Eaton® Battery Communications Module

Installation Manual

Powering Business Worldwide

p/n: P-164000946
Revision 04

IMPORTANT SAFETY INSTRUCTIONS - SAVE THESE INSTRUCTIONS

This manual contains important instructions that should be followed during installation and maintenance of the Battery Communications Module. Read all instructions before operating the equipment and save this manual for future reference.

CONSIGNES DE SÉCURITÉ IMPORTANTES — CONSERVER CES INSTRUCTIONS

Ce manuel comporte des instructions importantes que vous êtes invité à suivre lors de toute procédure d'installation et de maintenance de le module. Veuillez consulter entièrement ces instructions avant de faire fonctionner l'équipement et conserver ce manuel afin de pouvoir vous y reporter ultérieurement.

Chapter 1 Introduction

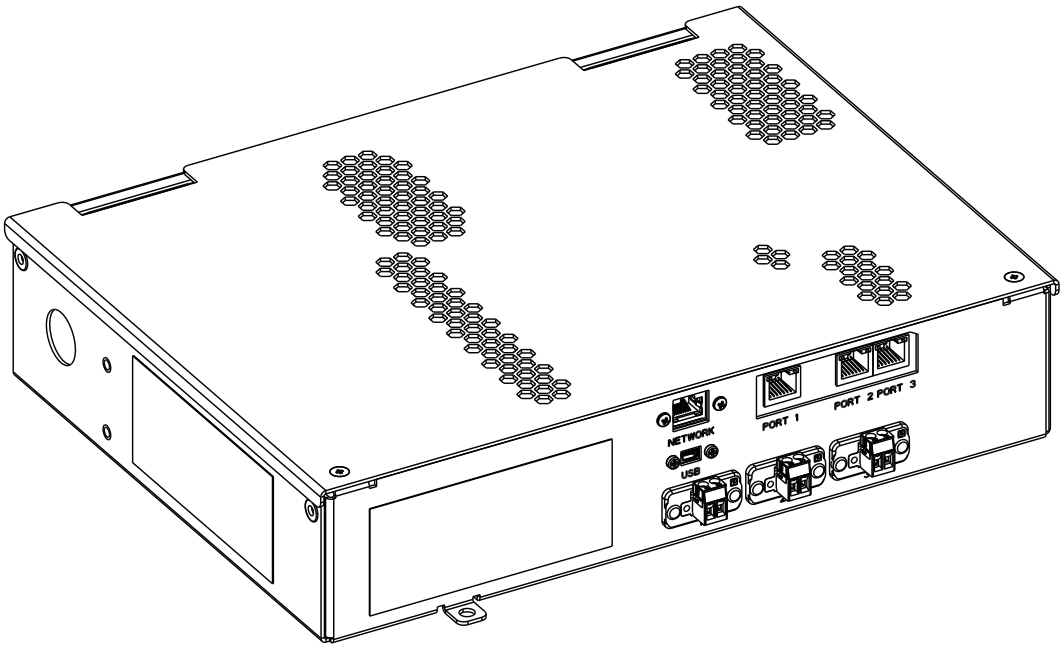
The Eaton® Battery Communications Module connects with an external battery system to gather information about the battery status and performance. The module stores battery information and can also transmit data to a cloud-based data storage system.

1.1 Battery Communications Module Overview

The Battery Communications Module (see Figure 1) has the following standard features:

- Regularly reads and stores data from the battery system
- Built-in web page to view data locally or through an Ethernet connection
- Modbus data to support external systems
- Stores data in the cloud, if the appropriate services are included

Figure 1. Eaton Battery Communications Module



1.2 Installation Features

The module has the following features:

- The communications module can be mounted either horizontally or vertically.
- AC power wiring can be routed through the hole provided on the side of the unit (see 2.3.1 *System Wiring Preparation*).
- Communication connections can be plugged directly into the unit.
- Auxiliary power, +24 Vdc, is provided to power any required external accessories (such as a wireless modem).

1.3 Conventions Used in This Manual

This manual uses these type conventions:

- **Bold type** highlights important concepts in discussions, key terms in procedures, and menu options, or represents a command or option that you type or enter at a prompt.
- *Italic type* highlights notes and new terms where they are defined.

Icon	Description
Note	Information notes call attention to important features or instructions.
[Keys]	Brackets are used when referring to a specific key, such as [Enter] or [Ctrl].

1.4 Symbols

The following are examples of symbols used on the equipment to provide important information:

RISK OF ELECTRIC SHOCK - Observe the warning associated with the risk of electric shock symbol.

CAUTION: REFER TO OPERATOR'S MANUAL - Refer to your operator's manual for additional information, such as important operating and maintenance instructions.

This symbol indicates you should not discard waste electrical or electronic equipment (WEEE) in the trash. For proper disposal, contact your local recycling/reuse or hazardous waste center.

1.5 Safety Warnings

NOTICE

This manual contains important instructions that should be followed during installation and maintenance of the communications module. Read all instructions before operating the equipment and save this manual for future reference.

NOTICE

Ce manuel comporte des instructions importantes que vous êtes invité à suivre lors de toute procédure d'installation et de maintenance de le module. Veuillez consulter entièrement ces instructions avant de faire fonctionner l'équipement et conserver ce manuel afin de pouvoir vous y reporter ultérieurement.

⚠ DANGER

The module contains LETHAL VOLTAGES. All repairs and service should be performed by AUTHORIZED SERVICE PERSONNEL ONLY. There are NO USER SERVICEABLE PARTS inside the module.

DANGER

Cet module peut générer des TENSIONS MORTELLES. L'installation et l'entretien ne doivent être effectués que par le PERSONNEL AUTORISÉ. Ne contient AUCUNE PIÈCE REMPLAÇABLE.

WARNING

- To reduce the risk of fire or electric shock, install this module in a temperature and humidity controlled, indoor environment, free of conductive contaminants. Ambient temperature must not exceed 40°C (104° F). Do not operate near water or excessive humidity (95% maximum). The system is not intended for outdoor use.
- Ensure all power is disconnected before performing installation or service.

WARNING

- Pour réduire les risques d'incendie et de decharge électrique, installer le module à l'intérieur, dans un endroit exempt d'éléments conducteurs et où la température et l'humidité sont régulées. La température ambiante ne doit pas dépasser 40°C (104°F). Ne pas faire fonctionner près d'une source d'eau ou dans un endroit très humide (95% maximum). Le système n'est pas conçu pour une utilisation extérieure.
- Toutes les sources d'alimentation doivent être débranchées avant de procéder à l'installation et à l'entretien.

1.6 For More Information

Visit the following website or contact an Eaton service representative for information on how to obtain copies of this manual:

www.eaton.com/us/en-us/products/backup-power-ups-surge-it-power-distribution.html

1.7 Getting Help

If help is needed with any of the following things:

- Scheduling initial startup
- Regional locations and telephone numbers
- A question about any of the information in this manual
- A question this manual does not answer

Please call the Customer Reliability Center at:

United States:	**1–800-843-9433**
Canada:	**1-800-461-9166 ext 260**
All other countries:	**Call your local service representative**

Please use the following e-mail address for manual comments, suggestions, or to report an error in this manual: E-ESSDocumentation@eaton.com

Chapter 2 Installation

This chapter covers the following areas:

- Installation options
- Communications module location
- Dimensions
- Wall or horizontal mount installation
- Input current and wire ratings
- Signal wire routing

⚠WARNING

Risk of electrical shock. Only qualified service personnel (such as a licensed electrician) should perform the electrical installation.

⚠CAUTION

To prevent electrical shock or damage to the equipment, verify that the circuit breaker or disconnect switch is off at the AC input service panel and locked out/tagged out in accordance with local implementation of National Fire Protection Association (NFPA) 70E, *Standard for Electrical Safety in the Workplace*, requirements.

2.1 Installation Options

Mount the communications module on a flat horizontal or vertical surface using the brackets provided. The brackets accommodate either vertical or horizontal mounting orientation. Secure the communications module to the mounting surface by fasteners appropriately sized for the weight of the device and the mounting surface.

2.2 Communications Module Location

Determine the appropriate location to install the communications module depending on the following factors:

- Environmental conditions (see 2.2.1 *Environmental Considerations*)
- Dimensions and weight (see 2.2.2 *Dimensions and Weight*)
- Wiring access to UPS, network connections, and AC power supply (see 2.3.1 *System Wiring Preparation*)
- Communications module flat horizontal or vertical surface-mount location

2.2.1 Environmental Considerations

For the system to operate properly, the installation site must meet the environmental parameters outlined in this manual and in the manual for the associated UPS and battery systems.

Make sure the environment meets the following operating restrictions for the Battery Communications Module:

The environmental requirements specified below are the maximum, not to exceed, ratings.

- There shall be at least a 1.8°F (1.0°C) difference between the dry bulb temperature and the wet bulb temperature, at all times, to maintain a non-condensing environment
- The maximum rate of temperature change shall be limited to 3°F over 5 minutes (36°F/hour), based on the ASHRAE Standard 90.1-2013

Observe caution regarding the operating environmental conditions. The newer, more energy efficient data center cooling methods (such as air side economization) can create much wider ranges of temperature and Relative Humidity (RH) in the UPS room or the data center.

Do not expose the UPS to overly aggressive environments, such as salt mist or corrosive gases. High relative humidity accelerates the effects of contaminants. The UPS should be installed in a G1 environment (based on ANSI/ISA S-71.04 classifications). If the UPS is used in a more aggressive environment, it can cause reduced product life and possibly early failure. If the installation location does not meet the recommended environment, contact your Eaton service representative for further information.

There are two aspects of this increased operating environment that can, if ignored, create issues:

- One aspect is the creation of microclimates, which are persistent variations of temperature and/or RH within a single room.

  For example, one side of the room is always cooler than the other side, no matter what the actual temperature is.

- The other aspect is the rate of change of temperature and/or RH, which can occur during transitions within the cooling system.

