Extron

DVI DA Plus Series • User Guide

Introduction

This user guide describes the installation, operation, and specifications of the Extron® DVI DA4 Plus, DVI DA6 Plus, and DVI DA8 Plus Distribution Amplifiers.

Unless stated otherwise, all references to the “distribution amplifier,” “DA,” or “DVI DA Plus Series” in this guide refer to the features or operation of all three models.

FCC Class A 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. The Class A limits 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 instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference. This interference must be corrected at the expense of the user.

NOTE: For more information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics, see the **Extron Safety and Regulatory Compliance Guide** on the Extron website.

Specifications Availability

Product specifications are available on the Extron website, **www.extron.com**.

About the DVI DA Plus Series

These Digital Visual Interface (DVI) Distribution Amplifiers accept one single link DVI-D input and distribute four (DVI DA4 Plus), six (DVI DA6 Plus), or eight (DVI DA8 Plus) single link DVI-D output signals.

All three models use the Extron EDID Minder® feature to maintain continuous EDID (**E**xtended **D**isplay **I**dentification **D**ata) communication with the attached source.

The EDID Lock feature allows EDID information to be retained, even after cycling power to the unit or changing the output displays.

The DVI DA4 Plus is 1U high and half a rack wide. The DVI DA6 Plus and DVI DA8 Plus are both 1U high and a full rack wide. All three models offer a variety of mounting options.

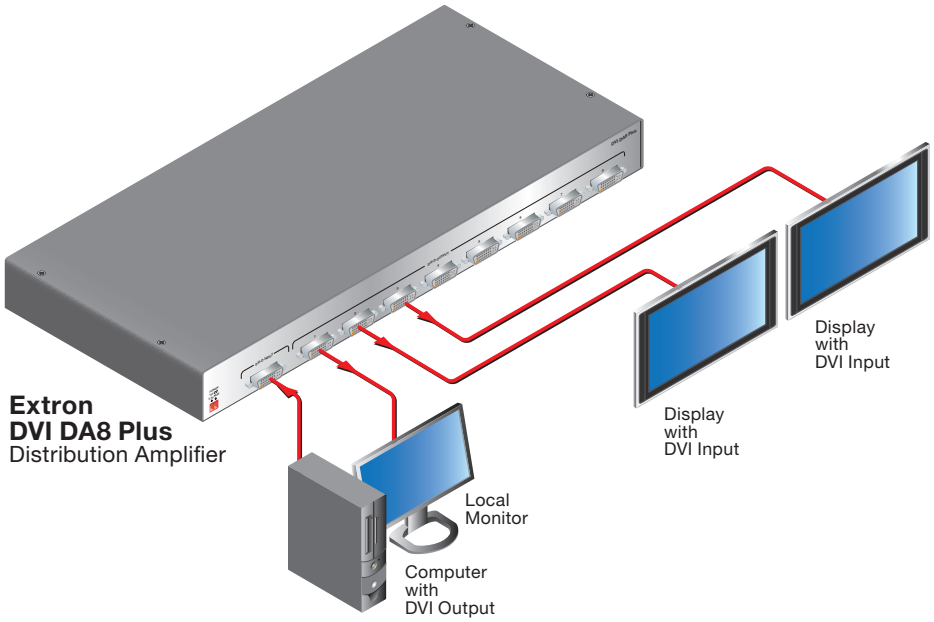


Figure 1. Typical Application for the DVI DA8 Plus

Features

EDID Minder — The EDID Minder maintains continuous EDID communication with the attached source to ensure that the DVI source powers up correctly and maintains a proper video output, even if the display is off.

EDID Lock — The last recorded EDID is saved to the input and used after a power cycle or after displays have been changed. The EDID presented to the input is not affected by power cycles or changing the output displays (even with hot-plug changes).

High resolution DVI-D input — The distribution amplifiers accept one single link DVI-D input, with a resolution range up to 1920x1200 or 1080p @ 60 Hz.

Input equalization — Input Equalization (EQ) conditions the input signals to ensure the integrity of the signals.

Pre-emphasis — This feature enables the distribution amplifier to compensate for poor signals delivered to the output devices.

DVI-D outputs — The units distribute four (DVI DA4 Plus), six (DVI DA6 Plus), or eight (DVI DA8 Plus) single link DVI-D output signals simultaneously, at resolutions up to 1920x1200 or 1080p @ 60 Hz.

