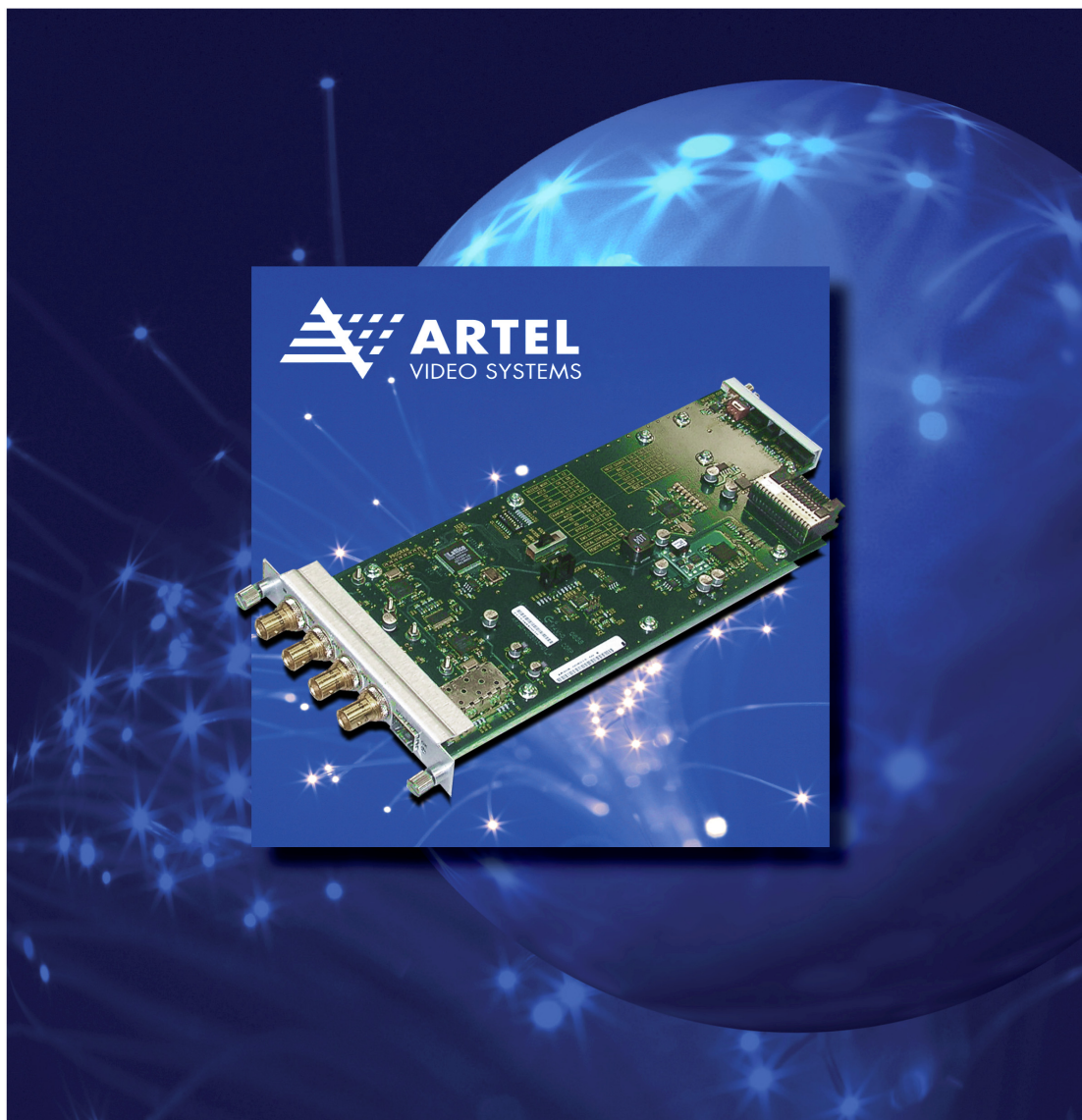


When the world is watching, you can depend on Artel.

DLC100 Function Module

Multi-Rate Digital Video

Optical Transmitter/Receiver/Transceiver/Repeater



Installation and Operations Guide

DLC100 Function Module

Multi-Rate Digital Video

Optical Transmitter/Receiver/Transceiver/Repeater

Installation and Operations Guide

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www.artel.com

CLASS I LASER CAUTIONS

The optical transmission system on some optical transmitter models is a Class I laser product. When the optical transmission system is installed in accordance with the procedures of this manual, the laser radiation is restricted to the optical cable, thus preventing human access. User modification to the system may alter the product classification and create a radiation hazard.

DO NOT, UNDER ANY CIRCUMSTANCES, stare directly into a fiber optic connector or use instruments to inspect fiber ends unless they have been confirmed to be unenergized. Although the light used in most fiber optic transmissions is not visible to the naked eye, potentially harmful levels of optical laser radiation may be present at the optical output ports and unconnected receive fiber ends. Prior to applying system power, connect fiber cables to either another DigiLink unit or to an optical power meter.

ESD CAUTIONS

The DigiLink video platform contains components that can be damaged by electrical static discharge. Ensure that you connect an approved anti-static wrist strap to your wrist and then to an electrical ground that is reliably connected to electrical ground before installing or removing the DigiLink video platform and sub-assemblies.

CAUTION

This manual is intended for use by trained service personnel. The use of controls, adjustments, or performance of procedures other than those specified herein may result in hazardous exposure to optical radiation.

