Pro Switching System Multi
Federal Communications Commission (FCC) Statement

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

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1. Specifications

Connectors:
RJ45 A/B (2 to 1) SWITCH CARDS – (3) RJ45 connectors
RJ45 DUAL CHANNEL A/B (2 to 1) SWITCH CARDS – (6) RJ45 connectors
RJ45 ABC (3 to 1) SWITCH CARDS – (4) RJ45 connectors
RJ45 ABCD (4 to 1) SWITCH CARDS – (5) RJ45 connectors
FIBER OPTIC A/B (2 to 1) SWITCH CARD – (3) duplex SC or ST
FIBER OPTIC DUAL CHANNEL A/B (2 to 1) SWITCH CARD – (6) duplex SC or ST
FIBER OPTIC ABC (3 to 1) SWITCH CARD – (4) duplex SC or ST
FIBER OPTIC ABCD (4 to 1) SWITCH CARD – (5) duplex SC or ST
CONTROLLER CARD – (1) RJ45, (2) RJ12 (6 wire), (2) Two-Position DC Power Entry, (2) Two-Position Alarm Contact Terminal Block

Indicators:
A/B (2 to 1) SWITCH CARDS – (2) LED, one for A, one for B
DUAL CHANNEL A/B (2 to 1) SWITCH CARDS – (4) LED, one each for A, B, C, and D
ABC (3 to 1) SWITCH CARDS – (3) LED, one each for A, B, and C
ABCD (4 to 1) SWITCH CARDS – (4) LED, one each for A, B, C, and D
CONTROLLER CARD – (3) LED, two for power, one for status, (2) Alarm Relay Contacts

Switches:
A/B (2 to 1) SWITCH CARDS – (2) momentary push-button switches, one for A, one for B
DUAL CHANNEL A/B (2 to 1) SWITCH CARDS – (4) momentary push-button switches, one for A, B, C, & D
ABC (3 to 1) SWITCH CARDS – (3) momentary push-button switches, one each for A, B, and C
ABCD (4 to 1) SWITCH CARDS – (4) momentary push-button switches, one each for A, B, C, and D
CONTROLLER CARD – (5) momentary push-button switches, one each for A, B, C, and D and one for SYSTEM, (2) 8-position dipswitch
4U RACK – (1) key-lock switch

Power:

<table>
<thead>
<tr>
<th>CARD TYPE</th>
<th>Steady-State Load at 12 VDC</th>
<th>Additional Load While Switching (Latching)</th>
<th>Additional Load For Non-Latching</th>
</tr>
</thead>
<tbody>
<tr>
<td>RJ45 A/B SWITCH</td>
<td>20 mA</td>
<td>65 mA</td>
<td>65 mA</td>
</tr>
<tr>
<td>RJ45 DUAL CHANNEL A/B SWITCH - INDIVIDUAL</td>
<td>20 mA</td>
<td>65 mA</td>
<td>130 mA</td>
</tr>
<tr>
<td>RJ45 DUAL CHANNEL A/B SWITCH - GANGED</td>
<td>20 mA</td>
<td>130 mA</td>
<td>130 mA</td>
</tr>
<tr>
<td>RJ45 ABC SWITCH</td>
<td>20 mA</td>
<td>65 mA</td>
<td>65 mA</td>
</tr>
<tr>
<td>RJ45 ABCD SWITCH</td>
<td>20 mA</td>
<td>65 mA</td>
<td>130 mA</td>
</tr>
<tr>
<td>MULTIMODE FIBER OPTIC A/B SWITCH</td>
<td>20 mA</td>
<td>95 mA</td>
<td>95 mA</td>
</tr>
<tr>
<td>MULTIMODE FIBER OPTIC DUAL CHANNEL A/B SWITCH - INDIVIDUAL</td>
<td>20 mA</td>
<td>95 mA</td>
<td>190 mA</td>
</tr>
<tr>
<td>MULTIMODE FIBER OPTIC DUAL CHANNEL A/B SWITCH - GANGED</td>
<td>20 mA</td>
<td>190 mA</td>
<td>190 mA</td>
</tr>
<tr>
<td>MULTIMODE FIBER OPTIC ABC SWITCH</td>
<td>20 mA</td>
<td>95 mA</td>
<td>190 mA</td>
</tr>
<tr>
<td>MULTIMODE FIBER OPTIC ABCD SWITCH</td>
<td>20 mA</td>
<td>95 mA</td>
<td>190 mA</td>
</tr>
<tr>
<td>SINGLEMODE FIBER OPTIC A/B SWITCH</td>
<td>25 mA</td>
<td>75 mA</td>
<td>75 mA</td>
</tr>
<tr>
<td>SINGLEMODE FIBER OPTIC DUAL CHANNEL A/B SWITCH - INDIVIDUAL</td>
<td>25 mA</td>
<td>75 mA</td>
<td>150 mA</td>
</tr>
<tr>
<td>SINGLEMODE FIBER OPTIC DUAL CHANNEL A/B SWITCH - GANGED</td>
<td>25 mA</td>
<td>150 mA</td>
<td>150 mA</td>
</tr>
<tr>
<td>SINGLEMODE FIBER OPTIC ABC SWITCH</td>
<td>25 mA</td>
<td>75 mA</td>
<td>150 mA</td>
</tr>
<tr>
<td>CARD TYPE</td>
<td>Steady-State Load at 12 VDC</td>
<td>Additional Load While Switching (Latching)</td>
<td>Additional Load For Non-Latching</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>----------------------------</td>
<td>-------------------------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>SINGLEMODE FIBER OPTIC ABCD SWITCH</td>
<td>25 mA</td>
<td>75 mA</td>
<td>150 mA</td>
</tr>
<tr>
<td>CONTROLLER CARD</td>
<td>50 mA</td>
<td>30 mA</td>
<td>N/A</td>
</tr>
<tr>
<td>CONTROLLER CARD WITH SNMP MODULE</td>
<td>300 mA</td>
<td>30 mA</td>
<td></td>
</tr>
</tbody>
</table>

The 4U rack may be powered with one or two external 12 VDC, 5 A, regulated supplies, or from 48 VDC. The external power supply module has an IEC input socket, for 100 – 240 VAC, 47 – 63 Hz INPUT, with a 12 VDC, 5 A, regulated OUTPUT.

Environment:
TEMPERATURE                 0° to 50° C operating, -40° to 70° C non-operating
HUMIDITY                    0 to 95% non-condensing
ALTITUDE                    40,000 ft maximum

Rack Size:
RACK – 7.0” H x 19” W x 6.5” D (not including handles and connectors)
RJ45 A/B (2 to 1) SWITCH CARDS – one slot (0.937 inches wide)
RJ45 DUAL CHANNEL A/B (2 to 1) SWITCH CARDS – one slot (0.937 inches wide)
RJ45 ABC (3 to 1) SWITCH CARDS – one slot (0.937 inches wide)
RJ45 ABCD (4 to 1) SWITCH CARDS – one slot (0.937 inches wide)
FIBER OPTIC A/B (2 to 1) SWITCH CARDS – one slot (0.937 inches wide)
FIBER OPTIC DUAL CHANNEL A/B (2 to 1) SWITCH CARDS – two slots (1.874 inches wide)
FIBER OPTIC ABC (3 to 1) SWITCH CARDS – one slot (0.937 inches wide)
FIBER OPTIC ABCD (4 to 1) SWITCH CARDS – two slots (1.874 inches wide)
CONTROLLER CARDS – one slot (0.937 inches wide)

The Pro Switching System Multi rack has 18 slots. Slots 1 – 16 are for switch cards, slot 17 is for the controller card, and slot 18 is reserved for the 48 VDC power supply card.
2. Introduction

The Pro Switching System Multi (PSSM) is a 4U high 19 inch rack style gang switch that supports multiple types of switch cards. Its rack mount chassis has 18 slots, one of which is reserved for future use. A Controller Card must be installed in one slot, leaving 16 slots for any mix of switch cards. Each switch card can be individually switched, or the entire rack can be switched from the Controller Card. Two RJ12 ports are provided that can be used to daisy chain up to 255 racks, thus allowing a single point of control for all the racks in a daisy chain system of racks. The PSSM also supports switching control via a +12 VDC signal, or via remote external momentary contact switches. When controlled via external momentary contact switches, the maximum number of racks that can be daisy chained together is limited to 64 racks.

The PSSM switch cards are available in five basic types.
Type 1: A/B (2 to 1) switch cards connect the COMMON port to the A port or the B port.
Type 2: Dual (INDIVIDUAL) Channel A/B (2 to 1) switch cards connect COMMON 1 port to the A port or the B port, and COMMON 2 port to the C port or the D port. When configured for Individual control, Channel 1 and Channel 2 operate independently.
Type 3: Dual (GANGED) Channel A/B (2 to 1) switch cards connect COMMON 1 port to the A port or the B port, and COMMON 2 port to the C port or the D port. When configured for Ganged control, Channel 1 and Channel 2 operate together. When COMMON 1 port is connected to the A port, COMMON 2 port is connected to the C port. When COMMON 1 port is connected to the B port, COMMON 2 is connected to the D port.
Type 4: ABC (3 to 1) switch cards connect the COMMON port to the A port, or the B port, or the C port.
Type 5: ABCD (4 to 1) switch cards connect the COMMON port to the A port, or the B port, or the C port, or the D port.

The DUAL CHANNEL A/B (2 to 1) switch cards are user configurable as INDIVIDUAL channel control or GANGED channel control.

The standard PSSM switch cards make the connections using latching telecommunication relays or latching fiber optic switching mechanisms. Latching circuitry allows the switch cards to retain their selected connections and maintain data flow even when power is lost or is removed.

PSSM switch cards are also available with non-latching relays or non-latching fiber optic switching mechanisms (please call for details). Non-latching switch cards will power up with the COMMON port connected to the A port, and when power is lost, these cards will automatically “fall-back” to the “COMMON port connected to the A port” connection state.

The Controller Card is available in three options: (Logic Only, RS-232, and SNMP). The Logic Only version supports individual card switching, Rack switching, and System Gang Switching using the front panel push-button switches, as well as Gang Switching using an external +12 VDC signal or external remote contact switch. A key lock switch on the rack allows the user to enable or disable manual switching (disables the front panel push-button switches). The RS-232 version supports the manual switching capabilities of the Logic Only version, as well as RS-232 communications on the Gang-In and Gang-Out connectors. The Gang-In connector can be configured to use RS-232 communications or external signal / contact. The RS-232 version allows racks to be addressed, and individual Switch Cards within the rack to be switched with serial commands. The SNMP version supports all the features of the RS-232 version, and adds an Ethernet port for SNMP, telnet, or web browser remote access. Note that there can only be one SNMP style Controller Card in a daisy chained system of racks, and it must be installed in the first rack in the system.

The SNMP Controller Cards also support SNMP traps or syslog messages (user configurable) for various events notifications, and can send these notifications to as many as 16 different remote monitoring locations.
3. Configuration

3.1 Controller Card Configuration

The following discussion will describe all user configurable settings on the Pro Switching System Multi Controller Card. Some of these settings are not applicable to all versions.

Switch SW6 on the RS232 Controller Card or the SNMP Controller Card is used to set the card’s address. The Controller Card address is used to identify the rack number when remotely accessing the switch through the serial port or Ethernet port. The Controller Card address can be set from 0x01 to 0xFF hex, with position 1 being the least significant bit and position 8 being the most significant bit. A switch in the ON position is a low or 0 bit, while a switch in the OFF position is a high or 1 bit. Address 0x00 is invalid and must not be used (it is used for factory test only). Each Controller Card within a multi-rack system must have a unique address. The first rack in the system should be assigned address 0x01, the next rack address 0x02, and so on through 0xFF. If an SNMP Controller Card is being used in a multi-rack system, it must be located in the first rack in the daisy-chained system of racks, and that card must be set to address 0x01. Only one SNMP Controller Card is permitted per multi-rack system.

The Controller Card also has user configurable jumpers. The 3-pin jumpers are positioned such that pin 1 is located toward the front or top of the card. For reference, the LED indicators and push-button switches are located at the front toward the top of the card. Each 3-pin jumper has a 2-position shunt, used to connect two of the three pins together.

