

Model MB8(F)

Multi-Buss Distribution Board

Operating and Installation Instructions

I. Warnings and Notices

- I. WARNING - To reduce the risk of fire or electric shock, do not expose this product to rain or moisture
- II. WARNING - This installation and all servicing should be made by qualified service personnel and should conform to all local codes
- III. NOTICE - This equipment shall be installed in a manner which prevents unintentional operation from employees or other personnel working about the premises, by falling objects, by building vibration and by similar causes
- IV. NOTICE - This equipment is not intended for use within the patient care areas of a Health Care Facility

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Section 1

Introduction

The MB8(F) Multi-Buss Distribution board provides eight individually configurable outputs to any AlarmSaf power supply or accessory board with an ABC expansion port. It accepts inputs from one or two independent voltage sources, either of which is available at any output by jumper selection. Egress control is individually selectable by output for continuous power, activate on fire alarm, or disable on fire alarm. Fire alarm control is provided through the base power supply's FAI input.

- Eight Individually Configurable Outputs
- Available with Class-2 Power Limited outputs (MB8) or Fused (non-power limited) outputs (MB8F)
- One or two independent voltage inputs for dual voltage systems, or increased current capability in a single voltage system
- Each output is configurable for either voltage source and FAI control by simple jumper selection
- Each output is capable of supplying up to 3A (MB8F) or 1.6A (MB8) up to the maximum current capability of each voltage source
- Fused versions use easily obtainable ATM-3 automotive miniature blade fuses

Section 2

Applicable Standards / Documents

NFPA Standards

NFPA 72 National Fire Alarm Code

NFPA 70 National Electrical Code

NFPA 731 Standard for the Installation of Electronic Premises Security Systems

Other

Applicable Local and State Building Codes

Requirements of the Local Authority Having Jurisdiction (LAHJ)

Other Applicable AlarmSaf Documents

52-296: Beacon Power Supply Installation Manual

52-375: PS5-M Installation Manual

52-326: PD8(F) Accessory Board Installation Manual

52-350: SPS4 Accessory Board Installation Manual

52-351: CMB8(F) Accessory Board Installation Manual

Section 3 System Overview

3.1 Electrical Ratings and Specifications

Manufactured By

AlarmSaf
6 Ledgerock Way, Unit 7
Acton, MA 01720
Tel: 978.658.6717; 800.987.1050
www.alarmsaf.com

Model Numbers

MB8, MB8F

Electrical Ratings

Inputs	Two Inputs: 0-24VDC Nominal @ 14 Amps maximum per input
Outputs	Eight Outputs: 1.6A (MB8) or 3A (MB8F) per output up to the maximum capability of each base power supply. Output voltages determined by base power supplies and jumper selections
Fuse Type (MB8F only)	ATM-3 Automotive Miniature Blade-type

Product Use

When installed in accordance with all standards listed in Section 2 of this document and used with an appropriate listed supply, the MB8(F) provides constant or FAI controlled outputs, sourced from one of two voltage sources for powering devices such as (but not limited to) Mag Locks, Door Strikes, Card Readers, Smoke Dampers, 4-Wire Smoke detectors, etc.

3.2 MB8(F) Terminal and Connector Descriptions and Electrical Ratings

Terminal / Connector	Description	Rating
P1	ABC Input or Output	0-24V Nominal at 14A per Buss (controlled by base supply(s))
P2	ABC Input or Output	
<i>TB1 - Outputs 1 through 4</i>		
Out1 +	Output 1 +	1.6A (MB8) or 3A (MB8F) maximum - Voltage determined by base supplies and jumper selection
Out1 -	Output 1 -	
Out2 +	Output 2 +	1.6A (MB8) or 3A (MB8F) maximum - Voltage determined by base supplies and jumper selection
Out2 -	Output 2 -	
Out3 +	Output 3 +	1.6A (MB8) or 3A (MB8F) maximum - Voltage determined by base supplies and jumper selection
Out3 -	Output 3 -	
Out4 +	Output 4 +	1.6A (MB8) or 3A (MB8F) maximum - Voltage determined by base supplies and jumper selection
Out4 -	Output 4 -	
<i>TB2 - Outputs 5 through 8</i>		
Out5 +	Output 5 +	1.6A (MB8) or 3A (MB8F) maximum - Voltage determined by base supplies and jumper selection
Out5 -	Output 5 -	
Out6 +	Output 6 +	1.6A (MB8) or 3A (MB8F) maximum - Voltage determined by base supplies and jumper selection
Out6 -	Output 6 -	
Out7 +	Output 7 +	1.6A (MB8) or 3A (MB8F) maximum - Voltage determined by base supplies and jumper selection
Out7 -	Output 7 -	
Out8 +	Output 8 +	1.6A (MB8) or 3A (MB8F) maximum - Voltage determined by base supplies and jumper selection
Out8 -	Output 8 -	

