H569-445 Intelligent Distribution Bay (IDB)

Secondary -48V_{DC} Power Distribution System

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This equipment must be installed in restricted access areas by qualified technicians only. Images contained in this manual are for illustrative purposes only. These images may not match your installation. Operator is cautioned to review the drawings and illustrations contained in this manual before proceeding. If there are questions regarding the safe operation of this powering system, please contact OmniOn Power Inc. OmniOn Power™ shall not be held liable for any damage or injury involving this product if used or operated in any manner or subject to any condition inconsistent with its intended purpose, or if installed or operated in an unapproved manner, or improperly maintained.

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Website:

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Document Number: 8600474740P

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Product Description

Overview

This manual describes the installation and operation of the H569-445 Intelligent Distribution Bay (IDB) that serves as a secondary circuit breaker distribution center for -48V dc power delivered from a primary battery plant. Each bay may be configured for 2, 4, 6 or 8 buses with up to 176 circuit breaker positions. Input feeder cable and secondary load terminations are distributed from either the top or bottom of the cabinet. There are two cabinet sizes, 20-position, or 22-position distribution panels, internal or external DC return bus bars and an intelligent control panel that allows every load in the bay to be continuously monitored.

The IDB uses Intelligent Protection Device (IPD) breakers to monitor current for individual loads and an array of other critical performance data. The IPD automatically provides the following comprehensive information to the controller without cumbersome and time-consuming programming.

- Load Current
- Power Usage
- Breaker Present
- Breaker Ampacity
- Slot Position
- Breaker Size (# slots)
- Breaker Temperature
- Life expectancy
- Number of Operations
- Number of Overloads
- On/Off/Trip Status
- Programmable Status LEDs
- Manufacturing Date
- Operation Time

The IDB also accepts standard bullet breakers or bullet fuse holders that simply report an alarm when tripped. This flexibility allows customers options depending on their monitoring needs.

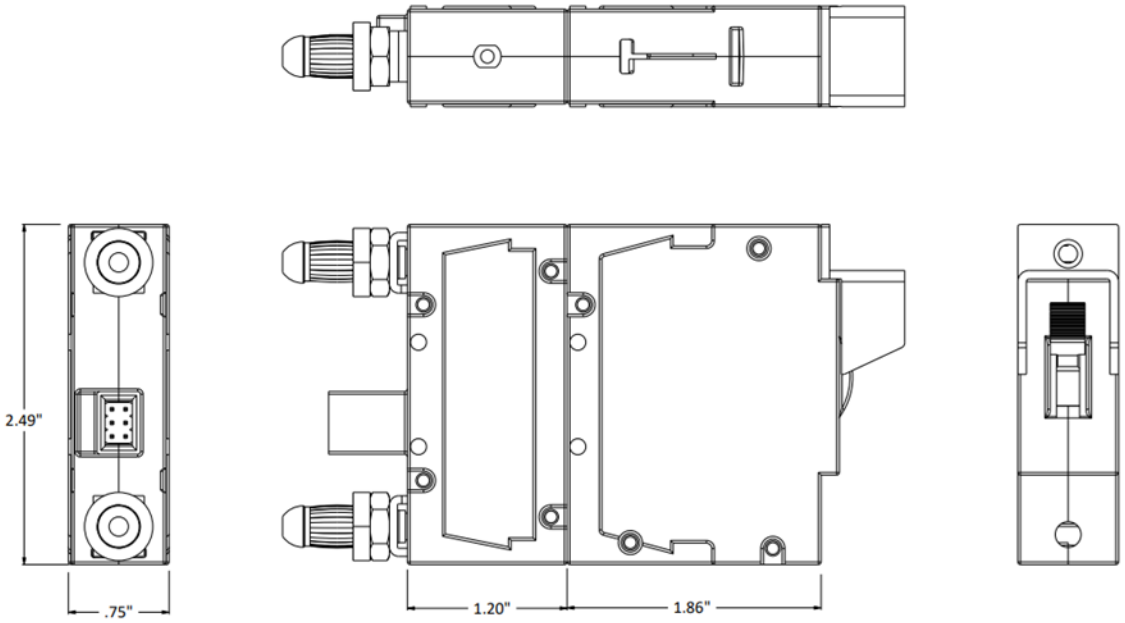


Figure 1 IPD Breaker

Cabinet

There are two IDB cabinet sizes. Cabinets are designed with 43U of vertical mounting space for 19-inch wide distribution panels. Cabinets are available in black or white colors. There are two distribution types. Each cabinet is equipped with either four 2x20 or 2X22 bullet-style position distribution panels and an intelligent control panel.

Options

- G401: 7ft x 30” x 24” Black Cabinet
- G402: 7ft x 30” x 24” White Cabinet
- G403: 7ft x 26” x 28” Black Cabinet
- G404: 7ft x 26” x 28” White Cabinet

Figure 2 Cabinet Options

Distribution Panels

Distribution panels accept either IPD circuit breakers or standard circuit breakers and fuse holders. Fuse holders accept TPS fuses up to 70amps and TLS fuses up to 125 amps. Circuit breakers are available in sizes up to 300 amps. Any fuse or circuit breaker may be installed in any position with no spacing requirements. An Intelligent Panel Control Card (IPCC Module) is installed on each panel to provide panel alarm LEDs, process data from the breakers and communicate with the controller. Each panel is rated for 800A.

Options

- G38: 2 x 20 Position Bullet Distribution Panel (Black, 17.5” High)
- G39: 2 x 20 Position Bullet Distribution Panel (White, 17.5” High)
- G42: 2 x 22 Position Bullet Distribution Panel (Black, 18.7” High)
- G43: 2 x 22 Position Bullet Distribution Panel (White, 18.7” High)

Figure 3 Distribution Panel Options

Intelligent Control Panel

Intelligent Control Panel is 3U tall. The IM1043E controller mounts to a door to allow access to both the front panel display and the I/O connections and wiring area located behind the door. The IM1043E receives redundant power from bus bars mounted on the back of the panel. When installed in a cabinet, the bus bars are linked to the A and B bus panels.

Features include fuse/breaker alarms, individual load currents, breaker sizes, status and locations, power loss alarms, individually configurable overload thresholds, individually configurable power loss, audible, and remote form-C input and output alarms.

Connecting to the control panel via an Ethernet port, and using standard secure login protocol, provides complete access to all assignments, configurations, alarms, inputs, and outputs. Remote connectivity through a high-speed dual port network connection allows the IDB to be connected to other network systems.

If a load bus is equipped with a panel shunt (1500A, 50mV), The controller monitors these shunts to determine actual currents and the remaining capacity of each load bus. This option may be helpful if a mixture of intelligent and standard breakers is used on the same panel.

Options:

- G288 : Black Controller
- G289 : White Controller

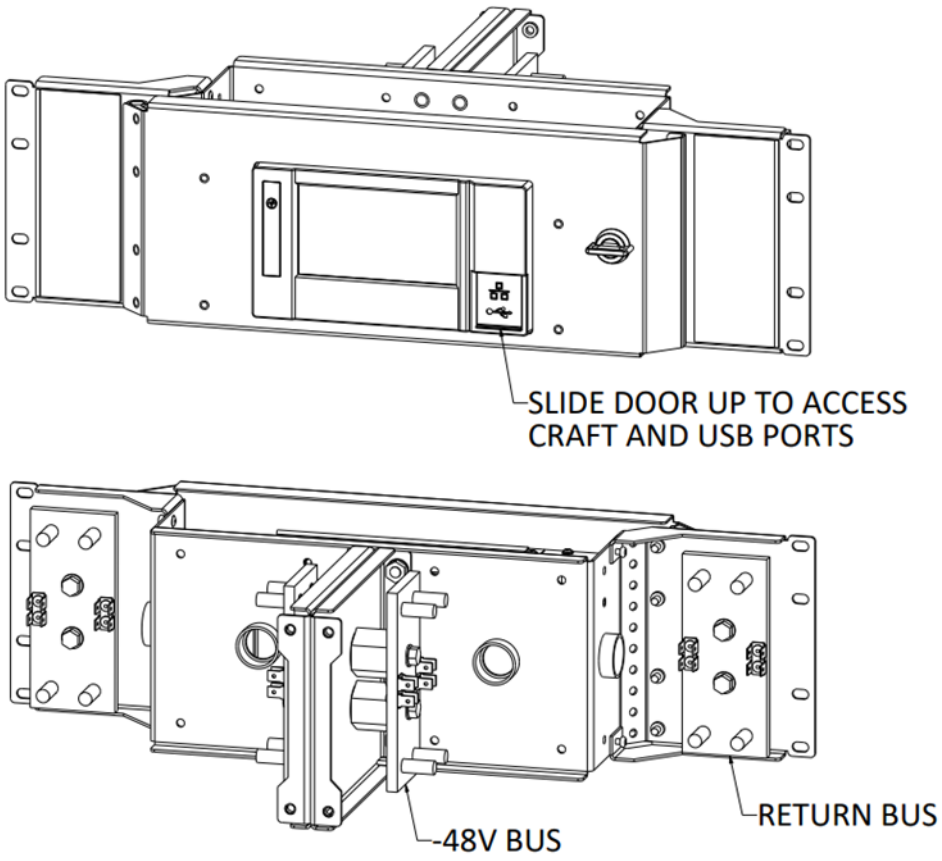


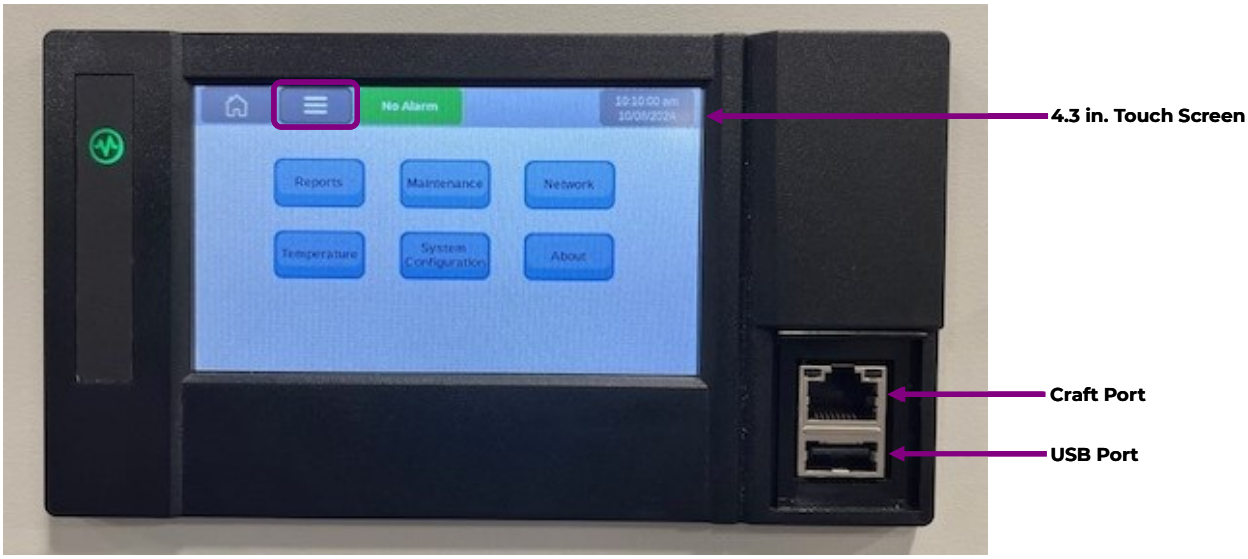
Figure 4 Intelligent Control Panel

Front Panel – Home

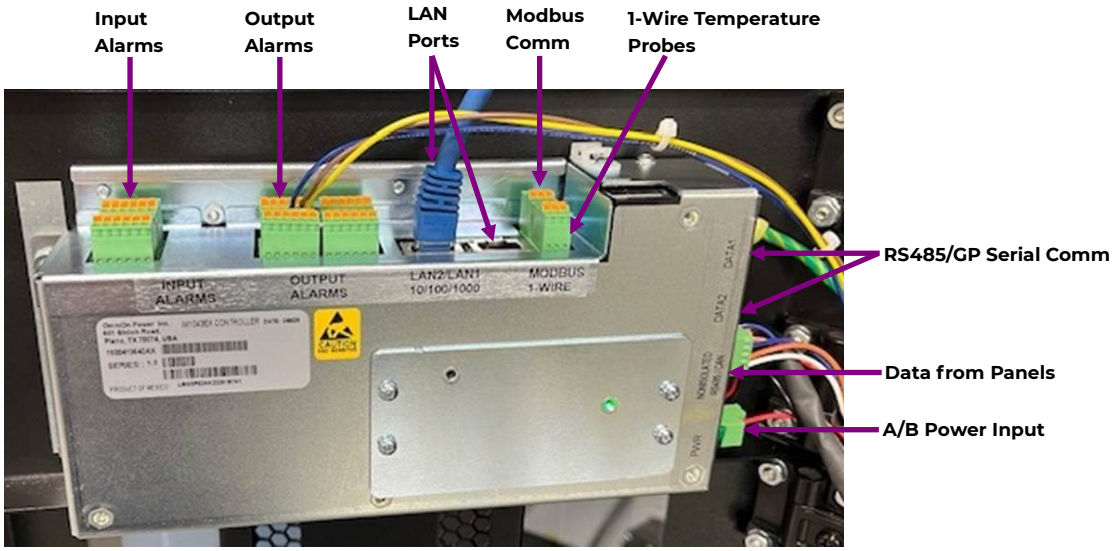
This is the main menu screen. Use the “Home” button to navigate back to this screen from anywhere within the controller menus.

Front Panel – Menu

The “Menu” button displays additional navigation available with the front panel display.



Rear Connections



Input Power:

- The controller receives redundant power from Bus A and Bus B.

Terminal Blocks:

- The maximum wire size to the terminal blocks is 12 AWG.

Communications:

- (2) LAN 10/100/1000 Base-T Ethernet ports (rear): These two LAN ports can be configured with a static IP address like the craft port or DHCP to allow remote access over the network.
- (2) Data Ports: These two ports allow RS485 Galaxy Protocol (GP) daisy-chain communication between additional IDB's and the primary controller.
- (1) 10/100 Base-T Ethernet port (front, local management only): Craft port providing its own private local network at 192.168.1.1. for an installer to view the IDB web pages.
- USB 2.0 (front): Supports connection of a USB mouse/keyboard or USB memory stick. The memory stick used for firmware upgrade or data downloads. Mouse or keyboard could be used in place of the touchscreen.
- Modbus RS485: Provides a connection to Modbus-enabled auxiliary equipment.

Digital Input/Outputs:

- **4 Binary Alarm Input Terminal Blocks:** (4 "dry" no voltage, 4 opto-isolated 24V sourced) user assignable in software.
- **7 Form-C Alarm Output Terminal Blocks (60 Vdc @ 0.5 A; Default as "Open on Alarm"):** User assignable in software.
- **1-Wire Bus Port:** Allows connection of up to 16 external cabinet temperature probes.

Load Bus Arrangements

A load bus is defined as one or more panels protected by a single circuit breaker or fuse at the battery plant. Cable from the battery plant is terminated at Load Connect Busses or Load Shunt Busses rated for 800 amperes. 3/8-inch hardware is provided for this connection. The size of the protecting circuit breaker or fuse protector ultimately determines the ampacity of the bus and overload settings. These must be programmed into the controller. The cabinet may be equipped for 2, 4, 6 or 8 loads. In 2, 4 or 6 load configurations, a bus bar link connects some panels together vertically. When internal return buses are ordered, load return bus details will be located either at the top or the bottom of the cabinet as shown depending on if a top cable feed or bottom cable feed was ordered. These may easily be unbolted and moved as required by the application. 3/8-inch hardware is provided for load return cables.

Load Connect Bus Details are used when the panel will be exclusively equipped with intelligent breakers while Load Shunt Bus Details are typically ordered for a panel with standard breakers or a mixture of standard and intelligent breakers.

Note: All bus bars are copper with a bright tin finish. Bus bars do not require buffing or the application of NO-OX before connection to terminal lugs or other bus bars.

Note: If changes are made to the input load buses, the controller must be reconfigured to the new arrangements so that the pictorial representations agree with actual layout.

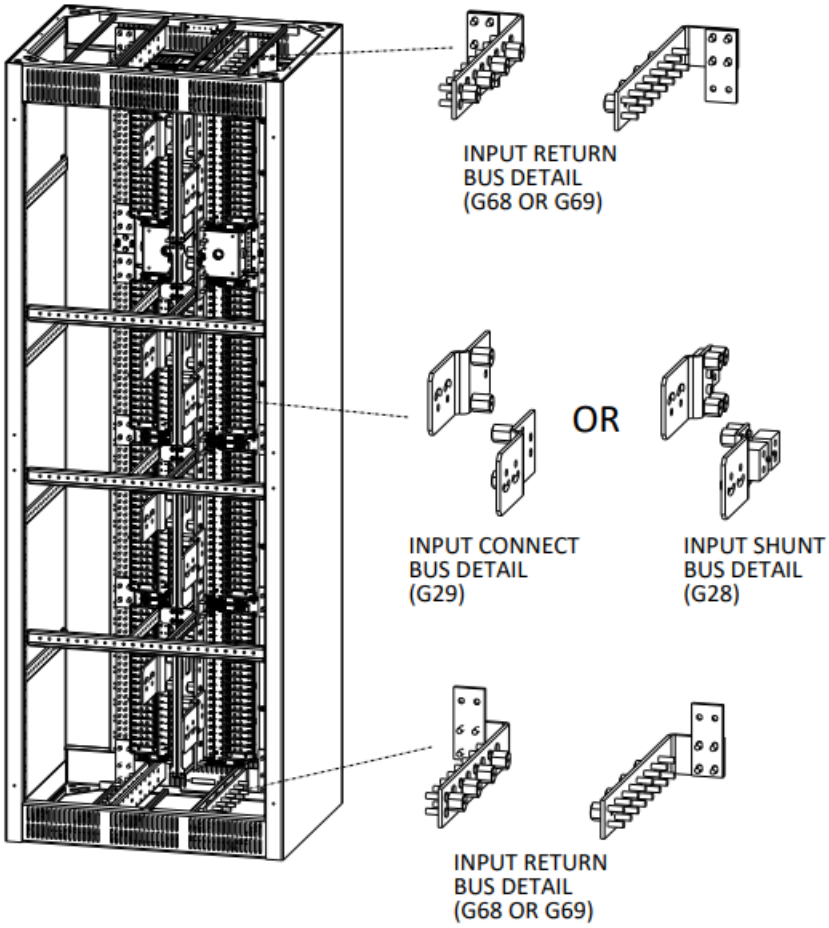


Figure 5 Input Load Bus Connection Points

Discharge Return Bus Options

Discharge return bus options for terminating fuse or circuit breaker return leads may either be internally mounted in the cabinet or externally mounted outside the distribution bay on a cable rack.

- G68: Optional internal input return bus pair for top or bottom of G401, G402 cabinet.
- G68A: Optional internal 2-hole ground bars for G38 and G39 20-position panels.
- G69: Optional internal input return bus pair for top or bottom of G403, G404 cabinet.
- G69A: Optional internal 2-hole ground bars for G42 and G43 22-position panels.
- 150021156 Optional external initial ground bar mounted to overhead framing or cable rack.
- 150021157 Optional external supplemental ground bars mounted to 150021156 ground bar.

Internal

The internal discharge return bus bar option terminates return cables from the cabinet at the top (and/or bottom) of the cabinet. There is a left-side bus that interconnects to return bars mounted on the left mounted circuit breaker panels and a right-side bus for the right mounted panels. The input bus is designed for landing eight 3/8-inch double-hole terminal lugs on 1-inch centers with a tongue width up to 1.7 inches wide. Each panel mounted discharge return bus is designed for terminating up to 2 AWG cable with 1/4-inch double-hole terminal lugs on 5/8-inch centers.

Advantage:

The advantage of internal returns is that load leads are paired at the fuse or circuit breaker and eliminates the need for identification tags on each return lead.

Drawbacks:

Cable congestion resulting from twice the number of leads in the distribution bay. Both the top and bottom input return connections are required to reach IDB full output capacity.

Return Bus Capacity Limit Per Side:

ONLY Top **OR** Bottom Connections: 1600A
BOTH Top **AND** Bottom Connections: 3200A

For these reasons, the internal discharge return option is recommended only for applications with smaller ultimate capacities. For most applications, the external return bus option is recommended.

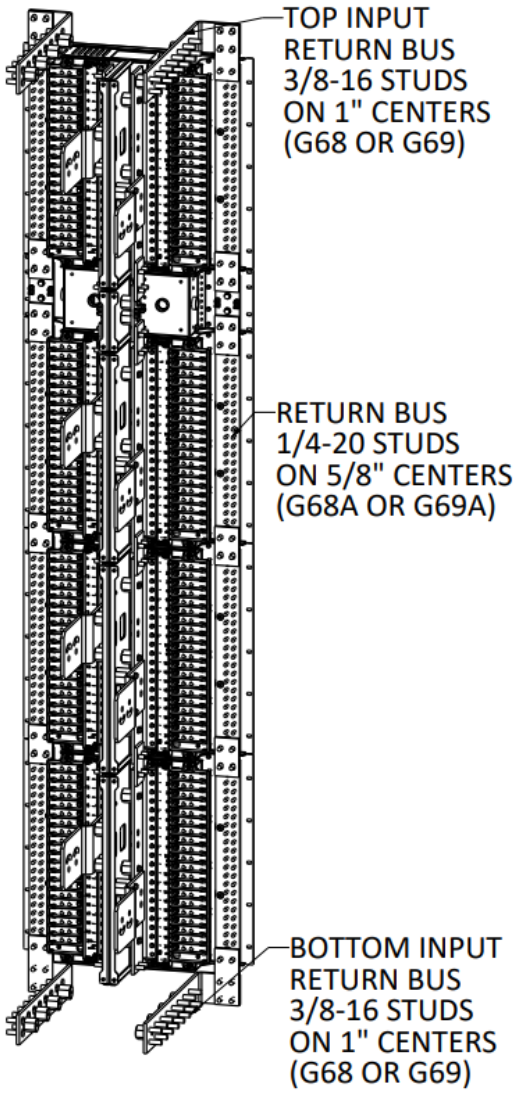


Figure 6 Internal Return Connections

External

The external discharge return bus bar options are shown in Figure 7 and 8. The external bus is mounted on a standard 15- or 20-inch ladder type cable rack. ED83019-50 Group 13 (150021156) and Group 13A (150021157) are rated for 2400 amperes of current. Option 150021156 provides the first bus bar and the cable rack mounting hardware. Option 150021157 provides a bus bar, the connecting bus bar, and insulating standoffs for stacking additional tiers as required. Refer to ED83019-50 drawing for other ground bar options.

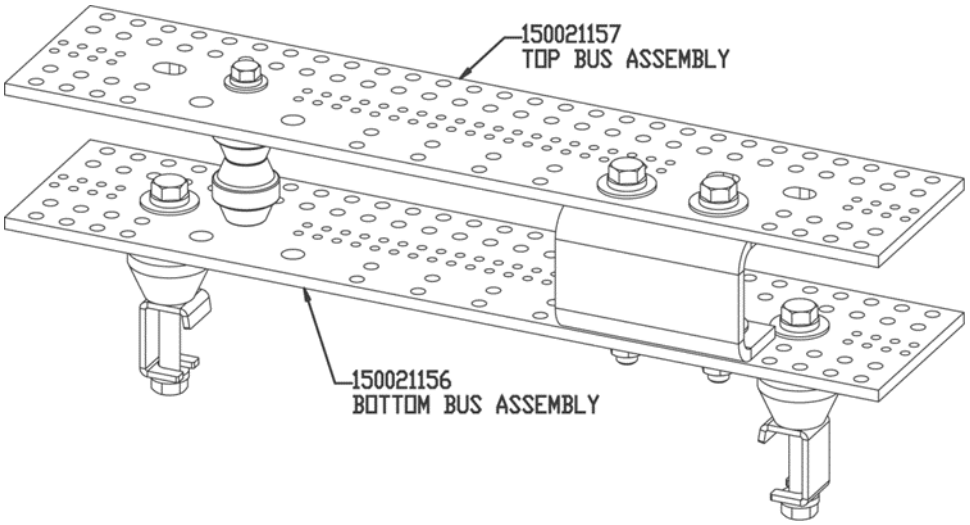


Figure 7 External Discharge Return Bus Options on Cable Rack

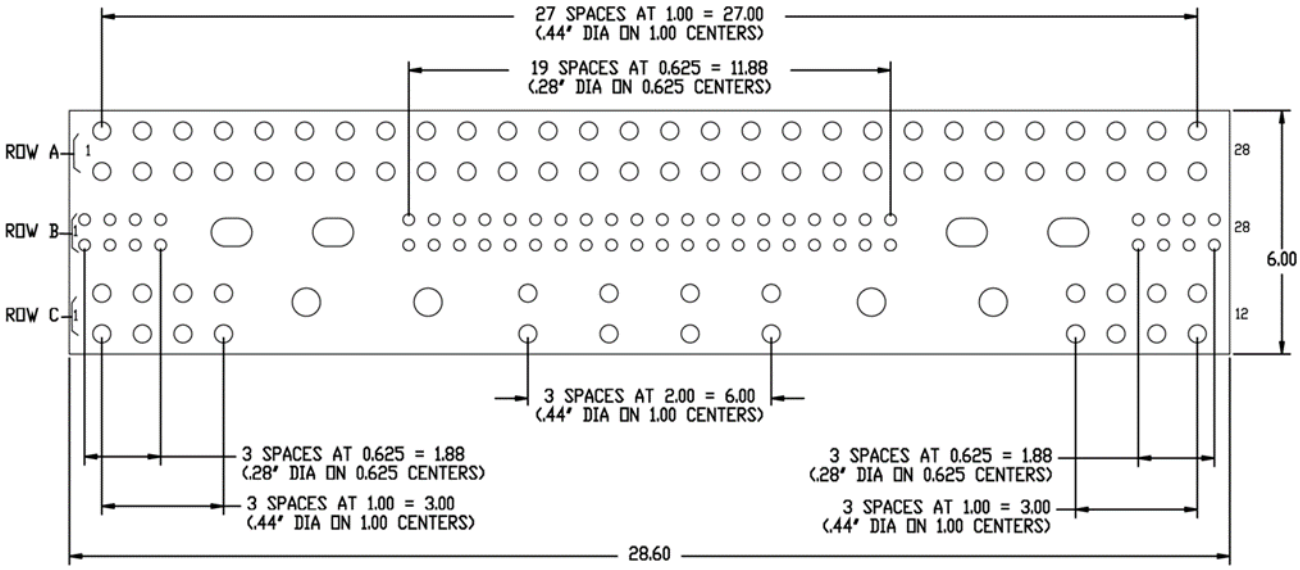


Figure 8 Bus Bar Hole Pattern and Numbering Schemes

Panel Positions and Labeling

The cabinet is configured for either top or bottom cable entry. The following figures show the default labeling orientation used for top and bottom fed IDB's. Panel designations (1, 2, 3, 4 etc.) and Load Bus designations (A, B, C, D, etc.) are stamped on the labels and the controller is programmed to reflect these designations.