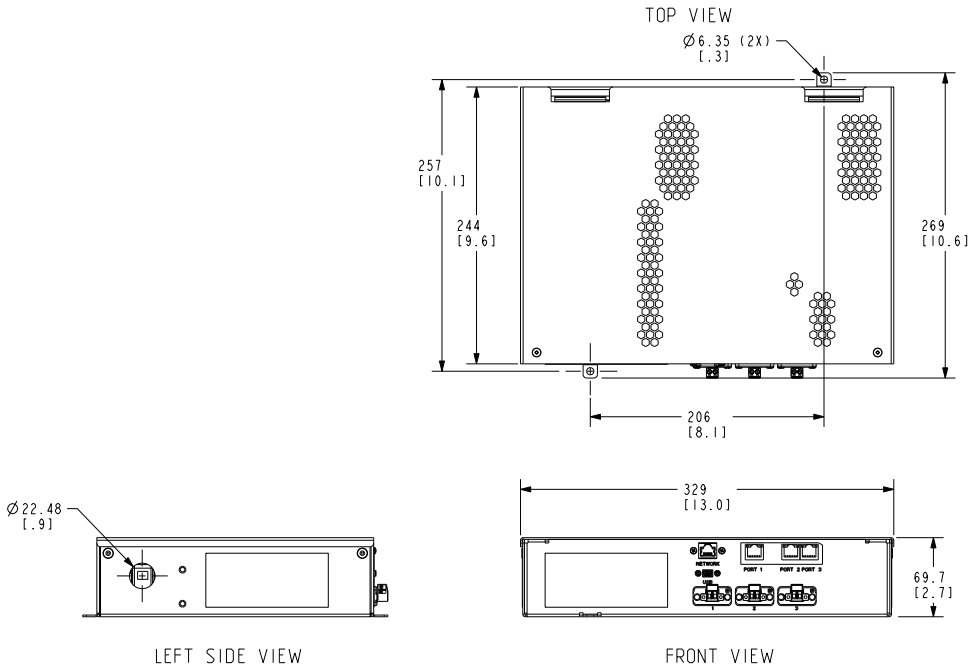
  Examples: changing the mixture ratio of inside versus outside air, or external changes in the outside air when going from nighttime into day, and back to night.

2.2.2 Dimensions and Weight

Table 1. Equipment Weight

Model	Shipping Weight kg (lb)	Installed Weight kg (lb)
Battery Communications Module	3.9 (8.5)	3.5 (7.7)

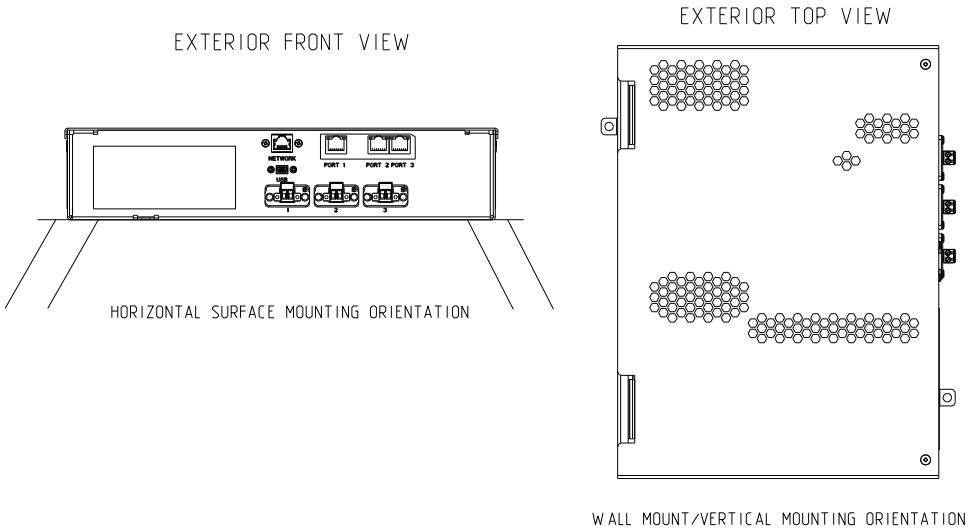
Figure 2. Battery Communications Module Dimensions



2.3 Installation

The Battery Communications Module can be installed on a horizontal or vertical (wall-mount) surface.

Figure 3. Mounting Options

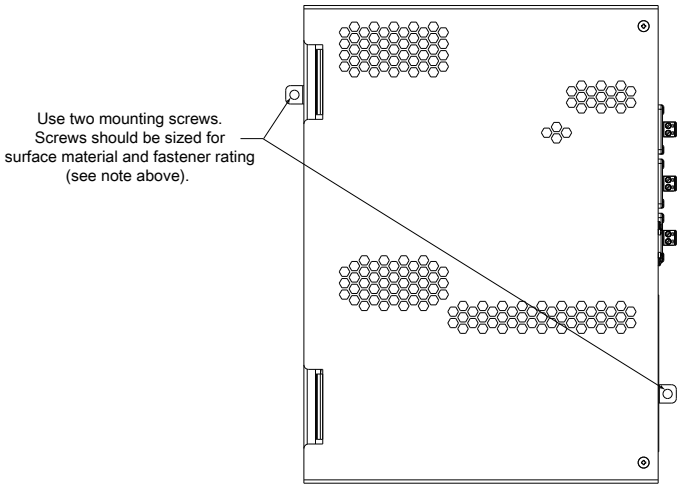


NOTE Make sure you use both bolt attachment points to install the controller. Anchors or other mounting hardware must also be rated at 25 pounds each or more in the mounting surface material used. Installation might require a washer (customer-provided) under the mounting hardware head depending on the size hardware used. A washer is recommended for 3/16", #8, M5, or smaller hardware.

Follow these steps to install the module:

1. Mark the location of the bracket holes and install appropriate anchors if required (see Figure 2 and Figure 3).
2. Place the controller in position and attach with bolts to the mounting surface (see Figure 4).

Figure 4. Wall or Horizontal Mount Installation



2.3.1 System Wiring Preparation

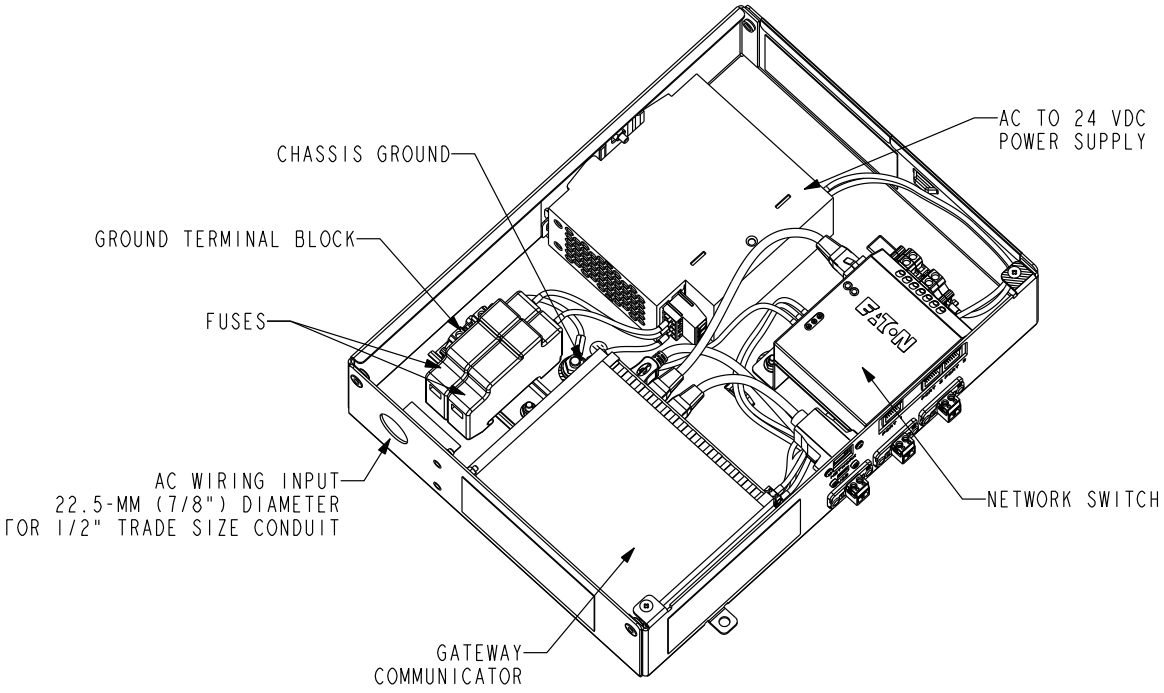
Read and understand the following notes while planning and performing the installation:

- Refer to national and local electrical codes for acceptable external wiring practices
- Material and labor for external wiring requirements are to be provided by designated personnel
- The communications module is designed for operation on a grounded source of supply
- Follow all applicable NEC and local codes
- Wire sizes listed are for copper wiring only

Table 2. Wiring

	Connection Points		
	Communications Module	**External Device**	
AC Power	Fuse inputs	AC source	Use minimum 14 AWG wire protected with a 15A circuit breaker + ground
Customer Network	Ethernet switch port	Customer system	Ethernet cable, Cat 5e or better
Battery BMS	Network	Battery BMS	Ethernet cable, Cat 5e or better
AC input rating:	380-480 Vac, 50/60 Hz, 0.3 A 100-240 Vac, 50/60 Hz, 1.5 A		

Figure 5. Battery Communications Module Components



2.4 Battery Communications Module Wiring

Install and connect the Battery Communications Module wiring and cables (see Table 2, Table 3, Figure 5, Figure 6, and Figure 7).

NOTE Attach the AC power wiring through the hole provided using the appropriate methods and strain relief as required by local codes.

Follow these steps to install the module wiring:

1. Connect the AC input voltage cables to the module.
2. Install Ethernet cabling between the system and the following external components:
   - Battery Management System (BMS) – Required
   - External monitoring system – Optional

Table 3. Battery Communications Module Connections

From	To	Cable Type (Supplied by Others)
NETWORK	Battery System BMS	Ethernet Cable
USB	Computer for Setup	USB Mini B to USB A Cable
PORT 1	Internet Connection Web Interface Modbus TCP	Ethernet Cable
PORT 2		Ethernet Cable
PORT 3		Ethernet Cable
TB 1	24 Vdc Accessory*	2 Wires
TB 2	24 Vdc Accessory*	2 Wires
TB 3	24 Vdc Accessory*	2 Wires
*The current draw for all 24 Vdc accessories combined cannot exceed 1.4A		

Figure 6. Battery Communications Module Connections

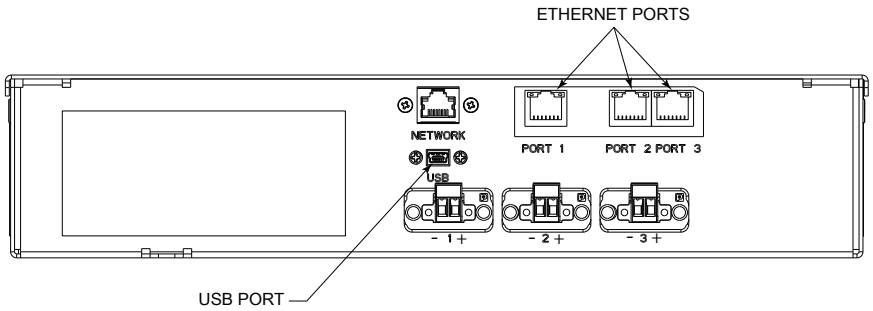
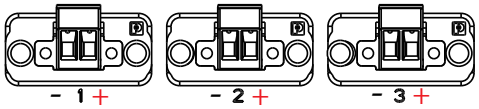


Figure 7. Polarity for 24 Vdc Accessories



2.5 Software and Firmware Installation

Configuration, upgrades, and any required software or firmware installation will be performed by qualified Eaton Service personnel during startup and commissioning.