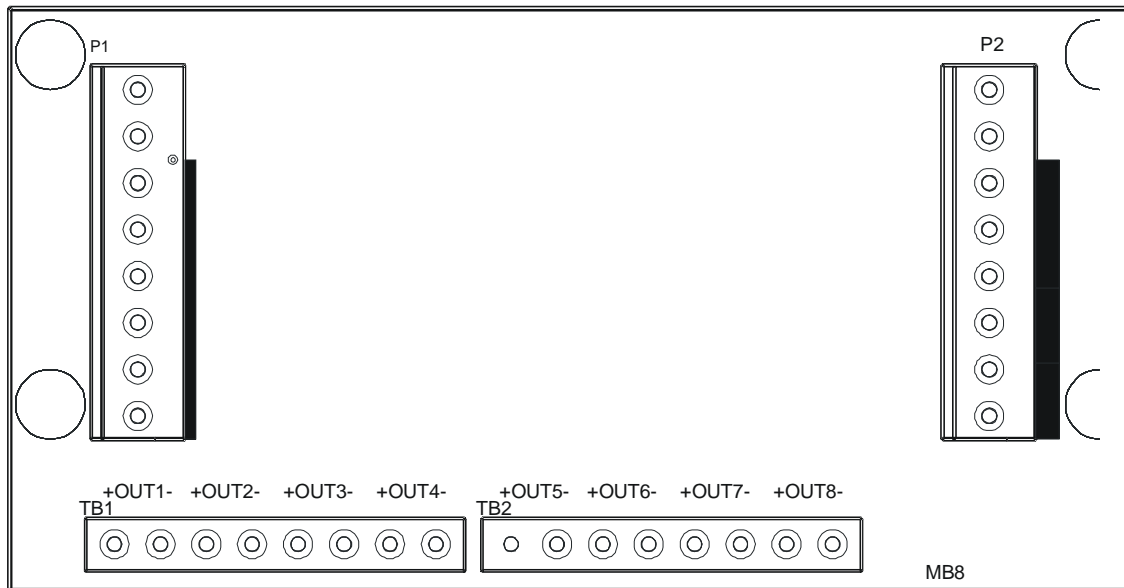


Figure 3.2.1

3.3 ABC Connectors and Harnesses

3.3.1 General Information

The ABC buss supplies the voltages (B1 and B2), fault status and FAI control to compatible accessory boards. B1 is supplied through pins 5 and 6 while B2, if used, is supplied through pins 7 and 8 of each connector. By using the appropriate cables, one or two independent voltage sources can be connected to the MB8(F) for distribution to its outputs. For more detailed information on the AlarmSaf ABC expansion port, see Appendix B, "About the Accessory Board Connector".

Note: If the FAI function is to be used, one of the voltage busses (B1 or B2) MUST be 12V or higher

3.3.2 Single Voltage Distribution

A single power source can be connected to the MB8(F) by using an 8-6 cable (Order # 00523 or 00524) connected to pins 1 through 6 of one of the ABC connectors (P1 or P2).

3.3.3 Dual Voltage Distribution

3.3.3.1: If both source voltages are present on the ABC buss, use an 8-8 cable (Order # 00521 or 00522) connected to either ABC Connector on the MB8(F) to provide both B1 and B2.

3.3.3.2: If two independent power supplies are used, use one 8-6 cable (Order #00523 or 00524) from the first power supply to either ABC connector (P1 or P2) on the MB8(F) for B1 and one 8-6 cable (Order #00523 or 00524) from the second power supply to the other ABC connector (P1 or P2) on the MB8(F) for B2.

3.3.4 ABC Cable Types

Cable Type	Order #	Description	Length	Notes
6-6	00519	ABC-01	8 inches	Used with Beacon Power supply REV A02 or earlier ONLY
6-6	00520	ABC-02	18 inches	Used with Beacon Power supply REV A02 or earlier ONLY
8-8	00521	ABC-03	8 inches	Brown wire identifies Pin 1
8-8	00522	ABC-04	18 inches	Brown wire identifies Pin 1
8-6	00523	ABC-05	8 inches	Brown wire identifies Pin 3 on the 8 connector end & Pin 1 on the 6 connector end
8-6	00524	ABC-06	18 inches	Brown wire identifies Pin 3 on the 8 connector end & Pin 1 on the 6 connector end

ABC-01: Used to connect a 6-pin ABC Beacon power supply to the first accessory board when the accessory board is located close to power supply.*

ABC-02: Used to connect a 6-pin ABC Beacon power supply to the first accessory board, when the accessory board is not located close to power supply.*

ABC-03: Used to connect the 8-pin ABC Beacon power supply accessory board to the first accessory board or to connect accessory board to accessory board over short distances.

