Extron® Electronics
INTERFACING, SWITCHING AND DISTRIBUTION

# User's Manual

# *DDS 100*

## Digital Display Scaler

68-457-01
Printed in USA

# 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.

### 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.

## 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.

**Conserver 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 présentés 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.

### Avertissement

**Alimentations** • 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 la 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'll y a remplacment incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un ype equivalent recommande par le constructeur. Mettre au reut les batteries usagees conformement aux instructions du fabricant.

## Sicherheitsanleitungen • Deutsch

**Dieses Symbol soll den Benutzer auf wichtige Anleitungen zur Bedienung und Wartung (Instandhaltung) in der Dokumentation hinweisen, die im Lieferumfang dieses Gerätes enthalten ist.**

**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 Sicherheitsanleitungen sollten aufbewahrt werden, damit Sie später 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.

### 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 Stift oder Kontakt ist für einen Erdschluß, und stellt eine Sicherheitsfunktion dar und sollte nicht umgangen oder außer Betrieb gesetzt werden.

**Stromunterbrechung** • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabeln aus der Rückseite des Gerätes oder aus dem Desktop-Strommodul (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 dagegengestellt werden können.

**Wartung** • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Im Inneren des Gerätes sind keine Teile enthalten, die vom Benutzer gewartet werden können. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst zu warten, da beim Öffnen oder Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags 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.

**Litium-Batterie** • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie nur durch diegleiche oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgung der verbrauchten Batterien bitte gemäß den Herstelleranweisungen.

## 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.**

### Precaucion

**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 especificamente recomendados por el fabricante, ya que podrian implicar riesgos.

### 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 puentearia ni eliminaria.

**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 sobrecalientamiento 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.

# Quick Start — DDS 100

## Installation

### *Step 1*

Install the four rubber feet on the bottom of the DDS 100 digital display scaler *(1A)*, or mount the scaler in a rack *(1B)*.

### *Step 2*

Turn off power to the input and output devices, and remove the power cords from them.

### *Step 3*

Attach the scaler to the input device, and attach the output device to the scaler *(3A)*. It does not matter which set of input connectors you use.

Input options *(3B)* are:

RGsB (connected to R, G, and B)

RGBS (connected to R, G, B, and H / HV)

RGBHV (connected to R, G, B, H / HV, and V).

Output options are the same as the input options plus VGA / XGA / SVGA / SXGA.

**Connect only one input device and one output device.**

### *Step 4*

Either attach a local monitor to the unused set of input connectors and set the 75Ω / Hi Z switch *(4)* to Hi Z, or attach BNC 75Ω termination adapters to the H / HV and V connectors of the unused set of input connectors and set the 75Ω / Hi Z switch to 75Ω.

### *Step 5*

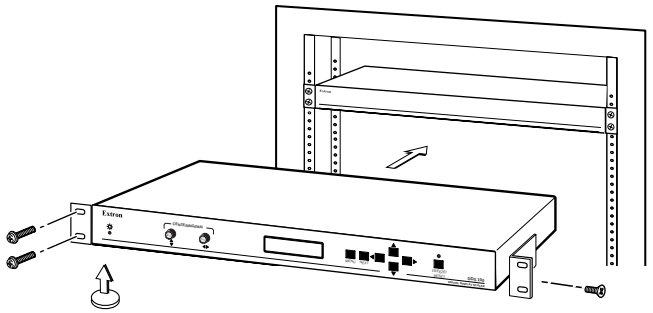
Set the sync selection switch *(5)* to the desired output sync format. The format must correspond to the output cables connected. (H = RGBHV, HV = RGBS, SOG = RGsB.)

### *Step 6*

Plug the scaler, input device, and output device into a grounded AC source, and turn on the input and output devices.

### *Step 7*

Use the LCD menu screens to configure the scaler (see the next page).

