MANUAL



DIGILINK MEDIA TRANSPORT PLATFORM

Function Module Chassis Systems

Installation and Operations Manual

WWW.ARTEL.COM

DigiLink Media Transport Platform

Function Module Chassis Systems

Installation and Operations Manual

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NOTICE

Artel Video Systems Corporation
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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 media 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 media 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.[1]

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[2]

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 media transport 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.

1 Shielded Cat 5e STP cabling is required. All specifications provided in this manual are based on the use of shielded Cat 5e STP cable with properly shielded RJ45 connectors.

2 For all DC Power Supply Units (PSU), the return connection must be reliably connected to earth meet all compliance and certifications.

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 media platform products:

DL4360x, DL4300, DL4000, DL4100, DL4000P

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 products follow 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: February, 2016

Revision history for the *DigiLink Media Transport Platform Chassis Installation and Operations Manual*.

Revision History

Revision	Document Number	Date	Reason for Change
A	**AR200-008000-01_K**	January, 2012	Initial release of this chassis-only manual. In addition to the chassis previously documented in the combined chassis/module manual, this manual contains material for the new 12-slot DL4300 chassis.
B	**AR200-008000-01_L**	January, 2014	Updated with the 12-slot DL4360x chassis and new front-panel graphics for DL4300 and DL4000.
C	**AR200-008000-01_M**	December, 2014	Copy edits and updated graphics.
D	**AR200-008000-01_N**	February, 2016	Updated Artel logo.

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About This Manual

This manual provides instructions for installing, configuring, and operating the DigiLink media transport platform chassis.

Audience

This manual is intended for the following trained and qualified service personnel who are responsible for installing and operating the DigiLink media transport platform:

- System installer
- Hardware technician
- System operator

Chassis Options

The DigiLink media transport platform offers a choice of five chassis models, from the full-feature, twelve-slot DL4360x chassis to the single-slot DL4100 chassis. The following table shows the features associated with each chassis model.

	Chassis Model (click on a chapter number to display the product chapter)				
Feature	DL4360X (Chapter 1)	DL4300 (Chapter 2)	DL4000 (Chapter 3)	DL4000P (Chapter 4)	DL4100 (Chapter 5)
Number of Function Module Slots	12	12	4	4 (passive only)	1
Switch Module	Yes	No	No	No	No
Power Supplies	1 or 2 AC, DC or one of each (modular/hot swappable)	1 or 2 AC, DC or one of each (modular/ hot swappable)	1 or 2 AC, DC or one of each (modular/ hot swappable)	None	1 AC (external)
Cooling	Active	Active	Active (1 fan per power supply module)	None	Convection
Module-to-Module Internal Communication	Yes[1]	Yes	Yes	No	No
Remote Monitoring and Management using Artel's DL-Manager	Yes	Yes	Yes	No	No

1. With the DLX001 control module installed.

Related Documentation

The following documentation contains material related to the DigiLink media transport platform:

Document	Provides . . .
DigiLink Media Transport Platform Data Sheet	Product operating and environmental specifications, and regulatory conformance information for the chassis options.
DigiLink Manager Setup and Operations Manual	Information about accessing and using Digilink Manager to configure and monitor function modules.
Function Module Installation and Operations Manuals	Module-specific manuals that provide module overview, installation, configuration, and operation information.
DLX001 Controller Module Operations Manual	Information about configuring the DLX001, which provide switching functionality for the DL4360x host chassis.
Function Module Quick Start Guides	Module-specific quick start guides that provide module configuration and operation information.
Function Module Data Sheets	Module-specific documents that provide module operating and environmental specifications, and regulatory conformance information.

Note: To obtain the latest versions of this manual and the documents listed in this section, 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.

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.

1

DL4360x Overview and Installation

This chapter introduces the DL4360x chassis and describes how to install and configure the device. The DL4360x chassis features twelve hot swappable function module slots, dual hot swappable power supplies, fan module, and controller module.

The DL4360x chassis also includes the following features:

- Space-efficient rugged chassis.
- Passive backplane with high speed interconnect between function modules (up to 72 Gb/s).
- Controller module that provides switching capabilities for interconnecting installed modules through the backplane.

  Note: A controller module without switching capabilities is also available.
- Fan module that provides ventilation for the installed function modules and hosts DigiLink Manager (or *DL Manager*), which is Artel's element management system for configuring and monitoring the function modules.
- Simple Network Management Protocol (SNMP) management.
- AC power, DC power, or dual (one of each).
- NEBS Level 3 certified.
- Unlimited, non-spaced installation.

Note: This chapter uses the following terms interchangeably:

- *Chassis* and *shelf* when referring to the DL4360x.
- *DigiLink Manager* and *DL Manager* when referring to the element management system.

This chapter contains the following sections:

DL4360x Laser Warnings

Function modules with optical transmitters that install into the DL4360x chassis contain Class 1 lasers. 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.

DL4360x Power Supplies Warning

The chassis can be supplied by more than one power source. All sources must be removed to de-energize the chassis.

Warning

De-energize the chassis before servicing any modules.

This unit has two power supply connections. Both connections must be removed to properly de-energize the system.

Failure to observe this warning could result in personal injury.

DLFM or DLM Module Warning

The DigiLink element management modules utilize an internal RTC (Real Time Clock) with battery backup that provides the system software with the time of day on system power up. The backup battery is a socketed lithium battery that lasts the life of the unit when the unit is operating in the specified environmental conditions. The battery is not field replaceable.

Note: If the lithium battery in a unit should fail, you must return the module to Artel Video Systems for repair. *Do not replace the battery yourself*. Although the battery is not intended to be field replaceable, the safety agencies require that the following warning be included in this document.

Warning

There is a danger of explosion if the battery is replaced incorrectly.

Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries in accordance with the manufacturer's instructions and local regulations.

Failure to observe this warning could result in personal injury.

Chassis Overview

The DL4360x chassis has twelve function module slots, two power supply module slots, a controller module slot, a fan module slot, and status LEDs. The chassis also contains a passive backplane that allows interconnecting of the installed function modules depending on the model of the installed controller module (for details, see the "Controller Module Overview" section on page 1-8). The controller module contains the Ethernet management ports required to access DL Manager, which resides on the fan module and allows you to monitor and configure the installed modules.

Figure 1-1 shows the chassis front panel components. This sample chassis configuration shows function modules occupying eleven of the twelve function module slots. A black, blank module tray is inserted in the unused module slot (Slot 8) to cover the slot opening and maintain proper ventilation.

Figure 1-1. DL4360x Chassis Front Panel View

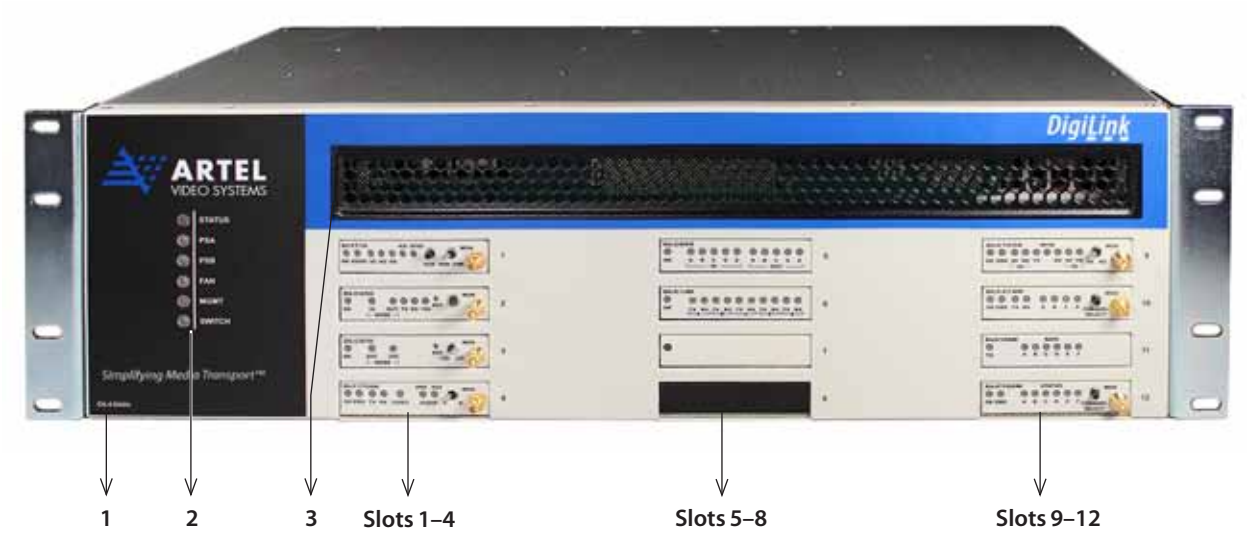


Table 1-1 describes the components called out in Figure 1-1.

Table 1-1. The DL4360x Chassis Front Panel Elements

Item	Description	for details, see...
1	DL4360X chassis and product model number	Installing the DL4360x Chassis (page 1-12)
2	Status LEDs: • STATUS—Chassis status indicator • PSA—Power supply module A status indicator • PSB—Power supply module B status indicator • FAN—Fan module status indicator • MGMT—DL Manager status indicator • SWITCH—Controller module status indicator	Powering Up and Monitoring the DL4360x (page 1-22)
3	Power supply modules intake vents	Ventilating the DL4360x Chassis (page 1-11)

Table 1-1. The DL4360x Chassis Front Panel Elements (Continued)

Item	Description	for details, see...
Slots 1–4	Function module slots	Installing a Function Module (page 1-21)
Slots 5–8	Function module slots	
Slots 9–12	Function module slots	

Figure 1-2 shows the chassis rear panel components. This sample chassis configuration shows eleven function modules, one controller module with switching capabilities, two power supply modules, and a fan module loaded in the chassis. A blank module tray is inserted into the unused function module slot (slot 8) to cover the slot opening and maintain proper ventilation.

Figure 1-2. DL4360x Chassis Rear Panel View

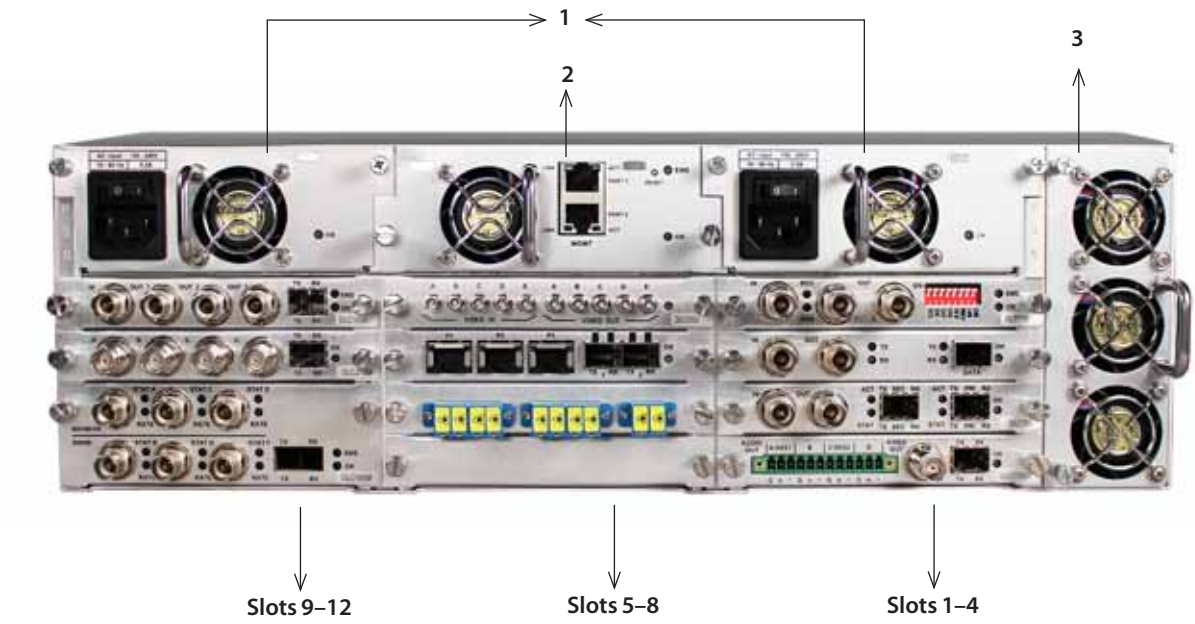


Table 1-2 describes the components called out in Figure 1-2.

Table 1-2. The DL4360x Chassis Rear Panel Elements

Item	Description	for details, see...
1	Power Supply Modules in Slot B (left) and Slot A (right).	• Power Supply Module Overview (page 1-6) • Installing and Cabling a Power Supply Module (page 1-15)

Table 1-2. The DL4360x Chassis Rear Panel Elements (Continued)

Item	Description	for details, see...
2	Controller module with switching capabilities. Not shown is the module version that does not include switching capabilities. Both module versions contain Ethernet management ports to access DL Manager, which resides on the fan module. Communication with DL Manager is accomplished through a chassis backplane connection between the controller and fan modules.	• Controller Module Overview (page 1-8) • Installing the DLX001 Controller Module (page 1-20) • Information about Accessing DL Manager (page 1-25)
3	Fan module that provides function module ventilation and hosts DL Manager.	• Fan Module Overview (page 1-9) • Installing the Fan Module (page 1-19)
Slots 9–12	Function module slots.	• Installing a Function Module (page 1-21)
Slots 5–8	Function module slots.	
Slots 1–4	Function module slots.	

Power Supply Module Overview

The DL4360x can be powered using a single power supply module or you can install two modules to increase system reliability. The power supply module is available in the following models:

- Model DLP360 (AC version)
- Model DLP361 (DC Version)

The power supply module features include the following:

- Load sharing when two power supply modules are installed.
- Voltage, temperature, and cooling fan alarms.
- Cooling fan that provides ventilation for the power supply module.

Figure 1-3 shows sample AC and DC power supply modules and the various module components.

Figure 1-3. DL4360x AC and DC Power Supply Modules

Table 1-3 describes the components called out in Figure 1-3.

Table 1-3. The DL4360x Power Supply Module Elements

Item	Power Supply Element	for details, see...
1	Power source connector (DC or AC) with ON/OFF switch.	Installing and Cabling a Power Supply Module (page 1-15) Note: The DC version comes with a terminal block (not shown) installed on the DC input.
2	Module handle	N/A
3	Ventilation fan	Ventilating the DL4360x Chassis (page 1-11)
4	OK Status LED	Powering Up and Monitoring the DL4360x (page 1-22)
5	Backplane connector	N/A

Controller Module Overview

The DL4360x can operate with or without switching capabilities depending on the controller module installed as follows:

- DLX001—Provides switching capabilities, allowing you to use the chassis backplane connections to switch inputs/outputs between the installed function modules.
- DLM001—Does not include switching capabilities.

  Note: When the DLM001 module is installed, the backplane interconnections are not available—all connections must be made through the external rear panel connections of each function module.

Both module versions include dual Ethernet management ports for accessing the DL Manager software that resides on the fan module (see the "Fan Module Overview" section on page 1-9). Dual interfaces allow you to daisy-chain multiple chassis management ports (see the "Information about Accessing DL Manager" section on page 1-25).

Figure 1-4. Controller Modules

Table 1-4 describes the components called out in Figure 1-4.

Table 1-4. DL4360x Controller Module Elements

Item	Power Supply Element	for details, see...
1	DL Manager management interfaces (10/100MB MGMT Port 1 and 2)	Information about Accessing DL Manager (page 1-25)
2	Reset switch for DL Manager	
3	EMS status LED for DL Manager	
4	(DLX001 only) Ventilation fan	N/A
5	(DLX001 only) Module handle	N/A
6	(DLX001 only) OK module status LED	Table 1-5
7	Backplane connector	N/A

Fan Module Overview

The DLFM010 fan module provides the following functions:

- Ventilates the function modules mounted in the chassis.
- Hosts the DL Manager software, which you access using the management ports located on the controller module (see the "Controller Module Overview" section on page 1-8 and the "Information about Accessing DL Manager" section on page 1-25).

The fan module consists of three fans that draw air in from the side of the chassis and over the function modules (see the "Ventilating the DL4360x Chassis" section on page 1-11). Should a fan fail, the speed of the operating fans increases to maintain proper chassis cooling.

Figure 1-5. DLFM010 Fan Module

Required Installation Tools and Equipment

To install the DL4360x as a rack-mounted unit, you need the following:

- Phillips head screwdriver to install the chassis in an equipment rack and to reposition the chassis mounting brackets (optional)
- Eight rack mounting screws and matching screw driver (not supplied)

Unpacking the DL4360x

When unpacking the DL4360x, set aside the packing material in case you need to repackage the unit later.

To unpack the DL4360x, perform the following steps:

1. Remove the DL4360x chassis, fan module, power supply modules, and function modules from the shipping cartons.

Note: Note: Artel ships the chassis with only the DLM001 controller module (non-switching) installed. If your order includes the DLX001 controller switch module, this module is shipped separately and must be installed in the chassis.

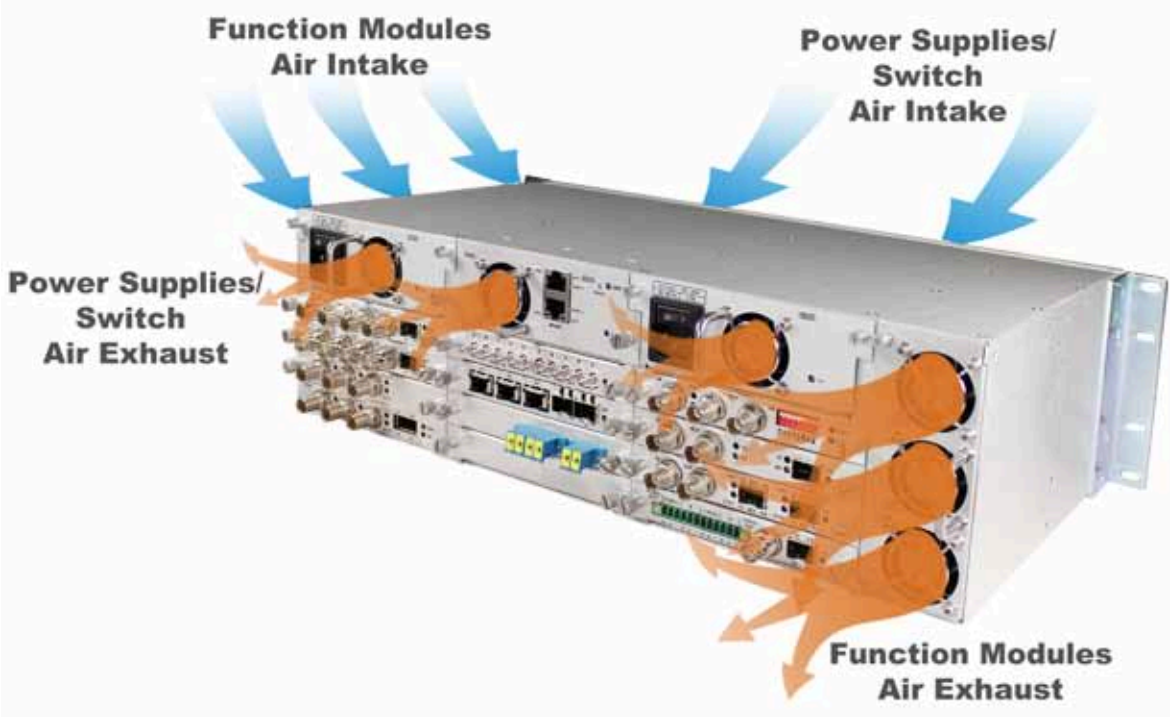
2. Check the configuration of the unit against the items listed on the packing slip. If you find any discrepancies, report them in accordance with the instructions in the "Artel Customer Service" section on page xvii.