ABC-04: Used to connect the 8-pin ABC Beacon power supply accessory board to the first accessory board or to connect accessory board to accessory board over long distances.

ABC-05: Short cable used to connect 8-pin ABC Beacon Power Supply to a 6-pin ABC accessory board such as the SPS4.

ABC-06: Long cable used to connect 8-pin ABC Beacon Power Supply to a 6-pin ABC accessory board such as the SPS4.

* *NOTE:* The ABC-01 and ABC-02 cables are used only on the older Beacon Power supply boards (PCB#: 38-118 REV A02 or earlier) that have a 6-pin ABC connector. **DO NOT USE** these cables on newer Beacon Power supply boards (PCB # 38-118 REV A03A or later) with 8-pin ABC connector boards or damage to the system could occur.

3.4 Output Terminals

The MB8(F)'s output terminals (TB1 and TB2) provide power distributed from the B1 and B2 (if present) supplies. The voltage source and FAI activation selections for each output are made through each output's configuration jumper settings. See Section 5 for configuration jumper settings.

Each output is protected by either an ATM-3 fuse (MB8F) or a 1.6A PTC (MB8). If an output PTC is tripped, remove the output load by either removing the output wiring or by pulling the output's configuration jumper (note it's position before removing) for 30 seconds.

CAUTION: Observe the polarity of the MB8(F) output terminals with respect to the load or damage to the load may occur.

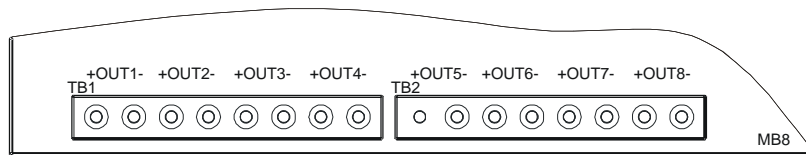


Figure 3.4.1

Section 4 Installation

4.1 Mounting

The MB8(F) mounts either in the accessory board space on the power supply or to the back of a metal enclosure.

CAUTION: Remove all power from the system before installation

4.1.1 Mounting On a Power Supply

1. Remove and save the four mounting screws from the accessory board mounting space on the power supply.
2. Install 6-32 x 1 1/4" Male-Female standoffs in the four locations where the screws were removed (the aluminum standoff, if present, is installed in the top left mounting hole).
3. Mount the MB8(F) to the standoffs using the screws removed in step 1
4. Connect ABC cable(s) appropriately (See section 3.3)

4.1.2 Mounting In a Metal Enclosure

1. Install four 6-32 x 3/4" Female-Female nylon standoffs on the appropriate mounting studs in the enclosure (the aluminum standoff, if present, is installed on the top left mounting stud).
2. Mount the MB8(F) to the standoffs using 6-32 x 3/8" screws.
3. Connect ABC cable(s) appropriately (See section 3.3)

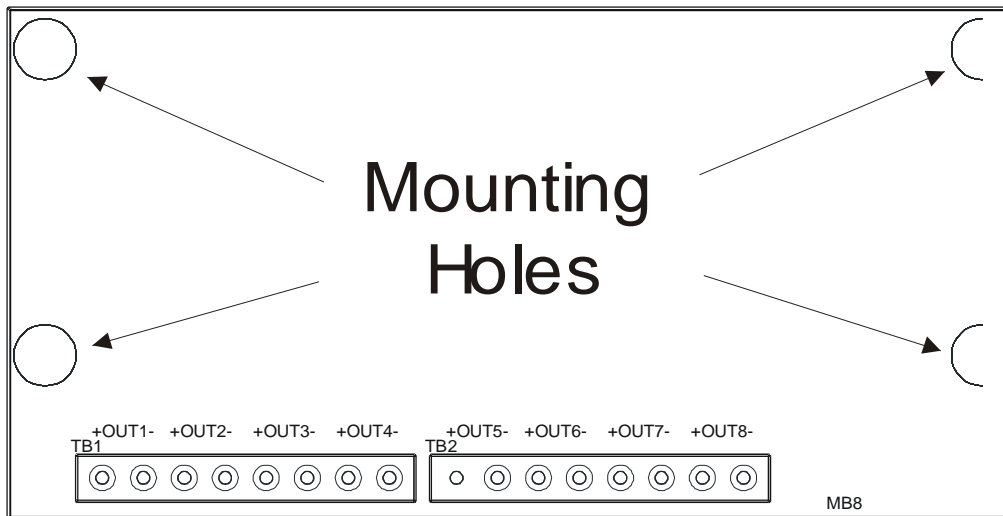


Figure 4.1.1

4.2 Wiring

4.2.1 Wire Routing

All wiring must be installed in accordance with NFPA70 [NEC760], NFPA72, and all local code requirements.

