SCP Hardware Quick Reference

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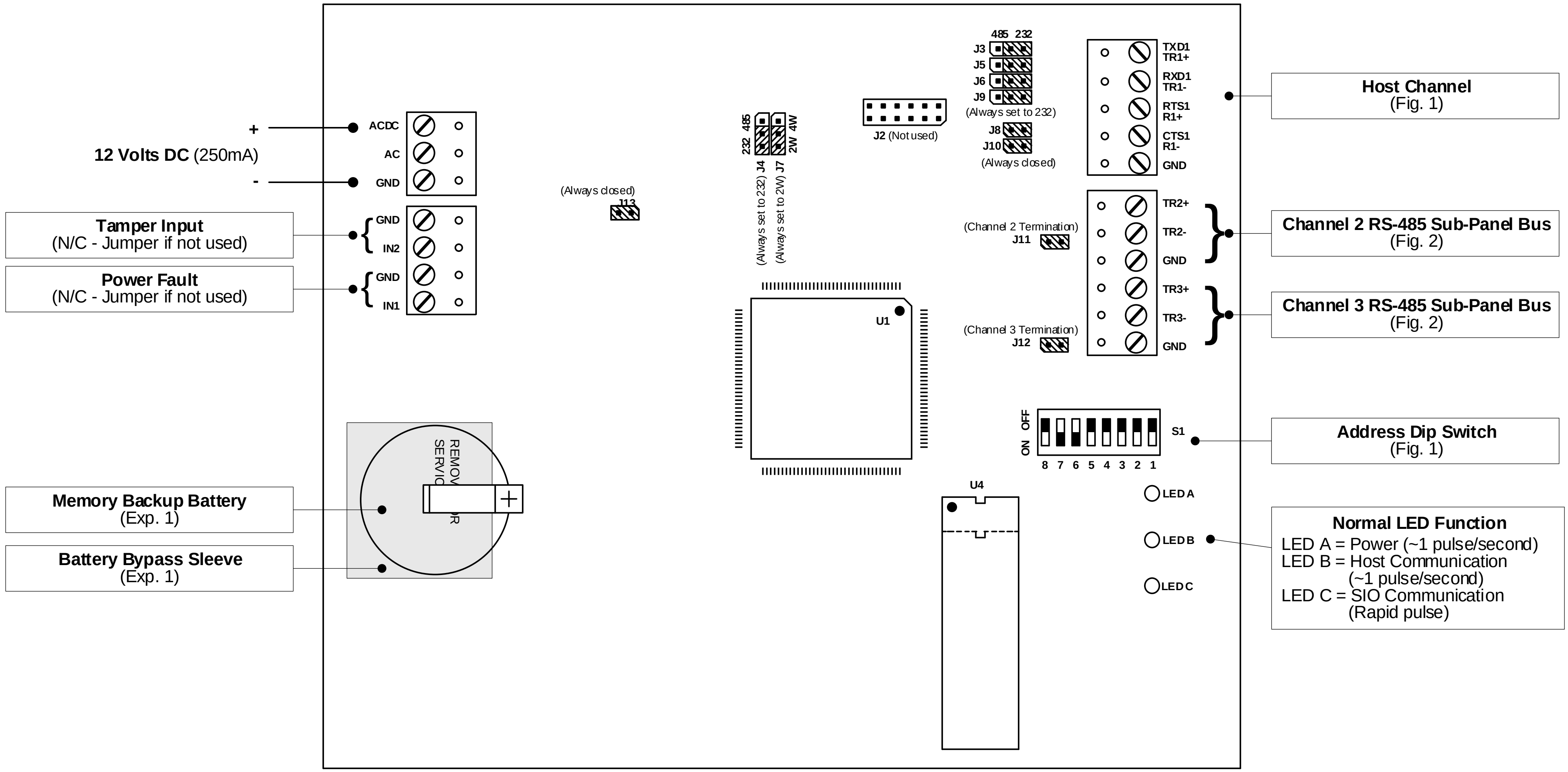
MINI-SCP Quick Reference

MINI-SCP not evaluated by UL



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Oview

Figure 1: Host Channel and Address Dip Switch Configuration

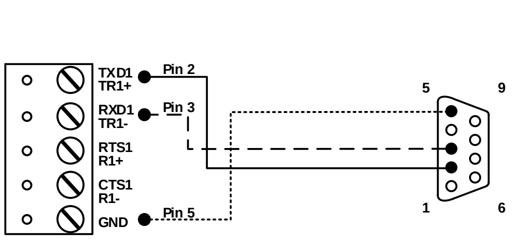
S1 - RS-232 Hardwired Address Dip Switch

Address	1	2	3	4	5	6	7	8
0	Off	Off	Off	Off	Off	On	On	Off

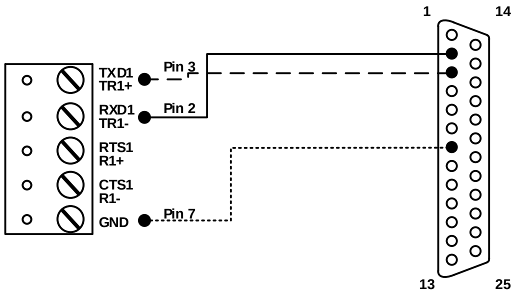
S1 - Dialup Address Dip Switch

Address	1	2	3	4	5	6	7	8
1	On	Off	Off	Off	On	On	On	Off

DB-9 Wiring



DB-25 Wiring



USR Sportster 33,600 External Modem DB-25 Wiring

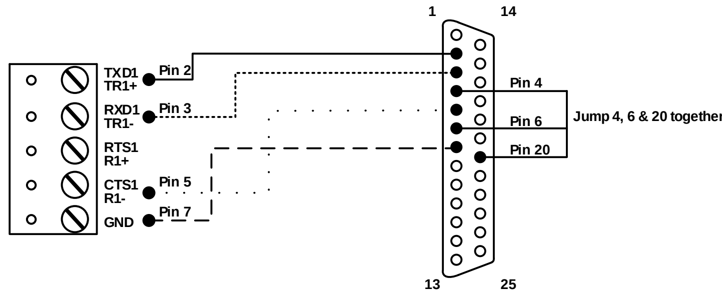
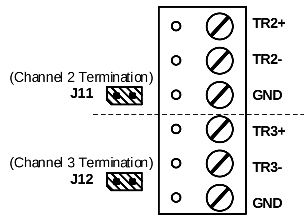


Figure 2: RS-485 Sub-Panel Bus Termination



The MINI-SCP has two distinct RS-485 sub-panel buses. Each bus needs to be terminated at both the beginning and ending points.

J11 is the termination jumper for the Channel 2 RS-485 Sub-Panel Bus.

J12 is the termination jumper for the Channel 3 RS-485 Sub-Panel Bus.

(see Two Wire RS-485 Wiring diagram for sub-panel wiring information)

Explanation 1: Memory Backup Battery

If the MINI-SCP 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 MINI-SCP 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 lithium battery or equivalent.

NOTE: When setting up or servicing the MINI-SCP, 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.

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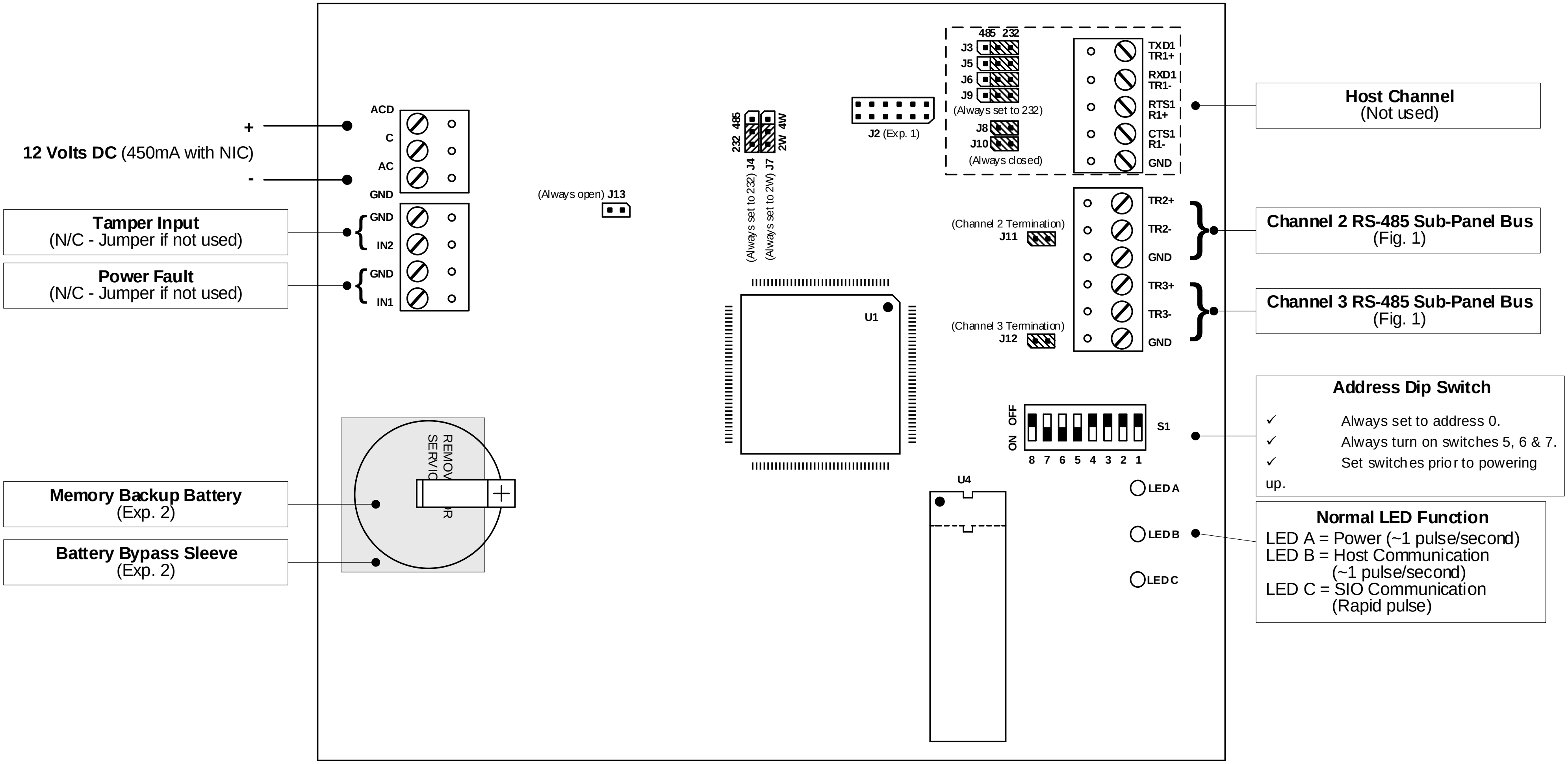
MINI-SCPE Quick Reference

Detail

MINI-SCPE not evaluated by UL



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Explanation 1: Network Interface Card

Oview

Network Interface Card Setup

The 10Base-T Network Interface Card (NIC) has been installed on the MINI-SCPE by the factory and acts as the interface between the software and the MINI-SCPE. The NIC will require an IP Address, Subnet Mask and Gateway in order for the software to communicate with it. To program this information into the NIC, a MAC Address is required. Every NIC has a unique MAC Address which can be found on the white tag that is attached to it. A sample of a MAC Address would be 00-20-4A-74-OF-7F and can be found under the model number of the NIC (CO-E1-11AA). Programming the NIC can be performed through one of three methods.

Method One: RS2 Programmer (P/N: RS2-PROG-TOOL)

The RS2 Programmer comes with a cross-over cable which is used to connect the programmer to the MINI-SCPEs NIC. After connecting the programmer to the NIC, power up the MINI-SCPE and the RS2 Programmer. The programming software will automatically launch.

Enter the NICs MAC Address into the MAC Address fields. Enter the desired IP Address, Gateway and Subnet Mask into their respective fields. Select the appropriate SCP type and software application from their respective drop lists and then click the 'Set Configuration' button. One of two messages will appear, 'Configuration set!' if the programming was successful or 'Panel timeout' if the programming failed.

Method Two: Access It!® Ultra SCPe IP Programmer

Access It!® Ultra installs a utilities folder which contains the SCPe IP Programmer. If the computer resides on the same subnet as the NIC being programmed, you may program it while connected to the network. From the start menu, click Start|Programs|Access It! Ultra|Utilities|SCPe IP Programmer to run the SCP-E/MINI SCP-E Programmer utility.

Enter the NICs MAC Address into the MAC Address fields. Enter the desired IP Address, Gateway and Subnet Mask into their respective fields. Select the appropriate SCP type and software application from their respective drop lists and then click the 'Set Configuration' button. One of two messages will appear, 'Configuration set!' if the programming was successful or 'Panel timeout' if the programming failed.

Method Three: Manually

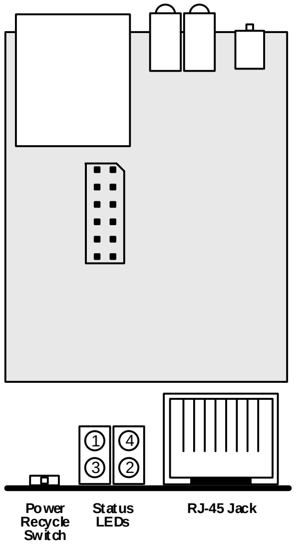
The manual ARP command is a tedious, but effective method in programming the NIC. This method should be used only as a *last* resort. If the computer resides on the same subnet as the NIC being programmed, you may program it while connected to the network. From the start menu, click Start|Run followed by typing 'cmd' for NT 4.0, 2000 and XP or 'command' for 98 and Me. This will open a Command Prompt window from which the following commands will be run from.

Command Prompt Window Portion

Command	Variable Reference	General Command Information
arp -s xxx.xxx.xxx.xxx yy-yy-yy-yy-yy-yy<Enter>	xxx.xxx.xxx.xxx = IP Address yy-yy-yy-yy-yy-yy = MAC Address	Temporarily sets the IP Address.
telnet xxx.xxx.xxx.xxx 1<Enter>	xxx.xxx.xxx.xxx = IP Address	The telnet connection will fail, but the NIC will change its IP Address.
telnet xxx.xxx.xxx.xxx 9999	xxx.xxx.xxx.xxx = IP Address	Opens a telnet session for further programming.

Telnet Session Window Portion

Command	Variable Reference	General Command Information
<Enter>		Enters the NICs Setup Mode.
0<Enter>		Selects option 0 Server configuration.
xxx<Enter>	xxx = First IP octet	Programs the NICs first IP octet.
xxx<Enter>	xxx = Second IP octet	Programs the NICs second IP octet.
xxx<Enter>	xxx = Third IP octet	Programs the NICs third IP octet.
xxx<Enter>	xxx = Fourth IP octet	Programs the NICs fourth IP octet.
Y	Y = Yes	Enables Gateway to be programmed.
xxx<Enter>	xxx = First Gateway octet	Programs the NICs first Gateway octet.
xxx<Enter>	xxx = Second Gateway octet	Programs the NICs second Gateway octet.
xxx<Enter>	xxx = Third Gateway octet	Programs the NICs third Gateway octet.
xxx<Enter>	xxx = Fourth Gateway octet	Programs the NICs fourth Gateway octet.
xx<Enter>	xx = Number of bits to mask (08) class C 24/8 bits (255.255.255.000) (16) class B 16/16 bits (255.255.000.000) (24) class A 8/24 bits (255.000.000.000)	Programs the NICs Subnet Mask
<Enter>		Bypasses the 'Change telnet config password' option.
1<Enter>		Selects option 1 Channel 1 configuration.
38400<Enter>		Programs the Baudrate to 38,400.
4C<Enter>		Programs the I/F Mode to 4C.
02<Enter>		Programs the Flow to 02.
xxxxx<Enter>	xxxxx = Network TCP port (03001) Default Access It!® setting (14001) If running Access It!® Lite or Access It!® UltraLite.	Programs the Port No to 03001 or 14001 IMPORTANT NOTE: Only set the Port No to 14001, when running Access It!® Lite or Access It!® UltraLite which require the Lantronix Redirector Software!
C0<Enter>		Programs the ConnectMode to C0.
<Enter>		Bypasses the first 'Remote IP Address' octet option.
<Enter>		Bypasses the second 'Remote IP Address' octet option.
<Enter>		Bypasses the third 'Remote IP Address' octet option.
<Enter>		Bypasses the fourth 'Remote IP Address' octet option.
<Enter>		Bypasses the 'Remote Port' option.
<Enter>		Bypasses the 'DisConnMode' option.
<Enter>		Bypasses the 'FlushMode' option.
<Enter>		Bypasses the hours 'DisConnTime' option.
<Enter>		Bypasses the minutes 'DisConnTime' option.
<Enter>		Bypasses the 'SendChar 1' option.
<Enter>		Bypasses the 'SendChar 2' option.
5<Enter>		Selects option 5 Expert settings.
45<Enter>		Programs the TCP Keepalive time to 45 seconds.
9<Enter>		Selects option 9 Save and exit.



LED	Description	LED Functions
1 (Green)	Serial Port Channel 1 Status	Lights solid green to indicate Channel 1 is idle. Blinks green to indicate Channel 1 is connected to the network and active.
2 (Yellow)	Serial Port Channel 2 Status	Lights solid yellow to indicate Channel 2 is idle. Blinks yellow to indicate Channel 2 is connected to the network and active.
3 (Red)	Diagnostics	Blinks or lights solid red in combination with the green (Channel 1) LED to indicate diagnostics and error detection. Red solid, green (Channel 1) blinking: 1x: EPROM checksum error 2x: RAM error 3x: Network controller error 4x: EEPROM checksum error 5x: Duplicated IP address on the network* 6x: Software does not match hardware* Red blinking, green (Channel 1) blinking: 4x: Faulty network connection* 5x: No DHCP response received*
4 (Green)	Network Link Status	Lights solid green to indicate network port is connected to the network

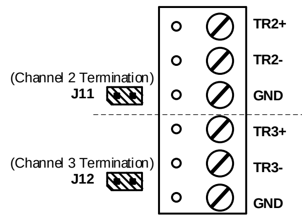
*non-fatal error

Explanation 2: Memory Backup Battery

If the MINI-SCPE 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 MINI-SCPE 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 lithium battery or equivalent.

NOTE: When setting up or servicing the MINI-SCPE, 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 1: RS-485 Sub-Panel Bus Termination



The MINI-SCPE has two distinct RS-485 sub-panel buses. Each bus needs to be terminated at both the beginning and ending points.

J11 is the termination jumper for the Channel 2 RS-485 Sub-Panel Bus.

J12 is the termination jumper for the Channel 3 RS-485 Sub-Panel Bus.

(see Two Wire RS-485 Wiring diagram for sub-panel wiring information)

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SCP-1MB Quick Reference

Detail

SCP-1MB not evaluated by UL

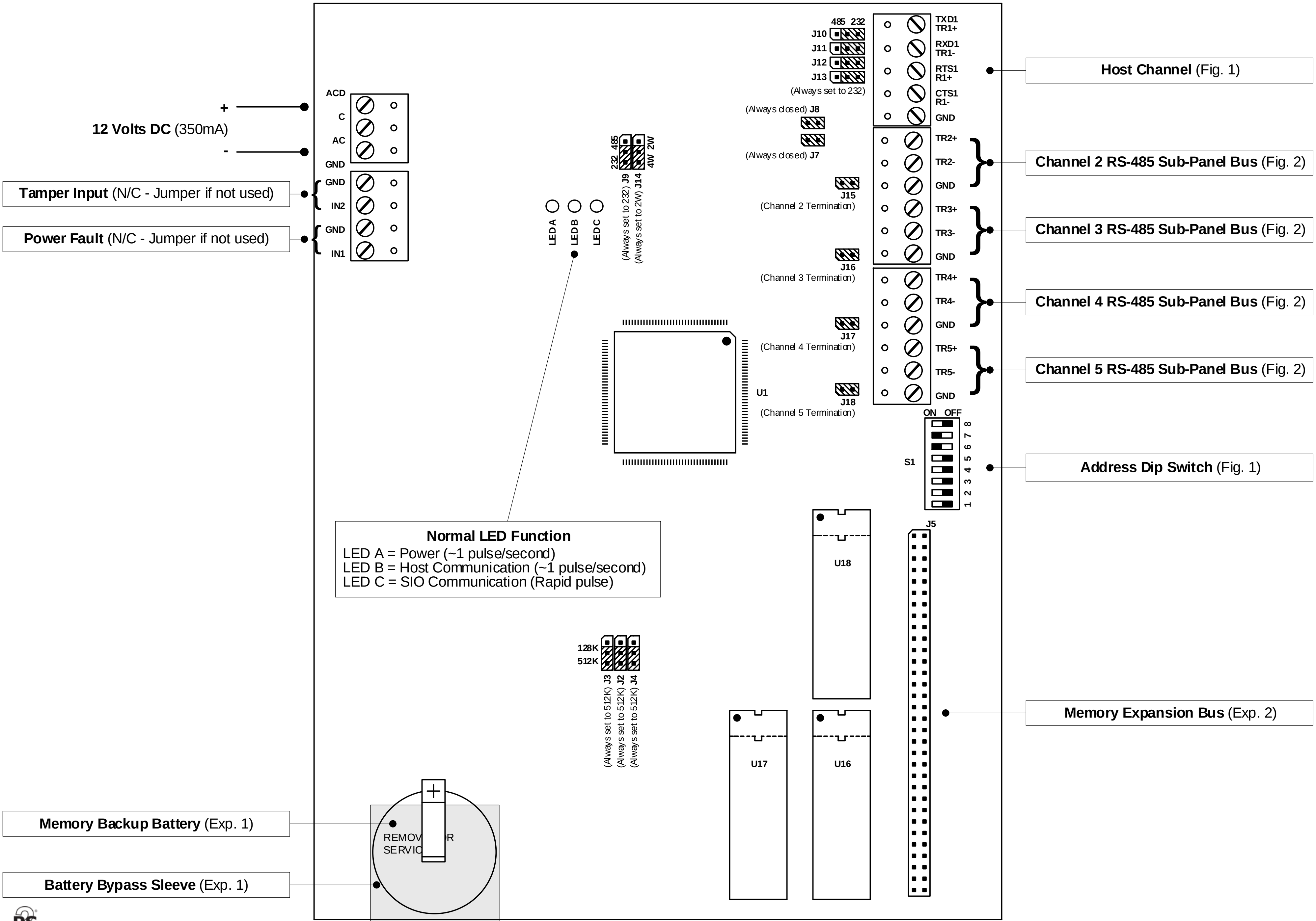

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Figure 1: Host Channel and Address Dip Switch Configuration

Oview

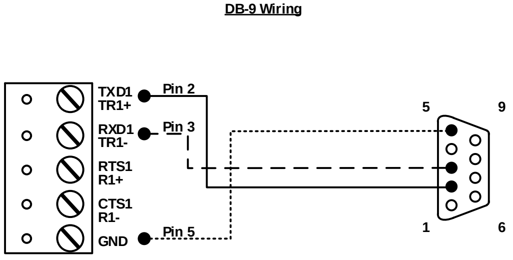
S1 - RS-232 Hardwired Address Dip Switch

Address	1	2	3	4	5	6	7	8
0	Off	Off	Off	Off	Off	On	On	Off

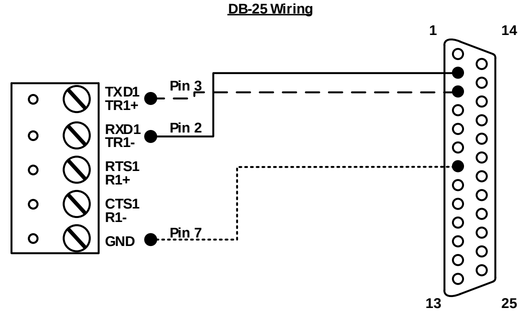
S1 - Dialup Address Dip Switch

Address	1	2	3	4	5	6	7	8
1	On	Off	Off	Off	On	On	On	Off

DB-9 Wiring



DB-25 Wiring



USR Sportster 33,600 External Modem DB-25 Wiring

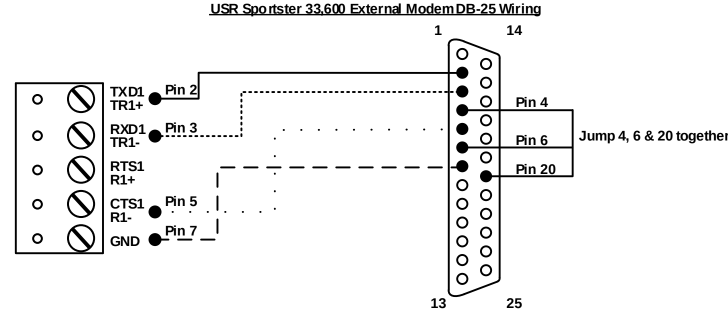
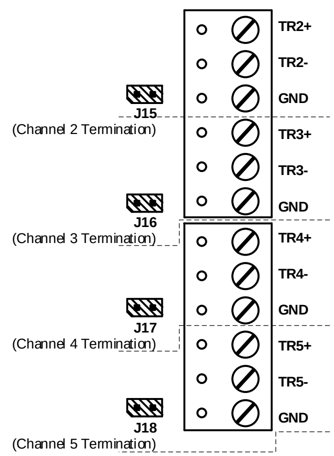


Figure 2: RS-485 Sub-Panel Bus Termination



The SCP-1MB has four distinct RS-485 sub-panel buses. Each bus needs to be terminated at both the beginning and ending points.

J15 is the termination jumper for the Channel 2 RS-485 Sub-Panel Bus.

J16 is the termination jumper for the Channel 3 RS-485 Sub-Panel Bus.

J17 is the termination jumper for the Channel 4 RS-485 Sub-Panel Bus.

J18 is the termination jumper for the Channel 5 RS-485 Sub-Panel Bus.

(see Two Wire RS-485 Wiring diagram for sub-panel wiring information)

Explanation 1: Memory Backup Battery

If the SCP-1MB 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 SCP-1MB 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 lithium battery or equivalent.

<u>NOTE</u>: When setting up or servicing the SCP-1MB, 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.

Explanation 2: Memory Expansion

The SCP-1MB is equipped with 1MB of upgradeable RAM. A maximum of 4MB may be achieved by adding the SCP-MEM3. Please refer to the SCP-MEM3 Quick Reference for detailed installation instructions.

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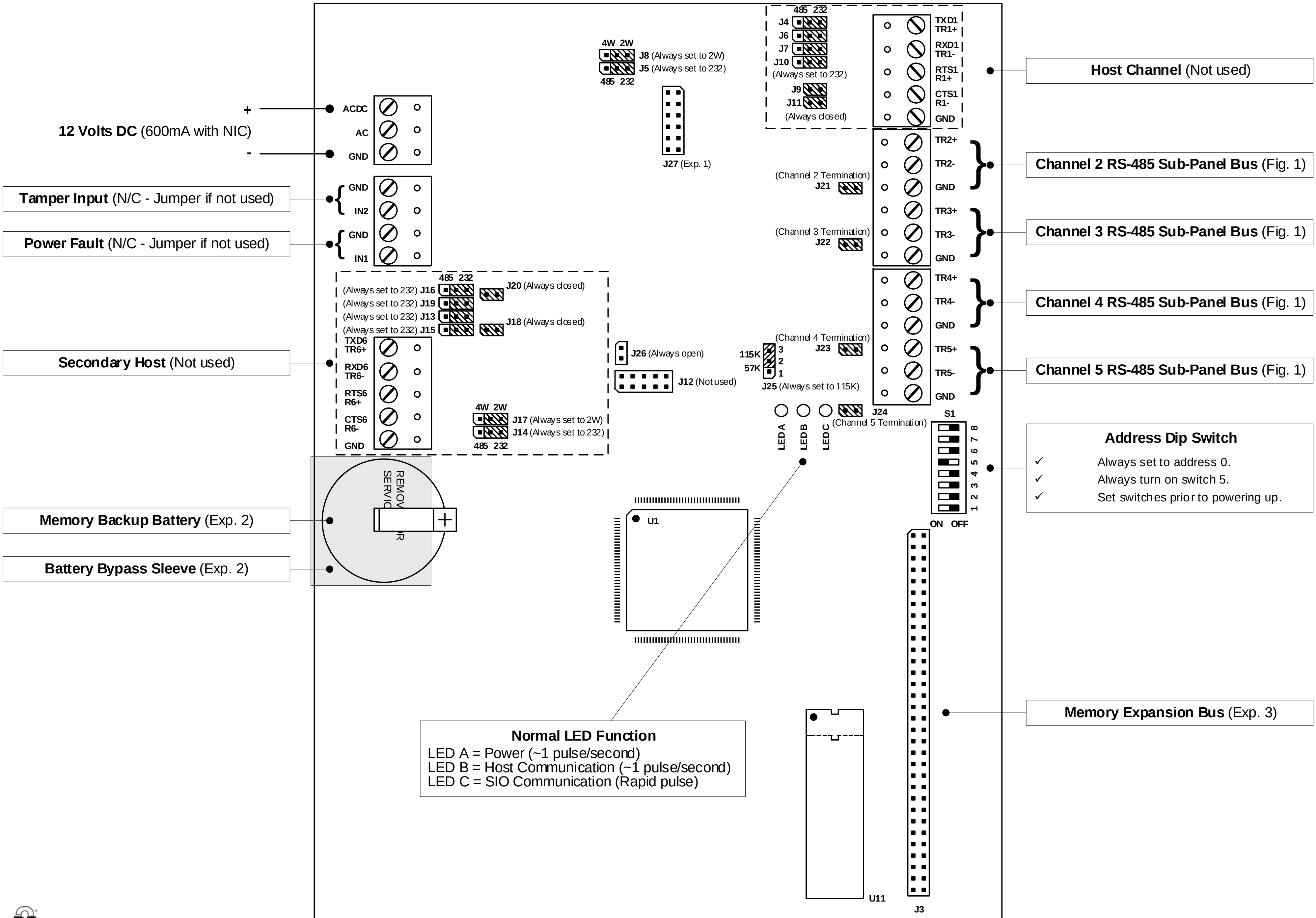
SCP-E Quick Reference

Detail

SCP-E not evaluated by UL



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Oview

Explanation 1: Network Interface Card

Network Interface Card Setup

The 10Base-T Network Interface Card (NIC) has been installed on the SCP-E by the factory and acts as the interface between the software and the SCP-E. The NIC will require an IP Address, Subnet Mask and Gateway in order for the software to communicate with it. To program this information into the NIC, a MAC Address is required. Every NIC has a unique MAC Address which can be found on the white tag that is attached to it. A sample of a MAC Address would be 00-20-4A-74-OF-7F and can be found under the model number of the NIC (CO-E1-11AA). Programming the NIC can be performed through one of three methods.

Method One: RS2 Programmer (P/N: RS2-PROG-TOOL)

The RS2 Programmer comes with a cross-over cable which is used to connect the programmer to the SCP-Es NIC. After connecting the programmer to the NIC, power up the SCP-E and the RS2 Programmer. The programming software will automatically launch.

Enter the NICs MAC Address into the MAC Address fields. Enter the desired IP Address, Gateway and Subnet Mask into their respective fields. Select the appropriate SCP type and software application from their respective drop lists and then click the'Set Configuration' button. One of two messages will appear, 'Configuration set!' if the programming was successful or 'Panel timeout' if the programming failed.

Method Two: Access It!® Ultra SCPe IP Programmer

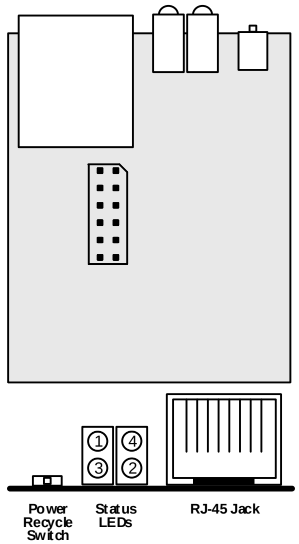
Access It!® Ultra installs a utilities folder which contains the SCPe IP Programmer. If the computer resides on the same subnet as the NIC being programmed, you may program it while connected to the network. From the start menu, click Start|Programs|Access It! Ultra|Utilities|SCPe IP Programmer to run the SCP-E/MINI SCP-E Programmer utility.

Enter the NICs MAC Address into the MAC Address fields. Enter the desired IP Address, Gateway and Subnet Mask into their respective fields. Select the appropriate SCP type and software application from their respective drop lists and then click the'Set Configuration' button. One of two messages will appear, 'Configuration set!' if the programming was successful or 'Panel timeout' if the programming failed.

Method Three: Manually

The manual ARP command is a tedious, but effective method in programming the NIC. This method should be used only as a *last* resort. If the computer resides on the same subnet as the NIC being programmed, you may program it while connected to the network. From the start menu, click Start|Run followed by typing 'cmd' for NT 4.0, 2000 and XP or 'command' for 98 and Me. This will open a Command Prompt window from which the following commands will be run from.

Command Prompt Window Portion		
Command	**Variable Reference**	**General Command Information**
arp -s xxx.xxx.xxx.xxx yy-yy-yy-yy-yy-yy<Enter>	xxx.xxx.xxx.xxx = IP Address yy-yy-yy-yy-yy-yy = MAC Address	Temporarily sets the IP Address.
telnet xxx.xxx.xxx.xxx 1<Enter>	xxx.xxx.xxx.xxx = IP Address	The telnet connection will fail, but the NIC will change its IP Address.
telnet xxx.xxx.xxx.xxx 9999	xxx.xxx.xxx.xxx = IP Address	Opens a telnet session for further programming.
Telnet Session Window Portion		
Command	**Variable Reference**	**General Command Information**
<Enter>		Enters the NICs Setup Mode.
0<Enter>		Selects option 0 Server configuration.
xxx<Enter>	xxx = First IP octet	Programs the NICs first IP octet.
xxx<Enter>	xxx = Second IP octet	Programs the NICs second IP octet.
xxx<Enter>	xxx = Third IP octet	Programs the NICs third IP octet.
xxx<Enter>	xxx = Fourth IP octet	Programs the NICs fourth IP octet.
Y	Y = Yes	Enables Gateway to be programmed.
xxx<Enter>	xxx = First Gateway octet	Programs the NICs first Gateway octet.
xxx<Enter>	xxx = Second Gateway octet	Programs the NICs second Gateway octet.
xxx<Enter>	xxx = Third Gateway octet	Programs the NICs third Gateway octet.
xxx<Enter>	xxx = Fourth Gateway octet	Programs the NICs fourth Gateway octet.
xx<Enter>	xx = Number of bits to mask (08) class C 24/8 bits (255.255.255.000) (16) class B 16/16 bits (255.255.000.000) (24) class A 8/24 bits (255.000.000.000)	Programs the NICs Subnet Mask
<Enter>		Bypasses the 'Change telnet config password' option.
1<Enter>		Selects option 1 Channel 1 configuration.
115200<Enter>		Programs the Baudrate to 115,200.
4C<Enter>		Programs the I/F Mode to 4C.
02<Enter>		Programs the Flow to 02.
03001<Enter>		Programs the Port No to 03001.
C0<Enter>		Programs the ConnectMode to C0.
<Enter>		Bypasses the first 'Remote IP Address' octet option.
<Enter>		Bypasses the second 'Remote IP Address' octet option.
<Enter>		Bypasses the third 'Remote IP Address' octet option.
<Enter>		Bypasses the fourth 'Remote IP Address' octet option.
<Enter>		Bypasses the 'Remote Port' option.
<Enter>		Bypasses the 'DisConnMode' option.
<Enter>		Bypasses the 'FlushMode' option.
<Enter>		Bypasses the hours 'DisConnTime' option.
<Enter>		Bypasses the minutes 'DisConnTime' option.
<Enter>		Bypasses the 'SendChar 1' option.
<Enter>		Bypasses the 'SendChar 2' option.
5<Enter>		Selects option 5 Expert settings.
45<Enter>		Programs the TCP Keepalive time to 45 seconds.
9<Enter>		Selects option 9 Save and exit.



LED	Description	LED Functions
1 (Green)	Serial Port Channel 1 Status	Lights solid green to indicate Channel 1 is idle. Blinks green to indicate Channel 1 is connected to the network and active.
2 (Yellow)	Serial Port Channel 2 Status	Lights solid yellow to indicate Channel 2 is idle. Blinks yellow to indicate Channel 2 is connected to the network and active.
3 (Red)	Diagnostics	Blinks or lights solid red in combination with the green (Channel 1) LED to indicate diagnostics and error detection. Red solid, green (Channel 1) blinking: 1x: EPROM checksum error 2x: RAM error 3x: Network controller error 4x: EEPROM checksum error 5x: Duplicated IP address on the network* 6x: Software does not match hardware* Red blinking, green (Channel 1) blinking: 4x: Faulty network connection* 5x: No DHCP response received*
4 (Green)	Network Link Status	Lights solid green to indicate network port is connected to the network
*non-fatal error		

Explanation 2: Memory Backup Battery

If the SCP-E 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 SCP-E 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 lithium battery or equivalent.

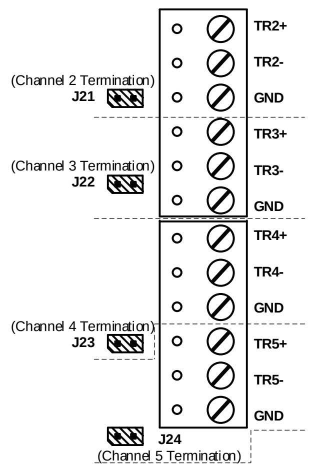
NOTE: When setting up or servicing the SCP-E, it is recommended to leave the battery bypass sleeve in place until all system testing is completed. By keeping the battery bypass sleeve in between the battery and the '+' post, you can be certain that the memory is being completely flushed during power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

Explanation 3: Memory Expansion

The SCP-E is equipped with 1MB of upgradeable RAM. A maximum of 8MB may be achieved by adding the SCP-MEM7 or 4MB by adding the SCP-MEM3.

Please refer to the SCP-MEM7 Quick Reference and the SCP-MEM3 Quick Reference for detailed installation instructions.