Ventilating the DL4360x Chassis

It is important that your DL4360x operates within the specified temperature range as described in the DigiLink Media Transport Platform data sheet. As shown in Figure 1-6, ventilation of the chassis components is separated into two sections as follows:

- Power supply and control module ventilation—Each power supply module and the control module (DLX001 only) contains its own cooling fan, which draws air in from the intake ventilation openings located on the front panel.
- Function module ventilation—The fan module draws air in from the ventilation slots located on the right side of the chassis and over the function modules.

Figure 1-6. DL4360x Air Flow



To ensure proper ventilation of the chassis and the installed modules, you must adhere to the following requirements when installing and operating your DL4360x:

- Maintain at least a 2 inch (5 cm) clearance around the sides, rear, and front of the chassis where the fans and ventilation slots are located. Keep these areas clear of any obstructions that might restrict air flow in or out of the chassis.
- Install the blank module trays in any unused function module slots.
- Visually inspect the ventilation fans for proper operation when the power is applied.

Installing the DL4360x Chassis

You can place the DL4360x chassis on a flat surface as a free-standing unit or rack mount it in a standard 19 inch equipment rack. As you position the DL4360x for installation, ensure that there is enough space in the back of the chassis to install and cable the various power supply and function modules.

Note: Before installing your DL4360x chassis, see the *DigiLink Media Transport Platform Data Sheet* for a detailed description of the DL4360x product specifications, including environmental requirements that you must adhere to when installing the chassis and power supply modules.

Warning

Restricted access.

This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock, or other means of security. Only trained and qualified personnel should be allowed to install or replace this equipment.

The section contains the following topics:

Installing the DL4360x as a Free-Standing Chassis

When installing the DL4360x chassis as a free-standing chassis, adhere to the following requirements:

- The surface must be flat, clean, and in a safe location. *Do not install the chassis on the floor*. In addition to increasing the risk of being damaged, placing the chassis on the floor increases the risk of dust building up in the chassis and causing problems related to overheating.
- The area must provide a 2 inch (5 cm) clearance on all four sides of the chassis for proper ventilation (see the "Ventilating the DL4360x Chassis" section on page 1-11) and accessing the power switch, status LEDs, module slots, and cable connections.

Installing the Chassis in a Rack

Before you install the chassis in an equipment rack, determine if you want to flush-mount or mid-mount the chassis into the rack as described in this section. Flush-mounting the chassis sets the front edge of the unit even with the front edge of the rack. Mid-mounting the chassis causes the front edge of the unit to protrude from the front of the rack.

Note: When installing multiple chassis in a rack, no vertical space between the units is required. The only limit to the number of chassis that you can place in a rack is the height of the rack.

Caution

If the system is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment might be greater than the room ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature specified for the system.

Caution

Installation of the equipment in a rack should be such that the amount of airflow required for safe operation of the equipment is not compromised.

Caution

Mounting of the equipment in the rack should be such that a hazardous condition is not created due to uneven mechanical loading.

Caution

Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on over-current protection and supply wiring. Appropriate consideration of equipment nameplate power ratings should be used when addressing this concern.

Caution

Reliable grounding of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (for example, use of power strips).

The section contains the following topics:

Flush-Mounting the Chassis

Artel ships the chassis with the mounting brackets installed for flush-mounting the unit as shown in Figure 1-7.

Figure 1-7. Flush-Mounted Chassis Bracket

To flush-mount the DL4360x in an equipment rack, perform the following steps:

1. Raise the unit to the appropriate installation height.
2. Align the screw holes on the mounting brackets with the screw holes on the equipment rack.
3. Install the screws through the chassis mounting brackets into the threaded screw holes on the rack. The chassis requires four screws for each side of the chassis (mounting screws not included).

Mid-Mounting the Chassis

To mid-mount the DL4360x in an equipment rack, perform the following steps:

1. Remove the six screws that secure each mounting bracket to the side of the chassis.
2. Align the mounting brackets with the mid-mount location on the chassis as shown in Figure 1-8 and secure the brackets to the chassis using the screws you removed in Step 1.
3. Install the chassis in the rack by securing the mounting brackets to the rack. The unit requires eight screws for each side of the chassis (mounting screws not included).

Figure 1-8. Mid-Mounted Chassis Bracket

Installing and Cabling a Power Supply Module

After you have installed your DL4360x chassis as described in the "Installing the DL4360x Chassis" section on page 1-12, you can install and cable one or two power supply modules into the chassis. When using two power supply modules, the DL4360x chassis accepts any combination of AC or DC modules. If you are installing only one power supply module, you can install the module in either slot but be sure to leave the blank tray in the unused slot.

Warning

To avoid risk of injury or possible equipment damage, ensure that your power source meets the specifications as described in the Media Transport Platform data sheet before applying power to your DL4360x.

Caution

Install and cable the power supply module before connecting to the power source.

This section contains the following topics:

Installing a Power Supply Module

To install a power supply module, perform the following steps:

1. From the back of the chassis, remove the two Phillips head screws that secure the blank tray to one of the power supply module slots and remove the tray.

   If you are installing only one power supply module, it does not matter which power supply module slot you use.

2. Slide the power supply module into the chassis slot (see Figure 1-9).
3. Push the power supply module in until it is firmly seated into the backplane and flush with the back of the chassis.
4. Secure the power supply module to the chassis using the two Phillips head mounting screws attached to the module.

Caution

For safety reasons, ensure that each power supply module is firmly mounted to the chassis using the Phillips head mounting screws.

Figure 1-9. Installing a Power Supply Module

Caution

To ensure proper ventilation of the DL4360x media transport system, insert a blank module tray in every unused function module and power supply module slot.

The power supply module is now ready to be connected to your power source. See either of the following sections:

- Cabling an AC Power Supply Module (page 1-17)
- Cabling a DC Power Supply Module (page 1-17)

Cabling an AC Power Supply Module

To connect the AC power supply module to the power source, you need the three-prong 320-C13 115/230 VAC power cord that was shipped with the module. Figure 1-10 shows the power source connector on the AC power supply module.

Figure 1-10. AC Power Supply Module Power Cord Connector

To cable an AC power supply module, perform the following steps:

1. From the rear panel of the DL4360x chassis, ensure that the module's power switch is in the OFF (0) position (see Figure 1-10).
2. Attach the AC power cord to the AC connector on the power supply module.
3. Attach the other end of the AC power cord to the AC power source.

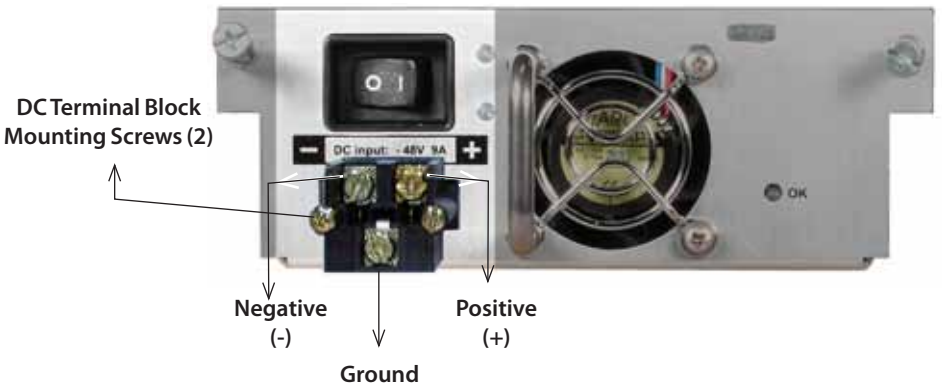
Note: *Do not switch the power modules on at this time*. Finish installing the other module types in the chassis and then see the"Powering Up and Monitoring the DL4360x" section on page 1-22.

Cabling a DC Power Supply Module

The DC version of the DL4360x power supply module has a -48 VDC input connector terminal block as shown in Figure 1-11.

Note: The DC terminal block is secured to the power supply module with two mounting screws, which allows you to leave the DC cables attached to the terminal block when swapping out the module (see the"Replacing Modules" section on page 1-27).

Figure 1-11. DC Power Supply Module Terminal Block



Caution

When connecting a DC power supply, make sure that you are connecting the DL4360x power supply module to a -48 VDC source that is isolated from any AC power and is reliably grounded to earth.

To cable a DC power supply module, perform the following steps:

1. From the rear panel of the DL4360x chassis, ensure that the power switch is in the OFF (0) position (see Figure 1-11).
2. Locate the terminal block assembly on the rear of the unit.
3. Loosen the three terminal screws marked - (negative), + (positive), and ground.

Caution

Before installing the cables in the next step, ensure that the polarity of the DC connections is correct. The unit will not operate if the polarity of the input DC voltage is not correct.

4. Install the three DC power source cables and tighten the screws to secure the connectors to the terminal block. Ensure that the cables or spade connector terminations are positioned under the screw heads.
5. Connect the other end of the power cable into an approved safety extra-low voltage (SELV) energy-output source.

Note: A fully loaded DL4360x chassis with twelve function modules and two power supply modules consumes approximately 234 W from a nominal 48 VDC circuit.
Observe the following recommendations:

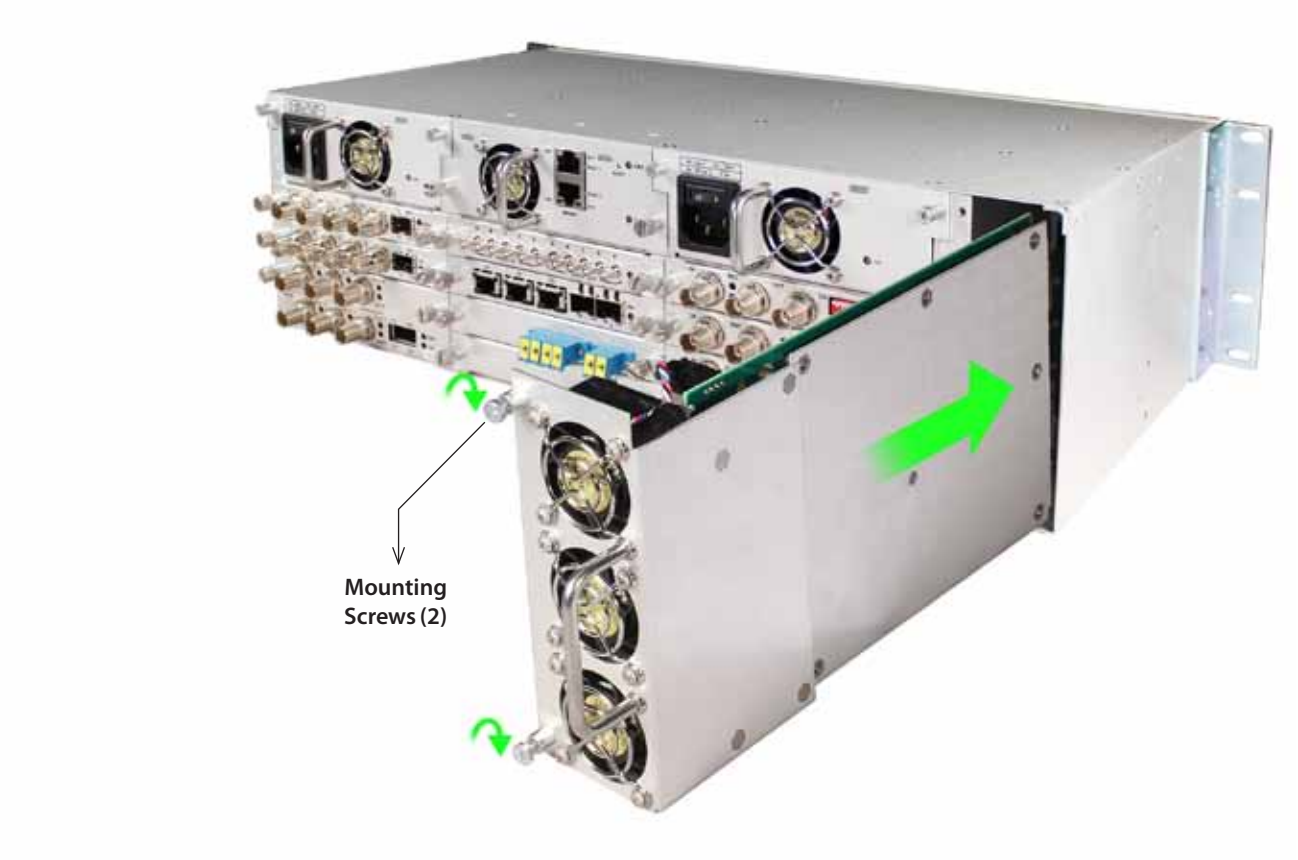
- We recommend slow blow (time delay) fusing, with a minimum fuse capacity of 6 A per DL4360x.
- If fast blow (fast-acting) fuses are used, we recommend using a minimum fuse capacity of 9 A per DL4360x to prevent nuisance blows due to inrush surge.
- We recommend a 6 A branch circuit breaker for the DL4360x -48 VDC power supply. Use a minimum of AWG #16 wire gauge on the 6 A circuit.

Note: *Do not switch the power module on at this time*. Finish installing the other module types in the chassis and then see the"Powering Up and Monitoring the DL4360x" section on page 1-22.

Installing the Fan Module

To install the fan module, slide the module into the fan module slot until the module is flush with the chassis, and then secure the module to the chassis using the two Phillips head mounting screws attached to the module.

Figure 1-12. Installing the Fan Module



Installing the DLX001 Controller Module

Use the following procedure only if your order includes the DLX001 controller module with switching capabilities.

Note: Artel ships the DL4360x with the DLM001 controller module (non-switch module) installed. If your order does not include the DLX001 module (switch module), skip this section.

To install the DLX001 controller module, perform the following steps:

1. From the rear panel of the DL4360x chassis, remove the two screws that secure the DLM001 module to the chassis and remove the module.

   The controller module slot is located between the two power supply chassis slots (see Figure 1-13).

2. Slide the DLX001 Controller module into the Controller module slot.
3. Push the model in until it is firmly seated into the backplane and flush with the back of the chassis.
4. Secure the module to the chassis using the two mounting screws attached to the module.

Note: Do not cable a management port (Port 1 or 2) to your management network at this time. For details about accessing and using DL Manager after you have all the chassis modules installed, see the "Information about Accessing DL Manager" section on page 1-25.

Figure 1-13. Installing the Controller Module

Installing a Function Module

You can install up to twelve function modules in the DL4360x. A function module can be installed in any available function module slot.

Note: To allow function modules to interconnect and exchange signals though the chassis backplane, you must install a DLX001 control module (see the "Installing the DLX001 Controller Module" section on page 1-20).

This section contains only the basic instructions for installing a function module in the DL4360x. Refer to the appropriate module-specific manual for detailed instructions about installing, configuring, and cabling the module.

To install a function module into the chassis, perform the following steps:

1. Configure the operation of the function module if required at this time.

   Note: Some function modules require that you configure them prior to installing them because they are configured using DIP switches that are mounted to the top of the module board.
   Some modules must be configured *after* you install the module by using DL Manager as described in the module's operation manual.

   See the appropriate module-specific manual for configuration information.

2. From the rear panel of the DL4360x chassis, remove the two screws that secure one of the blank module trays to the chassis and remove the tray.
3. Slide the function module into the chassis slot using the guide rails on either side of the slot.
4. Push the function model in until it is firmly seated into the backplane and flush with the back of the chassis.
5. Secure the function module to the chassis using the two mounting screws attached to the module.
6. Cable the function module (see the appropriate module-specific manual).

Repeat this procedure for each function module that you plan to install in the DL4360x.

Caution

To ensure proper ventilation of the DL4360x, insert a blank module tray in every unused function module slot.

Powering Up and Monitoring the DL4360x

The power supply modules provide power to the installed modules through the backplane. The chassis front panel status LEDs shown in Figure 1-14 indicate if the backplane, installed power supply modules, and installed function modules are operating correctly or if a problem exists.

Figure 1-14. DL4360x Front Panel Status LEDs

To power on and verify proper operation of the DL4360x, perform the following steps:

1. From the back of the chassis, turn the power switch for each power supply module ON (1).
2. From the front of the chassis, observe the status LEDs for proper operation as described in Table 1-5.

Table 1-5. DL4360x Chassis Status LEDs

LED	Description	State
Status	Operating status of the chassis backplane and installed function modules.	Off—Power to the chassis is unavailable. Check the power source connection.
		Green—Power is applied to the chassis and no alarm condition exists with any of the installed power supply, fan, or function modules.
		Yellow—Minor alarm condition exists. Power is applied to the chassis and at least one minor alarm condition exists in the chassis or one of the installed power supply, fan, or function modules. If this LED is yellow and no other minor alarm is indicated in a power supply, fan, or function module, then the temperature on the backplane is out of range. Check that adequate inlet and exhaust airflow is available.
		Red—Major alarm condition exists. Power is applied to the chassis and at least one major alarm condition exists in the chassis or one of the installed power supply, fan, or function modules. If this LED is red and no other major alarm is indicated in a power supply, fan, or function module, then a failure on the backplane is indicated. Replace the DL4360x chassis.

Table 1-5. DL4360x Chassis Status LEDs (Continued)

LED	Description	State
PSA or PSB	Operating status of the corresponding power supply module. The DL4360x checks the following power supply module functions: • Fan—Ventilation fan is operating. • Temperature—Operating temperature is within specifications. • Voltage—Voltage supplied to the backplane is within specifications. • Communication—Communication with the backplane exists. **Note:** There is a corresponding status LED located on the rear panel of a power supply module (see Figure 1-3).	Off—Power supply module is not installed in the corresponding slot or no power is applied to the chassis.
		Green—Power is applied to the corresponding power supply module and no alarm condition exists.
		Yellow—Minor alarm exists that indicates the temperature is out of range. Check that adequate inlet and exhaust airflow is available.
		Red—Major alarm condition exists with the corresponding power supply module. The power supply module can no longer provide power to the chassis. You must correct the problem immediately. Possible causes are as follows: • No input power to the power supply. Check that input voltage is present. • Fan is running slow or stopped. Replace the power supply. • Internal failure of the power supply. Replace the power supply. • Communication failure with the backplane. Replace the power supply. If the problem persists, replace the chassis.
FAN	Operating status of the fans in the fan module only. **Note:** PSU or switch fan failures are reported by the associated module's front panel status LED.	Off—Fan module is not installed or no power is applied to the chassis.
		Green—Power is applied no alarm condition exists.
		Yellow—Minor alarm exists indicating that the temperature is out of range. Check that adequate inlet and exhaust airflow is available or that a fan is not operating.
		Red—One of more fans is not operating.
MGMT	Operating status of DL Manager.	Off—Management module is not installed in the slot or no power is applied to the chassis
		Green—Normal operation.
		Yellow—Minor alarm exists that indicates the temperature is out of range or that there is not adequate inlet and exhaust airflow is available.
		Red—Major alarm condition exists.

