



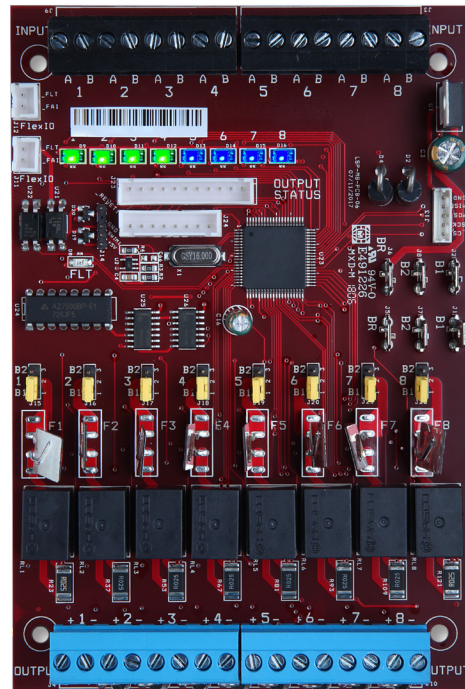
Power is knowledge.™

M8 / M8P Installation Manual

LifeSafety Power®



FLEXPOWER®



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**Description**

The M8/M8P power control modules add 8 zones to an FPO power supply system for powering and monitoring locks, cameras, or other critical devices. The M8/M8P MUST be used with an NL4 network module. The M8/M8P accepts either one or two voltage sources, either of which are selectable for output on a zone-by-zone basis. Each input is fully programmable via software to accept a voltage, dry contact, or open collector input. Each zone output is selectable via software for FAI operation, constant output, maglock output, or fail-safe or fail-secure doorstrike outputs. Output zone 8 is also programmable as a dry contact output. The suffix "P" added to the model number denotes Class 2 Power Limited outputs.

**Specifications**

<b>Power Input</b>	Voltage	12 or 24VDC nominal
	Current	12A maximum
	Standby Current	300mA All lock control relays active
<b>Zone Input</b>	Voltage Input	12 or 24VDC
	Max Current	10mA
<b>Zone Output</b>	Voltage	Same as input
	M8 Current	3.0A resistive
	M8P Current	2.5A resistive (Class 2 Power Ltd)
<b>Fuse</b>	3A	ATM automotive style (M8 only)
<b>Size</b>	M8/M8P	6.00" x 4.00" x 1.4" (152mm x 64mm x 36 mm)
<b>Weight</b>	M8/M8P	0.35lb (0.16kg)

**Regulatory Information**

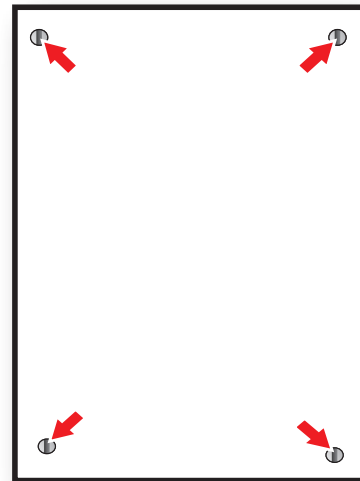
The equipment discussed within this manual has been tested to the following standards:

- UL294, UL603, UL1076
- ULC S318, ULC S319
- CSA C22.2 #205
- CSFM Approved

**Mounting the Power Control Module**

Mounting of the board to an enclosure is via the four snap-in standoffs supplied.

1. Locate the appropriate mounting holes in the enclosure and snap the standoffs into the holes.
2. Align the board mounting holes with the standoffs (be sure the PC board is properly oriented) and snap the board onto the standoffs.
3. Connections to the module shall be completed within the same room, not exceeding a length of 3 m.



*Class 2 power limited wiring must be separated from non-power limited wiring by a minimum of 1/4 inch and must use separate knockouts.*

*• The installation and all wiring methods shall be in accordance with ANSI/NFPA70 and all local codes.*

