



DIGILINK DLC450 FUNCTION MODULE



**HD, SD, ASI, and Gig-E Transport
Over 10Gig Ethernet Gateway**

**Installation and Operations
Manual**



DLC450 Function Module

HD, SD, ASI, and Gig-E Transport Over 10 Gig Ethernet Gateway

Installation and Operations Manual

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Revision history for the *DLC450 Function Module Installation and Operations Manual*.

Table 0-1. Manual Revision History

Revision History			
Revision	Document Number	Date	Reason for Change
A	AR200-008450-B00_A	March, 2014	Initial release.
B	AR200-008450-B00_B	January, 2015	Copy edits and new graphics.
C	AR200-008450-B00_C	March, 2015	Typo correction on front cover.
D	AR200-008450-B00_D	February, 2016	Updated Artel logo.
E	AR200-008450-B00_E	August, 2016	Added material that describes new module functionality.
F	AR200-008450-B00_F	December, 2016	Updated images and copy edits.



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About This Manual

This manual provides instructions for installing, configuring, and operating the DLC450 function module.

Audience

This manual is intended for the following trained and qualified service personnel who are responsible for installing and operating the DLC450 module:

- System installer
- Hardware technician
- System operator

Related Documentation

The following documentation contains material related to the DLC450 function module:

Document	Provides . . .
<i>DLC450 Data Sheet</i>	Product operating and environmental specifications, and regulatory conformance information.
<i>DLC450 Quick Start Guide</i>	Product configuration information and descriptions of the front and rear panel status LED operations.
<i>DigiLink Media Transport Platform Installation and Operations Manual</i>	Overview and installation instructions for the DigiLink media transport platform chassis options, including the following: <ul style="list-style-type: none">• DL4360x chassis—Installation of this 12-slot chassis, power supplies, switch module, and function modules.• DL4300 chassis—Installation of this 12-slot chassis, power supplies, and function modules.• DL4000 chassis—Installation of this 4-slot chassis, power supplies, and function modules.
<i>DigiLink Media Transport Platform Chassis Data Sheet</i>	Overview of the DigiLink media transport platform chassis options.
<i>DigiLink Manager Setup and Operations Manual</i>	Overview and operating instructions for the DigiLink Manager element management system.

Symbols and Conventions

This manual uses the following symbols and conventions.

Caution

A caution means that a specific action you take or fail to take could cause harm to the equipment or to the data transmission.



Warning

A warning describes an action you take or fail to take that could result in death, serious physical injury, or destruction of property.

Note: Important related information, reminders, and recommendations.

Italics—used for emphasis, for indicating the first occurrence of a new term, and for book titles

1. Numbered list—where the order of the items is important
 - Bulleted list—where the items are of equal importance and their order is unimportant

Artel Customer Service

You can reach Customer Service by e-mail at customercare@artel.com or by telephone:

In the US call (800) 225-0228, then select 1 for technical support.

Outside the US call (978) 263-5775, then select 1 for technical support.

When requesting assistance, please be ready to provide the following information:

- Your name and telephone number
- Product model and serial number
- Brief description of the problem
- List of symptoms
- Steps you have already taken to try to resolve the problem

If the product is damaged

If any portion of the unit is damaged, forward an immediate request to the delivering carrier to perform an inspection of the product and to prepare a damage report. Save the container and all packing materials until the contents are verified.

Concurrently, report the nature and extent of the damage to Artel Customer Service so that action can be initiated to either repair or replace the damaged items.

Do not return any items to Artel until you obtain instructions from Customer Service.

Report the problem or deficiency to Customer Service along with the model number and serial number. Upon receipt of this information, Artel will provide service instructions, or a *Return Authorization Number* and shipping information.

DLC450 Function Module

HD, SD, ASI, and Gig-E Transport Over 10 Gig Ethernet Gateway

Information About the DLC450 Module

This manual introduces the DLC450 function module and includes information for installing and configuring the module. The DLC450 module is a single channel ASI, SD-SDI, or HD-SDI over IP gateway with 1 Gigabit (G) of Ethernet traffic bridged between its 10G and 1G interfaces.

The DLC450 can operate as a transmitter or receiver as follows:

- **Transmitter**—Video input is auto-sensed as either HD-SDI or SD-SDI or ASI on the input BNC or backplane input. If the video data is ASI, it is packetized as SMPTE 2022-2 packets and SMPTE 2022-1 forward error correction (FEC) packets are included to maximize reliability. If the video data is HD-SDI or SD-SDI, it is packetized as SMPTE 2022-6 packets and SMPTE 2022-5 forward error correction packets are included to maximize reliability.
- **Receiver**—Either SMPTE 2022-1/2 ASI video or SMPTE 2022-5/6 SDI packets are received, de-encapsulated, and fed out both the backplane and BNC out. FEC packets are used if included to help recover packets that are lost due to an unreliable Ethernet link.

The DLC450 provides flexible user-configurable FEC and buffering settings:

- Selectable transmitter row and column FEC settings.
- Selectable receiver buffering.
- Designed to withstand burst outages in excess of 3 mS.

