

## User's Manual



### VersaTools® MDA 4V HD-SDI VersaTools® MDA 4V SDI Serial Digital Interface Mini Distribution Amplifier

68-616-01 Rev. C  
07 07

# Precautions

## Safety Instructions • English



This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.



This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

### Caution

**Read Instructions** • Read and understand all safety and operating instructions before using the equipment.

**Retain Instructions** • The safety instructions should be kept for future reference.

**Follow Warnings** • Follow all warnings and instructions marked on the equipment or in the user information.

**Avoid Attachments** • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

## Consignes de Sécurité • Français



Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).



Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

### Attention

**Lire les instructions** • Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

**Conservier les instructions** • Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

**Respecter les avertissements** • Observer tous les avertissements et consignes marqués sur le matériel ou présents dans la documentation utilisateur.

**Eviter les pièces de fixation** • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

## Sicherheitsanleitungen • Deutsch



Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.



Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

### Achtung

**Lesen der Anleitungen** • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits- und Bedienungsanleitungen genau durchlesen und verstehen.

**Aufbewahren der Anleitungen** • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

**Befolgen der Warnhinweise** • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

**Keine Zusatzgeräte** • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

## Instrucciones de seguridad • Español



Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.



Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

### Precaución

**Leer las instrucciones** • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

**Conservar las instrucciones** • Conservar las instrucciones de seguridad para futura consulta.

**Obedecer las advertencias** • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

**Evitar el uso de accesorios** • No usar herramientas o accesorios que no sean específicamente recomendados por el fabricante, ya que podrían implicar riesgos.

### Warning

**Power sources** • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

**Power disconnection** • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

**Power cord protection** • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

**Servicing** • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

**Slots and openings** • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

**Lithium battery** • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

### Avertissement

**Alertations** • Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de le contourner ni de la désactiver.

**Déconnexion de l'alimentation** • Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

**Protection du cordon d'alimentation** • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

**Réparation-maintenance** • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

**Fentes et orifices** • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

**Lithium Batterie** • Il a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un type equivalent recommande par le constructeur. Mettre au reut les batteries usagées conformément aux instructions du fabricant.

### Vorsicht

**Stromquellen** • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdsanschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

**Stromunterbrechung** • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stromversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

**Schutz des Netzkabels** • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegen gestellt werden können.

**Wartung** • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

**Schlitze und Öffnungen** • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

**Lithium-Batterie** • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

### Advertencia

**Alimentación eléctrica** • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearla ni eliminarla.

**Desconexión de alimentación eléctrica** • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

**Protección del cables de alimentación** • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

**Reparaciones/mantenimiento** • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

**Ranuras y aberturas** • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalentamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

**Batería de litio** • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

# Extron's Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

### USA, Canada, South America, and Central America:

Extron Electronics  
1001 East Ball Road  
Anaheim, CA 92805, USA

### Asia:

Extron Electronics, Asia  
135 Joo Seng Road, #04-01  
PM Industrial Bldg.  
Singapore 368363

### Europe, Africa, and the Middle East:

Extron Electronics, Europe  
Beeldschermweg 6C  
3821 AH Amersfoort  
The Netherlands

### Japan:

Extron Electronics, Japan  
Kyodo Building  
16 Ichibancho  
Chiyoda-ku, Tokyo 102-0082  
Japan

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product.

*If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), 65.6383.4400 (Asia), or 81.3.3511.7655 (Japan) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.*