Power Limited wiring requires that power limited and non-power limited wiring remain physically separated. Any power limited circuit entering the enclosure must remain at least one quarter inch ($\frac{1}{4}$ ") away from any non-power limited circuit wiring. Any power limited circuit wiring must enter and exit the enclosure through different knockouts than non-power limited circuit wiring.

Wiring within the enclosure should be routed around the perimeter of the cabinet. It should not be routed across the circuit boards. See the enclosure's documentation for complete wire routing instructions.

4.2.2 ABC Connector

See section 3.3

4.2.3 Output Wiring

Locate the output wiring terminal blocks (TB1 and TB2) and remove the terminal block from the header. Connect the wiring for the equipment to be powered to the terminal block. The PC board is labeled with the output numbers and polarity (See also section 3.2). Replace the terminal block on the header.

NOTE: Wire size for these terminals must be 22-14 AWG.

4.3 Labeling

If the MB8(F) was purchased separately from the power supply unit, the supplied label must be applied to the inside cover of the power supply's enclosure. The label shall not cover any ventilation holes or other labeling on the enclosure.

Section 5 Operating the MB8(F)

5.1 Jumper Configuration

Before powering a system containing an MB8(F), the jumpers must be set for proper operation. Failure to do so before applying power could damage the system.

Jumper	Description	Settings	Factory Default
JP1 - JP8	Output Voltage and FAI Control	1 (CB2) - B2 Constant 2 (EB2) - B2 Enable on FAI 3 (DB2) - B2 Disable on FAI 4 (CB1) - B1 Constant 5 (EB1) - B1 Enable on FAI 6 (DB1) - B1 Disable on FAI	CB1
JP9	FAI Buss Join	Up - FAI Connected between P1 & P2 Down - FAI NOT connected between P1 & P2	Down
JP10	Fault Buss Join	Up - Fault Buss connected between P1 & P2 Down - Fault Buss NOT connected between P1 & P2	Down

5.1.1 Output Voltage and FAI Control (JP1 through JP8)

These jumpers select the voltage source (B1 or B2 - See section 3.3) and FAI mode for each output. Jumper positions are numbered with position one being at the top (farthest away from the output terminals), and position six being at the bottom. Reference nomenclature is also provided on the PC board to the left of P1.

- Position 1 (CB2) - Constant power from the B2 buss is provided at the output. No action is performed when the system's FAI input is activated.
- Position 2 (EB2) - Power from the B2 buss is provided when the system's FAI input is activated.
- Position 3 (DB2) - Power from the B2 buss is provided when the system's FAI input is NOT active. Power to the output is dropped upon activation of the FAI input.
- Position 4 (CB1) - Constant power from the B1 buss is provided at the output. No action is performed when the system's FAI input is activated.
- Position 5 (EB1) - Power from the B1 buss is provided when the system's FAI input is activated.
- Position 6 (DB1) - Power from the B1 buss is provided when the system's FAI input is NOT active. Power to the output is dropped upon activation of the FAI input.

5.1 Jumper Configuration (continued)

5.1.2 FAI Buss Join (JP9)

Placing this jumper in the “up” position connects the FAI buss between P1 and P2. If two separate power supplies are connected to P1 and P2, BOTH will activate on an FAI input on either supply. This jumper should also be in the “up” position when one connector (P1 or P2) is used for power input, and the other connector is used as an output for further expansion.

Placing JP9 in the “down” position disconnects P1 from the FAI buss on the MB8(F). FAI activation of the MB8(F) MUST be performed through the supply connected to P2. An FAI activation on P1 will have no effect on the MB8(F) with JP9 down.

5.1.3 Fault Buss Join (JP10)

Placing this jumper in the “up” position connects the fault buss between P1 and P2. If two separate power supplies are connected to P1 and P2, BOTH will show a trouble with a trouble on either supply. This jumper should also be in the “up” position when one connector (P1 or P2) is used for power input, and the other connector is used as an output for further expansion.

Placing JP10 in the “down” position disconnects P1 from the fault buss on the MB8(F). This is useful if separation of faults between two supplies is desired.

