QuickSwitch® 6325/6325R
16-Channel ST Fiber Optic
A/B Switch, with Telnet & GUI

Catalog# 306325/306325R

Electro Standards Laboratories
ADVANCED SYSTEMS DESIGN & SERVICES

INFORMATION

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INTRODUCTION

The *QuickSwitch*® Model 6325(and RoHS compliant 6325R) is a 16-Channel ST Simplex A/B Switch with Telnet and GUI allows a device connected to the "COM" port access to the "A" or "B" port, for each channel. The Model 6325 is enclosed in a 2U, full rack size, all metal black chassis designed to provide EMI/RFI shielding and fit in a standard 19" rack.

The switch may be controlled manually via the front panel pushbuttons. Remote Control access can be accomplished using an Ethernet 10/100BASE-T connection and Telnet commands and allows the user to both control and monitor the switch position for each channel. The Graphical User Interface is also accessible through the RJ45 Remote port. The front panel LED display indicates the position for each channel and the unit power status.

Features:
- The switch ports are transparent to all data.
- Switch maintains position on power loss and continues to pass data.
- All fiber signals are switched via break-before-make MEMS-based mirror/prism switch technology.
- Independent channel control via front panel pushbuttons or Remote Control.
- Change all 16 Channel positions, simultaneously via the GUI Global Channel Change Checkbox or Telnet Commands.
- Control of the switch position from a 10/100-Base-T LAN Ethernet environment.
- Remote Control Telnet command interface or Graphical User Interface that allows the user to control switch position, lockout front panel operations, obtain switch status, as well as, query firmware version number, query serial number, and enable/disable autosend of switch positions.
- Front panel LED's for display the present position for each channel as well as power status.
- Front panel LED's display present position and power status.

- All A, B and COM ports are ST Simplex, Single mode, 9/125 micron, and support a wavelength of 1300-1550nm.
- Model 6325R is RoHS Compliant.

INSTALLATION

This section describes the physical connections required to start operating the *QuickSwitch*® 6325/6325R.

QuickSwitch® 6325/6325R Rear Panel

Figure 1: Model 6325/6325R Rear Panel

The rear panel view of the switch is shown in the above figure. On the rear of the switch are the following ports:

- **POWER** – Phoenix (F), External Power Supply Input connector.
- **REMOTE** – RJ45 (F), 10/100BASE-T LAN access Ethernet Remote Control port.
- **COM** – ST Simplex (F) connector, the "COMMON" or shared device port for each channel.
- **A** – ST Simplex (F) connector, the "A" device port for each channel.
- **B** – ST Simplex (F) connector, the "B" device port for each channel.

Power Supply

After all the proper connections have been made, plug the *QuickSwitch*® 6325/6325R into a 100VAC/240VAC, 50Hz/60Hz wall receptacle using the supplied 12VDC, 500mA, UL listed and LPS approved, 2-prong US non-polarized NEMA 1-15P plug wall mount power supply, P/N 516682.

Option: Wide Range Power Module, (Cat. No. 517277), 100VAC/240VAC, 50Hz/60Hz, IEC 60320 C14 inlet, can be ordered for use in place of the standard NEMA 1-15P plug power module that is included with the unit. Ideal for international applications.

Upon power up the *QuickSwitch*® 6325/6325R will process its power up routine. When the routine is done the front panel LED's will indicate the present (ON/OFF) status of the unit for each channel. At this point the unit is ready for operation.

Remote Ethernet Port Pinout

SIGNAL NAME	PIN #	DIRECTION
TRANSMIT DATA A (XMT-A)	1	OUTPUT
TRANSMIT DATA B (XMT-B)	2	OUTPUT
RECEIVE DATA A (RCV-A)	3	INPUT
RECEIVE DATA B (RCV-B)	6	INPUT

Table 1: Ethernet Remote Port Pinout

OPERATION

The *QuickSwitch®* 6325/6325R can be operated either by the front panel or through its Remote port.