Table 3.1.2 – Controller Card Shield and Ground Jumper Settings (* indicates factory default positions)

<table>
<thead>
<tr>
<th>Jumper</th>
<th>W1</th>
<th>W20</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RJ45 Shield</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connected to Frame Ground *</td>
<td>Pin 1 to Pin 2</td>
<td></td>
</tr>
<tr>
<td>Open</td>
<td>Pin 2 to Pin 3</td>
<td></td>
</tr>
<tr>
<td><strong>Power Supply Ground</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 Ohm Connection to Frame Ground*</td>
<td>Pin 1 to Pin 2</td>
<td></td>
</tr>
<tr>
<td>Direct Connection to Frame Ground*</td>
<td>Pin 2 to Pin 3</td>
<td></td>
</tr>
</tbody>
</table>

** On the SNMP Controller Card, the RJ45 Shield is connected to Signal Ground through zero ohm resistor R16. Therefore, the default setting for W20 is to connect the Power Supply Ground directly to Frame Ground.
Table 3.1.3 – RJ45 (Optional Ethernet Port) Pin Assignment

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal Name</th>
<th>Signal Direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Transmit Pair</td>
<td>Output</td>
</tr>
<tr>
<td>2</td>
<td>Transmit Pair</td>
<td>Output</td>
</tr>
<tr>
<td>3</td>
<td>Receive Pair</td>
<td>Input</td>
</tr>
<tr>
<td>6</td>
<td>Receive Pair</td>
<td>Input</td>
</tr>
</tbody>
</table>

Note: Although the RJ45 port is present on all versions of the Controller Card, this port is only used on the SNMP version of the Controller Card.

Table 3.1.4 – RJ12 GANG-IN Port Pin Assignment

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal Name</th>
<th>Signal Direction</th>
<th>Jumper</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>V+ (Approximately 11 VDC)</td>
<td>Output (current limited)</td>
<td>None</td>
</tr>
<tr>
<td>5</td>
<td>Signal Ground</td>
<td>Not Applicable</td>
<td>None</td>
</tr>
<tr>
<td>4</td>
<td>Transmit Data / SYS_A (I/O)</td>
<td>Output / (Input and Output)</td>
<td>W10</td>
</tr>
<tr>
<td>3</td>
<td>Receive Data / SYS_B (I/O)</td>
<td>Input / (Input and Output)</td>
<td>W9</td>
</tr>
<tr>
<td>2</td>
<td>Open / SYS_C (I/O)</td>
<td>None / (Input and Output)</td>
<td>W7</td>
</tr>
<tr>
<td>1</td>
<td>Open / SYS_D (I/O)</td>
<td>None / (Input and Output)</td>
<td>W8</td>
</tr>
</tbody>
</table>

Note: Jumpers W7, W8, W9, and W10 select the function of pins 1 through 4 on the GANG-IN port.

Table 3.1.5 – RJ12 GANG-OUT Port Pin Assignment

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal Name</th>
<th>Signal Direction</th>
<th>Jumper</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Open / SYS_D (I/O)</td>
<td>None / (Input and Output)</td>
<td>W14</td>
</tr>
<tr>
<td>5</td>
<td>Open / SYS_C (I/O)</td>
<td>None / (Input and Output)</td>
<td>W13</td>
</tr>
<tr>
<td>4</td>
<td>Transmit Data / SYS_B (I/O)</td>
<td>Output / (Input and Output)</td>
<td>W15</td>
</tr>
<tr>
<td>3</td>
<td>Receive Data / SYS_A (I/O)</td>
<td>Input / (Input and Output)</td>
<td>W11</td>
</tr>
<tr>
<td>2</td>
<td>Signal Ground</td>
<td>Not Applicable</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>V+ (Approximately 11 VDC)</td>
<td>Output (current limited)</td>
<td>None</td>
</tr>
</tbody>
</table>

Note: Jumpers W11, W13, W14, and W15 select the function of pins 3 through 6 on the GANG-OUT port.

Note: The PC board GANG-IN / GANG-OUT connectors are RJ12 6P6C jacks. When daisy-chain connecting multiple racks, a standard RJ11 6P4C male/male crossover cable is sufficient to daisy chain connect from the gang-out port on one rack to the gang-in port on the next if the controller cards in the racks support serial communications. For logic only controller cards, or when using the SYS_I/O signals a 6P6C cable is required.
Table 3.1.6 – Controller Card **GANG-IN** Port Configuration Jumper Settings

<table>
<thead>
<tr>
<th>Jumper</th>
<th>W10</th>
<th>W9</th>
<th>W7</th>
<th>W8</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gang-In Pin 4</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connected to TXD *</td>
<td>Pin 1 to Pin 2</td>
<td>Pin 1 to Pin 2</td>
<td>Pin 1 to Pin 2</td>
<td>Pin 1 to Pin 2</td>
</tr>
<tr>
<td>Connected to SYS_A (I/O)</td>
<td>Pin 2 to Pin 3</td>
<td>Pin 2 to Pin 3</td>
<td>Pin 2 to Pin 3</td>
<td>Pin 2 to Pin 3</td>
</tr>
<tr>
<td><strong>Gang-In Pin 3</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connected to RXD *</td>
<td>Pin 1 to Pin 2</td>
<td>Pin 1 to Pin 2</td>
<td>Pin 1 to Pin 2</td>
<td>Pin 1 to Pin 2</td>
</tr>
<tr>
<td>Connected to SYS_B (I/O)</td>
<td>Pin 2 to Pin 3</td>
<td>Pin 2 to Pin 3</td>
<td>Pin 2 to Pin 3</td>
<td>Pin 2 to Pin 3</td>
</tr>
<tr>
<td><strong>Gang-In Pin 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Connected *</td>
<td>Pin 1 to Pin 2</td>
<td>Pin 1 to Pin 2</td>
<td>Pin 1 to Pin 2</td>
<td>Pin 1 to Pin 2</td>
</tr>
<tr>
<td>Connected to SYS_C (I/O)</td>
<td>Pin 2 to Pin 3</td>
<td>Pin 2 to Pin 3</td>
<td>Pin 2 to Pin 3</td>
<td>Pin 2 to Pin 3</td>
</tr>
<tr>
<td><strong>Gang-In Pin 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Connected *</td>
<td>Pin 1 to Pin 2</td>
<td>Pin 1 to Pin 2</td>
<td>Pin 1 to Pin 2</td>
<td>Pin 1 to Pin 2</td>
</tr>
<tr>
<td>Connected to SYS_D (I/O)</td>
<td>Pin 2 to Pin 3</td>
<td>Pin 2 to Pin 3</td>
<td>Pin 2 to Pin 3</td>
<td>Pin 2 to Pin 3</td>
</tr>
</tbody>
</table>

* Factory Default Setting

Jumpers W7, W8, W9, and W10 function as a group to configure the GANG-IN port. Refer to table 3.1.4 for the GANG-IN port pin assignment. Connect to TXD and RXD to support RS-232 serial communications, or connect to SYS I/O signals to control the system with a remote 12 volt source or remote contact switches.

**NOTE:** RS-232 serial communication is not supported on the logic only version. A logic only Controller Card will be built with connections to the SYS I/O signals, and jumpers W7 – W11 and W13 – W15 will not be present.

The connections to V+ are through a Diode and through 1 K ohm resistors. The System Control signals are used as inputs and outputs. As an Input signal it is normally open. This input is driven to +12 VDC to switch the system to the desired state. For example SYS_A is driven to +12 VDC to switch the system to A. SYS_B is driven to +12 VDC to switch the system to B and so on. As an output, the signals are driven to +10 VDC when the user initiates a system switch. When the user initiates a SYSTEM switch to A, SYS_A and is driven to +10 VDC. When the user initiates a SYSTEM switch to B, SYS_B and is driven to +10 VDC and so on.

W9 and W10 should be set to TXD and RXD for systems using the serial input port, and for Controller Cards that have a network (SNMP) module installed, and for racks in a system with a network (SNMP) module in the first rack.

Table 3.1.7 – Controller Card **GANG-OUT** Port Configuration Jumper Settings

<table>
<thead>
<tr>
<th>Jumper</th>
<th>W11</th>
<th>W15</th>
<th>W13</th>
<th>W14</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gang-In Pin 3</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connected to RXD *</td>
<td>Pin 1 to Pin 2</td>
<td>Pin 1 to Pin 2</td>
<td>Pin 1 to Pin 2</td>
<td>Pin 1 to Pin 2</td>
</tr>
<tr>
<td>Connected to SYS_B (I/O)</td>
<td>Pin 2 to Pin 3</td>
<td>Pin 2 to Pin 3</td>
<td>Pin 2 to Pin 3</td>
<td>Pin 2 to Pin 3</td>
</tr>
<tr>
<td><strong>Gang-In Pin 4</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connected to TXD *</td>
<td>Pin 1 to Pin 2</td>
<td>Pin 1 to Pin 2</td>
<td>Pin 1 to Pin 2</td>
<td>Pin 1 to Pin 2</td>
</tr>
<tr>
<td>Connected to SYS_A (I/O)</td>
<td>Pin 2 to Pin 3</td>
<td>Pin 2 to Pin 3</td>
<td>Pin 2 to Pin 3</td>
<td>Pin 2 to Pin 3</td>
</tr>
<tr>
<td><strong>Gang-In Pin 5</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Connected *</td>
<td>Pin 1 to Pin 2</td>
<td>Pin 1 to Pin 2</td>
<td>Pin 1 to Pin 2</td>
<td>Pin 1 to Pin 2</td>
</tr>
<tr>
<td>Connected to SYS_C (I/O)</td>
<td>Pin 2 to Pin 3</td>
<td>Pin 2 to Pin 3</td>
<td>Pin 2 to Pin 3</td>
<td>Pin 2 to Pin 3</td>
</tr>
<tr>
<td><strong>Gang-In Pin 6</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Connected *</td>
<td>Pin 1 to Pin 2</td>
<td>Pin 1 to Pin 2</td>
<td>Pin 1 to Pin 2</td>
<td>Pin 1 to Pin 2</td>
</tr>
<tr>
<td>Connected to SYS_D (I/O)</td>
<td>Pin 2 to Pin 3</td>
<td>Pin 2 to Pin 3</td>
<td>Pin 2 to Pin 3</td>
<td>Pin 2 to Pin 3</td>
</tr>
</tbody>
</table>

* Factory Default Setting

Jumpers W11, W13, W14, and W15 function as a group to configure the GANG-OUT port. Refer to table 3.1.5 for the GANG-OUT port pin assignment. Connect to TXD and RXD to support RS-232 serial communications, or
connect to SYS I/O signals to control the system with a remote 12 volt source or remote contact switches.

W11 and W15 should be set to RXD and TXD for systems using the serial input port, and for Controller Cards that have a network (SNMP) module installed, and for racks in a system with a network (SNMP) module in the first rack.

Table 3.1.8 – Controller Card SNMP Configuration Jumper Settings

<table>
<thead>
<tr>
<th>Jumper</th>
<th>W16</th>
<th>W17</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNMP Jumper Settings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No SNMP card installed</td>
<td>Pin 1 to Pin 2</td>
<td>Pin 1 to Pin 2</td>
</tr>
<tr>
<td>SNMP card installed</td>
<td>Pin 2 to Pin 3</td>
<td>Pin 2 to Pin 3</td>
</tr>
</tbody>
</table>

Jumpers W16 & W17 should be set as follows:
- Both to position 1-2 if there is no network module installed (i.e. Controller Cards addressed 2 thru 255 in a multi-unit system).
- Both to position 2-3 if there is a network module installed.

**WARNING:** Damage may occur to the network module and/or Controller Card if these jumpers are set to position 1-2 with a network module installed.

The Controller Card has two independent power supply entry connectors. Each power supply has a set of alarm relay contacts. The alarm relay contacts are labeled COM for common and CON for contact. The user may select the normally open or normally closed contact.

