M5 Hardware Quick Reference

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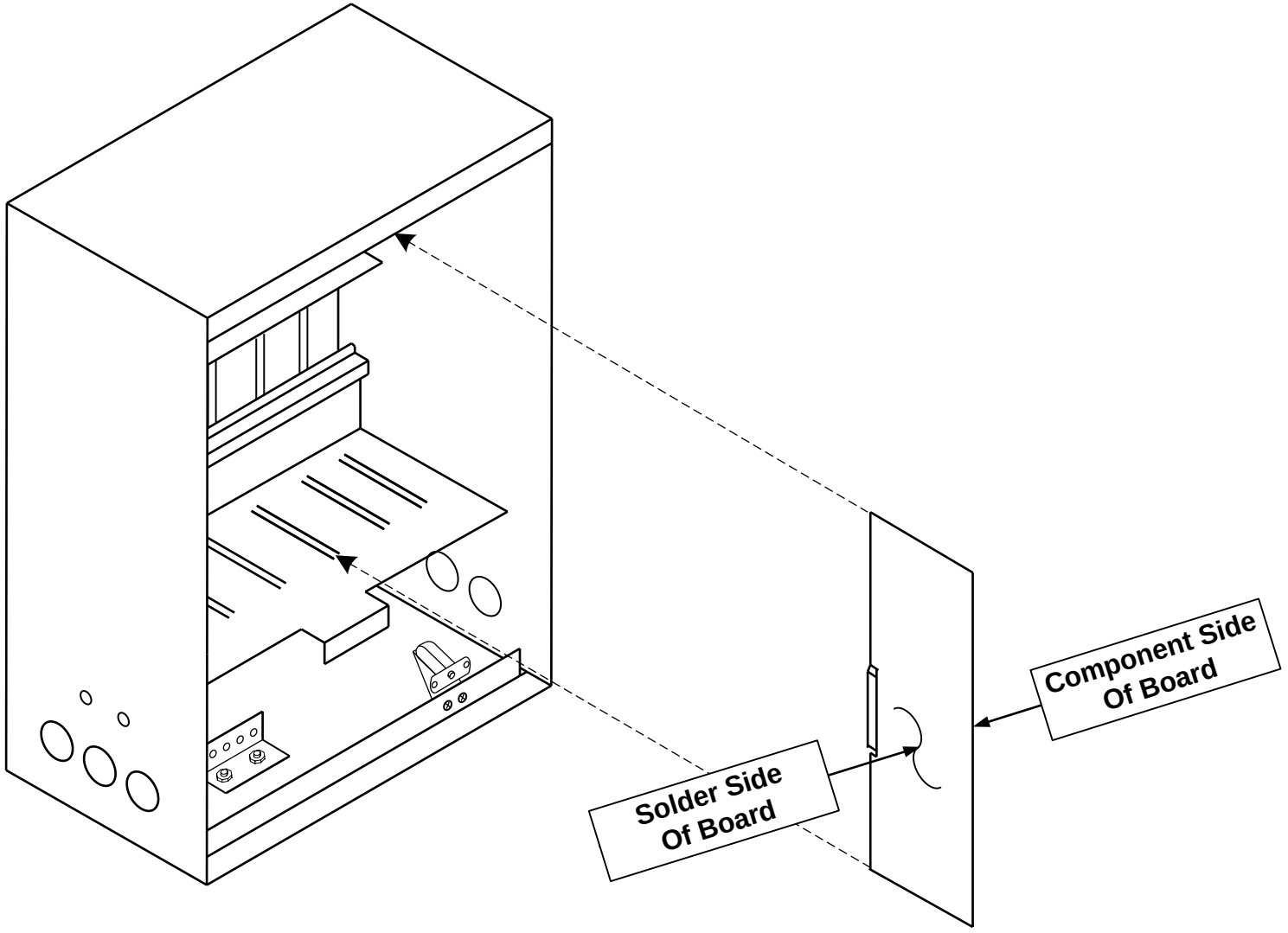
M5 Enclosure Quick Reference



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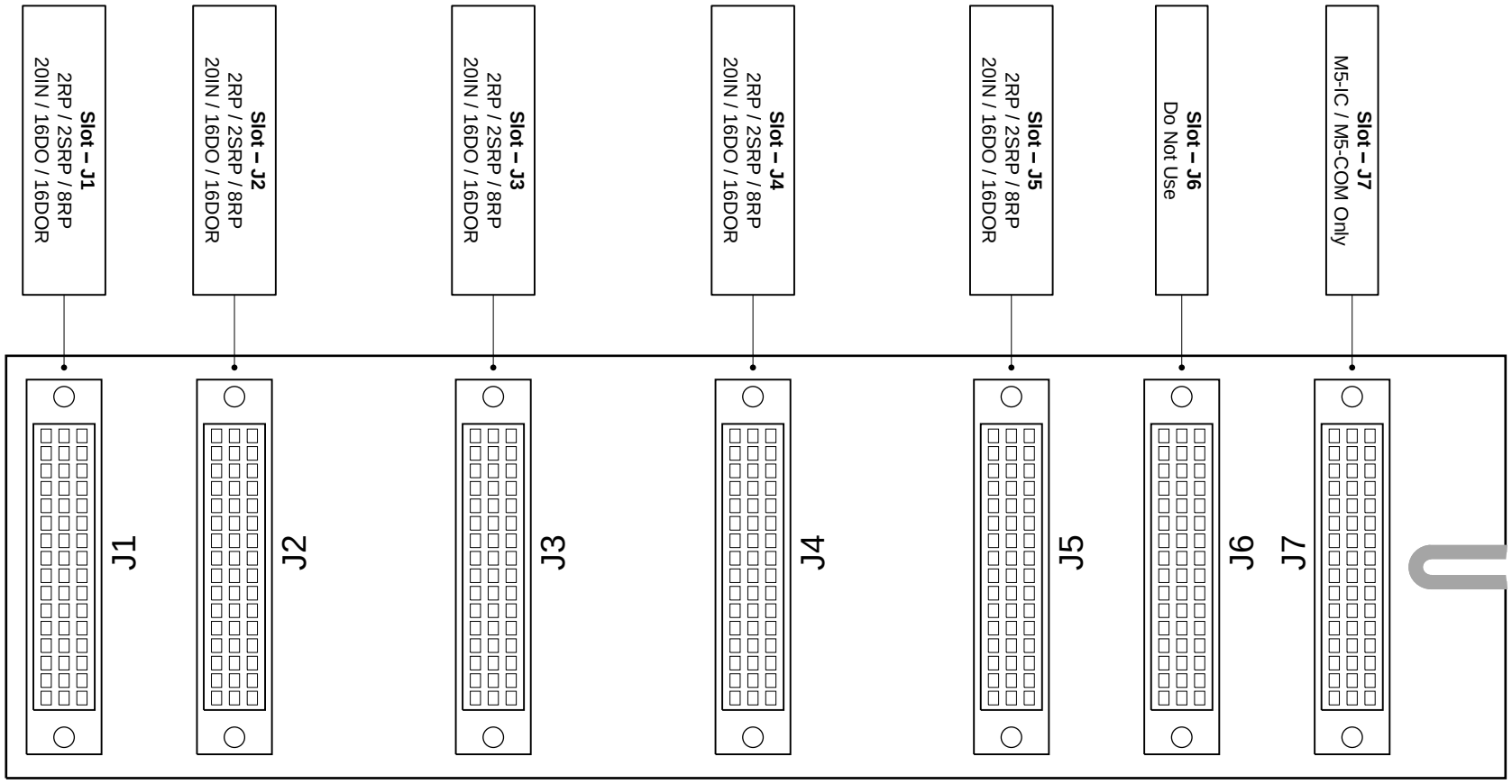
M5 Backplane Quick Reference



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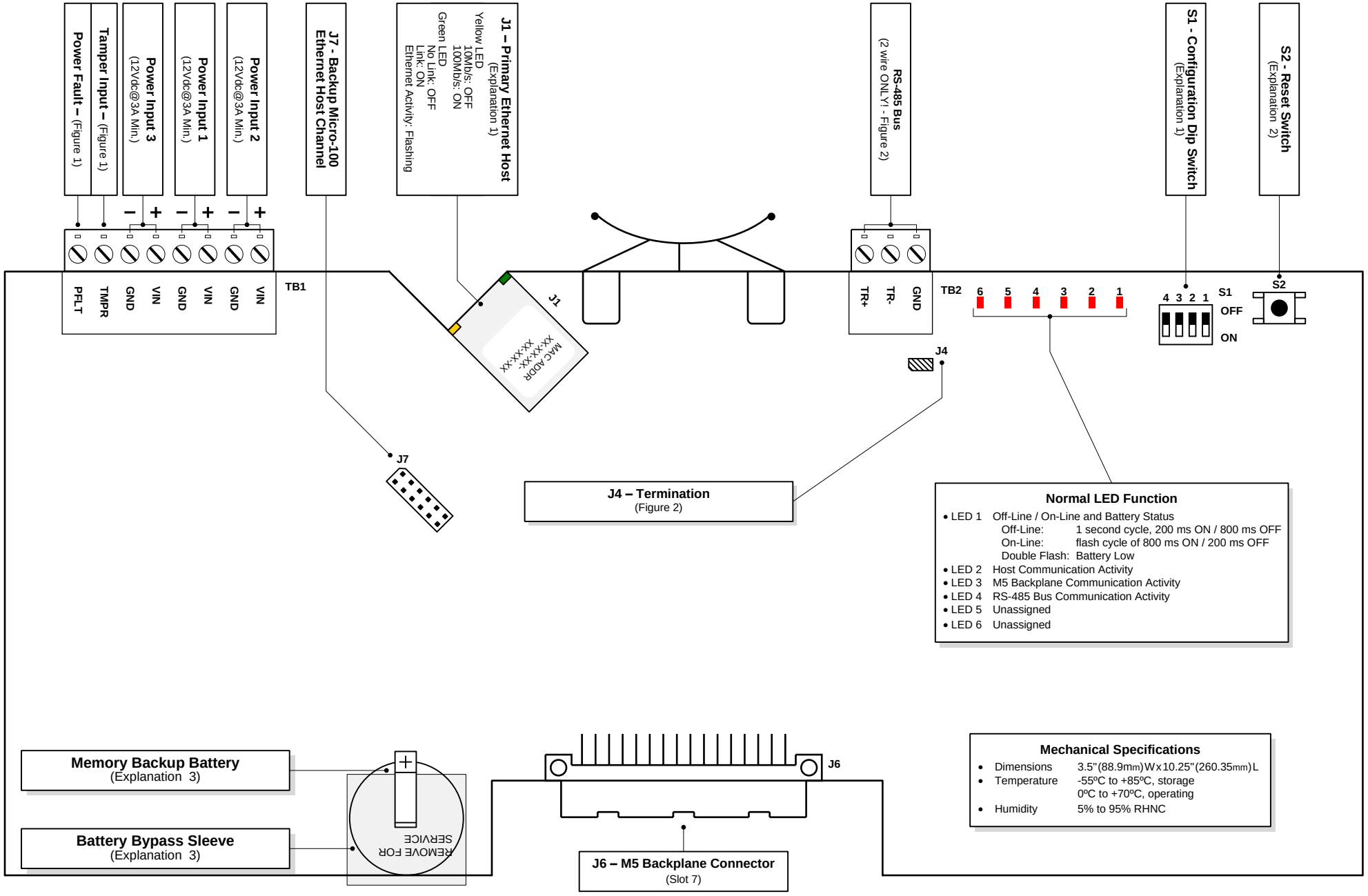
M5-IC Quick Reference

Detail



Explanation 1: S1 – Configuration DIP Switch & Primary 10/100 Ethernet Host Channel

Configuring Primary 10/100 Ethernet Host Channel
For DHCP Enabled Networks

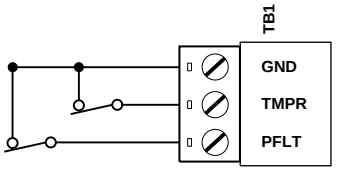
1. Set all S1 - Configuration DIP Switch DIPs OFF
2. Apply power to the M5-IC
3. Make note of the MAC address located on the side of the RJ45 jack
4. Run Access It! Universal
5. Create a new Channel
   - Channel Enabled: **X**
   - Protocol Type: **SCP**
   - Channel Type: **IP Server**
6. Create a new SCP
   - General Tab
     - Model: **M5-IC**
     - Device Installed: **X**
     - SCP Time Zone: **<Set accordingly>**
     - Initialization String: **<Leave blank>**
     - Address: **0**
     - SIO Port Speed
       - Port 1: **38400**
       - Port 2: **38400**
   - Comm Tab
     - Channel: **<Set to the newly created channel>**
     - TCP/IP Settings
       - IP Address: **<MACxxxxxxxxxxxx>**
         If the MAC address from step 3 was 00-0F-E5-00-03-4B then the IP Address field must be entered as the Host Name of MAC000FE500034B.
       - Port Number: **3001**
     - Encryption Settings: **None**

NOTE: If unable to resolve the Host Name to an IP Address, contact your local network administrator.

