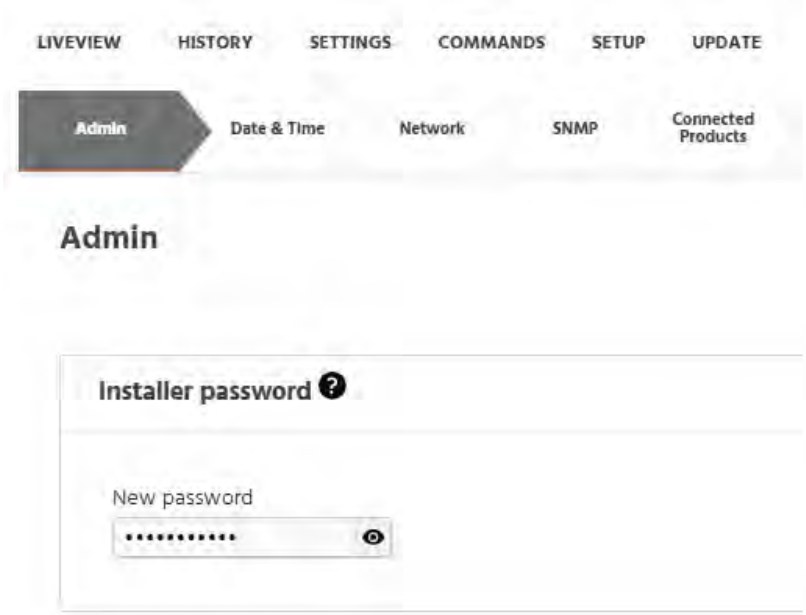
Step 5: If you would like the ReadyEdge to automatically reset after the update is complete, make sure the checkbox is CHECKED. If UNCHECKED, you will need to remove and restore power to the ReadyEdge after update.

Step 6: Click the "Upload" button to begin the update

3.8 LiveView Admin Configuration

Use the Admin tab under the Setup menu to modify the Installer Password. The Installer Password provides access to the Commands, Setup, and Update menus via the Lock/Unlock buttons in the upper right corner of the dashboard.

> ☞ ***NOTE**: Only a **Factory Reset** will clear the Installer Password. The user will be prompted to enter a new password the next time LiveView loads.*



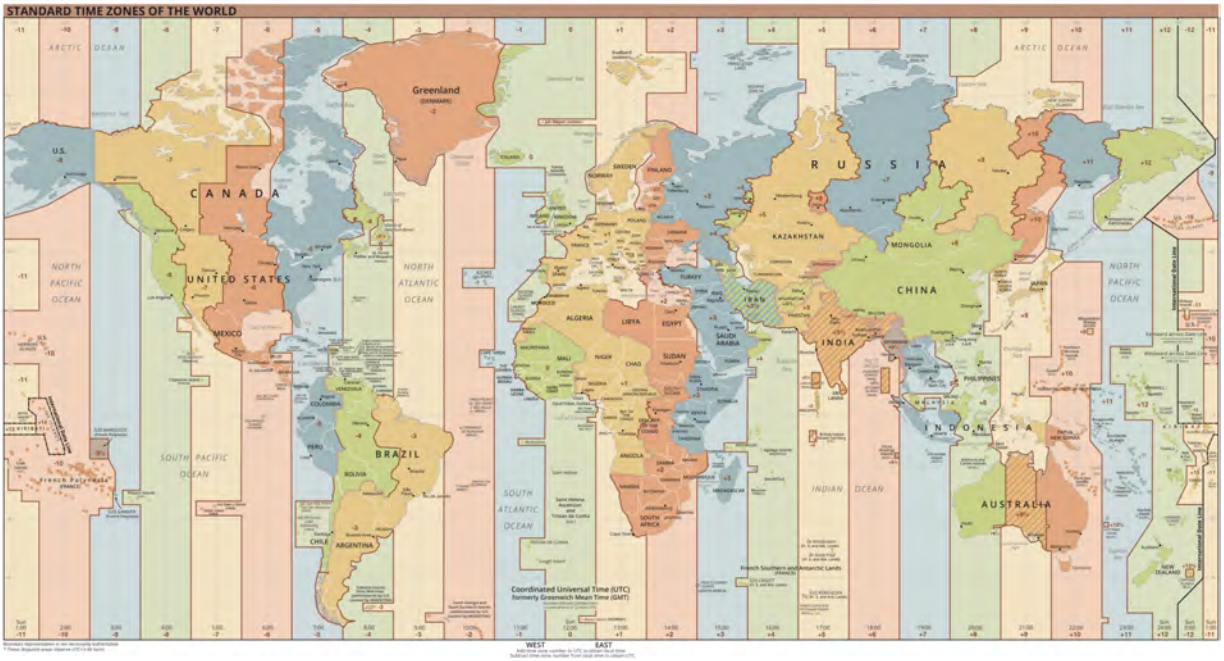
3.9 Date & Time Configuration

Time/Date is used for log data time-stamping, AGS control, schedules, and other time-based functions. It is important to set the correct Date & Time for optimal performance and operation.

Time & Date Settings can be found in LiveView Setup Menu under the Date & Time tab or in Morningstar Mobile App under Setup > Date & Time menu.

Step1 - Specify the Local Time Offset

Local Time Offset is your local time expressed as the number of hours:mins difference from Coordinated Universal Time (UTC). To find your Local Time Offset, reference the world map below. Note that these offsets are STANDARD time for each region.



Credit: Wikipedia.org List of UTC offsets

Step 2 - Choose from two Date/Time Source Options

1. **Time Servers (recommended)** - Select the Timer Servers source if the ReadyEdge is connected to the Internet. This option enables the ReadyEdge to periodically synchronize internal time and with internet-based time server(s). Accurate time and date will be maintained as long as there is a network connection. Time Server URLs can be modified in Network settings.

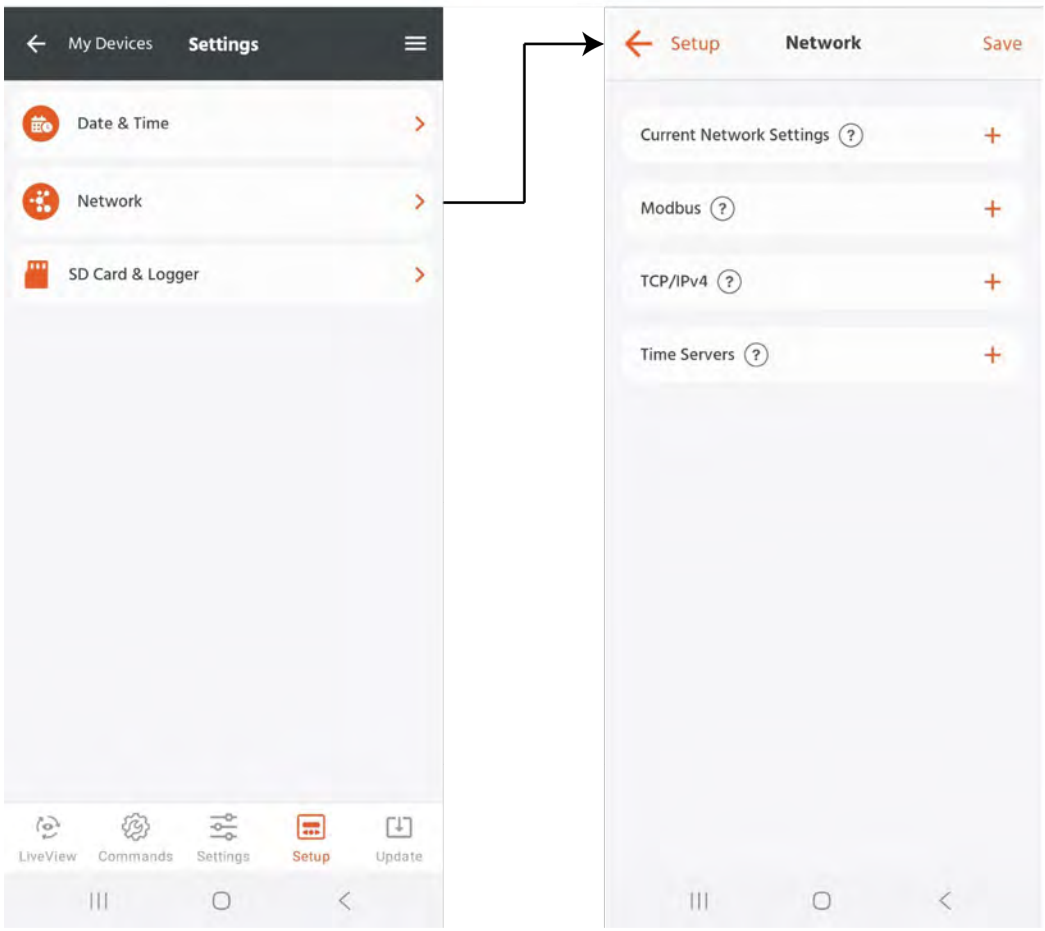
2. **Internal clock** - If an internet connection is not available in your application, use the ReadyEdge built-in real-time clock. The coin cell battery allows Time and Date to be retained through power cycles. If using the internal clock, UTC time and date are entered, and an offset for local time zone is specified. Note that the local offset must be adjusted when a time zone changes to DST, and back.

☞ ***NOTE**: Some time drift is inevitable when using the internal clock. We recommend connecting and adjusting time at Daylight Savings changes (if applicable) or annually.*

3.10 Network Configuration

Navigating to Network Settings in Morningstar Mobile App

Network Settings can be found in the Setup Menu as shown below.

