an EnerSys® company

Matrix 300™

1RU High Power Density DC Distribution Center

Technical Manual

Effective: January 2020

Safety Notes

Alpha Technologies Services, Inc. considers customer safety and satisfaction its most important priority. To reduce the risk of injury or death and to ensure continual safe operation of this product, certain information is presented differently in this manual. Alpha® tries to adhere to ANSI Z535 and encourages special attention and care to information presented in the following manner:

WARNING! GENERAL HAZARD

GENERAL HAZARD WARNING provides safety information to PREVENT INJURY OR DEATH to the technician or user.

WARNING! ELECTRICAL HAZARD

ELECTRICAL HAZARD WARNING provides electrical safety information to PREVENT INJURY OR DEATH to the technician or user.

WARNING! FUMES HAZARD

FUMES HAZARD WARNING provides fumes safety information to PREVENT INJURY OR DEATH to the technician or user.

WARNING! FIRE HAZARD

FIRE HAZARD WARNING provides flammability safety information to PREVENT INJURY OR DEATH to the technician or user.

There may be multiple warnings associated with the call out. Example:

WARNING! ELECTRICAL & FIRE HAZARD

This WARNING provides safety information for both Electrical AND Fire Hazards

CAUTION!

CAUTION provides safety information intended to PREVENT DAMAGE to material or equipment.

***NOTICE**:*

NOTICE provides additional information to help complete a specific task or procedure.

ATTENTION:

ATTENTION provides specific regulatory/code requirements that may affect the placement of equipment and /or installation procedures.

The following sections contain important safety information that must be followed during the installation and maintenance of the equipment. Read all of the instructions before installing or operating the equipment, and save this manual for future reference.

Matrix 300™

1RU High Power Density DC Distribution Center
Technical Manual

C048-102-30 R01, Rev. B

Effective: January 2020

Disclaimer

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 Alpha Technologies or your nearest Alpha representative.

Alpha shall not be held liable for any damage or injury involving its enclosures, power supplies, generators, batteries or other hardware if used or operated in any manner or subject to any condition not consistent with its intended purpose or is installed or operated in an unapproved manner or improperly maintained.

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Table of Contents

1.0 Purpose and Applicability

The purpose of this document is to detail the installation and operation instructions for the Matrix 300™ 1RU High Power Density DC Distribution Center.

1.1 Product Model

This document applies to the following configurations of the Matrix 300 1RU High Power Density DC Distribution Center:

Table 1. Matrix 300 Model Configurations

PART NUMBER	DESCRIPTION
C016-131-10	1RU Matrix Breaker Panel; 300A; A/B Input (8A/8B); LEDs
C016-138-10	1RU Matrix Breaker Panel; 300A; A/B Input (8A/8B); SmartSwitch; w/Ethernet

2.0 Theory of Operation

2.1 Introduction

The Matrix 300 1RU High Power Density DC Distribution Center provides high reliability, high power, DC Distribution in a compact 1RU space to maximize rack space for signal equipment.

2.2 Features

- Compact 1RU form factor
- 300A total rating
- 8A and 8B output circuits (dual input)
- Enclosed breaker compartment to prevent nuisance trips
- Remote monitoring via Form-C dry alarm contacts
- A/B power and breaker trip indication LED's (C016-131-10 model)
- SmartSwitch supervisory controller with per circuit current monitoring (C016-138-10 model)
- Embedded web server for real time network monitoring (C016-138-10 model)

3.0 Unpacking and Inspection

The Matrix 300 breaker panel was carefully packaged at the factory to withstand the normal rigors of shipping. However, you should carefully inspect the box and contents to confirm that no damage has occurred in transit. Most shipping carriers require notification of shipping damage within twenty-four hours of delivery, and it is the responsibility of the recipient to inspect the shipment immediately upon receipt.

3.1 Package Contents

- Matrix 300 1RU High Power Density DC Distribution Center
- Installation kit
- Rear plastic safety shield
- SmartSwitch module

4.0 Installation

4.1 Installation Preparation

When selecting an installation location, ensure that all of the following conditions are met before proceeding.

4.1.1 Elevated Operating Ambient Temperature

If you install the panel in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, take care to install the equipment in an environment compatible with the maximum ambient temperature (TMA).

4.1.2 Reduced Air Flow

Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

4.1.3 Mechanical Loading

Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

4.1.4 Circuit Overloading

Give consideration to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Use appropriate consideration for equipment nameplate ratings when addressing this concern.

4.1.5 Reliable Earthing

Maintain reliable earthing of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (e.g., use of power strips).

4.1.6 Disconnect Device

A readily accessible disconnect device must be incorporated in the building installation wiring.

4.2 Mechanical Mounting

***NOTICE**:*

THIS PRODUCT MUST BE INSTALLED WITHIN A RESTRICTED ACCESS LOCATION WHERE ACCESS IS THROUGH THE USE OF A TOOL, LOCK AND KEY, OR OTHER MEANS OF SECURITY, AND IS CONTROLLED BY THE AUTHORITY RESPONSIBLE FOR THE LOCATION. THIS PRODUCT MUST BE INSTALLED AND MAINTAINED ONLY BY QUALIFIED TECHNICIANS.

4.2.1 Rack Mount Ears

The Matrix 300 product can be mounted in a 19 in. or 23 in. rack configuration, in a front-flush or two offset mid-mount orientations (see Figure 1).

Step 1. Depending on the size of the rack, select one of the following sets of mounting ears:

- For 19 in. racks use (2) C590-1936-10
- For 23 in. racks use (2) C590-1937-10

Step 2. Orient the rack mount ears appropriately for a 19 in. or 23 in. rack and attach to panel using the included #10-32 hardware.

Step 3. Insert the Matrix 300 panel into the rack and secure the front mounting ears to the rack using the included #12-24 hardware.

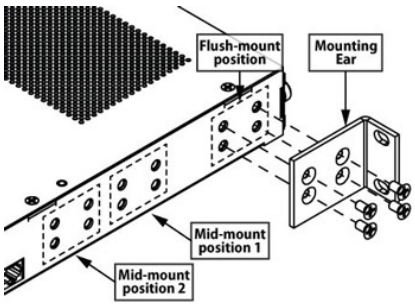


Figure 1. Mounting positions

4.3 Ground Installation

CAUTION!