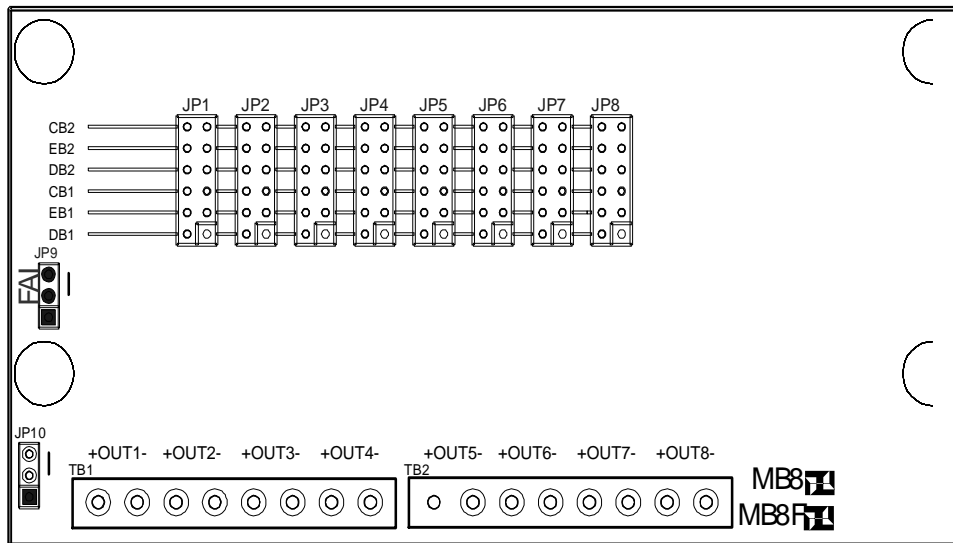


Figure 5.1.1

5.2 Visual Indicators

The MB8(F) has three LEDs to indicate status:

- Buss Voltage 1 - Indicates that voltage is present on the B1 buss when lit
- Buss Voltage 2 - Indicates that voltage is present on the B2 buss when lit
- FAI - Indicates that MB8(F) is receiving an FAI signal from the power supply(s) when lit

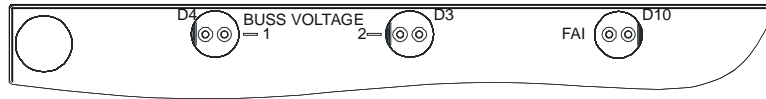


Figure 5.2.1

5.3 Troubleshooting

Condition	Possible Cause	Solution
No voltage on output	Jumper settings incorrect	Verify proper jumper settings
	Missing jumper	Verify jumper present
	No voltage supply	Verify the power supply
	Blown output fuse (MB8F)	Check output wiring and replace fuse
	Tripped output PTC (MB8)	Check output wiring and remove load for 30 seconds to reset
Incorrect voltage on output	Incorrect voltage buss selected	Verify proper jumper settings
	Power supply outputting incorrect voltage	Check power supply
Buss Voltage 1 LED not lit	No voltage on B1 Buss	Check B1 power supply and ABC cable
Buss Voltage 2 LED not lit	No voltage on B2 Buss	Check B2 power supply and ABC cable
Buss Voltage LEDs show different brightness	Normal	This is normal - LED brightness varies with input voltage
FAI LED lit	FAI activated on power supply	Check FAI input on system
FAI LED not lit	FAI not activated on power supply	FAI LED only lights when FAI activated on system
When one power supply indicates fault, the other supply does/doesn't simultaneously indicate fault	Fault Buss Join jumper (JP10) incorrectly set	Set jumper as desired - See Section 5.1.3
When one power supply's FAI activates, the other supply does/doesn't simultaneously activate	FAI Buss Join jumper (JP9) incorrectly set	Set jumper as desired - See Section 5.1.2

Section 6 Specifications

6.1 Electrical Specifications

6.1.1 Input Voltage (B1 and B2)	0-24VDC Nominal; If FAI function is used, one of the voltage busses (B1, or B2) MUST be 12V or higher.
6.1.2 Input Current (B1 and B2)	14A maximum per buss
6.1.3 Battery Requirement	0.01A in addition to output current for each buss. An additional 0.03A will be drawn from the buss with the greater voltage upon an FAI activation.

6.2 Temperature Specifications

6.2.1 Ambient Temperature Range	0°C to 49°C (32°F to 120°F)
6.2.2 Ambient Humidity	93% at 32°C (90°F) Maximum

6.3 Mechanical Specifications

6.3.1 Weight	0.22 Lbs (Not including hardware or cables)
6.3.2 Size	4.80"L x 2.70"W x 1.15"H NOTE: Width includes terminal block overhang of 0.2"