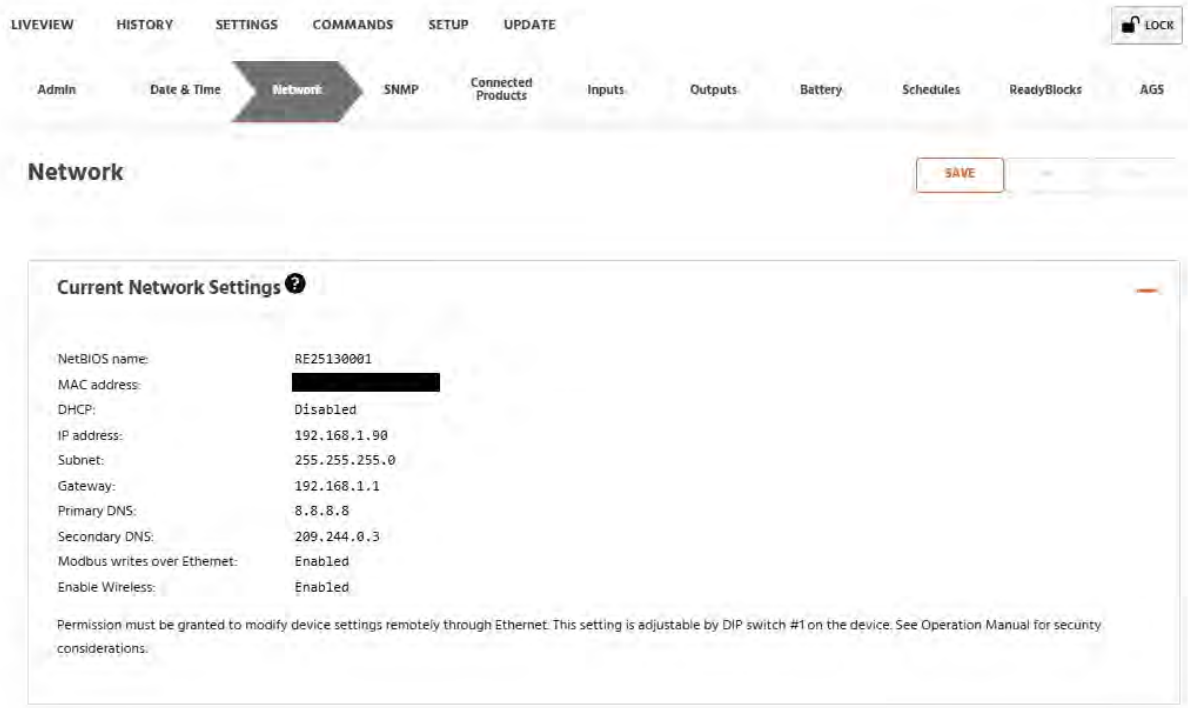


Network Settings page in the mobile app

Navigating to Network Settings in LiveView

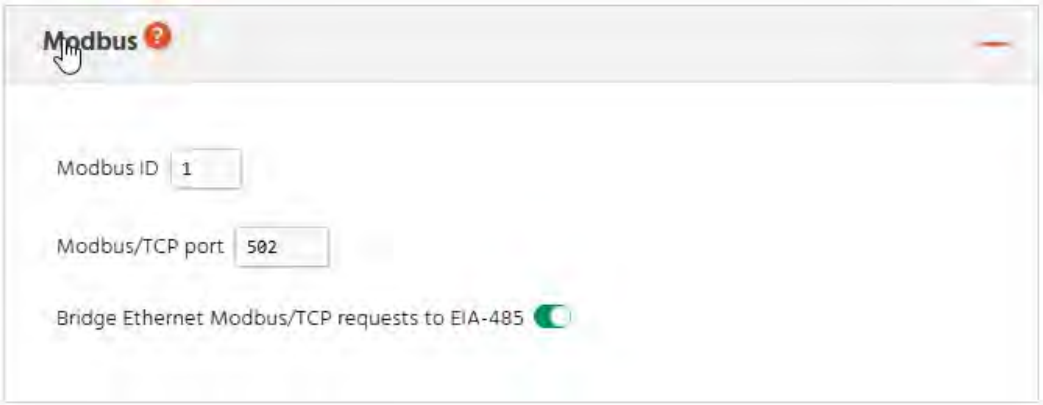
> ***NOTE**: Installer Access must be enabled and Read-Only Mode (DIP Switch #1) must be Off/Disabled to change network settings.*

Network settings can be found in the *Setup* menu under the *Network* tab as shown below. The current network settings are summarized on the first card as shown below.



Network Settings Details

Adjust MODBUS Settings



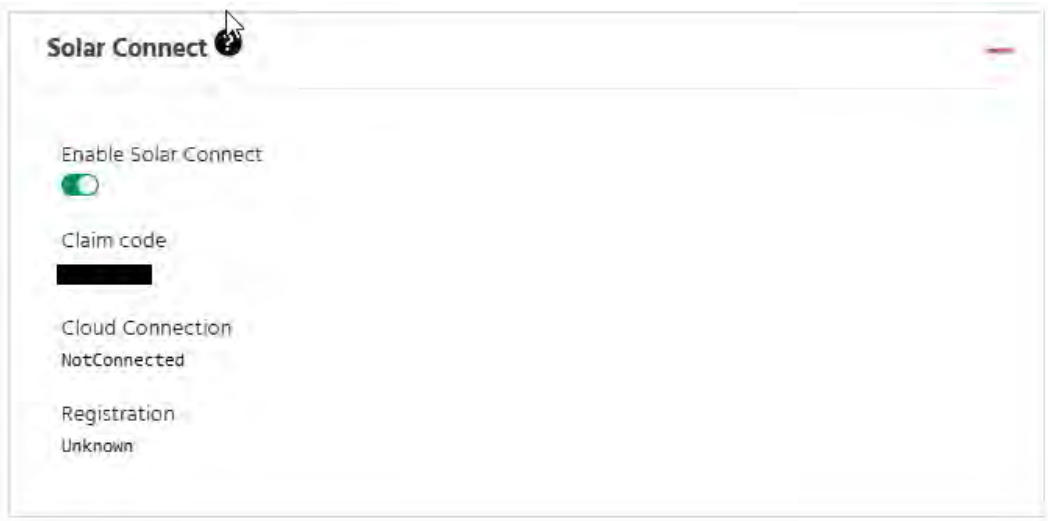
Modbus ID - Edit the MODBUS address of the ReadyEdge (default = 1)

Modbus/TCP port - Change the network port for ReadyEdge MODBUS TCP/IP communication (default port = 502)

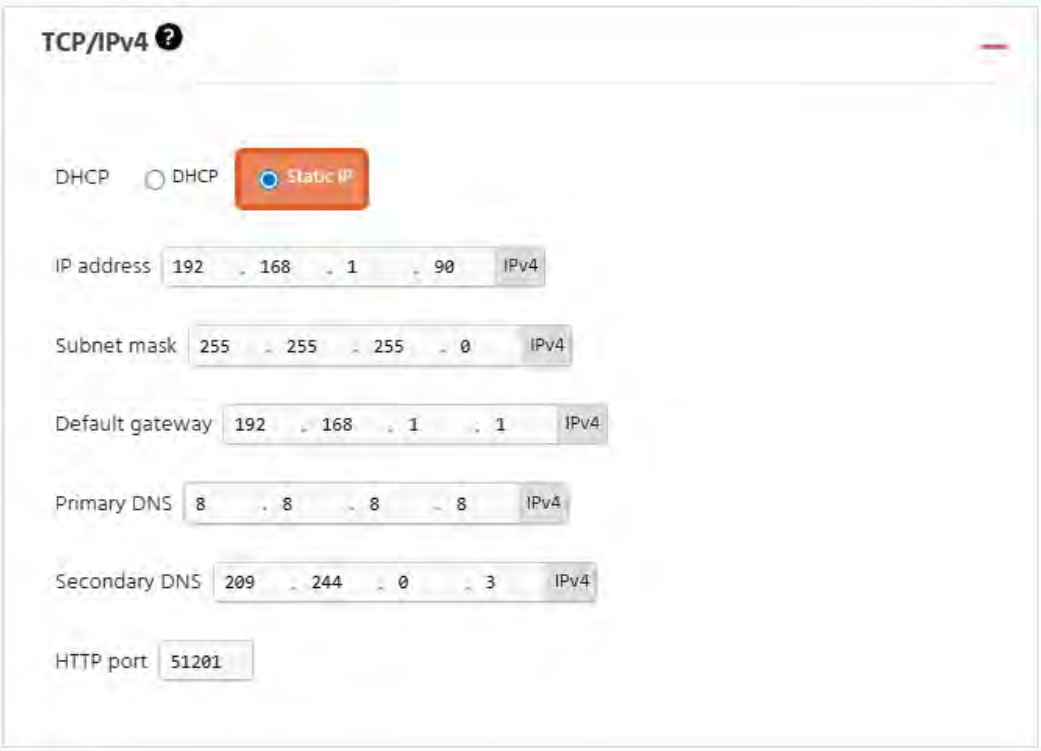
Bridge Ethernet Modbus/TCP requests to EIA-485 - Switch ON to enable Modbus bridging. When enabled, MODBUS TCP requests received via Ethernet that are NOT addressed to the ReadyEdge ID (default ID = 1) or its connected products will be “bridged” or transmitted serially onto the EIA-485 network to other MODBUS devices. If a device on the EIA-485 network has the correct ID and responds to the message, the ReadyEdge will “bridge” the response from that device back to the Ethernet network with a properly formed MODBUS TCP response message.

> ***NOTE**: MODBUS bridging will transmit MODBUS write commands to the EIA-485 network devices even if Read-Only Mode is enabled.*

Enable/Disable Morningstar Solar Connect Cloud Service



Edit TCP IP Network Settings



Modify Time Servers

If the ReadyEdge is connected to the Internet, it has the ability to periodically synchronize time and date from a time server. There are three pre-populated, public NTP servers, which users can modify as necessary. The ReadyEdge will attempt to connect to Timer Server 1 first to obtain current time and date. If connection fails, it will attempt to connect to Timer Server 2, and so forth.

To enable the use of these time servers, select the “Use Time Servers” option for *Date/Time Source* under the Date & Time tab.

3.11 SNMP Configuration

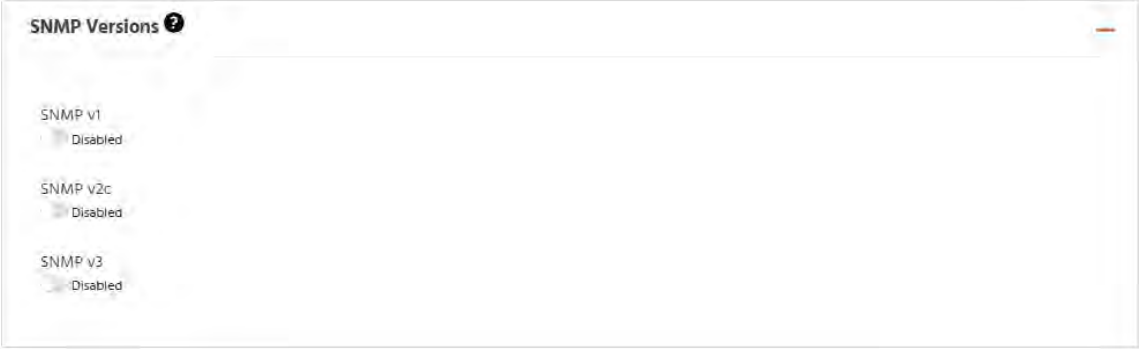
Adjusting SNMP Settings in Morningstar Mobile App

This adjustment is not yet supported in the mobile app.