QuickSwitch® 6325/6325R Front Panel

Pushbuttons and LED's

Figure 2: QuickSwitch® 6325/6325R Front Panel

Front Panel Indicators

The front panel view of the Switch System is shown in the above figure. On the front of the switch are the following controls and indicators for each channel:

Manual Control

The front panel view of the switch is shown in the above figure. On the front of the switch are the following controls and indicators:

- **A, B INDICATORS** –Red LED's indicate the switch position.
    - o The LED in the steady state indicates the position of the switch.
    - o If the front panel pushbutton is locked and the button is pressed, all LED's will light until the button is released.
- **MANUAL PUSHBUTTON** - the front panel pushbuttons allow the switch position to be changed.
    - o Depressing and releasing the pushbutton allows the user to toggle the connection status for the associated channel between the A and B positions.
    - o Pushbutton control can be inhibited if locked out remotely.

Remote Control Commands

All commands are ASCII Control commands. A Control command is created by pressing and holding the [CTRL] key and the designated character key simultaneously. For example, to create the CTRL-A command, simply press the [CTRL] and [A] keys on the keyboard simultaneously then release both.

Do not press the enter key at the end of a command. See Table 2 for details. All responses are terminated with a carriage return ('\r') followed by a new line feed ('\n').

A note to those programming their own systems to control this switch automatically: The ASCII Control commands are represented as the decimal equivalent of the numerical position of that letter in the alphabet, which can then be translated to hex. For example, CTRL-A translates to '1' in decimal or 0x01 in hex, since A is the 1st letter of the alphabet. CTRL-V, on the other hand, translates to '22' in decimal, and 0x16 in hex, since it is the 22nd letter of the alphabet.

Command	Parameter	Function	Response
CTRL-A <ch>	1-16: channel 0: gang	Switch to the A position	XXXX Channel <ch> - Position: A, <un/locked> Or 5005 All channels switched to position A.
CTRL-B <ch>	1-16: channel 0: gang	Switch to the B position	XXXX Channel <ch> - Position: Off, <un/locked> Or 6006 All channels switched to position B.
CTRL-I	N/A	Enable / Disable Autosend	<020/021> Autosend of updates to all serial and LAN interfaces has been <enabled/disabled>.
CTRL-L	N/A	Lock the front panel	4444 Channel <ch> - Position: <On/Off>, Locked Or 0200 All channels locked.
CTRL-U	N/A	Unlock the front panel	3333 Channel <ch> - Position: <On/Off>, Unlocked Or 0100 All channels unlocked.
CTRL-P <ch>	1-16: channel 0: All	Query position/ status	XXXX Channel <ch> - Position: <On/Off>, <un/locked> (for each channel)
CTRL-N	N/A	Query serial number	9020 M6325, Serial Number XXXXX
CTRL-M	N/A	Query MAC address	9030 Unit MAC address: XXXXXXXXXXXX

CTRL-V	N/A	Query firmware version number	9010 M6325, Firmware Version x.x, Compiled <Date>

Table 2: Remote Control Commands

Error conditions and responses not covered in Table 2:

- Issuing a command not found in Table 2 will respond with the error message: "5010 Invalid Command." and no switching will occur.
- If an invalid channel is specified for a command requiring a channel number, the unit will send the error message: "5020 Invalid channel specifier."
- Taking longer than 5 seconds before entering a channel specifier will result in the following error message:
    - "5110 Timed out entering channel specifier."

Whenever a front panel pushbutton operation takes place, the new status will automatically be sent to the Telnet

Switch Position on Power Down

If power to the *QuickSwitch*® 6325/6325R is lost, the switch will maintain its present position and continue to pass data. Upon power restore, the unit will remain in the position it was in at power down.

REMOTE ETHERNET CONNECTIONS

Verify the Hardware

Verify that the switch is currently powered. If the user needs to directly connect to the switch rather than through a LAN, a 10/100BASE-T crossover cable will be necessary (ESL can provide this – p/n 984228-006). This cable allows direct connection of the switch's Remote LAN port to a computer with a Network Interface Card (NIC).

If no LAN is available, use a Crossover Cable

If no LAN connection is available, the user can use a crossover cable. Plug one end of the cable into the RJ45 Remote port on the rear of the switch and the other end into the computer NIC as in Figure 3.
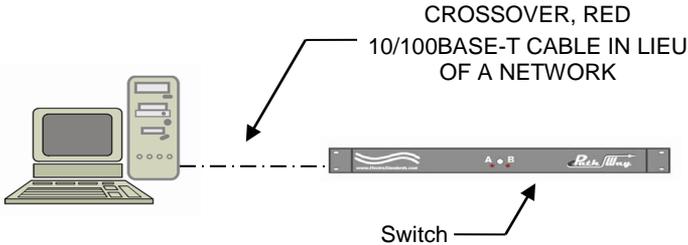
CROSSOVER, RED
10/100BASE-T CABLE IN LIEU
OF A NETWORK