Figure 1: RS-485 Sub-Panel Bus Termination



The SCP-E has four distinct RS-485 sub-panel buses. Each bus needs to be terminated at both the beginning and ending points.

J21 is the termination jumper for the Channel 2 RS-485 Sub-Panel Bus.

J22 is the termination jumper for the Channel 3 RS-485 Sub-Panel Bus.

J23 is the termination jumper for the Channel 4 RS-485 Sub-Panel Bus.

J24 is the termination jumper for the Channel 5 RS-485 Sub-Panel Bus.

(see Two Wire RS-485 Wiring diagram for sub-panel wiring information)

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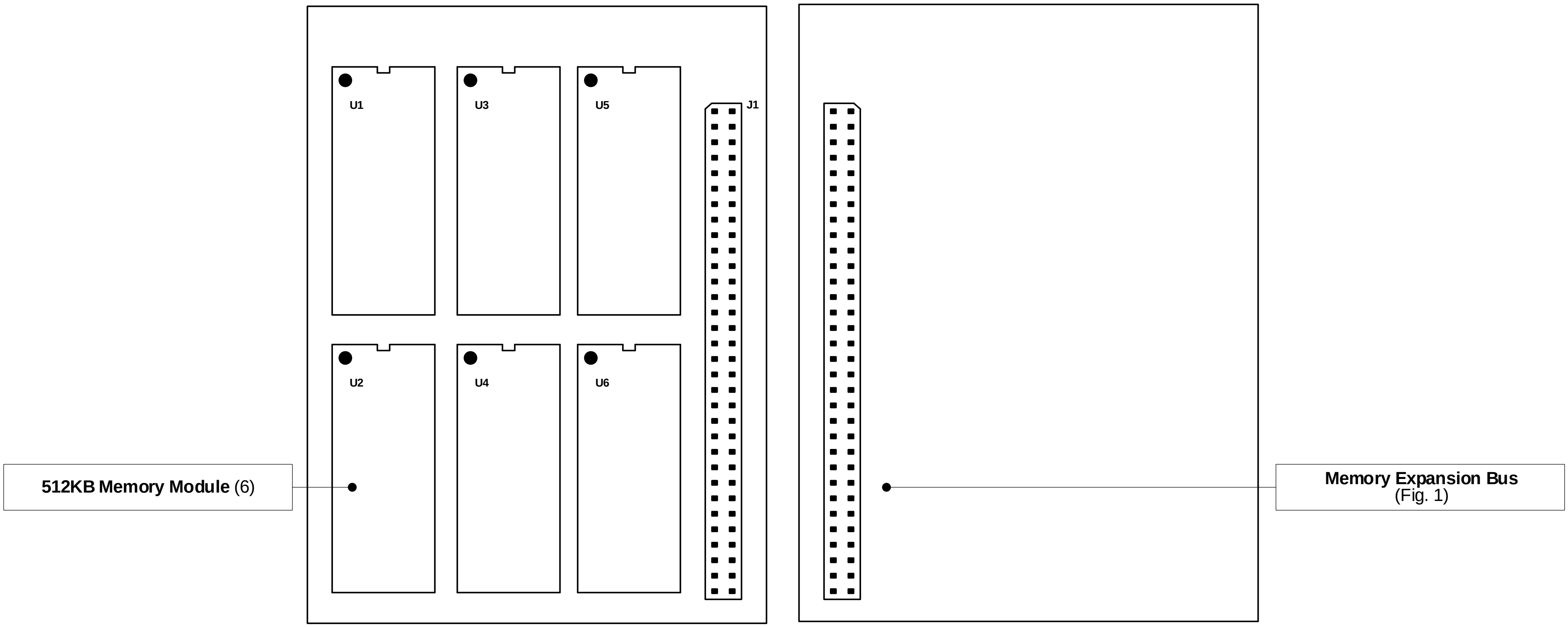
SCP-MEM3 Quick Reference

SCP-MEM3 not evaluated by UL

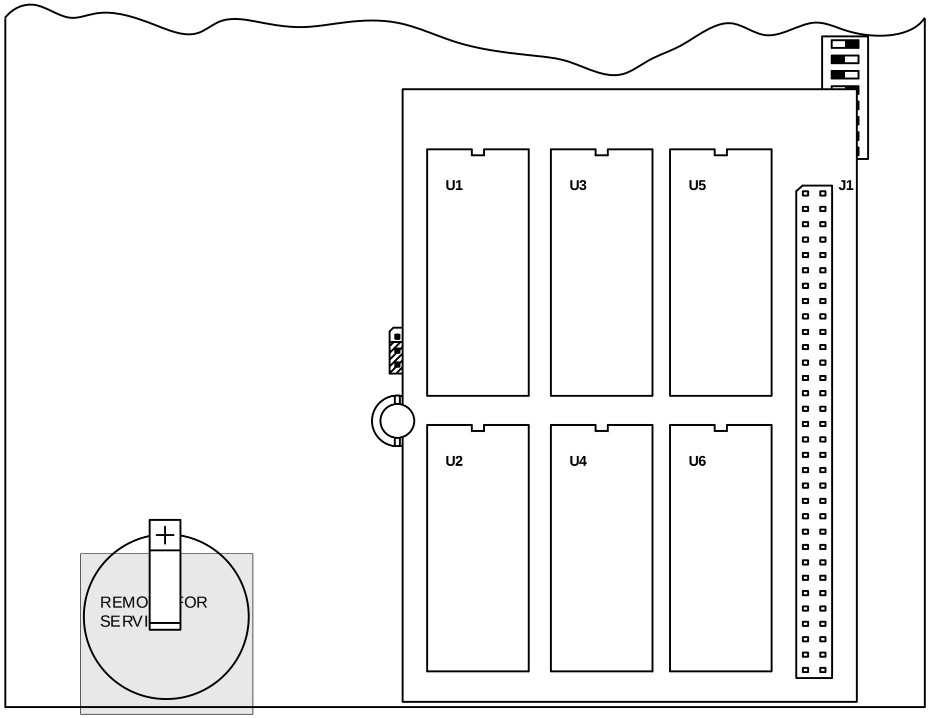
Detail



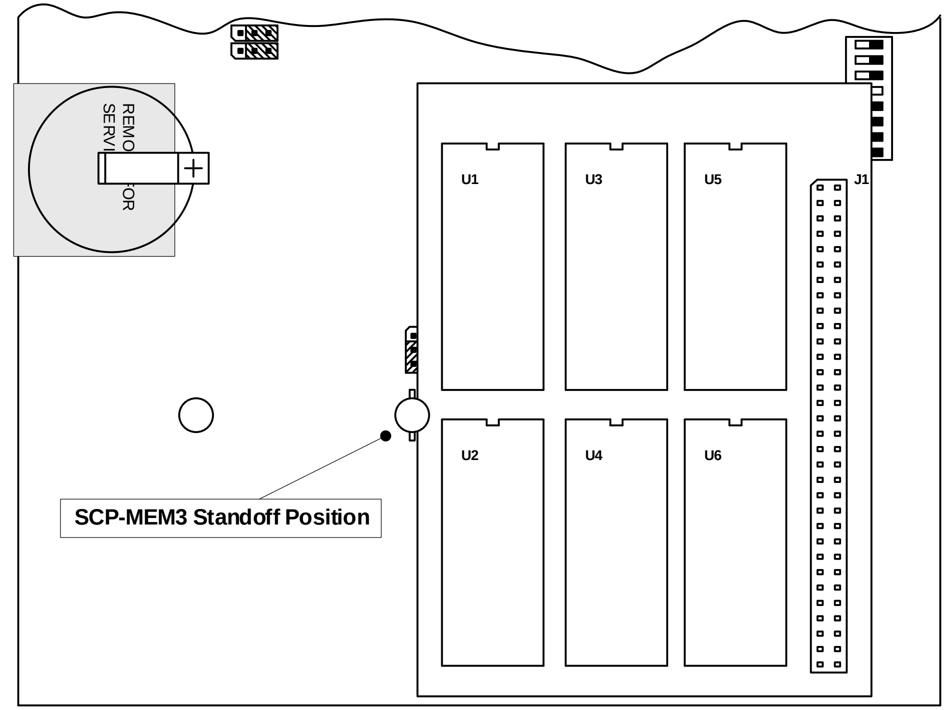
Top View

Bottom View

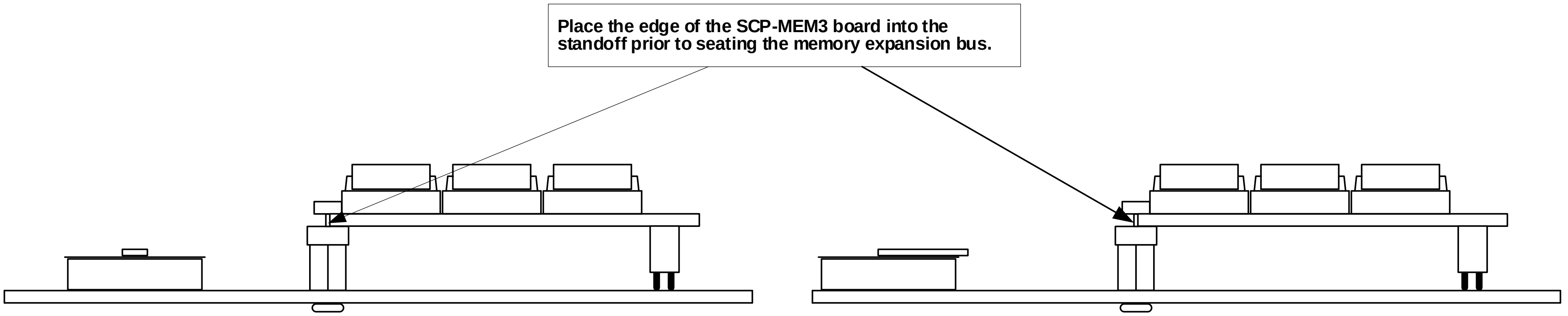
Figure 1: Proper Mounting



SCP-1MB Top View



SCP-E Top View

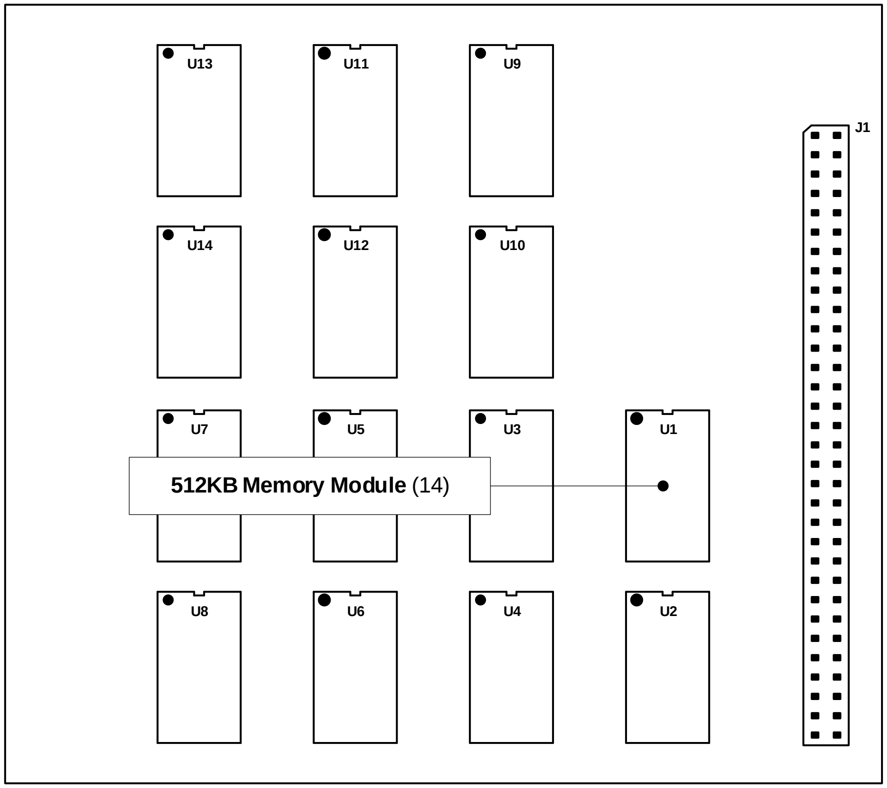


SCP-1MB Side View

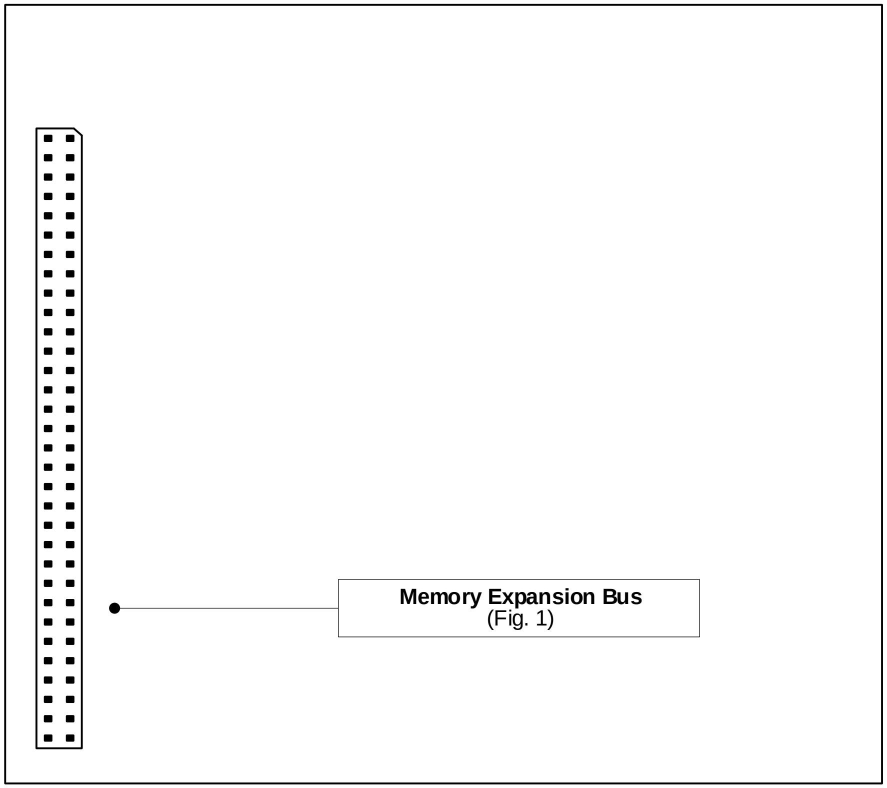
SCP-E Side View

SCP-MEM7 Quick Reference

SCP-MEM7 not evaluated by UL



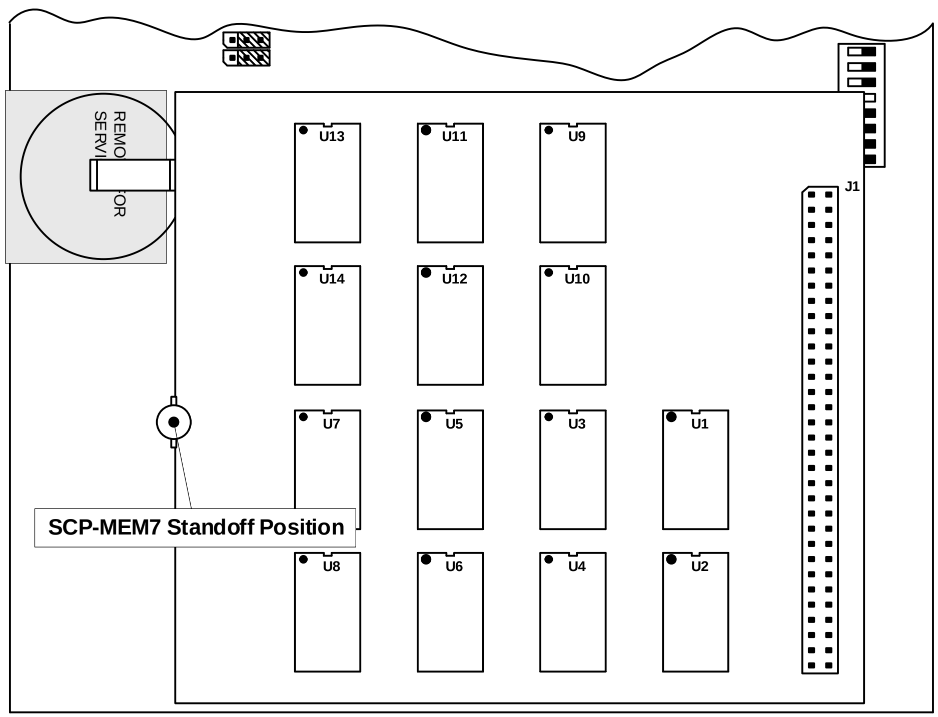
Top View



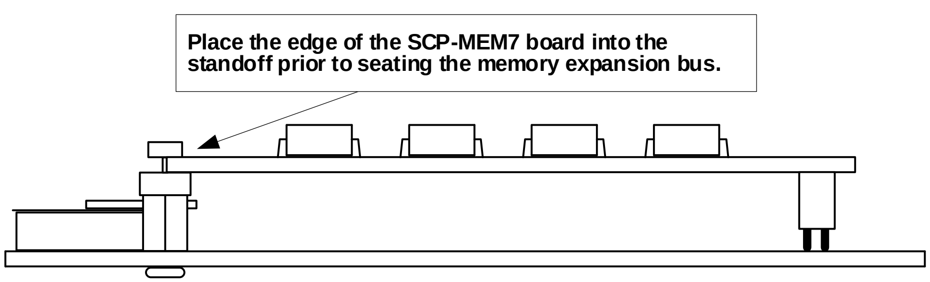
Bottom View

Figure 1: Proper Mounting

The SCP-MEM7 ONLY works on the SCP-E and is only supported with Access It!® Ultra, Access It!® Ultra Titanium Edition and Access It!® Enterprise Edition.



SCP-E Top View



SCP-E Side View

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EP-1501 Quick Reference

EP-1501 not evaluated by UL

Detail

Top View

10/100 Ethernet Host Channel
(Explanation 1)

Auxiliary Output 2 (2A@28Vdc - Figure 1)

Door Strike 1 (2A@28Vdc - Figure 1)

12 Volts DC ±10% ONLY!
(12Vdc - 900mA max.)

Optional Door Strike Power - VO / GND
(12Vdc - 300mA max.)

J3 - EP-1501 Power Source Selector

J3 Setting	Power Source
PoE	Power Over Ethernet
12V*	External Power Source

*12Vdc power connected to TB4. Positive lead to pin 3 (VIN) and negative lead to pin 4 (GND).

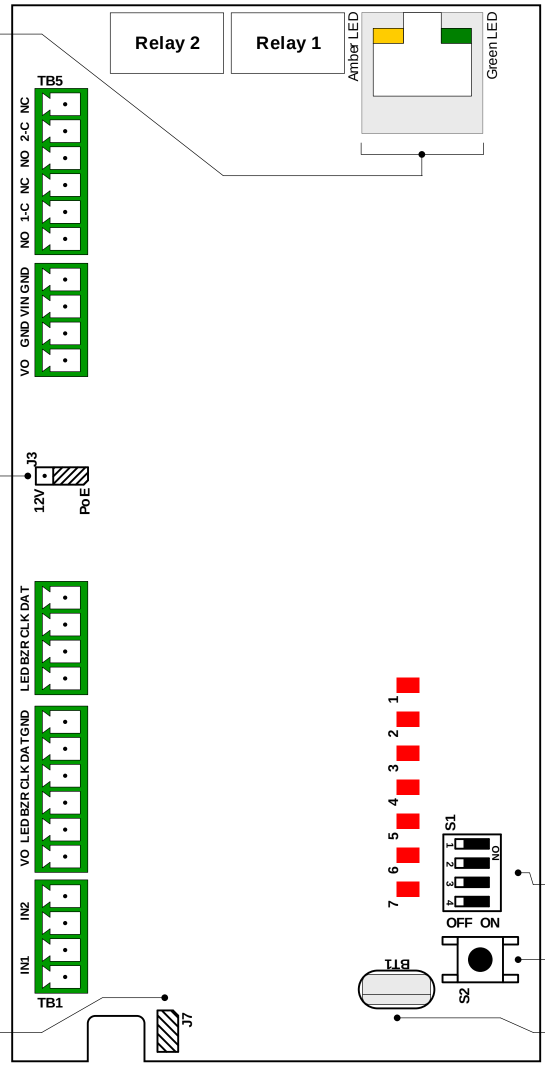
Reader Port 2
- Wiegand Reader (Figure 2)

Reader Port 1
- Wiegand Reader (Figure 3)
- MR-DT Keypad (Figure 3)
- RS-485 Reader Interface

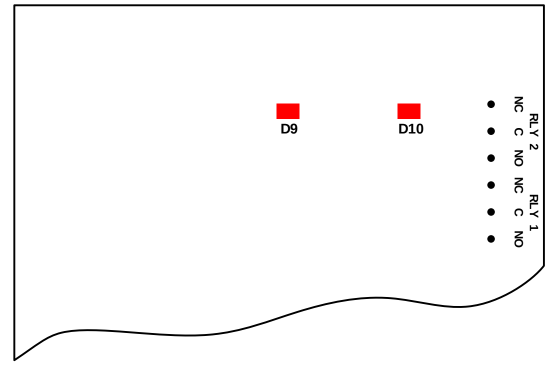
Exit Request 1 (N/O - Figure 4)

Door Contact 1
(N/C - Jumper if not used - Figure 4)

J7 - Tamper Input (N/C - Jumper if not used)



Bottom View



Status LED	Mostly On	Mostly Off	Toggle
1 - EP-1501 Status	Online	Offline	Battery Low (Double Flashes)
2 - Host Communication	• Flashes while communicating with host.		
3 - Reader 1 & 2 Activity	• Flashes when data is received from either reader port.		
4 - Door 1 Contact	Open	Closed	Fault
5 - Door 1 REX	Active	Inactive	Fault
6 – Cabinet Tamper	Alarm	Secure	N/A
7 - Not Used	N/A	N/A	N/A
D9 - Relay 1	Energized	De-Energized	N/A
D10 - Relay 2	Energized	De-Energized	N/A
Amber - Ethernet Speed	100 Mb/S	10 Mb/S	N/A
Green – Link/Activity	Link	No Link	Ethernet Activity

S1 - Configuration Dip Switch
(Explanation 1)

S2 - Reset Switch
(Does NOT erase system config./databases)

BT1 - SRAM Backup Battery
(Retains system config./databases about 2 weeks)

Mechanical Specifications
- Dimensions 5.5"(140mm)Wx2.75"(70mm)L
- Temperature -55ºC to +85ºC, storage
  0ºC to +70ºC, operating
- Humidity 0% to 95% RHNC

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 EP-1501
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: **EP-1501**
        - Device Installed: **X**
        - SCP Time Zone: **<Set accordingly>**
        - Initialization String: **<Leave blank>**
        - Address: **0**
    - 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.

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 EP-1501
4. Manually configure a computer to 192.168.0.100
5. Using a crossover cable, connect computer to EP-1501
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 EP-1501 to reboot
18. Remove power from the EP-1501
19. Set all S1 - Configuration DIP Switch DIPs OFF
20. Remove crossover cable and connect to network
21. Apply power to the EP-1501
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: **EP-1501**
        - Device Installed: **X**
        - SCP Time Zone: **<Set accordingly>**
        - Initialization String: **<Leave blank>**
        - Address: **0**
    - Comm Tab
        - Channel: **<Set to the newly created channel>**
        - TCP/IP Settings
            - IP Address: **<Set accordingly>**
            - Port Number: **3001**
        - Encryption Settings: **None**

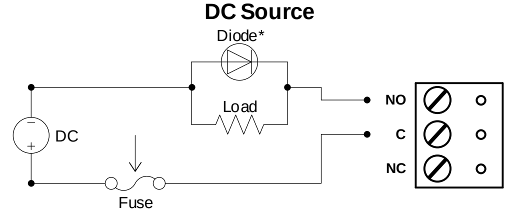
Bulk Erasing The System Configuration And Cardholder Databases

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 EP-1501
    - 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 EP-1501 reboots
5. The EP-1501 is now ready to be configured as needed

Figure 1: Output Wiring Options

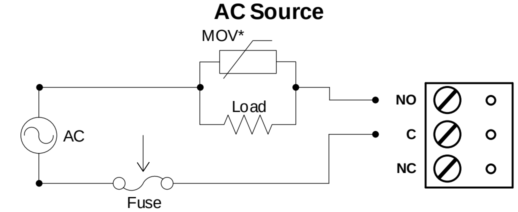
Depending on your power source, use one of the two methods of transient clamping shown below to protect the relay contacts and to reduce electromagnetic interference (EMI emissions). Always protect against accidental overloads by wiring in an inline fuse to the C (common) side of the relay as shown below.

DC Source



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

AC Source



***MOV Selection – Inductive Load**
Clamp Voltage > 1.5x Vac RMS
24Vac Strike, Panasonic ERZ-C07DK470 Typical

Figure 2: Reader Port 2

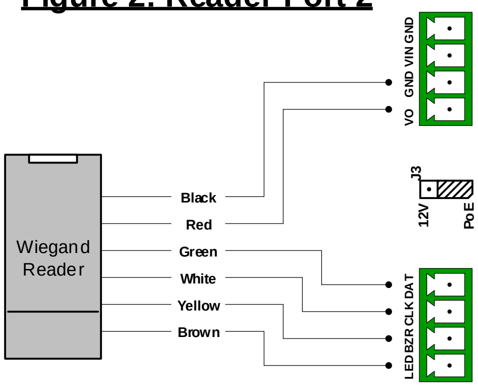


Figure 3: Reader Port 1

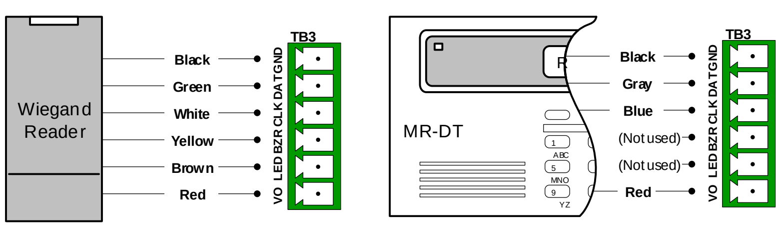
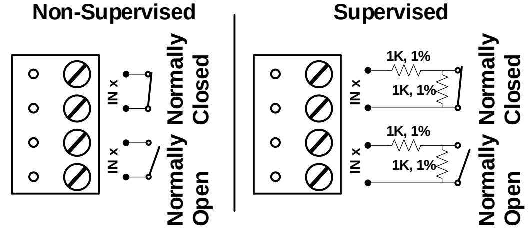


Figure 4: Input Wiring Options

Non-Supervised

Supervised



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EP-1501 Plus Quick Reference

Detail

EP-1501 Plus not evaluated by UL

Top View

10/100 Ethernet Host Channel
(Explanation 1)

Auxiliary Output 2 (2A@28Vdc - Figure 1)

Door Strike 1 (2A@28Vdc - Figure 1)

12 Volts DC ±10% ONLY!
(12Vdc - 900mA max.)

Optional Door Strike Power - VO / GND
(12Vdc - 300mA max.)

J3 - EP-1501 Power Source Selector

J3 Setting	Power Source
PoE	Power Over Ethernet
12V*	External Power Source

*12Vdc power connected to TB4. Positive lead to pin 3 (VIN) and negative lead to pin 4 (GND).

Reader Port 1

- Wiegand Reader (Figure 3)

*12Vdc power connected to TB4. Positive lead to pin 1 (VO) and negative lead to pin 2 (GND).

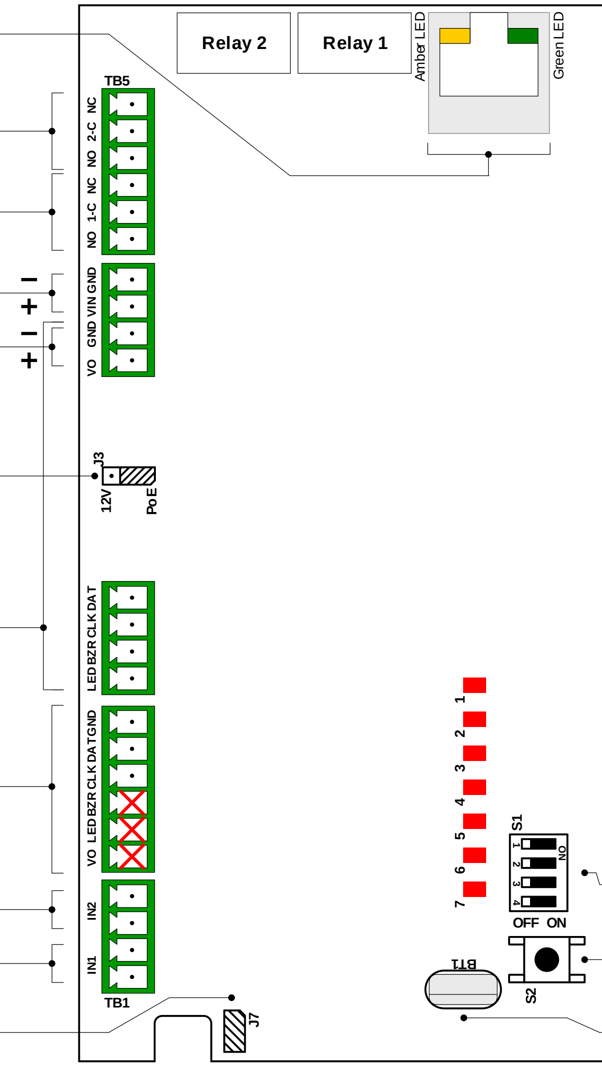
Sub-Panel Bus (Figure 2)

EP-1501	SIO Wiring
CLK	TR+
DAT	TR-
GND	GND
VO	Not Used
LED	Not Used
BZR	Not Used

Exit Request 1 (N/O - Figure 4)

Door Contact 1
(N/C - Jumper if not used - Figure 4)

J7 - Tamper Input (N/C - Jumper if not used)

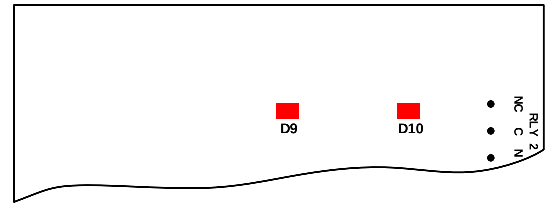


S1 - Configuration Dip Switch
(Explanation 1)

S2 - Reset Switch
(Does NOT erase system config./databases)

BT1 - SRAM Backup Battery
(Retains system config./databases about 2 weeks)

Bottom View



Status LED	Mostly On	Mostly Off	Toggle
1 - EP-1501 Status	Online	Offline	Battery Low (Double Flashes)
2 - Host Communication	• Flashes while communicating with host.		
3 - Reader 1 & 2 Activity	• Flashes when data is received from either reader port.		
4 - Door 1 Contact	Open	Closed	Fault
5 - Door 1 REX	Active	Inactive	Fault
6 – Cabinet Tamper	Alarm	Secure	N/A
7 - Not Used	N/A	N/A	N/A
D9 - Relay 1	Energized	De-Energized	N/A
D10 - Relay 2	Energized	De-Energized	N/A
Amber - Ethernet Speed	100 Mb/S	10 Mb/S	N/A
Green – Link/Activity	Link	No Link	Ethernet Activity

Mechanical Specifications

- Dimensions 5.5"(140mm)Wx2.75"(70mm)L
- Temperature -55ºC to +85ºC, storage
  0ºC to +70ºC, operating
- Humidity 0% to 95% RHNC

TOC

Oview

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 EP-1501
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: **EP-1501**
        - Device Installed: **X**
        - SCP Time Zone: **<Set accordingly>**
        - Initialization String: **<Leave blank>**
        - Address: **0**
    - 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

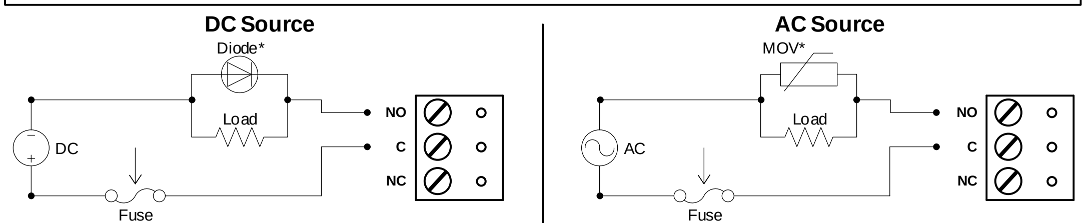
1. Set S1 - Configuration DIP Switch DIPs 1 & 2 ON
2. Set S1 - Configuration DIP Switch DIPs 3 & 4 OFF
3. Apply power to the EP-1501
    - LEDs 1 & 2 and LEDs 3 & 4 flash alternately at a .5 second rate
4. Within 10 seconds, switch S1 - Configuration DIP Switch DIP 1 OFF
    - LED 2 flashes at a 2 second 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 EP-1501 reboots
5. The EP-1501 is now ready to be configured as needed

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 EP-1501
4. Manually configure a computer to 192.168.0.100
5. Using a crossover cable, connect computer to EP-1501
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 EP-1501 to reboot
18. Remove power from the EP-1501
19. Set all S1 - Configuration DIP Switch DIPs OFF
20. Remove crossover cable and connect to network
21. Apply power to the EP-1501
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: **EP-1501**
        - Device Installed: **X**
        - SCP Time Zone: **<Set accordingly>**
        - Initialization String: **<Leave blank>**
        - Address: **0**
    - Comm Tab
        - Channel: **<Set to the newly created channel>**
        - TCP/IP Settings
            - IP Address: **<Set accordingly>**
            - Port Number: **3001**
        - Encryption Settings: **None**

Figure 1: Output Wiring Options

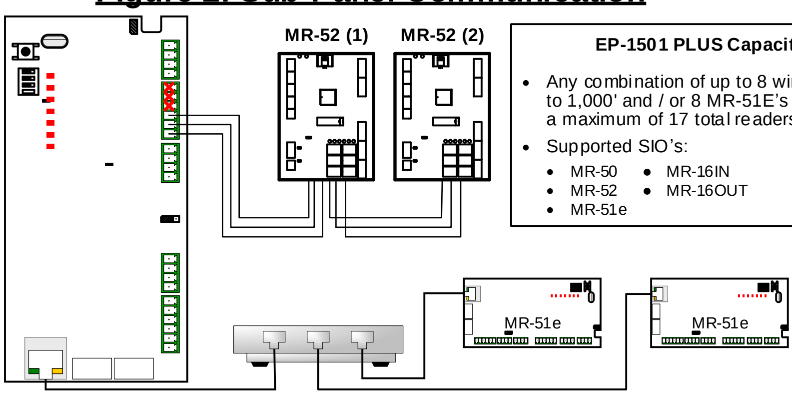
Depending on your power source, use one of the two methods of transient clamping shown below to protect the relay contacts and to reduce electromagnetic interference (EMI emissions). Always protect against accidental overloads by wiring in an inline fuse to the C (common) side of the relay as shown below.