Additional features include the following:

- Auto-senses the video signalling format.
- Supports transport of 1G (bridged from the 10G interface) of user data traffic through the rear panel SFP or backplane connection to Ethernet ports of other 1G Ethernet-featured modules in the chassis.
- Supports 10 Gigabit for transport of combined user data and video traffic over a SFP+.
- Fully transparent carriage of SDI data, audio, or ancillary data.
- Support for +/- 30 ppm frequency offset for HD (SMPTE 274 section 5.1 specifies +/- 10 ppm) and for SD video.
- Support for +/- 100 ppm for ASI streams.

- Standards-based encapsulation and FEC:
 - SMPTE 2022-5/6 IP encapsulation of HD-SDI or SD-SDI including FEC.
 - SMPTE 2022-1/2 IP Encapsulation of DVB-ASI including FEC.
 - SMPTE 2022-5 FEC recovers lost, damaged, or delayed packets of HD and SD-SDI.
 - SMPTE 2022-1 FEC recovers lost, damaged, or delayed packets of ASI.
- Support for unicast or multicast streaming.

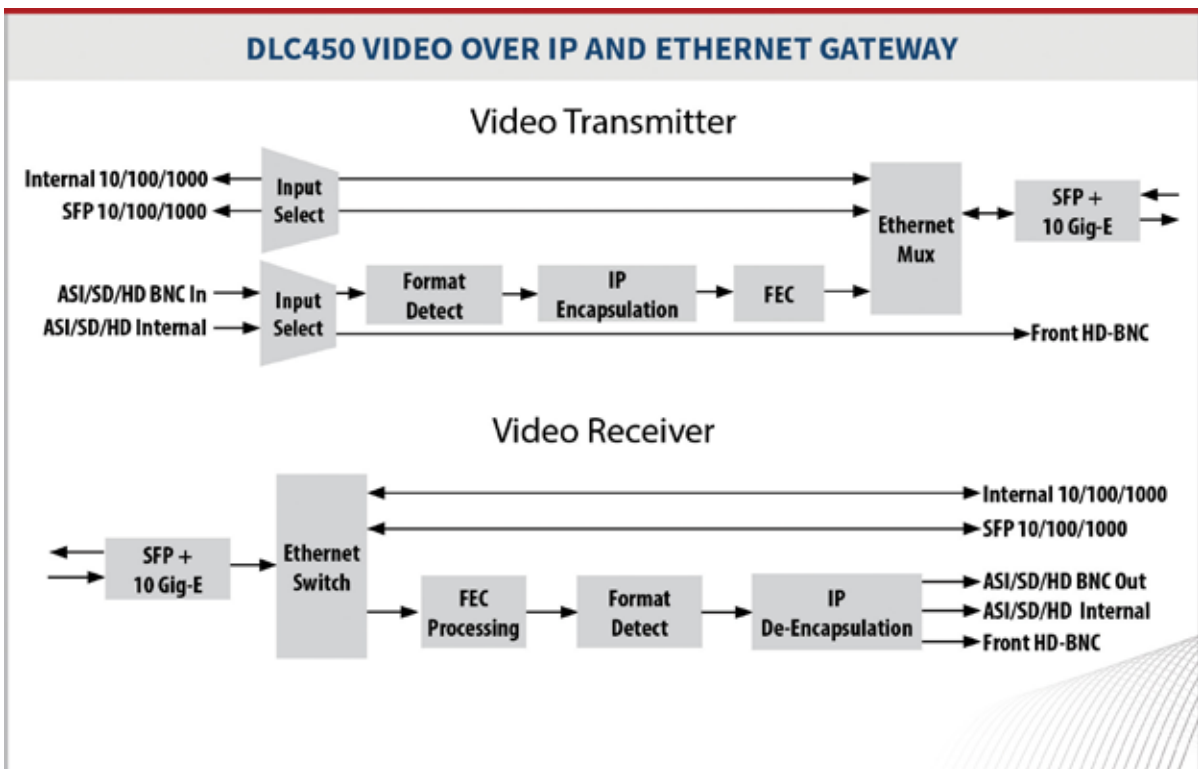
You provision and monitor the DLC450 module as follows:

- Provision and monitor the module remotely using DigiLink Manager, which is Artel's element management system (for more information, see the *DigiLink Manager Setup and Operations Manual*).
- Monitor the module locally using the front and rear panel status LEDs.
- Upgrade the FPGA using DigiLink Manager (see the *DigiLink Manager Setup and Operations Manual*).

DLC450 Module Functional Description

This section provides a functional description of the DLC450 module, including [Figure 1](#), which are functional block diagrams of the module operating in transmitter and receiver modes.

Figure 1. DLC450 Module Functional Block Diagrams



Electrical/Optical Inputs and Outputs

The DLC450 module can transport both video and user data and uses the following inputs and outputs:

- Two electrical rear panel connections for video data:
 - One input BNC connector (IN).
 - One output BNC connector (OUT).
- Rear panel SFP+ (10G) and SFP (1G) transceiver sockets:
 - 10G—User and video data. The module's operating mode determines the configuration of traffic through this port as follows:
 - Transmit (TX) mode—IP video traverses out of this socket.
 - Receive (RX) mode—IP video traverses in to this socket.
 - 1G—User data only

The SFP+ and SFP sockets support the following optics:

- WDM (1310 nm, 1550 nm)
- CWDM ITU G.694.2 (Channels 27-61)
- (SFP only) DWDM ITU G.694.1 (Channels 21-60)