Table 3.1.8 – Controller Card Alarm Contact Configuration Jumper Settings

<table>
<thead>
<tr>
<th>Jumper</th>
<th>W18</th>
<th>W19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Supply 1 Alarm Contact</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normally Closed Contact *</td>
<td>Pin 1 to Pin 2</td>
<td>Pin 1 to Pin 2</td>
</tr>
<tr>
<td>Normally Open Contact</td>
<td>Pin 2 to Pin 3</td>
<td>Pin 2 to Pin 3</td>
</tr>
<tr>
<td>Power Supply 2 Alarm Contact</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normally Closed Contact *</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normally Open Contact</td>
<td>Pin 1 to Pin 2</td>
<td>Pin 1 to Pin 2</td>
</tr>
<tr>
<td></td>
<td>Pin 2 to Pin 3</td>
<td>Pin 2 to Pin 3</td>
</tr>
</tbody>
</table>

* Factory Default Setting

Dip Switch SW7 function is reserved for future development, and should be left in the OFF position. Note: Dip Switch SW7 may not be installed.

### 3.2 Configuring PSSM Switch Cards

There are no jumpers or switch settings that need to be configured on most of the PSSM Switch Cards, however, the DUAL CHANNEL A/B SWITCH CARD has a jumper that allows the user to configure the channels for INDIVIDUAL control or GANGED control.

Table 3.2.1 – DUAL CHANNEL A/B SWITCH CARD Control Configuration Jumper Settings

<table>
<thead>
<tr>
<th>Jumper</th>
<th>W2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual Channel Control</td>
<td></td>
</tr>
<tr>
<td>Individual Control *</td>
<td>Pin 1 to Pin 2</td>
</tr>
<tr>
<td>Ganged Control</td>
<td>Pin 2 to Pin 3</td>
</tr>
</tbody>
</table>

* Factory Default Setting (Contact the Factory if you would like to order the Dual Channel A/B Switch Cards pre-configured for Ganged Control.)

Jumper W2 will ONLY be installed on DUAL CHANNEL A/B SWITCH CARDS, and will not be installed on other PSSM Switch Cards. Pin 1 on W2 is marked on the PC board silkscreen.
4. Installation

The PSSM Switch Cards and the Controller Card are installed from the rear of the rack.

4.1. Initial Installation

4.1.1 For each rack that contains an RS232 Controller Card, or an SNMP Controller Card, you must first set the Controller Card’s address using the address DIP switch on the Controller Card.

4.1.2 Using the card guides, carefully slide each card into the rack. Use caution to guide the switches and LED indicators as they go through the holes in the front panel. Fully insert the card until it makes connection to the card edge connector on the rack backplane.

4.1.3 Secure the card to the rack at the top and bottom of the card, using the screws provided.

4.1.4 The PC board GANG-IN / GANG-OUT connectors are RJ12 6P6C jacks. If daisy-chain connecting multiple racks, a standard RJ11 6P4C male/male crossover cable is sufficient to daisy chain connect from the gang-out port on one rack to the gang-in port on the next if the controller cards in the racks support serial communications. For logic only controller cards, or when using the SYS_I/O signals a 6P6C cable is required.

4.1.5 If you are going to remotely manage the system over an Ethernet network, you must first set the IP address, subnet mask and gateway address parameters on the Controller Card using the serial port connection. You should set these parameters before attaching a cable to the NETWORK port, as the default parameters may not work or could interfere with the operation of your Ethernet network. See section 6 for more information regarding IP setup.

4.1.6 Apply power to each rack, using the 12 VDC regulated power supply provided with your system. The ramp on the power supply connector should face the tab on the power supply entry header. When first installed, each switch should be cycled from A to B and back. On switches that have C and/or D positions, cycle the switch through all positions. It is possible for the latching relays to have changed state during shipping. Cycling the switch will assure that all latching relays and/or latching optical switching mechanisms are in a known state.

4.1.7 Connect cables between the A, B, C, D, and COMMON ports on the switch cards and your devices. The PSSM Switch cards provide straight thru connections and are bidirectional, i.e. they have no preference to signal direction. If your application requires a cross-over cable, use only 1 cross-over cable in that path. Use a straight through cable on the other side of the switch card.

4.2. Adding a rack to an installed multi-rack system

The following procedure was developed to prevent inadvertent system switching when adding a rack to an installed system of daisy-chained racks.

4.2.1 If the new rack contains an RS232 Controller Card, you must first set the Controller Card’s address. The address for the new rack should be unique – see .Section 3.1 for setting the Controller Card’s address DIP switch.

4.2.2 Remove power from the last rack in the existing multi-rack system. The standard PSSM Switch Cards use latching relays or latching optical switching mechanisms, so the equipment connected thru the rack that is powered down will continue to operate normally. If the PSSM contains non-latching switch cards, the connections thru these cards will “fall-back” to the “COMMON port connected to the A port” connection state when power is lost or removed. On non-latching DUAL Channel Switch Cards, COMMON 1 port will connect to the A port, and COMMON 2 port will connect to the C port when power is lost or removed.

4.2.3 Connect from the GANG-OUT port on the last rack in the system to the GANG-IN port on the new rack. The PC board GANG-IN / GANG-OUT connectors are RJ12 6P6C jacks. When daisy-chain connecting racks, a standard RJ11 6P4C male/male crossover cable is sufficient to daisy chain connect from the gang-out port on one rack to the gang-in port on the next if the controller cards in the racks support serial communications. For logic only controller cards, a 6P6C cable is required.

4.2.4 Apply power to both racks, using the 12 VDC regulated power supply provided with each unit. The ramp on the power supply connector should face the tab on the power supply entry header.

4.2.5 After the new rack has been powered up the first time, it is recommended that all of the Switch Cards in the rack be cycled from A to B and back. On switches that have C and/or D positions, cycle the switch through all positions. It is possible for the latching relays to have changed state during shipping. Cycling the switch will assure that all latching relays and/or latching optical switching mechanisms are in a known state. Once this has been done the system will be ready for use.
5. Operation

When power is applied to the Controller Card, the appropriate Power Supply LED should illuminate. Also, the alarm relay associated with the power supply should be energized, changing the state of the alarm relay contacts. On each PSSM Switch Card, either the "A", "B", "C", or the "D" LED should illuminate to indicate the currently connected port. On Dual Channel A/B Switch Cards, either the "A" or "B", AND either the "C" or "D" LED should illuminate to indicate the currently connected ports.

When the Key-Lock switch is OFF, the push-button switches in the rack will be disabled. Note that the rack will still switch in response to switch commands sent to the Gang In RS232 port, or to the E/N network port, or via an external dry contact closure if using this option. When the Key-Lock switch is ON, the push-button switches in the rack function normally.

The push-button switches on each PSSM Switch Card are used to switch only that card. Press and hold the "A" switch to connect the COMMON Port to the A Port. The "A" LED will illuminate when the switch operation has been completed. Release the switch when switching has finished. Press and hold the "B" switch to connect the COMMON Port to the B Port. The "B" LED will illuminate when the switch operation has been completed. Release the switch when switching has finished. Use the same process for positions "C" and "D". On Dual Channel Switch Cards, the A and B switches control the connections to COMMON port 1, and the C and D switches control the connections to COMMON port 2. If the Dual Channel Switch Card is configured for GANGED control, switches A and C operate as one, and switches B and D operate as one.

The push-button switches on the Controller Card are used to switch all cards in the rack, and are operated in the same fashion as the push-button switches on the individual Switch Cards. To switch the entire system (multiple racks ganged together), hold the "system" push-button while operating one of the A, B, C, or D push-button switches on the Controller Card. Operating the C or D push-buttons will have no effect on cards which do not have C or D ports.

The Controller Card STAT LED should blink under the following conditions:
The Controller Card push-button switches are used to initiate a "rack", or "system" level switching operation.
The Controller Card receives a switch command from the gang-in port or the E/N network port.

5.1 "SYSTEM" Switching Using the Gang-In System Control Signals

The System Control signals on the Gang In connector can be used as input control signals or as an output control signals. When used as an input control signals, the SYS_A, SYS_B, SYS_C, or SYS_D pin should be driven to +12 VDC to switch the system to A, B, C, or D respectively. The input circuit requires approximately 1 mA to operate.

As an output, these signals are driven to +10 VDC when the user initiates a system switch to A, B, C, or D. To protect the output circuits, each output goes through a 1 K ohm resistor. Therefore, the output should not be used to drive large loads.

The GANG-IN and GANG-OUT connectors supply V+ (approximately 11 VDC). These V+ outputs are provided through a diode and through 1 K ohm resistors, and therefore should not be used to drive large loads. These outputs are provided to allow system switching using only remote contact switches, connected to the System Control I/O pins. In this configuration, a momentary push-button switch or other dry contact closure connected to the GANG-IN or GANG-OUT port can be used to remotely control the system as shown in Figure 5.1.1. Figure 5.1.1 shows the GANG-IN and GANG-OUT pins are shown for reference. The switches / contacts shown in Figure 5.1.1 are EXTERNAL to the PSSM system. Refer to Table 3.1.6 for GANG-IN Port Configuration Jumper Settings, or Table 3.1.7 for GANG-OUT Port Configuration Jumper Settings.
5.2 RS232 Terminal Commands (Not applicable to Logic Only or SNMP Controller Cards)

This section describes the RS232 commands that are available when using an RS232 Controller Card. Logic Only Controller Cards do not support any serial commands, and SNMP Controller Cards respond to an enhanced set of RS232 commands – see Section 5.3 and Section 7 for more details on command syntax and responses for terminal commands supported by SNMP Controller Cards.

**IMPORTANT**: To start the “terminal” interface on an RS232 Controller Card so that it is ready to accept and respond to commands, set your terminal to 1200 Baud, No Parity, 8 Data Bits, 1 Stop Bit, then connect your terminal to the GANG-IN port (refer to Table 3.1.4), and press the SPACE KEY.

When the GANG-IN port on an RS232 Controller Card detects a 1200 Baud SPACE character, it starts the “terminal” interface and responds with the “>” prompt character. If you then type “help” and then press the ENTER KEY, the RS232 Controller Card will respond with the rack address, software version, and a list of the available commands – see Table 5.2.1 below.

Table 5.2.1 – RS232 Controller Card response to “help” command (1200, N, 8, 1)

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>help</td>
<td>displays current commands</td>
</tr>
<tr>
<td>SPACE</td>
<td>(space character starts terminal mode)</td>
</tr>
<tr>
<td>exit</td>
<td>(exit terminal mode)</td>
</tr>
<tr>
<td>get system</td>
<td>(n = rack addr, 1 to 255)</td>
</tr>
<tr>
<td>get rack n</td>
<td>(n = rack addr, 1 to 255)</td>
</tr>
<tr>
<td>get card y</td>
<td>(y = card addr, 1 to 4080)</td>
</tr>
<tr>
<td>get version n</td>
<td>(n = rack addr, 1 to 255)</td>
</tr>
<tr>
<td>get types n</td>
<td>(n = rack addr, 1 to 255)</td>
</tr>
<tr>
<td>get groups n</td>
<td>(n = rack addr, 1 to 255)</td>
</tr>
<tr>
<td>set system X</td>
<td>(X = A, B, C, or D)</td>
</tr>
<tr>
<td>set rack n X</td>
<td>(n = rack addr, 1 to 255, X = A, B, C, or D)</td>
</tr>
<tr>
<td>set card y X</td>
<td>(y = card addr, 1 to 4080, X = A, B, C, or D)</td>
</tr>
<tr>
<td>set groups n string</td>
<td>(n = rack addr, 1 to 255, string up to 16 chars)</td>
</tr>
</tbody>
</table>

NOTE: For commands that use a rack address “n”, refer to Section 3.1 on how to set the rack address DIP switch on the controller card. For commands that use a card address “y”, use the following formula to determine the card address of any card in any rack:  \[ y = 16 \times (\text{rack address} - 1) + \text{slot#} \]  Example: the card in slot 12 in rack 3 is card address 44.

Commands are not case sensitive and can be entered as either upper or lower case, except for the group string which...
treats group a and group A as two different groups. The RS232 Controller Card echoes each character it receives back to your terminal, allowing the user to backspace to correct typing errors. Each word on a command line must be separated by a single SPACE character. The command is processed when you press the ENTER KEY. All of the above commands except “help” and “exit” may be abbreviated by using only the first character of each word on the command line. For example:

“g s<CR>” is the same as “get system<CR>”.
“s r 2 A<CR>” is the same as “set rack 2 A<CR>”.

The following table shows an example of each command along with the expected Response and Action. Please note that each command must be followed by a carriage return (ASCII HEX 0x0D).