Adjusting SNMP Settings in LiveView

Enable SNMP Version(s)

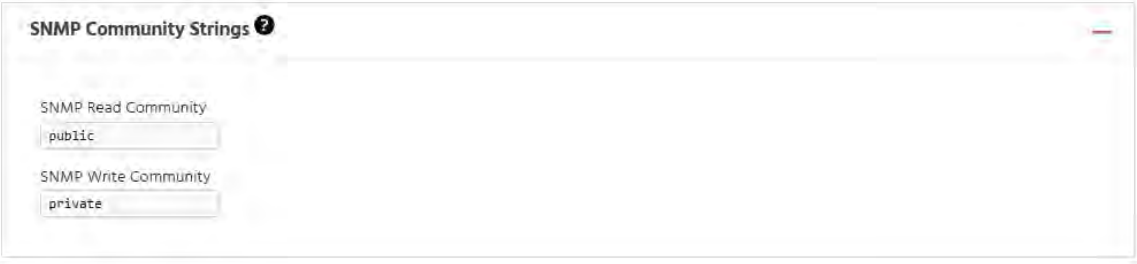
The ReadyEdge Supports Simple Network Messaging Protocol (SNMP) v1, v2c, and v3. Each version can be enabled and disabled independently. Later versions tend to improve performance and increase security.



Enable the SNMP version(s) needed to support your network.

> ***NOTE:*** Due to protocol limitations in v1 and v2c, you must enable and use SNMP v3 to monitor more than one Connected Product.

Specify SNMP Community Strings



The full details of SNMP community strings are beyond the scope of this document, but they are basically a simple form of authentication and authorization. The SNMP client, when reading data, must provide the read community string; likewise, when writing data, it must provide the write community string. Default community strings are shown in the screenshot above.

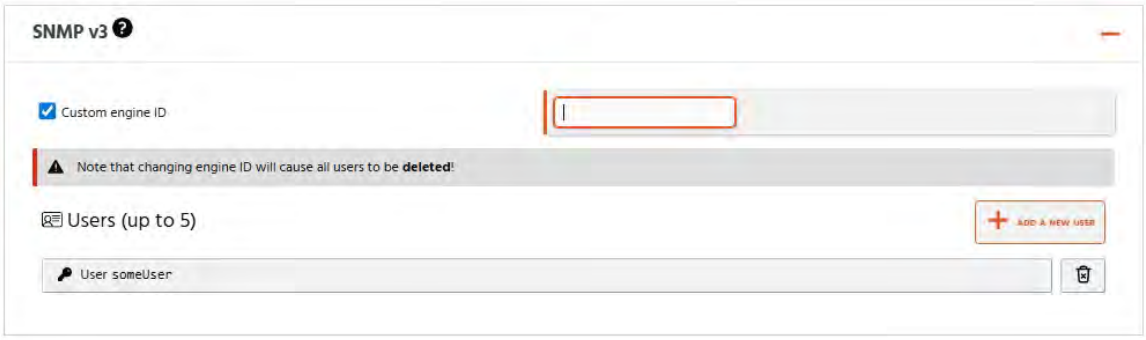
> ***WARNING**: The SNMP protocol sends community strings in plain text, offering very limited security. For improved security, use SNMP v3 with authentication and privacy passwords.*

SNMP v3 Settings

These are security and authentication settings specific to SNMP v3 (if enabled).

Custom Engine ID

You should almost always use the default Engine ID, but if you are cloning the same control configuration to many controls, the SNMP specification dictates that the Engine ID must be unique for each "administrative domain" so you would have to set a different Engine ID for each cloned control. Defining a Custom Engine ID also resets the SNMP boot count and erases any existing users and passwords. Setting an empty (blank string) Custom Engine ID triggers a reset to the default Engine ID.



Users

Define up to 5 users, using the same settings you will use in your SNMP client. Choose an authentication password hash algorithm and password, and an encryption algorithm and password. It is **strongly** recommended to use both an authentication password and a privacy password.

3.12 Edit Connected Products Settings

> ***NOTE**: The DIP switches on the Connected Product (ProStar, TriStar, etc) must be set to the "Custom" setting to make use of these adjustable settings.*

Editing Connected Product Settings in Morningstar Mobile App

Coming soon...

Editing Connected Product Settings in LiveView

Step 1 - Enable Installer Access

You will need Installer Access to access the Connected Products setup menu in LiveView. Follow the instructions in 3.6 Installer Access.

> ***NOTE**: If an installer password has not yet been created, you will be prompted to enter a new password before proceeding.*

Step 2 - Navigate to Connected Products Setup

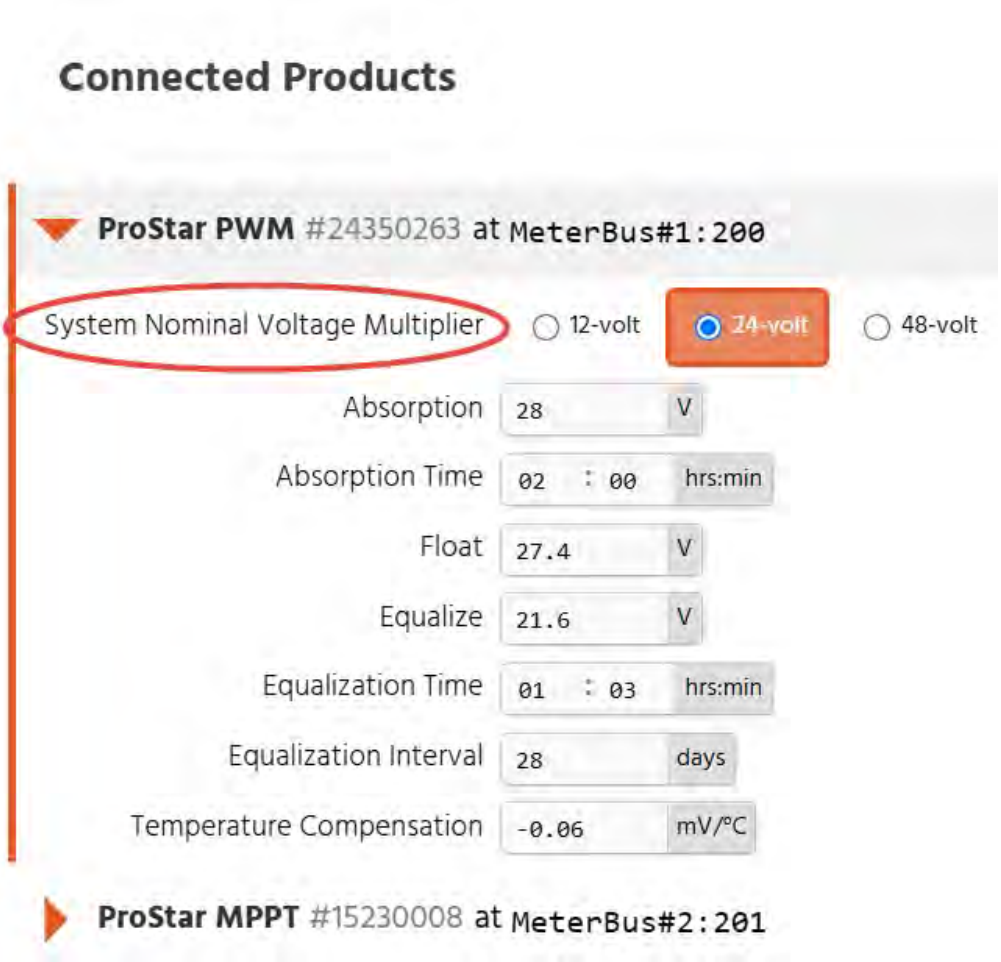
Navigate to the Connected Products tab under the Setup menu.

Step 3 - Choose a System Voltage Multiplier

The System Nominal Voltage Multiplier does the math for you in the user interface if you prefer to specify charge setpoints at a nominal voltage other than 12-volt.

For example, if the battery manufacturer provides charging setpoints at 48V nominal, you can set the multiplier to 48-volt and enter the settings for Absorption, Float, and Equalize voltage at 48V nominal as specified on the manufacturers spec sheet.

> ***NOTE**: Custom settings are always programmed into the Connected Product as 12 Volt nominal values. The product software multiplies the custom setpoints by 2X or 4X for 24V and 48V operation respectively automatically.*



Step 4 - Modify Connected Product Settings

Adjust any settings as necessary and click “Save” in the upper right corner of the screen to save changes.

3.13 Inputs Configuration

Modify Network Settings Using Morningstar Mobile App

These settings are currently only configurable using LiveView. See instructions below.

Modify Inputs Settings Using LiveView

Digital Inputs

The ReadyEdge has six(6) Digital Input connections. Digital Inputs detect low-resistance, “dry contact” open/close circuit signals. The ReadyEdge detects whether the digital input is in the open state or if the input is shorted , aka the closed state. Devices like smoke detectors, door sensors, or even a simple mechanical switch can be connected to a digital input. Each input is assigned a custom name and programmed to set Alerts on specific events.

> ***NOTE:*** A Digital Input may be used as the AGS generator feedback signal, but only **Digital Input 1** may be used for this purpose.

Step 1

For each input, specify a custom text label. This short descriptor will be used throughout the ReadyEdge user interface.

Step 2

Set the Alert condition as follows:

Never	no alert is sent when the Digital Input changes state
On Active	alert is sent when the input changes from open to shorted
On Inactive	alert is sent when the input changes from shorted to open
On Change	alert is sent each time the input changes state (open to short, short to open)

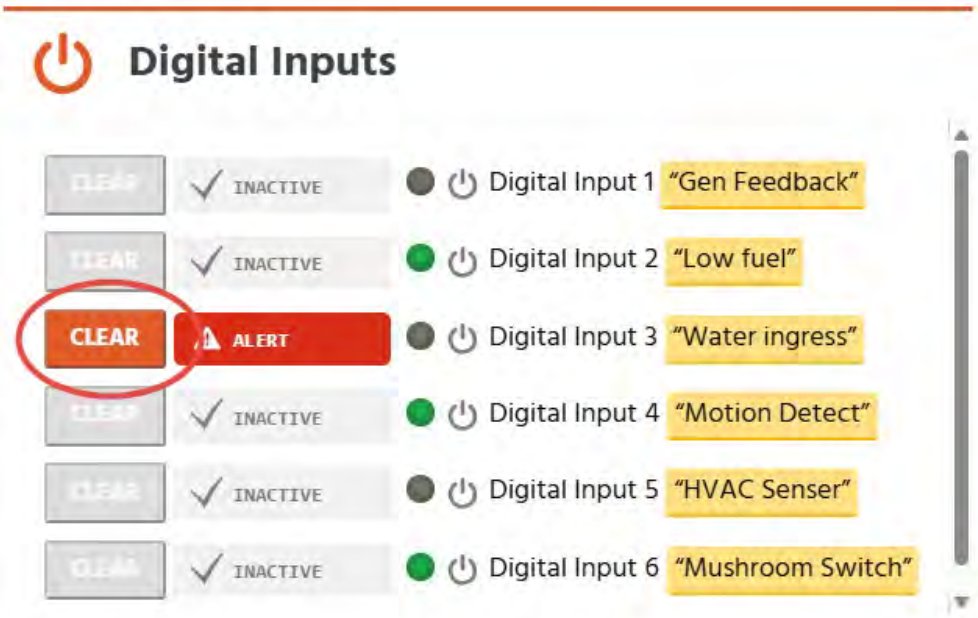
Step 3

Enable/Disable Auto-clear alerts.