External power supply — All three models are powered by an ENERGY STAR® qualified external 12 VDC power supply (provided with the units), which provide worldwide compatibility, low power consumption, and reduced operating costs.

Power on pin 14 — The distribution amplifiers provide a 5 VDC (250 mA) power on each output for peripheral devices.

Front panel indicator LED — The LED light on the front panel provides feedback about power status and whether an input signal is detected.

Versatile mounting options — All three units can be mounted in a rack, under a desk, or set on a tabletop.

Installation

All three distribution amplifiers can be mounted on tabletops, under furniture, and in racks by following these steps:

1. Ensure that the input sources, the distribution amplifier, and the output displays are all turned off and all power sources and signal cables are disconnected.
2. Mount the unit as described in **Mounting** on page 8.
3. Connect the cables (see **Rear Panel Features**).
4. If required, configure the internal DIP switches to **disable EDID** (see page 5) from certain outputs or to activate the **EDID Lock mode** (see page 6).
5. Plug in the **power supply** (see page 3).
6. Turn on the display devices.
7. Turn on the input devices (see **Operation** on page 4).

Rear Panel Features

The rear panels for the DVI DA4 Plus (top panel), the DVI DA6 Plus (middle panel), and DVI DA8 Plus (bottom panel) are shown below.

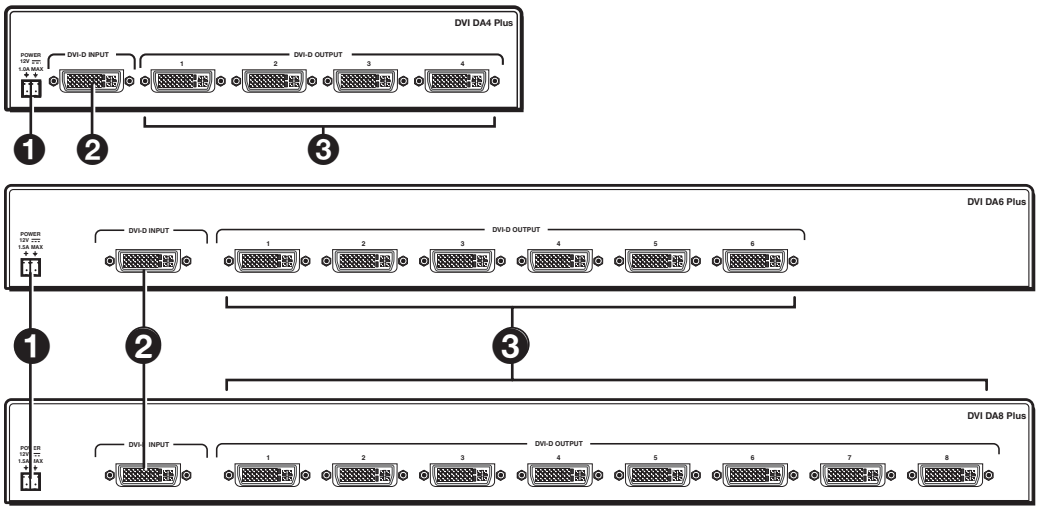


Figure 2. Rear Panel Features

❶ **Power input** — Connect the two pole, 3.5 mm captive screw connector from the power supply (provided with the unit) to this socket on the rear panel.

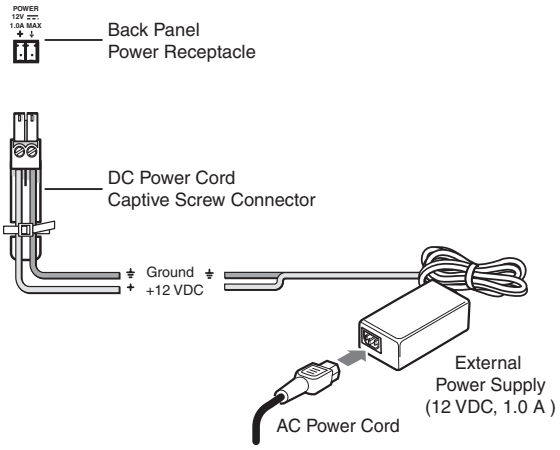


Figure 3. Power Supply Connection

The external power supply in the illustration above (12 VDC, 1.0 A) is for use with the DVI DA4 Plus. The DVI DA6 Plus and DVI DA8 Plus use a 12 VDC, 2 A external power supply.