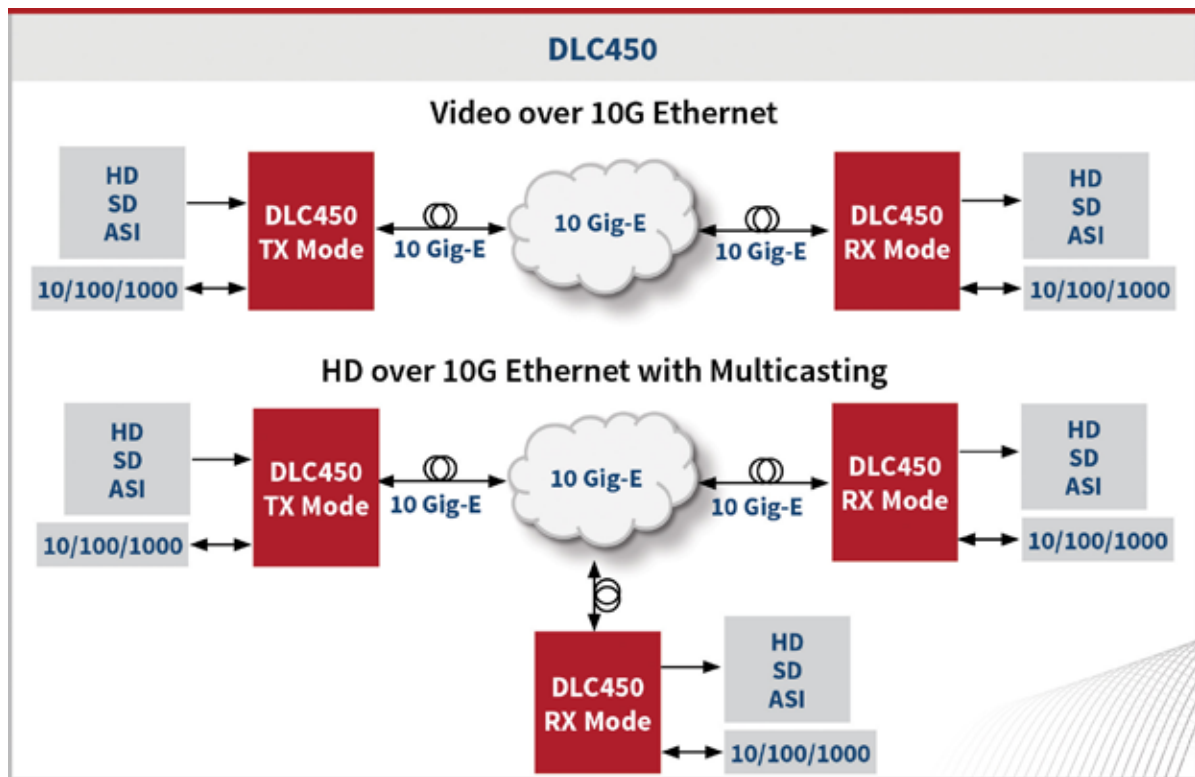
The SFP+ and SFP sockets support the following electrical connections:

- (SFP only) RJ45
- (SFP+ only) 10GbE passive copper cables
- Backplane connections for sharing signals with other host chassis modules.
- Front panel 75 Ohm HD-BNC output jack (MON) for local signal monitoring (see the [“Monitoring the Module Using the Monitor Jack”](#) section on page 16).

DLC450 Sample Applications

Figure 2 shows how you can configure the DLC450 for transporting either HD-SDI, SD-SDI, or ASI and 1G user data traffic over a 10G Ethernet network or transporting HD video over a 10G Ethernet network with multicasting.

Figure 2. DLC450 Sample Applications



Overview of the DLC450 Module

This section provides an overview of the components that make up the DLC450 module.