Switch

Figure 3: Crossover Cable connection for no LAN

If connecting to a LAN use a 10/100Base-T Cable

Use a straight through 10/100BASE-T patchcord from the switch's LAN Remote port to a LAN connection, and likewise, reconnect the computer used to configure the system via a standard, straight through patchcord to the LAN as in Figure 4. ESL can provide this cable (p/n 984231-006).
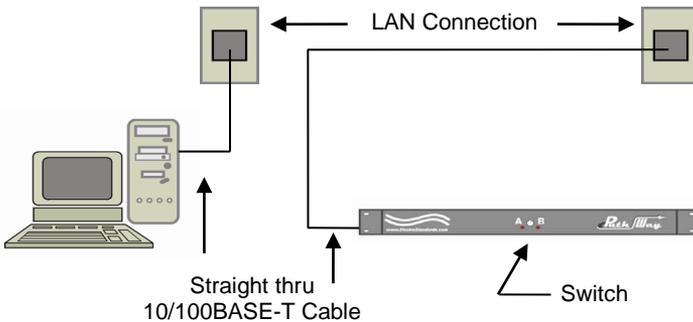
LAN Connection

Straight thru
10/100BASE-T Cable

Switch

Figure 4: Connecting to a LAN with a 10/100Base-T cable.

10/100BASE-T LAN SETUP

Network Setup

The switch is configured from the factory to use DHCP to automatically get its IP address from a DHCP server on the local area network when connected to the network and powered up. Therefore, a DHCP server is needed on the local area network for the initial configuration. After that the switch can be configured to use a static IP address. To find the IP address of a switch that it has gotten from the DHCP server or to reconfigure the IP Address of the switch, use the Lantronix® DeviceInstaller application.

Getting DeviceInstaller

DeviceInstaller requires Microsoft's .NET Framework version 4.0 or higher. If the .NET Framework is not already installed, it must first be installed. The .NET Framework can be downloaded from Microsoft's website, either as a web install, or as a standalone installation. The latest version of DeviceInstaller can be downloaded from Lantronix's website.

Finding the IP Address of the Switch

After installing DeviceInstaller and opening it, the software will automatically search for devices on the network. Once found, the devices will be listed in the right pane (see Figure 5). Match the MAC address on the rear of the unit to the MAC address ("Hardware Address") shown in DeviceInstaller to correctly identify the desired unit and find the associated IP address.

Figure 5: Finding the IP address in DeviceInstaller

If the desired device is not found in the list at all, the unit may have been previously set with a static IP address that is not compatible with the current network's subnet and configuration. In this case, it may be necessary to reset the IP address. See section "Resetting the Remote Ethernet Port" on page 14.

If use of the DeviceInstaller software is not something that can be done in a particular circumstance, please consult Electro Standards for specialized and tailored instructions on finding the unit on the network.

Unreachable Status in Red

If the desired device shows up in red and says "Unreachable", typically with an IP address that starts with "169" as the first octet, then the IP Address will need to be reconfigured (see Figure 6). Alternatively, the unit can be power cycled while the unit's Remote port is connected to the network.

The reason for the "Unreachable" status has to do with a failure to obtain an IP address through DHCP. When a unit is configured for DHCP, upon power up, it will spend a certain period of time (typically a few minutes) attempting to obtain an IP address from a DHCP server. If no server can be found, the unit will assign itself an IP Address via its AutoIP protocol. This AutoIP assignment is what allows the unit to still be found via DeviceInstaller. It is strongly recommended to keep AutoIP enabled if DHCP is in use.
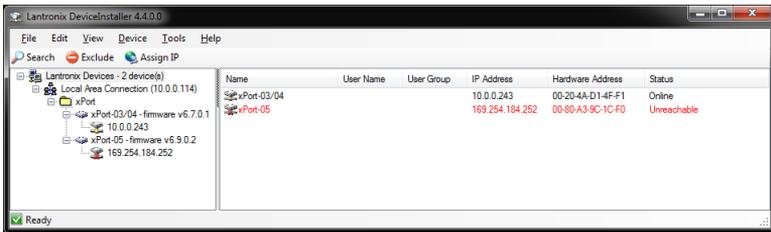

Figure 6: Unreachable unit shown in red in DeviceInstaller

Static/DHCP IP Address Configuration

The switch can be configured to use a static IP address or DHCP. This is done through the DeviceInstaller software. After finding the unit in DeviceInstaller, regardless of whether it is unreachable or not, select the desired item in the list in the right pane. Click the "Assign IP" button along the top menu bar (see Figure 5 or Figure 6). Follow the prompts shown either to assign a static IP or to set the unit to DHCP.

