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<td>LP-1501 PLUS</td>
<td>27</td>
<td>MR-16OUT Series 2</td>
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</tr>
<tr>
<td>LP-4502</td>
<td>33</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**MINI-SCP Quick Reference**

- **12 Volts DC (250mA)**
  - **ACDC**
  - **AC**
  - **GND**

- **Tamper Input**
  - (N/C - Jumper if not used)
  - **IN2**
  - **GND**
  - **IN1**

- **Power Fault**
  - (N/C - Jumper if not used)
  - **IN2**
  - **GND**
  - **IN1**

- **Memory Backup Battery**
  - (Exp. 1)

- **Battery Bypass Sleeve**
  - (Exp. 1)

- **Address Dip Switch**
  - (Fig. 1)

- **Host Channel**
  - (Fig. 1)

- **Channel 2 RS-485 Sub-Panel Bus**
  - (Fig. 2)

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

- **Normal LED Function**
  - LED A = Power (~1 pulse/second)
  - LED B = Host Communication (~1 pulse/second)
  - LED C = SIO Communication (Rapid pulse)

**Notes:**
- Always set to 232
- Always set to 2
- Always closed

**Revision:** 10/2013
**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

**12 Volts DC (450mA with NIC)**

- **ACD**
- **C**
- **AC**
- **GND**
- **IN1**

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

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

**Memory Backup Battery**
(Exp. 2)

**Battery Bypass Sleeve**
(Exp. 2)

---

**Address Dip Switch**
- Always set to address 0.
- Always turn on switches 5, 6 & 7.
- Set switches prior to powering up.

**Normal LED Function**
- **LED A** = Power (~1 pulse/second)
- **LED B** = Host Communication (~1 pulse/second)
- **LED C** = SI0 Communication (Rapid pulse)

---

**Host Channel**
(Not used)

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

**Channel 3 RS-485 Sub-Panel Bus**
(Fig. 1)

---

**Removing for Service**

---

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Revised: 10/2013
**Explanation 1: Network Interface Card**

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-74-0F-7F and can be found under the model number of the NIC (CO-E111AA). 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-SCPE's 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 NIC's MAC Address into the NIC 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!® Utilities/SCPe IP Programmer to run the SCP/E/mini-SCpe-E Programmer utility.

Enter the NIC's MAC Address into the NIC 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.

**Command Prompt Window Portion**

<table>
<thead>
<tr>
<th>Command</th>
<th>Variable Reference</th>
<th>General Command Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARP</td>
<td>xx.xxx.xxx.xxx yy yy yy yy yy yyy (or Entrie)</td>
<td>临时 sets the IP Address.</td>
</tr>
<tr>
<td>Telnet xxx.xxx.xxx.xxx 1&gt;Enter&gt;</td>
<td>xx.xxx.xxx.xxx = IP Address</td>
<td>The telnet connection will fail, but the NIC will change its IP Address.</td>
</tr>
<tr>
<td>Telnet xxx.xxx.xxx.xxx 9999</td>
<td>xx.xxx.xxx.xxx = IP Address</td>
<td>Opens a telnet session for further programming.</td>
</tr>
</tbody>
</table>