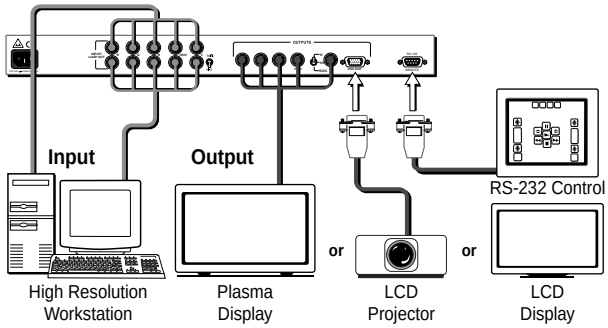


***1A*** Rubber Feet Bottom Side (4 Plcs)

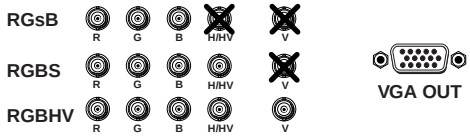
**or**

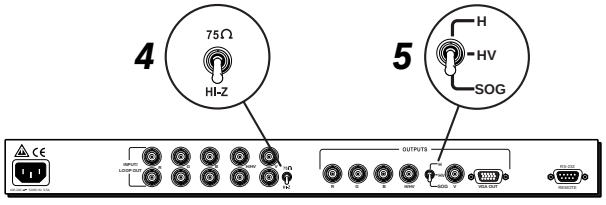
***1B*** Mounting Bracket Each Side with # 8 Screw (4 Plcs)

***3A***




***3B***



## Using the LCD Screen

The DDS 100's LCD screen informs you of status changes, and it provides access to menus that allow you to adjust the image and its parameters. The screen normally cycles through two default screens continuously. The first displays the DDS model, and the second displays the video input horizontal and vertical scan frequencies. If the video scan rate is out of range, the default cycle screens change to "Signal Out of Range" followed by the horizontal and vertical frequency screen.

The Menu button allows you to exit the default screens and advance from one menu to the next. The Next button allows you to step through the adjustment / selection screens within a menu. The front panel cursor buttons (Up, Down Left, and Right), and in some cases the centering / pan controls, can be used from the menu screens to make adjustments and select parameters. The menu sequence is:

Menu button: **Zoom/Size/Pan Controls**
- Next button: Zoom — Adjust the zoom view of the image.
- Next button: Size — Adjust the horizontal and vertical size of the image.
- Next button: Centering / pan — Center or pan the image.

Menu button: **Filter Controls**
- Next button: Horz. Filter — Select 1 of 4 filters. Select the filter that improves the image detail the most.
- Next button: Vertical filter — Select 1 of 10 filters. Select the filter that reduces the amount of image flicker the most.

Menu button: **Configuration Controls**

Next button: Output Res. — Select an output resolution:

| | | | |
|---|---|---|---|
| VGA | 680x480 | SVGA | 800x600 |
| MAC | 832x624 | PLASMA | 852x480 |
| XGA | 1024x768 | HDTV | 720p |
| PLASMA | 848x480 | PLSMA | 1280x768 |
| PLSMA | 1370x765 | | |

Next button: System Reset — Erase all user preset memory. (Resetting does not affect factory presets.)

Menu button: **Exit Menu**
- Menu button: Recycle through the zoom / size / pan controls menu.
- Next button: Display the default cycle screens.

## Front Panel Controls

**Centering/pan controls** — Shifts the physical position of the displayed image vertically and horizontally if the default cycle or the centering / pan screen is active.

**Freeze/reset** — Locks the output display to the current image if the default cycle is active. When the freeze function is active, the freeze LED is lit. To freeze the image, press the Freeze / reset button once. To unfreeze the image, press the Freeze / reset button again.

If the zoom, size, or centering / pan screen is active, pressing the Freeze / reset button resets adjustments for all three of the screens.

If the horizontal filter, vertical filter, or any output resolution screen is active, pressing the Freeze / reset button resets the setting of only the active screen.

**Executive mode** — Makes the LCD menus unavailable. This is useful for situations in which many end users operate the scaler and you want to prevent them from changing the adjustments you have made. To enable executive mode, press the Up and Down cursor buttons simultaneously. To disable executive mode, press the Up and Down buttons simultaneously again.

When executive mode is enabled, the centering / pan controls and the RS-232 port remain active.

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# Chapter One

## Introduction

About This Manual

About the Scaler

Features

# Introduction

## About This Manual

This manual contains installation, configuration, and operating information for Extron's DDS 100 digital display scaler.

This chapter describes the scaler's features. Chapter 2 describes how to install the scaler. Chapter 3 describes how to operate the scaler's features. Chapter 4 describes RS-232 programming for the scaler. Chapter 5 describes the control software for Windows, which the scaler uses. Chapter 6 provides troubleshooting information. Appendix A lists the scaler's specifications. Appendix B describes how to perform updates and repairs, lists the part numbers associated with the cables, and provides a glossary of terms.