ATTENTION:

- These products are intended to be supplied by a Listed Power Unit marked “Class 2” or “LPS”, rated 12 VDC, maximum 1.0 A (DVI DA4 Plus) or maximum 3.0 A (DVI DA6 Plus and DVI DA8 Plus). Always use a power supply supplied by or specified by Extron. Use of an unauthorized power supply voids all regulatory compliance certification and may cause damage to the supply and the end product.
- Ces produits doivent être alimentés uniquement par une source d’alimentation certifiée de classe 2 ou LPS, avec une tension nominale 12 Vcc, 1.0 A maximum (DVI DA4 Plus) ou 3 A maximum (DVI DA6 Plus et DVI DA8 Plus). Utilisez toujours une source d’alimentation fournie ou spécifiée par Extron. L’utilisation d’une source d’alimentation non autorisée annule toute certification de conformité réglementaire et peut endommager la source d’alimentation ainsi que le produit final.
- Unless otherwise stated, the AC/DC adapters are not suitable for use in air handling spaces or in wall cavities. The power supply is to be located within the same vicinity as the Extron A/V processing equipment in an ordinary location, Pollution Degree 2, secured to the equipment rack within the dedicated closet, podium or desk.
- Sauf mention contraire, les adaptateurs CA/CC ne conviennent pas à une utilisation dans les espaces d’aération ou dans les cavités murales. La source d’alimentation doit être placée à proximité de l’équipement de traitement audiovisuel Extron dans un emplacement ordinaire soumis à un degré de pollution de catégorie II, solidement fixée au rack d’équipement d’une baie technique, d’un pupitre, ou d’un bureau.
- The installation must always be in accordance with the applicable provisions of National Electrical Code ANSI/NFPA 70, article 75 and the Canadian Electrical Code part 1, section 16. The power supply shall not be permanently fixed to building structure or similar structure.
- L’installation doit toujours être conforme aux dispositions applicables du Code américain de l’électricité (National Electrical Code) ANSI/NFPA 70, article 75, et du Code canadien de l’électricité, partie 1, section 16. La source d’alimentation ne devra pas être fixée de façon permanente à la structure de bâtiment ou à d’autres structures similaires.

NOTE:

- The length of the exposed wires in the stripping process is critical. The ideal length is 3/16 inches (5 mm). Any longer and the exposed wires may touch, causing a short circuit between them. Any shorter and the wires can be easily pulled out even if tightly fastened by the captive screws.
- Do not tin the wires. Tinned wire does not hold its shape and can become loose over time.

❷ **Input connector** — Connect a single link DVI-D source device, with a resolution range up to 1920x1200 or 1080p@60 Hz, to the female DVI-I input, using a DVI cable.

NOTE: Although these distribution amplifiers have DVI-I connectors, they are only compatible with single link DVI-D video signals.

Input EQ conditions input signals to ensure the integrity of the signals delivered to the output devices.

❸ **Output Connectors** — Use DVI-I cables to connect up to four (DVI DA4 Plus), six (DVI DA6 Plus), or eight (DVI DA8 Plus) display devices.

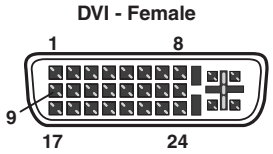
NOTE: The actual signal transmission distance can vary and depends on signal resolution, cable quality, graphics card, and display used in the system.

DVI Connector Pin Assignments

The illustration below shows the pin assignments for the DVI-I connectors.

See the note under **Input connector** on page 3 for information about DVI signal compatibility.

NOTE: The DVI DA Plus series distribution amplifiers are not High-Bandwidth Digital Content Protection (HDCP) compliant.



Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	TMDS data 2–	7	DDC data	13	Spare	19	TMDS data 0/5 shield
2	TMDS data 2+	8	Spare	14	+5 V power	20	Spare
3	TMDS data 2/4 shield	9	TMDS data 1–	15	Ground	21	Spare
4	Spare	10	TMDS data 1+	16	Hotplug detect	22	TMDS clock shield
5	Spare	11	TMDS data 1/3 shield	17	TMDS data 0–	23	TMDS clock+
6	DDC clock	12	Spare	18	TMDS data 0+	24	TMDS clock-

Front Panel Features

Figure 4 shows the front panel for the DVI DA4 Plus (top) and the front panel for the DVI DA6 Plus/DVI DA8 Plus, which are identical (bottom).