Bulk Erasing The System Configuration And Cardholder Databases

1. Set S1 - Configuration DIP Switch DIPs 1 & 2 ON
2. Set S1 - Configuration DIP Switch DIPs 3 & 4 OFF
3. Apply power to the M5-IC
   LEDs 1 & 2 and LEDs 3 & 4 flash alternately at a .5 second rate
4. Within 10 seconds, switch S1 - Configuration DIP Switch DIP 1 OFF
   LED 2 flashes at a 2 second rate as memory is being erased
   WARNING! DO NOT CYCLE POWER
   Erasing memory takes approximately 60 seconds to complete.
   LEDs 1 & 4 flash for 10 seconds after the memory has been erased, then the M5-IC reboots
5. The M5-IC is now ready to be configured as needed

Figure 1: Cabinet Tamper and Power Fault Wiring



Configuring Primary 10/100 Ethernet Host Channel
For A Static IP Address

1. Set S1 - Configuration DIP Switch DIP 2 ON
2. Set S1 - Configuration DIP Switch DIPs 1, 3 & 4 OFF
3. Apply power to the M5-IC
4. Manually configure a computer to 192.168.0.100
5. Using a crossover cable, connect computer to M5-IC
6. Open a web browser and go to 192.168.0.251
7. Set S1 - Configuration DIP Switch DIP 1 ON
8. Click on **'Click Here to Login'**
9. Click on **'Continue to this website (not recommended).'**
10. Enter a Username of **admin**
11. Enter a Password of **password**
12. Click **'Network'** from the left hand menu
13. Select **'Use Static IP configuration:'**
    - IP Address: **<Set accordingly>**
    - Subnet Mask: **<Set accordingly>**
    - Default Gateway: **<Set accordingly>**
14. Click **'OK'**
15. Click **'Apply Setting'** from the left hand menu
16. Click **'Apply, Reboot'** button
17. Wait 60 seconds for M5-IC to reboot
18. Remove power from the M5-IC
19. Set all S1 - Configuration DIP Switch DIPs OFF
20. Remove crossover cable and connect to network
21. Apply power to the M5-IC
22. Run Access It! Universal
23. Create a new Channel
    - Channel Enabled: **X**
    - Protocol Type: **SCP**
    - Channel Type: **IP Server**
24. Create a new SCP
    - General Tab
      - Model: **M5-IC**
      - Device Installed: **X**
      - SCP Time Zone: **<Set accordingly>**
      - Initialization String: **<Leave blank>**
      - Address: **0**
      - SIO Port Speed
        - Port 1: **38400**
        - Port 2: **38400**
    - Comm Tab
      - Channel: **<Set to the newly created channel>**
      - TCP/IP Settings
        - IP Address: **<Set accordingly>**
        - Port Number: **3001**
      - Encryption Settings: **None**

Explanation 2: S2 - Reset Switch

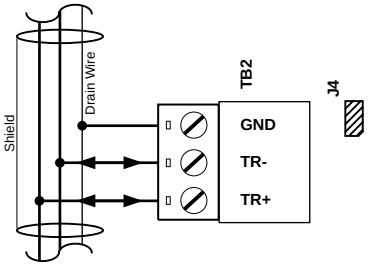
Pressing the S2 - Reset Switch will cause the M5-IC to reset.
This process will NOT erase the system configuration and cardholder databases.

Explanation 3: Memory Backup Battery

If the M5-IC should experience a complete power loss, the 3 volt lithium memory backup battery provides power to the onboard memory which contains the card file, activity transactions and system configuration data. The M5-IC will retain all database information during a power failure for up to 60 days. For optimum reliability, the memory backup battery should be replaced yearly using only a type BR2325, BR2330, or CR2330 lithium battery or equivalent.

NOTE: When setting up or servicing the M5-IC, it is recommended to leave the battery bypass sleeve in place until all system testing is completed. By keeping the battery bypass sleeve in between the battery and the '+' post, you can be certain that the memory is being completely flushed during power cycles. Upon completion, be certain to remove the battery bypass sleeve and store it within the enclosure for future use.

Figure 2: RS-485 Sub-Panel Bus Termination



The M5-IC has one 2 wire RS-485 sub-panel bus. The bus needs to be terminated at both the beginning and ending points.
J4 is the termination jumper for the RS-485 Sub-Panel Bus.

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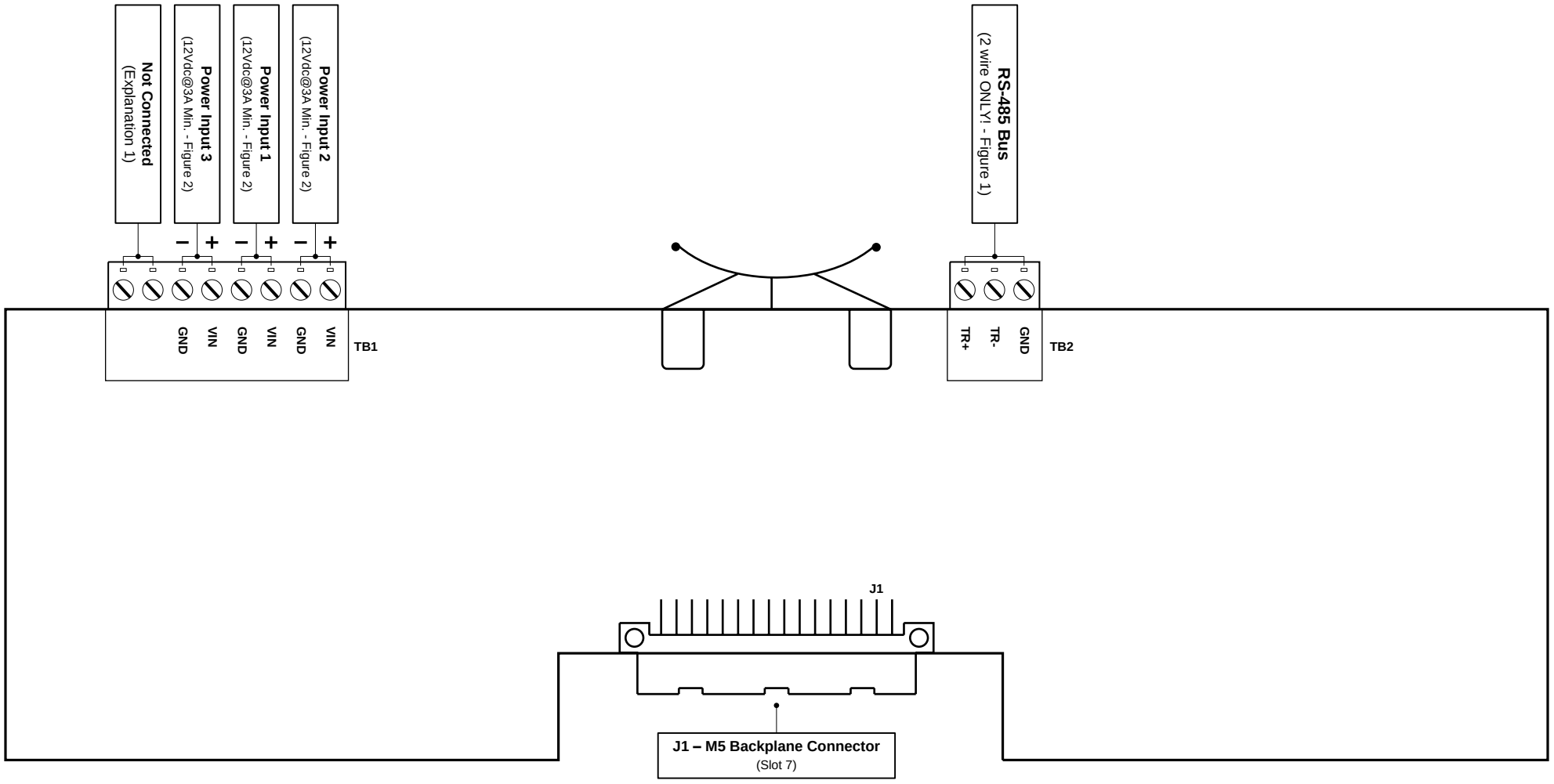
M5-COM Quick Reference



Mechanical Specifications

- Dimensions 3.5"(88.9mm)W x 10.25"(260.35mm)L
- Temperature -55ºC to +85ºC, storage
  0ºC to +70ºC, operating
- Humidity 5% to 95% RHNC

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Revised: 10/2013

Explanation 1: Cabinet Tamper / Power Fault Wiring

The M5-IC board has two dedicated inputs for cabinet tamper (TMPR) and UPS fault monitoring (PFLT). The M5-COM board installed in downstream M5 enclosures does not have dedicated inputs.

There are several options to wire tamper and power fault switches in downstream M5 enclosure(s):

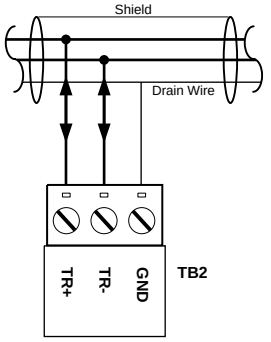
1. Tamper and power fault switches can be wired in series from the first M5 enclosure to downstream M5 enclosures. Wiring from the first M5 enclosure to downstream M5 enclosure(s) should be in conduit and inaccessible. *With this option the user cannot determine which M5 enclosure is reporting the alarm.*
2. Tamper and power fault switches can be wired to available M5-20IN board inputs.
3. Tamper and power fault switches can be wired to available reader port inputs.

The sensor inputs on the M5-20IN, M5-2RP, and M5-2SRP boards are configured as unsupervised, normally closed contacts. Refer to the specific I/O installation manual for wiring details.

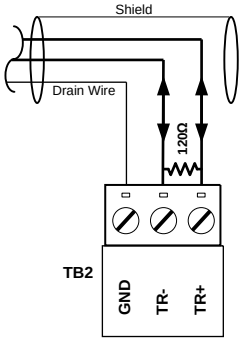
Figure 1: RS-485 Bus Termination

The M5-COM communicates to upstream and downstream M5 enclosures. TB2 is wired to TB2 of the M5-IC board and other downstream M5-COM boards. This interface allows multi-drop communication on a single bus up to 4,000 feet (1,200m). Use shielded twisted pair (min. 24AWG) cable with 120 ohm impedance.

When located at the end of the RS-485 bus, a separate 120 ohm resistor must be installed across TR+ and TR- (see below).



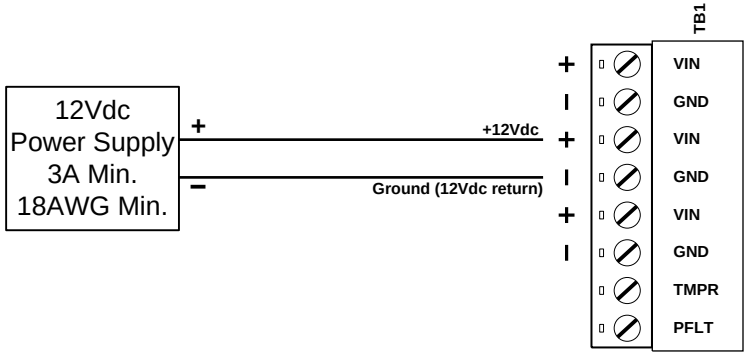
Middle of Bus – No Termination



End of Bus – 120 Ohm Termination

Figure 2: Power Input Wiring

Power is passed through to the back plane to power the I/O modules of the M5 enclosure. A larger power supply may be required depending on the system configuration. Three pairs of power connections in parallel are available. If needed, the other two pair can supply power to other I/O boards.