**Telnet Session Window Portion**

<table>
<thead>
<tr>
<th>Command</th>
<th>Variable Reference</th>
<th>General Command Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entrie</td>
<td></td>
<td>Enters the NIC's setup mode.</td>
</tr>
<tr>
<td>Submit</td>
<td></td>
<td>Selects option 0 Server configuration.</td>
</tr>
<tr>
<td>xxx&gt;Enter</td>
<td>xx = First IP octet</td>
<td>Programs the NIC's first IP octet.</td>
</tr>
<tr>
<td>xxx&gt;Enter</td>
<td>xx = Second IP octet</td>
<td>Programs the NIC's second IP octet.</td>
</tr>
<tr>
<td>xxx&gt;Enter</td>
<td>xx = Third IP octet</td>
<td>Programs the NIC's third IP octet.</td>
</tr>
<tr>
<td>xxx&gt;Enter</td>
<td>xx = Fourth IP octet</td>
<td>Programs the NIC's fourth IP octet.</td>
</tr>
<tr>
<td>Y&gt;Enter</td>
<td></td>
<td>Enables Gateway to be programmed.</td>
</tr>
<tr>
<td>xxx&gt;Enter</td>
<td>xx = First Gateway octet</td>
<td>Programs the NIC's first Gateway octet.</td>
</tr>
<tr>
<td>xxx&gt;Enter</td>
<td>xx = Second Gateway octet</td>
<td>Programs the NIC's second Gateway octet.</td>
</tr>
<tr>
<td>xxx&gt;Enter</td>
<td>xx = Third Gateway octet</td>
<td>Programs the NIC's third Gateway octet.</td>
</tr>
<tr>
<td>xxx&gt;Enter</td>
<td>xx = Fourth Gateway octet</td>
<td>Programs the NIC's fourth Gateway octet.</td>
</tr>
<tr>
<td>xxx&gt;Enter</td>
<td>xx = Number of bits to mask (08 class C 248 bits (255.255.255.000) (16 class B 1614 bits (255.255.000.000) (24 class A 8/24 bits (255.000.000.000)</td>
<td>Programs the NIC's Subnet Mask.</td>
</tr>
<tr>
<td>Exit</td>
<td></td>
<td>Bypasses the 'Change Local config password' option.</td>
</tr>
<tr>
<td>Exit</td>
<td>Exit</td>
<td>Selects option 1 Channel 1 configuration.</td>
</tr>
<tr>
<td>Exit</td>
<td>Exit</td>
<td>Programs the Port to 00.</td>
</tr>
<tr>
<td>xxx&gt;Exit</td>
<td>xxx = Network TCP port (03001) Default Access It!® setting (14001) If running Access It!® Lite or Access It!® UltraLite.</td>
<td>Programs the Port to be 00.</td>
</tr>
<tr>
<td>Exit</td>
<td>Exit</td>
<td>Programs the ConnectMode to 00.</td>
</tr>
<tr>
<td>Exit</td>
<td>Exit</td>
<td>Bypasses the first 'REMOTE IP Address' octet option.</td>
</tr>
<tr>
<td>Exit</td>
<td>Exit</td>
<td>Bypasses the second 'REMOTE IP Address' octet option.</td>
</tr>
<tr>
<td>Exit</td>
<td>Exit</td>
<td>Bypasses the third 'REMOTE IP Address' octet option.</td>
</tr>
<tr>
<td>Exit</td>
<td>Exit</td>
<td>Bypasses the fourth 'REMOTE IP Address' octet option.</td>
</tr>
<tr>
<td>Exit</td>
<td>Exit</td>
<td>Bypasses the 'Remote IP Address' octet option.</td>
</tr>
<tr>
<td>Exit</td>
<td>Exit</td>
<td>Bypasses the 'Remote IP Address' octet option.</td>
</tr>
<tr>
<td>Exit</td>
<td>Exit</td>
<td>Bypasses the 'Remote IP Address' octet option.</td>
</tr>
<tr>
<td>Exit</td>
<td>Exit</td>
<td>Bypasses the 'REMOTE IP Address' octet option.</td>
</tr>
<tr>
<td>Exit</td>
<td>Exit</td>
<td>Bypasses the 'REMOTE IP Address' octet option.</td>
</tr>
<tr>
<td>Exit</td>
<td>Exit</td>
<td>Bypasses the 'REMOTE IP Address' octet option.</td>
</tr>
<tr>
<td>Exit</td>
<td>Exit</td>
<td>Bypasses the 'REMOTE IP Address' octet option.</td>
</tr>
<tr>
<td>Exit</td>
<td>Exit</td>
<td>Bypasses the 'REMOTE IP Address' octet option.</td>
</tr>
</tbody>
</table>

**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**: If 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)
**SCP-1MB Quick Reference**

12 Volts DC (350mA)

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

**Normal LED Function**
- LED A = Power (~1 pulse/second)
- LED B = Host Communication (~1 pulse/second)
- LED C = SIO Communication (Rapid pulse)

**Host Channel (Fig. 1)**

**Channel 2 RS-485 Sub-Panel Bus (Fig. 2)**

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

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

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

**Address Dip Switch (Fig. 1)**

**Memory Expansion Bus (Exp. 2)**

**Memory Backup Battery (Exp. 1)**

**Battery Bypass Sleeve (Exp. 1)**

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Revised: 10/2013
Figure 1: Host Channel and Address Dip Switch Configuration

S1 - RS-232 Hardwired Address Dip Switch

<table>
<thead>
<tr>
<th>Address</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>On</td>
<td>On</td>
<td>Off</td>
</tr>
</tbody>
</table>

DB-9 Wiring

DB-25 Wiring

S1 - Dialup Address Dip Switch

<table>
<thead>
<tr>
<th>Address</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>On</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>On</td>
<td>On</td>
<td>On</td>
<td>Off</td>
</tr>
</tbody>
</table>

USR Sportster 33,600 External Modem DB-25 Wiring

Jump 4, 6 & 20 together

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.

NOTE: 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 upgradable 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.
12 Volts DC (600mA with NIC)

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

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

Secondary Host (Not used)

Memory Backup Battery (Exp. 2)

Battery Bypass Sleeve (Exp. 2)

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

Address Dip Switch
✓ Always set to address 0.
✓ Always turn on switch 5.
✓ Set switches prior to powering up.