If different Load Bus or Panel designations are desired, Panel and Load designations on panel labels must be changed to reflect these changes and IPCC switch settings changed to new panel numbers. The controller can reconfigure the designations using the web pages and a laptop.

Menu ►Settings ►Bay Configuration Choose where to locate Panel 1 as upper-left, upper-right, lower-left, or lower-right, change the panel names and change the name of the load buses as required. This is discussed in **Controller Operation-Bay Configuration** section of this manual.

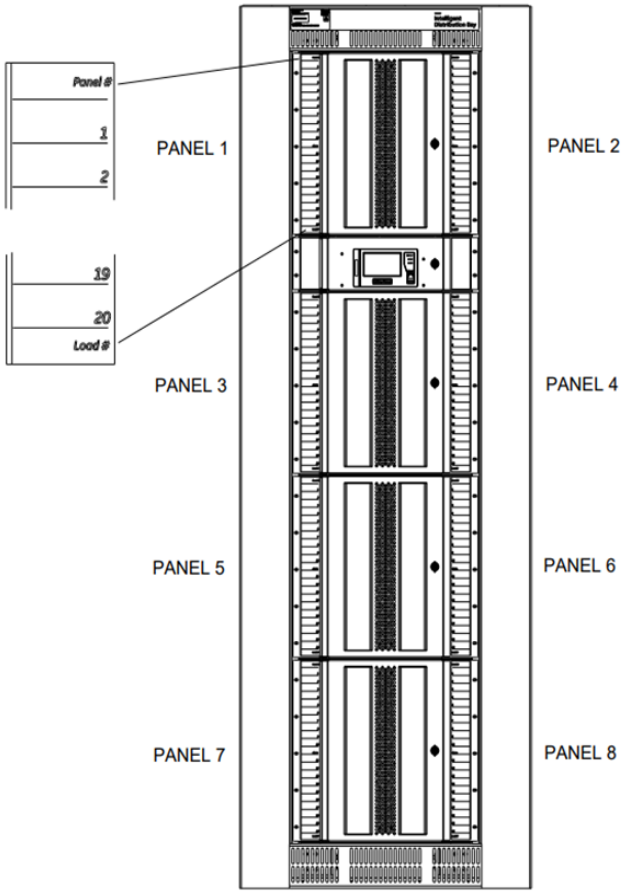


Figure 9 Panel Positions - Top Feed

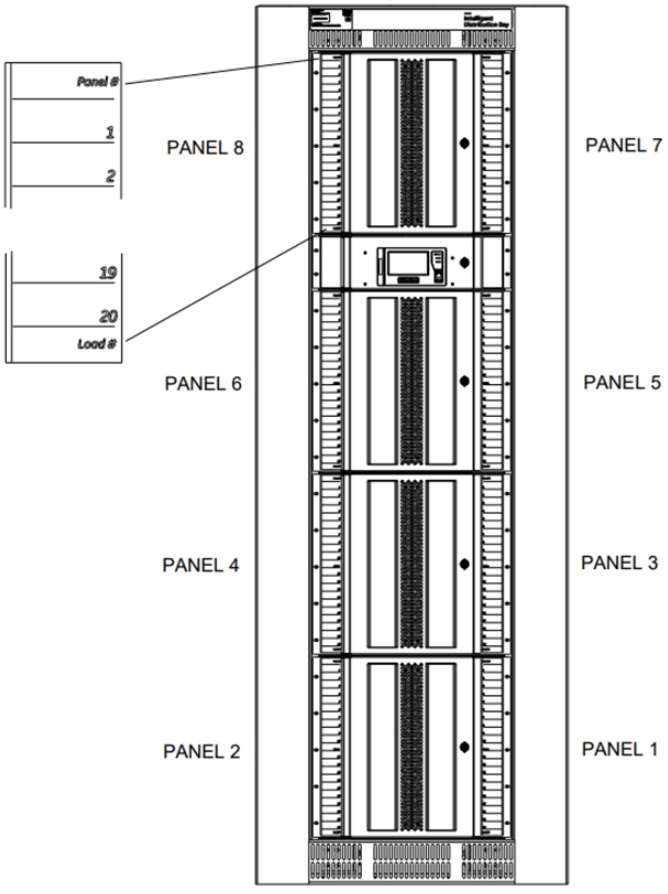


Figure 10 Panel Positions - Bottom Feed

Alarm and Status Lights

The IDB has a bay alarm, panel alarms and circuit breaker status LEDs to quickly locate and troubleshoot issues in the cabinet.

Bay Alarm LED

The bay alarm is located at the top of the cabinet. It is wired to an output relay on the controller. The light is green with no alarms and turns red on alarm. Which alarms activate the red alarm light can be set in the controller in alarm notifications.

Panel Alarm LED

The Intelligent Panel Control Card (IPCC) is located at the bottom of each panel and includes alarm LEDs. The light is green when the panel has power and there are no alarms. The light blinks red when communication fails and turns red on alarm.

Breaker LED

Each IPD breaker has an LED that provides breaker status. Using the web pages, under **Menu-Settings-Breaker LED Config,** user can set colors for eight different breaker conditions. The factory defaults are:

- Comm Fail — Red Flash
- Fault/Tripped — Red
- On — Green
- Off — White
- Health — Cyan
- Over Temp — Yellow
- Over Load — Yellow

IPCC Module

An Intelligent Panel Control Card (IPCC Module) is installed on each panel to provide panel alarm LEDs (described above), process data from the breakers and communicate with the controller.

There is a rotary switch on the IPCC that corresponds to the panel number. If panel numbers are reconfigured in the field, the IPCC switch must also be changed accordingly. There are two types of IPCC modules; IPCC-S includes additional circuitry required when a panel shunt is required, IPCC module does not.

The IPCC is keyed so it cannot be plugged in upside down.

Installation

Preparation

Safety Note

Read and follow all safety statements, warnings, and precautions in the Safety section of this manual before installing, maintaining, or repairing the equipment.

Installation Tools and Hardware

You will need the following tools and hardware to install the IDB:

- Material-handling equipment to unload the cabinet at the installation site, remove from shipping container, and set in final position [minimum lifting capacity: 500 lbs. (227Kg)] Note: Use the equipment weights and dimensions as a guideline for choosing material-handling equipment.
- Digital multimeter (DMM) with 0.05% accuracy on dc scale
- Insulated hand tools
- Screwdrivers (flat-blade and Phillips)
- Wire cutters and stripper
- Crimp Tools
- Drill and Drill Bits to install floor anchors
- Torque wrenches 25-720 in-lb
- Sockets: 5/16”, 7/16”, 9/16”, 3/4”, 15/16”, 19mm

Table 1 Torque Settings

Screw Size	Torque (Nm)	Torque (in-lb)
6-32	1.1	10
10-32	2.8	30
1/4”-20	7.3	65
5/16-18	15	135
3/8”-16	27	240

Unpacking and Inspection

IDB's ship on a 42 by 42-inch skid as shown below. A 15/16-inch wrench or socket is required to remove 5/8-inch diameter shipping bolts from skid. Before opening the packaging, carefully inspect the outside in the presence of shipping personnel for signs of damage. Carefully open the packaging to verify that the contents are complete and undamaged. If damaged, follow the shipping carrier's procedure for filing a damage claim. If the equipment must be returned, repack in the original shipping packaging.

Before continuing, verify that the following conditions exist at the installation site:

- Floor is conditioned and clean (refers to removal of any combustible flooring, e.g., carpet, wood, etc.).
- Job Site documentation details cabinet location.

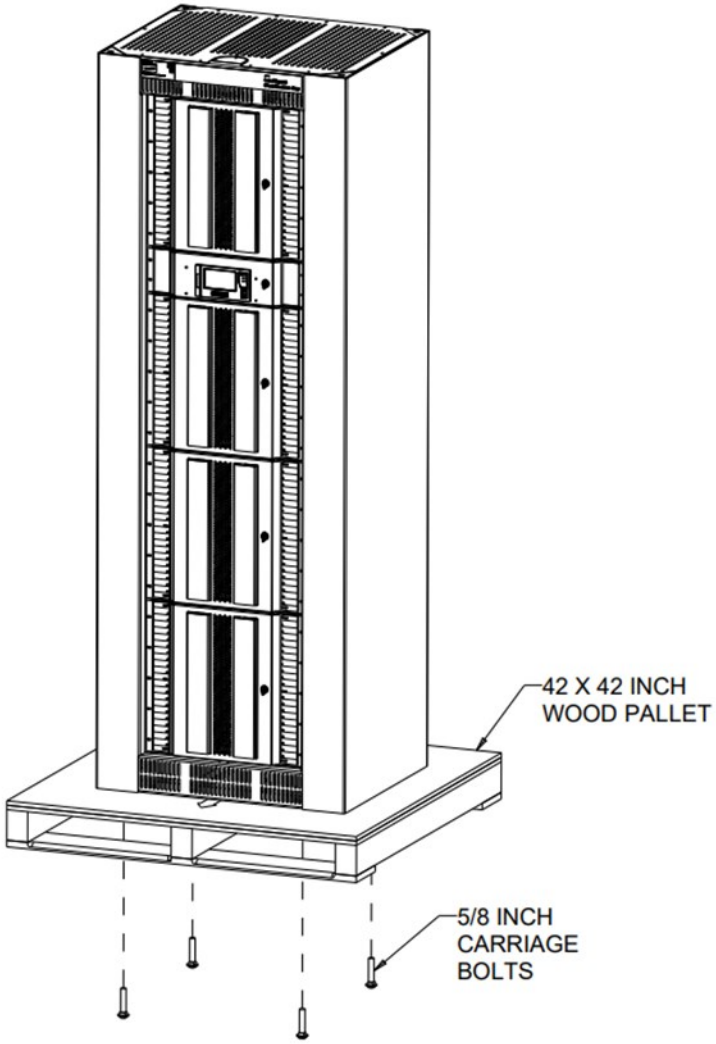


Figure 11 Cabinet Shipping Pallet

Floor Mounting

The cabinet will need to be securely mounted to the ground using (4) Hilti concrete anchors.

Step 1. Remove the rear covers of the cabinet.

Step 2. Move the cabinet into the desired location and mark the four slotted holes on the concrete floor.

Step 3. Temporarily move the cabinet and drill anchor holes to size and depth specified in table below and insert drop -in Hilti anchor for each hole.

Step 4. Carefully move the cabinet back into place while aligning the slotted mounting holes with the holes drilled.

Step 5. Shim under cabinet corners as necessary to level cabinet.

Step 6. Insert and securely fasten all four Hilti anchor bolts into the anchors. Torque anchors as specified in table 2.

Table 2 Anchor Kits

Seismic Zone	Ordering Code	Anchor Type (Hilti)	Hole Size	Wrench	Torque	
0,1,2	847135662	(4) 1/2 inch drop-in	5/8 inch bit 2” deep	3/4 inch	216 in·lbs (18 ft·lbs)	24.5 N·m
0,1,2,3,4	847135688	(4) 12 mm cap bolts	18mm bit 100mm deep	19 mm	720 in·lbs (60 ft·lbs)	81.6 N·m

Table 3 Isolation and Leveling Kits

Ordering Code	Description
408520408	Floor Insulation Kit (16 in x 24 ¼ in)
CC109121588	Shim Kit

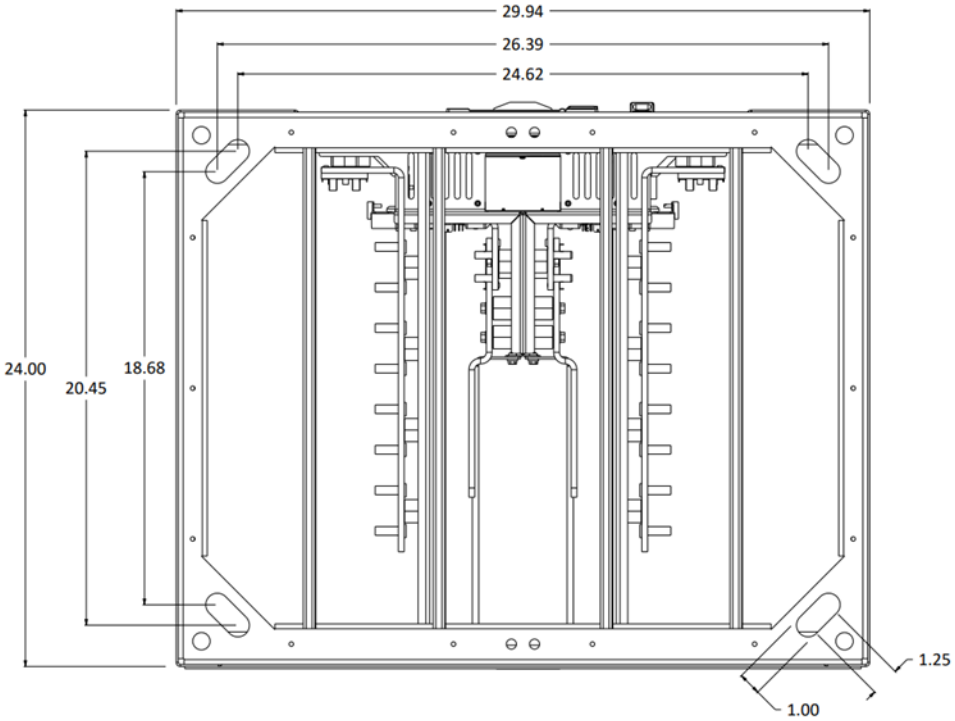


Figure 12 Footprint of G401 or G402 Cabinet

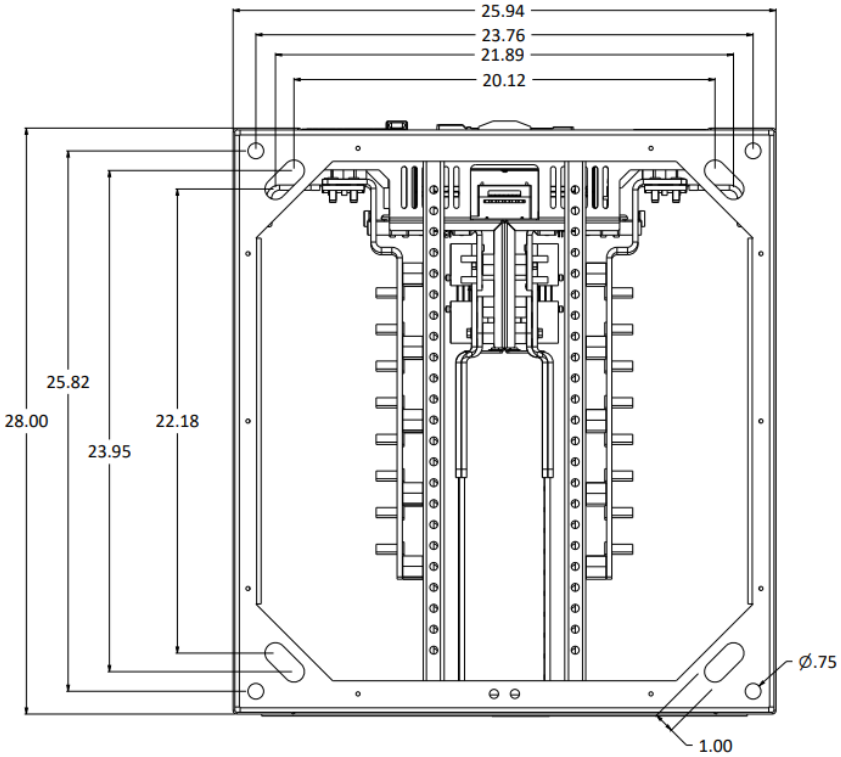


Figure 13 Footprint of G403 or G404 Cabinet

Cabinet Ground

Safety Note

Do not energize the IDB before ground is connected.

Ground Specifications

Cabinet ground connections are located on the front and rear top of the cabinet. Connect the ground cable with 3/8-inch hardware ensuring heat shrink and no-oxide compound are applied appropriately prior to termination. Torque the fasteners to 240 in-lbs.

- Local grounding practices will determine the grounding method and size of cable connected to the cabinet.
- Lug Landings: 3/8” on 1” centers.

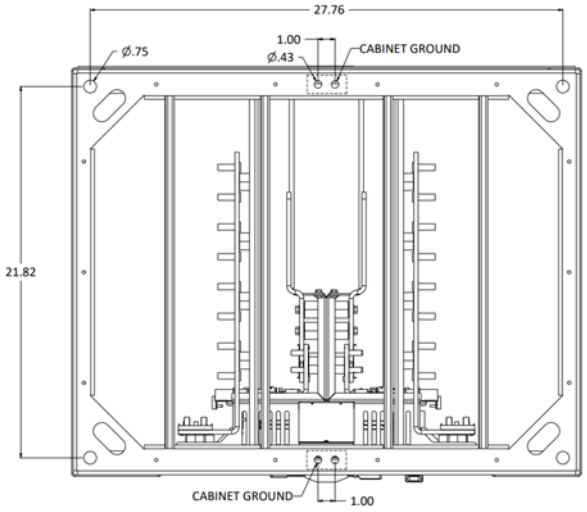


Figure 14 Top View of G401 or G402 Cabinet

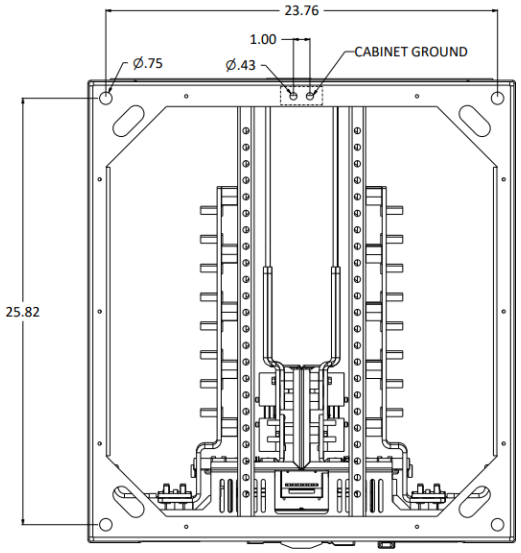


Figure 15 Top View of G403 or G404 Cabinet

Connect External Returns to Control Panel

When the bay is not equipped with internal return bus bars, connection must be made from the external return bus, located outside the cabinet, to the control panel bus bars to power the controller and alarm circuitry. There are both 5/16-18 studs on 1-inch centers and ¼" fastons available on the control panel bus bars. The minimum wire size is 18 AWG. Both the "A" and "B" busses should be connected to the external return bus.

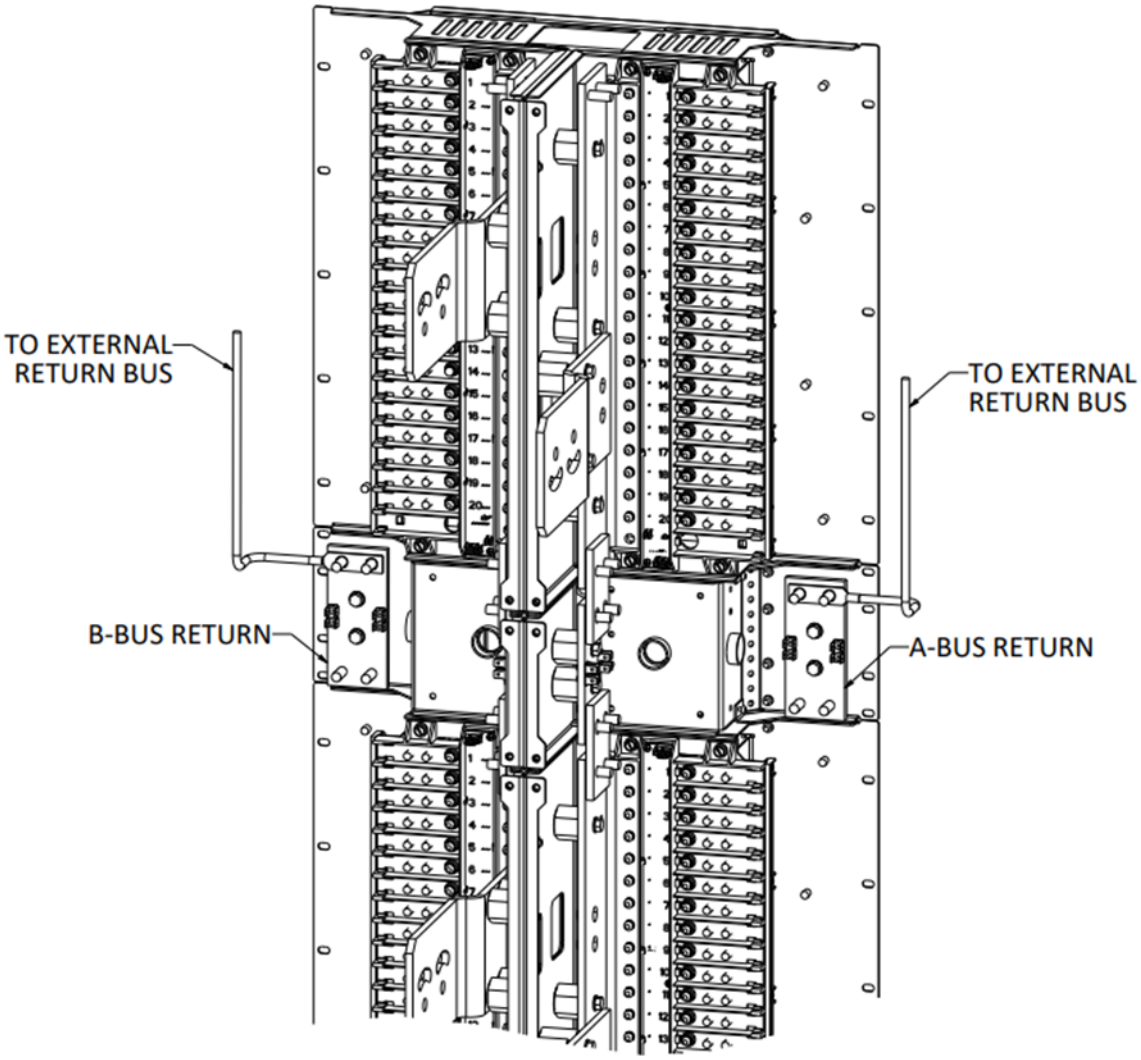


Figure 16 Connecting External Return to Control Panel

Input Connections

Safety Note

There are up to eight input load buses on the IDB. Inputs must be protected by a listed circuit breaker or branch rated fuse. The circuit breaker or fuse must be rated no larger than 800A when the input feeds a single panel and 1600A max when the input feeds two or more panels. Multiple power sources are present. Ensure all input power feeds are not energized before installing them. Electrical installation should only be performed by qualified personnel with proper tools and protective safety equipment.

Cable Routing and Termination Hardware

Input cables are routed as shown in the figures below. Lug landings are 3/8-16 on 1" centers spaced 1.75" apart. Up to four 750KCMIL cables may be connected to each input load bus.

1. **Input Feeds** - Run and terminate input feed cables to the Load Connection Bus of each load bus.
2. **Input Feed Returns** - Run and terminate input feed return cables to the Load Return Bus located either internal or external to the cabinet.
3. Torque 3/8" hardware to 240 in-lbs with 9/16" socket.