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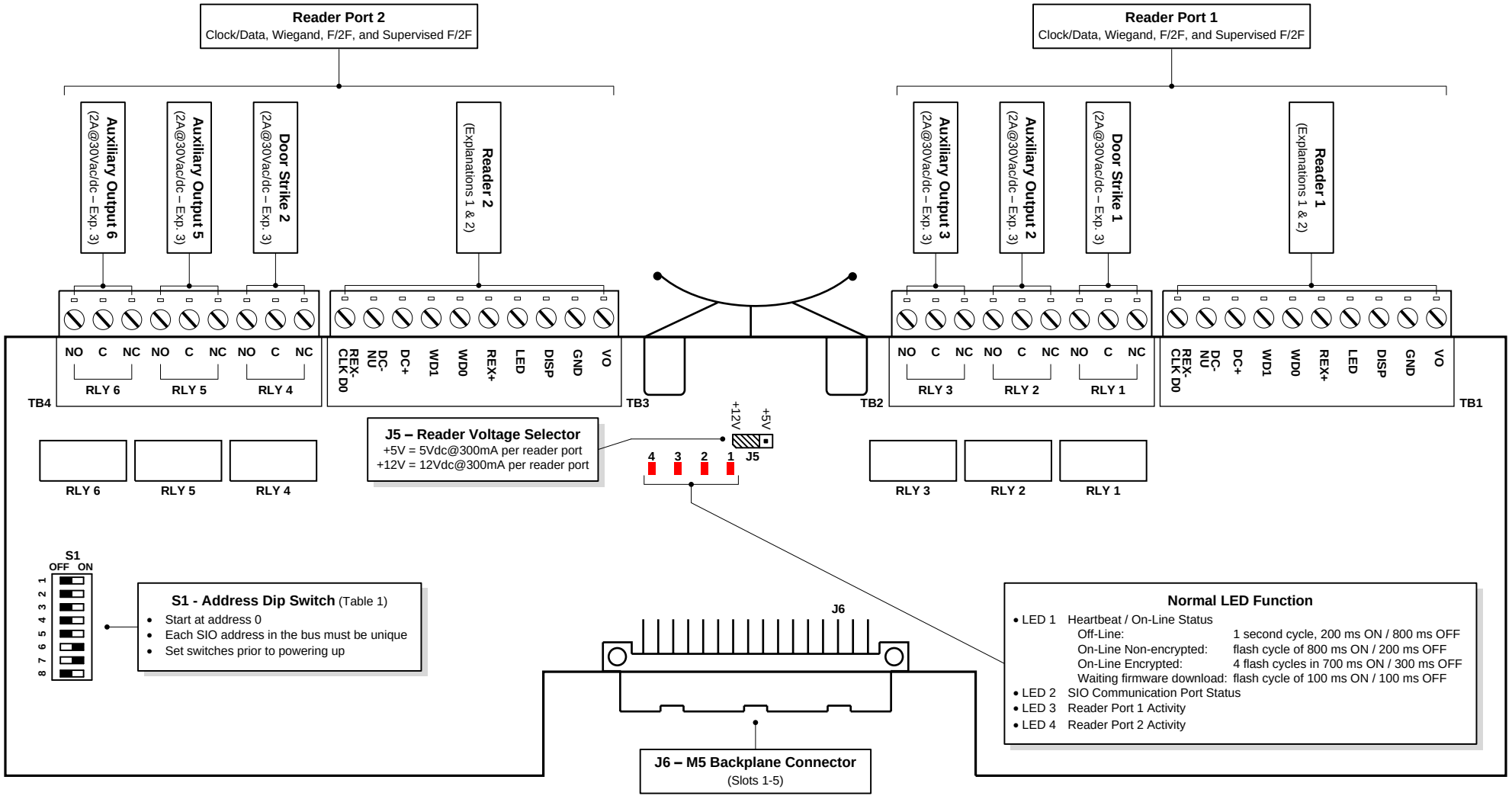
M5-2RP Quick Reference

Detail



Mechanical Specifications

- Dimensions 3.5"(88.9mm)Wx10.25"(260.35mm)L
- Temperature -55ºC to +85ºC, storage
  0ºC to +70ºC, operating
- Humidity 5% to 95% RHNC

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Revised: 5/2014

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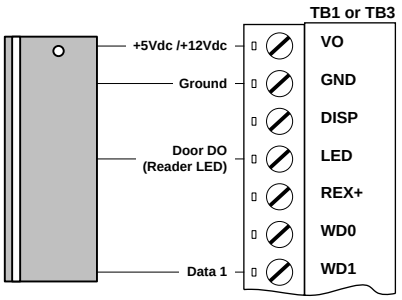
Oview

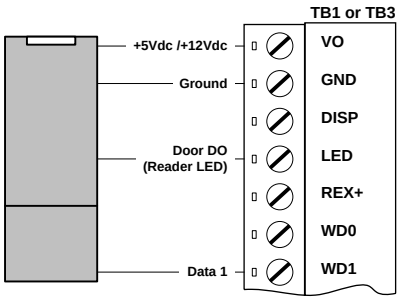
Table 1: S1 - Address Dip Switch

Address	1	2	3	4	5	6	7	8
0	Off	Off	Off	Off	Off	On	On	Off
1	On	Off	Off	Off	Off	On	On	Off
2	Off	On	Off	Off	Off	On	On	Off
3	On	On	Off	Off	Off	On	On	Off
4	Off	Off	On	Off	Off	On	On	Off
5	On	Off	On	Off	Off	On	On	Off
6	Off	On	On	Off	Off	On	On	Off
7	On	On	On	Off	Off	On	On	Off
8	Off	Off	Off	On	Off	On	On	Off
9	On	Off	Off	On	Off	On	On	Off
10	Off	On	Off	On	Off	On	On	Off
11	On	On	Off	On	Off	On	On	Off
12	Off	Off	On	On	Off	On	On	Off
13	On	Off	On	On	Off	On	On	Off
14	Off	On	On	On	Off	On	On	Off
15	On	On	On	On	Off	On	On	Off
16	Off	Off	Off	Off	On	On	On	Off
17	On	Off	Off	Off	On	On	On	Off
18	Off	On	Off	Off	On	On	On	Off
19	On	On	Off	Off	On	On	On	Off
20	Off	Off	On	Off	On	On	On	Off
21	On	Off	On	Off	On	On	On	Off
22	Off	On	On	Off	On	On	On	Off
23	On	On	On	Off	On	On	On	Off
24	Off	Off	Off	On	On	On	On	Off
25	On	Off	Off	On	On	On	On	Off
26	Off	On	Off	On	On	On	On	Off
27	On	On	Off	On	On	On	On	Off
28	Off	Off	On	On	On	On	On	Off
29	On	Off	On	On	On	On	On	Off
30	Off	On	On	On	On	On	On	Off
31	On	On	On	On	On	On	On	Off

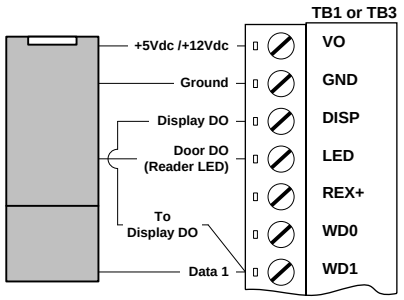
Explanation 1: Reader Wiring



Magnetic Stripe Reader



Wiegand or Unsupervised F/2F Reader



Supervised F/2F Reader

Explanation 2: Reader Input Wiring Configurations

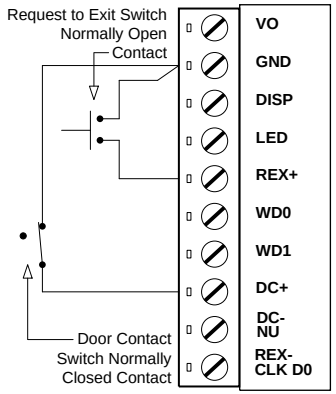


Figure 1

Door contact and request to exit may be configured in one of four ways:

1. Unsupervised Wired to the M5-2RP (Figure 1)
2. Unsupervised Wired to the F/2F Reader (Figure 2)
3. Supervised Wired to the F/2F Reader (Figure 3)
4. Wired to a M/R-J Box, WIU-2, or 4033-BGN (Not pictured)

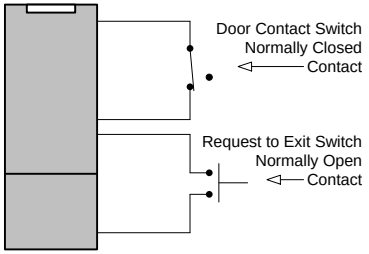


Figure 2

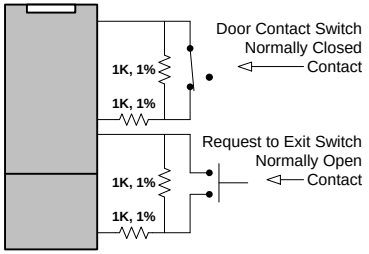


Figure 3

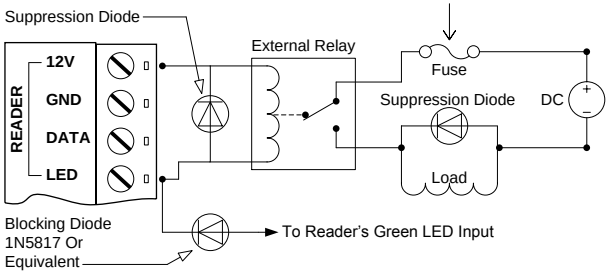
Explanation 3: Output Wiring Configurations

Use one of the two methods of transient clamping below to protect relay contacts and reduce EMI emissions. Protect against accidental overloads by wiring in an inline fuse to the common side of the relay.

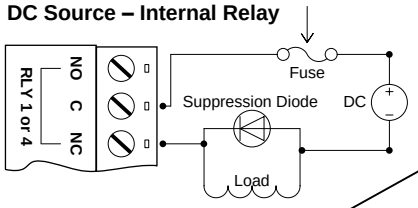
DC Source – Suppression Diode Selection

Diode Current Rating > 1x Strike Current
Diode Break Down Voltage: 4x Strike Voltage
12Vdc or 24Vdc Strike, Diode 1N4002 (100V / 1A) Typical

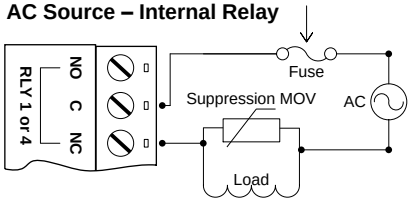
DC Source – External Relay



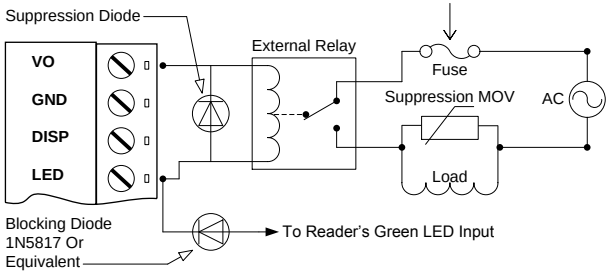
DC Source – Internal Relay



AC Source – Internal Relay



AC Source – External Relay



AC Source – Suppression MOV Selection

Clamp Voltage > 1.5x Vac RMS
24Vac Strike, Panasonic ERZ-C07DK470 Typical

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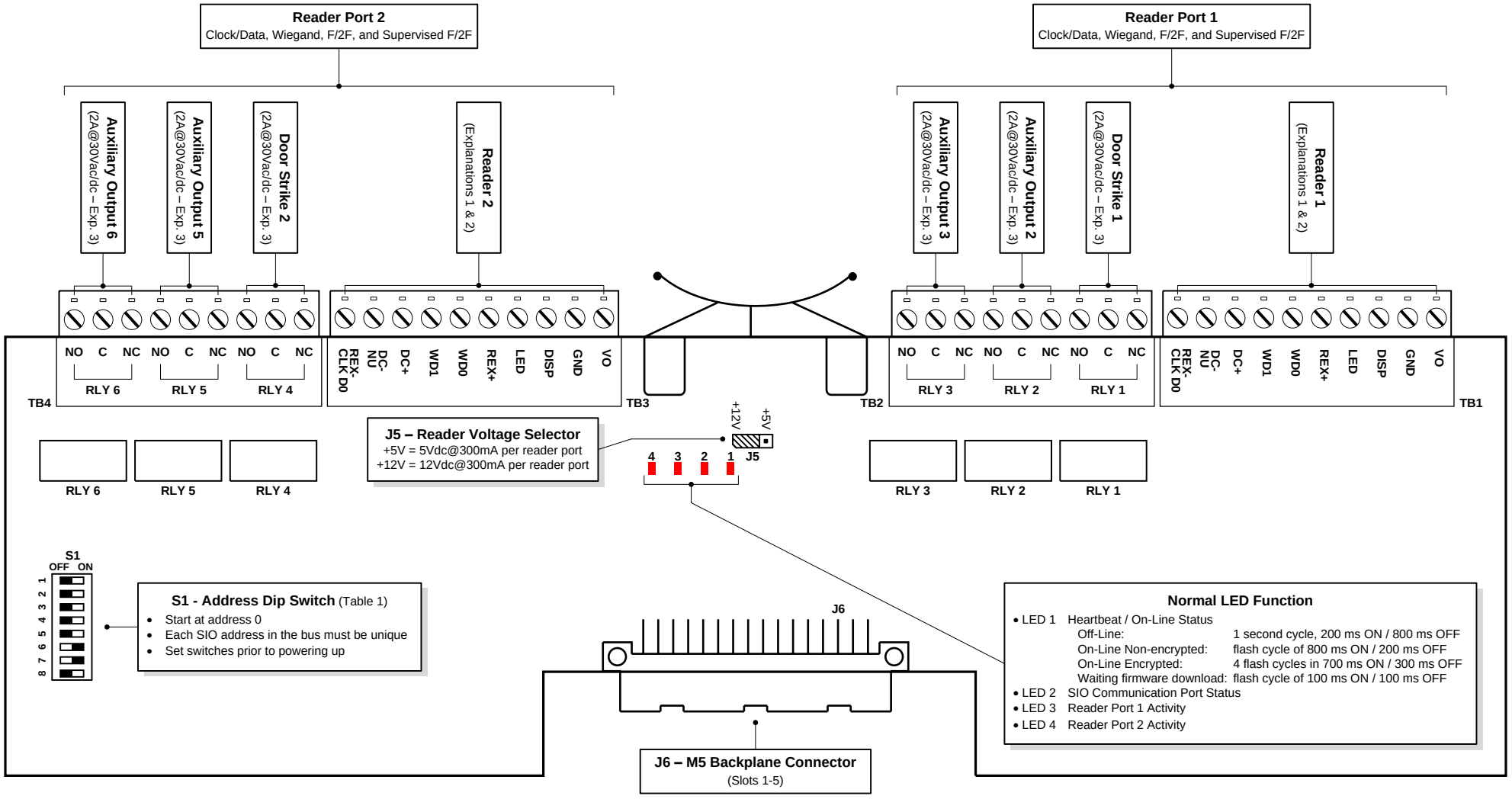
M5-2SRP Quick Reference