Memory Expansion Bus (Exp. 3)
Network Interface Card Setup

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-ES and the RS2 Programmer. The programming software will automatically launch. Enter the NIC’s MAC Address into the MAC Address fields. Enter the desired IP Address, Gateway and Subnet Mask into their respective fields. Select the appropriate SCP IP and software application from their respective drop lists and then click the ‘Next’ 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/SCP e IP Programmer to run the SCP-E/mini SCP-E programmer utility. Enter the NIC’s MAC Address into the MAC Address fields. 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 ‘Next’ 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 4.0.0000 and XP ‘command’ for 98 and Me. This will open a Command Prompt window from which the following commands will be run from.

---

**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-7C-71-12 and can be found under the model number of the NIC (CO-E1-111A). 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-E 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/SCP e IP Programmer to run the SCP-E/mini SCP-E programmer utility. Enter the NICs MAC Address into the MAC Address fields. 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 4.0.0000 and XP ‘command’ for 98 and Me. This will open a Command Prompt window from which the following commands will be run from.

---

**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’s active 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 BR2032 lithium battery or equivalent.

**NOTE:** When setting up or servicing the SCP-E, it is recommended to leave the battery bypass switch in place until all system testing is completed. By keeping the battery bypass switch in between the battery and the +5V post, you can be certain that the memory is being completely flushed during power cycles. Upon completion, be certain to remove the battery bypass switch 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

512KB Memory Module (6)

Top View

Bottom View

Memory Expansion Bus
(Fig. 1)

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Revised: 10/2013

SCP-MEM3 not evaluated by UL
Figure 1: Proper Mounting

Place the edge of the SCP-MEM3 board into the standoff prior to seating the memory expansion bus.
512KB Memory Module (14)
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.

**Figure 1: Proper Mounting**

Place the edge of the SCP-MEM7 board into the standoff prior to seating the memory expansion bus.
EP-1501 Quick Reference

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 - 300mA 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
(Doubled 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)W x 2.75"(70mm)L
- Temperature -55°C to +85°C, storage 0°C to +70°C, operating
- Humidity 0% to 95% RHNC

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Revised: 5/2014
**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: &MACxxxxxxx
       - 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
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.
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 G (common) side of the relay as shown below.

- **DC Source**
  - Diode**
  - Fuse
  - Fuse
  - NO
  - NC

- **AC Source**
  - MOV
  - Fuse

- **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: Reader Port 2**

- Wiegand Reader
- Black
- Red
- Green
- White
- Yellow
- Brown

---

**Figure 3: Reader Port 1**

- Wiegand Reader
- Black
- Green
- White
- Yellow
- Red
- Brown

---

**Figure 4: Input Wiring Options**

- Non-Supervised
  - Normally Normally
  - Open
- Supervised
  - Normally Normally
  - Open

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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 - 300mA 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)

Top View

1 - EP-1501 Status
Online Offline Battery Low

2 - Host Communication
Flash while communicating with host.

3 - Reader 1 & 2 Activity
Flash 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

Bottom View

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: -55°C to +85°C, storage 0°C to +70°C, operating
- Humidity: 0% to 95% RHNC
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: <MAC:xxxx:xxxx:xxxx:xxxx:xxxx>
           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 MAC000F500034B.
           - 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 3 & 4 OFF
3. Apply power to the EP-1501
4. Manually configure a computer to connect to network
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 G (common) side of the relay as shown below.

Figure 2: Sub-Panel Communication

EP-1501 PLUS Capacities
- Any combination of up to 8 wired SIOs’s up to 1,000’ and / or 8 MR-51E’s supporting a maximum of 17 total readers
- Supported SIO’s:
  - MR-50
  - MR-16IN
  - MR-52
  - MR-16OUT
  - MR-51e

Figure 3: Reader Port 1

DC Source
- Diode Selection – Inductive Load
  - Diode Current Rating > 1x Strike Current
  - Diode Break Down Voltage: 4x Strike Voltage
  - DC Source: 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

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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 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! 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
   Port1: 38400
   Port2: 38400
   Comm Tab
   Channel: <Set to the newly created channel>
   TCP/IP Settings
   IP Address: <MACxxxxxx>
   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

NOTE: For UL installations CR power to the onboard memory which contains the card file. This process will NOT erase the system configuration and cardholder databases

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 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.

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. JS 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.)

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

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EP-2500 Quick Reference

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

Normal Primary 10/100 Ethernet Host Channel LED Function
- LED D7: Primary 10/100 Ethernet Host Channel Activity
- LED SPD: Ethernet Speed (amber) 10Mb/S if off, 100Mb/S if on
- LED ACT: Link & Activity (green) No link if off, Good link if on, Activity if flashing

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 2 RS-485 Sub-Panel Activity
- LED 4: Channel 3 RS-485 Sub-Panel Activity
- LED 5: Not used
- LED 6: Not used

Remote LED Status
(Remote display of LED 1)
(Remote display of LED 2)
(Remote display of LED 3)
(Remote display of LED 4)

Battery Bypass Sleeve
(Explanation 3)

Memory Backup Battery
(Explanation 3)

S2 - Reset Switch
(Explanation 2)