<table>
<thead>
<tr>
<th>Command</th>
<th>Response</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>“SPACE” char</td>
<td>&gt;</td>
<td>starts terminal mode if not started (1200,N,8,1), otherwise system will echo back a “SPACE” char if already in terminal mode</td>
</tr>
<tr>
<td>get system</td>
<td>System Status (A, B, C, D, M or X) None. M for Mixed, X for empty.</td>
<td></td>
</tr>
<tr>
<td>set system B</td>
<td>System Set To B</td>
<td>All switch cards in system will switch to B</td>
</tr>
<tr>
<td>set rack 1 A</td>
<td>Rack 1 Set To A</td>
<td>All switch cards in rack 1 will switch to A</td>
</tr>
<tr>
<td>get card 8</td>
<td>Card 8 Status (A, B, C, D, or Empty) None</td>
<td>For Dual Channel Switch Cards, the status will be two characters, one for each channel. For example status AC means that COM1 is connected to A and COM2 is connected to C.</td>
</tr>
<tr>
<td>set card 8 B</td>
<td>Card 8 Set To B</td>
<td>Switch card 8 will switch to B</td>
</tr>
<tr>
<td>get version 1</td>
<td>Rack 1 Version Rev. 74C.A</td>
<td>None</td>
</tr>
<tr>
<td>get types 1</td>
<td>Rack 1 Types 1110223344440555</td>
<td>None. This response displays one character for each card slot. Type 0 = Empty, or Not Available, Type 1 = A/B Switch,</td>
</tr>
</tbody>
</table>
Type 2 = Dual Channel Independent A/B Switch,  
Type 3 = Dual Channel Ganged A/B Switch,  
Type 4 = ABC Switch,  
Type 5 = ABCD Switch.

get groups 1  
Rack 1 Groups 1234567812345678  
None. This response displays one character for each card slot, indicating which group each switch cards belongs to. An ASCII 0

set groups 1  
1111222233334444  
Rack 1 Groups Set To  
1111222233334444  
Set card slots 1 – 4 to group 1, card slots 5 – 8 to group 2, card slots 9 – 12 to group 3, and card slots 13 – 16 to group 4. Any character can be used to label a group, except “0” which indicates independent and “X” which skips a position (retains the previous group character). All cards in a group follow any switching command to any card in the group.

help  
(see Table 5.2.1 above)  
None
exit  
Good Bye  
Exits terminal mode

5.2.1 Programming Tips for Using the RS232 Terminal Commands

This section is applicable to RS232 Controller Cards WITHOUT an SNMP network module installed, and is intended for programmers who want to control the Pro Switching System Multi in an automated environment using a computer.

BACKGROUND:
When first energized, the PSSM RS232 Controller Card provides a special rack-to-rack interface at the Gang In connector, operating at 2400, N, 8, 1. When the Controller Card receives a 1200 baud SPACE character, it detects a framing error with null data. This causes it to enter “Terminal” mode and to automatically change its data rate to 1200 bps. The controller indicates that is has entered terminal mode by displaying a prompt character (“>”, ASCII HEX 0x3E). It then stays in terminal mode, until it receives the “exit” command, or detects 2400 baud characters.

While in terminal mode, the controller echoes the received characters and collects them into a buffer until it receives a carriage return character. The carriage return is echoed and then the controller begins to process the received command. Any characters received while the controller is processing the command are ignored. When the command is processed, the controller responds, followed by a prompt character, indicating that it is ready to receive another command. If the controller gets a command that is intended for another controller, it passes that command out the Gang Out port, and waits up to three seconds for a response. If it does not get a response, it responds “No Response”, followed by a prompt.

PROGRAMMING:
First your program must set its RS232 COM port to 1200, N, 8, 1.

Since the PSSM RS232 Controller Card may be in rack-to-rack interface mode, your program should then force the controller into terminal mode. This can be done by sending a SPACE character, followed by a carriage return character. If the Controller Card is in rack-to-rack interface mode, the SPACE character will cause the controller to go into Terminal mode, and will then respond with a prompt character. The carriage return will then cause it to respond with “Invalid Command”, followed by another prompt character. If the controller was already in terminal mode, the controller will simply respond “Invalid Command”, followed by a prompt character.

Now that the Controller Card is in terminal mode, your program can issue other commands, but must wait for the controller to issue the prompt character (“>”, ASCII HEX 0x3E) before sending each new command.

If the Controller Card looses power, it will reset itself when power is restored and come back up in the rack-to-rack interface mode. As such, you may want to include an error recovery routine in your program that tries to force terminal mode if your program does not receive a response from the Controller Card. In applications where your program will issue commands very infrequently, you may find it useful to force terminal mode before every command in case the controller has lost power since your last command.
5.3 Enhanced RS232 Terminal Commands for SNMP Controller Cards

This section is applicable to controller cards **WITH** an SNMP network module installed. The RS232 Gang In interface on the SNMP Controller Card operates at 9600 bps (rather than at 1200 bps as is the case for an RS232 Controller Card). The Gang Out interface on an SNMP Controller Card remains unchanged, and may still be used to connect to an RS232 Controller Card when daisy chaining multiple racks together. When daisy chaining multiple racks, only the first rack in the chain may have an SNMP Controller Card installed.

The SNMP Controller Card supports an enhanced set of serial commands that are listed below and described in more detail in section 7. To communicate with an SNMP Controller Card, set your RS232 terminal to 9600 baud, no parity, 8 data bits, and 1 stop bit. Connect this terminal to the GANG-IN port.

When you apply power to the system, the Controller Card and SNMP network module run a series of internal self tests and configuration steps. This takes approximately 5 seconds. After this process is complete you will see a sign-on message displayed on your serial console, similar to the following:

```
Network Agent Version 4.01C APR 2013
Copyright (c) 2013
All rights reserved
System starting ...
Rack position A
Console ready
>
```

At this point the SNMP Controller Card is now ready to receive RS232 serial commands via the Gang In connector. If you type “help” followed by the ENTER KEY, the list of available commands will be displayed as shown below. See Section 7 for a detailed description of each command.

**CONSOLE COMMANDS:**
- GET ALL (display all parameters)
- GET VERSION (display software versions)
- GET[SET] SYSTEM [A/B/C/D] (control all system ports)
- GET[SET] RACK N [A/B/C/D] (control single rack ports)
- GET[SET] PORT N [A/B/C/D] (control single port)
- GET EVERYRACK (display status for all racks)
- GET EVERYRACK N (display status for racks 1 thru N)
- GET POWER N (display power status)
- GET[SET] GROUPS N [string] (control single rack groups)
- GET TYPES N (display single rack types)
- GET[SET] IPADDRESS [X.X.X.X]
- GET[SET] SUBNETMASK [X.X.X.X]
- GET[SET] GATEWAY [X.X.X.X]
- GET[SET] PINGREPLY [ON/OFF]
- GET[SET] SNMPENABLE [ON/OFF]
- GET[SET] READCOMMUNITYNAME [string]
- GET[SET] WRITECOMMUNITYNAME [string]
- GET[SET] WEBENABLE [ON/OFF]
- GET[SET] WEBPASSWORD [string]
- GET[SET] WEBTIMEOUT [N] (seconds)
- GET[SET] WEBPORT [N]
- GET[SET] TELNETENABLE [ON/OFF]
- GET[SET] TELNETPASSWORD [string]
- GET[SET] TELNETTIMEOUT [N] (seconds)
- GET[SET] TELNETPORT [N]
- GET[SET] MONITORIP N [X.X.X.X] (0.0.0.0 to disable)
- GET MONITORIP (display all monitor IP addresses)
- SET MONITORIPRANGE N [X.X.X.S E] (N=Index,S=Start,E=End)
- GET[SET] MONITORINTERVAL [N] (1/10 seconds, 0 to disable)
- GET[SET] MONITORFAILCOUNT [N] (0 to disable)
- GET[SET] MONITOROKCOUNT [N] (0 = no auto recover)
- GET[SET] MONITORTIMES N HH:MM HH:MM (0:0:0 Always ON)
- GET MONITORTIMES (display all monitor times)
- GET[SET] AUTHENTICATIONTRAP [ON/OFF]
GET[SET] ALERTTYPE [TRAP/SYSLOG]
GET[SET] ALERTINTERVAL [N] (1 – 255 minutes, 0 for single)
GET[SET] AUTOSWITCH [NORMAL/BYPASS]
GET[SET] AUTOSWITCHTRIP [N] (0 – 255, Auto-Switch Trip Point)
GET[SET] DAY [MONDAY/TUESDAY/…]
GET[SET] TIME [HH:MM] (HOUR 0 – 23, MINUTE 0 – 59)
GET[SET] DATE [MM/DD/YYYY] (two digit month and day, four digit year)
GET[SET] ADMINIP N [X.X.X.X] (0.0.0.0 to disable an entry)
GET ADMINIP (display all administrator IP addresses)
GET[SET] MANAGER N [X.X.X.X] (0.0.0.0 to disable an entry)
GET MANAGER (display all SNMP managers)
PING X.X.X.X (ICMP ECHO to remote host)
GET[SET] EVENTLOG (GET to display event log, SET to clear event log)
SAVE save settings for next startup
RESET restart (use after SAVE)
SET DEFAULTS (restore default user settings, save required)

6. SNMP/Web Setup

To perform the initial setup of an SNMP Controller Card so that it can be remotely accessed over an Ethernet network, you will need a serial terminal capable of 9600 baud, no parity, 8 data bits, and 1 stop bit in order to configure the required networking parameters. Connect this terminal to the Gang In port. The necessary connections to a standard IBM compatible PC serial port DB9 connector are as follows:

<table>
<thead>
<tr>
<th>GANG-IN RJ11</th>
<th>SIGNAL</th>
<th>DIRECTION</th>
<th>HOST DB9</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>RECEIVED DATA</td>
<td>TO HOST</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>TRANSMITTED DATA</td>
<td>FROM HOST</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>GROUND</td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>

Apply power to the Pro Switching System Multi. The SNMP Controller Card requires approx 5 seconds to boot up, while it performs several internal self tests and initialization tasks. After this process is complete you will see a sign-on message similar to the following on your serial console:

```
Network Agent Version 4_01C APR 2013
Copyright (c) 2013
All rights reserved
System starting ...
Rack Position A
Console ready
>
```

At this point the SNMP Controller Card is ready to accept the networking related configuration commands necessary before you will be able to communicate with it over an Ethernet network. You will need to enter an IP address, subnet mask, and gateway address as well as read and write SNMP community names, a telnet password, and/or a web password depending on which of these options you want to use. These parameters must be saved into non-volatile memory, and the system then needs to be reset to allow it to reconfigure with the new settings. Any time one or more of these parameters is changed, they must be saved followed by a system reset. The following shows a typical setup session. Change the entered parameters shown below to suit your application requirements. These networking configuration commands are described in more detail in Section 7.

```
>set ipaddress 192.168.1.200
OK
>set subnetmask 255.255.255.0
OK
>set gateway 192.168.1.1
OK
>set readcommunityname public
OK
```
>set writecommunityname private
OK
>save
OK
>reset
restarting ...

After the system reinitializes, you will again be greeted by the sign-on message as before. You can now attach a 10base-T CAT5 cable between the Network port on the SNMP Controller Card and an available port on your Ethernet hub or switch/router. The SNMP Controller Card will now respond to telnet, SNMP and/or HTTP messages at the assigned IP address depending on which options you enabled on the SNMP Controller Card. Section 7 describes the commands that are available via the console prompt (telnet, web, or RS-232 interface). Section 8 describes the operation of the web browser interface, and Section 9 provides a MIB Path Summary that lists the supported SNMP variables and their functions.

7. Console Commands

The following list of commands are available from the console prompt (telnet, web, or RS232 interface) of the SNMP Controller Card. All commands can entered in any mix of upper or lower case (commands are not case sensitive), although several variable parameters are case sensitive (read/write community names, plus telnet and web passwords). GET, SET, SYSTEM, RACK, and PORT can all be abbreviated by the first letter of the command, allowing shorthand entry of switching commands.

GET ALL
Displays all parameters and settings. An example output is shown here.