Table 1-5. DL4360x Chassis Status LEDs (Continued)

LED	Description	State
SWITCH	Operating status of the DLX001 control module (if one is installed).	Off—Switch module is not installed in the slot or no power is applied to the chassis.
		Green—Normal operation
		Yellow—Minor alarm exists that indicates the temperature is out of range or that there is not adequate inlet and exhaust airflow is available.

Information about Accessing DL Manager

Artel's DL Manager is a web-based graphical user interface (GUI) that provides a network management interface for the DL4360x chassis. Using DL Manager, you can monitor and configure the operations of the installed function modules. DL Manager includes a real-time preemptive, multitasking operating system, TCP/IP stack, web server, and SNMP master agent.

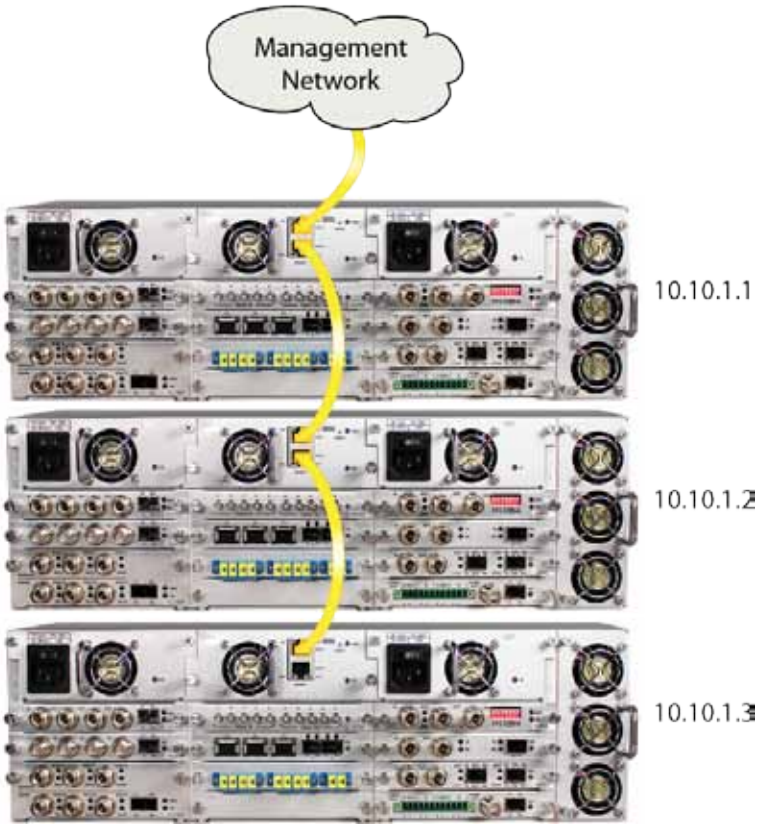
The DL Manager software resides on a single board computer within the DL4360x chassis fan module (see the "Fan Module Overview" section on page 1-9). Access to DL Manager is made through the management ports located on the controller module (see the "Controller Module Overview" section on page 1-8).

Artel ships DL Manager with a default IP address that allows you to connect locally to it using a client device. If you are going to connect DL Manager to your management network, you must first configure its network IP address as needed to connect to your network.

The DLX001 and DLM001 control modules contain two management port connections, which allows you to daisy chain the management port connections of multiple DL4360x chassis. Figure 1-15 shows an example of daisy chaining three DL4360x chassis, each with it own unique IP address.

Note: Before you can connect a daisy chain configuration to your management network, you must use a local client device to access the DL Manager instance on each chassis and configure each with a unique IP address (as shown in Figure 1-15) that will work on your network.

Figure 1-15. Sample Management Port Daisy Chain Application



Refer to the following manuals for details about accessing and using DL Manager with the DL4360x:

- *DigiLink Manager Setup and Operations Manual*
  Provides the following information:
  - Operational considerations
  - Configuring and cabling the client device
  - Accessing the DL Manager home page
- *DLX001 Control Module Operational Manual*
  Provides information about how to use DL Manager to monitor and manage the DLX001 switching capabilities.
- Assorted Function Module Manuals
  You will also need the installation and operation manual associated with each of the installed modules to see how they can be managed using DL Manager.

Replacing Modules

The DL4360x power supplies, fan, installed function modules, and DLX001 control module are hot swappable and can be replaced while power is applied to the chassis.

This section contains the following topics:

Replacing a Function Module or a DLX001 Control Module

This procedure provides a basic overview of the steps required to replace a function module or DLX001 control module. Refer to the appropriate module-specific manual for detailed instructions on installing, configuring, and cabling the module.

To replace a function module, perform the following steps:

1. Using DL Manager, save the module configuration to file (for details, see the *DigiLink Manager Setup and Operations Manual*).

   This step is:

   - Required for modules that must be configured using DL Manager.
   - Optional for modules that can be configured using DIP switches.

2. Remove the cables from the rear panel of the module.

   For the DLX001, the cables are management network cables.

3. Loosen the two mounting screws that secure the function module that you are replacing to the DL4360x chassis.
4. Slide the function module out of the chassis.
5. (Function modules only) Configure the DIP switches (if available) on the new function module.

   Note: For the function modules that do not contain configuration DIP switches, configure the modules after you install them in the chassis by using DL Manager.

6. Slide the replacement module into the slot using the guide rails on either side of the slot.
7. Push the model in until it is firmly seated into the backplane and flush with the back of the chassis.
8. Secure the module to the chassis using the two mounting screws attached to the module.
9. Replace the cables on the rear panel of the module.
10. To reconfigure the module by uploading its configuration file using DL Manager, see the *DigiLink Manager Setup and Operations Manual*.

Caution

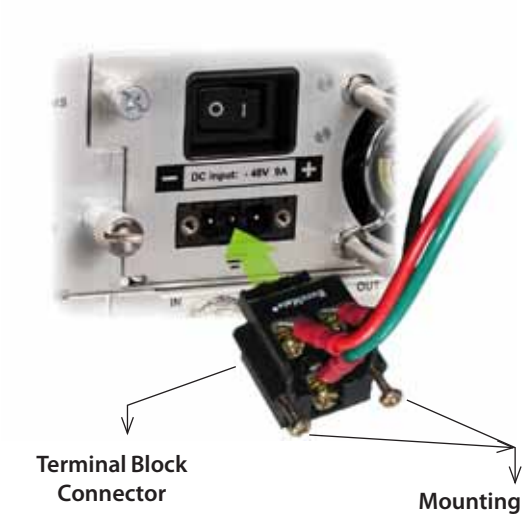
To ensure proper ventilation of the DL4360x media transport system, insert a blank module tray in every unused function module and power supply module slot.

Replacing a Power Supply Module

To replace a power supply module, perform the following steps:

1. Disconnect the main power source to the power supply module that you are replacing.
2. Remove the power source cable from the power supply module by doing one of the following:
   - AC power cable—Remove the AC power cord from the AC connector on the power supply module (see Figure 1-10).
   - DC power cable—Loosen the two Phillips head screws that secure the terminal block connector to the power supply module (see Figure 1-17) and remove the connector. Do not remove the cables from the terminal block connector because you will install the wired connector into the replacement power supply module.
3. Loosen the two Phillips head mounting screws that secure the power supply module to the DL4360x chassis.
4. Pull the power supply module out of the chassis using the module handle.
5. Slide the replacement power supply module into the chassis slot.
6. Push the power supply module in until it is firmly seated into the backplane and flush with the back of the chassis (see Figure 1-9).
7. Secure the power supply module to the chassis using the two Phillips head mounting screws attached to the module.
8. Attach the power source cable to the power supply module by doing one of the following:
   - AC power cable—Attach the AC power cord to the AC connector on the power supply module.
   - DC power cable—Replace the existing power supply terminal block connector with the wired terminal block connector that you removed from the original power supply module by following these steps:
     a. Loosen the two Phillips head screws that secure the terminal block connector to the power supply module and remove the connector.
     b. Insert the wired terminal block connector into the power supply module (see Figure 1-16). The connector is keyed to ensure a proper installation.
     c. Secure the terminal block connector to power supply module using the two Phillips head screws attached to the connector.
9. Reconnect the main power source.

Figure 1-16. DC Terminal Block Connector



Caution

To ensure proper ventilation of the DL4360x media transport system, insert a blank module tray in every unused function module and power supply module slot.

Caution

Ensure that the -48 VDC power supply wires are a minimum of AWG #16 wire gauge.

Replacing the Fan Module

Caution

To ensure proper ventilation of the DL4360x media transport system, replace the fan module immediately after removing it. Allowing the chassis to operate without a fan module for an extended period of time can damage the equipment.

Note: The fan module hosts the DL Manager software. Before you replace the module, you need to copy the DL Manager configuration to a file. After you replace the fan module, you need to configure access to DL Manager and then upload the configuration file.

To replace the fan module, perform the following steps:

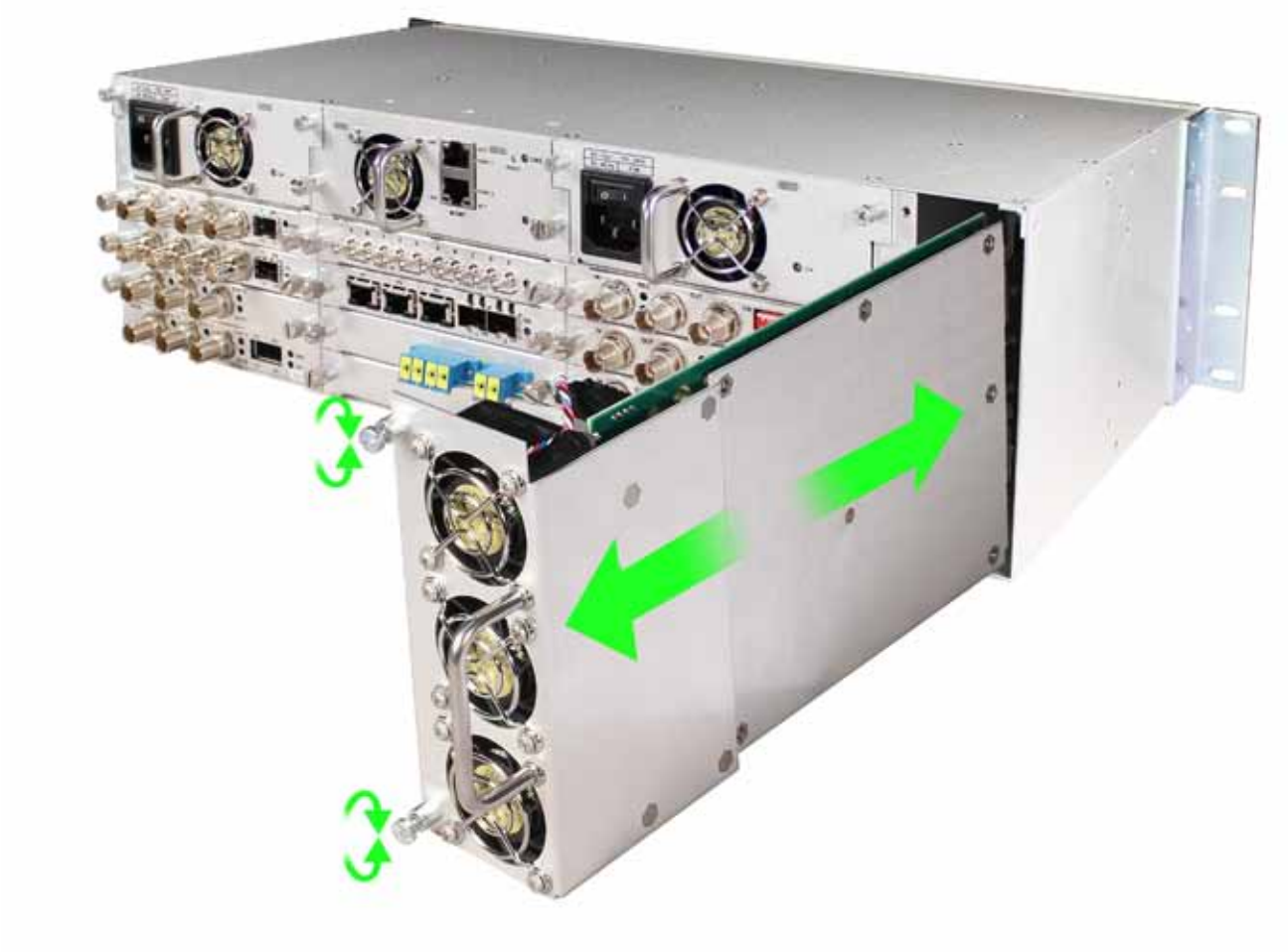
1. Access the chassis DL Manager and do the following:
   - Save the DL Manager configuration to a file.
   - Save the configuration of each installed function module to a file.

   For details, see the *DigiLink Manager Setup and Operations Manual*.

2. From the back of the chassis, loosen the two Phillips head mounting screws that secure the fan module to the DL4360x chassis (see Figure 1-17).
3. Pull the fan module out of the chassis using the module handle.
4. Slide the new fan module into the chassis slot.
5. Push the fan module in until it is firmly seated into the backplane and flush with the back of the chassis.
6. Secure the fan module to the chassis using the two Phillips head mounting screws attached to the module.
7. Configure DL Manager for connection to your management network. See the "Information about Accessing DL Manager" section on page 1-25.
8. From DL Manager, upload the configuration files for DL Manager and each installed function module.

   For details, see the *DigiLink Manager Setup and Operations Manual*.

Figure 1-17. Replacing the Fan Module



2

DL4300 Overview and Installation

This chapter introduces the DL4300 chassis and describes how to install and configure the device. The DL4300 chassis features twelve hot swappable function module slots, dual hot swappable power supplies, and a fan module.

The DL4300 chassis also includes the following features:

- Space-efficient rugged chassis.
- Passive backplane with high speed interconnect between function modules (up to 72 Gb/s).
- AC power, DC power, or dual (one of each).
- Separate cooling fans for the power supply modules and the function modules.
- NEBS Level 3 certified.
- Unlimited, non-spaced installation.
- Simple Network Management Protocol (SNMP) management.
- DigiLink Manager (or *DL Manager*), which is Artel's element management system for configuring and monitoring the function modules.

Note: This chapter uses the following terms interchangeably:

- Chassis and shelf when referring to the DL4300.
- *DigiLink Manager* and *DL Manager* when referring to the element management system.

This chapter contains the following sections:

DL4300 Laser Warnings

Function modules with optical transmitters that install into the DL4300 chassis contain Class 1 lasers. 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.

DL4300 Power Supplies Warning

The chassis can be supplied by more than one power source. All sources must be removed to de-energize the chassis.

Warning

De-energize the chassis before servicing any modules.

This unit has two power supply connections. Both connections must be removed to properly de-energize the system.

Failure to observe this warning could result in personal injury.

DLFM or DLM Module Warning

The DigiLink element management modules utilize an internal RTC (Real Time Clock) with battery backup that provides the system software with the time of day on system power up. The backup battery is a socketed lithium battery that lasts the life of the unit when the unit is operating in the specified environmental conditions. The battery is not field replaceable.

Note: If the lithium battery in a unit should fail, you must return the module to Artel Video Systems for repair. *Do not replace the battery yourself*. Although the battery is not intended to be field replaceable, the safety agencies require that the following warning be included in this document.

Warning

There is a danger of explosion if the battery is replaced incorrectly.

Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries in accordance with the manufacturer's instructions and local regulations.

Failure to observe this warning could result in personal injury.

Chassis Overview

The DL4300 chassis has twelve function module slots, two power supply module slots, a fan module slot, and status LEDs. The chassis also contains a passive backplane that allows functions modules installed in the same stack (slots 1–4, 5–8, or 9–12) to interconnect and exchange signals. For example, as shown in Figure 2-1, the modules installed in slots 1 to 4 can use the backplane to exchange signals between each other rather than use their external BNC connectors. These same modules can exchange signals with the modules installed in the other stacks (slots 5–8 or 9–12); however, this type of module interconnect must be made through the external BNC connectors of the modules.

The power supply modules that provide power to the chassis components also host the DL Manager software, which provides EMS capabilities for monitoring and configuring the installed function modules.

Figure 2-1 shows the chassis front panel components. This sample chassis configuration shows function modules occupying nine of the twelve function module slots. Blank module trays are inserted into the three unused module slots to cover the slot openings and maintain proper ventilation.

Figure 2-1. DL4300 Chassis Front Panel View

Figure 2-1 describes the components called out in Figure 2-1.

Table 2-1. The DL4300 Chassis Front Panel Elements

Item	Description	for details, see...
1	DL4300 chassis and product model number	Installing the DL4300 Chassis (page 2-10)
2	Status LEDs: • STATUS—Chassis status indicator • PSA—Power supply module A status indicator • PSB—Power supply module B status indicator • FAN	Powering Up and Monitoring the DL4300 (page 2-17)

Table 2-1. The DL4300 Chassis Front Panel Elements (Continued)

Item	Description	for details, see...
3	Power supply modules intake vents	Ventilating the DL4300 Chassis (page 2-9)
Slots 1–4	Function module slots	Installing a Function Module (page 2-16)
Slots 5–8	Function module slots	
Slots 9–12	Function module slots	

Figure 2-2 shows the chassis rear panel components. This sample chassis configuration shows nine function modules, two power supply modules, and a fan module loaded in the chassis. Blank module trays are inserted into the three unused function module slots to cover the slot openings and maintain proper ventilation.

Figure 2-2. DL4300 Chassis Rear Panel View

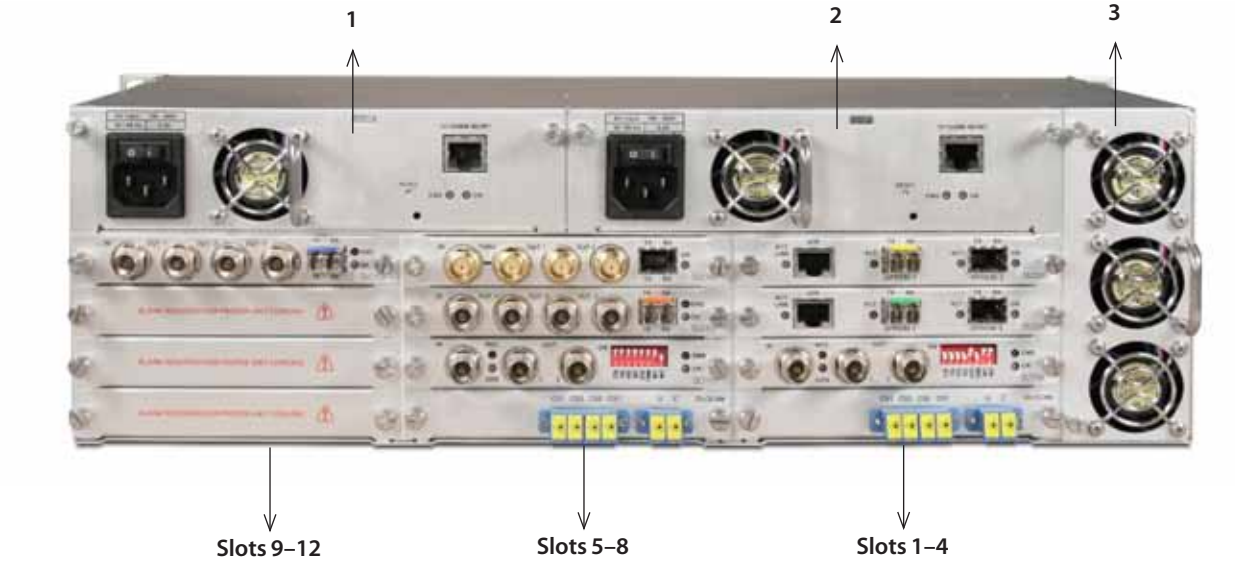


Table 2-2 describes the components called out in Figure 2-2.