DO NOT ENERGIZE THE PANEL BEFORE CHASSIS GROUND IS CONNECTED.

The chassis ground connection is located on left side of the panel when viewing from the rear. A two hole lug landing position is provided. See table below for termination information. A minimum of #6 AWG chassis ground cable is required.

IMPORTANT: Grounding hardware not included. A properly-sized grounding conductor must be installed per NEC (250.122).

Table 2. Chassis Ground Termination Summary

TWO HOLE LANDING TYPE	HOLE/ STUD SIZE	CENTER TO CENTER	RECOMMENDED TORQUE VALUE
Threaded Insert	1/4 in-20	5/8 in.	70 in-lbs

Step 1. Secure the ground cable to the chassis by tightening 1/4 in. hardware (see Figure 2).

Step 2. Torque the fasteners to 70 in-lbs.

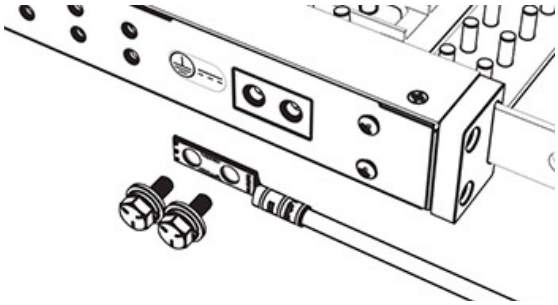


Figure 2. Chassis ground

4.4 Input Connections

WARNING! ELECTRICAL HAZARD

TO PROTECT PERSONNEL AND EQUIPMENT, 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.

***NOTICE**:*

MAKE SURE THAT ALL FEEDER CABLES HAVE HEAT SHRINK APPLIED PRIOR TO TERMINATION, AND THAT NO-OXIDE COMPOUND IS APPLIED TO ALL COPPER-TO-COPPER CONNECTIONS. USE ONLY COMPONENTS AND CRIMPING TOOLS APPROVED BY AGENCIES OR CERTIFYING BODIES RECOGNIZED IN YOUR COUNTRY OR REGION.

Table 3. Input Termination Summary

TWO HOLE LANDING TYPE	HOLE/ STUD SIZE	CENTER TO CENTER	RECOMMENDED TORQUE VALUE
Through Hole (w/Slot)	3/8 in.	5/8 in. - 1 in.	225 in-lbs

See Figure 3 for HOT and RTN input connection locations.

Step 1. Secure the RTN input cables/lugs to the RTN input bus bars located at the rear of the panel (see Figure 4). Ensure that all hardware is tightened.

Step 2. Secure the HOT input cables/lugs to the HOT input bus bars located at the rear of the panel (see Figure 5). Ensure that all hardware is tightened.

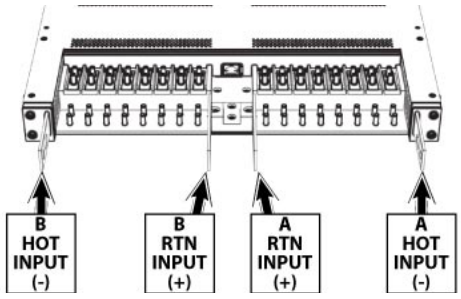


Figure 3. Input connections

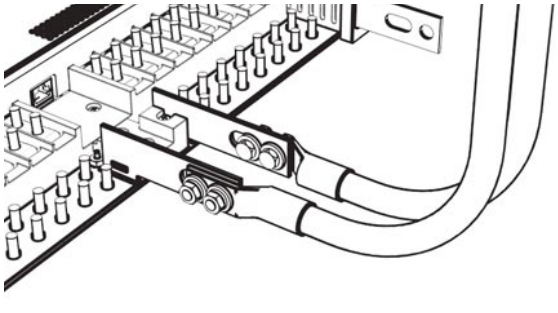


Figure 4. RTN input landing

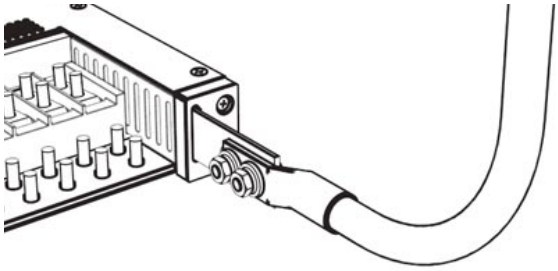


Figure 5. HOT input landing

4.5 Output Connections

CAUTION!

DO NOT PERFORM THIS STEP ON CIRCUITS WITH BREAKERS INSTALLED. ENSURE NO POWER IS PRESENT ON THE CIRCUIT BEING WIRED BEFORE PROCEEDING.

Table 4. Output Termination Specifications

TERMINATION TYPE	HOLE/ STUD SIZE	CENTER TO CENTER	RECOMMENDED TORQUE VALUE
Threaded Stud	1/4 in.	5/8 in.	70 in·lbs

See Figure 6 for HOT and RTN output connection locations.

Step 1. Secure the RTN output cables/lugs to the RTN output bus bars located at the rear of the panel (see Figure 7). Ensure that all hardware is tightened.

Step 2. Secure the HOT output cables/lugs to the HOT output bus bars located at the rear of the panel (see Figure 8). Ensure that all hardware is tightened.

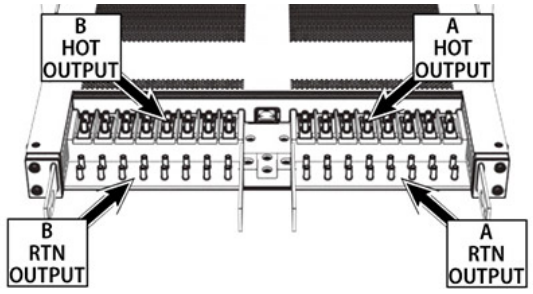


Figure 6. Output connections

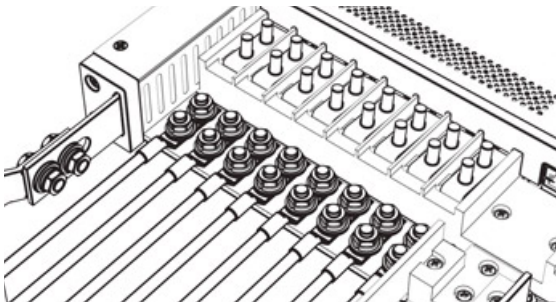


Figure 7. RTN output landing

4.6 Alarm Installation

The Matrix 300 product has Form-C dry alarm contacts for remote alarm monitoring. If alarm monitoring is required, a 8p8c (RJ-45) modular jack is provided for an alarm connection.