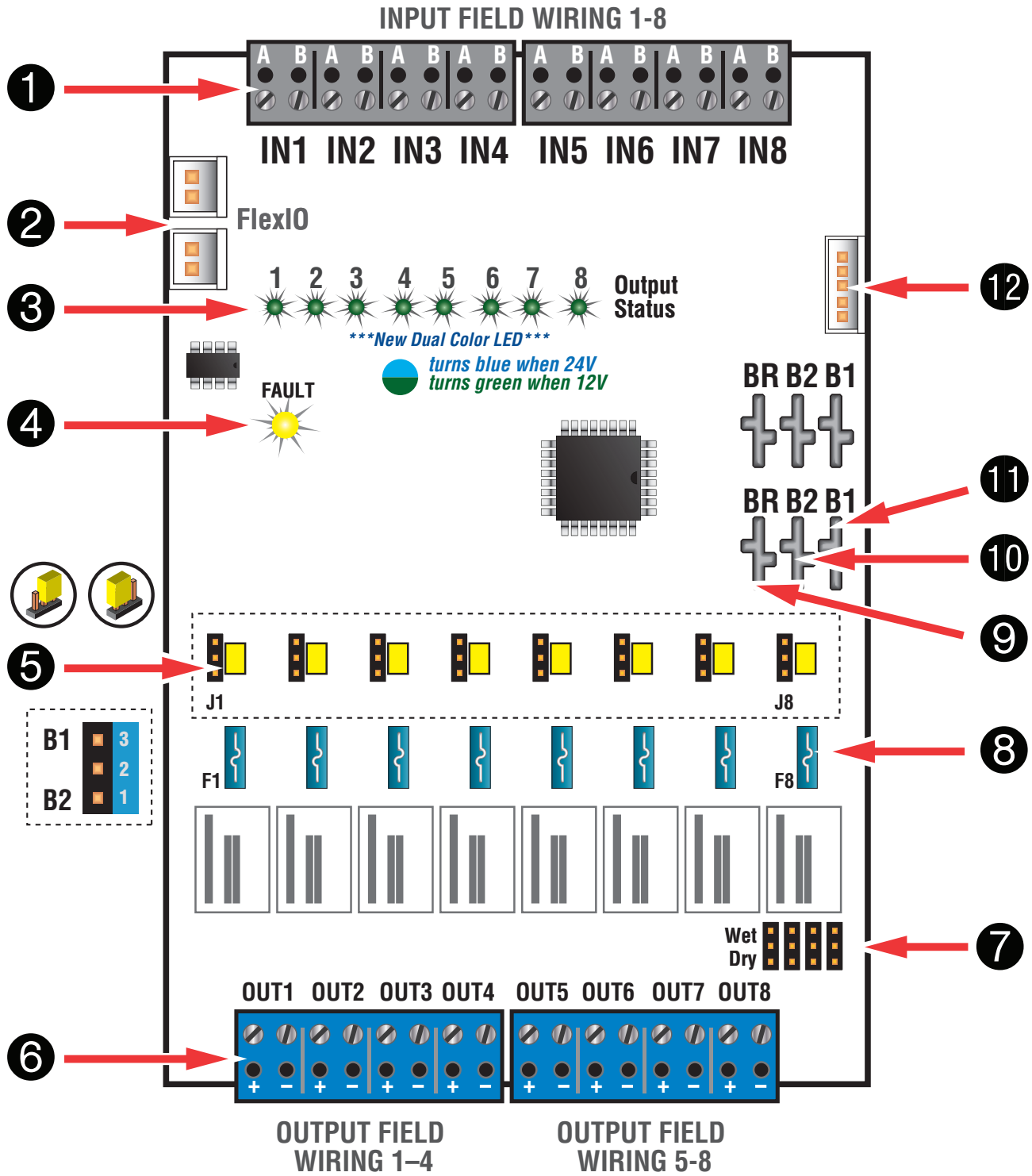
*For ULC compliance, installation and all wiring methods shall be in accordance with the Canadian Electrical Code, C22.1, Part I, Section 32.*

*All input wiring to the module shall be located within the same room (3 m).*



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Power Control Module Overview



## Power Control Module Overview

### 1 Zone Inputs (INPUT 1 – 8)

These are the input terminal strips. These terminals are removable and accept wire sizes from AWG12 – AWG22. The terminals are labeled on the PC board near the terminal strip. See the Input Wiring section of this manual for more information.

- When using a dry contact input, the contact is connected across the A and B terminals. **It is normal to measure a voltage across these two terminals.** This voltage is current limited and will not damage the activation contact.
- When using a voltage input, the voltage is connected to the B terminal. The activation voltage must be common grounded with the system voltage and must be between 12 and 24VDC. Leave the A terminal disconnected.
- When using an open collector input, place a jumper across the A and B terminals and connect the open collector to B. Note that the input source must be common grounded with the M8/M8P board's power source.

### 2 FlexIO Connectors

These connectors pass the FAI and Fault signals to and from the M8/M8P board and pass the FlexIO buss on to other accessory boards in the system.

### 3 Output Status LEDs (1 – 8) – Green/Blue

These LEDs indicate the status of the output. LED numbers correspond with the zone number (e.g. LED 1 for Output 1).

*When Powering Lock Devices:*

- **ON Steady** Door Locked (Fuse or PTC Intact)
- **SLOW Flashing** (1 per second) Door Unlocked (Either due to Zone Input or FAI)
- **FAST Flashing** (4 per second) Fault Detected on Zone
- **OFF** Fuse or PTC open, or zone disabled in software

*When Set for Constant Output:*

- **On Steady** Output Powered (Fuse or PTC Intact)
- **SLOW Flashing** (1 per second) Output Unpowered (Due to FAI)
- **FAST Flashing** (4 per second) Fault Detected on Zone
- **OFF** Fuse or PTC open, or zone disabled in software

These LEDs are bi-color and indicate the output voltage for each output as follows:

- **Green** – 12V Output
- **Blue** – 24V Output

**NOTE** LED colors are range based. Voltage Less than 13V will show Green. Voltage above 20V will show Blue. Voltage between 13 and 20 may show either voltage or a combination Green & Blue. Always verify voltage with a voltmeter.

### 4 Fault LED (FAULT) – Yellow

This LED lights when the M8/M8P detects a ruptured output fuse or other fault condition (including a tripped upper or lower limit - See the programming section for more information). This fault condition also transmits to the power supply through the FlexIO.