Figure 3. DLC450 Module Major Components

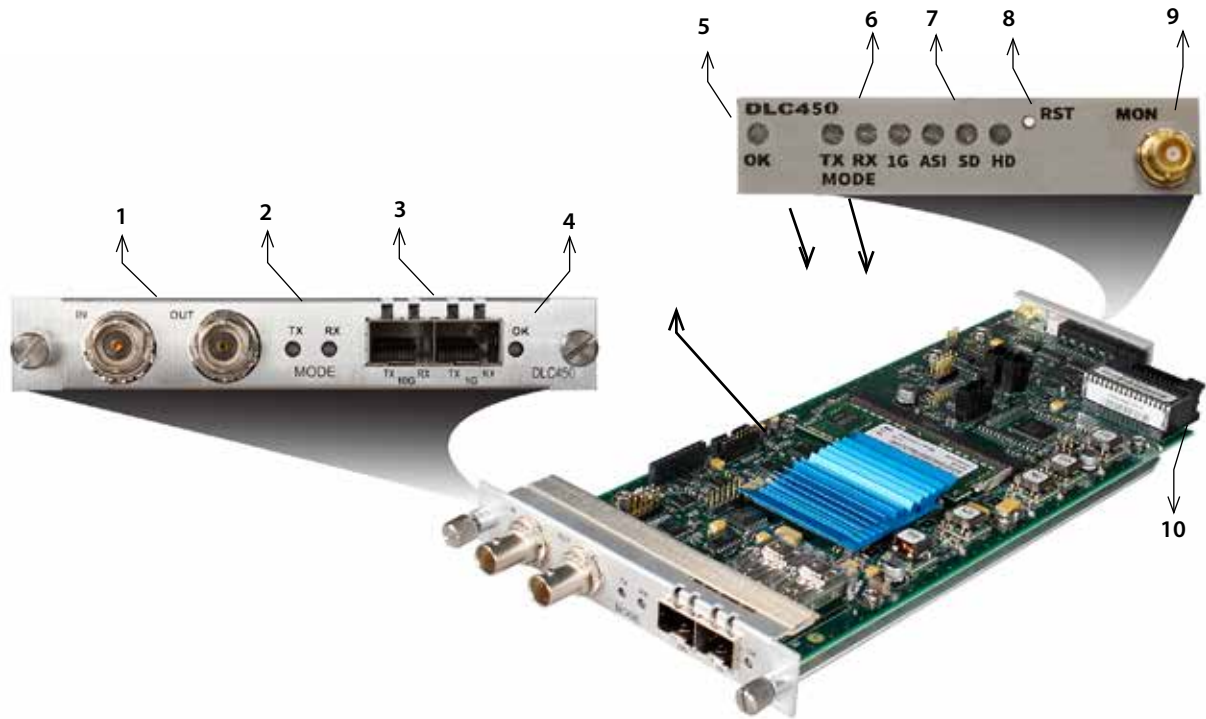


Table 1. DLC450 Elements

Item	Module Element	for details, see...
1	Rear panel BNC connectors for the following electrical connections: <ul style="list-style-type: none"> IN—Video in OUT—Video out 	Cabling the BNC Connections (page 8)
2	Operating mode indicators: <ul style="list-style-type: none"> TX MODE—Transmitter mode RX MODE—Receiver mode 	Understanding the Rear Panel Status LEDs (page 15)
3	SFP+ and SFP sockets: <ul style="list-style-type: none"> 10G—(SFP+) User and video data 1G—(SFP) User data only 	<ul style="list-style-type: none"> Cabling the SFP+ and SFP Connections (page 8) Understanding the Rear Panel Status LEDs (page 15)
4	Rear panel alarm indicator OK LED.	Understanding the Rear Panel Status LEDs (page 15)

Table 1. DLC450 Elements (Continued)

Item	Module Element	for details, see...
5	Front panel alarm indicator OK LED.	Understanding the Front Panel Status LEDs (page 13)
6	Front panel transmit (TX) and receive (RX) operating mode (MODE) indicator LEDs.	
7	Front panel status LEDs for the 1G SFP link and ASI, SD, and HD formats.	
8	Front panel reset switch (RESET) to restart the module's FPGA.	Using the DLC450 Reset Switch (page 18)
9	Front panel monitor 75 Ohm HD-BNC output jack (MON).	Monitoring the Module Using the Monitor Jack (page 16)
10	Backplane connector that provides power to the module, allows the module to share signals with other function modules, and is used for alarm and management signals.	Configuring the Module (page 8)

Installing the DLC450 Module

The DLC450 module and associated SFP and SFP+ are hot swappable, enabling you to safely install them while power is applied to the host chassis. Before you install the module, see the DLC450 data sheet for a detailed description of the module specifications, including environmental requirements, that you must adhere to when installing the module.

Note: You must install the DLC450 module in a chassis that includes DL Manager functionality as the module requires DL Manager for configuration and monitoring purposes. For more information, see the [“Configuring the Module”](#) section on page 8.

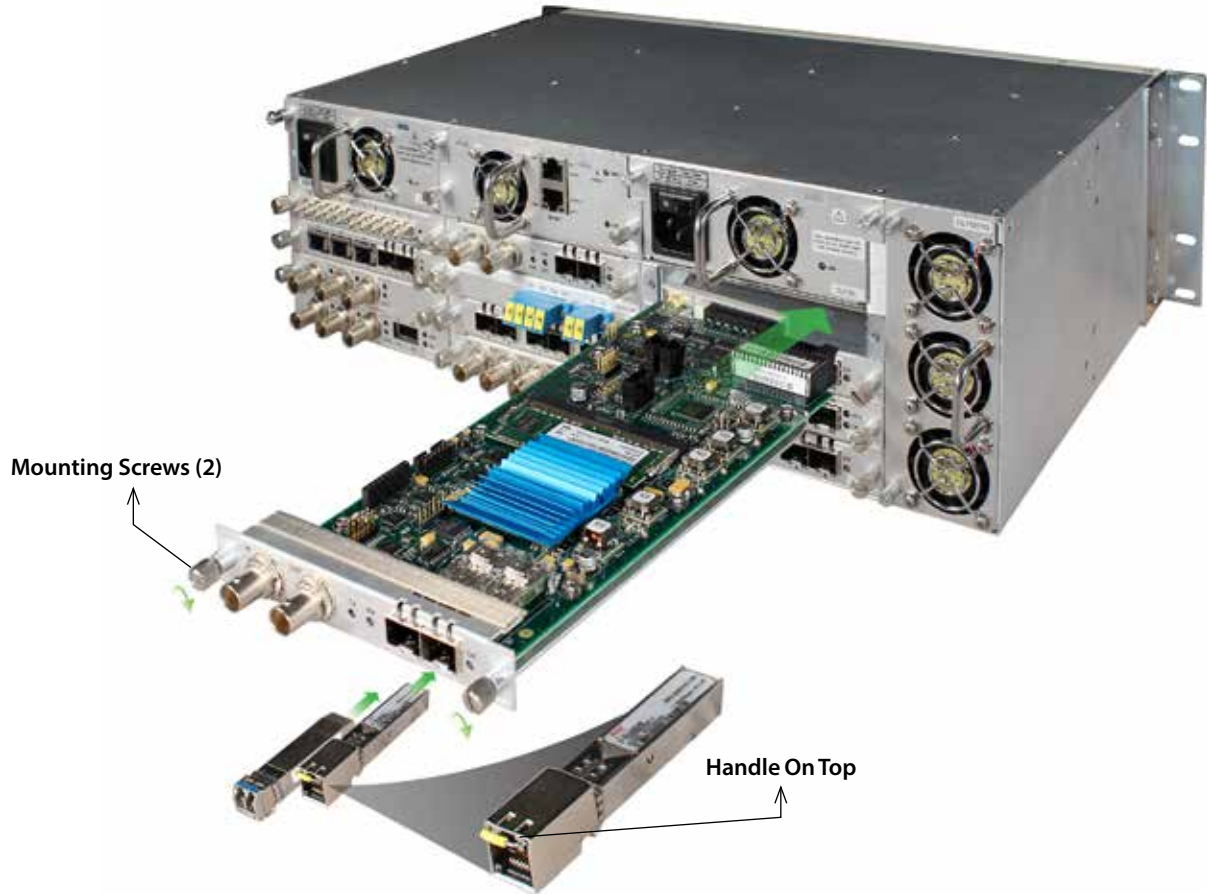
Note: When installing DLC450s in a DL4000 chassis where the installed power supply is either a DLP001 or DLP002, then the total power drawn by all of the installed modules must be less than 40 W. When installing DLC450s in a chassis with a DLP001A or DLP002A power supply, then the total power drawn by all of the installed modules must be less than 80 W.

