Glimmerglass
Optical Cyber Solutions

System Installation and Maintenance Guide

Systems 100, 500, and 600

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The Glimmerglass Intelligent Optical Switches manage fiber connectivity at the physical layer, remotely and automatically via a computer interface.

This manual describes how to install, turn up, and test the Glimmerglass System 100, System 500, and System 600 products, and how to perform various maintenance procedures on these systems.

Release Notice

The following table lists the version of this document that supports the current release of the Intelligent Optical Switch application:

Release Date	Glimmerglass Intelligent Optical Switch Product Release Number	Most Recent Document Version Number
July 2013	R08.00p000	A

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Introduction 1

Document Overview

This *System Installation and Maintenance Guide* describes the precautions and procedures for installing the Glimmerglass System 100, System 500, and System 600 products.

This guide contains the following chapters:

Chapter	Description
Chapter 1: Introduction	Describes the safety considerations, physical environment considerations, and handling guidelines that apply to all of the Glimmerglass systems (System 100, System 500, and System 600 products).
Chapter 2: Glimmerglass Systems Overview	Provides an overview of each of the Glimmerglass Intelligent Optical Switches and the software and hardware features of the systems.
Chapter 3: System 100 Installation	Outlines the procedure for installing the System 100.
Chapter 5: System 500 Installation	Outlines the procedure for installing the System 500.
Chapter 4: System 600 Installation	Outlines the procedure for installing the System 600.
Chapter 6: Connecting Power to AC Systems	Outlines the procedure for connecting power to AC-powered Glimmerglass systems.
Chapter 7: Connecting External Power to Dual DC Systems	Outlines the procedure for connecting power to dual DC-powered Glimmerglass systems.
Chapter 8: AC High-Availability (AC-HA) Shelf Installation	Outlines the procedure for installing the optional High-Availability Shelf and connecting it to the system.
Chapter 9: System Turn-Up, Configuration, and Verification	Outlines the procedures for the connecting to, controlling, and testing the Glimmerglass system once it is physically installed. These procedures are the same for System 100, System 500, and System 600 products.

Chapter	Description
Chapter 10: Maintenance Console	Outlines the Maintenance Console menu options and procedures.
Chapter 11: Glimmerglass System Maintenance	Provides a description of the Alarm/Status panel and describes routine maintenance and upgrade procedures for the Glimmerglass systems.
Appendix A: System Default Values	Lists the default settings for all parameters in the Glimmerglass IOS and the interfaces by which the parameters may be configured.

Safety Considerations

Before installing the Glimmerglass system, take note of the following safety considerations:

Parameter	Considerations
Physical Capabilities	To perform the installation, the installer must be physically able to lift the following amount: • 20 lbs to install System 100 • 38 lbs to install System 500 • 38 lbs to install System 600
Electrical Power	Enough electrical power is available to cause serious damage or injury. Be sure the power is unplugged before working on or near the power panel.
Lightwave Emissions	Fibers and fiber-optic connectors may emit invisible laser or LED radiation.
Electrostatic Discharge (ESD) Considerations	Maintenance and installation of the system requires the handling of components containing active electronics (and optics).

WARNING!	Eye damage may occur if the laser or LED beam is viewed directly or without proper optical instruments. Do not look directly into any fiber or optical connection unless you know it cannot possibly be live.

WARNING!	Some materials generate static electricity that can easily damage components containing active electronics.

FCC Certification Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following to conditions:

1. this device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Physical Environment Considerations

The operating environment should be within the required temperature and humidity ranges as specified below:

Parameter		Value
Temperature Range	(Operating)	5ºC to +40ºC
	(Short-term)	-5ºC to +50ºC
Relative Humidity	(Operating)	5% to 85%
	(Short-term)	5% to 95%

NOTE: For definition of terms and conditions, see Telcordia GR-63-CORE Operating Temperature and Humidity Criteria.

Handling Guidelines

Please use the following guidelines when handling system components:

- Do not allow components to contact sources of static electricity.
- Always wear a properly grounded ESD wrist strap.
- Do not hand components to an ungrounded person.
- Do not attach cellophane tape or gummed labels to components.
- Do not stack components on top of each other.
- Place components on an anti-static mat after removal.
- Repackage components in their original packing materials.

Glimmerglass Systems Overview

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Glimmerglass manufactures intelligent optical switches allowing users to remotely manage fiber connectivity at the physical level either directly or automatically.

The information below provides an overview of the features available with each of the switch models.

Glimmerglass System Models

Glimmerglass optical switch systems are available in three chassis types to provide a range of solutions accommodating various port count, connector-type, and rack space requirements. The chassis types are: System 100, System 500, and System 600.

Each chassis type supports both symmetric (*N*x*N*) and asymmetric (*N*x*M*) optical switch configurations. Depending upon total port count requirements, the system may contain a single or dual optical switch. For symmetric configurations, a single optical switch supports a maximum of 96x96 ports and a dual optical switch supports 192x192 ports. For asymmetric configurations, the single switch supports 1x191 (191x1) port and the dual switch support 192x24 to 24x192 ports. The System 100 chassis only supports single optical switch configurations.

In addition to the System type designation (100, 500, or 600), each chassis has a model designation indicating the chassis ECO level (hardware). This model number is found on the serial number label affixed to the chassis. The model numbers for the System 100, 500, and 600 are GG112, GG528, and GG514, respectively. "-C" and above chassis revisions support 10/100/1000BaseT Ethernet.

The following table identifies the general specifications for each chassis type. The maximum port count configurations are expressed using symmetric configurations. Where the maximums are less than the optical switch maximums, the constraint is imposed by the system size and space required for the fiber adaptors.

Specification	System 100	System 500	System 600
Maximum Symmetric Port Configuration by Connector Type			
MTP-8	96x96	192x192	192x192
MTP-12	96x96	192x192	192x192
LC/UPC or LC/APC	48x48	192x192	96x96
SC/UPC or SC/APC	24x24	150x150	48x48
FC/UPC or FC/APC	24x24	72x72	48x48
Physical Characteristics			
Rack Units	2U	8U	4U
Patch Panel Location	Back	Front	Back
Physical Dimensions inch mm	 3.5 x 17 x 20.8 89 x 432 x 528	 14 x 17.2 x 16.1 356 x 437 x 410	 7 x 16.6 x 27.8 178 x 437 x 706
Chassis Weight (Max) lbs kg	 20 9.1	 38 17.2	 38 17.2
Rack Type	EIA-310D - Mounting Hole Pattern		
Air Flow	Front to Back		
Rack Mounting Options	19" or 23"	19" or 23"	19" Only
Power Options			
DC Power Consumption	50W	85W	85W
Dual DC (Standard)	Two ("A" and "B" feeds) Pluggable Terminal Blocks (-48VDC nominal, -42VDC to -56VDC range)		
Single AC Power (Option)	IEC60320-1 C14 Receptacle for Power Cord Double Pole, Neutral Fuse (100 - 240VAC, 50-60Hz, Auto-Sensing)		
Redundant AC Power (Option)	External 1U Chassis, 2 Hot-Swappable Power Supplies (AC Inputs: 100 -240VAC, 50-60Hz, Auto-Sensing) (DC Outputs to Switch "A" and "B" feeds: -48VDC)		
Ethernet Ports	10/100BaseT (GG112, GG528, GG514 Revision B and below chassis) 10/100/1000BaseT (GG112, GG528, GG514 Revision C chassis)		
Serial	DE-9F Connector (Straight-Through Serial Cable)		

NOTES:	Maximum port counts reflect the actual patch panel fiber connections on each chassis. Actual port counts and patch panel requirements will vary when splitters are used internal to the system. Multiple connector types may be requested (e.g. mix of MTP and LC) System 600s ship with mounting rails that are required for rack mounting For Redundant AC power, the External 1U chassis and switch are connected with a DC wiring harness that is provided with the system.

Optional, Hardware-Enabled Features

This section discusses the following hardware features, which are optional hardware features that must be ordered with the system.

- Input Power Detection (below)
- Photonic Multicasting (page 8)
- Optical Splitter (page 10)
- Input Optical Splitter (page 11)
- Output Optical Splitter (page 14)
- Variable Optical Attenuation (VOA) (page 16)
- Dedicated VOA (page 16)
- Switched VOA (page 17)
- Low Power Operation (page 18)

Input Power Detection

With Input Power Detection, power monitors are installed at the input ports. This feature allows the optical power of the incoming signal to be measured and provides the following benefits:

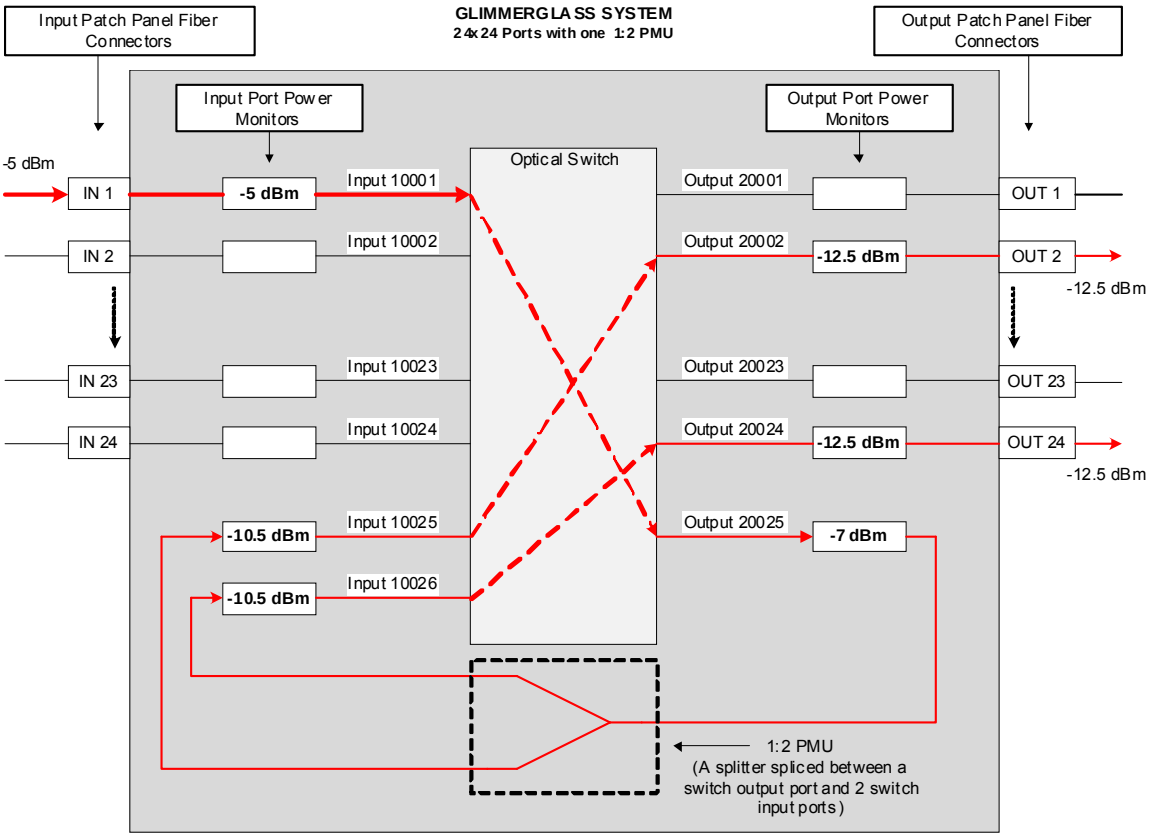
- Verification that a valid signal is present on the input fiber prior to connecting to an output.

- Reporting and tracking of the optical power for validation and troubleshooting purposes.
- Alarm generation for power changes at the input (e.g., fiber cut or tampering); this is useful for monitoring unconnected input ports.
- Insertion loss reporting for the system - the difference between the output and input power measurements.
- Power level evaluation by the system prior to executing protection switches.

Photonic Multicasting

The Photonic Multicasting feature allows a signal presented on any of the systems input ports to be connected through an internal 1x*N* splitter and then connected to any *N* of the systems output ports as depicted in Figure 1 on the next page. The content of the incoming signal is unchanged, but the optical power leaving the system will be lower due to both the two switch connections required and the intrinsic loss of the splitter itself. For this reason, the *N* (1x*N*) value is typically 2 or 4 when used without external amplification. For 1x2 splitters, unequal split ratios are supported.

Figure 1 Block Diagram of 24x24 Port System with Single 1:2 PMU



Referencing Figure 1 above, the input fibers are shown connected to the system patch panel on the left. The output fibers are shown connected at the right. Inside the system, the internal fibers are shown from the patch panel through a power monitor to/from the internal optical switch. The PMU is shown below the optical switch. The only connections shown as active are the dashed red lines. Only the power monitors for the ports involved in the connections show representative power values. Glimmerglass numbers input ports starting at 10001 and output ports at 20001.

In this example, the signal on the fiber connected to patch panel input 1 (IN 1) is connected through the 1:2 PMU to patch panel outputs 2 and 24 (OUT 2, OUT 24) as follows:

- The input fiber carries a signal with an optical power of -5 dBm. The Input Port power monitor reflects this power value.
- Input 10001 is connected to Output 20025. Output 20025 is spliced to the incoming side of the 1x2 splitter. The power monitor prior to the splitter is -7 dBm representing a 2 dB power loss for this connection.

- Inputs 10025 and 10026 immediately have a signal presented. In this example, the power monitors for both ports report -10.5 dBm. This represents the power penalty for the 1x2 splitter (in this case, 3.5 dB).
- Input 20025 is then connected to Output 20002. The output power monitor reports a power level of -12.5 dBm. This reflects another 2 dB of loss for the connection through the optical switch. The fiber connected to patch panel OUT 2 now carries a copy of the original signal from IN 1.
- Input 20026 is then connected to Output 20024. The characteristics are the same as above.

This method is very effective for distributing signals on demand where the optical link budgeting allows for the overall insertion loss (7.5 dB in the example above). Note that the internal splitter cannot be physically accessed. The optical switch ports are internal only - not brought to the external patch panel.

NOTES:
- In the ClickFlow GUI, the PMU ports are presented in a separate area of the Connection Screen and are not labeled with their port numbers. Instead, each PMU is assigned a letter designation (e.g., "A"). The PMU input, in this case, would be designated as "A" and the PMU outputs would be designated "A-1" and "A-2". Refer to the *Glimmerglass ClickFlow Graphical User Interface Manual* for more information.
- As each PMU requires one optical switch output port and *N* optical switch input ports, the total number of patch panel ports available is reduced for each PMU added. For the example in Figure 1, the patch panel ports are 24x24 but the actual optical engine is 26x25.
- The losses shown in Figure 1 are representative. Refer to the data sheets for the product for the loss ranges for different PMU sizes.
- The term, Photonic Multicasting, refers specifically to the configuration above (distributing one signal on any input to any *N* output ports. The next section discusses splitter configurations where the splitters are dedicated (spliced) to patch panel ports.

Optical Splitter

Optical splitter hardware provides the ability to split (1x*N*) either incoming or outgoing signals, as described in the following sections:

- “Input Optical Splitter” (below)
- “Output Optical Splitter” on page 14

Input Optical Splitter

1x*N* splitters may be added to the system after the patch panel but before the optical switch engine. In this configuration, each input fiber connector on the patch panel maps to *N* input ports on the optical switch. Figure 2, Figure 3, and Figure 4 show examples where input optical splitters may be useful.

There are three differences between PMUs and input optical splitters:

- First, the PMU is a shared resource (any patch panel input to any *N* patch panel outputs) whereas the input optical splitter is dedicated to a physical input port.
- Second, the loss through the system is less for an input optical splitter, as only one optical switch connection is required. Compare the powers shown at output ports 2 and 24 between Figure 2 and Figure 1 for an example of this point.
- Third, the input optical splitter always allows for passive monitoring as well as for distribution. The PMU is only effective for passive monitoring if the initial input port to output port connection is run through the PMU. If not, the connection must be broken and reconnected causing a ~20ms disruption in the through path.

Figure 2 Block Diagram: 24x24 Port System with 1x2 Input Splitter for "IN 1"

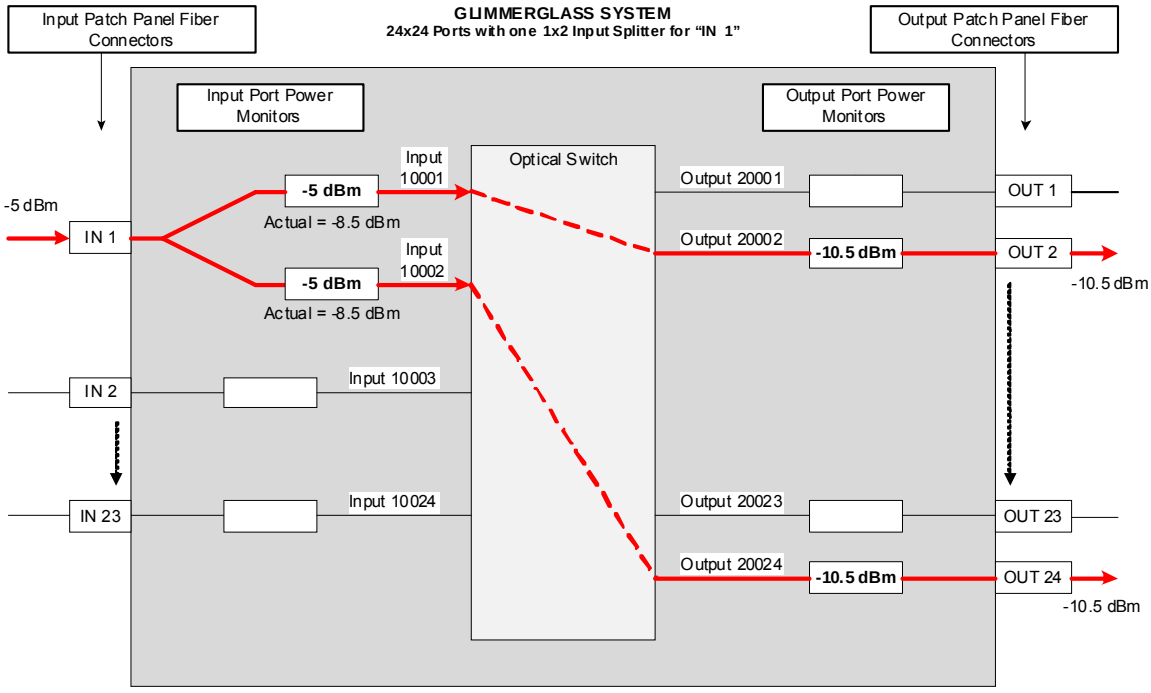


Figure 2 above shows a 24x24 port system with a single 1x2 input splitter. The diagram conventions for this figure as well as the following are the same as described for the PMU in the previous section. Note the following:

- Only the signal presented on the patch panel "IN 1" port may be split.
- The signal on "IN 1" is split then routed to input power monitors in this example.
- Each split is connected to a separate optical switch input. In this example, these inputs are 10001 and 10002 (first two optical switch inputs)
- The power monitors for these two optical inputs are adjusted to reflect the power at the single patch panel input (IN 1) - both report 5dBm. However, this is a 1x2 splitter (50/50 split ratio) which each leg actually 3.5 dB lower than the shown input power. This operation may be specified if it is preferred to see the power after the 3.5 dB loss. The above configuration is used to monitor the actual input power and to report a system loss which reflects the actual loss from input to output.
- Inputs 10001 and 10002 may be connected to any output port on the system. The connections in this example are below.
- Input 10001 is connected to Output 20002. The output power monitor shows the actual power of -10.5 dBm. This represents a 2 dB switch loss + a 3.5 dB splitter loss. The output power here is higher than when the PMU was used.
- Input 10002 is connected to Output 20024. The loss calculations and final output power are the same as above.
- Note that the Input Patch Panel only has 23 connectors while the optical switch has 24 input ports due to the use of the input splitter.

Figure 3 Block Diagram: 48x56 Port Switch w/ 24 1x2 Input Splitters ("IN 1 through IN 24")

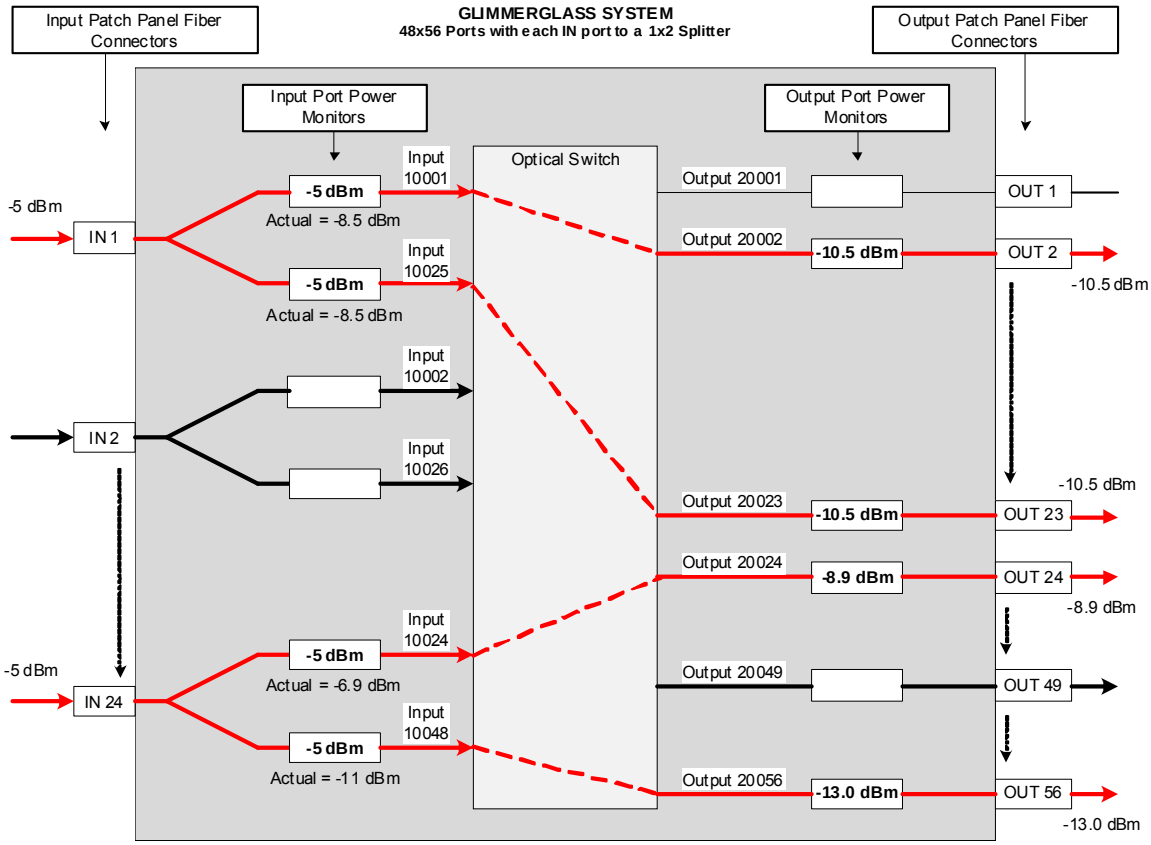


Figure 3 above shows an asymmetric (48x56 port) system where all 24 input connectors are routed through a 1x2 splitter to the optical engine. This results in 48 engine input ports. In this example, there are 56 output ports. The first 48 would allow for full use of all input ports for traffic. The last 8 (OUT 49 to OUT 56) could be used for passive monitoring or for connections to shared test equipment for protocol, BER type testing. Note the last 1x2 splitter (IN 24) is a 70/30 split ratio to illustrate the different output powers relative to the input. Finally, note that, in the above example, the top leg of the splitter is routed to the optical switch at 10001 and the second leg at 10025. This pattern is carried through to the last physical input. This simply illustrates another possible configuration which may be specified where the splits are grouped instead of adjacent as in Figure 2.

Figure 4 Block Diagram: 24x24 Ports with Input Splitters for Passive Monitoring

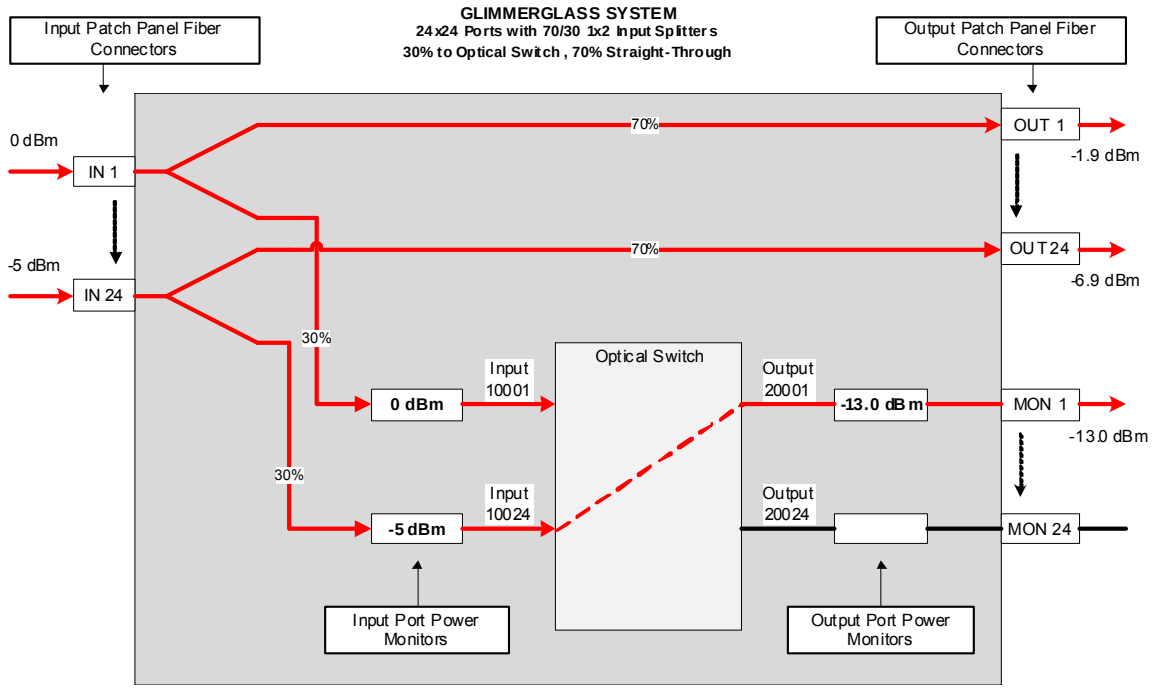


Figure 4 above shows a symmetric 24x24 port system with Input Splitters deployed for passive monitoring. In this example, the 1x2 splitters have a 70/30 split ratio. The 70% leg for each splitter is routed directly to the output patch panel (switching is not required). The 30% leg is routed to the optical switch. The outputs of the optical switch are connected to monitoring devices (e.g. probes). Any input signal (or two inputs, for duplex) may be switched to any of the monitoring devices fibered to the “MON” output ports. In the above example, only one port is connected (simplex) to output 20001 (MON 1). The loss through the system is 8 dB (2 dB for the switch, 6 dB for the 30% leg of the splitter).

For duplex monitoring, output 20002 would be fibered to MON 2 and the MON 1 and MON 2 fibers would be connected to a single probe. In this example, there would be 12 probes supporting switched monitoring of 24 inputs. Input port power monitoring is optional but, when present, allows the user to know the through signal power level. Note this system has 24 physical input connectors and 48 physical output connectors.

Output Optical Splitter

In this configuration, a switch output is split and presented to the switch on *N* patch panel ports. The output port and patch panel ports requiring this operation are designated at the time of the order for the system.

NOTES: The required number of switch ports is unchanged by the presence of output optical splitters. However, the output patch panel requires additional adaptors to accommodate the split. Thus a 1x4 splitter requires 4 output patch panel ports.

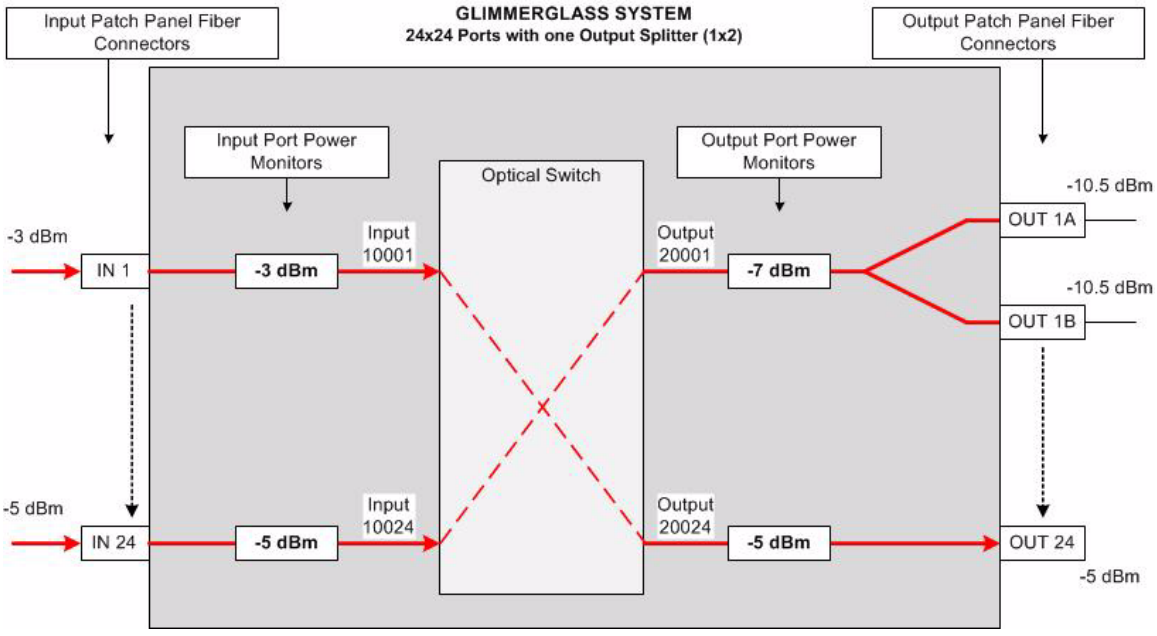
The system will only show the output optical power delivered to the splitter input. The user will not be able to use the system to monitor the power of each leg of the split.

The use of output splitters results in the following:

- The total number of switch ports is unchanged
- The required number of patch panel output ports is increased
- The output patch panel numbering will not correspond with the switch port numbering (i.e., two physical output ports for one switch output port)
- Lower insertion loss than with the PMU feature
- Cannot view output power level after the split

Figure 5 shows a functional representation of an output optical splitter.

Figure 5 Output Optical Splitter Functional Representation



Variable Optical Attenuation (VOA)

Glimmerglass offers two implementations for Variable Optical Attenuation: Dedicated VOA and Switched VOA. These features allow the user to adjust the output power (or loss) of connections via either the ClickFlow or TL1 user interfaces and eliminate the need to separately install either fixed attenuators or a standalone VOA device requiring a separate remote software control interface or on-site manual adjustment.

VOA operation in both cases allows 0.1dB resolution with ~10ms response times. Once set, the system monitors the power level and automatically adjusts the VOA setting to maintain operation at the set level.

Dedicated VOA

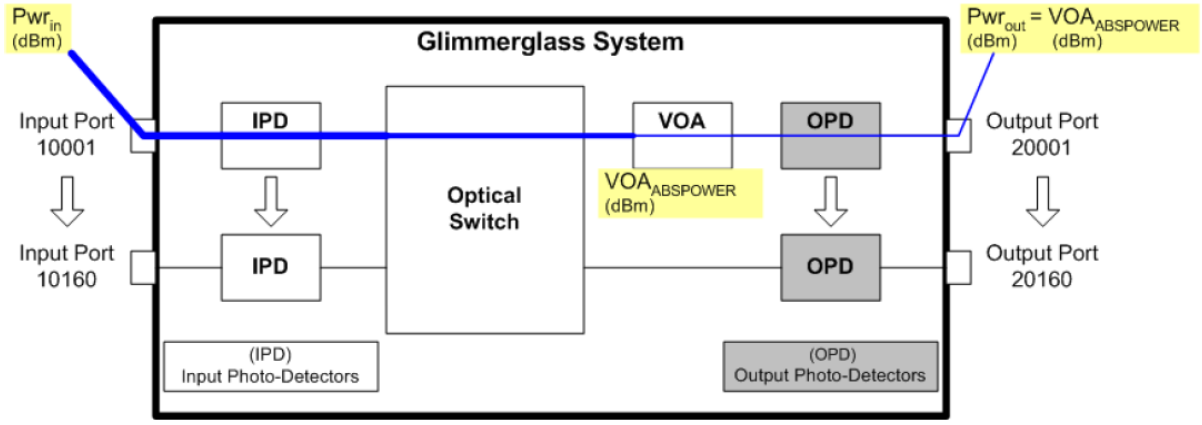
The Dedicated VOA feature allows users set/control the output optical power level (dBm) for connections to pre-designated outputs port. This mode of operation is called "Set Power".

The pre-designated output ports are implemented with VOA elements located in-line between the switch and the output power monitor for the port. Setting the output power level causes VOA to attenuate the signal until the output power monitor reaches the requested output power dBm value. The VOA will continuously adjust to accommodate to changes in the input signal power to maintain the set value.

NOTES:	The output power setting only applies when the setting is lower than the non-attenuated power value for this connection. Connections to VOA output ports will have a slightly higher insertion loss (0.4 to 0.8 dB) than connections to ports without VOA in-line VOA devices. This is due to the intrinsic loss of the in-line VOA device.

Figure 6 shows a functional representation of Dedicated VOA.

Figure 6 Dedicated VOA Functional Representation



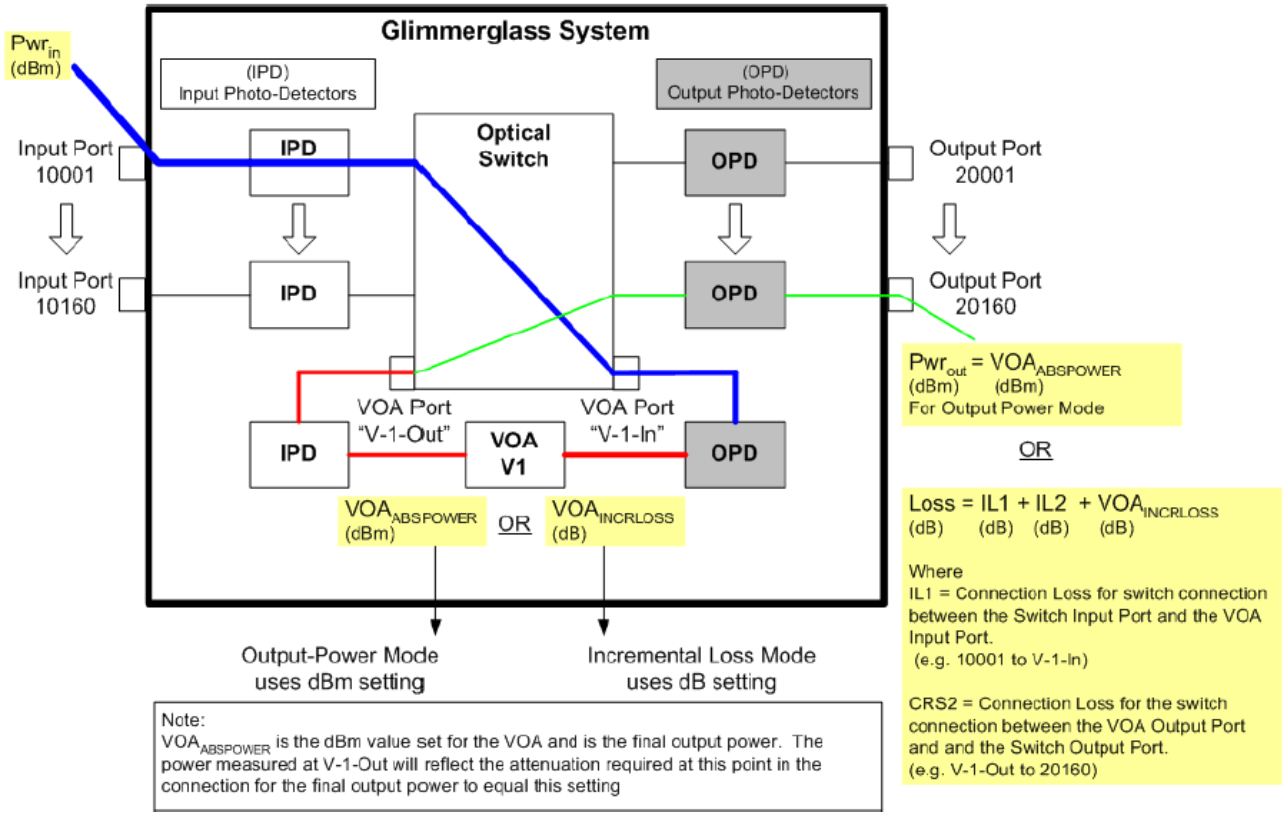
Switched VOA

The Switched VOA feature supports the "Set Power" as well as an "Attenuate" mode. In the "Attenuate" mode, the user is able to configure a loss value (in dB) to apply to the connection (for example, adding 1.5 dB of loss to the existing connection). In this mode, the output power level follows the input power level by the sum of the normal connection loss plus the configured loss amount.