### 5 Buss Selection Yellow Jumpers (1-8)

The M8/M8P can accept up to two power inputs connected to B1 and B2. This jumper selects which power supply input is used for the output. If a single power supply is used, set this jumper for Position 1.

- B1** This position selects the power supply connected to B1
- B2** This position selects the power supply connected to B2

### 6 Zone Outputs (OUTPUT 1-8)

These are the output terminals. These terminal strips are removable and accept wire sizes from AWG12 – AWG22. The terminals are labeled on the PC board near the terminal strip. See the Output Wiring section for more information.

**⚠** The M8 has reverse protection diodes across each output. If a delay is present on lock release, the diode should be removed from the circuit. See page 7 for more information.

### 7 Zone 8 Wet / Dry Output Selection (J26 - J28)

Zone 8 of the M8 is able to be set as a dry contact output. Factory default setting is all four jumpers set to "Wet". To set the zone as a dry output, all four jumpers must be set to "Dry".

### 8 Output Fuses (F1 – F8) – Optional

When using the fused version of the M8, these are the fuses for each zone output. Fuse numbers correspond with the zone (e.g. F1 is the fuse for OUT1). When using the M8P (PTC) version, these fuses will be replaced with soldered-in PTCs.

### 9 BR Connectors (J5 & J6)

The DC Common buss in the system. All DC boards in the system must have their BR fastons wired together for proper operation.

### 10 B2 Connectors (J7 & J8)

These fastons are for connection to the B2 buss in the system. The voltage on the B2 buss comes from a second power supply or a B100 secondary supply in dual voltage systems. This voltage will be directed to any outputs whose Buss Selection Jumper is set in the B2 position. If the M8/M8P is being used in a single voltage system, these fastons are left unused.

### 11 B1 Connectors (J1 & J2)

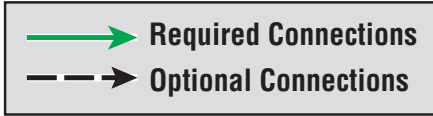
These fastons are for connection to the B1 buss in the system. The voltage on the B1 buss comes from a the first power supply. This voltage will be directed to any outputs whose Buss Selection Jumper is set in the B1 position.

### 12 SPI Connector (J13)

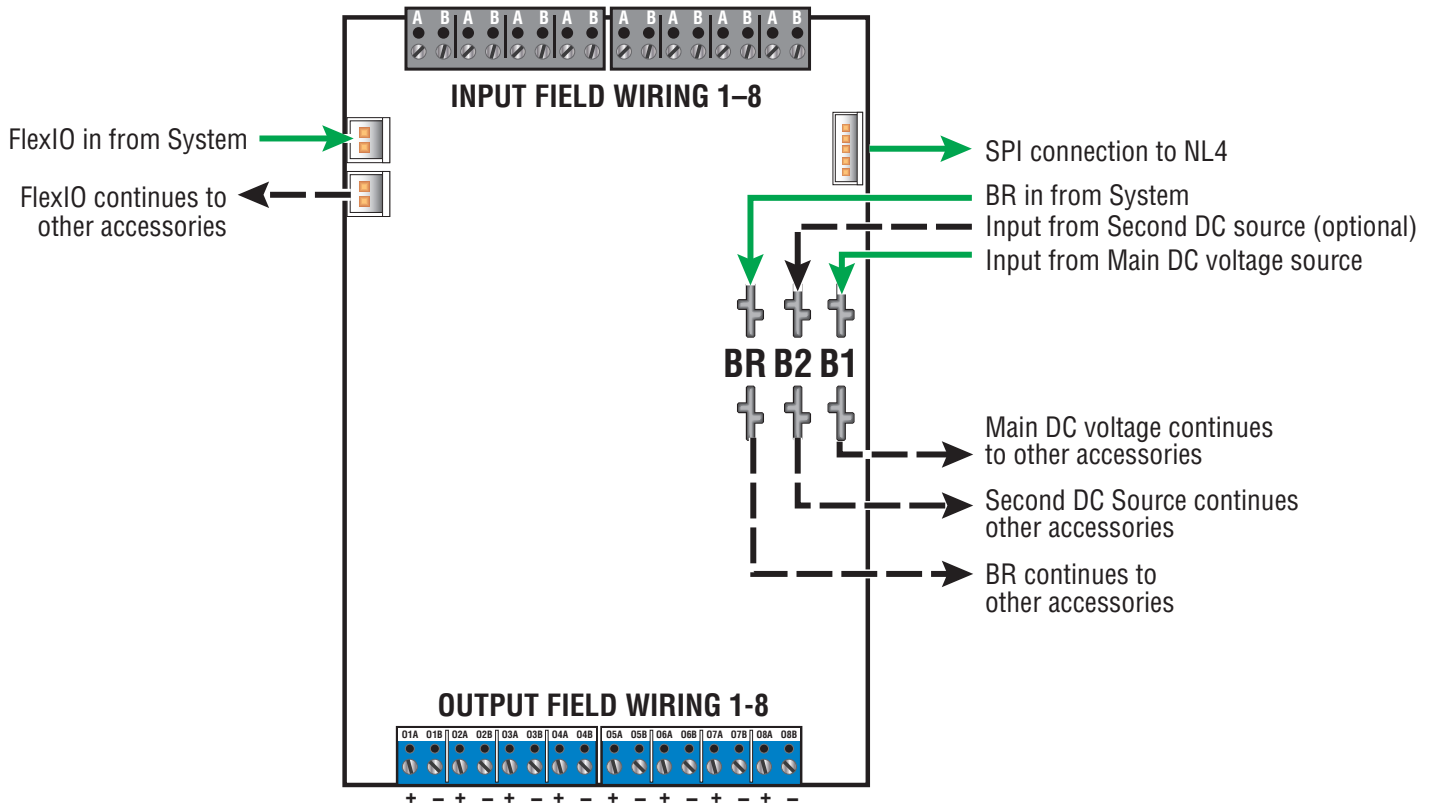
This connector accepts the SPI cable which provides communication between the M8/M8P and the NL4 board. This cable **MUST** be connected at all times for proper operation of the M8/M8P. The M8/M8P must be connected to an NL4 board and will not function if connected to an NL2 board.