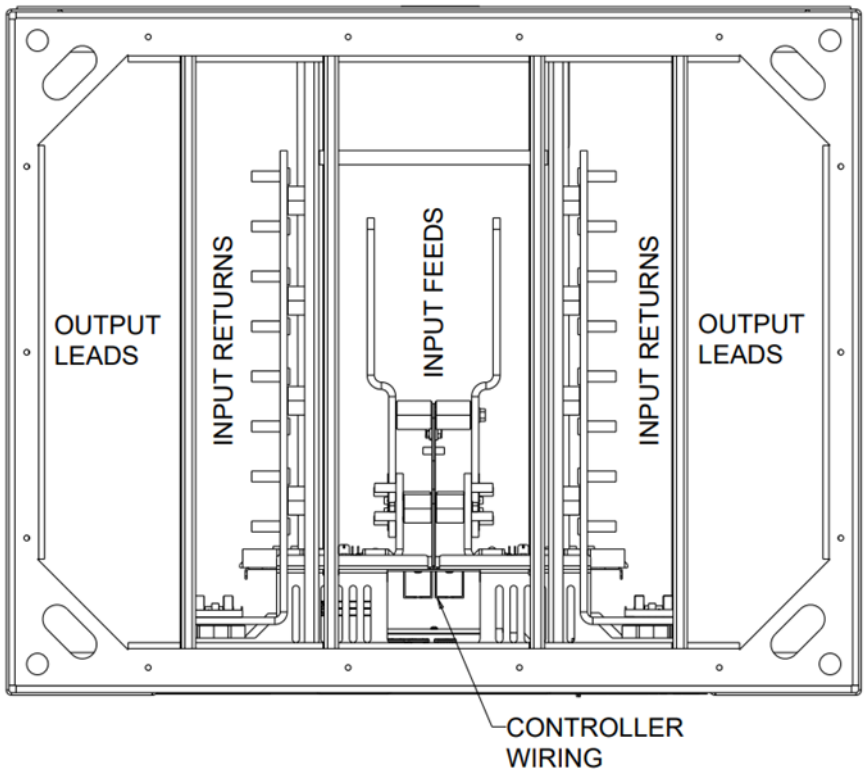


Figure 17 Distribution Cable Routing

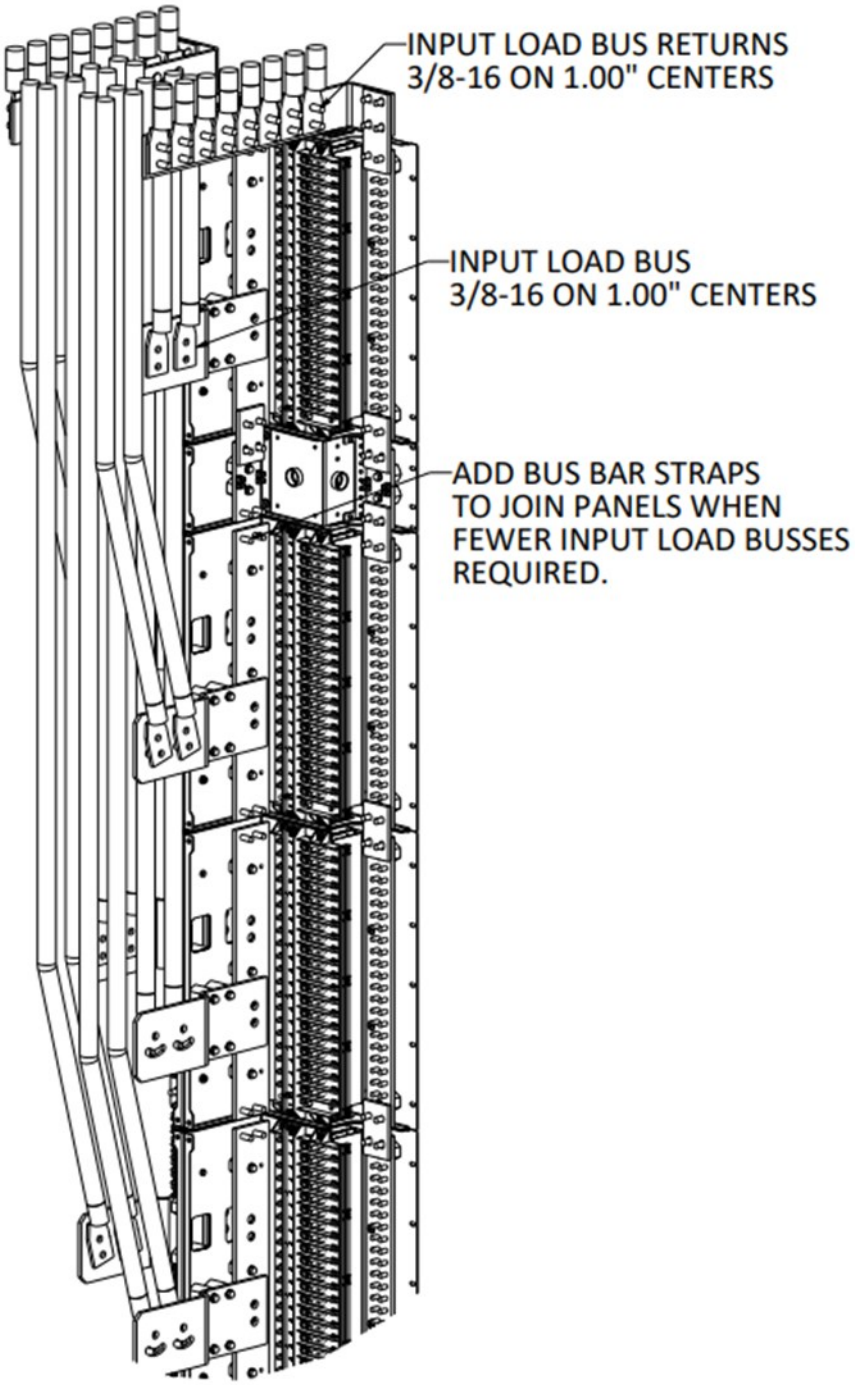


Figure 18 Input Load Bus Connections

Output Connections

Safety Note

Do not perform this step on circuits with breakers or fuses installed. Ensure no power is present on the circuit being wired before proceeding. Make sure that all cables have insulated terminals or heat shrink applied prior to termination and that no-oxide compound is applied to any non-plated copper-to-copper connections.

Cable Routing and Termination Hardware

Each panel has a total of 20 or 22 breaker positions. Output cables are routed as shown in the figure below. Lug landings are ¼-20 on 5/8" centers. Up to a 2awg lug may be connected directly to the output buses on each panel.

Determine whether the application is bottom feed or top feed – Consider how loads from each panel will exit the cabinet.

For each output load - Install return output cable first if internal return bus present, attach ¼-20 conical nuts provided with the system and torque to 65 in-lbs using a 7/16" socket. Then install the breaker output cable securing with ¼-20 conical nuts and torque to 65 in-lbs using a 7/16" socket.

Tag output cable pairs as needed.

Route output cables up (or down) as required in an organized fashion by tying to the lacing bars located throughout the cabinet**.**

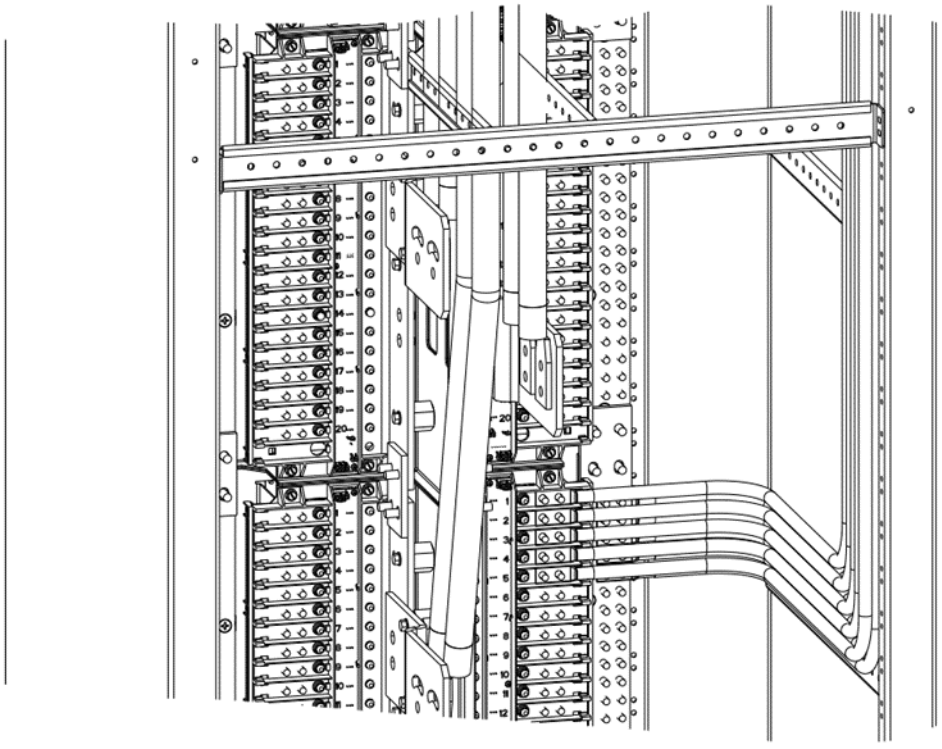


Figure 19 Distribution Panel Output Connections

Output Adapters

Output adapters are required for 2-pole and 3-pole circuit breakers to bridge the outputs and also for the return bus landings to enable connection of cables larger than 2AWG. Each adapter bus is sized for landing terminal lugs with 3/8 bolts on 1-inch centers.

1. **Install Two-Pole and Three-Pole Adapter Bus** - Install two-pole and three-pole adapter bus for each load fed by a two-pole and three-pole protector along with its internal return bus connection if present.
   a. Secure the adapter bus to the distribution panel output buses with 1/4-20 conical nuts.
   b. Torque to 65 in-lbs with 7/16” socket.
2. **Connect Output Cables to Adapter Bus**
   a. Run and terminate load cables to the adapter bus bars with 3/8-16 hardware.
   b. Torque to 240 in-lbs with 9/16” socket.

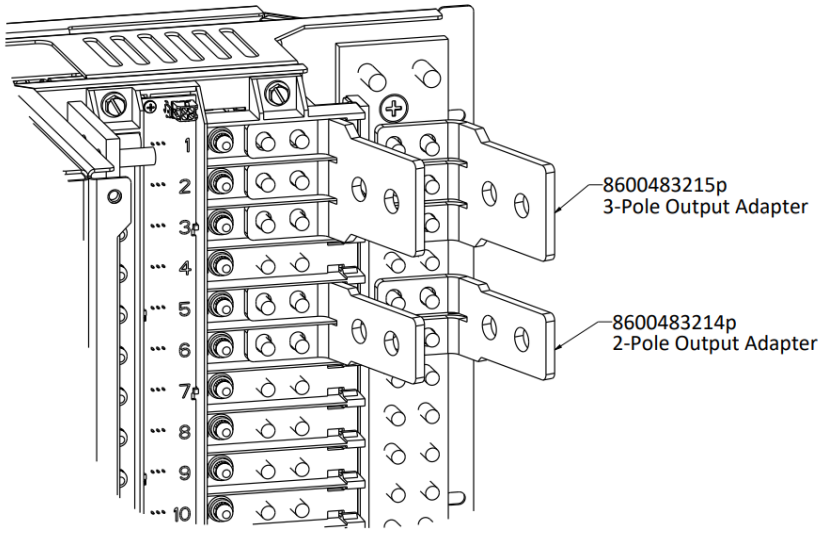


Figure 20 Load Circuit Output Adapters

Circuit Breaker Installation

Installation Notes:

- Breakers can only be installed one way with ON position to outside.
- Intelligent breakers connect to a six-pin communication connector while standard breakers with their single alarm pin insert into the outer alarm pin opening. Standard breakers with 2 or 3 alarm pins are not allowed.
- Ignore Line and Load markings on breakers.
  They are not consistently applied by all manufacturers.
- Bullet-style circuit breakers are installed in any position with no spacing restrictions.
    - Single-pole breakers through 100A
    - Two-pole breakers through 200A
    - Three-pole breakers through 300A

Installation:

Open the distribution door and insert breaker(s) into the bullet sockets as shown below. Ensure that the breaker is in the OFF position before installing the breaker in the panel.

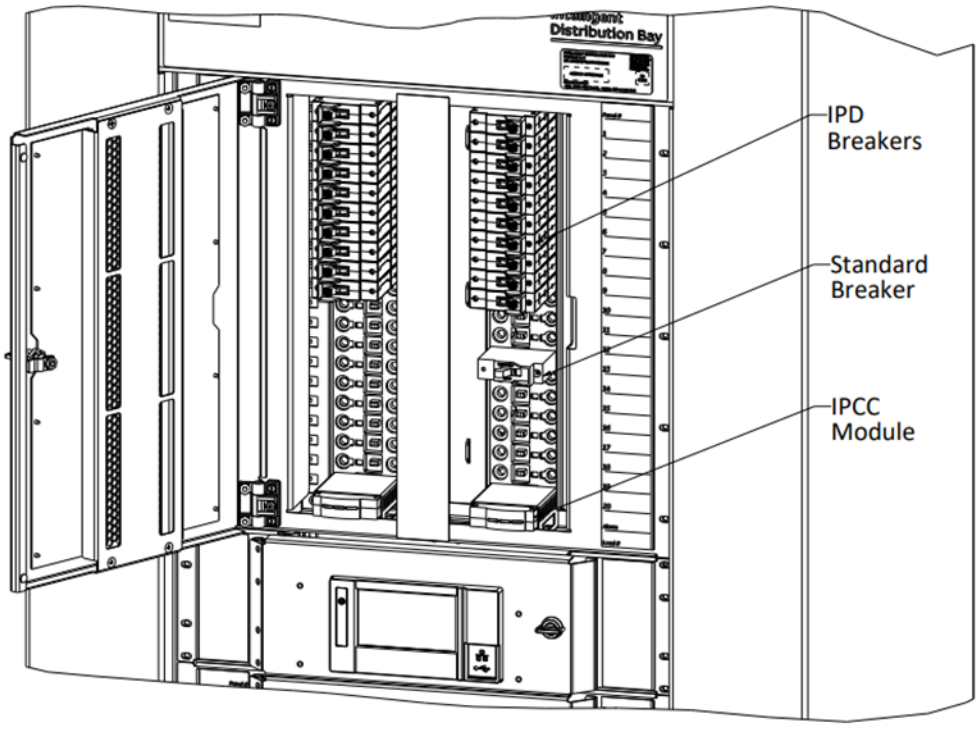


Figure 21 Installing Breakers (20 position shown)

Load Bus Reconfiguration

Multiple power sources are present. Electrical installation should only be performed by qualified personnel with proper tools and protective safety equipment.

Load bus arrangements are factory configured, but sometimes it may be necessary to reconfigure an IDB in the field. Cabinets are typically equipped in an 8-load bus configuration. Bus bar straps for each panel are shipped loose along with mounting hardware in a box at the bottom of the cabinet. It is possible to reconfigure the bus work to create 2, 4 or 6-bus configurations and to convert from top-feed to bottom-feed or vice-versa. The figures below represent the different layouts that can be achieved by simply adding or removing bus bar straps and updating controller menus.

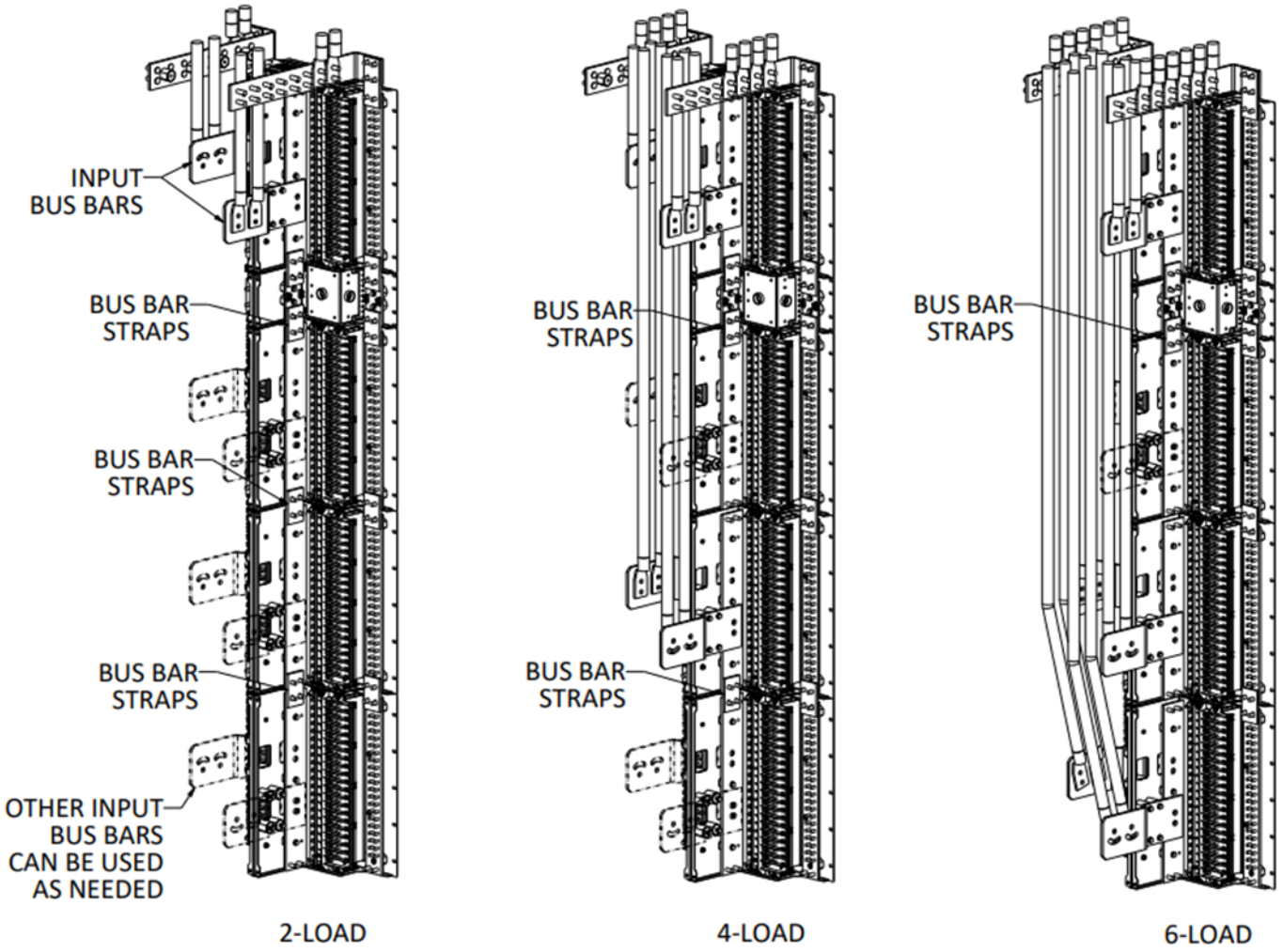


Figure 22 Top Feed: 2, 4 and 6-Load Configurations

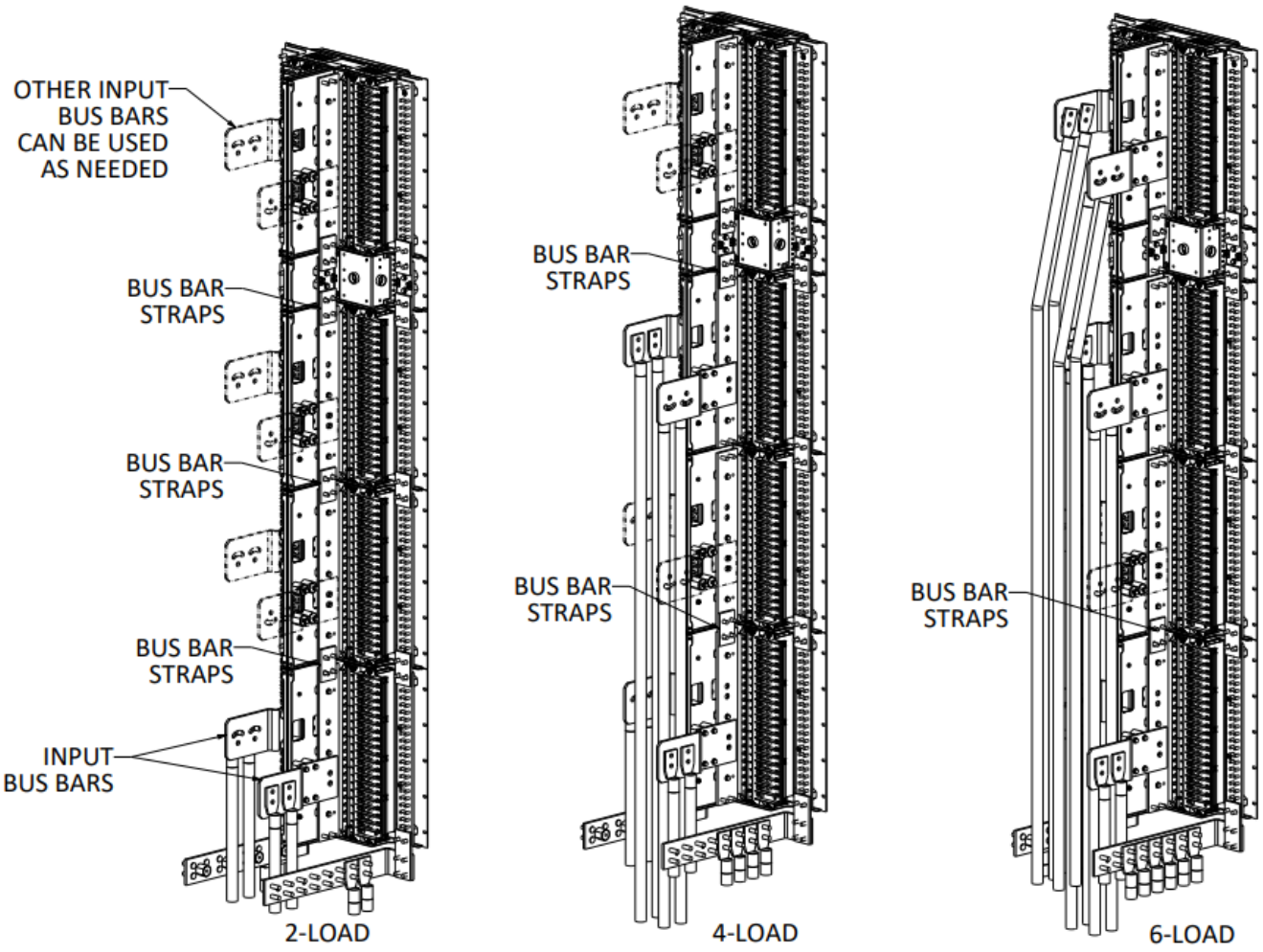


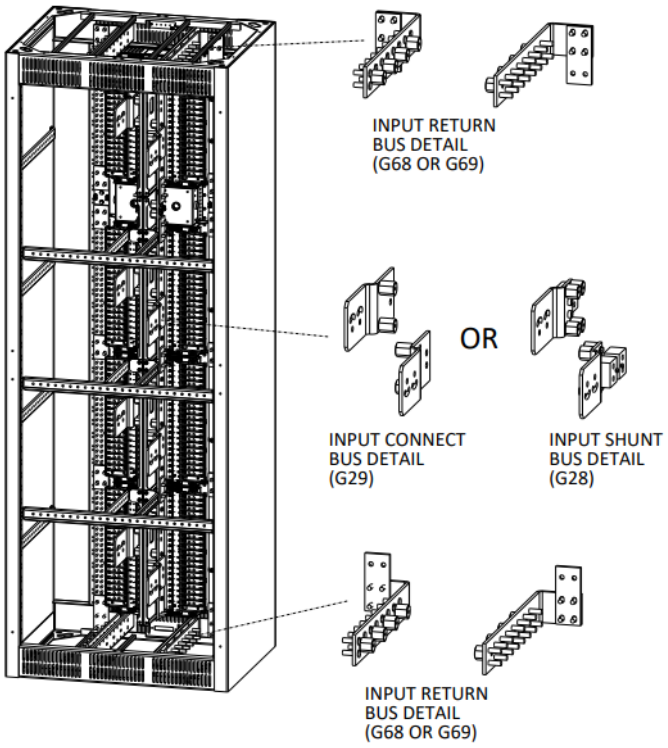
Figure 23 Bottom Feed: 2, 4 and 6-Load Configurations

Reconfiguration Instructions

1. **Skip Step if not moving input return bus details.** Move internal input return bus from top to bottom or bottom to top as required, if not already equipped in both places. **Note:** Internal return bus bars are not always present. Relocate bus bar and its four standoffs. Secure to cabinet with four 1/4-20 screws provided and 7/16" socket (Torque to 65 in-lb). Attach bus strap to vertical panel return bus bars using 5/16 hardware provided and ½" socket (Torque to 135 in-lb)

2. Input Connect Bus Details can be moved to make these connections closer to the bottom or top of the cabinet, but it is only necessary if the new bus layout requires them to move.

3. Panel Layout must be updated on the menu screens of the controller. Refer to **Controller Operation-Bay Configuration** section of this manual for reconfiguring the panel layout.



4. Relabel front panels as required with new Panel #'s and new Load #'s.

5. IPCC module rotary switch numbers must agree with the new panel number layout. Set rotary switch to 1 for new panel 1 location. Repeat for other panels.

   NOTE: IPCC modules can be added or removed while panel is energized.

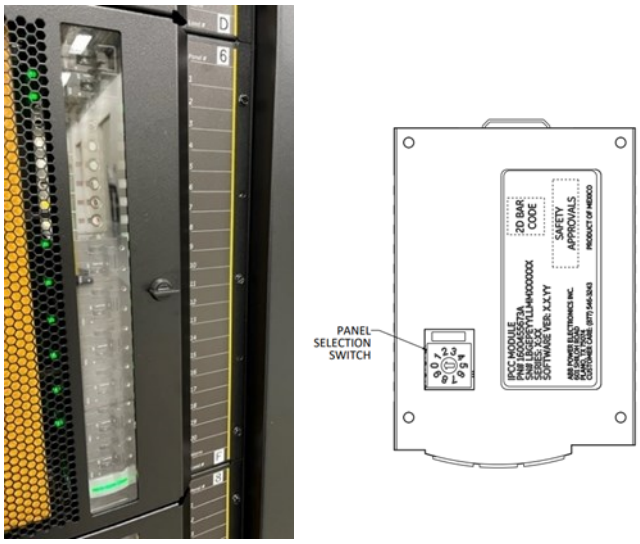


Figure 24 Reconfiguration of Bus, Labels & IPCC

Adding Load Bus Shunt Kits

Load shunts may be desired to determine the overall panel current when a panel is equipped with only standard circuit breakers or a mixture of standard and intelligent breakers. Installation requires adding the shunt kit to a panel and replacing the IPCC module with a version that includes a shunt monitoring circuit. The shunt is rated for 1500A at 50mV. The controller monitors the shunt through the IPCC-S module to determine actual current and the remaining capacity of the load bus.

The following steps describe this procedure.

Caution: Live potentials are present within a working IDB cabinet! Take proper precautions to insulate all tools and prohibit any live surface from contacting framework or any other grounded surface.

Note: If splitting existing loads within the IDB, the panel shunt assembly will be at a live potential as soon as it comes into contact with a distribution panel bus and must not be allowed to contact framework or any grounded surface during or following this step!

1. Connect (4) red glastic 1” standoffs to panel.
2. Attach shunt detail to panels charge bus with 3/8 hardware provided and 9/16” socket (Torque to 240 in-lb) and attach to standoffs with four 1/4-20 screws and 7/16” socket (Torque to 65 in-lb).
3. Connect red and black shunt wires from shunt to backplane as shown. Red wire to LSH1+ and Black wire to LSH1-.
4. Remove Bus Bar Straps to “split off” the panel as an individual load buses as required. Remove four 5/16” nuts, lock and flat washer with ½” socket. Store these unused links in bottom of cabinet.
5. Panel Layout needs to be updated on the menu screens of the controller to activate shunt. Refer to **Controller Operation-Bay Configuration** section of this manual for reconfiguring the panel layout and shunt activation.
6. Relabeling might also be required. Stamp or Label new load designations on the labels.
7. The IPCC module for the panel will need to be replaced with an IPCC-S version that includes the shunt circuit, if not already present. IPCC-S module rotary switch number must agree with the panel number. Set rotary switch to 4 for panel 4. etc.