The Switched VOA implementation moves the attenuators from a fixed output port assignment and places the attenuator between an internal input and an internal output port of the switch. This configuration removes the Dedicated VOA constraint of pre-designating which output ports will support attenuation and, therefore, allows attenuation to be performed between any input port and any output port.

Figure 7 shows a functional representation of Switched VOA.

Figure 7 Switched VOA Functional Representation



The use of Switched VOA results in the following:

- The required number of switch ports is increased (161x161 port switch in the above example instead of 160x160)

Low Power Operation

The Low Power operation feature shifts the operating range of the system and requires output power detectors with a higher tap percentage. Therefore, these systems will have a slightly higher insertion loss (~0.3 dBm). The overall operational range is -35dBm to 15dBm.

Standard Software

The following features are standard for all systems.

User Interfaces:

- ClickFlow Graphical User Interface
- TL1 Command Line Interface
- SNMPv3 (configuration and trap reporting)
- Maintenance Console

Configuration/Provisioning:

- User Account creation and administration
  - Assignment of user privileges to system and port resources
- System Configuration
  - Name, Description, Login Banner, IP configuration
  - NTP Operation
  - SNMP trap targets and community strings
  - Target Syslog servers
  - Connection Restoration
- Password and Session security policies
  - Password complexity/change rules
  - SSL security, no activity timeout, intrusion
- Port and Connection policies
  - Signal Threshold definition
- Port Attributes
  - Name, Description, Waveband, Signal Thresholds, Signal Threshold Alarm Severities
- Connections
  - Simplex and Duplex connections with lock option
  - Topology application with lock option

Reporting/Monitoring:

- Active alarm table and Alarm acknowledgment support
- System log viewing
- Real-time port/connection optical power and loss viewing

- Configuration reports for ports/connections
- System information

System Administration:

- Configuration Backup and Restore
- System Software Upgrade
- Reboot, Restart, Shutdown and Restore to Factory Defaults
- Session monitoring with force logoff capability
- Firewall (accept only) configuration

The Maintenance Console, ClickFlow and TL1 user interfaces are overviewed below. SNMP is accessed/controlled via an SNMP manager.

Maintenance Console (Serial Port or SSH Connection)

The Maintenance Console is the user interface presented when accessing the Glimmerglass system via the system's serial port or remotely using SSH. Both methods of access require authentication using one of two system-defined user accounts, “admin” or “maint”. Additional user accounts cannot be created for this interface.

The Maintenance Console “admin” and “maint” accounts are Linux users. They are separate from the system-defined accounts used by the ClickFlow and TL1 user interfaces. Therefore, the passwords for the system-defined Maintenance Console user accounts are not linked to the passwords for the system-defined TL1/ClickFlow user accounts.

Upon login as either “admin” or “maint”, a custom shell script is invoked presenting the user with a text-based menu. This menu provides access to basic installation and maintenance operations as well as the ability to access the TL1 user interface for provisioning the switch. The “admin” menu options cannot be changed. The “admin” account controls the both the password and menu options displayed for the `maint' account.

Though access to TL1 is provided via the Maintenance Console menu, this method is not intended to be a primary provisioning interface for the system. TL1 access from the Maintenance Console menu is provided to allow the system to be managed and provisioned from the serial port during periods when the system cannot be accessed over the network.

The Main Menu presented when the Maintenance Console is invoked provided access to the following:

- Only the “admin” user can change passwords for both login accounts and has full access to the options presented in the Main Menu.
- The “admin” user may customize the Main Menu options provided to the “maint” account. The “maint” user will have full access to the options presented in the customized menu.
- Main Menu options include:
  - Configuration of the system's network parameters (e.g., Host Name, IP addresses, Subnets, Gateway)
  - Configuration of firewall information ('allow list' configuration only)
  - Set date/time or NTP client configuration
  - Basic IP network troubleshooting (ping, network connections)
  - Command to reset the default passwords for the switch default 'admin' account used by the ClickFlow/TL1 user interfaces
  - Modification of the TCP/UDP port numbers used by the switch applications (i.e., ClickFlow/TL1/SNMP)
  - System-level maintenance operations (reboot, restart, shutdown, reset-to-factory defaults, restore configuration, software upgrade and rollback)
- An additional menu option is provided to allow a TL1 session to be opened and used to configure or provision the switch itself.
  - TL1 is normally accessed directly through the external network. This method of accessing TL1 is provided to allow continued switch configuration/provisioning when the connection to the external network is unavailable (e.g., must use the serial port). Using SSH to connect to the Maintenance Console then invoking a TL1 session is less efficient than direct TL1 connections. Command responses longer than 4096 characters are truncated using this access method.

Maintenance Console operation is described in Chapter 10, “Maintenance Console” starting on page 91.

ClickFlow Graphical User Interface

ClickFlow is a browser-based graphical user interface allowing users to provision and control the system though either an SSL-encrypted (https://) or non-encrypted (http://) connection. The ClickFlow interface shares user accounts/passwords with the TL1 interface.

ClickFlow usage is described in the *Glimmerglass ClickFlow™ Graphical User Interface Manual*.

TL1 User Interface

TL1 is the management protocol used to provide command line provisioning as well as control and monitoring of the system through the network. TL1 is invoked by opening a raw socket to the desired TCP port on the system. TCP ports are provided supporting verbose operation (e.g., normal login by operator) or streamlined operation (e.g., for scripting/automation) using either open or SSL-encrypted connections.

TL1 and ClickFlow share user accounts and passwords. TL1 user account administration supports configuration of TL1 privilege levels that are more restrictive than the ClickFlow privilege levels.

TL1 operation and commands are described in the *Glimmerglass TL1 Manual*.

Optional Software Features

This section discusses the following optional, licensed software features:

- Connection Protection (below)
- Virtual Private Switch (page 22)
- Port Grouping (page 23)

Connection Protection

The Connection Protection feature allows the user to configure working and protect input ports for either Simplex or Duplex connections. This feature allows the user to externally split a signal and route each leg of the split to a separate input port on the system. If a fiber cut or loss of light occurs on the working path, the system will detect this condition and change the connection(s) to use the protect path.

Virtual Private Switch

The Virtual Private Switch (VPS) feature allows users to modify "port-level" privileges for users. With VPS, a system administrator may control which ports each user may view or use. This allows a single switch to be divided among different users or groups of users where each "community" may only view and operate on their assigned ports.

Port Grouping

The Port Grouping feature allows a system administrator to allocate the system's ports among port groups for the purpose of restricting connections among ports in the system. By default, connections between port groups are prohibited. In the event that connections between certain groups is desired, each port group supports an allow list. For example, if GRP1 is placed in GRP2's allow list, then connections are permitted from GRP1 input ports to output ports in GRP2. To allow reverse connections, GRP2 must be placed in GRP1's allow list.

Port group rules prevent any user, even system administrators, from deliberately or accidentally making connections which violate the configuration. This feature allows a single user to have the ability to make connections in all groups and protects from making illegal connections, which is beneficial in preventing classified inputs from accidental connection to non-secure outputs.

In conjunction with the VPS feature, a single switch may be transparently used by separate user communities without inadvertent crossing of connections.

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System 100 Installation

3

System 100 Overview

The Glimmerglass System 100 Intelligent Optical Switch manages fiber connectivity at the physical layer, remotely and automatically via a computer interface. The System 100 consists of a 2U rack-mount chassis, control panel, and fiber I/O panel. It supports up to 96x96 user-accessible ports (192 fibers), depending upon connector-type and optional hardware feature content. Figure 8 and Figure 9 through Figure 13 highlight the main elements of the system.

Figure 8 Front View of System 100

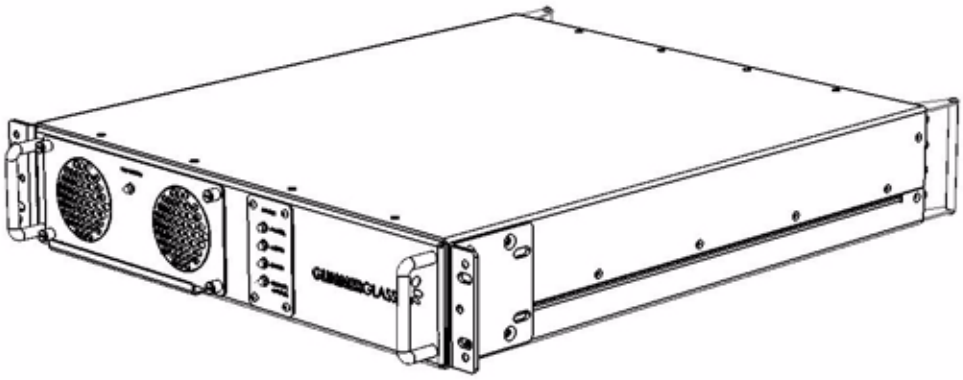


Figure 9 Rear View of DC-Powered System 100 with MTP Patch Panel

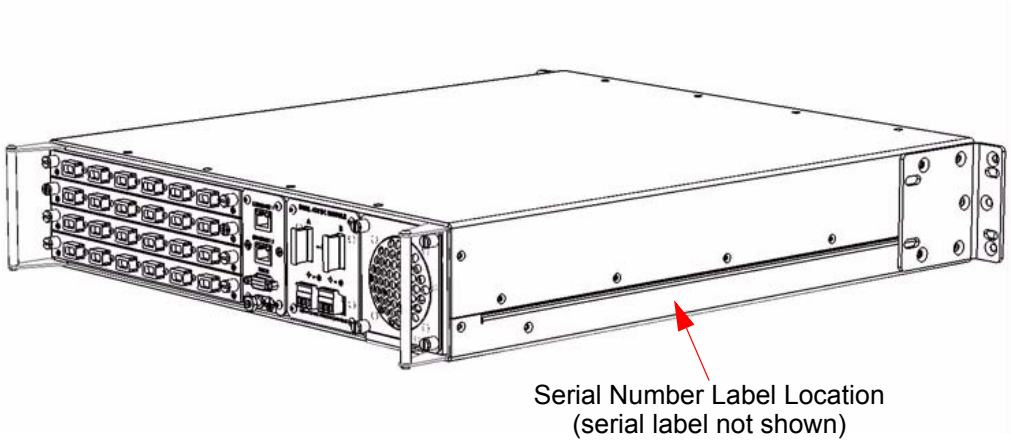


Figure 10 Rear View of AC-Powered System 100 with LC Connectors

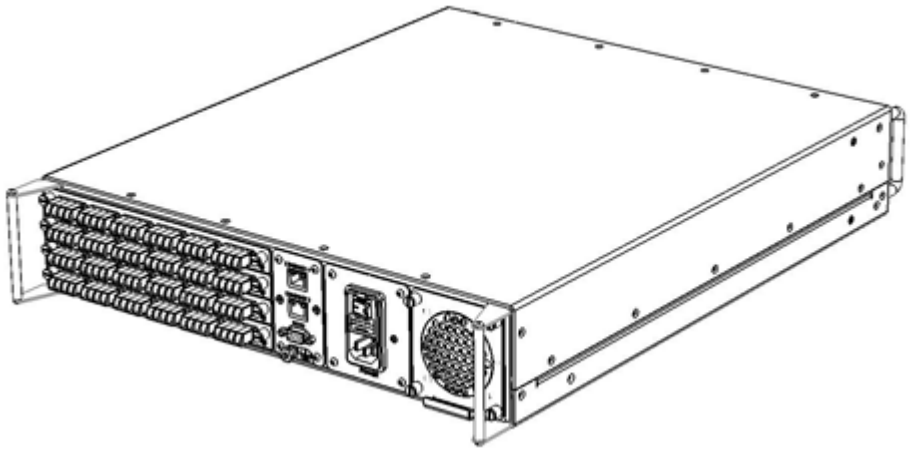


Figure 11 System 100 Front View

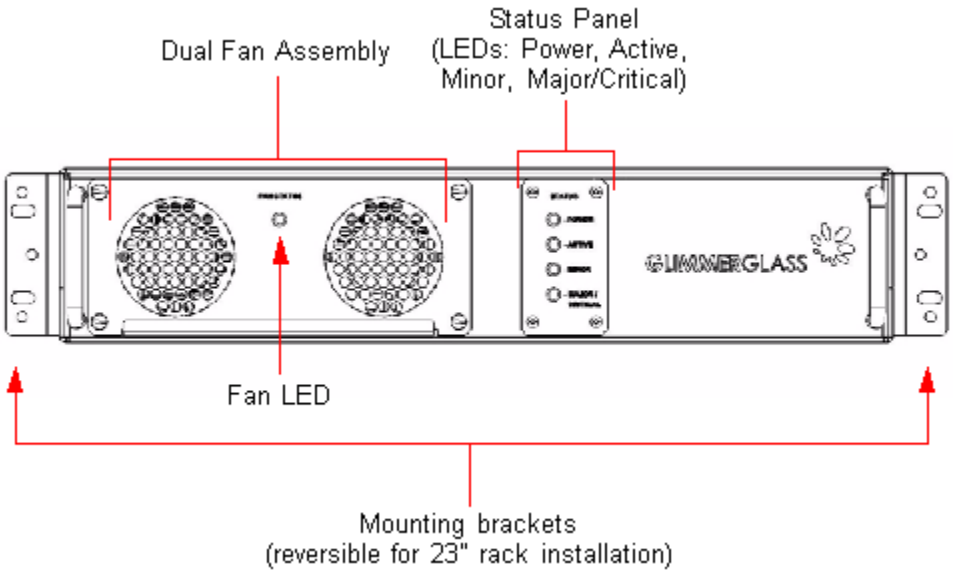


Figure 12 System 100 DC-Powered System (Rear View with MTP Connectors)

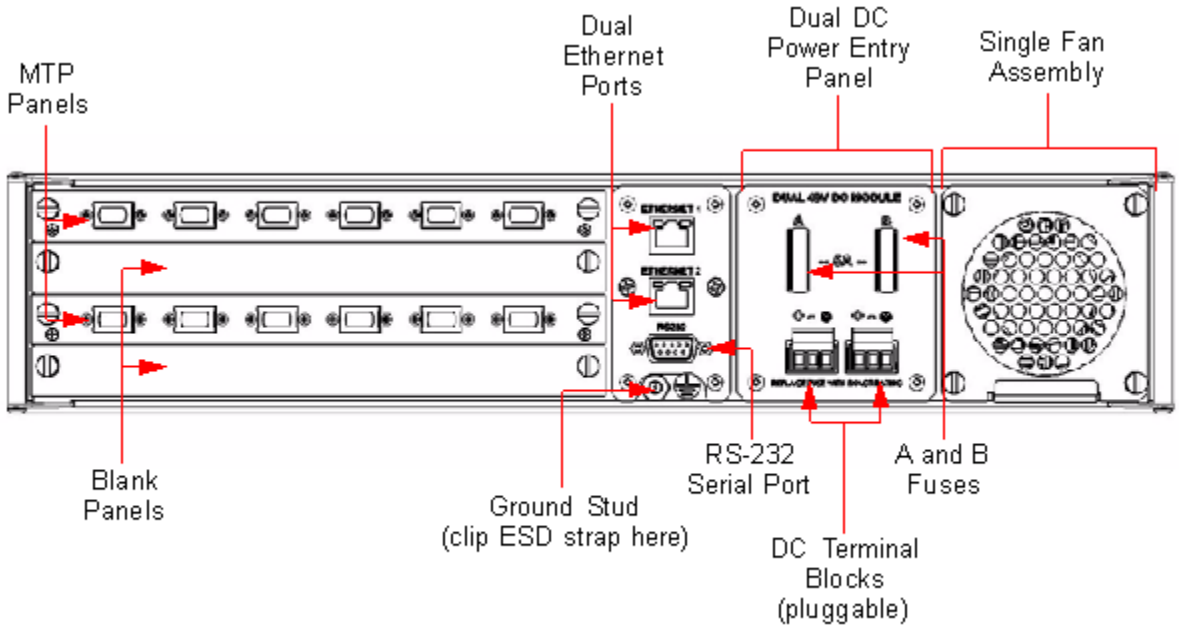
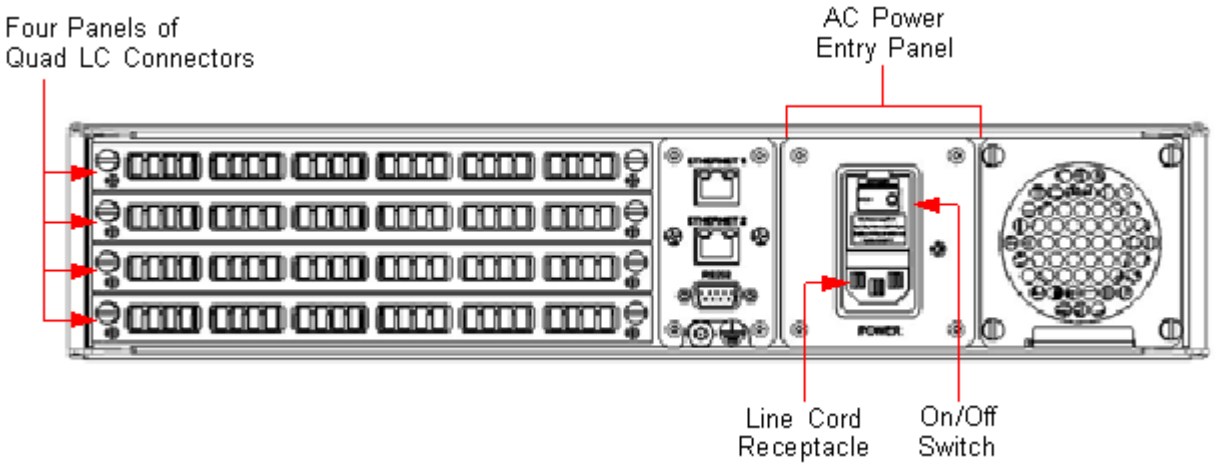


Figure 13 System 100 AC-Powered System (Rear View with LC Connectors)



Physical/Electrical Specifications

The following table lists the physical and electrical specifications of the System 100:

Attribute	Value
Chassis Dimensions[1] (HxWxD)	3.5" x 17" x 19" (89mm x 432mm x 482mm)
Weight	20 lbs (9.1 kg)
Packaging/Shipping Dimensions (Length x Width x Height)	27" x 24" x 9" (686mm x 607mm x 229mm)
Shipping Weight	28 lbs (12.7 kg)
AC Power Supply[2]	100 - 240 VAC, 50-60Hz (Auto-sensing)
Fuse Type (AC System)[3]	BK/GMC-2-R 5x20mm, 2A, 250 VAC, Med. Time Delay **Caution**: Double Pole/Neutral Fuse
DC Power	-48 VDC
Fuse Type (DC System)	BK/GMT-5A (Green), Fast Acting
Power Consumption	50 Watts

1. Dimensions exclude mounting bracket width (0.125" each side).
2. Internal AC power supply option.
3. Two fuses, located behind AC plug cover.

Equipment Inventory

The System 100 ships with the following components:

Hardware:

- (2) mounting brackets supporting installation in 19" or 23" racks (reversible)
  - The brackets are installed on the system in 19" orientation.
- (8) 12-24 pan head screws
  - For mounting in racks with 12-24 threading

Cables:

- (1) standard Ethernet cable (7', blue)
- (1) DE-9M/F serial cable (6')

Power Accessories:

For internal AC power supply systems:

- (1) AC power cord (6')
  - Supply-end plug type specified at time of order
- (2) spare BK/GMC-2-R fuses

For dual DC systems

- (4) BK/GMT-5A fuses
  - 2 for installation in the DC power entry panel
  - 2 spare fuses
- (2) Pluggable DC terminal blocks
  - One each for A and B feed wiring (see “Connecting External Power to Dual DC Systems” on page 57)

For external, redundant AC power systems

- See “AC High-Availability (AC-HA) Shelf Installation” on page 67 for inventory information on external 1RU chassis and power supplies.

Manuals/Documentation:

- (1) CD-ROM containing all Glimmerglass user manuals
- (1) CD-ROM containing Glimmerglass Console software and user manuals
  - Only included if Glimmerglass Console feature is ordered

- Patch Panel Plumbing Diagram (Only for MTP connector-type systems)
- Final QA Test Report

Through-Bulkhead Fiber Cleaner:

- (1) Through-bulkhead fiber cleaner appropriate to system's connector-type
  - IBC™ MTP Cleaner for MPO/MTP type connectors
  - Ferrule Mate (Seikoh Giken SFM-125) or IBC™ LC/1.25mm cleaner for systems with LC type connectors
  - Ferrule Mate (Seikoh Giken SFM-250) or IBC™ SC/2.5mm cleaner for systems with SC or FC type connectors

Facilities

The following table lists the facility requirements for the proper installation and function of the system:

Facility Type	Requirements
Equipment Rack	Cooper B-Line Network Frame, or equivalent
AC Utility Outlet	AC Power receptacle for connecting laptop during installation.
AC Equipment Outlet(s)	One for internal AC systems, two for AC High Availability shelf (on separate circuits for redundancy)
DC Power	Two -48VDC Power Feeds ("A" and "B" feeds to system)

Required Tools

The following tools are required to install the mounting brackets on the System 100 and to install the system into the equipment rack:

- Phillips head (PH3) screwdriver (12x24 rack screws)
- 3mm hex wrench (M5x12 hex screws used to secure mounting brackets to chassis)

Installing the System 100 in the Equipment Rack

NOTE: Before installing the System 100, carefully review the following sections:

- ”Safety Considerations” (page 2)
- ”Handling Guidelines” (page 4)
- ”Physical Environment Considerations” (page 3)

1. The mounting brackets (2) are pre-installed to the System 100 chassis in the 19" rack configuration per Figure 14. For a 23" rack configuration, remove the 10 M5x12 mounting screws (3mm hex) and then reattach the brackets per Figure 15.

Figure 14 System 100 Ear Assemblies for 19” Configuration

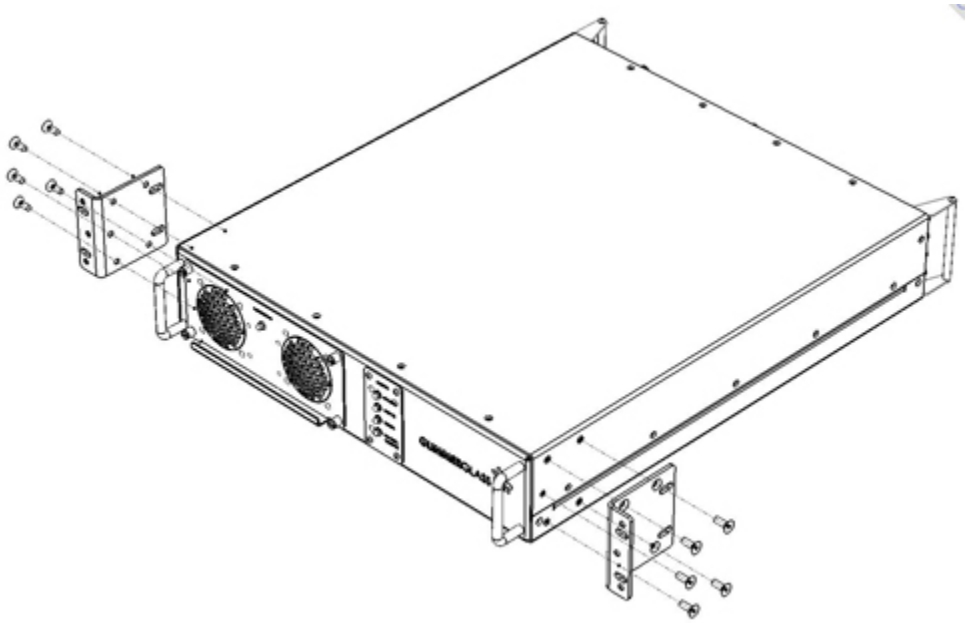
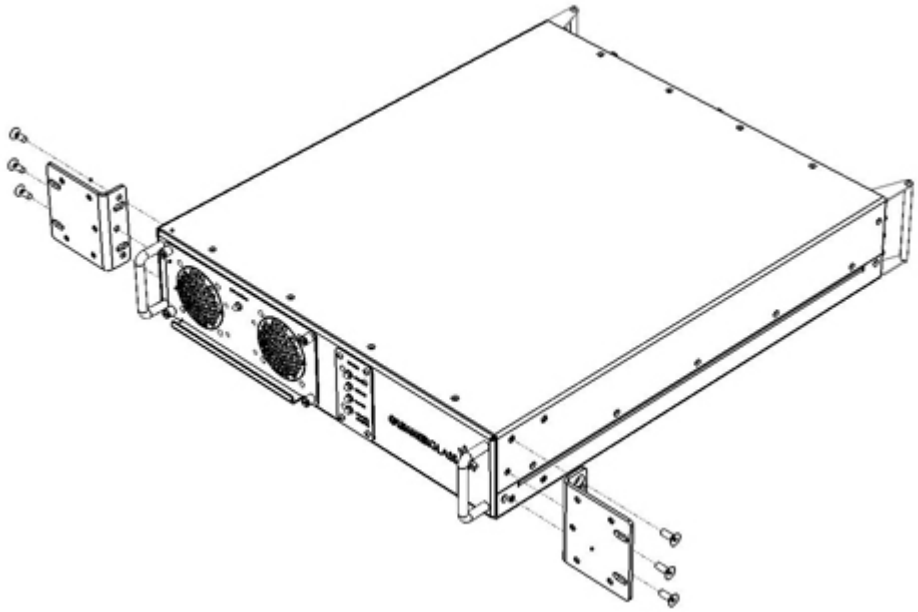
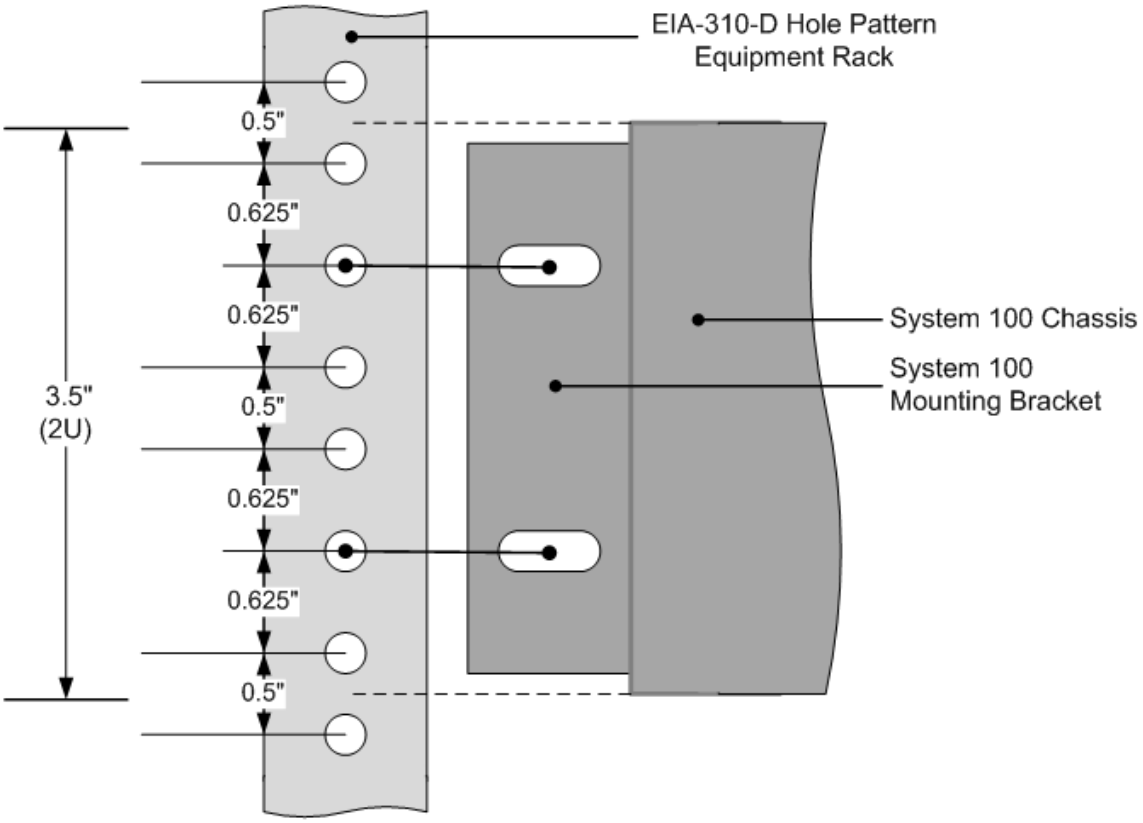


Figure 15 System 100 Ear Assemblies for 23” Configuration



2. Mount the System 100 chassis in the equipment rack. Figure 16 shows the System 100 mounting hole pattern referenced to an EIA-310-D hole pattern rack.

Figure 16 System 100 Mounting Hole Pattern



3. Connect power to the system:
   - For System 100 chassis with an AC power input, follow the procedures outlined in Chapter 6 (starting on page 53).
   - For System 100 chassis with dual DC power inputs, follow the procedures outlined in Chapter 7 (starting on page 57).

4. After connecting power, proceed to Chapter 9 (starting on page 73) for instructions on completing system turn-up, initial configuration and verification.

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System 600 Installation

4

System 600 Overview

The Glimmerglass System 600 Intelligent Optical Switch manages fiber connectivity at the physical layer, remotely and automatically via a computer interface. The System 600 consists of a 4U rack-mountable chassis, supporting up to 192x192 user-accessible ports (384 fibers), depending upon connector-type and optional hardware feature content. The patch panel used on the System 600 depends upon the port count, connector type, and whether or not an internal fiber spool is required (MTP systems only).

The System 600 chassis supports MTP, LC, SC, and FC connector types. The chassis has been modified allow access to electronics with memory/storage to facilitate factory return of systems installed in secure locations. Other changes include use of the pluggable DC terminal blocks, 4 hot-swappable fan assemblies, support for dual Ethernet ports, and use of a two-hole, long barrel ground lug.

NOTE:	The current System 600 chassis supports four fans on the front panel and is identified as Model #GG514-B. The previous System 600 chassis, Model #GG514-A, supported two front fans and two rear fans. The installation procedures described in this chapter apply to both models of the System 600.

Figure 17 through Figure 22 highlight the main elements of the Model #GG514-B and Model #GG514-A systems.

Figure 17 Oblique View of GG514-B System 600

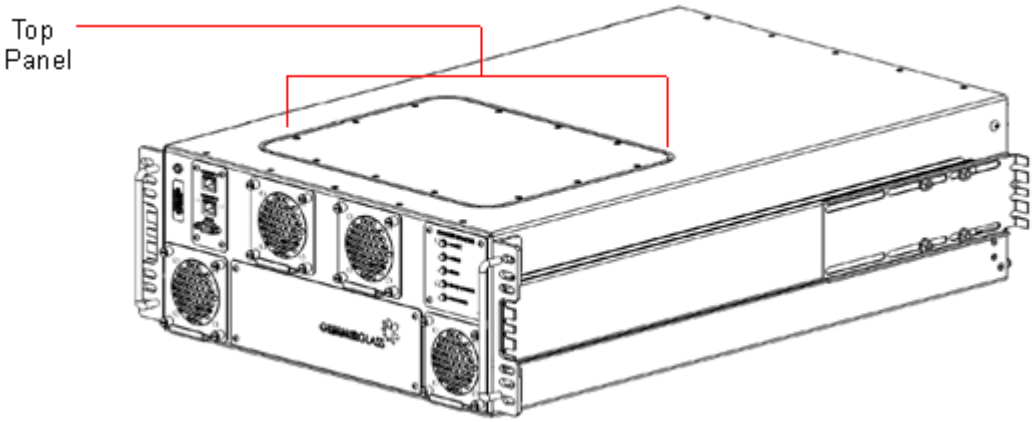


Figure 18 Rear View of AC-Powered System 600 with MTP Connectors (identical for GG514-A and GG514-B)

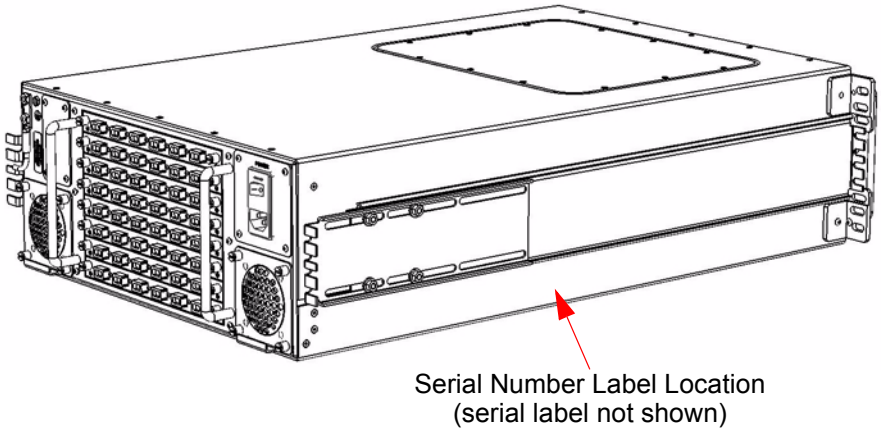


Figure 19 Front View of GG514-B System 600

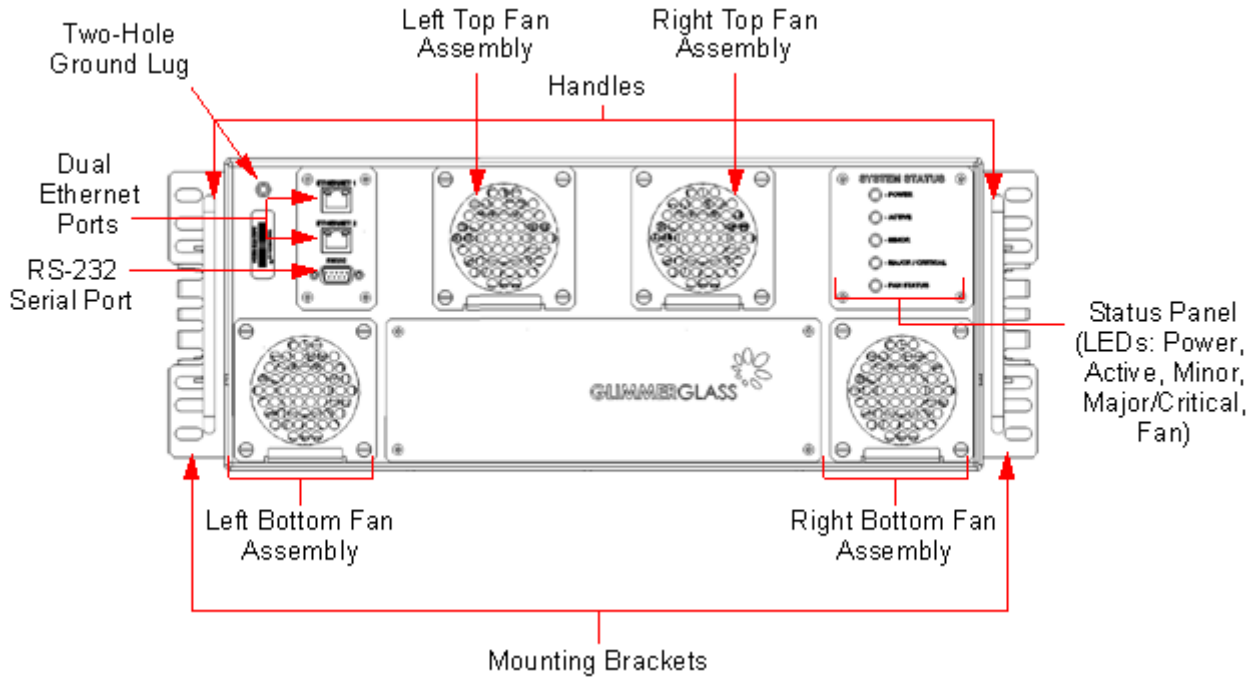


Figure 20 Front View of GG514-A System 600

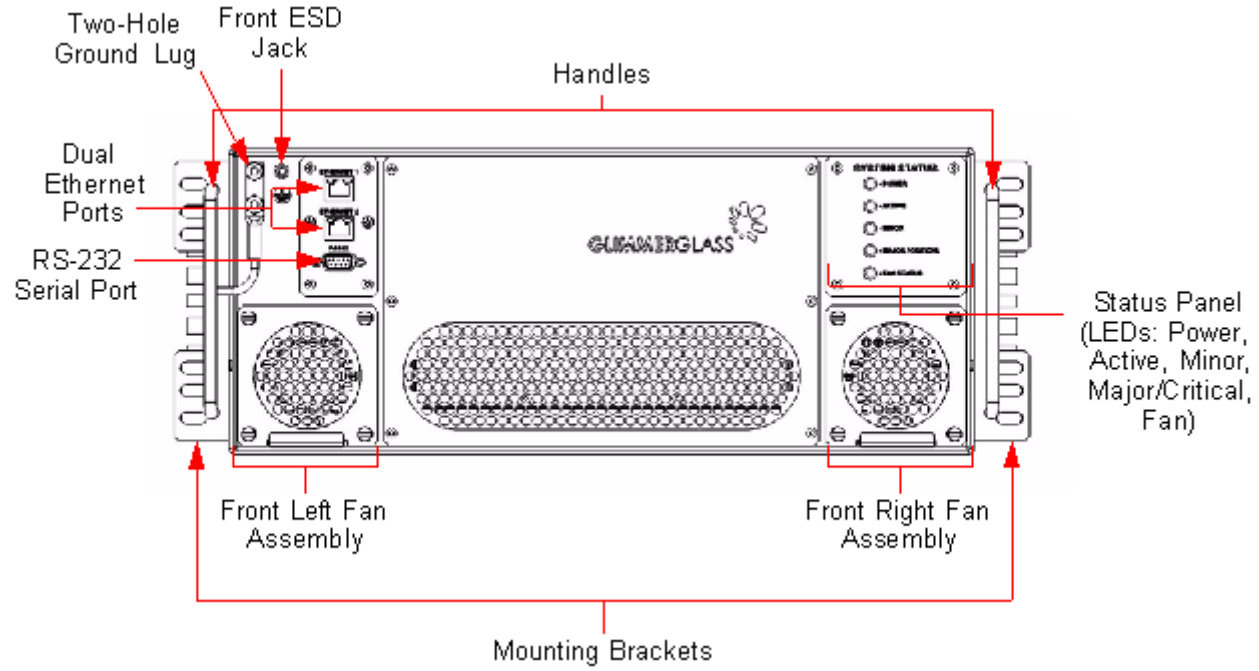


Figure 21 Rear View of System 600 with MTP Panel Supporting Internal Fiber Spools