## Connecting the Power Control Module

**⚠ Remove all AC and battery power from the FPO system before adding or replacing a power control board.**




Each of the **B1**, **B2**, **BR**, and **FlexIO** busses has *two connectors*. These connectors may be used interchangeably.  
 For example: **FlexIO** from the power supply may be connected to either of the M8's FlexIO connectors, the Main DC voltage source may connect to either B1 terminal, etc.



## Reverse Protection Diodes

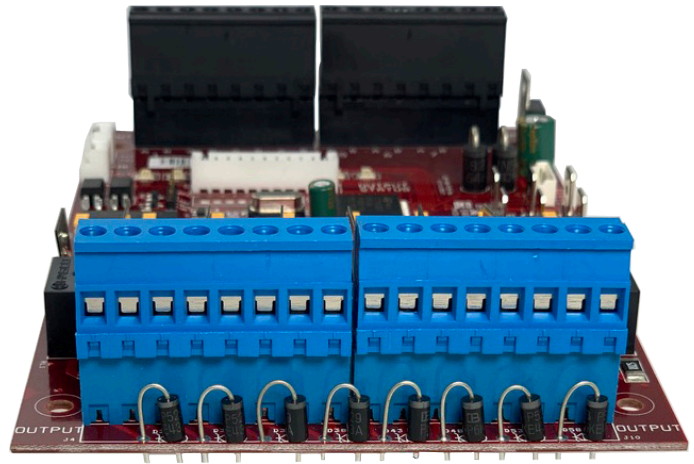
### Reverse Protection Diodes

The outputs of the M8/M8P have built-in reverse protection diodes. If a delay in lock release is present the diode from that zone should be removed from the circuit as shown below.

 Only remove the diodes from outputs requiring their removal!

### *M8 / M8P Diode Removal*

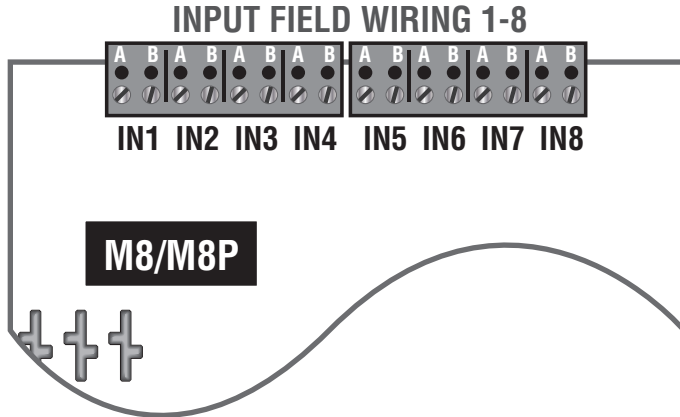
The diodes on the M8/M8P are on the top side of the board between the output terminals and the edge of the board. To remove the diode from the output circuit, simply cut and separate the exposed diode lead for the desired output zone - leave the diode body soldered to the pcb.



**cut diode lead**

## Input and Output Wiring

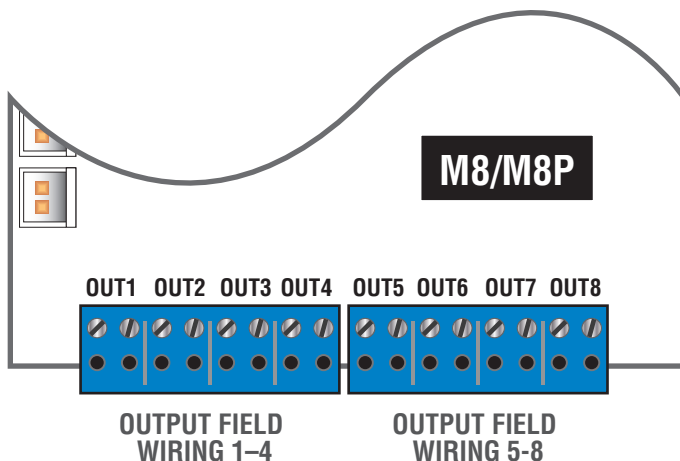
### INPUT WIRING



Each input on the **M8/M8P** has an “A” terminal and a “B” terminal.