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

## 安全须知 • 中文



这个符号提示用户该设备用户手册中有重要的操作和维护说明。



这个符号警告用户该设备机壳内有暴露的危险电压，有触电危险。

### 注意

**阅读说明书** • 用户使用该设备前必须阅读并理解所有安全和使用说明。

**保存说明书** • 用户应保存安全说明书以备将来使用。

**遵守警告** • 用户应遵守产品和用户指南上的所有安全和操作说明。

**避免追加** • 不要使用该产品厂商没有推荐的工具或追加设备，以避免危险。

### 警告

**电源** • 该设备只能使用产品上标明的电源。设备必须使用有地线的供电系统供电。第三条线（地线）是安全设施，不能不用或跳过。

**拔掉电源** • 为安全地从设备拔掉电源，请拔掉所有设备后或桌面电源的电源线，或任何接到市电系统的电源线。

**电源线保护** • 妥善布线，避免被踩踏，或重物挤压。

**维护** • 所有维修必须由认证的维修人员进行。设备内部没有用户可以更换的零件。为避免出现触电危险不要自己试图打开设备盖子维修该设备。

**通风孔** • 有些设备机壳上有通风槽或孔，它们是用来防止机内敏感元件过热。不要用任何东西挡住通风孔。

**锂电池** • 不正确的更换电池会有爆炸的危险。必须使用与厂家推荐的相同或相近型号的电池。按照生产厂的建议处理废弃电池。

## FCC Class A Notice

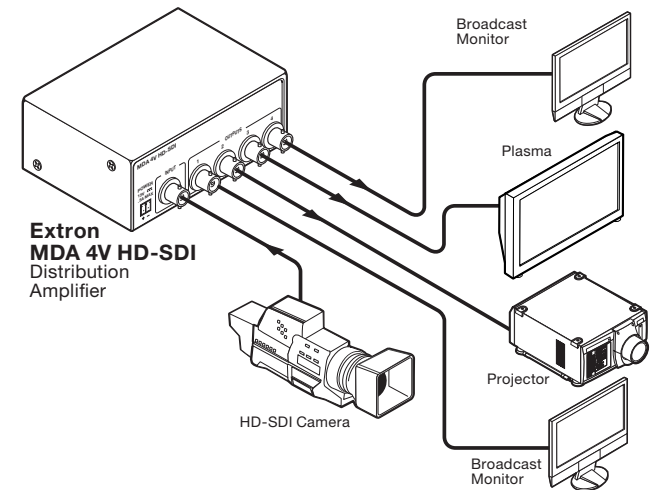
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. The Class A 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 instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

### **NOTE**

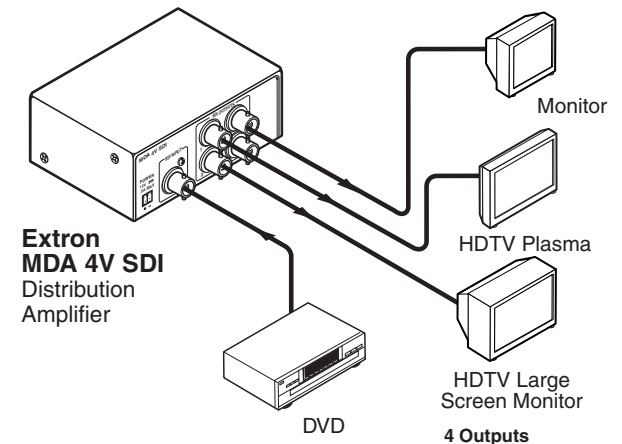
*This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance with FCC emissions limits.*

The Extron MDA 4V HD-SDI (figure 1) is a one-input, four-output, high definition serial digital interface (HD-SDI) mini distribution amplifier (MDA).

The Extron MDA 4V SDI (figure 2) is a one-input, four-output, serial digital interface (SDI) MDA.



**Figure 1 — Typical MDA 4V HD-SDI application**



**Figure 2 — Typical MDA 4V SDI application**

The MDAs are members of the Extron VersaTools® line of basic distribution amplifiers, switchers, and associated video accessories.

68-616-01 Rev. C  
07 07

All trademarks mentioned in this manual are the properties of their respective owners.

## MDA 4V HD-SDI and SDI User's Guide

The MDA 4V HD-SDI accepts high definition serial video with data rates of 1.485 Gbps and 2.97 Gbps, and standard definition serial video at a data rate of 270 Mbps.

The MDA 4V SDI accepts SMPTE-259M serial video on a female BNC connector. The MDA 4V SDI recognizes the  $4f_{sc}$  PAL,  $4f_{sc}$  NTSC, component 4:2:2, and Widescreen 4:2:2 standards.

Both MDAs receive the video on a female BNC connector. Both MDAs have automatic equalization and re-clocking capabilities. The rack-mountable MDAs ship with an external 12 V power supply.