Table 2-2. The DL4300 Chassis Rear Panel Elements

Item	Description	for details, see...
1	Power Supply Module Slot B (AC power supply module installed)	• Power Supply Module Overview (page 2-6) • Installing and Cabling a DL4300 Power Supply Module (page 2-13)
2	Power supply module Slot A (AC power supply module installed)	
3	Fan module slot	• Fan Module (page 2-8) • Replacing the Fan Module (page 2-22)

Table 2-2. The DL4300 Chassis Rear Panel Elements (Continued)

Item	Description	for details, see...
Slots 9–12	Function module slots	• Installing a Function Module (page 2-16)
Slots 5–8	Function module slots	
Slots 1–4	Function module slots	

Power Supply Module Overview

The DL4300 can be powered using a single power supply module or you can install a second module to increase system availability. The power supply module is available in the following models:

- Model DLM301-AC (AC version)
- Model DLM302-DC (DC version)

The power supply module features include the following:

- Load sharing when two power supply modules are installed.
- Voltage, temperature, and cooling fan alarms.
- Cooling fan that provides ventilation for the power supply module.
- DL Manager management interface. The module includes a computer board for hosting Artel's DL Manager (an element management system) and an Ethernet port for accessing DL Manager locally or over a management network.

  Note: You can use a DLM301-AC or DLM302-DC for its DL Manager functionality only and not use it as a power source for the DL4300. This allows you to use one module to provide power and a second module to provide DL Manager redundancy only, receiving its power through the chassis backplane.

For more information, see the "Information about Using DL Manager" section on page 2-19.

Figure 2-3 shows sample AC and DC power supply modules and the various module components.

Figure 2-3. DL4300 AC Power Supply Module

Table 2-3 describes the components called out in Figure 2-3.

Table 2-3. The DL4300 Power Supply Module Elements

Item	Power Supply Element	for details, see...
1	Power source connector (DC or AC)	Installing and Cabling a DL4300 Power Supply Module (page 2-13) **Note:** Note: The DC version comes with a terminal block (not shown) installed on the DC input.
2	Ventilation fan	Ventilating the DL4300 Chassis (page 2-9)
3	Module handle	N/A
4	Reset switch (for DL Manager)	*DL Manager Setup and Operations Manual*
5	DL Manager management interface (10/100MB MGMT Port)	Information about Using DL Manager (page 2-19)
6	Status LEDs: • EMS (for DL Manager) • ON	Powering Up and Monitoring the DL4300 (page 2-17)
7	Backplane connector	N/A

Fan Module

The DL4300 fan module, which comes installed in the chassis, ventilates the function modules mounted in the chassis. This module consists of three fans that draw air in from the side of the chassis and over the modules. Should a fan fail, the speed of the operating fans increases to maintain proper chassis cooling.

Figure 2-4. DL4300 Fan Module

Required Installation Tools and Equipment

To install the DL4300 as a rack-mounted unit, you need the following:

- Phillips head screwdriver to install the chassis in an equipment rack and to reposition the chassis mounting brackets (optional)
- Eight rack mounting screws and matching screw driver (not supplied)

Unpacking the DL4300

When unpacking the your DL4300, set aside the packing material in case you need to repackage the unit later.

To unpack the DL4300, perform the following steps:

1. Remove the DL4300 chassis (fan module installed), power supply modules, and function modules from the shipping cartons.

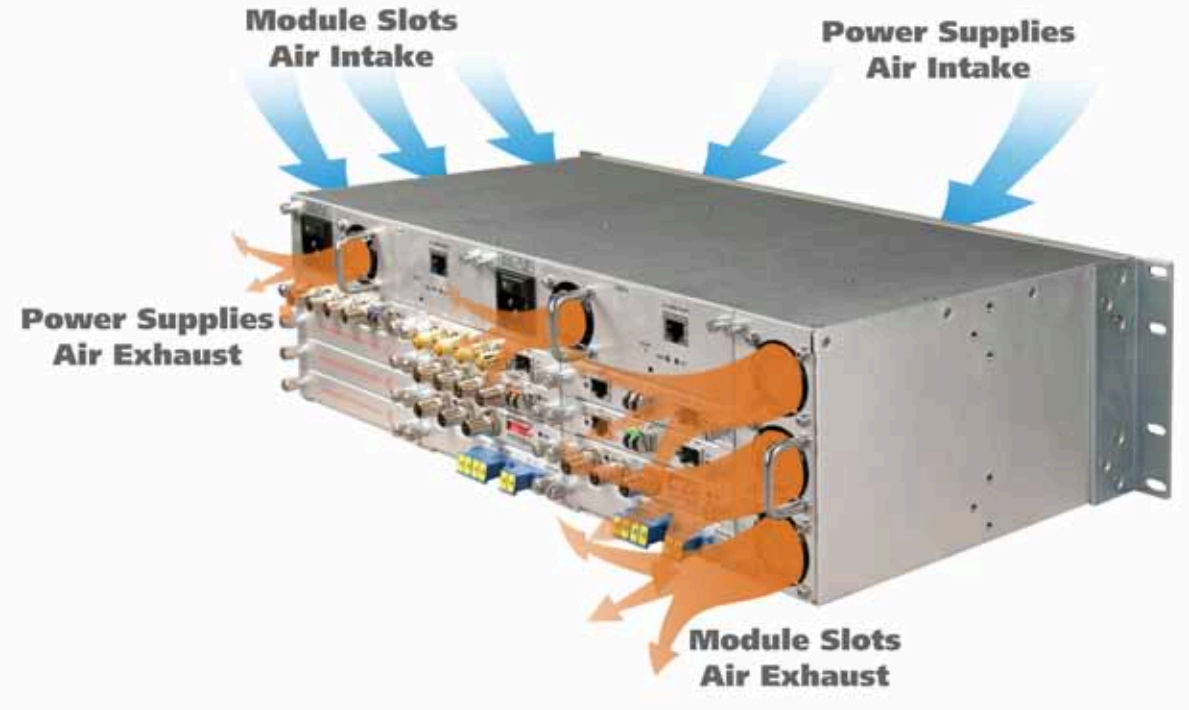
2. Check the configuration of the unit against the items listed on the packing slip. If you find any discrepancies, report them in accordance with the instructions in the "Artel Customer Service" section on page xvii.

Ventilating the DL4300 Chassis

It is important that your DL4300 operates within the specified temperature range as described in the DL4300 data sheet. As shown in Figure 2-5, ventilation of the chassis components is separated into two sections as follows:

- Power supply module ventilation—Each power supply module contains its own cooling fan, which draws air in from the intake ventilation openings located on the front panel.
- Function module ventilation—The fan module draws air in from the ventilation slots located on the right side of the chassis and over the function modules.

Figure 2-5. DL4300 Air Flow



To ensure proper ventilation of the chassis and the installed modules, you must adhere to the following requirements when installing and operating your DL4300:

- Maintain at least a 2 inch (5 cm) clearance around the sides, rear, and front of the chassis where the fan and ventilation slots are located. Keep these areas clear of any obstructions that might restrict air flow in or out of the chassis.
- Install the blank module trays in any unused function module slots.
- Visually inspect the ventilation fans for proper operation when the power is applied.

Installing the DL4300 Chassis

You can place the DL4300 chassis (with factory-installed fan module) on a flat surface as a free-standing unit or rack mount it in a standard 19 inch equipment rack. As you position the DL4300 for installation, ensure that there is enough space in the back of the chassis to install and cable the various power supply and function modules.

Note: Before installing your DL4300 chassis, see the DL4300 data sheet for a detailed description of the DL4300 product specifications including environmental requirements that you must adhere to when installing the chassis and power supply modules.

The section contains the following topics:

Installing the DL4300 as a Free-Standing Chassis

When installing the DL4300 chassis as a free-standing chassis, follow these requirements:

- The surface must be flat, clean, and in a safe location. *Do not install the chassis on the floor*. In addition to increasing the risk of being damaged, placing the chassis on the floor increases the risk of dust building up in the chassis and causing problems related to overheating.
- The area must provide a 2 inch (5 cm) clearance on all four sides of the chassis for proper ventilation (see the Ventilating the DL4300 Chassis (page 2-9) and accessing the power switch (AC version only), status LEDs, module slots, and cable connections.

Installing the Chassis in a Rack

Before you install the chassis in an equipment rack, determine if you want to flush-mount or mid-mount the chassis into the rack. Flush-mounting the chassis sets the front edge of the unit even with the front edge of the rack. Mid-mounting the chassis causes the front edge of the unit to protrude from the front of the rack.

Note: When installing multiple chassis in a rack, no vertical space between the units is required. The only limit to the number of chassis that you can place in a rack is the height of the rack.

Caution

If the system is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment might be greater than the room ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature specified for the system.

Caution

Installation of the equipment in a rack should be such that the amount of airflow required for safe operation of the equipment is not compromised.

Caution

Mounting of the equipment in the rack should be such that a hazardous condition is not created due to uneven mechanical loading.

Caution

Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on over-current protection and supply wiring. Appropriate consideration of equipment nameplate power ratings should be used when addressing this concern.

Caution

Reliable grounding of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (for example, use of power strips).

This section contains the following topics:

Flush-Mounting the Chassis

Artel ships the chassis with the mounting brackets installed for flush-mounting the unit as shown in Figure 2-6.

Figure 2-6. Flush-Mounted Chassis Bracket

To flush-mount the DL4300 in an equipment rack, perform the following steps:

1. Raise the unit to the appropriate installation height.
2. Align the screw holes on the mounting brackets with the screw holes on the equipment rack.
3. Install the screws through the chassis mounting brackets into the threaded screw holes on the rack. The chassis requires four screws for each side of the chassis (mounting screws not included).

Mid-Mounting the Chassis

To mid-mount the DL4300 in an equipment rack, perform the following steps:

1. Remove the six screws that secure each mounting bracket to the side of the chassis.
2. Align the mounting brackets with the mid-mount location on the chassis as shown in Figure 2-7 and secure the brackets to the chassis using the screws you removed in Step 1.
3. Install the chassis in the rack by securing the mounting brackets to the rack. The unit requires eight screws for each side of the chassis (mounting screws not included).

Figure 2-7. Mid-Mounted Chassis Bracket

Installing and Cabling a DL4300 Power Supply Module

After you have installed your DL4300 chassis as described in the "Installing the DL4300 Chassis" section on page 2-10, you can install and cable one or two power supply modules into the chassis. When using two power supply modules, the DL4300 chassis accepts any combination of AC or DC modules. If you are installing only one power supply module, you can install the module in either slot but be sure to leave the blank tray in the unused slot.

Warning

To avoid risk of injury or possible equipment damage, ensure that your power source meets the specifications as described in the DL4300 data sheet before applying power to your DL4300.

Caution

Install and cable the power supply module before connecting to the power source.

In addition to providing power to the chassis hardware components, the power supply modules host the DL Manager software. This means that you also need to cable the module's management network connection if you plan to use the DL Manager element management system. For information about connecting to DL Manager after you have cabled power to the power supply modules, see the "Information about Using DL Manager" section on page 2-19.

This section contains the following topics:

Installing a Power Supply Module

Installing a power supply requires a Phillips head screwdriver.

To install a power supply module, perform the following steps:

1. From the back of the chassis, remove the two Phillips head screws that secure the blank tray to one of the power supply module slots and remove the tray. If you are installing only one power supply module, it does not matter which power supply module slot you use.
2. Slide the power supply module into the chassis slot (see Figure 2-8).
3. Push the power supply module in until it is firmly seated into the backplane and flush with the back of the chassis.
4. Secure the power supply module to the chassis using the two Phillips head mounting screws attached to the module. The power supply module is now ready to be connected to your power source.

Caution

For safety reasons, ensure that each power supply module is firmly mounted to the chassis using the Phillips head mounting screws.

Figure 2-8. Installing a Power Supply Module

Caution

To ensure proper ventilation of the DL4300 media transport system, insert a blank module tray in every unused function module and power supply module slot.

Cabling an AC Power Supply Module

To connect the AC power supply module to the power source, you need the three-prong 320-C13 115/230 VAC power cord that was shipped with the module. Figure 2-9 shows the power source connector on the AC power supply module.

Figure 2-9. AC Power Supply Module Power Cord Connector

To cable an AC power supply module, perform the following steps:

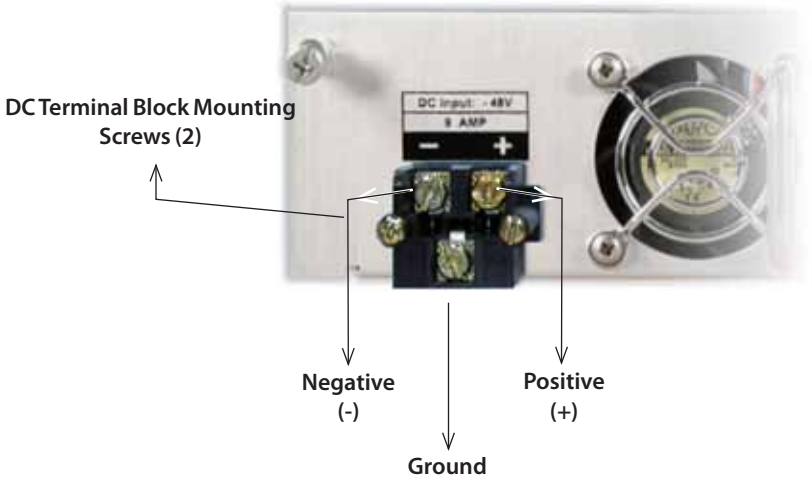
1. From the rear panel of the DL4300 chassis, attach the AC power cord to the AC connector on the power supply module (see Figure 2-9).
2. Attach the other end of the AC power cord to the AC power source.
3. When you are ready to apply power to the DL4300, push the AC switch to the ON (**I**) position.

Cabling a DC Power Supply Module

The DC version of the DL4300 power supply model has a -48 VDC input connector terminal block as shown in Figure 2-10.

Note: The DC terminal block is secured to the power supply module with two mounting screws, which allows you to leave the DC cables attached to the terminal block when swapping out the module (see the "Replacing a Function, Power Supply, or Fan Module" section on page 2-20).

Figure 2-10. DC Power Supply Module Terminal Block



Caution

When connecting a DC power supply, make sure that you are connecting the DL4300 power supply module to a -48 VDC source that is isolated from any AC power and is reliably grounded to earth.

To cable a DC power supply module, perform the following steps:

1. Locate the terminal block assembly on the rear of the unit (see Figure 2-10).
2. Loosen the three terminal screws marked - (negative), + (positive), and ground.

Caution

Before installing the cables in the next step, ensure that the polarity of the DC connections is correct. The unit will not operate if the polarity of the input DC voltage is not correct.

3. Install the three DC power source cables and tighten the screws to secure the connectors to the terminal block. Ensure that the cables or spade connector terminations are positioned under the screw heads.
4. Connect the other end of the power cable into an approved safety extra-low voltage (SELV) energy-output source.

Note: A fully loaded DL4300 chassis with twelve function modules and two power supply modules consumes approximately 250 W from a nominal 48 VDC circuit. We recommend slow blow (time delay) fusing, with a minimum fuse capacity of 7.5 A per DL4300. If fast blow (fast-acting) fuses are used, we recommend using a minimum fuse capacity of 10 A per DL4300 to prevent nuisance blows due to inrush surge.

Installing a Function Module

You can install up to twelve function modules in the DL4300. A function module can be installed in any available function module slot.

Note: To allow function modules to interconnect and exchange signals using the chassis backplane, you must install the modules in the same stack (slots 1–4, 5–8, or 9–12). To exchange signals between modules in different stacks, use their BNC connectors.

This section contains only the basic instructions for installing a function module in the DL4300. Refer to the appropriate module-specific manual for detailed instructions about installing, configuring, and cabling the module.

To install a function module into the chassis, perform the following steps:

1. Configure the operation of the function module (see the appropriate module-specific manual).

Note: Most function modules require that you configure them prior to installing them because they are configured using the DIP switches mounted to the top of the module board. Some modules must be configured *after* you install the module by using DL Manager as described in the module's operation manual.

2. From the rear panel of the DL4300 chassis, remove the two screws that secure one of the blank module trays to the chassis and remove the tray.
3. Slide the function module into the chassis slot using the guide rails on either side of the slot.
4. Push the function model in until it is firmly seated into the backplane and flush with the back of the chassis.
5. Secure the function module to the chassis using the two mounting screws attached to the module.
6. Cable the function module (see the appropriate module manual).

Repeat this procedure for each function module that you plan to install in the DL4300.

Caution

To ensure proper ventilation of the DL4300, insert a blank module tray in every unused function module slot.

Powering Up and Monitoring the DL4300

The power supply modules provide power to the installed modules through the backplane. The chassis front panel status LEDs shown in Figure 2-11 indicate if the backplane, installed power supply modules, and installed function modules are operating correctly or if a problem exists.

Figure 2-11. DL4300 Power Switch and Status LEDs

Note: How you apply power to the DL4300 depends on the type of power supply module that have installed (AC and/or DC). The AC module has a power switch that is located above the input connector. The DC power supply module does not have a power switch.

To power on and verify proper operation of the DL4300, perform the following steps:

1. Apply power to the chassis as follows:
   - AC power supply—Turn on the power switch located on the rear panel of the power supply module.
   - DC power supply—Apply power to the DC input.
2. Observe the status LEDs for proper operation as described in Table 2-4.