Detail



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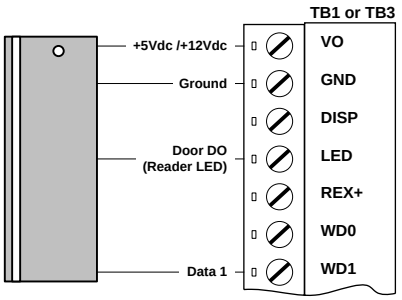
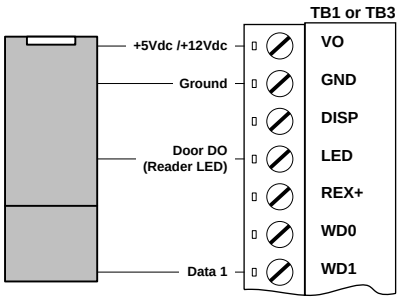
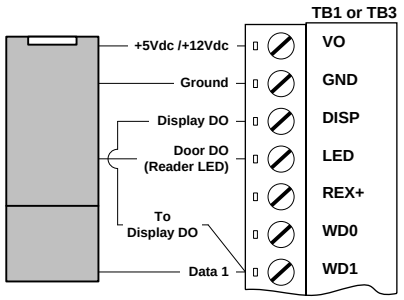
Explanation 1: Reader Wiring



Magnetic Stripe Reader



Wiegand or Unsupervised F/2F Reader



Supervised F/2F Reader

Explanation 2: Reader Input Wiring Configurations

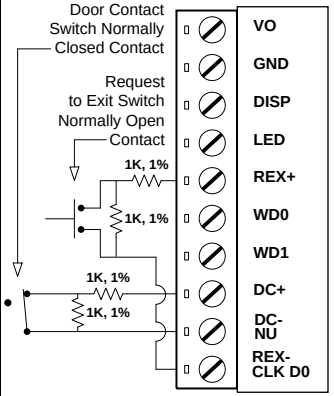


Figure 1

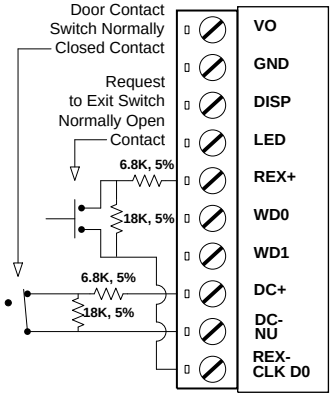


Figure 2

Door contact and request to exit may be configured in one of five ways:

1. Supervised 1K/1K EOL Wired to the M5-2SRP (Figure 1)
2. Supervised 6.8K/18K EOL Wired to the M5-2SRP (Figure 2)
3. Unsupervised Wired to the F/2F Reader (Figure 3)
4. Supervised Wired to the F/2F Reader (Figure 4)
5. Wired to a M/R-J Box, WIU-2, or 4033-BGN (Not pictured)

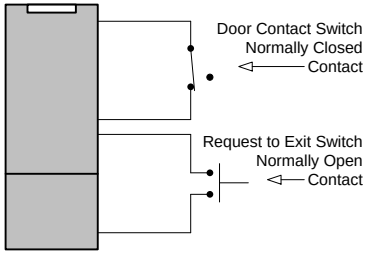


Figure 3

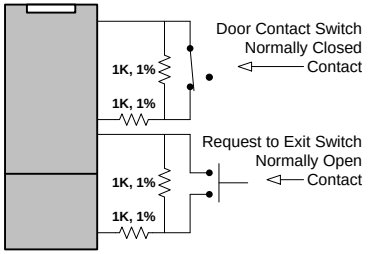


Figure 4

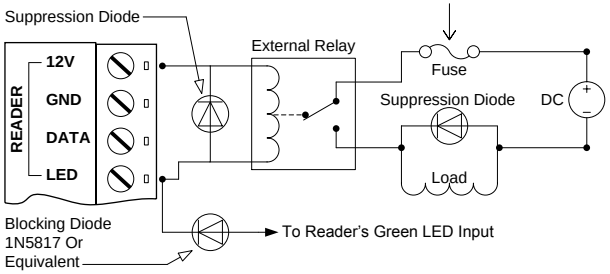
Explanation 3: Output Wiring Configurations

Use one of the two methods of transient clamping below to protect relay contacts and reduce EMI emissions. Protect against accidental overloads by wiring in an inline fuse to the common side of the relay.

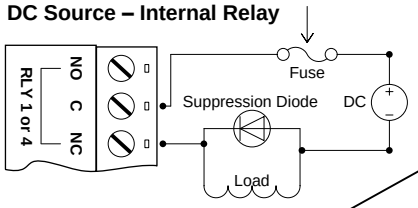
DC Source – Suppression Diode Selection

Diode Current Rating > 1x Strike Current
Diode Break Down Voltage: 4x Strike Voltage
12Vdc or 24Vdc Strike, Diode 1N4002 (100V / 1A) Typical

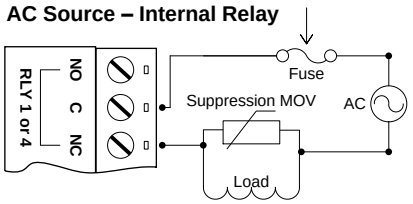
DC Source – External Relay



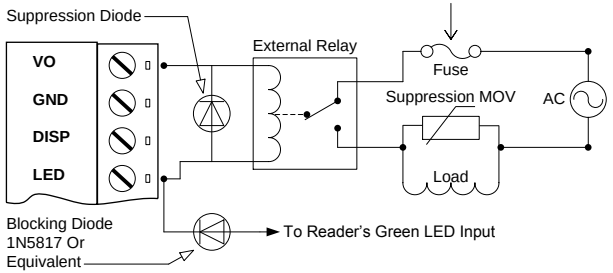
DC Source – Internal Relay



AC Source – Internal Relay



AC Source – External Relay



AC Source – Suppression MOV Selection

Clamp Voltage > 1.5x Vac RMS
24Vac Strike, Panasonic ERZ-C07DK470 Typical

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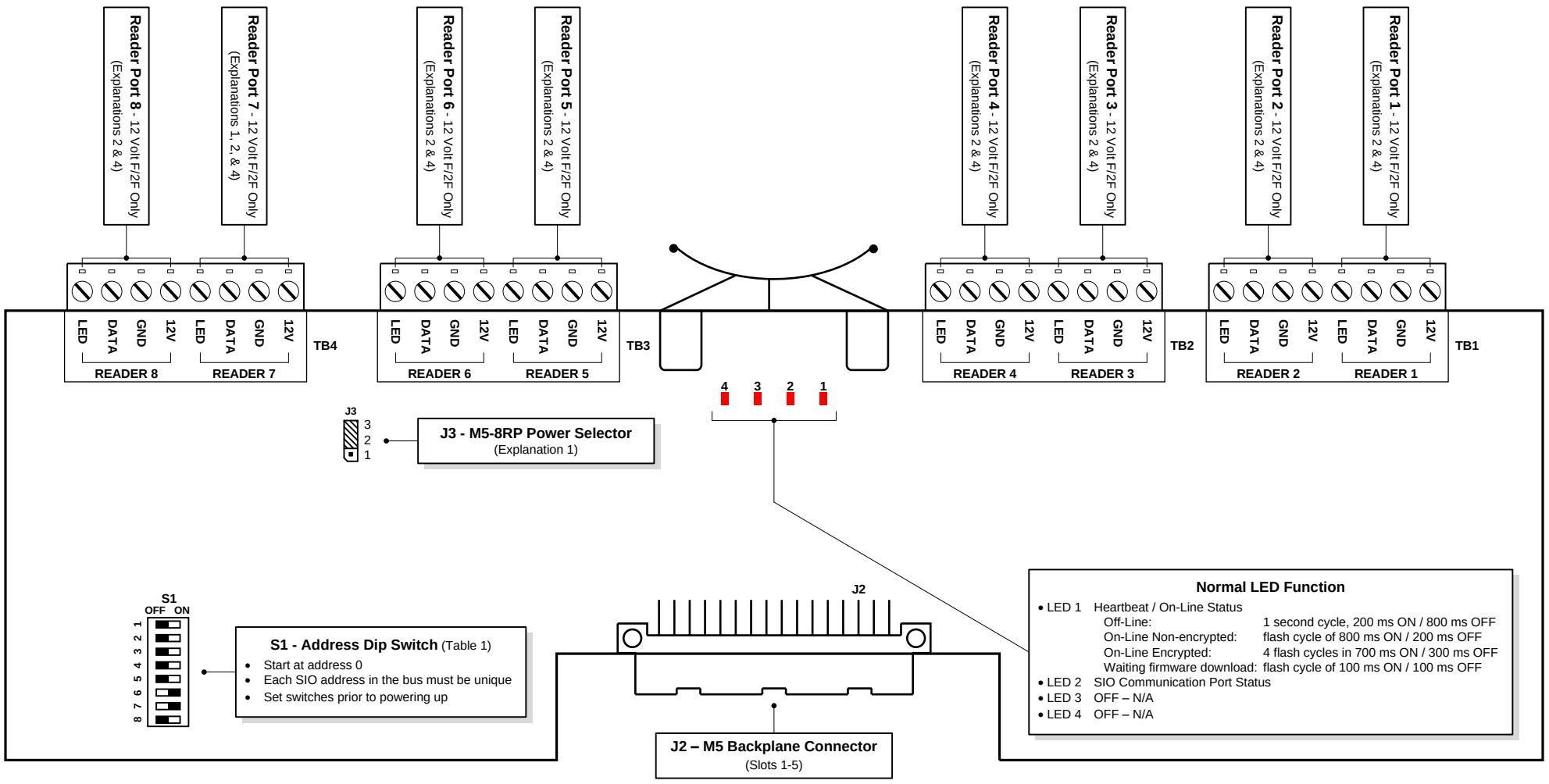

Mechanical Specifications

- Dimensions 3.5"(88.9mm)Wx10.25"(260.35mm)L
- Temperature -55ºC to +85ºC, storage
  0ºC to +70ºC, operating
- Humidity 5% to 95% RHNC

RS Technologies

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www.rs2tech.com

Revised: 5/2014

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5	On	Off	On	Off	Off	On	On	Off
6	Off	On	On	Off	Off	On	On	Off
7	On	On	On	Off	Off	On	On	Off
8	Off	Off	Off	On	Off	On	On	Off
9	On	Off	Off	On	Off	On	On	Off
10	Off	On	Off	On	Off	On	On	Off
11	On	On	Off	On	Off	On	On	Off
12	Off	Off	On	On	Off	On	On	Off
13	On	Off	On	On	Off	On	On	Off
14	Off	On	On	On	Off	On	On	Off
15	On	On	On	On	Off	On	On	Off
16	Off	Off	Off	Off	On	On	On	Off
17	On	Off	Off	Off	On	On	On	Off
18	Off	On	Off	Off	On	On	On	Off
19	On	On	Off	Off	On	On	On	Off
20	Off	Off	On	Off	On	On	On	Off
21	On	Off	On	Off	On	On	On	Off
22	Off	On	On	Off	On	On	On	Off
23	On	On	On	Off	On	On	On	Off
24	Off	Off	Off	On	On	On	On	Off
25	On	Off	Off	On	On	On	On	Off
26	Off	On	Off	On	On	On	On	Off
27	On	On	Off	On	On	On	On	Off
28	Off	Off	On	On	On	On	On	Off
29	On	Off	On	On	On	On	On	Off
30	Off	On	On	On	On	On	On	Off
31	On	On	On	On	On	On	On	Off

Explanation 1: J3 M5-8RP Power Selector & Reader Port 7

One M5-8RP Installed Within The M5 Enclosure

- J3 must be set to 2 & 3
- No additional power is required

J3: 3 / 2 / 1

Two M5-8RP Installed Within The Same M5 Enclosure

- J3 must be set to 2 & 3 (first board)
- J3 must be set to 1 & 2 (second board)
- Additional power is required (Figure 1)
- The 12V output on reader port 7 of the second M5-8RP is not current limited

J3 (first board): 3 / 2 / 1 — J3 (second board): 3 / 2 / 1

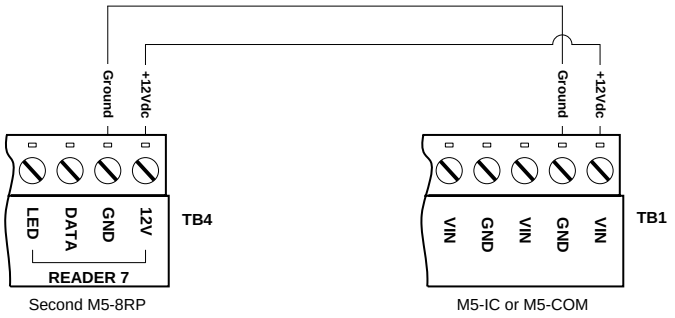
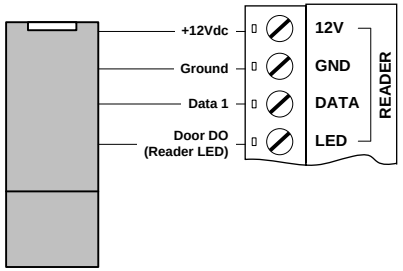