Note that if the unit was unreachable and DHCP operation is desired, the unit can be re-assigned to DHCP to force the unit to search for a DHCP server again and obtain an IP address.

Setting a static IP address does override both DHCP and AutoIP, meaning that the unit will always come up with that static IP address. Note that this may cause conflicts if another device on the network is using the same IP address, as the unit will not change its IP address automatically.

Resetting the Remote Ethernet Port

The Remote Ethernet port can be reset to factory defaults. This is especially useful in the event that an invalid IP address configuration is set and the unit becomes inaccessible through the Remote Ethernet port. To reset the IP address settings and any security settings (such as password protection on the Telnet Configuration port), the following steps must be performed:

- Power down the unit.

- Hold either, the Channel 1, or Channel 2 front-panel pushbutton, while powering the unit back up. The pushbutton can be released once any of the LED's on the front panel light up.

- The unit will run through its reset routine. Please wait while the unit completes the reset. The entire process will take about 7 seconds.

- Once the reset routine is complete, the unit will be ready for operation without any further power cycling. It may be a few additional moments before the Remote Ethernet port is accessible while the unit acquires an IP address.

REMOTE TELNET SESSION

Telnet can be used to connect to and command the switch. Before connecting and starting a Telnet Session, first connect the switch in accordance with the section entitled "**Error! Reference source not found.**". Once the network and security settings have been configured, the unit is ready for Telnet users to connect using a Telnet client.

Note that the default port for Telnet on this unit is 10001.

Telnet in Windows XP

Telnet in Windows XP can be done either through HyperTerminal, the command line, or any other 3rd party software that supports Telnet (such as PuTTY). When using the command line, the command format is:

telnet <ip address or host name> 10001

Telnet in Windows Vista/7/8

In versions of Windows after Windows XP, HyperTerminal has been removed and the command line Telnet client has been disabled. To use Telnet in these versions of Windows, either a 3rd party software solution that supports Telnet can be used (such as PuTTY), or the Telnet client can be enabled for the command line.

To enable the Telnet client for command line use, open the Control Panel. Select "Programs" if in "Category" view. In either view, select "Programs and Features". There will be an option to "Turn Windows features on or off" on the left. After clicking this, a dialog box will pop up with a list of features. Find "Telnet Client" in the list, check the box for that option, and press the "OK" button. Windows will take a few moments to configure itself, but once this is complete, the Telnet Command will be available through the command line.

The Telnet Command through the command line is the same as it was in Windows XP.

Telnet in Linux/Mac OS X

Telnet is commonly built into distributions of Linux and Mac OS X, or is readily available through a package manager or appropriate binary distribution. Often, Telnet Sessions are accomplished through the terminal. For example, in Ubuntu and Mac OS X, Telnet Sessions can be started with the command:

telnet <ip address or host name> 10001

Telnet Session

The default port for Telnet on this unit is 10001. Once connected, there will be no prompt and the unit will immediately be ready for command entry and status. See the Remote Control Commands in Table 2.