The 8p8c modular jack is located on the left side of the panel. Refer to mechanical drawings found in Appendix A for more details.

Step 1. Plug in a UTP cable with a TIA/EIA T568B termination into the alarm jack (see Figure 9). Refer to Table 5 below for alarm contact pinout information.

Step 2. Connect the cable to the site alarm monitoring system.

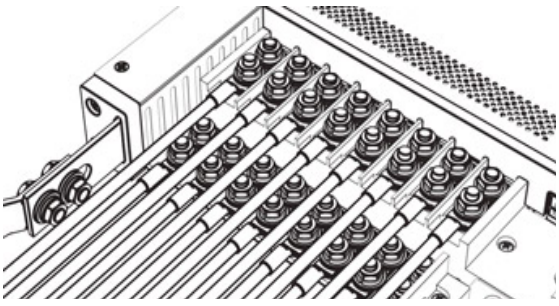


Figure 8. HOT output landing

Table 5. Alarm Contact Pinout

PIN 1	PIN 2	PIN 3	PINS 4-8
COM	N.C	N.O	Reserved

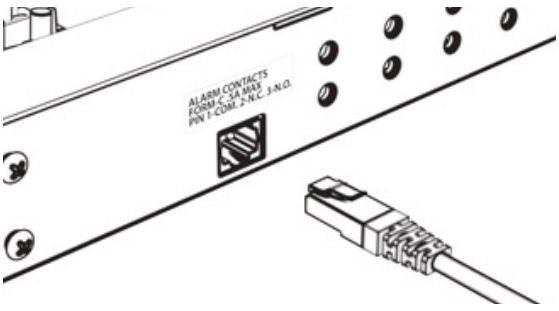


Figure 9. Alarm

4.7 Installing the Network Cable (Models with Ethernet Module Only)

If remote monitoring over the network is required, complete the following steps to connect the Ethernet module with embedded web server.

NOTE: For initial configuration, it is recommended to use a crossover Cat 5/5e/6 UTP cable to connect a laptop directly to the Ethernet port of the Matrix 300 panel. If the laptop is configured for Auto MDI-X, a straight-through cable may be used.

Step 1. Connect a Cat 5/5e/6 UTP Ethernet cable from the local network to the Ethernet port on the rear of the panel (see Figure 10). Refer to mechanical drawings in Appendix A for exact location. Use a TIA/EIA T-568B pinout for the network connection.

Step 2. For information on configuring the web server, see "5.6 Review System Status via the Embedded Web Server" on Page 16.

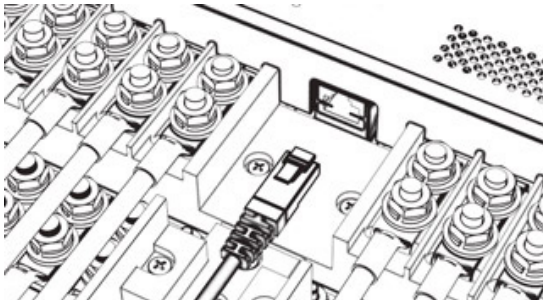


Figure 10. Embedded Ethernet option

4.8 Breaker Installation

***NOTICE**:*

SLIMLINE BREAKERS RATED GREATER THAN 65A DO NOT CARRY A UL 489 RATING AT THIS TIME. IF BREAKERS OF THIS AMPACITY ARE REQUIRED, CONTACT ALPHA PRODUCT SUPPORT FOR APPLICATION INFORMATION AND SPACING REQUIREMENTS.

CAUTION!

MAKE SURE CIRCUIT BREAKERS ARE IN THE OFF POSITION PRIOR TO INSTALLATION. ENSURE CIRCUIT BREAKERS ARE COMPLETELY INSERTED. ONLY USE BREAKERS APPROVED BY ALPHA TECHNOLOGIES. CONTACT PRODUCT SUPPORT FOR CURRENT INFORMATION ABOUT APPROVED BREAKERS.

There are 16 breaker positions in the Matrix 300 1RU High Power Density DC Distribution Center.

Step 1. Remove the breaker compartment door from the panel by loosening the two thumb screws on the door.

Step 2. Select a breaker of sufficient ampacity and insert it into the desired output circuit, making sure to seat the breaker securely (see Figure 11).

Step 3. Once all desired circuit breakers have been installed, reinstall the breaker compartment door and secure it with the thumb screws.

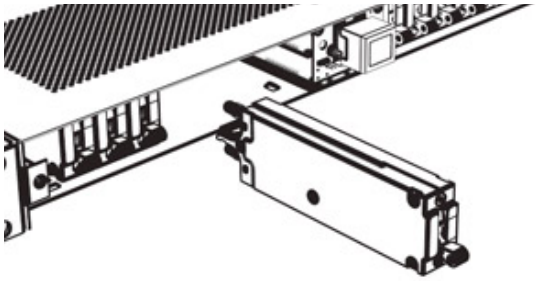


Figure 11. Breaker installation

4.9 Rear Plastic Safety Shield

WARNING! ELECTRICAL HAZARD

FAILURE TO REINSTALL THE BUS SAFETY COVER WILL CREATE AN ELECTRICAL HAZARD. THE PANEL MAY BE ENERGIZED WHEN INSTALLING THE REAR PLASTIC SAFETY COVER. USE INSULATED TOOLS AND APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT WHEN INSTALLING OR REMOVING THE REAR PLASTIC SAFETY COVER.

When all rear electrical connections have been completed, the rear plastic safety cover can be installed. The cover can be removed later to service the panel.