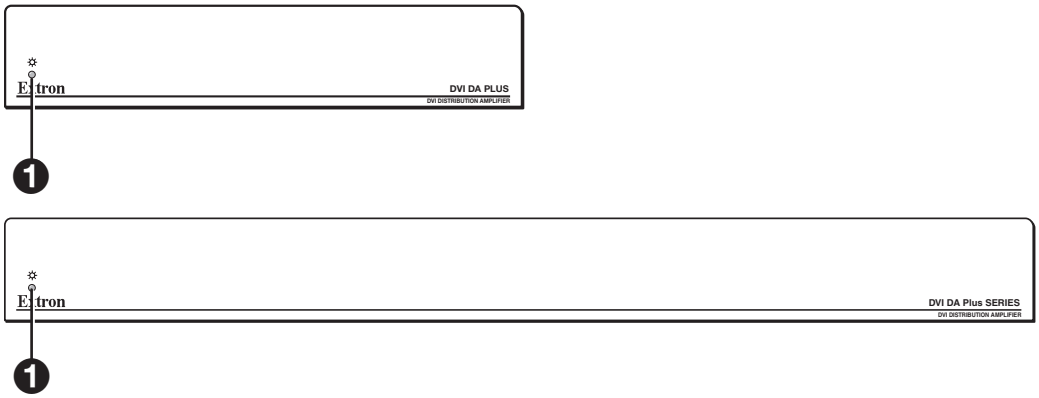


Figure 4. DVI DA Plus Series Front Panel Features

❶ **LED indicator** — This LED indicator lights amber when the unit is receiving power but no input signal. When the unit detects an input signal, the LED lights green.

Operation

Once the distribution amplifier has been **installed and the cables have been connected**:

1. Power on the display devices.
2. Power on the distribution amplifier. The LED lights amber to show that the unit is receiving power.
3. Power on the input device.

EDID Minder

When a DVI video source boots up, it normally communicates with the output device using the bidirectional Extended Display Identification Data (EDID) communication protocol. The source device then produces a signal with a resolution that is compatible with the output device.

The Extron EDID Minder feature maintains continuous EDID communication with the attached source and ensures that the DVI source powers up correctly and maintains a proper video output even if the display is off, or when a new monitor is connected to the output.

In default mode, when the distribution amplifier is powered on, it automatically scans all detectable outputs, selects the device with the lowest native resolution and passes the EDID information from that device to the input device.

While the distribution amplifier remains powered on, it monitors the Hot Plug Detect (HPD) signal on each output and repeats the scan process every time a display is connected or disconnected.

If all outputs displays are removed, the EDID provided is that of the last stored display to which the distribution amplifier was connected. If no output device has previously been connected to the unit, or the unit has been through a power cycle with no displays attached, the EDID uses the factory default, reporting a native rate of 1024x768.

When the EDID Minder is in **Lock Mode** (see **EDID Lock** on page 6), the last recorded EDID is stored to the input and used after a power cycle or after the displays have been changed.

Disabling the EDID Minder

Some applications require that the distribution amplifier does not automatically read the EDID from one or more specific outputs. In those cases, the EDID Minder feature can be disabled so those specific outputs are ignored during the automatic scanning process:

1. Remove and keep the screws holding the cover to the base. For the DVI DA4 Plus, there are three screws along the rear edge of the top and two screws on each side. For the DVI DA6 Plus and DVI DA8 Plus, there are four screws along the rear edge of the top and three screws along each side. Set aside the cover.
2. Check the part number of the printed circuit board (outlined in yellow in figure 5 on the next page). The boards must have a part number of 20-1496-01LF and higher for the DVI DA4 Plus or 20-1497-01LF and higher for the DVI DA6 Plus or DVI DA8 Plus.

   NOTE: If the part number of the board is lower than these values, you cannot deactivate the EDID Minder on your model. Replace the cover as described in step **5**.
3. Locate the DIP switches. There is a single bank of four switches for the DVI DA4 Plus (outlined in red in figure 5). Each switch regulates the correspondingly numbered output (1-4).