## About the Scaler

The DDS 100 digital display scaler converts high-resolution input signals to one of several output resolutions. The scaler was designed especially for displaying images on projectors with limited display resolutions, such as LCD (liquid-crystal display) projectors, DLP (digital light processor) projectors, and plasma projectors.

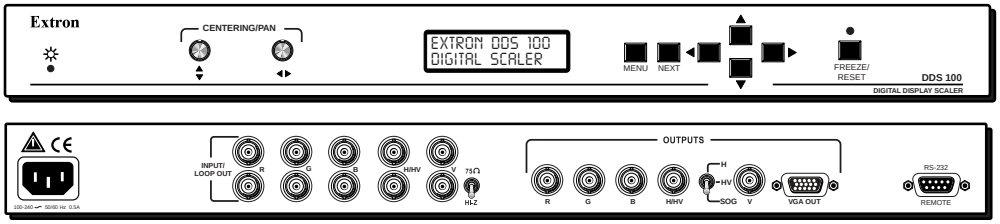



***Figure 1 — DDS 100 digital display scaler***

## Features

- **Autoscanning —** Automatically recognizes and converts the incoming computer image, up to 1600 x 1280 resolution, 100 kHz horizontal and 120 Hz vertical scan rates.
- **Executive mode —** Locks out all menu functions. When executive mode is active, the centering controls and the RS-232 port are still active.
- **Freeze —** Locks the output display to the current image. When the freeze function is active, the freeze LED (light-emitting diode) is lit.
- **High-quality color sampling —** Uses 24-bit sampling and provides 8 bits per color, for a total of 16.8 million colors.
- **High-quality zoom control —** Uses increased pixel clocking for variable zoom, providing better quality of the displayed image.
- **Horizontal and vertical controls —** Provides controls for sizing and centering the image. This provides increased flexibility for panning across the image while zooming.
- **Horizontal and vertical filtering —** Provides four levels of horizontal filter control and ten levels of vertical filter control. These user-selectable filtering controls reduce flicker and ensure that no picture detail is dropped during scaling.

- **Input —** Includes BNC inputs for RGsB (sync on green), RGBS (composite sync) and RGBHV. Also includes a second set of connectors for attaching a local monitor.
- **LCD menu display —** Provides access to several menus that control the image display.
- **Memory presets —** Uses 130 memory locations to store presets that include size, zoom, pan, centering, and filter control settings for various scan rates. The user can specify 30 of these presets, and the remainder were set at the factory. The DDS 100 digital display scaler automatically loads the control settings from the preset associated with the scan rate of the input video signal.
- **Output —** Outputs video as RGsB, RGBS, or RGBHV. BNC connectors and a 15-pin HD connector are provided, although only one output format can be used at any one time.
- **Output resolutions —** Supports the following output resolutions:
    - 640 x 480 (VGA)
    - 800 x 600 (SVGA)
    - 832 x 624 (Macintosh)
    - 852 x 480 (plasma)
    - 1024 x 768 (XGA)
    - 720p (HDTV)
    - 848 x 480 (plasma)
    - 1280 x 768 (plasma)
    - 1360 x 765 (plasma).
- **Power supply —** Includes an internal, 100-240 VAC, 50/60 Hz, auto-switchable power supply.
- **RS-232 control —** Provides control for third-party remote control of features and functions that can be programmed by using Extron's SIS™ (Simple Instruction Set™) or Extron's control software for Windows®.