   Note: IPCC modules can be added or removed while panel is energized.

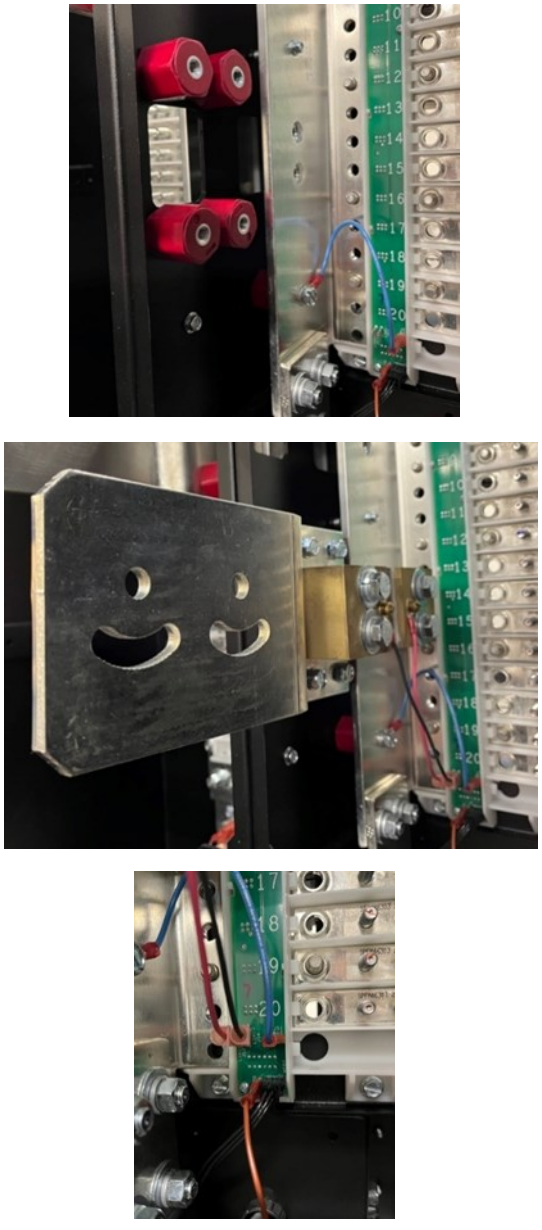


Figure 25 Panel Shunt Wiring

Top Cover

When cabinets are used in bottom feed applications, an optional cover kit may be installed on top of the cabinet as shown below. Secure cover with #12 mounting screws and 5/16” socket.

- 8600456590p cover for 26-inch wide cabinet.
- 8600399549p cover for 30-inch wide cabinet.

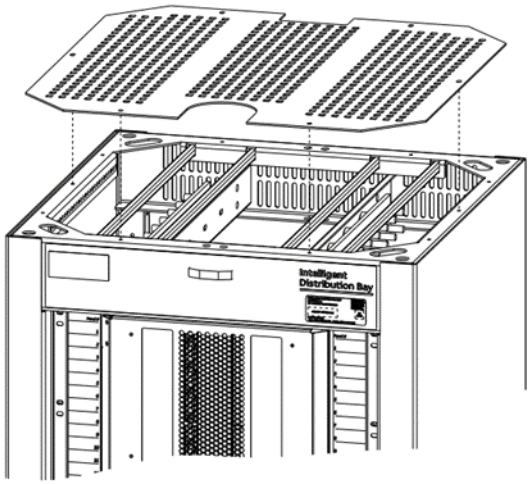


Figure 26 Top Cover Kit

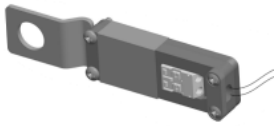
Control Wiring Pathway

Wiring to the controller can be routed from either the top or bottom of the cabinet along a central channel behind the front doors of each panel. Wiring is cable tied to lances located along this pathway as shown in the photo.

Figure 27 Control Wiring Pathway

Temperature Probes

Temperature Probes are an optional feature of the IDB allowing temperature measurements in and around the cabinet. Three types of temperature probes are offered to measure the hot-aisle temperature, cold aisle temperature and a generic ambient temperature probe.

Ordering Code	Description	Photo
1600210840A	Cold Aisle Temperature Probe (Blue Stripe)	
1600210841A	Hot Aisle Temperature Probe (Orange Stripe)	
1600093512A	Ambient Temperature Probe (Red Stripe)	

Probes may be located as desired around the IDB and wired to the 1-wire terminal block on the controller using a 2-conductor cable. Available in 25, 50 and 100ft lengths, this cable may be cut to length as needed. If more than one probe is required, a 1600127057A terminal block module may be ordered and installed in the control panel as shown below. Multiple temperature probes are wired to the terminal blocks and then a single cable is wired over to the controller terminal block.

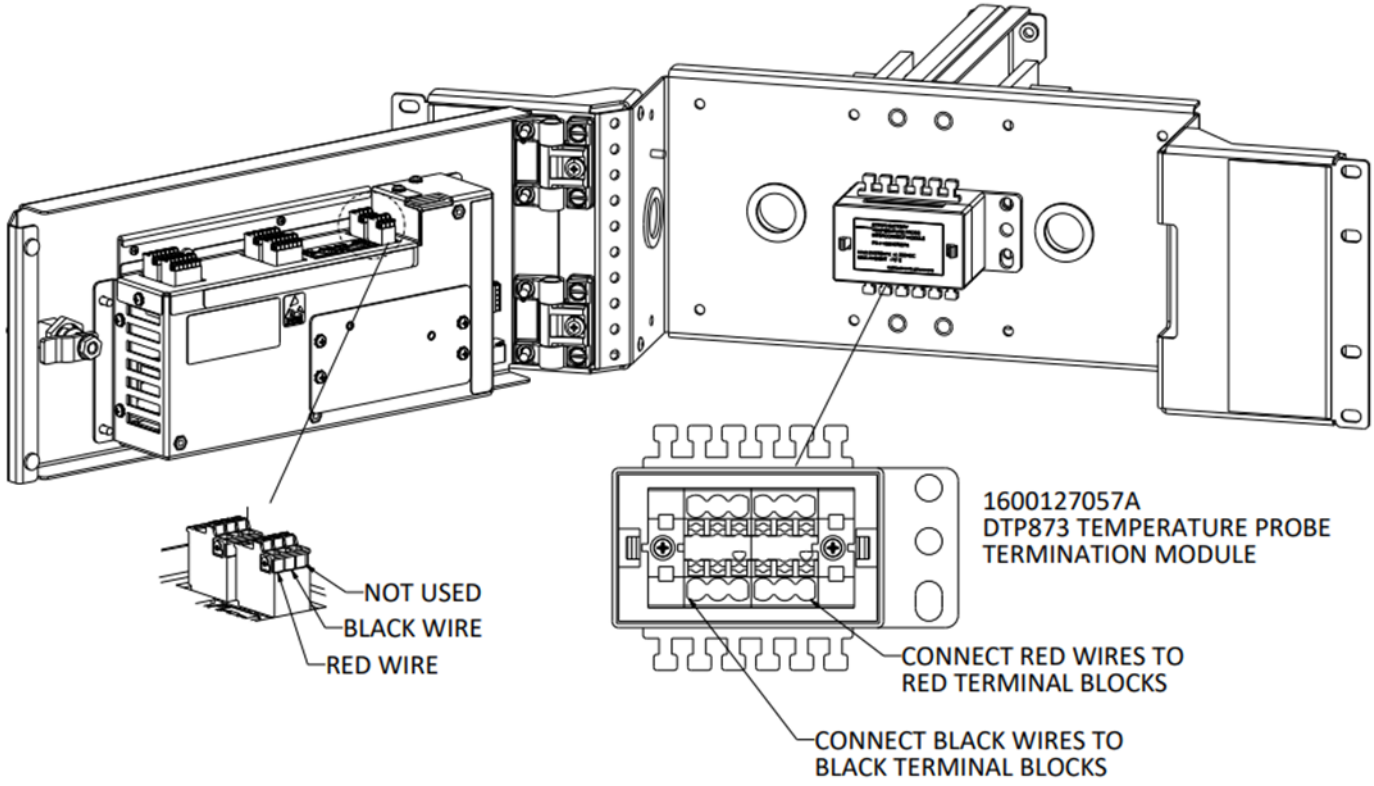


Figure 28 Temperature Probe Installation

Controller Operation

There are three ways to view data collected by the controller:

- Locally through the 4.3” touch screen display.
- Laptop connected to 10/100M Base-T craft port using standard web browser.
- Remote connection to 10/100/1000 Base-T ethernet LAN port using standard web browser. This port also supports machine-to-machine interfaces like SNMP, Modbus, and Telnet. All user access points can be made secure using password management.

There are similarities between the front panel and web screens, but they are not identical. They both provide menu bars for navigating to **Home, Maintenance, Settings, Documents, Reports, About, Temperature** and **Help** screens along with an interactive pictorial depiction of the panels and load busses in the bay. Front panel access allows the user to view data and make minor preference changes but web page access either through the local craft port or remotely is necessary for major configuration alterations.

Local Configuration (Laptop)

Change all system configurable parameters using a web browser interface with a computer connected to the craft port (RJ45 jack) on the front of the controller. Using the connected computer, open a web browser and enter the IP address **192.168.1.1** (default) in the web browser address field.

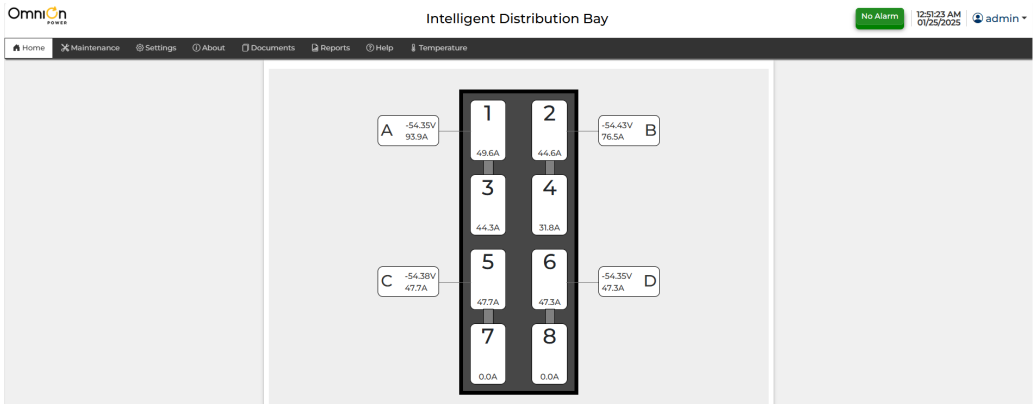
Once you establish a connection to the embedded ethernet module, use the following credentials to gain access to the protected data and administrative pages:

- Username: **admin**
- Password: **admin**

Navigating the Webserver

Once you access the webserver, you will be able to configure the controller.

Below is the **Home** page screen. The black menu bar includes **Home, Settings, Maintenance, Report, Documents, About, Temperature** and **Help** tabs. These tabs are replicated on the front panel menu tab. The distribution configuration is pictorially represented with active input feeder bus and panel buttons that link to comprehensive information of every load in the bay.



Settings

The IDB is factory configured so most installations will modify only a few settings. There are three types of settings: Configuration, Communication and Programming.

Configuration:

Site Info, Date/Time, Preferences: update site information, date, time, and preferences like display watts/amps, Celsius/Fahrenheit, local buzzer enable/disable etc.

Bay: reconfigures bay layout and labeling.

Input Feeds: set input protector size and overload and low voltage thresholds.

Panels: set overload thresholds for panels & breakers.

Breaker LED Config: set unique breaker status colors.

Temperature Probes: set high/low alarm thresholds for optional thermal probes.

Alarm Test: set parameters for alarm test.

Communication:

User Admin: set login access and permissions.

Security: enable network ports and front panel pin access.

Network: set external network IPv4, IPv6 access.

SNMP, Email, Email Reporting, Modbus: other access options.

Alarm Notifications: set severity, output relay, email and SNMP notifications for every alarm.

Alarm Cut-Off: Set a timeout for alarm levels.

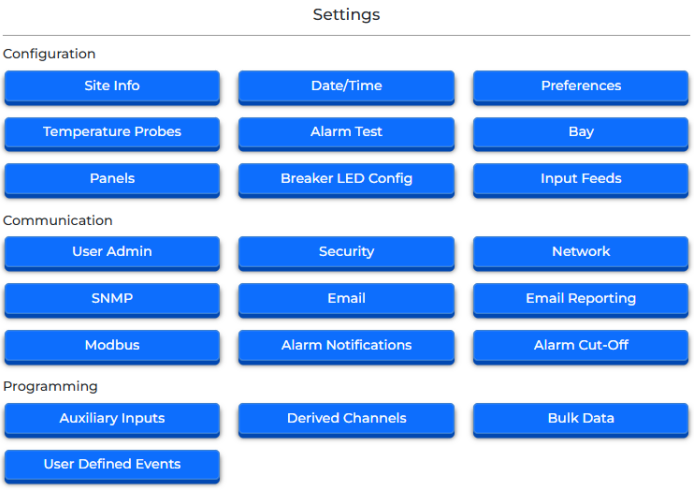
Programming:

Auxiliary Inputs: identify input alarms from terminal block.

Derived Channels:

Bulk Data:

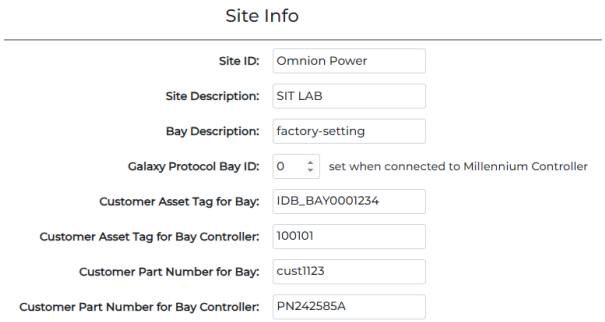
User Defined Events:



Configuration Settings

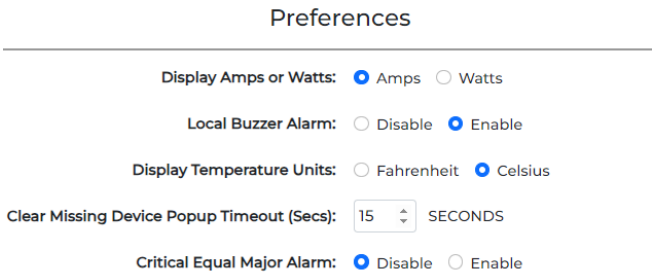
Site Info

To modify site information, navigate to **Settings – Site Info**. Site Settings identify site and bay information and any customer part numbers or identifiers for the bay.



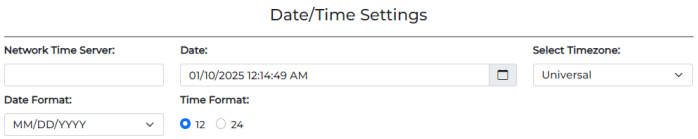
Preferences

Display settings like watts/amps, Celsius/ Fahrenheit, local buzzer enable/disable are customer preference settings.



Date/Time

To modify Date/Time, navigate to **Settings - Date/Time.**



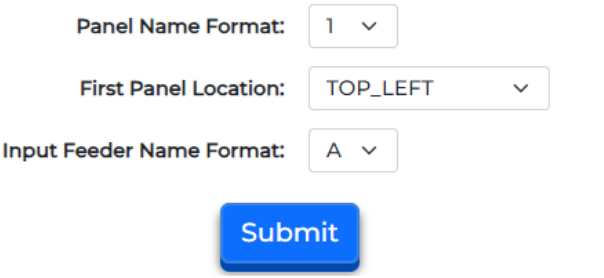
Bay Configuration

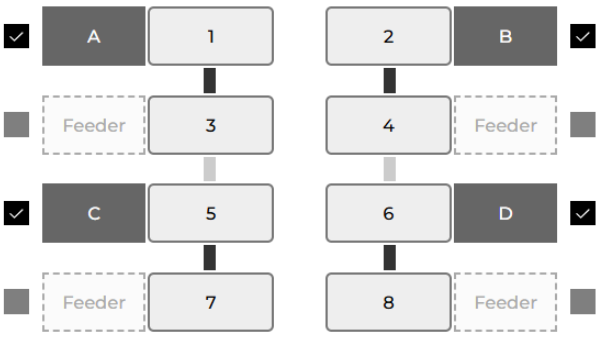
Skip if no changes needed.

To modify the panel, Input Feeds or labeling configuration of bay, navigate to **Settings - Bay**

- Select Input Feeder Name Format: A, A1 or 1
- Select Panel Name Format: A, A1 or 1
- Select First Panel Location: Top-Left, Top-Right, Bottom-Left or Bottom Right

  Note: If Panel Location changed, IPCC rotary switch number on each panel must also be changed to agree.
- Submit to save changes and the pictorial should dynamically update accordingly.
- Select input feeds desired (A-H)
- Check black side box if shunt desired on input feed
- Select bus links between panels to interconnect panels
- If good configuration, submit to save changes

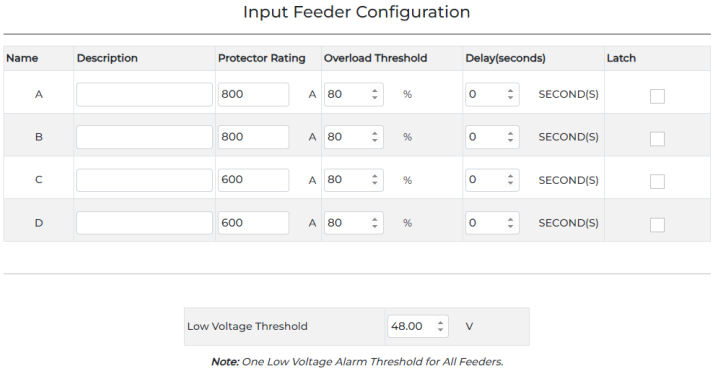




Input Feeder Configuration

To add input protector size and overload and low voltage thresholds for each input feeder, navigate to **Settings – Input Feeds** and fill in the table.

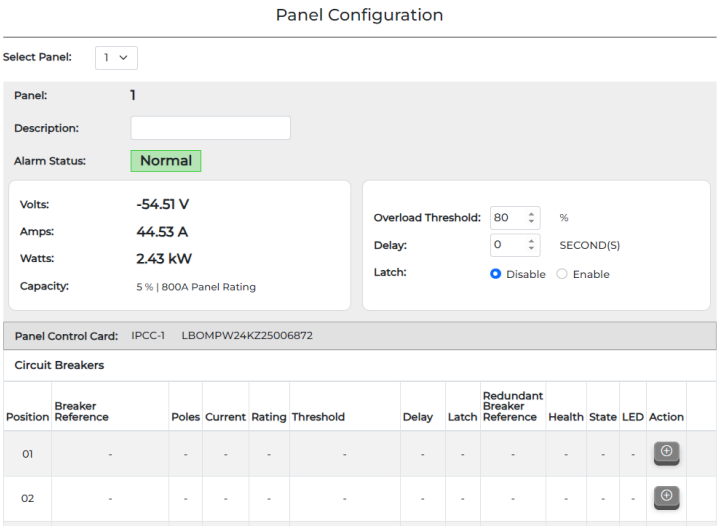
- Add Input Feeder Description if desired.
- Add amperage size of breaker protecting this input feed in the Power Plant.
- Select a % of this breaker size as threshold for Overload Alarm.
- Set Overload Alarm time delay if desired and whether it should be a latched alarm.
- Submit to save changes.



Panel Configuration

To set overload thresholds for panels and breakers, navigate to **Settings - Panels**

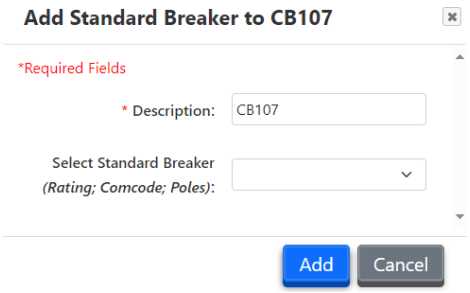
- Select Panel Name to view it's data.
- Add description for each panel if desired.
- Set Overload Threshold for panel alarm.
- Set an alarm time delay if desired and whether the panel threshold alarm should be a latched alarm.
- Set Overload Threshold for each populated breaker.
- Set Overload Alarm time delay if desired and whether it should be a latched alarm.
- Submit to save changes.



Adding Standard Breakers

Unlike IPD breakers, standard breakers do not auto populate into software. They must be manually added. Navigate to **Settings - Panels**. There is an action column with Plus button.

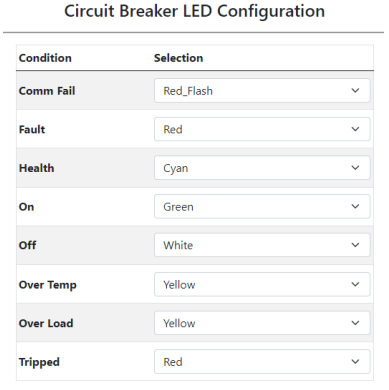
- Press Plus button
- Select standard breaker size from drop down menu
- Press Add button
- Standard breaker should appear in table and inventory
- Press Trash button to remove



Breaker LED Configuration

Skip if no changes needed.

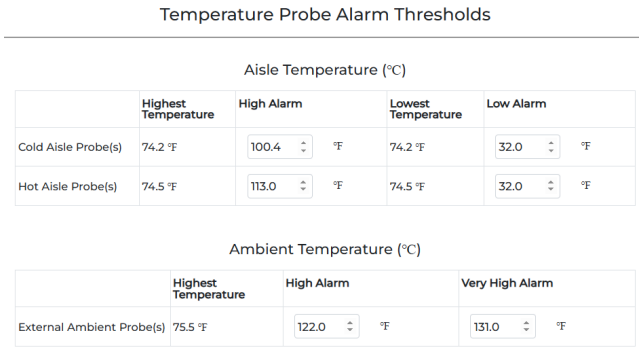
Multi-color indicator LEDs on either side of the breaker can be set to illuminate various colors depending on the breaker state. These colors are set by going to **Settings - Circuit Breaker LED Config**. Once submitted, this color-coded breaker alarm key is displayed on the front panel and web pages for each populated position in the bay.



Temperature Probe Alarm Thresholds

Skip if no temperature probes installed.

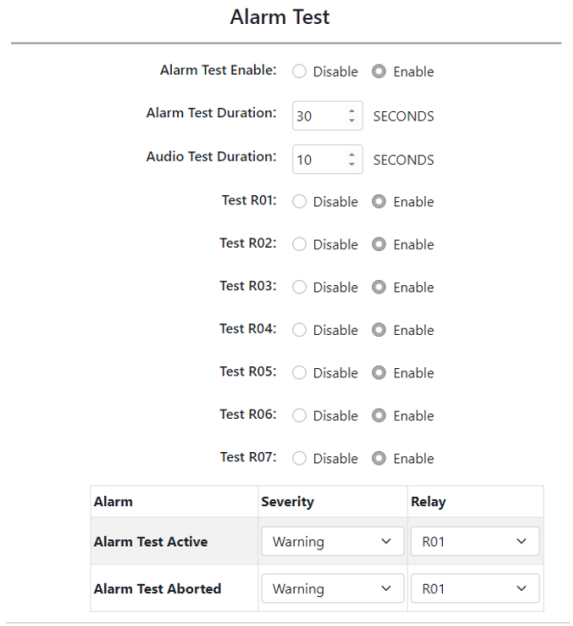
To set Low, High and Very High Alarm Thresholds for temperature probes, navigate to **Settings – Temperature Probes**. Hot Aisle, Cold Aisle and External Ambient temperature probes are wired to the controller's 1-wire temperature probe terminal block.



Setup Alarm Test for Output Relays

To setup alarm test for output relays, navigate to **Settings – Alarm Test.** Output relays wired to monitoring systems can be tested with this feature. The duration of the alarm contact activation can be from 5 to 300 seconds.

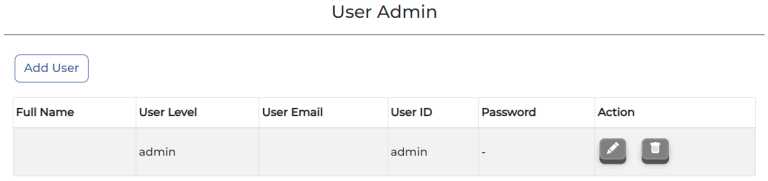
To then start the Alarm Test, navigate to **Maintenance – Start Alarm Test.**

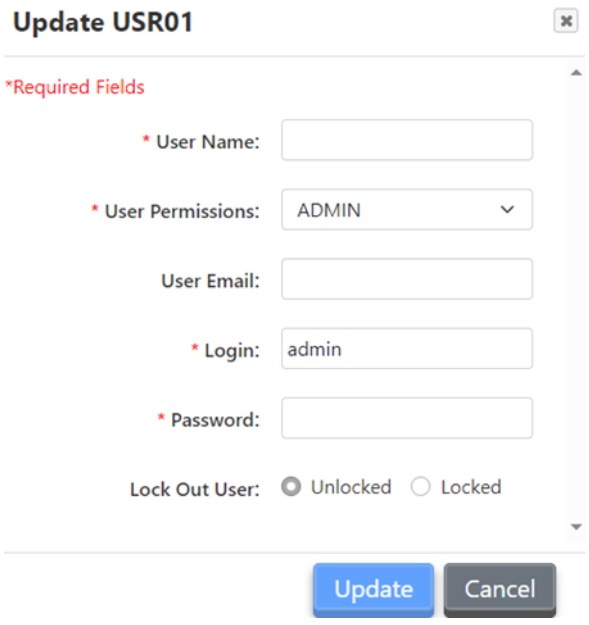


Communication Settings

Passwords

To administer passwords, navigate to **Settings – User Admin** There are three levels of access: User (Read Only), Super-User (Read/Write without password administration capabilities, and Administrator (Read/Write with password administration capabilities). Administer level access is required to perform password administration.