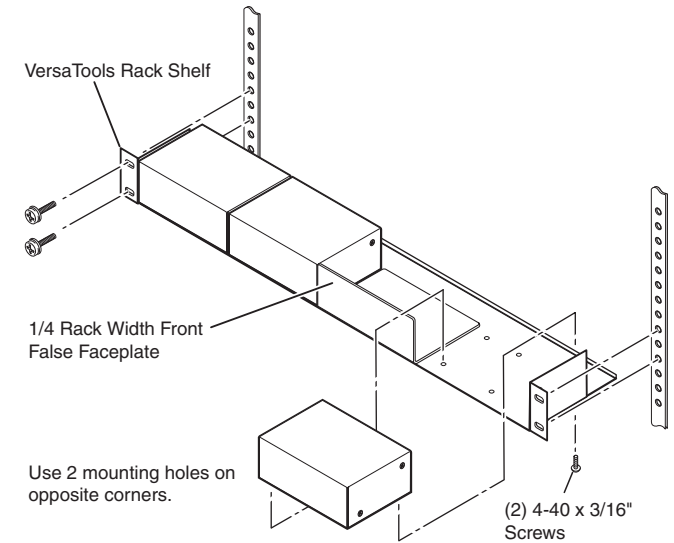
### Installation

The 1U high, quarter rack width, MDAs can be mounted on a rack shelf, behind a rack, or under a desk or tabletop..

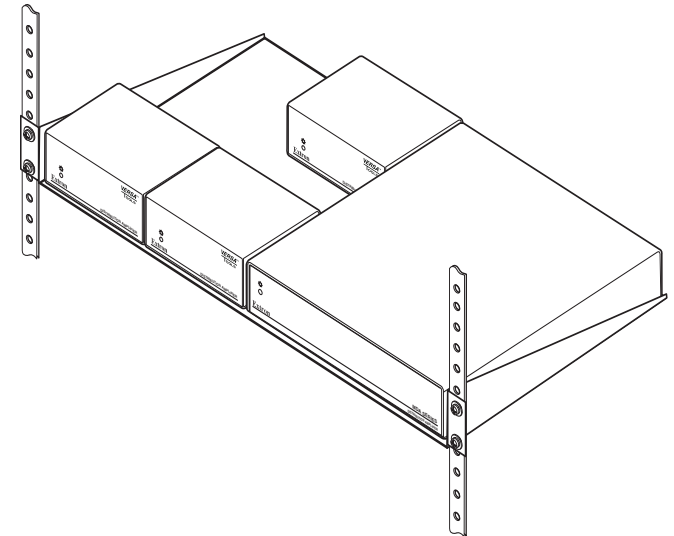
#### Rack mounting

For optional rack mounting, mount the MDA with any of the following rack shelves:

- RSF 123 VersaTools® rack shelf kit (part #60-190-20) (figure 3 on the next page)
- RSB 123 VersaTools rack shelf (part #60-604-20)
- RSU 126 6" deep universal rack shelf kit (part #60-190-10)
- RSB 126 6" deep basic rack shelf (part #60-604-10)
- RSU 129 1U universal rack shelf kit (part #60-190-01) (figure 4 on the next page)
- RSB 129 1U basic rack shelf (part #60-604-01)



**Figure 3 — Mounting the MDA on a VersaTools shelf**



**Figure 4 — Mounting the MDA on a standard shelf**

### UL requirements

The following Underwriters Laboratories (UL) requirements pertain to the installation of the MDA into a rack.

1. **Elevated operating ambient** — If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consider installing the equipment in an environment compatible with the maximum ambient temperature (T<sub>ma</sub>) specified by the manufacturer.
2. **Reduced air flow** — Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
3. **Mechanical loading** — Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
4. **Circuit overloading** — 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 overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
5. **Reliable earthing (grounding)** — Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (such as the use of power strips).