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

***MOV Selection – Inductive Load**
Clamp Voltage > 1.5x Vac RMS
24Vac Strike, Panasonic ERZ-C07DK470 Typical

Figure 2: Sub-Panel Communication



EP-1501 PLUS Capacities

- Any combination of up to 8 wired SIO's up to 1,000' and / or 8 MR-51E's supporting a maximum of 17 total readers
- Supported SIO's:
    - MR-50
    - MR-52
    - MR-51e
    - MR-16IN
    - MR-16OUT

Figure 3: Reader Port 1

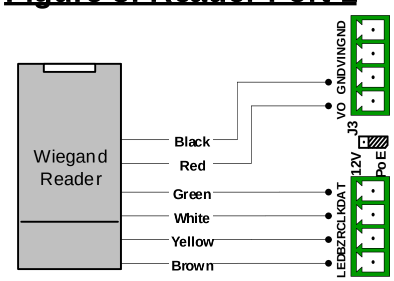
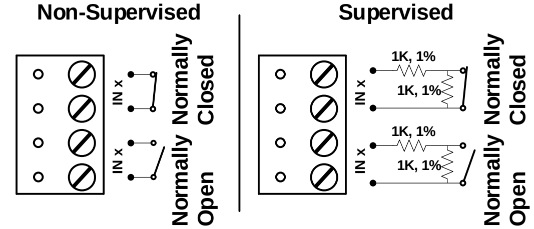


Figure 4: Input Wiring Options



EP-1502 Quick Reference

*Not evaluated by UL

Battery Bypass Sleeve
(Exp. 3)

Memory Backup Battery
(Exp. 3)

Normal LED Function

- LED 1 — Off-Line / On-Line & Battery Status
  - Off-Line if 20% on
  - On-Line if 80% on
  - Battery low if double flashing
- LED 2 — Serial Host Channel Activity
- LED 3 — Channel 1 Internal Sub-Panel Activity
- LED TMP — Channel 2 RS-485 Sub-Panel Activity
- LED FLT — Unassigned
- LED R1 — Reader Port 1 Activity
- LED R2 — Reader Port 2 Activity

S2 - Reset Switch
(Explanation 2)

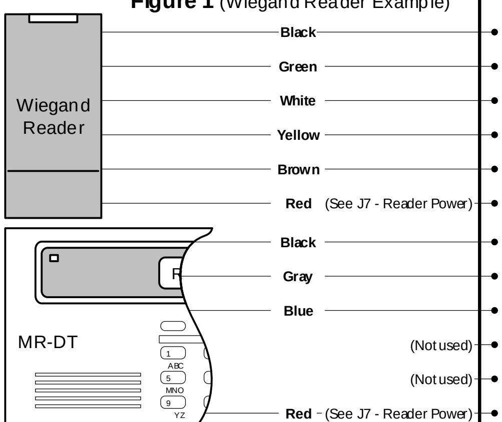
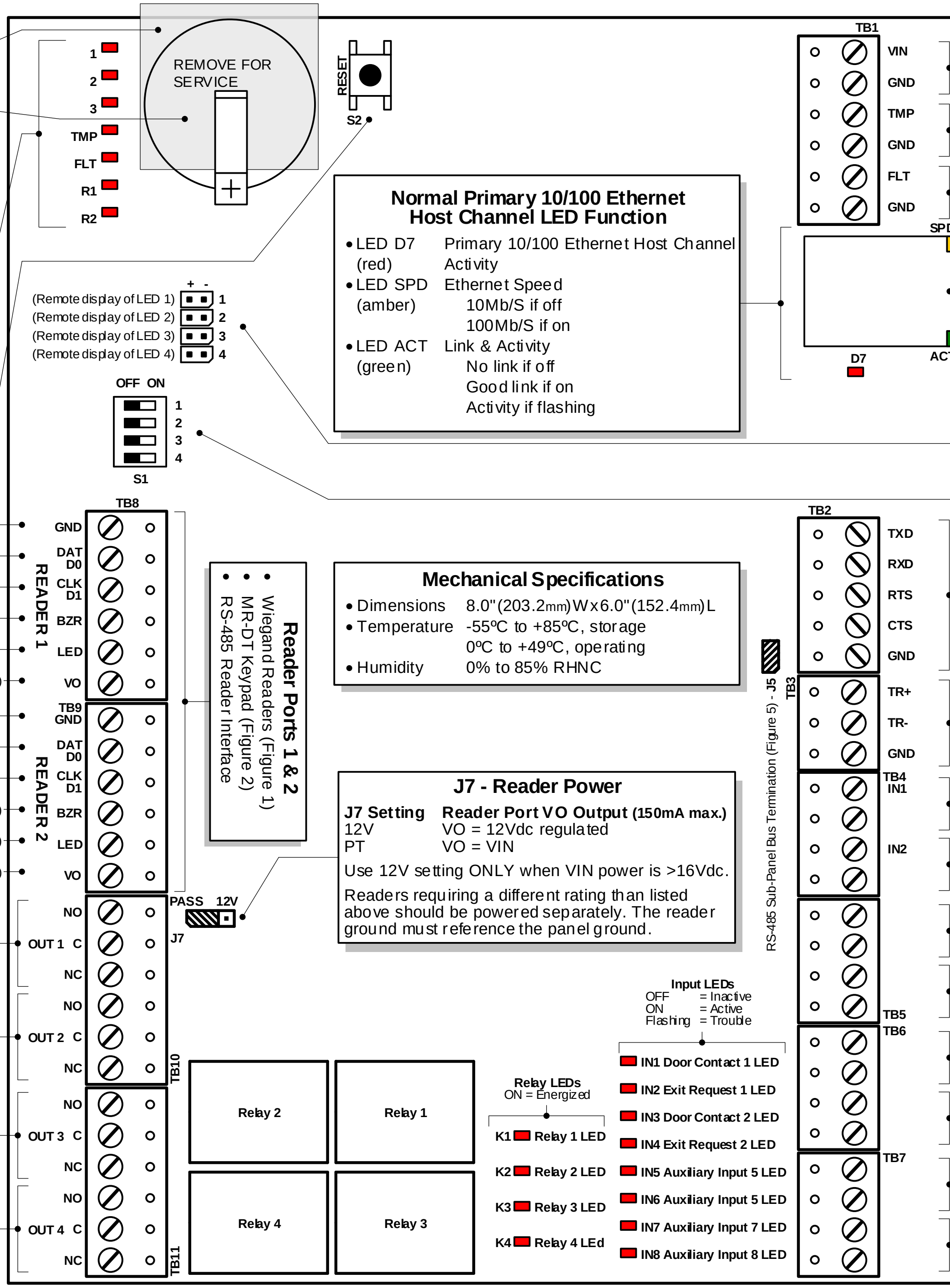


Figure 1 (Wiegand Reader Example)

Figure 2 (MR-DT* Keypad Example)



Door Strike 1
(Form-C, 5A@28Vdc, resistive - Figure 3)

Auxiliary Output 2
(Form-C, 5A@28Vdc, resistive - Figure 3)

Door Strike 2
(Form-C, 5A@28Vdc, resistive - Figure 3)

Auxiliary Output 4
(Form-C, 5A@28Vdc, resistive - Figure 3)

+ −

12 to 24 Volts DC
(500mA max.)

Tamper Input
(N/C - Jumper if not used)

Power Fault
(N/C - Jumper if not used)

10/100 Ethernet Host Channel
(Explanation 1)

Remote LED Status
(Observe polarity connection to LED)

S1 - Configuration Dip Switch
(Explanation 1)

Serial Host Channel*

Channel 2 RS-485 Sub-Panel Bus
(2 wire ONLY! - Figure 5)

Door Contact 1
(N/C - Jumper if not used - Figure 4)

Exit Request 1
(N/O - Figure 4)

Door Contact 2
(N/C - Jumper if not used - Figure 4)

Exit Request 2
(N/O - Figure 4)

Auxiliary Input 5
(N/C - Jumper if not used - Figure 4)

Auxiliary Input 6
(N/C - Jumper if not used - Figure 4)

Auxiliary Input 7
(N/C - Jumper if not used - Figure 4)

Auxiliary Input 8
(N/C - Jumper if not used - Figure 4)

TOC

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

Oview

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 EP-1502
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: **EP-1502**
     - 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.

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 EP-1502
4. Manually configure a computer to 192.168.0.100
5. Using a crossover cable, connect computer to EP-1502
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 EP-1502 to reboot
18. Remove power from the EP-1502
19. Set all S1 - Configuration DIP Switch DIPs OFF
20. Remove crossover cable and connect to network
21. Apply power to the EP-1502
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: **EP-1502**
      - 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**

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 EP-1502
   - 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 EP-1502 reboots
5. The EP-1502 is now ready to be configured as needed

Explanation 2: S2 - Reset Switch

Pressing the S2 - Reset Switch will cause the EP-1502 to reboot.
This process will NOT erase the system configuration and cardholder databases.

Explanation 3: Memory Backup Battery

If the EP-1502 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 EP-1502 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.

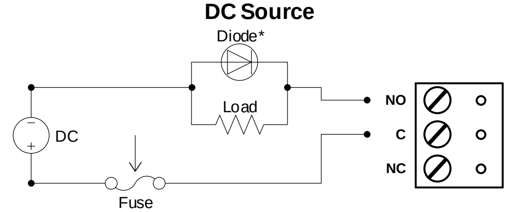
For UL installations, refer to NCL-12UL Hardware Installation Manual DOCNCL12UL-R0 for replacement procedures.

NOTE: When setting up or servicing the EP-1502, 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 3: Output Wiring Options

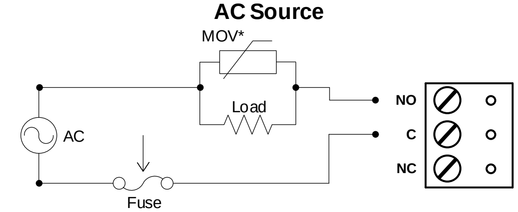
Depending on your power source, use one of the two methods of transient clamping shown below to protect the relay contacts and to reduce electromagnetic interference (EMI emissions). Always protect against accidental overloads by wiring in an inline fuse to the C (common) side of the relay as shown below.

DC Source



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

AC Source



***MOV Selection – Inductive Load**
Clamp Voltage > 1.5x Vac RMS
24Vac Strike, Panasonic ERZ-C07DK470 Typical

Figure 4: Input Wiring Options

Non-Supervised **Supervised**

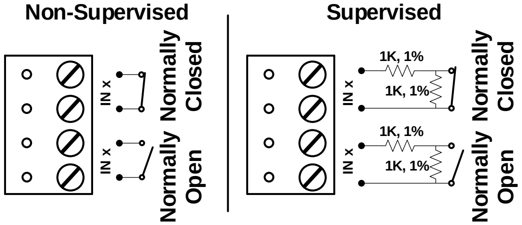
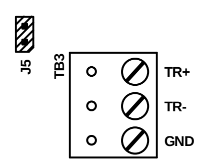


Figure 5: RS-485 Sub-Panel Bus Termination



The EP-1502 has one RS-485 sub-panel bus and must be terminated at the beginning and ending point.

J5 is the termination jumper for the Channel 2 RS-485 Sub-Panel Bus.

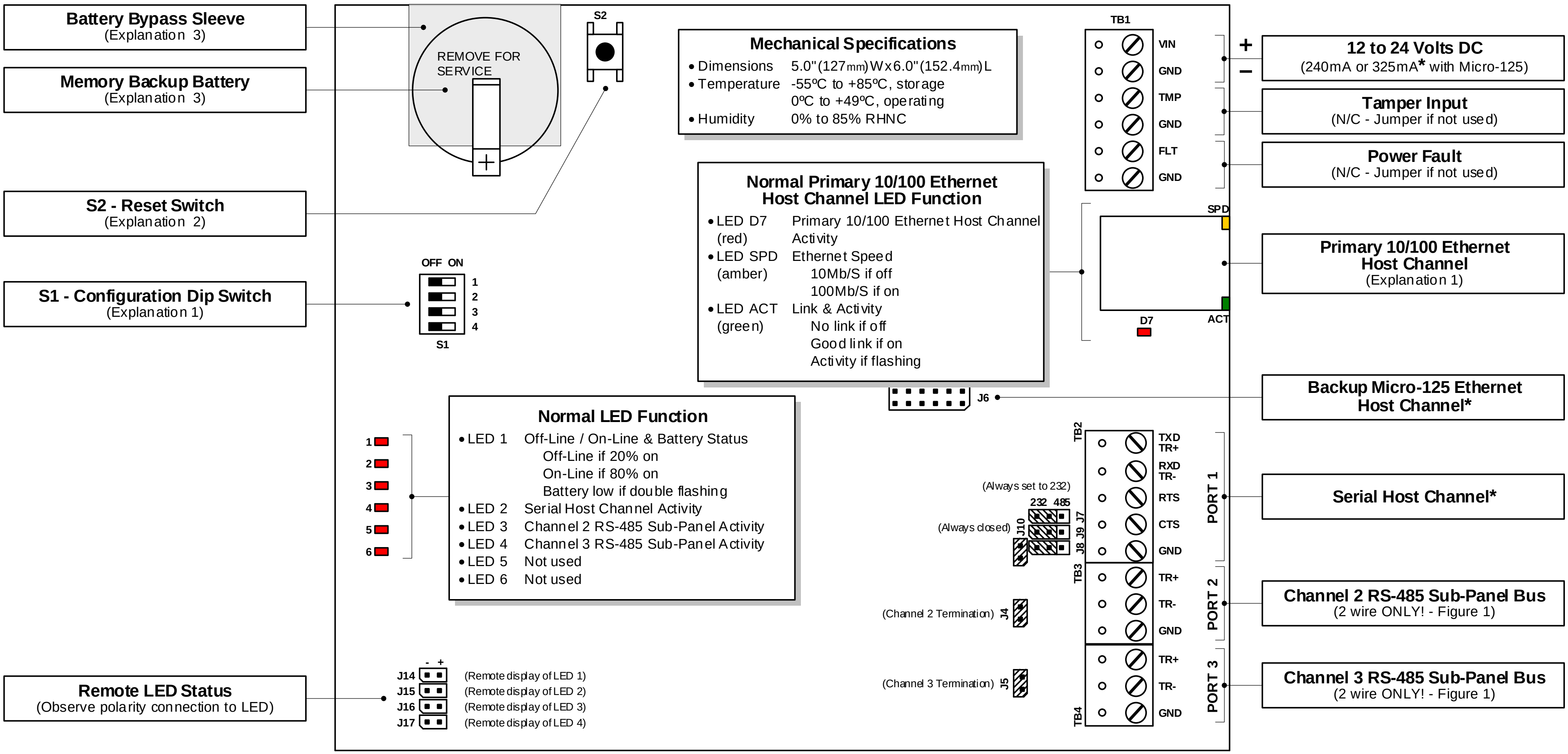
(see Two Wire RS-485 Wiring diagram for sub-panel wiring information)

TOC

EP-2500 Quick Reference

Not evaluated by UL

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 EP-2500
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: **EP-2500**
     - 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.

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 EP-2500
4. Manually configure a computer to 192.168.0.100
5. Using a crossover cable, connect computer to EP-2500
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 EP-2500 to reboot
18. Remove power from the EP-2500
19. Set all S1 - Configuration DIP Switch DIPs OFF
20. Remove crossover cable and connect to network
21. Apply power to the EP-2500
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: **EP-2500**
      - 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**

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 EP-2500
   - 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 EP-2500 reboots
5. The EP-2500 is now ready to be configured as needed

Explanation 3: Memory Backup Battery

If the EP-2500 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 EP-2500 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.

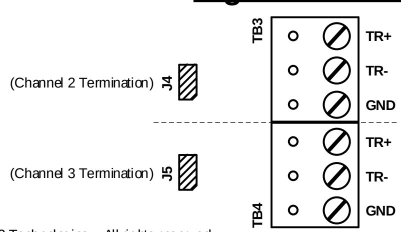
For UL installations, refer to NCL-12UL Hardware Installation Manual DOCNCL12UL-R0 for replacement procedures.

NOTE: When setting up or servicing the EP-2500, 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.

Explanation 2: S2 - Reset Switch

Pressing the S2 - Reset Switch will cause the EP-2500 to reboot.
This process will NOT erase the system configuration and cardholder databases.

Figure 1: RS-485 Sub-Panel Bus Termination



The EP-2500 has two distinct 2 wire RS-485 sub-panel buses. Each bus needs to be terminated at both the beginning and ending points.

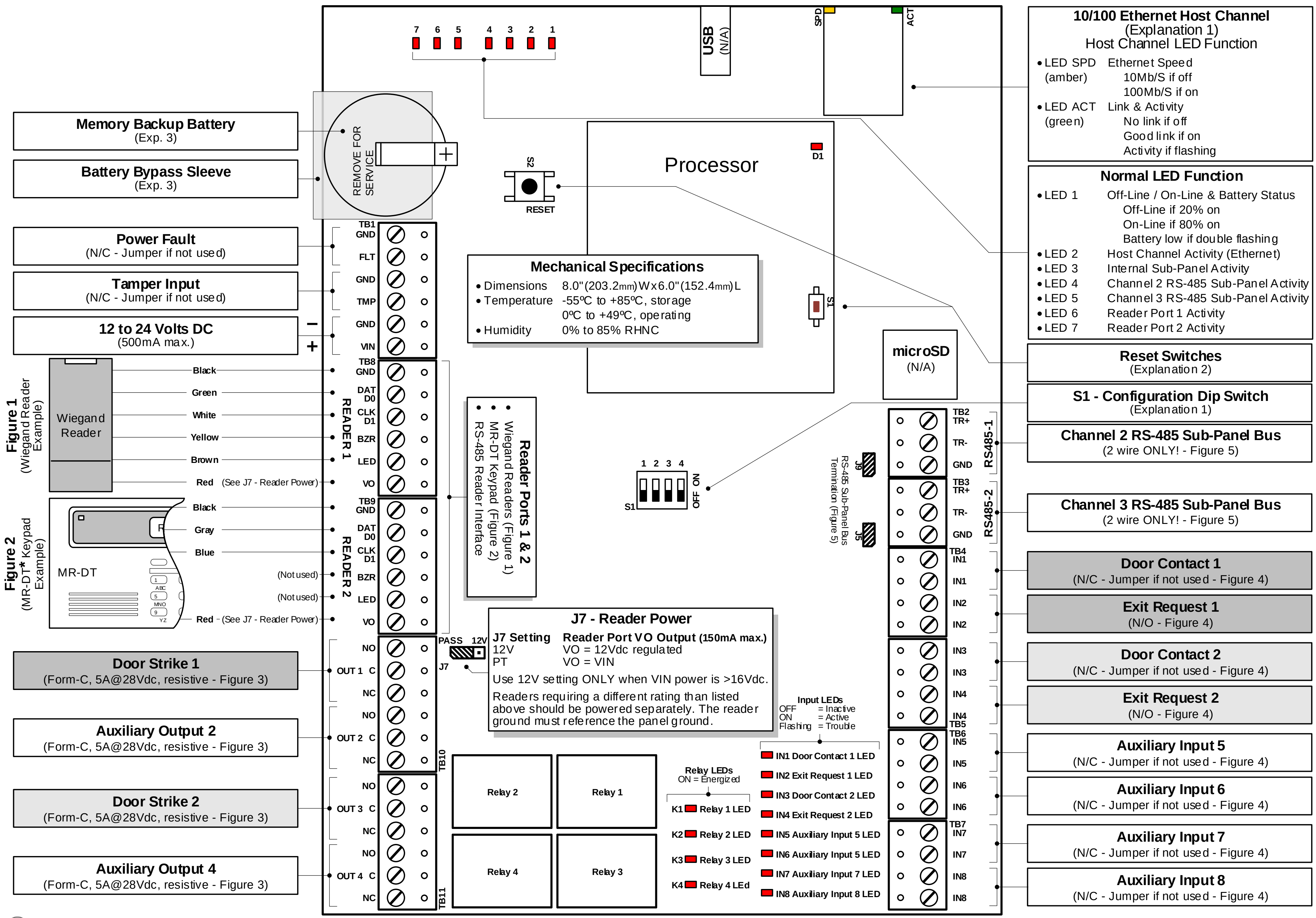
J4 is the termination jumper for the Channel 2 RS-485 Sub-Panel Bus.

J5 is the termination jumper for the Channel 3 RS-485 Sub-Panel Bus.

(see Two Wire RS-485 Wiring diagram for sub-panel wiring information)

EP-4502 Quick Reference

EP-4502 not evaluated by UL



TOC

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

Oview

Configuring Primary 10/100 Ethernet Host Channel (DHCP IP)

1. Set all S1 - Configuration DIP Switch DIPs OFF
2. Apply power to the EP-4502
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: **EP-4502 xMB**
     - xMB = Default card database size is 32MB, value can be adjusted within EP web browser.
     - 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**

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

Configuring Primary 10/100 Ethernet Host Channel (Static IP)

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 EP-4502
4. Manually configure a computer to 192.168.0.100
5. Using a crossover cable, connect computer to EP-4502
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** and a Password of **password**
11. Click **'Network'** from the left hand menu
12. Select **'Use Static IP configuration:'**
    - IP Address: **<Set accordingly>**
    - Subnet Mask: **<Set accordingly>**
    - Default Gateway: **<Set accordingly>**
13. Click **'Accept'**
14. Click **'Auto-Save'** from the left hand menu
    - Card Database Size: **<Set accordingly>**
15. Click **'Apply Setting'** from the left hand menu
16. Click **'Apply, Reboot'** button
17. Wait 60 seconds for EP-4502 to reboot
18. Remove power from the EP-4502
19. Set all S1 - Configuration DIP Switch DIPs OFF
20. Remove crossover cable and connect to network
21. Apply power to the EP-4502
22. Within Access It! Universal.NET create a new Channel
    - Channel Enabled: **X**
    - Protocol Type: **SCP**
    - Channel Type: **IP Server**
23. Within Access It! Universal.NET create a new SCP
    - General Tab
      - Model: **EP-4502 xMB**
      - xMB = Card database size configured in step 14.
      - 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**

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 EP-4502
   - 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 EP-4502 reboots
5. The EP-4502 is now ready to be configured as needed

Explanation 2: S2 - Reset Switches

Pressing the S1 or S2 - Reset Switches will cause the EP-4502 to reboot.
This process will NOT erase the system configuration and cardholder databases.

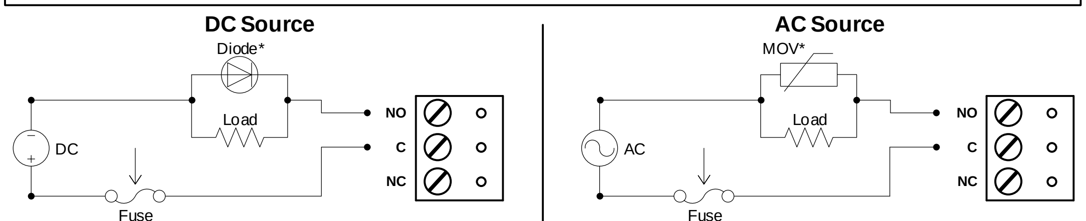
Explanation 3: Memory Backup Battery

If the EP-4502 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 EP-4502 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 EP-4502, 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 3: Output Wiring Options

Depending on your power source, use one of the two methods of transient clamping shown below to protect the relay contacts and to reduce electromagnetic interference (EMI emissions). Always protect against accidental overloads by wiring in an inline fuse to the C (common) side of the relay as shown below.



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

***MOV Selection – Inductive Load**
Clamp Voltage > 1.5x Vac RMS
24Vac Strike, Panasonic ERZ-C07DK470 Typical

Figure 4: Input Wiring Options

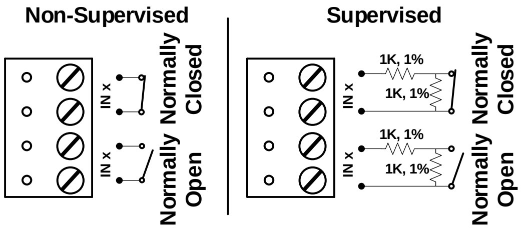
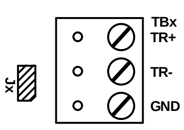


Figure 5: RS-485 Sub-Panel Bus Termination



The EP-4502 has two RS-485 sub-panel buses which must be terminated at their beginning and ending points.

J5 & J9 are termination jumpers for their respective Sub-Panel Bus.

(see Two Wire RS-485 Wiring diagram for sub-panel wiring information)

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LP-1501 Quick Reference

Detail

LP-1501 not evaluated by UL

Auxiliary Output 2 (2A@30Vdc)
See Figure 1

Door Strike 1 (2A@30Vdc)
See Figure 1

Local Power Supply (1.8A max plus readers)
CABLING: 1 twisted pair, minimum 18 AWG when using local 12Vdc
VIN (Voltage In): Positive 12 Volts ±10% DC
GND (Ground): Input Voltage Return (-)

Auxiliary Power

Power Source	Available Power
PoE	12Vdc@625mA max.
PoE+	12Vdc@1.25A max.
Local Power Supply	12Vdc@1.25A max.

VO (Voltage Out): Positive 12 Volts DC
GND (Ground): Input Voltage Return (-)

Wiegand Reader Port 2
See Figure 2

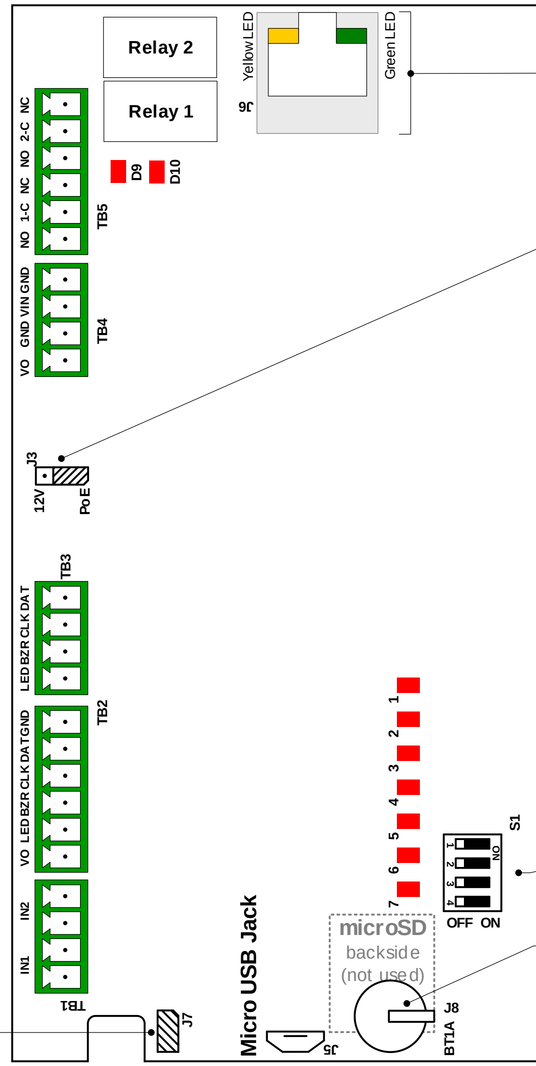
Reader Port 1
See Figure 3

- 1 Wiegand reader or 2 OSDP readers
- OSDP v2.1.6 support
- OSDP used for In/Out configurations only
- OSDP requires unique addressing from 0 - 3

Exit Request 1 - N/O
See Figure 4

Door Contact 1 - N/C (jumper if not used)
See Figure 4

J7 - Tamper Input
N/C (jumper if not used)



10/100 Ethernet Host Channel
See Explanation 1

J3 - Power Source Selector

J3 Setting	Power Source
PoE*	Power Over Ethernet
12V†	Local Power Supply

* PoE IEEE 802.3af compliant (12.95 W)
PoE+ IEEE 802.3at compliant (25 W)

†12Vdc power connected to TB4. Positive lead to pin 3 (VIN) and negative lead to pin 4 (GND)

Status LED	Mostly On	Mostly Off	Toggle
1 - LP-1501 Status	Online	Offline	N/A
2 - Host Communication	Flashes while communicating with host.		
3 - Reader 1 & 2 Activity	Flashes when data is received from either reader port		
4 - Door 1 Contact	Open	Closed	Fault
5 - Door 1 REX	Active	Inactive	Fault
6 - Cabinet Tamper	Alarm	Secure	N/A
7 - Not Used	N/A	N/A	N/A
D9 - Relay 1	Energized	De-Energized	N/A
D10 - Relay 2	Energized	De-Energized	N/A
Yellow - Ethernet Speed	100 Mb/S	10 Mb/S	N/A
Green - Link/Activity	Link	No Link	Ethernet Activity

S1 - Configuration Dip Switch
See Explanation 1

BT1A - SRAM Backup Battery
Retains system configuration/databases ~ 3 days

Alternate Host Channel
See Explanation 2

Mechanical Specifications

- Dimensions 5.5"(140mm) W x 2.75"(70mm) L
- Temperature -55ºC to +85ºC, storage
  0ºC to +70ºC, operating
- Humidity 5% to 95% RHNC

TOC

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

Oview

Configuring 10/100 Ethernet Host Channel For DHCP And DNS Enabled Networks

1. Set all S1 - Configuration DIP Switch DIPs OFF
2. Apply power to the LP-1501
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: **LP-1501**
     - Device Installed: **X**
     - SCP Time Zone: **<Set accordingly>**
     - Initialization String: **<Leave blank>**
     - Address: **0**
   - 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**

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

Configuring 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 LP-1501
4. Manually configure a computer to 192.168.0.100
5. Using a crossover cable, connect computer to LP-1501
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 LP-1501 to reboot
18. Remove power from the LP-1501
19. Set all S1 - Configuration DIP Switch DIPs OFF
20. Remove crossover cable and connect to network
21. Apply power to the LP-1501
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: **LP-1501**
      - Device Installed: **X**
      - SCP Time Zone: **<Set accordingly>**
      - Initialization String: **<Leave blank>**
      - Address: **0**
    - Comm Tab
      - Channel: **<Set to the newly created channel>**
      - TCP/IP Settings
        - IP Address: **<Set accordingly>**
        - Port Number: **3001**
      - Encryption Settings: **None**

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 LP-1501
   - 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 LP-1501 reboots
5. The LP-1501 is now ready to be configured as needed

Explanation 2: Alternate Host Channel

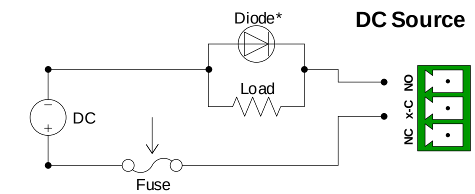
A micro USB Ethernet adapter may be used to enable alternate host channel communication. Alternate host channel communication is only used to communicate to the server machine and not to downstream Ethernet enabled SIOs.

Manufacturer: Plugable
Model: USB2OTGE100

Figure 1: Output Wiring Options

CABLING: As required for the load

Door lock mechanisms can generate feedback to the relay circuit that can cause damage and premature failure of the relay. For this reason, a diode must be used to protect the relay. Wire should be of sufficient gauge to avoid voltage loss.



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

Figure 2: Wiegand Reader Port 2

CABLING: 6-conductor, 18 AWG, 500 feet (150 m) max

Cannot be used if two OSDP readers are attached to Reader Port 1.

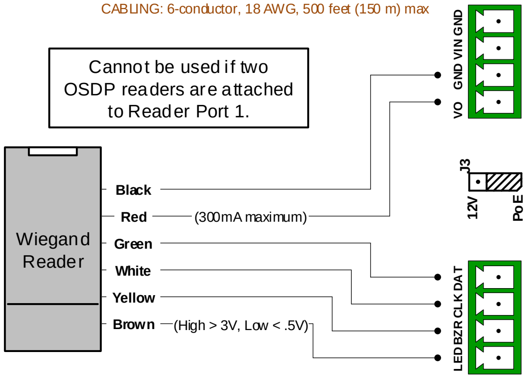


Figure 3: Reader Port 1 Options

Wiegand Reader Example
CABLING: 6-conductor, 18 AWG, 500 feet (150 m) max

OSDP / RS-485 Reader Example
CABLING: 1 twisted pair, 18 AWG for power and 1 twisted pair w/drain & shield, 24 AWG, 120Ω impedance, 2,000 feet (610 m) max for communication

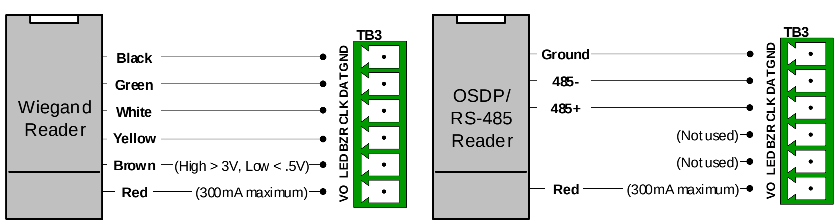
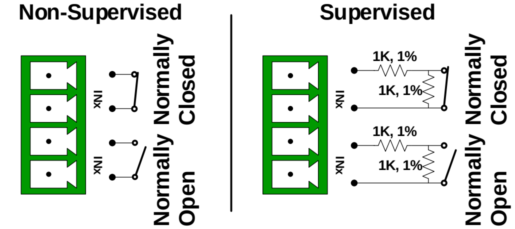


Figure 4: Input Wiring Options

CABLING: 1 twisted pair per input, 30Ω maximum



LP-1501 Plus Quick Reference

LP-1501 Plus not evaluated by UL

Auxiliary Output 2 (2A@30Vdc)
See Figure 1

Door Strike 1 (2A@30Vdc)
See Figure 1

Local Power Supply (1.8A max plus readers)
CABLING: 1 twisted pair, minimum 18 AWG when using local 12Vdc
VIN (Voltage In): Positive 12 Volts ±10% DC
GND (Ground): Input Voltage Return (-)

Auxiliary Power

Power Source	Available Power
PoE	12Vdc@625mA max.
PoE+	12Vdc@1.25A max.
Local Power Supply	12Vdc@1.25A max.

VO (Voltage Out): Positive 12 Volts DC
GND (Ground): Input Voltage Return (-)

Wiegand Reader Port 1
See Figure 3

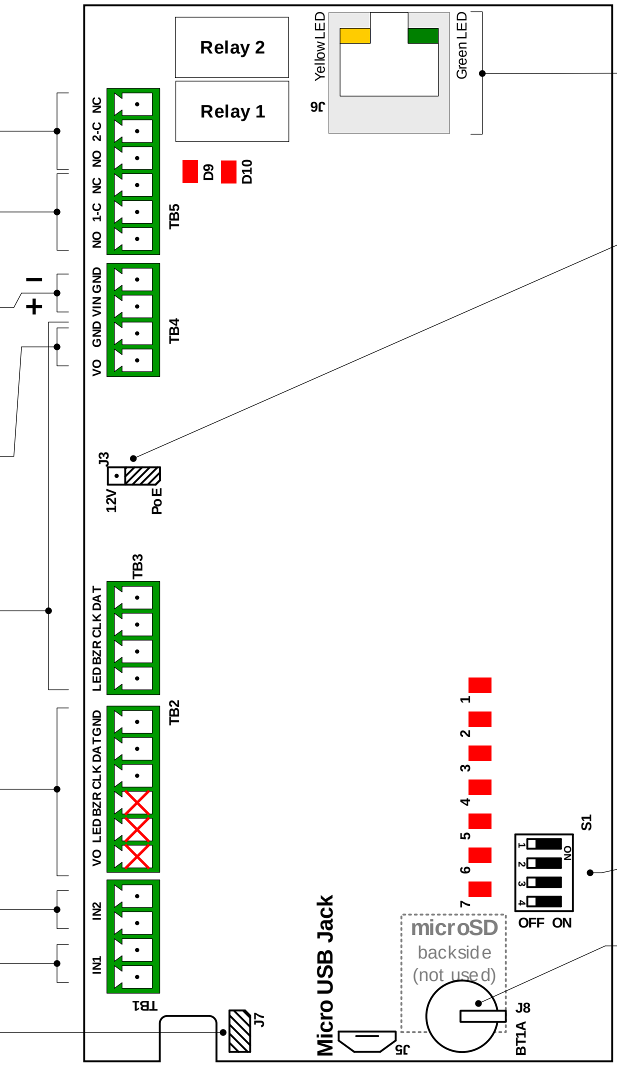
Sub-Panel Bus
See Figure 2

LP-1501 Plus	SIO Wiring
CLK	TR+
DAT	TR-
GND	GND
VO	Not Used
LED	Not Used
BZR	Not Used

Exit Request 1 - N/O
See Figure 4

Door Contact 1 - N/C (jumper if not used)
See Figure 4

J7 - Tamper Input
N/C (jumper if not used)



10/100 Ethernet Host Channel
See Explanation 1

J3 - Power Source Selector

J3 Setting	Power Source
PoE*	Power Over Ethernet
12V†	Local Power Supply

* PoE IEEE 802.3af compliant (12.95 W)
PoE+ IEEE 802.3at compliant (25 W)

†12Vdc power connected to TB4. Positive lead to pin 3 (VIN) and negative lead to pin 4 (GND)

Status LED	Mostly On	Mostly Off	Toggle
1 - LP-1501 Status	Online	Offline	N/A
2 - Host Communication	Flashes while communicating with host.		
3 - Reader 1 & 2 Activity	Flashes when data is received from either reader port		
4 - Door 1 Contact	Open	Closed	Fault
5 - Door 1 REX	Active	Inactive	Fault
6 - Cabinet Tamper	Alarm	Secure	N/A
7 - Not Used	N/A	N/A	N/A
D9 - Relay 1	Energized	De-Energized	N/A
D10 - Relay 2	Energized	De-Energized	N/A
Yellow - Ethernet Speed	100 Mb/S	10 Mb/S	N/A
Green - Link/Activity	Link	No Link	Ethernet Activity

S1 - Configuration Dip Switch
See Explanation 1

BT1A - SRAM Backup Battery
Retains system configuration/databases ~ 3 days

Alternate Host Channel
See Explanation 2

Mechanical Specifications

- Dimensions 5.5"(140mm)W x 2.75"(70mm)L
- Temperature -55ºC to +85ºC, storage
  0ºC to +70ºC, operating
- Humidity 5% to 95% RHNC

TOC

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

Oview

Configuring 10/100 Ethernet Host Channel For DHCP And DNS Enabled Networks

1. Set all S1 - Configuration DIP Switch DIPs OFF
2. Apply power to the LP-1501 Plus
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: **LP-1501 Plus**
     - Device Installed: **X**
     - SCP Time Zone: **<Set accordingly>**
     - Initialization String: **<Leave blank>**
     - Address: **0**
   - 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**

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

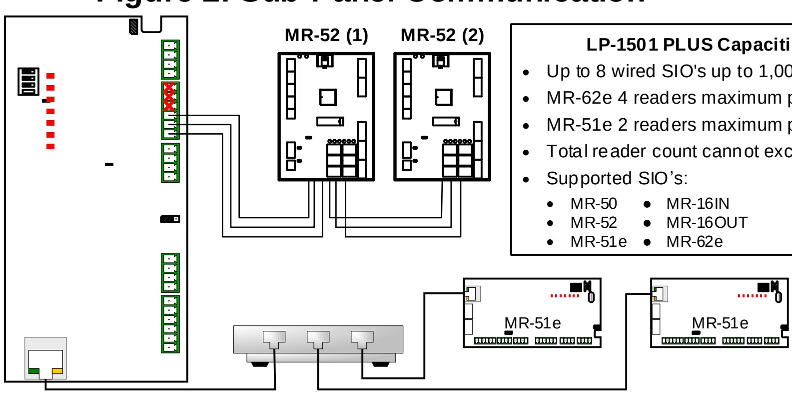
Configuring 10/100 Ethernet Host Channel For A Static IP Address

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 LP-1501 Plus
4. Manually configure a computer to 192.168.0.100
5. Using a crossover cable, connect computer to LP-1501 Plus
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 LP-1501 Plus to reboot
18. Remove power from the LP-1501 Plus
19. Set all S1 - Configuration DIP Switch DIPs OFF
20. Remove crossover cable and connect to network
21. Apply power to the LP-1501 Plus
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: **LP-1501 Plus**
      - Device Installed: **X**
      - SCP Time Zone: **<Set accordingly>**
      - Initialization String: **<Leave blank>**
      - Address: **0**
    - Comm Tab
      - Channel: **<Set to the newly created channel>**
      - TCP/IP Settings
        - IP Address: **<Set accordingly>**
        - Port Number: **3001**
      - Encryption Settings: **None**

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 LP-1501 Plus
   - 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 LP-1501 Plus reboots
5. The LP-1501 Plus is now ready to be configured as needed

Figure 2: Sub-Panel Communication



LP-1501 PLUS Capacities

- Up to 8 wired SIO's up to 1,000'
- MR-62e 4 readers maximum per board
- MR-51e 2 readers maximum per board
- Total reader count cannot exceed 17
- Supported SIO's:
  - MR-50
  - MR-52
  - MR-51e
  - MR-16IN
  - MR-16OUT
  - MR-62e

Explanation 2: Alternate Host Channel

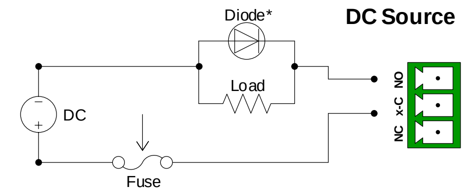
A micro USB Ethernet adapter may be used to enable alternate host channel communication. Alternate host channel communication is only used to communicate to the server machine and not to downstream Ethernet enabled SIOs.