SAFETY LISTING

CAN/CSA-C22.2 NO. 60950

EN 60950: International Safety Standards

NETWORK EQUIPMENT-BUILDING SYSTEMS (NEBS)

This product is NEBS Level 3 certified. Contact factory for details.

FEDERAL COMMUNICATIONS COMMISSIONS NOTICE

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 the instructions in this 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 must correct the interference at the user's own expense.

Compliance with applicable regulations depends on the use of shielded I/O cables. The user is responsible for procuring the appropriate cables.

CANADIAN EMISSIONS REQUIREMENTS

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur la matériel brouilleur: "Appareils Numériques", NMB-003 édictée par le Ministère des Communications.

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus", ICES-003 of the Department of Communications.

INTERNATIONAL EMC REQUIREMENTS

This equipment has been tested and found to comply with the limits of the following international standards.

EN55 022 Radiated & Conducted Emissions

CISPR 22 Class A

EN50 082-1 Immunity

IEC 801-2 ESD

EC 801-3 Immunity

EC 801-4 EFT

AS/NZ 3548

VCCI

Disposal and Recycling Information

Based on our customer requests, the DigiLink video platform and sub-assemblies contain lead solder that will avoid potentially unreliable solder connections when lead-free solder is used. When the product reaches its end of life, dispose of the product in accordance with state and local environmental laws and guidelines.

Declaration of Conformity

We,

Artel Video Systems Corporation

Located at

5B Lyberty Way

Westford, MA 01886

declare under our sole responsibility that the following DigiLink video platform product:

DLC100

to which this declaration relates, is in conformity with the following standards and other normative documents:

Product Safety: EN 60950

EMC: EN55 022, EN 50 082-1

NEBS: GR-63, GR-1089

The aforementioned product follows the provisions of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC.

Name: John Clark

Title: Vice President of Product Development

Date: January, 2012

Revision history for the *DLC100 Function Module Installation and Operations Guide*.

Revision History			
Revision	Document Number	Date	Reason for Change
A	AR200-008015-B00_K	January, 2012	Initial release.

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About This Guide

This guide provides instructions for installing, configuring, and operating the DLC100 function module.

Audience

This guide is intended for the following trained and qualified service personnel who are responsible for installing and operating the DLC100:

- System installer
- Hardware technician
- System operator

Related Documentation

The following documentation contains material related to the DLC100:

Document	Provides . . .
<i>DLC100 Data Sheet</i>	Product operating and environmental specifications, and regulatory conformance information.
<i>DLC100 Quick Start</i>	Product configuration information and descriptions of the front panel status LED operations.
<i>DL Manager Setup and Operations Guide</i>	Overview and operating instructions for the DL Manager element management system.
<i>DigiLink Video Platform Chassis Installation and Operations Guide</i>	Overview and installation procedures for the various chassis products available with the DigiLink video platform.
<i>DigiLink Video Platform Chassis Data Sheet</i>	Overview of the DigiLink video platform chassis options.

Note: To obtain the latest versions of this guide and related documents, go to www.artel.com.

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.



ARTEL

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.

DLC100 Function Module

Multi-Rate Digital Video Optical Transmitter/Receiver/Transceiver/Repeater

Information About the DLC100

Chassis Compatibility: DL4300, DL4000, and DL4100

Note: The installation and operation of the DLC100 module is similar regardless of the host chassis type.

This chapter introduces the DLC100 function module (DLC100), which is a flexible, bi-directional fiber optic transport module for all standard digital video formats from 19.39 megabits per second (Mb/s) to 1.485 gigabits per second (Gb/s). The DLC100 supports both compressed and uncompressed HDTV as well as compressed and uncompressed SDTV.

You can configure the DLC100 module as a receiver, transmitter, transceiver, or repeater. The DLC100 can transmit and receive independent signals simultaneously. A DL4000 chassis with four DLC100 modules provides four bi-directional multi-rate circuits in a single rack unit. For transmitting and receiving optical signals, the DLC100 uses Small Form Factor Pluggable (SFP) optics.

The DLC100 can transmit and receive external signals using the following built-in options:

- BNC connectors and SFP ports for connecting to external devices
- Backplane connector for connecting to other function modules in the host chassis

Provisioning and monitoring is accomplished using DIP switches, LEDs, front panel monitor jack, or Artel DL Manager, which is Artel's Element Management System (EMS). The DLC100 also has a set of major and minor alarms that indicate problems related to the power supplies, optics, temperature, and the input signals.

DLC100 Laser Warnings

The optional SFP module used in the DLC100 has a transmitter that contains a Class 1 laser. You must adhere to the standard safety practices for handling a Class 1 laser product, including the following warning.



Warning

Never stare directly into a fiber optic connector.

Although the light used in most fiber optic transmissions is not visible to the naked eye, potentially harmful levels of radiation may be present at the optical output ports and unconnected transmit fiber ends.

Failure to observe this warning could result in personal injury.



DLC100 Module Functional Description

Figure 1 shows the functional block diagram for the DLC100.