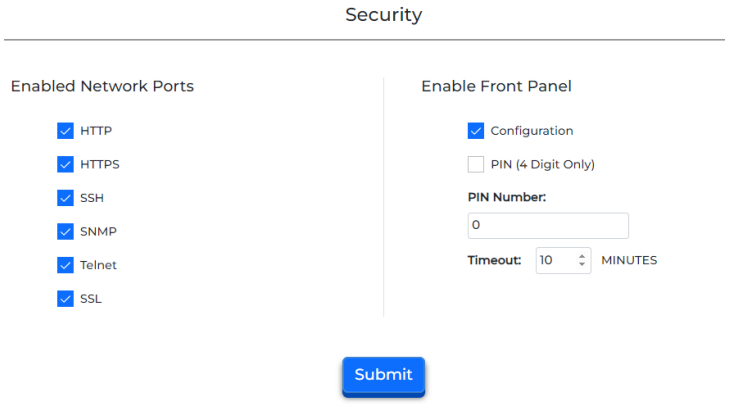


Security

To setup a front panel PIN number or Enable/Disable certain network port access, navigate to **Settings – Security**

A four-digit Power Identification Number (PIN) can be setup for users of the front panel for access to certain configurable items. This feature is shipped factory disabled and must be enabled by a remote user with administrator privileges. When the front panel PIN is enabled, the default PIN is 0000. Once enabled, a pin is required for certain non-maintenance actions like configuring the bay or clearing data for example.

Access to certain Network ports can be restricted using this screen.



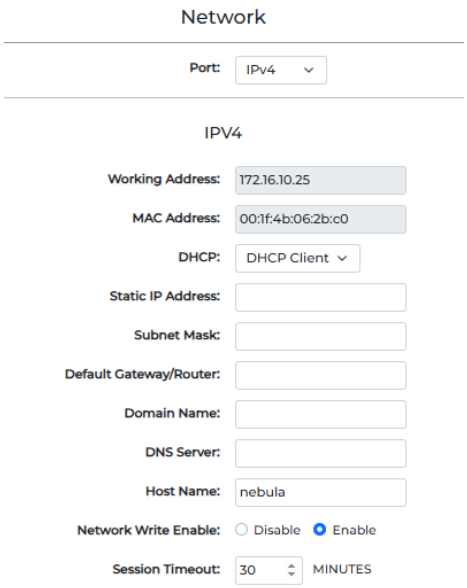
Remote Connection (Network Settings)

Two LAN 10/100/1000 Base-T Ethernet ports can be configured to allow remote access over the network. The controller provides network access and control capability for users under the HTTP, Telnet, FTP, SMTP, SNMP and TL1 protocols. Plug cable into one of the LAN ports as shown below.

Configuration settings for IPv4 and IPv6 are found on the web pages under **Settings-Network.** The controller is capable of simultaneous operation using IPv4 and IPv6 protocols. Using IPv4, the controller will utilize a single IPv4 address. This address will be assigned in one of 2 ways depending on the DHCP mode:

1. DHCP mode Static: The controller uses a static IPv4 address assigned by the user. The user must supply a subnet mask and a router address.
2. DHCP mode Client: The controller uses a dynamic IPv4 address assigned by a DHCP server on the network.

Set DHCP (Dynamic Host Configuration Protocol) to Client or Static mode.



SNMP

The controller provides configurable community strings for SNMP traps and Sets and Gets. These are configured on the web pages at **Settings-SNMP.**

Set/Get Community Strings: IP addresses and descriptions for up to three Set/Get community strings are provided. Default community strings descriptions are public, public-write, and private. Each string could be configured by an administrator to be write enabled or read only. The public-write and private have been defaulted with write capability.

Trap Community Strings: Individual IP addresses and description configurations for up to four public community string alarm traps are provided. Assignment of alarms to the appropriate community string is performed at **Settings-Alarm Notification.**

SNMP

SET/GET Profiles

Add New SNMP Profile

Identifier	Description	Community String	Access Level	SNMP Protocol	SNMPv3 Authentication Protocol	SNMPv3 Authentication Password	SNMPv3 Privacy Protocol	SNMPv3 Privacy Password	Action
CS1	SNMP Community String 1	public	USER	V2C	NONE	authpass	NONE	privpass	

Trap Destinations

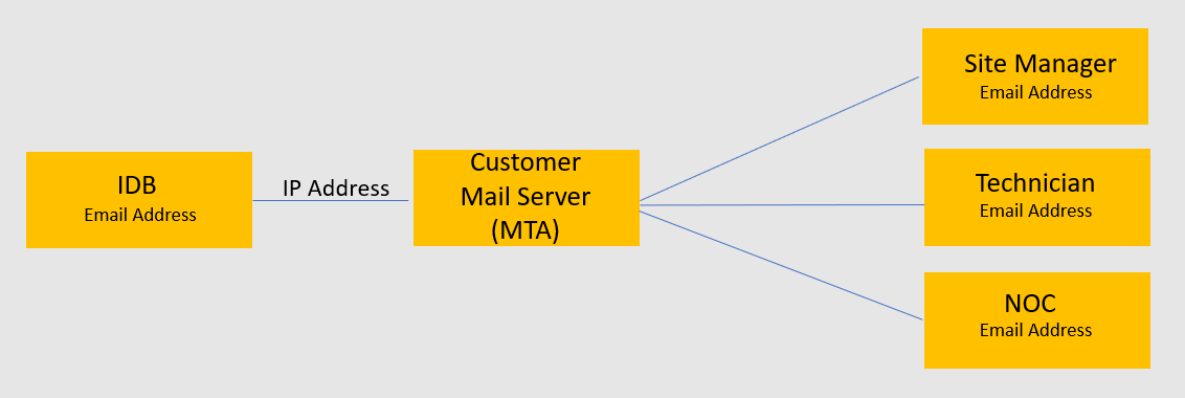
Add New Trap Destination

Description	Community String	IP Address	Trap Destination Test	Action
No matching records found				

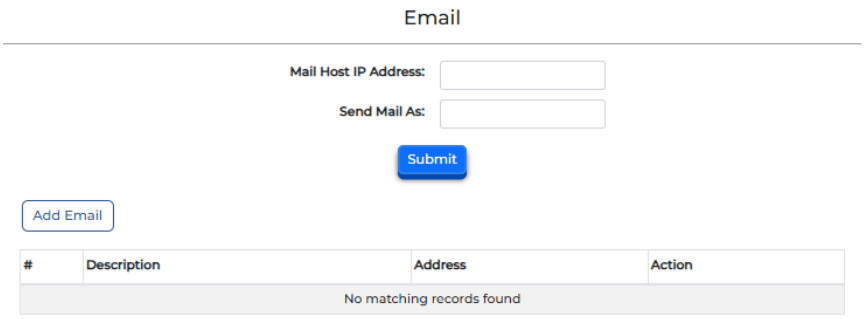
Email

Up to four separate email addresses can be assigned for alarm messages or Email Reporting. These are configured on the web pages at **Settings-Email.** Alarms are sent to email addresses at **Settings-Alarm Notification.**

The Email feature requires a Mail Host IP Address to connect the IDB to the mail server (MTA) within customers network. The IDB must also have an email address to communicate with the mail server. This email is configured in the “SEND MAIL AS” parameter located at **Settings-Email**.

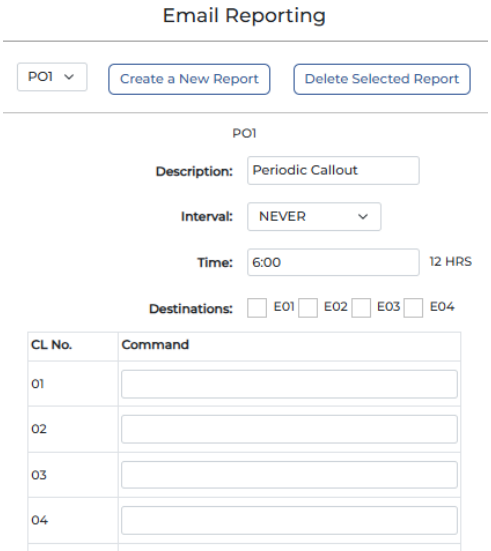


Email (continued)



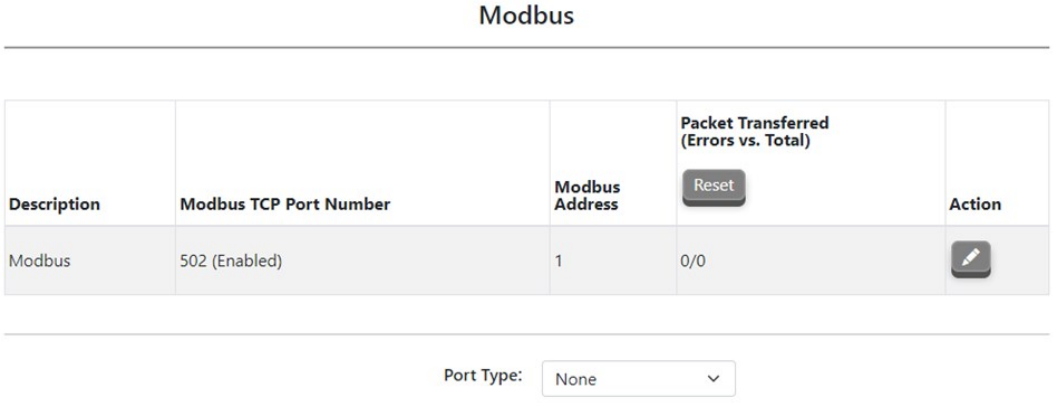
Email Reporting

Email Reporting uses T1.317 commands to send status information about the IDB to up to four email addresses at periodic time intervals. A T1.317 data dictionary is provided by navigating to documents -T1.317 data dictionary, Four separate status reports can be generated, each with their own delivery interval. Email Reporting is configured on the web pages at **Settings-Email Reporting**



Modbus

Another way to communicate with the controller is over Modbus. Modbus is configured on the web pages at **Settings-Modbus**. The modbus terminal block is designated TB1. The controller responds to modbus communication messages. A Modbus register table is provided by navigating to **Documents-Modbus Register Table.**

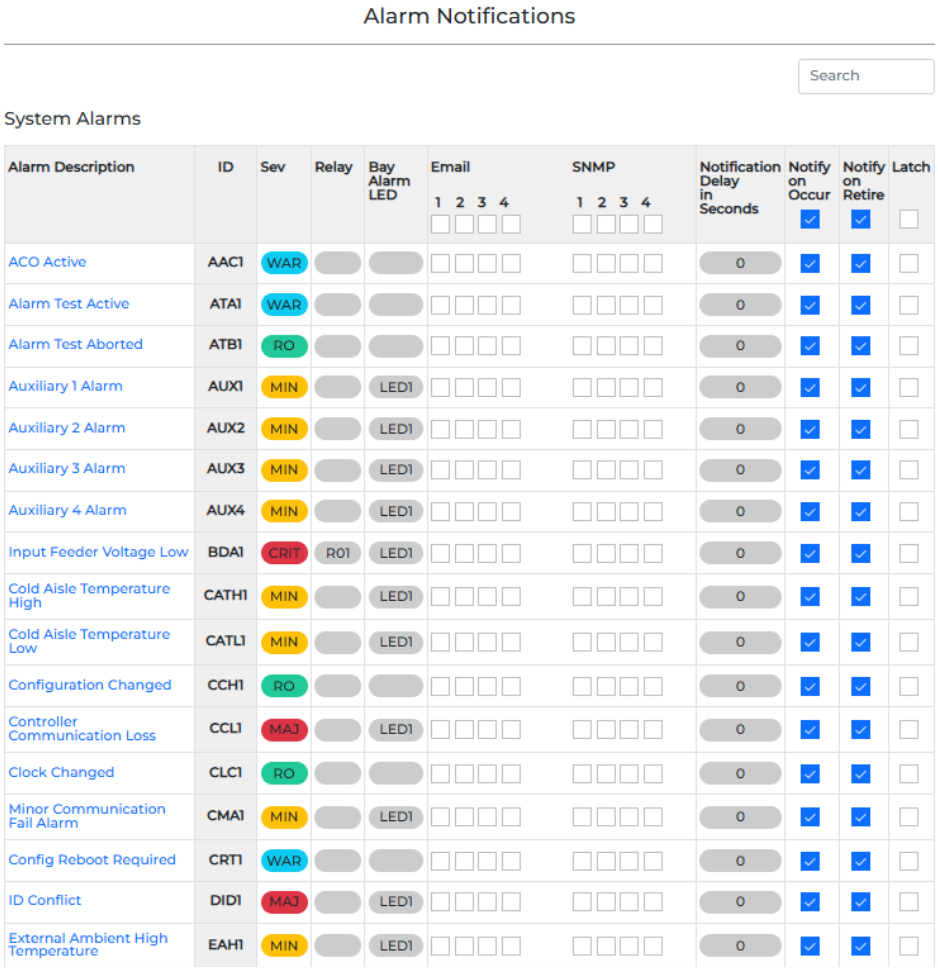


Alarms Notifications

Alarm notifications may be sent to specific SNMP trap locations, email addresses and alarm relays. Alarms are categorized as System Alarms, Panel Alarms, Circuit Breaker Alarms, Input Feeder Alarms and User Defined Event Alarms. These alarms are configured on the web pages at **Settings-Alarm Notifications.**

Each alarm is factory assigned a severity based on industry practices. However, they may be reassigned to PCR, MAJ, MIN, or RO (Record Only). An alarm condition with the RO severity results in the system controller transmitting the alarm without the severity but is stored in the history log. PCR, PMJ nor PMN are transmitted with the alarm. There are Seven User Alarm Relay. Relays are user definable in that the user may assign any combination of alarms to activate a relay. The following table shows a list of all alarms along with their descriptions, default settings, ranges and/or severity, assigned alarm relays and bay alarm LED. The output terminal block is identified as Output Alarms and designated TB1001 and TB1002.

ALARM RELAY DEFAULTS	
RELAY	**DESCRIPTION**
1	Power Loss
2	Circuit Breaker Trip
3	Overcurrent/ Overload
4	Hardware Failures
5-7	User Defined as Needed



External Ambient Very High Temperature	EAVH1	MIN		LED1	☐☐☐☐	☐☐☐☐	0	☑	☑	☐
External Password Reset	EPR1	WAR			☐☐☐☐	☐☐☐☐	0	☑	☑	☐
Excessive Login Attempts	EXL1	WAR			☐☐☐☐	☐☐☐☐	0	☑	☑	☐
Hot Aisle Temperature High	HATH1	MIN		LED1	☐☐☐☐	☐☐☐☐	0	☑	☑	☐
Hot Aisle Temperature Low	HATL1	MIN		LED1	☐☐☐☐	☐☐☐☐	0	☑	☑	☐
History Cleared	HCL1	RO			☐☐☐☐	☐☐☐☐	0	☑	☑	☐
Internal Ambient High Temperature	IAH1	MIN		LED1	☐☐☐☐	☐☐☐☐	0	☑	☑	☐
Internal Ambient Very High Temperature	IAVH1	MIN		LED1	☐☐☐☐	☐☐☐☐	0	☑	☑	☐
Major Communication Fail Alarm	MCM1	MAJ	R04	LED1	☐☐☐☐	☐☐☐☐	0	☑	☑	☐
Unconfigured Alarm Destination	NNC1	WAR			☐☐☐☐	☐☐☐☐	0	☑	☑	☐
Password At Default	PFD1	RO			☐☐☐☐	☐☐☐☐	0	☑	☑	☐
Program Line Invalid	PGI1	MIN		LED1	☐☐☐☐	☐☐☐☐	0	☑	☑	☐
Processor Halt	PHT1	WAR			☐☐☐☐	☐☐☐☐	0	☑	☑	☐
No Dial-Out Response	POR1	WAR			☐☐☐☐	☐☐☐☐	0	☑	☑	☐
Self Test Failed	STF1	RO			☐☐☐☐	☐☐☐☐	0	☑	☑	☐
Thermal Probe Failure	TPA1	MIN	R04	LED1	☐☐☐☐	☐☐☐☐	0	☑	☑	☐
USB Fault	USB1	MIN	R04	LED1	☐☐☐☐	☐☐☐☐	0	☑	☑	☐

Panel Alarms

Alarm Description	ID	Sev	Relay	Bay Alarm LED	Email 1 2 3 4	SNMP 1 2 3 4	Notification Delay in Seconds	Notify on Occur	Notify on Retire	Latch
					☐☐☐☐	☐☐☐☐		☑	☑	☐
Panel Fault	PAFL1	MAJ		LED1	☐☐☐☐	☐☐☐☐	0	☑	☑	☐
Panel Overload Latched	PAOL1	MAJ	R03	LED1	☐☐☐☐	☐☐☐☐	0	☑	☑	☐
Panel Overload	PAOV1	MAJ	R03	LED1	☐☐☐☐	☐☐☐☐	0	☑	☑	☐

Circuit Breaker Alarms

Alarm Description	ID	Sev	Relay	Bay Alarm LED	Email 1 2 3 4	SNMP 1 2 3 4	Notification Delay in Seconds	Notify on Occur	Notify on Retire	Latch
Standard Breaker Trip A	FAJA1	MAJ	R02	LED1	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐	0	☑	☑	☐
Standard Breaker Trip B	FAJB1	MAJ	R02	LED1	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐	0	☑	☑	☐
Circuit Breaker Fault	CBFL1	MAJ	R02	LED1	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐	0	☑	☑	☐
Circuit Breaker Health	CBHL1	WAR			☐ ☐ ☐ ☐	☐ ☐ ☐ ☐	0	☑	☑	☐
Circuit Breaker Off	CBOF1	RO			☐ ☐ ☐ ☐	☐ ☐ ☐ ☐	0	☑	☑	☐
Circuit Breaker Overload	CBOL1	MIN	R03	LED1	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐	0	☑	☑	☐
Circuit Breaker Overtemp	CBOT1	MIN	R03	LED1	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐	0	☑	☑	☐
Circuit Breaker Redundancy Fault	CBRL1	MIN	R03	LED1	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐	0	☑	☑	☐
Circuit Breaker Tripped	CBTR1	MAJ	R02	LED1	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐	0	☑	☑	☐
Circuit Breaker User Overload Latched	CBUL1	MIN	R03	LED1	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐	0	☑	☑	☐
Circuit Breaker User Overload	CBUO1	MIN	R03	LED1	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐	0	☑	☑	☐

Input Feeder Alarms

Alarm Description	ID	Sev	Relay	Bay Alarm LED	Email 1 2 3 4	SNMP 1 2 3 4	Notification Delay in Seconds	Notify on Occur	Notify on Retire	Latch
Input Feeder Overload Latched	IFOL1	CRIT	R03	LED1	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐	0	☑	☑	☐
Input Feeder Overload	IFOV1	CRIT	R03	LED1	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐	0	☑	☑	☐

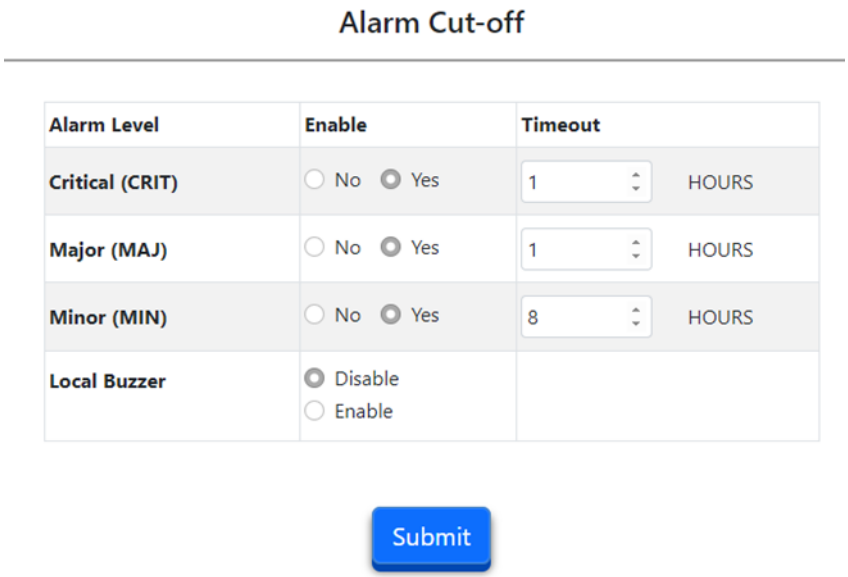
User Defined Event Alarms

Alarm Description	ID	Sev	Relay	Bay Alarm LED	Email 1 2 3 4	SNMP 1 2 3 4	Notification Delay in Seconds	Notify on Occur	Notify on Retire	Latch
No data found.										

Alarms Cut Off

The three levels of alarm notification can be set to time-out after a certain amount of time. These settings are found on the web pages at **Settings – Alarm-Cut Off.**

The local buzzer can also be enabled/disabled both here and at **Settings Preferences.**

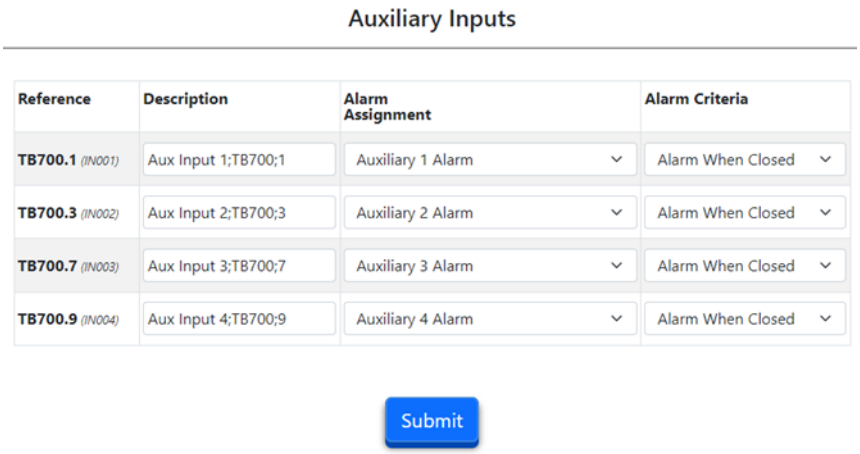


Programming Settings

The controller can accept alarm inputs as well as create user defined events (UDE), bulk data and derived channels.

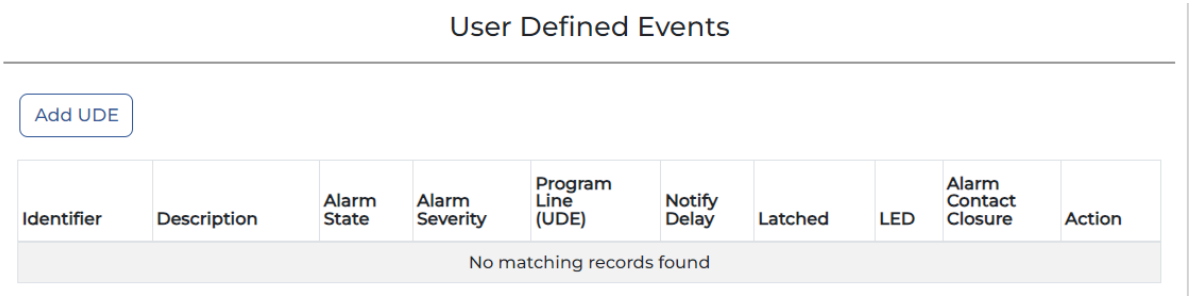
Auxiliary Inputs

There are four dry contact closures on the controller for accepting external alarms. These alarms are identified on the web page **Settings-Auxiliary Inputs**. The four input alarms are identified with a signal description, an alarm assignment and whether it alarms when closed or when open. The input terminal block is identified as Input Alarms and designated TB700.