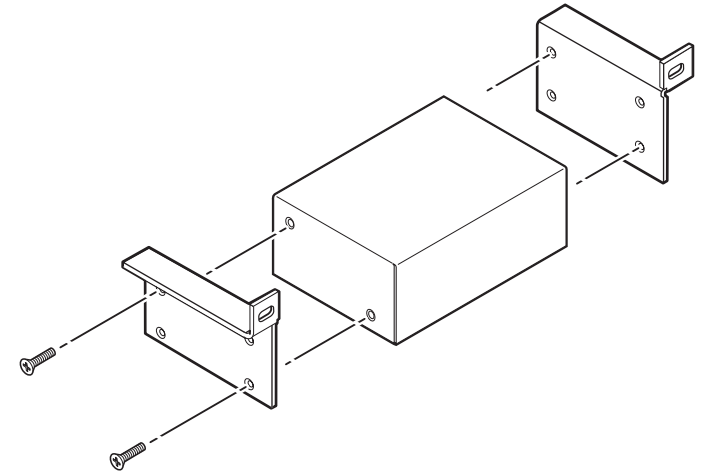
### Rack mounting instructions

**NOTE** *On the non-VersaTools rack shelves, the MDA can mount in the front or the rear of the rack.*

1. Remove the feet from the bottom of the MDA if they are already installed.
2. Mount the MDA using two 4-40 x 3/16" screws in opposite (diagonal) corners to secure the MDA to the shelf (figure 3 on page 3).
3. Install false faceplate(s) or other unit(s) to the rack shelf.
4. Insert the shelf into the rack, aligning the holes in the shelf with those of the rack.
5. Secure the shelf to the rack using the supplied machine screws (figure 4 on page 3).

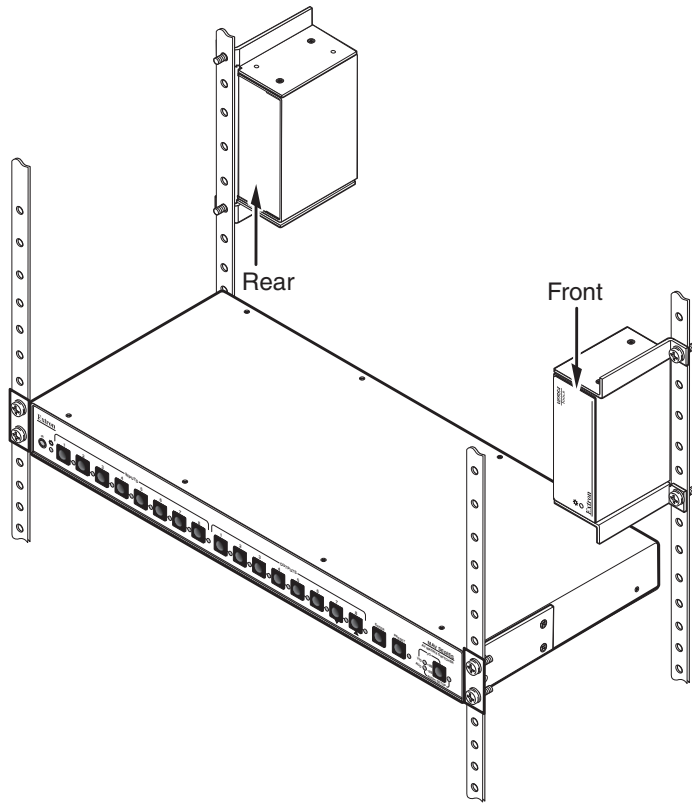
### Back of the rack mounting instructions

The MDA can be mounted to the rear of a rack using the Extron MBB 100 VersaTools back of the rack mounting kit (part #70-367-01) (figure 5). The kit allows the product to be vertically mounted to the front or rear rack supports and facing towards either the front or the rear of the rack.



**Figure 5 — Attaching the back of the rack kit**

1. Remove feet from the bottom of the MDA if they are installed.
2. Remove two screws from one side of the unit. Retain the screws for possible later reassembly without the bracket.
3. Attach one bracket to the side of the unit (figure 5) using the longer screws included in the kit.
4. Repeat steps 2 and 3 on the other side of the unit.
5. Mount the unit to the rack using the two included rack screws (figure 6, on the next page). The MDA can be vertically mounted facing in either direction.