Disabled	An alert condition is set when the Alert Condition becomes true (On Active or On Inactive) and remains set until the user manually clears the Alert.
Enabled	An alert condition is set when the Alert Condition becomes true (On Active or On Inactive) and automatically clears when the alert condition is no longer true. This setting does not apply to “On Change” condition.

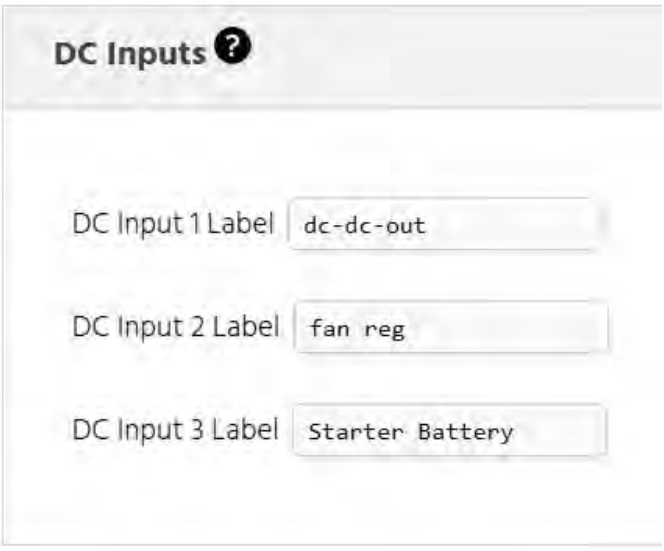
Alerts can be manually cleared in the following ways:

1. Use the LiveView dashboard Digital Inputs card: Click the “Clear” button next to the corresponding digital input (see screenshot below)
2. Send a MODBUS coil write command to the Clear Alert register
3. SNMP set of the clearAlert OID



DC Inputs

Assign short descriptions to each DC voltage measurement used. This short descriptor will be used throughout the ReadyEdge user interface.



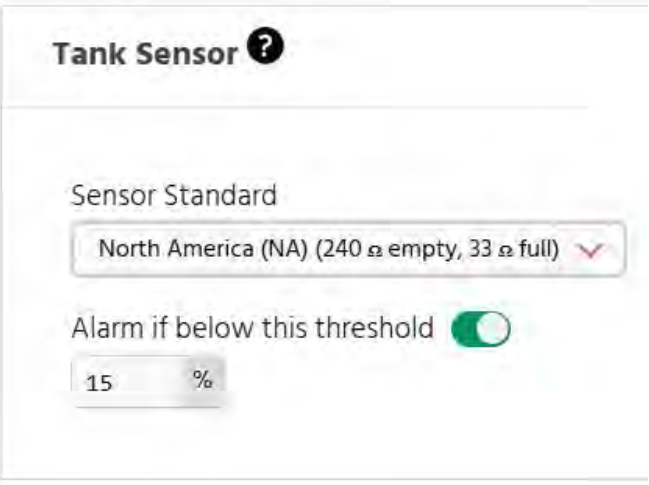
Tank Sensor

Step 1

Choose between the SAE/North American or European resistive tank sensor standard.

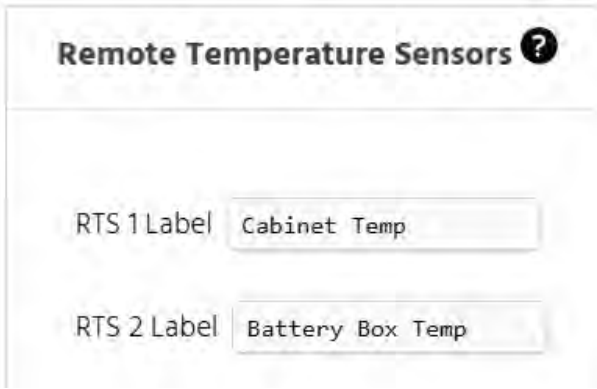
Step 2 - Optional

Set an Alert threshold for low tank level



Remote Temperature Sensors

Assign short descriptions to each temperature measurement used. This short descriptor will be used throughout the ReadyEdge user interface.


Remote Temperature Sensors
RTS 1 Label
Cabinet Temp
RTS 2 Label
Battery Box Temp

3.14 Outputs Configuration

Choose a DC Output option

Unassigned	Off by default. Able to be manually controlled with MODBUS commands.
Always On	12 Volt output port provides continuous power
AGS Start/Stop	Use the 12 Volt output port to send generator start/stop signal. See AGS configuration for more details.

3.16 Adjusting Schedules

Schedules can only be created and edited in LiveView. Use the Schedules Page to define and/or modify schedules for ReadyRelays and Automatic Generator Start.

About Schedules

Schedules define time blocks and days of the week based on the ReadyEdge internal real-time clock or network time if configured. Schedules will be visible on this page if the following conditions are met:

- AGS must be assigned to “Custom” mode for schedules to appear on this page
- ReadyRelay relays must be assigned to “Command/Schedule” for schedules to appear on this page

Relay Schedules

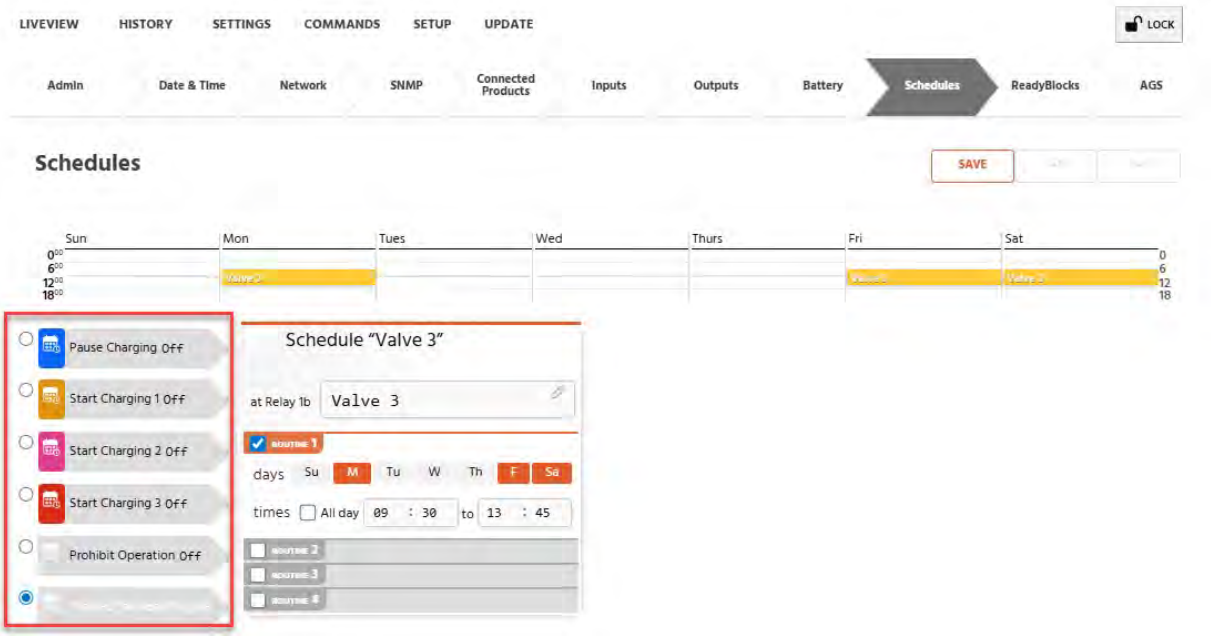
Define when a relay is on/off

AGS Charging Schedules (Custom Mode only)

Define hours of generator operation, paired with START and STOP criteria. The generator may run during the scheduled hours, but only if the START condition becomes true. The generator will stop at the end of the schedule, or sooner, if the STOP criteria becomes true. Navigate to the AGS tab under the Setup menu to create or edit the AGS START/STOP criteria.

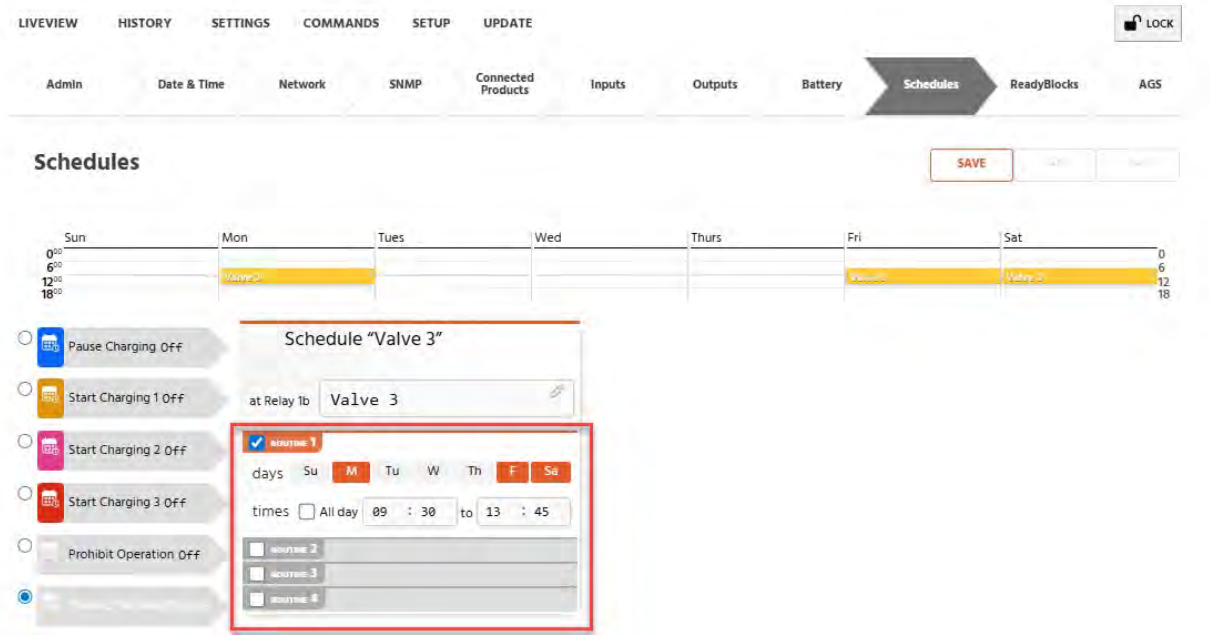
Step 1 Choose a Schedule to Edit

The schedules list is on the left side of the screen as shown in the red box in the screenshot below. Select a schedule to edit.



Step 2 Configure the Schedule Routines

A Routine defines the beginning and ending time when a relay or AGS schedule will be active, and on which day(s) of the week. Combine up to four (4) Routines in a single schedule to create comprehensive times of operation throughout the week. The Routine configuration is shown in the red box in the screenshot below.