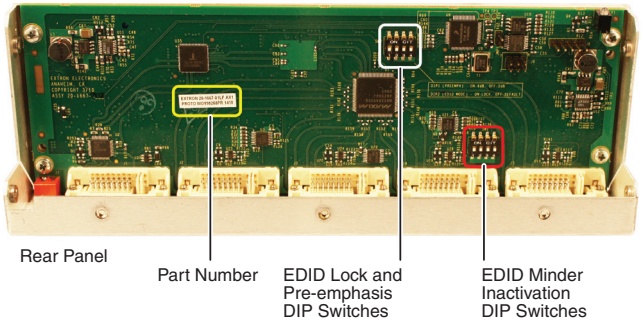


Figure 5. Printed Circuit Board for the DVI DA4 Plus

There are two banks of four switches for the DVI DA6 Plus (see figure 6) and the DVI DA8 Plus. In the bank to the left, each switch regulates the correspondingly numbered output (1-4). In the bank to the right, switches 1 and 2 correspond to outputs 5 and 6 for the DVI DA6 Plus; switches 1-4 correspond to outputs 5-8 for the DVI DA8 Plus.

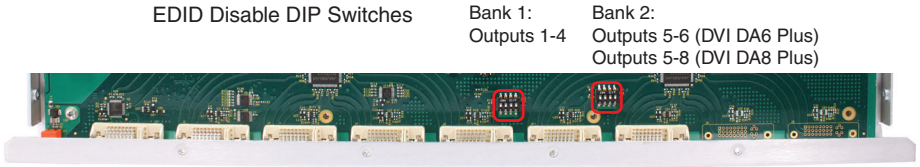
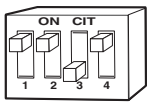


Figure 6. EDID Disable DIP Switches for the DVI DA6 Plus

4. By default the switches are in the “Off” (down) position, allowing the EDID information to be read from the corresponding output. To deactivate EDID Minder for one or more outputs, move the switch for that output to the “On” (up) position. In the diagram at right, the unit reads EDID from output 3, but not from outputs 1, 2, or 4.



5. Replace the cover, using the screws that were removed in step **1**.

EDID Lock

Some applications require the distribution amplifier to maintain specific EDID information. This information could be lost after power is cycled off and on or when a new output display is connected to the DVI DA Plus.

By default the EDID Lock mode DIP switch is set to “Off”. In this position, when the distribution amplifier is powered off, the EDID information that was being used is erased. When the distribution amplifier is powered back on, it automatically scans all detectable outputs, selects the device with the lowest native resolution and passes the EDID information from that device to the input device. If no output devices are detected, the distribution amplifier uses the factory default EDID (1024x768 @ 60 Hz).

While the distribution amplifier remains powered on, it monitors the Hot Plug Detect (HPD) signal on each output and repeats the scan process whenever a display is connected or disconnected.

When EDID Lock feature is enabled, the last recorded EDID is saved to the input and used when the power is cycled on and off or when a new display, with a different resolution, is connected.

Switch Position	Action on the Input
On (Lock)	• The last recorded EDID is stored to the input. • After a power cycle, the stored EDID is used. • After changing the displays connected to the DA, the stored EDID is used.
Off (Default)	• After a power cycle, the DA reads EDID from all valid displays, determines the lowest resolution, and stores that to the input. • After changing displays, the DA reads EDID from all valid displays, determines the lowest resolution, and stores that to the input. • When no displays are connected, the factory default EDID (1024x768 @ 60 Hz) is provided to the input.

To enable the EDID Lock feature:

1. Remove and keep the screws holding the cover to the base. For the DVI DA4 Plus, there are three screws along the rear edge of the top and two screws on each side. For the DVI DA6 Plus and DVI DA8 Plus, there are four screws along the rear edge of the top and three screws along each side. Set aside the cover.
2. Check the part number of the printed circuit board (see **figure 5** on page 5). The boards must have a part number of 20-1667-01LF and higher for the DVI DA4 Plus or 20-1683-02LF and higher for the DVI DA6 Plus or DVI DA8 Plus.

   NOTE: If the part number of the board is lower than these values, the EDID Lock feature is not available on your model. Replace the cover as described in step **5**.

3. Locate the Pre-emphasis and EDID Lock DIP switches. **Figure 5** shows the switches for the DVI DA4 Plus. The DVI DA6 Plus and DVI DA8 Plus have an identical block of DIP switches in a similar position on the circuit board. The EDID Lock DIP switch (number 2) is labeled EDID Mode.
4. By default, the EDID Mode DIP switch is in the down (disabled) position, allowing for normal operation. To enable the EDID Lock feature, toggle the switch to the up position.

   NOTE: Before enabling the EDID Lock feature, be sure the desired EDID is currently being used.