REMOTE GRAPHICAL USER INTERFACE SOFTWARE

To connect to the switch from a workstation or computer having access to the LAN that the **QuickSwitch**® 6325\6325R LAN port is connected to, simply launch a standard web browser and type in the appropriate IP address. The Java Applet will be automatically uploaded from the switch upon connection. The environment requirement for the GUI is Java 1.6 and above.
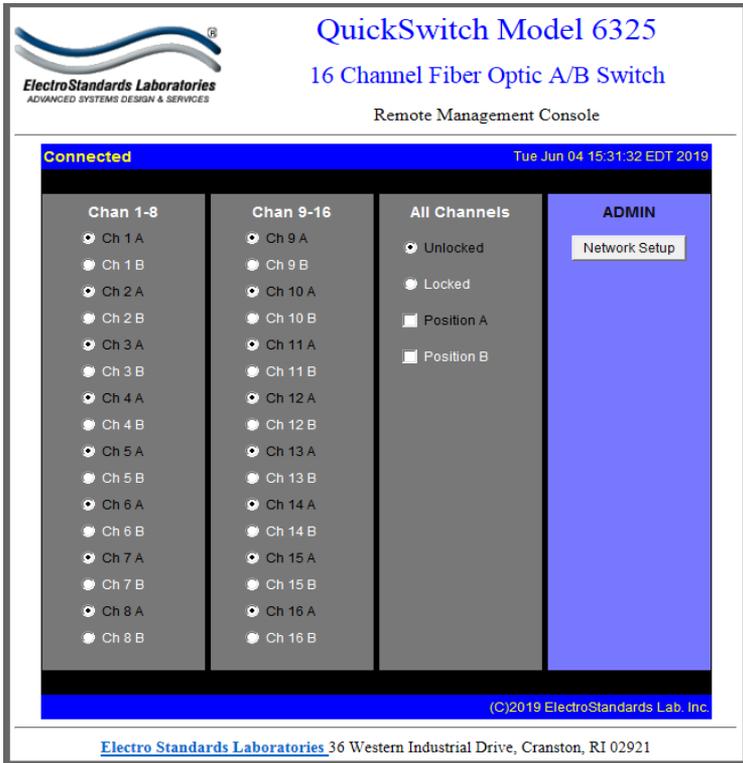

Figure 7: GUI in a Standard Web Browser

Java Security Policies

As of Java 7 update 51, stricter security policies enforced by the Java Runtime Environment that runs the GUI will require additional attention.

Due to the nature of this product, the GUI application can only be self-signed. Because of this self-signing and the new security policies, the Java security settings may need to be changed before use of the GUI is allowed.

To change these settings in Windows, open the Control Panel. While in "Large icon" or "Small icon" view, select "Java". On the "Security" tab, move the slider down to medium (see Figure 8). Medium allows self-signed application to run, while still alerting to all potential security hazards on a case-by-case basis. Optionally, if the unit is set to a static address, this can be added to the exception list here.
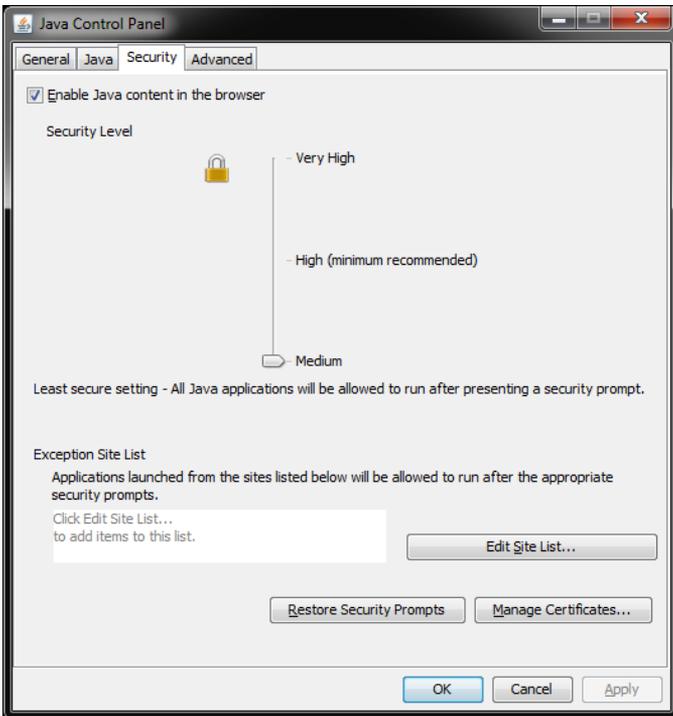