S1 - Configuration Dip Switch
(Explanation 1)

12 to 24 Volts DC
(240mA or 325mA* with Micro-125)

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

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

Backup Micro-125 Ethernet Host Channel*

Serial Host Channel*

Channel 2 RS-485 Sub-Panel Bus
(2 wire ONLY! - Figure 1)

Channel 3 RS-485 Sub-Panel Bus
(2 wire ONLY! - Figure 1)

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*Not evaluated by UL

Revised: 8/2018
### Explanation: S1 – Configuration DIP Switch & Primary 10/100 Ethernet Host Channel

#### For DHCP Enabled Networks

1. Set S1 - Configuration DIP Switch DIPs OFF
2. Apply power to the EP-2500
3. Note 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: <MACxxxxxxxxxxxxx>
           - If the MAC address from step 3 was 00-0F-ES-00-03-48 then the IP Address field must be entered as the Host Name of MAC000FES00034B.
         - Port Number: 3001
         - Encryption Settings: None

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

### Explanation: 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.

### Explanation: S3 – Memory Backup Battery

If the EP-2500 should experience a complete power loss, the 3 volt lithium memory battery backup 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: S4 – Panel Bus Termination

[Diagram of 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.)
Explanation 1: S1 – Configuration DIP Switch & Primary 10/100 Ethernet Host Channel

Configuring Primary 10/100 Ethernet Host Channel (DHCP IP)
1. Set 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.
8. Enter a Username of admin
   - IP Address: <Mac address>
   - IP Address: <Set accordingly>
   - Default Gateway: <Set accordingly>
   - Click ‘Accept’
9. Click ‘Auto-Save’ from the left hand menu
   - Card Database Size: <Set accordingly>
10. Click ‘Apply Setting’ from the left hand menu
   - IP Address: <Set accordingly>
   - 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 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 S - Configuration DIP Switch DIPs OFF
20. Remove crossover cable and connect to network

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 one 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.

Figure 4: Input Wiring Options

<table>
<thead>
<tr>
<th>Non-Supervised</th>
<th>Supervised</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Diode Selection - Inductive Load" /></td>
<td><img src="image" alt="MOV Selection - Inductive Load" /></td>
</tr>
</tbody>
</table>

*Diode Selection – Inductive Load*
- Diode Current Rating > 1 x 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-007DK470 Typical

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)
**LP-1501 Quick Reference**

**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.

VIN (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
- PoE+: IEEE 802.3at compliant (12.95 W)
- PoE+/ IEEE 802.3at compliant (25 W)

*PoE+ 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
  - 9 - Relay 1: Energized, De-Energized
  - D9 - Relay 2: Energized, De-Energized
  - 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)H
- **Temperature**: -55°C to +85°C, storage
  - 0°C to +70°C, operating
- **Humidity**: 5% to 95% RHNC

Revised: 8/2018
**Explanation 1: Configuration DIP Switch & 10/100 Ethernet Host Channel**

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

1. Set all S - 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: <MACxxxxxxxxxxx>
       - If the MAC address from step 3 was 00-0F-ES-00-03-48 then the IP Address field must be entered as the Host Name of MAC000F5000034B.
       - 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 admin
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 S - 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

**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 SIDs.

**Manufacturer:** Plugable
**Model:** USB200TGE100

**Figure 1: Output Wiring Options**

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**

**Figure 3: Reader Port 1 Options**

**Figure 4: Input Wiring Options**

**Non-Supervised:** 1 twisted pair per input, 350 maximum

**Supervised:** 1 twisted pair per input, 350 maximum
**LP-1501 Plus Quick Reference**

**10/100 Ethernet Host Channel**

See Explanation 1

**J3 - Power Source Selector**

J3 Setting | Power Source |
---|---|
**PoE** | Power Over Ethernet |
**PoE+** | IEEE 802.3af compliant (12.95 W) |
**PoE+** | IEEE 802.3at compliant (25 W) |

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

**Status LED**

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

**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" (140 mm) W x 2.75" (70 mm) L
- Temperature: -55°C to +85°C, operating
- 0°C to +70°C, non-operating
- Humidity: 5% to 95% RHNC
**Explanation 1: Configuration DIP Switch & 10/100 Ethernet Host Channel**

**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
7. Comm Tab
   - Channel: <Set to the newly created channel>
   - TCP/IP Settings:
     - IP Address: <MACxxxxxxxxxxxxx>
     - If the MAC address from step 3 was 00-0F-ES-00-03-4B then the IP Address field must be entered as the Host Name of MAC00FES00034B.
     - 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 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
   - 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
   - Encryption Settings: None
   - Channel: <Set to the newly created channel>
   - TCP/IP Settings: IP Address: <Set accordingly>
   - Port Number: 3001