- When using a dry contact to activate the input, the contact is placed across these terminals. ***It is normal to measure a voltage across these terminals when set for a dry contact input.***
- When set for a voltage input, the voltage to activate the zone is placed on the “B” terminal. The “A” terminal is left disconnected. Note that the voltage used to activate the zone must be common grounded with the M8 board’s power source.
- To use a DC ground or an open collector (transistor) as an input, place a wire jumper across the “A” and “B” terminals and connect the ground/open collector to the “B” terminal to activate the input. Note that the input source must be common grounded with the M8 board’s power source.

### OUTPUT WIRING



Each output on the **M8/M8P** has a “+” and “-” marked adjacent to the terminal to indicate polarity.

- ⚠ CAUTION** When powering magnetic loads such as maglocks, door strikes, solenoids, etc, each of these loads must have a reverse protection diode either built-in or external to the device.





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## Using the M8 Power Control Module

This section discusses software programming of the M8/M8P board. It assumes a basic understanding of the NL4 software GUI interface. Consult the NetLink manual (P03-037) for more information on using the NL4 interface.

### Accessing the M8/M8P from the NL4 interface

From the home page of the NL4 interface, click on the photo of the M8 in the "NL4 Connected Devices" section. Alternatively, the "M8" link to the right of the photo may be clicked.

### The M8 Status Page

The status page of the M8/M8P gives an overview of the current state of the M8/M8P board and allows manual output control.

**Return Button** - This button returns to the NL4 Home page. *Any changes must be saved prior to clicking this button or the changes will be lost.*

**Programming Button** - This button opens the programming page for the M8 module

**Device ID** - This field is the unique ID given to the M8 by the NL4.

**Model** - This is the model number of the board being monitored. In this case, "M8".

**M8 Notes** - This field allows the user to enter any notes regarding the M8 board. Click the Save Settings button to save the notes.

**AC Power** - This field gives the AC Power status of the connected power supplies. "ON" with a green background indicates that AC power is present.

**Output #** - This column shows each zone number and provides a checkbox for selecting one or more zones.

**Output Description** - This column shows the programmable descriptive name given to the zone. It can be changed directly by clicking on the text field and typing the description for each zone. Example descriptions include "Front Door Lobby, Mag", "Second Floor Door Holders", or "Cash Register 13 PTZ". Click "Save Settings" to save the descriptions.

**Voltage (V)** - This column shows the measured voltage at the output terminals of the M8 board for each zone. This is only the voltage at the output of the M8/M8P and does not indicate power at the field device.

**Current (A)** - This column shows the measured current being drawn from the output terminals of the M8/M8P for each zone.

**Power (W)** - This column shows the calculated power being supplied by the output terminals of the M8/M8P

for each zone.

**Power Ready** - This column indicates whether power is available to each zone. This column should be "Yes" - if any zone shows "No", verify jumper placement, fuse integrity, and proper DC voltage at the B1/B2 inputs of the M8/M8P board.

**Control Input** - This column indicates the state of the input terminals for each zone as "Active" or "Inactive". For example, if a zone is programmed for an Normally Open Input, the "Control Input" field for that zone will show "Active" when a closure is placed across the input terminals for that zone.

**FAI State** - This column shows the FAI status for each zone. If FAI control is disabled for the zone, the field will show "Disabled". If enabled, the field will show "Active" or "Inactive" to show the FAI status.

**Cycle Count** - This column shows the total number of cycles for each output since the count was last reset. Note that an activation must be present for at least 3 seconds to register. This counter can be used to monitor lock activations vs. expected life.

**Output Status** - This column shows the status of each zone of the M8/M8P. "Normal" indicates that the zone is working and configured correctly, and that there are no faults on that zone. "Fault" indicates a problem with that zone. Verify fuse/PTC integrity, jumper placement, and field wiring integrity.

**Enable / Disable Selected Outputs** - These buttons will manually enable or disable any outputs whose Output # checkbox is selected.

**Enable / Disable All Outputs** - These buttons will manually enable or disable all outputs on the M8.

**Reset Selected / All Outputs** - These buttons will manually disable outputs for 5 seconds, then return to normal. This function is helpful for resetting devices such as routers which would cause network loss when powered down.

**Reset Selected / All Cycle Counts** - These buttons will reset the cycle counter for one or more outputs to zero.

**Save Settings** - This button saves the output descriptions and M8 Notes fields when changed.

# NL4's M8 Status Page

**LifeSafety Power** **PowerCom**® POWER SYSTEM MANAGER

HOME Reporting Configure Tools msm Log Out Ver: 8.071-39

Client ID: LifeSafety Power  
 Return SITE ID: FPO75/250-B100M8NL4E2  
 Programming Date: Tue Aug 14 2018 Time: 13:13:24