6.3.3 CAD Drawing

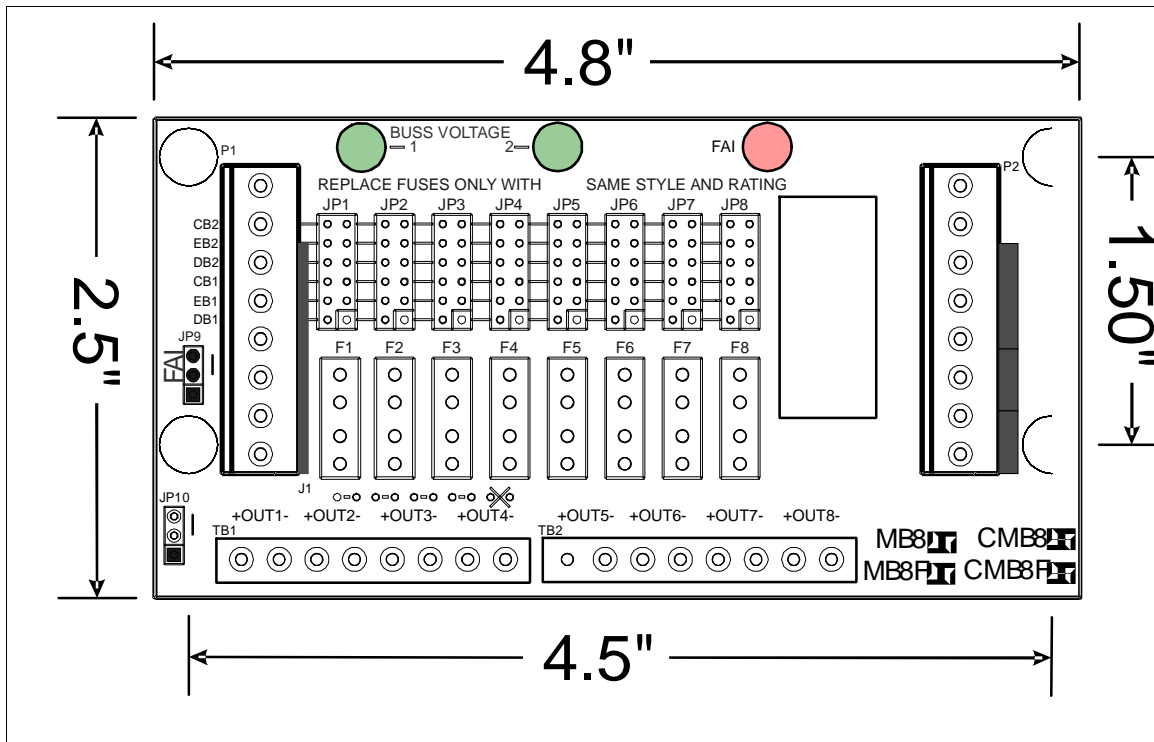
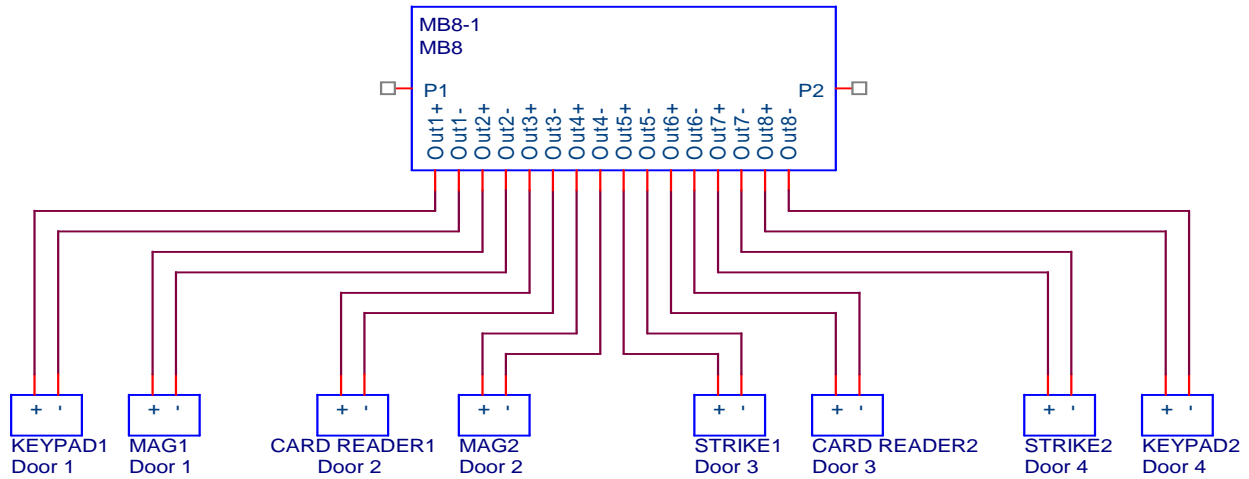