**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
4. LEDs 1 & 2 and LEDs 3 & 4 flash alternately at a .5 second rate
5. Within 10 seconds, switch S1 - Configuration DIP Switch DIP 1 OFF
6. LED 2 flashes at a 2 second rate as memory is being erased
7. WARNING! DO NOT CYCLE POWER
   - Erasing memory takes approximately 60 seconds to complete.
8. LEDs 1 & 4 flash for 10 seconds after the memory has been erased, then the LP-1501 Plus reboots
9. The LP-1501 Plus 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:** USB200OTGE100

**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: Sub-Panel Communication**

**Figure 3: Wiegand Reader Port 1**

**Figure 4: Input Wiring Options**

*Non-Supervised* 1 twisted pair per input, 300 maximum

**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 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: <MACxxxxx> (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
   - Bulk Erasing The System Configuration And Cardholder Databases
   - 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-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

---

**Figure 3: Output Wiring Options**

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 SICS.

- **Manufacturer:** Plugable
- **Model:** USB20OTGE100

---

**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 SICS.

**Figure 4: Input Wiring Options**

**Figure 5: RS-485 Sub-Panel Bus Termination**

The LP-1502 has one RS-485 sub-panel bus and must be terminated at the beginning and ending point. JS is the termination jumper for the Channel 2 RS-485 Sub-Panel Bus. (See Two Wire RS-485 Wiring diagram for sub-panel wiring formation)

---

**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 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-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.

---

**Refer to NCL-12UL Hardware Installation Manual DOCNCL12UL-R1**
Mechanical Specifications
- Dimensions: 5.0"(127mm)W x 6.0"(152.4mm)L
- Temperature: -55°C to +85°C, storage
  0°C to +70°C, 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

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 (-)

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

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

Primary 10/100 Ethernet Host Channel
- LED D2B: Ethernet Host Channel Activity (red)
- LED SPD: Ethernet Speed (yellow)
  10Mb/S if off
  100Mb/S if on
- LED ACT: Link & Activity
  Green
  No link if off
  Good link if on
  Activity if flashing

Alternate Host Channel
- See Explanation 4

Micro USB Jack
- MicroSD (not used)

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: \(<\text{Set accordingly}>\)
     - Initialization String: \(<\text{Leave blank}>\)
     - Address: 0
     - SIO Port Speed
     - Port 1: 38400
     - Port 2: 38400
   - Comm Tab
     - Channel: \(<\text{Set to the newly created channel}>\)
     - TCP/IP Settings
     - IP Address: \(<\text{MACxxxxxxxxxxx}>>\)

   If the MAC address from step 3 was 00-0F-16-00-03-4B then the IP Address field must be entered as the Host Name of MAC000F1600034B.
   - 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).’
   - Model: LP-2500
   - Device Installed: X
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: \(<\text{Set accordingly}>\)
   - Subnet Mask: \(<\text{Set accordingly}>\)
   - Default Gateway: \(<\text{Set accordingly}>\)
14. Click ‘Accept’
15. Click ‘Apply Setting’ from the left hand menu
16. Click ‘Apply Settings, Reboot’ button
   - Wait 60 seconds for LP-2500 to reboot
17. Remove power from the LP-2500
18. Set all S1 - Configuration DIP Switch DIPs OFF
19. Remove crossover cable and connect to network

#### 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.

<table>
<thead>
<tr>
<th>Explanation 3: Memory Backup Battery</th>
</tr>
</thead>
</table>

- 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 CR2320 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 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 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 SIDs.

**Manufacturer:** Plugable
**Model:** USB20TGE100

#### Figure 1: RS-485 Sub-Panel Bus Termination

- CABLING: 1 twisted pair wire - stranded, 24 AWG, 1.6X2 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)
Configuring Primary 10/100 Ethernet Host Channel For DHCP And DNS Enabled Networks

1. Set 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: <MACxxxxxxxxxxxxx>
         - If the MAC address from step 3 was 00-0F-ED-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
4. Within 10 seconds, switch S1 - Configuration DIP Switch DIP 1 OFF
5. LEDs 1 & 2 and LEDs 3 & 4 flash alternately at a .5 second rate
6. Within 10 seconds, switch S1 - Configuration DIP Switch DIP 2 OFF
7. LED 2 flashes at a 2 second rate as memory is being erased
8. LEDs 1 & 4 flash for 10 seconds after the memory has been erased, then the LP-4502 reboots
9. 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 information in the database 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 battery bypass sleeve in place until all system testing is completed. By keeping the battery bypass sleeve in between the battery and the "v" 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 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: USB200TGE100

Figure 3: Output Wiring Options

Diode Selection – Inductive Load
Diode Current Rating > 1x Strike Current
Diode Break Down Voltage: 4x Strike Voltage
12Vac or 24Vac Strike, Diode IN4002 (100V / 1A) Typical

Figure 4: Input Wiring Options

Non-Supervised

Supervised

Figure 5: RS-485 Sub-Panel Bus Termination

The LP-4502 has two RS-485 sub-panel buses which must be terminated at their beginning and ending points. 7S & 9J are termination jumpers for their respective Sub-Panel Bus.