System Status: A
IP Address: 192.168.1.30
MAC Address: 00 06 57 00 01 02
Subnet Mask: 255.255.255.0
Gateway IP Address: 192.168.1.1
PING Reply: Enabled
SNMP Enable: Enabled
Read Community Name: public
Write Community Name: private
Web Enable: Enabled
Web Password: mctech
Web Timeout: 300
Web Port: 80
Telnet Enable: Enabled
Telnet Password: dataman
Telnet Timeout: 80
Telnet Port: 23
Monitor Interval: 10
Monitor Fail Count: 5
Monitor Ok Count: 5
AutoSwitch Mode: NORMAL
AutoSwitch Trip Point: 0
Monitor IP Status: 0 UP, 0 DOWN, 0 ASSIGNED, 256 AVAILABLE
Monitor Times: ALWAYS ON, Current Day: 1 MONDAY
Date: 01/16/2012 Time: 09:25:54
Authentication Trap: Disabled
Alert Type: TRAP
Alert Interval: 0 – Single
Event Log Count: 1
ADMIN IP Addresses: 0 ASSIGNED, 8 AVAILABLE
SNMP Managers: 1 ASSIGNED, 15 AVAILABLE
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GET VERSION
Displays the software revisions of the network module and firmware on the SNMP Controller Card.

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GET SYSTEM
Displays the system status. This is the same as the status returned by the SNMP variable mpSystemGangPort. The GET SYSTEM command is meaningful only if you exclusively use the SET SYSTEM command to control the state of all of the PSSM switch cards simultaneously. The GET SYSTEM command queries rack 1 for status and assumes that all other racks in the system are in the same connection state. The status will be A, B, C, or D if all cards in the first rack have the same status. The status will be X for empty “not present” if there are no cards installed in the first rack. The status will be “M” for mixed status if the cards in the first rack do not all have the same status.

   System Status: A

For Dual Channel Switch cards:
Status value A means that COM1 is connected to A, and COM2 is connected to C.
Status value B means that COM1 is connected to B, and COM2 is connected to C.
Status value C means that COM1 is connected to A, and COM2 is connected to D.
Status value D means that COM1 is connected to B, and COM2 is connected to D.

SET SYSTEM [A/B/C/D]
Sets the entire system (all connected racks) to position A, B, C, or D. Not all values have meaning for all switch types. For example Set System D will not cause a switching action on ABC switches.

   For Dual Channel Switch Cards:
   Set values A and B connect COM1 to A or B respectfully.
   Set values C and D connect COM2 to C or D respectfully.

GET RACK N
Displays status of rack N (1-255). This is the same as the status returned by the SNMP variable mpRackCards. It displays a 16 character string showing the status of each card slot. If the rack contains any dual channel switches, the response will be 32 characters, 16 characters for the status of channel 1, followed by 16 characters for the status of channel 2.

   Rack Status: XXXBXXBXXXXBXAXX

For a Rack with Dual Channel Cards in slots 5 – 8, and 11 - 16:

   Rack Status:
   ABCDAABXXAABBBB
   XXXXCCCCXXDCCDDD

SET RACK N [A/B/C/D]
Sets the entire addressed rack N (1-255) to position A, B, C, or D. Not all values have meaning for all switch types.

   For Dual Channel Switch Cards:
   Set values A and B connect COM1 to A or B respectfully.
   Set values C and D connect COM2 to C or D respectfully.

GET PORT N
Displays the status of A/B switch card N (1-4080). Switch card addresses are assigned using the formula \( N = 16 \times (\text{rack address} - 1) + \text{slot}\# \). The response will be “A”, “B”, “C”, “D”, or “X” (if not present). Dual Channel switch cards will respond with two character status, one character for the channel 1 status followed by one character for the channel 2 status.

   Port Status: B
   Port Status: X
For Dual Channel Cards:

Port Status: AC

SET PORT N A[B/C/D]
Sets the addressed switch card N (1-4080) to position A, B, C, or D. Switch card addresses are assigned using the formula:

\[ N = 16 \times (\text{rack address} - 1) + \text{slot#} \]

For Dual Channel Switch Cards:
Set values A and B connect COM1 to A or B respectfully.
Set values C and D connect COM2 to C or D respectfully.

GET EVERYRACK
Displays status of all racks (1 thru 255). This command displays the “Rack Status” for racks 1 thru 255, stopping when it reaches rack 255 or encounters a “no response” from the requested rack. This is the same as the status returned by the SNMP variable mpRackCards. It displays a 16 character string showing the status of each card slot. The status may be 32 characters if the rack contains any Dual Channel Switch Cards.

Rack 1 Status: AAAABBAABBBBAABB
Rack 2 Status: AAAABBBBXXXXXXX
Rack 3 Status: no response

GET EVERYRACK N
Displays status of rack (1 thru N). This command displays the “Rack Status” for racks 1 thru N, stopping when it reaches rack N or encounters a “no response” from the requested rack. This is the same as the status returned by the SNMP variable mpRackCards. It displays a 16 character string showing the status of each card slot. The status may be 32 characters if the rack contains any Dual Channel Switch Cards.

Rack 1 Status: AAAABBAABBBBAABB
Rack 2 Status: AAAABBBBXXXXXXX
Rack 3 Status: no response

GET POWER N
Displays the status of the power supplies for rack N. If only one power supply is being used to power the rack or if one of the supplies in a dual powered rack is down, the response will be “One Supply Down”. If two supplies are used and both are operational, the response will be “Two Supplies”.

Power Status: One Supply Down
Power Status: Two Supplies

GET GROUPS N
Displays the group settings for rack N. One character for each of the sixteen cards in the rack. Any character can be used to label a group, except “0” which indicates independent and “X” which skips a position (retains the previous group character). All cards in a group follow any switching command to any card in the group.

Rack Groups: 1111222233334444

SET GROUPS N [string]
Set the group settings for rack N. One character for each of the sixteen cards in the rack. Any character can be used to label a group, except “0” which indicates independent and “X” which skips a position (retains the previous group character). All cards in a group follow any switching command to any card in the group.
GET TYPES N
Displays the switch card types for rack N. One character for each of the sixteen cards in the rack.
Type 0 = Empty, or Not Available
Type 1 = A/B Switch
Type 2 = Dual Channel A/B Switch, Independent Control
Type 3 = Dual Channel A/B Switch, Ganged Control
Type 4 = ABC Switch
Type 5 = ABCD Switch

Rack Types: 1110223444440555

SET IPADDRESS X.X.X.X
GET IPADDRESS
Set or display the current IP address of the SNMP Controller Card. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET SUBNETMASK X.X.X.X
GET SUBNETMASK
Set or display the current subnet mask of the SNMP Controller Card. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET GATEWAY X.X.X.X
GET GATEWAY
Set or display the gateway router’s IP address. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET PINGREPLY ON[OFF]
GET PINGREPLY
Set or display whether or not the SNMP Controller Card will respond to incoming PINGs (ICMP echo requests). Any change will not become permanent until a SAVE operation is performed.

SET SNMPENABLE ON[OFF]
GET SNMPENABLE
Set or display whether or not the SNMP interface on the SNMP Controller Card is enabled. Any change will not become permanent until a SAVE operation is performed.

SET READCOMMUNITYNAME string
GET READCOMMUNITYNAME
SET WRITECOMMUNITYNAME string
GET WRITECOMMUNITYNAME
Set or display the current read or write community name as specified. Any mix of upper/lower case letters (passwords are case sensitive), numerals, and/or printable symbols can be used. The password must be at least 1 char and no more than 23 chars in length. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET WEBENABLE ON[OFF]
GET WEBENABLE
Set or display the current state of web based access. The SNMP Controller Card will not accept any HTTP requests when web enable is off. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET WEBPASSWORD string
GET WEBPASSWORD
Set or display the current web password. Any mix of upper/lower case letters (passwords are case sensitive), numerals, and/or printable symbols can be used. The password must be at least 1 char and no more than 23 chars in length. Any change will not become permanent until a SAVE and RESET operation sequence is performed.
SET WEBTIMEOUT seconds
GET WEBTIMEOUT
Set or display the current web timeout in seconds. After a period of inactivity of this many seconds, the SNMP Controller Card will request a login. Note that the web timeout cannot be disabled, for security reasons, it can however, be set arbitrarily large.

SET WEBPORT N
GET WEBPORT
Set or display the current web port number. Changing the web port number from the default can be used to provide an additional level of security. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET TELNETENABLE ON[OFF]
GET TELNETENABLE
Set or display the current state of telnet based access. The SNMP Controller Card will not accept any telnet requests when telnet enable is off. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET TELNETPASSWORD string
GET TELNETPASSWORD
Set or display the current telnet password. Any mix of upper/lower case letters (passwords are case sensitive), numerals, and/or printable symbols can be used. The password must be at least 1 char and no more than 23 chars in length. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET TELNETTIMEOUT seconds
GET TELNETTIMEOUT
Set or display the current telnet timeout in seconds. After a period of inactivity of this many seconds, the SNMP Controller Card will disconnect any current telnet session. Note that the telnet timeout cannot be disabled, it can however, be set arbitrarily large.

SET TELNETPORT N
GET TELNETPORT
Set or display the current telnet port number. Changing the telnet port number from the default can be used to provide an additional level of security. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET MONITORIP N [X.X.X.X]
GET MONITORIP N
GET MONITORIP
Set or display the IP address(es) of the device(s) that the SNMP Controller Card is to PING to determine the Link State (UP) or (DOWN). The SNMP Controller Card can monitor several IP addresses. Setting a Monitor IP address to 0.0.0.0 will remove it from the monitored list. If all Monitor IP addresses are set to 0.0.0.0, the auto switch/recovery function and the LINK UP/DOWN alert function are disabled. Any change will not become permanent until a SAVE operation is performed. The SNMP Controller Card will send TRAP or SYSLOG messages when a Monitored Port Link State changes. The Monitor IP addresses can also be used to control an optional auto switch/recovery function. If enabled, the auto switch/recovery function will cause the Pro Switching System Multi to auto-switch to the normal path (B), connecting port B to the common port when all monitored port links are UP. When any of the monitored port links are DOWN, the auto switch/recovery function will cause the Pro Switching System Multi to auto-switch to the bypass path (A), connecting port A to the common port. See the AUTOSWITCHTRIP description for an explanation of the auto-switch trip point.

SET MONITORIPRANGE N [X.X.X.S E]
Set a range of Monitor IP addresses with a single command. N is the index of the starting entry in the Monitor IP address table. Valid index is 1 to 256. S is the last octet value of the Starting Monitor IP address, while E is the last octet value of the Ending Monitor IP address. For example to monitor all IP addresses 192.168.1.1 through 192.168.1.150, use the following command SET MONITORIPRANGE 1 192.168.1.1 150. This command will place 150 addresses in the Monitor IP address table. Any change will not become permanent until a SAVE operation is performed.
SET MONITORINTERVAL [N]
GET MONITORINTERVAL
Set or display the time interval between PINGs issued by the internal Ethernet node in the SNMP Controller Card, measured in 100 msec increments. To issue PINGs every 1.5 seconds, set this value to 15. The valid range is 1 to 255 (0.1 seconds to 25.5 seconds). A value of 0 disables the automatic switch/recovery function. Any change will not become permanent until a SAVE operation is performed.

SET MONITORFAILCOUNT [N]
GET MONITORFAILCOUNT
Set or display the number of successive PING attempts that must fail before the SNMP Controller Card automatically switches to the alternate paths and removes the normal path connection paths. The valid range is 1 to 255. A value of 0 disables the automatic bypass function, however automatic recovery will still operate if enabled. The LINK UP/DOWN alert function will still operate, and will report a monitored port Link State as DOWN each time a PING fails if the Link State was previously UP. When automatic bypass is enabled and any monitored port Link State is DOWN, the PSSM will perform an auto-switch to the bypass path (A), connecting port A to the common port. Any change will not become permanent until a SAVE operation is performed.