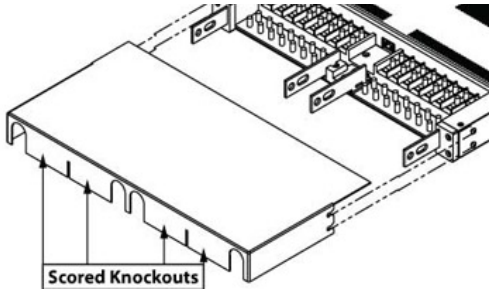


Figure 12. Safety cover

Step 1. The rear plastic safety cover is perforated at all input and output positions. Remove the scored knock-outs to allow the input and output cables to route though the cover. Remove knock-outs only where cable is installed.

Step 2. Slide the cover onto the mounting screws protruding from the sides of the panel to snap into place (see Figure 12).

5.0 Operation (C016-138-10 Model)

Operation instructions for models without the SmartSwitch controller can be found in Section 6.0 "Operation (C016-131-10 Model with LED Display)" on Page 19.

If you are using the Ethernet based web server, see Section 5.6 "Review System Status via the Embedded Web Server" on Page 16 for setup and operation instructions. Refer to Section 5.7 on Page 18 for a SmartSwitch user interface map.

5.1 User Interface

The Matrix 300 panel is available with a simple, innovative single-button user interface. The button is integrated with the LCD display.

To interact with the Matrix 300 panel:

- TAP and release the button to advance status screens or menu items.
- PRESS and HOLD the button for about three seconds to make a selection or change values.

If the button is not pressed for three minutes, the panel will return to automatically switching between panel status screens.

5.2 Home Screen Information

The home screen displays Input bus voltage, Input bus current, and alarm status. Under normal operation the home screen will be green. The dual input Matrix 300 SmartSwitch home screen will automatically cycle between the A and B bus displays. Tapping the screen once will cycle through the home screens manually. The available options from the home screen are Input A, Input B displays as well VIEW BKR LOAD, and SETUP menus.

The home screen also indicates the real time status of the panel based on its back light color. Refer to Table 6 below for the status information.

Table 6. Backlight Status

BACKLIGHT COLOR	STATUS INDICATED	ALARM SENT
Green	Normal Operation	No
Orange	Warning/Pre-Alarm	No
Red	Alarm	Yes

5.3 Initial Operation

Once all breakers are installed and power is present on the inputs, remove the breaker compartment door and slide the power switch to the on position. The power switch is located on the front right side of the SmartSwitch. The display will turn on and display the firmware version.

5.3.1 Breaker Inventory Process

Before the monitoring features of the Matrix 300 panel can be used, a breaker inventory must be taken.

Step 1. Upon first power up, the system will prompt “TURN ON THE BKRS HOLD 3S.”

Step 2. Turn on all breakers to be inventoried. Press and hold the SmartSwitch as prompted.

Step 3. The SmartSwitch will now display the number of breakers installed in the panel. If the number of breakers displayed is incorrect, ensure that all installed breakers are fully seated, in the correct orientation, and turned on.

Step 4. If the number of breakers is correct, press and hold the SmartSwitch for 3 seconds to continue.

Step 5. The SmartSwitch will now display “STORED PRESS TO CONT.” Tap the SmartSwitch to continue and set the breaker ampacity.

5.3.2 Setting Breaker Ampacity

The SmartSwitch will now display “SETUP BKR AMPS HOLD 3S.”

Step 1. Hold the SmartSwitch for 3 seconds to enter the menu to set breaker ampacity.

Step 2. The first breaker in inventory will be shown, along with its currently set ampacity. If the ampacity is incorrect, press and hold the SmartSwitch for 3 seconds to enter the menu.

Step 3. Tap the SmartSwitch until the correct ampacity is displayed (the display will advance through standard Slimline breaker ampacities: 1, 3, 5, 10, 20, 30, 40, 50, 60, 70, 80, 90, and 100), then press and hold for 3 seconds to save the value.

Step 4. The next breaker in inventory will now be displayed. Repeat Steps 1-3 for each breaker in inventory.

Step 5. Once all of the breaker ampacities are set correctly, advance to the screen that says “EXIT HOLD 3 S” and hold the SmartSwitch for 3 seconds to exit the menu and save the values.

This completes the initial SmartSwitch setup.

5.4 “VIEW BKR LOAD HOLD 3 S”

Entering this menu will display voltage, current, and alarm status information for each circuit that is stored in inventory. When the menu is entered, the first circuit in inventory will be displayed. Tapping the SmartSwitch will advance to the next circuit in inventory.

5.5 “SETUP HOLD 3 S” – Setup Menu

The setup menu is used to configure the SmartSwitch. The system will prompt you with “SETUP HOLD 3 S” to enter the menu. This menu is accessed by taping the home screen until the prompt appears, then pressing and holding the SmartSwitch for 3 seconds.

5.5.1 “SETUP BKR INV HOLD 3 S” – Breaker Inventory

Press and hold the SmartSwitch for 3 seconds to enter the menu and perform a breaker inventory. Follow the on-screen prompts to finish inventorying circuits. A breaker inventory must be performed every time a new circuit is added to the Matrix 300 panel. Refer to "5.3.1 Breaker Inventory Process" on Page 14 for instructions on how to complete a breaker inventory.

5.5.2 “SETUP BUS ALMS” – Bus Alarm Menu

This menu is used to set the input bus rating to enable the panels over current monitoring features.

Step 1. To set the bus A ampacity, select the option that says “SETUP BUS A HOLD 3 S.” The SmartSwitch will then display “HOLD TO EDIT, TAP TO SHIFT.” Tap to access the first bus.

Step 2. Three digits will now appear on screen with an arrow under the first digit.

Step 3. To edit a digit, hold the SmartSwitch for 3 seconds, then tap to change its value. Hold for 3 seconds to save the edits.

Step 4. Repeat these steps for each digit that needs to be edited.

Step 5. Repeat for bus B.

5.5.3 “SETUP BKR ALMS HOLD 3 S” – Breaker Alarm Menu

This menu is used to configure the alarm and warning threshold for overcurrent alarms.

The alarm setting is used to set the threshold for the panel’s overcurrent alarm. An alarm condition will annunciate locally with a red display and an audible alarm. It will also cause a remote alarm via the Form-C dry alarm contact and email alerts via the Ethernet web server.