Figure 1

Explanation 2: Reader Wiring



Supervised F/2F Reader

Explanation 3: Reader Input Wiring Configurations

Door contact and request to exit may be configured in one of three ways:

1. Unsupervised Wired to the F/2F Reader (Figure 2)
2. Supervised Wired to the F/2F Reader (Figure 3)
3. Wired to a M/R-J Box, WIU-2, or 4033-BGN (Not pictured)

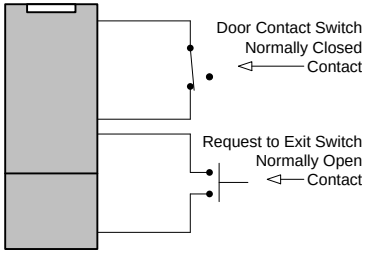


Figure 2

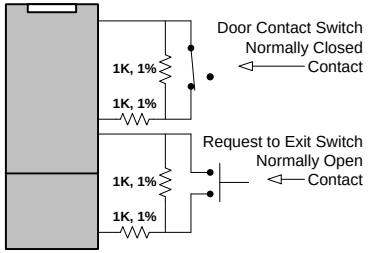


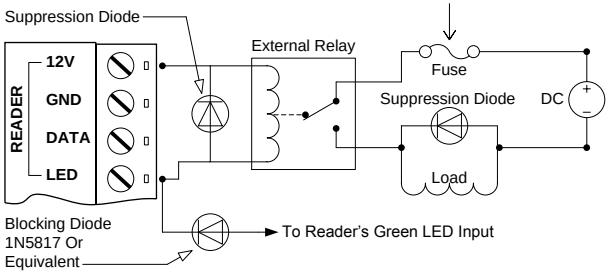
Figure 3

Explanation 4: Output Wiring Configurations

DC Source – Suppression Diode Selection

Diode Current Rating > 1x Strike Current
Diode Break Down Voltage: 4x Strike Voltage
12Vdc or 24Vdc Strike, Diode 1N4002 (100V / 1A) Typical

DC Source – External Relay



Use one of the two methods of transient clamping below to protect relay contacts and reduce EMI emissions. Locate the protection circuit as close to the load as possible (12 inches [30cm] recommended). The circuit's effectiveness decreases the further away it is.

Protect against accidental overloads by wiring in an inline fuse to the common side of the relay.

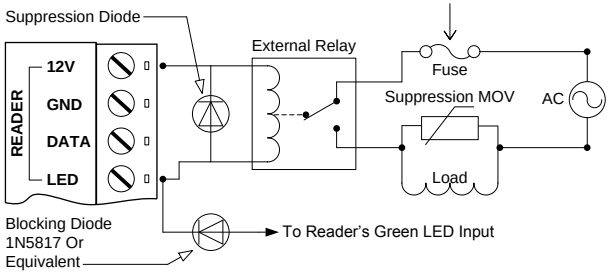
Important! The external relay's coil current must be restricted to 40mA.
- *The 5 volt relay coil resistance must be ≥ 125 ohms.*
- *The 12 volt relay coil resistance must be ≥ 300 ohms.*

Access It! Universal v4 and newer allows mapping a reader port to an output on a separate sub-panel which is connected to the same M5-IC.

AC Source – Suppression MOV Selection

Clamp Voltage > 1.5x Vac RMS
24Vac Strike, Panasonic ERZ-C07DK470 Typical

AC Source – External Relay



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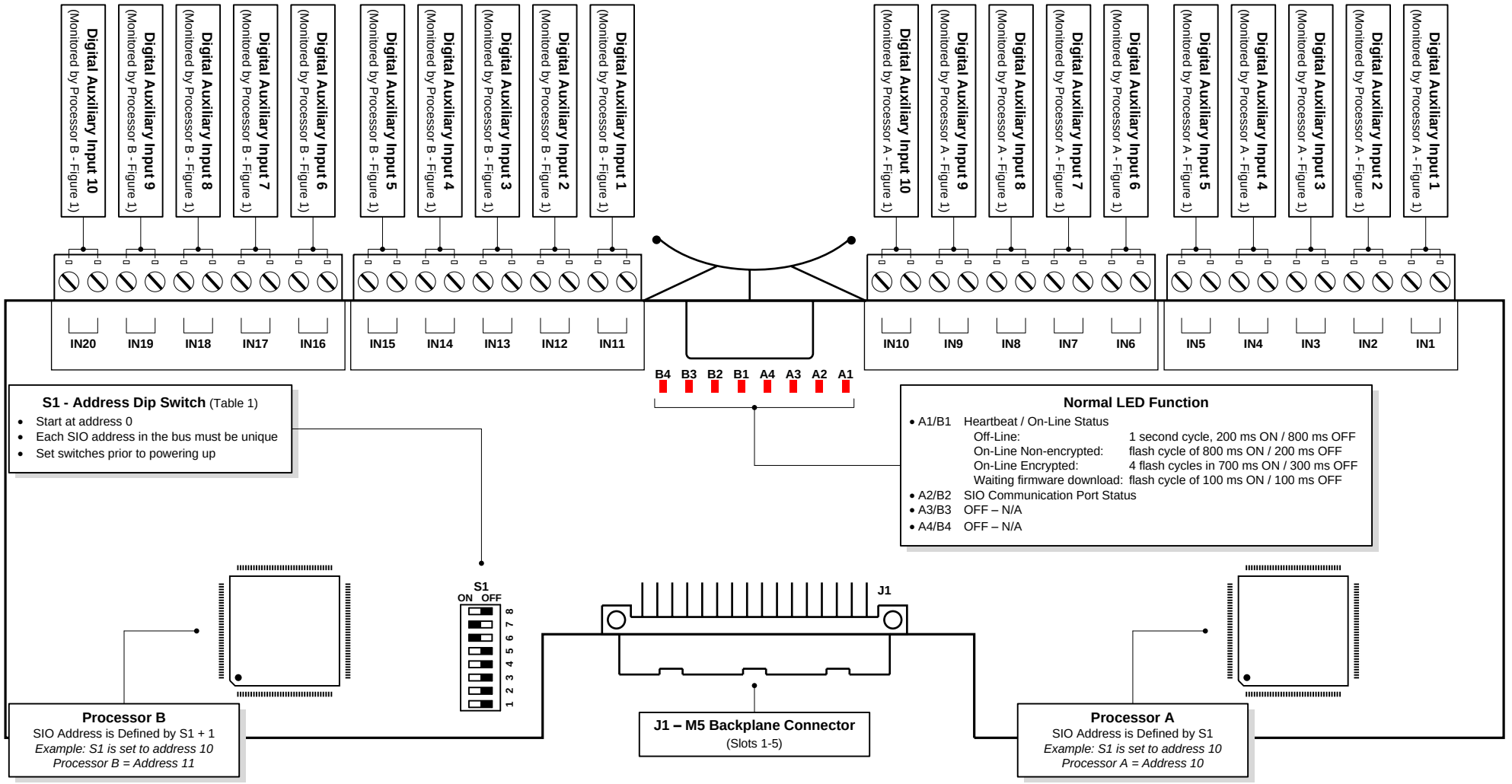

Mechanical Specifications

• Dimensions	3.5"(88.9mm)Wx10.25"(260.35mm)L
• Temperature	-55ºC to +85ºC, storage 0ºC to +70ºC, operating
• Humidity	5% to 95% RHNC

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www.rs2tech.com

Revised: 10/2013

Table 1: S1 - Address Dip Switch

Address	1	2	3	4	5	6	7	8
0	Off	Off	Off	Off	Off	On	On	Off
1	On	Off	Off	Off	Off	On	On	Off
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3	On	On	Off	Off	Off	On	On	Off
4	Off	Off	On	Off	Off	On	On	Off
5	On	Off	On	Off	Off	On	On	Off
6	Off	On	On	Off	Off	On	On	Off
7	On	On	On	Off	Off	On	On	Off
8	Off	Off	Off	On	Off	On	On	Off
9	On	Off	Off	On	Off	On	On	Off
10	Off	On	Off	On	Off	On	On	Off
11	On	On	Off	On	Off	On	On	Off
12	Off	Off	On	On	Off	On	On	Off
13	On	Off	On	On	Off	On	On	Off
14	Off	On	On	On	Off	On	On	Off
15	On	On	On	On	Off	On	On	Off
16	Off	Off	Off	Off	On	On	On	Off
17	On	Off	Off	Off	On	On	On	Off
18	Off	On	Off	Off	On	On	On	Off
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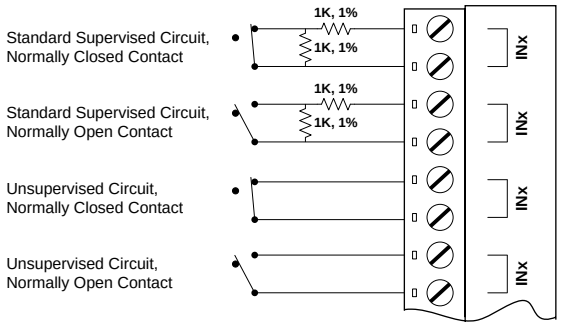
23	On	On	On	Off	On	On	On	Off
24	Off	Off	Off	On	On	On	On	Off
25	On	Off	Off	On	On	On	On	Off
26	Off	On	Off	On	On	On	On	Off
27	On	On	Off	On	On	On	On	Off
28	Off	Off	On	On	On	On	On	Off
29	On	Off	On	On	On	On	On	Off
30	Off	On	On	On	On	On	On	Off
31 N/A	–	–	–	–	–	–	–	–

Figure 1: Input Wiring Configurations



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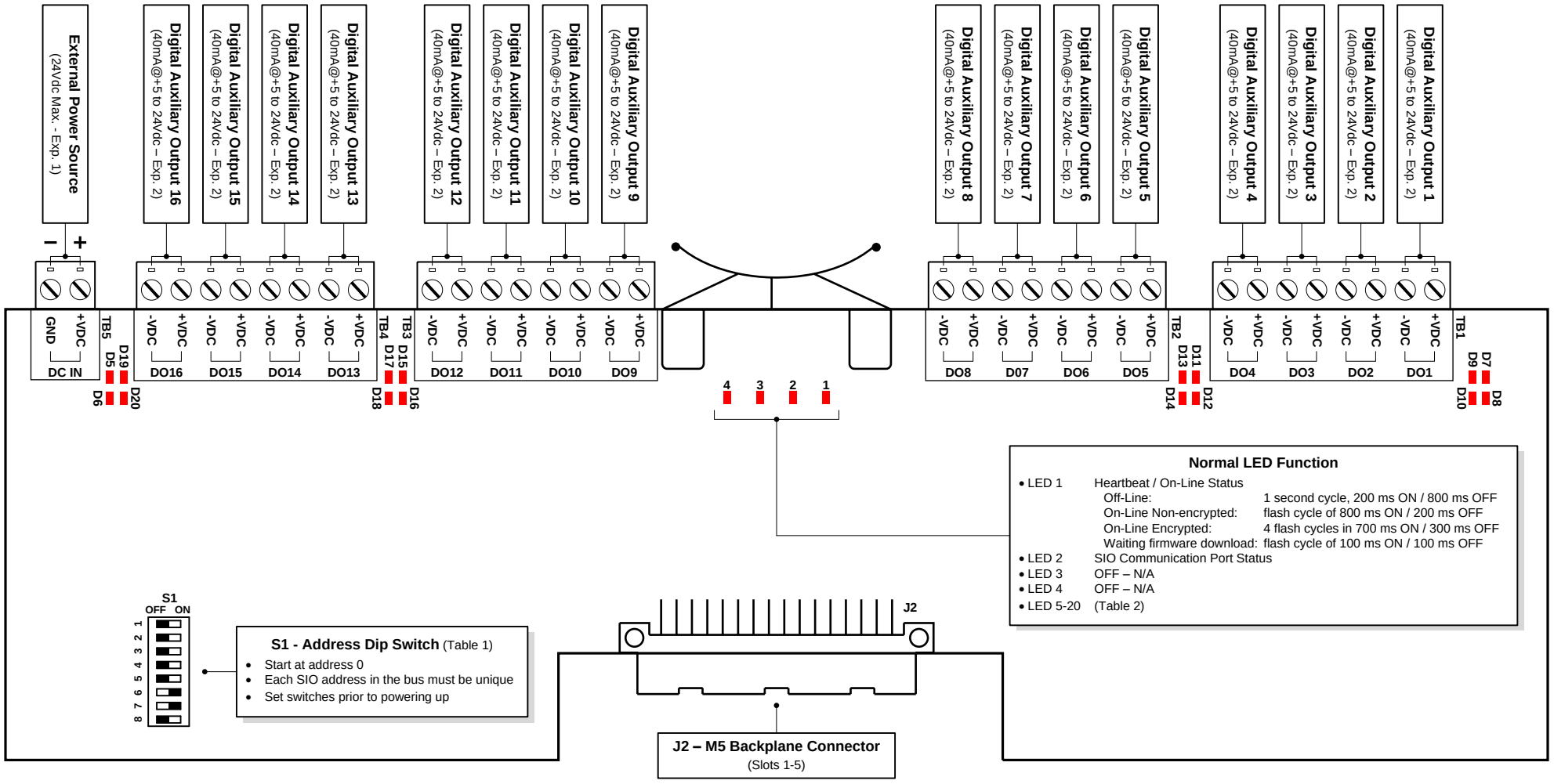