Table 2-4. DL4300 Chassis Status LEDs

LED	Description	State
Status	Operating status of the chassis backplane and installed function modules.	Off—Power to the chassis is unavailable. Check the power source connection.
		Green—Power is applied to the chassis and no alarm condition exists with any of the installed power supply, fan, or function modules.
		Yellow—Minor alarm condition exists. Power is applied to the chassis and at least one minor alarm condition exists in the chassis or one of the installed power supply, fan, or function modules. If this LED is yellow and no other minor alarm is indicated in a power supply, fan, or function module, then the temperature on the backplane is out of range. Check that adequate inlet and exhaust airflow is available.
		Red—Major alarm condition exists. Power is applied to the chassis and at least one major alarm condition exists in the chassis or one of the installed power supply, fan, or function modules. If this LED is red and no other major alarm is indicated in a power supply, fan, or function module, then a failure on the backplane is indicated. Replace the DL4300 chassis.
PSA or PSB	Operating status of the corresponding power supply module. The DL4300 checks the following power supply module functions: • Fan—Ventilation fan is operating. • Temperature—Operating temperature is within specifications. • Voltage—Voltage supplied to the backplane is within specifications. • Communication—Communication with the backplane exists. To see which module slot is A and which is slot B, see Figure 2-2. **Note:** There is a corresponding status LED located on the rear panel of a power supply module (see Figure 2-3).	Off—Power supply module is not installed in the corresponding slot or no power is applied to the chassis.
		Green—Power is applied to the corresponding power supply module and no alarm condition exists.
		Yellow—Minor alarm exists that indicates the temperature is out of range. Check that adequate inlet and exhaust airflow is available.
		Red—Major alarm condition exists with the corresponding power supply module. The power supply module can no longer provide power to the chassis. You must correct the problem immediately. Possible causes are as follows: • No input power to the power supply. Check that input voltage is present. • Fan is running slow or stopped. Replace the power supply. • Internal failure of the power supply. Replace the power supply. • Communication failure with the backplane. Replace the power supply. If the problem persists, replace the chassis.

Table 2-4. DL4300 Chassis Status LEDs (Continued)

LED	Description	State
FAN	Operating status of the fans in the fan module.	Off—Fan module is not installed or no power is applied to the chassis.
		Green—Power is applied no alarm condition exists.
		Red—One of more fans is not operating.

Information about Using DL Manager

Artel's DL Manager is a web-based graphical user interface (GUI) that provides a network management interface for the DL4300 chassis. Using DL Manager, you can monitor and configure the operations of the installed function modules. DL Manager includes a real-time preemptive, multitasking operating system, TCP/IP stack, web server, and SNMP master agent.

The DL Manager software resides on a single board computer within the DL4300 power supply module. Access to DL Manager is made through the management ports located on the module (see the "Power Supply Module Overview" section on page 2-6).

Artel ships DL Manager with a default IP address that allows you to connect locally to it using a client device. If you are going to connect DL Manager to your management network, you must first configure its network IP address as needed to connect to your network.

Refer to the following manuals for details about accessing and using DL Manager with the DL4000:

- *DigiLink Manager Setup and Operations Manual*
  Provides the following information:
  - Operational considerations
  - Configuring and cabling the client device
  - Accessing the DL Manager home page
- Assorted Function Module Manuals
  You will also need the installation and operation manual associated with each of the installed modules to see how they can be managed using DL Manager.

Replacing a Function, Power Supply, or Fan Module

The DL4300 power supplies, fan, and installed function modules are hot swappable and can be replaced while power is applied to the chassis.

This section contains the following topics:

Replacing a Function Module

To replace a function module, perform the following steps:

1. Remove the cables from the rear panel of the function module.
2. Loosen the two mounting screws that secure the function module that you are replacing to the DL4300 chassis.
3. Slide the function module out of the chassis.
4. Configure the DIP switches (if available) on the new function module.

   Note: Note: For the function modules that do not contain configuration DIP switches, configure it after you install it in the chassis by using DL Manager.

5. Slide the replacement function module into the slot using the guide rails on either side of the slot.
6. Push the function model in until it is firmly seated into the backplane and flush with the back of the chassis.
7. Secure the function module to the chassis using the two mounting screws attached to the module.
8. Replace the cables on the rear panel of the function module.

Refer to the appropriate module-specific guide for detailed instructions on installing, configuring, and cabling the module.

Caution

To ensure proper ventilation of the DL4300 media transport system, insert a blank module tray in every unused function module and power supply module slot.

Replacing a Power Supply Module

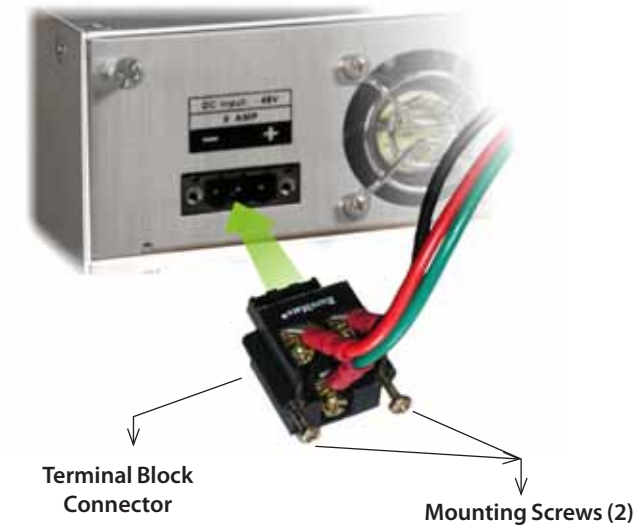
Replacing a power supply module requires a Phillips head screwdriver.

To replace a power supply module, perform the following steps:

1. Disconnect the main power source to the power supply module that you are replacing.

2. Remove the power source cable from the power supply module by doing one of the following:
   - AC power cable—Remove the AC power cord from the AC connector on the power supply module (see Figure 2-9).
   - DC power cable—Loosen the two Phillips head screws that secure the terminal block connector to the power supply module (see Figure 2-12) and remove the connector. Do not remove the cables from the terminal block connector because you will install the wired connector into the replacement power supply module.
3. If the power supply module's Ethernet port has a network cable attached to it for remote management, remove the Ethernet cable.
4. Loosen the two Phillips head mounting screws that secure the power supply module to the DL4300 chassis.
5. Pull the power supply module out of the chassis using the module handle.
6. Slide the replacement power supply module into the chassis slot.
7. Push the power supply module in until it is firmly seated into the backplane and flush with the back of the chassis (see Figure 2-8).
8. Secure the power supply module to the chassis using the two Phillips head mounting screws attached to the module.
9. Attach the power source cable to the power supply module by doing one of the following:
   - AC power cable—Attach the AC power cord to the AC connector on the power supply module.
   - DC power cable—Replace the existing power supply terminal block connector with the wired terminal block connector that you removed from the original power supply module by following these steps:
     a. Loosen the two Phillips head screws that secure the terminal block connector to the power supply module and remove the connector.
     b. Insert the wired terminal block connector into the power supply module (see Figure 2-3). The connector is keyed to ensure a proper installation.
     c. Secure the terminal block connector to power supply module using the two Phillips head screws attached to the connector.
10. Reconnect the main power source.
11. If the power supply module is to provide access to DL Manager functionality though its Ethernet port, configure DL Manager for connection to your management network. See the "Information about Using DL Manager" section on page 2-19.

Figure 2-12. DC Terminal Block Connector



Caution

To ensure proper ventilation of the DL4300 media transport system, insert a blank module tray in every unused function module and power supply module slot.

Replacing the Fan Module

Replacing the fan module requires a Phillips head screwdriver.

Caution

To ensure proper ventilation of the DL4300 media transport system, replace the fan module immediately after removing it. Allowing the chassis to operate without a fan module for an extended period of time can damage the equipment.

To replace the fan module, perform the following steps:

1. From the back of the chassis, loosen the two Phillips head mounting screws that secure the fan module to the DL4300 chassis (see Figure 2-13).
2. Pull the fan module out of the chassis using the module handle.
3. Slide the new fan module into the chassis slot.
4. Push the fan module in until it is firmly seated into the backplane and flush with the back of the chassis.
5. Secure the fan module to the chassis using the two Phillips head mounting screws attached to the module.

Figure 2-13. Replacing the Fan Module

3

DL4000 Overview and Installation

This chapter introduces the DL4000 chassis and describes how to install and configure the device. The DL4000 chassis features four hot swappable function module slots and dual hot swappable power supplies in a single-rack unit.

The DL4000 chassis also includes the following features:

- Space-efficient rugged 1 RU chassis.
- Passive backplane with high speed interconnect between function modules (up to 72 Gb/s).
- AC power, DC power, or dual (one of each).
- Dual cooling fans.
- Designed for NEBS Level 3 certification.
- Unlimited, non-spaced installation.
- Simple Network Management Protocol (SNMP) management.
- (Optional) Digilink Manager (or *DL Manager*), which is Artel's element management system for configuring and monitoring the function modules. The DL Manager software resides on the optional DLM130 power supply module.

Note: This chapter uses the following terms interchangeably:

- *Chassis* and *shelf* when referring to the DL4000.
- *DigiLink Manager* and *DL Manager* when referring to the element management system.

This chapter contains the following sections:

DL4000 Laser Warnings

Function modules with optical transmitters that install into the DL4000 chassis contain Class 1 lasers. 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.

DL4000 Power Supplies Warning

The chassis can be supplied by more than one power source. All sources must be removed to de-energize the chassis.

Warning

De-energize the chassis before servicing any modules.

This unit has two power supply connections. Both connections must be removed to properly de-energize the system.

Failure to observe this warning could result in personal injury.

DLFM or DLM Module Warning

The DigiLink element management modules utilize an internal RTC (Real Time Clock) with battery backup that provides the system software with the time of day on system power up. The backup battery is a socketed lithium battery that lasts the life of the unit when the unit is operating in the specified environmental conditions. The battery is not field replaceable.

Note: If the lithium battery in a unit should fail, you must return the module to Artel Video Systems for repair. *Do not replace the battery yourself*. Although the battery is not intended to be field replaceable, the safety agencies require that the following warning be included in this document.

Warning

There is a danger of explosion if the battery is replaced incorrectly.

Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries in accordance with the manufacturer's instructions and local regulations.

Failure to observe this warning could result in personal injury.

Chassis Overview

The DL4000 chassis consists of function module and power supply module slots, status LEDs, and a passive backplane for interconnecting the various modules.

Figure 3-1 shows the various external components of the chassis front panel. This sample chassis configuration shows function modules occupying three of the four function module slots. A blank tray is inserted into the unused Slot 4 to cover the slot openings and maintain proper ventilation.

Figure 3-1. DL4000 Chassis Front Panel View

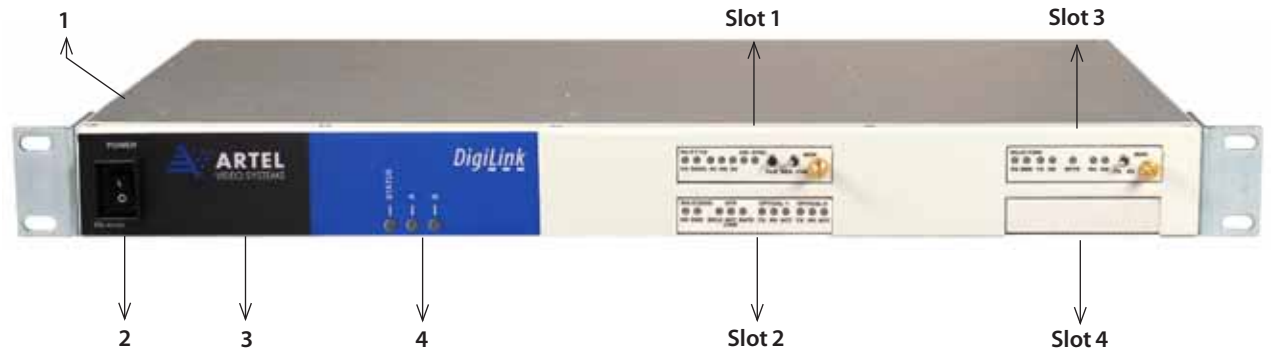


Table 3-1 describes the components called out in Figure 3-1.

Table 3-1. The DL4000 Chassis Front Panel Elements

Item	Description	for details, see...
1	DL4000 Chassis	Installing the DL4000 Chassis (page 3-9)
2	Power switch	Installing and Cabling a DL4000 Power Supply Module (page 3-13)
3	Product model number	N/A
4	Chassis and Power Supply Modules Status LEDs: • STATUS—Chassis status indicator • A—Power supply module A status indicator • B—Power supply module B status indicator	Powering Up and Monitoring the DL4000 (page 3-17)
Slot 1	Function module Slot 1 (function module installed)	Installing a Function Module (page 3-16)
Slot 2	Function module Slot 2 (function module installed)	
Slot 3	Function module Slot 3 (function module installed)	
Slot 4	Function module Slot 4 (blank tray installed)	

Figure 3-2 shows the various components of the chassis rear panel. This sample chassis configuration shows three function modules and one power supply module installed in the chassis. A blank tray is inserted into the unused Slot 4 to cover the slot opening and maintain proper ventilation.

Figure 3-2. DL4000 Chassis Rear Panel View

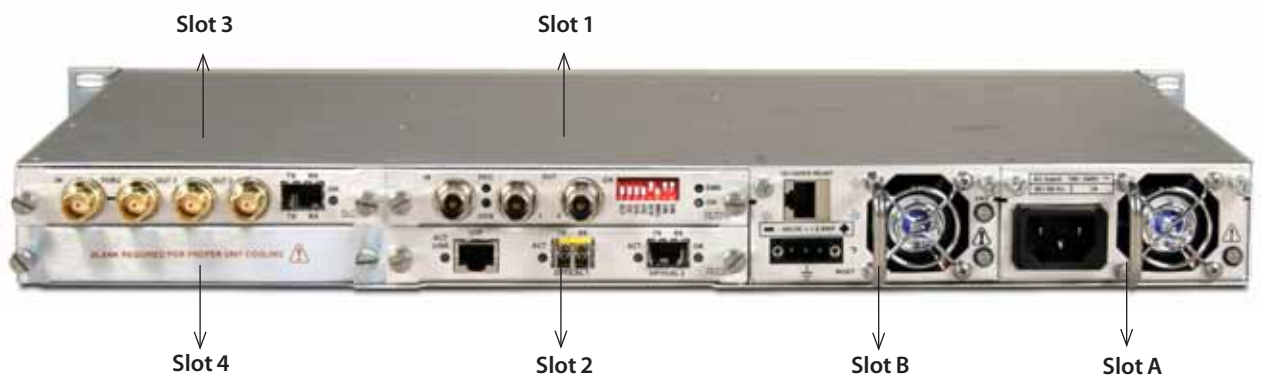


Table 3-2 describes the components called out in Figure 3-2.

Table 3-2. The DL4000 Chassis Rear Panel Elements

Item	Description	for details, see...
Slot 1	Function module Slot 1 (function module installed)	Installing a Function Module (page 3-16)
Slot 2	Function module Slot 2 (function module installed)	
Slot 3	Function module Slot 3 (function module installed)	
Slot 4	Function module Slot 4 (blank tray installed)	
Slot A	Power supply module Slot A (AC power supply module installed)	Installing and Cabling a DL4000 Power Supply Module (page 3-13)
Slot B	Power Supply Module Slot B (DC power supply module with DL Manager installed)	

Power Supply Module Overview

The DL4000 can be powered using a single power supply module or you can install a second one for increased system availability and ventilation. The features of the power supply module include the following:

- Limited load sharing when two power supply modules are installed
- Voltage, temperature, and cooling fan alarms
- Cooling fan that provides ventilation for the DL4000 chassis
- Monitoring interface

There are three types of power supply modules that you can use with the DL4000. The models are as follows:

- DLP001—AC version.
- DLP002—DC version.
- DLM130—DC version that includes a computer board for hosting Artel's DL Manager (an element management system) and an Ethernet port for accessing DL Manager locally or over a management network.

  If you require AC power redundancy, you can connect an external AC/DC power adapter (model DLM130P) to the DLM130 DC input connector. The output of the AC/DC adapter is 48 VDC so it can be connected to the DLM130 DC input connector.

  Power to the DL4000 chassis can be supplied by a single DLM130. To provide power redundancy, you can install dual DLM130 modules or you can install a single DLM130 along with either a DLP001 AC power supply or a DLP002 DC power supply.

  Note: You can use the DLM130 for its DL Manager functionality only and not use it as a power source for the DL4000. This application requires that either a DLP001 or DLP002 provide the power to the DL4000 chassis, including the DLM130, which receives its power through the backplane.

Figure 3-3 shows the DLM130 power supply module and the various module components, which are the same for all power DL4000 supply modules except where noted in Table 3-3.

Figure 3-3. DLM130 Power Supply Module

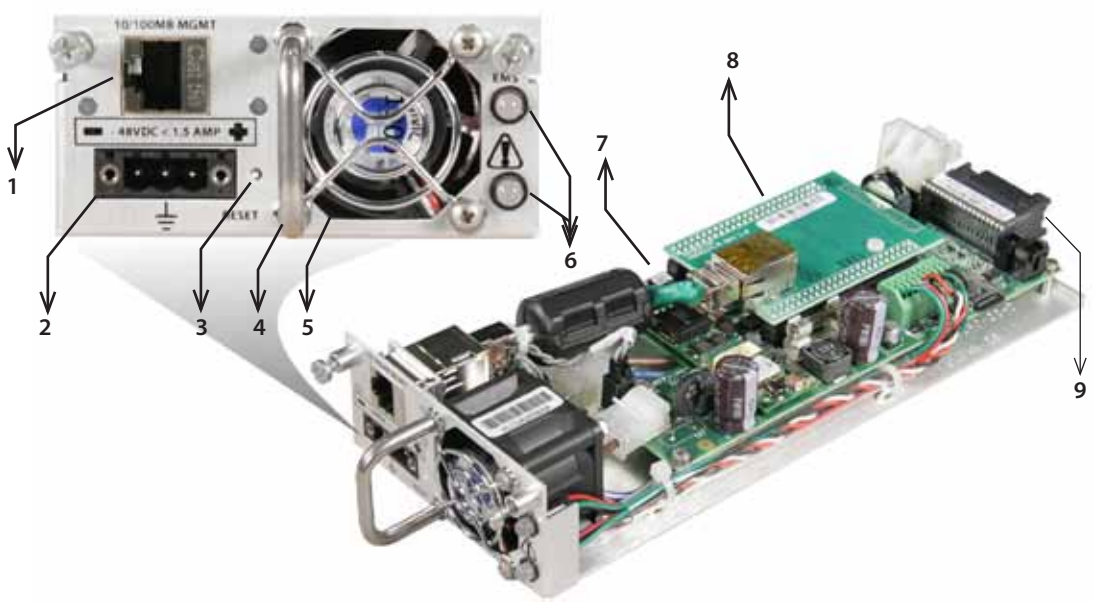


Table 3-3 describes the components called out in Figure 3-3.

Table 3-3. The DL4000 Power Supply Module Elements

Item	Power Supply Element	for details, see...
1	(DLM130 only) RJ-45 Ethernet connector	Installing and Cabling a DL4000 Power Supply Module (page 3-13)
2	Power source connector: AC or DC (shown)	
3	(DLM130 only) DL\x11 Manager reset button	Information About Using DL Manager (page 3-19)
4	Module handle	N/A
5	Ventilation fan	Ventilating the DL4000 Chassis (page 3-8)
6	Status LEDs	Powering Up and Monitoring the DL4000 (page 3-17)
7	(DLM130 only) Power supply logic	N/A
8	(DLM130 only) DL Manager computer board	Information About Using DL Manager (page 3-19)
9	Backplane connector	N/A

Required Installation Tools and Equipment

To install the DL4000 as a rack-mounted or wall-mounted unit, you need:

- Phillips head screwdriver to reposition the chassis mounting ears (optional)
- Four rack mounting screws and matching screw driver (not supplied)

Unpacking the DL4000

When unpacking the your DL4000, set aside the packing material in case you need to repackage the unit later.