(see Two Wire RS-485 Wiring diagram for sub-panel wiring information)
RS - 485 Bus (Figure 3)

J2 - Address Jumpers  
(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)
The SCP is at the beginning of the bus, so Jx IS terminated. (see SCP quick reference sheet for specific jumper identification)

Table 1: J2 - Address Jumpers

<table>
<thead>
<tr>
<th>Address</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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</tr>
</tbody>
</table>

Figure 1: Wiring Configurations

- **Normally Closed**
- **Normally Open**
- **Normally Closed Supervised**
- **Normally Open Supervised**

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

Total Maximum Wire Length of 4,000'
(1 twisted pair with shield, 24 AWG)

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

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Reader Port Power

VO = VIN

Readers requiring a different rating must be powered separately. The reader ground must reference the MR-50 ground.

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)

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

Mechanical Specifications
- Dimensions: 4.25" (107.9mm) W x 2.75" (69.85mm) L
- Temperature: -55°C to +85°C, storage -35°C to +70°C, operating
- Humidity: 10% to 95% RHNC

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)

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)
**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 an inline fuse to the C (common) side of the relay as shown below.

**Figure 4: Input Wiring Configurations**

- Normally Closed
- Normally Open
- Normally Closed Supervised
- Normally Open Supervised

**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)

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

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---

**Table 1: J2 - Address Jumpers**

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**MR-50 Series 3 Quick Reference**

**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)
- S1-6 thru S1-7: Baud Rate (Table 2)
- S1-8: Require Encryption if ON

**Normal LED Function**
- D1 On-Line Status: OFF: 1 sec OFF, 20% ON
  ON: Non-encrypted (1 sec OFF, 80% ON)
  ON: Encrypted (1 sec OFF, 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: -55°C to +85°C
- Operating Temperature: 10°C to +70°C
- Humidity: 5% to 95% RHNC
- Weight: 4 oz. (120 g) nominal

**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**
- (50mA max plus readers)
- CABLING: 1 twisted pair, minimum 24 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

---

**Reader Port Wiring**

**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 twisted & shield, 24 AWG, 120Ω impedance, 2,000 feet (600 m) max for communication

---

**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 ensure that the input voltage is within the voltage range of the reader. The reader power output terminal, TB4-6 (VO), is not current limited.
Table 1: SIO Address

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<th>S1-3</th>
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Table 2: Baud Rate

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*Access 11 Universal NET default value.

Figure 3: Output Wiring Options

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: 4x Strike Current
- Diode Break Down Voltage: 4x Strike Voltage

12Vdc or 24Vdc Strike, Diode 1N4002 (100V / 1A) Typical

Figure 4: Input Wiring Options

Normally Closed
- Normally Closed Supervised

Normally Open
- Normally Open Supervised

Figure 5: Two Wire RS-485 Wiring

Total Maximum Wire Length of 4,000 Feet (1,200m)

The SCP is at the beginning of the bus, so Jx IS terminated.
(see SCP quick reference for specific jumper identification)
MR-51E Quick Reference

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)H
• Temperature -55°C to +85°C, storage
0°C to +70°C, operating
• Humidity 10% to 95% RHNC

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 other 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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www.rs2tech.com
Revised: 5/2014
**Figure 1: Reader Port 1**

- Wiegand Reader

**Figure 2: Reader Port 2**

- Wiegand Reader

**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.

**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

**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**

- Non-Supervised
- Supervised

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**Figure 1: Wiring Configurations**

- **Normally Closed**
- **Normally Opened**
- **Normally Closed Supervised**
- **Normally Opened Supervised**

**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**

- **SCP-1MB**
- **Total Maximum Wire Length of 4,000’**
- **MR-52 (0)**
- **MR-52 (1)**
- **MR-52 (2)**

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

**Normal LED Function**
- LED A = Power (~1 pulse/second)
- LED B = SCP Communication (Rapid pulse)
- LED 1-B = 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"(152.4)mm x 8.0"(203.2)mm L
- Temperature: -55°C to +85°C, storage 0°C to +49°C, operating
- Humidity: 0% to 85% RHNC

**Reader Ports 1 & 2**
- MR-DT Keypad (Figure 2)
- RS-485 Reader Interface

**Reader Ports & LEDs**
- Relay 1 LED
- Relay 2 LED
- Relay 3 LED
- Relay 4 LED
- Relay 5 LED
- Relay 6 LED

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

**12 to 24 Volts DC**
- (850mA max.)

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

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

**Auxiliary Output 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)

**Wiegand Reader**
- (See J2 - Reader Power) - Red
- Brown
- Yellow
- White
- Green
- Black

**Auxiliary Output**
- (Not used)
- Not used

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

**J2 - Reader Power**
- J2 Setting: Reader Port VO Output (150mA max.)
- 12V
- VO = 12Vdc regulated
- PT = 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.