2.6 Battery Communicator Interface

This section describes how to use the Eaton Battery Communicator interface to connect to the Battery Communications Module and use the communicator's features with the module.

2.6.1 Required Materials

Firmware and Drivers

USB drivers are required to connect to the communications module via a USB port (these are not required if connecting via an Ethernet port). If not already installed on your PC, download the PXG USB drivers from https://www.eaton.com/us/en-us/skuPage.PXG900.html:

1. Click **Software and firmware updates**.
2. Choose the PX USB Configuration file.
3. Save and extract the zip file to an accessible folder for later driver installation.

Hardware and Tools

- Mini USB cable or 1m or longer CAT5 or better ethernet cable
- Computer equipped with:
  - Web browser (Google Chrome is preferred)
  - An available USB or Ethernet port
  - A *.tar*-compatible decompression program such as 7-Zip or WinZip

Connection Requirements

This procedure requires that computer connected to the communications module by one of the following methods:

- Locally via the USB port – requires USB cable (see Figure 6)
- Locally via one of the communications module Ethernet ports – requires an Ethernet cable (see Figure 6)
- Remotely via the customer network connected to one of the communications module Ethernet ports (see Figure 6)

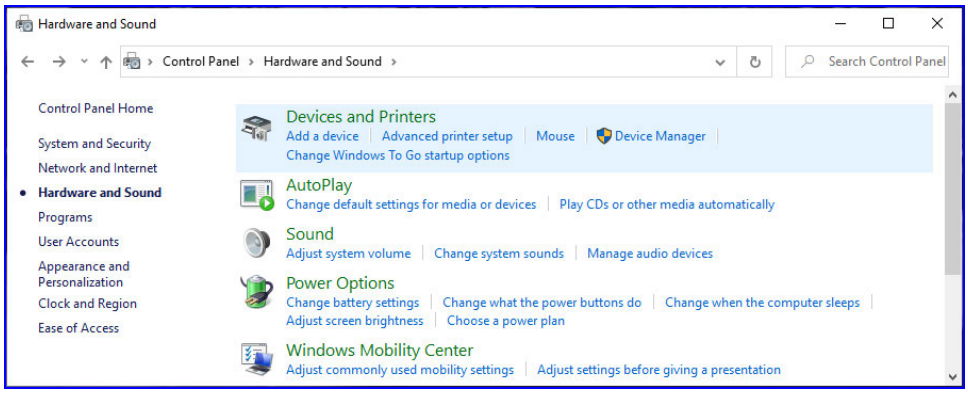
2.6.2 Driver Installation – USB Connection

NOTE If using an Ethernet connection, skip this section.

If your computer does not already have the PXG USB drivers installed, install the drivers as follows:

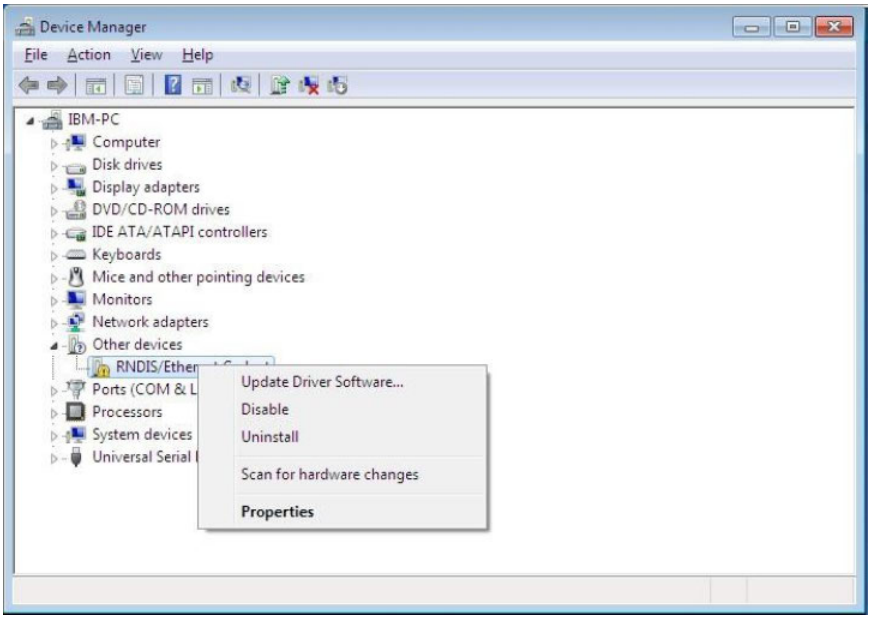
1. Apply power to the Battery Communications Module.
2. Ensure that a USB cable is connected between the computer and the communications module mini USB port (see Figure 6). The cable must be connected to update the driver.
3. Open the Control Panel and select **Hardware and Sound** (see Figure 8).

Figure 8. Control Panel – Hardware and Sound



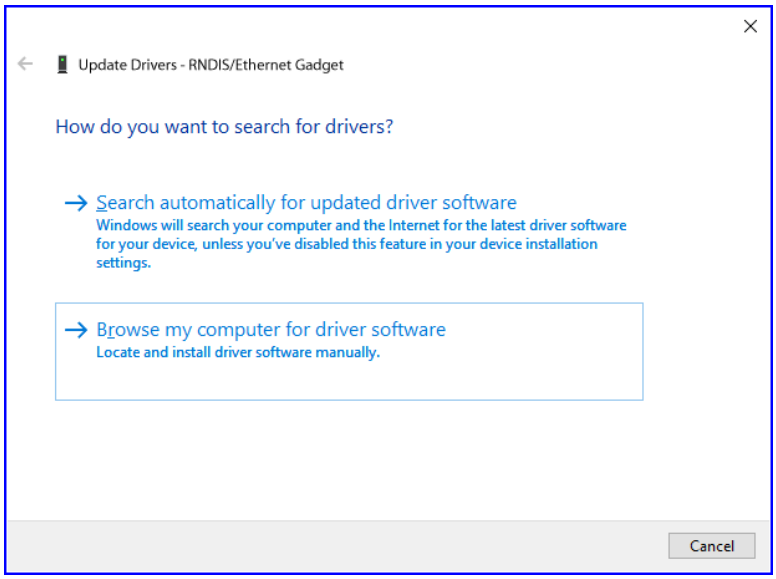
4. Under Devices and Printers, click **Device Manager**.
5. In the **Device Manager** window, expand **Other devices** (see Figure 9).

Figure 9. Device Manager Window



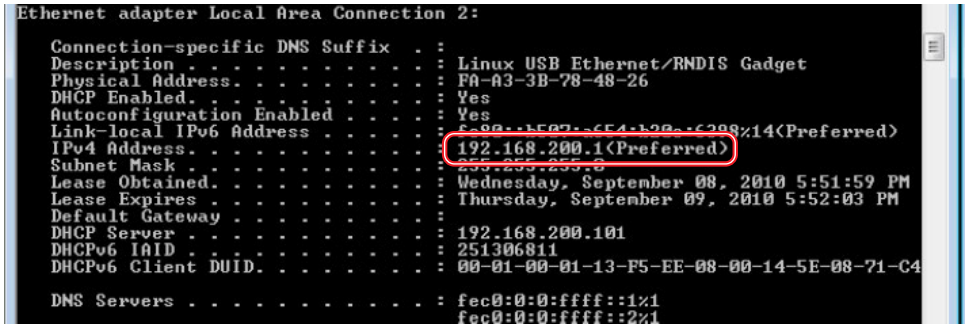
6. Right-click the **RNDIS/Ethernet Gadget** and select **Update Driver Software.** The **Update Drivers** window displays (see Figure 10).

Figure 10. Update Drivers Window



7. Select **Browse my computer for driver software**.
8. Locate and select the folder containing the *powerxpert.inf* file.
9. If the message "Windows can't verify the publisher of this driver software" displays, select **Install this driver software anyway**.
10. To verify that drivers are installed correctly: open the **Start** menu and open a command prompt.
11. Enter *ipconfig/all*.
12. Verify that the assigned IPv4 address assigned to your PC is in the 192.168.200.*x* range, where *x* is typically *1* (see Figure 11).

Figure 11. Verify the IPv4 Address



2.6.3 Connecting to the Unit

You can access the Battery Communicator web page either through the USB port or Ethernet ports 1, 2, or 3. You can access Modbus TCP through the Ethernet ports 1, 2 or 3. See Figure 6 to view these connections.

Before using one of these methods to connect, install the unit as described in the previous sections and ensure that power to the unit is turned on.

USB Connection

To use the USB port to connect to the unit:

1. Connect one end of a mini USB cable to the unit and the other end to your computer.
2. Open a web browser on the computer and enter the address *192.168.200.101*.
3. Enter the credentials to log on to the unit.

NOTE The operator log in credentials are set during the setup and commissioning of the device. The Eaton service engineer should provide them.

Ethernet Connection

To use an Ethernet port to connect to the unit:

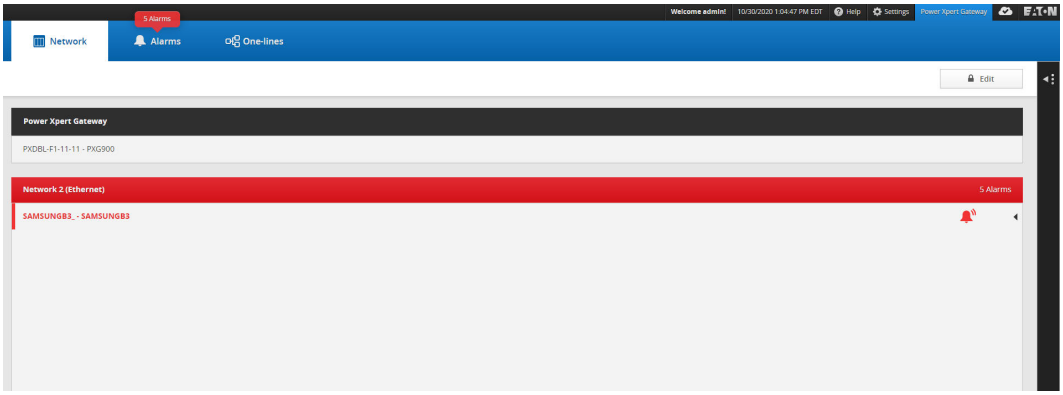
1. Connect one end of an Ethernet cable to the unit and the other end to your computer.
2. Open a web browser on the computer and enter the assigned IP (DHCP or Static).
   - The default Static ID is *192.168.200.101*.
3. Enter the credentials to log on to the unit.

NOTE The operator log in credentials are set during the setup and commissioning of the device. The Eaton service engineer should provide them.