To install the DLC450 module in the host chassis (see [Figure 4](#)), perform the following steps:

- From the back of the chassis, remove the two screws that secure the blank tray to the unused function module slot.
Use any available function module slot.
- Slide the module into the chassis slot using the printed circuit board guide rails on either side of the slot.
- Push the module in until it is firmly seated into the backplane and flush with the chassis.
- Tighten the two mounting screws that secure the module to the chassis.
- Install the Artel approved SFP+ in the 10G socket and the SFP in the 1G socket of the module (handle on top as shown in [Figure 4](#)).
Push the SFP+ and SFP into their designated sockets until they are firmly seated.

6. Insert a blank tray in any unused chassis module slot to maintain proper ventilation.

Figure 4. DLC450 Module and SFP+ Installation



Cabling the DLC450 Module

This section describes how to cable the external connections of the DLC450 module, which can receive and transmit external signals over its BNCs, SFP+, and SFP. The cabling configuration that you use depends on your application.

Figure 5. DLC450 BNC Connectors, 10G SFP+ Socket, and 1G SFP Socket



Cabling the BNC Connections

To connect to the BNC connectors on the DLC450, use a high quality 75 Ohm precision video coax cable, such as Belden 1694A cable.

To cable the BNC electrical connections, perform the following tasks:

- Input signal—Connect the coax cable to the DLC450 receive connector (IN) and the source device's electrical transmit connector.
- Output signal—Connect the coax cable to the DLC450 transmit connector (OUT) and the destination device's electrical receive connector.

Cabling the SFP+ and SFP Connections

When using an optical SFP+ or SFP, use a single mode fiber when connecting to the LC connectors of the SFPs.

To cable the 10G (SFP+) and 1G (SFP) connections, perform the following tasks:

1. (Optical only) Remove the safety plug that protects the TX and RX ports.
Cover any unused optical port to keep the port clean.
2. Connect the fiber optic or electrical cable between the SFP+ and SFP connectors on the module and the external source or destination device as follows:
 - 10G Socket—(SFP+) User and video data.
 - 1G Socket—(SFP) User data only.

Configuring the Module

You configure the DLC450 module operation using the DigiLink Manager (DL Manager) element management system and the module's configuration page.

Artel ships the DLC450 configured as follows:

Table 2. DLC450 Factory Settings

Parameter	Setting	Parameter	Setting
Module Settings (for details, see Table 3)		Transmitter Settings (for details, see Table 6)	
Operational Mode	Receive	Video Source	In BNC
Video	Enabled	Destination IP Addr	239.0.0.1
1G	Disabled	Port	4096
Jumbo Frames	Enabled	Time To Live	128
IP Address	192.168.100.10	HD-SDI FEC Settings	
Netmask	255.255.255.0	FEC Mode	None
Gateway	--	Column	128
Video Alarm	Disabled	Row	16
10G SFP+ Alarm	Enabled	SD-SDI FEC Settings	

Parameter	Setting	Parameter	Setting
1G SFP Alarm	Disabled	FEC Mode	None
Video Signal Types (for details, see Table 4)		Column	128
HD-SDI	Enabled	Row	8
SD-SDI	Enabled	ASI FEC Settings	
ASI	Enabled	FEC Mode	None
Receiver Settings (for details, see Table 5)		Column	8
Source IP Addr	--	Row	8
Multicast Group	239.0.0.1		
Port	4096		
Recovery Buffer	Sm		

Prerequisites

To configure the DLC450 module, you must access the DL Manager that manages the module. For details about accessing and setting up DL Manager, see the *DigiLink Manager Setup and Operations Manual*.