SET MONITOROKCOUNT [N]
GET MONITOROKCOUNT
Set or display the number of successive PING attempts that must succeed before the SNMP Controller Card automatically switches back to the normal paths and removes the alternate connection paths. The valid range is 1 to 255. A value of 0 disables only the automatic recovery function, however automatic bypass will still operate if enabled. The LINK UP/DOWN alert function will still operate, and will report a monitored port Link State as UP each time a PING succeeds if the Link State was previously DOWN. If auto recovery is disabled the user must manually switch back to the normal path via the front panel toggle switch or by issuing a “set system B” command. When automatic recovery is enabled and ALL monitored ports Link State is UP, the PSSM will perform an auto-switch to the normal path (B), connecting port B to the common port. Any change will not become permanent until a SAVE operation is performed.

SET MONITORTIMES N [X.X.X.X]
GET MONITORTIMES N
GET MONITORTIMES
Set or display the Monitor Start and End Times for each day of the week. For N (1 = MONDAY, 2 = TUESDAY, 3 = WEDNESDAY, 4 = THURSDAY, 5 = FRIDAY, 6 = SATURDAY, 7 = SUNDAY). A GET without specifying the N (day) will return the start and end monitoring times for all days. A GET will return a string similar to the following: (Day 3 WEDNESDAY S: 06:30 E: 18:45) which represents WEDNESDAY Start Monitor Time 6:30 AM, End Monitor Time 6:45 PM. To SET the Monitor Times for TUESDAY to Start at 5:00 AM and End at 7:50 PM, enter the following command: “SET MONITORTIMES 2 5:00 19:50”. When the MONITORINTERVAL is not zero and there is at least one non-zero MONITORIP, the Network Monitor will monitor the non-zero ports, and maintain the Link State (UP or DOWN) for each non-zero port. The purpose of the Monitor Times is to set a window for reporting (sending TRAP or SYSLOG messages) and for auto-bypass/recovery switching. If the current Time is outside the Monitor Times for the current Day, the Network Monitor will not report on the status of the monitored ports and will not auto-switch. Setting the Monitor Times to 00:00 00:00 will cause the Network Monitor to report status on the monitored ports and auto-switch if enabled, independent of the current Day and Time.

SET AUTHENTICATIONTRAP ON[OFF]
GET AUTHENTICATIONTRAP
Set or display the current state of authentication error traps. Authentication traps will be generated when this parameter is set to ON, and not when OFF. Note that this setting only affects the trap generation, and not how the SNMP Controller Card handles an authentication failure. An authentication failure generally means that an SNMP access was attempted with an incorrect community name. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET ALERTTYPE [TRAP/SYSLOG]
GET ALERTTYPE
Set or display the type of alert messages sent by the SNMP Controller Card when certain events such as a change in switch state occur. The SNMP Controller Card can be configured to issue either syslog messages, or SNMP traps.
Note that at least one IP address must be entered using the “SET MANAGER N X.X.X.X” command before either syslog messages or traps will be issued. See section 9 for a list of the traps supported by the PSSM, and see section 10 for a list of the supported syslog messages.

SET ALERTINTERVAL [N]
GET ALERTINTERVAL
Set or display the time interval between Monitored Port status update TRAP or SYSLOG messages, measured in minute increments. The Network Monitor will issue a TRAP or SYSLOG message each time a monitored port Link State changes. Additionally, at the Alert Interval in minutes, it will send a TRAP or SYSLOG message for each monitored port with Link State DOWN. The valid range is 1 to 255 (minutes). A value of 0 sets it to “Single” mode. In “Single” mode, a single TRAP or SYSLOG message is sent for each monitored port Link State change. Any change will not become permanent until a SAVE operation is performed.

SET AUTOSWITCH [NORMAL/BYPASS]
GET AUTOSWITCH
Set or display the Auto-Switch Mode. If Auto-Bypass is enabled, the PSSM will Auto-Switch to the bypass path (A), connecting port A to the common port when any monitored port Link State is DOWN. If Auto-Recovery is enabled, the PSSM will Auto-Switch to the normal path (B), connecting port B to the common port when ALL monitored port Link States are UP. In NORMAL Auto-Switch Mode, the Auto-Switch function will continue to Auto-Switch to the appropriate bypass/normal path depending on the Link State of the monitored ports, overriding any user selection. In BYPASS Auto-Switch Mode, the Auto-Switch function will Auto-Switch on changes to monitored port Link State. When in BYPASS mode, if a monitored port Link State changes from UP to DOWN, or if the status changes from one monitored port DOWN to all monitored ports UP, the Auto-Switch function will Auto-Switch as appropriate. However, the user may bypass this Auto-Switch feature and manually force a change in the connection path until another monitored port Link State changes. Any change will not become permanent until a SAVE operation is performed.

SET AUTOSWITCHTRIP [N]
GET AUTOSWITCHTRIP
Set or display the auto-switch trip point. When auto switch/recover function is enabled, the auto-switch trip point sets the number of monitored ports which can have a Link State of DOWN before auto-switching to the bypass path (A), connecting port A to the common port. If the number of monitored ports which have a Link State of DOWN is greater than the auto-switch trip point, the PSSM will auto-switch to the bypass path. The valid range is 0 to 255. Any change will not become permanent until a SAVE operation is performed.

SET DAY
GET DAY
Set or display the day of the week. The DAY and TIME are used in conjunction with the Monitor Times for reporting and auto-switching functions. For a SET, enter the text for the desired DAY (MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY, SATURDAY, or SUNDAY). When a GET DAY is received, it will display a number associated with the DAY string, which corresponds to the number in the Monitor Times list. The DAY is not preserved through a loss of power. If this feature is required for your application, the SNMP Controller card is available with a battery backed Real-Time-Clock.

SET TIME
GET TIME
Set or display the time of day, using a 24 hour clock from 00:00 to 23:59. To set the time, enter the time in hours and minutes as follows: To set the time for 6:30AM “SET TIME 06:30” and for 5:45PM “SET TIME 17:45”. The TIME is not preserved through a loss of power. If this feature is required for your application, the SNMP Controller card is available with a battery backed Real-Time-Clock.

SET DATE [MM/DD/YYYY]
GET DATE
Set or display the date, using a two digits for month (1 through 12), two digits for day (1 through 31), and four digits for the year up to 9999. The DATE is not preserved through a loss of power. If this feature is required for your application, the SNMP Controller card is available with a battery backed Real-Time-Clock. To allow the user to enter the year with only two digits, the “Base Year” is maintained if a SAVE is performed. The term “Base Year” as used here means the year with the last two digits set to zero. For the Year 2012, the “Base Year” is 2000.
SET ADMINIP N X.X.X.X
Set administrator N (1-8) IP address. Up to 8 different administrator IP addresses can be entered. To remove an entry from the list, set the IP address to 0.0.0.0. If all 8 ADMIN IP addresses are 0.0.0.0 (no ADMIN IP addresses are configured) the SNMP Controller Card will allow access via the Ethernet interface from any IP address, subject to the existing password and enable flags for each interface. If one or more ADMIN IP addresses are non-zero, the SNMP Controller Card will only process messages received from the configured (non-zero) ADMIN IP addresses. All other messages will be ignored. This ADMIN IP address filtering feature applies to the telnet, web browser and SNMP Ethernet interfaces and to the PING reply functions. The ADMIN IP address filtering does not affect outgoing PING and ARP messages so the SNMP Controller Card is still able to monitor any IP address for the “auto-switch” features. The administrator IP addresses can be different than the manager IP addresses. Any change will not become permanent until a SAVE operation is performed.

GET ADMINIP N
Display the IP address of administrator N (1-8). If no value is entered for “N”, then all administrator IP addresses will be displayed.

    ADMIN IP Addresses:
    1: 192.168.1.113
    2: 192.168.1.115
    3: 192.168.1.149
    4: 192.168.1.100

GET ADMINIP
Display all administrator IP addresses.

SET MANAGER N X.X.X.X
Set SNMP manager N (1-16) IP address. Up to 16 SNMP MANAGER IP addresses can be entered for destinations of trap messages. Trap messages will be sent to all enabled MANAGER IP addresses. To remove an entry from the list, set the IP address to 0.0.0.0.

GET MANAGER N
Display SNMP manager N (1-16) IP address. If no value is entered for “N”, then all SNMP manager IP addresses will be displayed.

    SNMP Managers:
    1: 192.168.1.113
    2: 192.168.1.115
    3: 192.168.1.149
    4: 192.168.1.100

GET MANAGER
Display all SNMP manager IP addresses.

PING X.X.X.X
Causes the SNMP Controller Card to issue a single ICMP echo request packet to the designated IP address. If a response is received, the SNMP Controller Card will display the message “Reply from X.X.X.X”. If no response is received within 5 seconds, the SNMP Controller Card will display the message “Request timed out”.

GET EVENTLOG
SET EVENTLOG
The Event Log stores the most recent 32 traps. The Event Log is reset if power is lost, or the Ethernet Module is reset. The GET EVENTLOG command displays the Event Log in a format similar to SYSLOG messages. The SET EVENTLOG command clears the Event Log.

SAVE
Save settings for next startup. All settings are stored in NV memory and restored upon power on. Changes to parameters will not become permanent unless a SAVE operation is performed.
RESET
Causes the Controller Card to reboot and reloads all parameters from stored settings. The SNMP Controller Card takes approx 5 seconds to reboot completely.

SET DEFAULTS
Restore user default settings. A SAVE operation is required to make the changes permanent.

? HELP
Displays a list of commands.

CONSOLE COMMANDS:
GET ALL (display all parameters)
GET VERSION (display software versions)
GET[SET] SYSTEM [A/B/C/D] (control all system ports)
GET[SET] RACK N [A/B/C/D] (control single rack ports)
GET[SET] PORT N [A/B/C/D] (control single port)
GET EVERYRACK (display status for all racks)
GET EVERYRACK N (display status for racks 1 thru N)
GET POWER N (display power status)
GET[SET] GROUPS N [string] (control single rack groups)
GET TYPES N (display single rack types)
GET[SET] IPADDRESS [X.X.X.X]
GET[SET] SUBNETMASK [X.X.X.X]
GET[SET] GATEWAY [X.X.X.X]
GET[SET] PINGREPLY [ON/OFF]
GET[SET] SNMPENABLE [ON/OFF]
GET[SET] READCOMMUNITYNAME [string]
GET[SET] WRITECOMMUNITYNAME [string]
GET[SET] WEBENABLE [ON/OFF]
GET[SET] WEBSMART [string]
GET[SET] WEBTIMEOUT [N] (seconds)
GET[SET] WEBPORT [N]
GET[SET] TELNETENABLE [ON/OFF]
GET[SET] TELNETPASSWORD [string]
GET[SET] TELNETTIMEOUT [N] (seconds)
GET[SET] TELNETPORT [N]
GET[SET] MONITORIP N [X.X.X.X] (0.0.0.0 to disable)
GET MONITORIP (display all monitor IP addresses)
SET MONITORIP RANGE N [X.X.X.S E] (N=Index, S=Start, E=End)
GET[SET] MONITORINTERVAL [N] (1/10 seconds, 0 to disable)
GET[SET] MONITORFAILCOUNT [N] (0 to disable)
GET[SET] MONITORRECOVER [N] (0 = no auto recover)
GET[SET] MONITORTIMES N HH:MM HH:MM (0:0:0 Always ON)
GET MONITORTIMES (display all monitor times)
GET[SET] AUTHENTICATION TRAP [ON/OFF]
GET[SET] ALERTTYPE [TRAP/SYSLOG]
GET[SET] ALERTINTERVAL [N] (1 – 255 minutes, 0 for single)
GET[SET] AUTOSWITCH [NORMAL/BYPASS]
GET[SET] AUTOSWITCHTRIP [N] (0 – 255, Auto-Switch Trip Point)
GET[SET] DAY [MONDAY/TUESDAY/...]
GET[SET] TIME [HH:MM] (HOUR 0 – 23, MINUTE 0 – 59)
GET[SET] DATE [MM/DD/YYYY] (two digit month and day, four digit year)
GET[SET] ADMINIP N [X.X.X.X] (0.0.0.0 to disable an entry)
GET ADMINIP (display all administrator IP addresses)
GET[SET] MANAGER N [X.X.X.X] (0.0.0.0 to disable an entry)
GET MANAGER (display all SNMP managers)
PING X.X.X.X (ICMP ECHO to remote host)
GET[SET] EVENTLOG (GET to display event log, SET to clear event log)
SAVE save settings for next startup
RESET restart (use after SAVE)
SET DEFAULTS (restore default user settings, save required)
8. Web Interface

The SNMP Controller Card also provides access to the console commands listed in Section 7 through a web browser interface. When enabled (see SET WEBENABLE command) accessing the default page on the SNMP Controller Card (by entering the module’s IP address in the address bar of your web browser application e.g. Internet Explorer, Netscape, etc) will present the following page:

Web Interface Version 1.0
Copyright (c) 2009.
All rights reserved.