2.6.4 Initial Page

After you log in, the following web page opens in the browser:

Figure 12. Battery Communicator Initial Page

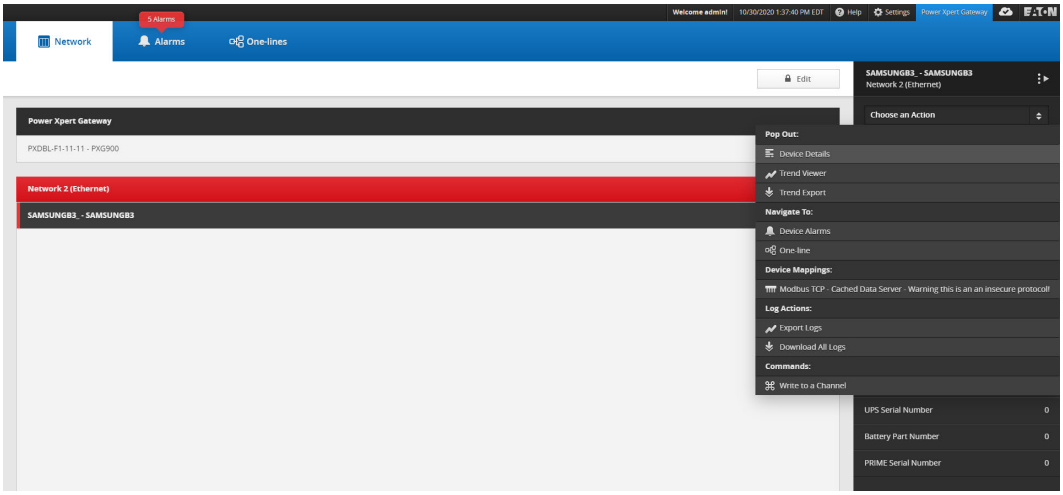


2.6.5 Viewing Device Data

To view device data in the Battery Communicator interface:

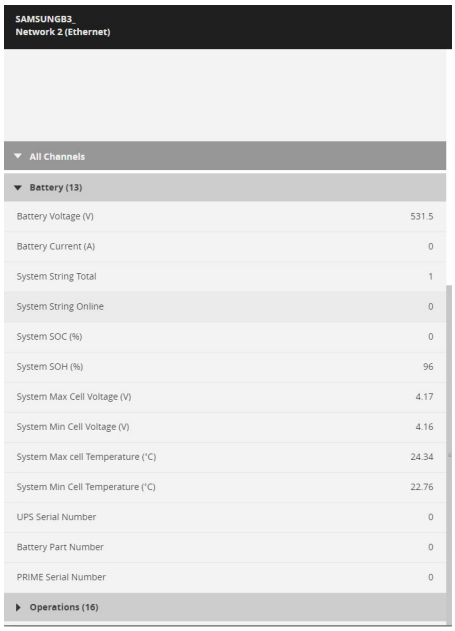
1. Click on the device listed under **Network 2 (Ethernet)**.
   - The name of the device is highlighted in black, and a window on the right side of the screen opens displaying information from the configured device.
2. Click **Choose an Action** and select **Device Details**.

Figure 13. Battery Communicator Device Details



3. Scroll down and click on the arrows next to **Battery** and **Operations** to expand the details of all available data channels.

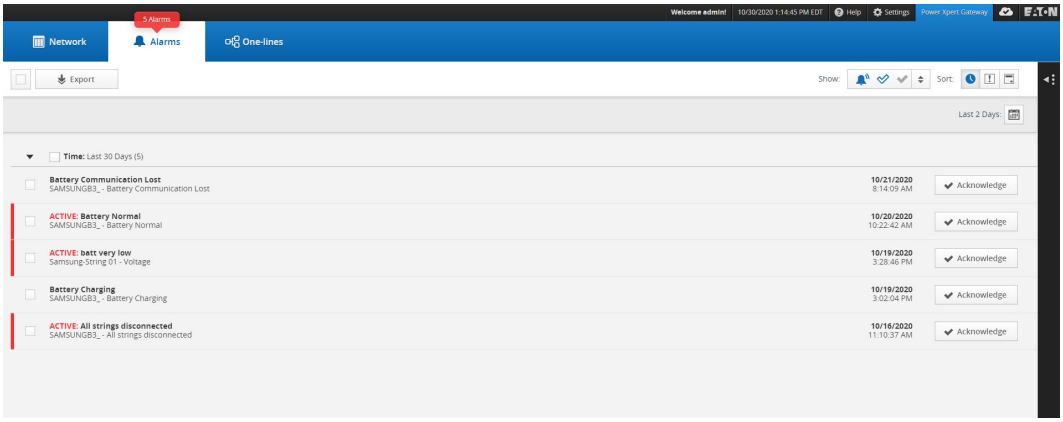
Figure 14. Battery Communicator Data Channels



2.6.6 Viewing and Acknowledging Alarms

To view alarms, click the **Alarms** tab next to the **Network** tab. To acknowledge an alarm on this tab, click the **Acknowledge** button on the right side of each alarm entry.

Figure 15. Battery Communicator Alarms Tab

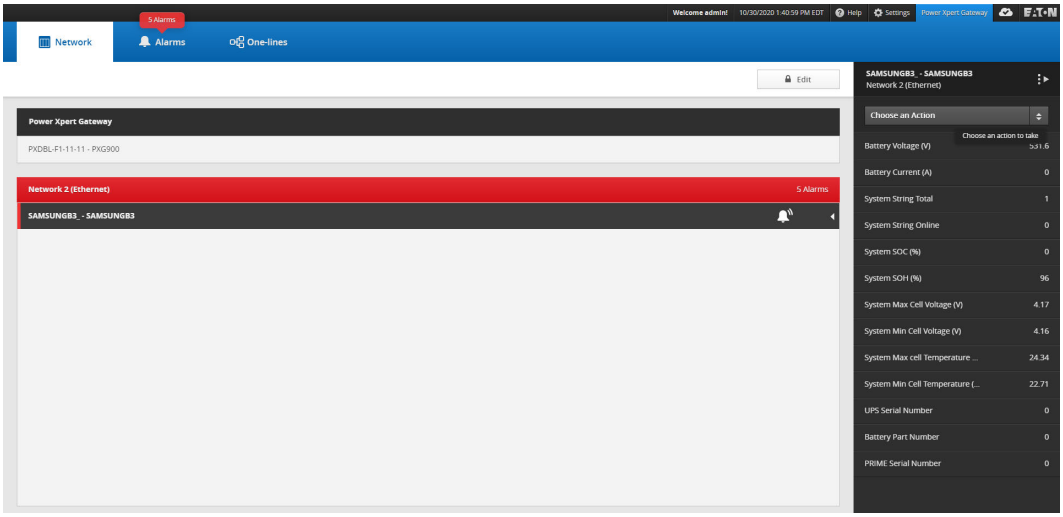


2.6.7 Downloading a Modbus Map

To download a Modbus Map in the Battery Communicator interface:

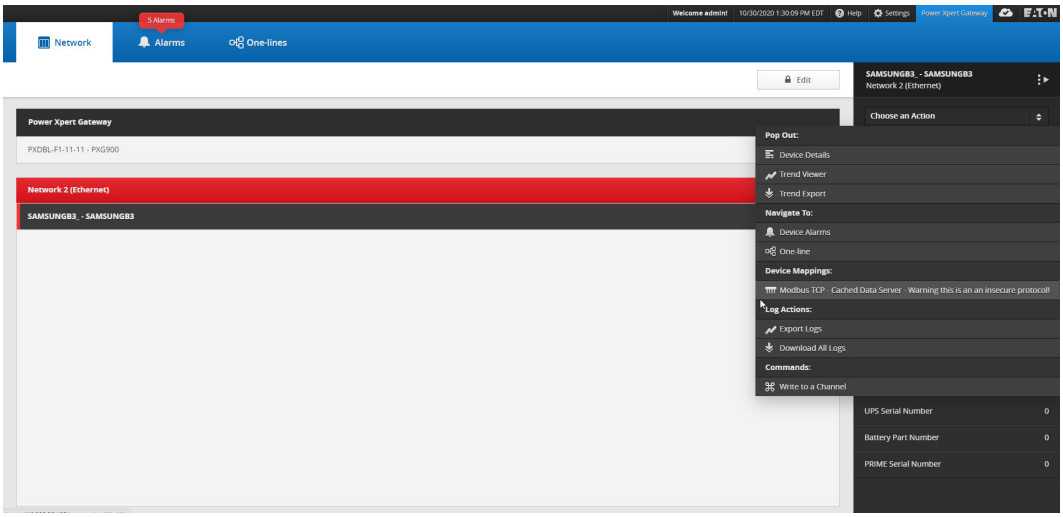
1. Click the device listed under **Network 2 (Ethernet)**.
    - The name of the device is highlighted in black, and a window on the right side of the screen opens displaying information from the configured device.

Figure 16. Battery Communicator Device Information



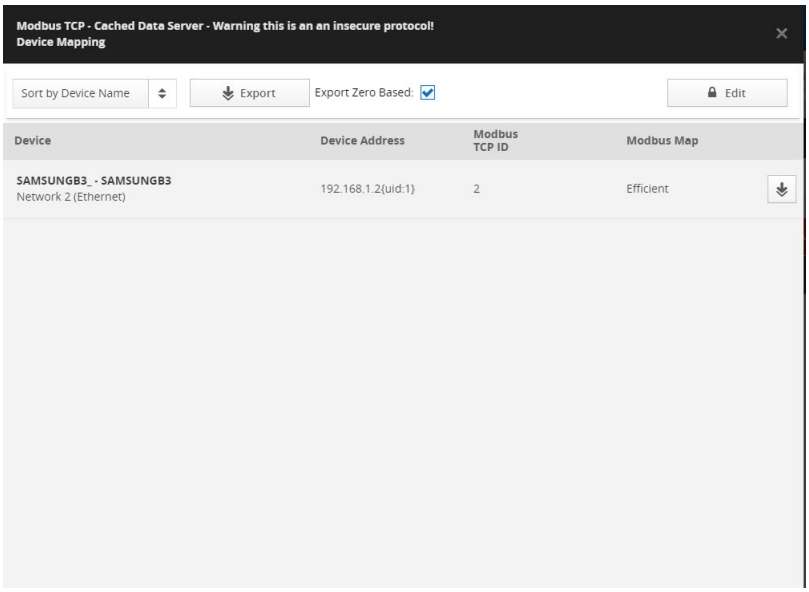
2. Click **Choose an Action** checkbox and select **Modbus TCP** under **Device Mappings**.