Manufacturer: Plugable
Model: USB2OTGE100

Figure 1: Output Wiring Options

CABLING: As required for the load

Door lock mechanisms can generate feedback to the relay circuit that can cause damage and premature failure of the relay. For this reason, a diode must be used to protect the relay. Wire should be of sufficient gauge to avoid voltage loss.



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

Figure 3: Wiegand Reader Port 1

CABLING: 6-conductor, 18 AWG, 500 feet (150 m) max

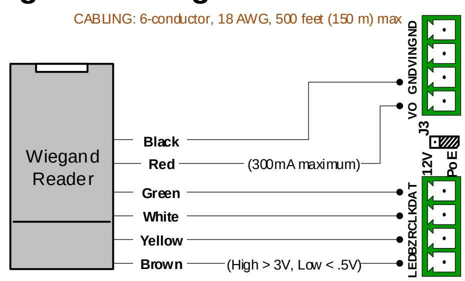
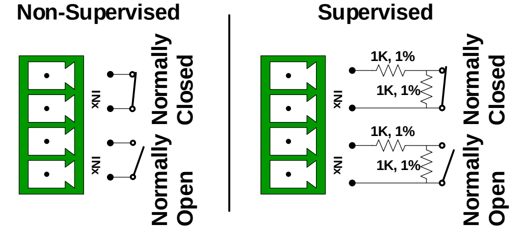


Figure 4: Input Wiring Options

CABLING: 1 twisted pair per input, 30Ω maximum

Non-Supervised **Supervised**



LP-1502 Quick Reference

TOC

Detail

*Not evaluated by UL

Normal LED Function

- LED 1 Off-Line / On-Line and Battery Status
  - Off-Line if 20% on
  - On-Line if 80% on
  - Battery low if double flashing
- LED 2 Host Channel Activity (Ethernet)
- LED 3 Channel 1 Internal Sub-Panel Activity
- LED 4 Channel 2 RS-485 Sub-Panel Activity
- LED 5 Not used
- LED R1 Reader Port 1 Activity
- LED R2 Reader Port 2 Activity

S1 - Configuration Dip Switch

See Explanation 1

Figure 1

Wiegand Reader Example

CABLING: 6-conductor, 18 AWG, 500 feet (150 m) max

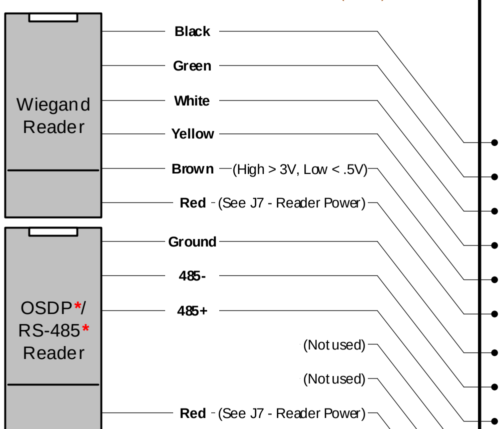


Figure 2

OSDP* / RS-485* Reader Example

CABLING: 1 twisted pair, 18 AWG for power and 1 twisted pair w/drain & shield, 24 AWG, 120Ω impedance, 2,000 feet (610 m) max for communication

Door Strike 1

Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 3

Auxiliary Output 2

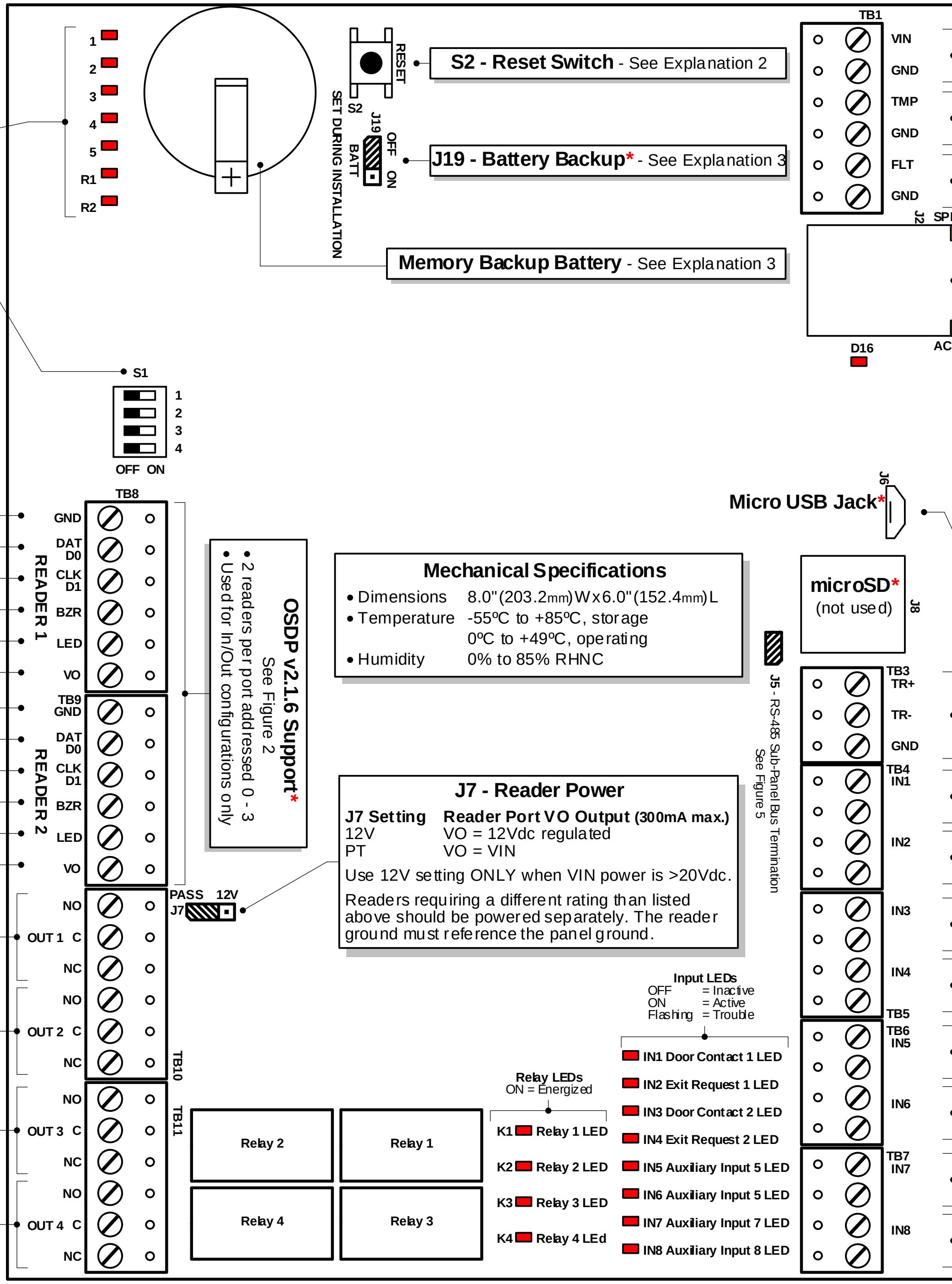
Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 3

Door Strike 2

Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 3

Auxiliary Output 4

Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 3



S2 - Reset Switch - See Explanation 2

J19 - Battery Backup* - See Explanation 3

Memory Backup Battery - See Explanation 3

Micro USB Jack*

microSD* (not used)

OSDP v2.1.6 Support*

See Figure 2

- 2 readers per port addressed 0 - 3
- Used for In/Out configurations only

Mechanical Specifications

- Dimensions 8.0"(203.2mm)Wx6.0"(152.4mm)L
- Temperature -55ºC to +85ºC, storage
  0ºC to +49ºC, operating
- Humidity 0% to 85% RHNC

J7 - Reader Power

J7 Setting	Reader Port VO Output (300mA max.)
12V	VO = 12Vdc regulated
PT	VO = VIN

Use 12V setting ONLY when VIN power is >20Vdc.

Readers requiring a different rating than listed above should be powered separately. The reader ground must reference the panel ground.

Power (500mA max plus readers)

CABLING: 1 twisted pair, minimum 18 AWG

VIN (Voltage In): Positive 12 to 24 Volts ±10% DC
GND (Ground): Input Voltage Return (-)

Tamper Input

N/C (jumper if not used)

Power Fault

N/C (jumper if not used)

Primary 10/100 Ethernet Host Channel

See Explanation 1

Normal LED Function

- LED D16 (red) Ethernet Host Channel Activity
- LED SPD (yellow) Ethernet Speed
  - 10Mb/S if off
  - 100Mb/S if on
- LED ACT (green) Link & Activity
  - No link if off
  - Good link if on
  - Activity if flashing

Alternate Host Channel*

See Explanation 4

Channel 2 RS-485 Sub-Panel Bus

See Figure 5

Door Contact 1 - N/C (jumper if not used)

See Figure 4

Exit Request 1 - N/O

See Figure 4

Door Contact 2 - N/C (jumper if not used)

See Figure 4

Exit Request 2 - N/O

See Figure 4

Auxiliary Input 5 - N/O

See Figure 4

Auxiliary Input 6 - N/O

See Figure 4

Auxiliary Input 7 - N/O

See Figure 4

Auxiliary Input 8 - N/O

See Figure 4

TOC

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

Oview

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

1. Set all S1 - Configuration DIP Switch DIPs OFF
2. Apply power to the LP-1502
3. Make note of the MAC address located on the side of the RJ45 jack
4. Run Access It! Universal.NET*
5. Create a new Channel
   - Channel Enabled: **X**
   - Protocol Type: **SCP**
   - Channel Type: **IP Server**
6. Create a new SCP
   - General Tab
     - Model: **LP-1502**
     - 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**

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 LP-1502
   - 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 LP-1502 reboots
5. The LP-1502 is now ready to be configured as needed

Explanation 2: Reset Switch

Pressing the S2 - Reset Switch will cause the LP-1502 to reboot.

This process will NOT erase the system configuration and cardholder databases.

Explanation 3: Memory Backup Battery

If the LP-1502 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 LP-1502 will retain all database information during a power failure for up to60 days. For optimum reliability, the memory backup battery should be replaced yearly using only a type BR2330 or CR2330 lithium battery or equivalent.

For UL installations, refer to NCL-12UL Hardware Installation Manual DOCNCL12UL-R1 for replacement procedures.

NOTE*: When setting up or servicing the LP-1502, it is recommended to leave the J19 - Battery Backup jumper OFF until all system testing is completed. By keeping the J19 - Battery Backup jumper OFF, you can be certain that the memory is being flushed during power cycles. Upon completion, be sure to set the J19 - Battery Backup jumper ON.

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 LP-1502
4. Manually configure a computer to 192.168.0.100
5. Using a crossover cable, connect computer to LP-1502
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 LP-1502 to reboot
18. Remove power from the LP-1502
19. Set all S1 - Configuration DIP Switch DIPs OFF
20. Remove crossover cable and connect to network
21. Apply power to the LP-1502
22. Run Access It! Universal.NET*
23. Create a new Channel
    - Channel Enabled: **X**
    - Protocol Type: **SCP**
    - Channel Type: **IP Server**
24. Create a new SCP
    - General Tab
      - Model: **LP-1502**
      - 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 4: Alternate Host Channel*

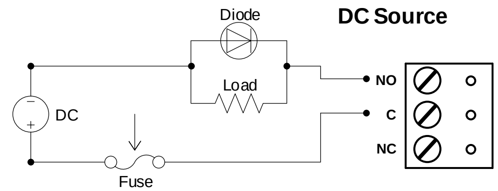
A micro USB Ethernet adapter may be used to enable alternate host channel communication. Alternate host channel communication is only used to communicate to the server machine and not to downstream Ethernet enabled SIOs.

Manufacturer: Plugable
Model: USB20OTGE100

Figure 3: Output Wiring Options

CABLING: As required for the load

Door lock mechanisms can generate feedback to the relay circuit that can cause damage and premature failure of the relay. For this reason, a diode must be used to protect the relay. Wire should be of sufficient gauge to avoid voltage loss.



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

Figure 4: Input Wiring Options

CABLING: 1 twisted pair per input, 30Ω maximum

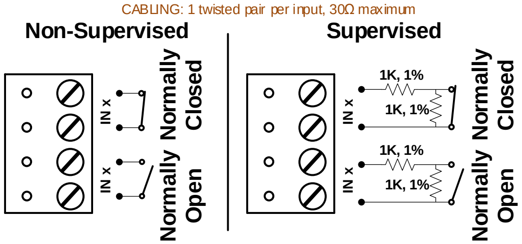
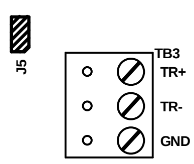


Figure 5: RS-485 Sub-Panel Bus Termination

CABLING: 1 twisted pair w/drain & shield, 24 AWG, 120Ω impedance



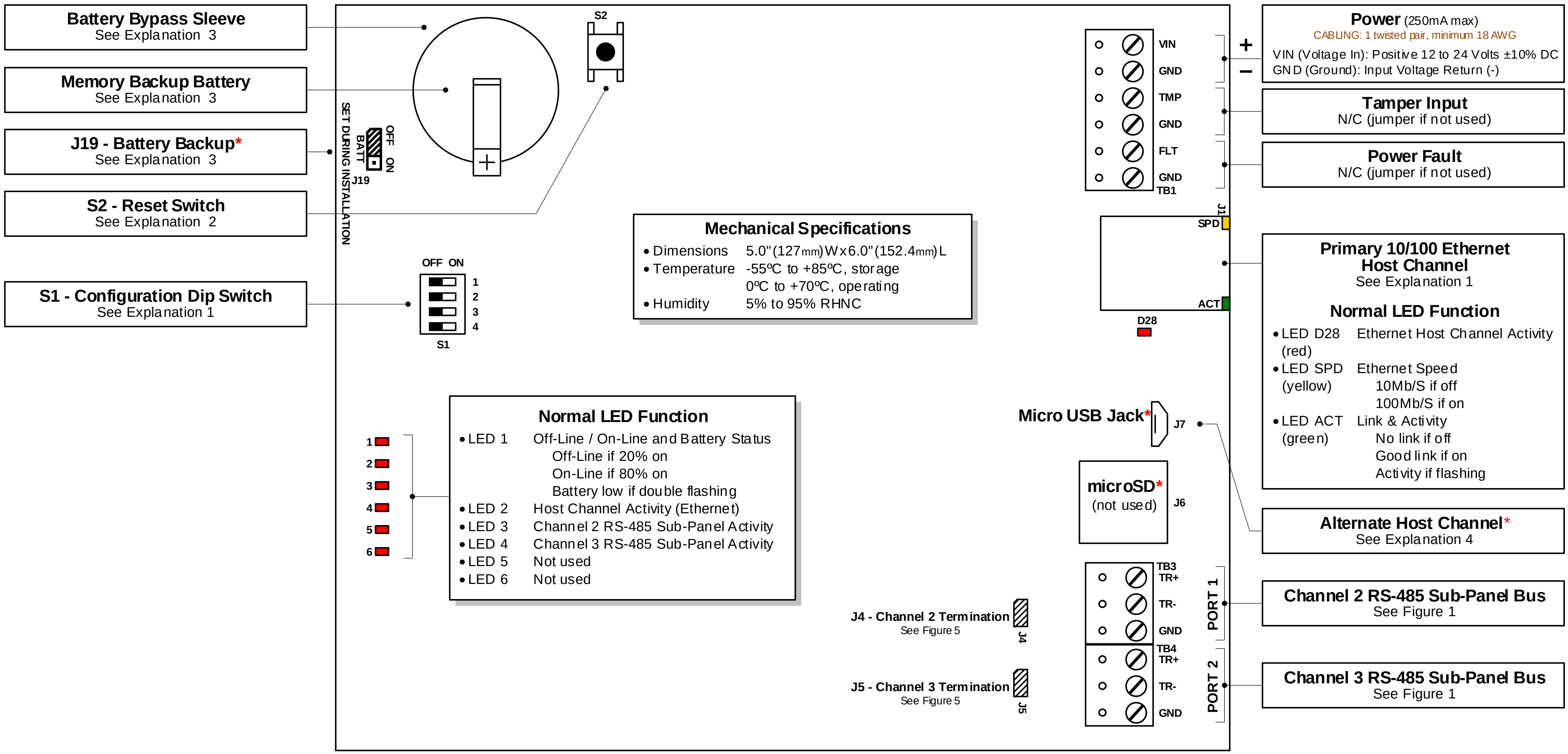
The LP-1502 has one RS-485 sub-panel bus and must be terminated at the beginning and ending point.

J5 is the termination jumper for the Channel 2 RS-485 Sub-Panel Bus.

(see Two Wire RS-485 Wiring diagram for sub-panel wiring information)

Only Stand-Alone system was evaluated by UL

Refer to NCL-12UL Hardware Installation Manual DOCNCL12UL-R1


Battery Bypass Sleeve
See Explanation 3
Memory Backup Battery
See Explanation 3
J19 - Battery Backup*
See Explanation 3
S2 - Reset Switch
See Explanation 2
S1 - Configuration Dip Switch
See Explanation 1
S2
SET DURING INSTALLATION
BATT
OFF
ON
J19
OFF ON
1
2
3
4
S1
Mechanical Specifications
• Dimensions 5.0"(127mm)Wx6.0"(152.4mm)L
• Temperature -55ºC to +85ºC, storage
0ºC to +70ºC, operating
• Humidity 5% to 95% RHNC
Normal LED Function
• LED 1 Off-Line / On-Line and Battery Status
Off-Line if 20% on
On-Line if 80% on
Battery low if double flashing
• LED 2 Host Channel Activity (Ethernet)
• LED 3 Channel 2 RS-485 Sub-Panel Activity
• LED 4 Channel 3 RS-485 Sub-Panel Activity
• LED 5 Not used
• LED 6 Not used
1
2
3
4
5
6
VIN
GND
TMP
GND
FLT
GND
TB1
+
−
Power (250mA max)
CABLING: 1 twisted pair, minimum 18 AWG
VIN (Voltage In): Positive 12 to 24 Volts ±10% DC
GND (Ground): Input Voltage Return (-)
Tamper Input
N/C (jumper if not used)
Power Fault
N/C (jumper if not used)
J1
SPD
ACT
D28
Primary 10/100 Ethernet
Host Channel
See Explanation 1
Normal LED Function
• LED D28 (red) Ethernet Host Channel Activity
• LED SPD (yellow) Ethernet Speed
10Mb/S if off
100Mb/S if on
• LED ACT (green) Link & Activity
No link if off
Good link if on
Activity if flashing
Micro USB Jack*
J7
microSD*
(not used)
J6
Alternate Host Channel*
See Explanation 4
J4 - Channel 2 Termination
See Figure 5
J4
J5 - Channel 3 Termination
See Figure 5
J5
TB3
TR+
TR-
GND
TB4
TR+
TR-
GND
PORT 1
PORT 2
Channel 2 RS-485 Sub-Panel Bus
See Figure 1
Channel 3 RS-485 Sub-Panel Bus
See Figure 1

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

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

1. Set all S1 - Configuration DIP Switch DIPs OFF
2. Apply power to the LP-2500
3. Make note of the MAC address located on the side of the RJ45 jack
4. Run Access It! Universal.NET*
5. Create a new Channel
   - Channel Enabled: **X**
   - Protocol Type: **SCP**
   - Channel Type: **IP Server**
6. Create a new SCP
   - General Tab
     - Model: **LP-2500**
     - 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**

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

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 LP-2500
4. Manually configure a computer to 192.168.0.100
5. Using a crossover cable, connect computer to LP-2500
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 **'Accept'**
15. Click **'Apply Setting'** from the left hand menu
16. Click **'Apply Settings, Reboot'** button
17. Wait 60 seconds for LP-2500 to reboot
18. Remove power from the LP-2500
19. Set all S1 - Configuration DIP Switch DIPs OFF
20. Remove crossover cable and connect to network
21. Apply power to the LP-2500
22. Run Access It! Universal.NET*
23. Create a new Channel
    - Channel Enabled: **X**
    - Protocol Type: **SCP**
    - Channel Type: **IP Server**
24. Create a new SCP
    - General Tab
      - Model: **LP-2500**
      - 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**

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 LP-2500
   - 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 LP-2500 reboots
5. The LP-2500 is now ready to be configured as needed

Explanation 2: Reset Switch

Pressing the S2 - Reset Switch will cause the LP-2500 to reboot.
This process will NOT erase the system configuration and cardholder databases.

Explanation 3: Memory Backup Battery

If the LP-2500 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 LP-2500 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 BR2330 or CR2330 lithium battery or equivalent.

For UL installations, refer to NCL-12UL Hardware Installation Manual DOCNCL12UL-R1 for replacement procedures.

NOTE*: When setting up or servicing the LP-2500, it is recommended to leave the J19 - Battery Backup jumper OFF until all system testing is completed. By keeping the J19 - Battery Backup jumper OFF, you can be certain that the memory is being completely flushed during power cycles. Upon completion, be sure to set the J19 - Battery Backup jumper ON.

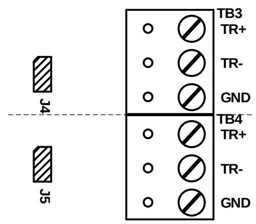
Explanation 4: Alternate Host Channel*

A micro USB Ethernet adapter may be used to enable alternate host channel communication. Alternate host channel communication is only used to communicate to the server machine and not to downstream Ethernet enabled SIOs.

Manufacturer: Plugable
Model: USB20OTGE100

Figure 1: RS-485 Sub-Panel Bus Termination

CABLING: 1 twisted pair w/drain & shield, 24 AWG, 120Ω impedance



The LP-2500 has two distinct 2 wire RS-485 sub-panel buses. Each bus needs to be terminated at both the beginning and ending points.

J4 is the termination jumper for the Channel 2 RS-485 Sub-Panel Bus.

J5 is the termination jumper for the Channel 3 RS-485 Sub-Panel Bus.

(see Two Wire RS-485 Wiring diagram for sub-panel wiring information)

LP-4502 Quick Reference

LP-4502 not evaluated by UL

Normal LED Function

- LED 1 — Off-Line / On-Line and Battery Status
  - Off-Line if 20% on
  - On-Line if 80% on
  - Battery low if double flashing
- LED 2 — Serial Host Channel Activity
- LED 3 — Channel 1 Internal Sub-Panel Activity
- LED 4 — Channel 2 RS485-1 Sub-Panel Activity
- LED 5 — Channel 3 RS485-2 Sub-Panel Activity
- LED R1 — Reader Port 1 Activity
- LED R2 — Reader Port 2 Activity

S1 - Configuration Dip Switch

See Explanation 1

Figure 1

Wiegand Reader Example

CABLING: 6-conductor, 18 AWG, 500 feet (150 m) max

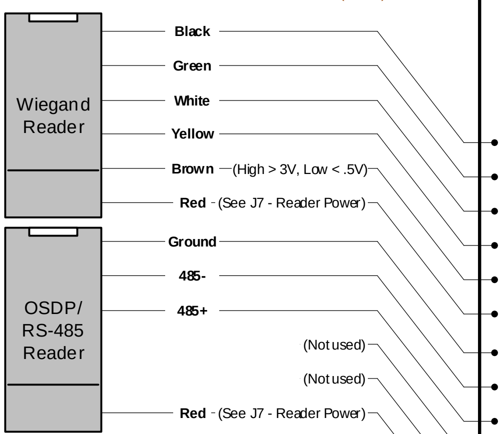


Figure 2

OSDP / RS-485 Reader Example

CABLING: 1 twisted pair, 18 AWG for power and 1 twisted pair w/drain & shield, 24 AWG, 120Ω impedance, 2,000 feet (610 m) max for communication

Door Strike 1

Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 3

Auxiliary Output 2

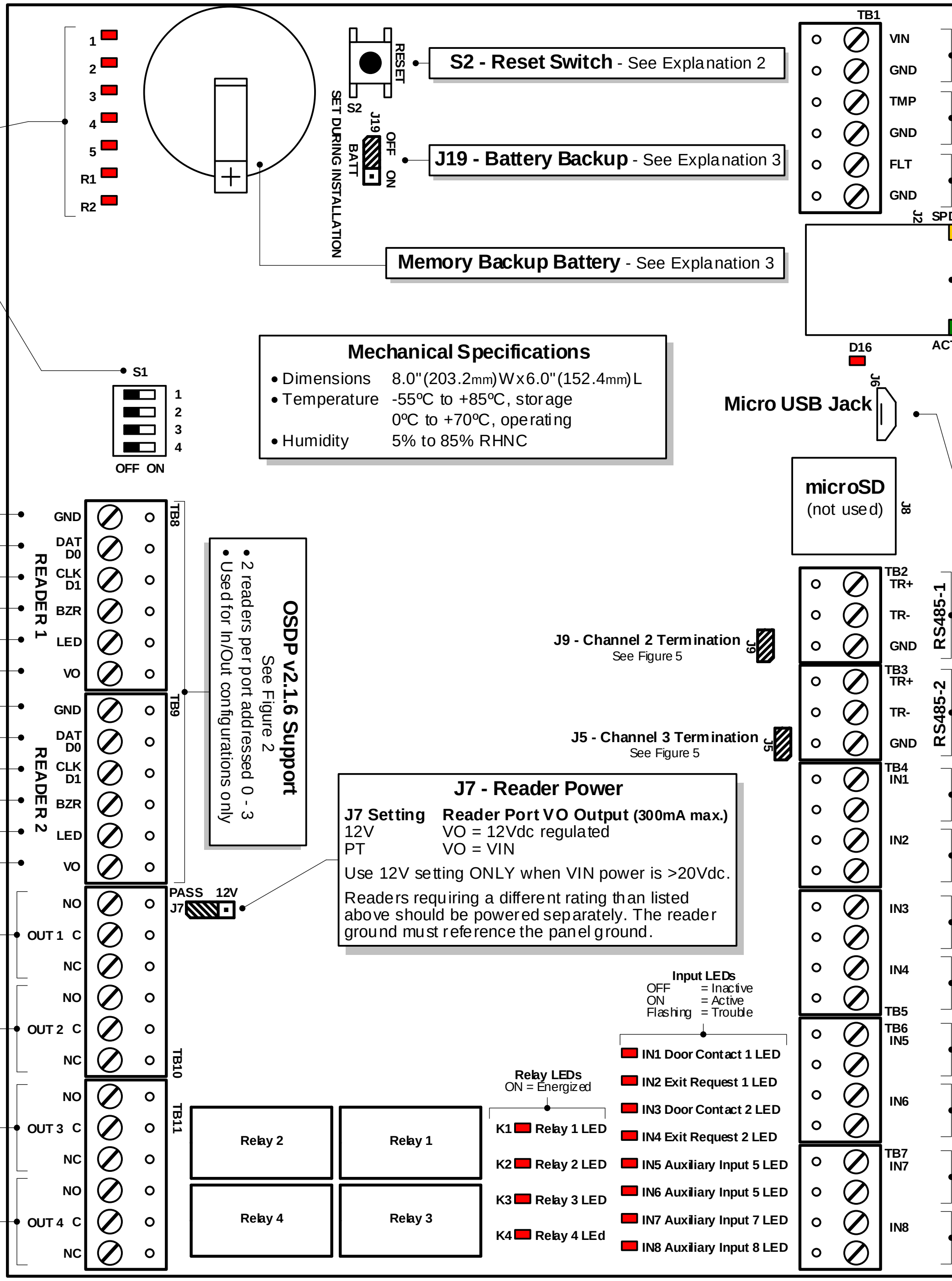
Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 3

Door Strike 2

Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 3

Auxiliary Output 4

Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 3



Mechanical Specifications

- Dimensions: 8.0"(203.2mm) W x 6.0"(152.4mm) L
- Temperature: -55ºC to +85ºC, storage; 0ºC to +70ºC, operating
- Humidity: 5% to 85% RHNC

J7 - Reader Power

J7 Setting	Reader Port VO Output (300mA max.)
12V	VO = 12Vdc regulated
PT	VO = VIN

Use 12V setting ONLY when VIN power is >20Vdc.

Readers requiring a different rating than listed above should be powered separately. The reader ground must reference the panel ground.

Power (550mA max plus readers)

CABLING: 1 twisted pair, minimum 18 AWG

VIN (Voltage In): Positive 12 to 24 Volts ±10% DC
GND (Ground): Input Voltage Return (-)

Tamper Input

N/C (jumper if not used)

Power Fault

N/C (jumper if not used)

Primary 10/100 Ethernet Host Channel

See Explanation 1

Normal LED Function

- LED D16 (red) — Ethernet Host Channel Activity
- LED SPD (yellow) — Ethernet Speed
  - 10Mb/S if off
  - 100Mb/S if on
- LED ACT (green) — Link & Activity
  - No link if off
  - Good link if on
  - Activity if flashing

Alternate Host Channel

See Explanation 4

Channel 2 RS-485 Sub-Panel Bus

See Figure 5

Channel 3 RS-485 Sub-Panel Bus

See Figure 5

Door Contact 1 - N/C (jumper if not used)

See Figure 4

Exit Request 1 - N/O

See Figure 4

Door Contact 2 - N/C (jumper if not used)

See Figure 4

Exit Request 2 - N/O

See Figure 4

Auxiliary Input 5 - N/O

See Figure 4

Auxiliary Input 6 - N/O

See Figure 4

Auxiliary Input 7 - N/O

See Figure 4

Auxiliary Input 8 - N/O

See Figure 4

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

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

1. Set all S1 - Configuration DIP Switch DIPs OFF
2. Apply power to the LP-4502
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: **LP-4502 xMB**
        - xMB = Default card database size is 32MB, value can be adjusted within LP web browser.
        - 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**

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 LP-4502
    - 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 LP-4502 reboots
5. The LP-L502 is now ready to be configured as needed

Explanation 2: Reset Switch

Pressing the S2 - Reset Switch will cause the LP-4502 to reboot.
This process will NOT erase the system configuration and cardholder databases.

Explanation 3: Memory Backup Battery

If the LP-4502 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 LP-4502 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 BR2330 or CR2330 lithium battery or equivalent.

NOTE: When setting up or servicing the LP-4502, it is recommended to leave the J19 - Battery Backup jumper OFF until all system testing is completed. By keeping the J19 - Battery Backup jumper OFF, you can be certain that the memory is being completely flushed during power cycles. Upon completion, be sure to set the J19 - Battery Backup jumper ON.

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 LP-4502
4. Manually configure a computer to 192.168.0.100
5. Using a crossover cable, connect computer to LP-4502
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** and a Password of **password**
11. Click **'Network'** from the left hand menu
12. Select **'Use Static IP configuration:'**
    - IP Address: **<Set accordingly>**
    - Subnet Mask: **<Set accordingly>**
    - Default Gateway: **<Set accordingly>**
13. Click **'Accept'**
14. Click **'Auto-Save'** from the left hand menu
    - Card Database Size: **<Set accordingly>**
15. Click **'Apply Setting'** from the left hand menu
16. Click **'Apply, Reboot'** button
17. Wait 60 seconds for LP-4502 to reboot
18. Remove power from the LP-4502
19. Set all S1 - Configuration DIP Switch DIPs OFF
20. Remove crossover cable and connect to network
21. Apply power to the LP-4502
22. Within Access It! Universal.NET create a new Channel
    - Channel Enabled: **X**
    - Protocol Type: **SCP**
    - Channel Type: **IP Server**
23. Within Access It! Universal.NET create a new SCP
    - General Tab
        - Model: **LP-4502 xMB**
        - xMB = Card database size configured in step 14.
        - 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 4: Alternate Host Channel

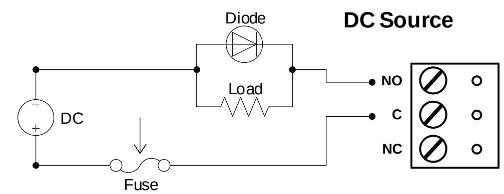
A micro USB Ethernet adapter may be used to enable alternate host channel communication. Alternate host channel communication is only used to communicate to the server machine and not to downstream Ethernet enabled SIOs.

Manufacturer: Plugable
Model: USB2OTGE100

Figure 3: Output Wiring Options

CABLING: As required for the load

Door lock mechanisms can generate feedback to the relay circuit that can cause damage and premature failure of the relay. For this reason, a diode must be used to protect the relay. Wire should be of sufficient gauge to avoid voltage loss.



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

Figure 4: Input Wiring Options

CABLING: 1 twisted pair per input, 30Ω maximum

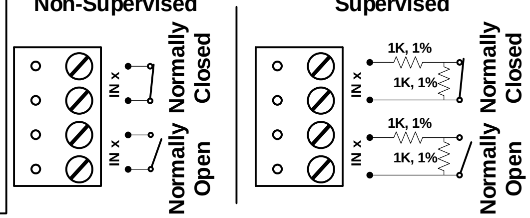
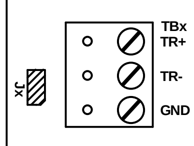


Figure 5: RS-485 Sub-Panel Bus Termination

CABLING: 1 twisted pair w/drain & shield, 24 AWG, 120Ω impedance



The LP-4502 has two RS-485 sub-panel buses which must be terminated at their beginning and ending points.

J5 & J9 are termination jumpers for their respective Sub-Panel Bus.

(see Two Wire RS-485 Wiring diagram for sub-panel wiring information)

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MR-50 Series 1 Quick Reference

Detail

MR-50 Series 1 not evaluated by UL

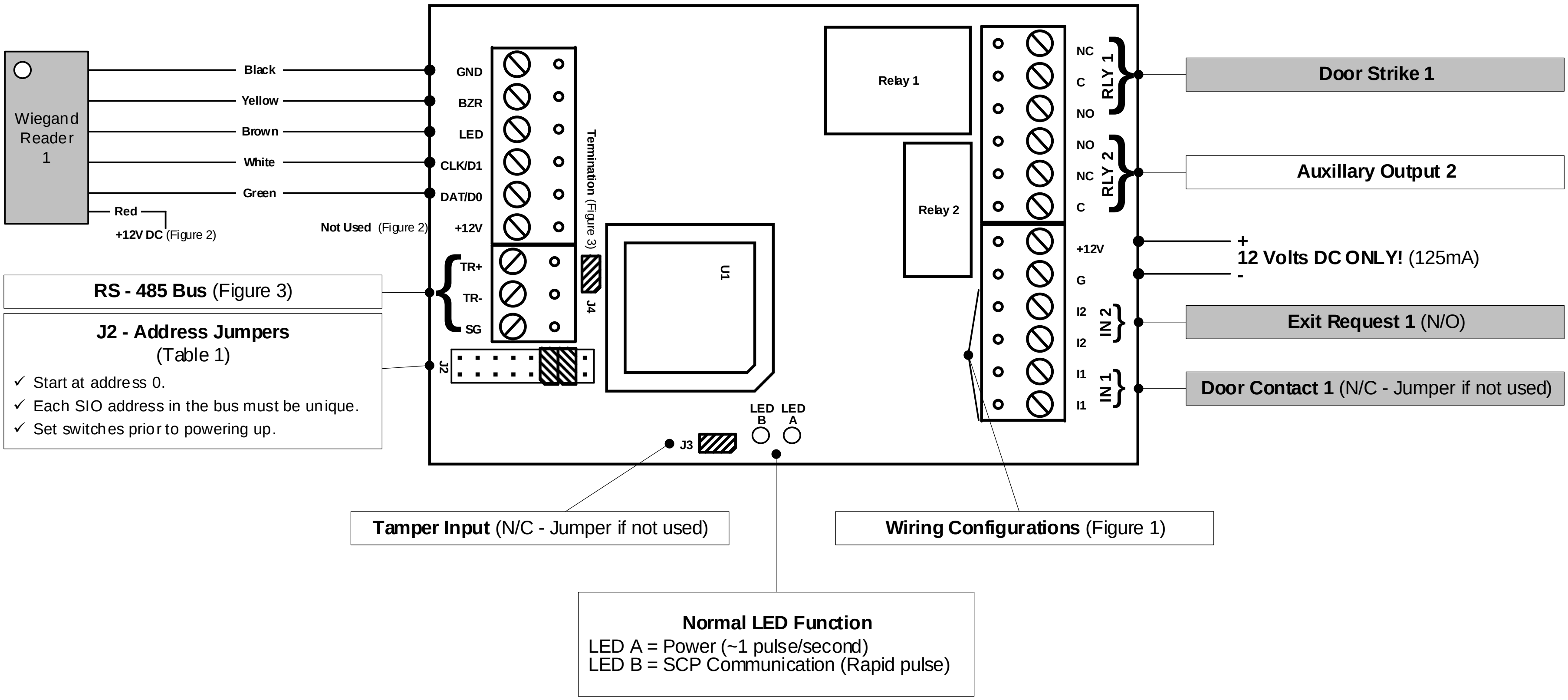

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Table 1: J2 - Address Jumpers

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

Figure 1: Wiring Configurations

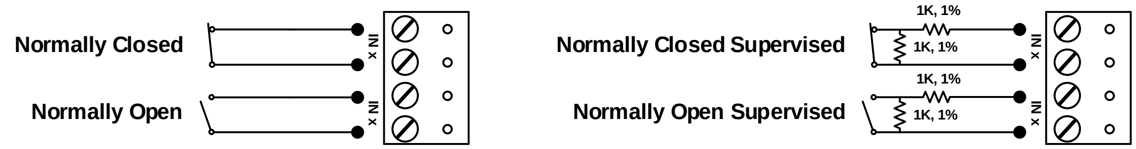


Figure 2: Reader Power Wiring

When wiring readers which require more than 50mA of current, it is recommended to use the default wiring method reflected in the drawing below. This wiring method will work in all cases. Notice the +12V lead (Red) of the reader is directly connected to the power supply. This ensures the full amount of current needed by the reader is being supplied for proper reader functionality. The Ground lead (Black) of the reader must reference the same ground as the MR-50 and may be wired to the GND of the reader wiring block.

In cases where the reader current draw is less than 50mA of current, it is possible to connect the positive lead (Red) of the reader to the (+12V) of the reader wiring block.