S1 - Address Dip Switch (Table 1)

- Start at address 0
- Each SIO address in the bus must be unique
- Set switches prior to powering up

Normal LED Function

- LED 1 Heartbeat / On-Line Status
  - Off-Line: 1 second cycle, 200 ms ON / 800 ms OFF
  - On-Line Non-encrypted: flash cycle of 800 ms ON / 200 ms OFF
  - On-Line Encrypted: 4 flash cycles in 700 ms ON / 300 ms OFF
  - Waiting firmware download: flash cycle of 100 ms ON / 100 ms OFF
- LED 2 SIO Communication Port Status
- LED 3 OFF – N/A
- LED 4 OFF – N/A
- LED 5-20 (Table 2)

Mechanical Specifications

- Dimensions 3.5"(88.9mm)W x 10.25"(260.35mm)L
- Temperature -55ºC to +85ºC, storage
  0ºC to +70ºC, operating
- Humidity 5% to 95% RHNC

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6	Off	On	On	Off	Off	On	On	Off
7	On	On	On	Off	Off	On	On	Off
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14	Off	On	On	On	Off	On	On	Off
15	On	On	On	On	Off	On	On	Off
16	Off	Off	Off	Off	On	On	On	Off
17	On	Off	Off	Off	On	On	On	Off
18	Off	On	Off	Off	On	On	On	Off
19	On	On	Off	Off	On	On	On	Off
20	Off	Off	On	Off	On	On	On	Off
21	On	Off	On	Off	On	On	On	Off
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23	On	On	On	Off	On	On	On	Off
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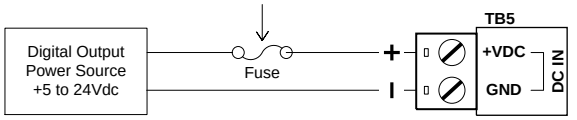
25	On	Off	Off	On	On	On	On	Off
26	Off	On	Off	On	On	On	On	Off
27	On	On	Off	On	On	On	On	Off
28	Off	Off	On	On	On	On	On	Off
29	On	Off	On	On	On	On	On	Off
30	Off	On	On	On	On	On	On	Off
31	On	On	On	On	On	On	On	Off

Table 2: Output Status LEDs

On = Energized

Output Number	Associated LED
1	D7
2	D8
3	D9
4	D10
5	D11
6	D12
7	D13
8	D14
9	D15
10	D16
11	D17
12	D18
13	D19
14	D20
15	D5
16	D6

Explanation 1: External Power Source



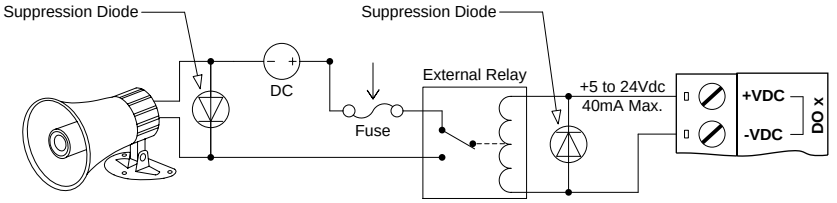
Explanation 2: Output Wiring

Protect relay contacts and reduce EMI emissions by using a contact protection circuit as close to the load as possible (12 inches [30cm] recommended). The circuit's effectiveness decreases the further away it is.

Protect against accidental overloads by wiring in an inline fuse to the common side of the relay.

Important! The external relay's coil current must be restricted to 40mA.

- *The 5 volt relay coil resistance must be ≥ 125 ohms.*
- *The 12 volt relay coil resistance must be ≥ 300 ohms.*
- *The 24 volt relay coil resistance must be ≥ 600 ohms.*



Suppression Diode Selection

Diode Current Rating > 1x Strike Current
Diode Break Down Voltage: 4x Strike Voltage
12Vdc or 24Vdc Strike, Diode 1N4002 (100V / 1A) Typical

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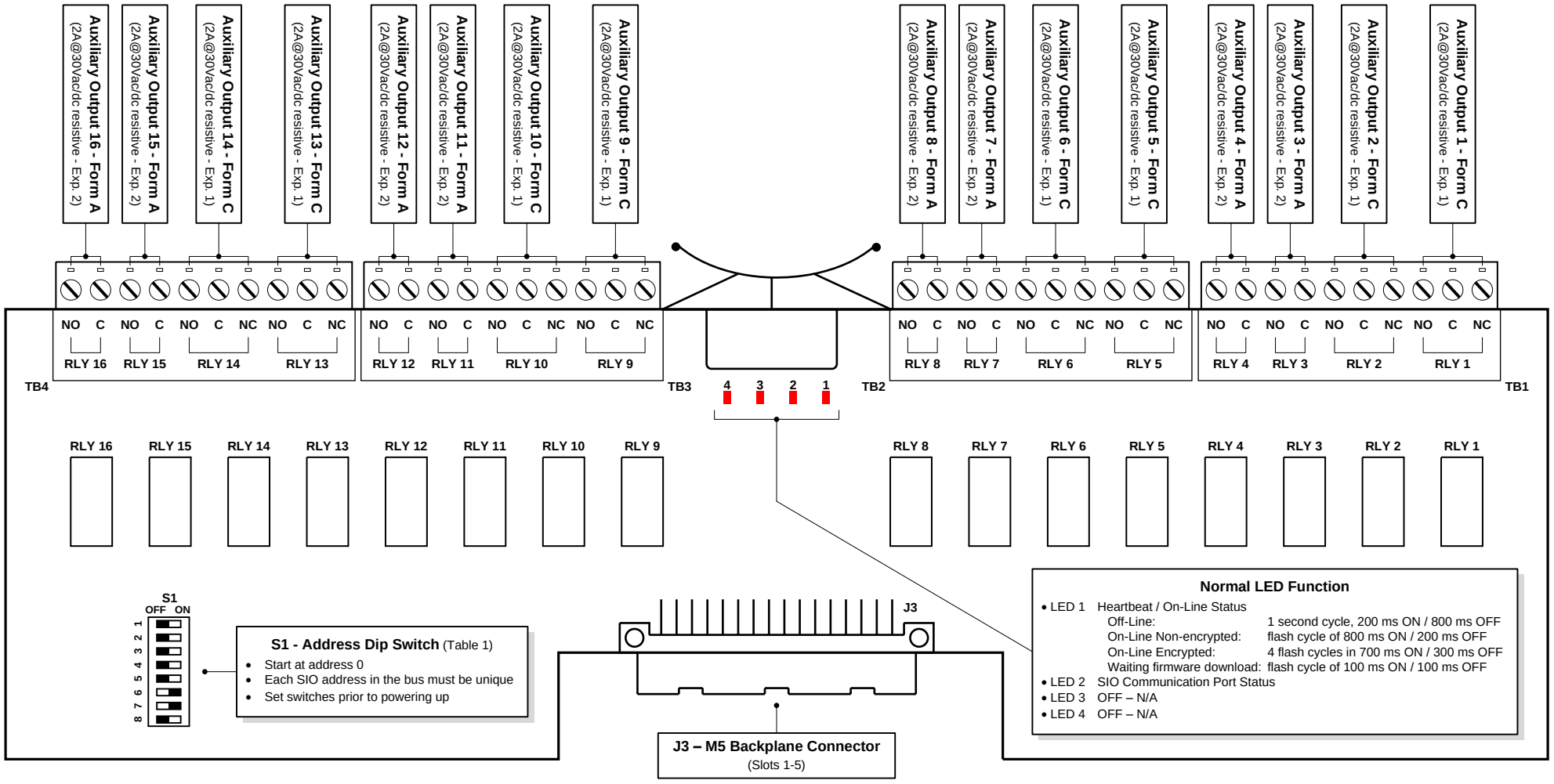
M5-16DOR Quick Reference



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- LED 2 SIO Communication Port Status
- LED 3 OFF – N/A
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Temperature	-55ºC to +85ºC, storage 0ºC to +70ºC, operating
Humidity	5% to 95% RHNC

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6	Off	On	On	Off	Off	On	On	Off
7	On	On	On	Off	Off	On	On	Off
8	Off	Off	Off	On	Off	On	On	Off
9	On	Off	Off	On	Off	On	On	Off
10	Off	On	Off	On	Off	On	On	Off
11	On	On	Off	On	Off	On	On	Off
12	Off	Off	On	On	Off	On	On	Off
13	On	Off	On	On	Off	On	On	Off
14	Off	On	On	On	Off	On	On	Off
15	On	On	On	On	Off	On	On	Off
16	Off	Off	Off	Off	On	On	On	Off
17	On	Off	Off	Off	On	On	On	Off
18	Off	On	Off	Off	On	On	On	Off
19	On	On	Off	Off	On	On	On	Off
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22	Off	On	On	Off	On	On	On	Off
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24	Off	Off	Off	On	On	On	On	Off
25	On	Off	Off	On	On	On	On	Off
26	Off	On	Off	On	On	On	On	Off
27	On	On	Off	On	On	On	On	Off
28	Off	Off	On	On	On	On	On	Off
29	On	Off	On	On	On	On	On	Off
30	Off	On	On	On	On	On	On	Off
31	On	On	On	On	On	On	On	Off

Explanation 1: Form C Output Wiring Configurations

When controlling power to the door strike, the Normally Open and Common poles are used. When momentarily removing power to unlock the door, as with a mag lock, the Normally Closed and Common poles are used.

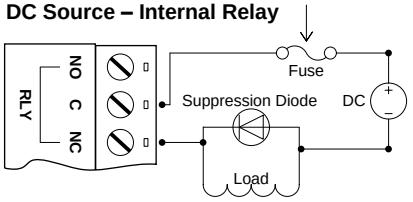
Use one of the two methods of transient clamping below to protect relay contacts and reduce EMI emissions. Locate the protection circuit as close to the load as possible (12 inches [30cm] recommended). The circuit's effectiveness decreases the further away it is.

Protect against accidental overloads by wiring in an inline fuse to the common side of the relay.

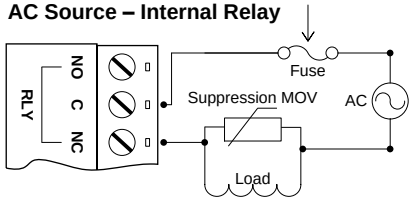
DC Source – Suppression Diode Selection

Diode Current Rating > 1x Strike Current
Diode Break Down Voltage: 4x Strike Voltage
12Vdc or 24Vdc Strike, Diode 1N4002 (100V / 1A) Typical

DC Source – Internal Relay



AC Source – Internal Relay



AC Source – Suppression MOV Selection

Clamp Voltage > 1.5x Vac RMS
24Vac Strike, Panasonic ERZ-C07DK470 Typical

Explanation 2: Form A Output Wiring Configurations

When controlling power to the door strike, the Normally Open and Common poles are used. When momentarily removing power to unlock the door, as with a mag lock, the Normally Closed and Common poles are used. If the relay does not have a Normally Closed pole, the relay must be configured by the host to be energized when in the locked state. Check with local building codes for proper egress door installation.

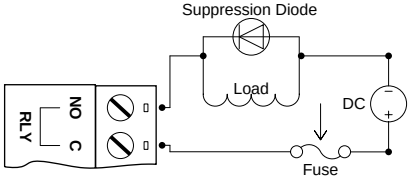
Use one of the two methods of transient clamping below to protect relay contacts and reduce EMI emissions. Locate the protection circuit as close to the load as possible (12 inches [30cm] recommended). The circuit's effectiveness decreases the further away it is.

Protect against accidental overloads by wiring in an inline fuse to the common side of the relay.