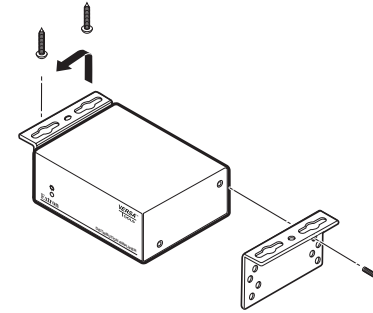


**Figure 6 — Typical back of the rack installations**

### Furniture mounting

Furniture mount the MDA using the optional MBU VersaTools under desk mounting kit (part #70-212-01) as follows:

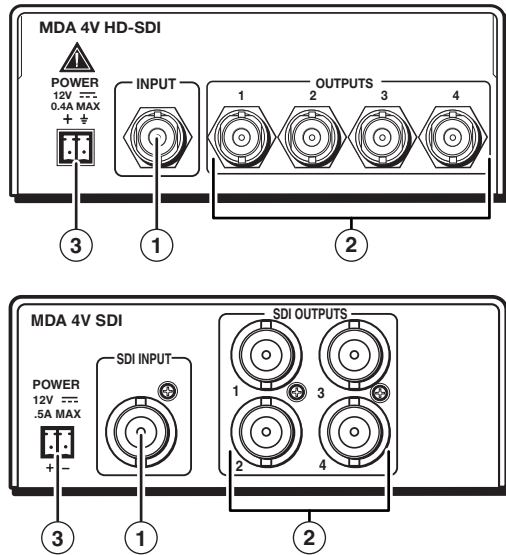
1. Attach the mounting brackets to the MDA with the provided machine screws (figure 7).



**Figure 7 — Under-desk mounting the MDA**

2. If feet were previously installed on the bottom of the MDA, remove them.
3. Hold the MDA with the attached brackets against the underside of the table or other furniture. Mark the location of the screw holes of the bracket on the mounting surface.
4. Drill 3/32" (2 mm) diameter pilot holes, 1/4" (6.3 mm) deep in the mounting surface at the marked screw locations.
5. Insert #8 wood screws into the four pilot holes. Tighten each screw into the mounting surface until just less than 1/4" of the screw protrudes.
6. Align the mounting screws with the slots in the brackets and place the MDA against the surface, with the screws through the bracket slots.
7. Slide the MDA slightly forward or back, then tighten all four screws to secure the MDA.

## Connections



**Figure 8 — MDA 4V HD-SDI and SDI rear panels**

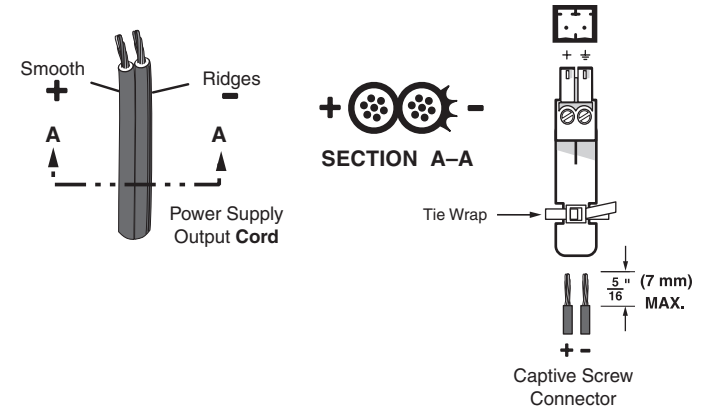
- ① **HD-SDI or SDI Input connector** — Connect an HD-SDI or SDI input to this BNC connector. The MDA automatically equalizes input, regardless of the rate.

**NOTE** The MDA 4V HD-SDI can handle SDI video at the signal rate of 270 Mbps.

- ② **HD-SDI or SDI Outputs (1 through 4) connectors** — Connect up to four HD-SDI or SDI devices to these BNC connectors. If the MDA recognizes the input rate, the MDA outputs re-clocked HD-SDI or SDI outputs.