Device ID: M8-1 Model: M8 M8 Notes: AC Power: ON ver.0.20

Output #	Output Description	Voltage (V)	Current (A)	Power (W)	Power Ready	Control Input	FAI State	Cycle Count	Output Status
<input type="checkbox"/> 1	Lobby Door - Lock	12.375	0.374	4.628	Yes	Inactive	Inactive	12	Normal
<input type="checkbox"/> 2	Storage Closet - Lck	0.000	0.000	0.000	Yes	Inactive	Disabled	0	Normal
<input type="checkbox"/> 3	Loading Dock - Lock	0.000	0.000	0.000	Yes	Inactive	Disabled	0	Normal
<input type="checkbox"/> 4	Room 1 - Lock	0.000	0.000	0.000	Yes	Inactive	Disabled	0	Normal
<input type="checkbox"/> 5	Room 2 - Lock	0.000	0.000	0.000	Yes	Inactive	Disabled	0	Normal
<input type="checkbox"/> 6	Room 3 - Lock	0.000	0.000	0.000	Yes	Inactive	Disabled	0	Normal
<input type="checkbox"/> 7	Room 4 - Lock	0.000	0.000	0.000	Yes	Inactive	Disabled	0	Normal
<input type="checkbox"/> 8	Room 5 - Lock	12.375	0.000	0.000	Yes	Inactive	Disabled	14	Normal

The M8 Status Page

## Programming the M8 Power Control Module

From the Status page of the NL4 interface, click the "Programming" button near the top left corner. This will open the M8's configuration page.

**"Return" Button** - This button returns to the M8 Status page. *Any changes must be saved prior to clicking this button or the changes will be lost.*

**"Save Settings" Button** - This button will save all changes on the page.

**"Fill All" Button (top)** - This button will take all settings from Zone 1 and copy them to Zones 2 through 8.

**"Import Settings" Button** - This button opens a page allowing you to select an M8 Configuration file to import. Click the Browse button to select the file, then click open. After selecting the file, click "Download" then "Confirm".

**"Export Settings" Button** - This button saves the configuration of the M8 zones to a file, which may be imported to other M8 boards. If prompted after clicking, select "Save File". Check the "Include Output Descriptions" selection to include the output descriptions in the export file.

**"Fill All" Buttons (Column)** - Each column has a "Fill All" button. This button takes the setting from Zone 1 of that column only and copies it to Zones 2 through 8.

**Output #** - This column shows each zone number

**Output Description** - This column shows the programmable descriptive name given to the zone.

**Control Input Type** - This column has a drop-down list for the type of input to be used to activate the zone. Choices include:

*Normally Closed* - Normally Closed (NC) dry contact. The input will be activated when the contact is opened.

*Normally Open* - Normally Open (NO) dry contact. The input will be activated when the contact is closed.

*Open Collector* - An open collector transistor output will activate the input when the input is pulled to ground.

*Voltage* - A positive voltage (12-24VDC) will activate the input.

*Disabled* - The input terminals will have no effect.

**Output Load Type** - This column has a drop-down list for the type of device being powered. Select the type of device closest to the device being powered. Choices include:

*Maglock* - The output power will be removed when the input is activated. Zone 8 also adds NC Contact for dry contact operation (See page 5 #7).

*Fail-Secure Strike* - The output power will be applied when the input is activated. Zone 8 also adds NO Contact for dry contact operation (See page 5 #7).

*Constant ON* - The output will always have power, regardless of the state of the input.

**Unlock on FAI Activation** - This column has a drop-down list to select whether an FAI condition will affect the output of each zone. Choices are "Yes" and "No"

**Unlock on AC Loss** - This column has a drop-down list to select whether an AC Loss will affect the output of each zone. Choices are "Yes" and "No". This is useful for regions where it is required to unlock all doors upon a loss of AC.

**Email Alert on Fault** - This column has a drop-down list to select whether fault conditions on each zone will send an email alert when email is configured in the NL4. Choices are "Yes" and "No".

**Voltage Lower Limit (V)** - This column allows setting a lower voltage limit to trigger a fault for each zone. For example, if the lower voltage limit is set for 23.5V, a fault will be triggered if the voltage on that zone goes below 23.5V. This limit will not be triggered when the zone is deactivated via the zone's input, FAI, or other intended deactivation.

**Voltage Upper Limit (V)** - This column allows setting an upper voltage limit to trigger a fault for each zone. For example, if the upper voltage limit is set for 26.0V, a fault will be triggered if the voltage on that zone goes above 26.0V.


**Current Lower Limit (A)** - This column allows setting a lower current limit to trigger a fault for each zone. For example, if the lower current limit is set for 1.0A, a fault will be triggered if the current on that zone falls below 1.0A. This limit will not be triggered when the zone is deactivated via the zone's input, FAI, or other intended deactivation.

**Current Upper Limit (A)** - This column allows setting an upper current limit to trigger a fault for each zone. For example, if the upper current limit is set for 2.0A, a fault will be triggered when the current on that zone goes above 2.0A.

**Cycle Count Limit** - This column allows setting a limit to trigger a fault when the zone is activated a certain number of total cycles.

**Output Limit Setting Aid** - This section allows automatic setting of the upper and lower voltage and current limits for each output. To utilize the automatic settings, all output field wiring must be completed to the output devices to be powered. Enter the desired percentage for each limit, and click the "Start Measurement" button. The M8 will briefly cycle each output on and off and measure the voltage and current levels for each device. When complete, the upper and lower limits will be set based on the entered percentages.