Please logon:

Password: 

Submit

Figure 8.1 Logon Screen

Note: If using a pop up blocker on your web browser, be sure to allow pop ups from the IP address of the Pro Switching System Multi, otherwise you could experience trouble receiving a response through the web interface.

After successfully entering the correct web password (see SET WEBPASSWORD command) you will get the command console page shown in Figure 8.2.

**IMPORTANT:** Do NOT click on the “submit” button or press the “enter” key on your keyboard multiple times. The web browser interface on the SNMP Controller Card typically takes 5 to 10 seconds to process a command and return a response. Clicking on “submit” or hitting “enter” multiple times while the SNMP Controller Card is processing a command can cause it to decide that the interface is not functioning properly. If this happens, the SNMP Controller Card will become non-responsive until it receives a valid login request i.e. you must re-enter the SNMP Controller Card’s IP address in the address bar of your web browser, and then re-logon when the logon screen appears.

Command console:

Enter new command: 

Send Command Logoff

Figure 8.2 Initial Command Screen

At this point you may enter any valid command into the text box and click “Send Command” to execute (see Section 7 for a complete description of the console commands). The following is an example result of the GET ALL command.
Command console:

Output from last command...

System Status: A
IP Address: 192.168.1.30
MAC Address: 00 06 57 00 01 02
Subnet Mask: 255.255.255.0
Gateway IP Address: 192.168.1.1
PING Reply: Enabled
SNMP Enable: Enabled
Read Community Name: public
Write Community Name: private
Web Enable: Enabled
Web Password: mctech
Web Timeout: 300
Web Port: 80
Telnet Enable: Enabled
Telnet Password: dataman
Telnet Timeout: 80
Telnet Port: 23
Monitor Interval: 10
Monitor Fail Count: 5
Monitor Ok Count: 5
AutoSwitch Mode: NORMAL
AutoSwitch Trip Point: 0
Monitor IP Status: 0 UP, 0 DOWN, 0 ASSIGNED, 256 AVAILABLE
Monitor Times: ALWAYS ON, Current Day: 1 MONDAY
Date: 01/01/2010 Time: 01:56:28
Authentication Trap: Disabled
Alert Type: TRAP
Alert Interval: 0 – Single
Event Log Count: 1
ADMIN IP Addresses: 0 ASSIGNED, 8 AVAILABLE
SNMP Managers: 1 ASSIGNED, 15 AVAILABLE
Model 4: 4_01C APR 2013, Rev. 74C.A

Enter new command: [Input Field]

Send Command   Logoff

Figure 8.3 Example Command Results Screen for GET ALL command

The SNMP Controller Card will allow only 1 telnet or web access session at a time. For this reason, the web timeout and telnet timeout parameters should be set to reasonable timeout values. To free up a session without waiting for the web timeout, click “Logoff”. Typing “quit” at the telnet prompt will similarly close a telnet session. Resetting the SNMP Controller Card will also clear any existing web or telnet sessions.
9. MIB Path Summary
* NOTE: The MIB contains definitions that do not apply to every product in the PSSM family.

[internet] – 1.3.6.1
[private] – 1.3.6.1.4
[enterprises] – 1.3.6.1.4.1
[mctech] – 1.3.6.1.4.1.9477

[mctech] – 1.3.6.1.4.1.9477
private enterprise number

[mcAgent] – 1.3.6.1.4.1.9477.1
SNMP Agent

[mpSwitchSystem] – 1.3.6.1.4.1.9477.1.8
Multiport Switch System

[mpSystemGangPort] – 1.3.6.1.4.1.9477.1.8.1

[mpRackTable] – 1.3.6.1.4.1.9477.1.8.2
[mpRackIndex] – 1.3.6.1.4.1.9477.1.8.2.1.1.RackIndex
[mpRackGangPort] – 1.3.6.1.4.1.9477.1.8.2.1.2.RackIndex
[mpRackKeyStat] – 1.3.6.1.4.1.9477.1.8.2.1.3.RackIndex
[mpRackPowerStat] – 1.3.6.1.4.1.9477.1.8.2.1.4.RackIndex
[mpRackSoftwareVersion] – 1.3.6.1.4.1.9477.1.8.2.1.5.RackIndex
[mpRackName] – 1.3.6.1.4.1.9477.1.8.2.1.6.RackIndex
[mpRackCards] – 1.3.6.1.4.1.9477.1.8.2.1.7.RackIndex
[mpRackGroups] – 1.3.6.1.4.1.9477.1.8.2.1.8.RackIndex
[mpRackHealth] – 1.3.6.1.4.1.9477.1.8.2.1.9.RackIndex
[mpRackTypes] – 1.3.6.1.4.1.9477.1.8.2.1.10.RackIndex

[mpSwitchTable] – 1.3.6.1.4.1.9477.1.8.3
[mpSwitchIndex] – 1.3.6.1.4.1.9477.1.8.3.1.1.SwitchIndex
[mpSwitchPort] – 1.3.6.1.4.1.9477.1.8.3.1.2.SwitchIndex
[mpSwitchSoftwareVersion] – 1.3.6.1.4.1.9477.1.8.3.1.3.SwitchIndex
[mpSwitchName] – 1.3.6.1.4.1.9477.1.8.3.1.4.SwitchIndex
[mpSwitchType] – 1.3.6.1.4.1.9477.1.8.3.1.5.SwitchIndex

[mclpRequester] – 1.3.6.1.4.1.9477.2
[mTrapInfo] – 1.3.6.1.4.1.9477.3
[mGenericTrap] – 1.3.6.1.4.1.9477.3.1
[mSpecificTrap] – 1.3.6.1.4.1.9477.3.2

[mManagerTable] – 1.3.6.1.4.1.9477.4
[mManagerIndex] – 1.3.6.1.4.1.9477.4.1.1.ManagerIndex
[mManagerIp] – 1.3.6.1.4.1.9477.4.1.2.ManagerIndex

[mNetworkMonitorObjects] – 1.3.6.1.4.1.9477.6
[mDay] – 1.3.6.1.4.1.9477.6.1
[mTime] – 1.3.6.1.4.1.9477.6.2
[mDate] – 1.3.6.1.4.1.9477.6.3
[mMonitorInterval] – 1.3.6.1.4.1.9477.6.4
[mMonitorFailCount] – 1.3.6.1.4.1.9477.6.5
[mMonitorOkCount] – 1.3.6.1.4.1.9477.6.6
[mAutoSwitchMode] – 1.3.6.1.4.1.9477.6.7
Traps generated by the system

<table>
<thead>
<tr>
<th>Trap</th>
<th>Type</th>
<th>Trap ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>coldStart</td>
<td>generic</td>
<td>0</td>
</tr>
<tr>
<td>authenticationFailure</td>
<td>generic</td>
<td>4</td>
</tr>
<tr>
<td>mpRackKeyLockChange</td>
<td>specific</td>
<td>1</td>
</tr>
<tr>
<td>mpRackGangSwitchChange</td>
<td>specific</td>
<td>2</td>
</tr>
<tr>
<td>mpSwitchCardChange</td>
<td>specific</td>
<td>3</td>
</tr>
<tr>
<td>mpSwitchPortChange</td>
<td>specific</td>
<td>4</td>
</tr>
<tr>
<td>mpSystemGangSwitchChange</td>
<td>specific</td>
<td>6</td>
</tr>
<tr>
<td>mpRackPowerStatChange</td>
<td>specific</td>
<td>7</td>
</tr>
<tr>
<td>mpSystemAutoSwitchChange</td>
<td>specific</td>
<td>8</td>
</tr>
<tr>
<td>linkStateChangeUP</td>
<td>specific</td>
<td>9</td>
</tr>
<tr>
<td>linkStateChangeDOWN</td>
<td>specific</td>
<td>10</td>
</tr>
</tbody>
</table>

Multiport Switch System SNMP Variable Definitions:

[mpSystemGangPort] – 1.3.6.1.4.1.9477.1.8.1
Multiport Switch System gang port. This variable is used to control all switch cards in the system. A system may consist of up to 255 racks, each rack containing up to 16 switch cards. This variable may be set with a single character to A, B, C, or D. Not all values have meaning for all switch types.
On a “GET” of this variable, only rack with address 0x01 will respond.
The rack status will be A, B, C, or D if all of the switch cards have the same status.
The rack status will be X for empty if there are no switch cards installed in the rack.
The rack status will be M for mixed if the switch cards do not have the same status.

For DUAL channel A/B Switch cards:
Set values A and B connect COM1 to A or B respectfully.
Set values C and D connect COM2 to C or D respectfully.
Status value A means that COM1 is connected to A, and COM2 is connected to C.
Status value B means that COM1 is connected to B, and COM2 is connected to C.
Status value C means that COM1 is connected to A, and COM2 is connected to D.
Status value D means that COM1 is connected to B, and COM2 is connected to D.

[mpRackTable] – 1.3.6.1.4.1.9477.1.8.2
Multiport Switch Rack variable table. This variable is not directly accessible.

[mpRackIndex] – 1.3.6.1.4.1.9477.1.8.2.1.1.RackIndex
Controller Card “Rack” address. The Controller Card address is set via an eight position dip switch on the card. Each Controller Card in the system MUST have a unique address, in the
range of 0x01 to 0xFF hex. Address 0x00 is invalid, and must not be used. This is a read only variable.

[mpRackGangPort] – 1.3.6.1.4.1.9477.1.8.2.1.2.RackIndex
Multiport Switch Rack gang port. This variable is used to control all switch cards in a rack. A rack may contain up to 16 switch cards.

This variable may be set with a single character to A, B, C, or D. Not all values have meaning for all switch types.
On a “GET” of this variable, only rack with address 0x01 will respond.
The rack status will be A, B, C, or D if all of the switch cards have the same status.
The rack status will be X for empty if there are no switch cards installed in the rack.
The rack status will be M for mixed if the switch cards do not have the same status.

For DUAL channel A/B Switch cards:
Set values A and B connect COM1 to A or B respectfully.
Set values C and D connect COM2 to C or D respectfully.
Status value A means that COM1 is connected to A, and COM2 is connected to C.
Status value B means that COM1 is connected to B, and COM2 is connected to C.
Status value C means that COM1 is connected to A, and COM2 is connected to D.
Status value D means that COM1 is connected to B, and COM2 is connected to D.

[mpRackKeyStat] – 1.3.6.1.4.1.9477.1.8.2.1.3.RackIndex
Multiport Switch Rack Key-Lock Switch Status. This is a read only variable. This variable can be used to determine if the Key-Lock Switch is in the OFF or ON position. The front panel switches in the rack are disabled when the Key-Lock Switch is in the OFF position. The PSSM Switches will still respond to switch control signals and commands from the GANG-IN and GANG-OUT ports.

[mpRackPowerStat] – 1.3.6.1.4.1.9477.1.8.2.1.4.RackIndex
Multiport Switch Rack Power Status. This is a read only variable.
On the Controller Card, there are two DC power entry connectors. If power is applied to both power entry connectors, the Power Status will report “TwoSupplies”. If power is applied to only one of the power entry connectors, the Power Status will report “One Supply Down”.

[mpRackSoftwareVersion] – 1.3.6.1.4.1.9477.1.8.2.1.5.RackIndex
Controller Card Software Version. This is a read only variable, and is limited to a maximum of 14 characters.

[mpRackName] – 1.3.6.1.4.1.9477.1.8.2.1.6.RackIndex
Controller Card Identification String. The string is limited to a maximum of 14 characters.

[mpRackCards] – 1.3.6.1.4.1.9477.1.8.2.1.7.RackIndex
Multiport Switch Rack Card Status / Control, One character for each of the sixteen cards in the rack. Card slots which are not populated will be represented by an X character. Characters represent Card slots 1 through 16, from left to right. This variable may be used to set any or all cards in a rack with a single command. When setting, enter one character for each card in the rack, up to 16 characters. Valid Set commands may contain A, B, C, or D, and X to leave a card unchanged. Valid Set commands may NOT mix A, B, C, and D characters in a single command.
For example: string AXAXAAXXX is valid, but string AXBXAAXXX is NOT valid.