The warning setting is used to set the threshold for the panel’s overcurrent warning (pre-alarm). The warning will only annunciate locally.

5.5.4 “SETUP ADVANCED HOLD 3 S” – Advanced Settings Menu

The advanced menu contains the following functions. Changing these settings or using these functions may affect the monitoring capabilities of the panel.

Restore Defaults

Resets all of the panel settings back to factory default. This will clear breaker inventory and set the breaker ampacity, warning, and alarm thresholds back to their default settings.

Setup Demo

This assigns fake values to current and breaker inventory for demonstration purposes. It should not be used during normal operation.

System Info

This displays the firmware version installed on the controller.

5.6 Review System Status via the Embedded Web Server

This section applies to the Matrix 300 products with the optional embedded web server installed.

The optional embedded Ethernet module provides remote monitoring via IP-based Ethernet networks and a web browser. To view the system status, you will need to connect the Ethernet port on the rear of your Matrix 300 to your network. See "4.7 Installing the Network Cable" on Page 11 for information on installing the network cable.

By default, the Ethernet module is configured from the factory with a static IP address and network settings, as defined below.

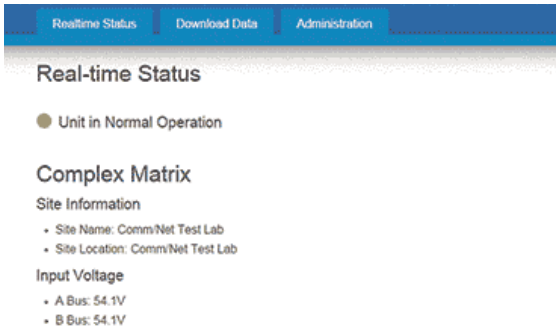


Figure 13. Matrix with SmartSwitch real-time status page

5.6.1 Default Static Network Settings

Use these settings to set up a local network to communicate with the embedded web server:

- IPV4 Address: **192.168.123.123**
- Subnet Mask: **255.255.255.0**
- Default Gateway: **192.168.123.1**
- Primary DNS: **192.168.123.1**
- Secondary DNS: **8.8.8.8**

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: **root**
- Password: **password**

5.6.2 Navigating the Web Server

Upon loading the Matrix 300 web server, the Administration Home Page will be displayed.

5.6.3 Administration Settings

When accessing the web server for the first time, it is necessary to configure the administration settings. Click on the "Administration" tab to access these settings.

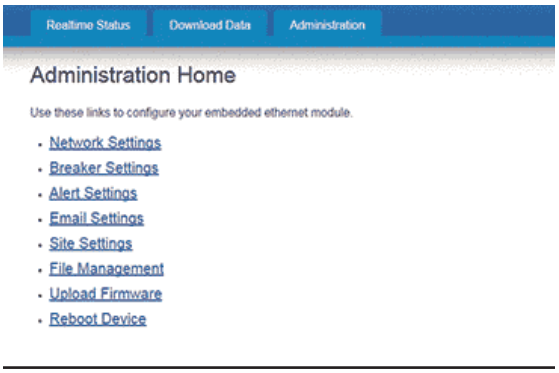


Figure 14. Administration home page

Network Settings

See "5.6.1 Default Static Network Settings" on Page 16 for the default network settings for the Matrix 300 web interface. You can access and change any of the settings on this page. Note: changes to IP settings will require a reboot to the web server (this does not interfere with normal operation).

E-mail and SNMP Settings

The e-mail settings are used to configure the e-mail notification feature of the Matrix 300. If this setting is configured, you will receive e-mail notifications about the status of the Matrix 300. This feature is not enabled by default.

Site Settings

Allows you to change the site name and location displayed on the Ethernet web server.

File Management

Allows a user to upload and delete files to the Matrix 300 Ethernet controller.

NOTICE:

DO NOT MODIFY .CFG FILES. THEY CONTAIN CRITICAL SYSTEM CONFIGURATIONS. CONTACT ALPHA FOR INFORMATION REGARDING FILE MANAGEMENT.

Upload Firmware

This menu is used to update the firmware for the Ethernet web server.

Reboot Device

This allows the user to reboot the Ethernet web server device remotely.

Download Data

This tab is accessible from any menu and can be used to download the Matrix 300 history logs.

5.7 SmartSwitch User Interface Map (C016-138-10 SmartSwitch Model)

- FROM STANDBY:
  - (Input A Display)
  - (Input B Display)**
  - VIEW BKR LOAD HOLD 3S
    - (A1 / 01*)
    - (A2 / 02*)
    - (A3 / 03*)
    - (A4 / 04*)
    - (A5 / 05*)
    - (A6 / 06*)
    - (A7 / 07*)
    - (A8 / 08*)
    - (B1 / 09*)
    - (B2 / 10*)
    - (B3 / 11*)
    - (B4 / 12*)
    - (B5 / 13*)
    - (B6 / 14*)
    - (B7 / 15*)
    - (B8 / 16*)
    - EXIT HOLD 3S
  - SETUP
    - SETUP BKR INV
      - TURN ON ALL BKRS HOLD 3S
        - # OF BREAKERS CORRECT
        - EXIT HOLD 3S
    - SETUP BUS ALMS
      - SETUP RATING HOLD 3S
      - EXIT HOLD 3S
    - SETUP BKR ALRMS
      - ALARM %
      - WARNING%
      - EXIT HOLD 3S
    - SETUP ADVANCED
      - RESTORE DEFAULTS
      - SETUP DEMO
      - SYSTEM INFO
      - EXIT HOLD 3S

About this map

- Screens in parentheses "( )" are information only. There are no further menu items beyond these screens.
- Press and hold SmartSwitch for 3 seconds to enter a menu. Tap to advance between items.

* Dual Input Matrix / Single Input Matrix breaker display

** Does not display on single input Matrix (skips to breaker menu).

6.0 Operation (C016-131-10 Model with LED Display)

Operation instructions for models with the SmartSwitch controller can be found in Section 5.0 "Operation (C016-138-10 Model)" on Page 13.