# The Programming Page



**PowerCom®** POWER SYSTEM MANAGER

HOME   Reporting   Configure   Tools
msm Log Out
Ver: 8.071-39

**Client ID** LifeSafety Power

**SITE ID** FPO75/250-B100M8NL4E2

**Date** Tue Aug 14 2018
**Time** 13:47:56

Return
Save Settings
Fill All
Import Settings

Include Output Description  Export Settings

Output #	Output Description	Control Input Type	Output Load Type	Unlock on FAI Activation	Unlock on AC Loss	Email Alert on Fault	Voltage Lower Limit (V)	Voltage Upper Limit (V)	Current Lower Limit (A)	Current Upper Limit (A)	Cycle Count Limit
	<span style="background-color: cyan; padding: 2px 5px;">Fill All</span>	<span style="background-color: cyan; padding: 2px 5px;">Fill All</span>	<span style="background-color: cyan; padding: 2px 5px;">Fill All</span>	<span style="background-color: cyan; padding: 2px 5px;">Fill All</span>	<span style="background-color: cyan; padding: 2px 5px;">Fill All</span>	<span style="background-color: cyan; padding: 2px 5px;">Fill All</span>	<span style="background-color: cyan; padding: 2px 5px;">Fill All</span>	<span style="background-color: cyan; padding: 2px 5px;">Fill All</span>	<span style="background-color: cyan; padding: 2px 5px;">Fill All</span>	<span style="background-color: cyan; padding: 2px 5px;">Fill All</span>	<span style="background-color: cyan; padding: 2px 5px;">Fill All</span>
1	Lobby Door - Lock	Normally Open ▼	Maglock ▼	Yes ▼	Yes ▼	Yes ▼	8.663	16.087	0.262	0.486	10000000
2	Storage Closet - Lock	Normally Open ▼	Fail-secure Strike ▼	No ▼	No ▼	Yes ▼	8.663	16.087	0.000	0.900	10000000
3	Loading Dock - Lock	Normally Open ▼	Fail-secure Strike ▼	No ▼	No ▼	Yes ▼	8.642	16.049	0.000	0.900	10000000
4	Room 1 - Lock	Normally Open ▼	Fail-secure Strike ▼	No ▼	No ▼	Yes ▼	17.637	32.755	0.000	0.900	10000000
5	Room 2 - Lock	Normally Open ▼	Fail-secure Strike ▼	No ▼	No ▼	Yes ▼	8.642	16.049	0.000	0.900	10000000
6	Room 3 - Lock	Normally Open ▼	Fail-secure Strike ▼	No ▼	No ▼	Yes ▼	8.642	16.049	0.000	0.900	10000000
7	Room 4 - Lock	Normally Open ▼	Fail-secure Strike ▼	No ▼	No ▼	Yes ▼	8.621	16.011	0.000	0.900	10000000
8	Room 5 - Lock	Normally Open ▼	Maglock ▼	No ▼	No ▼	Yes ▼	8.000	32.870	0.000	0.900	10000000

**Output Limit Setting Aid**

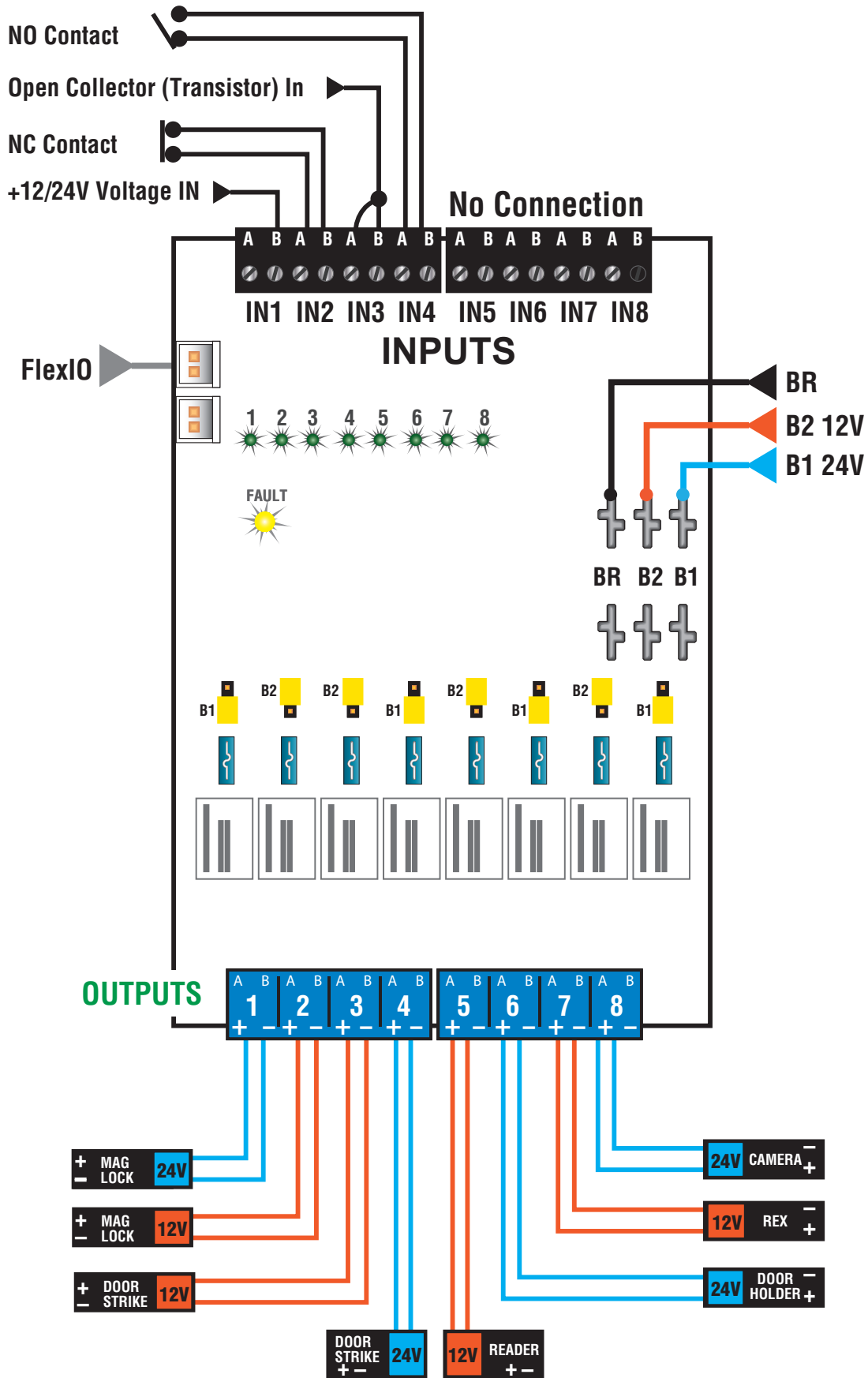
Set voltage upper limits to  % above the measured values     
 Set current upper limits to  % above the measured values  
 Set voltage lower limits to  % below the measured values     
 Set current lower limits to  % below the measured values