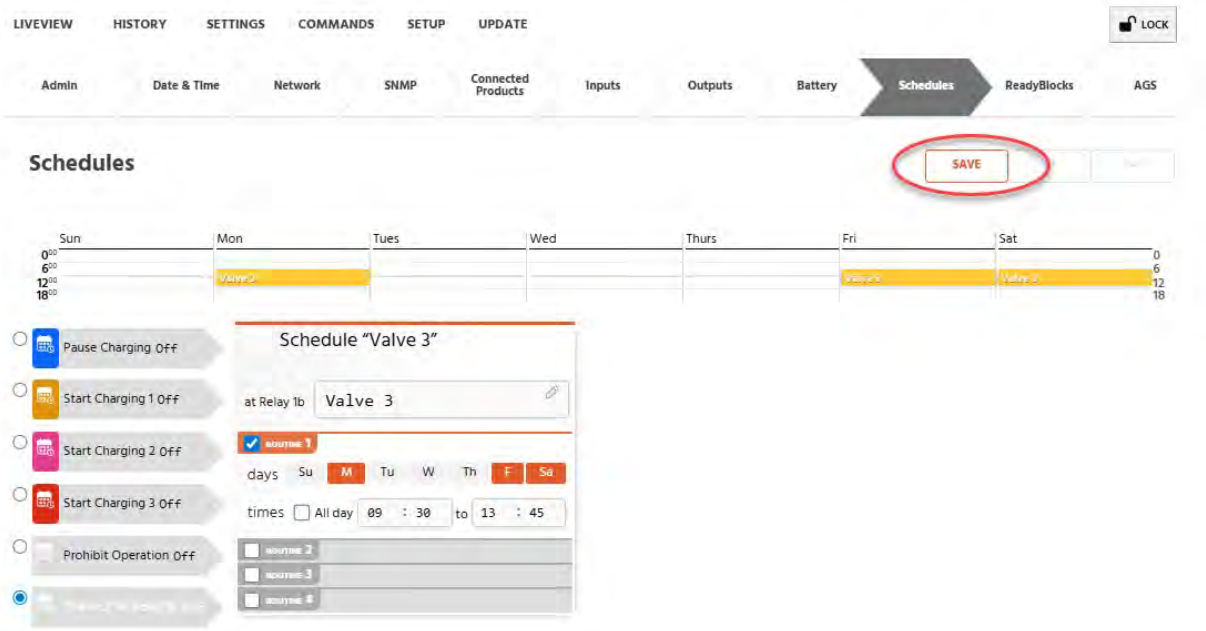


1. Select which day(s) of the week the Routine should be active.
2. Select a beginning and end time for the time block. If the Routine should run the entire 24hrs that day, check the "All Day" checkbox.
3. Check additional Routines on the list, configure as needed to build your schedule.

> ***NOTE**: If the ending time of a Routine is past midnight, the time block will extend into the following day as necessary.*

Step 3 Save Your Work

Remember to save your changes when complete! Click the Save button in the upper right as shown below.



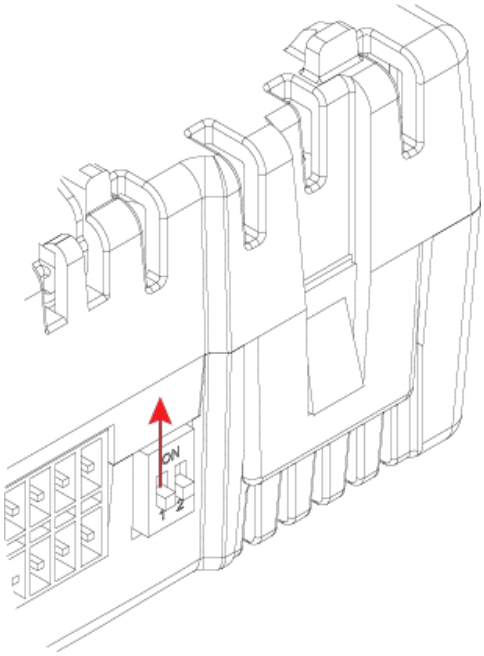
3.19 Prevent Modifications by Enabling Read-Only Mode

After all changes to ReadyEdge settings are complete, the *Read-Only Enable* DIP switch can be set to prevent any further changes. This feature prevents further configuration changes via the LiveView and Mobile App user interfaces.

> ***NOTE**: This feature does not prevent modification of settings using MODBUS protocol write commands.*

> ***NOTE**: This feature does not prevent modification of settings using SNMP protocol.*

To enable Read-Only Mode, DIP switch 1 must be placed in the UP / ON position as show in illustration 3.8 below. The Read-Only LED should turn RED.

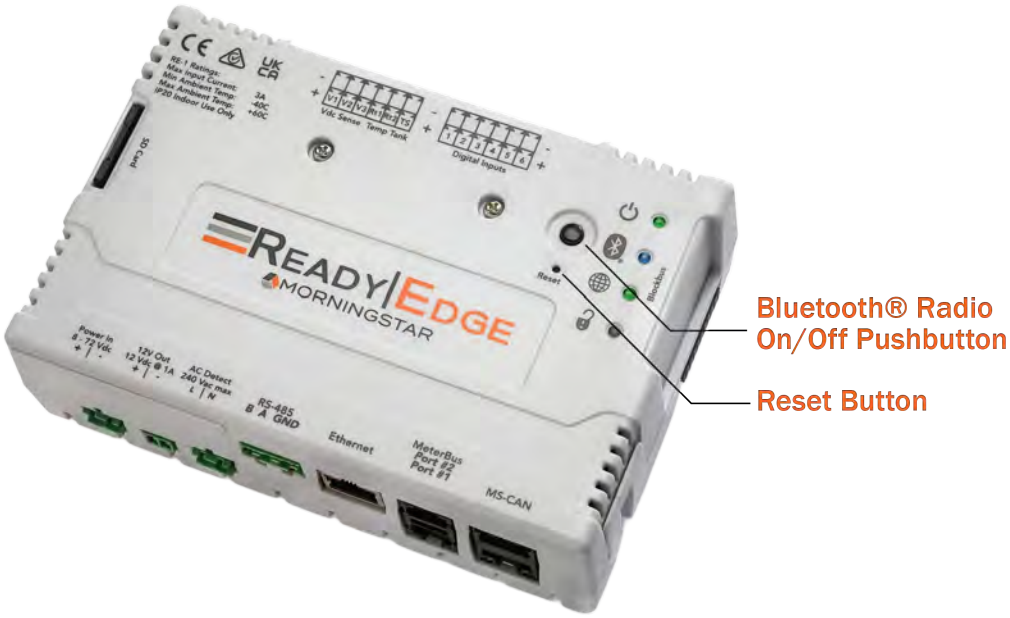


3.8 Set DIP switch 1 ON to enable read-only mode

4.1 LED Indications

Major LED Indications	
Status LED (Top LED)	
Green-solid	No Local or Remote faults
Green-flashing	Recovery Firmware Downgrade
Red-solid (heartbeat)	Active ReadyEdge Fault
Red-flashing	Active Remote (Connected Morningstar Device) Fault
Bluetooth LED	
Unlit	OFF
Blue-solid	Bluetooth Enabled
IOT Connectivity	
Unlit	Not Connected
Green-solid	Cloud Connected
Read Only Mode	
Green-solid	DIP Switch OFF
Red-solid	DIP Switch ON

4.2 Buttons and Switches (Physical)



Bluetooth and Reset Button Locations

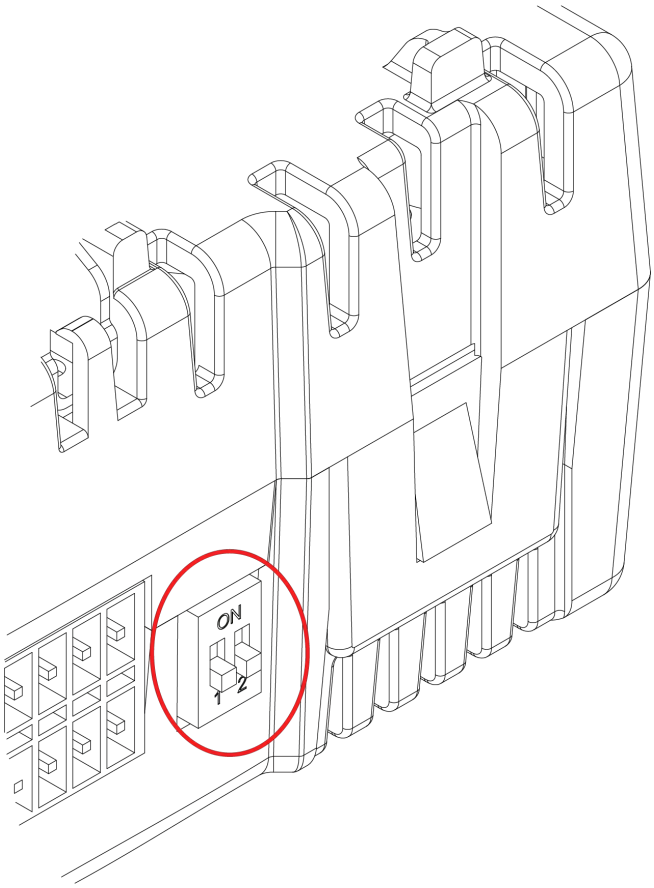
Bluetooth Radio On/Off Pushbutton

Button	Action	Indication
Momentary Press	Toggle the wireless Bluetooth radio on and off	Blue Bluetooth indicator: ON = Radio On / OFF = Radio Disabled

Reset Button

See Section 3.1 Default Configuration for details

DIP Switches



ReadyEdge DIP switches location

DIP Switch	Function
1	Read-Only Mode: ON = Enabled OFF = Disabled
2	Future / not used

The Read-Only Mode feature prevents further configuration changes via the LiveView, Mobile App, SNMP, and Modbus TCP interfaces.

> ⚠ ***CAUTION**: The Read-Only feature does not prevent modification of settings using direct serial communications.*

4.3 User Interfaces Overview

LiveView 2.0 Webpages Dashboard

LiveView 2.0 webpages are served from the ReadyEdge itself on a local network. Pages include a system dashboard, full configuration options, system management configuration, and historic data. The pages are viewable from any web browser on the local or private network to which the ReadyEdge is connected.

See 3.3 Accessing LiveView Web App for more details on how to connect.

Morningstar Mobile App

Connect to the ReadyEdge with a mobile device using the built-in Bluetooth radio. Use the mobile app to view pertinent operating information, modify critical settings, and update ReadyEdge firmware.

See 3.4 Connect Using Morningstar Mobile App for more details on how to download the app and get started.

Morningstar Solar Connect Data Service

View status and historic information for up to (50) systems from a single dashboard in the cloud using *Morningstar Solar Connect* remote monitoring service (included). Solar Connect is accessible via the internet, anywhere in the world.

See 3.5 Solar Connect Overview for more details on how to register and connect your ReadyEdge.