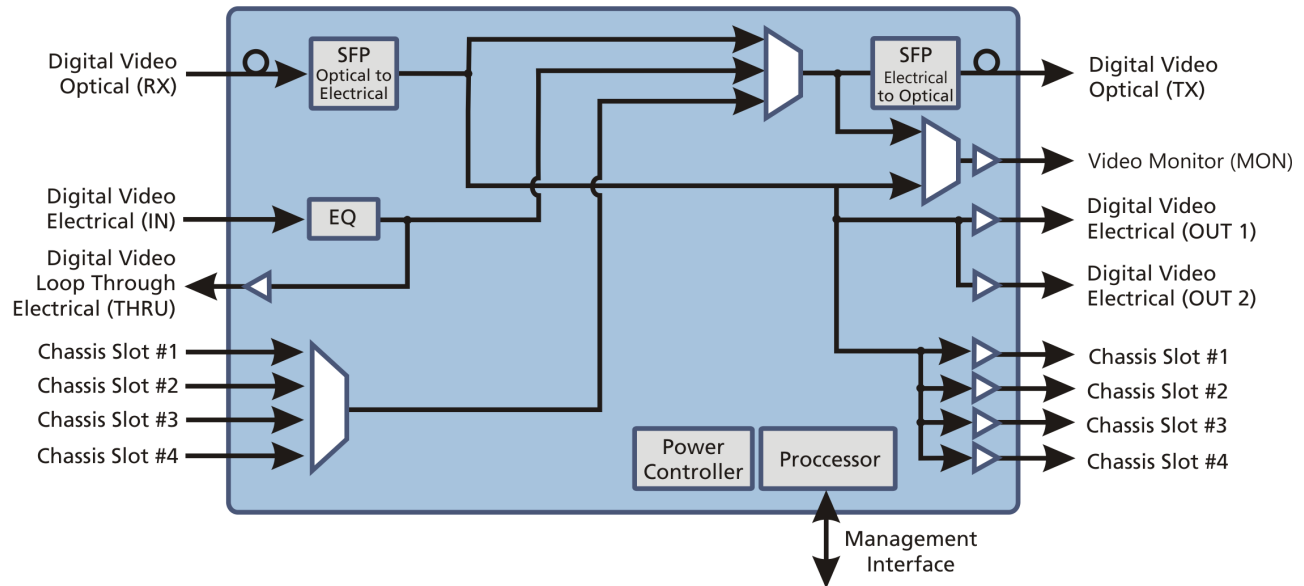


Figure 1. DLC100 Module Functional Block Diagram

The video formats that the DLC100 supports includes the following:

- 1.485 Gb/s—HD-SDI (SMPTE 292M)
- 270 Mb/s:
 - SD-SDI (SMPTE 259M-C, ITU 656)
 - SDTI (SMPTE 305M)
 - DVB-ASI
 - ARTEL 270
- 19.39 Mb/s—ATSC (SMPTE 310)

This section contains the following topics:

- [Signal Paths \(page 3\)](#)
- [Electrical Input \(page 4\)](#)
- [Electrical Outputs \(page 4\)](#)
- [Optical Input and Output \(page 4\)](#)

Signal Paths

The DLC100 contains the following two primary signal paths:

- Electrical input to optical transmit

- Optical receive to electrical output

Both hardware and software provide flexibility in routing, such as allowing optical to optical repeater and the selection of input and output paths.

The DLC100 allows you to select one the following transmitter sources:

- Optical receiver output (repeater mode)
- Electrical input BNC
- One of the other host chassis slots (transmit mode).

The receive path is connected to the two electrical outputs and is also made available to the function modules located in the remaining host chassis slots.

The monitor output is selectable to allow access to the optical transmit or receive paths.

Electrical Input

The electrical input is a precision 75 Ohm BNC and includes an automatic cable equalizer. This input passes through a multi-rate reclocker that detects the signal rate but is format transparent.

When no electrical input signal is connected, the DLC100 transmits a standby signal to the optical receiver to maintain the optical link between modules.

Note: For optimal performance, follow the recommendations stated in the DLC100 specifications sheet for full cable lengths and cable types.

Electrical Outputs

The electrical output is a precision 75 Ohm BNC with a multirate driver. The following connectors provide the electrical outs:

- Loop through (THRU)—Equalized electrical BNC IN signal
- Main out (OUT 1 and OUT 2)—Electrical output of the received optical signal (RX)

The mini 75 Ohm SMB monitor jack (MON) located on the front panel also provides an electrical output. The user-selectable signals on this connector are the signals that the DLC100 optically transmits or receives.

Receive electrical outputs are provided on two output BNCs via dual rate drivers directly connected to the receive path reclocker. The electrical output signals are also made available to the function modules located in the remaining host chassis slots.

Note: For optimal performance, follow the recommendations stated in the DLC100 specifications sheet for full cable lengths and cable types.

Optical Input and Output

The optical interface is provided by a single SFP socket. The SFP uses LC/PC connectors. Optical performance is dependant the quality of your optical fiber and fiber interconnects, and on the selected SFP, which must be specifically qualified by Artel to pass video signals. Consult Artel for available SFP options.

DLC100 Module Overview

Figure 2 provides a view of the major components of the DLC100.