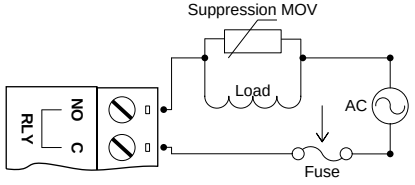
DC Source – Suppression Diode Selection

Diode Current Rating > 1x Strike Current
Diode Break Down Voltage: 4x Strike Voltage
12Vdc or 24Vdc Strike, Diode 1N4002 (100V / 1A) Typical

DC Source – Internal Relay



AC Source – Internal Relay



AC Source – Suppression MOV Selection

Clamp Voltage > 1.5x Vac RMS
24Vac Strike, Panasonic ERZ-C07DK470 Typical

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M2000 Base Quick Reference

Detail

Digital Inputs - (Figure 1)

TB1 (IN1 - IN5)

PIN 1	Reader 1 Door Contact – DI 1
PIN 2	Reader 1 Door Contact – DI 1 return
PIN 3	Reader 1 REX – DI 2
PIN 4	Reader 1 REX – DI 2 return
PIN 5	Reader 2 Door Contact – DI 3
PIN 6	Reader 2 Door Contact – DI 3 return
PIN 7	Reader 2 REX – DI 4
PIN 8	Reader 2 REX – DI 4 return
PIN 9	Reader 3 Door Contact – DI 5
PIN 10	Reader 3 Door Contact – DI 5 return

TB2 (IN6 - IN10)

PIN 1	Reader 3 REX – DI 6
PIN 2	Reader 3 REX – DI 6 return
PIN 3	Reader 4 Door Contact – DI 7
PIN 4	Reader 4 Door Contact – DI 7 return
PIN 5	Reader 4 REX – DI 8
PIN 6	Reader 4 REX – DI 8 return
PIN 7	Auxiliary Input 9 – DI 9
PIN 8	Auxiliary Input 9 – DI 9 return
PIN 9	Auxiliary Input 10 – DI 10
PIN 10	Auxiliary Input 10 – DI 10 return

Readers - 12Vdc Only (Explanations 2 & 3)

TB3 (Reader Port 1)

PIN 1	+12Vdc
PIN 2	GND
PIN 3	Reader Data 1 – DI
PIN 4	Reader LED – DO1

TB4 (Reader Port 2)

PIN 1	+12Vdc
PIN 2	GND
PIN 3	Reader Data 1 – DI
PIN 4	Reader LED – DO2

TB5 (Reader Port 3)

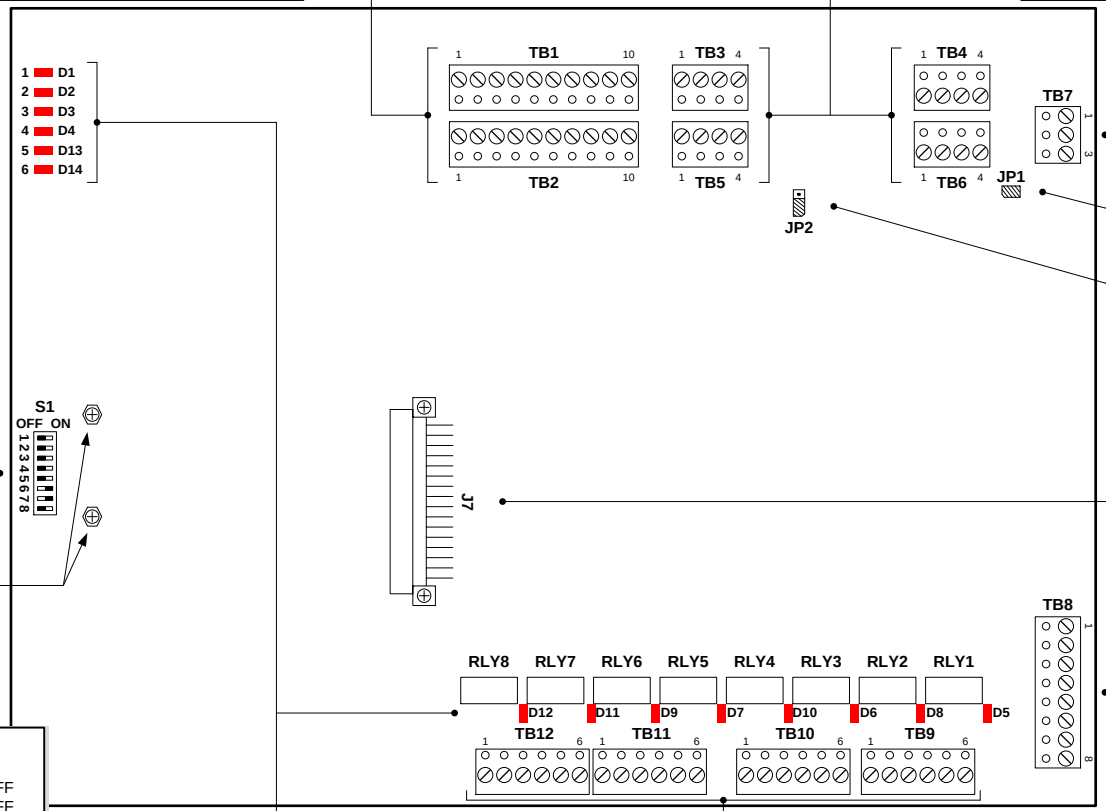
PIN 1	+12Vdc
PIN 2	GND
PIN 3	Reader Data 1 – DI
PIN 4	Reader LED – DO3

TB6 (Reader Port 4)

PIN 6	+12Vdc
PIN 7	GND
PIN 8	Reader Data 1 – DI
PIN 9	Reader LED – DO4

Mechanical Specifications

- Dimensions 3.5"(88.9mm)Wx10.25"(260.35mm)L
- Temperature -55ºC to +85ºC, storage
  0ºC to +70ºC, operating
- Humidity 5% to 95% RHNC



TB7 - RS-485 Bus Port 2
(2 wire ONLY! - Figure 2)

JP1 - Termination
(Figure 2)

JP2 - Always set to LO

S1 - Address Dip Switch (Table 1)

- Start at address 0
- Each SIO address in the bus must be unique
- Set switches prior to powering up

J7 - M5-IC Connector

Mounts
Replace card puller with mounting screws.

TB8

PIN 1	18Vac (Do not use 24 Vac)
PIN 2	18Vac (Do not use 24 Vac)
PIN 3	GND
PIN 4	+12Vdc out
PIN 5	Tamper Switch (GND)
PIN 6	Tamper Switch
PIN 7	12V Battery +
PIN 8	12V Battery –

LEDs

D1	Off-Line / On-Line and Battery Status
	Off-Line: 1 second cycle, 200ms ON / 800ms OFF
	On-Line: 1 second cycle, 800ms ON / 200ms OFF
	Double Flash: Battery Low
D2	Host Communication Activity
D3	J7 Communication Activity
D4	RS-485 Bus Communication Activity
D5	Output 1 - ON = Energized
D6	Output 3 - ON = Energized
D7	Output 5 - ON = Energized
D8	Output 2 - ON = Energized
D9	Output 6 - ON = Energized
D10	Output 4 - ON = Energized
D11	Output 7 - ON = Energized
D12	Output 8 - ON = Energized
D13	Unassigned
D14	Unassigned

Outputs - (Explanation 1)

TB9 (Out 1 - Out 2)

PIN 1	Door Strike 1 – C
PIN 2	Door Strike 1 – NC
PIN 3	Door Strike 1 – NO
PIN 4	Auxiliary Output 2 – C
PIN 5	Auxiliary Output 2 – NC
PIN 6	Auxiliary Output 2 – NO

TB10 (Out 3 - Out 4)

PIN 1	Door Strike 2 – C
PIN 2	Door Strike 2 – NC
PIN 3	Door Strike 2 – NO
PIN 4	Auxiliary Output 4 – C
PIN 5	Auxiliary Output 4 – NC
PIN 6	Auxiliary Output 4 – NO

TB11 (Out 5 - Out 6)

PIN 1	Door Strike 3 – C
PIN 2	Door Strike 3 – NC
PIN 3	Door Strike 3 – NO
PIN 4	Auxiliary Output 6 – C
PIN 5	Auxiliary Output 6 – NC
PIN 6	Auxiliary Output 6 – NO

TB12 (Out 7 - Out 8)

PIN 1	Door Strike 4 – C
PIN 2	Door Strike 4 – NC
PIN 3	Door Strike 4 – NO
PIN 4	Auxiliary Output 8 – C
PIN 5	Auxiliary Output 8 – NC
PIN 6	Auxiliary Output 8 – NO

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Revised: 5/2014

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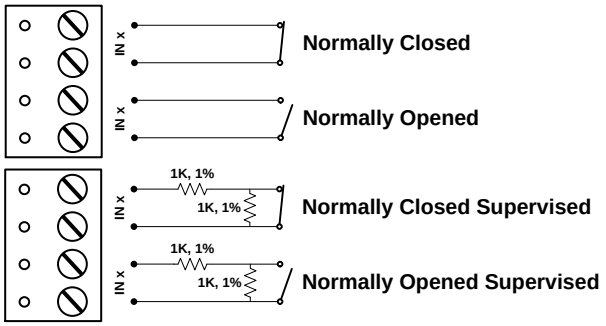
Oview

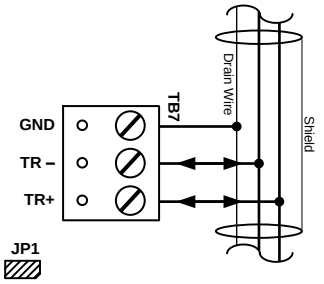
Table 1: S1 - Address Dip Switch

Address	1	2	3	4	5	6	7	8
0	Off	Off	Off	Off	Off	On	On	Off
1	On	Off	Off	Off	Off	On	On	Off
2	Off	On	Off	Off	Off	On	On	Off
3	On	On	Off	Off	Off	On	On	Off
4	Off	Off	On	Off	Off	On	On	Off
5	On	Off	On	Off	Off	On	On	Off
6	Off	On	On	Off	Off	On	On	Off
7	On	On	On	Off	Off	On	On	Off
8	Off	Off	Off	On	Off	On	On	Off
9	On	Off	Off	On	Off	On	On	Off
10	Off	On	Off	On	Off	On	On	Off
11	On	On	Off	On	Off	On	On	Off
12	Off	Off	On	On	Off	On	On	Off
13	On	Off	On	On	Off	On	On	Off
14	Off	On	On	On	Off	On	On	Off
15	On	On	On	On	Off	On	On	Off
16	Off	Off	Off	Off	On	On	On	Off
17	On	Off	Off	Off	On	On	On	Off
18	Off	On	Off	Off	On	On	On	Off
19	On	On	Off	Off	On	On	On	Off
20	Off	Off	On	Off	On	On	On	Off
21	On	Off	On	Off	On	On	On	Off
22	Off	On	On	Off	On	On	On	Off
23	On	On	On	Off	On	On	On	Off
24	Off	Off	Off	On	On	On	On	Off
25	On	Off	Off	On	On	On	On	Off
26	Off	On	Off	On	On	On	On	Off
27	On	On	Off	On	On	On	On	Off
28	Off	Off	On	On	On	On	On	Off
29	On	Off	On	On	On	On	On	Off
30	Off	On	On	On	On	On	On	Off
31	On	On	On	On	On	On	On	Off

Exp. 1: Input Wiring Configurations



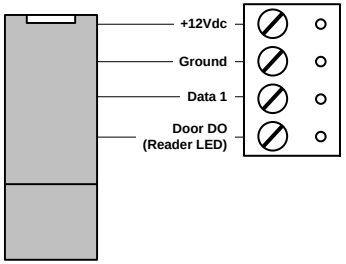
Exp. 2: RS-485 Sub-Panel Bus Termination



The M2000 Base has one 2 wire RS-485 sub-panel bus. The bus needs to be terminated at both the beginning and ending points.

JP1 is the termination jumper for the RS-485 Sub-Panel Bus.

Exp. 3: Reader Wiring



Supervised F/2F Reader

Exp. 4: Reader Input Wiring Configurations

Door contact and request to exit may be configured in one of four ways:

1. Unsupervised Wired to the F/2F Reader (Figure 2)
2. Supervised Wired to the F/2F Reader (Figure 3)
3. Wired to a M/R-J Box, WIU-2, or 4033-BGN (Not pictured)
4. Wired to the dedicated input on the M2000 Base

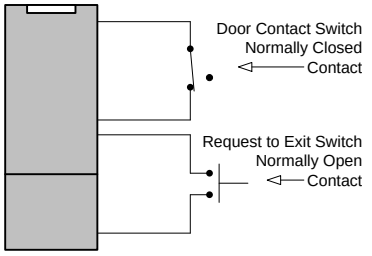


Figure 2

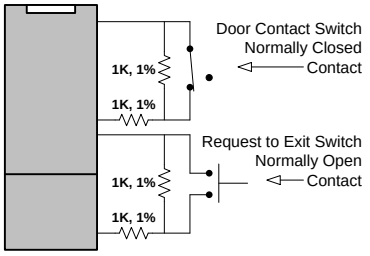


Figure 3

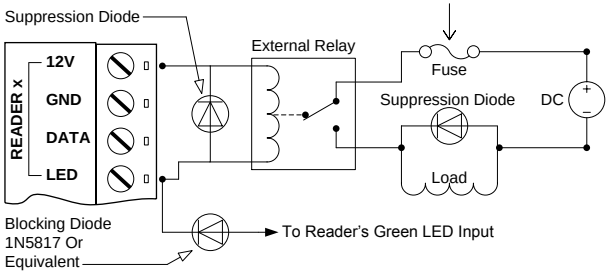
Exp. 5: Output Wiring Configurations

Use one of the two methods of transient clamping below to protect relay contacts and reduce EMI emissions. Protect against accidental overloads by wiring in an inline fuse to the common side of the relay.