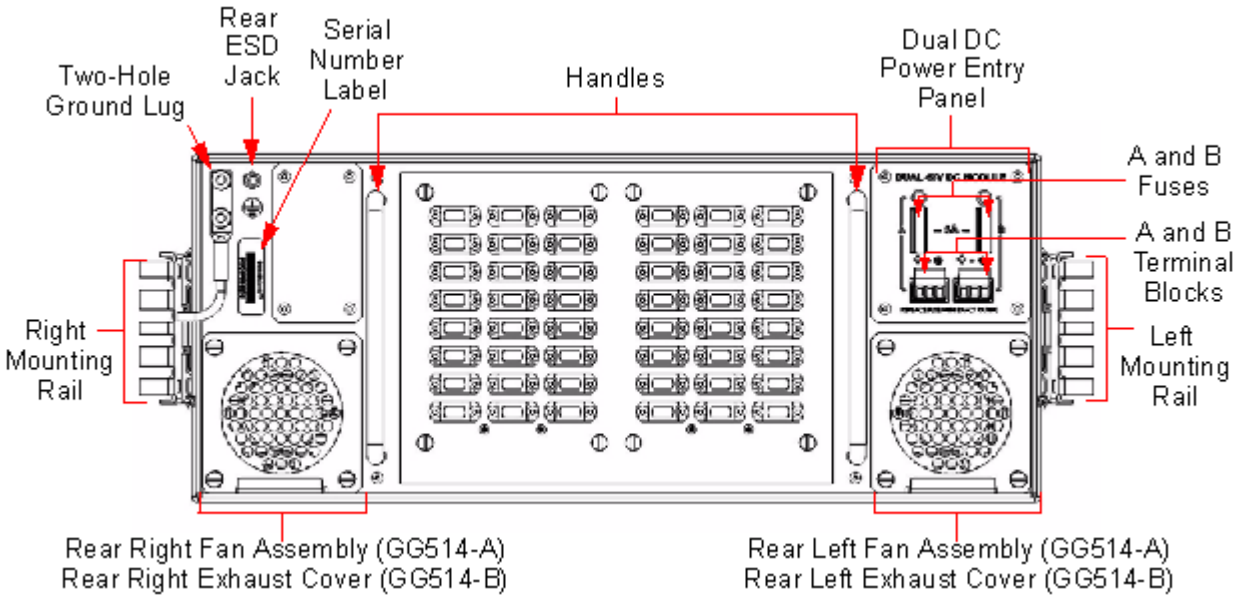
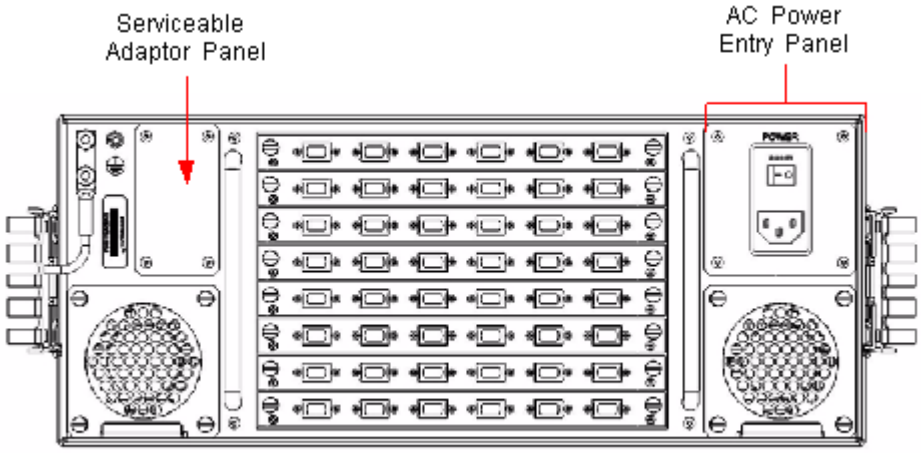


Figure 22 Rear View of System 600 with MTP Connectors (No Fiber Spool Option)



Physical/Electrical Specifications

The following table lists the physical and electrical specifications of the System 600:

Attribute	Value
Chassis Dimensions[1] (HxWxD)	7.0” x 16.6” x 27.8” (178mm x 437mm x 706mm)
Weight	36 lbs (16.3 kg) without slide hardware 38 lbs (17.2 kg) with slide mounts on chassis 45 lbs (20.4 kg) with slide mounts/rails attached.
Packaging/Shipping Dimensions (Length x Width x Height)	32” x 23” x 13” (813mm x 584mm x 330mm)
Shipping Weight	55 lbs (25 kg)
AC Power Supply[2]	100 – 240 VAC (Auto-sensing)
Fuse Type (AC System)	BK/GMC-2-R 5x20mm, 2A, 250 VAC, Med. Time Delay
DC Power	-48 VDC
Fuse Type (DC System)	BK/GMT-5A (Green), Fast Acting
Power Consumption	85 Watts

1. Dimensions exclude mounting bracket width and mounting rails (0.125" each side).
2. Internal AC power supply option.

Equipment Inventory

The System 600 ships with the following components:

Hardware:

- (2) mounting brackets (attached) supporting installation in a 19" rack
- (2) slide rail assemblies for attachment to the rack
- (8) 12-24 pan head screws
    - For mounting in racks with 12-24 threading

Cables:

- (1) standard Ethernet cable (7', blue)
- (1) DE-9M/F serial cable (6')

Power Accessories:

For internal AC power supply systems:

- (1) AC power cord (6')
  - Supply-end plug type specified at time of order
- (2) spare BK/GMC-2-R fuses

For dual DC systems

- (4) BK/GMT-5A fuses
  - 2 for installation in the DC power entry panel
  - 2 spare fuses
- (2) Pluggable DC terminal blocks
  - One each for A and B feed wiring (see “Connecting External Power to Dual DC Systems” on page 57)

For external, redundant AC power systems

- See “AC High-Availability (AC-HA) Shelf Installation” on page 67 for inventory information on external 1RU chassis and power supplies.

Manuals/Documentation:

- (1) CD-ROM containing all Glimmerglass user manuals
- (1) CD-ROM containing Glimmerglass Console software and user manuals
  - Only included if Glimmerglass Console feature is ordered
- Patch Panel Plumbing Diagram (Only for MTP connector-type systems)
- Final QA Test Report

Through-Bulkhead Fiber Cleaner:

- (1) Through-bulkhead fiber cleaner appropriate to system's connector-type
  - IBC™ MTP Cleaner for MPO/MTP type connectors
  - Ferrule Mate (Seikoh Giken SFM-125) or IBC™ LC/1.25mm cleaner for systems with LC type connectors
  - Ferrule Mate (Seikoh Giken SFM-250) or IBC™ SC/2.5mm cleaner for systems with SC or FC type connectors

Facilities

The following table lists the facility requirements for the proper installation and function of the system:

Facility Type	Requirements
Equipment Rack	Cooper B-Line Network Frame, or equivalent
AC Utility Outlet	AC Power receptacle for connecting laptop during installation.
AC Equipment Outlet(s)	One for internal AC systems, two for AC High Availability shelf (on separate circuits for redundancy)
DC Power	Two -48VDC Power Feeds ("A" and "B" feeds to system)

Required Tools

The following tools are required to install the mounting brackets on the System 600 and to install the system into the equipment rack:

- Phillips head (PH3) screwdriver (12x24 rack screws)
- 3mm hex wrench (M5x12 hex screws used to secure mounting brackets to chassis)

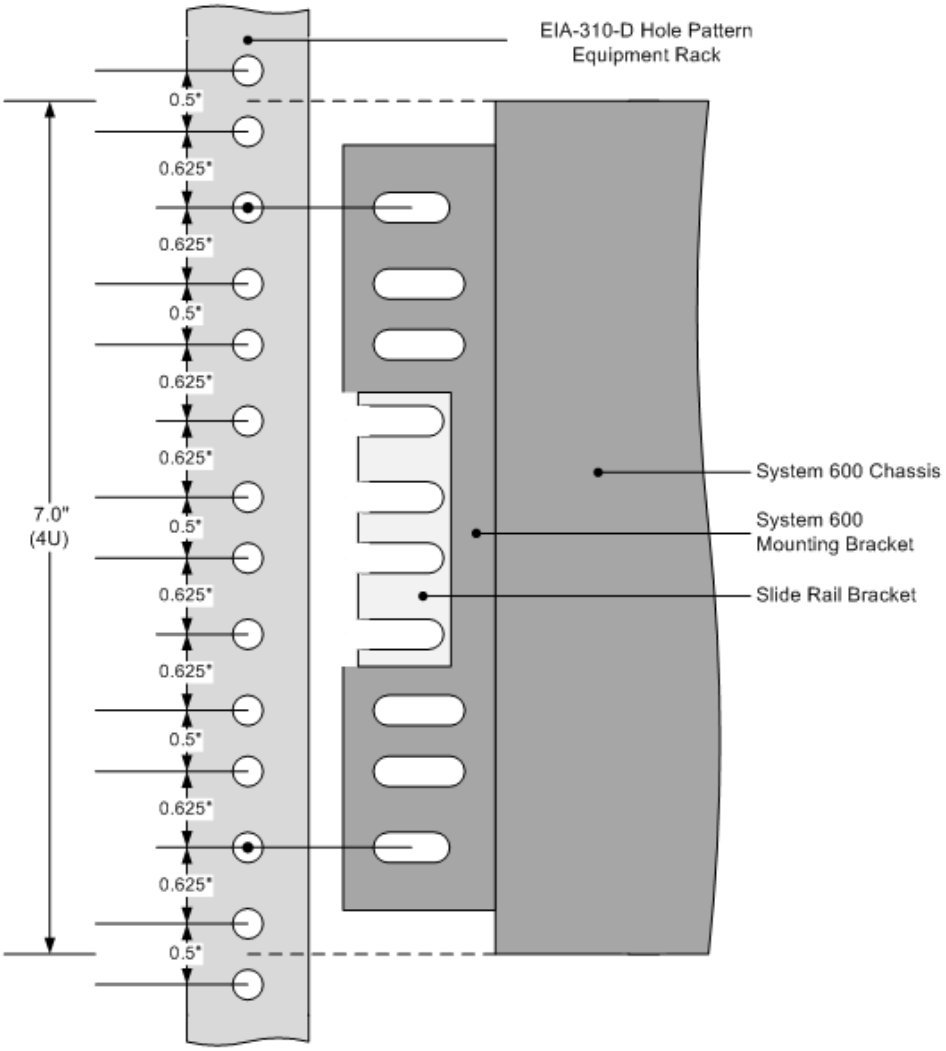
Installing the System 600 in the Equipment Rack

NOTE: Before installing the System 600, carefully review the following sections:

- ”Safety Considerations” (page 2)
- ”Handling Guidelines” (page 4)
- ”Physical Environment Considerations” (page 3)

1. 1.Mount the slide rail assemblies in the equipment rack. Figure 23 shows the standard mounting for the System 600 in an EIA-310-D hole pattern rack for reference.

Figure 23 System 600 Mounting Hole Pattern



2. After the slide rail assemblies are secured, install the System 600 onto the slide rail assemblies and secure the System 600 mounting bracket to the equipment rack.

3. Connect power to the system:
   - For System 600 chassis with an AC power input, follow the procedures outlined in Chapter 6 (starting on page 53).
   - For System 600 chassis with dual DC power inputs, follow the procedures outlined in Chapter 7 (starting on page 57).

4. After connecting power, proceed to Chapter 9 (starting on page 73) for instructions on completing system turn-up, initial configuration and verification.

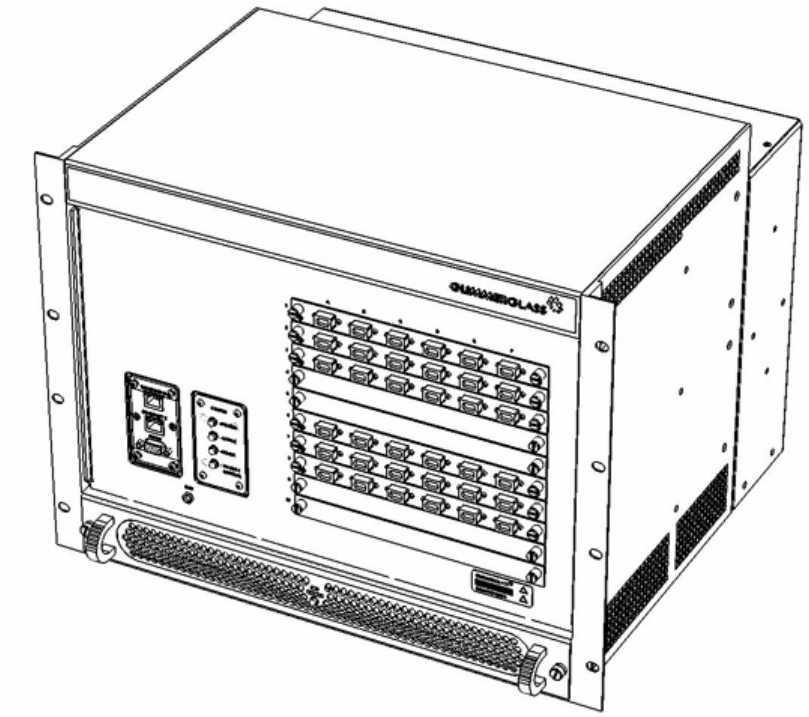
System 500 Installation

5

System 500 Overview

The Glimmerglass System 500 Intelligent Optical Switch manages fiber connectivity at the physical layer, remotely and automatically via a computer interface. The System 500 consists of an 8U rack-mountable chassis with dual DC power feeds supporting up to 192x192 user-accessible ports (384 fibers), depending upon connector-type and optional hardware feature content. The front panel used on the System 500 depends upon the port count and connector type. Figure 24 through Figure 29 show both System 500 front panels as well as the main elements of the system.

Figure 24 Front View of System 500 with MTP Front Panel

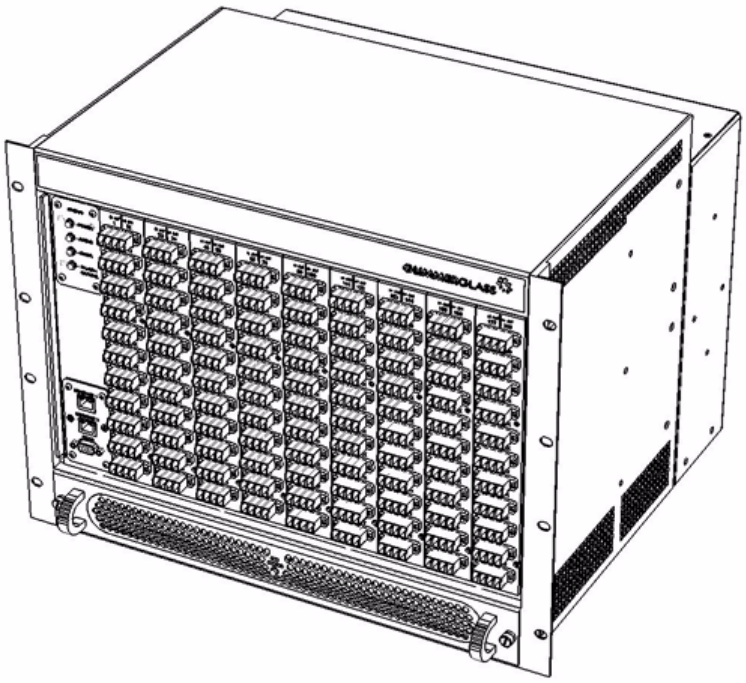


The MTP panel shown in Figure 24 supports both MTP connectors and single fiber connectors. The maximum capacity is dependent on the connector type:

- 192x192 ports (384 fibers) using MTP-12 or MTP-8 connectors

- 120x120 ports (240 fibers) using LC connectors
- 60x60 ports (120 fibers) using SC or FC connectors

Figure 25 Front View of System 500 with LC Front Panel



The LC front panel shown in Figure 25 supports LC, SC, and FC connectors. The maximum capacity is dependent on the connector type:

- 192x192 ports (384 fibers) using LC connectors
- 150x150 ports (300 fibers) using SC connectors
- 72x72 ports (144 fibers) using FC connectors

Figure 26 Rear View of System 500

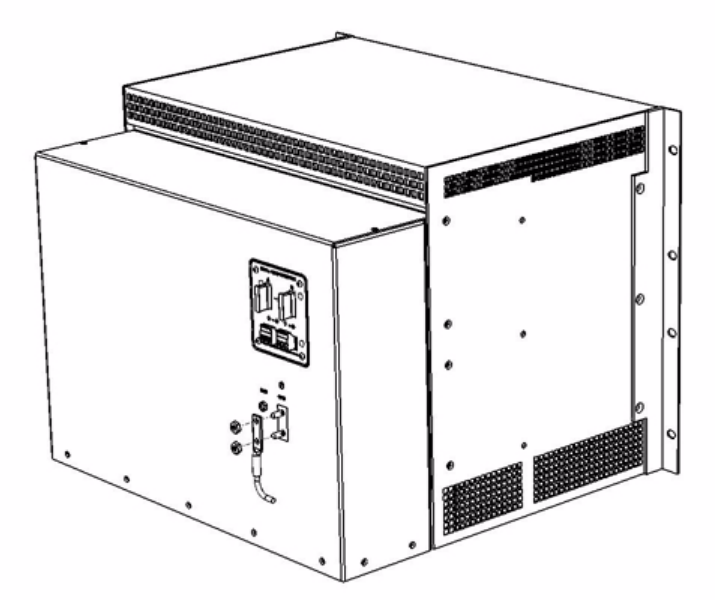


Figure 27 highlights the main elements of a System 500 with MTP connectors.

Figure 27 Front View of System 500 with MTP Connectors

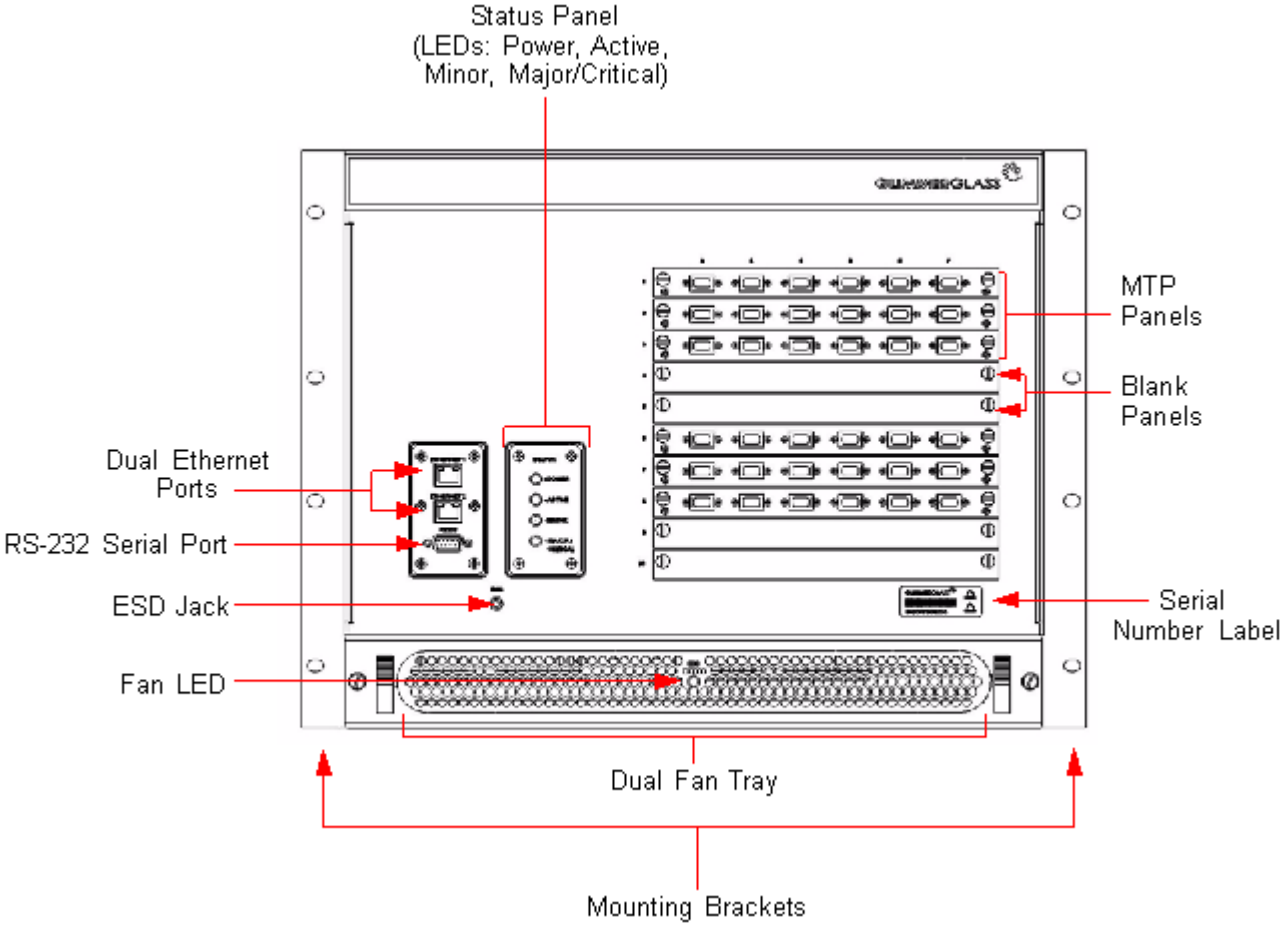


Figure 28 highlights the main elements of a System 500 with LC connectors.

Figure 28 Front View of System 500 with LC Adaptors

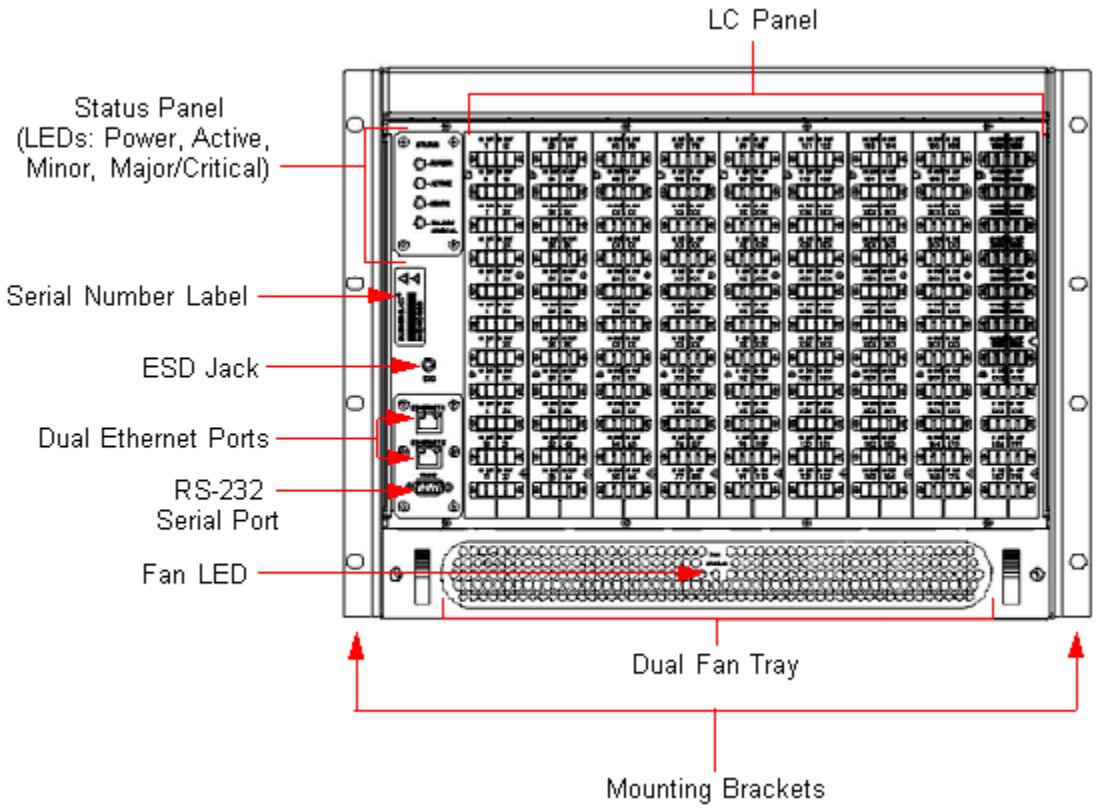
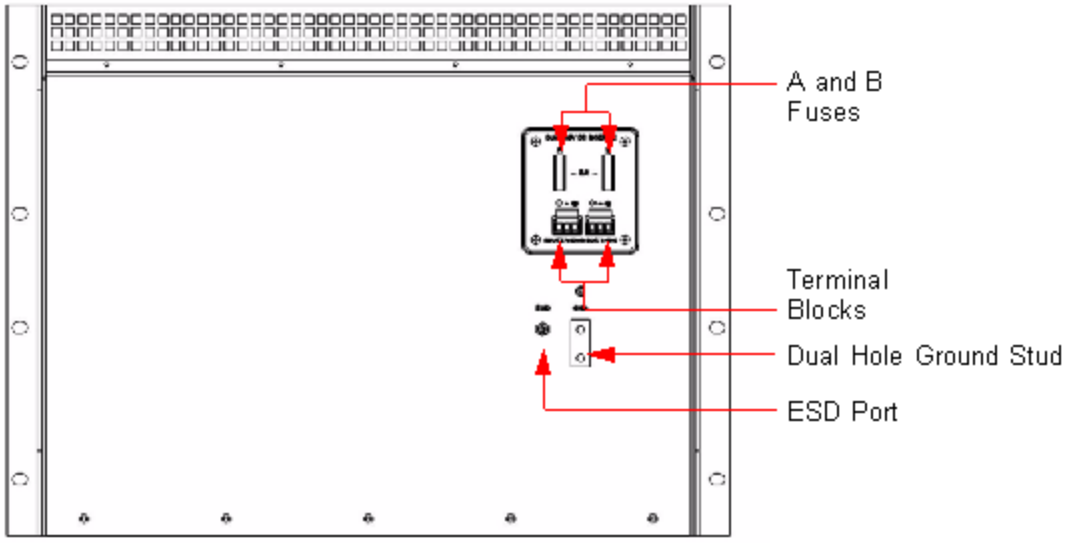


Figure 29 Rear View of System 500



Physical/Electrical Specifications

The following table lists the physical and electrical specifications of the System 500:

Attribute	Value
Chassis Dimensions[1] (HxWxD)	14" x 17.2" x 16.1" 356mm x 437mm x 410 mm)
Weight	38 lbs (17.2 kg)
Packaging/Shipping Dimensions (Length x Width x Height)	26" x 26" x 22" (660mm x 660mm x 559mm)
Shipping Weight	55 lbs (24.95 kg)
AC Power Supply[2]	100 - 240 VAC, 50-60Hz (Auto-sensing)
Fuse Type (AC System)[3]	BK/GMC-2-R 5x20mm, 2A, 250 VAC, Med. Time Delay **Caution**: Double Pole/Neutral Fuse
DC Power	-48 VDC
Fuse Type (DC System)	BK/GMT-5A (Green), Fast Acting
Power Consumption	85 Watts

1. Dimensions exclude mounting bracket width (0.125" each side).
2. Internal AC power supply option.
3. Two fuses, located behind AC plug cover.

Equipment Inventory

The System 500 ships with the following components:

Hardware:

- (2) mounting brackets (attached) supporting installation in a 19" rack
  - Brackets for 23" racks must be ordered if required
- (8) 12-24 pan head screws
  - For mounting in racks with 12-24 threading

Cables:

- (1) standard Ethernet cable (7', blue)

- (1) DE-9M/F serial cable (6')

Power Accessories:

For internal AC power supply systems:

- (1) AC power cord (6')
  - Supply-end plug type specified at time of order
- (2) spare BK/GMC-2-R fuses

For dual DC systems

- (4) BK/GMT-5A fuses
  - 2 for installation in the DC power entry panel
  - 2 spare fuses
- (2) Pluggable DC terminal blocks
  - One each for A and B feed wiring (see “Connecting External Power to Dual DC Systems” on page 57)

For external, redundant AC power systems

- See “AC High-Availability (AC-HA) Shelf Installation” on page 67 for inventory information on external 1RU chassis and power supplies.

Manuals/Documentation:

- (1) CD-ROM containing all Glimmerglass user manuals
- (1) CD-ROM containing Glimmerglass Console software and user manuals
  - Only included if Glimmerglass Console feature is ordered
- Patch Panel Plumbing Diagram (Only for MTP connector-type systems)
- Final QA Test Report

Through-Bulkhead Fiber Cleaner:

- (1) Through-bulkhead fiber cleaner appropriate to system's connector-type
  - IBC™ MTP Cleaner for MPO/MTP type connectors
  - Ferrule Mate (Seikoh Giken SFM-125) or IBC™ LC/1.25mm cleaner for systems with LC type connectors
  - Ferrule Mate (Seikoh Giken SFM-250) or IBC™ SC/2.5mm cleaner for systems with SC or FC type connectors

Facilities

The following table lists the facility requirements for the proper installation and function of the system:

Facility Type	Requirements
Equipment Rack	Cooper B-Line Network Frame, or equivalent
AC Utility Outlet	AC Power receptacle for connecting laptop during installation
AC Equipment Outlet(s)	Two for AC High Availability Shelf (on separate circuits for redundancy)
DC Power	Two -48VDC Power Feeds ("A" and "B" feeds to system)

Required Tools

The following tools are required to install the System 500 into the equipment rack:

- Phillips head (PH3) screwdriver (12x24 rack screws)

Installing the System 500 in the Equipment Rack

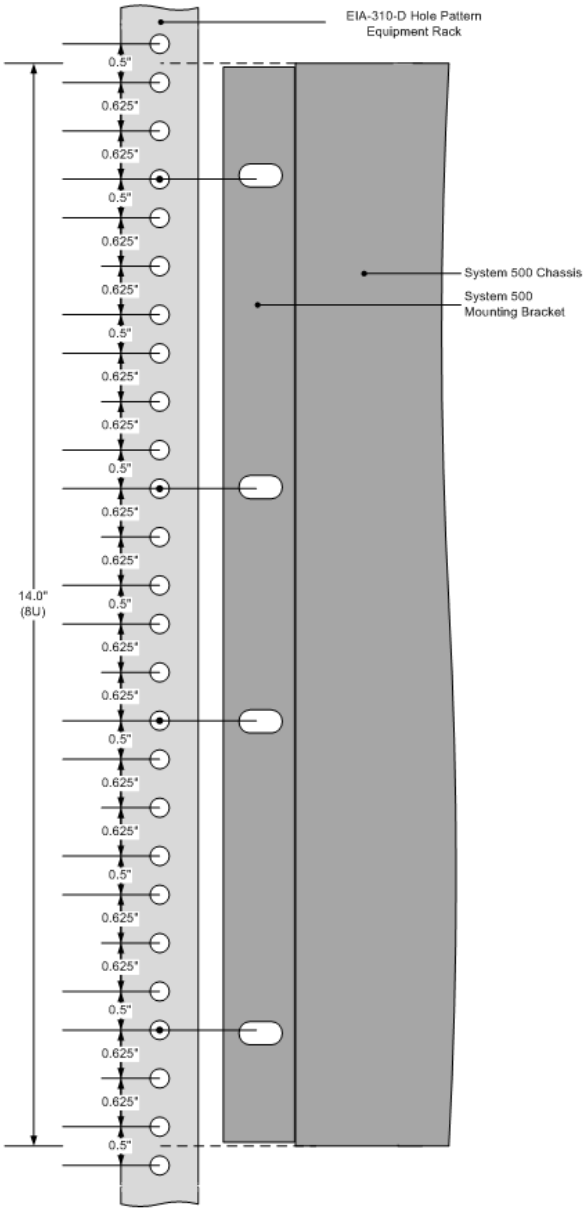
NOTE: Before installing the System 500, carefully review the following sections:

- ”Safety Considerations” (page 2)
- ”Handling Guidelines” (page 4)
- ”Physical Environment Considerations” (page 3)

1. Mount the System 500 chassis in a 19" equipment rack. Figure 30 shows the System 500 mounting hole pattern referenced to an EIA-310-D hole pattern rack.

NOTE: If mounting brackets for a 23" equipment rack were purchased, these mounting brackets will need to be installed first. However, the mounting hole pattern is the same as in Figure 30. Instructions for installing the 23" mounting brackets are shipped with the brackets themselves.

Figure 30 System 500 Mounting Hole Pattern



2. Connect power to the system:
   - For System 500 chassis with an AC power input, follow the procedures outlined in Chapter 6 (starting on page 53).
   - For System 500 chassis with dual DC power inputs, follow the procedures outlined in Chapter 7 (starting on page 57).

3. After connecting power, proceed to Chapter 9 (starting on page 73) for instructions on completing system turn-up, initial configuration and verification.

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Connecting Power to AC Systems

6

An AC-powered system contains a single internal AC/DC power supply supporting 100-240 VAC, 50/60 Hz input power. No jumpers or switches need to be set to select the voltage/frequency operation.

Each system is shipped with a 6’ AC line cord with an IEC 60230-C13 plug on the equipment end (for connection to the Glimmerglass AC power entry panel). The supply-end plug of the line cord will be the plug-type indicated on the order form of the system. The default supply-end plug type for North America systems is NEMA 5-15P.

NOTE:	The Glimmerglass system requires the use of the AC line cord provided with the system (do not use another line cord for the Glimmerglass system, as damage to the system may result). In addition, do not attempt to use the AC line cord provided with the Glimmerglass system for any purpose other than connecting the Glimmerglass system to AC power.

Figure 31 shows the AC Power Entry panel for AC-powered Glimmerglass systems. As shown in Figure 32, the AC Power Entry panel houses the AC plug receptacle, an on/off switch, and two 5x20mm 2Amp fuses (inside the receptacle housing and held in carriers). To access the fuses, insert a thin, flat blade screwdriver into the slot a the top of the housing and twist to open the cover.

Figure 31 AC Power Entry Panel

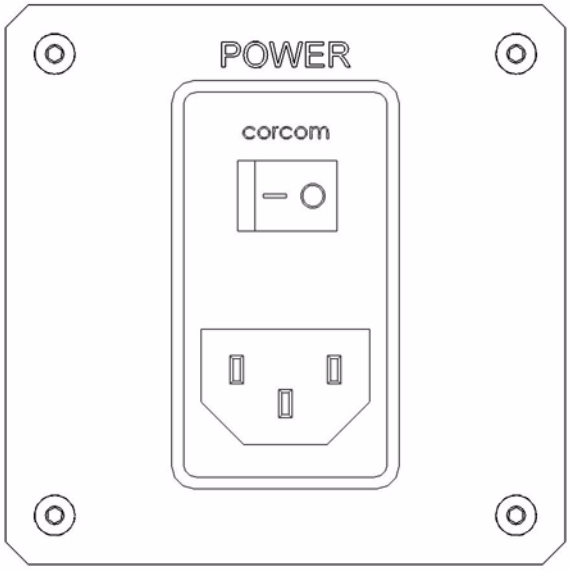
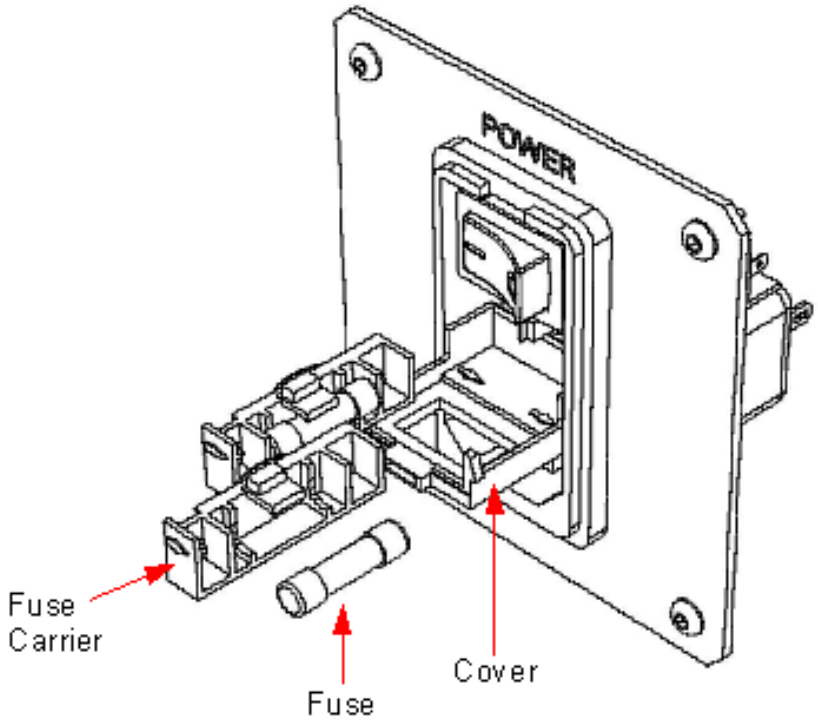


Figure 32 AC Power Entry Panel with Open Cover and Extracted Fuse



Connecting AC Power

Follow these steps to connect AC power to the Glimmerglass system:

NOTE:	No chassis ground is required for the Glimmerglass systems. The system is grounded through the safety ground on the AC plug, as long as the AC outlet providing service is correctly grounded.