Summary of User Interface Capabilities and Features

	Mobile App	LiveView 2.0	Solar Connect
Connection Type	Bluetooth	Local Area Network (LAN)	Internet / Cloud
Access	Local, < 10 meters	On a shared network	Anywhere in the world
View Real-time Data	Yes, limited values	Yes, all values	~15min Intervals, limited values
View Status of Many ReadyEdge systems	No	No	Yes
Edit ReadyEdge Settings	Basic	Basic & Advanced	No
Edit Connected Product Settings	No	Yes	No
View Logged Data	No	Yes	Yes
Enable ReadyEdge to connect to Solar Connect data service a begin sending data	Yes	Yes	No
Claim and Register ReadyEdge on Solar Connect	No	No	Yes
Update ReadyEdge Firmware	Yes	Yes	No
Update Connected Product Firmware	No	No	No

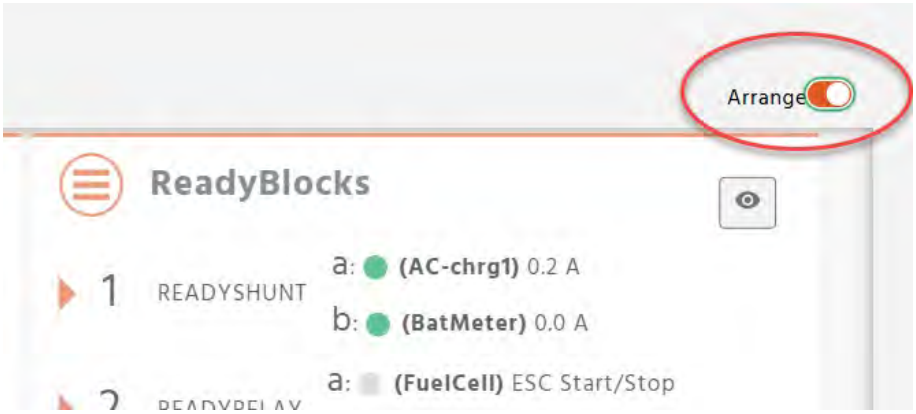
LiveView Dashboard

Overview

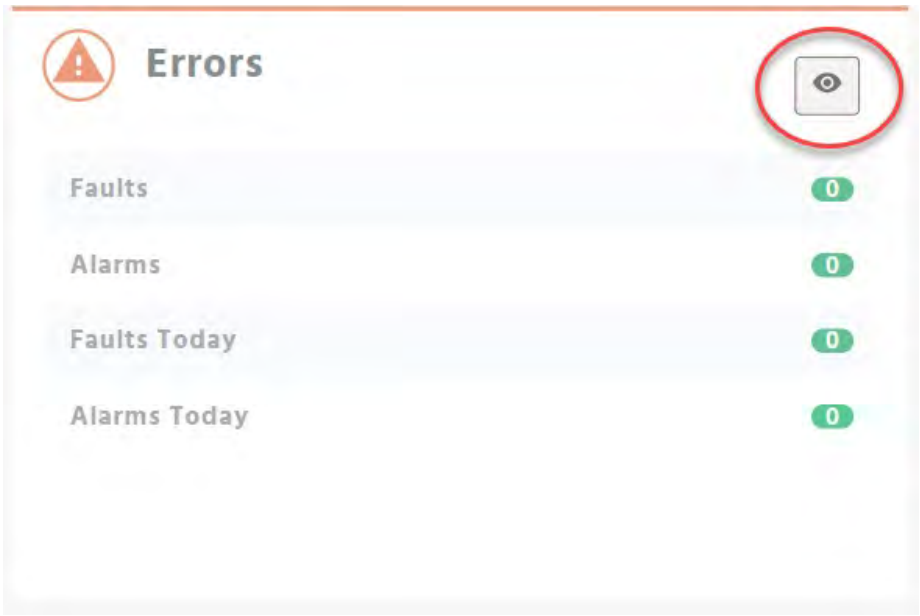
The LiveView real-time dashboard features a grid of “Cards”, which are containers that group related information and controls. The number of cards and type of information available will vary depending on the product.

The cards can be rearranged and/or hidden to customize the dashboard as needed as follows:

Step 1 - Click the Arrange slider in the upper right corner of the dashboard to move the cards around on the dashboard.



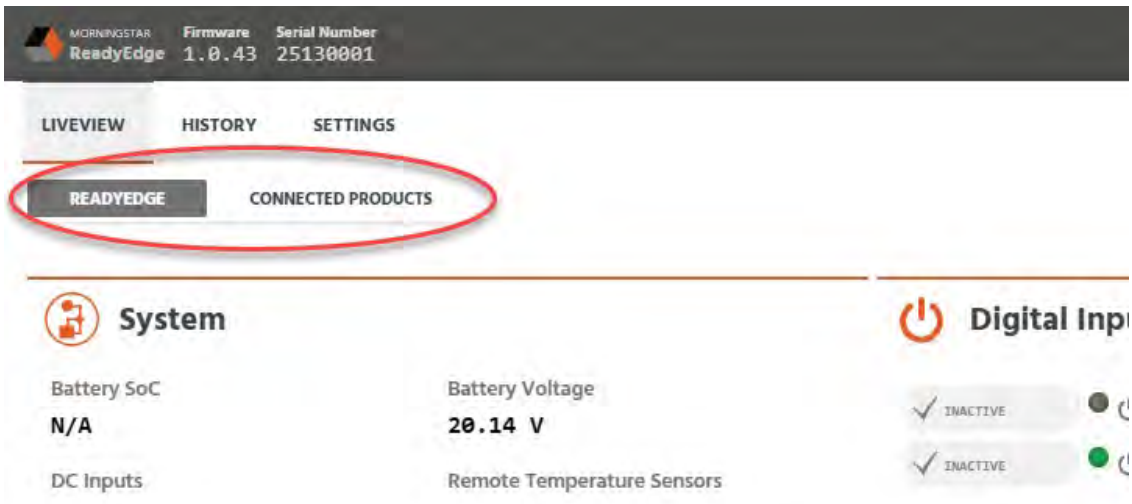
Step 2 - Click the Eye icon to toggle the visibility of any card on the dashboard.



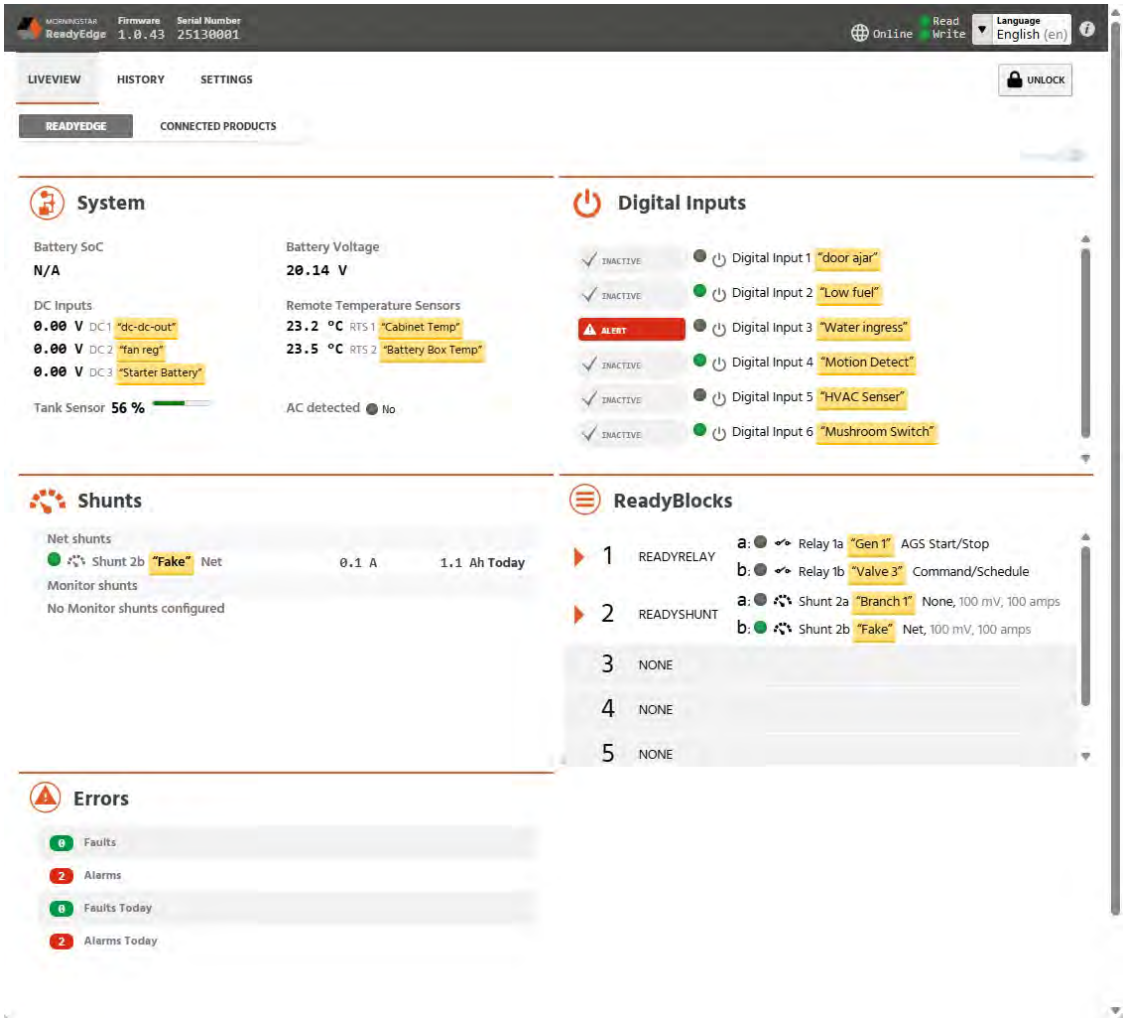
Step 3 - When satisfied with the cards arrangement and visibility, click the Arrange slider to return to normal dashboard view. The dashboard configuration will be retained unless the unit is factory reset.

ReadyEdge Dashboard

The ReadyEdge dashboard has two distinct views. One view for the ReadyEdge itself and a second view for Connect Products. You can switch between dashboard views by selecting a tab as shown in the screenshot below.