Figure 17. Battery Communicator Device Mappings



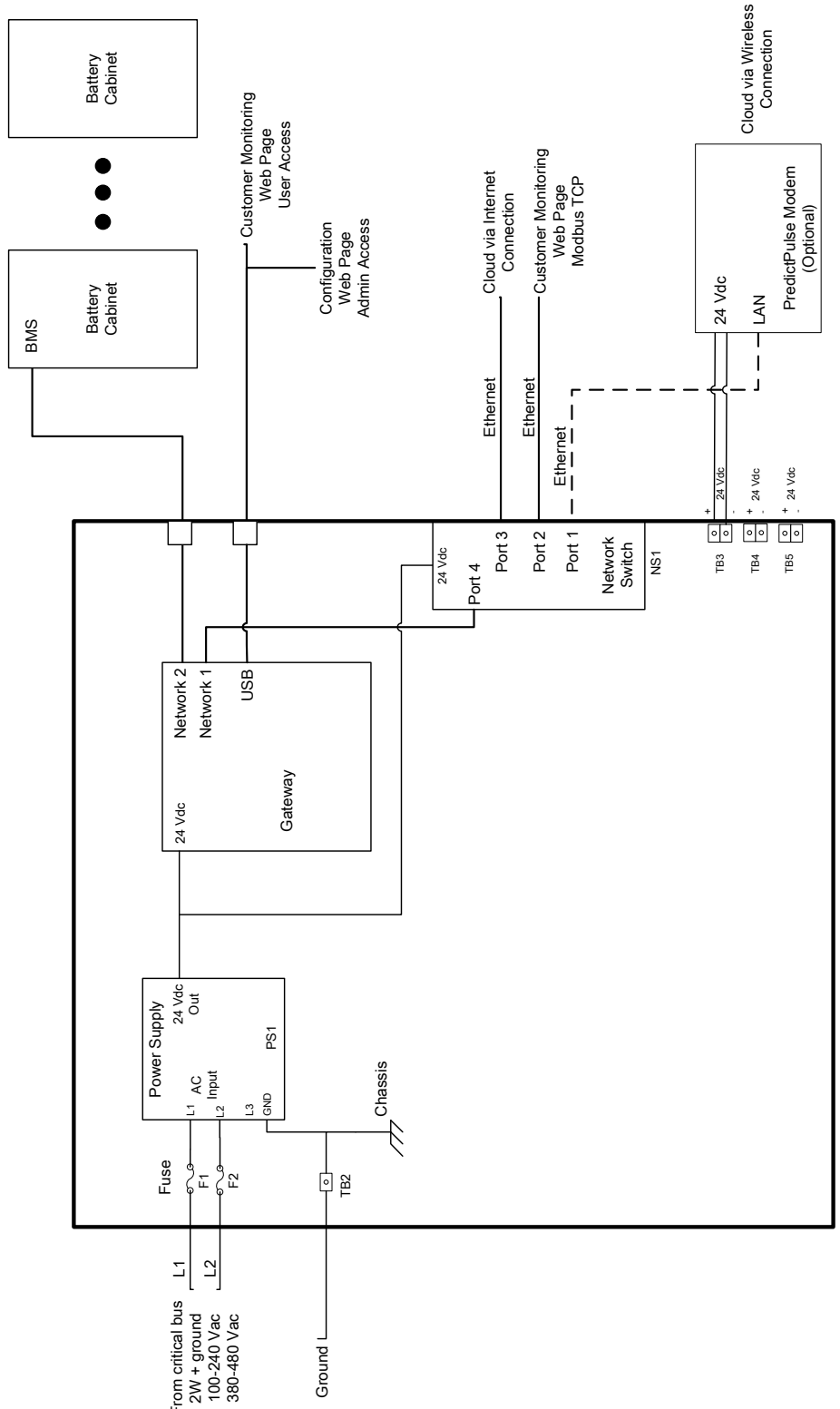
3. Click **Export Zero Based** and click the download button next to the type of Modbus Map on the right.
   - The Modbus Map downloads to the connected computer.

Figure 18. Battery Communicator TCP Window



2.7 Block Diagram

Figure 19. Block Diagram



Chapter 3 Download History and Event Logs – Operator Account Level

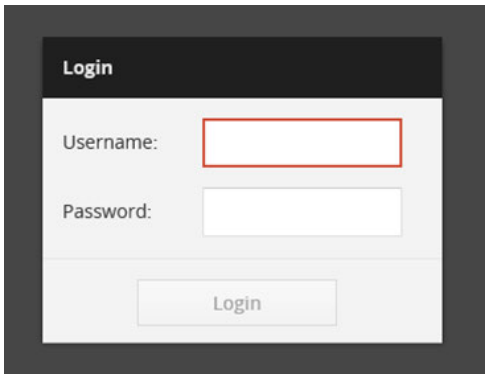
This chapter provides instructions for downloading the history and event logs for a battery system from the Battery Communications Module. The communications module records lithium battery data in internal log files via Modbus. These log files are uploaded monthly to Eaton Cloud Services, if enabled and an external Internet connection is available. Log files can also be downloaded directly from the communications module regardless of cloud functionality status.

3.1 Downloading Battery Communications Module Log Files

1. Connect to the Battery Communicator user interface:
   a. To connect via USB:
      - With the Battery Communications Module powered up and connected to your PC via USB, open the web browser and navigate to http://192.168.200.101.
   b. To connect locally via Ethernet:
      - Connect an Ethernet cable between the computer and one of the three Ethernet ports on the communications module
      - Configure your computer's IP address, Subnet mask, and gateway as needed
      - Open the web browser and navigate to the IP address that was assigned to the Battery Communicator interface during startup
   c. To connect remotely via Ethernet:
      - Connect the computer to the same network as the communications module
      - Open the web browser and navigate to the IP address that was assigned to the Battery Communicator interface during startup
2. Once connected to the Battery Communicator interface via USB or Ethernet, you will be prompted to enter a user ID and password (see Figure 20). Use the credentials that were setup during the Battery Communicator interface startup.

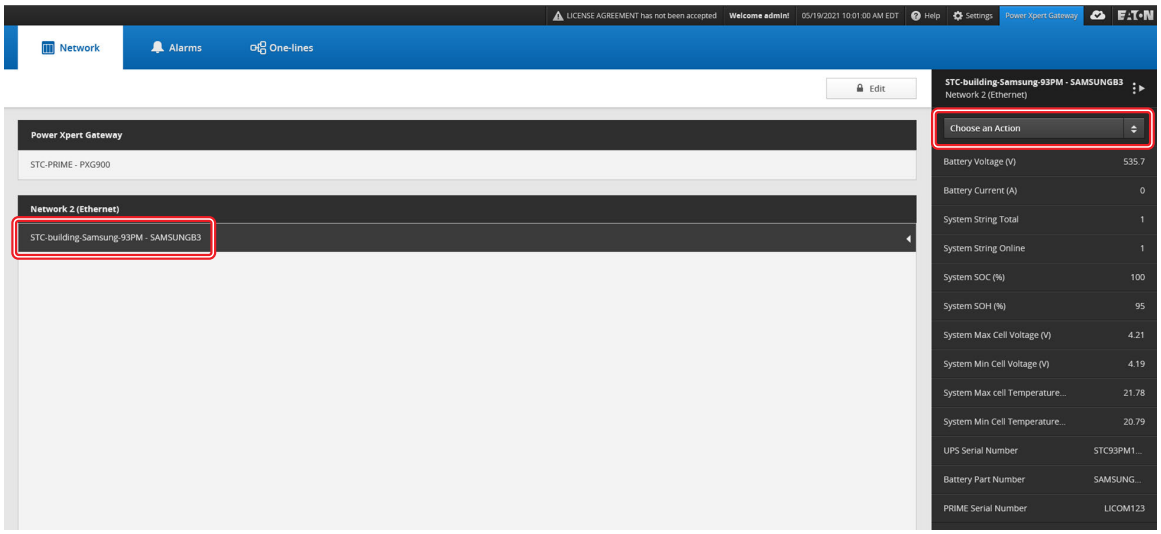
NOTE Operator level account access is required for this procedure.

Figure 20. Login Screen



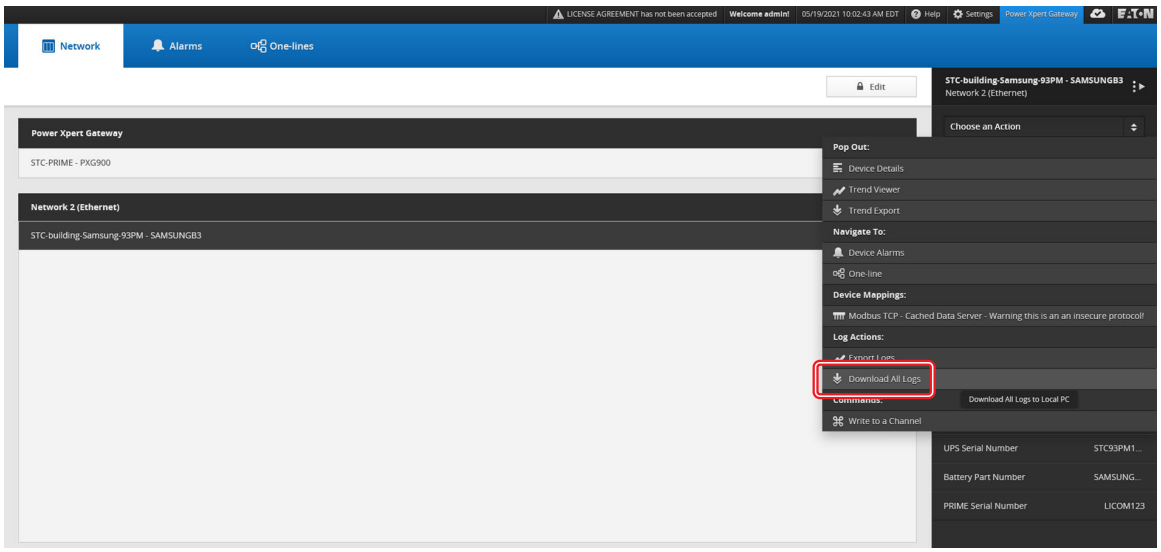
3. The device screen displays. Select the battery listed under *Network 2* (see Figure 21).

Figure 21. Device Screen



4. A menu displays on the right side of the screen. Click **Choose an Action** (see Figure 21).
5. Click **Download All Logs** on the drop-down menu (see Figure 22).

Figure 22. Click Download All Logs



6. Save the *.tar* file.
7. To open the *.tar* file, use a decompression program such as 7-Zip or WinZip. The *.tar* file contains *.csv* (comma-separated values) log files for each month.

3.2 File Format

The log files are csv files and downloaded in a compressed *.tar* file format. The files can be extracted with any *.tar*-compatible program, such as 7–Zip or WinZip.