1. Verify that the on/off switch on the AC power entry panel is in the "OFF" position.
2. Connect the AC power cord to the rear panel of the chassis (Figure 31), and route the cables along the side of the frame to the AC power outlet reserved for the Glimmerglass system.
3. Proceed to Chapter 9, “System Turn-Up, Configuration, and Verification” , for the procedure for turning up and testing the system.

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Connecting External Power to Dual DC Systems 7

Systems with dual DC power entry panels support input DC power from two DC power sources. One input power source is connected to the "A" power terminal block and the second source is connected to the "B" power terminal block. The Glimmerglass dual DC power entry panel uses pluggable terminal blocks for each feed. The pluggable terminal blocks are included in the parts box included with the system. The power entry panel also houses the system fuses for each power feed.

NOTE:	For systems purchased with external, redundant AC power supplies, refer to “AC High-Availability (AC-HA) Shelf Installation” on page 67 for information on installing the external 1U chassis/supplies and interconnecting to the dual DC power entry panel on the system.

Procedure Overview

The steps for safely wiring the chassis to the DC power sources are enumerated in the following section. As an overview, these steps intend to assure the following:

1. The system (chassis) ground is connected.
2. The wiring to the pluggable terminal block is correct and the polarity for -48VDC is correct.
3. The DC power is first checked for the "A" feed to the system by turning power on and validating power/operation.
4. The “A” feed is disconnected and then the “B” feed to the system is checked by turning power on a validating power/operation. (Steps 3 and 4 ensure that both feeds have the correct polarity.)

Figure 33 and Figure 34 show the Dual DC power entry panel and identify the locations of the terminal blocks, terminal block headers, fuse holders, fuses, LEDs, and wire/feed designations.

Figure 33 DC Power Entry Panel

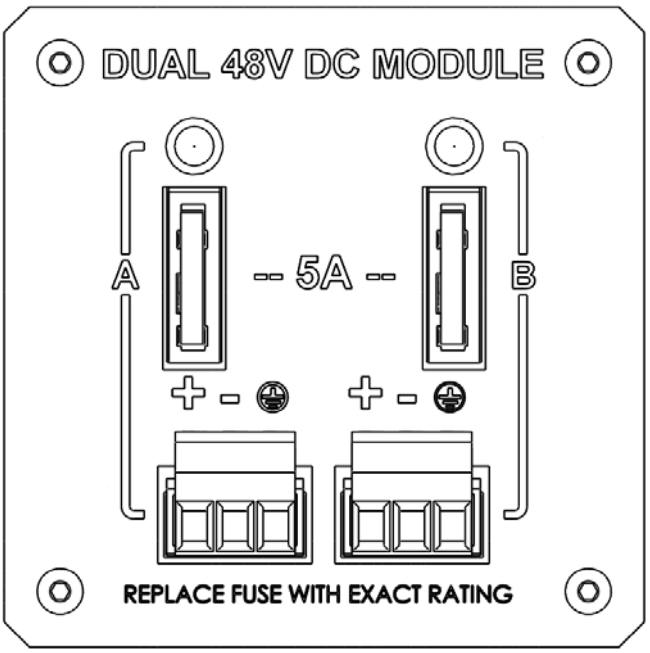
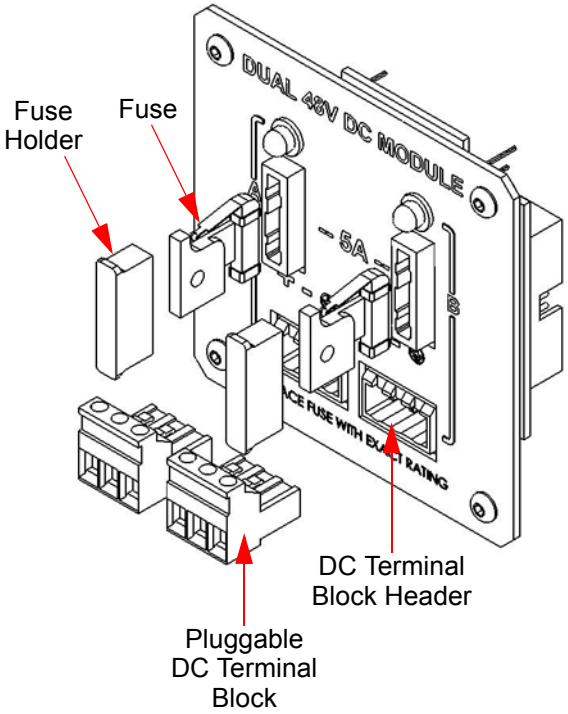


Figure 34 Dual DC Power Entry Panel



Required Tools and Materials

The following tools may be required for connecting the RTN, -48V, and ground wires to the Glimmerglass System:

- Wires
  - 14 or 16 AWG stranded copper wire (red, black, green/yellow) for connection between pluggable terminal block and DC power source.
  - For System 500/600 ground lug, 8 AWG stranded copper wire (green/yellow) if the chassis ground lug is used in lieu of the ground terminals on the pluggable terminal blocks.
  - For System 100, 14 or 16 AWG stranded copper wire (green/yellow) if the chassis ground stud is used in lieu of the ground terminals on the pluggable terminal blocks.
- Ring terminals
  - Size appropriate to wiring (above) to be used
- 0.6 x 3.5mm blade screwdriver
  - For the set screws on the pluggable terminal block used to secure the RTN, -48V, and Ground wires in the terminal block.
- 3/8" hex nut driver
  - For single hex nut on ground stud on System 100
  - For two hex nuts securing dual hole, long barrel ground lug on both the System 500 and System 600.
- Wire stripper
  - For preparing ends of the wires for termination with a ring terminal.
- Crimping tools
  - For attachment of ring terminals to the DC wires and to chassis ground lug
    - The dual hole, long barrel ground lug provided with both the System 500 and System 600 is a Panduit LCC8-10BW-L Die Color - Red, Wire Size - 8 AWG (stranded copper), Wire Strip Length - ¾"

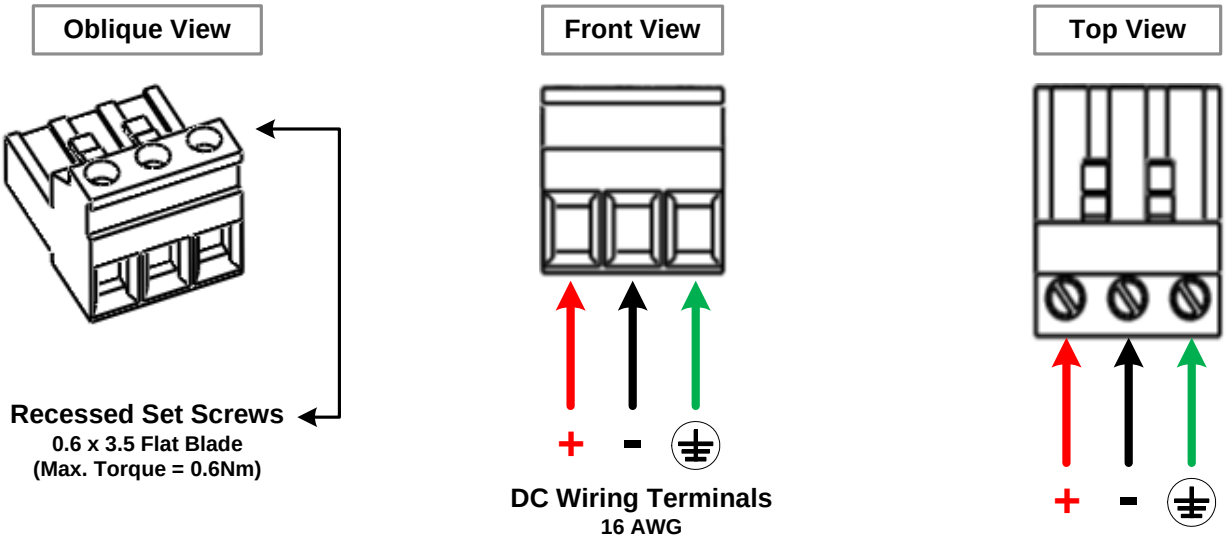
NOTE:	This ground lug on the System 500/600 and the ground stud on the System 100 is provided for installations where it is preferred to run the ground to the chassis instead of using the ground terminals provided on the pluggable terminal blocks.

Wiring the System and Connecting DC Power

Prior to connecting the system to the -48 VDC power sources, the RTN, -48V, and ground wiring must be cut, stripped, and connected to the pluggable terminal blocks.

Figure 35 shows a pluggable terminal block referencing the labeling on the Glimmerglass DC power entry panel. The orientation shown corresponds to the orientation when the terminal block is plugged into the terminal header on the system.

Figure 35 Pluggable Terminal Block on DC Power Entry Panel



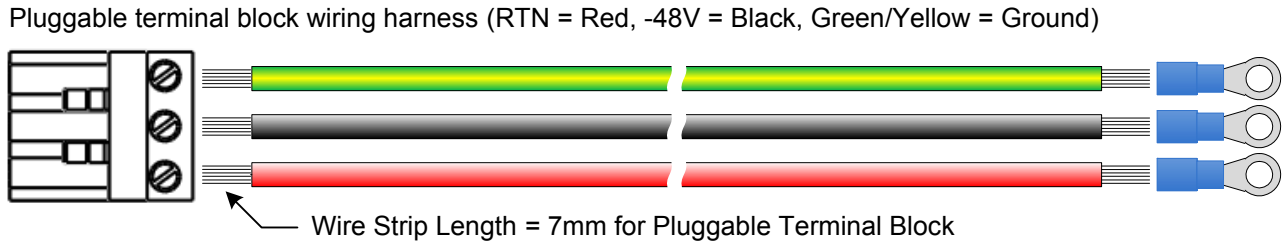
There are two methods of wiring the system: With ground attached to the terminal block, or with ground connected to the chassis. Depending on which grounding method is used, follow the associated procedure to connect the wiring and connect the system to DC power:

- “Wiring the System and Connecting DC Power (Ground to Terminal Block)” (below)
- ”Wiring the System and Connecting DC Power (Ground to Chassis)” (page 63)

Wiring the System and Connecting DC Power (Ground to Terminal Block)

Figure 36 depicts the first method where the ground wire connection is to the terminal block (the wire strip length shown is for the wire ends to be secured in the terminal blocks).

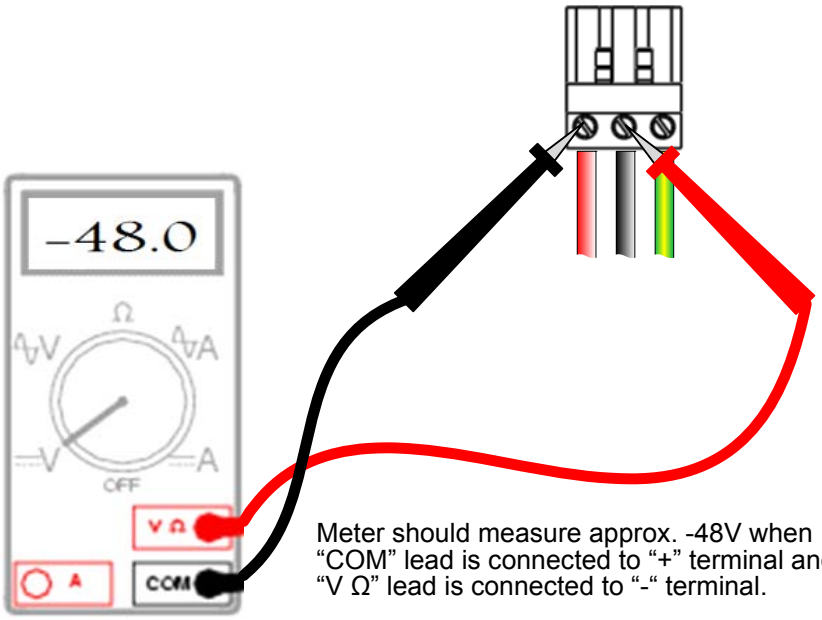
Figure 36 Ground, RTN, and -48V Wires Connected to Terminal Block



Perform the following steps to wire the system (with ground to terminal block) and connect DC power:

1. Prepare both terminal blocks by performing the following steps for each terminal block:
   a. Open the terminal block wire terminals by turning the recessed set screws counter-clockwise.
   b. Strip and insert the wires as shown in Figure 36, then secure the wires by tightening the set screws clockwise.
   c. For the supply/ground ends (right), strip and connect the wires as appropriate for the terminals used (Figure 36 shows ring terminals).
   d. Confirm that the terminal block wiring and terminals are secure after connecting.
2. Turn off the power source committed for the "A" feed.
3. Obtain one of the pluggable terminal block wiring harnesses assembled in step 1.
4. Connect the free end of the terminal block ground wire to the ground bus bar (or equivalent) for the rack.
5. Using a voltmeter, ensure the resistance between the ground on the terminal block and the bus bar is < 1Ω. If not, correct the wiring termination at the pluggable terminal block or the crimped-on connector.
6. Remove the protective tape from the terminal block header for the "A" feed on the system.
7. Plug the terminal block into the terminal block header on the system (with the "A" fuse not inserted).
8. With no fuse installed in the “A” feed fuse slot, turn on the power source committed to the “A” feed and confirm the correct polarity for -48 VDC at the terminal block using a voltmeter as shown in the Figure 37.

Figure 37 Using a Voltmeter to Verify Correct Polarity for -48VDC



9. Once -48 VDC is confirmed, install a GMT-5 fuse in the slot for the "A" feed.
   - The LED for the "A" feed should change from OFF to GREEN.
   - The LED for the "B" feed should change from OFF to RED.
   - The Power LED on the System Panel should change from OFF to GREEN.

10. Remove the pluggable terminal block from the "A" feed to remove power from the system.

11. Starting at step 2 above, repeat the same procedure for the “B” feed through to step 9. In this case, the following should be observed when the “B” feed fuse is installed.
   - The LED for the "B" feed should change from OFF to GREEN.
   - The LED for the "A" feed should change from OFF to RED.
   - The System Power LED should change from OFF to GREEN.

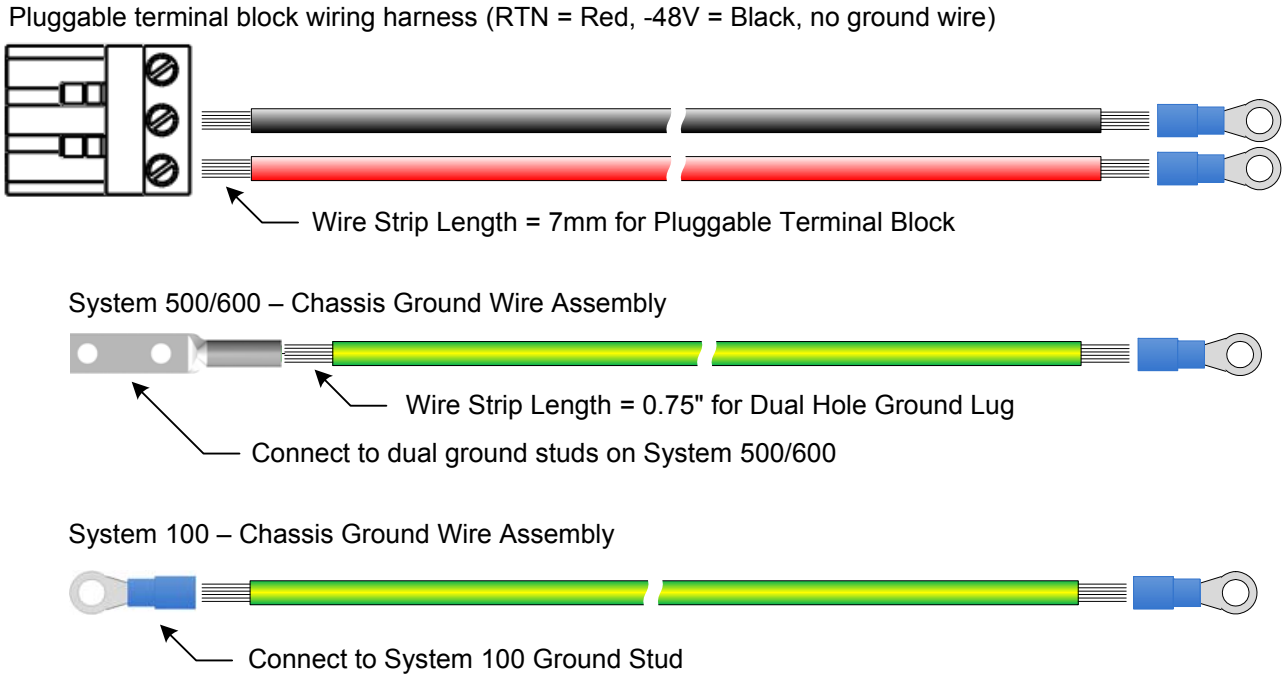
12. If the above is successful for the "B" feed, then plug in the terminal block for the "A" feed.
   - The LED for the "A" feed should change from RED to GREEN.

The procedure is complete once both A and B LEDs are GREEN. The system is correctly grounded and connected to the DC power sources. Proceed to Chapter 9, “System Turn-Up, Configuration, and Verification” , for the procedure for turning up and testing the system.

Wiring the System and Connecting DC Power (Ground to Chassis)

Figure 38 depicts another method where the ground wire is connected to the ground lug/stud on the system.

Figure 38 Ground Wire Connection to Chassis, RTN and -48V Wires to Terminal Block



Perform the following steps to wire the system (with ground to chassis) and connect DC power:

1. Prepare both terminal blocks by performing the following steps for each terminal block:
   a. Open the terminal block wire terminals by turning the recessed set screws counter-clockwise.
   b. Strip and insert the RTN and -48V wires as shown and secure by tightening the set screws (clockwise).
   c. To connect the ground, do one of the following:
      - For a System 500 or 600, a ground lug is provided and is shipped connected to the ground studs on the system. Remove this from the system for connection to 8 AWG stranded copper wire. The wire strip length is shown in the figure. After inserting the wire, crimp and confirm the integrity of the crimp. Then strip, crimp right-hand side as appropriate for connection to the ground bus bar (or equivalent).
      - For a System 100, a ground stud is provided (#10x32 X 0.5) and a ring terminal is to be used to fasten the ground wire to the ground stud. The same wire gauge used for the terminal blocks (i.e. 16 or 14 AWG) is to be

used for the ground wire. Prepare the right hand end as appropriate for connection to the ground bus bar (or equivalent).

d. Confirm that the terminal block wiring and terminals are secure after connecting.

2. Turn off the power source committed for the "A" feed.

3. Obtain one of the pluggable terminal block wiring harnesses assembled in step 1.

4. Connect the ground wire between the system and the ground bus bar (or equivalent) for the rack.
   - For System 100, attach the ground wire to the provided stud.
   - For either System 500 or System 600, re-fasten the two-hole, long barrel ground lug to the chassis.

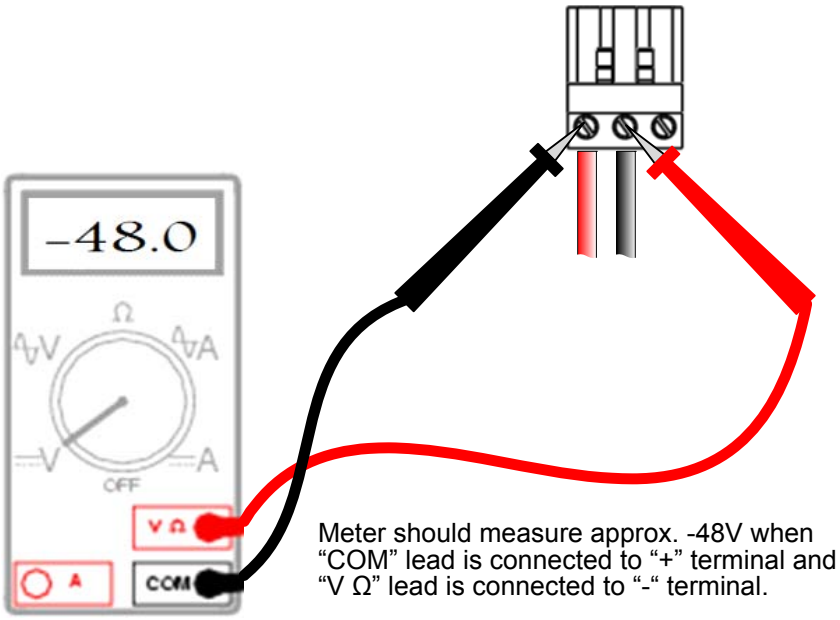
5. Using a voltmeter, ensure the resistance between the ground on the terminal block and the bus bar is < 1Ω. If not, correct the wiring crimps.

6. Remove the protective tape from the terminal block header for the "A" feed on the system as well as for the "A" fuse slot.

7. Plug the terminal block into the terminal block header on the system (with the "A" fuse not inserted).

8. With no fuse installed in the “A” feed fuse slot, turn on the power source committed to the “A” feed and confirm the correct polarity for -48 VDC at the terminal block using a voltmeter as shown in the Figure 39.

Figure 39 Using a Voltmeter to Verify Correct Polarity for -48VDC



9. Once -48 VDC is confirmed, install a GMT-5 fuse in the slot for the "A" feed.
   - The LED for the "A" feed should change from OFF to GREEN.
   - The LED for the "B" feed should change from OFF to RED.
   - The Power LED on the System Panel should change from OFF to GREEN.

10. Remove the pluggable terminal block from the "A" feed to remove power from the system.

11. Starting at step 2 above, repeat the same procedure for the “B” feed through to step 9. In this case, the following should be observed when the “B” feed fuse is installed.
    - The LED for the "B" feed should change from OFF to GREEN.
    - The LED for the "A" feed should change from OFF to RED.
    - The System Power LED should change from OFF to GREEN.

12. If the above is successful for the "B" feed, then plug in the terminal block for the "A" feed.
    - The LED for the "A" feed should change from RED to GREEN.

The procedure is complete once both A and B LEDs are GREEN. The system is correctly grounded and connected to the DC power sources. Proceed to Chapter 9, “System Turn-Up, Configuration, and Verification” , for the procedure for turning up and testing the system.

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AC High-Availability (AC-HA) Shelf Installation 8

AC-HA Shelf Overview

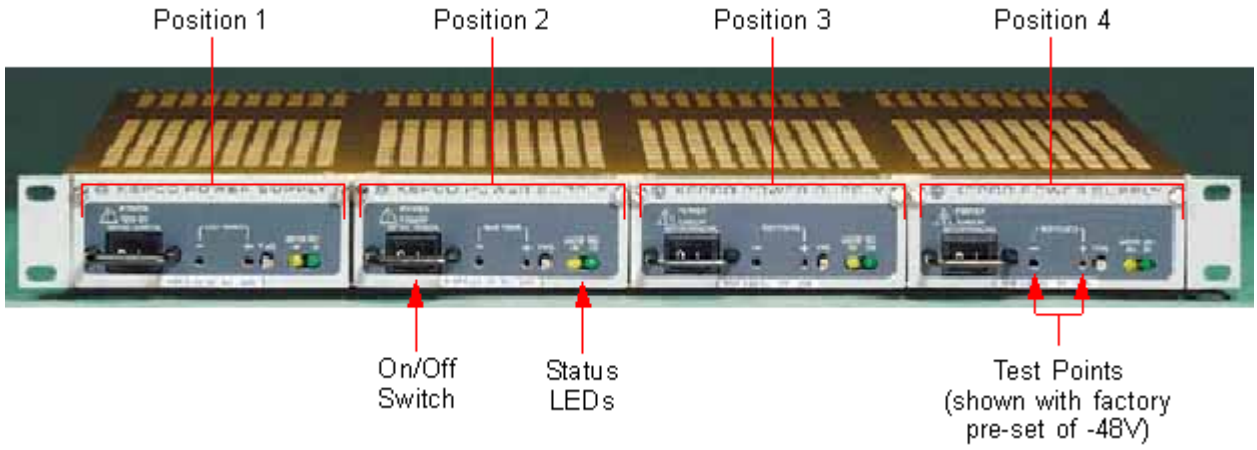
The AC High Availability (AC-HA) shelf supports redundant AC power connections to a Glimmerglass system. In this configuration, the Glimmerglass System is a -48V shelf which is powered via two DC feeds from the AC-HA shelf.

AC High Availability is implemented using a KEPCO RA 19-1U rack adapter housing two HSF 48.2.1UR AC/DC power supplies (see Figure 40 and Figure 41 below). These power supplies convert the AC input (100 - 240VAC/50-60Hz, single phase) to 48VDC - the specification sheets and instruction manual for the rack adapter are included in the shipping box for the rack adapter and power supplies.

The rack adaptor is shipped pre-configured for use with the Glimmerglass system. The AC line cords and the DC wiring harnesses are shipped connected to the rack adaptor, the dip switches are set for local sensing and independent operation for the power supplies.

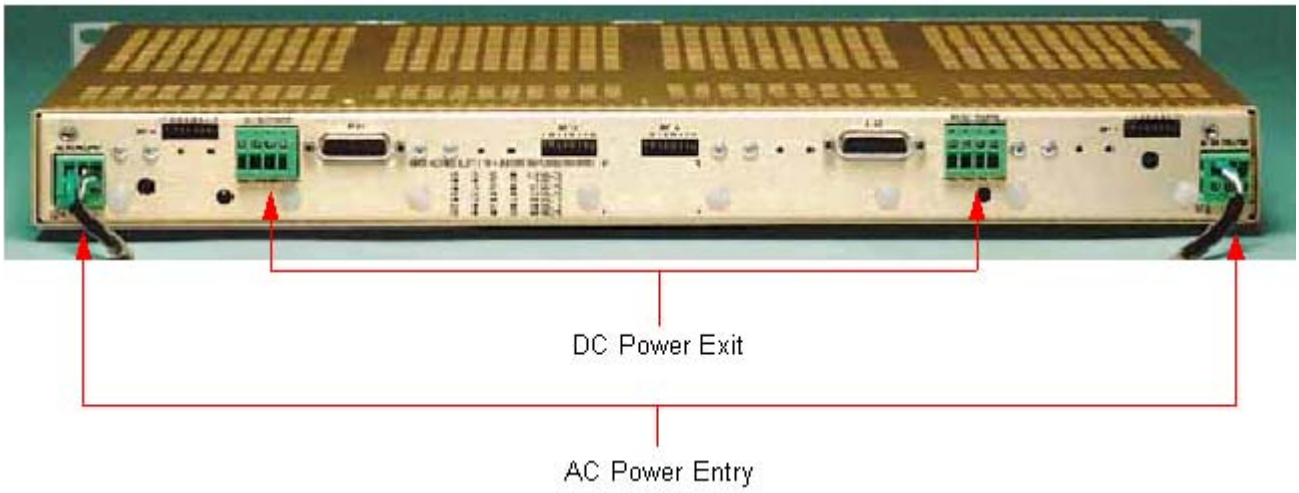
The rack adaptor/power supplies combination allows redundant AC operation. Each AC input independently controls one of the HSF 48-2.1U supplies allowing one AC input to be assigned to the "A" feed and the other AC input to the assigned to the "B" feed on the system. By convention, the "A" feed is connected to the DC output of the power supply in slot 4, the "B" feed to the power supply in slot 1.

Figure 40 Front View of KEPCO RA 19-IU



NOTE: Figure 40 shows unit populated with four power supplies. For Glimmerglass, only slots 1 and 4 are populated with power supplies. Slots 2 and 3 are covered with filler plates.

Figure 41 Rear View of KEPCO RA 19-1U



When installing the AC-HA shelf, follow the procedure in Chapter 7 (starting on page 55) for connecting DC-powered systems to make the -48VDC connection between the System and the AC-HA shelf:

Equipment Inventory

The power supply rack adaptor is shipped in separate packaging and is configured/wired for proper operation with the Glimmerglass system. The following items are included with the shipment:

- (1) RA 19-1U rack adaptor (pre-keyed for HSF 48-2.1U power supplies)
- (2) HSF 48-2.1U power supplies (installed in slots 1 and 4 of the rack adaptor)
- (2) RFP 19-1U-12 blank filler plates (installed in the slots 2 and 3 of the rack adaptor)
- (4) nylon cable clamps with release lever (these are pre-installed; used to secure AC Input and DC output cables prior to the terminal blocks on the rear of the power supply rack adaptor chassis)
- (2) 6' AC line cords, supply end connectors specified at time of order. The line cords are pre-attached and secured via the nylon cable clamp.
- (2) 6' DC wiring harnesses with pre-terminated DC Terminal Blocks for attachment to the Terminal Header Blocks on Glimmerglass DC Power Entry panel (e.g. "A" feed and "B" feed). The wiring harnesses are pre-attached and secured via the nylon cable clamp.
- (1) RA 19-1U rack adaptor instruction manual
- (1) RFP 19-1U-12 instruction sheet
- (1) HSF-1UR 100W instruction manual

Required Tools

The following tools are required for installing the AC-HA shelf:

- 0.6x3.5mm blade screwdriver, used to:
  - Check/secure the DC output wires connecting the wiring harnesses to terminal blocks on the rear of the power supply rack adaptor
  - Check/secure the AC line cord wires (L, N, and G for Line, Neutral, Ground respectively).
  - Check/secure the two front panel screws for each power supply in the rack adaptor.
- Phillips head (e.g. PH3) screwdriver for mounting the power supply rack adaptor in the rack

For AC-HA installations, it is necessary to ground the system chassis using the ground post on the system. The following tools are also needed for AC-HA installations with System 100:

- 3/8" hex nut driver for the nut on the ground post
- 14 AWG green (green/yellow) stranded copper wire and ring terminal crimp connector
- Crimp Tool (for attachment of the ring terminal crimp connector to the ground wire)

The following tools are also needed for AC-HA installations with System 500 or System 600:

- 3/8" hex nut driver for the nuts on the two-hole ground posts
- 8 AWG green (green/yellow) stranded copper wire to crimp to the two-hole, long barrel grounding lug.
- A crimp tool suitable for a long barrel grounding lug (e.g. Thomas & Betts TMS25S crimp tool)

Preparation Notes

It is recommended to provide 1U of free space above the power supply rack adaptor to ensure the ambient temperature does not rise above the operating temperature.

If the pre-terminated wiring harnesses are to be shortened, the recommended stripping length is 7mm and the stranded wire should be tinned. If the wires will be replaced, use 16 or 14 AWG wire.

Installing the Power Supply Rack Adaptor

Perform the following steps to install the AC-HA shelf with a Glimmerglass system:

1. Unpack the power supply rack adaptor.
2. Inspect the equipment for damage, and immediately report any problems to Glimmerglass Customer Support for evaluation and correction.
3. Loosen the front panel screws (two each) used to retain the two power supplies in the chassis.
4. Reseat each power supply (slide forward then reinsert).
5. Tighten the two front panel screws for each power supply (maximum torque = 2in.-lbs)

6. Ensure screws retaining the L, N, and G wires are secure at both AC Power Input Terminal Blocks. (maximum torque = 4in.-lbs)

7. Ensure the DC output wires are secure at both DC Output terminal blocks. (maximum torque = 4in.-lbs)

8. Install the power supply rack adaptor chassis in the 19" rack. Do not plug in the AC line cords.

9. If not previously completed, connect the Glimmerglass chassis ground (rack or rack bus bar).
   - For the System 100 chassis, connect the ground wire to the ground stud provided.
   - For the System 500 and System 600 chassis, connect the ground wire to the two-hole, long barrel ground lug provided with the system (8 AWG stranded copper conductor).

NOTE: The Power Supply Rack Adaptor is grounded through the ground connection (G wire) to the AC plug. No separate chassis ground is required, as long as the AC outlet providing service is correctly grounded.

10. From the Glimmerglass system packaging, retrieve the two GMT-5 fuses (in fuse holders) and install these into the "A" and "B" fuse slots on the Glimmerglass DC Power Entry Panel.

11. Ensure the "On/Off" power switch on each HSF 48-2.1U power supply front panel is in the "Off" position.

12. Route and plug the DC Terminal Block connected to the power supply rack adaptor DC output labeled "PS4" to the "A" Terminal Block Header on the Glimmerglass DC Power Entry Panel.

13. Route and plug the DC Terminal Block connected to the power supply rack adaptor DC output labeled "PS1" to the "B" Terminal Block Header on the Glimmerglass DC Power Entry Panel.

14. Plug the input AC Power line cords into the AC power receptacles reserved for the Glimmerglass system.

NOTE: For AC redundancy, the receptacles should be on separate circuits.

15. Turn on the two power supplies using the power switch on the front panel of each HSF 48-2.1UR power supply.

16. Proceed to Chapter 9, “System Turn-Up, Configuration, and Verification” , for the procedure for turning up and testing the system.

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System Turn-Up, Configuration, and Verification

9

Turn-Up Overview

This chapter covers the procedures for bring the system up on the network (IP configuration) then validating the system configuration as well as the steps to validate the integrity of all input and output ports. This last step consists of ensuring no fibers are broken by checking straight-through connections with a fiber optic test set (e.g., source laser and power meter).

The methods described in this chapter show performing initial configuration tasks using the Maintenance Console interface accessed using the Serial Port.

All new systems ship with the following IP configuration:

Port	IP Address	Netmask	Gateway IP Address
Ethernet 1	192.168.2.200	255.255.255.0	192.168.2.201
Ethernet 2	192.168.3.200	255.255.255.0	

The factory default administrative user passwords are:

User Interface	Username	Default Password	Comments
Maintenance Console	admin	password	Embedded Linux User
ClickFlow/TL1	admin	password	IOS Application User

If desired, it is possible to connect a laptop to either of the Ethernet ports and to use either SSH to access the Maintenance Console interface or to use a browser to connect to ClickFlow:

- To connect via ClickFlow, use the default IP address and set the LAN adapter settings to assign the laptop an IP address on the 192.168.2.0 (Ethernet 1) or 192.168.3.0 (Ethernet 2) network. To configure the system via ClickFlow, refer to the Name/IP and Date/Time options in Chapter 9 of the *Glimmerglass ClickFlow Graphical User Interface Manual*.
- Using SSH, you will still need to authenticate as the Maintenance Console admin user and then use the procedures in this chapter.

System turn-up and control using SSH includes the following tasks that are described in this chapter:

System Turn-On and Connecting to the Maintenance Console

Follow the steps below to connect to and configure the system IP information. It is recommended to connect Ethernet cable only after the IP addresses have been configured, as the default IP addresses may conflict with existing IP addresses on the network.

1. Power on the system and wait for the ACTIVE LED on the LED Panel to change to SOLID GREEN.
   - After power on, the POWER LED will be GREEN and the ACTIVE LED will be OFF
   - After approximately 70 seconds, the ACTIVE LED will start to FLASH ON/OFF
   - Approximately 1 minute later, the ACTIVE LED will change to SOLID GREEN

   NOTE: If the ACTIVE LED changes to SOLID RED, contact Glimmerglass Customer Support.

2. Connect a serial cable between the laptop and the system.
   - Glimmerglass provides a 6' DB-9 male/female straight-through serial cable with each system. If using a different cable, ensure it is a straight-through cable (not a null-modem or custom cable)
   - A USB-to-DB9 adapter will be required if the laptop does not have a DB-9 serial port. At this point, it may be worthwhile to configure the laptop network adapter to allow connecting to the system's Ethernet 1 or 2 ports and continue using SSH to login.

3. Open a terminal emulator program on the laptop such as PuTTY or Tera Term and configure the terminal emulation settings as follows:
   - Baud = 9600, Data bits = 8, Stop bits = 1, Parity = None, Flow Control = None
   - Set the Terminal Emulation as VT100

4. With the terminal emulator application window active, press the **<ENTER>** key to obtain a login prompt from the system.