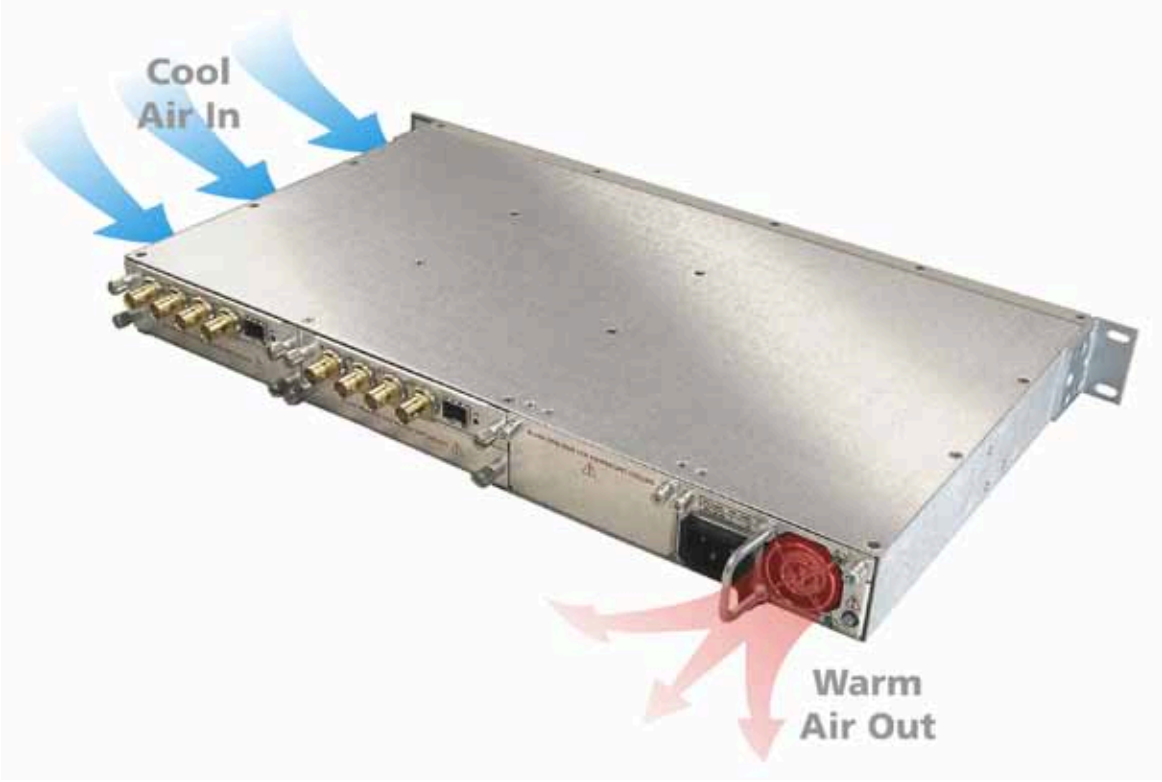
To unpack the DL4000, perform the following steps:

1. Remove the DL4000 chassis, power supply module, and function module from the shipping cartons.
2. Check the configuration of the unit against the items listed on the packing slip. If you find any discrepancies, report them in accordance with the instruction in "About This Manual".

Ventilating the DL4000 Chassis

It is important that your DL4000 operates within the specified temperature range as described in the DL4000 data sheet. To ventilate the DL4000 chassis, each power supply module is equipped with a fan that draws air in through the ventilation slots located on the side of the chassis near the function module slots. The chassis maintains adequate ventilation even when you install four function modules and only one power supply module. Figure 3-4 shows how the fan draws air through the side of the chassis and over the function modules when power is applied. A second power supply, if installed, provides redundant cooling and power.

Figure 3-4. DL4000 Air Flow



To ensure proper ventilation of the chassis and the installed modules, you must adhere to the following requirements when installing and operating your DL4000:

- Maintain at least a 2 inch (5 cm) clearance around the sides and rear of the chassis where the fan and ventilation slots are located. Keep these areas clear of any obstructions that might restrict air flow in or out of the chassis.
- Install the module blank trays in any unused module slots.
- Visually inspect the ventilation fan for proper operation when the power is applied.

Installing the DL4000 Chassis

You can place the DL4000 chassis on a flat surface as a free-standing unit, rack mount it in a standard 19 inch equipment rack, or mount the chassis to a wall. As you position the DL4000 for installation, ensure that there is enough space in the back of the chassis to install and cable the various power supply and function modules.

Note: Before installing your DL4000 chassis, see the DL4000 data sheet for a detailed description of the DL4000 product specifications including environmental requirements that you must adhere to when installing the chassis and power supply modules.

The section contains the following topics:

Installing the DL4000 as a Free-standing Chassis

When installing the DL4000 chassis as a free-standing chassis, follow these requirements:

- The surface must be flat, clean, and in a safe location. The chassis must not be installed on the floor. In addition to increasing the risk of being damaged, placing the chassis on the floor increases the risk of dust building up in the chassis and causing problems related to overheating.
- The area provides a 2 inch (5 cm) clearance on all four sides of the chassis for proper ventilation (see the "Ventilating the DL4000 Chassis" section on page 3-8) and accessing the power switch, status LEDs, module slots, and cable connections.

Installing the Chassis in a Rack

Before you install the chassis in an equipment rack, determine if you want to flush-mount or mid-mount the chassis into the rack. Flush-mounting the chassis sets the front edge of the unit even with the front edge of the rack. Mid-mounting the chassis causes the front edge of the unit to protrude from the front of the rack.

Note: When installing multiple chassis in a rack, no vertical space between the units is required. The only limit to the number of chassis that you can place in a rack is the height of the rack.

Caution

If the system is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment might be greater than the room ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature specified for the system.

Caution

Installation of the equipment in a rack should be such that the amount of airflow required for safe operation of the equipment is not compromised.

Caution

Mounting of the equipment in the rack should be such that a hazardous condition is not created due to uneven mechanical loading.

Caution

Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on over-current protection and supply wiring. Appropriate consideration of equipment nameplate power ratings should be used when addressing this concern.

Caution

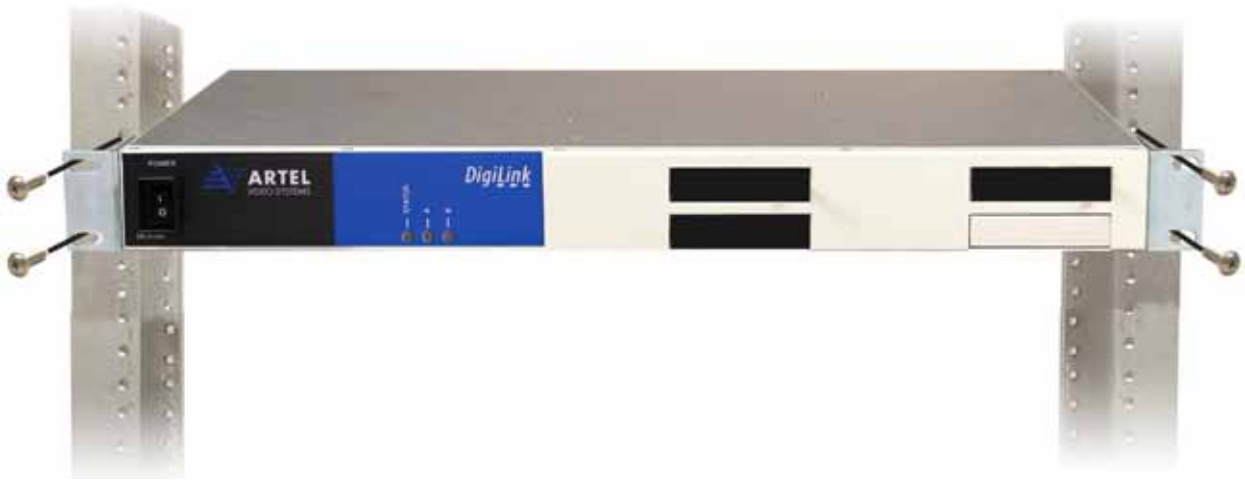
Reliable grounding of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (for example, use of power strips).

This section contains the following topics:

Flush-Mounting the Chassis

Artel ships the chassis with the mounting brackets installed for flush-mounting the unit as shown in Figure 3-5.

Figure 3-5. Flush-Mounted Chassis Bracket



To flush-mount the DL4000 in an equipment rack, perform the following steps:

1. Raise the unit to the appropriate installation height.
2. Align the screw holes on the mounting brackets with the screw holes on the equipment rack.
3. Install the screws through the chassis mounting brackets into the threaded screw holes on the rack. The chassis requires two screws for each side of the chassis (mounting screws not included).

Mid-Mounting the Chassis

To mid-mount the DL4000 in an equipment rack, perform the following steps:

1. Remove the three screws that secure each mounting bracket to the side of the chassis.
2. Align the mounting brackets with the mid-mount location on the chassis as shown in Figure 3-6 and secure the brackets to the chassis using the screws you removed in Step 1.
3. Install the chassis in the rack by securing the mounting brackets to the rack. The unit requires two screws for each side of the chassis (mounting screws not included).

Figure 3-6. Mid-Mounted Chassis Bracket

Mounting the Chassis to a Wall

To install the DL4000 as a wall-mounted unit, perform the following steps:

1. Remove the three screws that secure each of the mounting brackets to the side of the chassis.
2. Rotate the mounting brackets 90° to the mid-mounting position shown in Figure 3-7.
3. Secure the mounting brackets to the chassis using the screws that you removed in Step 1.
4. Secure the chassis to the wall with four mounting screws (mounting screws not included).

Figure 3-7. Wall-Mounted Chassis Bracket

Installing and Cabling a DL4000 Power Supply Module

After you have installed your DL4000 chassis as described in the "Installing the DL4000 Chassis" section on page 3-9, you can install and cable one or two power supply modules into the chassis. When using two power supply modules, the DL4000 chassis accepts any combination of AC or DC modules. If you are installing a single power supply module, you can install the module in either slot, but be sure to leave the blank tray in the unused slot.

Warning

To avoid risk of injury or possible equipment damage, ensure that your power source meets the specifications as described in the DL4000 data sheet before applying power to your DL4000.

Caution

Install and cable the power supply module before connecting to the power source.

Note: A DL4000 chassis with two power supply modules installed dissipates more power that a chassis with one power supply module due to internal power dissipation within the power supplies.

This section contains the following topics:

Installing a Power Supply Module

Installing a power supply requires a Phillips head screwdriver.

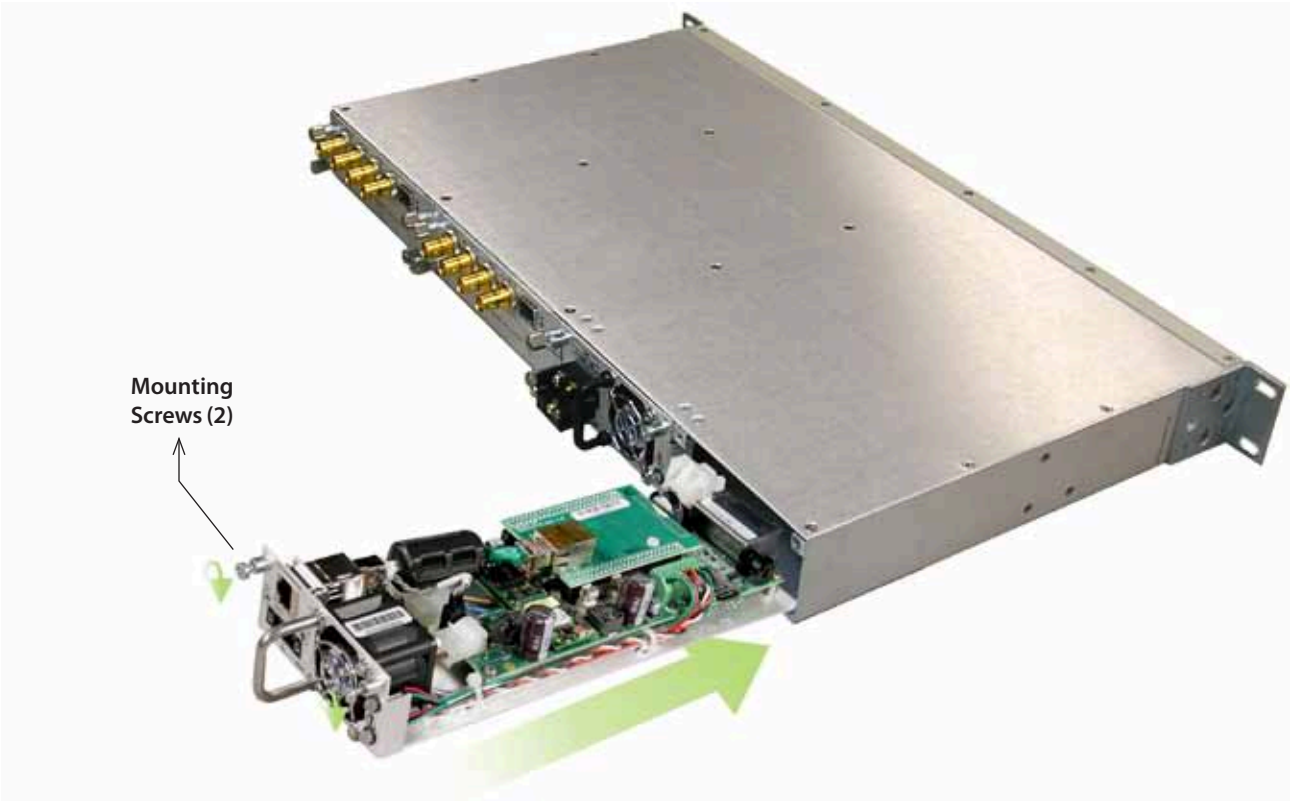
To install a power supply module, perform the following steps:

1. From the back of the chassis, remove the two Phillips head screws that secure the blank tray to one of the power supply module slots and remove the tray. If you are installing only one power supply module, it does not matter which power supply module slot you use.
2. Slide the power supply module into the chassis slot.
3. Push the power supply module in until it is firmly seated into the backplane and flush with the back of the chassis (see Figure 3-8).
4. Secure the power supply module to the chassis using the two Phillips head mounting screws attached to the module. The power supply module is now ready to be connected to your power source.

Caution

For safety reasons, ensure that each power supply module is firmly mounted to the chassis using Phillips head mounting screws.

Figure 3-8. Installing a Power Supply Module



Caution

To ensure proper ventilation of the DL4000 video transport system, insert a blank module tray in every unused function module and power supply module slot.

Cabling an AC Power Supply Module

To connect the AC power supply module to the power source, you need the three-prong 320-C13 115/230 VAC power cord that was shipped with the module or an equivalent power cord. Figure 3-9 shows the power source connector on the AC power supply module.

Figure 3-9. AC Power Supply Module Power Cord Connector

To cable an AC power supply module, perform the following steps:

1. From the rear panel of the DL4000 chassis, attach the AC power cord to the AC connector on the power supply module (see Figure 3-9).
2. Attach the other end of the AC power cord to the AC power source.

Note: A DL4000 chassis with two power supply modules installed dissipates more power that a chassis with one power supply module due to internal power dissipation within the power supplies.

Cabling a DC Power Supply Module

The DC version of the DL4000 power supply model has a -48 VDC input connector terminal block as shown in Figure 3-10.

Caution

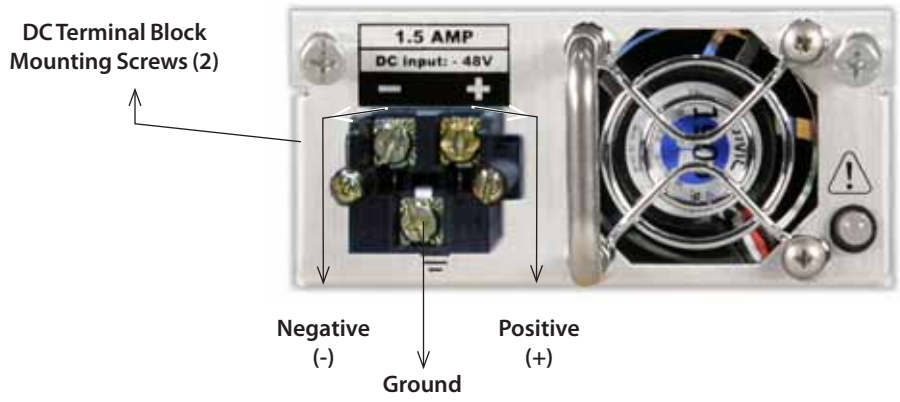
When connecting a DC power supply, make sure that you are connecting the DL4000 power supply module to a -48 VDC source that is isolated from any AC power and is reliably grounded to earth.

Note: A fully loaded DL4000 chassis with four function modules and two power supply modules consumes approximately 60 W from a nominal 48 VDC circuit. We recommend slow blow (time delay) fusing, such as a T2.0 fuse with a minimum fuse capacity of 2.0 A per DL4000. If fast blow (fast-acting) fuses are used, we recommend using a minimum fuse capacity of 5 A per DL4000 to prevent nuisance blows due to inrush surge.

Note: (DLM130 power module only) If you require AC power redundancy, you can connect an external AC/DC power adapter (model DLM130P) to the DLM130 DC input connector. The output of the AC/DC adapter is 48 VDC so it can be connected to the DLM130 DC input connector.

Note: The DC terminal block is secured to the power supply module with two mounting screws, allowing you to leave the DC cables attached to the terminal block when swapping out the module (see the "Replacing a Function or Power Supply Module" section on page 3-19).

Figure 3-10. DC Power Supply Module Terminal Block



To cable a DC power supply module, perform the following steps:

1. Locate the terminal block assembly on the rear of the unit (see Figure 3-10).
2. Loosen the three terminal screws marked - (negative), + (positive), and ground.

Caution

Before installing the cables in the next step, ensure that the polarity of the DC connections is correct. The unit will not operate if the polarity of the input DC voltage is not correct.

3. Install the three DC power source cables and tighten the screws to secure the connectors to the terminal block. Ensure that the cables or spade connector terminations are positioned under the screw heads.
4. Connect the other end of the power cable into an approved safety extra-low voltage (SELV) energy-output source.

Installing a Function Module

You can install up to four function modules in the DL4000. A function module can be installed in any available function module slot. This section contains only the basic instructions for installing a function module in the DL4000. Refer to the appropriate module-specific manual for detailed instructions on installing, configuring, and cabling the module.

To install a function module into the chassis, perform the following steps:

1. Configure the operation of the function module (see the appropriate module-specific manual).

   Note: Most function modules require that you configure them prior to installing them because they are configured using the DIP switches mounted to the top of the module board. One exception is the DLC410 function module, which must be configured *after* you install the module by using DL Manager as described in the module's operation manual.

2. From the rear panel of the DL4000 chassis, remove the two screws that secure one of the module slot covers to the chassis.