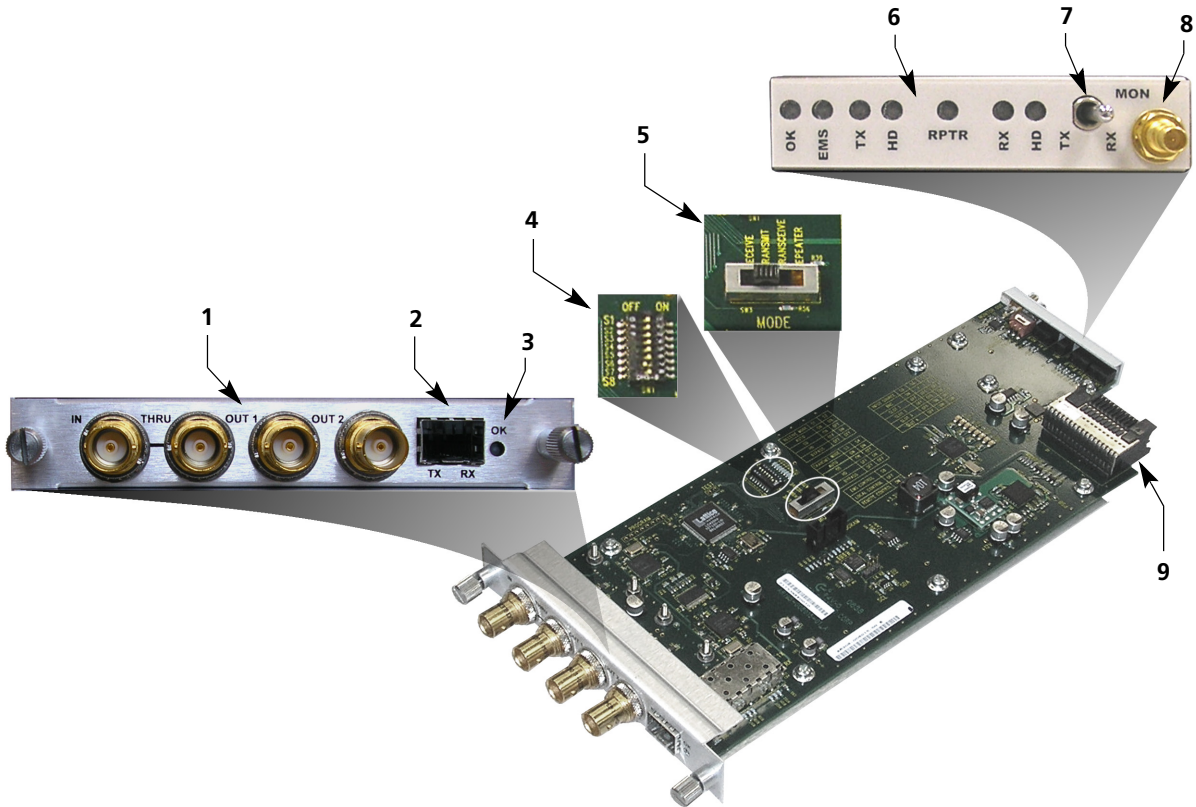


Figure 2. DLC100 Module Major Components

Table 1 describes the components called out in Figure 2.

Table 1. DLC100 Elements

Item	DLC100 Element	for details, see...
1	Rear panel BNC connectors for the following electrical connections: <ul style="list-style-type: none"> IN—Video in THRU—Loop through OUT 1—Video out 1 OUT 2—Video out 2 	Cabling the DLC100 Module (page 11)
2	SFP socket for the following optical connections: <ul style="list-style-type: none"> TX—Transmit RX—Receive 	Cabling the DLC100 Module (page 11)
3	Rear panel alarm indicator LED (OK).	Understanding the Status LEDs (page 13)

Table 1. DLC100 Elements (Continued)

Item	DLC100 Element	for details, see...
4	SW1 configuration DIP switch.	Setting the SW1 Configuration DIP Switch (page 8)
5	Mode Select switch.	Setting the Mode Select Switch (page 7)
6	Front panel status LEDs: <ul style="list-style-type: none"> • OK—Alarm indicator • EMS—Element Management System indicator • TX—Transmit signal indicator • HD (transmit)—High definition rate indicator • RPTR—Repeater indicator • RX—Receive signal indicator • HD (receive)—High definition rate indicator 	Understanding the Status LEDs (page 13)
7	Front panel Monitor Source Select switch: <ul style="list-style-type: none"> • RX—Optical receive signal • TX—Optical transmit signal 	Using the Monitor Jack (page 16)
8	Front panel monitor mini 75 Ohm SMB output jack.	
9	Backplane connector—Provides power to the module, allows the module to share signals with other function modules, and is used for alarm and management signals.	N/A

Configuring the DLC100 Module Operation

This section describes how to configure the DLC100 mode of operation and the function of the transmit and receive signal connections. The two switches that control the functionality of the DLC100 are the Mode Select slide switch and the SW1 configuration DIP switch (see [Figure 2](#)).

Note: You configure the DLC100 while the module is out of the host chassis because the Mode Select slide switch and the SW1 configuration DIP switch are mounted to the top of the module PCB.

Artem ships the DLC100 configured for full functionality, which means that the DLC100 operates as follows:

- Operating mode: Tranceive
A function of the Mode Select switch, the DLC100 receives and transmits independent signals.
- Signal type: Auto
A function of the SW1 configuration DIP switch, the DLC100 automatically detects standard signal rates.
- Transmit signal source: BNC input
A function of the SW1 configuration DIP switch.
- EMS override enabled: A function of the SW1 configuration DIP switch, DL Manager can change the DLC100 configuration.

When installing a new DLC100, you modify the settings of the Mode Select switch and SW1 configuration DIP switch only when you need to restrict the functionality of the DLC100 module. For example, to limit the types of signals the DLC100 recognizes, you modify the settings of the SW1 configuration DIP switch as described in this section.

This section contains the following topics:

- [Setting the Mode Select Switch \(page 7\)](#)
- [Setting the SW1 Configuration DIP Switch \(page 8\)](#)

Setting the Mode Select Switch

To select the operating mode for your DLC100, use the Mode Select switch (see [Figure 3](#)).