5. Log in using the default Maintenance Console admin user credentials (admin, password).

6. The terminal emulator window will display the Maintenance Console Main Menu as shown below.

```
BD0020 login: admin
Password:
gshell v2.1.3 | SN: 04BD4PC10020
Software Version: R07.01p001
Copyright(c) 2011 Glimmerglass Networks, Inc. All Rights Reserved.

================================================================
Main Menu (enter Q to quit)
Wed Jun 15 15:18:30 UTC 2011
================================================================
  1. Set Maintenance Console Login Password
  2. Set date/time
  3. Configure network
  4. Reset ClickFlow/TL1 "admin" passwd
  5. Display serial number
  6. Configure start-up options
  7. Configure NTP
  8. Configure firewall
  9. Configure Syslog Service
 10. Show active network connections
 11. Ping
 12. TLl console
 13. Upgrade software
 14. Transfer File to System using FTP
 15. Reset to Factory Default
 16. Reset SNMP to Factory Default
 17. Rollback to other partition
 18. Restore IOS Configuration
 19. Configure available menu options
 20. Restart (Application)
 21. Shutdown (before power off)
 22. Reboot

 Select an option:
```

NOTES: Options in the Main Menu are selected by entering the number for the desired option at the “Select an option:” prompt.

To use SSH, connect the laptop (configured with a static IP address on the 192.168.2.0 network (255.255.255.0) to the system using a standard Ethernet cable (crossover not required, will auto-detect).

Open an SSH session (supported by both Tera Term and PuTTY) using the Maintenance Console admin user credentials. After authentication, the Maintenance Console Main Menu will be displayed.

Setting the Date and Time

The system's internal clock will slowly drift over time, therefore during system installation the clock setting should be checked and if required corrected.

The Set Date/Time option in the Maintenance Console Main menu will prompt for date and time separately. To keep the current date or time, just press the **<Enter>** key. The following example changes only the time:

```
Select an option: 2

================================================================
Set UTC date/time (enter Q to return to main menu)
================================================================
MM/DD/YYYY [06/16/2011]:
HH:MM:SS   [15:20:17]: 15:22:00
Thu Jun 16 15:22:00 UTC 2011
```

NOTE: For automatic date/time synchronization via NTP servers, see “Configure NTP” on page 108.

Configuring the Host Name and IP Address of the System

The factory default for the system's switch name and host name are the same, and are derived from the system's serial number:

<third & fourth characters><last four characters>

The system's switch name may be revised by the ClickFlow **System > System Configuration > Name/IP** menu option (see the *Glimmerglass ClickFlow Graphical User Interface Manual* for more information), by the TL1 SET-SID command and by the SNMP sysName (see the *Glimmerglass Transaction Language 1 Manual* and the *Glimmerglass SNMP User Manual* for more information). Changes to the switch name take effect immediately; system reboot is not required.

The system's host name may be revised by the Maintenance Console **Configure network** selection (below), the TL1 ED-NE-GEN command, or the SNMP netHostName. Changes to the host name take effect on the next system reboot.

The default system host name and IP address (192.168.2.200) can be changed via the Main menu. To access the system from a Local Area Network (LAN), a gateway must also be configured.

To configure the system host name and IP address via the Main menu:

1. Establish a connection as described in ”System Turn-On and Connecting to the Maintenance Console” on page 74.

2. From the main menu, select “Configure network”.

```
Select an option: 3

=================================================================
Current Network configuration
=================================================================
Hostname                    : BD0020
IP addr Ethernet 1          : 192.168.2.200
Netmask Ethernet 1          : 255.255.255.0
Gateway for Ethernet 1      : 192.168.2.201
IP addr Ethernet 2          : 192.168.3.200
Netmask Ethernet 2          : 255.255.255.0

Do you want to modify Network Parameters? [Y|N]:
```

3. Press **Y** to modify network parameters.

4. At the **hostname** prompt, either press **<ENTER>** to keep the existing value or enter a new value and then press **<ENTER>**.

NOTE: This is the "short hostname" which excludes the domain name; it must be 1-63 characters, composed only of alphanumeric and dash (-).

5. At the **IP address Ethernet 1** prompt, either press **<ENTER>** to keep the existing value or enter a new value and then press **<ENTER>**.

6. For the **netmask Ethernet 1**, **gateway Ethernet 1**, **IP address Ethernet 2**, and **netmask Ethernet 2**, prompts as well, either press **<ENTER>** to keep the existing values or enter new values and then press **<ENTER>**.

NOTES: The ETHERNET 2 port is provided for local craft access. It is not routed (meaning it has no gateway). A craft notebook PC that has been configured for the "craft subnet" may be directly attached to the ETHERNET 2.

The “netmask Ethernet 2” prompt shown in the example below will be displayed only if an IP address has been entered in response to the “IP address Ethernet 2” prompt.

```
================================================================
Set network configuration
================================================================
hostname [BD0020]:
IP address Ethernet 1 [192.168.2.200]: 192.168.2.43
netmask Ethernet 1 [255.255.255.0]:
gateway Ethernet 1 (use '.' to erase) [192.168.2.201]: 192.168.2.1
IP address Ethernet 2 (use '.' to erase) [192.168.3.201]: 192.168.3.43
netmask Ethernet 2 [255.255.255.0]:

Reboot the system for network configuration changes to take effect


================================================================
Main Menu (enter Q to quit)
Thu Jun 16 14:52:22 UTC 2011
================================================================
 1. Set Maintenance Console Login Password
 2. Set date/time
 3. Configure network
 4. Reset ClickFlow/TL1 "admin" password
 5. Display serial number
 6. Configure start-up options
 7. Configure NTP
 8. Configure firewall
 9. Configure Syslog Service
10. Show active network connections
11. Ping
12. TLl console
13. Upgrade software
14. Transfer File to System using FTP
15. Reset to Factory Default
16. Reset SNMP to Factory Default
17. Rollback to other partition
18. Restore IOS Configuration
19. Configure available menu options
20. Restart (Application)
21. Shutdown (before power off)
22. Reboot

Select an option:
```

7. To put the changes into effect, the system must be rebooted as described in the procedure, “System Reboot from Maintenance Console” on page 79.

Rebooting or Power-Cycling the System

Changes to the System IP configuration require a system reboot to take effect. This can be accomplished through the Maintenance Console or by power-cycling the system. The procedures below describe both methods.

System Reboot from Maintenance Console

Do the following to reboot the system:

1. If not connected to the system, connect to the Main menu as described in ”System Turn-On and Connecting to the Maintenance Console” on page 74.
2. From the main menu, select “Reboot”.
3. At the "Are you sure you want to reboot? [Y|N]: " prompt, enter **Y** to confirm the reboot (to cancel the reboot, enter **N** at the prompt).
4. Connect the Ethernet cable to port ETHERNET 1 if the cable is not already connected.

Example of the above procedure:

```
Select an option: 22
Are you sure you want to reboot? [Y|N]: Y
Logging out and rebooting....
```

Power Cycling the System

Do the following to power-cycle the system:

1. If not connected to the system, connect to the Main menu as described in ”System Turn-On and Connecting to the Maintenance Console” on page 74.
2. From the main menu, select “Shutdown”.
3. At the "Do you want to continue? [Y|N]:" prompt, enter **Y** to confirm shutdown. (To cancel shutdown, enter **N** at the prompt.)

4. Wait approximately one minute for shutdown to complete (the STATUS panel ACTIVE LED will turn off).

5. Once the system has shut down, do one of the following:
   - For AC-powered systems, turn the power off and on using the On/Off switch.
   - For DC-powered systems, remove and then reinstall the A and B fuses.
   - For AC-HA systems, turn off the On/Off switch on both AC power supply modules, and then turn them both on again.

Example of the above procedure:

```
Select an option: 21

Shutdown should be run before turning power off to the unit.
It will break all optical connections, shut down application
   services,
and turn off internal power supplies.

Do you want to continue? [Y|N]: Y
Shutting down IOS System....
The system is going down NOW!
Sent SIGTERM to all processes
Sent SIGKILL to all processes
Requesting system halt
System halted.
```

Verifying the System

Once the system is installed and connected, connect the system inputs and outputs as described below to verify that the system has been installed properly and that the major system components are working properly. To verify the system, the following equipment is required:

- (1) Glimmerglass system (fully installed and connected)
- (1) Computer connected to the Glimmerglass ClickFlow GUI
- (1) Laser source (1310nm and/or 1550nm, as appropriate)
- (1) Optical power meter (required if the system is not equipped with optional Input Power Detection)

NOTE: Before connecting fiber patch cables to the Glimmerglass system, please ensure that the cable's fiber optic connectors have been cleaned (see “Patch Panel Maintenance and Fiber Cleaning” on page 135).

Accessing the ClickFlow™ Graphical User Interface (GUI)

The Glimmerglass ClickFlow™ Graphical User Interface (GUI) is a web-based interface that displays a graphical view of the Glimmerglass Intelligent Optical Switch in a standard browser to provide point-and-click operation, configuration, and monitoring of the system.

The ClickFlow GUI supports the following web browsers:

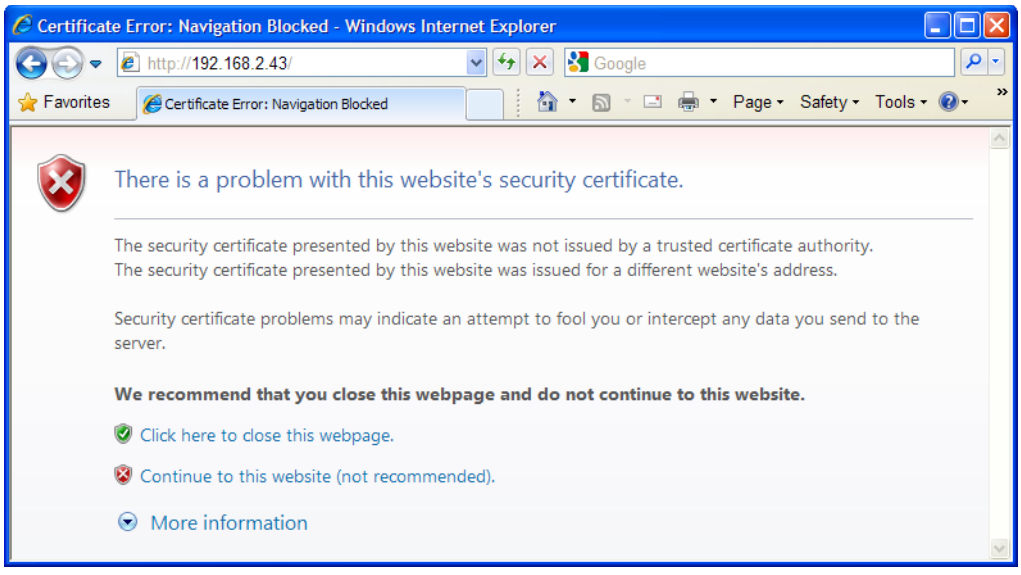
- Microsoft Internet Explorer version 7 through 9
- Mozilla Firefox version 7 through 12

NOTE:	JavaScript and cookies must be enabled in the web browser in order to access the ClickFlow GUI.

Logging into the ClickFlow™ GUI

After entering the appropriate IP address for the system and successfully connecting, the browser application will display a security warning (Figure 42) that displays information about the security certificate for the page to be displayed (see the *ClickFlow™ Graphical User Interface Manual* for more information on security features and installation of the self-signed security certificate to eliminate the warning on subsequent ClickFlow logins).

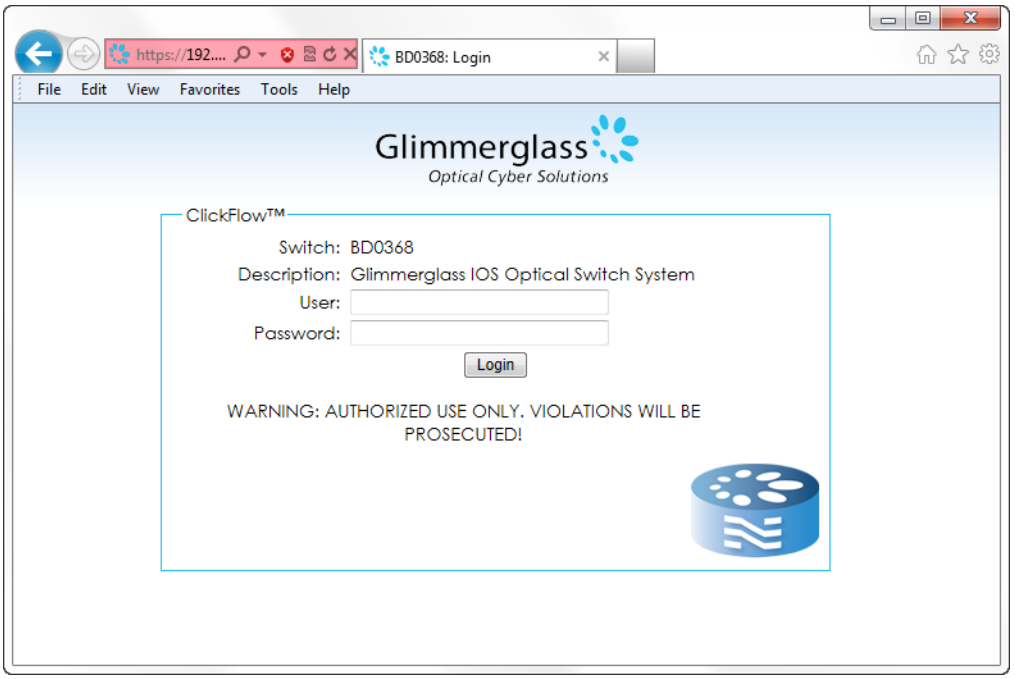
Figure 42 Security Warning (Microsoft Internet Explorer 8)



Click **<Continue to this website>** to continue to the ClickFlow GUI.

The ClickFlow GUI will display the User Authentication screen (Figure 43) that requests a user name and password to access the main ClickFlow GUI screen.

Figure 43 User Authentication Screen



The system ships with the following defaults for the System Administrator account:

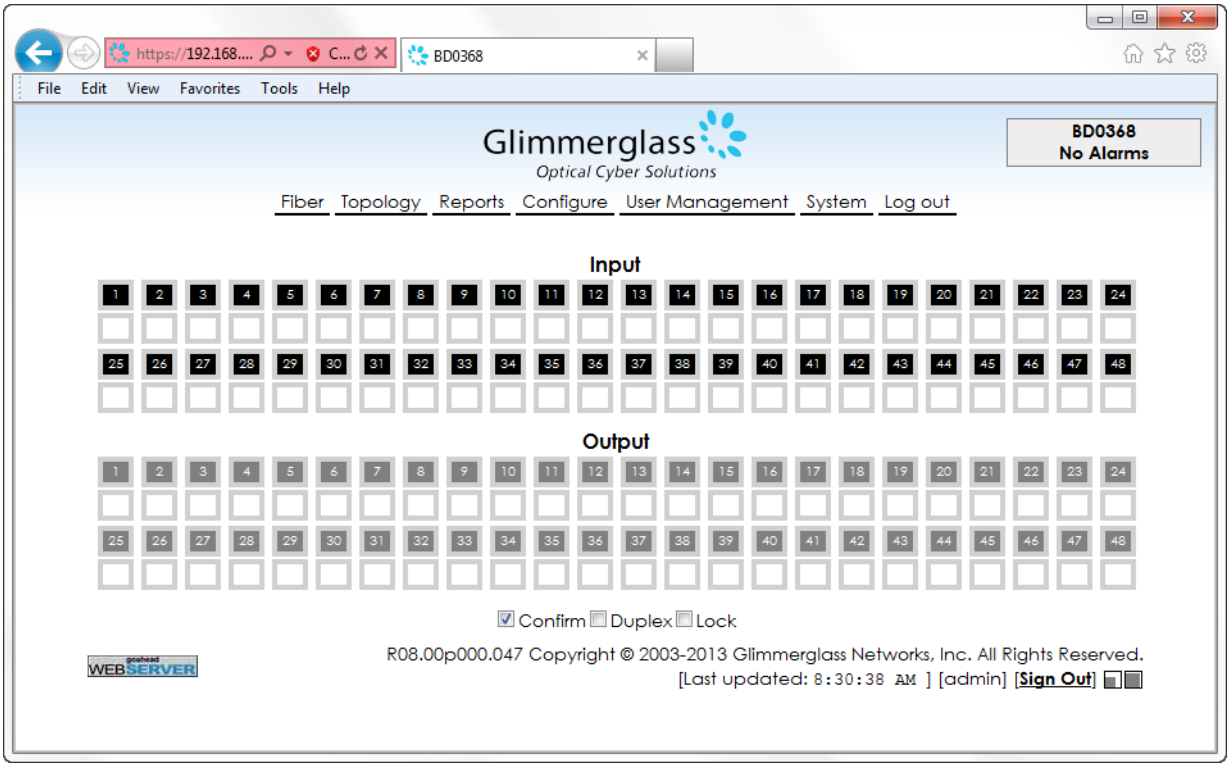
- User Name: admin
- Password: password

Enter the above user name and password for the first-time login. After logging in, it is strongly recommended that the user change the administrator password from the default value (see the *ClickFlow™ Graphical User Interface Manual* for more information).

NOTE:	Multiple users can access the ClickFlow GUI concurrently, so changes made by any one user to the configuration of the system will be reflected in the ClickFlow GUI sessions of all users who are logged in.

After a successful log-in, you should see a screen similar to that in Figure 44. The actual screen may look slightly different depending on the specific system configuration.

Figure 44 ClickFlow™ GUI Connection Screen



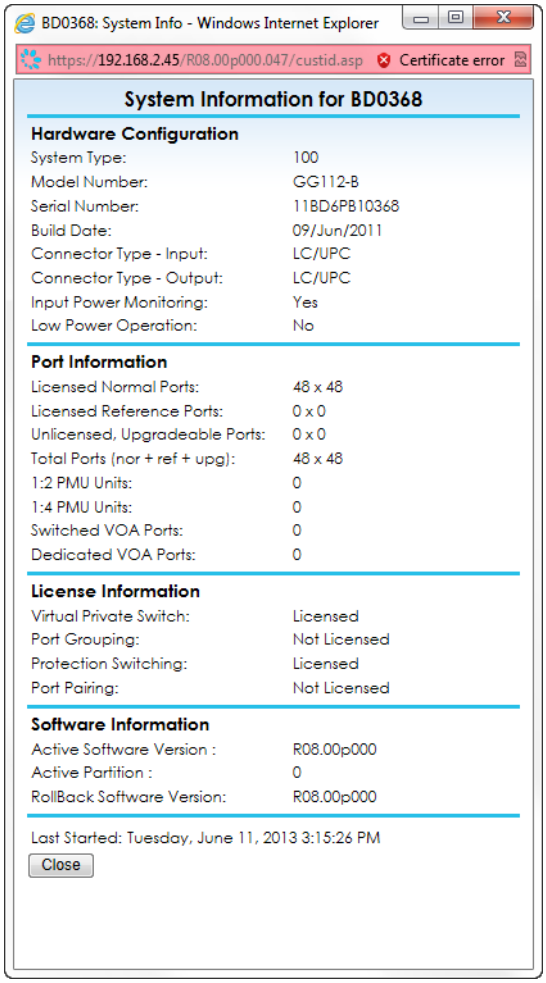
System Hardware and Software Configuration

To verify that the system configuration includes the ordered optional hardware and software features:

1. In a standard web browser, log into the ClickFlow GUI to access the Connection Screen. (See ”Logging into the ClickFlow™ GUI” on page 81 for information on logging into the ClickFlow GUI.)

2. From the Connection screen, select the **Reports > System Info** menu option to open the System Info window (Figure 45).

Figure 45 ClickFlow™ System Information Screen



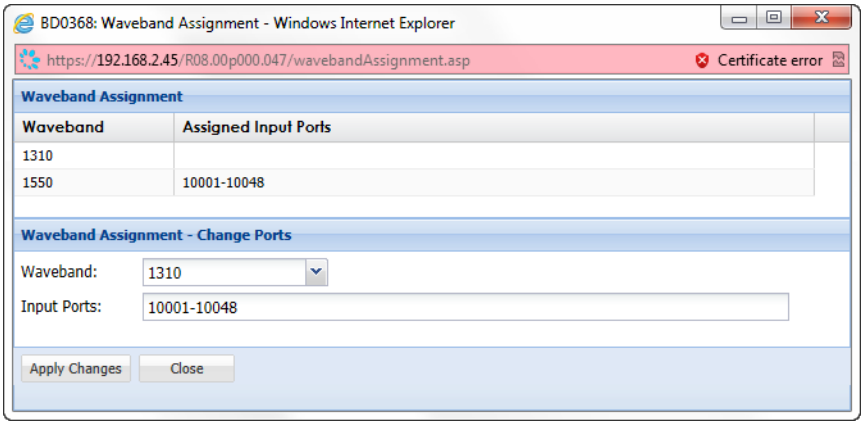
Connecting All Inputs and Outputs

To verify that the system is working properly, connect the system inputs and outputs and verify the input and output power:

1. In a standard web browser, log into the ClickFlow GUI to access the Connection Screen. (See ”Logging into the ClickFlow™ GUI” on page 81 for information on logging into the ClickFlow GUI.)

2. From the Menu at the top of the Connection Screen, select **Configure > Ports > Change Waveband Assignment** to open the Waveband Assignment window (Figure 46).

Figure 46 Waveband Assignment Window



The upper portion of this window shows the current waveband assignments for all input ports in the system. In this case, all ports are assigned to the 1550 waveband. If the light source is 1310nm, then select 1310 in the bottom section of the window and enter all the ports to change to the 1310 waveband. The entry of these fields is shown above. The **Apply Changes** button must be clicked to apply the entered values. This example shows changing all ports to 1310 from 1550.

3. Using the Waveband Assignment window, change the waveband assigned to the ports to match the light source that will be used to validate the ports.

4. Click the **Apply Changes** button.

NOTE: Be sure to click the **Apply Changes** button after updating the selections. Changes are not applies unless the **Apply Changes** button is clicked.

5. Click the **Close** button to close the window.

6. From the Fiber menu, select the Connect All option (**Fiber > Connect All**) to make straight-through connections on all ports (e.g., input 1 to output 1, input 2 to output 2, etc.).

7. Click **OK** in the confirmation box to finish the request and make the selected connections.

NOTES: See ”Display the Port and Connection Color Legend” on page 88 for a definition of the Connection screen port and connection colors.
Figure 47 below shows a Connection screen example for a system with Input Power Detection, Figure 48 shows a Connection screen example for a system without Input Power Detection.

In both the figures below, the Alarm Panel (upper right corner) indicates the presence of Critical Alarms. This is because the default setting for each output port is to report a connection fault as critical. As all connections except input 1 to output 1 are dark, each is reporting a critical alarm.

Figure 47 Connection Screen (with Input Power Detection)

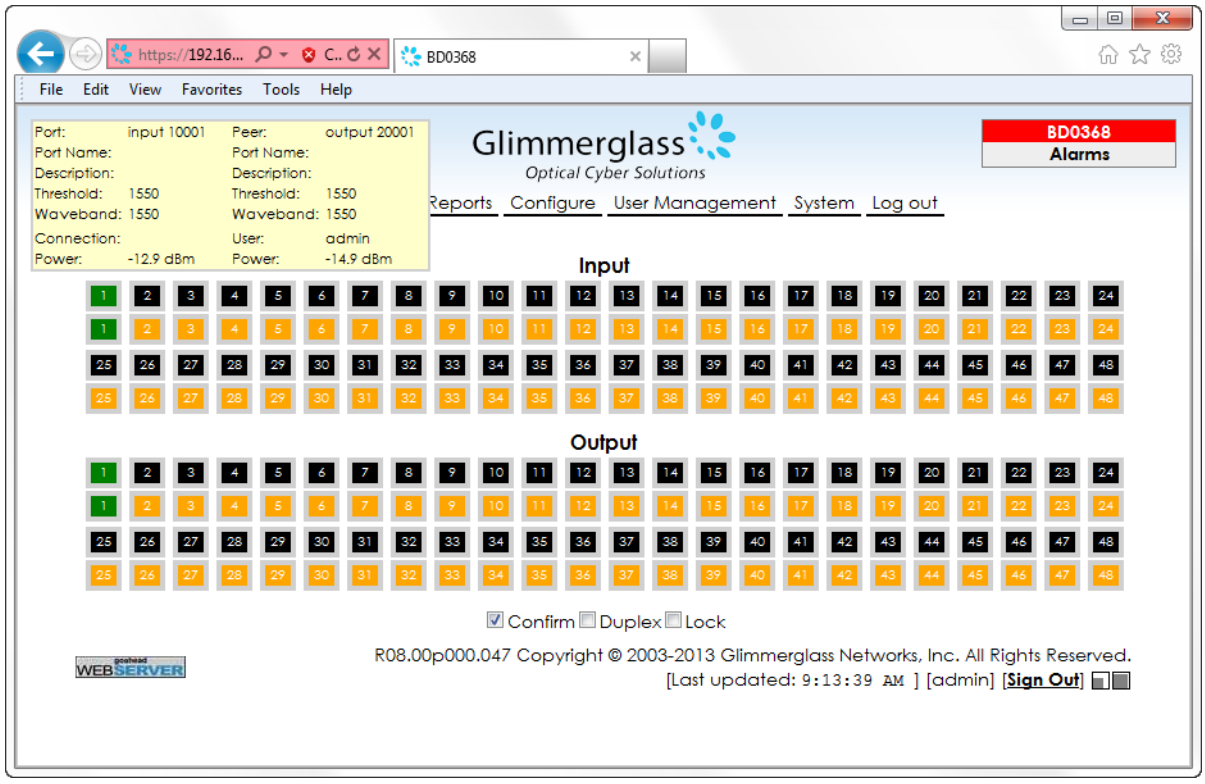
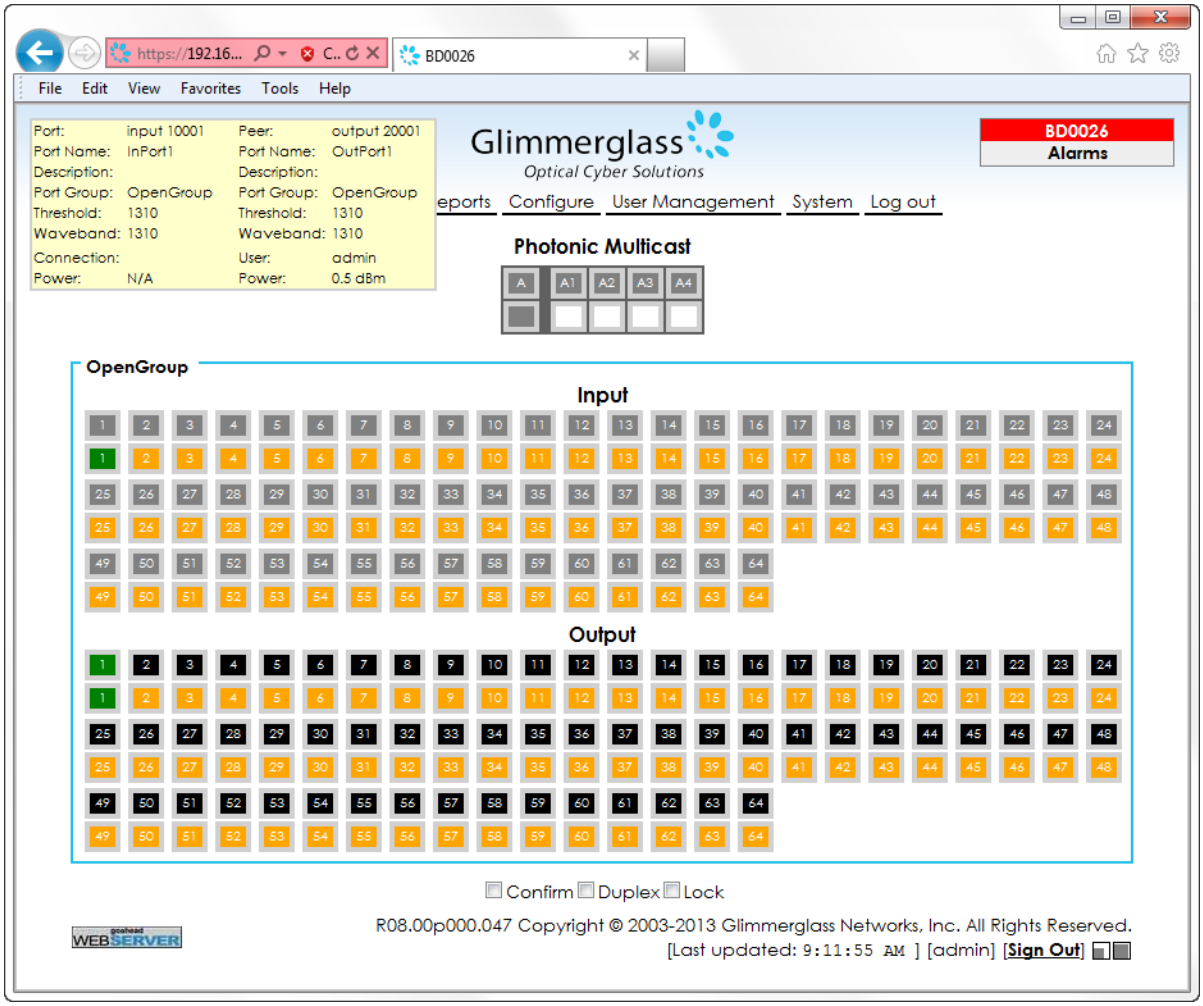


Figure 48 Connection Screen (without Input Power Detection)

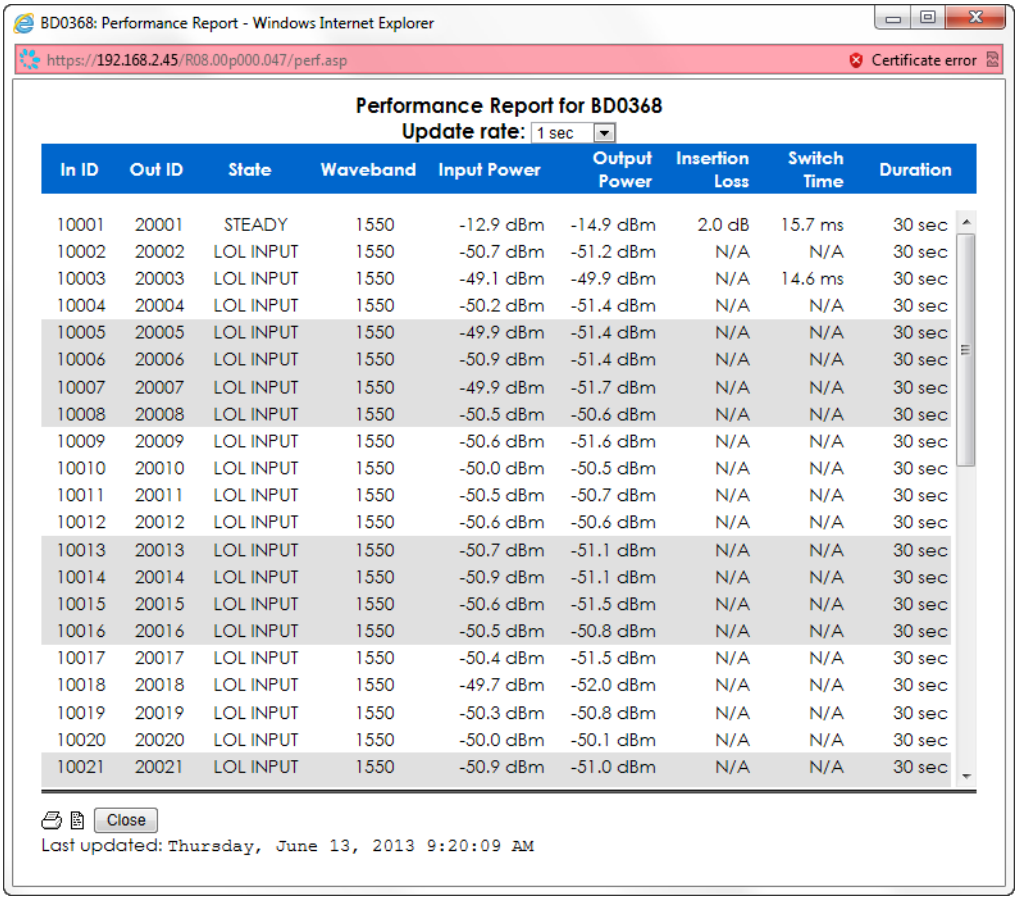


8. If the system is configured with the Input Power Detection feature:
   a. Connect the laser source to Input 1 on the I/O panel. The ClickFlow GUI should display the live connection on the port with the color green.
   b. From the ClickFlow GUI Connection screen, select the **Reports > Performance** menu option to view the Performance Report window for the system.
   c. In the Performance Report window (Figure 49), read the Insertion Loss value for Input 1.

   If the system is not configured with the Input Power Detection feature:
   a. Use the optical power meter to measure the power of the input laser source.
   b. Connect the laser source to Input 1 on the I/O panel. The ClickFlow GUI should display the live connection on the port with the color green (Figure 48).
   c. In the ClickFlow GUI Connection screen, move the mouse over either Input 1 or Output 1 to view the Port Information box for the connection.
   d. Read the Power value for the output port of the connection.

e. Subtract the output power value from the input power value to obtain the insertion loss for the connection.

Figure 49 Performance Report Window



In ID	Out ID	State	Waveband	Input Power	Output Power	Insertion Loss	Switch Time	Duration
10001	20001	STEADY	1550	-12.9 dBm	-14.9 dBm	2.0 dB	15.7 ms	30 sec
10002	20002	LOL INPUT	1550	-50.7 dBm	-51.2 dBm	N/A	N/A	30 sec
10003	20003	LOL INPUT	1550	-49.1 dBm	-49.9 dBm	N/A	14.6 ms	30 sec
10004	20004	LOL INPUT	1550	-50.2 dBm	-51.4 dBm	N/A	N/A	30 sec
10005	20005	LOL INPUT	1550	-49.9 dBm	-51.4 dBm	N/A	N/A	30 sec
10006	20006	LOL INPUT	1550	-50.9 dBm	-51.4 dBm	N/A	N/A	30 sec
10007	20007	LOL INPUT	1550	-49.9 dBm	-51.7 dBm	N/A	N/A	30 sec
10008	20008	LOL INPUT	1550	-50.5 dBm	-50.6 dBm	N/A	N/A	30 sec
10009	20009	LOL INPUT	1550	-50.6 dBm	-51.6 dBm	N/A	N/A	30 sec
10010	20010	LOL INPUT	1550	-50.0 dBm	-50.5 dBm	N/A	N/A	30 sec
10011	20011	LOL INPUT	1550	-50.5 dBm	-50.7 dBm	N/A	N/A	30 sec
10012	20012	LOL INPUT	1550	-50.6 dBm	-50.6 dBm	N/A	N/A	30 sec
10013	20013	LOL INPUT	1550	-50.7 dBm	-51.1 dBm	N/A	N/A	30 sec
10014	20014	LOL INPUT	1550	-50.9 dBm	-51.1 dBm	N/A	N/A	30 sec
10015	20015	LOL INPUT	1550	-50.6 dBm	-51.5 dBm	N/A	N/A	30 sec
10016	20016	LOL INPUT	1550	-50.5 dBm	-50.8 dBm	N/A	N/A	30 sec
10017	20017	LOL INPUT	1550	-50.4 dBm	-51.5 dBm	N/A	N/A	30 sec
10018	20018	LOL INPUT	1550	-49.7 dBm	-52.0 dBm	N/A	N/A	30 sec
10019	20019	LOL INPUT	1550	-50.3 dBm	-50.8 dBm	N/A	N/A	30 sec
10020	20020	LOL INPUT	1550	-50.0 dBm	-50.1 dBm	N/A	N/A	30 sec
10021	20021	LOL INPUT	1550	-50.9 dBm	-51.0 dBm	N/A	N/A	30 sec

Display the Port and Connection Color Legend

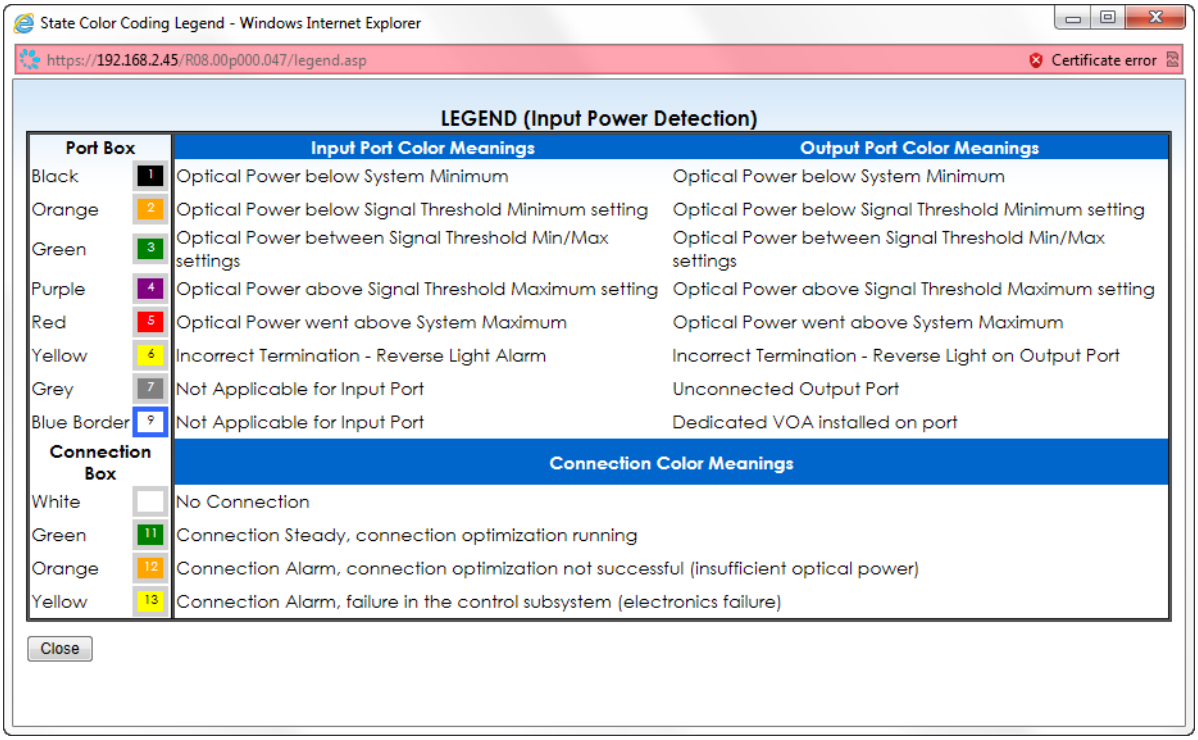
Each port on the Connection screen is represented by two boxes. The top box defines the port number and its color characterizes the power level on that port. The bottom box defines the connection state of the port. If the port is not connected, then the connection state box does not contain a number and is displayed in white. If the port is connected, then the connection state box contains the number of the port to which it is connected and the color characterizes the state of the connection.