# Chapter Two

## Installation

Front and Rear Panels

Setting Configuration Switches

Installation Overview

# Installation

## Front and Rear Panels

### Front panel features

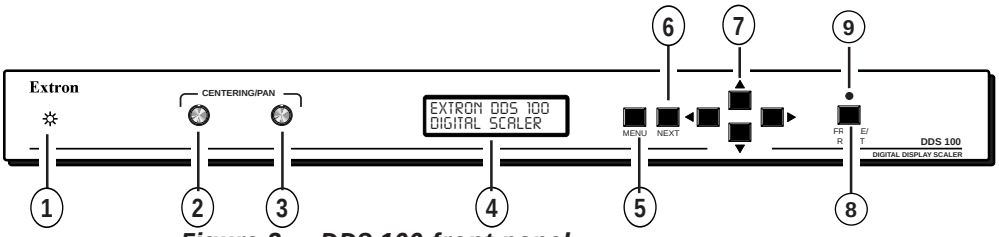



*Figure 2 — DDS 100 front panel*

1. **Power indicator LED —** Lights to indicate that the scaler is receiving power.
2. **Vertical centering/pan control —** Allows you to pan or center the image vertically. See "Adjusting an image" on page 3-5 for more information.
3. **Horizontal centering/pan control —** Allows you to pan or center the image horizontally. See "Adjusting an image" on page 3-5 for more information.
4. **LCD —** Displays status information and menu screens. See "Navigating the Menu Screens" on page 3-3 for more information.
5. **Menu button —** Steps through the LCD menus. See "Using the Menu and Next buttons" on page 3-3 for more information.
6. **Next button —** Steps through LCD screens within a menu. See "Using the Menu and Next buttons" on page 3-3 for more information.
7. **Cursor buttons —** Allow you to adjust the image and select video parameters. See "Adjusting an image" on page 3-5 for more information.
8. **Freeze/reset button —** Freezes / unfreezes the displayed image, or resets the zoom and size values. See "Adjusting an image" on page 3-5.
9. **Freeze LED —** Lights to indicate the that the freeze feature is active.

## Rear panel features

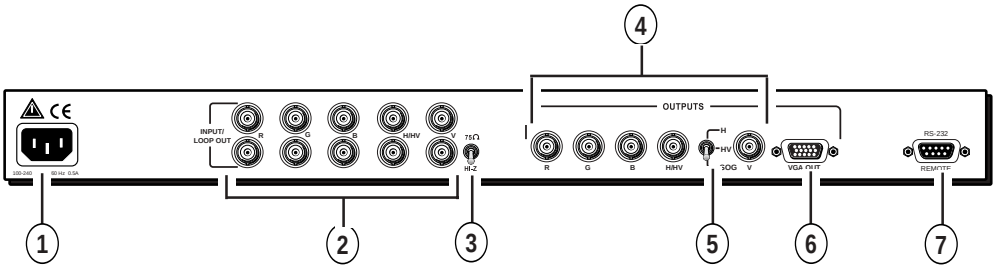



*Figure 3 — DDS 100 rear panel*

(1) **AC power connector —** Standard AC power connector attaches the scaler to any power source from 100VAC to 240VAC, operating at 50 Hz or 60 Hz.

(2) **Input connectors —** BNC female connectors for RGsB (sync on green), RGBS (composite sync), or RGBHV input. One set of connectors is used for the input device, and one set is available for a local monitor, if desired.

**NOTE** *You must set the 75Ω/Hi-Z switch to correspond to the presence or absence of a local monitor. See item (3) below.*

(3) **75Ω/Hi-Z switch —** Provides termination for computer video input. Set the switch to **75Ω** if no local monitor is attached to the scaler, and install two BNC 75-ohm termination adapters, one on the H / HV input BNC connector, and one on the V input BNC connector, of the unused set of input BNC connectors. Set the switch to **Hi-Z** if a local monitor is attached.

(4) **Output connectors —** BNC female connectors for RGsB (sync on green), RGBS (composite sync), or RGBHV output.

(5) **Sync selection switch —** Allows you to choose how the sync output signals will be routed:

**H —** If the switch is set to **H**, the scaler outputs separate horizontal and vertical sync signals; only horizontal sync is routed through the H / HV output connector.

**HV —** If the switch is set to **H/V**, the scaler outputs a composite sync signal (H and V combined) on the H / HV output connector.

**SOG —** If the switch is set to **SOG** (sync on green), the scaler outputs a composite sync signal on the green video signal via the G output connector.

(6) **VGA output connector —** 15-pin HD female VGA connector for the output projector.

**NOTE** *You can connect only one output device. Do not connect two output devices, or the scaler will be double-terminated.*

(7) **RS-232 connector —** 9-pin D female connector that allows you to attach a computer or controlling device for remote control of the DDS 100.

## Setting Configuration Switches

The DDS 100 includes two toggle switches on the back panel.

The two-position switch allows you to select 75Ω or Hi-Z termination.


Set the switch to the top position, labeled **75Ω**, if no local monitor is attached to the scaler. Set the switch to the bottom position, labeled **Hi-Z**, if a local monitor is attached.

The three-position switch allows you to select between RGBHV (separate horizontal and vertical sync), RGBS (composite sync), and RGsB (sync on green).


Set the toggle switch to the top position, labeled **H**, for RGBHV output. Set the switch to the middle position, labeled **HV**, for RGBS output. Set it to the bottom position, labeled **SOG**, for RGsB output.