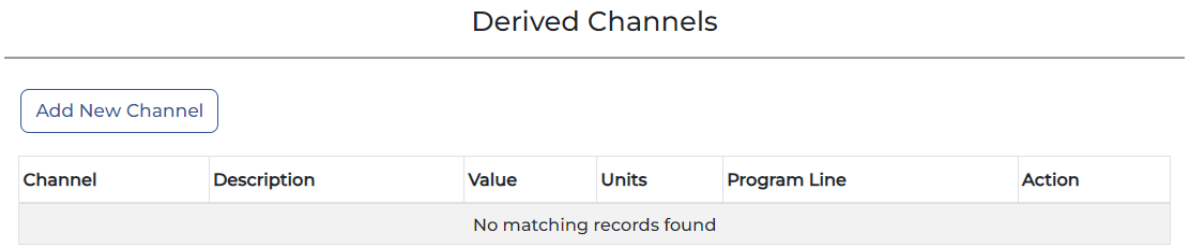
User Defined Events

User Defined Events (UDE) can be defined using T1.317 variables and basic mathematical operators to create a specific program line. Once the event is created, it has similar attributes to other alarms. These UDEs are configured on the web page **Settings-User Defined Events**. Creation of UDEs is described further at **Documents-UDE Help.**



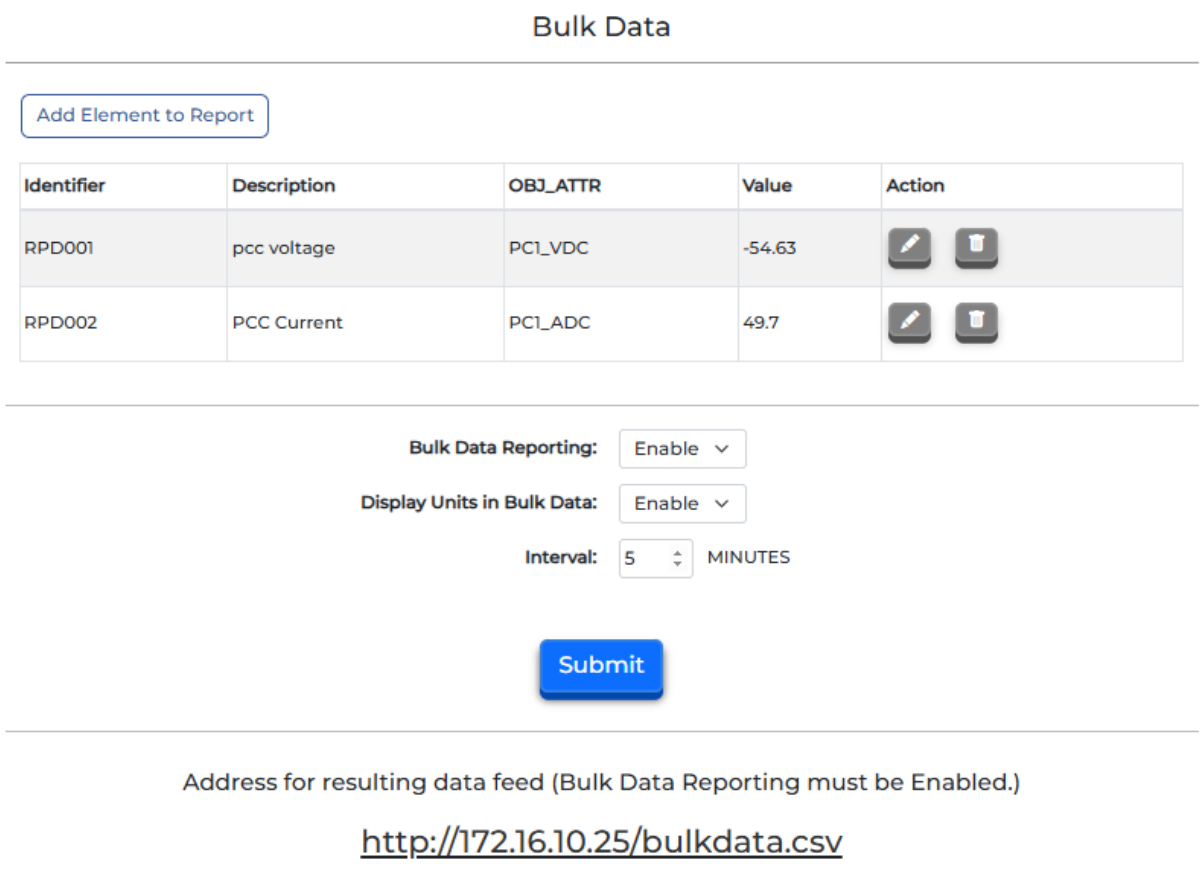
Derived Channels

Derived Channels can be defined using T1.317 variables and basic mathematical operators to create a specific program line. Once the event is created, it has similar attributes to other alarms. These channels are configured on the web page **Settings-Derived Channels.**



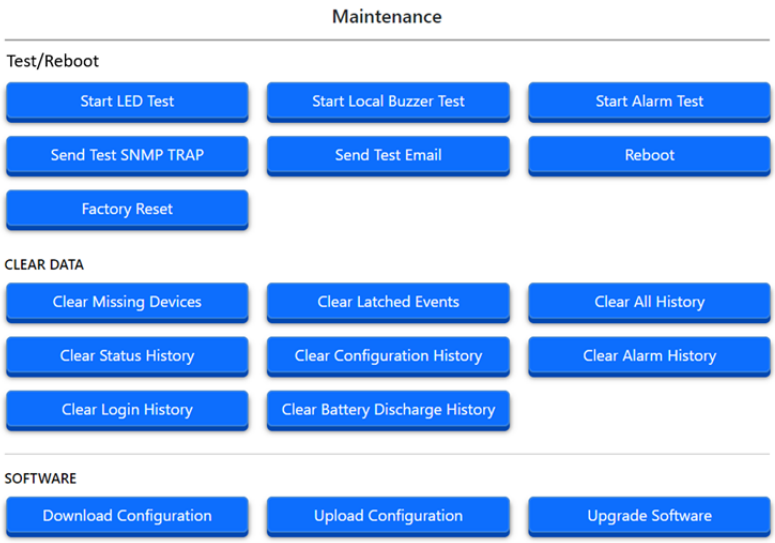
Bulk Data

Bulk Data Reporting is used to send data using T1.317(object, attributes) to a file stored in the controller at the IP address listed below. Customer may want to look at voltage or current over time, for example, and store that data in a file. These channels are configured on the web page **Settings-Bulk Data.**



Maintenance

These operations are generally performed post installation and during maintenance windows. There are three categories of Maintenance: Test/Reboot, Clear Data, and Software.



Test/Reboot:

Start Lamp Test: temporarily illuminates all status indicators on breakers, IPCC modules and controller.

Start Local Buzzer Test: temporarily activates buzzer if it is enabled in Settings.

Start Alarm Test: sequentially operates some or all of the output relays as programmed in Settings.

Send Test SNMP Trap: generates the configured SNMP traps to network server without having to generate an actual alarm. All assigned traps are sent out at once.

Send Test Email: sends email to all addresses setup in Settings.

Reboot: restarts the controller.

Factory Reset: resets controller to its original factory defaults.

Clear Data:

Clear Missing Devices: clears alarms generated when components are removed like breakers and IPCC modules. Allows controller to reinventory equipment.

Clear Latched Events: used to clear latched events or alarms.

Clear All History: clears all controller history.

Clear State History: clears only state history. These are logged device states.

Clear Configured History: clears only configuration history.

Clear Alarm History: clears only alarm history.

Clear Login History: clears only login history.

Clear Battery Discharge History: clears only low bus voltage history.

Software:

Download Configuration: downloads current config.gal file of the controller.

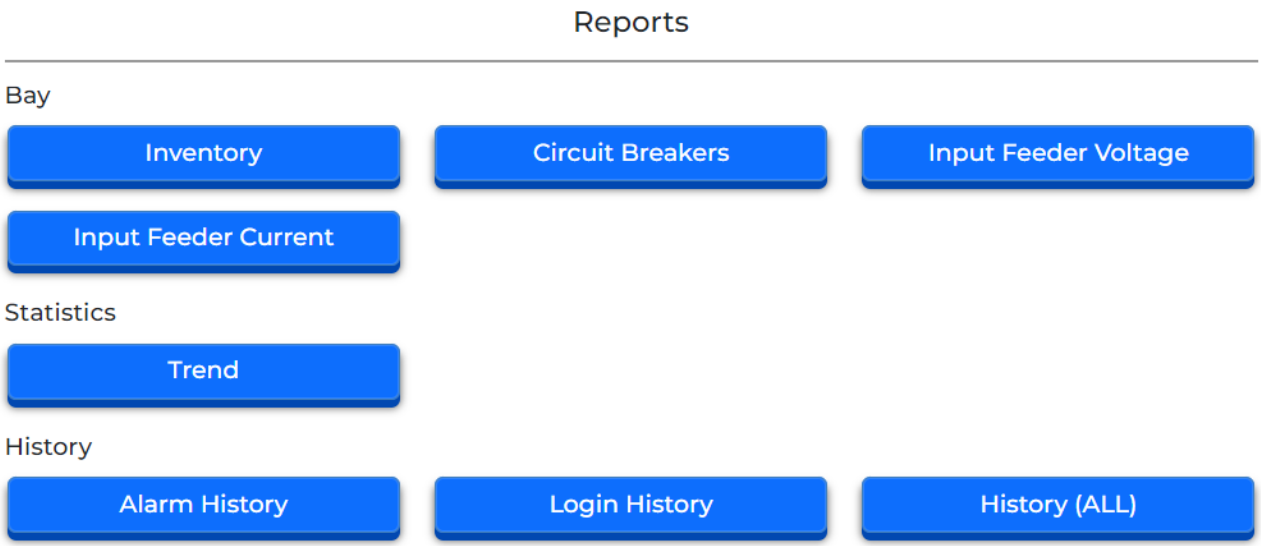
Upload Configuration: uploads a new config.gal file to controller.

Upgrade Software: provides path to upgrade various software components in the controller. These include boot block, defaults, web pages, application code etc.

These software functions can also be performed from the front panel using a USB stick.

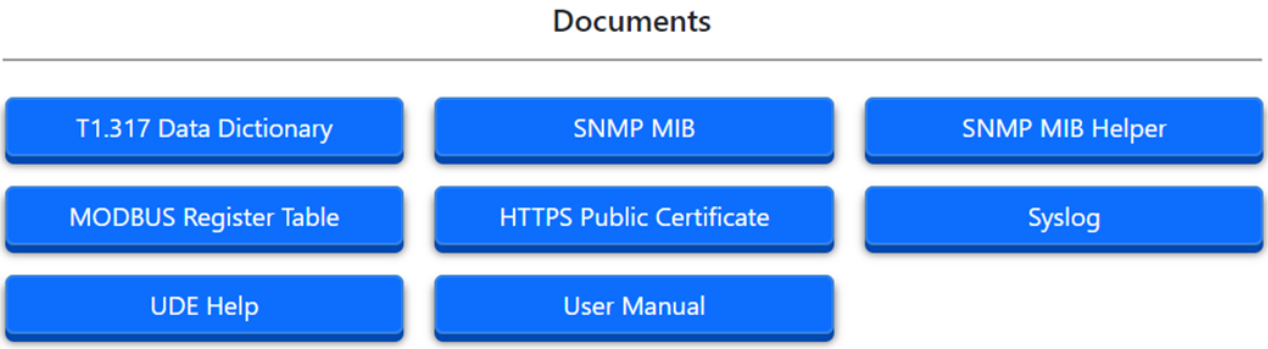
Reports

The Reports page provides information about the bay that can be exported as external files. These include Inventory of all comcoded items in bay, Input Feeder Voltage Charts, Circuit Breaker Configurations, Input Feeder Current Charts, Trend Statistics, Alarm History, Login History and All History.



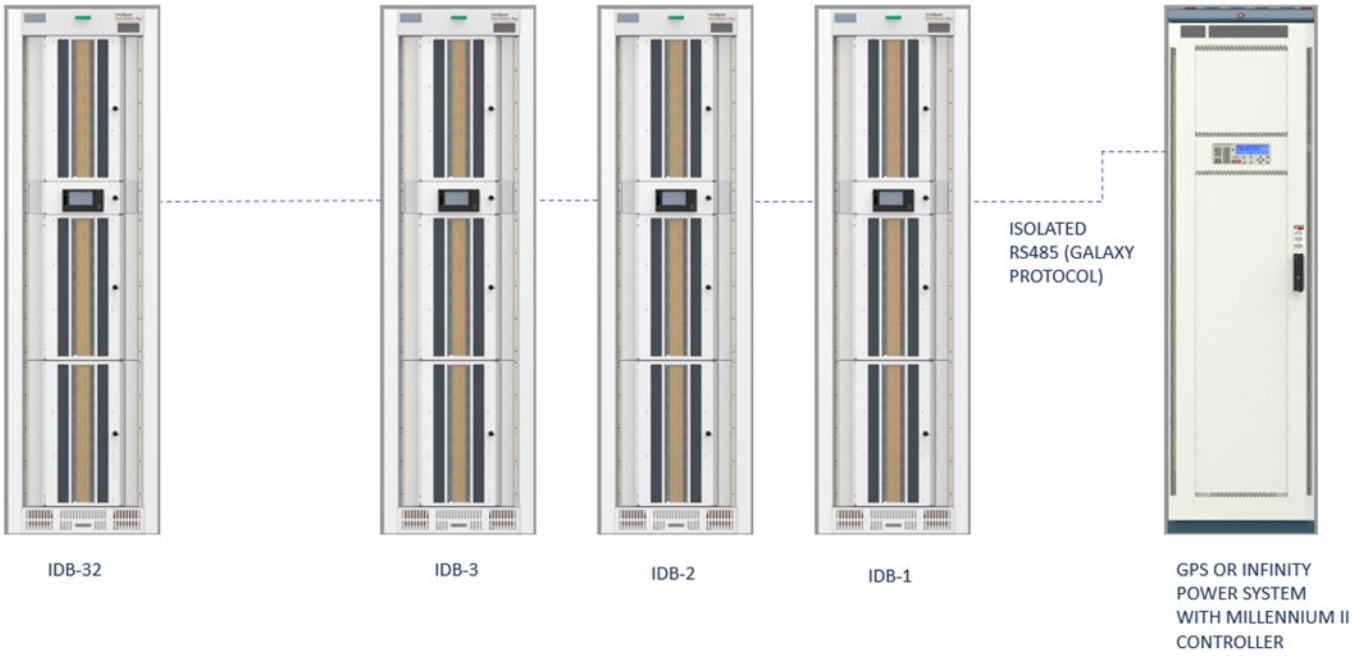
Documents

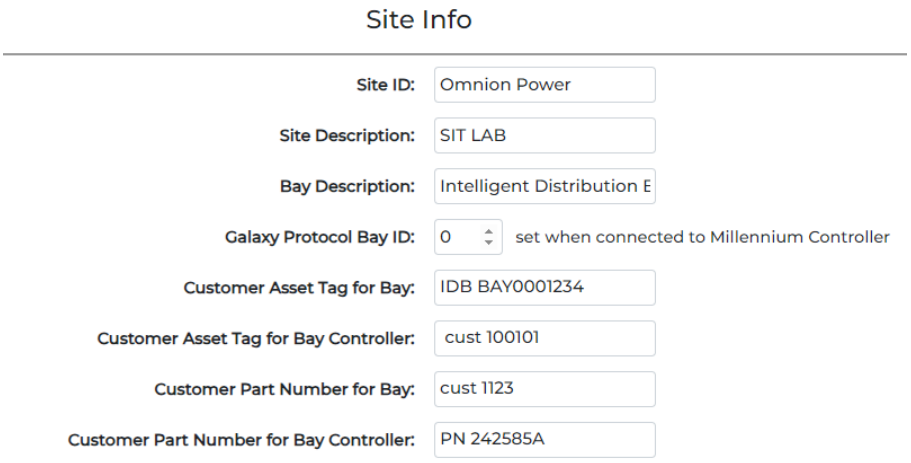
The Documents page provides helpful programming documents including a library of advanced network information pertaining to T1.317 Data Dictionary, SNMP MIB, SNMP MIB Helper, MODBUS Register Table, HTTPS Public Certificate and Syslog. There is also a UDE Help document for help configuring User Defined Alarms. A copy of this product manual is also available here.



Remote Connection to Millennium II Controller (Galaxy Protocol)

There are two Data Ports to allow RS485 Galaxy Protocol (GP) daisy-chain communication between additional IDB's and the primary controller. This setup is optional. Each IDB connected to the Millennium controller must have a unique ID to allow the controller to differentiate between the bays. This ID setting is found on the web pages under **Menu-Settings-Site Info.** It is called Galaxy Protocol Bay ID. Up to 32 bays can communicate with the Millennium controller.





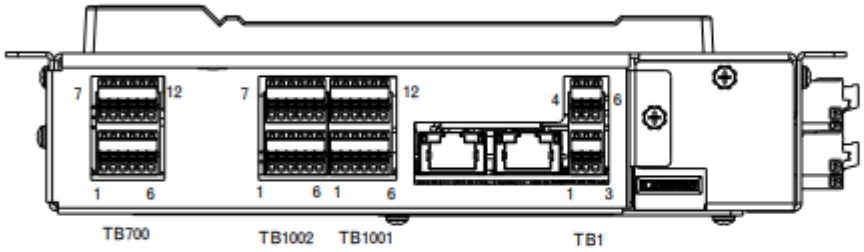
Controller Terminal Block Designations

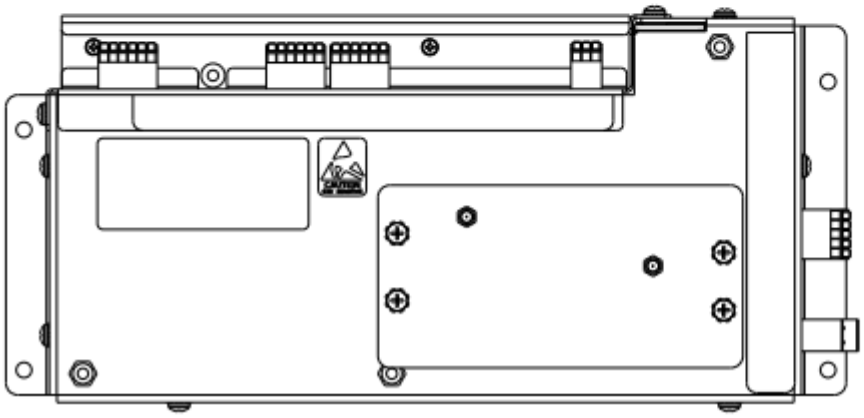
TB700
1: AUX1-ALM IN
2: ALM-RTN
3: AUX2-ALM IN
4: N/C
5: N/C
6: N/C
7: AUX3-ALM IN
8: ALM-RTN
9: AUX4-ALM IN
10: N/C
11: N/C
12: N/C

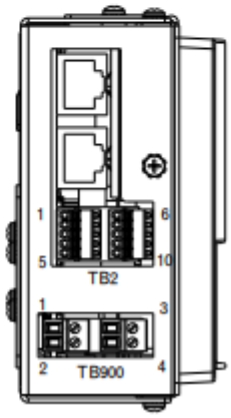
TB1002
1: RLY5-NC
2: RLY5-C
3: RLY5-NO
4: RLY6-NC
5: RLY6-C
6: RLY6-NO
7: RLY7-NC
8: RLY7-C
9: RLY7-NO
10: RLY8-NC
11: RLY8-C
12: RLY8-NO

TB1001
1: RLY1-NC
2: RLY1-C
3: RLY1-NO
4: RLY2-NC
5: RLY2-C
6: RLY2-NO
7: RLY3-NC
8: RLY3-C
9: RLY3-NO
10: RLY4-NC
11: RLY4-C
12: RLY4-NO

TB1
1: 1W (THERMAL PROBE
2: 1W-RTN
3: N/C
4: MODBUS A
5: MODBUS B
6: MODBUS RTN







TB2
1: N/C
2: AGND
3: +12V OUT
4: RS485+
5: RS485-
6: N/C
7: AGND
8: +12V IN
9: RS485+
10: RS485-

TB900
1: VB1+
2: VB1-
3: VB2+
4: VB2-

Menu Maps

Front Panel

System Config

General Settings

- Set Temp Units C/F
- Set Units Amps/Watts
- Enable/Disable Local Buzzer
- Enable/Disable Network Write Access
- Set Bay ID
- Set Time Clear Missing Device Popup Window Appears

Maintenance

System Controller

- Start LED Test
- Start Local Buzzer Test
- Start Alarm Test
- Reboot
- Factory Reset
- Software
  - Download Configuration
  - Upload Configuration
  - Upgrade Software

Clear Data

- Clear Missing Devices
- Clear Latched Events

Network

- Set DHCP Client/Static
- Set IPv4
- Set IPv6

Reports

Alarm History

Export History

Panel Usage

Temperature

- Monitor Ambient, Cold Aisle and Hot Aisle Temperature Probes if Installed

About

- General Product Information: Software Version, Bay Serial Number, Bay Description, Site Info etc.

Web Pages

Settings

Configuration

- Site Information
- Date/Time
- Preferences
  - Set Temp Units C/F
  - Set Units Amps/Watts
  - Enable/Disable Local Buzzer
  - Set Time Clear Missing Device Popup Window Appears
- Bay
- Panels
- Input Feeds
- Breaker LED Config
- Temperature Monitors
- Alarm Test

Communication

- User Admin
- Security
- Network
- SNMP
- Email
- Periodic Callout
- Modbus
- Alarm Notifications
- Alarm Cut-Off

Programming

- Auxiliary Inputs
- Derived Channels
- Bulk Data
- User Defined Events

Maintenance

Test/Reboot

- Start LED Test
- Start Local Buzzer Test
- Start Alarm Test
- Send Test SNMP Trap
- Send Test Email
- Reboot
- Factory Reset

Clear Data

- Clear Missing Devices
- Clear Latched Events
- Clear All History
- Clear Status History
- Clear Configuration History
- Clear Alarm History
- Clear Login History
- Clear Battery Discharge History

Software

- Download Configuration
- Upload Configuration
- Upgrade Software

Help

- Technical Support Phone Number and Email
- Search

Reports

Bay

- Inventory
- Circuit Breakers
- Input Feeder Voltage
- Input Feeder Current

Statistics

- Trend

History

- Alarm History
- Login History
- History (ALL)

Documents

- T1.317 Data Dictionary
- SNMP MIB
- SNMP MIB Helper
- MODBUS Register Table
- HTTPS Public Certificate
- Syslog
- UDE Help
- User Manual

Temperature

- Monitor Cold Aisle, Hot Aisle and Ambient Temperature Probes if Installed

About

- General Product Information: Software Version, Bay Serial Number, Bay Description, Site Info etc.

Wiring Schematics

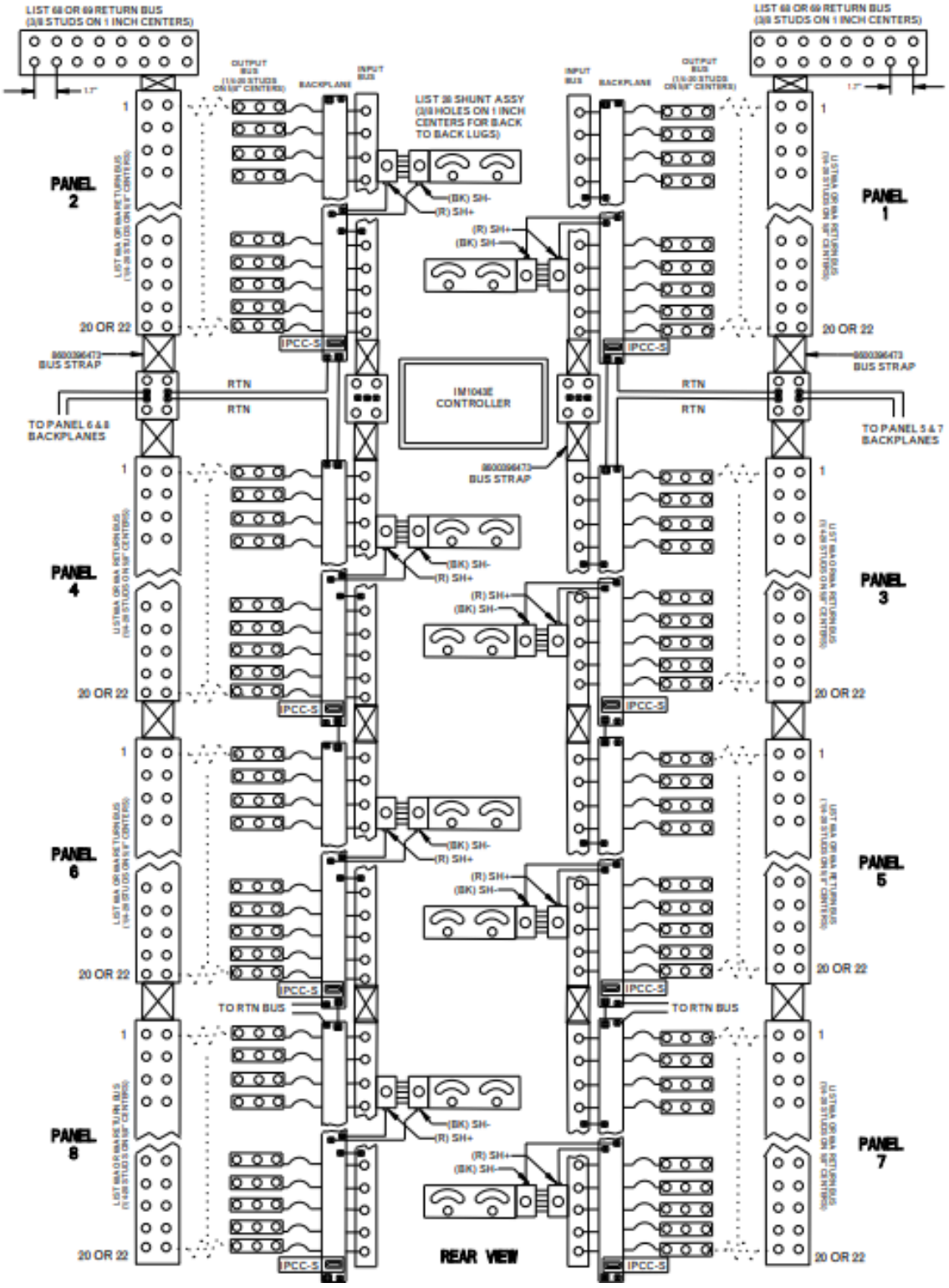


Figure 29 Panel Wiring Schematic with Load Shunts

Wiring Schematics (continued)