- ③ **Power connector** — Plug the external 12 VDC power supply into this 2-pole captive screw connector. The power supply is included with the unit. Figure 9, on the next page, shows how to wire the connector.

**CAUTION** Voltage polarity is critical when you are connecting the power supply. Applying power with incorrect voltage polarity could damage the power supply and the MDA. Identify the power cord negative lead by the ridges on the side of the cord.



**Figure 9 — Power connector wiring**

To verify the polarity before connection, plug in the power supply with no load and check the output with a voltmeter.

**WARNING** The two power cord wires must be kept separate while the power supply is plugged in. Remove power before wiring.

**CAUTION** The length of the exposed (stripped) copper wires is important. The ideal length is 5/16" (7 mm). Longer bare wires can short together. Shorter wires are not as secure in the connectors and could be pulled out.

Use the supplied tie-wrap to strap the power cord to the extended tail of the connector.

**NOTE** Your MDA may have shipped with a blue captive screw connector. This blue connector can be plugged into either a blue or an orange power receptacle.

The blue connector does not have the extended tail or the included tie-wrap.

**NOTE** Do not tin the power supply leads before installing them in the direct insertion connector. Tinned wires are not as secure in the connectors and could be pulled out.

Alternatively, an Extron P/S 123 Universal 12 VDC Power Supply, part #60-814-01, can power up to eight MDAs or other Extron 12 VDC devices using only one AC power connector.



Indicators

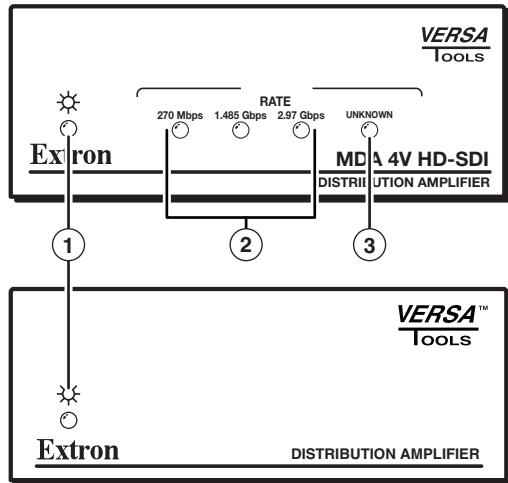


Figure 10 — MDA 4V HD-SDI and SDI front panels

- ① **Power LED** — Indicates power is applied.
- ② **Rate indicators (MDA 4V HD-SDI only)** — These indicators light to indicate the detected input video rate on the HD-SDI input BNC connector. The recognized rates are 270 Mbps, 1.485 Gbps, or 2.97 Gbps.
- ③ **Unknown rate indicator (MDA 4V HD-SDI only)** — When lit, this LED indicates that an input is detected on the HD-SDI input BNC connector but that the MDA did not recognize the rate.

**NOTE** The MDA equalizes and distributes the input regardless of whether the rate is recognized or not.

System operation

After the MDA and all of its connected devices are powered up, the system is fully operational. If any problems are encountered, ensure all cables are routed and connected properly.

Specifications

Video

Gain.....	Unity
Resolution.....	8 or 10 bits, automatic
Operation standards	
MDA 4V HD-SDI.....	SMPTE-259M SMPTE 292M SMPTE 424M ITU-R BT.601 ITU-R BT.1120
MDA 4V SDI.....	143 Mb/s (4f <sub>sc</sub> NTSC) 177 Mb/s (4f <sub>sc</sub> PAL) 270 Mb/s (4:2:2 component video) 360 Mb/s (4:2:2 widescreen component video), autoselected
Equalization and re-clocking.....	Automatic for up to -30 dB of cable loss
Auto data rate lock (MDA 4V HD-SDI).....	Yes