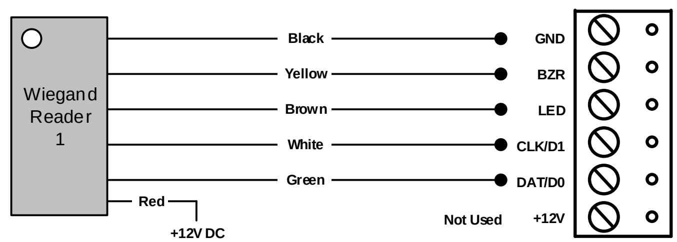
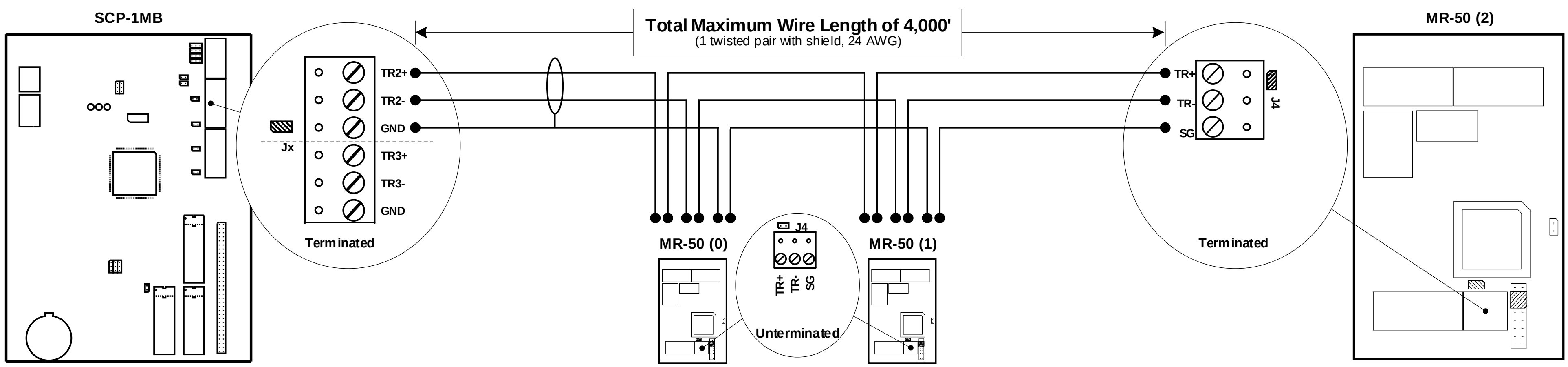


Figure 3: Two Wire RS-485 Wiring



*The SCP is at the beginning of the bus, so Jx **IS** terminated.*
(see SCP quick reference sheet for specific jumper identification)

*MR-50s (0) and (1) are in the middle of the bus, so J4 is **NOT** terminated.*

*The MR-50 (2) is at the end of the bus, so J4 **IS** terminated.*

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MR-50 Series 2 Quick Reference

Detail

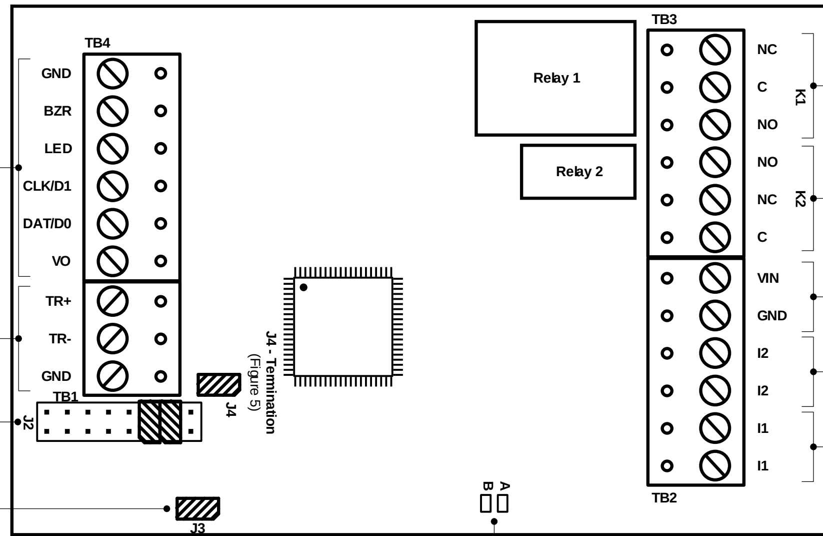
MR-50 Series 2 not evaluated by UL

Reader Port
- Wiegand Readers (Figure 1)
- MR-DT Keypad (Figure 2)
- RS-485 Reader Interface

RS-485 Bus (Figure 5)

J2 - Address Jumpers (Table 1)
- Start at address 0.
- Each SIO address in the bus must be unique.
- Set switches prior to powering up.

J3 - Tamper Input
(N/C - Jumper if not used)



Door Strike 1
(5A@28Vdc - Figure 3)

Auxiliary Output 2
(1A@28Vdc or dry contact use)

12 to 24 Volts DC ±10% ONLY!
(12Vdc - 150mA max. plus reader current)

Exit Request
(N/O - Figure 4)

Door Contact 1
(N/C - Jumper if not used - Figure 4)

Normal LED Function
- LED A = Power (~1 pulse/second)
- LED B = SCP Communication (Rapid pulse)

Mechanical Specifications
- Dimensions 4.25"(107.9mm)Wx2.75"(69.85mm)L
- Temperature -55ºC to +85ºC, storage
  -35ºC to +70ºC, operating
- Humidity 10% to 95% RHNC

Reader Port Wiring

Reader Port Power
VO=VIN
Readers requiring a different rating must be powered separately. The reader ground must reference the MR-50 ground.

Figure 1 (Wiegand Reader Wiring)

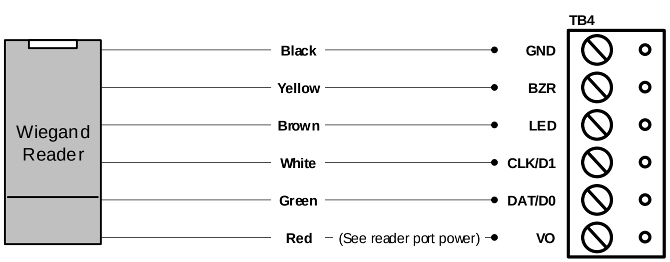


Figure 2 (MR-DT Keypad Wiring)

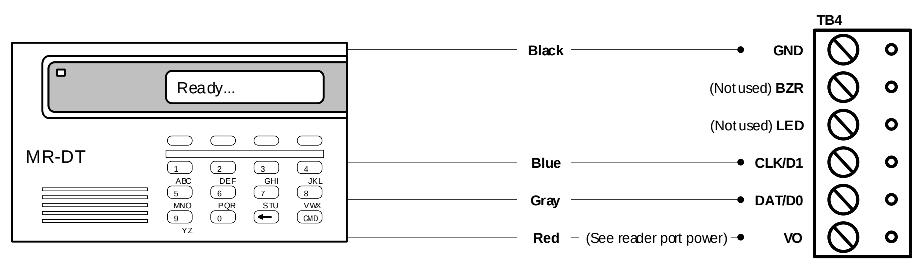


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Table 1: J2 - Address Jumpers

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

Figure 3: Output Wiring Configurations

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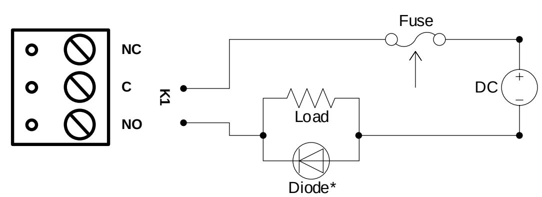
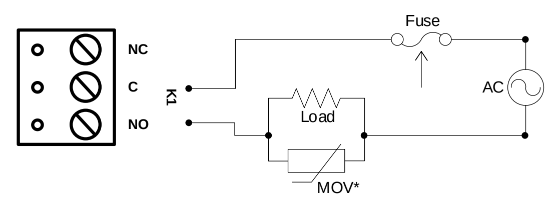
Depending on your power source, use one of the two methods of transient clamping shown below to protect the relay contacts and to reduce electromagnetic interference (EMI emissions). Always protect against accidental overloads by wiring in an inline fuse to the C (common) side of the relay as shown below.

DC Source



AC Source



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

***MOV Selection – Inductive Load**
Clamp Voltage > 1.5x Vac RMS
24Vac Strike, Panasonic ERZ-C07DK470 Typical

Figure 4: Input Wiring Configurations

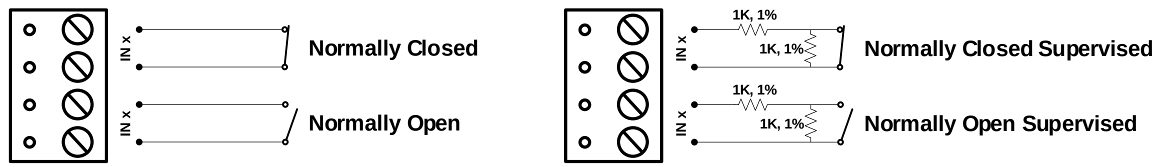
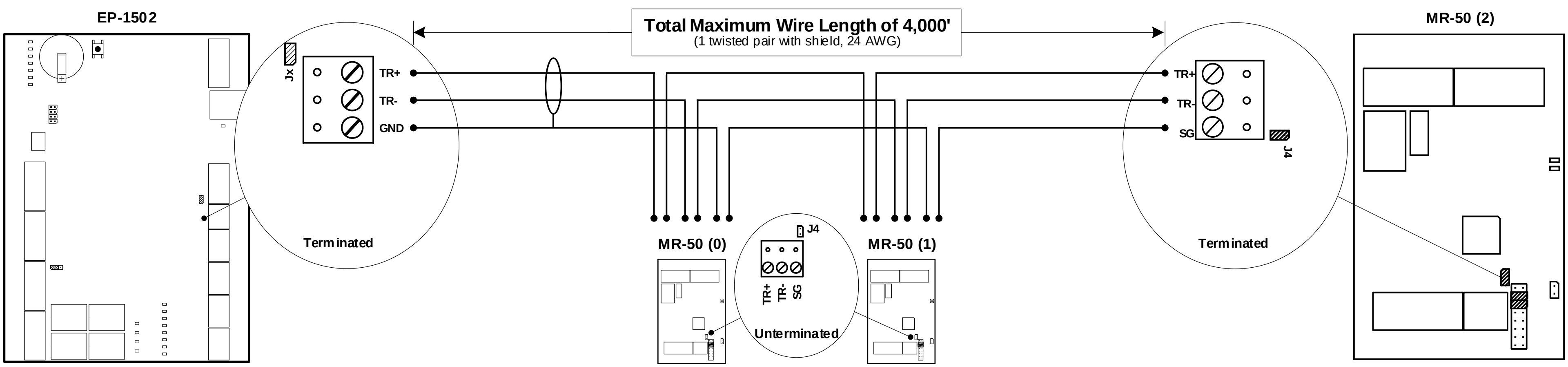


Figure 5: Two Wire RS-485 Wiring



*The SCP is at the beginning of the bus, so Jx **IS** terminated.*
(see SCP quick reference for specific jumper identification)

*MR-50s (0) and (1) are in the middle of the bus, so J4 is **NOT** terminated.*

*The MR-50 (2) is at the end of the bus, so J4 **IS** terminated.*

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MR-50 Series 3 Quick Reference

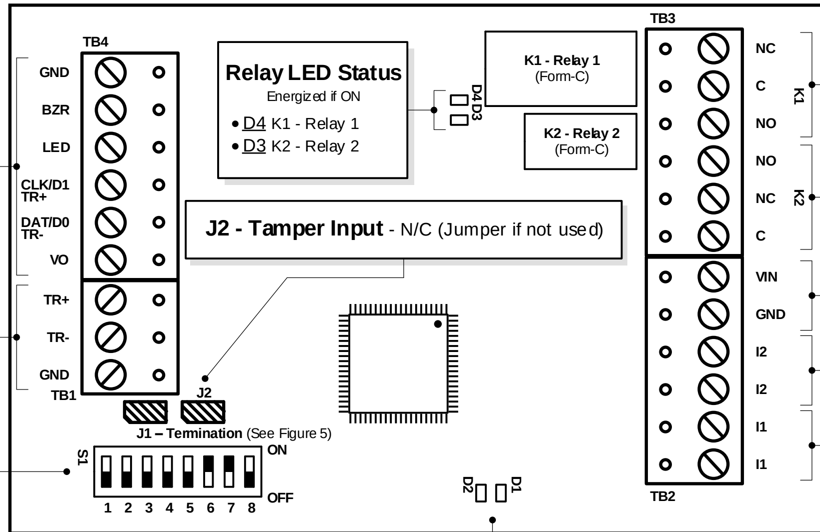
Detail

MR-50-S3 not evaluated by UL

Reader Port
- Wiegand Readers (See Figure 1)
- OSDP* / RS-485 Readers (See Figure 2)

Two Wire RS-485 Bus
See Figure 5

S1 - Configuration Switch
- S1-1 thru S1-5: SIO Address (Table 1)
  Each SIO address must be unique.
- S1-6 thru S1-7: Baud Rate (Table 2)
- S1-8: Require Encryption if ON



Door Strike (K1)
Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 3

Auxiliary Output 2 (K2)
1A@30Vdc resistive
See Figure 3

Primary Power (150mA max plus readers)
CABLING: 1 twisted pair, minimum 18 AWG
VIN (Voltage In): Positive 12 to 24 Volts ±10% DC
GND (Ground): Input Voltage Return (-)

Exit Request - N/O
See Figure 4

Door Contact - N/C (Jumper if not used)
See Figure 4

Normal LED Function

• D1	On-Line Status:	OFF if 1 sec rate, 20% ON ON Non-encrypted if 1 sec rate, 80% ON ON Encrypted if .1 sec ON, .1 sec OFF x 3 then .1 sec ON, .3 sec OFF Awaiting firmware download if .1 sec ON, .1 sec OFF
• D2	SCP Communication:	Rapid pulse

Specifications
- Dimension 4.25" (108mm) W x 2.75" (70mm) L x 1" (25mm) H
- Storage Temperature: -55ºC to +85ºC
- Operating Temperature: -40ºC to +75ºC
- Humidity: 5% to 95% RHNC
- Weight: 4 oz. (120 g) nominal

Reader Port Wiring

Reader Port Power
The input power is passed through to the reader terminal strip and is available for powering a reader. Readers that require different voltage requirements must be powered separately. Care must be taken to insure that the input voltage is within the voltage range of the reader. The reader power output terminal, TB4-6 (VO), is not current limited.

Figure 1
Wiegand Reader Example
CABLING: 6-conductor, 18 AWG, 500 feet (150 m) max

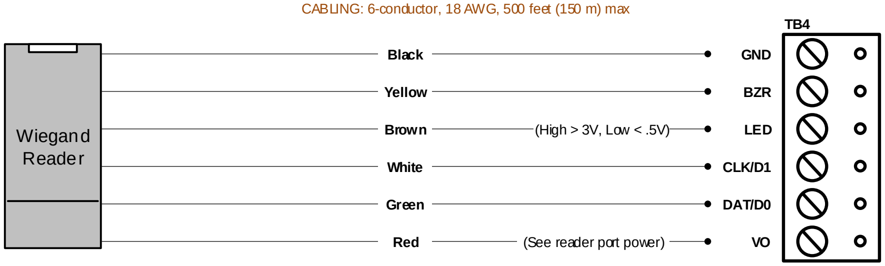
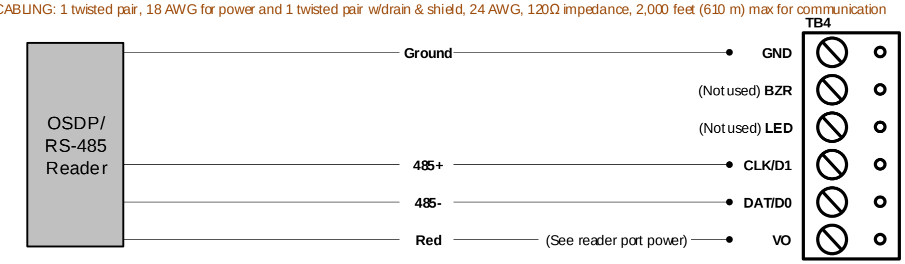


Figure 2
OSDP* / RS-485 Reader Example
CABLING: 1 twisted pair, 18 AWG for power and 1 twisted pair w/drain & shield, 24 AWG, 120Ω impedance, 2,000 feet (610 m) max for communication



*OSDP v2.1.6 Support
- 2 readers per port addressed 0 – 3
- Used for In/Out configurations only

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Table 1: SIO Address

Address	S1-1	S1-2	S1-3	S1-4	S1-5
0	OFF	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF
5	ON	OFF	ON	OFF	OFF
6	OFF	ON	ON	OFF	OFF
7	ON	ON	ON	OFF	OFF
8	OFF	OFF	OFF	ON	OFF
9	ON	OFF	OFF	ON	OFF
10	OFF	ON	OFF	ON	OFF
11	ON	ON	OFF	ON	OFF
12	OFF	OFF	ON	ON	OFF
13	ON	OFF	ON	ON	OFF
14	OFF	ON	ON	ON	OFF
15	ON	ON	ON	ON	OFF

Address	S1-1	S1-2	S1-3	S1-4	S1-5
16	OFF	OFF	OFF	OFF	ON
17	ON	OFF	OFF	OFF	ON
18	OFF	ON	OFF	OFF	ON
19	ON	ON	OFF	OFF	ON
20	OFF	OFF	ON	OFF	ON
21	ON	OFF	ON	OFF	ON
22	OFF	ON	ON	OFF	ON
23	ON	ON	ON	OFF	ON
24	OFF	OFF	OFF	ON	ON
25	ON	OFF	OFF	ON	ON
26	OFF	ON	OFF	ON	ON
27	ON	ON	OFF	ON	ON
28	OFF	OFF	ON	ON	ON
29	ON	OFF	ON	ON	ON
30	OFF	ON	ON	ON	ON
31	ON	ON	ON	ON	ON

Table 2: Baud Rate

S1-6	S1-7	Baud Rate
ON*	ON*	38,400 bps
OFF	ON	19,200 bps
ON	OFF	9,600 bps
OFF	OFF	115,200 bps

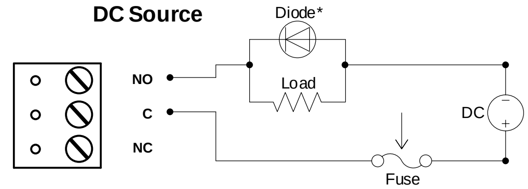
*Access It! Universal.NET default value.

Oview

Figure 3: Output Wiring Options

CABLING: As required for the load

Door lock mechanisms can generate feedback to the relay circuit that can cause damage and premature failure of the relay. For this reason, a diode must be used to protect the relay. Wire should be of sufficient gauge to avoid voltage loss.



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

Figure 4: Input Wiring Options

CABLING: 1 twisted pair per input, 30Ω maximum

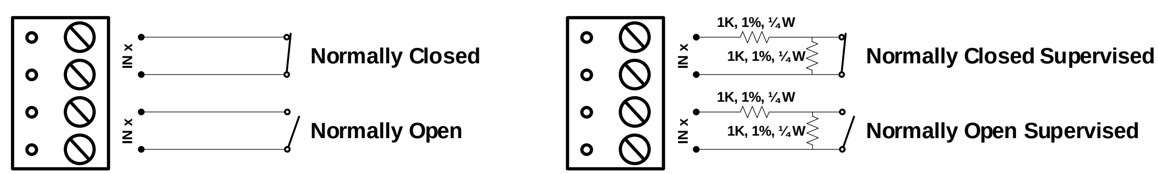
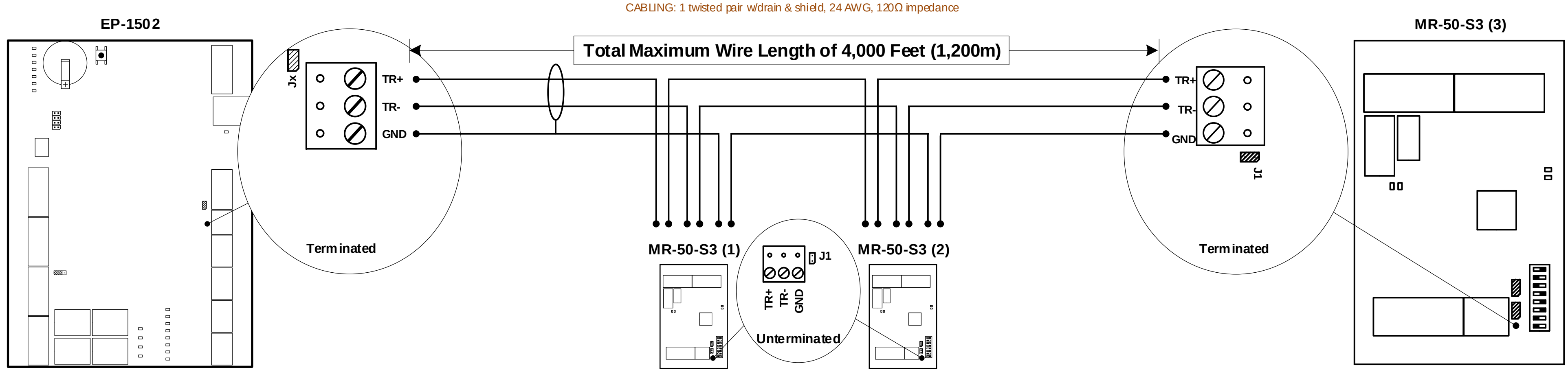


Figure 5: Two Wire RS-485 Wiring

CABLING: 1 twisted pair w/drain & shield, 24 AWG, 120Ω impedance



*The SCP is at the beginning of the bus, so Jx **IS** terminated.*
(see SCP quick reference for specific jumper identification)

*MR-50-S3s (1) and (2) are in the middle of the bus, so J1 is **NOT** terminated.*

*The MR-50-S3 (3) is at the end of the bus, so J1 **IS** terminated.*

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MR-51E Quick Reference

MR-51E not evaluated by UL

Detail

Top View

10/100 Ethernet
MAC Address - Found On Front (Explanation 1)

Auxiliary Output 2 (5A@28Vac/dc - Figure 3)

Door Strike 1 (5A@28Vac/dc - Figure 3)

12 Volts DC ±10% ONLY!
(12Vdc - 900mA max.)

Optional Door Strike Power - VO / GND
(12Vdc - 300mA max.)

Reader Port 2
- Wiegand Reader (Figure 2)

J5 - MR-51E Power Source Selector

J5 Setting	Power Source
PoE	Power Over Ethernet
12V*	External Power Source

*12Vdc power connected to TB5. Positive lead to pin 3 (VIN) and negative lead to pin 4 (GND).

Reader Port 1
- Wiegand Reader (Figure 1)
- MR-DT Keypad (Figure 1)
- RS-485 Reader Interface

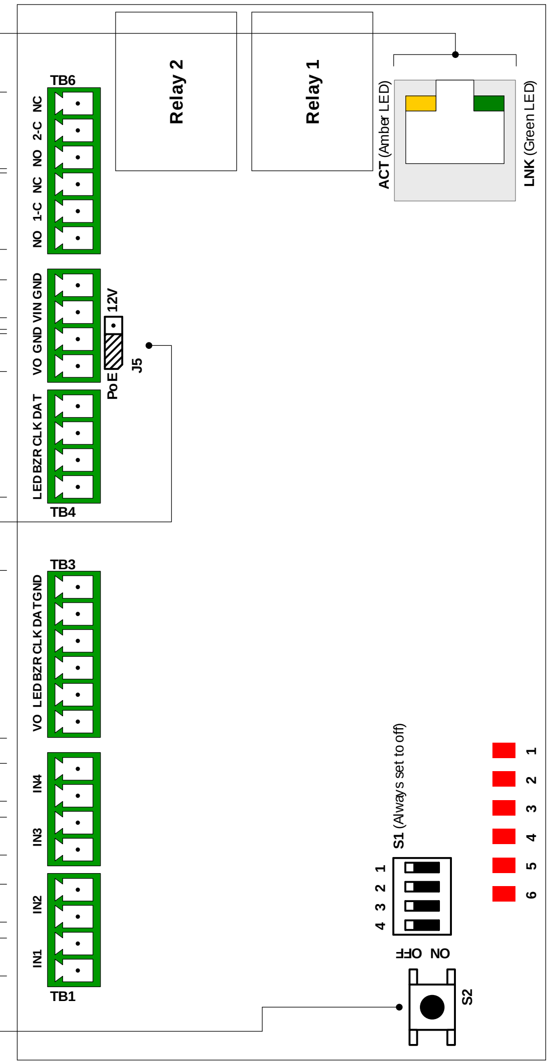
Auxiliary Input 4
(N/C - Jumper if not used - Figure 5)

Auxiliary Input 3
(N/C - Jumper if not used - Figure 5)

Exit Request 1 (N/O - Figure 5)

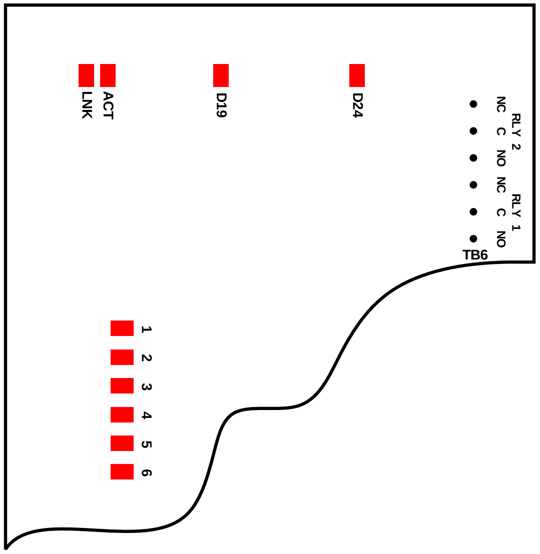
Door Contact 1
(N/C - Jumper if not used - Figure 5)

S2 - Reset Switch
(Explanation 2)



Mechanical Specifications
- Dimensions 5.5"(140mm)Wx2.75"(70mm)L
- Temperature -55ºC to +85ºC, storage
  0ºC to +70ºC, operating
- Humidity 10% to 95% RHNC

Bottom View



Status LED	Mostly On	Mostly Off	Toggle
1 - Awaiting IP Address	N/A	Offline	N/A
1 - Obtained IP Address	• Four (4) pulses per second when online.		
2 - Awaiting IP Address	N/A	N/A	Awaiting IP Address
2 - Obtained IP Address	• Flashes when data is received from the SCP.		
3 - Reader 1 & 2 Activity	• Flashes when data is received from either reader port.		
4 - Door 1 Contact	Open	Closed	Fault
5 - Door 1 REX	Active	Inactive	Fault
6 - Auxiliary Input 3	Open	Closed	Fault
D19 - Relay 1	Energized	De-Energized	N/A
D24 - Relay 2	Energized	De-Energized	N/A
ACT - Network Activity	Activity	No Activity	N/A
LNK - Network Link	Link	No Link	N/A

MR-51E Requirements
- Compatible Processors: EP-2500 or EP-1502; Minimum Firmware: 1.107
- Minimum MR-51E Firmware: 1.2.2

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Oview

Figure 1: Reader Port 1

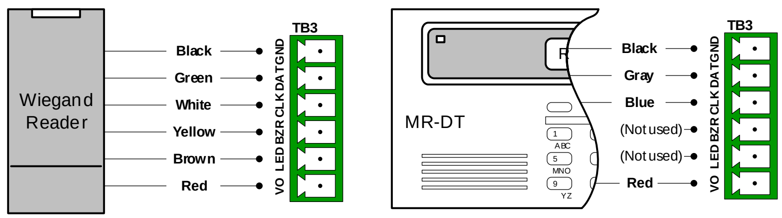


Figure 2: Reader Port 2

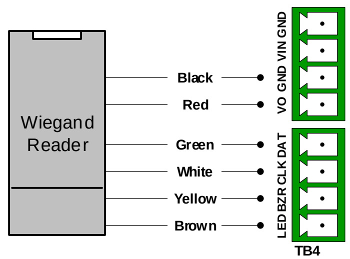
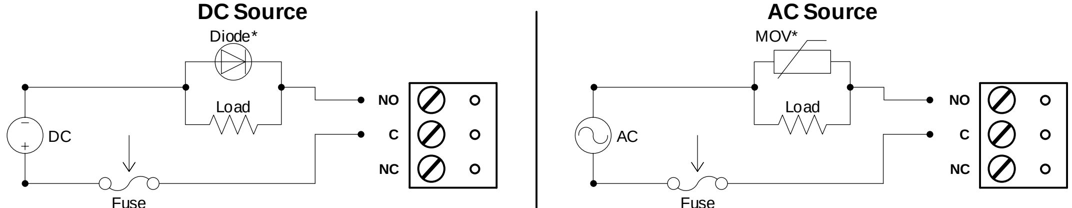


Figure 3: Output Wiring Options

Depending on your power source, use one of the two methods of transient clamping shown below to protect the relay contacts and to reduce electromagnetic interference (EMI emissions). Always protect against accidental overloads by wiring in an inline fuse to the C (common) side of the relay as shown below.



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

***MOV Selection – Inductive Load**
Clamp Voltage > 1.5x Vac RMS
24Vac Strike, Panasonic ERZ-C07DK470 Typical

Explanation 1: 10/100 Ethernet

Configuring Primary 10/100 Ethernet Host Channel

1. Set all S1 - Configuration DIP Switch DIPs OFF
2. Apply power to the MR-51E
3. Run Access It! Universal
4. From the File Menu, select Go|Main|Hardware
5. Click the plus sign (+) to expand the SCPs
6. Click the plus sign (+) to expand the SCP the MR-51E will be installed on
7. Select the SIOs branch, not the plus sign(+)
8. A list of all available SIOs appear in the pane to the right of the hardware tree
9. Edit the first uninstalled SIO from the right hand pane
   General Tab
      Model: **MR-51E**
      Device Installed: **X**
      IP Address: **<Enter IP Address to be assigned to MR-51E>**
      MAC Address: **<MAC Address of MR-51E>**
10. Click Save button

NOTE: The IP Address is downloaded to the EP controller, then automatically assigned to the MR-51E when power is applied. It is strongly suggested MR-51E is attached to the same physical switch as the EP controller

Explanation 2: S2 - Reset Switch

Pressing the S2 - Reset Switch will cause the MR-51E to reset.

Figure 4: Mounting Information

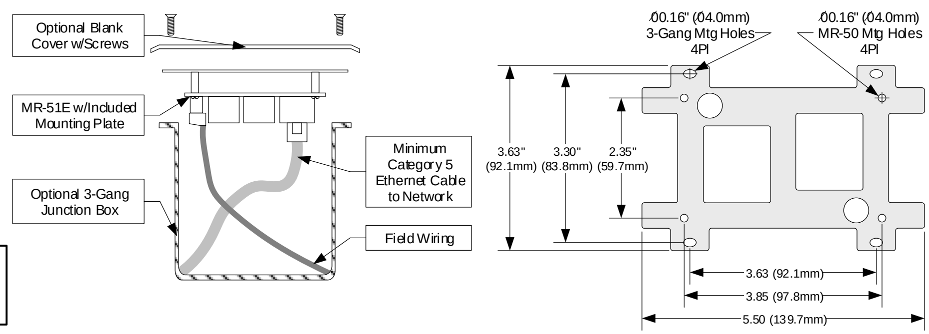
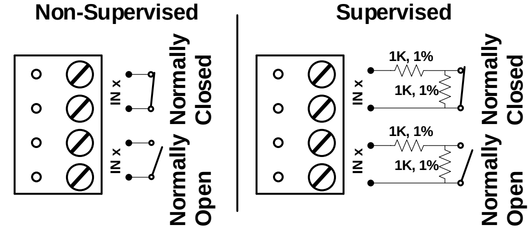


Figure 5: Input Wiring Options



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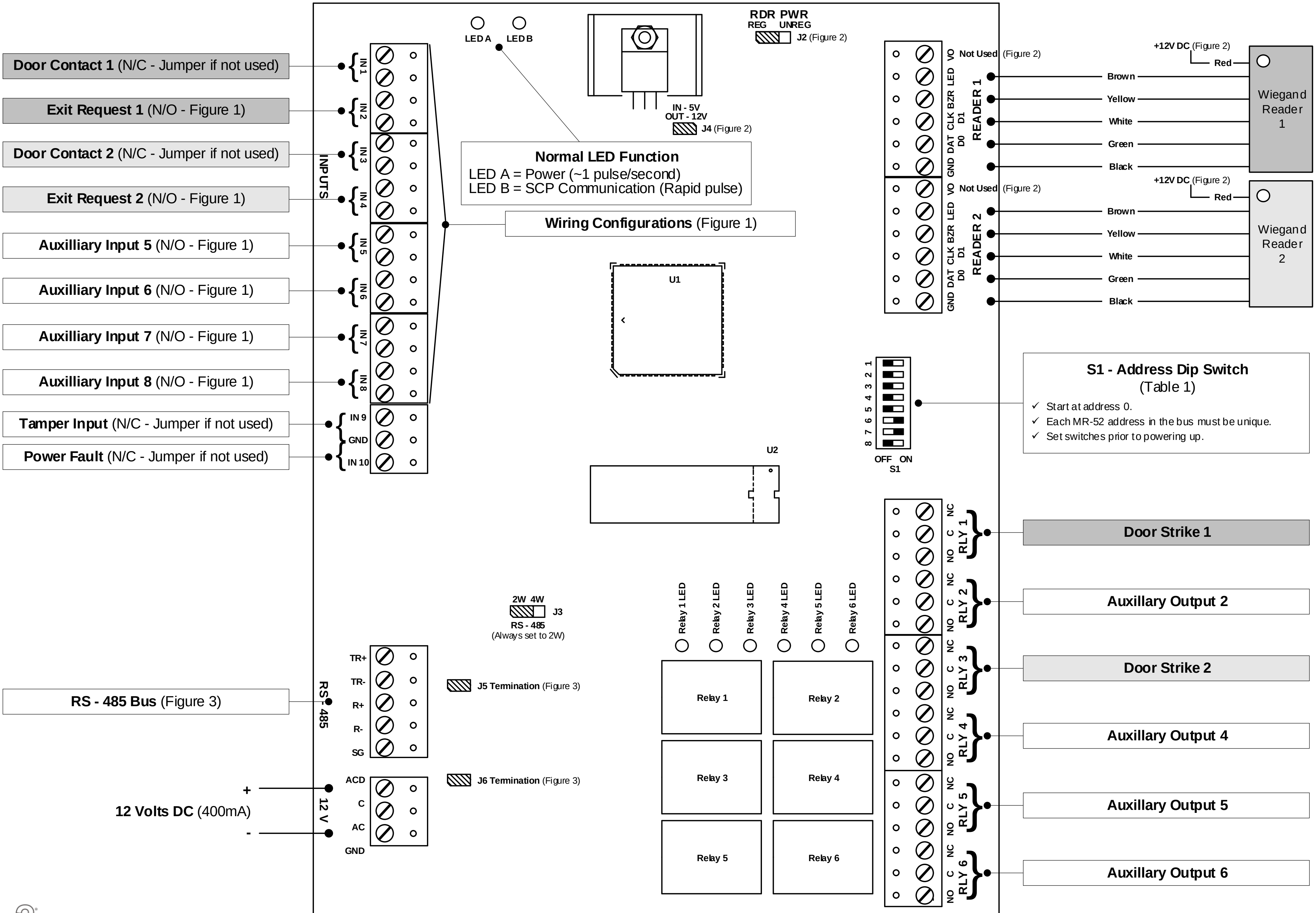
MR-52 Series 1 Quick Reference

Detail

MR-52 Series 1 not evaluated by UL



RS2 Technologies - 400 Fisher Street, Suite G - Munster, IN 46321 - (877) 682-3532 - Fax (219) 836-9102
www.rs2tech.com

Revised: 10/2013

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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

Figure 1: Wiring Configurations

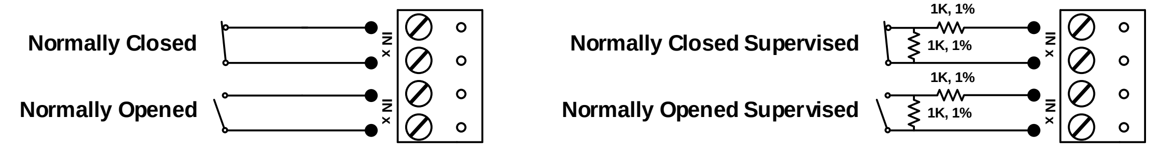


Figure 2: Reader Power Wiring

When wiring readers which require more than 75mA of current, it is recommended to use the default wiring method reflected in the drawing below. This wiring method will work in all cases. Notice the +12V lead (Red) of the reader is directly connected to the power supply. This ensures the full amount of current needed by the reader is being supplied for proper reader functionality. The Ground lead (Black) of the reader must reference the same ground as the MR-52 and may be wired to the GND of the reader wiring block.

In cases where the reader current draw is less than 75mA of current, it is possible to connect the positive lead (Red) of the reader to the (VO) of the reader wiring block. Note however, that J4 determines the reader voltage output of 5 volts jumpered or 12 volts un-jumpered of terminal (VO). Also note that when powering readers from the reader wiring block that J2 may be set to REG for regulated power or UNREG for unregulated power.