To configure the DLC450 module operation, perform the following steps:

- From a browser window, enter the IP address of the DL Manager that manages the module.
The Home page displays.
- From the Home page menu bar, click **Shelf View**.
The Shelf View page displays, which shows the rear chassis panel along with the Installed Modules table.
- From the Installed Modules table, click the **DLC450** link listed in the Module Type column.
The Module Status page displays, which shows the module's current configuration, alarm conditions (if any), and SFP+ and SFP optical status.
- From the menu bar, click **Configuration**.
The Configuration page displays.
- From the Module Settings panel, configure the following parameters:

Table 3. Module Settings Parameters

Parameter	Description
Operational Mode	<p>Select the module operating mode (relative to the 10G video circuit) as follows:</p> <ul style="list-style-type: none"> Receive—The module receives encapsulated video on the SFP+ RX connection, applies a FEC algorithm, and then de-encapsulates the video. Transmit—The module transmits encapsulated video on the SFP+ TX connection. Optionally, it may have included FEC data.

Table 3. Module Settings Parameters (Continued)

Parameter	Description
Video	Enable or Disable video transport over the 10G link.
1G	From the drop-down list, disable or specify the source of the 1Gbps Ethernet to be bridged over the 10G link: <ul style="list-style-type: none"> • disabled • SFP • Backplane—This option is available only when the DLC450 is installed in a DL4360x chassis. Note: Select only Ethernet ports that are not in use.
Jumbo Frames	Enable or disable support for IP Frames that are greater than 1518 bytes and up to 9216 bytes in size.
IP Address	Specify the local IP address of the module. This address responds to pings and is the source IP address of any video transmissions from this module.
Netmask	Specify the netmask for the module.
Gateway	(Optional) Specify the IP address of the network gateway if needed.
Video Alarm	Enable or Disable the alarm for when no video is detected.
10G SFP+ Alarm	Enable or Disable the alarm for when the 10Gbps SFP+ is not present.
1G SFP Alarm	Enable or Disable the alarm for when the 1Gbps SFP is not present.

6. From the Video Signal Types panel, configure the following parameters:

Table 4. Video Signal Types Parameters

Parameter	Description
HD-SDI	Enable or Disable detection or output of HD-SDI video format.
SD-SDI	Enable or Disable detection or output of SD-SDI video format.
ASI	Enable or Disable detection or output of ASI video format.

7. From the Receiver Settings panel, configure the following parameters:

Table 5. Receiver Settings Parameters

Parameter	Description
Source IP Addr	(Optional) Specify the IP address filter value of the video source. Enter a value using dotted-decimal format (for example, 10.10.10.1) to only accept video traffic from this IP address. If the video source is another DLC450, this is the IP Address of the transmitter module. To disable filtering on the source IP, clear this field.

Table 5. Receiver Settings Parameters (Continued)

Parameter	Description
Multicast Group	(Optional) Specify the Multicast Group Address, which is used when the receiver is to join and receive video from a multicast group. Enter a value using dotted-decimal format (for example, 225.0.0.1).
Port	(Optional) Specify the destination UDP port address. Valid values are as follows: 1 to 65535 . The default is 4096 .
Recovery Buffer	Specify the tolerance of the receive ports as follows: <ul style="list-style-type: none"> Sm—When set to small, stream latency is minimized and late arriving packets are dropped. Lg—When set to large, tolerance for late arriving packets and stream latency are maximized.

- From the Transmitter Settings panel, configure the following parameters:

Table 6. Transmitter Settings Parameters

Parameter	Description
Video Source	Select the video source to transmit from the drop-down list. The options that display in the list will vary depending on the modules that are installed in the host chassis.
Destination IP Addr	Specify the IP address to which the video is sent. When multicast is in use, this is the Multicast Group Address. Enter a value using dotted-decimal format (for example, 10.10.10.1).
Port	(Optional) Specify the module port to use for transmitting IP packets. Valid destination UDP port numbers are as follows: 1 to 65535 . The default is 4096 .
Time To Live	Specify the number of route hops that a packet may make before it is dropped. Valid values are as follows: 1 to 255 .
HD-SDI FEC Settings	Specify the HD-SDI FEC settings. The default FEC mode is None . The value for FEC Column (L) must be between 1 and 750 for HD-SDI. Values of (L * D) are further restricted to 3000 for HD-SDI streams. Valid values are as follows: <ul style="list-style-type: none"> Column Range—1 to 750 RowColumn Range—4 to 750 Row * Column—3000 The value for FEC Row (D) must be between 4 and 255 . Values of (L * D) are further restricted to 3000 for HD-SDI streams. Valid values are as follows: <ul style="list-style-type: none"> Range—4 to 255 Row * Column—3000

Table 6. Transmitter Settings Parameters (Continued)