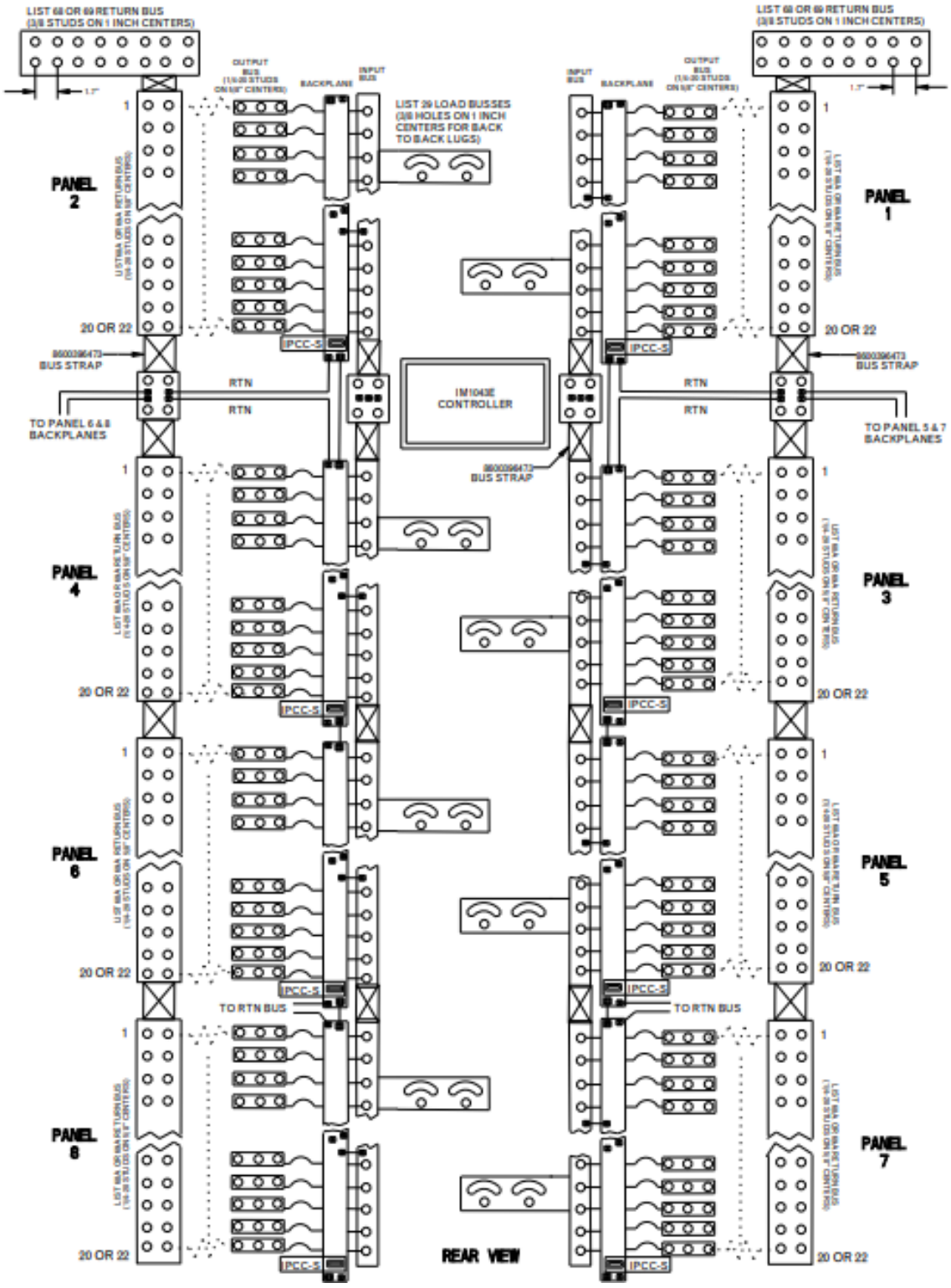


Figure 30 Panel Wiring Schematic with Connection Busses

Specifications

Electrical			
Voltage:	-48Vdc (-36 to -60Vdc)		
Output Current:	800A per panel, up to 6400A per bay		
Number of Input Load Busses:	2, 4, 6 or 8		
Outputs per Panel:	20 or 22 positions per panel		
Over Current Protectors:	TPS/TPL Plug-in bullet up to 125A (Standard only) Single pole breaker up to 100A (Standard or Intelligent) Double pole breaker up to 200A (Standard or Intelligent) Triple pole breaker up to 300A (Standard or Intelligent)		
Distribution and Bus Terminations			
Cabinet Ground Connection:	3/8” dia on 1” centers		
Input Bus Connections:	3/8” dia on 1” centers spaced 1-3/4” apart		
Output Breaker Connection:	Single pole: ¼-20 studs on 5/8” centers (2awg max) Double and Triple pole: lug adapters 3/8” dia on 1” centers		
Output Internal Return Connection:	Single pole: ¼-20 studs on 5/8” centers (2awg max) Double and Triple pole: lug adapters 3/8” dia on 1” centers		
Output External Return Connection:	28 landings for ¼” bolted lugs on 5/8” centers 40 landings for 3/8” bolted lugs on 1” centers		
Mechanical			
G401 Black Cabinet G402 White Cabinet	inches: 84H x 30W x 24D	mm: 2134H x 762W x 610D	weight 450lbs
G403 Black Cabinet G404 White Cabinet	inches: 84H x 26W x 28D	mm: 2134H x 660W x 711D	weight 425lbs
Environmental			
Environment:	Use this equipment in a controlled environment (an area where the humidity is maintained at levels that cannot cause condensation on the equipment, the contaminating dust is controlled, and the steady-state ambient temperature is within the range specified).		
Temperature:	0 to 40°C (32 to 104F)		
Humidity:	0 to 95% RH non-condensing		
Elevation:	-500 to 2800m (-1640 to 9186ft)		
Agency Compliance			
Safety:	CSA C22.2 No., UL Listed (cULus) 60950-1, NEBS level 3 certification		

Safety

Safety Statements

- Do not install this equipment on combustible surfaces
- Rules and Regulations - Follow all national and local rules and regulations when making field connections.
- Compression Connectors
    - U. S. or Canada installations - use Listed/Certified compression connectors to terminate Listed/Certified field-wire conductors.
    - All installations - apply the appropriate connector to the correct size conductor as specified by the connector manufacturer, using only the connector manufacturer's recommended or approved tooling for that connector.
- Electrical Connection Securing: Torque to the values specified on labels or in the product documentation.
- Cable Dress - dress to avoid damage to the conductors and undue stress on the connectors.
- Circuit Breakers and Fuses
    - Use only those specified in the equipment ordering guide.
    - Size as required by the National Electric Code (NEC) and/or local codes.
    - Safety Tested Limits - Refer to the equipment ratings to assure current does not exceed:
      Continuous Load (List 1) - 60% of protector rating
      Maximum Load (List 2 - typically end of discharge) - 80% of protector rating.
    - GMT Style Fuses - Use only fuses provided with safety caps.
    - Field-wired Conductors - Follow all National Electric Code (NEC) and local rules and regulations.
    - Insulation rating: 90°C minimum; 105°C (minimum) if internal to enclosed equipment cabinets.
    - Size AC field-wired conductors with 75°C ampacity (NEC) equal to or greater than their panel board circuit breaker rating.
- AC and DC input disconnect/protection - Provide accessible devices to remove input power in an emergency.
- Alarm Signals - Provide external current limiting protection. Rating 60V, 0.5A unless otherwise noted.
- Grounding - Connect the equipment chassis directly to ground. In enclosed equipment cabinets connect to the cabinet AC.

Precautions

- Install, service, and operate equipment only by professional, skilled and qualified personnel who have the necessary knowledge and practical experience with electrical equipment and who understand the hazards that can arise when working on this type of equipment.

- Disconnect batteries from outputs and/or follow safety procedures while working on equipment. Batteries may be connected in parallel with the output of the rectifiers. Turning off the rectifiers will not necessarily remove power from the bus.

- Do not disconnect permanent bonding connections unless all power inputs are disconnected.

- Verify that equipment is properly safety earth grounded before connecting power. High leakage currents may be possible.

- Exercise care and follow all safety warnings and practices when servicing this equipment. Hazardous energy and voltages are present in the unit and on the interface cables that can shock or cause serious injury.

- Use the following precautions in addition to proper job training and safety procedures:

    - Use only properly insulated tools.

    - Remove all metallic objects (key chains, glasses, rings, watches, or other jewelry).

    - Follow Lock Out Tag Out (LOTO) procedures: customer specified, site specific, or general as appropriate.

    - Disconnect all power input before servicing the equipment. Check for multiple power inputs.

    - Wear safety glasses.

    - Follow Personal Protective Equipment requirements: customer specified, site specific, or general as appropriate.

    - Test circuits before touching.

    - Be aware of potential hazards before servicing equipment.

    - Identify exposed hazardous electrical potentials on connectors, wiring, etc.

    - Avoid contacting circuits when removing or replacing covers;.

    - Use a personal ESD strap when accessing or removing electronic components.

    - Follow procedures for working at heights more than 4ft above the floor: customer specified, site specific, or general as appropriate.

- Personnel with electronic medical devices need to be aware that proximity to DC power and distribution systems, including batteries and cables, typically found in telecommunications utility rooms, can affect medical electronic devices, such as pacemakers. Effects decrease with distance.

Appendix A: Definitions

10/100 Base-T Port

Supports a web-based user interface using standard browsers. It can provide alarm and control information to a distributed or centralized Network Operation Center (NOC) using the Simple Network Management Protocol (SNMP) or the Transaction Machine Language (TL1), which allow the controller to provide alarm information to the NOC for integrated network management. The controller provides network access and control capability for users under the HTTP, HTTPS, Telnet, FTP, SMTP, SNMP, SHH and TL1 protocols. The typical protocol functions are as follows:

HTTP

HTTP (hypertext transfer protocol) is the foundation protocol of the World Wide Web (www) and can be used in any client-server application involving hypertext. HTTP makes use of TCP (transmission control protocol) for client to server connection and IP (internet protocol) for internetworking. The controller's standard HTTP protocol web pages provide integrated site information with an enhanced graphical user interface. The on-board HTTP web pages server is password protected for read/write privilege. Further access restrictions can be implemented using the software read/write disable capabilities configured through the front panel. The controller has a configurable timeout for connections that remain idle more than a user-programmed time period.

TELNET

Telnet provides remote log-on capability to a computer or server. The terminal-to-terminal connection with Telnet is based on a TCP connection for traffic between user and server. Once login is established, the controller will support this session until the "exit" command is received or the idle timeout limit is reached. A command line interface is used to view and configure the controller's features and thresholds. Backup, restore, and upgrade procedures may also be performed.

SNMP

SNMP (simple network management protocol) is the most dominant network management standard. It allows communication and control via open standards host systems for centralized management of multiple plants. A standard MIB for the controller is available on the web pages under **Menu-Documents**. Up to four SNMP alarm trap destinations can be programmed using the Network Settings link found in **Menu-Settings** tab of the web pages. Alarms then can be assigned under Alarm Notification also found in the **Menu-Settings** tab of the web pages.

SMTP

SMTP (simple mail transfer protocol) provides a basic electronic email facility. It provides a mechanism for transferring messages among separate hosts and browser applications. The protocol is used in Gateway for sending alarm messages and alerts through email.

FTP

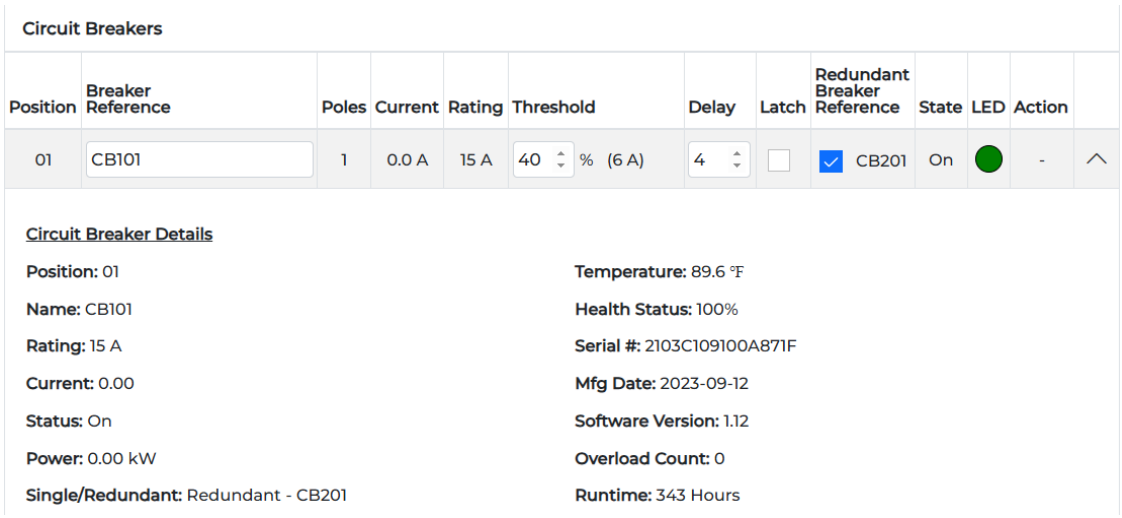
FTP (file transfer protocol) is used to send files from one system to another under user commands. The protocol is used with the controller for downloading files and upgrades through a TCP connection. Application software, default configuration file, and web pages are uploaded to the controller using FTP.

TL1

TL1 is the transaction language command interface that allows direct communication with a central monitoring system and is defined by Telcordia for various equipment. It allows communication and control via open standards host systems for centralized management of multiple plants. The protocol is typically used over an X.25 network for alarm reporting.

Health

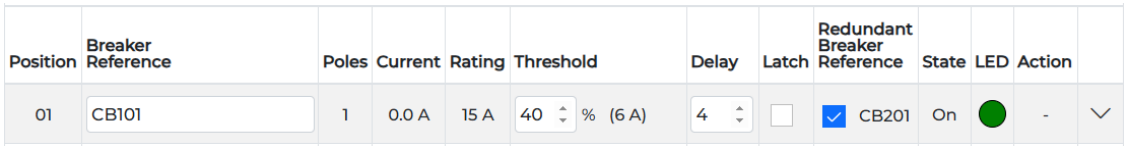
This is a calculated service life expectancy generated from the IPD's internal processing unit that monitors various parameters and events during the device's operating time. Life affecting parameters include excessive switching with and without load, overload conditions, operating temperature, runtime, etc., can all contribute to degrade the circuit breaker over time. Each IPD tracks these and other parameters for utilization in an internal algorithm that provides a recommendation time to replace. This recommendation time is expressed as a percentage of remaining service life. Consider replacing circuit breaker when Health % reaches zero. This feature is only a recommendation. A breaker that is damaged should be replaced regardless of showing a positive health value. Health is located in the drop down information box for each IPD breaker populated on a panel.



Redundancy

Some loads require both primary and backup power. This is often referred to as an A/B power feed or redundant power feed. The controller allows every breaker on the panel to be identified as either redundant or independent. If the redundant breaker reference is checked, redundant alarms will be generated for the following conditions:

1. Redundant breaker is missing, off or in overload tripped
2. Redundant breaker ratings are different



Delay

This is a time delay set in seconds before an alarm is generated. This delay is often used to prevent nuisance alarms from being generated and reported.

Latch

When alarms are generated, they alarm until the alarm condition no longer exists and then they retire. If any alarm is designated as a latched alarm, the alarm will stay activated until it is manually retired (unlatched) by the user.

Threshold

Alarm Threshold is a percentage of the maximum value at which an alarm is generated. There are three alarm threshold settings in the IDB. **Input Feeder Threshold** is a percentage of the ampacity rating of the circuit breaker at the power plant feeding the panel(s). It is typically set to 80% of that breakers rating. **Panel Threshold** is a percentage of the panel's 800A ampacity rating. It is typically set at 80% of this 800A panel rating. **Circuit Breaker Threshold** is a percentage of the circuit breaker's rated ampacity. This is typically set to 40% for redundant breakers and 80% for non-redundant breakers.

Appendix B: Circuit Breaker and Fuse Options

Intelligent Protection Devices (IPDs)

Part Number	Rating	# of poles	Picture
4600397167P	5A	1	
4600397168P	10A	1	
4600397169P	15A	1	
4600397170P	16A	1	
4600397171P	20A	1	
4600397172P	25A	1	
4600397173P	30A	1	
4600397174P	40A	1	
4600397175P	50A	1	
4600397176P	60A	1	
4600397177P	70A	1	
4600397178P	80A	1	
4600397179P	90A	1	
4600397180P	100A	1	
4600410581P	125A	2	
4600410582P	150A	2	
4600410585P	175A	2	
4600410586P	200A	2	
4600410587P	225A	3	
4600410588P	250A	3	
4600410589P	300A	3	
8600483214P	2-Position Adapter Bus Kit (one required for 2-pole IPD and one for internal return bus)		
8600483215P	3-Position Adapter Bus Kit (one required for 3-pole IPD and one for internal return bus)		

Note 1: All IPDs are rated for $80V_{DC}$ and 10KAIC interrupt rating

Standard Bullet Style Load Circuit Breakers

Ordering Code	Amperage	CB Positions (Poles)	Min Wire Gauge	Picture
407998137	3	1	10	
407998145	5	1	10	
407998152	10	1	10	
407998160	15	1	10	
407998178	16	1	10	
407998186	20	1	10	
407998194	25	1	10	
407998202	30	1	10	
408213486	40	1	8	
407998210	45	1	8	
407998228	50	1	6	
407998236	60	1	6	
407998244	70	1	2	
407998251	80	1	2	
407998269	90	1	2	
407998277	100	1	2	
CC848808551	100	2	2	
408185353	125	2	2	
408185346	150	2	1/0	
450023081	175	2	1/0	
408564941	200	3	2/0	
CC408573975	225	3	4/0	
408535752	250	3	4/0	

TPS/TLS Fuses

Ordering Code	Amperage	Ordering Code	Amperage	Picture
406700567	3	406700658	40	
406700583	5	406700674	50	
406700591	6	406700682	60	
406700609	10	406700690	70	
406700617	15	CC408618020	80	
406700625	20	CC408618037	90	
406700633	25	CC408618045	100	
406700641	30	CC408618061	125	
402328926	0.18 Alarm Fuse			
408548944	Bullet Fuse Holder, TFD-101-011-09 (Alarms on Blown Fuse or Fuse Head Removal)			
CC408617410	Bullet Fuse Holder, TFD-102-011-10 (Alarms on Blown Fuse Only)			

Appendix C: T1.317 Command Language

The controller command language is based on the T1.317 standard. This section describes the commands, objects and attributes used to access measurements, configuration, and control parameters in the controller. On the web pages, go to **Menu-Documents** for a T1.317 Data Dictionary.

Objects and Attributes

The T1.317 standard organizes system parameters called attributes into groups called objects.

An object-attribute pair uniquely identifies a measurement, configuration, or control parameter. For example, the object-attribute pair “dc1,vdc” identifies the plant voltage while the object-attribute pair “dc1,adc” identifies the plant load current. In each of these examples “dc1” identifies the plant object and “vdc” and “adc” identify DC voltage and DC current, respectively.

There are three main commands involved with plant operations in the system controller command set. The command “sta” is used to get the status of the plant, the command “cha” is used to change a plant parameter, and the command “ope” is used to initiate a plant function. A person at the “user” level can only perform the sta operations. A person at the “super-user” and “administrator” level can also perform the "cha" and "ope" operations.

Instructions in the T1.317 command set take the following form:

command object,attribute[=parameter].

Certain commands do not require a value for parameter, while others do. Note that text parameters are to be enclosed in quotation marks while numeric parameters are not to be enclosed in quotation marks.

Appendix D: SNMP

SNMP Overview

In addition to supporting the basic protocols (Telnet, HTTP, FTP, and SMTP) on TCP/IP, the controller supports conveying system alarm and control information to a Network Operation Center (NOC) using the Simple Network Management Protocol (SNMP). SNMP is the most popular protocol for managing diverse networks. Using SNMP to access management information data and retrieve alarm information can allow company personnel to more easily manage system performance and remotely find and solve system problems. A controller serves as an SNMP Agent. A SNMP Host system is used to communicate to a multitude of SNMP Agents. A number of SNMP Host packages are available such as HP OpenView, Castle Rock Computing SNMPc, IBM NetView, Lucent OneVision, and Sun Micro's NetManager. OmniOn Power™ also provides a SNMP Host focused on the needs of the power engineer with its Manager product.

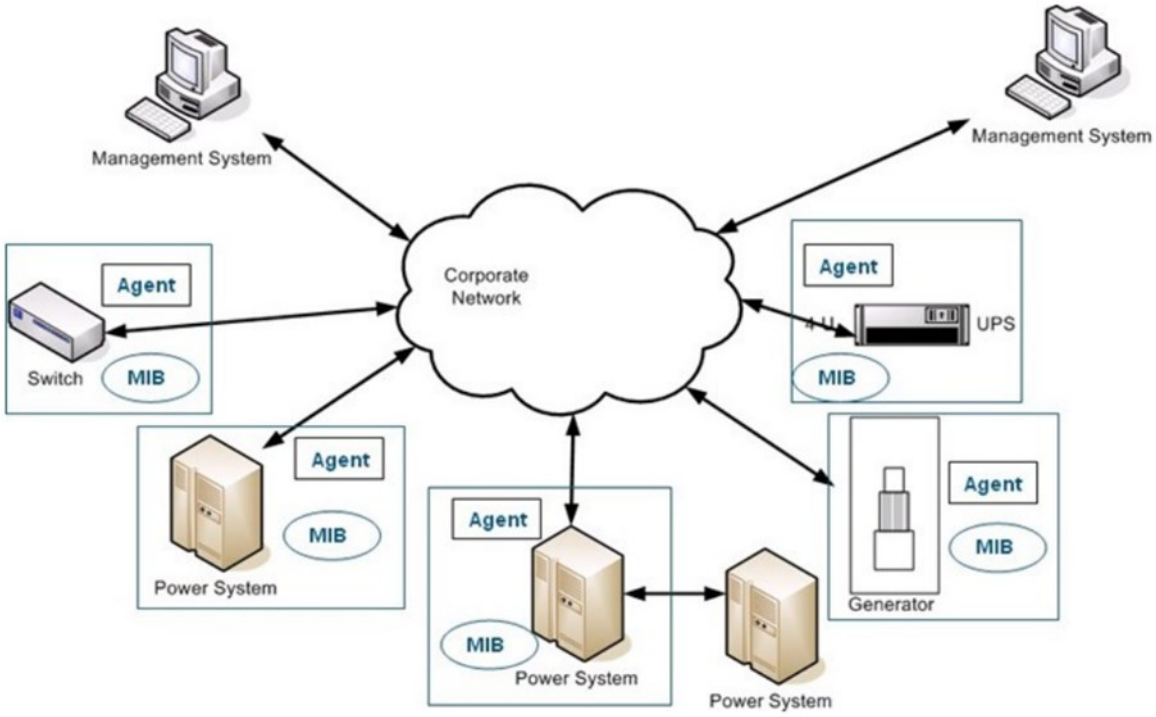


Figure D-1: Typical Network Monitoring Layout

Simple Network Management Protocol is an application-layer protocol designed to facilitate the exchange of management information between network devices. There have been several releases of SNMP in its history and the controller implements an SNMPv2C Agent. SNMPv2C is backwards compatible with SNMPv1.

A key part of the SNMP protocol is the detailed Management Information Base (MIB) that describes all Agent variables that can be accessed. For the controller, this includes all the objects controlled or monitored in the system such as: distribution monitoring cards, alarms, etc. Essentially, all elements described in the T1.317 protocol are available in SNMP. The MIB will be needed by any SNMP Host that wishes to communicate with the controller and can be retrieved from **Documents** section of web page.

SNMP Operations

Interactions between the SNMP Host and the SNMP Agent can be any of four different types of commands: Reads, Writes, Traversal operations, and Traps. SNMP utilizes six operations to respond to the various SNMP Hosts: Get, GetNext, GetBulk, Set, Trap, and Inform. The controller implements the Get, GetNext, Set, and Trap operations.

- **Get** - Allows the SNMP Host to retrieve a value from the SNMP Agent.
- **GetNext** - Allows the SNMP Host to retrieve the next value in sequence from a table or list of variables in the SNMP Agent.
- **Set** - Allows the SNMP Host to set a value within the SNMP Agent.
- **Trap** - Used by the SNMP Agent (the power system controller) to asynchronously inform the SNMP Host of an event such as an alarm notification. Unlike the other operations, the trap does not require a response from the host. The SNMP Agent must be configured with appropriate addresses of the SNMP Host.

SNMP Configuration

SNMP functionality is always available. No enabling or disabling of the feature is required. Appropriate trap destinations and assignments of specific alarms must be configured for SNMP to properly send out Traps. Users can configure these SNMP parameters from the browser interface. They may also be configured from a Telnet command line interface.

Configuration of the IP addresses for Trap destinations is performed under the **Menu - Settings - SNMP** tab. The controller supports up to four different destinations for SNMP messages. Each destination (1 through 4) is configured with an IP address. The sample screen for this configuration follows.

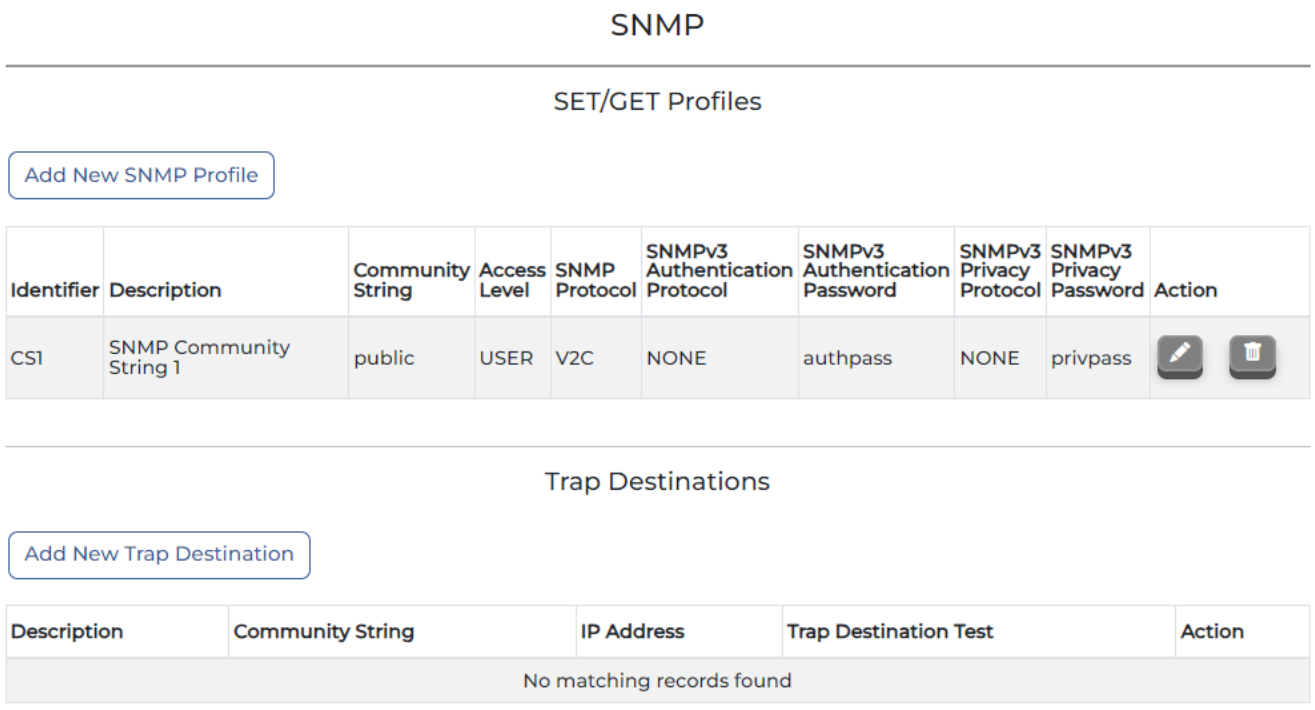


Figure D-2: SNMP Settings Screen

Individual alarms or events are assigned as Traps to one of the four specific SNMP destinations. Assignment of the alarm and events is performed under the “Alarm Notification” link under the main configuration “Settings” tab. The sample screen for this configuration follows.