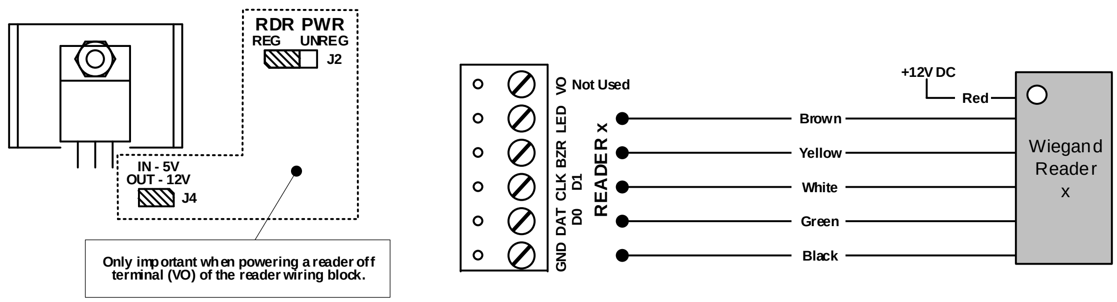
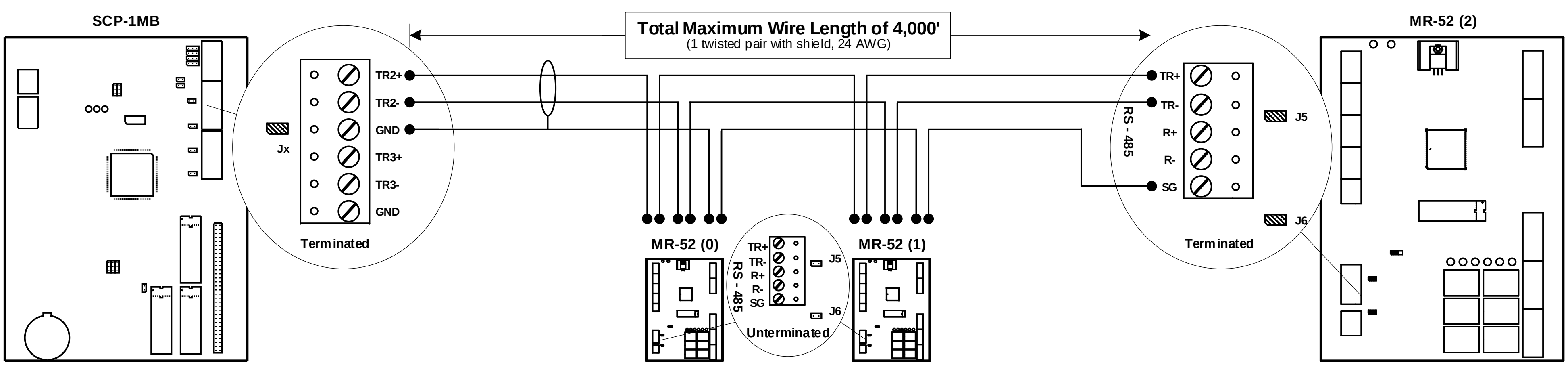


Figure 3: Two Wire RS-485 Wiring



*The SCP is at the beginning of the bus, so Jx **IS** terminated.*
(see SCP quick reference sheet for specific jumper identification)

*MR-52s (0) and (1) are in the middle of the bus, so J5 and J6 are **NOT** terminated.*

*The MR-52 (2) is at the end of the bus, so J5 & J6 **ARE** terminated.*

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MR-52 Series 2 Quick Reference

Detail

*Not evaluated by UL

Door Contact 1
(N/C - Jumper if not used - Figure 4)

Exit Request 1 (N/O - Figure 4)

Door Contact 2
(N/C - Jumper if not used - Figure 4)

Exit Request 2 (N/O - Figure 4)

Auxiliary Input 5 (N/O - Figure 4)

Auxiliary Input 6 (N/O - Figure 4)

Auxiliary Input 7 (N/O - Figure 4)

Auxiliary Input 8 (N/O - Figure 4)

Tamper Input
(N/C - Jumper if not used)

Power Fault
(N/C - Jumper if not used)

J2 - Reader Power

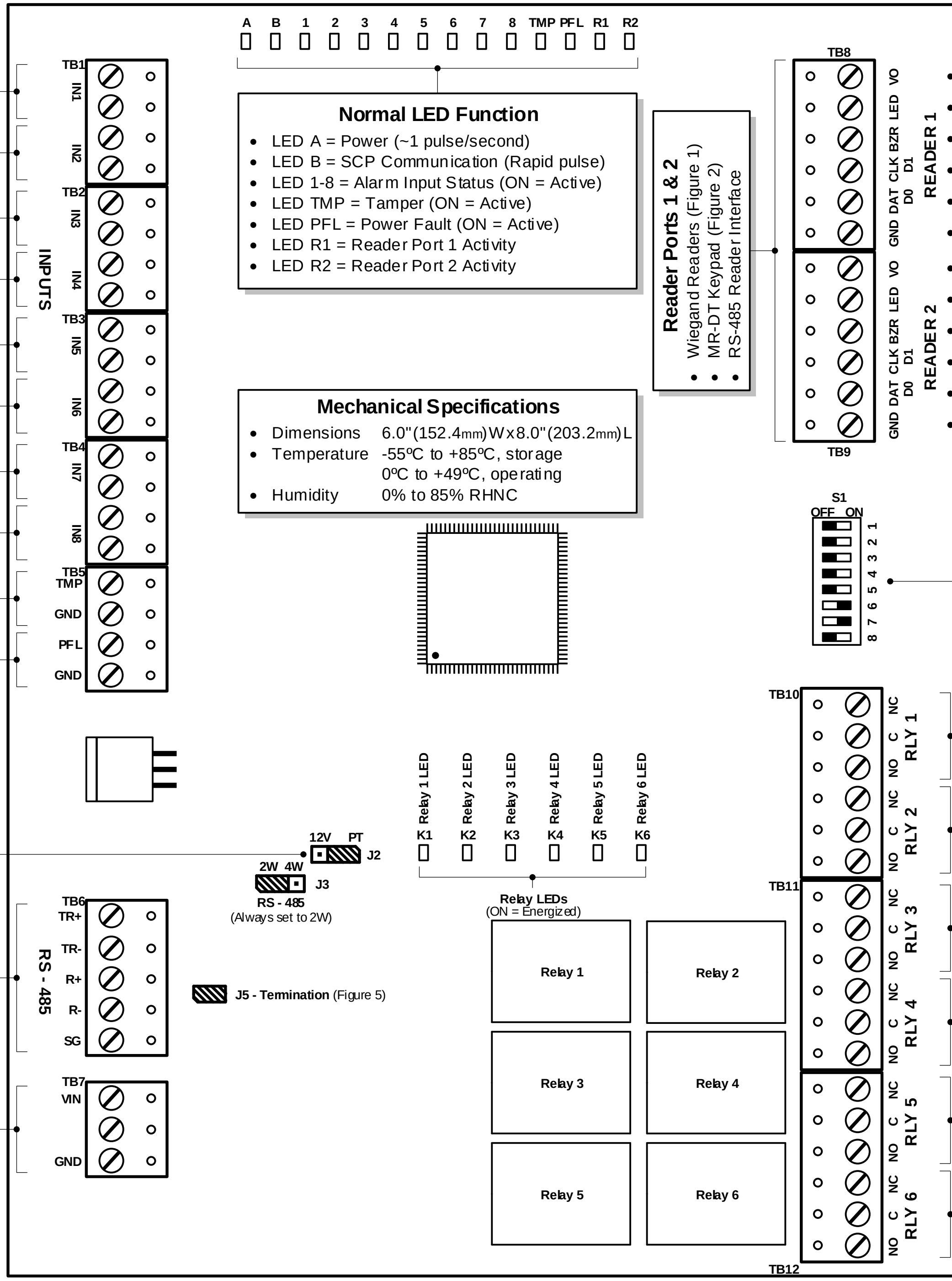
J2 Setting	Reader Port VO Output (150mA max.)
12V	VO = 12Vdc regulated
PT	VO = VIN

Use 12V setting ONLY when VIN power is >16Vdc.

Readers requiring a different rating than listed above should be powered separately. The reader ground must reference the panel ground.

RS-485 Bus
(2 wire ONLY! - Figure 5)

12 to 24 Volts DC
(550mA max.)



Normal LED Function

- LED A = Power (~1 pulse/second)
- LED B = SCP Communication (Rapid pulse)
- LED 1-8 = Alarm Input Status (ON = Active)
- LED TMP = Tamper (ON = Active)
- LED PFL = Power Fault (ON = Active)
- LED R1 = Reader Port 1 Activity
- LED R2 = Reader Port 2 Activity

Mechanical Specifications

- Dimensions 6.0"(152.4mm)Wx8.0"(203.2mm)L
- Temperature -55ºC to +85ºC, storage
  0ºC to +49ºC, operating
- Humidity 0% to 85% RHNC

Reader Ports 1 & 2

- Wiegand Readers (Figure 1)
- MR-DT Keypad (Figure 2)
- RS-485 Reader Interface

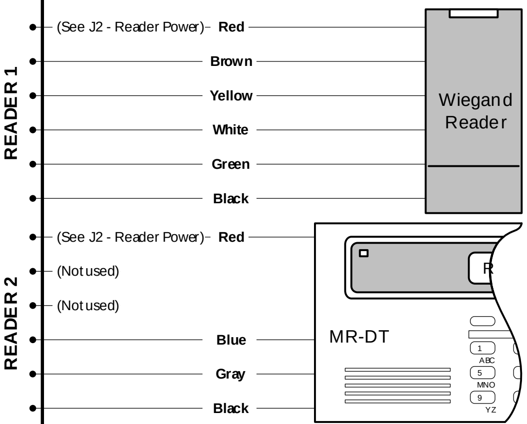


Figure 1 (Wiegand Reader Example)

Figure 2 (MR-DT* Keypad Example)

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.

Door Strike 1
(5A@28Vdc resistive - Figure 3)

Auxiliary Output 2
(5A@28Vdc resistive - Figure 3)

Door Strike 2
(5A@28Vdc resistive - Figure 3)

Auxiliary Output 4
(5A@28Vdc resistive - Figure 3)

Auxiliary Output 5
(5A@28Vdc resistive - Figure 3)

Auxiliary Output 6
(5A@28Vdc resistive - Figure 3)

TOC

Oview

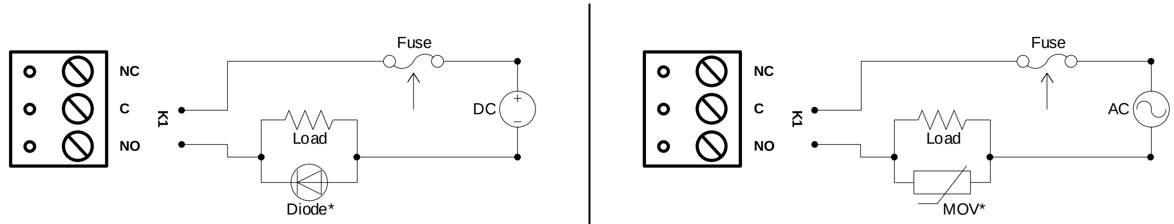
Table 1: S1 - Address Dip Switch

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

Figure 3: Output Wiring Configurations

Depending on your power source, use one of the two methods of transient clamping shown below to protect the relay contacts and to reduce electromagnetic interference (EMI emissions). Always protect against accidental overloads by wiring in an inline fuse to the C (common) side of the relay as shown below.

DC Source **AC Source**



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

***MOV Selection – Inductive Load**
Clamp Voltage > 1.5x Vac RMS
24Vac Strike, Panasonic ERZ-C07DK470 Typical

Figure 4: Input Wiring Configurations

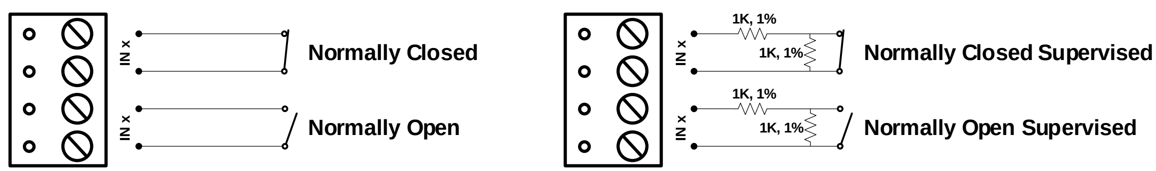
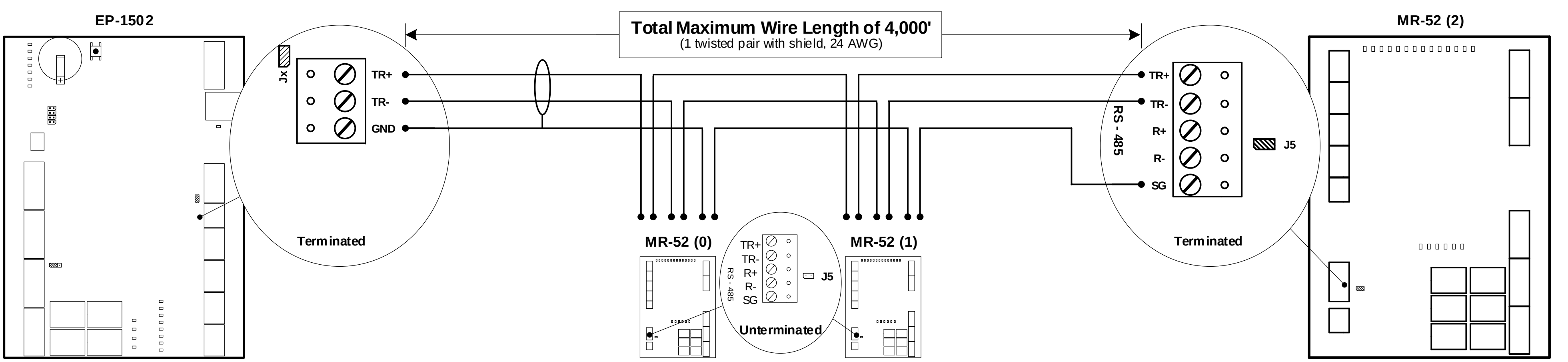


Figure 5: Two Wire RS-485 Wiring



*The SCP is at the beginning of the bus, so Jx **IS** terminated.*
(see SCP quick reference for specific jumper identification)

*MR-52s (0) and (1) are in the middle of the bus, so J5 is **NOT** terminated.*

*The MR-52 (2) is at the end of the bus, so J5 **IS** terminated.*

Refer to NCL-12UL Hardware Installation Manual DOCNCL12UL-R1

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MR-52 Series 3 Quick Reference

Detail

Not evaluated by UL

Door Contact 1 - N/C (Jumper if not used)
See Figure 2

Exit Request 1 - N/O
See Figure 2

Door Contact 2 - N/C (Jumper if not used)
See Figure 2

Exit Request 2 - N/O
See Figure 2

Auxiliary Input 5 - N/O
See Figure 2

Auxiliary Input 6 - N/O
See Figure 2

Auxiliary Input 7 - N/O
See Figure 2

Auxiliary Input 8 - N/O
See Figure 2

Tamper Input
N/C (jumper if not used)

Power Fault N/C (jumper if not used)

J1 - Reader Power (300mA max per port)

PT Position - VO = VIN (12Vdc to 24Vdc ±10%)
If VIN is 12Vdc, PT position MUST be used!

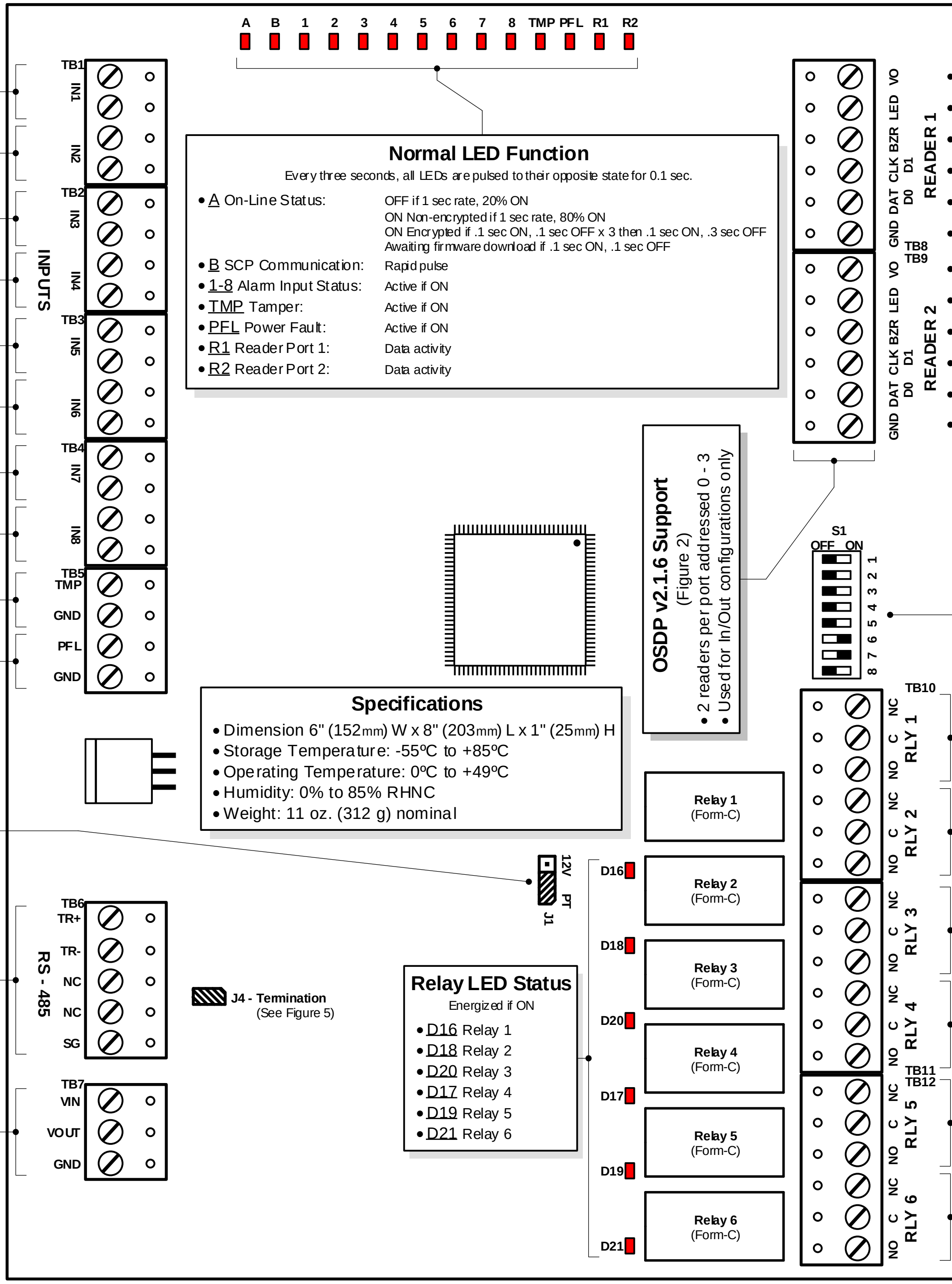
12V Position - VO = 12Vdc ±10% regulated
Use 12V position ONLY if VIN power is >20Vdc.

Readers requiring a different rating than listed above should be powered separately. The reader ground must reference the panel ground.

Two Wire RS-485 Bus
See Figure 3

Power (550mA max plus readers)
CABLING: 1 twisted pair, minimum 18 AWG

VIN (Voltage In): Positive 12 to 24 Volts ±10% DC
VOUT (Voltage Out): Not used
GND (Ground): Input Voltage Return (-)



Normal LED Function

Every three seconds, all LEDs are pulsed to their opposite state for 0.1 sec.

• A On-Line Status:	OFF if 1 sec rate, 20% ON ON Non-encrypted if 1 sec rate, 80% ON ON Encrypted if .1 sec ON, .1 sec OFF x 3 then .1 sec ON, .3 sec OFF Awaiting firmware download if .1 sec ON, .1 sec OFF
• B SCP Communication:	Rapid pulse
• 1-8 Alarm Input Status:	Active if ON
• TMP Tamper:	Active if ON
• PFL Power Fault:	Active if ON
• R1 Reader Port 1:	Data activity
• R2 Reader Port 2:	Data activity

Specifications

- Dimension 6" (152mm) W x 8" (203mm) L x 1" (25mm) H
- Storage Temperature: -55ºC to +85ºC
- Operating Temperature: 0ºC to +49ºC
- Humidity: 0% to 85% RHNC
- Weight: 11 oz. (312 g) nominal

Relay LED Status

Energized if ON

- D16 Relay 1
- D18 Relay 2
- D20 Relay 3
- D17 Relay 4
- D19 Relay 5
- D21 Relay 6

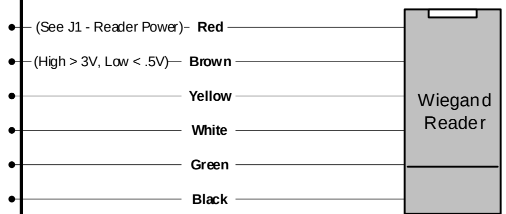


Figure 1
Wiegand Reader Example
CABLING: 6-conductor, 18 AWG, 500 feet (150 m) max

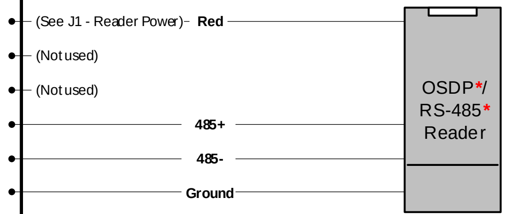


Figure 2
OSDP / RS-485 Reader Example
CABLING: 1 twisted pair, 18 AWG for power and 1 twisted pair w/drain & shield, 24 AWG, 120Ω impedance, 2,000 feet (610 m) max for communication

S1 - Configuration Switch

- S1-1 thru S1-5: SIO Address (Table 1)
  Each SIO address must be unique.
- S1-6 thru S1-7: Baud Rate (Table 2)
- S1-8: Require Encryption if ON

Door Strike 1
Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 1

Auxiliary Output 2
Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 1

Door Strike 2
Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 1

Auxiliary Output 4
Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 1

Auxiliary Output 5
Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 1

Auxiliary Output 6
Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 1

TOC

Oview

Table 1: SIO Address

Address	S1-1	S1-2	S1-3	S1-4	S1-5
0	OFF	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF
5	ON	OFF	ON	OFF	OFF
6	OFF	ON	ON	OFF	OFF
7	ON	ON	ON	OFF	OFF
8	OFF	OFF	OFF	ON	OFF
9	ON	OFF	OFF	ON	OFF
10	OFF	ON	OFF	ON	OFF
11	ON	ON	OFF	ON	OFF
12	OFF	OFF	ON	ON	OFF
13	ON	OFF	ON	ON	OFF
14	OFF	ON	ON	ON	OFF
15	ON	ON	ON	ON	OFF

Address	S1-1	S1-2	S1-3	S1-4	S1-5
16	OFF	OFF	OFF	OFF	ON
17	ON	OFF	OFF	OFF	ON
18	OFF	ON	OFF	OFF	ON
19	ON	ON	OFF	OFF	ON
20	OFF	OFF	ON	OFF	ON
21	ON	OFF	ON	OFF	ON
22	OFF	ON	ON	OFF	ON
23	ON	ON	ON	OFF	ON
24	OFF	OFF	OFF	ON	ON
25	ON	OFF	OFF	ON	ON
26	OFF	ON	OFF	ON	ON
27	ON	ON	OFF	ON	ON
28	OFF	OFF	ON	ON	ON
29	ON	OFF	ON	ON	ON
30	OFF	ON	ON	ON	ON
31	ON	ON	ON	ON	ON

Table 2: Baud Rate

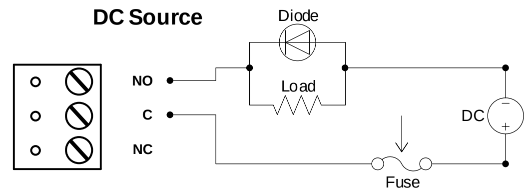
S1-6	S1-7	Baud Rate
ON	ON	38,400 bps†
OFF	ON	19,200 bps*
ON	OFF	9,600 bps*
OFF	OFF	115,200 bps*

†Access It! Universal.NET default value.
*Not evaluated by UL

Figure 1: Output Wiring Options

CABLING: As required for the load

Door lock mechanisms can generate feedback to the relay circuit that can cause damage and premature failure of the relay. For this reason, a diode must be used to protect the relay. Wire should be of sufficient gauge to avoid voltage loss.



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

Figure 2: Input Wiring Options

CABLING: 1 twisted pair per input, 30Ω maximum

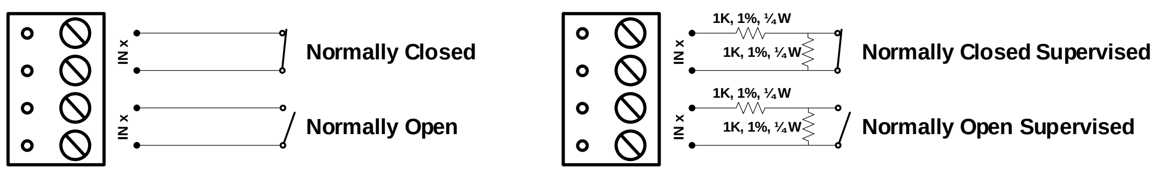
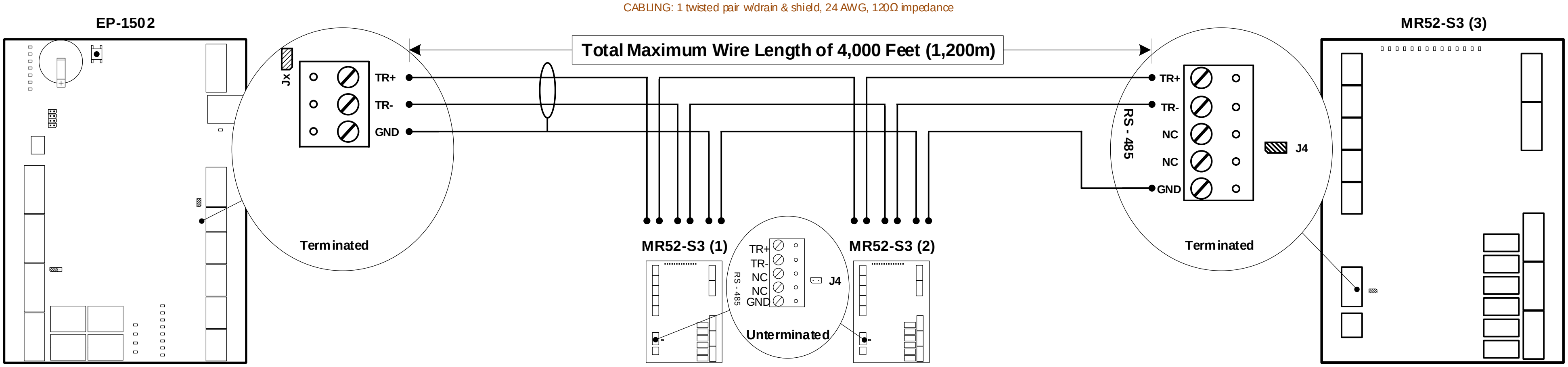


Figure 3: Two Wire RS-485 Wiring

CABLING: 1 twisted pair w/drain & shield, 24 AWG, 120Ω impedance



*The SCP is at the beginning of the bus, so Jx **IS** terminated.*
(see SCP quick reference for specific jumper identification)
Only Stand-Alone system was evaluated by UL

*MR52-S3s (1) and (2) are in the middle of the bus, so J4 is **NOT** terminated.*

*The MR52-S3 (3) is at the end of the bus, so J4 **IS** terminated.*

Refer to NCL-12UL Hardware Installation Manual DOCNCL12UL-R1

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MR-62E Quick Reference

Detail

MR-62E not evaluated by UL

S1 - Configuration Dip Switch
See Explanation 1

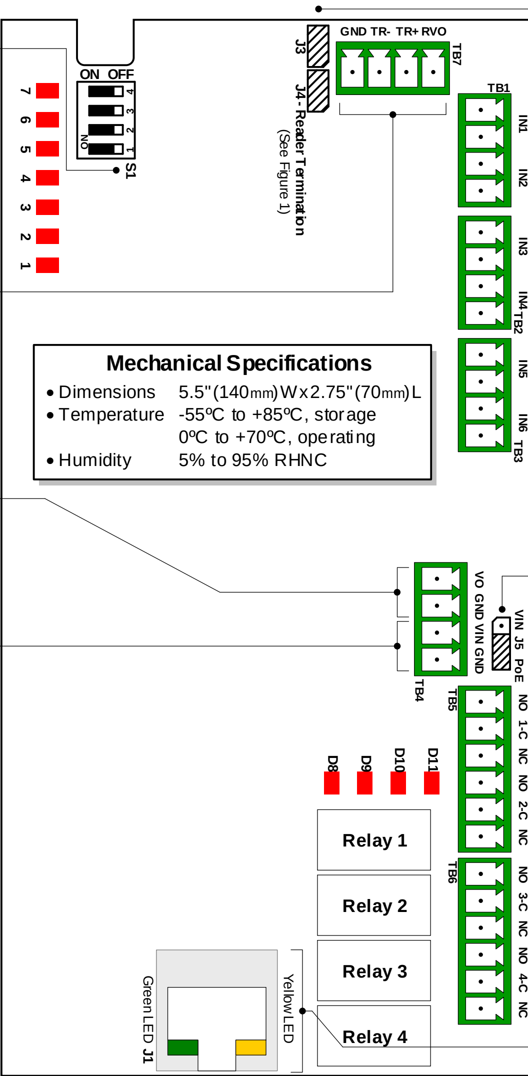
OSDP Reader Port
See Figure 1
- Up to 4 OSDP readers controlling 2 portals
- OSDP v2.1.6 support
- OSDP used for In/Out configurations only
- OSDP requires unique addressing from 0 - 3

Auxiliary Power

Power Source	Available Power
PoE	12Vdc@660mA max.
PoE+	12Vdc@1A max.
Local Power Supply	12Vdc@1A max.

VO (Voltage Out): Positive 12 Volts DC
GND (Ground): Input Voltage Return (-)

Local Power Supply (1.7A max plus readers)
CABLING: 1 twisted pair, minimum 18 AWG when using local 12Vdc
VIN (Voltage In): Positive 12 Volts ±10% DC
GND (Ground): Input Voltage Return (-)



Mechanical Specifications
- Dimensions 5.5"(140mm)Wx2.75"(70mm)L
- Temperature -55ºC to +85ºC, storage; 0ºC to +70ºC, operating
- Humidity 5% to 95% RHNC

J3 - Tamper Input
N/C (jumper if not used)

Door Contact 1 - N/C (jumper if not used)
See Figure 2

Exit Request 1 - N/O
See Figure 2

Door Contact 2 - N/C (jumper if not used)
See Figure 2

Exit Request 2 - N/O
See Figure 2

Auxiliary Input 5 - N/O
See Figure 2

Auxiliary Input 6 - N/O
See Figure 2

J5 - Power Source Selector

J5 Setting	Power Source
PoE*	Power Over Ethernet
VIN†	Local Power Supply

* PoE IEEE 802.3af compliant (12.95 W)
PoE+ IEEE 802.3at compliant (25 W)

†12Vdc power connected to TB4. Positive lead to pin 3 (VIN) and negative lead to pin 4 (GND)

Door Strike 1 (2A@30Vdc)
See Figure 3

Auxiliary Output 2 (2A@30Vdc)
See Figure 3

Door Strike 2 (2A@30Vdc)
See Figure 3

Auxiliary Output 4 (2A@30Vdc)
See Figure 3

10/100 Ethernet Host Channel
See Explanation 1

Normal LED Function
At power up, LED 1 turns ON then LEDs 2 through 7 are turned ON then OFF in sequence.

LED	Description	Status		
1	On-line Status	On-line = 4 pulses/sec; 0.1 sec ON, 0.1 sec OFF, OFF for .3 sec		
	Off-line = 0.2 sec ON, 0.8 sec OFF			
		Awaiting firmware download = 0.1 sec ON, 0.1 sec OFF		
		ON	**OFF**	**Flashing**
2*	Door 1 Contact	Open	Closed	Fault
3*	Door 1 REX	Active	Inactive	Fault
4*	Door 2 Contact	Open	Closed	Fault
5*	Door 2 REX	Active	Inactive	Fault
6*	Auxiliary Input 4	Active	Inactive	Fault
7*	Auxiliary Input 5	Active	Inactive	Fault
Yellow	Ethernet Speed	10 Mb/S	100 Mb/S	N/A
Green	Link/Ethernet Activity	No Link	Link	Ethernet Activity

*Every 3 seconds the LED is pulsed to its opposite state for 0.1 seconds, otherwise the LED is OFF.

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Oview

Explanation 1: 10/100 Ethernet

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 MR-62E
4. Manually configure a computer to 192.168.0.100
5. Using a crossover cable, connect computer to MR-62E
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>**
    Select DHCP if needed.
14. Click **'Accept'**
15. Click **'Apply Setting'** from the left hand menu
16. Click **'Apply and Reboot'** button
17. Wait 60 seconds for MR-62E to reboot
18. Remove power from the MR-62E
19. Set all S1 - Configuration DIP Switch DIPs OFF
20. Remove crossover cable and connect to network
21. Apply power to the MR-62E
22. Run Access It! Universal.NET
23. Navigate to the Hardware section
24. Click the arrow to expand the SCPs
25. Click the arrow to expand the SCP the MR-62E will be installed under
26. Select SIOs
    A list of all available SIOs appear in the pane to the right of the hardware tree.
27. Edit the first uninstalled SIO from the right hand pane
    General Tab
    Model: **MR-62E**
    Device Installed: **X**
    IP Address: **<Enter IP Address to be assigned to MR-62E>**
    MAC Address: **<MAC Address of MR-62E>**
28. Click Save button

Bulk Erasing MR-62E

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 MR-62E
    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
    LEDs 1 & 2 alternately flash at a 0.5 second rate while memory is erased.
    WARNING! DO NOT CYCLE POWER
    Erasing memory takes approximately 60 seconds to complete.
    Once memory is erased, LED 1 will be on for ~3 seconds, then the MR-62E reboots.
5. The MR-62E is now ready to be configured as needed

Figure 1: OSDP Reader Port

CABLING:
RS-485/power: 2 twisted pair w/drain & shield, 24 AWG, 120Ω impedance, 4,000 feet (1220 m) max
OR
RS-485: 1 twisted pair w/drain & shield, 24 AWG, 120Ω impedance, 4,000 feet (1220 m) max
Power: 1 pair 18 AWG (cable type and gauge determined by length and voltage/current requirements, local power source may be required)

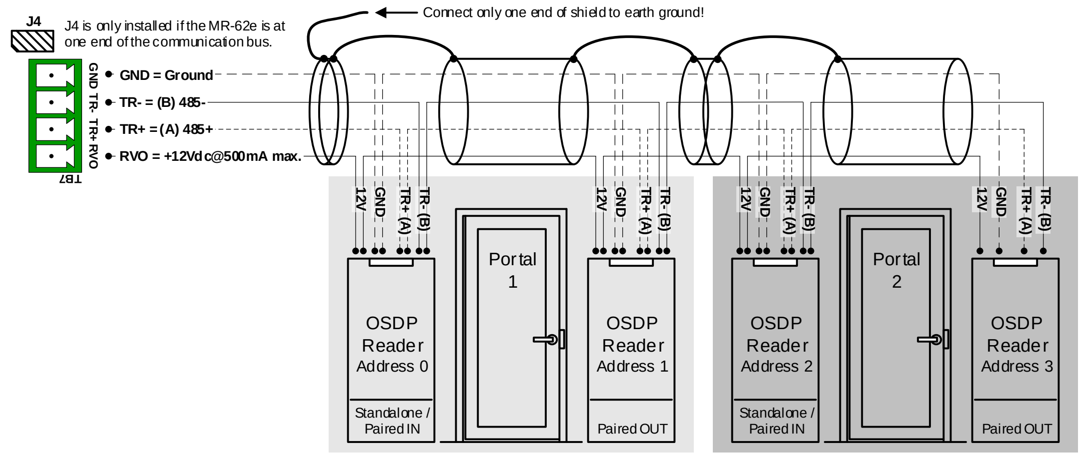


Figure 2: Input Wiring Options

CABLING: 1 twisted pair per input, 30Ω maximum

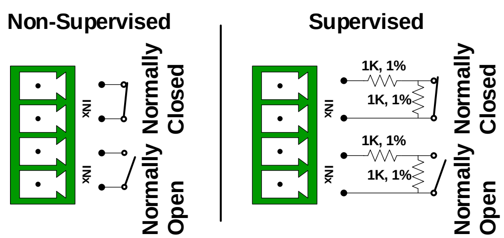
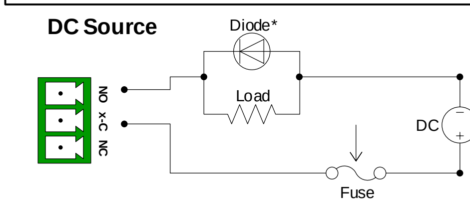


Figure 3: Output Wiring Options

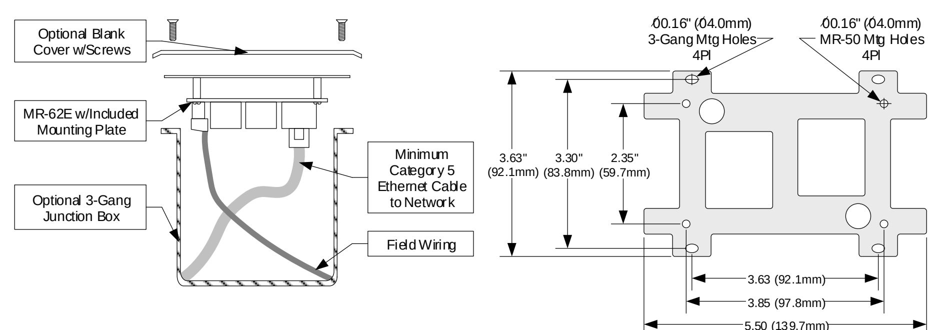
CABLING: As required for the load

Door lock mechanisms can generate feedback to the relay circuit that can cause damage and premature failure of the relay. For this reason, a diode must be used to protect the relay. Wire should be of sufficient gauge to avoid voltage loss.