## Installation Overview

To install the DDS 100 for basic operation, follow these general steps:

1. If desired, mount the scaler in a rack (see "Mounting the scaler" below). Otherwise, install the rubber feet (see "Installing the rubber feet" on page 2-5).
2. Turn off power to the input and output devices, and unplug the power cables from them.
3. Attach the scaler to the input device, and attach the output device to the scaler. See "Cabling" on page 2-6.
4. Set up the configuration switches. See "Setting configuration switches" above for details.
5. Plug the scaler, input device, and output device into a grounded AC source.
6. Turn on the input and output devices.
7. Use the LCD menu screens to configure the scaler. See "Operation", chapter 3.
8. The image from the input device should appear on the output device. If it does not, double check steps 3 and 4 and make adjustments as needed.

### Mounting the scaler

The DDS 100 ships with four uninstalled rubber feet. If you are going to rack mount the unit, do so before cabling the unit, and do not install the rubber feet. If you are not rack mounting the scaler, skip to "Installing the rubber feet" on page 2-5.

To rack mount the scaler, do the following:

1. Attach the mounting brackets (supplied with the scaler) on either side of the scaler, as shown in figure 4. Use four screws per mounting bracket.

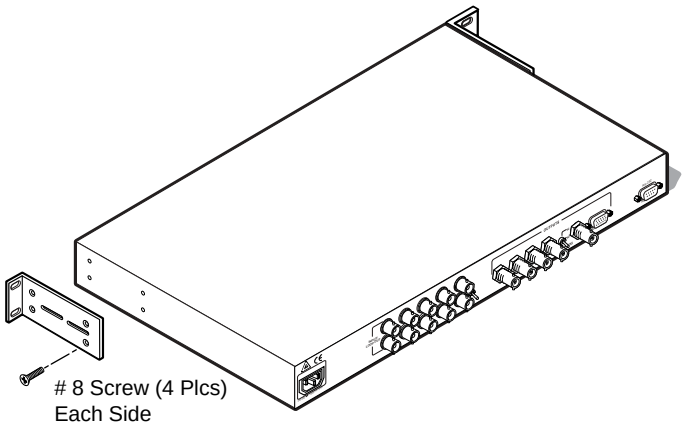



***Figure 4 — Installing mounting brackets***

2. Using two screws per mounting bracket, attach the scaler to the rack as shown in figure 5.

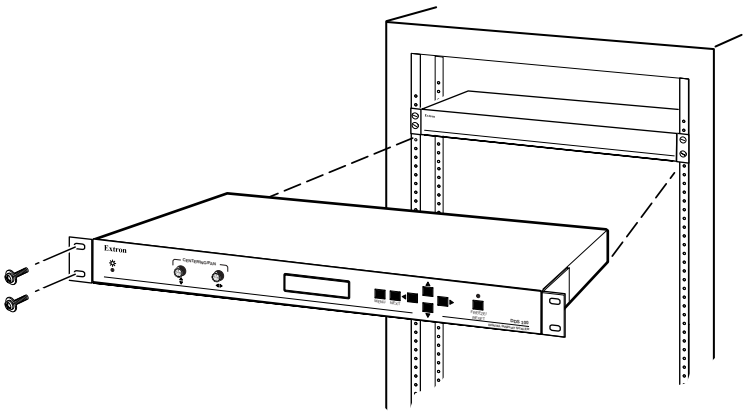


***Figure 5 — Mounting the scaler***

## Installing the rubber feet

The DDS 100 ships with four uninstalled rubber feet. Install the rubber feet only if you are not rack mounting the scaler. To install the rubber feet, do the following:

1. Turn the DDS 100 upside down and place it on a flat surface.
2. Remove the protective backing from a rubber foot.

3. Place the rubber foot on one corner of the scaler as shown in figure 6, and press it into place.

**NOTE** *Position each rubber foot carefully before pressing it into place. It is difficult to move a foot after it is in place.*