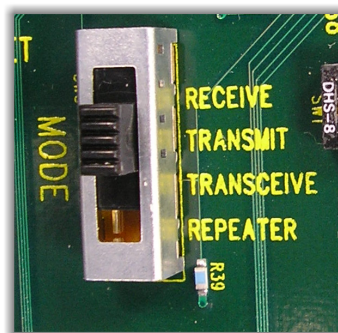


Figure 3. DLC100 Mode Select Switch

[Table 2](#) describes the operating mode options, alarm status, and the signal types that are present depending on the operating mode.

Table 2. Mode Select Switch Settings

Setting	The DLC100 module . . .	Electrical Signal		Optical Signal	
		IN	OUT	RX	TX
RECEIVE	Receives optical signals only. The SFP laser used to transmit signals is turned off and the transmit alarms are disabled.		X	X	
TRANSMIT	Transmits signals only. The SFP receiver is disabled and the receive alarms are disabled.	X			X
TRANSCEIVE	Receives and transmits signals. The SFP laser and receiver are enabled as are the associated alarms. Artel ships the DLC100 module set for transceiver operation.	X	X	X	X
REPEATER	Reclocks the received optical signal and transmits the signal back out. The optical receive signal is also available on the electrical outputs.		X	X	X

Setting the SW1 Configuration DIP Switch

The SW1 configuration DIP switch (see [Figure 4](#)) determines the following DLC100 operating parameters:

- Signal rates
- Transmit source
- Remote control

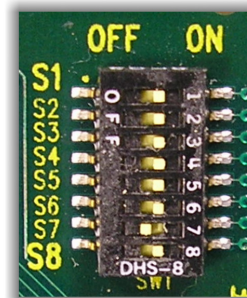


Figure 4. SW1 Configuration DIP Switch

This section contains the following topics:

- [Setting the Transmit and Receive Rates \(page 9\)](#)
- [Setting the Electrical Input Source \(page 9\)](#)
- [Setting the Element Management System Function \(page 10\)](#)

Setting the Transmit and Receive Rates

To configure the transmit and receive rates of the DLC100, set switches S1 through S4 to the desired settings. [Table 3](#) describes the possible receive and transmit switch settings. The switch settings shown in bold type represent the factory-set configuration settings.

Table 3. SW1 Configuration DIP Switch: Receive and Transmit Settings

Receive Configuration	S1	S2	Transmit Configuration	S3	S4
AUTO	ON	ON	AUTO	ON	ON
SD	ON	OFF	SD	ON	OFF
HD	OFF	ON	HD	OFF	ON
BYPASS	OFF	OFF	BYPASS	OFF	OFF

The configuration rates are described as follows:

- AUTO—Automatically reclocks SD (270 Mb/s) and HD (1.485 Mb/s, 1.485/1.01 Mb/s) and passes through all other rates.
- SD—Allows and reclocks SD (270 Mb/s) only. All other rates are and locked out.
- HD—Allows and reclocks uncompressed HD (1.485 Mb/s, 1.485/1.01 Mb/s), 19.39 Mb/s ATSC, and other rates. SD (270 Mb/s) is the only rate that is locked out.
- BYPASS—Allows all rates to pass through without reclocking.

Note: While all rates are passed without reclocking, faster signals may contain unacceptable jitter.

Setting the Electrical Input Source

To configure the electrical input source of the DLC100, set switches S5 through S7 to the desired settings. [Table 4](#) describes the possible electrical source settings. The switch setting shown in bold type represents the factory-set configuration setting.

Table 4. SW1 Configuration DIP Switch: Electrical Input Source Settings

Electrical Input Source	S5	S6	S7
BNC (IN)	ON		
SLOT 1	OFF	OFF	OFF
SLOT 2	OFF	ON	OFF
SLOT 3	OFF	OFF	ON
SLOT 4	OFF	ON	ON

Switches S5, S6, and S7 work with the Mode Select switch and do not override the Mode Switch setting (see the ["Setting the Mode Select Switch" section on page 7](#)).

Setting the Element Management System Function

To set the EMS function, DL Manager, switch S8 to one of the following positions:

- **OFF**—Disabled: DL Manager cannot change the DLC100 module configuration.
- **ON**—Enabled (default setting): DL Manager can change the DLC100 module configuration. If the module is operating in EMS Override mode, as indicated by a green OK LED on the front panel, then the EMS Override DIP switch has no effect until you use DL Manager to take the module out of override mode and set it to local mode (see the *DL Manager Setup and Operations Guide*).

Installing the DLC100 Module and SFP

The DLC100 and associated SFP are hot swappable, enabling you to safely install them while power is applied to the host chassis. Before installing your DLC100, see the DLC100 Single Channel Multi-rate Transceiver data sheet for a detailed description of the DLC100 product specifications including environmental requirements that you must adhere to when installing the module.

To install the DLC100 in the host chassis, perform the following steps (see [Figure 5](#)):

1. From the back of the chassis, remove the two screws that secure the blank tray to one of the unused function module slots (if necessary). Use any available function module slot.
2. Slide the DLC100 into the slot using the printed circuit board guide rails located on both sides of the slot.
3. Push the DLC100 in until it is firmly seated into the backplane and flush with the chassis.
4. Tighten the two mounting screws that secure the module to the chassis.

Note: Failure to properly secure the DLC100 to the chassis with the two mounting screws can result in disconnecting the module from the backplane when you attach a cable to the monitor connector located on the front panel.

5. Install the SFP into the DLC100 (handle on top as shown in [Figure 5](#)). Push the SFP into the socket located on the right side of the function module until it is firmly seated into the socket.