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

Figure 4: Mounting Information



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MR-16IN Series 1 Quick Reference

Detail

MR-16IN Series 1 not evaluated by UL

Auxilliary Input 1 (N/O - Figure 1)

Auxilliary Input 2 (N/O - Figure 1)

Auxilliary Input 3 (N/O - Figure 1)

Auxilliary Input 4 (N/O - Figure 1)

Auxilliary Input 5 (N/O - Figure 1)

Auxilliary Input 6 (N/O - Figure 1)

Auxilliary Input 7 (N/O - Figure 1)

Auxilliary Input 8 (N/O - Figure 1)

Tamper Input (N/C - Jumper if not used)

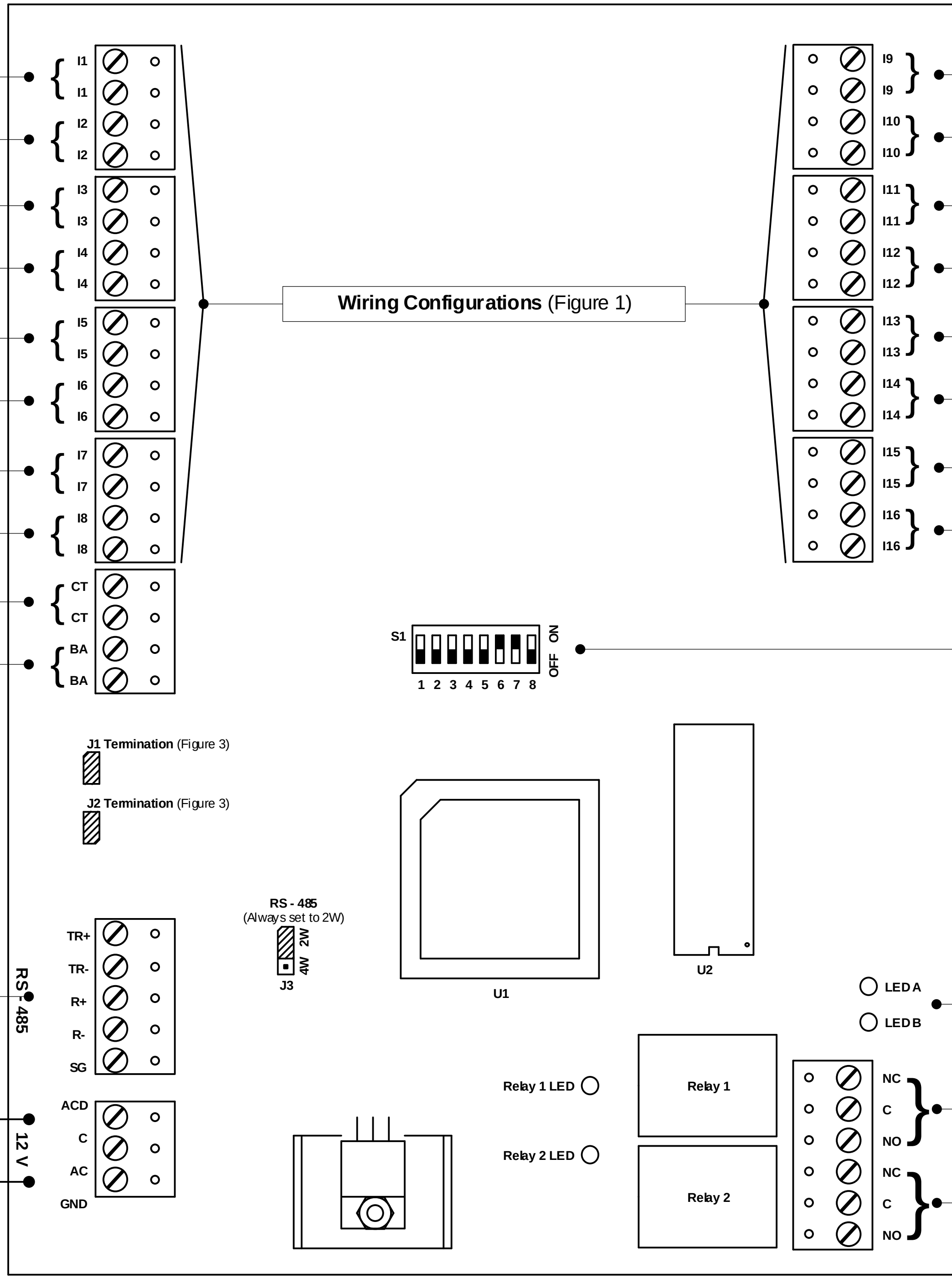
Power Fault (N/C - Jumper if not used)

RS - 485 Bus (Figure 2)

+

12 Volts DC (350mA)

-



Auxilliary Input 9 (N/O - Figure 1)

Auxilliary Input 10 (N/O - Figure 1)

Auxilliary Input 11 (N/O - Figure 1)

Auxilliary Input 12 (N/O - Figure 1)

Auxilliary Input 13 (N/O - Figure 1)

Auxilliary Input 14 (N/O - Figure 1)

Auxilliary Input 15 (N/O - Figure 1)

Auxilliary Input 16 (N/O - Figure 1)

S1 - Address Dip Switch
(Table 1)

- ✓ Start at address 0.
- ✓ Each MR-16IN address in the bus must be unique.
- ✓ Set switches prior to powering up.

Normal LED Function
LED A = Power (~1 pulse/second)
LED B = SCP Communication (Rapid pulse)

Auxillary Output 1

Auxillary Output 2

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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

Oview

Figure 1: Wiring Configurations

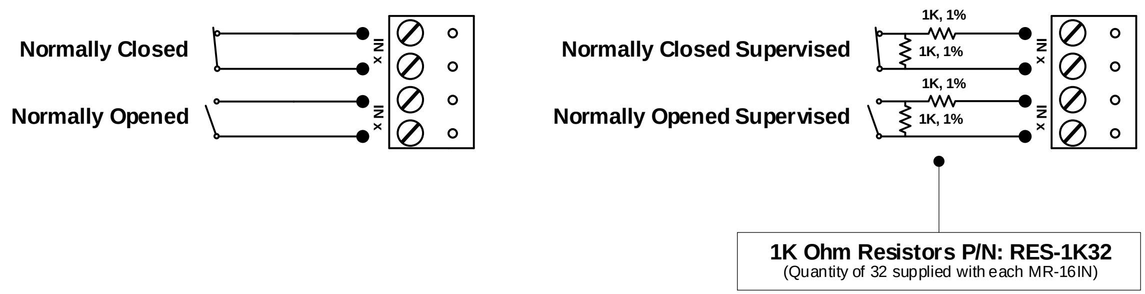
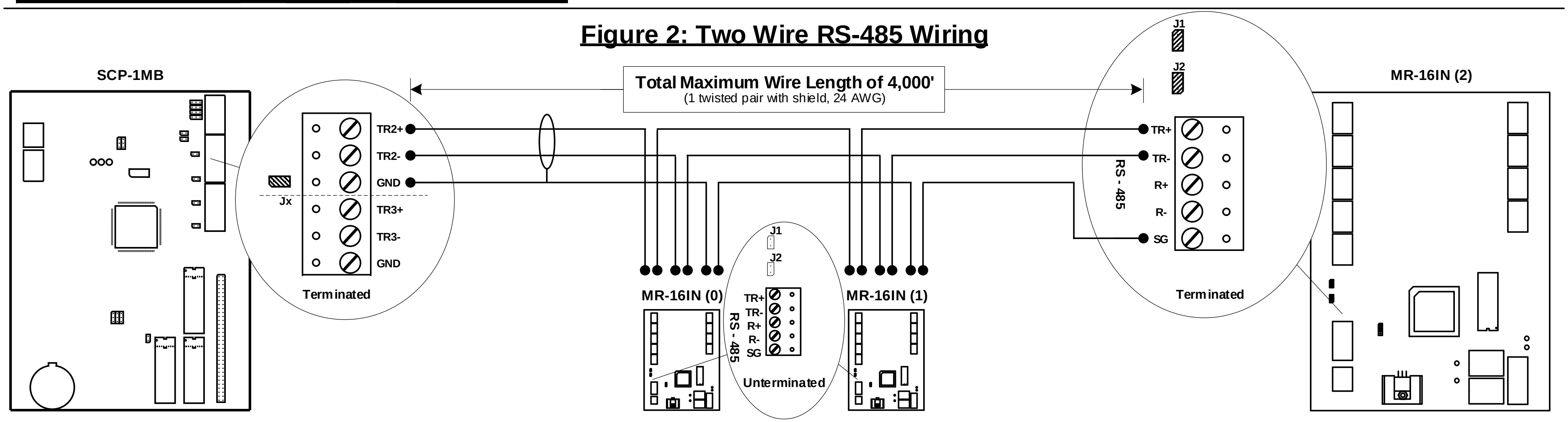


Figure 2: Two Wire RS-485 Wiring



*The SCP is at the beginning of the bus, so Jx **IS** terminated.*
(see SCP quick reference sheet for specific jumper identification)

*MR-16INs (0) and (1) are in the middle of the bus, so J1 and J2 are **NOT** terminated.*

*The MR-16IN (2) is at the end of the bus, so J1 & J2 **ARE** terminated.*

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MR-16IN Series 2 Quick Reference

Detail

Auxiliary Input 1 (N/O - Figure 2)

Auxiliary Input 2 (N/O - Figure 2)

Auxiliary Input 3 (N/O - Figure 2)

Auxiliary Input 4 (N/O - Figure 2)

Auxiliary Input 5 (N/O - Figure 2)

Auxiliary Input 6 (N/O - Figure 2)

Auxiliary Input 7 (N/O - Figure 2)

Auxiliary Input 8 (N/O - Figure 2)

Tamper Input
(N/C - Jumper if not used)

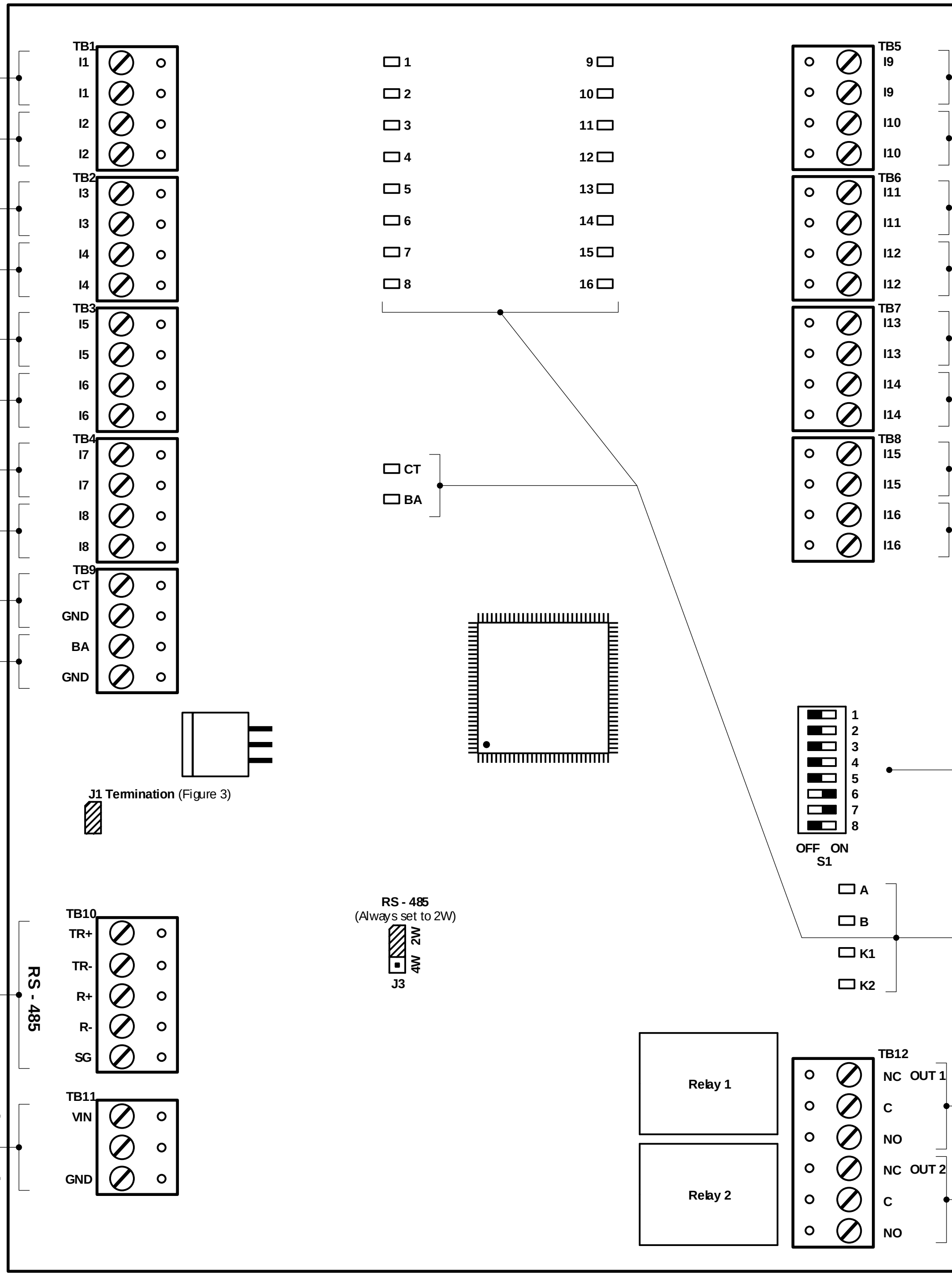
Power Fault
(N/C - Jumper if not used)

Mechanical Specifications

- Dimensions 6.0"(152.4mm)W x 8.0"(203.2mm)L
- Temperature -55ºC to +85ºC, storage
  0ºC to +49ºC, operating
- Humidity 0% to 85% RHNC

RS-485 Bus
(2 wire ONLY! - Figure 3)

12 to 24 Volts DC
(350mA max.)



Auxiliary Input 9 (N/O - Figure 2)

Auxiliary Input 10 (N/O - Figure 2)

Auxiliary Input 11 (N/O - Figure 2)

Auxiliary Input 12 (N/O - Figure 2)

Auxiliary Input 13 (N/O - Figure 2)

Auxiliary Input 14 (N/O - Figure 2)

Auxiliary Input 15 (N/O - Figure 2)

Auxiliary Input 16 (N/O - Figure 2)

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 A = Power (~1 pulse/second)
- LED B = SCP Communication (Rapid pulse)
- LED K1 = Relay 1 (ON = Energized)
- LED K2 = Relay 2 (ON = Energized)
- LEDs 1-16 = Alarm Input Status (ON = Active)
- LED BA = Power Fault (ON = Active)
- LED CT = Tamper (ON = Active)

Auxiliary Output 1
(5A@28Vdc resistive - Figure 1)

Auxiliary Output 2
(5A@28Vdc resistive - Figure 1)

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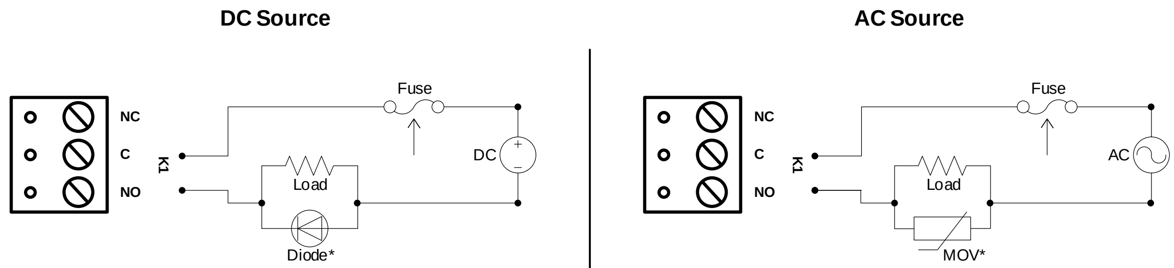
Table 1: S1 - Address Dip Switch

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

Figure 1: Output Wiring Configurations

Oview

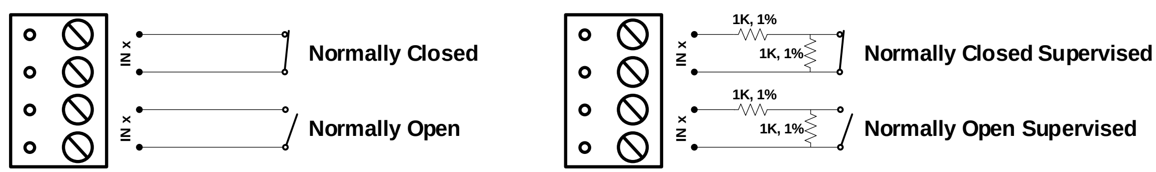
Depending on your power source, use one of the two methods of transient clamping shown below to protect the relay contacts and to reduce electromagnetic interference (EMI emissions). Always protect against accidental overloads by wiring in an inline fuse to the C (common) side of the relay as shown below.



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

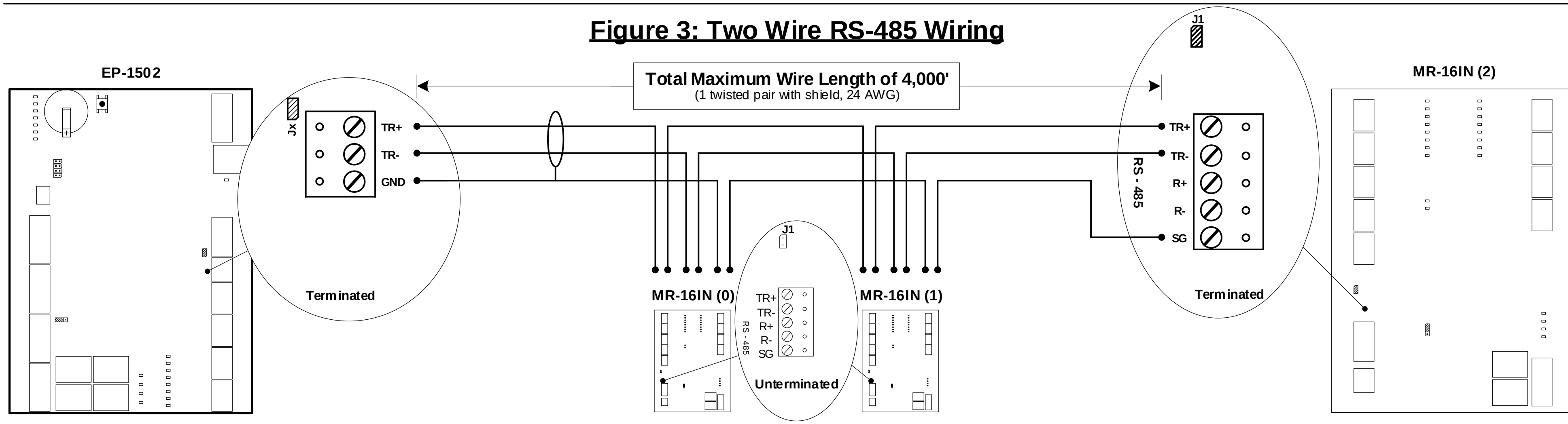
***MOV Selection – Inductive Load**
Clamp Voltage > 1.5x Vac RMS
24Vac Strike, Panasonic ERZ-C07DK470 Typical

Figure 2: Input Wiring Configurations



1K Ohm Resistors P/N: RES-1K32
(Quantity of 32 supplied with each MR-16IN)

Figure 3: Two Wire RS-485 Wiring



*The SCP is at the beginning of the bus, so Jx **IS** terminated.*
(see SCP quick reference for specific jumper identification)

*MR-16INs (0) and (1) are in the middle of the bus, so J1 is **NOT** terminated.*

*The MR-16IN (2) is at the end of the bus, so J1 **IS** terminated.*

Refer to NCL-12UL Hardware Installation Manual DOCNCL12UL-R1

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MR-16IN Series 3 Quick Reference

Detail

Not evaluated by UL

Auxiliary Input 1 - N/O
See Figure 2

Auxiliary Input 2 - N/O
See Figure 2

Auxiliary Input 3 - N/O
See Figure 2

Auxiliary Input 4 - N/O
See Figure 2

Auxiliary Input 5 - N/O
See Figure 2

Auxiliary Input 6 - N/O
See Figure 2

Auxiliary Input 7 - N/O
See Figure 2

Auxiliary Input 8 - N/O
See Figure 2

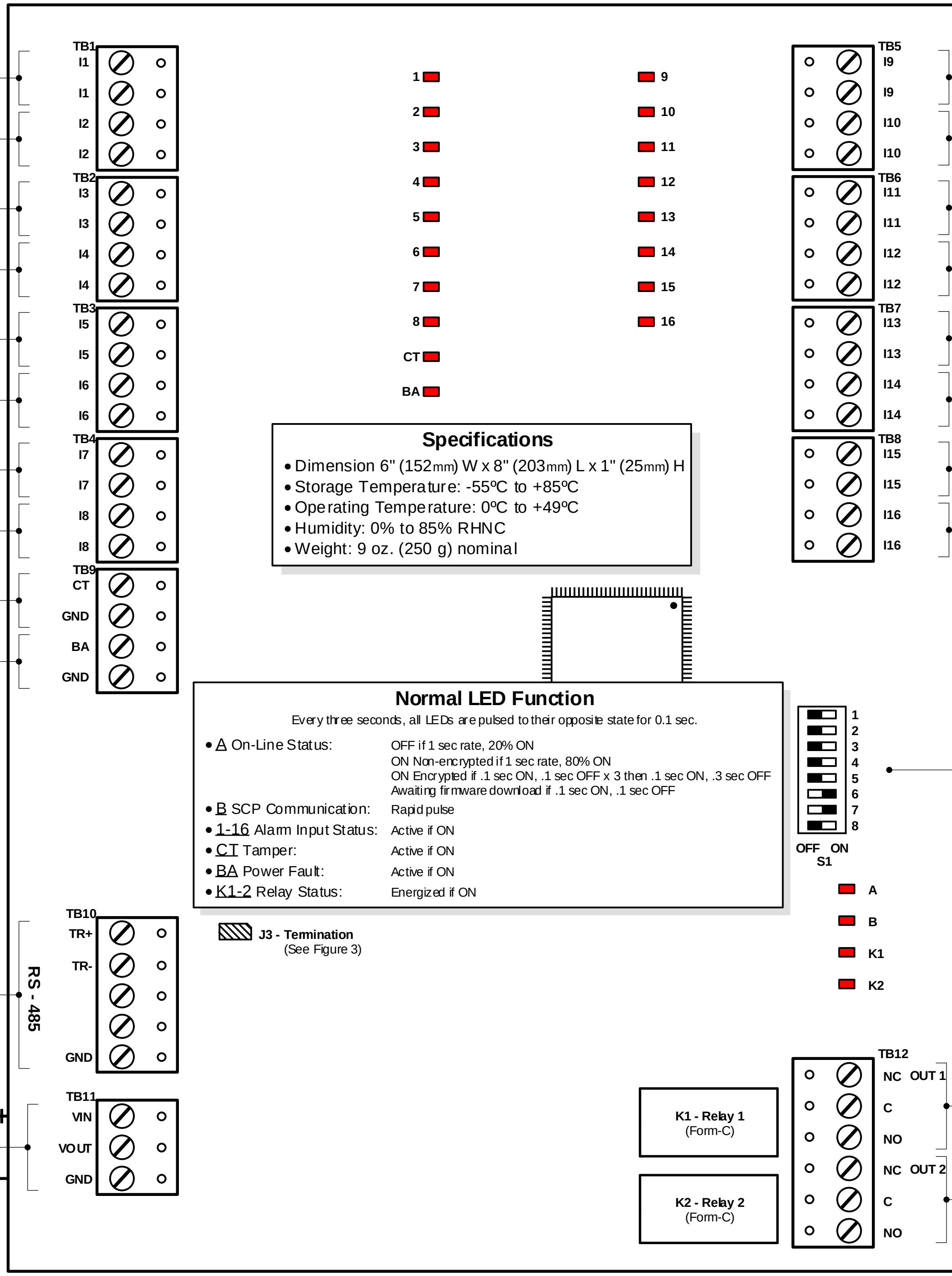
Tamper Input
N/C (jumper if not used)

Power Fault
N/C (jumper if not used)

Two Wire RS-485 Bus
See Figure 3

Power (350mA max)
CABLING: 1 twisted pair, minimum 18 AWG

VIN (Voltage In): Positive 12 to 24 Volts ±10% DC
VOUT (Voltage Out): Not used
GND (Ground): Input Voltage Return (-)



Specifications

- Dimension 6" (152mm) W x 8" (203mm) L x 1" (25mm) H
- Storage Temperature: -55ºC to +85ºC
- Operating Temperature: 0ºC to +49ºC
- Humidity: 0% to 85% RHNC
- Weight: 9 oz. (250 g) nominal

Normal LED Function

Every three seconds, all LEDs are pulsed to their opposite state for 0.1 sec.

- A On-Line Status: OFF if 1 sec rate, 20% ON
  ON Non-encrypted if 1 sec rate, 80% ON
  ON Encrypted if .1 sec ON, .1 sec OFF x 3 then .1 sec ON, .3 sec OFF
  Awaiting firmware download if .1 sec ON, .1 sec OFF
- B SCP Communication: Rapid pulse
- 1-16 Alarm Input Status: Active if ON
- CT Tamper: Active if ON
- BA Power Fault: Active if ON
- K1-2 Relay Status: Energized if ON

Auxiliary Input 9 - N/O
See Figure 2

Auxiliary Input 10 - N/O
See Figure 2

Auxiliary Input 11 - N/O
See Figure 2

Auxiliary Input 12 - N/O
See Figure 2

Auxiliary Input 13 - N/O
See Figure 2

Auxiliary Input 14 - N/O
See Figure 2

Auxiliary Input 15 - N/O
See Figure 2

Auxiliary Input 16 - N/O
See Figure 2

S1 - Configuration Switch
- S1-1 thru S1-5: SIO Address (Table 1)
  Each SIO address must be unique.
- S1-6 thru S1-7: Baud Rate (Table 2)
- S1-8: Require Encryption if ON

Auxiliary Output 1
Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 1

Auxiliary Output 2
Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 1

TOC

Oview

Table 1: SIO Address

Address	S1-1	S1-2	S1-3	S1-4	S1-5
0	OFF	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF
5	ON	OFF	ON	OFF	OFF
6	OFF	ON	ON	OFF	OFF
7	ON	ON	ON	OFF	OFF
8	OFF	OFF	OFF	ON	OFF
9	ON	OFF	OFF	ON	OFF
10	OFF	ON	OFF	ON	OFF
11	ON	ON	OFF	ON	OFF
12	OFF	OFF	ON	ON	OFF
13	ON	OFF	ON	ON	OFF
14	OFF	ON	ON	ON	OFF
15	ON	ON	ON	ON	OFF

Address	S1-1	S1-2	S1-3	S1-4	S1-5
16	OFF	OFF	OFF	OFF	ON
17	ON	OFF	OFF	OFF	ON
18	OFF	ON	OFF	OFF	ON
19	ON	ON	OFF	OFF	ON
20	OFF	OFF	ON	OFF	ON
21	ON	OFF	ON	OFF	ON
22	OFF	ON	ON	OFF	ON
23	ON	ON	ON	OFF	ON
24	OFF	OFF	OFF	ON	ON
25	ON	OFF	OFF	ON	ON
26	OFF	ON	OFF	ON	ON
27	ON	ON	OFF	ON	ON
28	OFF	OFF	ON	ON	ON
29	ON	OFF	ON	ON	ON
30	OFF	ON	ON	ON	ON
31	ON	ON	ON	ON	ON

Table 2: Baud Rate

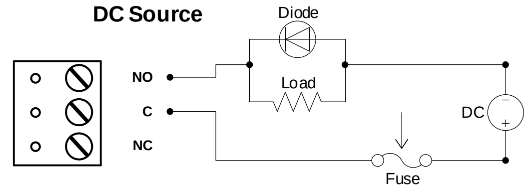
S1-6	S1-7	Baud Rate
ON	ON	38,400 bps†
OFF	ON	19,200 bps*
ON	OFF	9,600 bps*
OFF	OFF	115,200 bps*

†Access It! Universal.NET default value.
*Not evaluated by UL

Figure 1: Output Wiring Options

CABLING: As required for the load

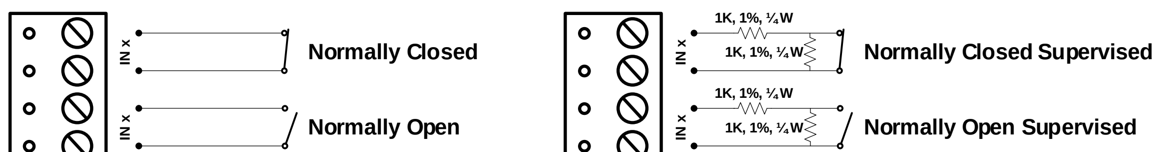
Door lock mechanisms can generate feedback to the relay circuit that can cause damage and premature failure of the relay. For this reason, a diode must be used to protect the relay. Wire should be of sufficient gauge to avoid voltage loss.



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

Figure 2: Input Wiring Options

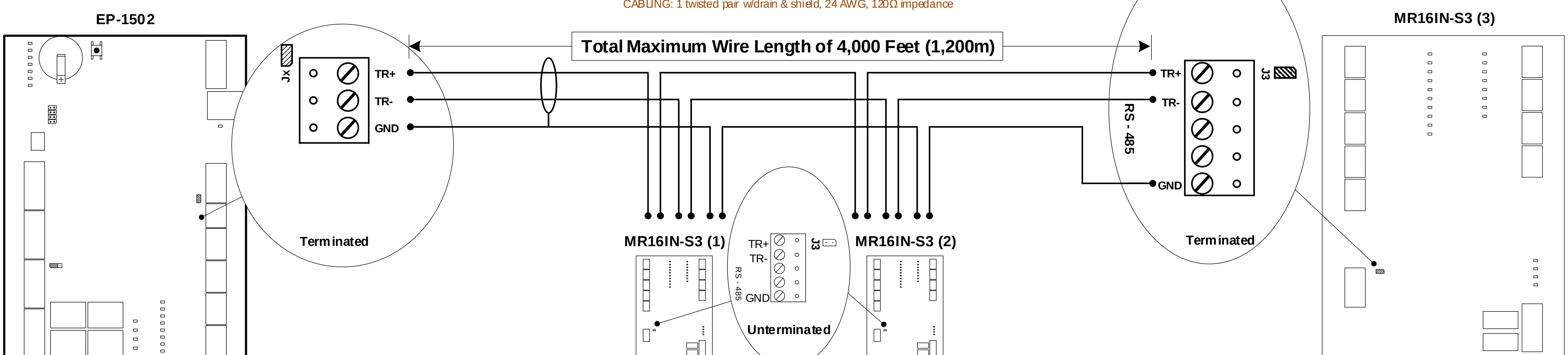
CABLING: 1 twisted pair per input, 30Ω maximum



1K Ohm Resistors P/N: RES-1K32
(Quantity of 32 supplied with each MR-16IN-S3)

Figure 3: Two Wire RS-485 Wiring

CABLING: 1 twisted pair w/drain & shield, 24 AWG, 120Ω impedance



*The SCP is at the beginning of the bus, so Jx **IS** terminated.*
(see SCP quick reference for specific jumper identification)

*MR16IN-S3s (1) and (2) are in the middle of the bus, so J3 is **NOT** terminated.*

*The MR16IN-S3 (3) is at the end of the bus, so J3 **IS** terminated.*

Only Stand-Alone system was evaluated by UL

Refer to NCL-12UL Hardware Installation Manual DOCNCL12UL-R1

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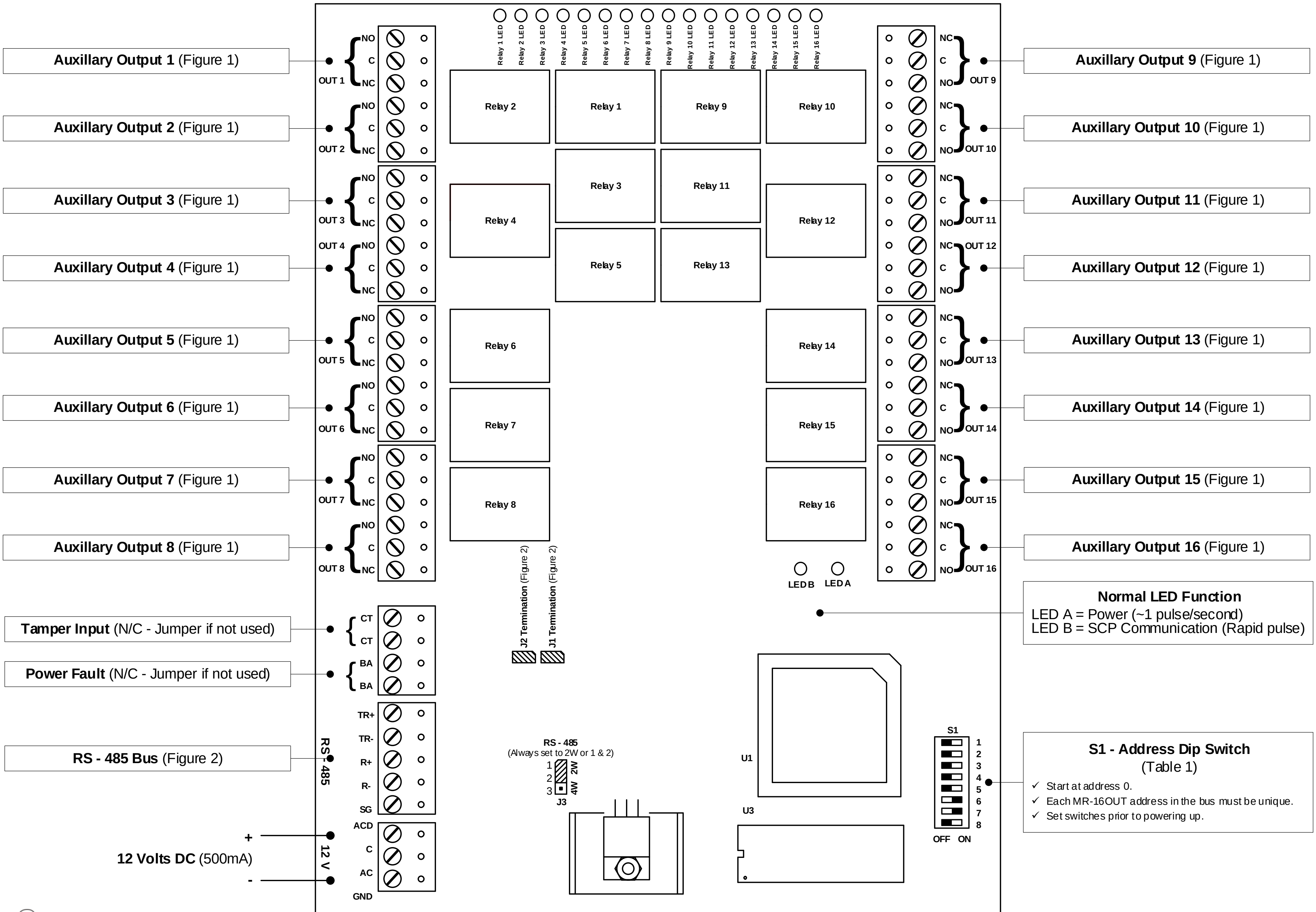
MR-16OUT Series 1 Quick Reference

Detail

MR-16OUT Series 1 not evaluated by UL



TOC

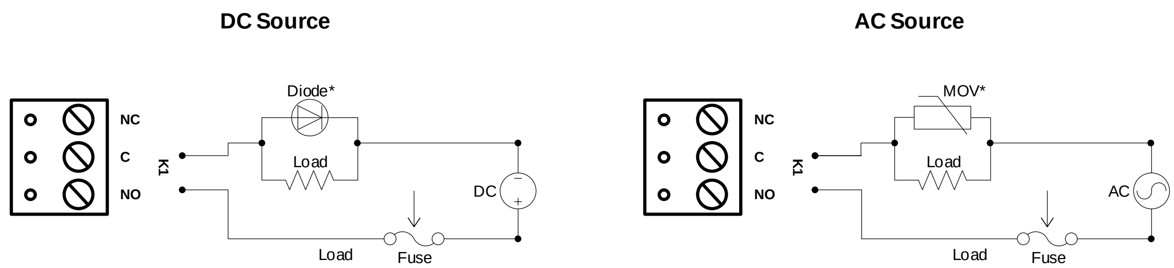
Table 1: S1 - Address Dip Switch

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

Oview

Figure 1: Output Wiring

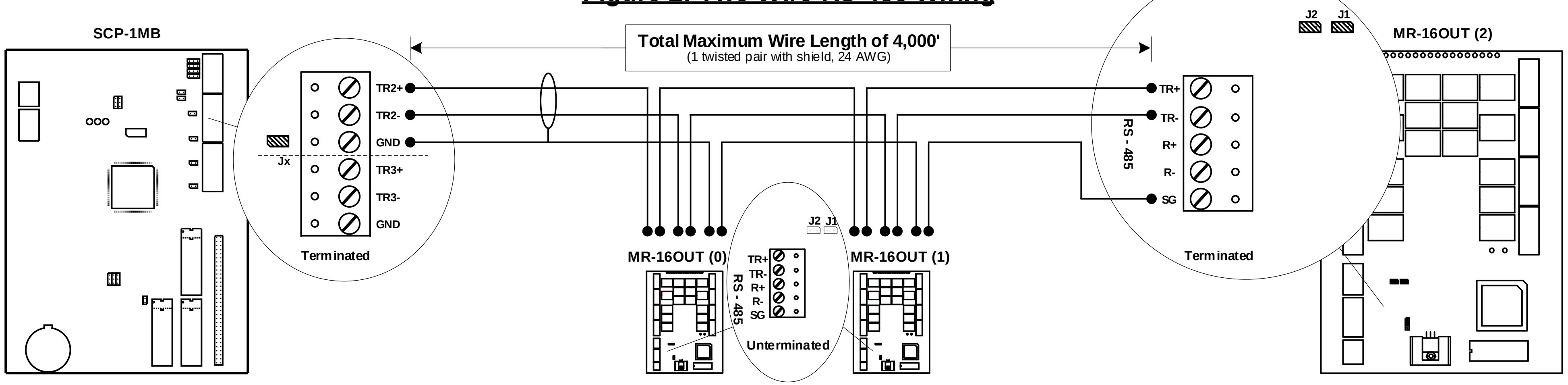
Depending on your power source, use one of the two methods of transient clamping shown below to protect the relay contacts and to reduce electromagnetic interference (EMI emissions). Always protect against accidental overloads by wiring an in-line fuse to the C (common) side of the relay as shown below.