To display the Port and Connection Color Legend:

1. In a standard web browser, log into the ClickFlow GUI to access the Connection Screen. (See ”Logging into the ClickFlow™ GUI” on page 81 for information on logging into the ClickFlow GUI.)

2. From the Connection screen, select the **Reports > Legend** menu option to open the State Color Coding Legend window (Figure 50).

Figure 50 State Color Coding Legend Window



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Maintenance Console

10

Maintenance Console Overview

The Maintenance Console is used to configure system level attributes and to troubleshoot IP network issues. The Linux Maintenance Console shell provides a character-based menu available either when directly connected to the serial port or through a Secure Shell (SSH) login.

> **NOTE:** See “System Turn-On and Connecting to the Maintenance Console” on page 74 for the procedure on logging into the Maintenance Console.

Successful login to the “admin” Maintenance Console account provides access to the main menu:

```
BD0020 login: admin
Password:
gshell v2.1.3 | SN: 04BD4PC10020
Software Version: R07.01p001
Copyright(c) 2011 Glimmerglass Networks, Inc. All Rights Reserved.

===============================================================
Main Menu (enter Q to quit)
Wed Jun 15 15:18:30 UTC 2011
===============================================================
  1. Set Maintenance Console Login Password
  2. Set date/time
  3. Configure network
  4. Reset ClickFlow/TL1 "admin" passwd
  5. Display serial number
  6. Configure start-up options
  7. Configure NTP
  8. Configure firewall
  9. Configure Syslog Service
 10. Show active network connections
 11. Ping
 12. TLl console
 13. Upgrade software
 14. Transfer File to System using FTP
 15. Reset to Factory Default
 16. Reset SNMP to Factory Default
 17. Rollback to other partition
 18. Restore IOS Configuration
 19. Configure available menu options
 20. Restart (Application)
 21. Shutdown (before power off)
 22. Reboot

 Select an option:
```

To select an option, enter its number and press the **<Enter>** key. Depending on the option, there may be additional level of menus or prompts. To exit the menu, type "**q**", followed by the **<Enter>** key.

The Maintenance Console menu options are described in the following sections of this chapter:

NOTE: Many of the system configuration and maintenance actions may also be performed via the ClickFlow GUI, as noted in the table below. A laptop PC may be connected to the system's Network port (Ethernet 1) or the Craft Access port (Ethernet 2). The IP address of the directly attached laptop PC must be on the same IP subnet as the system's Ethernet port. For more information on ClickFlow System menu windows see the *ClickFlow Graphical User Interface Manual*.

Menu Option **Menu Sub-Options**	**Page**	**Also Supported by Clickflow**
1. Set Maintenance Console Login Password	100	No
2. Set date/time	104	Yes
3. Configure network	105	Yes
4. Reset ClickFlow/TL1 "admin" passwd	106	No
5. Display serial number	106	Yes
6. Configure start-up options	106	Yes
7. Configure NTP 1. List Current NTP configuration 2. Modify NTP Server IP addresses 3. Start the NTP service 4. Stop the NTP service	108 109 110 110 111	Yes
8. Configure firewall 1. List allowed IP addresses 2. Add IP address to allowed list 3. Remove IP address from allowed list 4. Commit Firewall Changes 5. Restart the firewall	111 112 112 113 114 114	No
9. Configure Syslog Service 1. List Current Syslog configuration 2. Modify Syslog IP addresses 3. Restart the Syslog service 4. Application Syslog Messages Log Level	114 115 116 116 117	Yes
10. Show active network connections	118	No
11. Ping	118	No

Menu Option Menu Sub-Options	Page	Also Supported by Clickflow
12. TLI console	119	No
13. Upgrade software	119	Yes
14. Transfer File to System using FTP 1. Transfer Software Upgrade Image file 2. Transfer other file	120 121 123	Via Upload
15. Reset to Factory Default	123	Yes
16. Reset SNMP to Factory Default	124	No
17. Rollback to other partition	125	Yes
18. Restore IOS Configuration	125	Yes
19. Configure available menu options	127	No
20. Restart (Application)	128	Yes
21. Shutdown (before power off)	129	Yes
22. Reboot	130	Yes

Security

The following table describes the security features of the Glimmerglass systems.

Security Method	Interface	Description
Password	Maintenance Console Local Access (Serial-port) and Remote Access (Ethernet - SSH)	Password authentication is required. The “admin” account's own password may be revised after successful login. The “admin” account's password can only be reset to the factory default via the serial port; hence it is protected by system physical access security. The Maintenance Console “admin” password is not the same as the ClickFlow/TL1 “admin” password; hence its distribution may be controlled more tightly. Two accounts are provided: “admin” and “maint”. The “admin” account may configure the password and menu options for the “maint” user account. For further information see “Maintenance Console User Accounts” on page 95.
	ClickFlow and TL1	Password authentication is required. The account's own password may be revised after successful login. The "admin" password can only be reset to the factory default via the Maintenance Console. Only accounts with administrative/mange privilege may revise other user account passwords.
	SNMP	SNMP v1/v2c/v3 access Community Names, Security Names, and User Authentication Keys may be configured by an authenticated SNMP v3 user. For more information see the *Intelligent Optical System SNMP User Manual*.
Firewall	Maintenance Console (SSH), ClickFlow, SNMP, and TL1	Remote access may be restricted to a list of allowed IP addresses. Configuration and viewing of this list is restricted to the Maintenance Console "admin" account.
Revise/Disable TCP Ports	ClickFlow, SNMP, and TL1	The ClickFlow, SNMP, and TL1 TCP/UDP port numbers may be revised from their factory default values, or set to zero to disable the port, by a Maintenance Console, ClickFlow, SNMP, and Glimmerglass Console user with administrative privilege.

Security Method	Interface	Description
Encryption	Maintenance Console remote access (SSH)	Remote access to the Maintenance Console is restricted to SSH (SSL).
	ClickFlow and TL1	ClickFlow and TL1 remote access may be configured to be unencrypted or encrypted (SSL). For SSL the Glimmerglass system uses a self-signed certificate.
	SNMP	SNMP v3 access may be configured to use DES payload encryption. Unencrypted v1/v2/v3 access may be disabled by an authenticated SNMP v3 user. For more information see the *Intelligent Optical System SNMP User Manual*.

Maintenance Console User Accounts

You can log in to the Maintenance Console accounts using either the serial port or over the network via a SSH (Secure Shell) session. The following table describes the roles of the three Maintenance Console accounts.

Account User ID	Default Password	Maintenance Console Account Description
"admin”	"password”	The Maintenance Console administrative account. The “admin” can change its own password and set the password for the “maint” account. Furthermore, “admin” can control the menu options displayed for the “maint” account, see “Configure Available Menu Options” on page 127.
"maint”	"password”	An account whose role (menu options) may be configured by "admin". The installation default "maint" role allows switch replacement and restoration of the prior switch's configuration from a system configuration backup file.

NOTES:
- The Maintenance Console accounts are not shared with the ClickFlow and TL1 accounts. Thus, changing the password for a Maintenance Console account does not affect the passwords in ClickFlow or TL1.
- For releases prior to R07.00p000, the Maintenance Console default password was based on the system serial number "<first four chars in serial#>.<last three chars in serial#>".
- Software upgrade does not change the previously defaulted/configured passwords.
- To reset passwords to the factory defaults, see “Set Maintenance Console Login Password” on page 100.

The Maintenance Console accounts have different privileges, according to the following table:

Maintenance Console Menu Option	admin	maint	
		Default	Optional
Set Maintenance Console Login Password Set own password Set password of other accounts	 ✓ ✓		
Set date and time	✓	✓	✓
Configure network	✓	✓	✓
Reset ClickFlow/TL1 “admin” password	✓		✓
Display serial number	✓		✓
Configure start-up options	✓		✓
Configure NTP	✓		✓
Configure firewall	✓		✓
Configure Syslog Service	✓		✓
Show active network connections	✓		✓
Ping	✓	✓	✓
TL1 console	✓		✓
Upgrade software	✓		✓
Transfer File to System using FTP	✓	✓	✓
Reset to Factory Default	✓		✓
Reset SNMP to Factory Default	✓		✓
Rollback to other partition	✓		✓
Restore IOS Configuration	✓	✓	✓

Maintenance Console Menu Option	admin	maint	
		Default	Optional
Configure available menu options	✓		
Restart (Application)	✓		✓
Shutdown (before power off)	✓		✓
Reboot	✓	✓	✓

NOTE: “Optional” menu options may be enabled/disabled by the admin user, see “Configure Available Menu Options” on page 127.

The installation default "maint" account Main menu is shown below:

```
BD0020 login: maint
Password:
gshell v2.1.3 | SN: 04BD4PC10020
Software Version: R07.01p001
Copyright(c) 2011 Glimmerglass Networks, Inc.  All Rights Reserved.

================================================================
Main Menu (enter Q to quit)
Fri Jun 17 22:25:27 UTC 2011
================================================================
 1. Set date/time
 2. Configure network
 3. Show active network connections
 4. Ping
 5. Transfer File to System using FTP
 6. Restore IOS Configuration
 7. Reboot

Select an option:
```

Log in Using the Serial Port

To log in to a Maintenance Console account using the serial port (RS232 DE-9-F):

1. Connect a terminal emulator supporting VT100 to the Glimmerglass system serial port.

NOTE: For more information see ”Connecting Directly via the Serial Port” on page 132.

2. If the system is not powered on, power it on, the system boot output will be presented. A successful system boot sequence will conclude with the following output:

```
BD0020 login:

------------------
I2C devices found:

NET  ADDR  SLOT  DEVICE   STATUS
 0   0x56    3   MBRD     OK
 0   0x52   11   SCP      OK
 7   0x57   12   VOA      OK
 0   0x50    1   PDC-1C   OK    0x2C.ADM1025   0x54.eprom256
 3   0x50    2   PDC-2C   OK    0x2C.ADM1025   0x54.eprom256
 1   0x53    4   HVI      OK    0x27.GPIO      0x57.eprom256
 1   0x50    5   HVB-W    OK    0x18.LM83      0x19.LM83
 1   0x51    6   HVB-X    OK    0x29.LM83      0x2A.LM83
 1   0x52    7   HVB-Y    OK    0x4C.LM83      0x4D.LM83
 2   0x55    9   MCA      OK    0x18.LM83
 2   0x57   10   MPS      OK    0x27.GPIO      0x0C.DAC
   0x48.ADS7828   0x4B.TMP100


Archive: R07.01p000-BD-1-A  2011-03-07 10:36:11
S/N: 04BD4PC10020

=== Ready ===
```

NOTE: The I2C devices found list display varies as a function of the number of installed ports and installed options (Input Power Detection, VOA, etc.).

3. If the system is powered on, press the <Enter> key to display the login prompt:

```
BD0020 login:
```

NOTE: The format of the login prompt is

`<host name> login:`

If the host name was changed to a value different than the factory default system host name (see “Configuring the Host Name and IP Address of the System” on page 76), the login prompt will reflect that changed name. The system default host name is derived from the system serial number:

`<third & fourth characters><last four characters>`

4. Type in the account name, either **admin** or **maint**.

5. Enter the appropriate password.

```
BD0020 login: admin
Password:
```

After login, the system displays the Maintenance Console main menu (see “Maintenance Console Overview” on page 91).

Log in Using SSH

The Glimmerglass system allows secure-shell (SSH) access to the Maintenance Console accounts over the IP network using TCP port 22. An SSH client exists on most Linux/Unix platforms. Many Windows-based terminal emulators also support SSH (TeraTerm, etc.). Log in using the IP address of the Glimmerglass system with either the “admin” or “maint” account and provide the appropriate password.

NOTES: Depending on your SSH client and its configuration, the first time you log in to the Glimmerglass system, you may be asked to accept the “host key” for the unit.

For more connection information, see either ”Connecting to Laptop (PC)” on page 131 or ”Connecting Indirectly via a LAN” on page 132.

For installation default IP addresses see ”Configure Network Parameters” on page 105.

An example first-time login from a Linux client follows:

```
% ssh -l admin 192.168.2.200
The authenticity of host '192.168.2.200 (192.168.2.200)' can't be
   established.
RSA key fingerprint is 8d:aa:6b:3c:a0:fa:17:fd:dc:82:d8:63:99:b0:b9:bd.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.168.2.200' (RSA) to the list of known hosts.
admin@192.168.2.200's password:
```

After login, the system displays the Maintenance Console main menu (see “Maintenance Console Overview” on page 91).

Set Maintenance Console Login Password

The administration Maintenance Console account "admin" can change its own password and set the passwords of the other Maintenance Console accounts. The other Maintenance Console accounts are essentially shared roles not individual users hence they are prohibited from changing their own passwords.

To change the "admin" account password:

1. Log in to the "admin" account.
2. In the main menu, select "Set Maintenance Console Login Password".
3. Enter the user selection number for "admin" (1).
4. Enter the current "admin" password (the password is not echoed as it is typed).
5. Enter the new "admin" password.
6. Re-enter the new "admin" password.
7. Enter "q" to exit the set password option.

```
Select an option: 1
================================================================
Change Maintenance Console Login Password (enter 'Q' to quit)
================================================================
Select user whose password is to be modified:
 1: admin
 2: maint
Please select one of the user numbers above: 1
Current password:
New password:
Reenter new password:
Password for 'admin' changed
```

NOTE: When changing the “admin” account password the new password must abide by the switch password complexity policy as well as the similarity check configured in the password change policy. Password history checks do not apply to the Maintenance Console user accounts.

The factory default policy (new system) requires the following:

- Minimum of 8 characters in length
- Requirement for 1 each of punctuation, numeric, and lower-case characters
- The new password cannot equal the old password (in this case, "password")
- The new password cannot contain the user name (forward/backward, case insensitive)
- Passwords cannot contain white space or any of the following special characters: comma (,), question mark (?), colon (:), semi-colon (;), apostrophe (`), double quote ("), and backslash (\)

The settings for the password complexity and change policies may be reviewed by administrative users by connecting to ClickFlow and opening the **System > System Configuration > Account Options** window.

In general, the “admin” account password cannot be changed back to “password” as the password policies will prevent this password (too simple). To reset the “admin” account password to the default see “Reset Maintenance Console Passwords” on page 102.

To change the "maint" account password:

1. Log in to the "admin" account.
2. In the main menu, select "Set Maintenance Console Login Password".
3. Enter 2 as the user selection number.
4. Enter the account new password (the password is not echoed as it is typed).
5. Re-enter the new password.

6. Enter "q" to exit the set password option.

```
Select an option: 1
================================================================
Change Maintenance Console Login Password (enter 'Q' to quit)
================================================================
Select user whose password is to be modified:
 1: admin
 2: maint
Please select one of the user numbers above: 2
New password:
Reenter new password:
Password for 'maint' changed
```

NOTE: When changing the "maint" account password, the new password must abide by the password complexity policy. The password change policy is not checked.

Reset Maintenance Console Passwords

If you forget the password of the “maint” account, their passwords can be set by the “Set Maintenance Console Login Password” on page 100. If you forget the password for the Maintenance Console “admin” account, you can reset all of the Maintenance Console account passwords to factory defaults by using the boot-time options, as described below.

A general procedure to recover from lost Maintenance Console “admin” account password is as follows:

1. Connect a terminal emulator supporting VT100 to the Glimmerglass system serial port (RS232 DE-9-F).

2. Power cycle the unit and interrupt the auto-boot sequence.

To interrupt the auto-boot sequence, press **<Enter>** when the "Hit a key to interrupt auto-boot" message is output during boot up. An example of the output is shown below.

```
GXN Boot 1.2.4

Linux: console=ttyS0,9600 rw
   ip=192.168.2.44::192.168.2.201:255.255.255.0:BD0020:eth0:off
   nfsroot=, root=/dev/mtdblock2

Hit a key to interrupt auto-boot.

*****************************************************************

Current Parameters
------------------
        root=1 ipaddr1=192.168.2.44 ipaddr2=192.168.3.44
   gateway1=192.168.2.201 mask1=255.255.255.0 mask2=255.255.255.0
   hostname=BD0020 serverip= nfsroot= lastdev=1 sn=04BD4PC10020

Other Parameters
----------------
        resetPass=no

Select An Option:
H - Hostname
I - IP
M - Netmask
G - Gateway
B - Boot now
P - Shell password reset
F - Factory
=>
```

3. Select the “P” option to indicate that passwords should be reset.

4. Select the “B” option to continue booting.

5. At the login prompt, log in as “admin” using the factory-default password.

6. Follow the procedures from the last section, “Set Maintenance Console Login Password” on page 100, to change the password for the “admin” account and to assign a new password to the “maint” account.

Set Date and Time

The Glimmerglass system date and time are in UTC. The time zone is not configurable. The system date and time may be set in the following ways:

- Automatically via NTP:
  - Via the Maintenance Console (see ”Configure NTP” on page 108)
  - Via the ClickFlow GUI (**System > System Configuration > Date/Time**)
  - Via the TL1 interface (SET-NTP-SERVER command)
  - Via the SNMP interface (iosSystem > sysAdministration > sysClock subtree)
- Manually:
  - Via the Maintenance Console (described below in this section)
  - Via the ClickFlow GUI (**System > System Configuration > Date/Time**)
  - Via the TL1 interface (ED-DAT command)
  - Via the SNMP interface (iosSystem > sysAdministration > sysClock subtree)

NOTE: If the system date and time are set manually, the internal clock will slowly drift over time. Because of this, the system time should be periodically corrected via the application interfaces.

The Set Date and Time option in the Maintenance Console will prompt for date and time separately. To keep the current date or time, just press the **<Enter>** key.

NOTE: If NTP is enabled on the system, the following error message will be displayed if the “Set date/time” menu option is entered from the Maintenance Console Main Menu:

```
*** NTP Service running. Set Date/Time not permitted***
```

The following example changes only the time:

```
Select an option: 2

================================================================
Set date/time (enter Q to return to main menu)
================================================================
MM/DD/YYYY [05/02/2008]:
HH:MM:SS   [22:07:38]: 22:09:00
Fri May  2 22:09:00 UTC 2008
```

Configure Network Parameters

The Network Parameters may be configured via the Maintenance Console (below), the ClickFlow GUI (**System > System Configuration > Name/IP**), the TL1 interface (ED-NE-GEN command), and the SNMP interface (iosSystem > sysAdministration > sysNetwork subtree).

Select this option to view or change the network parameters, such as host name, IP addresses, etc. The changes will not take effect until the next reboot. Note that network parameters also may be set by interrupting the auto-boot using the serial-port console.

NOTES: To keep the current setting, press the **<Enter>** key.

The host name is the "short hostname" which excludes the domain name; it must be 1-63 characters, composed only of alphanumeric and dash (-).

```
Select an option: 3
================================================================
Current Network configuration
================================================================
Hostname                  : BD0020
IP addr Ethernet 1        : 192.168.2.200
Netmask Ethernet 1        : 255.255.255.0
Gateway for Ethernet 1    : 192.168.2.201
IP addr Ethernet 2        : 192.168.3.200
Netmask Ethernet 2        : 255.255.255.0

Do you want to modify Network Parameters? [Y|N]: Y

============================================================
Set network configuration
================================================================
hostname [BD0020]:
IP address Ethernet 1 [192.168.2.200]: 192.168.2.43
netmask Ethernet 1 [255.255.255.0]:
gateway Ethernet 1 (use '.' to erase) [192.168.2.201]: 192.168.2.1
IP address Ethernet 2 (use '.' to erase) [192.168.3.200]: 192.168.3.43
netmask Ethernet 2 [255.255.255.0]:

Reboot to have the new network parameters take effect
```

Reset ClickFlow/TL1 “admin” Password

Select this option to reset the ClickFlow and TL1 passwords for the “admin” account to the factory default. You will be asked to confirm the reset.

```
Select an option: 4

Are you sure you want to reset ClickFlow/TL1 password for "admin"? [Y|N]: Y
Resetting...
```

Display Serial Number

This option just displays the serial of the Glimmerglass system. This is useful for determining the factory-default password.

```
Select an option: 5

Serial Number: 09BD1PA10267

ArcName="R07.01p000-BD-1-A"
ArcDate="2011-04-15 10:47:30"
```

Configure Start-Up Options

The Start-Up Options may be configured via the Maintenance Console (below), the ClickFlow GUI (**System > System Configuration > Startup Options**), and the SNMP interface (sysNetwork subtree).

Select this option to view or change the system start-up options, such as the ClickFlow and TL1 TCP port numbers, and whether SSL is enabled.

```
Select an option: 6

================================================================
Current Start-up Options
================================================================
-operationMode        = normal
-tl1SmartPort         = 10033
-tl1FastPort          = 10034
-tl1SmartSSLPort      = 10035
-tl1FastSSLPort       = 10036
-tl1SSLEnable         = 0
-webPort              = 80
-webSSLEnable         = 1
-webSSLPort           = 443
-snmpPort             = 161

Do you want to modify Start-up Options? [Y|N]: Y

================================================================
Configure start-up options. (Type 0 to disable)
================================================================
-operationMode [normal]:
-tl1SmartPort [10033]:
-tl1FastPort [10034]:
-tl1SmartSSLPort [10035]:
-tl1FastSSLPort [10036]:
-tl1SSLEnable [0]:
-webPort [80]:
-webSSLEnable [1]:
-webSSLPort [443]:
-snmpPort [161]: 0

Restart application for start-up option changes to take effect.
```

NOTE: When editing the start-up options, note the following:

- To keep the current setting for an option, press the **<Enter>** key.
- TCP port numbers cannot be less than 80 and cannot be greater than 65535.
- Do not duplicate TCP port numbers; doing so will make certain services unavailable.
- To disable a port, set the port number to 0.
- To change the System Operation mode, change the value of the -operationMode startup option to "normal" (default) or "maint". Any value other than "maint" will establish normal operation mode.

Changes to the start-up options do not take effect until the application is restarted or the system is rebooted.

In the above example, SNMP access is disabled by setting the snmpPort to **0**.

In the system maintenance operation mode the switch's SNMP Agent is disabled, the Glimmerglass Console Management interface is disabled, and system-level privilege Manage is required for ClickFlow and TL1 login. The system maintenance operation mode may be used to prevent flooding Network Operations Center with events (e.g., SNMP traps, Glimmerglass Console GGNMSGs, SYSLOG messages) when a system is under maintenance.

Configure NTP

The system date and time may be set in the following ways:

- Automatically via NTP:
  - Via the Maintenance Console (described below in this section)
  - Via the ClickFlow GUI (**System > System Configuration > Date/Time**)
  - Via the TL1 interface (SET-NTP-SERVER command)
  - Via the SNMP interface (iosSystem > sysAdministration > sysClock subtree)
- Manually:
  - Via the Maintenance Console (see ”Set Date and Time” on page 104)
  - Via the ClickFlow GUI (**System > System Configuration > Date/Time**)
  - Via the TL1 interface (ED-DAT command)
  - Via the SNMP interface (iosSystem > sysAdministration > sysClock subtree)

NOTE:	When NTP is enabled, the system date and time cannot be set manually.

When enabled, NTP automatically maintains system time synchronization with external NTP Servers. Up to three NTP Server IP addresses may be specified.

Select the “Configure NTP” option to view or change the system NTP configuration.

```
Select an option: 7

================================================================
Network Time Protocol (NTP) services configuration
Tue Nov 2 20:25:36 UTC 2010
================================================================

Current NTP Configuration

IP Address for NTP Server 1       :
IP Address for NTP Server 2       :
IP Address for NTP Server 3       :
NTP Service State                 : Stopped

================================================================

Do you want to modify the current NTP Configuration? [Y|N]: Y

================================================================
NTP Administration Menu ('Q' to quit)
================================================================

 1. List Current NTP configuration
 2. Modify NTP Server IP addresses
 3. Start the NTP service
 4. Stop the NTP service

Select an option:
```

List Current NTP configuration

Select this Configure NTP menu option to re-display the current NTP configuration; this may be used to confirm changes after modifying the NTP Server IP addresses or the NTP service state.

Modify NTP Server IP addresses

Select this Configure NTP menu option to modify (add/change/delete) NTP Server IP addresses. If the NTP service is running (previously started) then it will automatically restart after the IP addresses are modified. In the following example, two NTP Server IP addresses were added.

```
Select an option: 2

================================================================
Modify Current NTP Server IP addresses
================================================================
IP Addresses must be entered using Dotted-Decimal notation
(e.g. a.b.c.d where each of the numbers represented by a, b, c and d
range between 0 and 255)

IP Address of NTP Server 1 (use '.' to erase) []: 192.168.1.8
IP Address of NTP Server 2 (use '.' to erase) []: 192.168.1.24
IP Address of NTP Server 3 (use '.' to erase) []:

================================================================
NTP Administration Menu ('Q' to quit)
================================================================

 1. List Current NTP configuration
 2. Modify NTP Server IP addresses
 3. Start the NTP service
 4. Stop the NTP service

Select an option:
```

Start the NTP service

Select this Configure NTP menu option to start NTP. The Network Time Protocol usually takes approximately 4 to 5 minutes to achieve time synchronization.

```
Select an option: 3

Starting  NTP Daemon
Synchronizing with time servers:
192.168.1.8
192.168.1.24[  OK  ]
Syncing hardware clock to system time: [  OK  ]
Starting ntpd: [  OK  ]
```

Stop the NTP service

Select this Configure NTP menu option to stop NTP.

```
Select an option: 4

Are you sure you want to stop NTP service? [Y|N]: Y
Stopping  NTP Daemon
Shutting down ntpd: [  OK  ]
```

Configure Firewall

The Glimmerglass system incorporates a simple firewall that enables you to restrict network access to only a list of machines or networks. By default, the access list is empty, so the firewall will allow access by any machine. As new entries are added to the list, access will be restricted to only those entries when the firewall is restarted.

Selecting this option presents another set of menu options:

```
Select an option: 8

================================================================
Firewall configuration (enter Q to return to main menu)
================================================================
After making changes to the firewall configuration,
Commit firewall changes (option 4) and Restart Firewall (option 5)
for changes to take effect.

 1. List allowed IP addresses
 2. Add IP address to allowed list
 3. Remove IP address from allowed list
 4. Commit Firewall Changes
 5. Restart the firewall
```

To exit the firewall configuration menu, type “q”, followed by the **<Enter>** key. If you have made changes to the firewall configuration, be sure to restart the firewall before quitting.

NOTE:	Firewall configuration changes are not saved permanently until you commit changes (see “Commit Firewall Changes” on page 114), even if you restart the firewall. This allows you to recover from bad firewall configurations by simply rebooting the Glimmerglass system. Only when you are satisfied with the configuration should you commit them to save them permanently.

List Allowed IP Addresses

Select this option to display the list of allowed IP addresses. The default empty access list is displayed as “Allow List <ALL>.”

```
Select an option: 1

-----------------------------------------
 Allowed List
-----------------------------------------
allow 192.168.0.0/22
allow 64.233.199.23/32
```

The above example allows:

- All machines on the 192.168.0.0, 192.168.1.0, 192.168.2.0, and 192.168.3.0 networks
- One specific machine at the IP address of 64.233.199.23

Add IP Address to Allowed List

Select this option to add an entry to the allowed list. The entry must be in the form of a.b.c.d/m where:

- *a.b.c.d* is the IP address in dotted quad notation

- *m* is the number of bits in the subnet mask (1-32)

```
Select an option: 2

Add IP address to the list of allowed hosts.

The address must be in the form of a.b.c.d/m where:
 a.b.c.d is the IP address in dotted quad notation
 m is the number of bits in the subnet mask

IP address/mask to add: 64.233.199.23/32
```

List the entries again to verify your changes.

Remove IP Address from Allowed List

Select this option to remove an entry from the allowed list. If you enter an address that is not in the list, it will have no effect. If you remove the last entry in the list, the firewall will allow access to any machine.

```
Select an option: 3

Remove IP address from the list of allowed hosts.

The address must be in the form of a.b.c.d/m where:
 a.b.c.d is the IP address in dotted quad notation
 m is the number of bits in the subnet mask

If all addresses are removed from the list, then the
firewall defaults to allowing traffic from any site.

IP address/mask to remove: 64.233.199.23/32
```

List the entries again to verify your changes.

Commit Firewall Changes

Select this option to save firewall configuration changes in non-volatile memory so that they will be persisted through a power-cycle or reboot.

```
Select an option: 4
Firewall Changes Saved Successfully....
```

Restart the Firewall

To have changes to the firewall take effect, you must select this option to restart the firewall.:

```
Select an option: 5
Are you sure you want to restart the firewall? [Y|N]: Y
Restarting...
allow access from 192.168.0.0/22
```

WARNING:	If you are logged in via SSH, make sure your machine is included in the allowed list before restarting the firewall.

Configure Syslog Service

The Syslog Service may be configured via the Maintenance Console (below), the ClickFlow GUI (**System > System Configuration > Syslog**), the TL1 interface (SET-SYLOG-SERVER command), and the SNMP interface (iosSystem > sysAdministration > sysLog subtree).

Select the "Configure Syslog Service" option to view or change the system Syslog configuration.

```
Select an option: 9

================================================================
Syslog (System Logger) Service configuration
Tue Mar 15 22:35:49 UTC 2011
================================================================

Current Syslog Service Configuration

Syslog IP Address 1                       :
Syslog IP Address 2                       :
Syslog IP Address 3                       :
Syslog Service State                      : Started
Application Syslog Messages Log Level     : OFF

================================================================

Do you want to modify the current Syslog Configuration? [Y|N]: Y

================================================================
Syslog Service Administration Menu ('Q' to quit)
================================================================

 1. List Current Syslog configuration
 2. Modify Syslog IP addresses
 3. Restart the Syslog service
 4. Application Syslog Messages Log Level

Select an option:
```

List Current Syslog Configuration

Select this Configure Syslog Service option to re-display the current Syslog configuration; this may be used to confirm changes after modifying the Syslog Server IP address or the Syslog logging level.

Modify Syslog IP Addresses

Select this Configure Syslog Service option to modify (add/change/delete) Syslog Server IP addresses. The Syslog Service will automatically restart/reload after the IP addresses are modified.

```
Select an option: 2

================================================================
Modify Current Syslog IP addresses
================================================================
IP Addresses must be entered using Dotted-Decimal notation
(e.g. a.b.c.d where each of the numbers represented by a, b, c and d
range between 0 and 255)

Syslog IP Address 1 (use '.' to erase) []: 192.168.1.126
Syslog IP Address 2 (use '.' to erase) []: 192.168.1.149
Syslog IP Address 3 (use '.' to erase) []:
Reloading system logger...[  OK  ]

================================================================
Syslog Service Administration Menu ('Q' to quit)
================================================================

 1. List Current Syslog configuration
 2. Modify Syslog IP addresses
 3. Restart the Syslog service
 4. Application Syslog Messages Log Level

Select an option:
```

Restart the Syslog Service

The Syslog service is automatically started during system boot and is automatically reloaded when the IP addresses are modified, hence the operator is not required to restart the syslog service. However, this Configure Syslog Service menu option may be used to restart and reload the service.

```
Select an option: 3

Reloading system logger...[  OK  ]
```

Application Syslog Messages Log Level

Select this Configure Syslog Service menu option to modify the application logging level; the levels are:

- OFF—Do not log to the external Syslog Servers.
- AUTO—Post messages that are logged to the TL1 AUTO log. These include user actions that change the system configuration, alarm events, and advisory events. The latter excludes actions and events that are related to security, which are posted to the SECU log.
- SECU—Post messages that are logged to the TL1 SECU log and also messages that are logged to the AUTO log.

```
Select an option: 4

Current Application Syslog Messages Log Level : OFF
Do you want to change? [Y|N]: y
 1. OFF
 2. AUTO
 3. SECU
Select an option (Q to quit): 3

================================================================
Syslog Service Administration Menu ('Q' to quit)
================================================================

 1. List Current Syslog configuration
 2. Modify Syslog IP addresses
 3. Restart the Syslog service
 4. Application Syslog Messages Log Level

Select an option:
```

Show Active Network Connections

Select this option to show the active IP network connections. The system will list all of the active internet connections to the system.

```
Select an option: 10

SSH port (22):
    192.168.1.135:51792
TL1 Smart port (10033):
    192.168.1.132:14322
TL1 Fast port (10034):
    192.168.1.148:54426
Web port (80):
    192.168.1.175:2271
    192.168.1.175:2260
    192.168.1.175:2262
Web SSL port (443):
    192.168.1.175:1205
    192.168.1.175:2261
    192.168.1.175:2264
    192.168.1.175:2270
    192.168.1.175:2269
```

Ping

Select this option to “ping” another machine. This command is useful to determine if the Glimmerglass system has network connectivity to the specified machine. Press the **<Enter>** key to exit this option.

```
Select an option: 11

IP address to ping (<Enter> to quit): 192.168.1.175
PING 192.168.1.175 (192.168.1.175): 56 data bytes
84 bytes from 192.168.1.175: icmp_seq=0 ttl=128 time=1.0 ms
84 bytes from 192.168.1.175: icmp_seq=1 ttl=128 time=0.4 ms
84 bytes from 192.168.1.175: icmp_seq=2 ttl=128 time=0.6 ms

--- 192.168.1.175 ping statistics ---
3 packets transmitted, 3 packets received, 0% packet loss
round-trip min/avg/max = 0.4/0.6/1.0 ms
```

TL1 Console

This option opens a TL1 session with the system (using the same textual window). The TL1 Console session supports entry of TL1 commands via the Maintenance Console (see the *Glimmerglass TL1 Manual* for more information on TL1 commands and responses). Press **Ctrl-]** and then **e** to terminate the TL1 session.

```
Select an option: 12

Escape character is ^].  Connecting....

<act-user::admin:1::********;

   BD0090 08-05-12 17:34:38
M  1 COMPLD
   "admin:2008-05-09,21-33-38,0,NO,"
   /* WARNING: AUTHORIZED USE ONLY. VIOLATIONS WILL BE PROSECUTED! */
;
<wrt-db:::1:::FORCE=0;

   BD0090 08-05-12 17:40:13
M  1 COMPLD
;
<
<Ctrl-]> pressed
Console escape. Commands are:
 c console
 e exit
e
================================================================
Main Menu (enter Q to quit)
================================================================
  1. Set shell login passwd
```

Upgrade Software

This option enables manual upgrade of system software using an upgrade file provided by Glimmerglass Customer Service. Select this option only when directed by Glimmerglass Customer Service. See “System Software Upgrade and Rollback Procedures” on page 154 for details on using this command.

Transfer File to System Using FTP

This option supports upload of a file via FTP to the system's /dnld directory. This option supports:

- Upload of a system software upgrade file from an FTP server as part of the software upgrade procedure. The example in this section is repeated in “System Software Upgrade and Rollback Procedures” on page 154.
- Upload of a system configuration backup file from an FTP server as part of “Restore IOS Configuration” on page 125.

Select "Transfer File to System Using FTP" option to initiate the procedure to transfer a file:

```
Select an option: 14

================================================================
Transfer File to System using FTP (enter Q to quit)
================================================================

The file to be transferred must be on your FTP server.
You will need the following information:
   - FTP server's IP address
   - FTP user name
   - FTP user's password
   - FTP server's source file path and name
   - Destination File name (for option 3 only)

 1. Transfer Software Upgrade Image file (GGNIOSUPG.tgz)
 2. Transfer Configuration backup file (iosconfigbackup.xml)
 3. Transfer other File

Select an option:
```

Transfer Software Upgrade Image File

To transfer a system software upgrade file from an FTP server to the system, select the "Transfer Software Upgrade image file" option, enter the requested FTP information, then review and confirm the requested FTP operation:

```
Select an option: 1
FTP Server IP address: 192.168.1.149
FTP Server Port (Press Enter for Port 21):
FTP username: ftpuser
FTP password:
FTP Source path and name: glimmerglass/ios/R07.01p002/GGNIOSUPG.tgz

Parameters provided:
 FTP server       :    192.168.1.149
 FTP server port  :    21
 FTP username     :    ftpuser
 FTP password     :    ******
 FTP Source File  :    glimmerglass/ios/R07.01p002/GGNIOSUPG.tgz
 Destination File :    GGNIOSUPG.tgz

Do you want to continue? [Y|N]: Y

File (/dnld/GGNIOSUPG.tgz) Transferred Successfully
```

NOTES: For anonymous FTP access, press Enter in response to the username and password requests.