Figure 6.3.1

Appendix A Sample Application

Four Door Access System



Dual Voltage System with one MB8 and FAI control

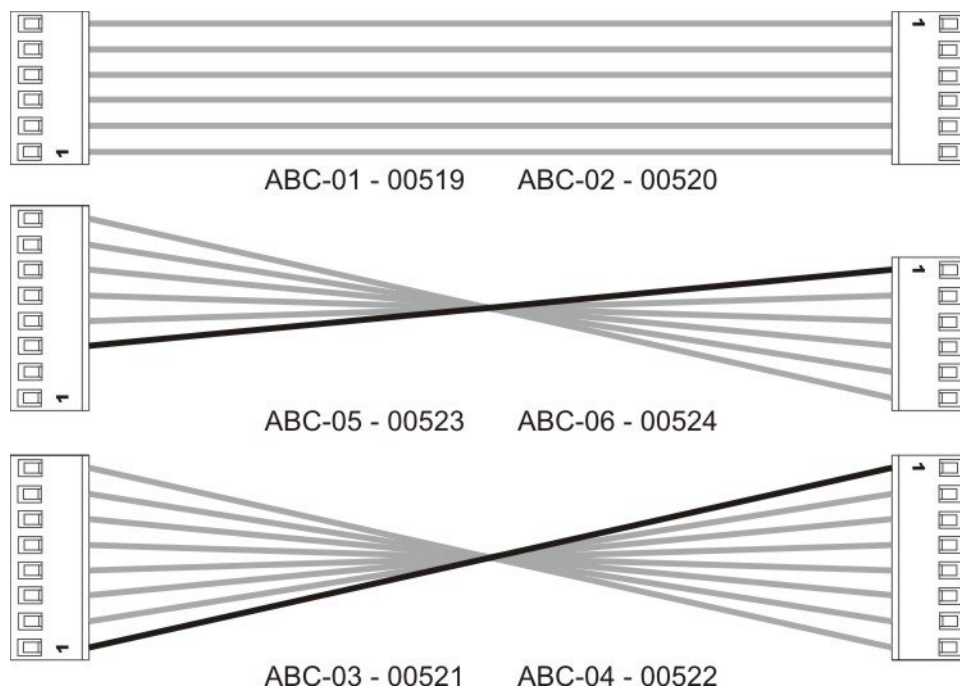
- B1 connected to 24V source, B2 connected to 12V source
- MB8 Outputs 1 and 3 set for CB1 to provide constant power for 24V Reader and Keypad
- MB8 Output 2 set for DB1 for 24V to disconnect power from Maglock on Fire Alarm
- MB8 Output 4 set for DB2 for 12V to disconnect power from Maglock on Fire Alarm
- MB8 Output 5 set for EB2 to power 12V doorstrike on Fire Alarm
- MB8 Output 7 set for EB1 to power 24V doorstrike on Fire Alarm
- MB8 Outputs 6 and 8 set for CB2 to provide constant power for 12V Reader and Keypad

APPENDIX B, PAGE 1

About the Accessory Board Connector

The AlarmSaf Accessory Board Connector (ABC) allows plug-in system expansion using compatible AlarmSaf accessory boards. The ABC is capable of carrying both primary and secondary voltages (if applicable), DC common, fault status, and fire alarm interface status. Products can be daisy-chained together, maintaining voltage, fault, FAI, and DC common continuity throughout the chain.

NOTE: There are 6-pin and 8-pin versions of the ABC. The 6-pin version carries ONLY a single voltage while the 8-pin version can carry two independent voltages for dual voltage systems.



6-Pin and 8-Pin Accessory Board Connectors

* **NOTE:** The ABC-01 and ABC-02 cables are used only on the older Beacon Power supply boards (PCB#: 38-118 REV A02 or earlier) that have a 6-pin ABC connector. **DO NOT USE** these cables on newer Beacon Power supply boards (PCB # 38-118 REV A03A or later) with 8-pin ABC connector boards or damage to the system could occur.

APPENDIX B, PAGE 2

About the Accessory Board Connector (continued)

Voltage Busses (B1 and B2)

The voltage busses (B1 and B2) are carried on pins 5-8 of the ABC. B1 is the primary voltage, and should typically be the higher of the two voltages in a dual voltage system. The B1 and B2 (if used) voltages are distributed through the accessory boards connected to the ABC. See the documentation for the particular accessory boards being used for details on how to utilize the B1 and/or B2 voltages. Note that 6-pin ABC connectors can carry only the B1 voltage, while 8-pin ABC connectors can carry both B1 and B2. In order for the B2 voltage to be present, a second power supply must be included in the system (AC to DC or DC to DC).

CAUTION: If more than one power supply is connected to any of the voltage busses, the system will not operate properly and damage to the system could occur. Verify that only one power supply is connected to each voltage buss before powering the system.

Fault Status Buss

The fault status buss carries the DC Fault status between accessory boards and power supplies. Any product with fault detection and/or reporting capability can report a fault to or from the ABC chain. Unless otherwise noted in a product's documentation, AC faults are not transmitted through the fault status buss.

Some accessory boards have a jumper to split the fault buss. This allows the separation of faults between two power supplies in some dual voltage systems. If the buss is not split, any fault on either power supply or any accessory board will show on both power supplies. If the buss is split, faults on each side of the jumper will go to their respective power supply only, allowing easier troubleshooting fault conditions, but requiring monitoring of the fault outputs of both power supplies. Note that only one split should be used in the fault status buss. See the documentation for the accessory boards in the system to determine which, if any, have a fault buss split jumper.