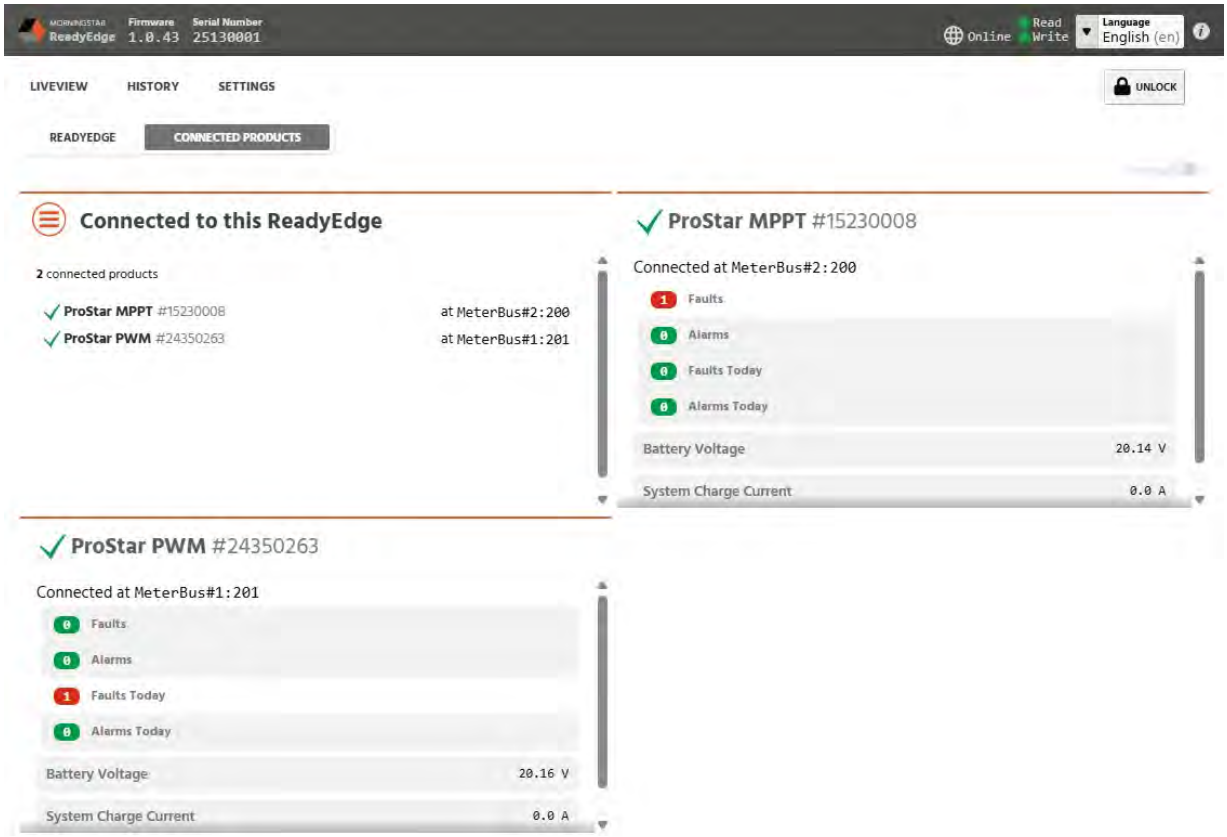
View #1 - ReadyEdge Dashboard View



- **System** - displays key values on overall system operation including Battery status, voltages, temperatures, tank level, and AC status

- **Digital Inputs** - shows the current state for each Digital Input
- **Shunts** - if a ReadyShunt block is installed, shunt current measurements will be displayed
- **ReadyBlocks** - summary information on all ReadyBlocks including present status/state
- **Errors** - displays Faults and Alarms that are currently active as well as any that have occurred today

View #2 - Connected Products Dashboard View



Connected to this ReadyEdge - Provides a summary view of all Morningstar products connected to the ReadyEdge including:

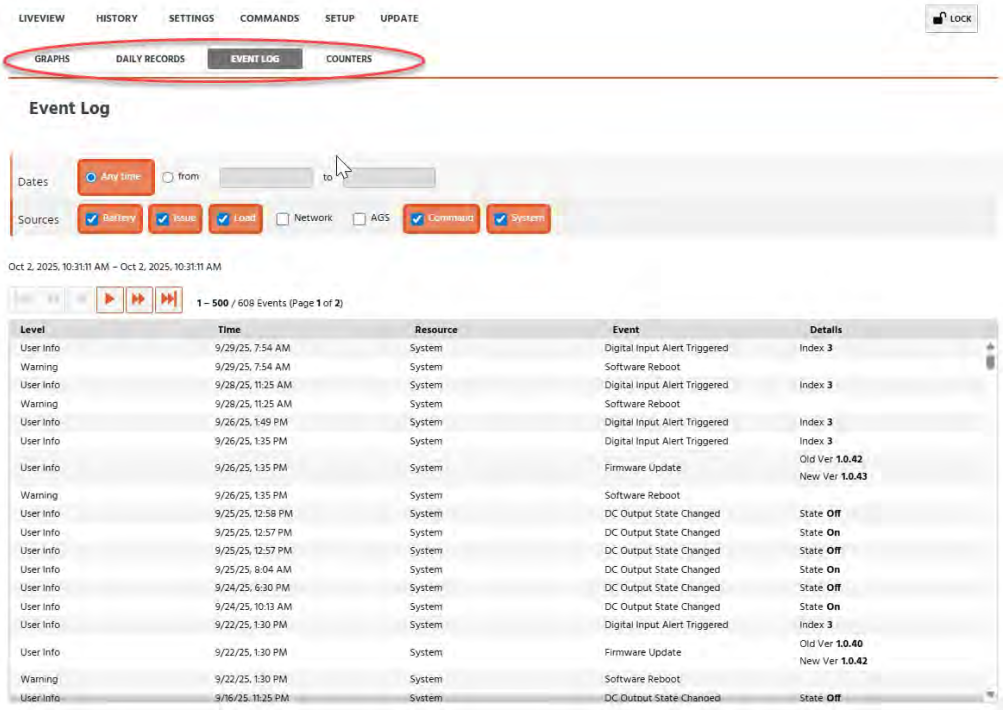
- Green checkmark if they are currently connected and communicating
- Product Serial number
- Which physical port the product is connected to and the assigned Modbus ID

Product Cards (one card per Connected Product)

- Any active faults/alarms and any faults/alarms that have occurred today
- Battery Voltage and Charge Current
- Detailed accounting of operating information

LiveView History Page

The History page provides four different views of logged information. To change views, select one of the tabs as shown in the screenshot below.



Graphs

Charts of daily key values including (depending on product and system configuration):

- Battery Voltage min/max daily
- Battery SOC min/max daily
- Battery Net Ah daily
- Charge Ah & Load Ah daily

Daily Records

A table of key values captured daily. Export to .CSV file for use in spreadsheets, etc using the “Download” button.

Event Log

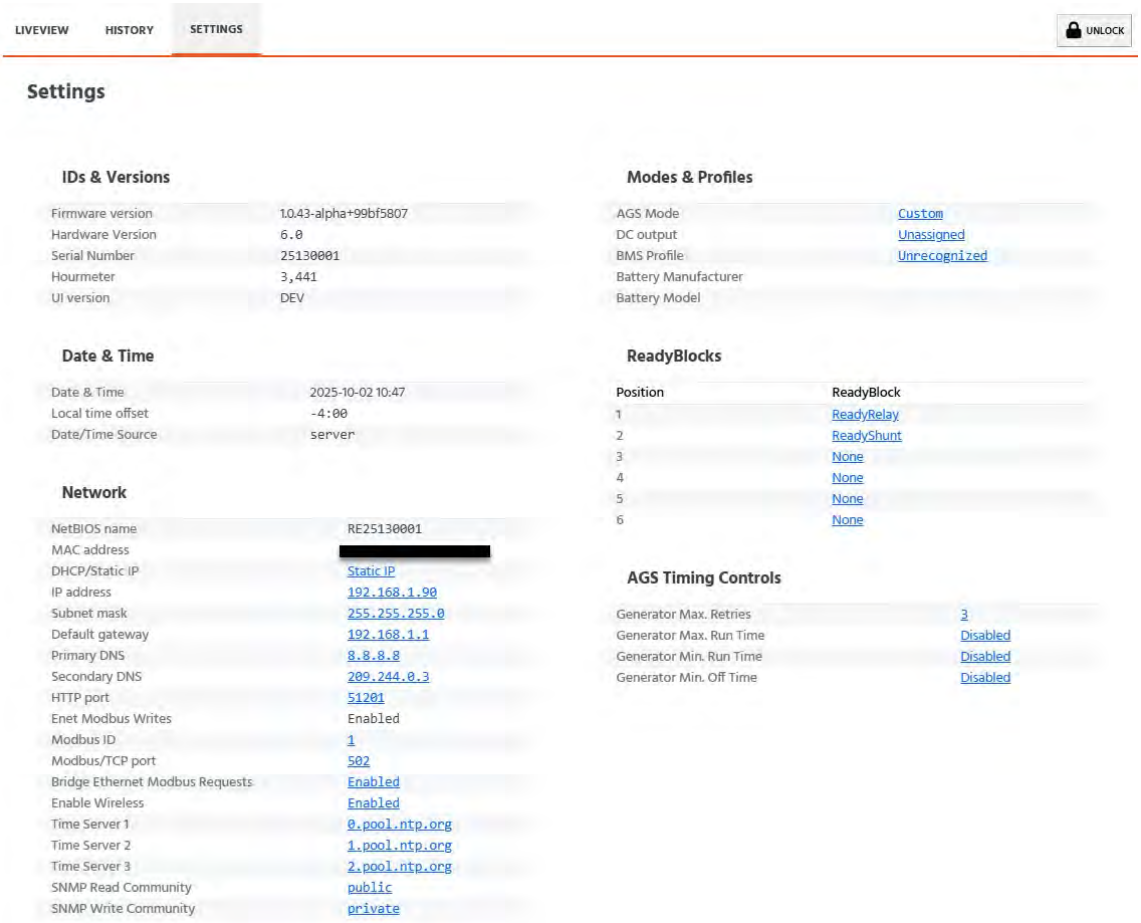
A real-time log of events system-wide. Each event is timestamped. Filter by date and event type.

Counters

Comprehensive list of Daily, Resettable, and Total Ah and kWh counters

LiveView Settings Page

The Settings page provides at-a-glance reference for key configuration information. Hyperlinks are provided to navigate to the location in the Setup pages to adjust each value. An Installer Password will be required to edit most settings.