Parameter	Description
SD-SDI FEC Settings	<p>Specify the SD-SDI FEC settings. The default FEC mode is None.</p> <p>The value for FEC Column (L) must be between 1 and 375 for SD-SDI. Values of (L * D) are further restricted to 1500 for SD-SDI.</p> <p>Valid values are as follows:</p> <ul style="list-style-type: none"> • Column Range—1 to 375 • RowColumn Range—4 to 375 • Row * Column—1500 <p>The value for FEC Row (D) must be between 4 and 255. Values of (L * D) are further restricted to 1500 for SD-SDI streams.</p> <p>Valid values are as follows:</p> <ul style="list-style-type: none"> • Range—4 to 255 • Row * Column—1500
ASI FEC Settings	<p>Specify the ASI FEC settings. The default FEC mode is None.</p> <p>The value for FEC Column (L) must be between 1 and 20 for ASI. Values of (L * D) are further restricted to 100 for ASI streams.</p> <p>Valid values are as follows:</p> <ul style="list-style-type: none"> • Range—1 to 20 • Row * Column—100 <p>The value for FEC Row (D) must be between 4 and 20. Values of (L * D) are further restricted to 100 for ASI streams.</p> <p>Valid values are as follows:</p> <ul style="list-style-type: none"> • Range—4 to 20 • Row * Column—100

9. Click **Submit**.

The configuration is saved and the module is ready to process video.

Monitoring DLC450 Operations

This section describes how to monitor DLC450 operations using the front and rear panel status LEDs or DigiLink Manager and contains the following topics:

- [Monitoring the Module Using the Module Status LEDs \(page 13\)](#)
- [Monitoring the Module Using the Monitor Jack \(page 16\)](#)
- [Monitoring the Module Using DL Manager \(page 16\)](#)

Monitoring the Module Using the Module Status LEDs

This section describes how to monitor the module's operations using the front and rear panel LEDs and contains the following topics:

- [Understanding the Front Panel Status LEDs \(page 13\)](#)
- [Understanding the Rear Panel Status LEDs \(page 15\)](#)

Understanding the Front Panel Status LEDs

[Table 7](#) describes the states of the DLC450 front panel status LEDs as shown in [Figure 6](#).

Figure 6. DLC450 Front Panel Status LEDs



Table 7. DLC450 Front Panel Status LEDs

LED	Indicates ...	State	Description
OK	Module status	Off	If power is applied to the system, an internal fault with the module may exist.
		Green	Normal operation.
		Yellow	Minor alarm condition exists.
		Red	Major alarm condition exists.

Table 7. DLC450 Front Panel Status LEDs (Continued)

LED	Indicates ...	State	Description
MODE: TX	Transmitter mode indicator	Off	Receiver mode is selected or Video is disabled (see Table 3).
		Green	Valid video format as configured in DL Manager.
		Yellow	No video format detected as configured in DL Manager.
		Yellow (flashing)	In Unicast mode and no Address Resolution Protocol (ARP) reply.
		Red	No link.
MODE: RX	Receiver mode indicator	Off	Transmitter mode is selected or Video is disabled (see Table 3).
		Green	Valid video detected on the 10 G interface with correct IP configuration.
		Yellow	No video input at receiver detected.
		Yellow (flashing)	Packet errors detected.
		Red	No link.
1G	1G SFP link	Off	1G not enabled.
		Green	Link established.
		Green (flashing)	Link established with activity.
		Yellow	RX optical power high.
		Yellow (flashing)	1G Ethernet enabled, errors detected.
		Red	No link.
		Red (flashing)	No SFP installed, low light, or loss of signal.
ASI	ASI signal mode indicator	Off	ASI disabled or other rate detected.
		Green	ASI enabled and ASI detected.
		Yellow	ASI enabled but no signal detected.
		Red	Input fault or ASI not enabled but ASI detected.
SD	SD signal mode indicator	Off	SD disabled or other rate detected.
		Green	SD enabled and SD detected.
		Yellow	SD enabled but no signal detected.
		Red	Input fault or SD not enabled but SD detected.

Table 7. DLC450 Front Panel Status LEDs (Continued)

LED	Indicates ...	State	Description
HD	HD signal mode indicator	Off	HD disabled or other rate detected.
		Green	HD enabled and HD detected.
		Yellow	HD enabled but no signal detected.
		Red	Input fault or HD not enabled but HD detected.

Understanding the Rear Panel Status LEDs

Table 8 describes the states of the DLC450 rear panel status LEDs as shown in Figure 7.

Figure 7. DLC450 Rear Panel Status LEDs

Table 8. DLC450 Rear Panel Status LEDs

LED	Indicates ...	State	Description
TX Mode	Transmitter mode indicator	--	Same operation as the front panel MODE: TX LED (see Table 7).
RX Mode	Receiver mode indicator	--	Same operation as the front panel MODE: RX LED (see Table 7).
10G TX	10G transmitter mode status	Off	Not valid during normal operation.
		Green	Normal operation.
		Red	TX fault.
		Red (flashing)	No SFP+ installed.
10G RX	10G receiver mode status	Off	Not valid during normal operation.
		Green	Link established.
		Green (flashing)	Link established with activity.
		Yellow	RX optical power high.
		Red	No link.
		Red (flashing)	No SFP+ installed, low light, or loss of signal.

Table 8. DLC450 Rear Panel Status LEDs (Continued)

LED	Indicates ...	State	Description
1GTX	1G transmitter mode status	Off	1G not enabled.
		Green	Normal operation.
		Red	TX fault.
		Red (flashing)	No SFP installed.
1GRX	1G receiver mode status	Off	1G not enabled.
		Green	Link established.
		Green (flashing)	Link established with activity.
		Yellow	RX optical power high.
		Yellow (flashing)	1G Ethernet enabled, errors detected.
		Red	No link.
		Red (flashing)	No SFP installed, low light, or loss of signal.
OK	Module status	--	Same operation as the front panel OK LED (see Table 7).