Data is collected at varying intervals depending on the battery system status:

- Every 15 minutes in float mode
- Every 1 second during battery discharge
- Every 30 seconds during battery recharge

3.2.1 Data Log File Naming Convention

Data log file naming convention on file system

The data log file will follow the naming convention below when the file is stored in file system:

PRIME_DATA_<Name>_<Model>_<UPS serial number>_<Month><Year>.csv

Example: PRIME_DATA_Battery1_SAMSUNGB3_EN087UJJ84_Apr2020.csv

Data log file naming convention while sending by user action

The data log file follows the naming convention below for the csv file from the Battery Communications Module:

PRIME_DATA_<Name>_<Model>_<UPS serial number>_<Month><Year>_partial.csv

Example: PRIME_DATA_Battery1_SAMSUNGB3_EN087UJJ84_Apr2020_partial.csv

3.2.2 Data Log File Internal Details

Header 1 Format

Table 4 shows the format for header 1.

The following is an example csv string for Header 1:

UPS Serial Number:EN087UJJ84,File Format Version:1.0,Top Level Battery Part Number:123456789,IP Address:192.168.155.155,PRIME Firmware version:0.0.1,Time Zone:ABC,String 1 Module 1 Serial Number:11, String 1 Module 2 Serial Number:12, ….

Table 4. Header 1 Format

Header Name	Description
UPS Serial Number	UPS serial number
File Format Version	The data log file format version
Top Level Battery Part Number	Contains battery information, configuration, model, etc. CTO of battery string
IP Address	The configured IP address of the PRIME device
Firmware version of PRIME	The firmware version of the PRIME unit
Time Zone	The configured time zone of the PRIME unit
Battery Module Serial Numbers	The individual battery module serial numbers. Up to 500 serial numbers separated by comma (20 batteries x 25 cabinets)

Header 2 Format

Header-2 contains channel name strings as column header (see Table 5).

The following is an example csv string for Header 2:

Date(dd-mm-yyyy),Time(hh:mm:ss),SAMSUNGB3_RPO:Battery Voltage,SAMSUNGB3_RPO:Battery Current, SAMSUNGB3_RPO:System String Total,SAMSUNGB3_RPO:System String Online,SAMSUNGB3_RPO:Battery Remaining,SAMSUNGB3_RPO:Battery Life Remaining,SAMSUNGB3_RPO:System Max Cell Voltage, SAMSUNGB3_RPO:System Min Cell Voltage,SAMSUNGB3_RPO:System Max cell Temperature, SAMSUNGB3_RPO:System Min Cell Temperature,Samsung-String 01:Voltage,Samsung-String 01:Amps, Samsung-String 01:SOC,Samsung-String 01:SOH,Samsung-String 01:Max Cell Voltage,Samsung-String 01: Average Cell Voltage,Samsung-String 01:Min Cell Voltage,Samsung-String 01:Max Cell Temperature,Samsung-String 01:Average Cell Temperature,Samsung-String 01:Min Cell Temperature,

Table 5. Header 2 Format

Metric Name	Comments
Date	Local date
Time	Local time
System Voltage	Voltage to one decimal place, vvvv.v
System Amps	Current to one decimal place, aaaa.a
System String Total	Integer from 1 to n
System Strings Online	Integer from 1 to n
System SOC	% from 0 to 100, one decimal place ppp.p
System SOH	% from 0 to 100, one decimal place ppp.p
System Max cell Voltage	Voltage to three decimal places, v.vvv
System Min cell Voltage	Voltage to three decimal places, v.vvv
System Max Temperature	Temperature to 1 decimal place, ttt.t
System Min Temperature	Temperature to 1 decimal place, ttt.t
Cabinet y String n Voltage	Voltage to one decimal place, vvvv.v
Cabinet y String n Amps	Current to one decimal place, aaaa.a
Cabinet y String n SOC	% from 0 to 100, one decimal place ppp.p
Cabinet y String n SOH	% from 0 to 100, one decimal place ppp.p
Cabinet y String n max cell Voltage	Voltage to three decimal places, v.vvv
Cabinet y String n avg cell Voltage	Voltage to three decimal places, v.vvv
Cabinet y String n min cell Voltage	Voltage to three decimal places, v.vvv
Cabinet y String n max cell Temperature	Temperature to 1 decimal place, ttt.t
Cabinet y String n avg cell Temperature	Temperature to 1 decimal place, ttt.t
Cabinet y String n min cell Temperature	Temperature to 1 decimal place, ttt.t

Raw Data Format

All rows that follow Header-2 will contain the actual value at the sampled time.

The following is an example of raw data:

28-4-2020,13:49:5,506.70,0.00,1.00,0.00,0.00,97.00,3.98,3.96,23.87,22.48,506.70,0.00,61.70, 97.00,3.98,3.97,3.96,23.84,23.01,22.48,

Chapter 4 Warranty

4.1 Limited Factory Warranty

Eaton Battery Communications Module

WARRANTOR: The warrantor for the limited warranties set forth herein is Eaton Corporation Inc., an Ohio Corporation ("Eaton").

LIMITED WARRANTY: This limited warranty (this "Warranty") applies only to the original end-user (the "End-User") of the Eaton Battery Communications Module (the "Product") and cannot be transferred. This Warranty applies even in the event that the Product is initially sold by Eaton for resale to an End-User. **This warranty is not valid unless a separately purchased Startup service is purchased.**

LIMITED WARRANTY PERIOD: The period covered by this Warranty for Product installed [and currently located] in the fifty (50) United States and the District of Columbia is twelve (12) months from the date of Product startup or eighteen (18) months from the date of Product shipment, whichever occurs first, for parts coverage and 90 days from the date of Product startup for labor coverage. The period covered by this Warranty for Product installed [and currently located] outside of the fifty (50) United States and the District of Columbia is twelve (12) months from the date of Product startup or eighteen (18) months from the date of Product shipment, whichever occurs first, for parts coverage.

WHAT THIS LIMITED WARRANTY COVERS: The warrantor warrants that the Eaton Battery Communications Module electronics and Eaton-provided accessories (individually and collectively, the "Warranted Items") are free from defects in material and workmanship. If, in the opinion of Eaton, a Warranted Item is defective and the defect is within the terms of this Warranty, Eaton's sole obligation will be to repair or replace such defective item (including by providing service, parts, and labor, as applicable), at the option of Eaton. The Warranted Item will be repaired or replaced onsite at the End-User's location or such other location as determined by Eaton. Any parts that are replaced may be new or reconditioned. All parts replaced by Eaton shall become the property of Eaton.

WHAT THIS LIMITED WARRANTY DOES NOT COVER: This Warranty does not cover any defects or damages caused by: (a) failure to properly store the Product before installation; (b) shipping and delivery of the Product if shipping is FOB Factory; (c) neglect, accident, fire, flood, lightning, vandalism, acts of God, Customer's neglect, abuse, misuse, misapplication, incorrect installation; (d) repair or alteration not authorized in writing by Eaton personnel or performed by an authorized Eaton Customer Service Engineer or Agent; or (e) improper testing, operation, maintenance, adjustment, or any modification of any kind not authorized in writing by Eaton personnel or performed by an authorized Eaton Customer Service Engineer or Agent.

This Warranty is not valid: (a) unless an authorized Eaton Customer Service Engineer (in the USA) or Agent (outside of the USA) performs startup and commissioning of the Product; (b) if the Product is moved to a new location by someone other than an authorized Eaton Customer Service Engineer (in the USA) or Agent (outside of the USA); or (c) if the Product's serial numbers have been removed or are illegible. Any Warranted Items repaired or replaced pursuant to this Warranty will be warranted for the remaining portion of the original Warranty subject to all the terms thereof. Labor warranty is not provided for Product located outside of the fifty (50) United States or the District of Columbia. **Any equipment, parts, or materials included in the Product and not manufactured by Eaton are warranted solely by the manufacturer of such equipment, parts, or materials and are not included as part of this Warranty.**

THIS WARRANTY IS THE END-USER'S SOLE RESPONSIBILITY AND IS EXPRESSLY IN LIEU OF, AND THERE ARE NO OTHER EXPRESSED OR IMPLIED GUARANTEES OR WARRANTIES (INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PURPOSE, WHICH ARE EXPRESSLY DISCLAIMED).

LIMITATION OF LIABILITY: In no event shall Eaton be liable for any indirect, incidental, special, or consequential damages of any kind or type whatsoever, or based on any claim or cause of action, however denominated. Eaton shall not be responsible for failure to provide service or parts due to causes beyond Eaton's reasonable control. In no case will Eaton's liability under this Warranty exceed the replacement value of the Warranted Items.

END-USER'S OBLIGATIONS: In order to receive the benefits of this Warranty, the End-User must use the Product in a normal way, follow the Product's user's guide, and protect against further damage to the Product if there is a covered defect.

OTHER LIMITATIONS: Eaton's obligations under this Warranty are expressly conditioned upon receipt by Eaton of all payments due to it (including interest charges, if any). During such time as Eaton has not received payment of any amount due to it for the Product, in accordance with the contract terms under which the Product is sold, Eaton shall have no obligation under this Warranty. Also during such time, the period of this Warranty shall continue to run and the expiration of this Warranty shall not be extended upon payment of any overdue or unpaid amounts.

COSTS NOT RELATED TO WARRANTY: The End-User shall be invoiced for, and shall pay for, all services not expressly provided for by the terms of this Warranty, including without limitation site calls involving an inspection that determines no corrective maintenance is required. Any costs for replacement equipment, installation, materials, freight charges, travel expenses, or labor of Eaton representatives outside the terms of this Warranty will be borne by the End-User.

OBTAINING WARRANTY SERVICE: In the USA, call the Eaton Customer Reliability Center 7x24 at 800-843-9433. Outside of the USA, call your local Eaton sales or service representative, or call the Eaton Customer Reliability Center in the USA at 919-870-3028. For comments or questions about this Limited Factory Warranty, write to the Customer Quality Representative, 3301 Spring Forest Road, Raleigh, North Carolina 27616 USA.

4.2 Eaton End-User License Agreement

IMPORTANT, READ CAREFULLY. THIS END USER LICENSE AGREEMENT (THE "AGREEMENT") IS A BINDING CONTRACT BETWEEN YOU, THE END-USER (THE "LICENSEE") AND EATON INTELLIGENT POWER LIMITED, IRELAND, OR ONE OF ITS AFFILIATES ("EATON" OR "LICENSOR"). BY OPERATING THIS UNINTERRUPTIBLE POWER SUPPLY (UPS) PRODUCT INCLUDING SOFTWARE EMBEDDED IN IT (FIRMWARE), YOU, THE LICENSEE, ARE AGREEING TO BE BOUND BY THE TERMS, CONDITIONS, AND LIMITATIONS OF THIS AGREEMENT. READ THE TERMS AND CONDITIONS OF THIS AGREEMENT CAREFULLY BEFORE, INSTALLING OR OPERATING THE PRODUCT. IF YOU DO NOT AGREE TO THE TERMS OF THIS AGREEMENT, PROMPTLY RETURN THE UNUSED PRODUCT TO EATON.