Figure 15. Power and alarm LEDs

6.1 Initial Power Up

Step 1. Turn on the feed breakers to energize the panel. All input power LEDs should now be illuminated (see Figure 15).

Step 2. Perform a breaker inventory. The logic controller has a blue LED that will be flashing indicating that a breaker inventory needs to be performed. Refer to "6.2 Breaker Inventory" for instructions on how to complete this task.

6.2 Status LEDs

Table 7. Status LEDS

LED	STATUS INDICATED	NORMAL OPERATION	ALARM STATE
Green	A Input Power Present	On	N/A
Orange	B Input Power Present	On	N/A
Red	Breaker Tripped	Off	Red

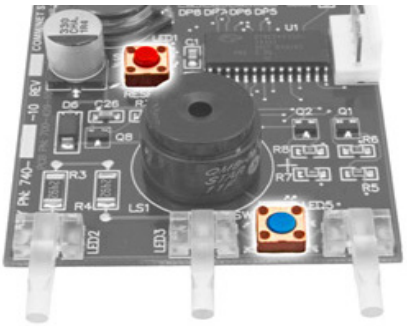


Figure 16. Matrix controller

6.3 Breaker Inventory

Step 1. Remove the breaker compartment door. Power on all installed circuit breakers.

Step 2. Upon first power up there will be a blue LED flashing to indicate that breaker inventory needs to be performed. To perform a breaker inventory press and hold the blue button, which is the button closest to the front of the panel. See Figure 16 for location of the breaker inventory button.

Step 3. Hold the button until the blue led turns on and subsequently turns off. This should take about 5 seconds.

Step 4. The blue LED will then flash once for each breaker stored in inventory. Breaker inventory will remain in the controller memory even if power is lost.

Note: If a new breaker is installed after an inventory has been completed, it will cause an alarm until a new breaker inventory is taken.

6.4 Temporarily Silencing the Audible Alarm

Step 1. Remove the breaker compartment door of the Matrix 300 panel.

Step 2. Tap the blue breaker inventory button. This is the button closest to the front of the panel.

This will silence the audible alarm until one of the following occurs:

- The breaker is reset and trips again
- Another breaker trip

6.5 Performing Factory Reset of the Logic Controller

***NOTICE**:*

PERFORMING THIS ACTION WILL REMOVE ALL BREAKER INVENTORY. THE PANEL WILL NOT ALARM PROPERLY UNTIL INVENTORY IS PERFORMED AGAIN.

Step 1. To perform a full factory reset (erasing all breaker inventory and alarm settings), hold the breaker inventory button (blue button closest to the front of the panel) and momentarily tap the processor reset button (red button toward the middle of the logic controller). See Figure 16 on Page 19 for location of the breaker inventory and processor reset buttons.

Step 2. Continue holding the breaker inventory button until the blue Breaker Inventory LED turns off.

Step 3. When the breaker inventory button is released, the blue breaker inventory LED will be flashing, indicating that the factory reset was successful.

7.0 Maintenance Operations

7.1 Breaker Removal

CAUTION!

THE PANEL MAY BE ENERGIZED. THE PANEL SHOULD ONLY BE SERVICED BY QUALIFIED PERSONNEL WITH INSULATED TOOLS AND APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT. ONLY REMOVE A BREAKER ONCE IT IS TURNED OFF.

Included in the Matrix 300 product installation kit is a breaker extraction tool.

Step 1. Remove the breaker compartment door by loosening the two thumbscrews.

Step 2. Turn off the circuit breaker to be removed.

Step 3. Using the captive screws, attach the breaker extractor to the breaker. There are threaded inserts on the face of the breaker for this purpose (see Figure 17).

Step 4. Pull the breaker straight out of the front of the panel (see Figure 18).

Step 5. Reinstall the breaker compartment door.

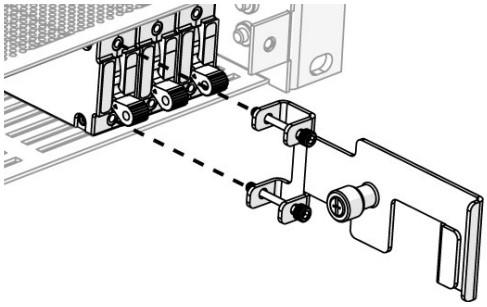


Figure 17. Breaker extraction tool

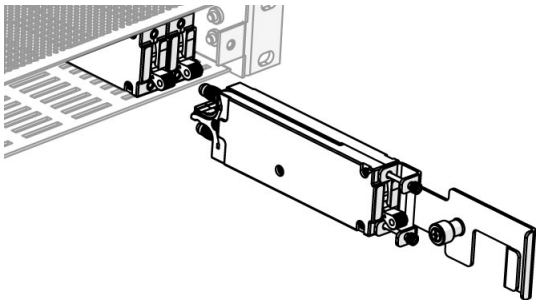


Figure 18. Breaker removal

8.0 Product Specifications

Table 8. Technical Specifications

ELECTRICAL	
Voltage	-48VDC
Input Busses	Dual (A/B)
Load Current Per Bus	300A max. continuous
Total Load Current	300A max. continuous
Alarm Contacts	Form-C, 60VDC @ 0.5A max
Circuits	16 (8A/8B)
Maximum Input Interruption Device	300A

MECHANICAL	
Dimensions L x H x D	17 x 1.75 x 14.72
Weight	12-18 lbs

ENVIRONMENTAL	
Operating Temperature	0 to 50°C
Humidity	0 to 95% RH non-condensing
Elevation	-500 to 3000m

Table 9. Agency Certifications

UL	
UL File Number	E473904
UL Standard	ANSI/UL 60950-1

9.0 Models and Accessories

Table 10. Model Configurations

DESCRIPTION	PART NUMBER
Matrix 300 Panel; Dual Input; -48VDC; 8A/8B Breaker Positions; Standard LED Indicators	C016-131-10
Matrix 300 Panel; Dual Input; -48VDC; 8A/8B Breaker Positions; SmartSwitch Supervisory Controller; Ethernet	C016-138-10