If the FTP user ID and password contain any of the following URL reserved delimiter characters, then they must be preceded by back-slash "\":

";", "/", "?", ":", "@", "&", "=", "+", "$".

Transfer Configuration Backup File

To transfer a system configuration backup file from an FTP server to the system, select the "Transfer Configuration backup file" option, enter the requested FTP information, then review and confirm the requested FTP operation:

```
Select an option: 2
FTP Server IP address: 192.168.1.149
FTP Server Port (Press Enter for Port 21):
FTP username: ftpuser
FTP password:
FTP Source path and name: glimmerglass/ios/backup/BD0020_config.xml

Parameters provided:
 FTP server       :    192.168.1.149
 FTP server port  :    21
 FTP user         :    ftpuser
 FTP password     :    ******
 FTP Source File  :    glimmerglass/ios/backup/BD0020_config.xml
 Destination File :    iosconfigbackup.xml

Do you want to continue? [Y|N]: Y
Starting File Transfer.....
File (/dnld/iosconfigbackup.xml) Transferred Successfully
```

Transfer Other File

This option is the same as "Transfer Software Upgrade image file," except that the destination file name must be specified. Select "Transfer other file" option, enter the requested FTP information, then review and confirm the requested FTP operation:

```
Select an option: 3
FTP Server IP address: 192.168.1.149
FTP Server Port (Press Enter for Port 21):
FTP username: ftpuser
FTP password:
FTP Source path and name: glimmerglass/ios/R07.01p002/GGNIOSUPG.tgz
Destination Filename: GGNIOSUPG.tgz

Parameters provided:
 FTP server       :    192.168.1.149
 FTP server port  :    21
 FTP username     :    ftpuser
 FTP password     :    ******
 FTP Source File  :    glimmerglass/ios/R07.01p002/GGNIOSUPG.tgz
 Destination File :    GGNIOSUPG.tgz

Do you want to continue? [Y|N]: Y

File (/dnld/GGNIOSUPG.tgz) Transferred Successfully
```

Reset to Factory Default

This option allows you to reset the entire system configuration to the factory defaults. There is no sub-menu to this option, but the reset request must be confirmed as shown below. The system default values are listed in Appendix A starting on page 165.

WARNING:	This operation breaks all connections and clears the entire system configuration database.

```
Select an option: 15
================================================================
This will reset Configuration to factory default
All Your Changes Will Be Lost.....
================================================================
Are you sure you want to continue? [Y|N]: Y
Sun Jun 10 16:52:47 UTC 2012: Starting Factory Default Reset process....
Sun Jun 10 16:52:47 UTC 2012: Reset ClickFlow/TL1 'admin' user password to
   default
Sun Jun 10 16:52:47 UTC 2012: Disable syslog messages from application
Sun Jun 10 16:52:47 UTC 2012: Stop IOS application
Sun Jun 10 16:52:58 UTC 2012: Remove user configuration
Sun Jun 10 16:52:58 UTC 2012: Reset 'admin' and 'maint' passwords to default
Sun Jun 10 16:52:59 UTC 2012: Factory Default Reset process Completed....
Logging out and Rebooting...
```

NOTES:

The system's current IP configuration is not defaulted. Therefore, remote network access to the system is not affected by the reset to defaults.

The passwords for all default system accounts are reset to default. These passwords will need to be used when accessing the system via the Maintenance Console, ClickFlow/TL1, or SNMP after the system initializes.

The Runtime parameter options will only be defaulted on new systems (Model Numbers GG112-C, GG514-C, GG528-C or higher). For older systems, these values must be defaulted by the user through Click-Flow, TL1 or SNMP. See the "Runtime Options" section in the *Glimmerglass ClickFlow GUI Manual* for more information.

Reset SNMP to Factory Default

This option allows you to set the SNMP configuration to the factory default. The SNMP access tables and target address tables are defaulted (see the *Glimmerglass Intelligent Optical Systems SNMP*

User Manual for further information). There is no sub-menu to this option, but the reset request must be confirmed as shown below.

```
Select an option: 16
================================================================
This will reset SNMP configuration to factory default
All Your Changes Will Be Lost.....
================================================================
Are you sure you want to continue? [Y|N]: Y
Wed Nov 10 18:21:28 UTC 2010: Starting SNMP Factory Default Reset....
Wed Nov 10 18:21:28 UTC 2010: Stopping IOS application....
Wed Nov 10 18:21:49 UTC 2010: Reset SNMP Configuration....
Wed Nov 10 18:21:49 UTC 2010: Starting IOS application....
Wed Nov 10 18:21:49 UTC 2010: Reset SNMP config to factory default - Successful
```

Rollback to Other Partition

This option enables rolling back a software upgrade to the previously installed software release. See ”System Software Upgrade and Rollback Procedures” on page 154 for details on using this selection.

Restore IOS Configuration

The system configuration may be backed up to an encrypted XML file and restored from an encrypted XML file via the ClickFlow, SNMP and TL1 interfaces. The ClickFlow web browser (HTTPS), TL1 (FTP), or SCP/SFTP or may be used to copy (export/import) the system configuration file to/from a Linux server or Windows PC.

The system configuration XML file includes identifying information such as: system name, serial number, when the file was created, by whom (user-id) and an optional user entered comment/description. The XML file also includes read-only information about the system (hardware features, licenses and embedded software version); the read-only information is not restored by Restore System Configuration.

The Maintenance Console does not support system configuration backup, but it does support restore via the following two menu options:

- Transfer File to System using FTP - The system configuration backup XML file is retrieved from an FTP server, see “Transfer Configuration Backup File” on page 122.

- Restore IOS Configuration - The system configuration XML file in the system's /dnld directory is verified and then restored.

NOTE: If the system configuration backup XML file is not on an FTP server then it could be pushed to the system via SCP, for example from a Windows PC via "pscp" or "WinSCP". The name of the system configuration XML file in the /dnld directory must be "iosconfigbackup.xml".

The ClickFlow Restore System Configuration interface is more user friendly than the Maintenance Console in that it combines upload and restore, and it shows information (backup date, system serial number, system name, etc.) from the system configuration file before the restore request is confirmed. However, it may be convenient to use the Maintenance Console configuration restore as part of a failed switch replacement procedure in which the maintenance technician configures the replacement switch network parameters (IP, etc.) and then restores the last backup from the failed switch.

After the system configuration file has been transferred to the system's /dnld directory via FTP or SCP, select "Restore IOS configuration" in the main menu and then confirm the request.

```
Select an option: 18

================================================================
Restore IOS Configuration (enter Q to quit)
================================================================

Are you sure you want to continue? [Y|N]: Y
 Fri Jun 17 23:16:33 UTC 2011:  Starting IOS Configuration Restore....
Reloading system logger...
 Fri Jun 17 23:16:42 UTC 2011:  IOS Configuration Restore - Success
 Fri Jun 17 23:16:42 UTC 2011:  Reboot the system to effect changes
```

NOTES: If the system configuration file format is invalid, or the configuration is not applicable to this system (e.g., the port count does not match, etc.), then the configuration will not be restored and the Maintenance Console response will indicate failure. The configuration file will be restored if the system's serial number does not match that in the configuration file.

A system reboot is required to effect network parameters (IP address, etc.) changes and startup option (TCP/UDP ports) changes. To reboot the system select "Reboot" in the main menu.

Configure Available Menu Options

The Maintenance Console administrative user "admin" may configure the role (main menu options) of the "maint" account.

In the following example, "Configure available menu options" is selected in the main menu.

```
Select an option: 19
================================================================
Modify 'maint' user's available menu options (enter Q to quit)
================================================================
Options available:
 *1. Set date/time
 *2. Configure network
  3. Reset ClickFlow/TL1 "admin" password
  4. Display serial number
  5. Configure start-up options
  6. Configure NTP
  7. Configure firewall
  8. Configure Syslog Service
 *9. Show active network connections
*10. Ping
 11. TLl console
 12. Upgrade software
*13. Transfer File to System using FTP
 14. Reset to Factory Default
 15. Reset SNMP to Factory Default
 16. Rollback to other partition
*17. Restore IOS Configuration
 18. Restart (Application)
 19. Shutdown (before power off)
*20. Reboot
('*' indicates option already available to user)
Please enter an option to toggle (<Enter> when finished):
```

Entering a menu option number toggles its enable/disable state, if it is disabled it changes to enabled, and if it is disabled it changes to enabled.

We observe the enabled menu options, those flagged by "*" in the example above, and decide to add "Configure firewall" per the following example.

```
Please enter an option to toggle (<Enter> when finished): 7
Options available:
 *1. Set date/time
 *2. Configure network
  3. Reset ClickFlow/TL1 "admin" password
  4. Display serial number
  5. Configure start-up options
  6. Configure NTP
 *7. Configure firewall
  8. Configure Syslog Service
 *9. Show active network connections
*10. Ping
 11. TLl console
 12. Upgrade software
*13. Transfer File to System using FTP
 14. Reset to Factory Default
 15. Reset SNMP to Factory Default
 16. Rollback to other partition
*17. Restore IOS Configuration
 18. Restart (Application)
 19. Shutdown (before power off)
*20. Reboot
('*' indicates option already available to user)
Please enter an option to toggle (<Enter> when finished):
Changes for user name 'maint' have been saved.
```

Restart (Application)

This option allows you to restart the Glimmerglass system application services to have any changes to the start-up options take effect. Restarting the application will not disturb any optical connections, but the ClickFlow and TL1 services will be unavailable while they are restarted and all ClickFlow and TL1 users will be logged off.

There is no sub-menu to this option, but the restart request must be confirmed as shown in the figure below.

```
Select an option: 20

Restarting application services will not disturb existing
optical connections, but will prevent access to the switch
while the services restart.

Are you sure you want to restart? [Y|N]:
```

Shutdown

Before turning power off to the unit, it is recommended that you select this option to shut down all activity and turning off high-voltage electronics. All established optical connections will be broken.

NOTES:
- After a shutdown, the unit must be rebooted or power cycled to restart the system.
- Shutdown takes less than a minute and the system STATUS panel ACTIVE LED will extinguish upon completion.

```
Select an option: 21

Shutdown should be run before turning power off to the unit.
It will break all optical connections, shut down application services,
and turn off internal power supplies.

Do you want to continue? [Y|N]: Y
Shutting down IOS System....
The system is going down NOW!
Sent SIGTERM to all processes
Sent SIGKILL to all processes
Requesting system halt
System halted.
```

Reboot

Select this option to software reboot the Glimmerglass system. You must reboot, for instance, to have new network parameters take effect.

> **NOTE:** Software reboot of the Glimmerglass system will not disturb optical connections.

```
Select an option: 22

Are you sure you want to reboot? [Y|N]: Y
Logging out and rebooting....
```

Log Out

To log out of the Maintenance Console account, type “Q” at the main menu, then the **<Enter>** key. If logged in via a serial port, then the login prompt is displayed. If logged in via an SSH session then the SSH session is terminated.

```
Select an option: q

BD0020 login:
```

Glimmerglass System Maintenance 11

This chapter outlines the following system maintenance procedures:

Connecting to the System

Each Glimmerglass product can be connected to a computer either directly or indirectly via a Local Area Network (LAN). Contact your system administrator to obtain the IP address for the Glimmerglass system.

	This section describes how to connect to existing, configured systems. For newly-installed, non-configured systems, see Chapter 9, “System Turn-Up, Configuration, and Verification” starting on page 73.
NOTES:	Before connecting the system to a computer, verify that the computer does not have any other active network connections, such as other ethernet ports or wireless LAN connections. Other system connections may experience interference from the Glimmerglass system connection.

Connecting to Laptop (PC)

To connect to the system directly from a computer:

1. Contact your system administrator to obtain the system IP address and subnet for the Ethernet port to which you will connect (typically the ETHERNET 2 port). Modify the com-

puter's TCP/IP properties so that the computer has a network mask and IP address on the same network as the Glimmerglass System.

NOTE:	For installation default IP addresses, see "Configure Network Parameters" on page 105.

2. Using an ethernet cable, connect the computer to the system's Ethernet port (either the ETHERNET 1 or ETHERNET 2 port).

3. Open a web browser and type the Glimmerglass system's IP address to access the ClickFlow™ GUI.

NOTE:	If using Internet Explorer, enter the "http://" prefix before the IP address.

4. In the security certificate pop-up window, accept the security certificate.

Connecting Indirectly via a LAN

To connect to the Glimmerglass system from a computer on a Local Area Network (LAN):

1. Contact your system administrator to obtain the primary (Ethernet Port 1) IP address for the system.

NOTE:	For installation default IP addresses, see "Configure Network Parameters" on page 105.

2. From a computer on the LAN, open a web browser and type the Glimmerglass system's IP address to access the ClickFlow GUI.

NOTE:	If using Internet Explorer, enter the "http://" prefix before the IP address.

3. In the security certificate pop-up window, accept the security certificate.

Connecting Directly via the Serial Port

To access the Maintenance Console from the serial port, the following items are required:

- A computer or laptop supporting serial connection via a standard DB-9F connector OR via USB with a USB-to-DB9-F adapter.

- RS-232 serial cable (DB-9M to DB-9F). Glimmerglass provides one 6' cable with each system.
- Terminal emulation program supporting VT100 terminal emulation and configured with the following serial port settings:
  - Baud = 9600
  - Data bits = 8
  - Stop bits = 1
  - Parity = None
  - Flow Control = None

To access the Maintenance Console from the serial port, do the following:

1. Connect a serial cable between the laptop and the system.

2. Open a terminal emulator program on the laptop such as PuTTY or Tera Term and configure the terminal emulation settings as follows:
   - Baud = 9600
   - Data bits = 8
   - Stop bits = 1
   - Parity = None
   - Flow Control = None
   - Set the Terminal Emulation as VT100

3. With the terminal emulator application window active, press the **<ENTER>** key to obtain a login prompt from the system.

4. Log in using the Maintenance Console admin user credentials.

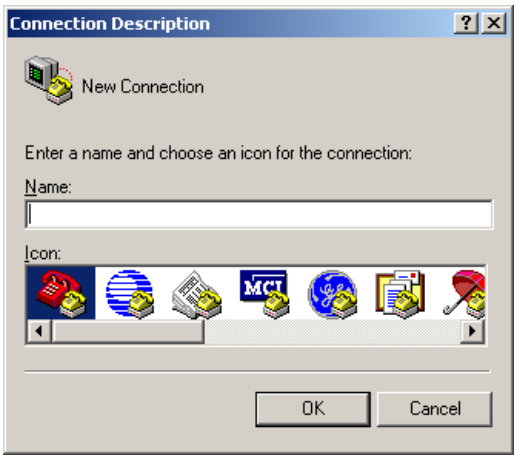
Serial Port Connection (Example using Windows HyperTerminal)

To configure the serial port settings of the computer using Windows HyperTerminal:

1. From the Windows desktop, click on **Start > Programs > Accessories > Communications > HyperTerminal**.

2. From the Connection Description window, select an icon and name for the connection (Figure 51). Click **OK**.

Figure 51 Connection Description Window



3. From the Connect To window, click the **Connect Using** pull-down menu and select the appropriate COM port location of the PC serial port (Figure 52). Click **OK**.

Figure 52 Connect To Window

4. At the COM Properties window, configure the serial port settings as follows:
   - Bits per second: 9600
   - Data bits: 8
   - Parity: none
   - Stop bits: 1
   - Flow control: none

5. Click **OK**.

6. Select **File > Save** to save the configuration.

7. Press **<Enter>** to receive the Maintenance Console login prompt. At the login prompt, enter “admin” to log in as the admin user. Then enter the default password (“password”) for the “admin” account to receive the Maintenance Console main menu.

Patch Panel Maintenance and Fiber Cleaning

Inspection and cleaning of fiber connectors prior to plugging fiber connectors into the system is a necessary and critical step in preventing damage to the internal fiber end-faces of the system as well as to ensuring optimum performance for connections through the system.

Use of potentially dirty or damaged fiber connectors will result in one or all of the following:

1. High insertion loss. Dust or dirt obscuring the core or preventing a proper mating between the two connectors (creating an air gap or misalignment of the cores).
   - Glimmerglass systems use single mode fiber with a core diameter of 9µm.
   - Common airborne dust particles may range from 1 - 20µm.
   - A 1µm dust particle on the core may result in ~1dB of additional loss. A >9µm particle could completely obscure the core resulting in no light passing through the connection.

2. High Back Reflection
   - Contamination may result in a high back reflection which could de-stabilize the source transmitter.

3. Permanent damage to the internal connector fiber end-face resulting in an unusable port.
   - Depending on the nature of the contaminant, mating the external connector to the internal connector may scratch, pit, or crack the fiber end face resulting in permanent damage to either end face.
   - Depending on the optical power of the input signal, contaminants may heat up over time and permanently damage the fiber end face.

Ensuring that fiber end faces are clean prior to mating will prevent transmission problems and prevent damage to the system connectors.

NOTE:	Connector end-face damage is not covered under warranty. Damaged connectors require the system to be returned for correction.

Fiber Inspection and Cleaning Recommendations.

To ensure optimum product performance, the Glimmerglass QA department inspects the end-face on all fiber connectors and performs insertion loss and ORL (Optical Return Loss) measurements on all ports (input and output) to ensure that the internal connectors (inside of the adaptors on the patch panel) are within specification. All adaptors are then capped prior to shipment.

The following sections contain recommendations that are intended to preclude the introduction of the problems described above which may damage or affect the optical performance of the system.

- “Fiber Inspection Recommendations” (below)
- ”Fiber Cleaning Recommendations” (page 136)
- ”Other Recommendations” (page 137)

Fiber Inspection Recommendations

Both the internal and external fiber end faces are to be inspected for cleanliness prior plugging the fiber connector into the system patch panel. Several manufacturers provide products designed for this purpose. Glimmerglass recommends use of an inspection product providing for indirect viewing of the fiber end face to preclude eye injury to personnel.

NOTE:	Never look directly at the fiber end face or use an inspection tool for direct viewing unless you are certain that there is no laser source connected at the opposite end.

Glimmerglass service personnel use both digital and analog probe technology that allows inspection of both internal (through the bulkhead adaptor) and external fiber connectors. Both probe types allow for indirect viewing of the fiber end face. In the case of the digital probe, the image is displayed on a computer screen (e.g laptop) via a USB connection to the computer. Analog probes are portable, handheld units with a built in LCD screen for indirect viewing of the fiber end face.

Westover Scientific (http://www.westoverfiber.com/index.php) manufactures fiber probe inspection equipment used by Glimmerglass. Note that these probes support adaptor attachments to support inspection of fiber end faces for all connector types (e.g. FC, LC, SC, and MTP) supported on Glimmerglass systems.

Fiber Cleaning Recommendations

There are many techniques for cleaning fiber connectors and, to some extent, the technique required to clean a fiber depends on the nature of the contamination.

The inspection/cleaning method below is intended to ensure that fibers with clean, undamaged end-faces are connected to the system and should suffice in most cases. Should a fiber not pass inspection after this check, do not use it on the system.

Glimmerglass provides one through-bulkhead fiber cleaner (connector-type appropriate) with each system for the purpose of cleaning the internal fiber end-faces without the need to remove the connector panel to access the internal fiber connector.

For single fiber connectors (LC, SC, or FC), a CLEtop reel cleaner should be procured to clean fiber patch cable connectors. For MTP systems, the through bulkhead cleaner has an attachment for cleaning MTP patch cable connectors. This method is very effective for cleaning the MTP connector.

The procedure below should be followed prior to plugging a fiber connector into the patch panel on the Glimmerglass system.

1. Uncap and inspect the internal fiber connector on the system using fiber probe/attachment appropriate to the connector type.

2. If necessary, clean the internal fiber connector using the provided through bulkhead fiber cleaner. If the internal fiber end-face cannot be cleaned, unfasten the fiber panel and slide forward to access the internal connector. Remove the connector and clean directly. Re-insert into the adaptor and slide the fiber panel back into place and secure.

3. Uncap and inspect the fiber connector on the patch cable to be connected to the system patch panel.

4. If necessary, clean the fiber connector and then re-inspect. Repeat until clean or set aside if cannot be cleaned.

5. Connect the inspected, clean fiber connector to the Glimmerglass patch panel.

Other Recommendations

1. The adaptors for unused ports on the system should always be capped to prevent airborne dust/contaminants from adhering to the internal fiber connector end face.

2. Protective caps removed from in-service ports should be retained for re-use and stored in a sealable, clean plastic bag.

3. Unused external fiber connectors (patch cords) should always be capped to prevent damage to the fiber/ferrule as well as to protect against contamination.

Alarm/Status Panel

This section describes the alarm conditions which are reported by Glimmerglass systems. The Status Panels on the systems (Figure 55 and Figure 56 below) have LEDs for indicating Critical/Major and Minor alarm conditions. The system software supports alarm acknowledgment. When an alarm is acknowledged, the alarm LED indicators are refreshed to reflect the severity of unacknowledged alarms. If all alarms are acknowledged, the alarm LEDs will return to the no alarm state (GREEN). Acknowledging alarms does not clear the alarm (with the exception of Intrusion alarms).

The System Status panel for the System 100 and System 500 is shown in Figure 53. The alarm panel for the System 600 is shown in Figure 54.

Figure 53 Alarm Panel for System 100 and System 500

Figure 54 Alarm Panel for System 600

The LED states are defined in the table below.

LED Name	LED State (Color)	State Definition	Possible Meanings or Causes
Power	Off	System Mainboard not receiving -48VDC	Source DC Circuits - off Source DC Circuits – incorrect polarity DC Fuse(s) - not installed or tripped External AC Power Supplies - off AC Line Cord not connected AC Power Switch set to "Off" AC Fuse(s) - tripped AC-Powered System supply failure System Mainboard failure Faulty internal wiring harness Faulty LED If none of the LEDs work but the system boots, failure of internal Alarm Panel connector
	Solid Green	System Mainboard receiving -48VDC	Source power (AC or DC) present
Active	Off	Glimmerglass software is not initialized, Linux OS may or may not be loaded.	Normal if System is off (Power LED = Off) Normal if Linux OS is loading (Power LED = On) Normal if System has been shutdown from Main Menu (Power LED = On) Faulty LED if system is operational
	Flashing Green	Glimmerglass software loading and initializing	Normal during boot up (power-cycle or reboot) Normal if applications restarted from Main Menu
	Solid Green	Glimmerglass software is initialized	System is operational
	Red	Glimmerglass software failed to initialize or halted during operation.	System not operational, cannot connect via ClickFlow or TL1. • Contact Glimmerglass Technical Support
MI	Solid Green	No active MI alarms or All MI alarms are acknowledged	
	Solid Yellow	Active MI alarm(s)	Minor (MI) alarm which has not been cleared or acknowledged.

LED Name	LED State (Color)	State Definition	Possible Meanings or Causes
MJ/CR	Solid Green	No active MJ/CR alarms or All CR/MJ alarms are acknowledged	
	Solid Red	Active MJ/CR alarm(s)	Major (MJ) or Critical (CR) alarm which has not been cleared or acknowledged.
Fan[1]	Off	No Power to Fans	Normal State if no input power Abnormal State if Alarm Panel Power LED is Green Possible Causes: • Bad LED (if fans are actually working) • Internal wiring fault (if fans not working)
	Solid Orange	Power to Fans + Linux OS not loaded	Normal LED State during Linux OS Load Abnormal LED State if persists beyond 2 minutes Possible Causes: • Failure of Linux OS to load. Check serial port boot messages and report to Glimmerglass Customer Support if condition persists.
	Solid Green	Power to Fans + Linux OS loaded + Fans are operational	Normal LED State during initialization and after initialization if all fans are operating correctly.
	Solid Red	One or more Fans have failed.	Probable fan failure. Alternatively, a fan assembly may have been removed. If a fan failure is suspected, view the fan icons in the ClickFlow GUI to identify the failing fan and then contact Glimmerglass Customer Support to arrange for replacement.

1. Fan alarm LED location:
   System 100 – Located on the front of the system on the dual fan module.
   System 500 – Located on the front of the system on the fan tray.
   System 600 – Located on the Alarm Panel (front or back of the system, depending on customer order)

The normal sequencing of the Status (Power/Active) and fan LEDs during boot up is as follows:

Power Up Sequence Step	Power LED State	ACTIVE LED State	Fan LED State
Apply Power to System	Solid Green	Off	Solid Orange
Linux OS Loaded/ Glimmerglass SW loading	Solid Green	Flashing Green	Solid Green[1]
Glimmerglass SW Loaded/ Initialized	Solid Green	Solid Green	Solid Green

1. The initial setting to Solid Green does not confirm that all fans are functioning correctly. This determination is made after the Glimmerglass software initializes and can interrogate the fan status.

NOTE: The initial setting to Solid Green does not indicate all fans are functioning correctly. This determination is made only after the Glimmerglass software initializes and can interrogate the fans. Thus, it is possible for the initial "solid green" indication to change to "solid red" after initialization if a failed fan is present in the system.

Alarm Conditions and Alarm Types

The table below shows the alarms that may occur in the Glimmerglass switch:

- Alarm Condition indicates the condition leading to the alarm
- Alarm Type indicates the code used to designate the alarm condition
- Alarm Object indicates the resource for which the alarm is detected
- Severity indicates the severity assigned to the alarm for logging/reporting

Alarm Condition	Alarm Type	Alarm Object	Severity
Hardware Alarms			
No DC Input Power	48VFLT	A-FEED | B-FEED	Major (MJ)
No DC Fuse	FUSEFLT	A-FEED | B-FEED	Major (MJ)
Single Fan Failure	FANFLT	<Fan Name>	Minor (MI)
Multiple Fan Failure	FANFLT	MULTIPLE-FANS	Major (MJ)
Engine Temperature	TEMPHI	ENGINE	Critical (CR)

Alarm Condition	Alarm Type	Alarm Object	Severity
MPS – Vbb too low	VBBLO	MPS	Critical (CR)
MPS – Vbb too high	VBBHI	MPS	Critical (CR)
MPS – Vfb too low	VFBLO	MPS	Critical (CR)
MPS – Vfb too high	VFBHI	MPS	Critical (CR)
Software Alarms			
Intrusion Detected	INTRUSION	USER | CHANNEL	Minor (MI)
NTP Sync. Loss	NTPFLT	CLOCK	Critical (CR)
Optical Alarms			
Min. Power Threshold	STMIN	<Port #>	<User Defined>
Max. Power Threshold	STMAX	<Port #>	<User Defined>
Connection Fault	CSFLT	<Output Port#>	<User Defined>
Reverse Light	LGTRVRS	<Output Port#>	Critical (CR)
Max. System Power	PWRMAX	<Port #>	Major (MJ)

Alarm severity is user-configurable for three optical alarms: STMIN, STMAX, and CSFLT. This may be done on a per-port basis. Therefore, an STMIN may be considered critical for one port and could be minor for another port. The alarm severities which may be assigned for these conditions are Critical, Major, Minor, Notice, and Disable. The severity of “Notice” means the alarm will be logged but no external notification for the alarm will be sent.

Alarm/Status Panel Replacement

Should an LED on the Alarm/Status Panel fail, the panel can be replaced without returning the system to Glimmerglass for repair. Contact Glimmerglass Customer Support to arrange for a replacement panel.

This procedure requires a 5/64" hex wrench and observance of proper ESD procedures for part handling and replacement. The Alarm/Status panel assembly consists of an Alarm/Status PCB with the LEDs mounted to the panel plate via standoffs. The PCB is connected via a ribbon cable to the system mainboard. Enough slack (around 1") is present in this cable to allow the assembly to be pulled forward and the ribbon cable retainers to be opened.

The procedure for replacing the Alarm/Status panel is the same for all Glimmerglass systems, except where specifically noted in the following steps:

1. Turn off power to the system.
2. Connect ESD wrist strap to the ESD jack or system ground terminal.
3. Using the 5/64" Hex Wrench, remove the four screws used to fasten the Alarm/Status panel to the system chassis.
4. Pull the Alarm/Status panel forward around 1" to gain access to the ribbon cable.
5. Slide the retaining clips securing the Alarm/Status ribbon cable away from the cable then remove the ribbon cable from the Alarm/Status panel connector. Ensure the ribbon cable does not retract into the chassis such that it cannot be reached.
6. (System 100 only) On the System 100, a ground wire is also present and is connected to the lower left standoff. Use the 5/64" hex wrench to remove the screw retaining the ground wire ring connector on the System 100. This screw additionally holds a standoff in place, so when removing the screw, be sure that the standoff does not fall inside the chassis.
7. Set aside the Alarm/Status panel.
8. Remove the replacement Alarm/Status panel and screws from the packaging.
9. Orient the Alarm/Status panel correctly with the front panel of the system.
10. Fasten the ribbon cable to the new Alarm/Status panel connector (the ribbon cable is key to ensure proper connection).
11. (System 100 only) For System 100s, you must also attach the ground wire between the lower left screw and the PCB board. Remove the lower left screw, place the ground ring connector in place, an replace the screw.
12. Slide the ribbon cable retaining clips into place to secure the ribbon cable to the connector.
13. Place the Alarm/Status panel back into the chassis, placing the ribbon cable inside the opening and then aligning the screw holes.
14. Using the 4 new screws provided with the replacement panel, fasten the panel to the chassis. Turn the screws until tight + an additional ¼ turn.

NOTE: Use of Loc-Tite on the screws is recommended.

15. Discard the failed Alarm/Status panel.

Fan Assembly

Each Glimmerglass system has a fan assembly. The replacement procedures for the different systems are described in the following sections:

- “Replacing the System 100 Fan Assembly” (below)
- ”Replacing the System 500 Fan Assembly” (page 147)
- ”Replacing the System 600 Fan Module Assemblies” (page 148)

Replacing the System 100 Fan Assembly

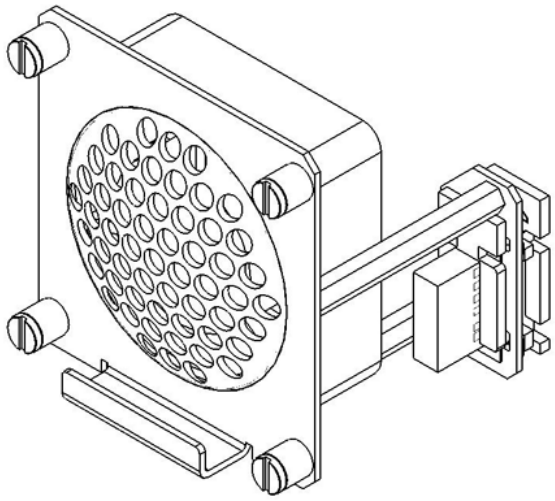
The System 100 chassis contains two replaceable fan modules. These modules can be removed and replaced without powering down the system (they are hot-pluggable). The rear fan module supports one fan. The front module supports two fans and the fan LED indicator. Should a fan fail, the affected module can be determined remotely by viewing the Alarm Box on the ClickFlow Connection Screen and observing which fan icon shows a failure (see the *Glimmerglass ClickFlow™ Graphical User Interface Manual* for more information). See the following two sections for the procedures on how to replace the rear and front fan modules:

- “Replacing the System 100 Rear Fan Module” on page 144
- “Replacing the System 100 Front Fan Module” on page 146

Replacing the System 100 Rear Fan Module

This procedure requires a small, slotted screwdriver (e.g. 3.5mmx0.60) to loosen 4 screws fastening the rear fan module assembly faceplate to the system chassis. The screws only need to be loosened - they do not need to be completely removed from the fan module faceplate. Figure 55 shows the System 100 rear fan module.

Figure 55 System 100 Rear Fan Assembly



Follow these steps to replace the System 100 rear fan module:

1. Loosen the four slotted screws (one on each corner) that secure the rear fan module faceplate to the chassis.

2. Grasp the fan module handle and slide the fan module straight back till the module catches on the chassis. Then, rotate the fan module counter-clockwise and remove from the chassis. The fan module assembly has two long standoffs extending the wiring harness to a power connector (note that the System 100 chassis has cutouts to accommodate these standoffs).

   NOTE: Do not reach inside the open area for the rear fan module.

3. Remove the replacement rear fan module assembly from its packaging.

4. Orient the rear fan module assembly such that the standoffs fit into the cutouts on the chassis. The easiest method is to place the bottom standoff in position and then rotate (clockwise) the side standoff into position.

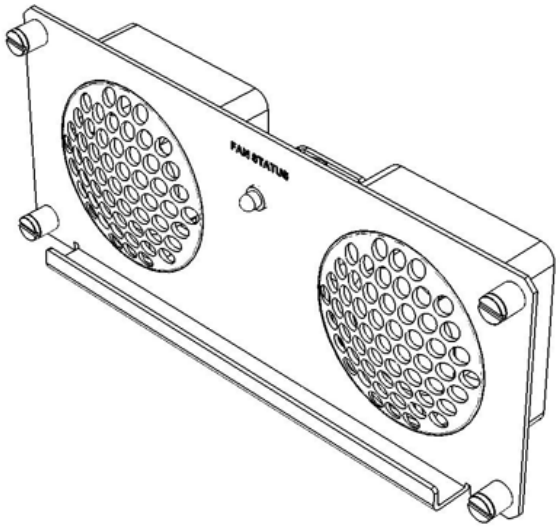
5. Once the assembly standoffs are correctly placed, slide the assembly back into the system until the power connector engages (the fan may intermittently turn on).

6. Tighten the four slotted screws to re-secure the assembly faceplate to the chassis. Once tightened, the fan should be operational and the fan alarm should clear (both the front panel assembly fan LED indicator and the ClickFlow Alarm Box fan icon)

Replacing the System 100 Front Fan Module

This procedure requires a slotted screwdriver to loosen 4 captive thumbscrews fastening the front fan module assembly faceplate to the system chassis. Figure 56 shows the System 100 front fan module.

Figure 56 System 100 Front Dual Fan Assembly



Follow these steps to replace the System 100 front fan module:

1. Loosen the 4 captive thumbscrews that secure the front fan module assembly to the chassis. Note, these screws hold the assembly in place, hold the panel in place so it does not fall after the last screw is loosened.

2. Grasp and pull the front fan module assembly forward and to remove it from the system.

NOTE: Do not reach inside the open area for the front fan module.

3. Remove the replacement front fan module assembly from its packaging.

4. Orient the replacement front fan module for installation.

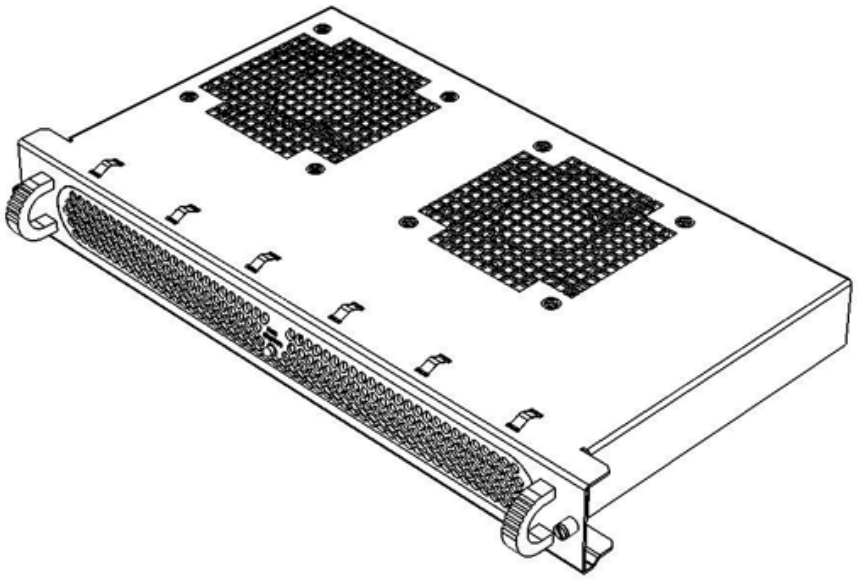
5. Position the replacement fan module assembly for installation by aligning the 4 captive thumbscrews on the assembly with their corresponding holes in the chassis.

6. Tighten the 4 captive thumbscrews by hand. Then tighten an addition ¼ turn with the screwdriver. The fans and fan LED indicator should turn on. After a few seconds, the fan LED indicator should become solid green.

Replacing the System 500 Fan Assembly

The fans for the System 500 chassis are mounted in a removable, hot-swappable fan tray. Failure of either fan in the fan tray is addressed by sending a replacement fan tray. The failed fan tray is to be returned to Glimmerglass in the replacement fan tray packaging. Figure 57 shows the System 500 fan tray.

Figure 57 System 500 Fan Tray



This procedure requires a slotted screwdriver to loosen 4 captive thumbscrews fastening the front fan module assembly faceplate to the system chassis.