**Detailed Diagram**
- J5 - Termination (Figure 5)
- Relay LEDs (ON = Energized)
- Relay 1
- Relay 2
- Relay 3
- Relay 4
- Relay 5
- Relay 6

**Figure 1 (Wiegand Reader Example)**

**Figure 2 (MR-DT* Keypad Example)**

*Not evaluated by UL*
Table 1: S1 - Address Dip Switch

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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.

**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)

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Refer to NCL-12UL Hardware Installation Manual DOCNCL12UL-R1
MR-52 Series 3 Quick Reference

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, 18 AWG, 600 feet (183 m) max
VIN (Voltage IN): Positive 12 to 24 Volts ±10% DC
VOUT (Voltage OUT): Not used
GND (Ground): Input Voltage Return (-)

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Revision: 5/2019

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
- **B** SCP Communication: Rapid pulse
- **C** Alarm Input Status: Active if ON
- **D** Tamper: Active if ON
- **E** Power Fault: Active if ON
- **F** Reader Port 1: Data activity
- **G** Reader Port 2: Data activity

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

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

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Revision: 5/2019
Table 1: SIO Address

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Table 2: Baud Rate

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

Figure 1: Output Wiring Options

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.

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

Figure 2: Input Wiring Options

Normally Closed Supervised
Normally Open Supervised

Figure 3: Two Wire RS-485 Wiring

Total Maximum Wire Length of 4,000 Feet (1,200m)

The SCP is at the beginning of the bus, so J4 IS terminated.
MR52-S3s (1) and (2) are in the middle of the bus, so J4 is NOT terminated.
MR52-S3 (3) is at the end of the bus, so J4 is NOT terminated.

Refer to NCL-12UL Hardware Installation Manual DOCNCL12UL-R1
Explanation 1: 10/100 Ethernet

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

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
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: admin
12. Click 'Login'
13. Select 'Use Static IP configuration:'
   - IP Address: <Set accordingly>
   - Subnet Mask: <Set accordingly>
   - Default Gateway: <Set accordingly
14. Click 'Apply'
15. Click 'Click Save button'
16. Set all S1 - Configuration DIP Switch DIPs OFF
17. Remove crossover cable and connect to network
18. Run Access It!
19. Navigate to the Hardware section
20. Click the arrow to expand the SCPs
21. Click the arrow to expand the SCP the MR-62E will be installed under
22. Select SIOs
   - A list of all available SIOs appear in the pane to the right of the hardware tree.
23. 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>
24. 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
4. LEDs 1 & 2 and LEDs 3 & 4 flash alternately at a .5 second rate.
5. Within 10 seconds, switch S1 - Configuration DIP Switch DIP 1 OFF
6. 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.
7. The MR-62E is now ready to be configured as needed

Figure 1: OSDP Reader Port

CABLING: 1 twisted pair per input, 30Ω maximum

Figure 2: Input Wiring Options

Non-Supervised

Supervised

Figure 3: Output Wiring Options

Non-Supervised

Supervised

Figure 4: Mounting Information

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**Auxiliary Input 1 (N/O - Figure 1)**

**Auxiliary Input 2 (N/O - Figure 1)**

**Auxiliary Input 3 (N/O - Figure 1)**

**Auxiliary Input 4 (N/O - Figure 1)**

**Auxiliary Input 5 (N/O - Figure 1)**

**Auxiliary Input 6 (N/O - Figure 1)**

**Auxiliary Input 7 (N/O - Figure 1)**

**Auxiliary 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)**

**Wiring Configurations (Figure 1)**

- **S1 - Address Dip Switch**
  
  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)

**Auxiliary Output 1**

**Auxiliary Output 2**
### Table 1: S1 - Address Dip Switch

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<th>3</th>
<th>4</th>
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</table>

The SCP is at the beginning of the bus, so Jx is terminated.

See SCP quick reference sheet for specific jumper identification.

### Figure 1: Wiring Configurations

- **Normally Opened**
- **Normally Closed**
- **Normally Opened Supervised**
- **Normally Closed Supervised**

1K Ohm Resistor P/N: RES-1K32

(Quantity of 32 supplied with each MR-16IN)

### Figure 2: Two Wire RS-485 Wiring

- **Total Maximum Wire Length of 4,000’** (1 twisted pair with shield, 24 AWG)

The SCP is at the beginning of the bus, so J1 & J2 are **NOT** terminated.

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.
Table 1: S1 - Address Dip Switch

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</tbody>
</table>

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

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 G (common) side of the relay as shown below.