Table 11. Accessories

DESCRIPTION	PART NUMBER
90 Degree Input Lug Bracket Connection Kit	C016-1476-10

Table 12. Replacement Parts

DESCRIPTION	PART NUMBER
Matrix 300 Mounting Kit; Includes: - Mounting Ears/Hardware for 19” and 23” Rack Configurations - 1RU Slimline Breaker Puller/Extractor Tool - Heat Shrink - Hardware Kit	C750-044-10

Table 13. Supported Circuit Breakers

DESCRIPTION	PART NUMBER
3A Slimline Circuit Breaker	C470-700-10
5A Slimline Circuit Breaker	C470-701-10
10A Slimline Circuit Breaker	C470-702-10
20A Slimline Circuit Breaker	C470-703-10
30A Slimline Circuit Breaker	C470-704-10
40A Slimline Circuit Breaker	C470-705-10
50A Slimline Circuit Breaker	C470-706-10
60A Slimline Circuit Breaker	C470-707-10
70A Slimline Circuit Breaker	C470-728-10*
80A Slimline Circuit Breaker	C470-729-10*
100A Slimline Circuit Breaker	C470-730-10*

*Contact factory for application support for breakers rated 70A and up.

Table 14. Supported Lugs for Chassis Ground Connections

WIRE GAUGE	LUG BARREL TYPE	ALPHA PART NUMBER	MANUFACTURER	MANUFACTURER PART NUMBER	CRIMP DIE REQUIRED
#4 AWG	Long	C538-085-10	Burndy	YAZV4C2TC14FX	Burndy U4CRT, W4CRT, W4CVT, X4CRT

Table 15. Supported Lugs for Input Connections

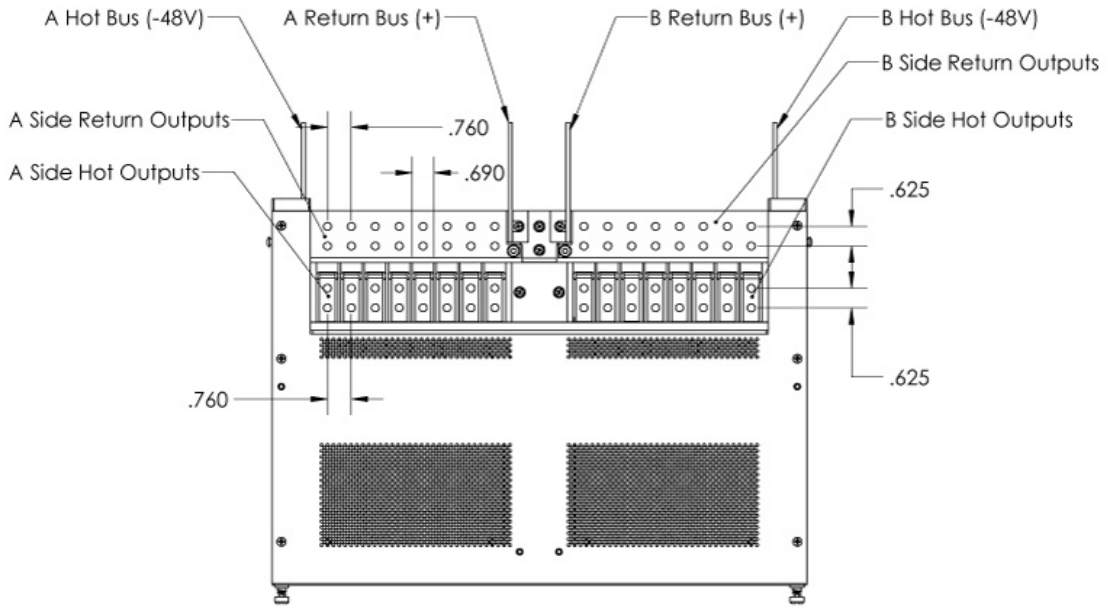
WIRE GAUGE	LUG BARREL TYPE	ALPHA PART NUMBER	MANUFACTURER	MANUFACTURER PART NUMBER	CRIMP DIE REQUIRED
1/0	Standard	C538-132-10	Burndy	YAV25L2TC38FX	Burndy U25RT, W25VT, W25RT, X25RT
2/0	Standard	C538-312-10	Burndy	YAV26L2NT38FX	Burndy U26RT, W26VT, W26RT, X26RT
4/0	Standard; narrow tongue	C538-220-10	Burndy	YAV28L2NT38FX	Burndy U28RT, W28VT, W28RT, X28RT
4/0	Standard; narrow tongue	C538-245-10	Burndy	YAV29L2NT38FX	Burndy U29RT, W29VT, W29RT, X29RT
350 MCM	Standard; narrow tongue	C538-404-10	Burndy	YA34L2NT38FX	Burndy U32RT, W32VT, W32RT
500 MCM	Standard; narrow tongue	C538-131-10	Burndy	YA38L2NT38FX	Burndy U38XRT

Table 16. Supported Lugs for Output Connections

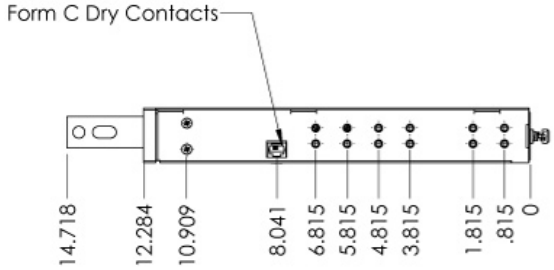
WIRE GAUGE	LUG BARREL TYPE	ALPHA PART NUMBER	MANUFACTURER	MANUFACTURER PART NUMBER	CRIMP DIE REQUIRED
#2 AWG	Standard; narrow tongue	C538-173-10	Burndy	YAV2CL2NT14FX	Burndy U2CRT, W2CVT, W2CRT, X2CRT
#4 AWG	Standard	C538-405-10	Burndy	YAV4CL2TC14FX	Burndy U4CRT, W4CVT, W4CRT, X4CRT
#6 AWG	Standard	C538-128-10	Burndy	YAV6CL2TC14FX	Burndy U5CRT, W5CVT, W5CRT, X5CRT
#8 AWG	Long	C538-018-10	Burndy	YAZ8C2TC14FX	Burndy U8CRT, W8CVT, W8CRT, X8CRT
#10-14 AWG	Standard	C538-120-10	Burndy	YAV102TC14	Burndy Y8MRB-1 (Dieless)