Figure 8: Java Security Settings

When connecting to the GUI in a web browser, the security warning will prompt for permission before continuing (see Figure 9). Please confirm that the information presented regarding the name and location is correct before proceeding. Note that the publisher will show as "Unknown" since this was self-signed and not verified by a certificate authority. Selecting the checkbox at the bottom and clicking the "Run" button will allow the GUI to finish loading and be ready for operation.
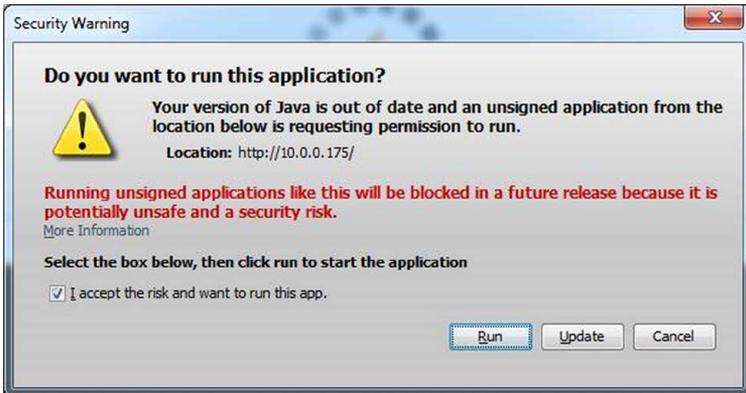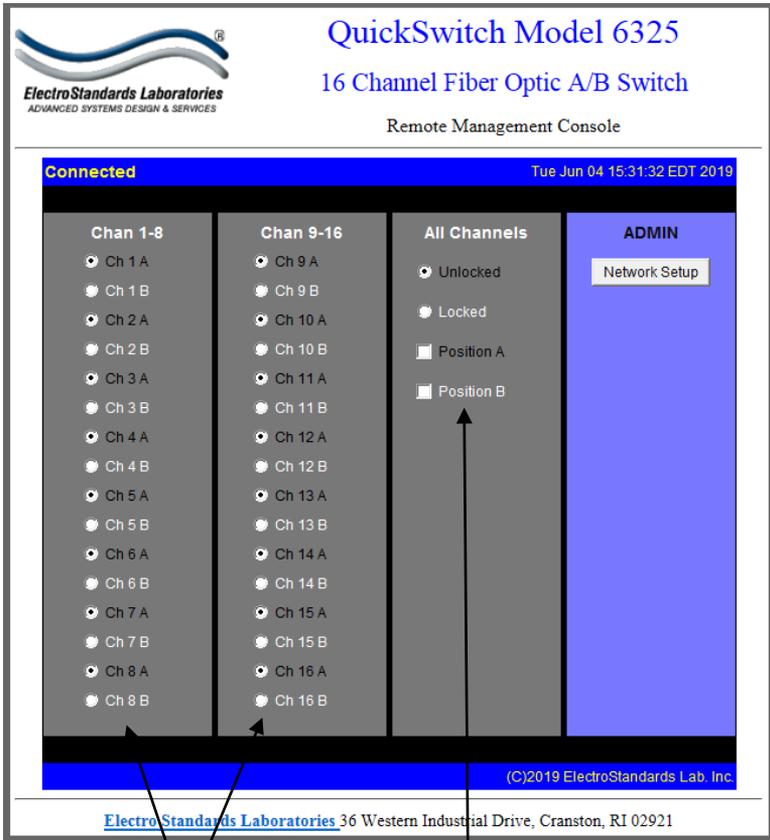

Figure 9: Java Security Warning

Changing Switch Position and Lock Status

To change the switch position, click on the radio button for "A", "B", on the desired channel. Locking and unlocking the front panel pushbutton can be accomplished by clicking the "Locked" or "Unlocked" radio buttons. Global position commands can be sent to all channels simultaneously See Figure 10.


Switch position by selecting "A" or "B" for desired channel.

Lock and unlock the front panel operation or send position change to all channels simultaneously.