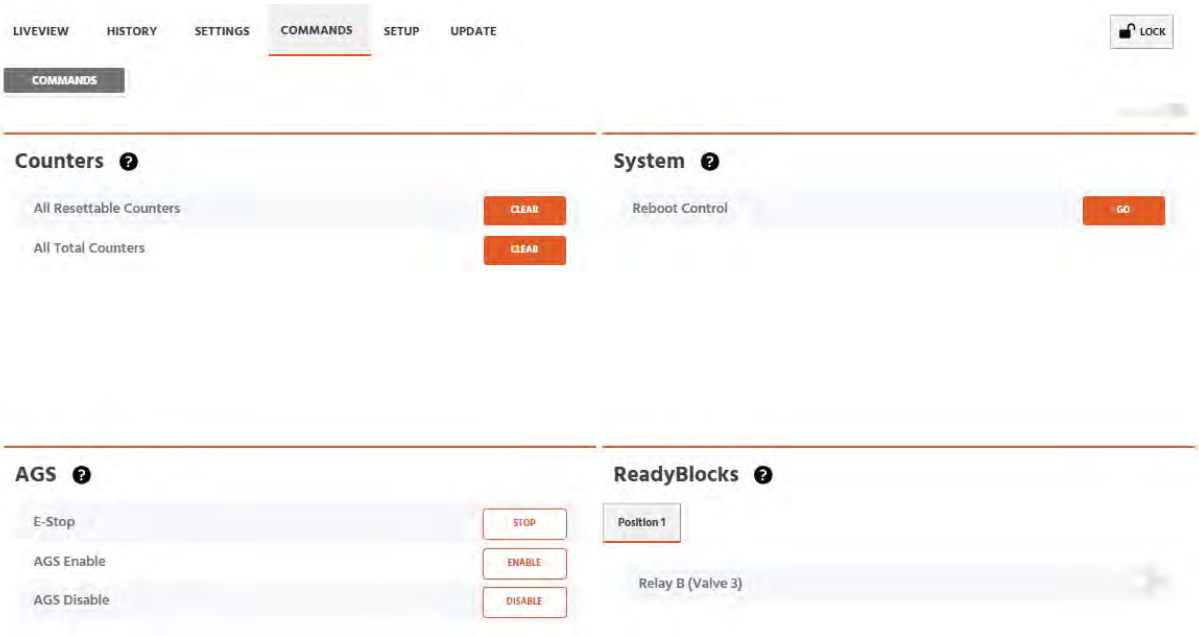


LiveView Commands Page

The Commands menu provides controls to take action. The type of command cards available/visible on the page will depend on the product and configuration.

Access to the Commands page requires the Installer Password. See section 3.6 Installer Access for instructions.

ReadyEdge Commands Page



Counters Commands Card

Visibility: Always Visible

All Resettable Counters

Clears the Resettable Amp-hour (Ah)and Resettable kilowatt-hour (kWh) counter values to zero. Resettable counters are intended to track short-term energy accumulation. For example, accumulations since a battery replacement, or a new load was added to a system.

All Total Counters

Clears the Total Ah and Total kWh counter values to zero. Total counters are intended to track long-term / lifetime accumulations of a system.

System Commands Card

Visibility: Always Visible

Reboot Control

Software resets the device. All device functions will cease until the reboot is complete.

> ☞ ***NOTE**: In the case of the ReadyEdge, all Connected Products will remain powered and operational. Only the ReadyEdge will reboot.*

AGS Commands Card

Visibility: Visible when Automatic Genstart Enabled & Configured

E-Stop

Stop the generator immediately - override all automatic control. Remains in the stop/off state until E-Stop toggled off.

AGS Enable - Visible when AGS Mode = AGS Basic or AGS Advanced

Override AGS automatic control and force the generator ON immediately (while still taking into account the Timing Controls: max runtime and min off time)

AGS Disable - Visible when AGS Mode = AGS Basic or AGS Advanced

Override AGS automatic control and force the generator OFF immediately (while still taking into account the Timing Controls: max runtime and min off time)

Manual Generator Control (Enable/ Disable) - Visible when AGS Mode = Manual

Manually turn the generator on/off while still taking into account the Timing Controls (max runtime and min offtime for Enable; min runtime for Disable).

ReadyBlocks Commands Card

Visibility: Visible when (1) or more ReadyRelays are configured for Commands/Schedule control

Relay N (custom name)

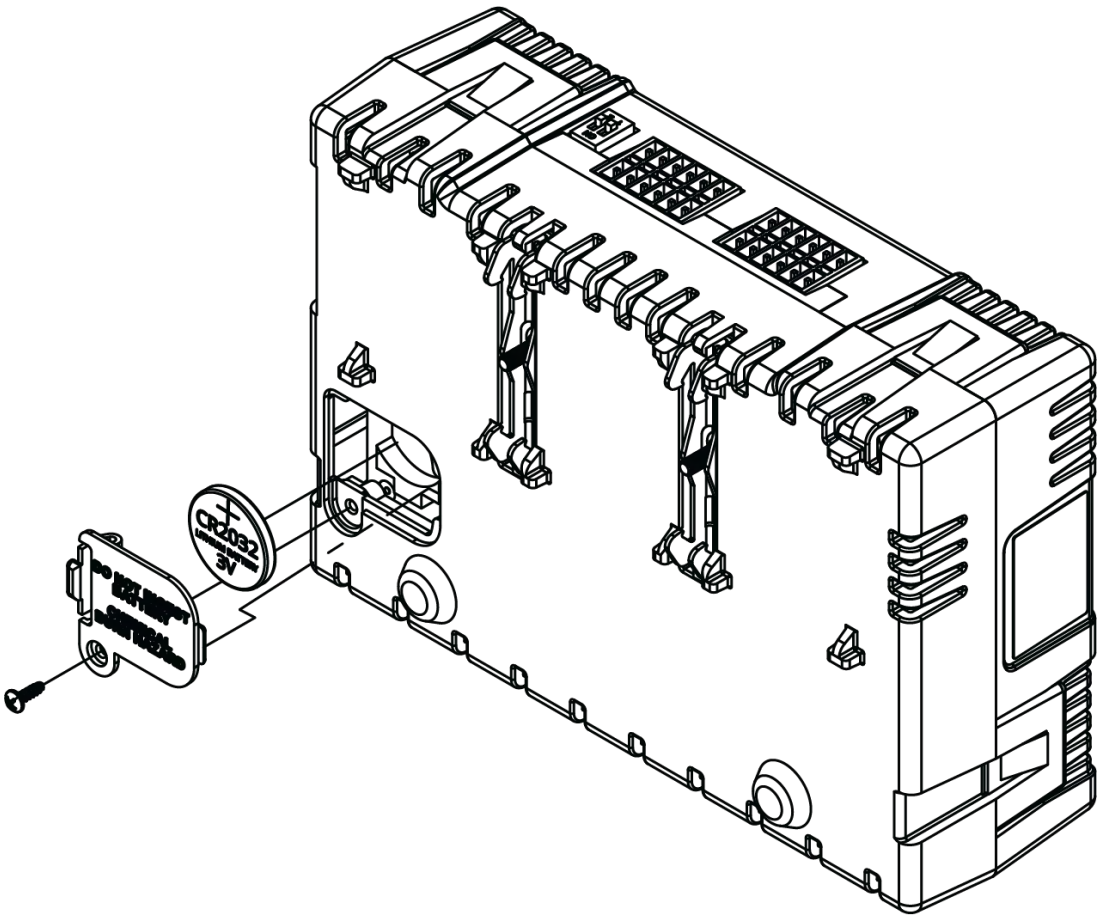
ReadyRelays that have been assigned the Command/Schedule function can be toggled ON-OFF manually with the slider switch

> ☞ ***NOTE**: If the ReadyRelay also has a schedule assigned, the On/Off command only works when the relay is scheduled to be Off.*

5.1 Replacing the Coin Cell Battery

The ReadyEdge coin cell battery ensures that clock settings are retained when the unit is not powered on. The battery will need replacement every 5 to 10 years. An alarm will be set in software when the battery is running low.

The coin cell compartment is located on the bottom of the unit. The ReadyEdge will need to be removed from the DIN rail and flipped over to replace the battery.



Replacing the Coin Cell Battery

Step 1

The battery cover is secured with a single Philips screw. Remove the screw and plastic battery compartment cover. Set them aside.

Step 2

Using a small flat-blade screw driver, gently pry the coin cell from the holder.

Step 3

Replace with a new CR2032 coin cell battery. Insert with the positive (+) side facing up1

Step 4

Replace the plastic battery cover and secure it with the small Philips screw

6.0 Limited Warranty

All Morningstar Integrated Series™ products are warrantied to be free from defects in materials and workmanship for a period of FIVE (5) years from the date of shipment to the original end user. Warranty on replaced units, or field-replaced components, will be limited only to the duration of the original product coverage. Warranty on replaced units, or field-replaced components, will be limited only to the duration of the original product coverage. Morningstar will, at its option, repair or replace any such defective units.

CLAIM PROCEDURE

Before requesting warranty service, check the Operator's Manual to verify product failure. Return the defective product to your authorized Morningstar distributor with shipping charges prepaid. Provide proof of date and place of purchase.

An RMA number must be issued by Morningstar prior to return of any unit(s) under this warranty. RMA information must include product model, serial number, detailed failure description, panel type, array size-configuration, type of batteries and system load details. This information is critical to rapid disposition of your warranty claim.

Morningstar will pay the return shipping charges if the repairs are covered under the warranty.

WARRANTY EXCLUSIONS AND LIMITATIONS

This warranty does not apply under the following conditions:

- Damage by accident, negligence, abuse or improper use
- PV or load currents exceeding the ratings of the product
- Unauthorized product modification or attempted repair
- Damage occurring during shipment
- Damage results from acts of nature such as lightning and weather extremes

THE WARRANTY AND REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHERS, EXPRESS OR IMPLIED. MORNINGSTAR SPECIFICALLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. No Morningstar distributor, agent or employee is authorized to make any modification or extension to this warranty.

MORNINGSTAR IS NOT RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND, INCLUDING BUT NOT LIMITED TO LOST PROFITS, DOWNTIME, GOODWILL OR DAMAGE TO EQUIPMENT OR PROPERTY.

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7.0 Technical Specifications & Certifications

Specifications	
ELECTRICAL	
Nominal Battery Voltage	12-24-48 Vdc
Battery Voltage Range	8-72 V
Maximum Input Current (Power In)	3 A
12V Output Terminal Voltage Range	12V±200 mV
12V Output Terminal Maximum Current	1A
AC Detection (Maximum Voltage Input)	240 Vac
Real-Time Clock (RTC)	Yes, w/coin cell (CR-2032)
COMMUNICATIONS	
SD Card	Yes (card not included)
MeterBus	Yes (2 ports)
EIA-485	Yes
Ethernet	100BASE-TX
Controller Area Network (CAN)	Yes
Bluetooth Low Energy radio (BLE)	Yes
Supported Protocols	Modbus, ModbusIP, HTTP, SNMP v3, Bluetooth LE
MECHANICAL	
Dimensions (mm/in.)	157.5, Length x 106.2, Height x 54.1, Width (6.201, Length x 4.180, Height x 2.130, Width)
Weight (g/oz.)	411 g (14.5 oz.)
Wire Size	#24-16 AWG / 0.2 - 1.3 mm²
Enclosure	IP20, Type 1 (Indoor)
ENVIRONMENTAL	

Maximum Operating Altitude	3000 m
Ambient Operating Temperature Range	-40C to +60C
Storage Temperature	-50C to +80C
Humidity	100% (Non-Condensing)
Certifications	
UL 62109-1 / CSA 22.2 107-1	
IEC 62109-1	
IEC 62368-1	
EMC Directive 2014/30/EU	
Radio Equipment Directive (RED) 2014/53/EU	
FCC Part 15 Subpart B, Class B	
ICES-003 Issue 7, Class B	
ACMA AS/NZS CISPR 32:2015	
CEC Listing for Australia (JAS-ANZ)	