When set with a single character, this command functions the same as a set mpSwitchPort
command. When set with more than one character, this command overrides any group settings in place (see mpRackGroups for more information on group settings).

For DUAL channel A/B Switch cards:
Set values A and B connect COM1 to A or B respectfully.
Set values C and D connect COM2 to C or D respectfully.
If the rack contains any Dual Channel Switch Cards, the status will contain 16 characters for status 1, followed by 16 characters for status 2.
The following is an example of a status response for a rack with two Dual Channel Switch Cards in slots 1 and slot 3. The status for card 1 is COM1 connected to A, and COM2 connected to C. The status for card 3 is COM1 connected to B, and COM2 connected to D.

mpRackCards status string: AXBXXXXXXXXXXXXXCXDXXXXXXXXXXXXX

[mpRackGroups] – 1.3.6.1.4.1.9477.1.8.2.1.8.RackIndex
Multiport Switch Rack Group Status / Control, One character for each of the sixteen cards in the rack. Any character can be used to label a group, except “0” which indicates independent and “X” which skips a position (retains the previous group character). All cards in a group follow any switching command to any card in the group.

[mpRackHealth] – 1.3.6.1.4.1.9477.1.8.2.1.9.RackIndex
Multiport Switch Rack Configuration Status, One character for each of the sixteen cards in the rack.
This is a read only variable is a string of 16 characters. A “1” will be displayed for card slots which are populated, and a “0” will be displayed for card slots which are not populated.

[mpRackTypes] – 1.3.6.1.4.1.9477.1.8.2.1.10.RackIndex
Multiport Switch Rack Card Type, One character for each of the sixteen cards in the rack.
This is a read only variable is a string of “Card Type” 16 characters.
Type 0 = Empty, or Not Available
Type 1 = A/B Switch
Type 2 = Dual Channel A/B Switch, Independent Control
Type 3 = Dual Channel A/B Switch, Ganged Control
Type 4 = ABC Switch
Type 5 = ABCD Switch

[mpSwitchTable] – 1.3.6.1.4.1.9477.1.8.3
Multiport Switch Card variable table. This variable is not directly accessible.

[mpSwitchIndex] – 1.3.6.1.4.1.9477.1.8.3.1.1.SwitchIndex
Multiport Switch “Card” address. Each switch card address is determined by the position it is installed in the rack and the address of the rack. The formula used to determine the switch card’s address is:
card address = 16 * (rack address – 1) + slot #
For example Switch cards 1 through 16 are in rack 1, and Switch cards 17 through 32 are installed in rack 2, and so on up to Switch cards 4065 through 4080 are installed in rack 255.

[mpSwitchPort] – 1.3.6.1.4.1.9477.1.8.3.1.2.SwitchIndex
Multiport Switch Card connected port. This variable is used to control which port on the switch card is connected to the common port on the switch card. When set to A, the switch card will connect the common port to the A port. When set to B, the switch card will connect the common port to the B port, and so on for C and D. When queried, the status of the switch card
will be reported as A, B, C, or D if the addressed card slot is populated, or the status will be X for Empty if the addressed card slot is empty.

For DUAL channel A/B Switch cards:
Set values A and B connect COM1 to A or B respectfully.
Set values C and D connect COM2 to C or D respectfully.
Dual Channel Switch Cards provide two character status, one for each channel.
Dual Channel example: AC for COM1 connected to A, and COM2 connected to C.

[mpSwitchSoftwareVersion] – 1.3.6.1.4.1.9477.1.8.3.1.3.SwitchIndex
Multiport Switch Card Software Version. This is a read only variable, and is limited to a maximum of 14 characters. On the Pro Switching System Multi, the Controller Card provides this response for each switch in the rack.

[mpSwitchName] – 1.3.6.1.4.1.9477.1.8.3.1.4.SwitchIndex
Multiport Switch Card Identification String. The string is limited to a maximum of 14 characters.

[mpSwitchType] – 1.3.6.1.4.1.9477.1.8.3.1.5.RackIndex
Multiport Switch Card Type, read only character variable.
Type 0 = Empty, or Not Available
Type 1 = A/B Switch
Type 2 = Dual Channel A/B Switch, Independent Control
Type 3 = Dual Channel A/B Switch, Ganged Control
Type 4 = ABC Switch
Type 5 = ABCD Switch

[mclpRequester] – 1.3.6.1.4.1.9477.2
The IP address of the remote entity that last accessed branch 1.3.6.1.4.1.9477.1. This variable can be used to identify the last IP address to access any mcAgent variable. It is returned in the authenticationFailure message.

[mpTrapInfo] – 1.3.6.1.4.1.9477.3
Group of trap information variables. This variable is not directly accessible.

[mcGenericTrap] – 1.3.6.1.4.1.9477.3.1
Indication of generic trap events. This variable is bit mapped such that bit 0 is trap 0, bit 1 is trap 1, etc. Write an integer with 1 in bit positions to clear particular trap indications. For example write 17 to clear traps 0 & 4.

[mcSpecificTrap] – 1.3.6.1.4.1.9477.3.2
Indication of specific trap events. This variable is bit mapped such that bit 1 is trap 1, bit 2 is trap 2, etc. Write an integer with 1 in bit positions to clear particular trap indications. For example write 18 to clear traps 1 & 4.

[mcManagerTable] – 1.3.6.1.4.1.9477.4
Table for SNMP Manager IP addresses. This variable is not directly accessible.

[mcManagerIndex] – 1.3.6.1.4.1.9477.4.1.1.ManagerIndex
Index used to identify unique entries in the Manager IP address table.

[mcManagerIp] – 1.3.6.1.4.1.9477.4.1.2.ManagerIndex
SNMP Manager IP address. Destination IP address for TRAP or SYSLOG messages.
[mcNetworkMonitorObjects] – 1.3.6.1.4.1.9477.6
Group of Network Monitor Object variables. This variable is not directly accessible.

[mcDay] – 1.3.6.1.4.1.9477.6.1
Current day identification number, used to identify which monitor times should be used.

[mcTime] – 1.3.6.1.4.1.9477.6.2
Current time. Used with monitor start and end times to determine if action should be taken. Also used to timestamp TRAP or SYSLOG messages.

[mcDate] – 1.3.6.1.4.1.9477.6.3
Current Date. Used to timestamp TRAP or SYSLOG messages.

[mcMonitorInterval] – 1.3.6.1.4.1.9477.6.4
Monitor Interval in 1/10 seconds, 0 to disable network monitor function. Used to specify the time between PING attempts.

[mcMonitorFailCount] – 1.3.6.1.4.1.9477.6.5
Monitor Fail Count, 0 to disable auto-fail switch to A. Also used as successive PING failure count to declare Link State DOWN.

[mcMonitorOkCount] – 1.3.6.1.4.1.9477.6.6
Monitor OK Count, 0 to disable auto-recover switch to B. Also used as successive PING success count to declare Link State UP.

[mcAutoSwitchMode] – 1.3.6.1.4.1.9477.6.7
Auto-Switch Mode, NORMAL will switch to A when ANY monitored Link is DOWN, and will switch to B when ALL monitored Links are UP. NORMAL mode switches continuously. BYPASS will switch to A when a new monitored Link goes DOWN and will switch to B when ALL monitored Links go UP. BYPASS mode switches on Link state changes, allowing the user to BYPASS the Auto-Switch state until a new Link goes DOWN or all Links go UP.

[mcAutoSwitchTripPoint] – 1.3.6.1.4.1.9477.6.8
Auto-Switch Trip Point, 0 - Auto-Switch when ANY monitored Link is DOWN. For values from 1 - 255, Auto-Switch when the number of monitored Links DOWN is greater than the Auto-Switch Trip Point. Note: when ALL monitored Links are DOWN, Auto-Switching will occur if enabled.

[mcAlertType] – 1.3.6.1.4.1.9477.6.9
Alert Type, TRAP or SYSLOG message.

[mcAlertInterval] – 1.3.6.1.4.1.9477.6.10
Alert Interval, in minutes (1 - 255), 0 = single alert. Reports all Monitored Links that are DOWN.

[mcAuthTrapEnable] – 1.3.6.1.4.1.9477.6.11
Authentication TRAP Enable/Disable. When enabled, an Authentication error trap is sent to the SNMP manager(s) when an SNMP access is attempted with an incorrect community name.

[mcMonitorAlarm] – 1.3.6.1.4.1.9477.6.12
Monitor Alarm state follows auto-switch logic. The Alarm state may drive a LED and/or a set of relay contacts. The user may set the alarm state to test the alarm output or to clear or quiet an alarm while corrective action is taken. Setting the alarm state while auto-switching is enabled in normal mode will cause an auto-switch action.
[mcMonitorPortTable] – 1.3.6.1.4.1.9477.6.13
Table for Monitored Port IP and Link State variables. This variable is not directly accessible.

[mcMonitorPortIndex] – 1.3.6.1.4.1.9477.6.13.1.1.MonitorPortIndex
Index used to uniquely identify a Monitor Port IP and Link State.

[mcMonitorPortIp] – 1.3.6.1.4.1.9477.6.13.1.2.MonitorPortIndex
Monitored Port IP address. Non-zero monitor IP addresses will be monitored using PING requests.

[mcMonitorPortLinkState] – 1.3.6.1.4.1.9477.6.13.1.3.MonitorPortIndex
Monitored Port Link State. When a new monitor port IP address is assigned, its Link state is unknown. After MonitorFailCount successive failed PING requests, the Link state is changed to DOWN. After MonitorOkCount successive successful PING requests, the Link state is changed to UP.

[mcMonitorTimeTable] – 1.3.6.1.4.1.9477.6.14
Table for Monitor Time variables. This variable is not directly accessible.

[mcMonitorTimeIndex] – 1.3.6.1.4.1.9477.6.14.1.1.MonitorTimeIndex
Index used to uniquely identify monitor time period by day.

[mcMonitorTimePeriod] – 1.3.6.1.4.1.9477.6.14.1.2.MonitorTimeIndex
Monitor Time Period Identification String (Enter Start and End Times as follows HH:MM HH:MM to set). The current day selects the monitor period, and the current time is compared to the start and end times to determine if action should be taken.

Multiport Switch System SNMP Trap Definitions:

All traps carry the sysObjectId (1.3.6.1.2.1.1.2) variable, whose value is 1.3.6.1.4.1.9477.1.

coldStart – generic trap 0
This trap is sent during a power on initialization and reboot of the SNMP controller. It carries the sysDescr variable (1.3.6.1.2.1.1.1).

authenticationFailure – generic trap 4
This trap is sent as a result of an authentication failure in processing an SNMP request. Generally an authentication failure occurs as a result of an SNMP request with an invalid community name. It carries the IpRequester variable.

mpRackKeyLockChange – specific trap 1
This trap is sent when the key switch is changed on a rack. It carries the mpRackKeyStat variable.

mpRackGangSwitchChange – specific trap 2
This trap is sent when a rack gang switch occurs. It carries the mpRackGangPort variable.

mpSwitchCardChange – specific trap 3
This trap is sent when a card is removed from or inserted into a rack. It carries the mpSwitchPort variable.

mpSwitchPortChange – specific trap 4
This trap is sent when an individual card is switched. It carries the mpSwitchPort variable.
mpSystemGangSwitchChange – specific trap 6
This trap is sent when a system gang switch occurs. It carries the mpSystemGangPort variable.

mpRackPowerStatChange – specific trap 7
This trap is sent when the rack power supply status changes. It carries the mpRackPowerStat variable.

mpSystemAutoSwitchChange – specific trap 8
This trap is sent when a system auto switch occurs. It carries the mpSystemGangPort variable.

linkStateChangeUP – specific trap 9
This trap is sent when a Monitored Link State changes from DOWN to UP. It carries the mpMonitorPortIp of the Monitored Port that changed state.

linkStateChangeDOWN – specific trap 10
This trap is sent when a Monitored Link State changes from UP to DOWN. It carries the mpMonitorPortIp of the Monitored Port that changed state.