Figure 10: Change the switch position and lockout from the GUI

Querying the Status of the Unit

Once connected, the GUI will stay up-to-date on the current position and status of the unit. Any changes that are made outside of the GUI, such as by pushbutton, will be reflected in the GUI. These changes will cause the radio buttons of the GUI to automatically change to show the new status. Note the checkbox for the Global Channel change will remain checked until a channel is moved into a different state either by pushbutton or remote command, and the check will only return when the button is selected again to send a command to all channels. See Figure 11.
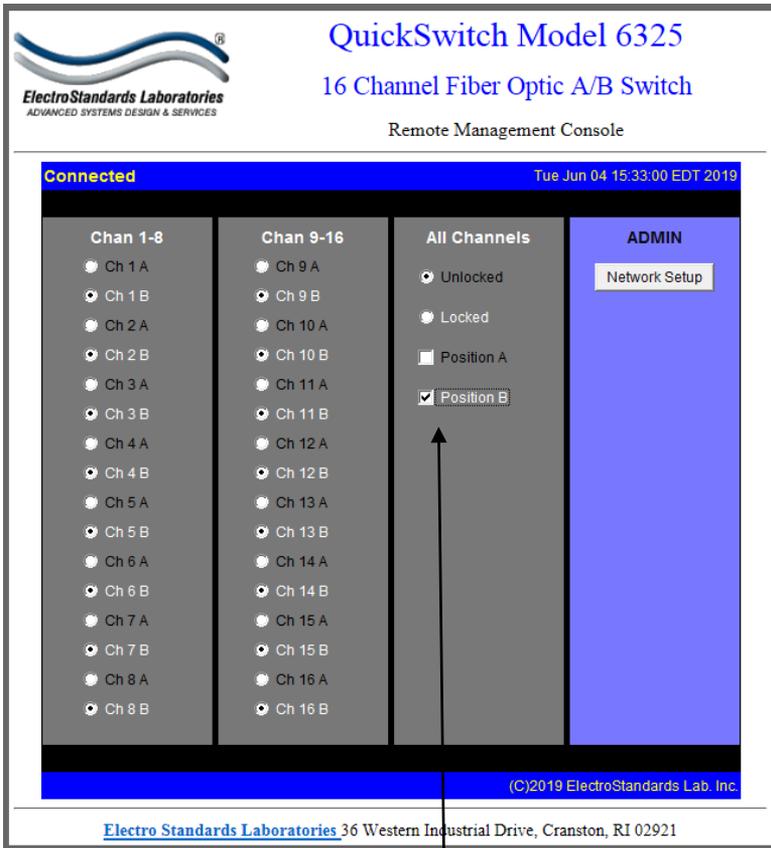
Global Channel Checkbox.

Figure 11: The GUI indicates all channels were switched to position "B" via the Global Channel Checkbox.

Reconfiguring the IP Address

To reconfigure the switch's IP address, click the "Setup" button on the main panel.
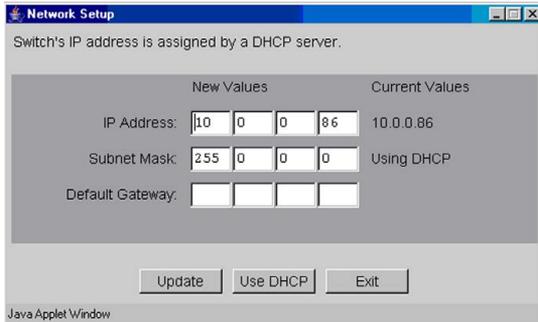

Figure 12: Reconfiguring the IP Address

By default the switch's IP address is acquired from a DCHP server on your local area network. You can change it by assigning a static IP address to it. But be careful in doing that. You have to make sure that no other devices on the network use the same IP address that you are going to assign to this switch. If you are not sure, ask your network administrator for assistance.

If you are using Windows XP SP2 or another operating system with a firewall installed, you will get something similar to Figure 13 the first time you click the "IP Address" button to open the Network setup screen.

Figure 13: Windows Security Alert

This is because the GUI needs to open a UDP port (port number: 0x77fe, 30718) to communicate with the switch. Click the "Unblock" button to allow the operation.

In case the switch already has a static IP Address assigned. The screen will look as in Figure 14.
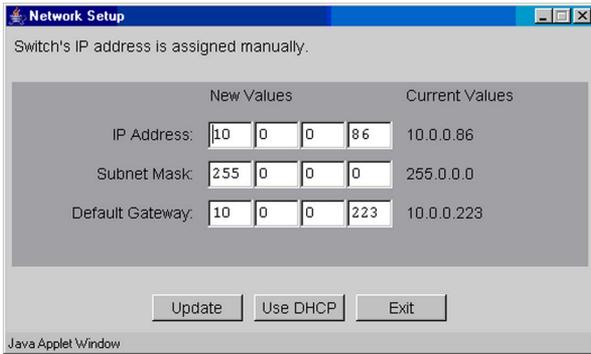

Figure 14: Static IP address

Fill in all the fields with correct values and click the "Update" button to update the IP address settings. The update will take effect immediately and the switch will reboot, hence the current connection will be terminated.

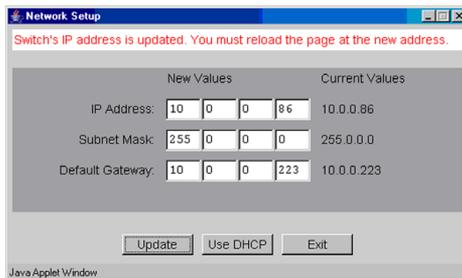You will see the following screen: Figure 15

Figure 15: IP Address is updated.