3. Slide the function module into the chassis slot using the guide rails on either side of the slot.
4. Push the function model in until it is firmly seated into the backplane and flush with the back of the chassis.
5. Secure the function module to the chassis using the two mounting screws attached to the module.
6. Cable the function module (see the appropriate module-specific chapter).

Repeat this procedure for each function module that you plan to install in the DL4000.

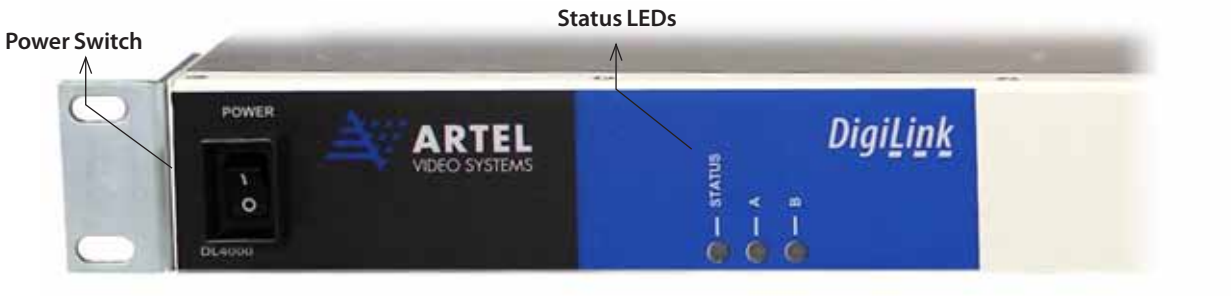
Caution

To ensure proper ventilation of the DL4000 video transport system, insert a blank module tray in every unused function module and power supply module slot.

Powering Up and Monitoring the DL4000

The front panel of the DL4000 contains a power switch and status LEDs as shown in Figure 3-11. The power switch controls power to the installed modules through the backplane. The status LEDs indicate if the backplane, installed power supply modules, and installed function modules are operating correctly or if a problem exists.

Figure 3-11. DL4000 Power Switch and Status LEDs



To power on the DL4000 and verify proper operation of the DL4000, perform the following steps:

1. Push the Power switch to the on position (I).
2. Observe the status LEDs for proper operation as described in Table 3-4.

Table 3-4. DL4000 Chassis Status LEDs

LED	Description	State
Status	Operating status of the chassis backplane and installed function modules.	Off—Power to the chassis is unavailable. Check the power source connection.
		Green—Power is applied to the chassis and no alarm condition exists with any of the installed power supply or function modules.
		Yellow—Minor alarm condition exists. Power is applied to the chassis and at least one minor alarm condition exists in the chassis or one of the installed power supply or function modules. If this LED is yellow and no other minor alarm is indicated in a power supply module or function module, then the temperature on the backplane is out of range. Check that adequate inlet and exhaust airflow is available.
		Red—Major alarm condition exists. Power is applied to the chassis and at least one major alarm condition exists in the chassis or one of the installed power supply or function modules. If this LED is red and no other major alarm is indicated in a power supply module or function module, then a failure on the backplane is indicated. Replace the DL4000 chassis.
A or B	Operating status of the corresponding power supply module. The DL4000 checks the following power supply module functions: • Fan—Ventilation fan is operating. • Temperature—Operating temperature is within specifications. • Voltage—Voltage supplied to the backplane is within specifications. • Communication—Communication with the backplane exists. To see which module slot is A and which is slot B, see Figure 3-2. **Note:** There is a corresponding status LED located on the rear panel of a power supply module (see Figure 3-3).	Off—Power supply module is not installed in the corresponding slot or no power is applied to the chassis.
		Green—Power is applied to the corresponding power supply module and no alarm condition exists.
		Yellow—Minor alarm exists that indicates the temperature is out of range. Check that adequate inlet and exhaust airflow is available.
		Red—Major alarm condition exists with the corresponding power supply module. The power supply module can no longer provide power to the chassis. You must correct the problem immediately. Possible causes are as follows: • No input power to the power supply. Check that input voltage is present. • Fan is running slow or stopped. Replace the power supply. • Internal failure of the power supply. Replace the power supply. • Communication failure with the backplane. Replace the power supply. If the problem persists, replace the chassis.

Information About Using DL Manager

Artel's DL Manager is a web-based graphical user interface (GUI) that provides a network management interface for the DL4000 chassis. Using DL Manager, you can monitor and configure the operations of the installed function modules. DL Manager includes a real-time preemptive, multitasking operating system, TCP/IP stack, web server, and SNMP master agent.

The DL Manager software resides on a single board computer within the DL4000's DLM130 power supply module. Access to DL Manager is made through the management ports located on the module (see the Power Supply Module Overview (page 3-6).

Artel ships DL Manager with a default IP address that allows you to connect locally to it using a client device. If you are going to connect DL Manager to your management network, you must first configure its network IP address as needed to connect to your network.

Refer to the following manuals for details about accessing and using DL Manager with the DL4000:

- *DigiLink Manager Setup and Operations Manual*
  Provides the following information:
  - Operational considerations
  - Configuring and cabling the client device
  - Accessing the DL Manager home page
- Assorted Function Module Manuals
  You will also need the installation and operation manual associated with each of the installed modules to see how they can be managed using DL Manager.

Replacing a Function or Power Supply Module

The DL4000 function and power supply modules are hot swappable and can be replaced while power is applied to the chassis.

This section contains the following topics:

Replacing a Function Module

To replace a function module, perform the following steps:

1. Remove the cables from the rear panel of the function module.
2. Loosen the two mounting screws that secure the function module that you are replacing to the DL4000 chassis.
3. Slide the function module out of the chassis.

4. Configure the DIP switches (if available) on the new function module.

   Note: For the function modules that do not contain configuration DIP switches, configure it after you install it in the chassis by using DL Manager.

5. Slide the replacement function module into the slot using the guide rails on either side of the slot.
6. Push the function model in until it is firmly seated into the backplane and flush with the back of the chassis.
7. Secure the function module to the chassis using the two mounting screws attached to the module.
8. Replace the cables on the rear panel of the function module.

Refer to the appropriate module-specific manual for detailed instructions on installing, configuring, and cabling the module.

Caution

To ensure proper ventilation of the DL4000 video transport system, insert a blank module tray in every unused function module and power supply module slot.

Replacing a Power Supply Module

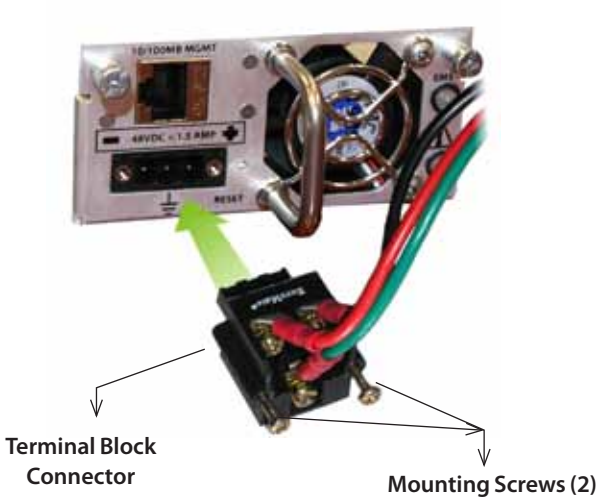
Replacing a power supply module requires a Phillips head screwdriver.

To replace a power supply module, perform the following steps:

1. Disconnect the main power source to the power supply module that you are replacing.
2. Remove the power source cable from the power supply module using one of the following procedures:
   - AC power cable—Remove the AC power cord from the AC connector on the power supply module (see Figure 3-9).
   - DC power cable—Loosen the two Phillips head screws that secure the terminal block connector to the power supply module (see Figure 3-12) and remove the connector. Do not remove the cables from the terminal block connector because you will install the wired connector into the replacement power supply module.
3. (DLM130 only) If the power supply module's Ethernet port has a network cable attached to it for remote management, remove the Ethernet cable.
4. Loosen the two Phillips head mounting screws that secure the power supply module to the DL4000 chassis.
5. Pull the power supply module out of the chassis using the module handle.
6. Slide the replacement power supply module into the chassis slot.
7. Push the power supply module in until it is firmly seated into the backplane and flush with the back of the chassis (see Figure 3-8).
8. Secure the power supply module to the chassis using the two Phillips head mounting screws attached to the module.

9. Attach the power source cable to the power supply module using one of the following procedures:
   - AC power cable—Attach the AC power cord to the AC connector on the power supply module.
   - DC power cable—Replace the existing power supply terminal block connector with the wired terminal block connector that you removed from the original power supply module by following these steps:
     a. Loosen the two Phillips head screws that secure the terminal block connector to the power supply module and remove the connector.
     b. Insert the wired terminal block connector into the power supply module. The connector is keyed to ensure a proper installation.
     c. Secure the terminal block connector to power supply module using the two Phillips head screws attached to the connector.
10. Reconnect the main power source.
11. (DLM130 only) If the power supply module is to provide access to DL Manager functionality though its Ethernet port, configure DL Manager for connection to your management network. See the "Information about Using DL Manager" section on page 2-19.

Figure 3-12. DC Terminal Block Connector



Caution

To ensure proper ventilation of the DL4000 video transport system, insert a blank module tray in every unused function module and power supply module slot.

4

DL4000P Overview and Installation

This chapter introduces the DL4000P chassis and describes how to install and configure it. The DL4000P chassis is a passive device that can accommodate up to four of the DLOxy family of coarse wavelength division multiplexing (CWDM) and wave division multiplexing (WDM) optics modules.

Note: The DL4000P is an unpowered chassis and is used to house the DLOxy optics function modules only.

The DL4000P chassis includes the following features:

- Space-efficient rugged 1 RU chassis
- Unlimited, non-spaced installation

This chapter contains the following sections:

DL4000P Laser Warnings

Function modules with optical transmitters that install into the DL4000P chassis contain Class 1 lasers. 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.

Chassis Overview

The DL4000P chassis consists of four function module slots. Figure 4-1 shows the various external components of the chassis front panel. This sample chassis configuration shows function modules occupying three of the four function module slots.

Figure 4-1. DL4000P Chassis Front Panel View

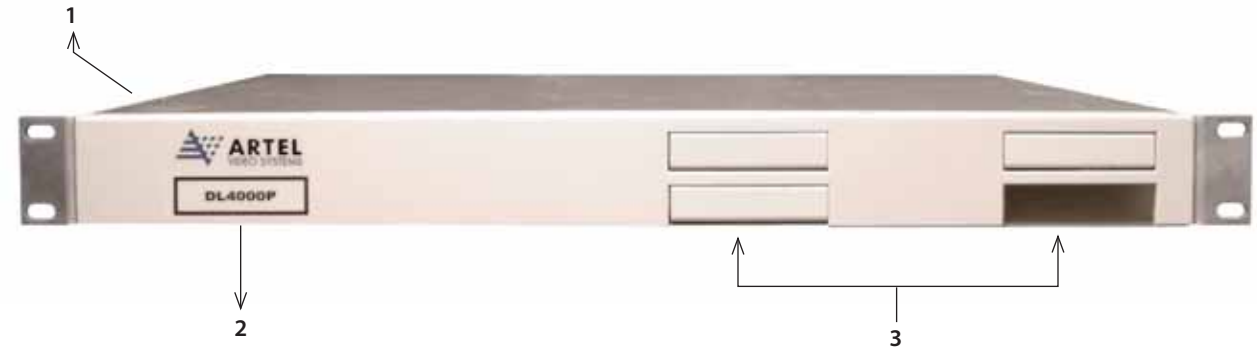


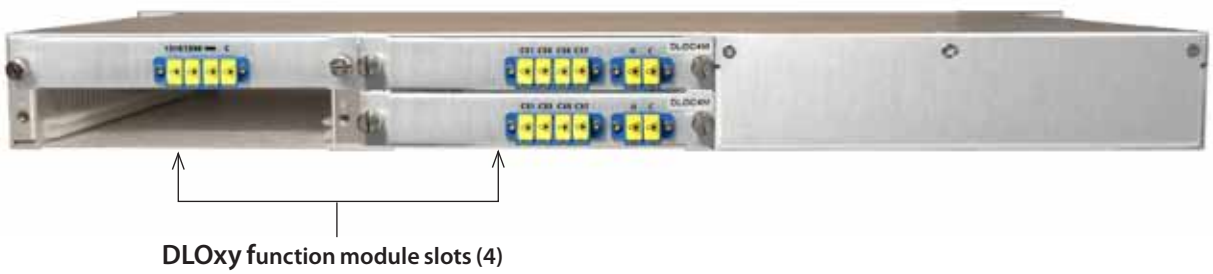
Table 4-1 describes the components called out in Figure 4-1.

Table 4-2. The DL4000P Chassis Front Panel Elements

Item	Description	for details, see...
1	DL4000P Chassis	Installing the Chassis and Function Modules (page 4-4)
2	Product model number	N/A
3	DLOxy function module slots (4)	Installing the Chassis and Function Modules (page 4-4)

Figure 4-2 shows the module slots of the chassis rear panel. In this sample chassis configuration, there are three function modules installed and one empty module slot.

Figure 4-2. DL4000P Chassis Rear Panel View



Required Installation Tools and Equipment

To install the DL4000P as a rack-mounted or wall-mounted unit, you need:

- Phillips head screwdriver to reposition the chassis mounting ears (optional)
- Four rack mounting screws and matching screw driver (not supplied)

Unpacking the DL4000P

When unpacking the your DL4000P, set aside the packing material in case you need to repackage the unit later.

To unpack the DL4000P, perform the following steps:

1. Remove the DL4000P chassis and function modules from the shipping cartons.
2. Check the configuration of the unit against the items listed on the packing slip. If you find any discrepancies, report them in accordance with the instruction in "About This Manual".

Installing the Chassis and Function Modules

You can place the DL4000P chassis on a flat surface as a free-standing unit, rack mount it in a standard 19 inch equipment rack, or mount the chassis to a wall. As you position the DL4000P for installation, ensure that there is enough space in the back of the chassis to install and cable the various function modules.

Note: Before installing your DL4000P chassis, see the DL4000P data sheet for a detailed description of the DL4000P product specifications including environmental requirements that you must adhere to when installing the chassis.

The section contains the following topics:

Flush-Mounting the Chassis

Artel ships the chassis with the mounting brackets installed for flush mounting the unit as shown in Figure 4-3.

Figure 4-3. Flush-Mounted Chassis Bracket

To flush mount the DL4000P in an equipment rack and install the DLOxy function modules, perform the following steps:

1. Raise the unit to the appropriate installation height.
2. Align the screw holes on the mounting brackets with the screw holes on the equipment rack.
3. Install the screws through the chassis mounting brackets into the threaded screw holes on the rack. The chassis requires two screws for each side of the chassis (mounting screws not included).
4. Install the DLOxy function modules.

Note: When installing multiple chassis in a rack, no vertical space between the units is required. The only limit to the number of chassis that you can place in a rack is the height of the rack.

Information About Other Installation Options

See the information provided in the Chapter 3, "DL4000 Overview and Installation" for information about the following additional chassis installation options:

- Installing the DL4000 as a Free-standing Chassis (page 3-9)
- Mid-Mounting the Chassis (page 3-11)
- Mounting the Chassis to a Wall (page 3-12)

5

DL4100 Overview and Installation

This chapter introduces the DL4100 chassis and describes how to install and configure the device. The DL4100 chassis features a single hot swappable function module slot.

This chapter contains the following sections:

DL4100 Laser Warnings

Function modules with optical transmitters that install into the DL4100 chassis contain Class 1 lasers. 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.

Chassis Overview

The DL4100 chassis consists of one function module slot and a power status LED. Figure 5-1 shows the components of the chassis front panel. This sample chassis configuration shows a function module occupying the module slot.

Figure 5-1. DL4100 Chassis Front Panel View

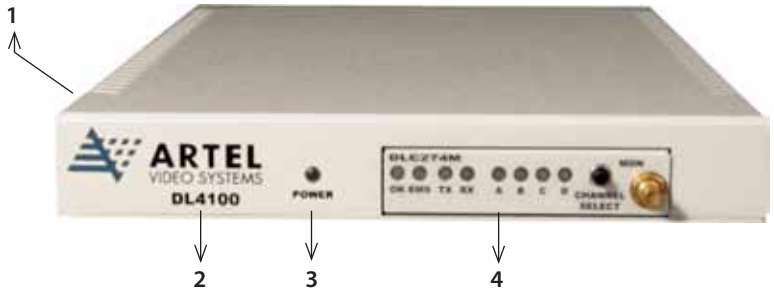


Table 5-1 describes the components called out in Figure 5-1.

Table 5-1. The DL4100 Chassis Front Panel Elements

Item	Description	for details, see...
1	DL4100 Chassis	Installing the DL4100 Chassis (page 5-4)
2	Product model number	N/A
3	Chassis power status LED	Applying Power and Installing a Function Module (page 5-11)
4	Function module slot	

Figure 5-2 shows the various components of the chassis rear panel. In this sample chassis configuration, there is a function module loaded in the chassis.

Figure 5-2. DL4100 Chassis Rear Panel View

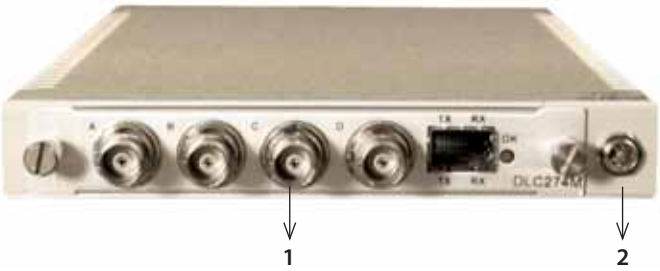


Table 5-2 describes the components called out in Figure 5-2.

Table 5-2. The DL4100 Chassis Rear Panel Elements

Item	Description	for details, see...
1	Function module slot (function module installed	Applying Power and Installing a Function Module (page 5-11)
2	Locking power supply connector	

Required Installation Tools and Equipment

To install the DL4100 as a rack-mount or wall-mount unit, you need the following items:

- Phillips head screwdriver
- Small adjustable wrench
- Grounding wire (wall-mount only)

Unpacking the DL4100

When unpacking the your DL4100, set aside the packing material in case you need to repackage the unit later.

To unpack the DL4100, perform the following steps:

1. From the shipping cartons, remove the DL4100 chassis, power supply adapter, chassis mounting assembly (rubber feet, optional wall-mount bracket, or optional rack-mount shelf), and function module.
2. Check the configuration of the unit against the items listed on the packing slip. If you find any discrepancies, report them in accordance with the instruction in "About This Manual".

Ventilating the DL4100 Chassis

It is important that your DL4100 operates within the specified temperature range as described in the DL4100 data sheet. The DL4100 relies on convection cooling to maintain a proper operating temperature for the installed function module.

To ensure proper convection cooling of the chassis and the installed module, it is important that you maintain at least a 2 inch (5 cm) clearance around the sides and rear of the chassis where the ventilation slots are located. Keep these areas clear of any obstructions that might restrict air flow around the chassis.

Installing the DL4100 Chassis

You can place the DL4100 chassis on a flat surface as a free-standing unit, rack mount it in a standard 19 inch equipment rack, or mount the chassis to a wall. As you position the DL4100 for installation, ensure that there is enough space in the back of the chassis to install and cable the function module.