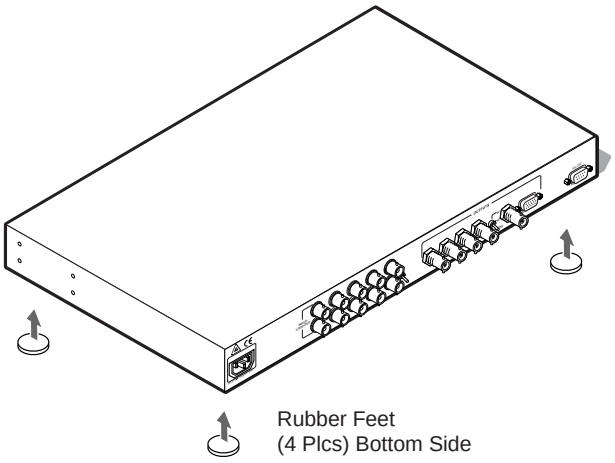



***Figure 6 — Installing the rubber feet***

4. Repeat steps 2 and 3 to install a rubber foot on each of the remaining corners of the scaler.
5. Turn the DDS 100 right side up and place it in the desired installation location.

## Cabling

The scaler can connect to an input device, such as an interface that is attached to a high-resolution workstation, and to an output device, such as an LCD projector, LCD display, or plasma display. Refer to figure 7 as you connect the devices.

Use the following information when attaching both input and output cables to the scaler.

**RGsB** — If coax cables are connected and terminated (75 ohms) to the red, green, and blue channels only, the format will be sync on green.


**RGBS** — If coax cables are connected and terminated (75 ohms) to the R, G, B, and H / HV (composite sync) channels, the format will be composite sync.


**RGBHV** — If coax cables are connected and terminated (75 ohms) to the R, G, B, H / HV, and V channels, the format is separate horizontal and vertical sync.

1. Use BNC connectors to connect the input device to the input / loop out connectors. It does not matter whether you use the top or bottom row of connectors.

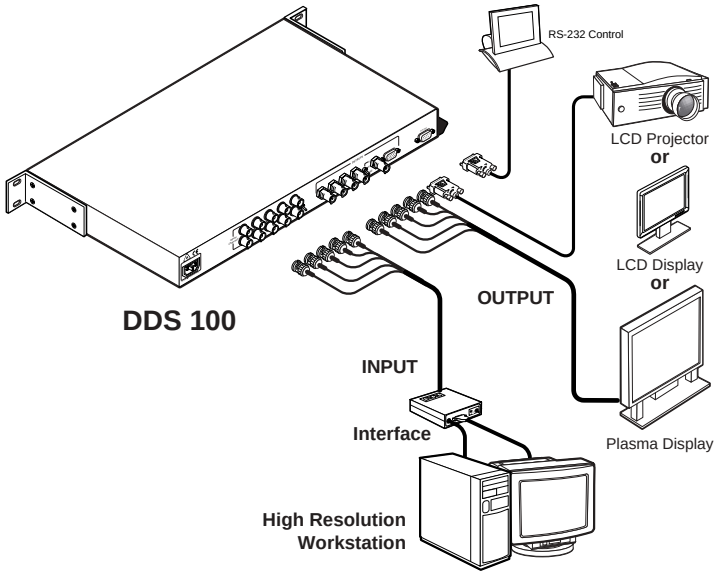



***Figure 7 — Connecting the scaler***

**NOTE** *If there is no video input, no video output appears through the output device.*

2. If desired, attach a local monitor to the remaining row of input BNC connectors.

**NOTE** *If a local monitor is attached, set the 75Ω/Hi-Z switch to **Hi-Z**. If a local monitor is not attached, set the 75Ω/Hi-Z switch to **75Ω**, and install two BNC 75-ohm termination adapters, one on the H/HV input BNC connector, and one on the V input BNC connector, of the unused set of input BNC connectors. See item (3) on page 2-3 for more information.*

3. Use BNC connectors or a 15-pin HD VGA / XGA / SVGA / SXGA connector to connect the scaler to the output device.

**NOTE** *You can connect only one output device. Do not connect two output devices, or the scaler will be double-terminated.*

**NOTE** *You must set the three-position sync selection switch to match the cabled sync format. See item (5) on page 2-3 for more information.*