Video input

Number/signal type	
MDA 4V HD-SDI.....	1 SDI, HD-SDI, or 3G-SDI digital component video
MDA 4V SDI.....	1 SMPTE-259M serial digital component video
Connectors.....	1 BNC female
Data rates.....	19 Mbps to 2.97 Gbps
Input cable equalization.....	Automatic
HD-SDI.....	120 m (400') using Extron RG6 cable 60 m (200') using Extron RG59 cable
SDI.....	150 m (500') using Extron RG6 cable 120 m (400') using Extron RG59 cable
Nominal level.....	0.8 V <sub>p-p</sub>
Minimum/maximum levels.....	0.5 V to 1 V <sub>p-p</sub> with no offset
Impedance.....	75 ohms
Return loss	
MDA 4V HD-SDI.....	<-15 dB @ 5 MHz to 2.97 GHz
MDA 4V SDI.....	<-15 dB @ 5 MHz to 270 MHz
Maximum DC offset.....	5 V
Input coupling.....	AC

## MDA 4V HD-SDI and SDI User's Guide

### Video output

Number/signal type	
MDA 4V HD-SDI.....	4 single link SDI, HD-SDI, or 3G-SDI digital component video
MDA 4V SDI .....	4 reclocked SMPTE-259M serial digital component video
Connectors .....	4 BNC female
Reclocking	
MDA 4V HD-SDI.....	Automatic for 270 Mbps, 1.485 Gbps, 2.97 Gbps, or bypassed for other rates
MDA 4V SDI .....	Automatic for 143 Mbps, 177 Mbps, 270 Mbps, or 360 Mbps
Nominal level .....	0.8 Vp-p
Minimum/maximum levels.....	0.5 V to 1.0 Vp-p
Impedance.....	75 ohms
Return loss	
MDA 4V HD-SDI.....	<-25 dB @ 100 MHz
MDA 4V SDI .....	<-25 dB @ 5 MHz
DC offset.....	±5 mV maximum with input at 0 offset

### Sync

Standards.....	4f <sub>sc</sub> NTSC, 4f <sub>sc</sub> PAL, SMPTE-259M
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### General

External power supply .....	100 VAC to 240 VAC, 50/60 Hz, external, autoswitchable; to 12 VDC, 1 A, regulated
Power input requirements .....	12 VDC, 0.4 A (max.)
Temperature/humidity .....	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing
Cooling .....	Convection, unvented
Rack mount .....	Yes, with optional standard 1U 9.5" rack shelf, part #60-190-01 or 60-604-01; or with VersaTools® 1U, 3.5" deep rack shelf, part #60-190-20 or 60-604-20; or with the MBB 100 Back of the Rack Mounting Kit, part #70-367-01. Also furniture mountable with optional VersaTools Under Desk Mounting Kit MBU 123, part #70-212-01.
Enclosure type .....	Metal

Enclosure dimensions.....	1.7" H x 4.3" W x 3.0" D (1U high, quarter rack wide) 4.3 cm H x 10.9 cm W x 7.6 cm D (Depth excludes connectors and knobs.)
Product weight .....	0.5 lbs (0.2 kg)
Shipping weight .....	2 lbs (1 kg)
Vibration.....	ISTA 1A in carton (International Safe Transit Association)
Listings.....	UL, CUL
Compliances.....	CE, FCC Class A, VCCI, AS/NZS, ICES
MTBF.....	30,000 hours
Warranty .....	3 years parts and labor

**NOTE** All nominal levels are at ±10%.

**NOTE** Specifications are subject to change without notice.

## Part Numbers

### MDAs

MDA	Part number
MDA 4V HD-SDI	60-884-01
MDA 4V SDI	60-448-01

### Optional accessories and cables

Accessory or cable	Part number
RSU 129 9" 1U universal rack shelf kit	60-190-01
RSB 129 9" 1U basic rack shelf	60-604-01
RSU 126 6" deep 1U universal rack shelf kit	60-190-10
RSU 126 6" deep 1U universal rack shelf	60-604-10
RSF 123 3" deep 1U VersaTools® rack shelf kit	60-190-20
RSB 123 3" deep 1U VersaTools rack shelf	60-604-20
MBD 129 through desk mounting kit	70-077-02
MBB 100 VersaTools back of the rack mounting kit	70-367-01
MBU 123 VersaTools under-desk mounting kit	70-212-01
EPS 1210 (12 V, 1A power supply)	70-055-01
RG6 BNC series cables (various lengths)	26-383- <i>nn</i>