Note: When you do not install an SFP, the TX and RX status LEDs located on the DLC100 front panel both flash. See [Table 5](#) for other status LED indications.

6. Repeat this procedure for each DLC100 that you are installing in the chassis.

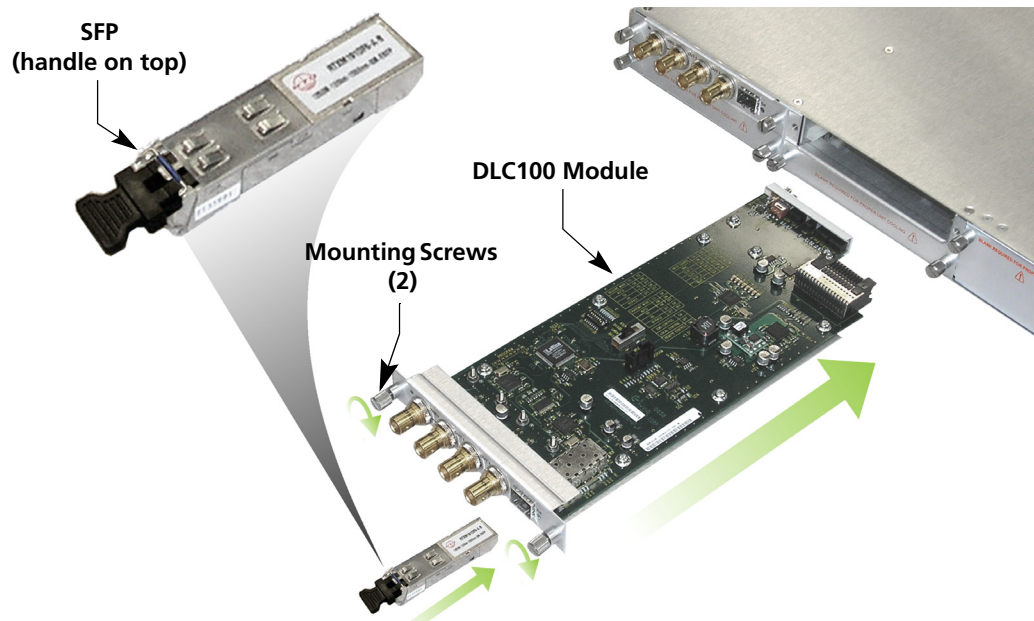


Figure 5. DLC100 Module and SFP Installation

Note: Insert a blank tray in any unused chassis module slots to maintain proper ventilation.

Cabling the DLC100 Module

The DLC100 allows you to transmit and receive signals over electrical and fiber optic cable connections. The cabling configuration that you use depends on your application. You can have electrical in and out, optical in and out, or any combination of the two. The electrical and optical connectors are located on the back panel of the DLC100 (see [Figure 6](#)).

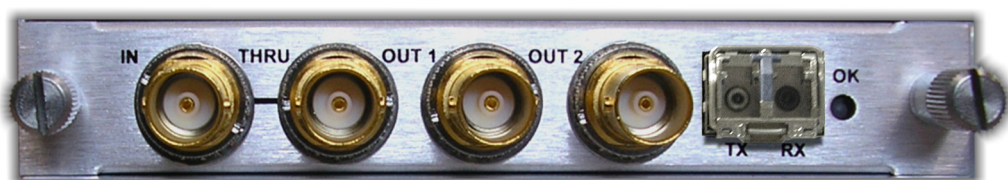


Figure 6. DLC100 BNC Electrical and SFP Optical Connectors

Note: When handling fiber optic cables, adhere to the standard safety practices for handling a Class 1 laser product (see the "[DLC100 Laser Warnings](#)" section on page 2).

This section contains the following topics:

- [Cabling the Electrical Connections \(page 12\)](#)
- [Cabling the Optical Connections \(page 12\)](#)

Cabling the Electrical Connections

To connect to the BNC connectors on the DLC100, use a high quality 75 Ohm precision video coax cable, such as Belden 1694A cable.

To cable the electrical connections, perform the following tasks:

- Input signal—Connect the signal cable to the DLC100 receive connector (IN) and the source device's electrical transmit connector.
- Output signal—Connect the electrical cable to one or more of the following DLC100 BNC connectors and the destination device's electrical receive connector:
 - OUT 1
 - OUT 2
 - THRU

The outputs of OUT1 and OUT 2 are identical and independent. The DLC100 uses different drivers to output the same data.

The THRU output is an active equalized loop-through signal of the electrical input signal. Use the THRU output to daisy-chain the input signal to other devices or to monitor the input signal on a monitoring device.

Cabling the Optical Connections

Use a single mode fiber when connecting to the LC connectors on the DLC100 SFP.

To cable the optical connections, perform the following tasks:

1. Remove the SFP safety plug that protects the TX and RX ports. Cover any unused optical port to keep the port clean.
2. Cable the optical connections as follows:
 - Receive signal—Connect the fiber optic cable to the source device's optical transmit connector and the SFP receive optical connector (RX) on the DLC100 module.
 - Transmit signal—Connect the fiber optic cable to the destination device's optical receive connector and the SFP transmit optical connector (TX) on the DLC100 module.

Monitoring the DLC100 Module Operations

You monitor the operation of the DLC100 using the status LEDs and monitor jack located on the front panel of the module (see [Figure 7](#)).