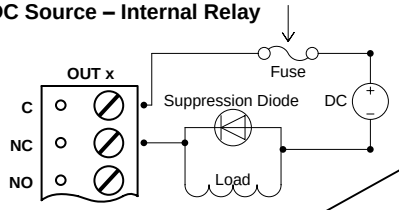
DC Source – Suppression Diode Selection

Diode Current Rating > 1x Strike Current
Diode Break Down Voltage: 4x Strike Voltage
12Vdc or 24Vdc Strike, Diode 1N4002 (100V / 1A) Typical

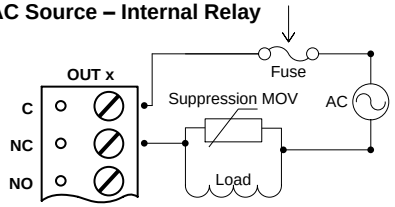
DC Source – External Relay



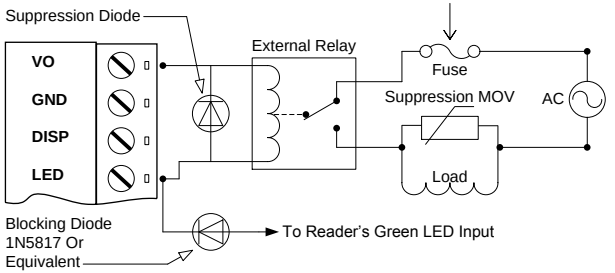
DC Source – Internal Relay



AC Source – Internal Relay



AC Source – External Relay



AC Source – Suppression MOV Selection

Clamp Voltage > 1.5x Vac RMS
24Vac Strike, Panasonic ERZ-C07DK470 Typical

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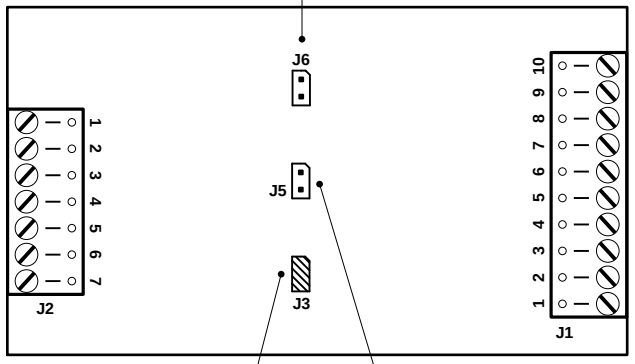
WIU-2 Quick Reference

J6 – HID™ Reader Supervision

The 2-pin connector J6 is the HID reader supervision connector. By default, the connector is not jumpered and HID reader supervision is disabled. Place a jumper over this connector to enable HID reader supervision.

Open: Disabled *default*
Closed: Enabled



J2 – Controller Interface Connector

J1-1: 12Vdc *Power for WIU-2.*
J1-2: Ground
J1-3: Door DO/LED Control *Used to control door strike and activate green LED.*
J1-4: Reader F/2F Data
J1-5: Strike Normally Closed
J1-6: Strike Common
J1-7: Strike Normally Opened

J1 – Reader Interface Connector

J1-1: Door DI Common *Return*
J1-2: Door DI Switch
J1-3: Exit DI Common *Return*
J1-4: Exit DI Switch
J1-5: Wiegand Data 1
J1-6: Wiegand Data 0
J1-7: DO/LED Control *Used to control door strike and activate green LED.*
J1-8: Beeper Control *Signal switches to ground to activate the beeper.*
J1-9: -12Vdc Ground
J1-10: +12Vdc Power *Fused power, 250mA maximum.*

J3 – Two-State Reporting Connector

The 2-pin connector J3 is the 2-state reporting connector. By default, this connector is jumpered to enable 2-state reporting. Remove the jumper to disable 2-state reporting.

Open: Disabled
Closed: Enabled *default*

J5 – Reserved

The 2-pin connector J5 is reserved.

Open: Disabled *default*
Closed: Enabled

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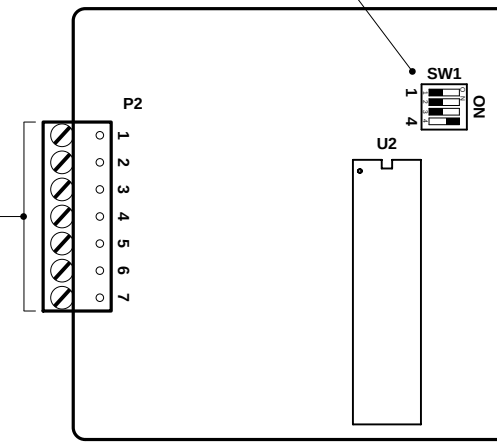
4033-BGN Quick Reference

SW1 – Dipswitch

	OFF	ON
Dip 1	Not Used	Not Used
Dip 2	CASI 3201 (C10103) HID Standard 26 (H10301) HID Standard 37 (H10302) HID Corporate 1000 (H103XX)	Treats 32-bit cards as CASI BCD cards.
Dip 3	Use existing HID readers without the supervision feature.	HID supervised mode – uses new HID readers with supervision feature.
Dip 4	No Two-State Switch status message sent to CASI panel.	Two-State Switch supervised mode – sends status message to CASI panel.



P2 – Controller Interface Connector

P2-1: +12Vdc Power
P2-2: -12Vdc Ground
P2-3: Door Strike Control DO
P2-4: Reader Data 1
P2-5: Door Strike Relay Normally Closed
P2-6: Door Strike Relay Common
P2-7: Door Strike Relay Normally Open

P1 – Reader Interface Connector

P1-10: +12Vdc Power
P1-9: -12Vdc Ground & Door DI Common
P1-8: Beeper Control
P1-7: LED Control
P1-6: Wiegand Data 1
P1-5: Wiegand Data 0
P1-4: Exit DI Switch
P1-3: Exit DI Common
P1-2: Door DI Switch
P1-1: Not Used

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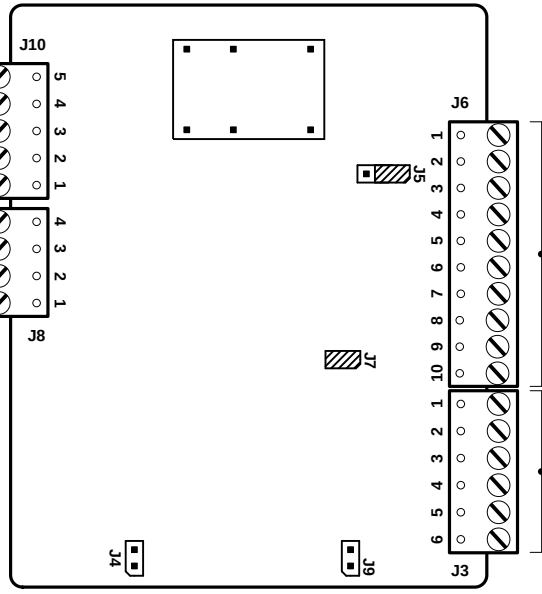
WIU-4 Quick Reference

Jumper Settings

	Description	OFF	ON
J4	Door and REX Supervision	2-State Supervision *Default*	4-State Supervision
J5	Reserved	N/A	Must be jumped across pins 1 and 2
J7	Cabinet Tamper Switch	N/A	Jumper ON if not used *Default*
J9	Reserved	*Default*	N/A



J10 – Door Strike Relay Connector

J10-5: Normally Open Contact *NO*
J10-4: Not Used
J10-3: Normally Closed Contact *NC*
J10-2: Relay Power Common *Return*
J10-1: Relay Power Source

J8 – Controller Interface Connector

J8-4: Reader F/2F Data
J8-3: Door DO
J8-2: Ground
J8-1: Power 12vDC *power for WIU-4*

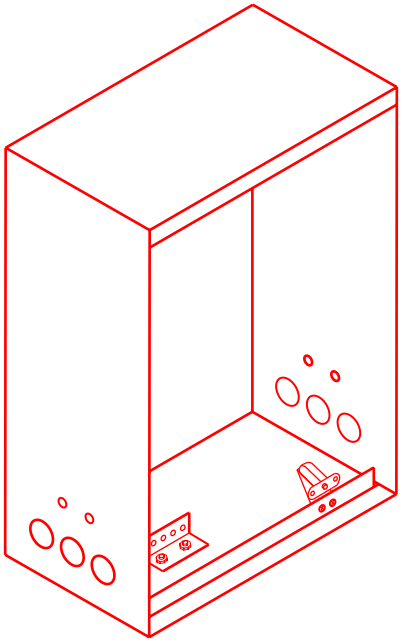
J6 – Reader Interface Connector

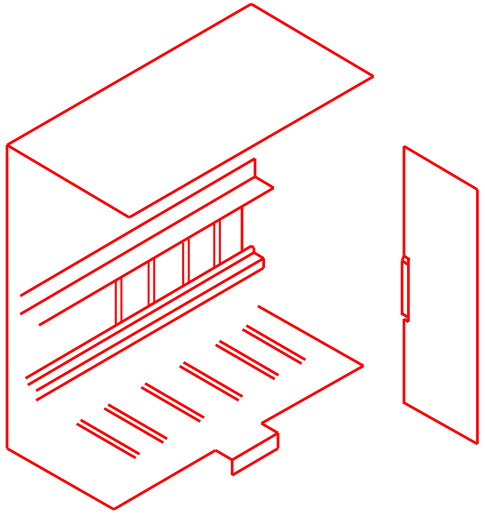
J6-1: +12Vdc Reader Power* *Fused power, 250mA maximum.*
J6-2: Ground
J6-3: Wiegand Data 0
J6-4: Wiegand Data 1
J6-5: Green LED *Switches to ground during door unlock time.*
J6-6: Red LED *Optional - Switches to ground during door unlock time.*
J6-7: Beeper *Optional - Signal switches to ground to activate the beeper.*
J6-8: Tamper Select** *Optional*
0Vdc = no tamper
Open = tamper
J6-9: Tamper Common** *Optional - Ground Output*
J6-10: +5Vdc Reader Power*

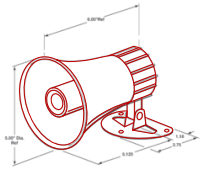
* Use J6-1 or J6-10 for reader power, not both.
** If not used, tie J6-8 to J6-9

J3 – Door and REX Connector

J3-1: +12Vdc *Fused power, 250mA maximum.*
J3-2: Ground
J3-3: Door High *5Vdc output.*
J3-4: Door Common *Return – 0-5Vdc input.*
J3-5: REX High *5Vdc output.*
J3-6: REX Common *Return – 0-5Vdc input.*

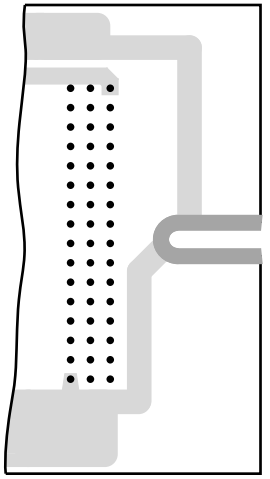






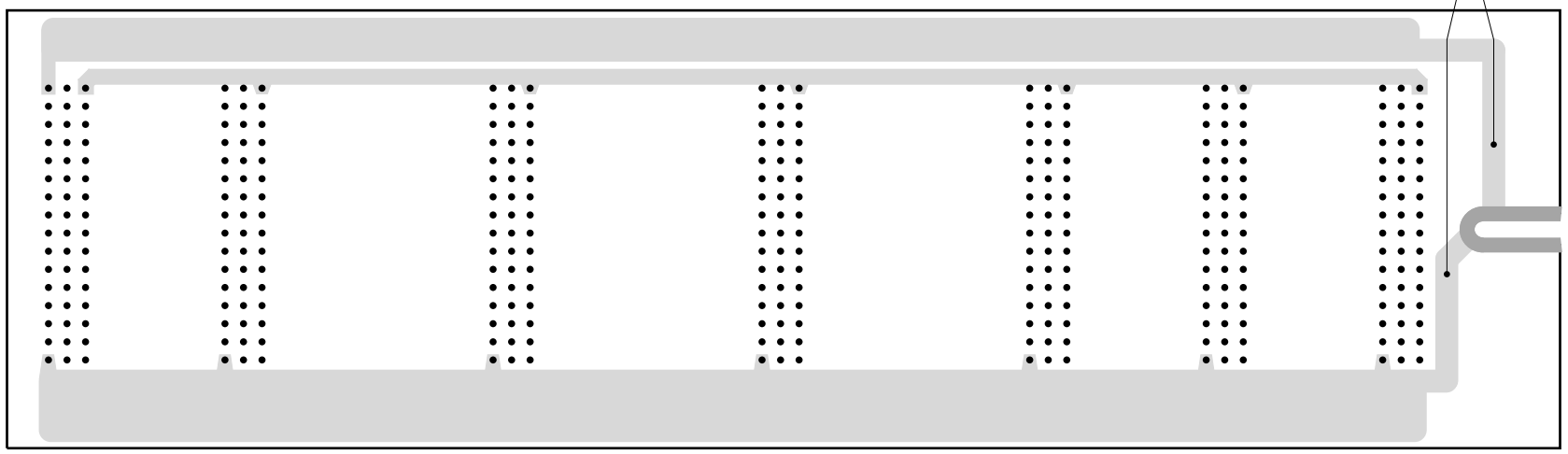
Back View

Figure 1: Ground Traces



Explanation 1: Ground Traces

When using a single earth ground where all M5 enclosures are wired together via the RS-485 Bus, additional action is required.

If using unique earth grounds for each M5 enclosure, no additional action is required.

The system requires that only ONE earth ground be utilized for each M5 enclosure. If using more than one M5 enclosure sharing the same earth ground, the ground trace(s) on the additional enclosures need to be modified as in Figure 1 to prevent ground loop issues.