5. Replace the cover, using the screws that were removed in step **1**.

Pre-emphasis

Pre-emphasis compensates for long cable runs, distortion, and pixilation on the distribution amplifier outputs. To enable pre-emphasis:

1. Remove and keep the screws holding the cover to the base. For the DVI DA4 Plus, there are three screws along the rear edge of the top and two screws on each side. For the DVI DA6 Plus and DVI DA8 Plus, there are four screws along the rear edge of the top and three screws along each side. Set aside the cover.
2. Check the part number of the printed circuit board (see **figure 5** on page 5). The boards must have a part number of 20-1667-01LF and higher for the DVI DA4 Plus or 20-1683-02LF and higher for the DVI DA6 Plus or DVI DA8 Plus.

   NOTE: If the part number of the board is lower than these values, you cannot activate pre-emphasis on your model. Replace the cover as described in step **5**.
3. Locate the Pre-emphasis DIP switch (number 1), which is labeled Preemph.
4. By default, the Pre-emphasis DIP switch is in the down (disabled) position. To enable pre-emphasis, toggle the switch to the up position.
5. Replace the cover, using the screws that were removed in step **1**.

Troubleshooting

- **No output signal** — Check that the front panel LED is lit (amber shows that the unit is receiving power, green shows that it is also receiving an input signal). If LED is not lit, check the **Power input** (see page 3) and the **Input connector** (see page 3).
- **No output signal or poor quality signal** — Check the integrity of the cabling from the source device to the distribution amplifier and from the distribution amplifier to each of the display devices.
  - DVI signals run at very high frequency and poor connections can cause degradation or loss of the signal, or jitter.
  - Signal transmission distance can vary greatly and depends on signal resolution, cable type, cable quality, graphics card and the display used in the system.
  - Use only cable that is designed for DVI signals.
  - Limit or avoid the use of adapters or couplers.
  - Enable the Pre-emphasis feature
- **Display device displays a flashing black or blue screen, snow or other distortion** — A device that is not HDCP compliant may be receiving HDCP-encrypted signals. The DVI DA Plus series distribution amplifiers are not HDCP compliant.
- **Signal on some displays but not others** — Reboot the source device. When the source device boots up, the EDID handling feature ensures that the output resolution of the source device matches the requirements of the display device with the lowest resActuallyolution.
- If an additional display device is added, which requires an even lower resolution, the image does not display correctly on that monitor until the source device is shut down and rebooted. At that time, EDID handling ensures that the output resolution of the source device is recalibrated to meet the needs of the additional display device.

  NOTE: For EDID handling to work correctly, you must disable the EDID Lock feature for all outputs (see **EDID Lock** on page 6).

Mounting

This section outlines the various mounting options available for the DVI DA Plus series of distribution amplifiers.

Tabletop Placement

Attach the four provided rubber feet to the bottom of the unit and place it in any convenient location.

Rack Mounting

UL Guidelines for Rack Mounting

The following Underwriters Laboratories (UL) guidelines are relevant to the safe installation of these products in a rack:

Elevated operating ambient temperature — If the unit is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Therefore, install the equipment in an environment compatible with the maximum ambient temperature (Tma: +122 °F, +50 °C) specified by Extron.

Reduced air flow — Install the equipment in the rack so that the equipment gets adequate air flow for safe operation.

Mechanical loading — Mount the equipment in the rack so that uneven mechanical loading does not create a hazardous condition.

Circuit overloading — Connect the equipment to the supply circuit and consider the effect that circuit overloading might have on overcurrent protection and supply wiring. Give appropriate consideration to the equipment nameplate ratings when addressing this concern.

Reliable earthing (grounding) — Maintain reliable grounding of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (such as the use of power strips).

Rack Mounting the DVI DA4 Plus

The DVI DA4 Plus can be mounted a range of (optional) rack shelves. To mount the units, follow the instructions provided with the rack mounting kit.

Rack Mounting the DVI DA6 Plus and DVI DA8 Plus

The DVI DA6 Plus and DVI DA8 Plus distribution amplifiers can be mounted using the Extron MBD 149 rack mount kit (provided) following the instructions provided with the MBD 149.

Under-desk Mounting

Mount the DVI DA6 Plus or DVI DA8 Plus under furniture, using the optional Extron MBU 149 under-desk mounting kit. Mount the DVI DA4 Plus using the optional Extron MBU 123 under-desk mounting kit. Follow the instructions provided with the appropriate kit.

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