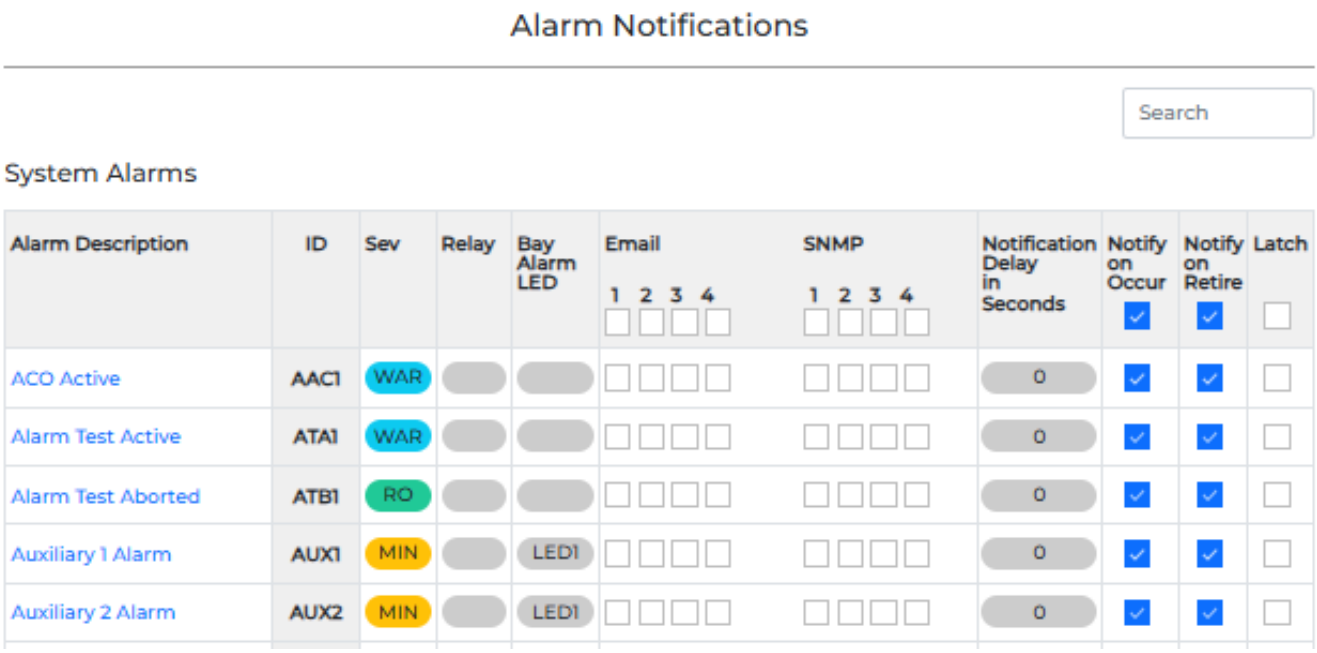


Figure D-3: Alarm Notifications Screen

Community Strings

SNMP Community Strings can serve as trap destinations as well as passwords or user IDs for network elements. The community name assigns an access environment for a set of SNMP Hosts or Agents using that community name. An SNMP Host or Agent within the community can be said to exist within the same administrative domain. Because devices that do not know the proper community name are precluded from SNMP operations, network management personnel can use the community name as a weak form of authentication. Community strings can be either read only or read/write. Having this capability provides further security by restricting the ability to alter the configuration of the managed device.

The controller defaults the value of the community string to “public” with read/write access. There are also up to three Set/Get community strings that can be used. These are defaulted as “public”, “public-write”, and “private” with the last two having read/write access.

Appendix E: Secure Protocols

Secured protocols include support for the SNMPv3, IPv6, HTTPS/SSL, SSH, and SFTP protocols.

Reboot Required

Configuration changes involving IP addresses and protocol operational mode variable items require a reboot. Allow the controller to run for at least 2 minutes following a saved change to ensure the change has been saved to non-volatile memory before powering the unit down or any rebooting operation.

Security

Security related settings are found on the web pages under **Menu-Settings-Security**.

The network related items are:

- Port behavior on failed login attempts (number of failed attempts allowed value of 3-10 attempts, time to lock the port value 0 to 5 minutes in 1 minute increments).
- Password rules to encourage the use of strong passwords. These include minimum password length (3 to 15 characters) and requirements for the inclusion of different types of characters (≥ one upper case, ≥ one lower case, ≥ one number, and ≥ one special character).
- Individual protocol (network ports) enables to allow the blocking of non-secure protocols.

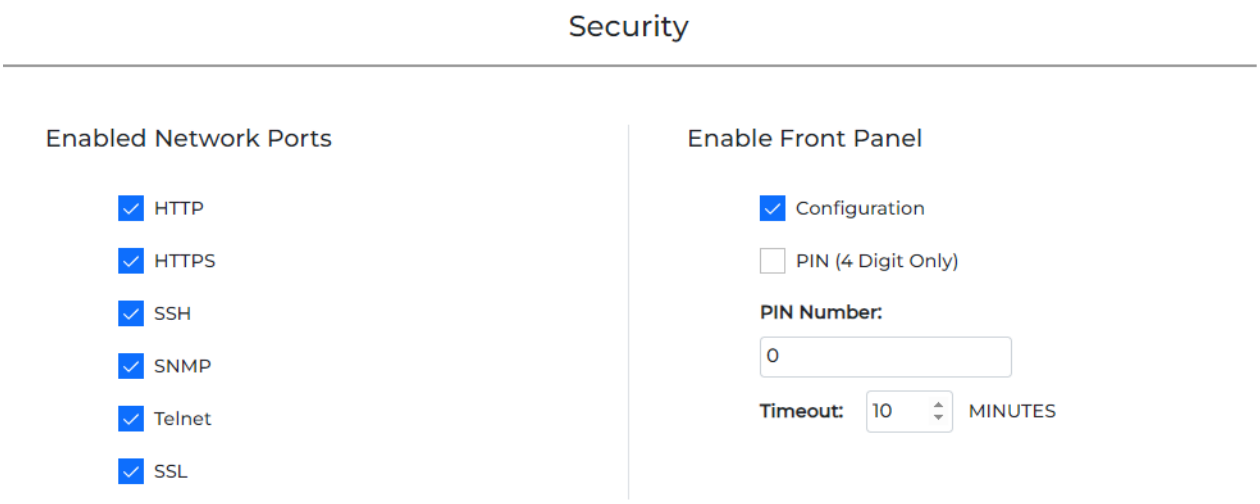


Figure E-1: Security Configuration

Internet Protocols (IPv4 and IPv6)

Configuration settings for IPv4 and IPv6 are found on the web pages under **Menu-Settings-Network.**

The screen provides for IPv6 and IPv4 related settings. Figure E-2 shows Static DHCP selected in the IPv4 section of the given example and the basic required parameter settings for IPv4 (Static IP address, Subnet Mask, and Default Gateway Router IP address) are configured.

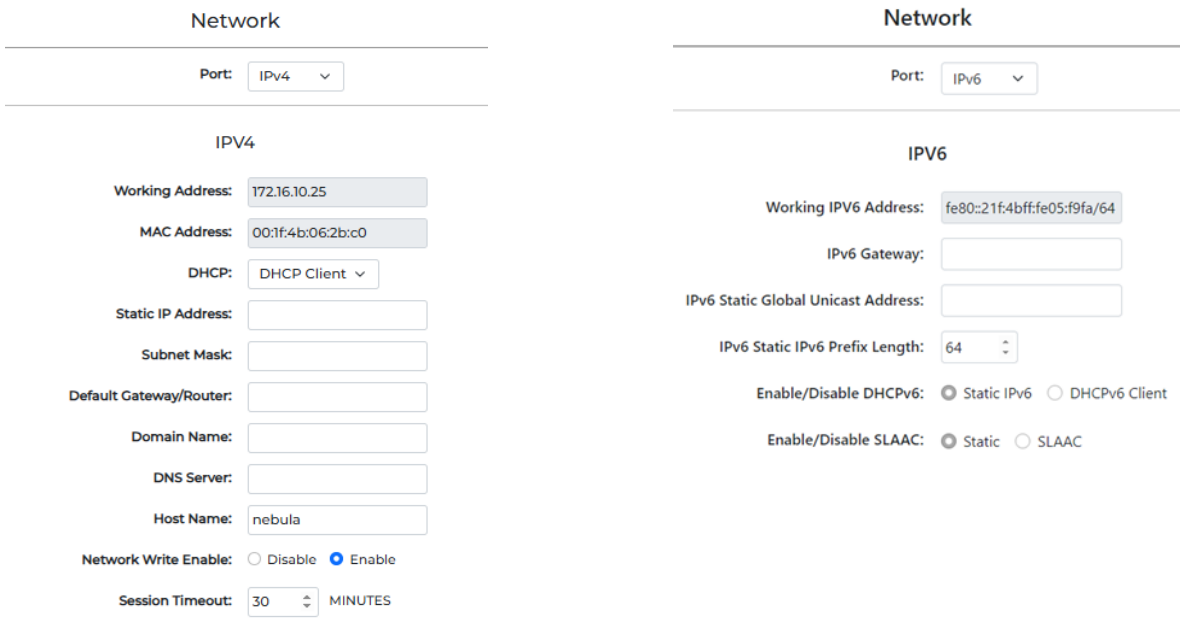


Figure E-2: Network Settings for IPv4 and IPv6

IPv4

The controller is capable of simultaneous operation using IPv4 and IPv6 protocols. Using IPv4, the controller will utilize a single IPv4 address. This address will be assigned in one of 2 ways depending on the DHCP mode:

1. DHCP mode Static: In this configured mode, the controller uses a static IPv4 address assigned by the user. The user must supply a subnet mask and a router address.
2. DHCP mode Client: In this configured mode, the controller uses a dynamic IPv4 address assigned by a DHCP server on the network.

IPv6

The controller supports IPv6. Operating with IPv6, the controller can have multiple IPv6 addresses. It can have Link Local Address and multiple Global Unicast Addresses. These items are shown in the top section of the Network Settings screen. The controller will have a single Link Local address. This Link Local address is automatically generated by the controller based on its MAC address. It is displayed in the Network Settings screen. The link local address can only be used on the local link (subnet) and will not be routed through the network. Browsers will not accept a link local address in a URL.

The controller may also have one or more Global Unicast Address. One of these addresses can be manually entered by the user. Entry of this IPv6 address is in the “Static IPv6 Address” field shown. Another Global address can be automatically generated by the controller using the SLAAC protocol. The SLAAC protocol allows routers to send a router advertisement messages. These messages will supply the router address, the link prefix (subnet) and network options. One of these network options, the autonomous address-configuration flag, will instruct the controller to generate a Global Unicast Address based on the router prefix and the controller's MAC address. This IPv6 address is displayed as the “Current IPv6 Address”.

HTTPS (SSL)

The controller supports the Hyper-Text Transfer Protocol with SSL Encryption. It is capable of supporting browser access using HTTP and HTTPS. The standard controller is shipped with HTTP enabled and HTTPS disabled. However, specific customer configurations requiring only secured protocols will have HTTP access disabled and HTTPS access enabled. The desired HTTP protocol access is selected by prepending the URL address with the respective “http://” or “https://” to in the browser. If the controller is accessed using its IPv4 address with HTTPS, the browser will issue a screen indicating a problem with the website’s security certificate as shown below.

Figure E-3: Security Problem Screen Using Explorer

In this case, select “Continue to this website (not recommended)” and the controller login screen will be presented. Continue to Login into the controller using the appropriate passwords (ABB super-user, and administrator by default). The browser will complain about a mismatched address in the certificate if the controller is accessed using its IPv4 address for HTTPS. Clicking on the Certificate error screen shows the error as seen below. The controller will be fully accessible using IPv4 and HTTPS with this mismatched address.

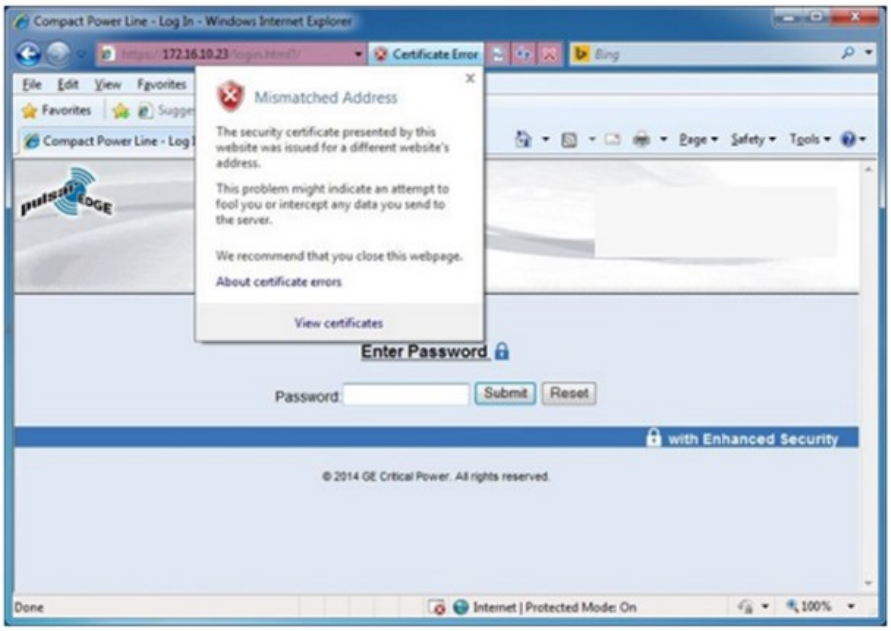


Figure E-4: Mismatched Address Certificate Error Screen

To enable HTTPS connectivity to the controller without browser warnings in IPv6 the following procedures must be followed:

1. Contact OmniOn Power™ Technical Support for the certificate file.
2. Change the file extension to ".crt"
3. Right click on the certificate file ASDC_2048.crt and select: "Install Certificate"
4. When prompted select: "Place all certificates in the following store"
5. Browse to select: "Trusted root certification authorities"

The device certificate created by the controller identifies the controller by its IPv6 address. Whenever the IP address of a controller is changed, it is necessary to reboot the controller. Allow 2 minutes for all the changes to be stored prior to rebooting. Upon reboot, the controller will create a device certificate for the new IP address. This process may take several minutes. Now the “https:” prepended URL can be used to access error free connection. Note: an IPv6 address must be enclosed in [ ] when in a URL. Sample web screen follows.

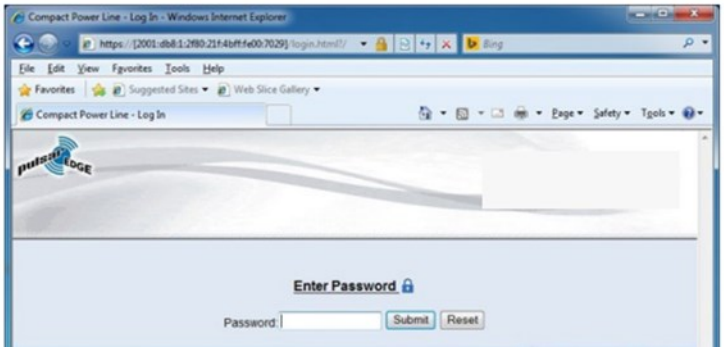


Figure E-5: HTTPS Connectivity Over IPv6 Controller Login Screen

SNMP

In addition to supporting the basic protocols on TCP/IP, the controller supports conveying system alarm and control information to a Network Operation Center (NOC) using the Simple Network Management Protocol (SNMP). The controller implements the secured SNMPv3 as well as the SNMPv2C agent that is backwards compatible with SNMPv1. The various configuration items for the protocols can be found in the **Settings-SNMP** web screen depicted below.

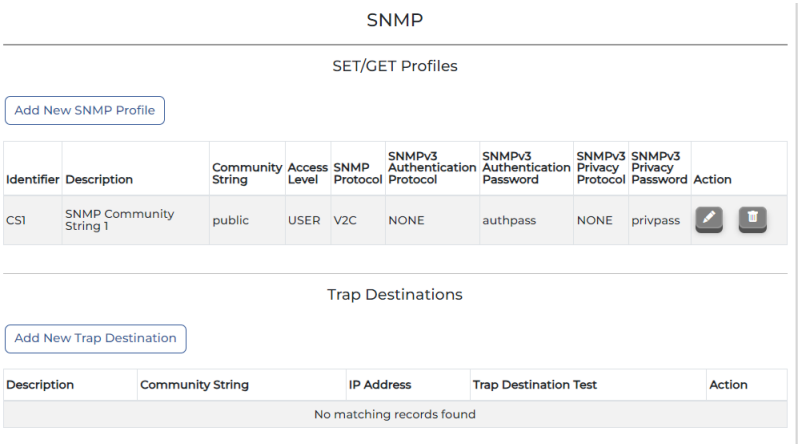


Figure E-6: SNMP Settings Screen

For security reasons the SNMPv1/v2c community string and SNMPv3 user information can only be modified when logged in as administrator. The controller has four SET/GET profiles that can be used as either SNMPv1/v2c community strings or SNMPv3 users. The Community String/User field is the value of community string or username that will be accepted by the controller. Each one of these values must be unique (or blank). The SNMP Protocol field determines how each is used. The Access Level (User, Super-User, and Administrator) field determines which SNMP operations are valid and the scope for each.

The choices are:

- USER – has read-only access (SNMP GET operation) to data (OIDs) within the controller MIB
- SUPER-USER – has read and write access (SNMP SET and GET operations) to OIDs within the controller MIB
- ADMINISTRATOR – has read and write access to all OIDs supported by the controller

SNMPv3 users have additional protocol and password fields to support authentication and privacy. (These fields are only accessible if the SNMPv3 protocol is selected).

Authentication protocols are NONE, MD5 and SHA. Privacy protocols are NONE, DES and AES 128-bit. Whenever the SET/GET profiles are modified the controller will require about 15 seconds before the changes take effect. This allows the controller type to perform the calculations necessary to create new crypto keys.

Four Trap Community String entries allow the user to specify a target IP address (IPv4 or IPv6) for alarm notifications (Traps) and one of the SET/GET Profiles to be used with the trap.

SFTP

The controller implements the SSH File Transfer Protocol (also Secure File Transfer Protocol, or SFTP) to provide file access, file transfer, and file management functionalities over any reliable data stream. WinSCP, an open source free SFTP client, FTP client, WebDAV client and SCP client for Windows, was used to test the file transfer capability between the controller and a remote computer. This software can be downloaded at http://winscp.net/eng/download.php.

By default, WinSCP attempts to use a temporary file to allow file transfers to be interrupted and resumed. The controller's file system does not allow the creation of temporary files, so the feature must be disabled in WinSCP. Disable this feature by going to Options ▸ Preferences ▸ Endurance in WinSCP and check the disable for the "transfer resume/transfer to temporary file". Sample WinSCP screen shots follow.

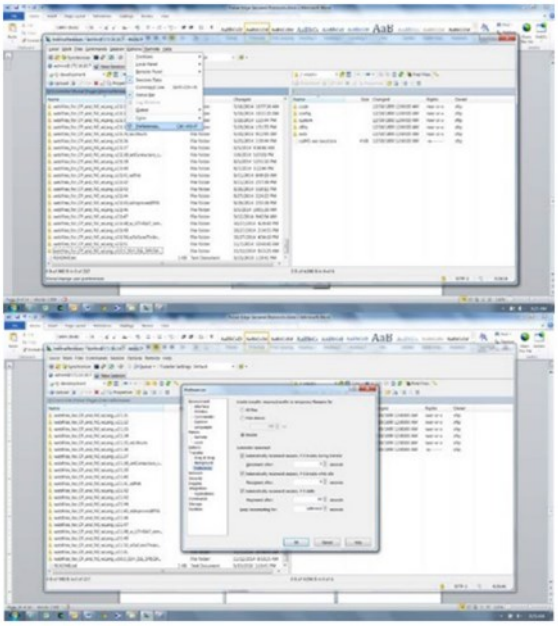


Figure E-7: Sample WinSCP Configuration Screens for Disable

When logging into the controller using WinSCP, as with FTP, the username is not validated unless the controller has the “User Name and Password” login method enabled (Settings ▸ Passwords).

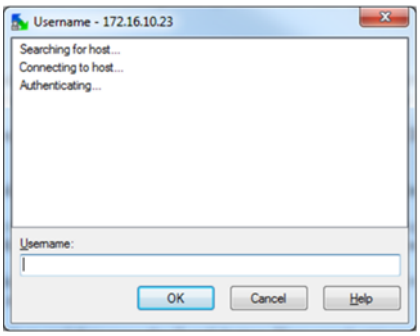


Figure E-8: WinSCP Login Screen

When connecting to a controller for the first time WinSCP will alert the user to store the controller’s security key in the key cache. Press Yes. This key will remain valid until the controller’s IP address is modified.

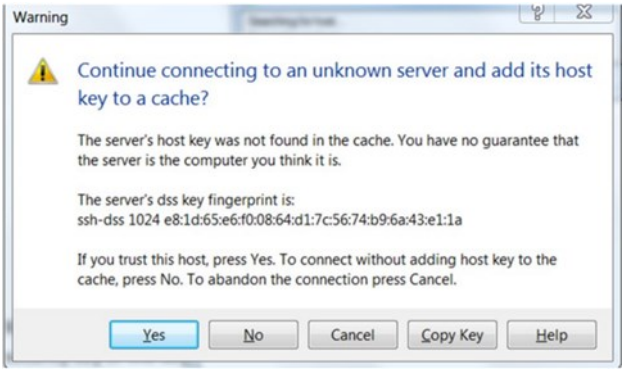


Figure E-9: WInSCP Security Key Warning Screen

Following is a sample screen of using a WinSCP SFTP connection to a Galaxy Pulsar Edge controller

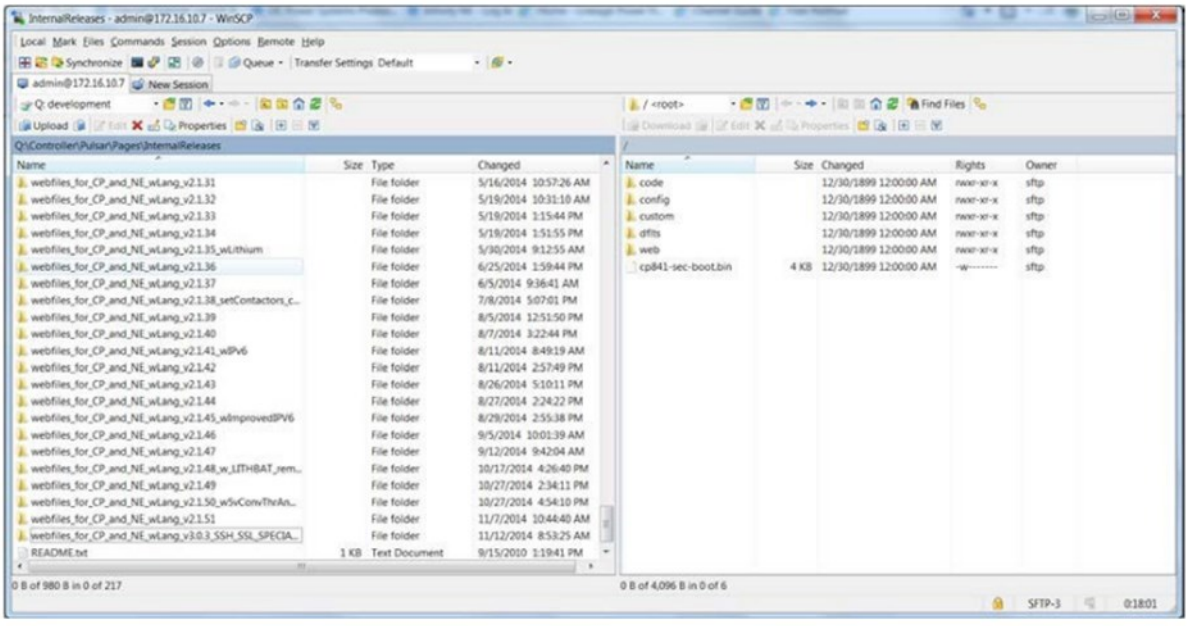


Figure E-10: WInSCP SFTP Connection

SSH

The controller supports the Secure Shell (SSH) cryptographic network protocol for secure data communication, remote command-line login, remote command execution, and other secure network services between itself and a networked computer. It is a replacement for Telnet that offers encryption. The controller's SSH implementation has been tested using PuTTY. PuTTY is an SSH and telnet client, developed originally by Simon Tatham for the Windows platform. It is open source software that is available with source code and is developed and supported by a group of volunteers. Putty can be downloaded at http://www.putty.org/ . A typical download is the "putty.exe" executable that covers the Telnet and SSH client. When connecting to the controller for the first time, PuTTY will alert the user to store the controller's security key in the key cache (sample screen below). Select "Yes", enter a login, and the controller password, to access the SSH server (the controller). This key will remain valid until the controller's IP address is modified.

Figure E-11: PuTTY Security Key Warning Screen

Below is a sample controller's screen once the controller's SSH Server has been accessed. Standard T1.317 commands can be used.

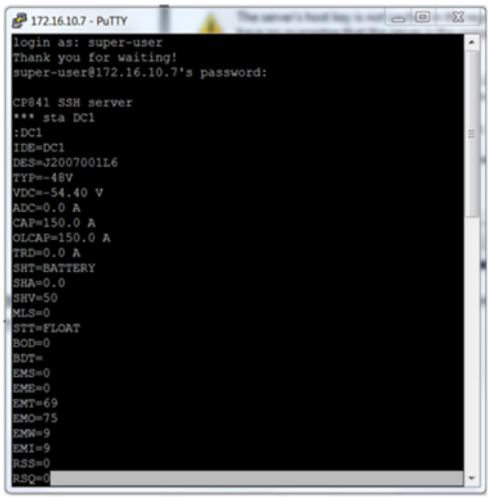


Figure E-12: PuTTY SSH Login Example Screen

Revision History

Revision	Date	Description of the change
1.0	2023 Oct	Initial Release
2.0	10/15/2024	Updated product images with additional updates, Miscellaneous formatting changes, Adding standard breaker information to controller, Output alarms changed from 4 to 7 relays
3.0	02/12/2025	Update web page pictorials, add Temperature to menu bar of web pages, update Home Screen, Bay Configuration, Security, Inventory and Date/Time screens, add standard breaker trip alarms to alarm notifications

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