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

Normal Open
Normal Closed
Normal Closed Supervised

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

Figure 3: Two Wire RS-485 Wiring

Total Maximum Wire Length of 4,000’
(1 twisted pair with shield, 24 AWG)

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**

**Specifications**
- Dimension: 6" (152 mm) W x 8" (203 mm) L x 1" (25 mm) H
- Storage Temperature: -55°C to +85°C
- Operating Temperature: 0°C to +49°C
- Humidity: 0% to 85% RH/NC
- Weight: 9 oz. (250 g) nominal

**Normal LED Function**
- Every three seconds, all LEDs are pulsed to their opposite state for 0.1 sec.
  - **On-Line Status:** OFF if 1 sec OFF, 20% ON
  - **Non-encrypted:** If 1 sec, 80% ON
  - **Encrypted:** If 1 sec ON, 1 sec OFF if 3 sec OFF
- **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

**Two Wire RS-485 Bus**
- See Figure 3

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

**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 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)
Table 1: SIO Address

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

Figure 1: Output Wiring Options

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](image)

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

![Input Wiring Options](image)

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

Figure 3: Two Wire RS-485 Wiring

![Two Wire RS-485 Wiring](image)

The SCP is at the beginning of the bus, so J1 is terminated.

Only Stand-Alone system was evaluated by UL

Refer to NCL-12UL Hardware Installation Manual DOCNCL12UL-R1
The SCP is at the beginning of the bus, so Jx is terminated. (see SCP quick reference sheet for specific jumper identification)

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

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Table 1: S1 - Address Dip Switch

DC Source

*Diode Selection – Inductive Load
Diode Current Rating > 1.5x Vac RMS
Diode Break Down Voltage: 4x Strike Voltage
12Vdc or 24Vdc Strike, Diode 1N4002 (100V / 1A) Typical

AC Source

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

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.

Figure 2: Two Wire RS-485 Wiring

Figure 1: Output Wiring

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Table 1: S1 - Address Dip Switch

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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**

**AC Source**

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)

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Refer to NCL-12UL Hardware Installation Manual DOCNCL12UL-R1
### MR-16OUT Series 3 Quick Reference

#### 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 (110mA max)
- **CARLING:** 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

#### J1 - Termination
- **RS-485**
- **GND**
- **TB11**
- **VIN**
- **VOUT**

### Normal LED Function
- **On-Line Status:** OFF if 1 sec rate, 20% ON
- **ON Non-encrypted:** 1 sec rate, 80% ON
- **ON Encrypted:** 1 sec ON, 1 sec OFF x 3 then 1 sec ON, 3 sec OFF
- **Awaiting firmware download:** 1 sec ON, 1 sec OFF

#### 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

---

**Note:** Not evaluated by UL.
### Table 1: SIO Address

<table>
<thead>
<tr>
<th>Address</th>
<th>S1-1</th>
<th>S1-2</th>
<th>S1-3</th>
<th>S1-4</th>
<th>S1-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>1</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>2</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>3</td>
<td>ON</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>4</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
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<tr>
<td>5</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>6</td>
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<td>ON</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>7</td>
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<td>OFF</td>
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<tr>
<td>8</td>
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<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>9</td>
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</tr>
<tr>
<td>11</td>
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<tr>
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<td>15</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
</tbody>
</table>

### Table 2: Baud Rate

<table>
<thead>
<tr>
<th>S1-6</th>
<th>S1-7</th>
<th>Baud Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON</td>
<td>ON</td>
<td>38,400 bps</td>
</tr>
<tr>
<td>OFF</td>
<td>ON</td>
<td>19,200 bps*</td>
</tr>
<tr>
<td>ON</td>
<td>OFF</td>
<td>9,600 bps*</td>
</tr>
<tr>
<td>OFF</td>
<td>OFF</td>
<td>115,200 bps*</td>
</tr>
</tbody>
</table>

*Access is Universal.NET default value. 
*Not evaluated by UL.

### Figure 1: Output Wiring Options

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.

### Figure 2: Two Wire RS-485 Wiring

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

Total Maximum Wire Length of 4,000 Feet (1,200m)

The SCP is at the beginning of the bus, so Jx is terminated.

Only Stand-Alone system was evaluated by UL

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Refer to NCL-12UL Hardware Installation Manual DOCNCL12UL-R1
**MUX-8 Quick Reference**

**Port 1 RS-485 SCP Bus** (Figure 1)

12 to 24 Volts DC (300mA)

S1 - Dip Switch (Always set to OFF, ON, ON, OFF)

**Normal LED Function**
- LED A: Power (~1 pulse/second)
- LEDs 1-9: SIO Communication (Rapid pulse)

**Mechanical Specifications**
- Dimensions: 5.0"(127mm)Wx6.0"(152.4mm)L
- Temperature: -55°C to +85°C, storage 0°C to +49°C, operating
- Humidity: 0% to 85% RHNC

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**Figure 1: Port 1 RS-485 SCP Bus Wiring**

The upstream RS-485 communication bus of the MUX-8 must NOT BE terminated. This includes the SCP and any SIO devices wired to Port 1.

**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-Panel (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.