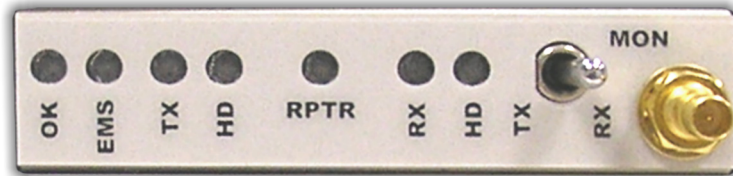


Figure 7. DLC100 Status LEDs and Monitor Connector

Note: You can also use DL Manager to monitor the module operations (see the *DL Manager Setup and Operations Guide*).

This section contains the following topics:

- [Understanding the Status LEDs \(page 13\)](#)
- [Using the Monitor Jack \(page 16\)](#)

Understanding the Status LEDs

[Table 5](#) describes the different states of the DLC100 status LEDs as shown in [Figure 7](#).

Table 5. DLC100 Status LEDs

LED	Indicates . . .	State	Description	Alarms	Action
OK (also located on the rear panel (see Figure 6))	The DLC100 status	Off	If power is applied to the system, an internal fault with the DLC100 may exist.	None	Replace the DLC100.
		Green	Normal operation.	None	None.
		Yellow	If the RX LED is not flashing yellow, then a temperature alarm is indicated.	Minor	Address the problem indicated by the RX alarm or check that there is adequate inlet and exhaust airflow.
		Red	The TX or RX LEDs may indicate the cause of the alarm or the alarm condition can indicate an internal error.	Major	Address the problem indicated by the TX or RX alarm or replace the DLC100.

Table 5. DLC100 Status LEDs (Continued)

LED	Indicates . . .	State	Description	Alarms	Action
EMS	Element Management System status	Off	The DLC100 is in local mode and its configuration is controlled by the onboard configuration switches.	None	None.
		Green	The DLC100 is in remote mode and the configuration has been set by the DL Manager EMS. When in remote mode, the actual configuration of the module will likely not match the settings of the configuration switches and changing the configuration switches will have no effect on the module's operation.	None	None.

Table 5. DLC100 Status LEDs (Continued)

LED	Indicates . . .	State	Description	Alarms	Action
TX	Transmitter status	Off	Transmitter is disabled. The DLC100 is in receiver-only operating mode.	None	None.
		Green (solid)	Normal operation (input signal is present).	None	None.
		Green (flashing)	No SFP is installed (RX and TX LEDs are both flashing) or an SFP TX failure exists.	Major	Install an SFP or replace the existing SFP.
		Yellow (solid)	The DLC100 cannot detect an input signal and is transmitting the standby signal.	none	Check the input signal or change the operating mode to Receive.
		Yellow (flashing)	No SFP is installed (RX and TX LEDs are both flashing) or an optical SFP TX failure exists. Also, the DLC100 cannot detect an input signal and is transmitting the standby signal.	Major	Install an SFP or replace the existing SFP. Also, check the input signal or change the operating mode to Receive.
		Red (solid)	The DLC100 detects an incorrect input signal rate. For example, you have the DLC100 configured to receive 270 Mb/s signal rates only, but another signal rate is received.	None	Check the input signal and the DLC100 configuration.
		Red (flashing)	No SFP is installed (RX and TX LEDs are both flashing) or an SFP TX failure exists. Also, the DLC100 detects an incorrect input signal rate. For example, you have the DLC100 configured to receive 270 Mb/s signal rates only but another signal rate is received.	Major	Install an SFP or replace the existing SFP. Also, check the DLC100 configuration.
HD	Transmitter rate	Off	270 Mb/s signal.	None	None.
		Green	1.485 Gb/s or 1.485/1.001 Gb/s signal (uncompressed HD).	None	None.
		Yellow	19.39 Mb/s signal (ATSC HD or other signal rate).	None	None.
RPTR	Repeater mode status	Off	Repeater mode disabled.	None	None.
		Green	Repeater mode enabled (optical output = optical input).	None	None.

Table 5. DLC100 Status LEDs (Continued)

LED	Indicates . . .	State	Description	Alarms	Action
RX	Receiver status	Off	Receiver is disabled. The DLC100 is in transmit-only operating mode.	None	None.
		Green	Normal operation (receiver signal is present).	None	None.
		Yellow (solid)	Standby signal is being received from the transmitter.	None	Check the signal supplied to the transmitter.
		Yellow (flashing)	Receive optical power is high.	Minor	Check the input signal.
		Red (solid)	The DLC100 detects an incorrect input signal type. For example, you have the DLC100 configured to receive 270 Mb/s signal rates only, but another signal rate is received.	None	Check the input signal and the DLC100 configuration.
		Red (flashing)	No SFP is installed (RX and TX LEDs are both flashing), a low receiver power condition exists, or an SFP RX failure exists.	Major	Install an SFP or replace the existing SFP.
HD	Receiver rate	Off	270 Mb/s signal.	None	None.
		Green	1.485 Gb/s or 1.485/1.001 Gb/s signal (uncompressed HD).	None	None.
		Yellow	19.39 Mb/s signal (ATSC HD) or other signal rate.	None	None.

Using the Monitor Jack

To monitor the DLC100 transmit and receive signals, perform the following steps:

1. Connect the monitor cable to the mini 75 Ohm SMB monitor jack (MON) located on the DLC100 front panel (see [Figure 7](#)).
2. Switch the monitor select switch to the desired position:
 - TX—View signals that the module is transmitting optically
 - RX—View signals that the module is receiving optically

Note: You can also use the rear panel THRU and OUT2 BNC connectors for transmit and receive signal monitoring, respectively.

Removing the SFP and DLC100 Module

You can safely remove either the SFP from the DLC100 or the DLC100 from the host chassis while power is applied to the module.