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

***MOV Selection – Inductive Load**
Clamp Voltage > 1.5x Vac RMS
24Vac Strike, Panasonic ERZ-C07DK470 Typical

Figure 2: Two Wire RS-485 Wiring



The SCP is at the beginning of the bus, so Jx ***IS*** *terminated.*
(see SCP quick reference sheet for specific jumper identification)

MR-16OUTs (0) and (1) are in the middle of the bus, so J1 and J2 are ***NOT*** *terminated.*

The MR-16OUT (2) is at the end of the bus, so J1 & J2 ***ARE*** *terminated.*

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MR-16OUT Series 2 Quick Reference

Detail

Auxiliary Output 1
(5A@28Vdc resistive - Figure 1)

Auxiliary Output 2
(5A@28Vdc resistive - Figure 1)

Auxiliary Output 3
(5A@28Vdc resistive - Figure 1)

Auxiliary Output 4
(5A@28Vdc resistive - Figure 1)

Auxiliary Output 5
(5A@28Vdc resistive - Figure 1)

Auxiliary Output 6
(5A@28Vdc resistive - Figure 1)

Auxiliary Output 7
(5A@28Vdc resistive - Figure 1)

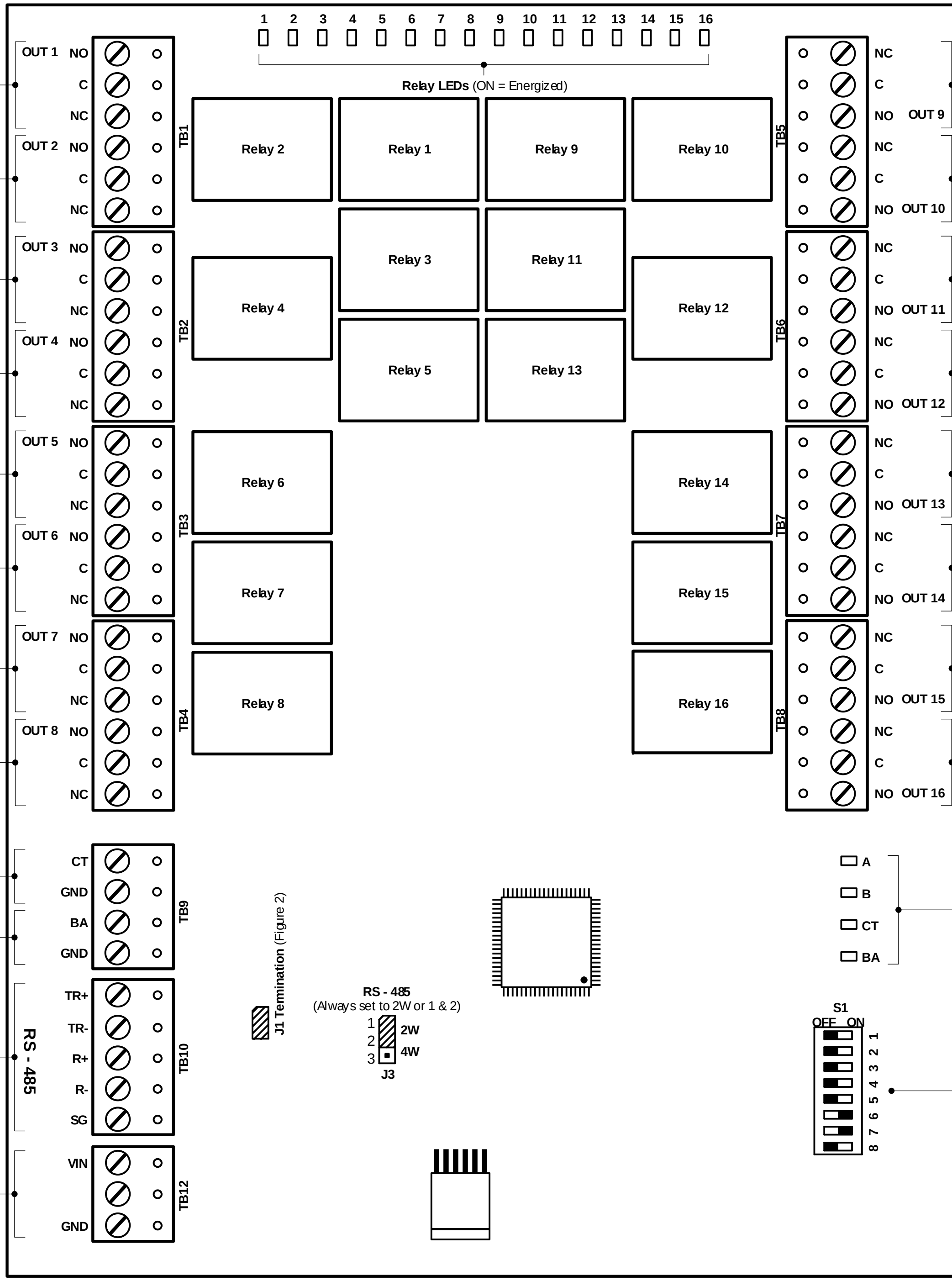
Auxiliary Output 8
(5A@28Vdc resistive - Figure 1)

Tamper Input
(N/C - Jumper if not used)

Power Fault
(N/C - Jumper if not used)

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

12 to 24 Volts DC
(1100mA max.)



Auxiliary Output 9
(5A@28Vdc resistive - Figure 1)

Auxiliary Output 10
(5A@28Vdc resistive - Figure 1)

Auxiliary Output 11
(5A@28Vdc resistive - Figure 1)

Auxiliary Output 12
(5A@28Vdc resistive - Figure 1)

Auxiliary Output 13
(5A@28Vdc resistive - Figure 1)

Auxiliary Output 14
(5A@28Vdc resistive - Figure 1)

Auxiliary Output 15
(5A@28Vdc resistive - Figure 1)

Auxiliary Output 16
(5A@28Vdc resistive - Figure 1)

Normal LED Function

- LED A = Power (~1 pulse/second)
- LED B = SCP Communication (Rapid pulse)
- LED CT = Tamper (ON = Active)
- LED BA = Power Fault (ON = Active)

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.

Mechanical Specifications

- Dimensions 6.0"(152.4mm)Wx8.0"(203.2mm)L
- Temperature -55ºC to +85ºC, storage
  0ºC to +49ºC, operating
- Humidity 0% to 85% RHNC

TOC Oview

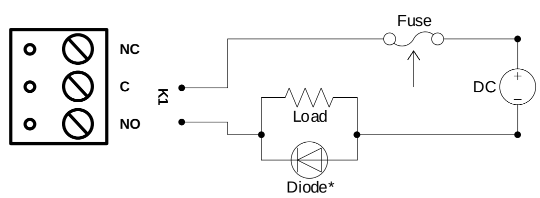
Table 1: S1 - Address Dip Switch

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

Figure 1: Output Wiring Configurations

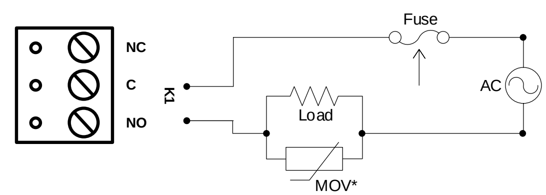
Depending on your power source, use one of the two methods of transient clamping shown below to protect the relay contacts and to reduce electromagnetic interference (EMI emissions). Always protect against accidental overloads by wiring in an inline fuse to the C (common) side of the relay as shown below.

DC Source



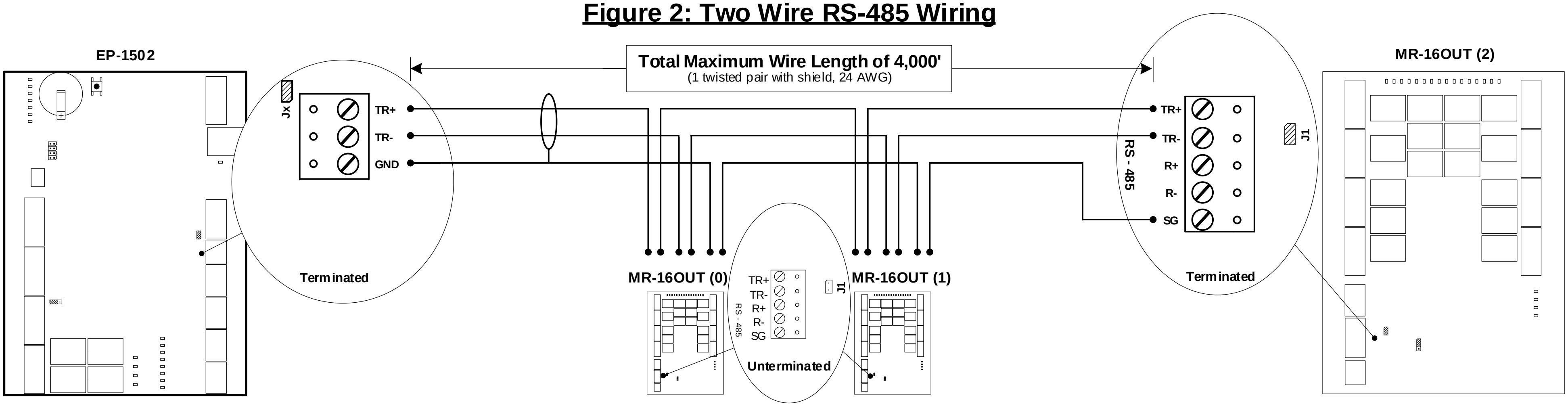
***Diode Selection – Inductive Load**
Diode Current Rating > 1x Strike Current
Diode Break Down Voltage: 4x Strike Voltage
12Vdc or 24Vdc Strike, Diode 1N4002 (100V / 1A) Typical

AC Source



***MOV Selection – Inductive Load**
Clamp Voltage > 1.5x Vac RMS
24Vac Strike, Panasonic ERZ-C07DK470 Typical

Figure 2: Two Wire RS-485 Wiring



*The SCP is at the beginning of the bus, so Jx **IS** terminated.*
(see SCP quick reference for specific jumper identification)

*MR-16OUTs (0) and (1) are in the middle of the bus, so J1 is **NOT** terminated.*

*The MR-16OUT (2) is at the end of the bus, so J1 **IS** terminated.*

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MR-16OUT Series 3 Quick Reference

Detail

**Not evaluated by UL*

Auxiliary Output 1
Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 1

Auxiliary Output 2
Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 1

Auxiliary Output 3
Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 1

Auxiliary Output 4
Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 1

Auxiliary Output 5
Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 1

Auxiliary Output 6
Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 1

Auxiliary Output 7
Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 1

Auxiliary Output 8
Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 1

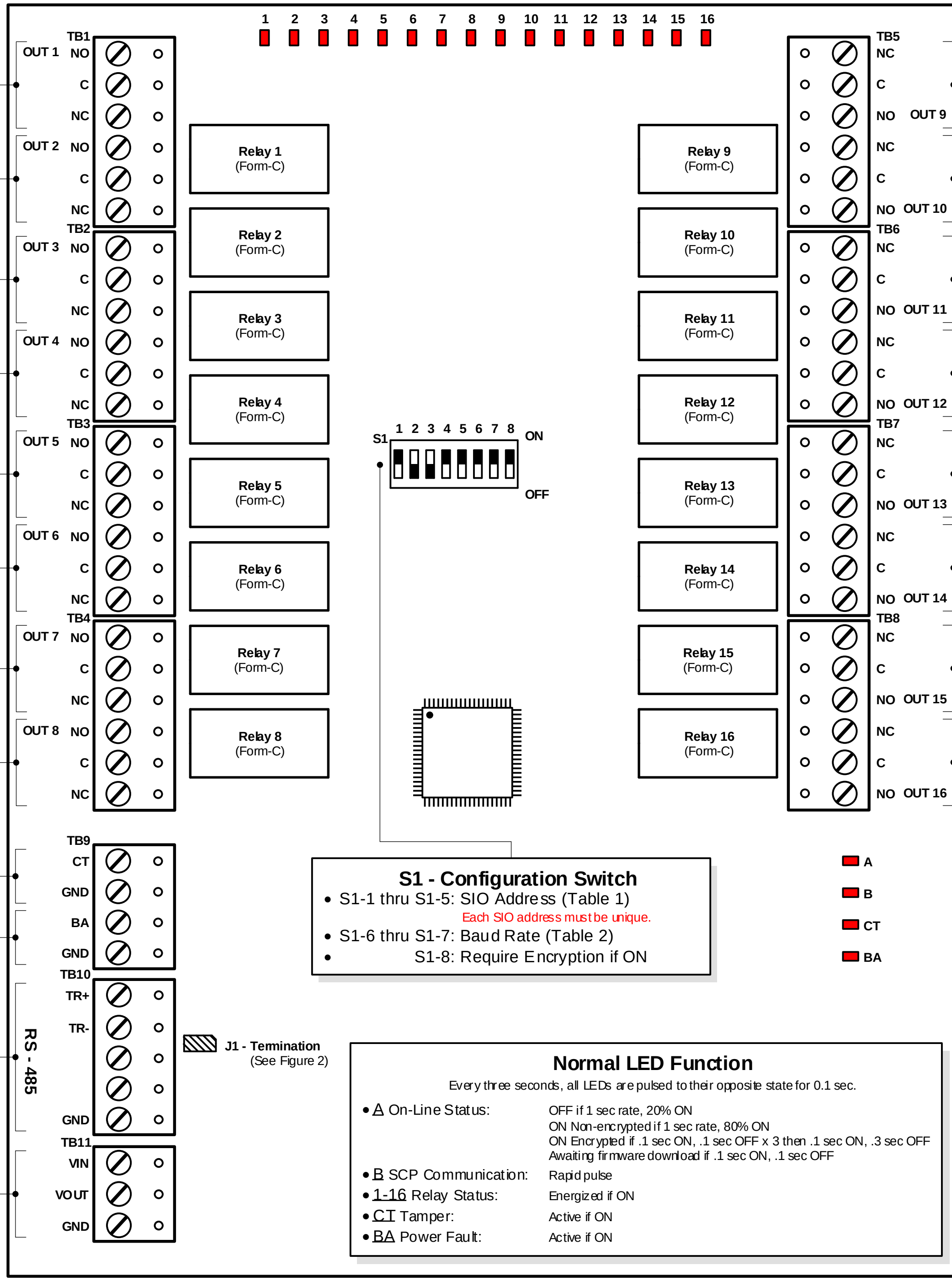
Tamper Input
N/C (jumper if not used)

Power Fault
N/C (jumper if not used)

Two Wire RS-485 Bus
See Figure 2

Power (1100mA max)
CABLING: 1 twisted pair, minimum 18 AWG

VIN (Voltage In): Positive 12 to 24 Volts ±10% DC
VOUT (Voltage Out): Not used
GND (Ground): Input Voltage Return (-)



S1 - Configuration Switch
- S1-1 thru S1-5: SIO Address (Table 1)
  Each SIO address must be unique.
- S1-6 thru S1-7: Baud Rate (Table 2)
- S1-8: Require Encryption if ON

Normal LED Function

Every three seconds, all LEDs are pulsed to their opposite state for 0.1 sec.

• A On-Line Status:	OFF if 1 sec rate, 20% ON ON Non-encrypted if 1 sec rate, 80% ON ON Encrypted if .1 sec ON, .1 sec OFF x 3 then .1 sec ON, .3 sec OFF Awaiting firmware download if .1 sec ON, .1 sec OFF
• B SCP Communication:	Rapid pulse
• 1-16 Relay Status:	Energized if ON
• CT Tamper:	Active if ON
• BA Power Fault:	Active if ON

Auxiliary Output 9
Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 1

Auxiliary Output 10
Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 1

Auxiliary Output 11
Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 1

Auxiliary Output 12
Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 1

Auxiliary Output 13
Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 1

Auxiliary Output 14
Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 1

Auxiliary Output 15
Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 1

Auxiliary Output 16
Normally Open Wiring: 5A@30Vdc resistive
Normally Closed Wiring: 3A@30Vdc resistive
See Figure 1

Specifications
- Dimension 6" (152mm) W x 8" (203mm) L x 1" (25mm) H
- Storage Temperature: -55ºC to +85ºC
- Operating Temperature: 0ºC to +49ºC
- Humidity: 0% to 85% RHNC
- Weight: 14 oz. (400 g) nominal

Table 1: SIO Address

Address	S1-1	S1-2	S1-3	S1-4	S1-5
0	OFF	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF
5	ON	OFF	ON	OFF	OFF
6	OFF	ON	ON	OFF	OFF
7	ON	ON	ON	OFF	OFF
8	OFF	OFF	OFF	ON	OFF
9	ON	OFF	OFF	ON	OFF
10	OFF	ON	OFF	ON	OFF
11	ON	ON	OFF	ON	OFF
12	OFF	OFF	ON	ON	OFF
13	ON	OFF	ON	ON	OFF
14	OFF	ON	ON	ON	OFF
15	ON	ON	ON	ON	OFF

Address	S1-1	S1-2	S1-3	S1-4	S1-5
16	OFF	OFF	OFF	OFF	ON
17	ON	OFF	OFF	OFF	ON
18	OFF	ON	OFF	OFF	ON
19	ON	ON	OFF	OFF	ON
20	OFF	OFF	ON	OFF	ON
21	ON	OFF	ON	OFF	ON
22	OFF	ON	ON	OFF	ON
23	ON	ON	ON	OFF	ON
24	OFF	OFF	OFF	ON	ON
25	ON	OFF	OFF	ON	ON
26	OFF	ON	OFF	ON	ON
27	ON	ON	OFF	ON	ON
28	OFF	OFF	ON	ON	ON
29	ON	OFF	ON	ON	ON
30	OFF	ON	ON	ON	ON
31	ON	ON	ON	ON	ON

Table 2: Baud Rate

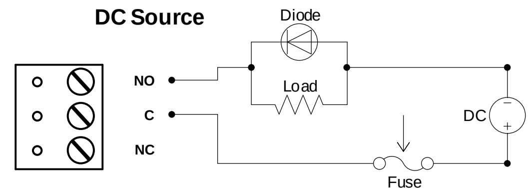
S1-6	S1-7	Baud Rate
ON	ON	38,400 bps†
OFF	ON	19,200 bps*
ON	OFF	9,600 bps*
OFF	OFF	115,200 bps*

†Access It! Universal.NET default value.
*Not evaluated by UL

Figure 1: Output Wiring Options

CABLING: As required for the load

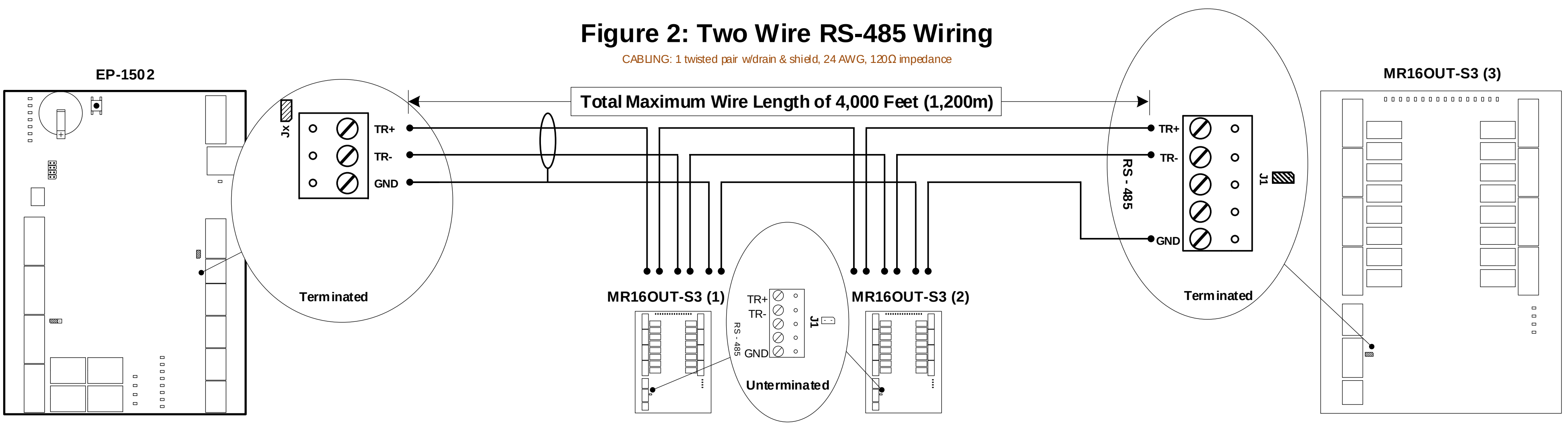
Door lock mechanisms can generate feedback to the relay circuit that can cause damage and premature failure of the relay. For this reason, a diode must be used to protect the relay. Wire should be of sufficient gauge to avoid voltage loss.



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

Figure 2: Two Wire RS-485 Wiring

CABLING: 1 twisted pair w/drain & shield, 24 AWG, 120Ω impedance



*The SCP is at the beginning of the bus, so Jx **IS** terminated.*
(see SCP quick reference for specific jumper identification)
Only Stand-Alone system was evaluated by UL

*MR16OUT-S3s (1) and (2) are in the middle of the bus, so J1 is **NOT** terminated.*

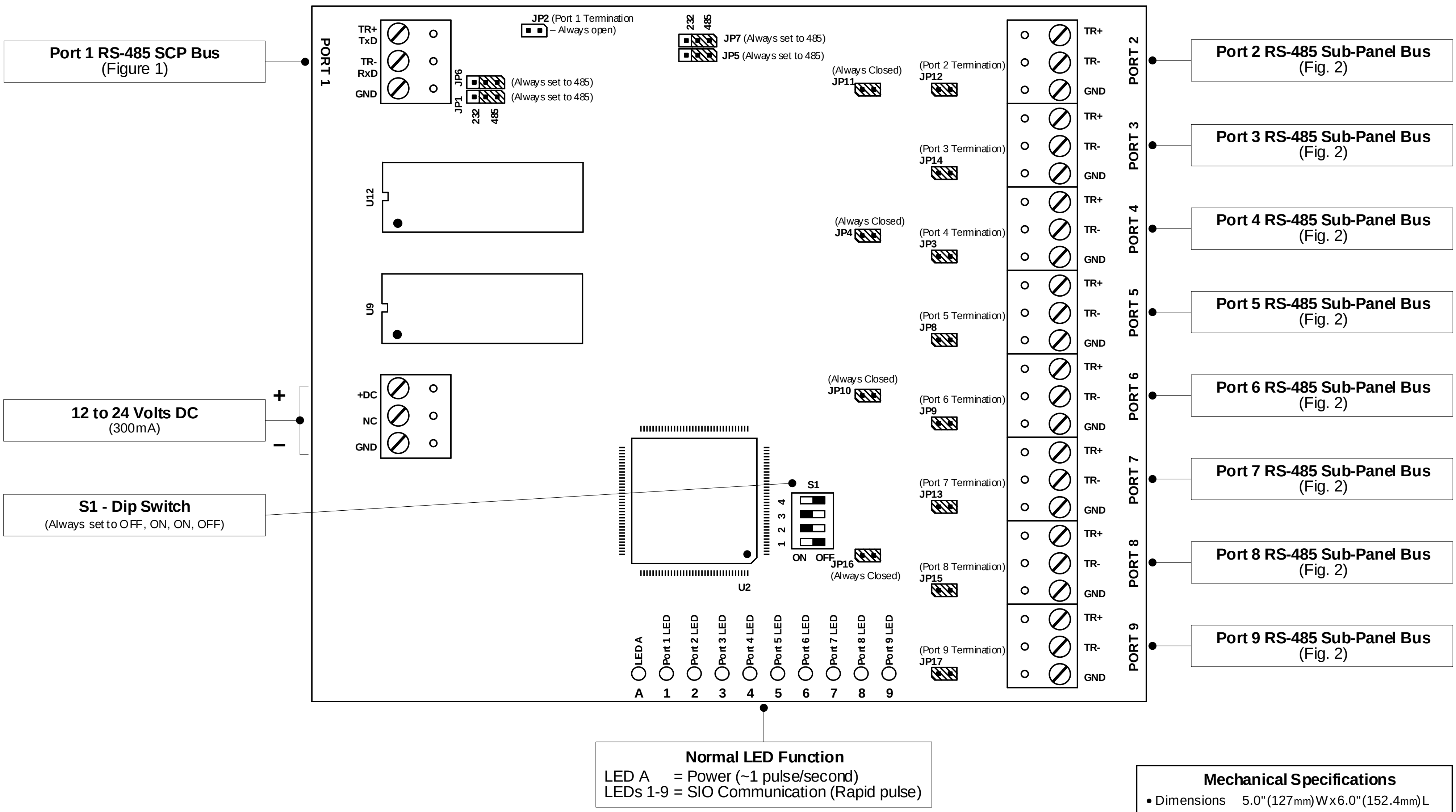
*The MR16OUT-S3 (3) is at the end of the bus, so J3 **IS** terminated.*

Refer to NCL-12UL Hardware Installation Manual DOCNCL12UL-R1

TOC

MUX-8 Quick Reference

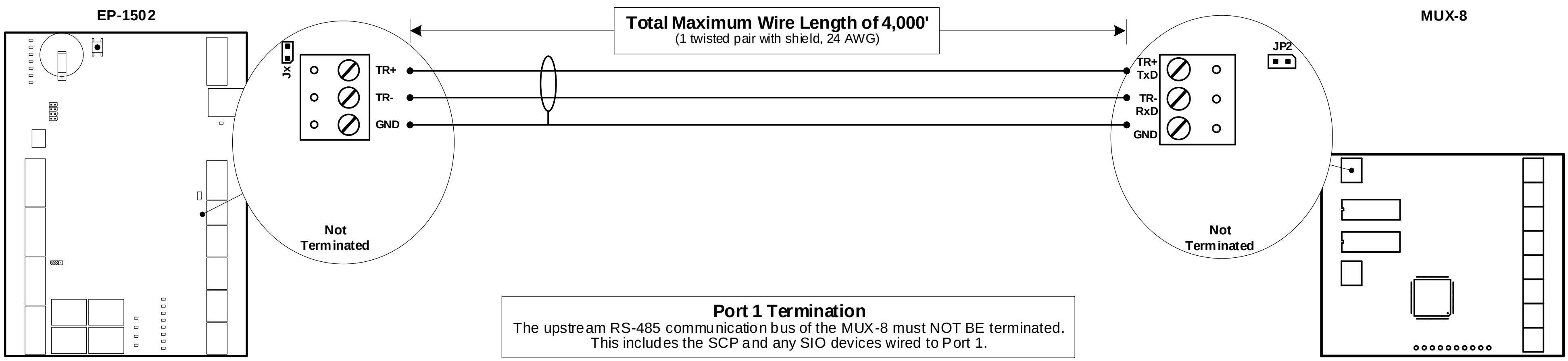
Detail



Mechanical Specifications

- Dimensions 5.0"(127mm) W x 6.0"(152.4mm) L
- Temperature -55ºC to +85ºC, storage
  0ºC to +49ºC, operating
- Humidity 0% to 85% RHNC

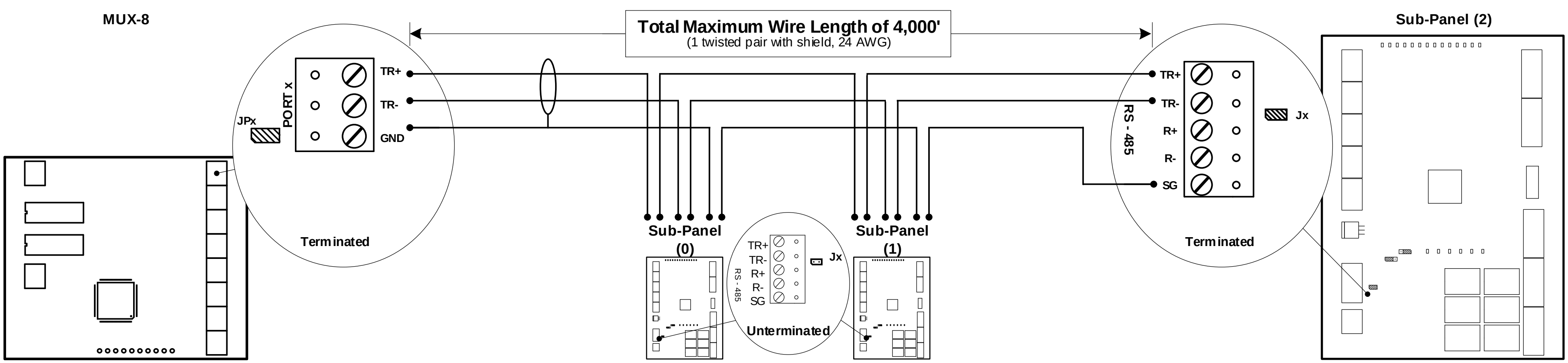
Figure 1: Port 1 RS-485 SCP Bus Wiring



*Jx **IS NOT** terminated.*
(see SCP quick reference sheet for specific jumper identification)

*JP2 **IS NOT** terminated.*

Figure 2: Port x RS-485 Sub-Panel Bus Wiring



*The MUX-8 is at the beginning of the bus, so JPx **IS** terminated.*

*Sub-Panels (0) and (1) are in the middle of the bus, so Jx is **NOT** terminated.*

*The Sub-Panel (2) is at the end of the bus, so Jx **IS** terminated.*

TOC

OptoHub Quick Reference

Detail

Power (250mA max)
CABLING: 1 twisted pair, minimum 18 AWG

Input Voltage Return (-) = COMMON
Chassis Ground = CHASSIS GROUND
Positive 12 Volts ±15% DC (+) = +12V

Port 1 RS-485 Sub-Panel Bus (Fig. 2)

Port 2 RS-485 Sub-Panel Bus (Fig. 2)

Port 3 RS-485 Sub-Panel Bus (Fig. 2)

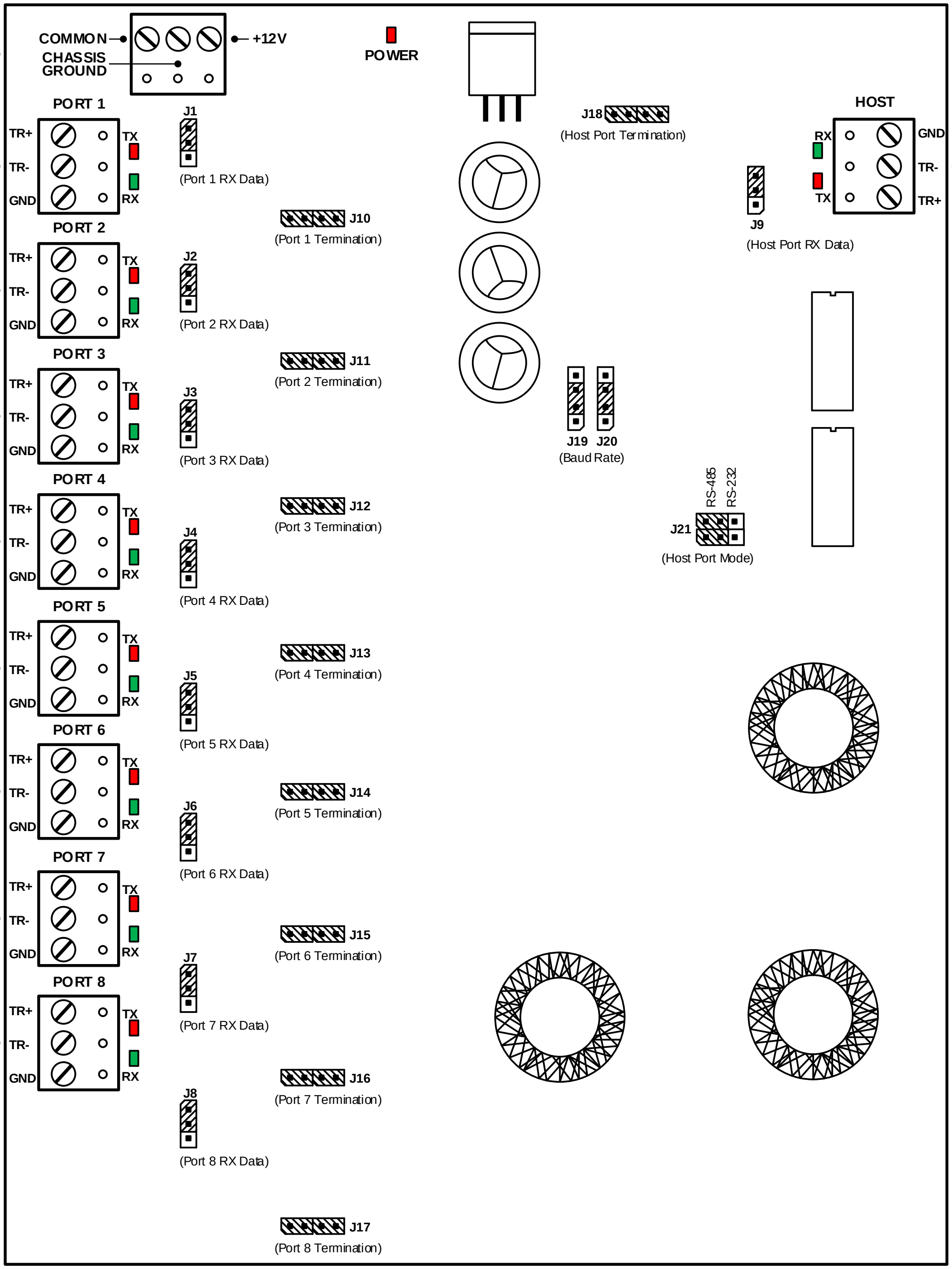
Port 4 RS-485 Sub-Panel Bus (Fig. 2)

Port 5 RS-485 Sub-Panel Bus (Fig. 2)

Port 6 RS-485 Sub-Panel Bus (Fig. 2)

Port 7 RS-485 Sub-Panel Bus (Fig. 2)

Port 8 RS-485 Sub-Panel Bus (Fig. 2)



Host Port RS-485 SCP Bus (Figure 1)

Jumpers	Setting	Configuration
J1 – J9 (RX Data)	Top	Port RX is enabled (default)
	Bottom	Port RX is disabled
J10 – J18 (Port Termination)	On	RS-485 Termination is on
	Off	RS-485 Termination is off
J19 – J20 (Baud Rate)	Top	9,600 Kbps
	Center	115,200 Kbps* (recommended)
	Bottom	38,400 Kbps
	Off	230,400 Kbps
J21 (Host Port Mode)	Right	Host port is RS-232**
	Left	Host port is RS-485

* It is recommended to use 115,200 Kbps baud rate (J19-J20) even when communicating to SIO devices at 38,400 Kbps.

**J18 jumpers must be off for RS-232 mode.

Normal LED Function

- **POWER** (board is powered on): ON
- **Host TX** (SCP transmit communication): Rapid pulse
- **Host RX** (SCP receive communication): Rapid pulse
- **Port 1-8 TX** (SIO transmit communication): Rapid pulse
- **Port 1-8 RX** (SIO receive communication): Rapid pulse

Specifications

- Dimension 6" (152mm) W x 8" (203mm) L x 1" (25mm) H
- Storage Temperature: -55ºC to +85ºC
- Humidity: 0% to 95% RHNC
- Weight: 10 oz. (290 g) nominal

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www.rs2tech.com

Revised: 9/2021

Figure 1: Host Port RS-485 SCP Bus Wiring and Termination

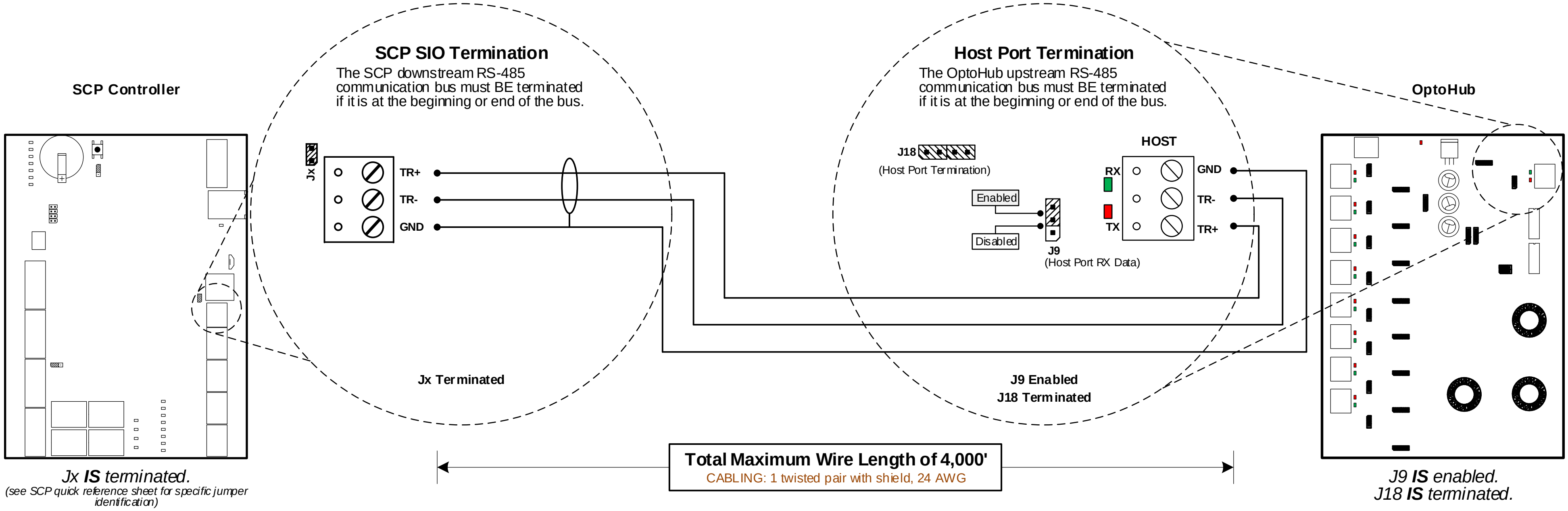

Figure 2: Port x RS-485 Sub-Panel Bus Wiring and Termination