Start Measurement

Output Limit Setting Aid aids in setting the output voltage and current limits of all outputs to a certain percentage above and below the measured value. Verify that all outputs are connected to their normal operating load and be aware that during this process ALL outputs will be simultaneously powered. Enter the desired percentage values for upper and lower limits, then click the "Start Measurement" button. The process will take approximately 10 seconds, after which the upper and lower limits of all output voltages and currents will be set according to the entered percentages.

*The M8 Programming Page*

M8/M8P Application Example



## M8/M8P Application Example

This section shows various input and output types all wired to a single M8 board. These are for example purposes only and your exact application may not be shown.

### Zone 1

#### **24V Mag Lock Output, Voltage Input**

This zone shows a typical 24V Mag Lock application, using a voltage input on the zone. The door can be configured via software to unlock upon an FAI signal being received from the FPO Power Supply.

*Jumper Position: B1*

### Zone 2

#### **12V Mag Lock Output, NC Relay Contact Input**

This zone shows a typical 12V Mag Lock application, using a NC relay contact as the input for the zone. The door can be configured via software to unlock upon an FAI signal being received from the FPO Power Supply.

*Jumper Position: B2*

### Zone 3

#### **12V Door Strike Output, Open Collector (transistor) Input**

This zone shows a typical 12V Door Strike application, using an open collector (transistor) input on the zone. The door can be configured via software to unlock upon an FAI signal being received from the FPO Power Supply.

*Jumper Position: B2*

### Zone 4

#### **24V Door Strike Output, NO Relay Contact Input**

This zone shows a typical 24V Door Strike application, using a NO relay contact as the input for the zone. The door can be configured via software to unlock upon an FAI signal being received from the FPO Power Supply.

*Jumper Position: B1*

### Zone 5

#### **12V Reader Power, no control input**

This zone shows continuous 12V auxiliary power for powering a device such as a reader. The output can be configured via software to remove power upon an FAI signal being received from the FPO Power Supply.

*Jumper Position: B2*

### Zone 6

#### **24V Door Holder Power, no control input**

This zone shows continuous 24V auxiliary power for powering devices such as door holders. The output can be configured via software to remove power upon an FAI signal being received from the FPO Power Supply.

*Jumper Position: B1*

### Zone 7

#### **12V REX Power, no control input**

This zone shows continuous 12V auxiliary power for powering devices such as REX devices. The output can be configured via software to remove power upon an FAI signal being received from the FPO Power Supply.

*Jumper Position: B2*

### Zone 8

#### **24V Camera Output, no control input**

This zone shows continuous 24V auxiliary power for powering devices such as PTZ Cameras. The output can be configured via software to remove power upon an FAI signal being received from the FPO Power Supply.

*Jumper Position: B1*

**IMPORTANT**

All information, including illustrations, is believed to be reliable. Users, however, should independently evaluate the suitability of each product for their particular application. LifeSafety Power makes no warranties as to the accuracy or completeness of the information, and disclaims any liability regarding its use. LifeSafety Power's only obligations are those in the LifeSafety Power Standard Terms and Conditions of Sale for this product, and in no case will LifeSafety Power or its distributors be liable for any incidental, indirect, or consequential damages arising from the sale, resale, use, or misuse of the product. Specifications are subject to change without notice. In addition, LifeSafety Power reserves the right to make changes—without notification to Buyer—to processing or materials that do not affect compliance with any applicable specification.