NOTE: Not all accessory boards have fault detection or reporting capability, however the fault status is still carried through these accessory boards to maintain continuity through the chain.

APPENDIX B, PAGE 3

About the Accessory Board Connector (continued)

Fire Alarm Interface (FAI) Status Buss

The FAI status buss carries FAI activation signals on systems utilizing a Fire Alarm Interface. This buss is used to control outputs on compatible accessory boards. See the documentation for the accessory boards in the system to determine FAI capability.

Some accessory boards have a jumper to split the FAI buss, allowing independent control of groups of accessory boards and power supplies with multiple FAI input sources. If the buss is not split, all power supplies and accessory boards with FAI capability will change state upon activation of *any* FAI input source in the chain. If the buss is split, FAI activation of any FAI input source will only activate accessory boards or power supplies up to the split. Products after the split require their own FAI input source.

Note: Not all accessory boards have FAI capability; however the FAI status is still carried through these accessory boards to maintain continuity through the chain.

DC Common

The DC Common (ground) for the system is maintained through the entire ABC chain. Any power supplies or accessory boards connected to the chain are common grounded through the ABC.

Accessory Boards

The following is a list of currently available AlarmSaf Accessory Boards with ABC connectors:

ACCESSORY MODULE		MODULE DESCRIPTION	ABC CABLE	
ORDER	MODEL#		ORDER	MODEL#
10041, 10042	PD8(F)	8 outputs	00521	ABC-03
10067, 10068	MB8(F)	8 outputs w/FAI & voltage selection	00521	ABC-03
10069, 10070	CMB8(F)	8 outputs w/FAI; 4 Relay Controlled	00521	ABC-03
10066	SPS4	Secondary Power Source Module: 5-18V @ 4A	00523	ABC-05
03207	FAIM	Fire Alarm Input Module (used w/PS5-M)	00521	ABC-03
97471	EDB-10	Power Distribution Module for proprietary systems	00523	ABC-05
97472	LDB-8	Power Distribution Module for proprietary systems	00523	ABC-05

Glossary

ABC	See "Accessory Board Connector"
Accessory Board Connector	Connector present on some AlarmSaf power supplies and accessory boards, allowing plug-in expansion of the system
Accessory Board	An AlarmSaf product for use with AlarmSaf power supplies containing an ABC connector. These boards allow plug-in expansion of the functionality of the system. Examples of accessory boards include, but are not limited to, voltage distribution (simple and controlled), secondary DC-DC power supplies, and NAC Circuit expanders.
AC-DC Converter	A DC power supply whose voltage input is either direct from the AC line or through a step-down AC transformer
Buss 1 (B1)	The primary DC voltage in a system. Typically the higher of the two voltages in dual voltage systems
Buss 2 (B2)	The secondary DC voltage in a system. Only dual voltage systems use this voltage.
Class 2 Power Limited	A voltage output or wiring which conforms to NEC Article 725.
Controlled Distribution	Voltage distribution providing on/off control for the outputs. Control can be from FAI, an access control panel, card reader, or other device. The MB8(F) and CMB8(F) accessory boards, and the APD8(F) are examples of controlled distribution.
DC-DC Converter	A DC power supply whose voltage input comes from another DC source. DC-DC converters allow multi-voltage system backup with a single battery set.
FAI	See "Fire Alarm Interface"
Fire Alarm Interface	Input present on some AlarmSaf products allowing control of output(s) in the system. Typically used for dropping power to maglocks on egress doors during a fire alarm condition, but can also be used for other control functions, such as resetting smoke detectors
Negative Trip	An input which is activated upon the switching of a DC Common to its terminals. The DC Common may either be from an external (common grounded) source, or may be provided as one of the terminals of the input, depending on the product. This input type is used with a dry contact or open collector input.
Positive Trip	An input which is activated upon the switching of a positive DC voltage to its terminals. The positive voltage may either be from an external (common grounded) source, or may be provided as one of the terminals of the input, depending on the product. This input type is used with a dry contact or voltage input.
Power Limited	A voltage output or wiring which conforms to NEC Article 725.
PTC	A resettable overcurrent protection device, similar to a fuse or circuit breaker.
Rack Mount	A product which has an enclosure that allows mounting in a standard 19 inch equipment rack
Simple Distribution	Voltage distribution without any control function for the distributed outputs. Power is always available to the outputs. The PD8(F) accessory board is an example of simple distribution.
Voltage Distribution	Splitting a bulk power supply output into multiple, current limited outputs to prevent a single circuit failure from taking down an entire system. The multiple terminal outputs also simplify wiring by providing a pair of terminals for each circuit, rather than wiring several circuits to a single pair of terminals.