Follow these steps to replace the System 500 fan tray:

1. Loosen the 2 slotted screws (left and right side) that secure the fan tray assembly to the chassis.

2. Grasp the rounded, knurled handles on each side of the fan tray assembly and slide it forward and out of the fan tray assembly slot.

3. Remove the replacement fan tray assembly from its packaging.

4. Position each side of the metal housing of the fan tray assembly inside the side rails for the fan tray assembly slot in the chassis.

5. Slide the fan tray assembly forward until the fan tray front panel contacts the chassis.

6. Grasp the handles and insert the fan tray fully - the fan and fan tray LED will turn on.
7. Tighten the captive thumbscrews.
8. Return the original fan tray to Glimmerglass.

Replacing the System 600 Fan Module Assemblies

The following sections describe the procedures for replacing the fan module assemblies for the two models of the System 600:

- “Fan Replacement for the GG514-A System 600 Chassis” (below)
- ”Fan Replacement for the GG514-B System 600 Chassis” (page 150)

Fan Replacement for the GG514-A System 600 Chassis

The Model GG514-A System 600 chassis contains four replaceable fan module assemblies (two assemblies on the front and two on the back of the system), and each assembly supports one fan.

NOTE:	The front and rear assemblies are not interchangeable. The replacement from Glimmerglass will be specific to the location as the front fans are intake and the rear fans are exhaust.

The fan modules can be removed and replaced without powering down the system (hot-pluggable). Should a fan fail, the affected module can be determined remotely by viewing the Alarms Display on the ClickFlow Connection screen and observing which fan icon shows a failure.

Figure 58 and Figure 59 show the Model GG514-A System 600 front and rear fan assemblies. (Note that these assemblies are keyed and there is a small round hole on the rear of the assembly which is on the bottom for the rear fan assembly and on the top for the front fan assembly.)

Figure 58 Model GG514-A System 600 Front Fan Assembly

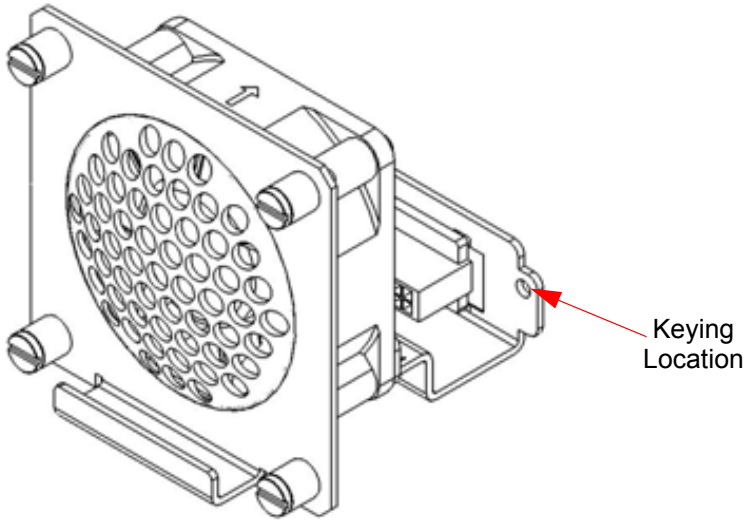
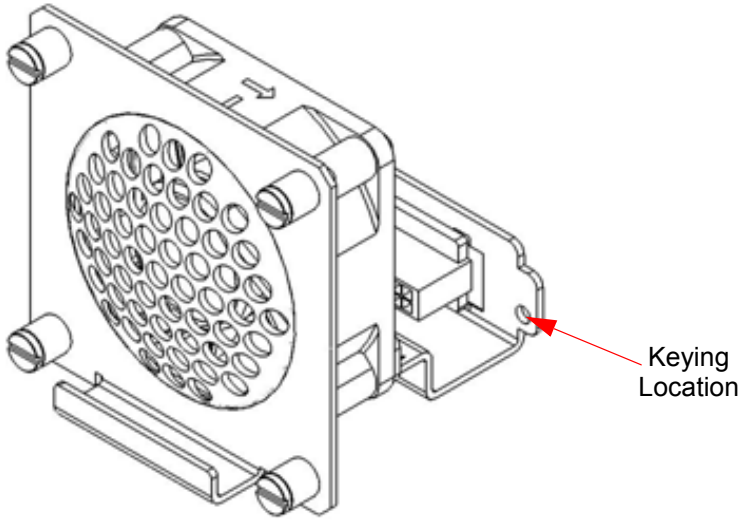


Figure 59 Model GG514-A System 600 Rear Fan Assembly



This procedure requires a flat blade screwdriver to loosen the 4 captive thumbscrews fastening the fan module assembly faceplate to the system chassis.

Follow these steps to replace the Model GG514-A System 600 fan assemblies:

1. Loosen the four slotted screws (each corner) that secure the fan module faceplate to the chassis.

2. Grasp the fan module handle and slide the fan module straight-back and remove from the chassis.

NOTE: Do not reach inside the open area

3. Remove the fan module assembly from its packaging.

4. Insert the replacement fan module assembly into the system (handle at bottom).

5. Tighten the four slotted screws to re-secure the assembly faceplate to the chassis.

   Once tightened, the fan should be operational and the Fan Alarm should clear on the System Status Panel.

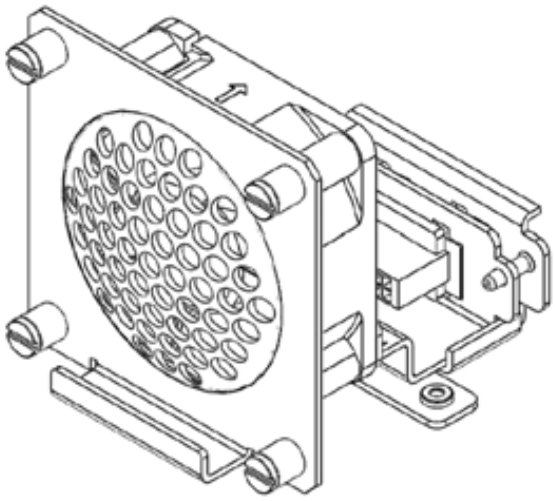
Fan Replacement for the GG514-B System 600 Chassis

The Model GG514-B System 600 chassis contains four replaceable fan module assemblies located on the front panel of the system. Each assembly supports one fan. There is no difference between the four fan assemblies; the same assembly is used in each of the four locations.

The fan modules can be removed and replaced without powering down the system. Should a fan fail, the affected module can be determined remotely by viewing the Alarms Display on the ClickFlow Connection screen and observing which fan icon shows a failure.

Figure 60 shows the Model GG514-B System 600 fan assembly.

Figure 60 Model GG514-B System 600 Fan Assembly



This procedure requires a flat blade screwdriver to loosen the 4 captive thumbscrews fastening the fan module assembly faceplate to the system chassis.

Follow these steps to replace the Model GG514-B System 600 fan assemblies:

1. Loosen the four slotted screws (each corner) that secure the fan module faceplate to the chassis.

2. Grasp the fan module handle and slide the fan module straight back and remove from the chassis.

   NOTE: Do not reach inside the open area

3. Remove the fan module assembly from its packaging.

4. Insert the replacement fan module assembly into the system (handle at bottom).

5. Tighten the four slotted screws to re-secure the assembly faceplate to the chassis.

   Once tightened, the fan should be operational and the Fan Alarm should clear on the System Status Panel.

Replacing Fuses

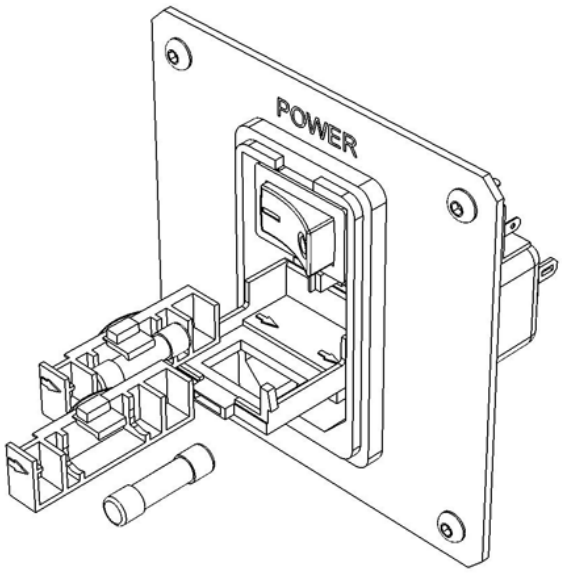
The procedures for fuse replacement in both AC and DC power systems are presented in the following sections.

- “Replacing Fuses for AC-Powered Systems” on page 151
- “Replacing Fuses for DC-Powered Systems” on page 152

Replacing Fuses for AC-Powered Systems

Figure 61 shows the AC Power Entry panel for AC-powered Glimmerglass systems. As shown in Figure 61, the AC Power Entry panel houses the AC plug receptacle, an on/off switch, and two 5x20mm 2Amp fuses (inside the receptacle housing and held in carriers). To access the fuses, insert a thin, flat blade screwdriver into the slot a the top of the housing and twist to open the cover.

Figure 61 AC Power Entry Panel with Open Cover and Extracted Fuse



Follow these steps to replace the fuses on an AC-powered Glimmerglass system:

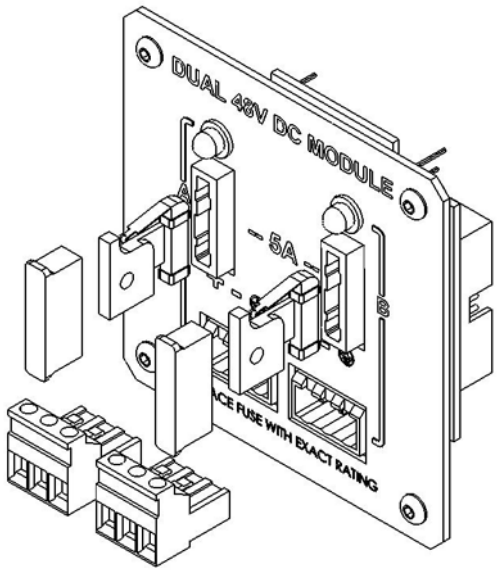
1. Remove the line cord from the system.
2. Open the AC receptacle exposing the two-fuse carriers (Figure 61).
3. Slide the fuse carrier to the left (in the opposite direction of arrow) and extract the fuse carrier.
4. Remove the fuse from the carrier, then inspect and replace the fuse if blown.
5. Insert the replacement fuse in the carrier (two replacement fuses are shipped with the system). For additional replacement fuses, refer to the physical/electrical specifications for each system type (page 28 for System 100, page 48 for System 500, and page 38 for System 600).
6. Re-insert the fuse carrier and lock it into place by sliding the carrier to the right (in the direction of the arrow).

Replacing Fuses for DC-Powered Systems

Figure 62 shows the pluggable DC terminal block that consists of a removable, 3-position terminal block, to which the -48V RTN, -48 Volt, and chassis ground wires are connected. This terminal block connects to (plugs into) a DC terminal header block incorporated in the system's DC power entry

panel along with the “A” and “B” feed fuses. Figure 62 shows the DC Power Entry Panel with the fuses and terminal blocks extracted.

Figure 62 DC Power Entry Panel with Extracted Fuse and Fuse Holder



Follow these steps to replace the fuses on a DC-powered Glimmerglass system:

1. Identify the blown fuse in the DC Power Entry Panel. The ClickFlow GUI will display a post-fuse alarm for the blown fuse (A or B).

2. Remove the blown fuse from the fuse housing and, if necessary, remove the fuse protector from the blown fuse for installation on the replacement fuse. Note that the spare fuses shipped with the system have fuse protectors installed.

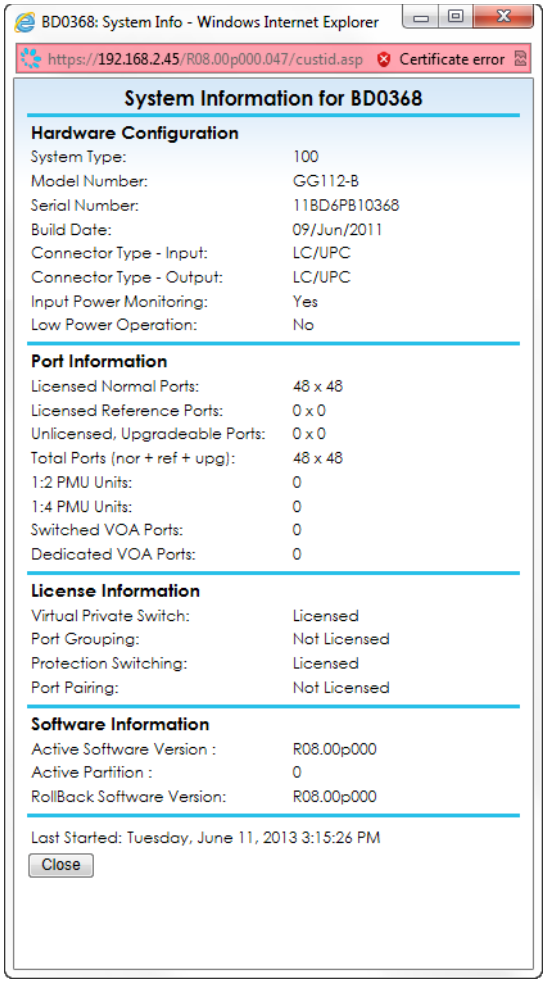
3. Insert the replacement fuse in the fuse housing. Ensure that the replacement fuse has a fuse protector installed. For additional replacement fuses, refer to the physical/electrical specifications for each system type (page 28 for System 100, page 48 for System 500, and page 38 for System 600).

System Software Upgrade and Rollback Procedures

The system contains two non-volatile Flash RAM partitions (0 and 1), both containing the system software (Linux OS and Intelligent Optical Switch application) and the system configuration data. One of the two partitions is marked as the Boot Partition; on a power-cycle or user initiated reboot the system will boot from the Boot Partition. The other partition is the Rollback Partition; if software rollback is initiated the roles of the two partitions are reversed and the system is booted from the former rollback partition. On a software upgrade the rollback partition is upgraded to the new software, then the roles of the two partitions are reversed and the system is booted from the former rollback partition.

The ClickFlow **Reports > System Info** menu selection opens the System Info window (Figure 63) which displays the boot partition and version, plus the rollback partition and version.

Figure 63 ClickFlow System Information Window



NOTES:	Current system hardware models and software releases support software upgrade and rollback without interruption of the optical switch connections. See *Software Release Note - Release R05.00p004* for "glitchless" upgrade/rollback hardware and software requirements. For system software upgrade from a release prior to R07.01p000, see "Software Upgrade Procedures" in the *Glimmerglass System Installation and Maintenance Guide* for the release being upgraded.

The system software upgrade process consists of three phases:

Upgrade Phase	Description
1: Upload	Upload the software upgrade file to the system's volatile /dnld directory. The upgrade file size is approximately 17MB. The duration of this upgrade phase is a function of the network speed and the latency between the server/PC containing the upgrade file and the system being upgraded.
2: Upgrade	Verify the upgrade file and then upgrade the non-volatile inactive/rollback partition with the new kernel and application files. System availability is unaffected by this upgrade phase; the system continues to operate under the current release. The duration of this upgrade phase is 3 - 7 minutes as a function of the system model.
3: Reboot	Reboot to activate the upgraded partition. If the upgraded partition is booted successfully, then the roles of the boot and rollback partitions are reversed, otherwise the original boot partition is rebooted. The system is unavailable during this reboot phase. The duration of this final upgrade phase is 2 - 3 minutes.

The three software upgrade phases are supported by each of the user interfaces (ClickFlow, TL1, SNMP, and Maintenance Console) as follows:

Interface	Phase	Description
ClickFlow	Upload	Upgrade System Software window - Upgrade phase 1: Upload …
	Upgrade	Upgrade System Software window - Upgrade phase 2: Upgrade …
	Reboot	Upgrade System Software window - Upgrade phase 3: Reboot …
TL1	Upload	COPY-RFILE:::<ctag>:::SRC=<src>,DEST=<dest>;
	Upgrade	APPLY-UPGRADE:::<ctag>;
	Reboot	INIT-SYS:::<ctag>::SOFTREBOOT;

Interface	Phase	Description
SNMP	Upload	Not supported; upload via SCP/SFTP, ClickFlow (HTTPS), TL1 (FTP), or Maintenance Console (FTP).
	Upgrade	sysProvisionTable.prCommand sysUpgrade
	Reboot	sysProvisionTable.prCommand sysReboot
Maintenance Console	Upload	Main Menu selection "Transfer File to System using FTP"
	Upgrade	Main Menu selection "Upgrade software", optionally includes reboot
	Reboot	Main Menu selection "Reboot"
SCP/SFTP	Upload	Push the upgrade file via SCP/SFTP from a Linux server or Windows PC

The three software upgrade phases do not have to be directly contiguous. For example, a Linux server with TL1 automation scripts could perform the non-disruptive upload and upgrade phases during the normal system high availability hours and then be scheduled to reboot all of the systems at midnight or during a scheduled maintenance period.

NOTE: Rebooting a system after a system software upgrade phase failure will simply reboot the current release.

In addition, the three software upgrade phases do not have to be performed by the same interface. For example, for the upload phase a Linux server script could push the upgrade files to each system via SCP/SFTP, and then complete the remaining phases by TL1 or SNMP.

The following sections describe the upgrade and rollback procedures:

- “Maintenance Console System Software Upgrade Process” (below)
- “Maintenance Console System Software Rollback Process” on page 163

Maintenance Console System Software Upgrade Process

Upgrading software via the Maintenance Console is a multi-step process. Software must first be uploaded to the system, either via FTP or via SCP, and then once the software is uploaded the inactive/rollback partition must be upgraded to the new software version. Finally, the system must be rebooted in order to activate the upgraded partition. The following sections describe these steps:

- Uploading software:
  - “Uploading Software via FTP” on page 157
  - “Uploading Software via SCP” on page 159

- “Upgrading the Inactive/Rollback Partition” on page 160
- “Rebooting to the Upgraded Partition” on page 162

Where feasible, logging in via the serial port is preferable to logging in via SSH because the serial port connection displays reboot progress messages. The upgrade phase progress messages are displayed on both the SSH and serial interfaces.

NOTES: The upgrade procedure via the ClickFlow GUI is much simpler than that via the Maintenance Console. While an upgrade via ClickFlow is typically performed remotely, it may also be performed locally via a laptop PC connected directly to the system's Craft Access port (Ethernet 2). The laptop PC Ethernet port IP address must be on the same IP subnet as the Craft Access port.

Uploading Software via FTP

The software upgrade file may be uploaded to the system /dnld directory by SCP (Secure Copy Protocol), as described in “Uploading Software via SCP” on page 159, or FTP (File Transfer Protocol), as described in this section.

Figure 64 Transfer File to System using FTP

```
Select an option: 14

================================================================
Transfer File to System using FTP (enter Q to quit)
================================================================

The file to be transferred must be on your FTP server.
You will need the following information:
   - FTP server's IP address
   - FTP user name
   - FTP user's password
   - FTP server's source file path and name
   - Destination File name (for option 2 only)

 1. Transfer Software Upgrade Image file (GGNIOSUPG.tgz)
 2. Transfer other file

Select an option: 1
FTP Server IP address: 192.168.1.149
FTP Server Port (Press Enter for Port 21):
FTP username: ftpuser
FTP password:
FTP Source path and name: Glimmerglass/IOS/R07.01p002/GGNIOSUPG.tgz

Parameters provided:
 FTP server       :    192.168.1.149
 FTP server port  :    21
 FTP username     :    ftpuser
 FTP password     :    ******
 FTP Source File  :    Glimmerglass/IOS/R07.01p002/GGNIOSUPG.tgz
 Destination File :    GGNIOSUPG.tgz

Do you want to continue? [Y|N]: Y

File (/dnld/GGNIOSUPG.tgz) Transferred Successfully
```

Perform the following steps to upload software via FTP:

1. Copy the Glimmerglass system upgrade file (GGNIOSUPG.tgz) to a directory on your FTP server.

   NOTE: In this example it is assumed that:
   - The FTP server IP address is `192.168.1.149`
   - The FTP server directory is `Glimmerglass/IOS/R07.01p001`

2. Initiate a Maintenance Console “admin” account session via the serial-port or via SSH:
   - “Log in Using the Serial Port” on page 97
   - “Log in Using SSH” on page 99

3. Select **Transfer File to System using FTP** in the Maintenance Console Main Menu. The FTP requirements and sub-menu is displayed (see Figure 64 on page 158).

4. Enter **1** to select **Transfer Software Upgrade Image file**.

5. When prompted, enter the FTP parameters. For example:

```
FTP Server IP address: 192.168.1.149
FTP Server Port (Press Enter for Port 21):
FTP username: ftpuser
FTP password:
FTP Source path and name: Glimmerglass/IOS/R07.01p001/GGNIOSUPG.tgz
```

NOTES:

For anonymous FTP access, press Enter in response to the username and password requests.

If the FTP user ID and password contain any of the following URL reserved delimiter characters, then they must be preceded by back-slash "\":

";", "/", "?", ":", "@", "&", "=", "+", "$".

6. After reviewing the entered FTP parameters, enter **Y** in response to "Do you want to continue?"

   The FTP file transfer will start and successful completion is indicated by message:

```
File (/dnld/GGNIOSUPG.tgz) Transferred Successfully
```

After the software upgrade file has been successfully copied to system's download directory, proceed to the next software upgrade phase, described in “Upgrading the Inactive/Rollback Partition” on page 160.

Uploading Software via SCP

The software upgrade file may be uploaded to the system /dnld directory by FTP (File Transfer Protocol, see “Uploading Software via FTP” on page 157), or by SCP (Secure Copy Protocol) as described in this section.

The SCP client command is native to Linux servers. On MS Windows an SCP client application that supports SCP/SFTP is required. Examples of free SCP client applications are:

Application	Description
pscp.exe	A small command line application that is part of the PuTTY distribution. Glimmerglass Technical Support can provide the pscp.exe file.

Application	Description
WinSCP	GUI application (download from winscp.net)

Perform the following steps to upload software via SCP:

1. Copy the Glimmerglass system upgrade file (GGNIOSUPG.tgz) to a directory on Linux server or Windows PC.

2. SCP the system upgrade file to the system. In the example below the pscp application is used in an MS Windows command window with both pscp.exe and GGNIOSUPG.tgz in the C:\temp directory:

```
C:\temp>pscp GGNIOSUPG.tgz admin@192.168.2.41:/dnld
admin@192.168.2.41's password:
GGNIOSUPG.tgz           | 16625 kB | 2230.6 kB/s | ETA: 00:00:00 | 100%
C:\temp>
```

After the software upgrade file has been successfully copied to system's download directory, proceed to the next software upgrade phase, see “Upgrading the Inactive/Rollback Partition” (below).

Upgrading the Inactive/Rollback Partition

After the software upgrade file has been uploaded via FTP or SCP to the volatile /dnld directory, then the upgrade file integrity and validity for this system can be verified and the contents can be copied to the non-volatile inactive/rollback partition. System availability is unaffected during this upgrade phase; the system continues to operate under the current release. The duration of this upgrade phase is 3-7 minutes as a function of the system model.

Figure 65 Software Upgrade

```
Select an option: 13

================================================================
SOFTWARE UPGRADE (enter Q to quit)
================================================================
Software upgrade file version: R07.01p001

Select the desired upgrade option

 1. Full Upgrade (Install and Activate with reboot)
 2. Partial Upgrade (Install software, No activation)

Select an option: 1

Starting Upgrade process...(this may take several minutes)
 Sun Apr  3 21:44:17 UTC 2011:  Processing upgrade request.
 Sun Apr  3 21:44:18 UTC 2011:  Verifying File - /dnld/scripts.tgz...
 Sun Apr  3 21:44:18 UTC 2011:  Verification Complete -
   /dnld/scripts.tgz...
 Sun Apr  3 21:44:18 UTC 2011:  Starting Upgrade.
 Sun Apr  3 21:44:19 UTC 2011:  Starting file copies.
 Sun Apr  3 21:44:21 UTC 2011:  Verifying File -
   /dnld/kernelpmppc750f.tgz...
 Sun Apr  3 21:44:21 UTC 2011:  Verification Complete -
   /dnld/kernelpmppc750f.tgz...
 Sun Apr  3 21:44:24 UTC 2011:  Verifying File - /dnld/app.tgz...
 Sun Apr  3 21:44:24 UTC 2011:  Verification Complete - /dnld/app.tgz...
 Sun Apr  3 21:44:26 UTC 2011:  Copying kernel fileset...
 Sun Apr  3 21:44:26 UTC 2011:  Copying application fileset ...
 Sun Apr  3 21:46:02 UTC 2011:  Copy of kernel fileset complete.
 Sun Apr  3 21:49:01 UTC 2011:  Copy of application fileset complete.
 Sun Apr  3 21:49:02 UTC 2011:  File copies completed.
 Sun Apr  3 21:49:02 UTC 2011:  Software upgrade - Successful
 Sun Apr  3 21:49:02 UTC 2011:  Finishing Upgrade....
 Sun Apr  3 21:49:02 UTC 2011:  REBOOT the system to effect New Software
 Logging out and rebooting....
```

Perform the following steps to upgrade the system's software:

1. Select **Upgrade software** in the Maintenance Console Main Menu.

   The software upgrade version and upgrade options are displayed (Figure 65 above).

NOTE:	If the upgrade file is corrupt or is not applicable to this system then an error message and the main menu will be displayed.:

2. Verify that the displayed upgrade version is the expected version, then do one of the following:
   - Enter **1** to select Full Upgrade
   - Enter **2** to select Partial Upgrade

Upgrade of the inactive/rollback partition will proceed and progress messages will be displayed (see Figure 65 on page 161). The duration of this upgrade phase is 3-7 minutes as a function of the system model; it concludes with the message “REBOOT the system to effect New Software”. If Full Upgrade had been selected, the system will reboot automatically completing system software upgrade. If Partial Upgrade had been selected, proceed to the next software upgrade phase (see “Rebooting to the Upgraded Partition” below).

Rebooting to the Upgraded Partition

After the inactive/rollback partition has been successfully upgraded, a system reboot will boot the upgraded partition. If the reboot to the upgraded partition is successful, then the roles of the boot and rollback partitions are reversed. Otherwise, the original boot partition is rebooted. The system is unavailable during this reboot phase. The duration of this final upgrade phase is 2-3 minutes.

After the inactive/rollback partition has been successfully upgraded (but not rebooted), you may complete the upgrade process or cancel the upgrade.

To complete the upgrade:

1. Select **Reboot** in the Maintenance Console Main Menu (see “Reboot” on page 130).

To cancel the upgrade:

1. Select **Upgrade software** in the Maintenance Console Main Menu.

   Upgrade software will detect the presence of an incomplete upgrade and offer an option to cancel the upgrade.

2. Enter **1** to select **Abort upgrade**.

3. Enter **Y** to confirm the abort upgrade request.

```
Select an option: 13

================================================================
SOFTWARE UPGRADE (enter Q to quit)
================================================================

Software Release R07.01p001 has already been installed
in the inactive partition, but not activated.
To abort the upgrade and remain on the current release, select 1
To finish upgrade and activate, select 2
Note: Abort upgrade will remove upgrade files and flags.
      Finish and Activate upgrade will reboot the system

 1. Abort upgrade
 2. Finish and Activate Upgrade

Select an option: 1

Are you sure you want to abort upgrade and clear upgrade files? [Y|N]: Y
Abort Upgrade Successful
```

Maintenance Console System Software Rollback Process

The system contains two non-volatile Flash RAM partitions (0 and 1), both containing the system software (Linux OS and Intelligent Optical Switch application) and the system configuration data. One of the two partitions is marked as the Boot Partition; on a power-cycle or user-initiated reboot the system will boot from the Boot Partition. The other partition is the Rollback Partition. If a software rollback is initiated, the roles of the two partitions are reversed, the system is booted from the former rollback partition, and the system configuration reverts to that at the time of the prior system software upgrade.

System software rollback is supported by the four system interfaces as follows:

Interface	Description
ClickFlow	Rollback System Software window
TL1	APPLY-ROLLBACK:::<ctag>;
SNMP	sysProvisionTable.prCommand sysRollback
Maintenance Console	Main Menu selection "Rollback to other partition"

To perform a rollback to the previous software version:

1. In the Maintenance Console Main Menu, select “Rollback to other partition”.

   The software release versions in the active/boot partition and inactive/rollback partition are displayed.

2. At the subsequent prompt, enter one of the following:
   - Enter **Y** to rollback the system software to the inactive/rollback release version.
   - Enter **N** to remain with current active/boot release version.

```
Select an option: 17

================================================================
Rollback software version to that in the Rollback Partition
================================================================

 Software Version on Active Partition     :   R07.01p000
 Software Version on Rollback Partition   :   R07.00p003

================================================================
Are you sure you want to continue? [Y|N]: Y

 Sun Apr  3 20:40:27 UTC 2011:  Starting rollback to other boot partition
 Sun Apr  3 20:40:27 UTC 2011:  Stop IOS application
 Sun Apr  3 20:40:34 UTC 2011:  Starting Directory copy.
 Sun Apr  3 20:40:35 UTC 2011:  Directory copy complete.
 Sun Apr  3 20:40:35 UTC 2011:  Swapping Boot partition
 Sun Apr  3 20:40:40 UTC 2011:  Logging out and Rebooting from other boot
   partition....
```

System Default Values

A

The table below lists the default settings for all items in the Glimmerglass IOS and the interfaces by which the items may be configured.

- Installation Default Value—Value in a new system shipped from Glimmerglass.
- Factory Reset Value—Value established via the Reset To Factory Defaults operation.
- Interfaces—System interfaces by which the value may be configured:
  - CF—ClickFlow (see the *Glimmerglass ClickFlow™ Graphical User Interface Manual*)
  - MC—Maintenance Console (see Chapter 10, “Maintenance Console,” on page 91 of this document)
  - SNMP—SNMP (see the *Glimmerglass IOS SNMP User Manual*)
  - TL1—TL1 (see the *Glimmerglass Transaction Language 1 Manual*)

Table of System Default Values

Item	Installation Default Value	Factory Reset Value	Interfaces
Maintenance Console User Accounts			
'admin' account password	password	(installation default)	MC
'maint' account password	password	(installation default)	MC
ClickFlow/TL1 User Accounts			
'admin' account password	password	(installation default)	CF TL1 (default via MC)
'madmin' account password	password	(installation default)	CF TL1 (default via MC)

Item	Installation Default Value	Factory Reset Value	Interfaces
SNMP User Accounts			
v1/v2 Community Strings	Read = glimmerPublic Write = glimmerPrivate	(installation default)	CF TL1 SNMP
'glimmerPublic' Security Name	No separate authentication key	(installation default)	SNMPv3
'glimmerAuthOnlyMD5' Security Name	Authentication Key = glimmerMD5AuthPassword	(installation default)	SNMPv3
' glimmerAuthOnlySHA' Security Name	Authentication Key = glimmerSHAAuthPassword	(installation default)	SNMPv3
'glimmerPrivacyMD5SHA' Security Name	Authentication Key = glimmerMD5DESAuthPassword Privilege Key = glimmerMD5DESPrivPassword	(installation default)	SNMPv3
System Network Configuration			
Host Name	Default Name (*CCSSSS*) *CC* are the 3rd and 4th characters of the system S/N. *SSSS* is the last 4 characters of the system S/N	(installation default)	CF MC TL1 SNMP
System Name	Default Name (*CCSSSS*) *CC* are the 3rd and 4th characters of the system S/N. *SSSS* is the last 4 characters of the system S/N	(installation default)	CF TL1 SNMP
Ethernet 1 Port IP Address	192.168.2.200	Not changed	CF MC TL1 SNMP
Ethernet 1 Port IP Subnet Mask	255.255.255.0	Not changed	CF MC TL1 SNMP
Ethernet 1 Port Gateway IP Address	192.168.2.201	Not changed	CF MC TL1 SNMP
Ethernet 2 Port IP Address	192.168.3.200	Not changed	CF MC TL1 SNMP
Ethernet 2 Port IP Subnet Mask	255.255.255.0	Not changed	CF MC TL1 SNMP
Firewall – Allow List	Allow "all"	(installation default)	MC

Item	Installation Default Value	Factory Reset Value	Interfaces
Startup Parameter Configuration (TCP/UDP Ports)			
Operation Mode (-operationMode)	normal	(installation default)	CF MC
SNMP Listening Port (-snmpPort)	Port 161 (UDP, well known SNMP port)	(installation default)	CF MC SNMP
Smart TL1 Port (-tl1SmartPort)	Port 10033 (TCP)	(installation default)	CF MC SNMP
Fast TL1 Port (-tl1FastPort)	Port 10034 (TCP)	(installation default)	CF MC SNMP
Smart TL1 SSL Port (-tl1SmartSSLPort)	Port 10035 (TCP)	(installation default)	CF MC SNMP
Fast TL1 SSL Port (-tl1FastSSLPort)	Port 10036 (TCP)	(installation default)	CF MC SNMP
Secure all TL1 Sessions (-tl1SSLEnable)	0 (disabled)	(installation default)	CF MC SNMP
ClickFlow – http access (-webPort)	Port 80 (TCP, well known http port)	(installation default)	CF MC SNMP
Secure ClickFlow (-webSSLEnable)	1 (enabled)	(installation default)	CF MC SNMP
ClickFlow – https access (-webSSLPort)	Port 443 (TCP, well known https port)	(installation default)	CF MC SNMP
System Date/Time Configuration			
Clock Source	Internal Clock (free running)	(installation default)	CF MC SNMP TL1
NTP Servers 1 to 3	None	(installation default)	CF MC SNMP TL1
Syslog Configuration			
Syslog IP Destinations	None	(installation default)	CF MC SNMP TL1
Log Level	Off	(installation default)	CF MC SNMP TL1
SNMP Trap Destinations			
SNMP v2 Trap Destinations	None[1]	(installation default)	CF TL1 SNMP

Item	Installation Default Value	Factory Reset Value	Interfaces
SNMP v1/v3 Trap Destinations	None[1]	(installation default)	SNMPv3
ClickFlow/TL1 User Account Security Parameter Configuration			
Password Aging Default (PAGE)	0 Days (Equates to “off”)	(installation default)	CF TL1
Password Change Default (PCND)	0 Days (Equates to “off”)	(installation default)	CF TL1
Password Minimum Interval (PINT)	0 Days (Equates to “off”)	(installation default)	CF TL1
Account Aging Interval (UOUT)	0 Days (Equates to “off”)	(installation default)	CF TL1
ClickFlow/TL1 Login/Session Security Parameter Configuration			
Maximum Invalid Login Attempts (MXINV)	0 (Equates to “off”)	(installation default)	CF TL1
Lockout Duration (DURAL)	1 minute	(installation default)	CF TL1
No-Activity Timeout (TMOUT)	10 minutes	(installation default)	CF TL1
System Runtime Parameter Configuration			
AutoSave Enable	On	(installation default)	CF SNMP TL1
AutoSave Delay	60 seconds	(installation default)	CF SNMP TL1
Connection Restore	Restore	(installation default)	CF SNMP TL1
Perf Switch Throttle Enable	Off	(installation default)	CF SNMP TL1
Event Reporting Mode	Summary	(installation default)	CF SNMP TL1
Confirm Required	User Selected	(installation default)	CF TL1
Default Connection Mode	Simplex	(installation default)	CF TL1
ClickFlow Ports per Row	0 (Equates to system default of 32)	(installation default)	CF

Item	Installation Default Value	Factory Reset Value	Interfaces
ClickFlow PMUs per Row	0 (Equates to system default of 4)	(installation default)	CF
Port Configuration			
Port Group	OpenGroup (All ports in this group)	(installation default)	CF SNMP TL1
Input and Output Port Names – Normal Ports	None	(installation default)	CF SNMP TL1
PMU and VOA Port Names – Reference Ports (PMU & SVOA)	Default Port Names (based on port type and direction)	(installation default)	CF SNMP TL1
Port Descriptions (All Ports)	None	(installation default)	CF SNMP TL1
STMINSEV	Disabled	(installation default)	CF SNMP TL1
STMAXSEV	Disabled	(installation default)	CF SNMP TL1
CSFLTSEV	Critical	(installation default)	CF SNMP TL1
Protection Rules	None	(installation default)	CF SNMP TL1
VOA Settings	Mode = Off, Value = 0 for all VOAs	(installation default)	CF SNMP TL1
Connection Configuration			
Connection Descriptions	None (No connections)	(installation default)	CF SNMP TL1
Connection NVRAM	Empty (No connections)	(installation default)	CF SNMP TL1
Signal Threshold Configuration			
1550 Signal Threshold	STMIN = -20dBm, STMAX = 5dBm, Hyst = ±1dB	(installation default)	CF SNMP TL1
1310 Signal Threshold	STMIN = -20dBm, STMAX = 5dBm, Hyst = ±1dB	(installation default)	CF SNMP TL1

Item	Installation Default Value	Factory Reset Value	Interfaces
ClickFlow Login Screen Elements			
System Description	"Glimmerglass IOS Optical Switch System"	(installation default)	CF SNMP
Login Warning	"WARNING: AUTHORIZED USE ONLY. VIOLATIONS WILL BE PROSECUTED!"	(installation default)	CF

1. The SNMP Target Address table default includes three entries (rows) as examples/prototypes, however the rows are disabled (row status is notInService(2).