1.0 DEFINITIONS

1.1 Documentation. "Documentation" means the user guides and manuals for the installation and use of the UPS, whether made available over the internet, provided in CD-ROM, DVD, hard copy or other form.

1.2 Firmware. "Firmware" means software programs that are embedded in the product for which Licensee is granted a license hereunder, the Documentation therefore and, to the extent available, Updates thereto. The Firmware is licensed hereunder in object code (machine readable) form only except that certain software programs may include limited portions in source code (human-readable) form.

1.3 Update. "Update" means a subsequent release of the Firmware, if and when developed by Eaton. An Update does not include any release, new version, option, or future product, which Eaton licenses separately.

2.0 FIRMWARE LICENSE

2**.1 Ownership.** Eaton or its third party licensors retains all title, copyright and other proprietary rights in, and ownership of the Firmware regardless of the media upon which the original or any copy may be recorded or fixed.

2.2 License Grant. Eaton grants to Licensee a limited, revocable, non-exclusive, non-assignable license to use the Firmware in conjunction with the operation of the product to which the Firmware pertains or other products as described by Eaton in the Documentation. Licensee does not acquire any rights, express or implied, other than those expressly granted in this Agreement.

2.3 Restrictions and Requirements. Licensee will not, nor will it permit others to, modify, adapt, translate, reverse engineer, decompile, or disassemble the Firmware or any component thereof (including the Documentation), or create derivative works based on the Firmware (including the Documentation), except to

the extent such foregoing restriction is prohibited by applicable law or applicable open source license to, and only to, any open source software component that is incorporated into the Firmware (if any). Copyright laws and international treaties protect the Firmware, including the Documentation. Unauthorized copying of the Firmware, the Documentation or any part thereof, is expressly prohibited. For avoidance of doubt, Eaton does not grant Licensee a license to any of Eaton's brands, logos, designs, trade dress, service marks, trademarks, domain names or trade names, in whole or in part. Licensee agrees to install or allow installation of all corrections of substantial defects, security patches, minor bug fixes and updates, including any enhancements, for the Firmware in accordance with the instructions and as directed by Eaton.

2.4 Transfer and Assignment Restrictions. Licensee will not sell, resell, assign, lease, sublicense, encumber, or otherwise transfer its interest in this Agreement or in the Firmware, or the Documentation in whole or in part, or allow any other person or entity, including any parent or subsidiary of Licensee or other subsidiary of Licensee's parent, to copy, distribute, or otherwise transfer the Firmware without the prior written consent of Eaton. Licensee may transfer the Firmware directly to a third party only in connection with the sale of the Eaton product in which it is installed.

3.0 TERMINATION

3**.1 Termination.** This Agreement and the license granted hereunder automatically terminates if Licensee breaches any provision of this Agreement. Eaton may terminate this license at any time with or without cause.

3.2 Effect of Termination. Immediately upon termination of this Agreement or the license granted hereunder, Licensee will cease using the product. The parties' rights and obligations under the following sections of this Agreement will survive termination of this Agreement: Article 1.0, Section 2.1, Section 2.3, Section 2.4, Article 3.0, Article 4.0 and Article 5.0.

4.0 INFRINGEMENT AND WARRANTIES

4.1 Infringement. If Licensee learns of a threat, demand, allegation, or indication that the UPS with its firmware infringes or misappropriates any third party intellectual property rights (including but not limited to any patent, copyright, trademark, trade dress, or trade secret) ("Intellectual Property Claim"), Licensee will notify Eaton promptly of such claim. Eaton may, in its sole discretion, elect to assume sole control of the defense and settlement of said Intellectual Property Claim and Licensee will provide reasonable information and assistance to Eaton for the defense of such claim.

4.2 Disclaimer of Warranties. THE FIRMWARE IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, . EATON DOES NOT WARRANT THAT THE FIRMWARE WILL BE ERROR-FREE OR SECURE FROM UNAUTHORIZED ACCESS. THE LICENSEE EXPRESSLY ACKNOWLEDGES THAT TO THE EXTENT PERMITTED BY APPLICABLE LAW, THE USE OF THE PRODUCT IS AT LICENSEE'S SOLE RISK.

5.0 GENERAL PROVISIONS

5.1 Update Policy. Eaton may from time to time, but has no obligation to, create Updates of the Firmware or components thereof.

5.2 Limitation on Liability. NOTWITHSTANDING ANY PROVISION OF THIS AGREEMENT TO THE CONTRARY, LICENSEE EXPRESSLY UNDERSTANDS AND AGREES THAT EATON, ITS AFFILIATES, AND ITS LICENSORS, WILL NOT BE LIABLE FOR: (A) ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, CONSEQUENTIAL OR EXEMPLARY DAMAGES WHICH MAY BE INCURRED BY LICENSEE OR ANY THIRD PARTY, HOWEVER CAUSED AND UNDER ANY THEORY OF LIABILITY. THIS WILL INCLUDE, BUT NOT BE LIMITED TO, ANY LOSS OF PROFIT (WHETHER INCURRED DIRECTLY OR INDIRECTLY), ANY LOSS OF GOODWILL OR BUSINESS REPUTATION, ANY LOSS OF DATA SUFFERED, COST OF PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES, OR OTHER INTANGIBLE LOSS; (B) ANY LOSS OR DAMAGE WHICH MAY BE INCURRED BY LICENSEE OR ANY THIRD PARTY. THESE LIMITATIONS ON EATON'S LIABILITY WILL APPLY WHETHER OR NOT EATON HAS BEEN ADVISED OF OR SHOULD HAVE BEEN AWARE OF THE POSSIBILITY OF ANY SUCH LOSSES ARISING. TO THE EXTENT PERMITTED BY LAW, THE TOTAL LIABILITY OF EATON, ITS AFFILIATES, AND ITS LICENSORS, FOR ANY CLAIMS UNDER THESE TERMS, INCLUDING FOR ANY IMPLIED WARRANTIES, IS LIMITED TO THE AMOUNT PAID FOR THE UPS. THIS SECTION 5.2

STATES EATON'S ENTIRE LIABILITY AND LICENSEE'S SOLE AND EXCLUSIVE REMEDY UNDER THIS AGREEMENT, AND IS SUBJECT TO ALL LIMITATIONS STATED IN SECTION 4.2.

5.3 Notices. All notices required to be sent hereunder will be in writing and will be deemed to have been given when mailed by first class mail to the address shown below:

LICENSE NOTICES:
Eaton Intelligent Power Limited
Eaton House,
30 Pembroke Road,
Dublin 4,
D04 Y0C2,
Ireland

5.4 Severability. If any provision of this Agreement is held to be invalid or unenforceable, the remaining provisions of this Agreement will remain in full force.

5.5 Waiver. The waiver by either party of any default or breach of this Agreement will not constitute a waiver of any other or subsequent default or breach. Failure to enforce or delay in enforcing any provision of this Agreement will not constitute a waiver of any rights under any provisions of this Agreement.

5.6 Entire Agreement. This Agreement constitutes the complete agreement between the parties and supersedes all prior or contemporaneous agreements or representations, written or oral, concerning the subject matter of this Agreement. This Agreement may not be modified or amended except in a writing specifically referencing this Agreement and signed by a duly authorized representative of each party. No other act, document, usage or custom will be deemed to amend or modify this Agreement. The Firmware, or portions thereof, may also be subject to additional paper or electronic license agreements. In such cases, the terms of this Agreement will be supplemental to those in the additional agreements, to the extent not inconsistent with the additional agreements. If a copy of this Agreement in a language other than English is included with the Firmware or Documentation, it is included for convenience and the English language version of this Agreement will control.

5.7 Heirs, Successors, and Assigns. Each and all of the covenants, terms, provisions and agreements herein contained will be binding upon and inure to the benefit of the parties hereto and, to the extent expressly permitted by this Agreement, their respective heirs, legal representatives, successors and assigns.

5.8 Export Restrictions. Licensee agrees to comply fully with all relevant export laws and regulations of the United States and all other countries in the world (the "Export Laws") to assure that neither the Firmware nor any direct product thereof are (I) exported, directly or indirectly, in violation of Export Laws; or (ii) are intended to be used for any purposes prohibited by the Export Laws. Without limiting the foregoing, Licensee will not export or re-export the Firmware: (i) to any country to which the U.S. has embargoed or restricted the export of goods or services (see http://www.treasury.gov/resource-center/sanctions/Programs/Pages/Programs.aspx), or to any national of any such country, wherever located, who intends to transmit or transport the Firmware back to such country; (ii) to any end user who Licensee knows or has reason to know will utilize the Firmware in the design, development or production of nuclear, chemical or biological weapons; or (iii) to any end-user who has been prohibited from participating in U.S. export transactions by any federal agency of the U.S. government.

5.9 U.S. Government Restricted Rights. The Firmware is a "commercial item" as that term is defined at 48 C.F.R. § 2.101, consisting of "commercial computer software" and "commercial computer software documentation", as such terms are used in 48 C.F.R. § 12.212, and is provided to the U.S. Government only as a commercial end item. Consistent with 48 C.F.R. § 12.212 and 48 C.F.R. §§ 227.7202-1 through 227.7202-4, all U.S. Government End Users acquire the Firmware with only those rights set forth herein. Contractor/ manufacturer is Eaton Corporation, 1000 Eaton Boulevard, Cleveland, Ohio 44122.

5.10 Third Party Intellectual Property Rights. The Firmware may contain components (including open source software components) that are owned by third parties ("Third Party Licensors") and are provided with, incorporated into, or embedded in, the Firmware pursuant to license arrangements between Eaton and such third parties. Third Party Licensor components in the Firmware are not licensed or warranted under the terms of this document, but are instead subject to the Third Party Licensors' license agreements. Licensee will not

modify, delete, or obfuscate any copyright or other proprietary rights notices of Third Party Licensors contained in the Firmware.

5.11 Indemnity. Licensee shall defend, indemnify and hold Eaton and its officers, directors, employees, and agents harmless from and against all losses, damages, liabilities, claims, actions, and associated costs and expenses (including reasonable attorneys' fees and expenses) by reason of injury or death to any person or damage to any tangible or intangible property arising or resulting from the negligence or willful misconduct of the Licensee, its employees, contractors, or agents, in connection with Licensee's use of Firmware and Documentation. Licensee shall be responsible for any breach of this Agreement by its officers, directors, employees, contractors, or agents. Licensee shall defend, indemnify, and hold Eaton and its officers, directors, employees, and agents harmless from and against any and all losses, damages, liabilities, claims, actions, and associated costs and expenses (including reasonable attorneys' fees and expenses) arising out of or in connection with any breach of this Agreement.

5.12 Open Source Software. The Firmware may contain certain components owned by Eaton that are provided with, incorporated into, linked to, or embedded in the Firmware that are subject to third party open source licenses ("Eaton Open Source Components"). Eaton OpenSource Components are subject to the open source licenses corresponding to the particular software component. To the extent there are any conflicts between the terms of this Agreement and any open source license corresponding to Eaton Open Source Components or additional obligations by such open sources license that are not set forth in this Agreement, the terms of the open source license will control.