Appendix A: Mechanical Drawings

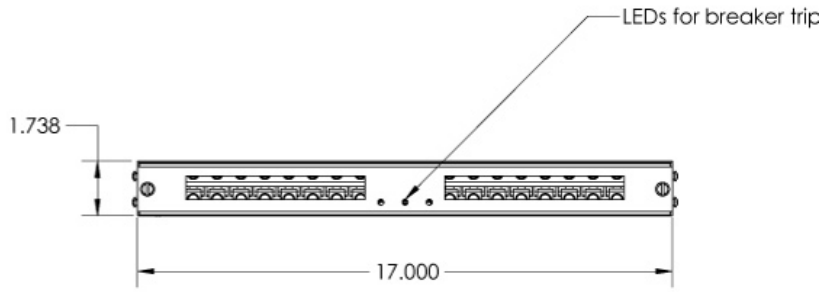
A.1 C016-131-10 Model



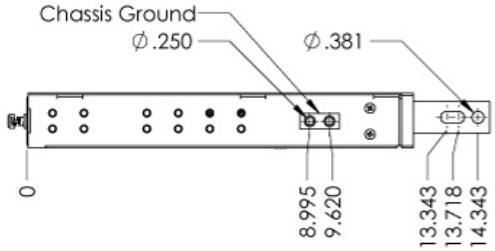
Top View



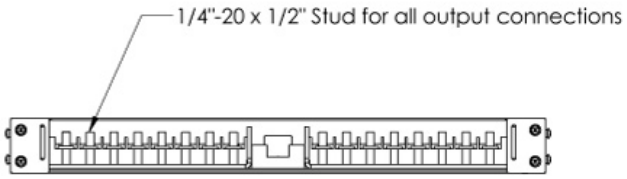
Side View



Front View

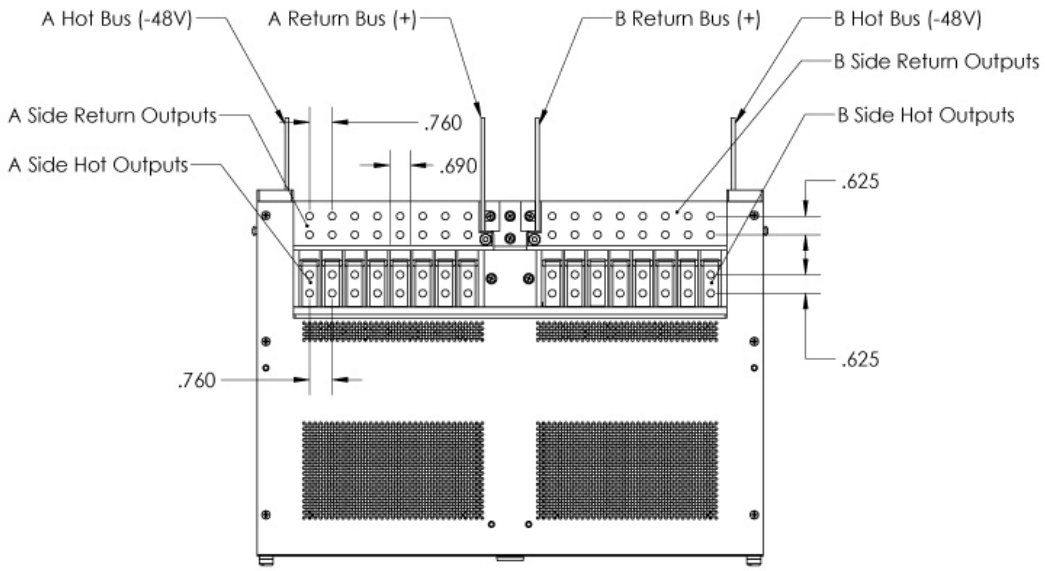


Side View

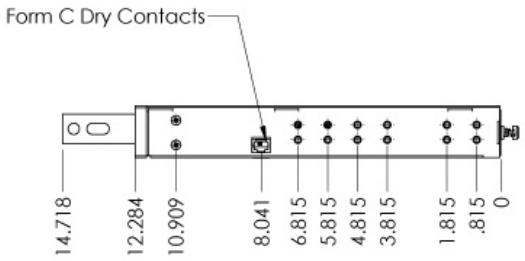


Rear View

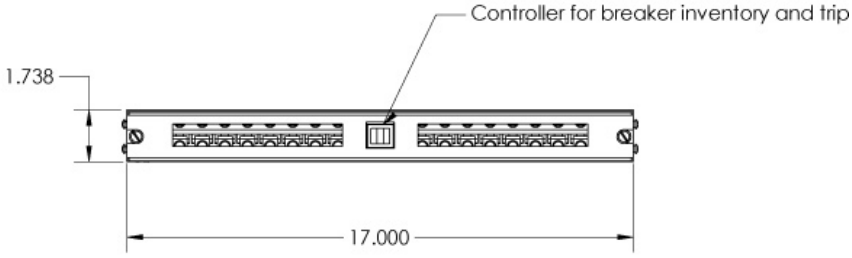
A.2 C016-138-10 Model



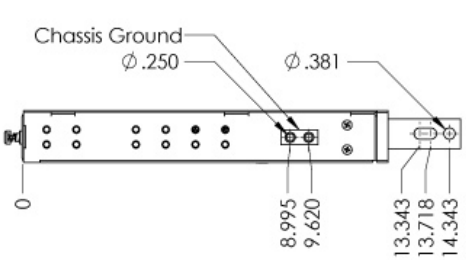
Top View



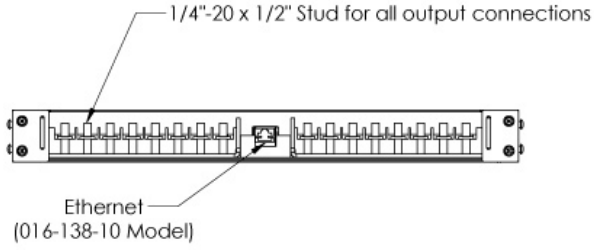
Side View



Front View



Side View



Rear View

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