This section contains the following topics:

- [Removing the SFP \(page 17\)](#)
- [Removing the DLC100 Module \(page 17\)](#)

Removing the SFP

To remove the SFP from the DLC100, perform the following steps:

1. Remove the fiber optic cables from the SFP.
2. Pull down on the SFP handle to dislodge the SFP from the DLC100 module (see [Figure 8](#)).
3. Using the SFP handle, pull the SFP out of the DLC100.

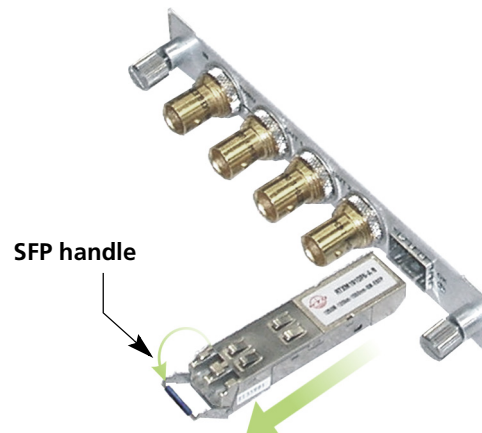


Figure 8. Removing the SFP

Removing the DLC100 Module

To remove the DLC100 from the host chassis, perform the following steps:

1. Remove the fiber optic cables from the DLC100 SFP.
2. Remove the coaxial cables from the BNC connectors.
3. Loosen the two mounting screws that secure the DLC100 to the chassis.
4. Using the two mounting screws, pull the DLC100 out of the 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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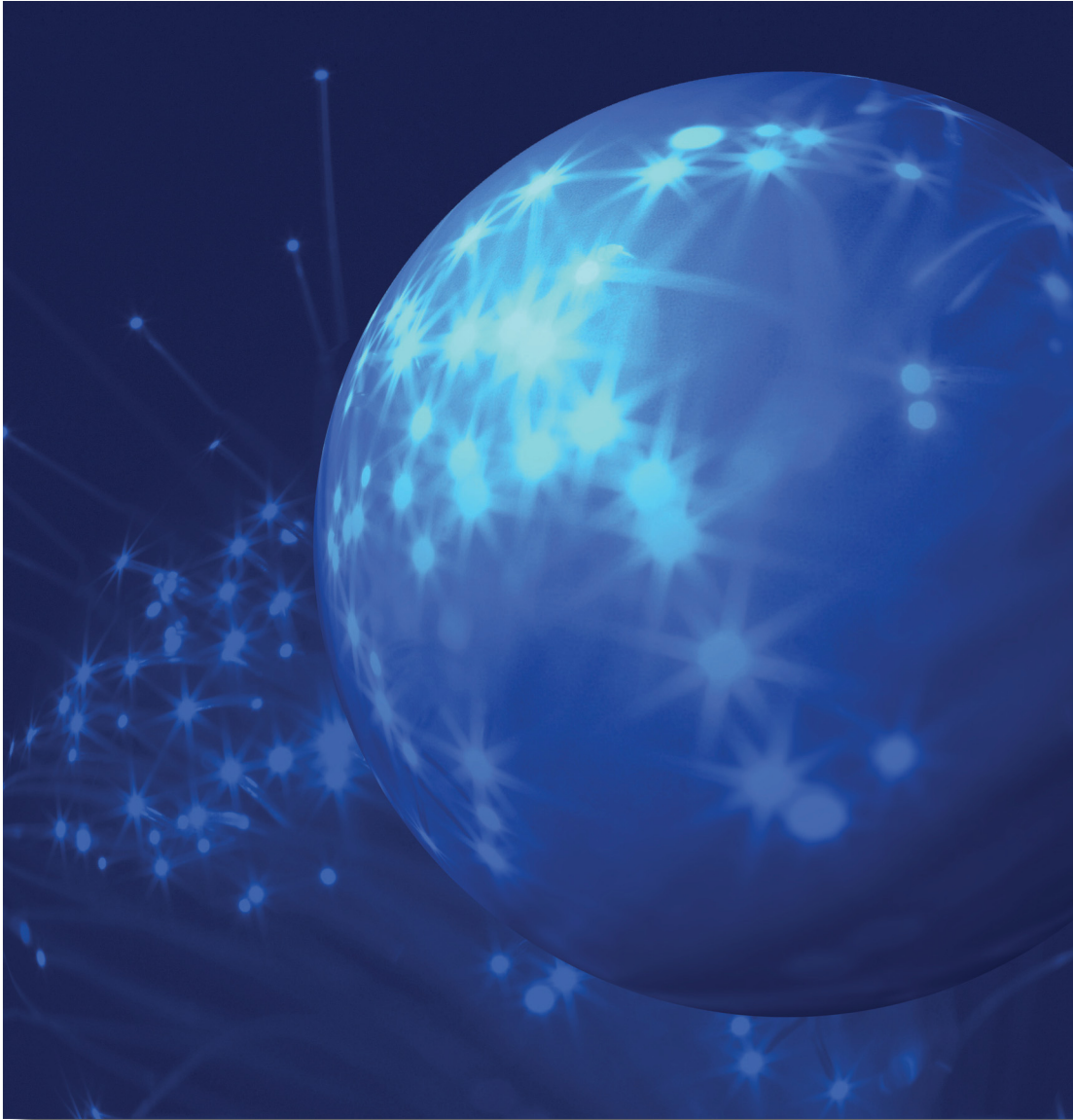
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