5.13 Confidentiality. Licensee acknowledges that confidential aspects of the Firmware (including any proprietary source code) are a trade secret of Eaton, the disclosure of which would cause substantial harm to Eaton that could not be remedied by the payment of damages alone and such confidential aspects of the Firmware shall not be disclosed to third parties without the prior written consent of Eaton. Accordingly, Eaton will be entitled to preliminary and permanent injunctive and other equitable relief for any breach of this Section 5.13.

5.14 Note on JAVA Support. The Firmware may contain support for programs written in JAVA. JAVA technology is not fault tolerant and is not designed, manufactured, or intended for use or resale as online control equipment in hazardous environments requiring fail-safe performance, such as in the operation of nuclear facilities, aircraft navigation or communications systems, air traffic control, direct life support machines, or weapons systems, in which the failure of JAVA technology could lead directly to death, personal injury, or severe physical or environmental damage. EATON DISCLAIMS ALL DAMAGES INCLUDING DIRECT, INDIRECT AND CONSEQUENTIAL DAMAGES RELATING TO THE FAILURE OF ANY SOFTWARE INCLUDING JAVA PROGRAMS AND/OR JAVA TECHNOLOGY.

5.15 Governing Law. This Agreement will be interpreted and enforced in accordance with the laws of Ireland, without regard to choice of law principles. Any claim or suit with respect to this Agreement shall be brought in the Courts of Ireland, unless mandatory law imposes otherwise.

4.3 Eaton Cybersecurity Recommendations

The Eaton Battery Communications Module has been designed with cybersecurity as an important consideration. A number of features are offered in the product to address cybersecurity risks. These Cybersecurity Recommendations provide information to help users to deploy and maintain the product in a manner that minimizes the cybersecurity risks. These Cybersecurity Recommendations are not intended to provide a comprehensive guide to cybersecurity, but rather to complement customers' existing cybersecurity programs.

Eaton is committed to minimizing the cybersecurity risk in its products and deploying cybersecurity best practices in its products and solutions, making them more secure, reliable and competitive for customers.

Table 6. Cybersecurity Recommendations

Category	Description
Asset Management	Keeping track of software and hardware assets in your environment is a pre-requisite for effectively managing cybersecurity. Eaton recommends that you maintain an asset inventory that uniquely identifies each important component. To facilitate this, the Battery Communications Module supports the following identifying information: Hardware - manufacturer, type, serial number, f/w version number, and location. Software - publisher, name, version, and version date. The HMI to serve up a webpage that identifies the software loaded on the device. This is the software developed by Eaton and also maintained in a version control system
Risk Assessment	Eaton recommends conducting a risk assessment to identify and assess reasonably foreseeable internal and external risks to the confidentiality, availability and integrity of the system | device and its environment. This exercise should be conducted in accordance with applicable technical and regulatory frameworks such as IEC 62443 and NERC-CIP. The risk assessment should be repeated periodically.
Physical Security	An attacker with unauthorized physical access can cause serious disruption to system/device functionality. Additionally, Industrial Control Protocols don't offer cryptographic protections, making ICS and SCADA communications especially vulnerable to threats to their confidentiality. Physical security is an important layer of defense in such cases. The Battery Communications Module is designed to be deployed and operated in a physically secure location. Following are some best practices that Eaton recommends to physically secure your system/device: • Secure the facility and equipment rooms or closets with access control mechanisms such as locks, entry card readers, guards, man traps, CCTV, etc. as appropriate. • Restrict physical access to cabinets and/or enclosures containing the Battery Communications Module and the associated system. Monitor and log the access at all times. • Physical access to the telecommunication lines and network cabling should be restricted to protect against attempts to intercept or sabotage communications. It's a best practice to use metal conduits for the network cabling running between equipment cabinets. • RJ-45 and USB Type B connectors. RJ-45 connector is used for Modbus communication and always enabled. USB Type B connector is used for configuring the Battery Communications Module.

Table 6. Cybersecurity Recommendations (Continued)

Category	Description
	• Do not connect removable media (e.g., USB devices, SD cards, etc.) for any operation (e.g., firmware upgrade, configuration change, or boot application change) unless the origin of the media is known and trusted. • Before connecting any portable device through a USB port or SD card slot, scan the device for malware and viruses. Delete
Account Management	Logical access to the system | device should be restricted to legitimate users, who should be assigned only the privileges necessary to complete their job roles/ functions. Some of the following best practices may need to be implemented by incorporating them into the organization's written policies: • Ensure default credentials are changed upon first login. The Battery Communications Module should not be deployed in production environments with default credentials, as default credentials are publicly known. • No account sharing - Each user should be provisioned a unique account instead of sharing accounts and passwords. Security monitoring/logging features in the product are designed based on each user having a unique account. Allowing users to share credentials weakens security. • Restrict administrative privileges - Attackers seek to gain control of legitimate credentials, especially those for highly privileged accounts. Administrative privileges should be assigned only to accounts specifically designated for administrative duties and not for regular use. • Leverage the roles / access privileges to provide tiered access to the users as per the business /operational need. Follow the principle of least privilege (allocate the minimum authority level and access to system resources required for the role). • Perform periodic account maintenance (remove unused accounts). • Ensure password length, complexity and expiration requirements are appropriately set, particularly for all administrative accounts (e.g., minimum 10 characters, mix of upper- and lower-case and special characters, and expire every 90 days, or otherwise in accordance with your organization's policies). • Enforce session time-out after a period of inactivity.
Time Synchronization	Many operations in power grids and IT networks heavily depend on precise timing information. • Ensure the system clock is synchronized with an authoritative time source (using manual configuration, NTP, SNTP, or IEEE 1588).
Network Security	The Battery Communications Module supports network communication with other devices in the environment. This capability can present risks if it's not configured securely. Following are Eaton recommended best practices to help secure the network. Additional information about various network protection strategies is available in Eaton Cybersecurity Considerations for Electrical Distribution Systems [R1]. Eaton recommends segmentation of networks into logical enclaves, denying traffic between segments except that which is specifically allowed, and restricting communication to host-to-host paths (for example, using router ACLs and firewall rules). This helps to protect sensitive information and critical services and creates additional barriers in the event of a network perimeter breach. At a minimum, a

Table 6. Cybersecurity Recommendations (Continued)

Category	Description
	utility Industrial Control Systems network should be segmented into a three-tiered architecture (as recommended by NIST SP 800-82[R3]) for better security control. Communication Protection: -The Battery Communications Module provides the option to encrypt its network communications. Please ensure that encryption options are enabled. You can secure the product's communication capabilities by taking the following steps: **Eaton recommends using your own certificate.** Eaton recommends opening only those ports that are required for operations and protect the network communication using network protection systems like firewalls and intrusion detection systems / intrusion prevention systems. Use the information below to configure your firewall rules to allow access needed for the Battery Communications Module to operate smoothly. **Eaton recommends using "whitelisting" when allowing access to the Battery Communications Module.**
Remote Access	Remote access to devices/systems creates another entry point into the network. Strict management and validation of termination of such access is vital for maintaining control over overall ICS security.
Logging and Event Management	• Eaton recommends logging all relevant system and application events, including all administrative and maintenance activities. • Logs should be protected from tampering and other risks to their integrity (for example, by restricting permissions to access and modify logs, transmitting logs to a security information and event management system, etc.). • Ensure that logs are retained for a reasonable and appropriate length of time. • Review the logs regularly. The frequency of review should be reasonable, taking into account the sensitivity and criticality of the system | device and any data it processes.
Secure Maintenance	**Best Practices** Update device firmware prior to putting the device into production. Thereafter, apply firmware updates and software patches regularly. Eaton publishes patches and updates for its products to protect them against vulnerabilities that are discovered. Eaton encourages customers to maintain a consistent process to promptly monitor for and install new firmware updates. Please check Eaton's cybersecurity website for information bulletins about available firmware and software updates. **See Vulnerabilty Management below.**
Business Continuity / Cybersecurity Disaster Recovery	Software can be re-installed from released software packages in the event of corrupted software.
Sensitive Information Disclosure	Eaton recommends that sensitive information (i.e. connectivity, log data, personal information) that may be stored by the Battery Communications Module be adequately protected through the deployment of organizational security practices. Device does not store sensitive information.

Table 6. Cybersecurity Recommendations (Continued)

Category	Description
Decommissioning or Zeroisation	It is a best practice to purge data before disposing of any device containing data. Guidelines for decommissioning are provided in NIST SP 800-88. Eaton recommends that products containing embedded flash memory be securely destroyed to ensure data is unrecoverable. • Embedded Flash Memory on Boards and Devices Eaton recommends the following methods for disposing of motherboards, peripheral cards such as network adapters, or any other adapter containing non-volatile flash memory. – Destroy: Shred, disintegrate, pulverize, or Incinerate by burning the device in a licensed incinerator
Vulnerability Management	In general, Eaton recommends monitoring vendor sites, the ICS CERT, and NIST National Vulnerability Database (NVD) for known vulnerabilities in products and mitigating or remediating the vulnerabilities as recommended though patches, updates, or compensating controls. Eaton publishes cybersecurity notifications and known vulnerabilities for its products on www.eaton.com/ cybersecurity. Users are also able to report cybersecurity issues and receive automated cybersecurity notifications on this site. Eaton recommends registering for these notifications. The product is composed of components that can be configured to meet a range of connectivity, functionality, and security needs. For cybersecurity notifications, general software updates, and vulnerability management policies the user should reference then individual vendor sites. **Eaton:** www.eaton.com/cybersecurity www.eaton.com/us/en-us/company/news-insights/cybersecurity/security-notifications.html www.cybectec.com/customers/ Users are encouraged to keep a track of the security patches released by the COTS vendors and apply them to their environment as appropriate. Note: Many compliance frameworks and security best practices require a monthly vulnerability review. For many non-COTS products vulnerabilities will be communicated directly through the vendor site.

References:

[R1] Cybersecurity Considerations for Electrical Distribution Systems (WP152002EN):
http://www.eaton.com/ecm/groups/public/@pub/@eaton/@corp/documents/content/pct_1603172.pdf

[R2] Cybersecurity Best Practices Checklist Reminder (WP910003EN):
http://www.cooperindustries.com/content/dam/public/powersystems/resources/library/1100_EAS/WP910003EN.pdf

[R3] NIST SP 800-82 Rev 2, Guide to Industrial Control Systems (ICS) Security, May 2015:
https://ics-cert.us-cert.gov/Standards-and-References

[R4] National Institute of Technology (NIST) Interagency "Guidelines on Firewalls and Firewall Policy, NIST Special Publication 800-41", October 2009:
http://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-41r1.pdf

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