Monitoring the Module Using the Monitor Jack

You can monitor the video that the DLC450 receives or transmits by using the front panel monitor jack (MON). The monitor jack output depends on which mode you configured the module to operate in as follows:

- Transmitter Mode—Output is a copy of the ASI, SD-SDI, HD-SDI signal received on the BNC In connector on the rear panel.
- Receiver Mode—Output is a copy of the ASI, SD-SDI, HD-SDI signal sent out the BNC Out connector on the rear panel.

To connect a monitor to the DLC450 to view the transmit or receive signal, connect the monitor cable between the monitor and the 75 Ohm HD-BNC monitor jack located on the DLC450 front panel (see [Figure 3](#)).

Monitoring the Module Using DL Manager

This section shows how to use DL Manager to view the module's current configuration, major and minor alarm status, and the optical status of the SFP+ and SFP.

Prerequisites

To monitor the DLC450 module using DL Manager, you must access the DL Manager that manages the module. For details about accessing and setting up DL Manager, see the *DigiLink Manager Setup and Operations Manual*.

To monitor the DLC450 module operation, perform the following steps:

1. From a browser window, enter the IP address of the DL Manager that manages the module.
The Home page displays.
2. From the Home page menu bar, click **Shelf View**.
The ShelfView page displays, which shows the rear chassis panel along with the Installed Modules table.
3. From the Installed Modules table, click the **DLC450** link listed in the Module Type column.
The Module Status page displays, which shows the following information:

Table 9. Module Status Page

Panel	Field	Description
Current Configuration	Mode	Configured operating mode: Receiver, Transmitter, or Disabled.
	Video Alarms	Configured operating state: Enabled or Disabled.
	10G SFP+ Alarms	Configured operating state: Enabled or Disabled.
	1G SFP Alarms	Configured operating state: Enabled or Disabled.
	Video	Configured operating state: Enabled or Disabled.
	HD-SDI	Configured operating state: Enabled or Disabled.
	SD-SDI	Configured operating state: Enabled or Disabled.
	ASI	Configured operating state: Enabled or Disabled.
Traffic Status	10G Link	Link status: Up or Down.
	Video	Detected video type: HD-SDI, SD-SDI, or ASI. The displayed video type includes the word "DISABLED" when the type is configured as Disabled (see Table 4) or "INVALID" when for example 1080p24 is connected. Just the video type displays when it is configured as Enabled .
	1G Link	Link status: Up, Down, or Disabled
	1G	Connection that the 1G is configured to use as follows: <ul style="list-style-type: none"> SFP—Rear panel 1G SFP socket. Backplane—Chassis backplane connection. This connection type is only possible when the module is installed in a DL4360x chassis.

Table 9. Module Status Page (Continued)

Panel	Field	Description
Alarms	Major Alarms	Detected major alarm status of monitored entities as follows: <ul style="list-style-type: none"> Green—No alarms detected. Red—Alarm detected that requires immediate attention. When the alarm indicator is red, DL Manager provides a descriptive list of any detected alarms to indicate the source of the problem.
	Minor Alarms	Detected minor alarms (if any).
10G SFP+ Status	Model Number	Assigned model number.
	Wavelength	Detected value.
	Serial Number	Assigned serial number.
	Rx Power	Detected power level of the input signal.
	Tx Power	Detected power level of the optical transmitter.
1G SFP Status	Model Number	Assigned model number.
	Wavelength	Detected value.
	Serial Number	Assigned serial number.
	Rx Power	Detected power level of the input signal.
	Tx Power	Detected power level of the optical transmitter.
Routing Labels	Channel	Labels that you specify for the interfaces using DL Manager.
	Type	
	Label	
	Description	

Using the DLC450 Reset Switch

The DLC450 front panel includes a recessed, push-button reset switch (RST) that resets the module, which is similar to the power-up sequence of the module. Resetting the module interrupts data transmission through the module but does not erase any user-selected parameters.

Figure 8. DLC450 Reset Switch

To reset the DLC450, press the reset button momentarily.

Removing an SFP, SFP+, or Module

You can safely remove either the SFP or SFP+ from a DLC450 module, or the module from the host chassis while power is applied to the module.

This section contains the following topics:

- [Removing an SFP or SFP+ \(page 19\)](#)
- [Removing a Module \(page 19\)](#)

Removing an SFP or SFP+

To remove an SFP or SFP+ from a DLC450 module, perform the following steps:

1. Remove the cables from the SFP or SFP+.
2. Pull down on the SFP or SFP+ handle to dislodge it from the module.
3. Using the handle, pull the SFP or SFP+ out of the module.

Removing a Module

To remove a DLC450 module from the host chassis, perform the following steps:

1. Remove the cables from the BNC connectors.
2. Remove the cables from the SFP and SFP+.
3. Loosen the two mounting screws that secure the module to the host chassis.
4. Using the two mounting screws, pull the module out of the host chassis.

Caution

To avoid problems associated with overheating, do not leave a function module slot open when power is applied to the chassis. Every module slot must contain a module or blank tray to ensure proper ventilation when power is applied.



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