Close the pop up and browser window, and re-open a browser window. Type in the new IP address of the switch and reconnect. You are now ready to use the remote switch operations with the GUI connected to the switch at its new IP address.

TROUBLESHOOTING

Described below are some common troubleshooting steps and solutions. If following the troubleshooting guide does not solve the problem, please contact Technical Support for further assistance.

Switching Issues

Pressing and releasing a front panel pushbutton does not cause the channel to switch.

- Check that the unit is properly powered and that the front panel LED's indicate the present position.
- If both LED's light up while the pushbutton is held, front panel operation is locked out and must be unlocked through the Remote.

Commanding the unit remotely to switch does not cause the unit to switch.

- Check that the Remote Connection is still active. In Telnet Sessions, query the unit to see if a response is received.
- Consider disconnecting and attempting to reconnect to ensure that the Remote Connection is still accessible.

Remote Ethernet Connection Issues

A Telnet Session with the unit cannot be opened.

- Check that the physical connections are correct. See section Remote Ethernet Connections on page 10 for more information.
- Check that the IP address settings have been configured properly. See section "10/100BASE-T LAN Setup" on page 12 for more information.
- Ensure that the Telnet port being used is correct. Note that the default port number is 10001.
- Check that no other users are currently connected to the switch remotely. If another Telnet Session is active, new connections will not be established. Note that the unit will refuse the connection, causing the connection failure message to appear typically much sooner than if the connection attempt timed out from being unable to locate the unit on the network.

A GUI Session with the unit cannot be opened.

- If directing a web browser window to the IP address of the switch results in a time out, the physical connections and IP address connections should be checked. See "Remote Ethernet Connections" on page 10 and "10/100BASE-T LAN Setup10/100BASE-T LAN Setup" on page 12, respectively.

The web browser connects to the switch and the page loads, but the GUI does not.

- If the page loads but the applet does not, a newer version of Java may be required. If the Java version is up to date, be sure that the browser's plugin was updated as well.

The GUI loads, but displays an error message stating that the switch is busy and another user is connected.

- The unit only supports one Remote Connection at any instant in time. Please be sure to close any existing Telnet or GUI Sessions to proceed.

When attempting to load the GUI, a pop up is shown saying that this was blocked by current security settings.

- Due to changes in security policy enforcement as of Java 7 update 51, it may be required to change Java security settings in order to allow the self-signed GUI to run. Please see Section "Java Security Policies" on page 17 for more information and instructions.

The IP address configuration of the unit is invalid and needs to be reset.

- The unit's IP address and security settings can be restored to factory defaults by following the procedure in the "Resetting the Remote Ethernet Port" section on page 14.

SPECIFICATIONS

Size
Width: 19" [48.3 cm] (19" full rack size)
Height: 3. 5" [8.9 cm] (2U)
Depth: 10.75" [27.4 cm]
Weight: 9.0 lbs [4.1 kg]

Environment
Operation Temperature: 0°C to 50°C
Storage Temperature: -40°C to 85°C
Humidity: 10% to 90% without condensation

Power Requirements
DC Voltage: 12VDC
DC Current: 280mA (peak), 130mA (nominal)
DC Power: 3.4W (peak), 1.6W (nominal)

Signal Port Ratings
Typical Optical Power: 300mW (500mW max)

Signal Port Interfaces
(48) ST Simplex, Single mode, 9.125 micron, 1300/1550nm ports

Signal Port Channels
(16) Channels A/B, Common
Independent Control
Simultaneous Control

Remote Port Interface
(1) RJ45 (F) port
Telnet operation (default port: 10001)

Front Panel Control and Indicators
(32) Red LED's
(16) Pushbuttons

Power Supply 516682
Input: 100-240VAC, 50/60Hz, 0.2A
Output: 12VDC (regulated), 0.5A

CUSTOMER & TECHNICAL SUPPORT

Customer Support

For customer assistance, ordering assistance, or communications cables of any length or configuration, please contact Electro Standards Laboratories, (877) 943-1164 and ask for sales/customer support.

Technical Support

For technical support with unit operation, cable configuration, etc., please contact Electro Standards Laboratories, (877) 943-1164 and ask for technical support. Please have the unit model number and serial number available when you call.