Note: Before installing your DL4100 chassis, see the DL4300 data sheet for a detailed description of the DL4100 product specifications including environmental requirements that you must adhere to when installing the chassis and power supply module.

The section contains the following topics:

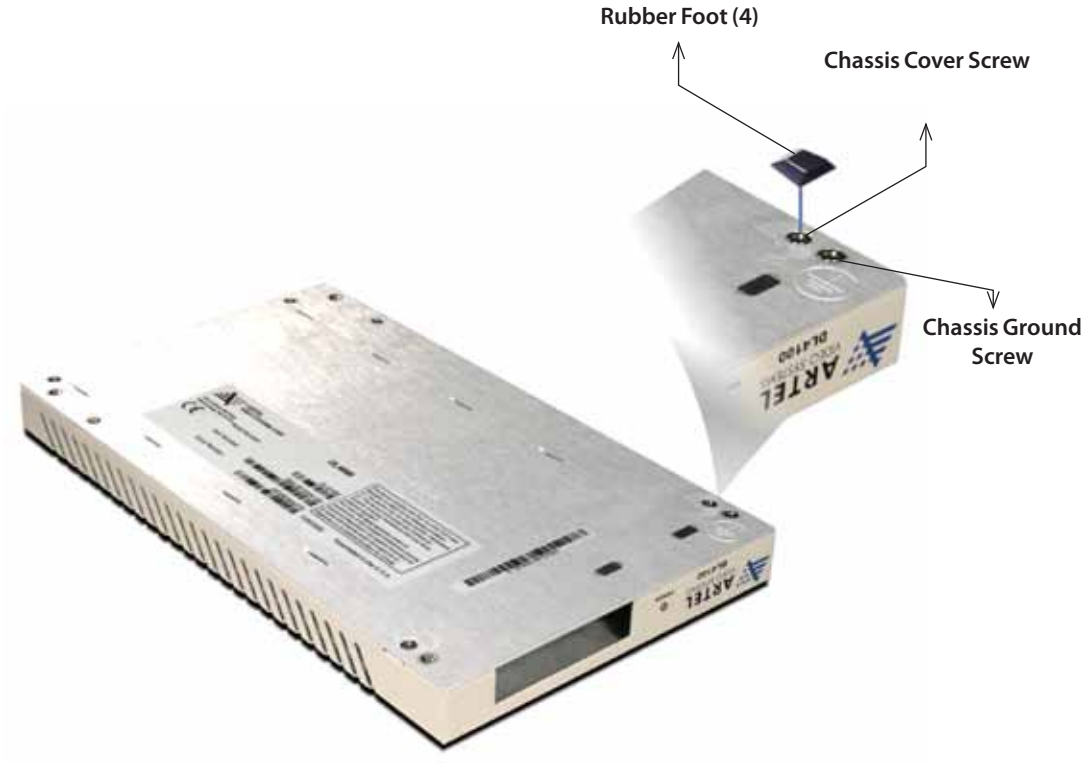
Installing the DL4100 as a Free-Standing Chassis

When installing the DL4100 chassis as a free-standing chassis, follow these requirements:

- The surface must be flat, clean, and in a safe location. The chassis must not be installed on the floor. In addition to increasing the risk of being damaged, placing the chassis on the floor increases the risk of dust building up in the chassis and causing problems related to overheating.
- The area provides a 2 inch (5 cm) clearance on all four sides of the chassis for proper ventilation (see the "Ventilating the DL4100 Chassis" section on page 5-4) and accessing the status LED, module slot, and cable connections.

To install the chassis as a free standing unit, place the DL4100 chassis upside down on a flat surface and secure the four rubber feet to the corners of the chassis bottom as shown in Figure 5-3. Place the rubber feet over the chassis cover screws. Do not cover the ground screw.

Figure 5-3. Free-Standing Chassis



Installing the Chassis in a Rack

To mount the chassis in an equipment rack, you need the optional shelf-mount plate and four equipment rack mounting screws (not provided).

To mount the chassis in an equipment rack, perform the following steps:

1. Place the DL4100 chassis upside down on a flat surface and secure the shelf-mount plate to the chassis bottom using the eight plate screws that came with the plate.
2. Insert the shelf-mount plate and chassis into the equipment rack and align the screw holes on the shelf bracket with the screw holes on the equipment rack.
3. Install the screws through the shelf bracket into the threaded screw holes on the rack. The shelf bracket requires two screws for each side of the bracket.

Mounting the Chassis to a Wall

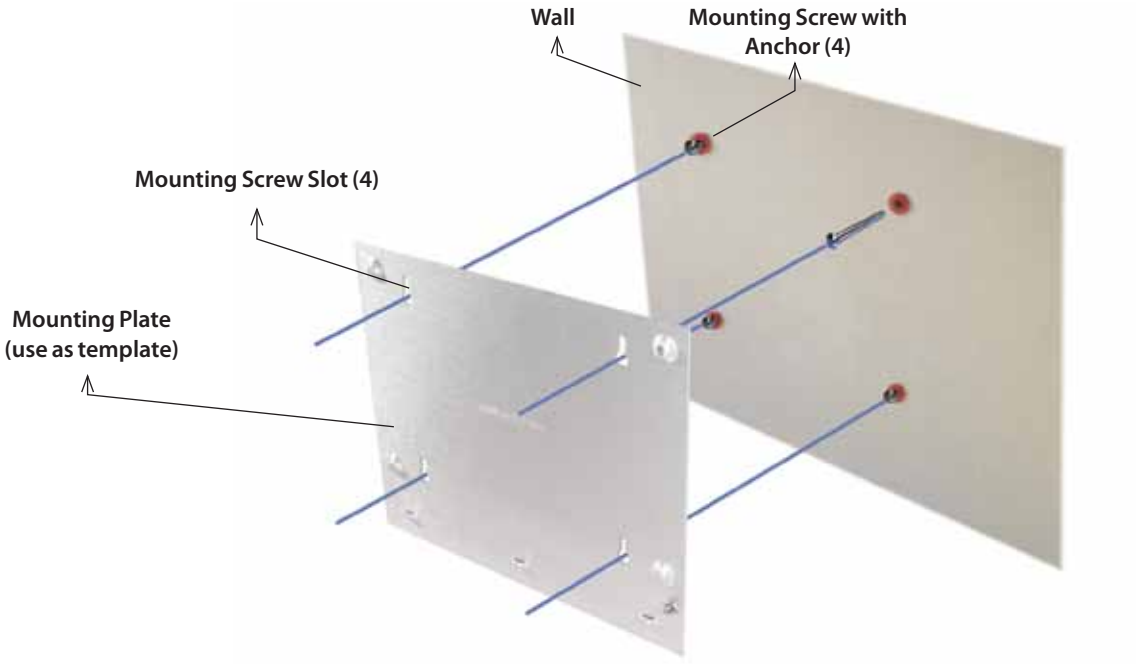
To install the DL4100 using the wall-mount plate, you need the following items:

- DL4100 wall-mount plate
- Four self-tapping screws (not supplied) to secure the plate to the wall
- Four screw anchors (optional/not supplied)
- Drill with bit (not supplied) large enough for screw anchors
- Ground wire (not supplied)
- Medium size Phillips-head screw driver (not supplied)
- Small adjustable wrench (not supplied)

To install the DL4300 as a wall-mounted unit, perform the following steps:

1. Use the wall-mount plate as a template to mark the locations for the four mounting screws on the wall as shown in Figure 5-4.

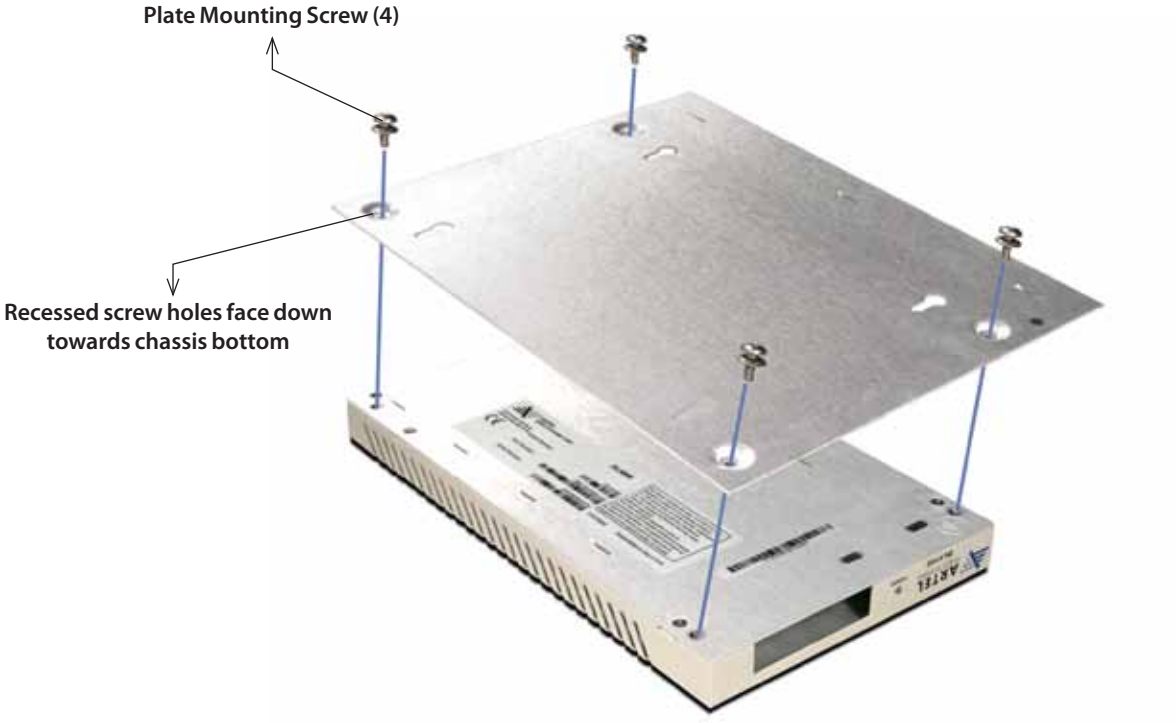
Figure 5-4. Wall-Mount Chassis Plate: Installing Mounting Screws



2. (Optional) Drill holes for the four screw anchors and insert the anchors.
3. Screw the mounting screws in place. Do not screw them in all the way; leave about 1/4 inch of the screw exposed so that you can slide the wall-mount plate over them as described later in the procedure.

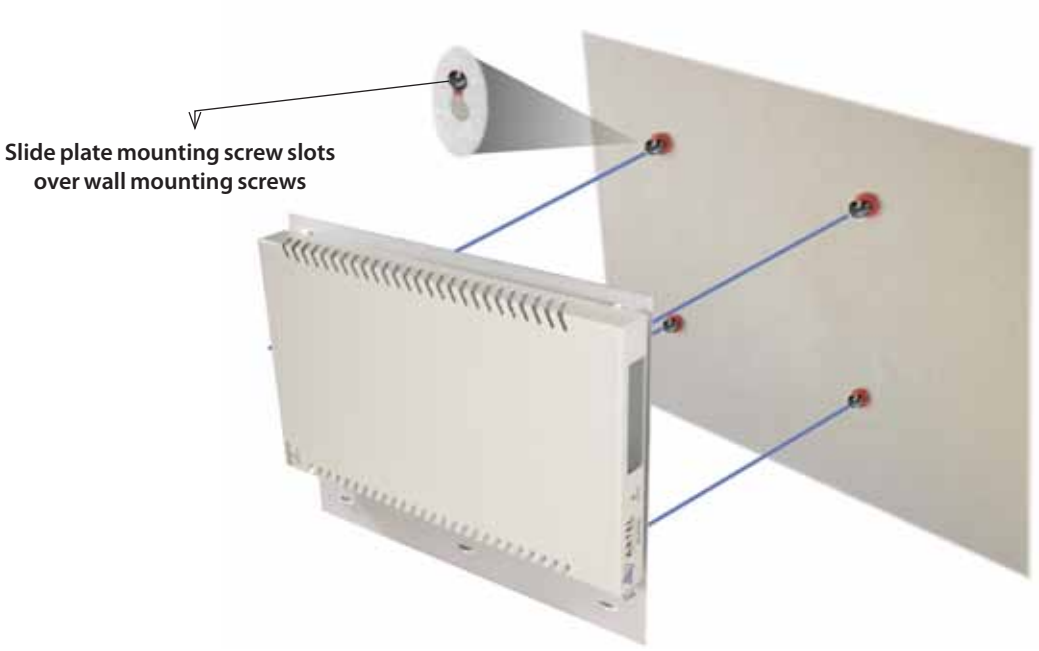
4. Take the DL4100 chassis, place it upside down on a flat surface, and secure the wall-mount plate to the chassis bottom using the four plate screws that came with the plate as shown in Figure 5-5.

Figure 5-5. Wall-Mount Chassis Plate: Securing to the Chassis



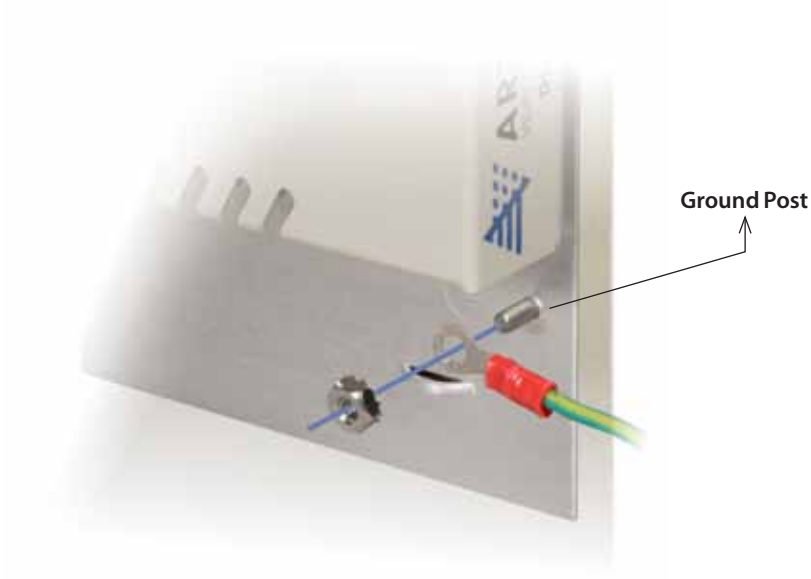
5. Align the plate mounting screw slots with the wall mounting screws and mount the plate to the wall as shown in Figure 5-6.

Figure 5-6. Wall-Mount Chassis Plate: Installing Mounting Screws



Ground the chassis and wall-mount plate using a grounding wire (not supplied) and the plate's ground post and nut as shown in Figure 5-7.

Figure 5-7. Wall-Mount Chassis Plate: Ground Wire



6. Attach the AC adapter and install the function module (see "Applying Power and Installing a Function Module" section on page 5-11).

7. Dress the function module cables as shown in Figure 5-8. Use the wall-mount plate's cable tie loops and cable ties to secure the cables to the plate and remove the strain from the function module connections.

Figure 5-8. Wall-Mount Chassis Plate: Cable Dressing

Applying Power and Installing a Function Module

After you have installed your DL4100 chassis as described in the "Installing the DL4100 Chassis" section on page 5-4, you can attach the AC power adapter and install a module into the chassis.

Warning

To avoid risk of injury or possible equipment damage, ensure that your power source meets the specifications as described in the DL4100 data sheet before applying power to your DL4100.

Caution

You must use the power adapter supplied by Artel for powering the DL4100. Use of any other power adapter is prohibited and may damage the devices.

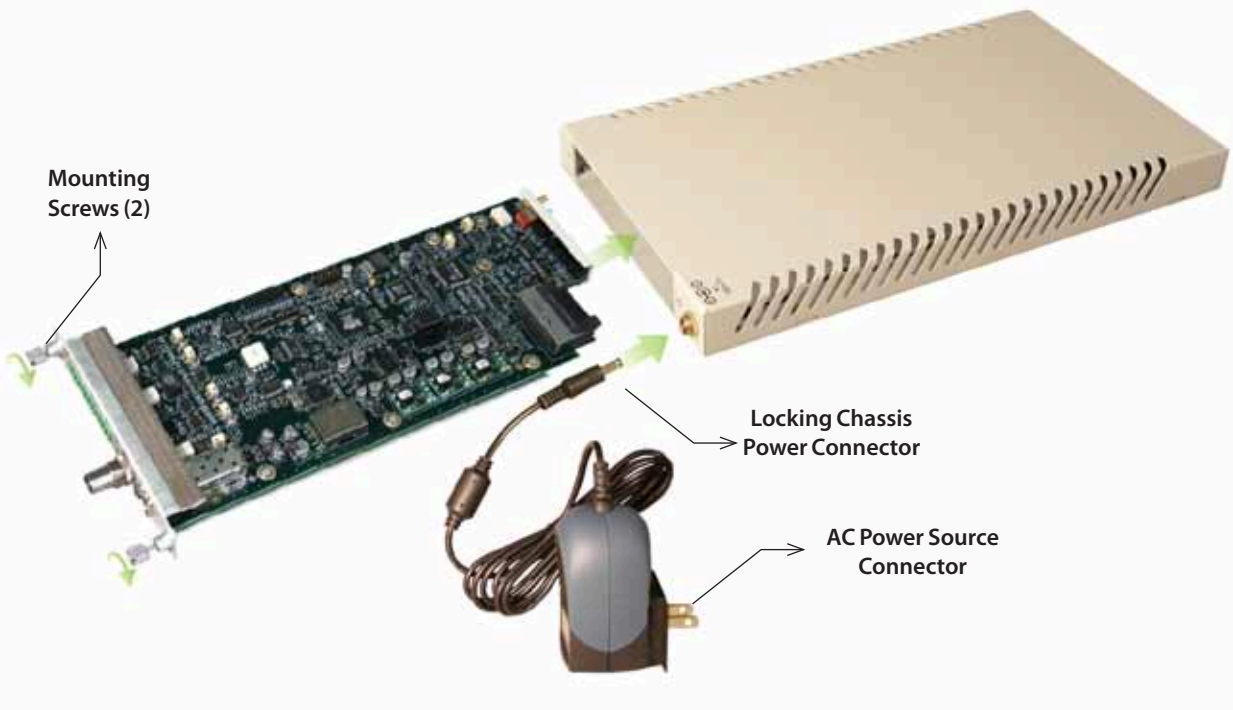
To apply power and install a function module, perform the following steps:

1. (Optional) Change the AC connector on the AC power adapter if needed. The power adapter comes with alternate AC connectors to accommodate different AC outlet types. Use the push button located near the metal connectors to remove the installed connector.
2. Attach the power adapter's chassis connector to the chassis power connector located on the rear panel as shown in Figure 5-9.
3. Plug the power adapter into the AC power source. Power is applied to the DL4100 as indicated by the Power status LED located on the front panel (see Figure 5-9).

   Note: The Power status LED illuminates green when power is applied to the chassis, whether or not a function module is installed.

4. Configure, install, and cable the function as described in the appropriate module-specific manual.

Figure 5-9. Applying Power and Installing Function Module



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