3

# Chapter Three

## Operation

Navigating the Default Cycle Screens

Navigating the Menu Screens

Preset Memory

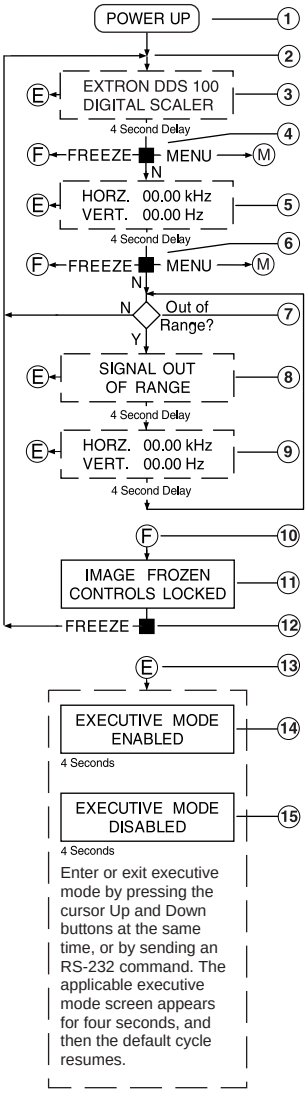
Serial Communication

# Operation

The front panel includes an LCD menu screen that displays the current status of the DDS 100 and the scan rate of the current video input signal. You can also use it to control the image display.

## Navigating the Default Cycle Screens

The figure below shows the flow chart for the DDS 100's LCD default cycle. Each rectangular box represents an LCD screen. Dashed lines indicate a screen that can be replaced temporarily by another screen.




**1** Entry point into the flow chart from power up.

**2** Path into the model identification screen.

**3** Model identification screen, which is displayed for four seconds.

**4** Three possible paths from the model identification screen:

1. If no button is pressed, the path is through black box N (no button).
2. If the Freeze button is pressed, the path is through (F) (see (F) on the next page).
3. If the Menu button is pressed, the path is through (M) (see (M) on the next page).

**5** Horizontal / vertical frequency screen, which is displayed for four seconds, shows the horizontal and vertical scan rates of the input signal.

**6** Three possible paths from the horizontal / vertical frequency screen:

1. If no button is pressed, the path is through black box N (no button).
2. If the Freeze button is pressed, the path is through (F) (see (F) on the next page).
3. If the Menu button is pressed, the path is through (M) (see (M) on the next page).

**7** Input scan rate out of range decision box:
N = No. Loops back to the model identification screen ((2), (3)).
Y = Yes. Goes to the signal out of range screen ((8)).

**8** Signal out of range screen, which is displayed for four seconds.

**9** Horizontal / vertical frequency of the out-of-range signal, which is displayed for four seconds and then loops back to (7).

**10** Entry into path (F). The Freeze button was pressed, or the RS-232 freeze command was issued.

**11** Image frozen / controls locked screen.

(12) The Freeze button was pressed. The image frozen / controls locked screen disappears, and the frozen image is released.

(13) Entry into path (E). The cursor Up and Down buttons were pressed together, or the executive mode RS-232 command was issued.

(14) Executive mode enabled screen, which appears for four seconds and then loops back to the default cycle.

(15) Executive mode disabled screen, which appears for four seconds and then loops back to the default cycle.

(E) Path to the executive mode screens.

(F) Path to the image frozen / controls locked screen.

(M) Path to the zoom / size / pan controls menu screens.

**NOTE** *If the signal is out of range, or if there is no video input, there is no video output through the output device.*

# Navigating the Menu Screens

## Using the Menu and Next buttons

Figure 8, on the next page, shows the DDS 100 flow chart. The default cycle, zoom, size, and centering / pan screen boxes have dashed lines to indicate that there are alternate screens for executive mode and for minimum / maximum values exceeded.

When the Next button is used to step through menu screens, an alternate screen might be displayed, depending on previous adjustments or selections. For example, if the zoom screen adjustment exceeds the minimum or maximum limit, the applicable alternate zoom screen is displayed. The zoom is left in that state. The next time the zoom screen is entered, the applicable alternate zoom screen is displayed again.

**NOTE** *You cannot enter any menu screens if the input signal is out of range. You can enter the menu screens if there is no input signal.*

- To enter the zoom / size / pan controls menu from the default cycle ((1), (2)), press and release the Menu button on the front panel.
- To step through the menu screens ((3), (4), (5), (6)) and loop back to the zoom / size / pan controls menu entry screen, press and release the Menu button repeatedly.
- To return to the default cycle screens, press and release the Next button from the exit menu ((7)). Or, wait eight seconds without pressing any buttons from any menu screen; a time-out will occur, and the default cycle screens will appear.
- To step through the menu screens ((3), (8), (9)) and loop back to the menu entry screen ((10)), press and release the Next button from within a menu screen.
- To exit to the next menu entry screen from within any menu, press and release the Menu button.

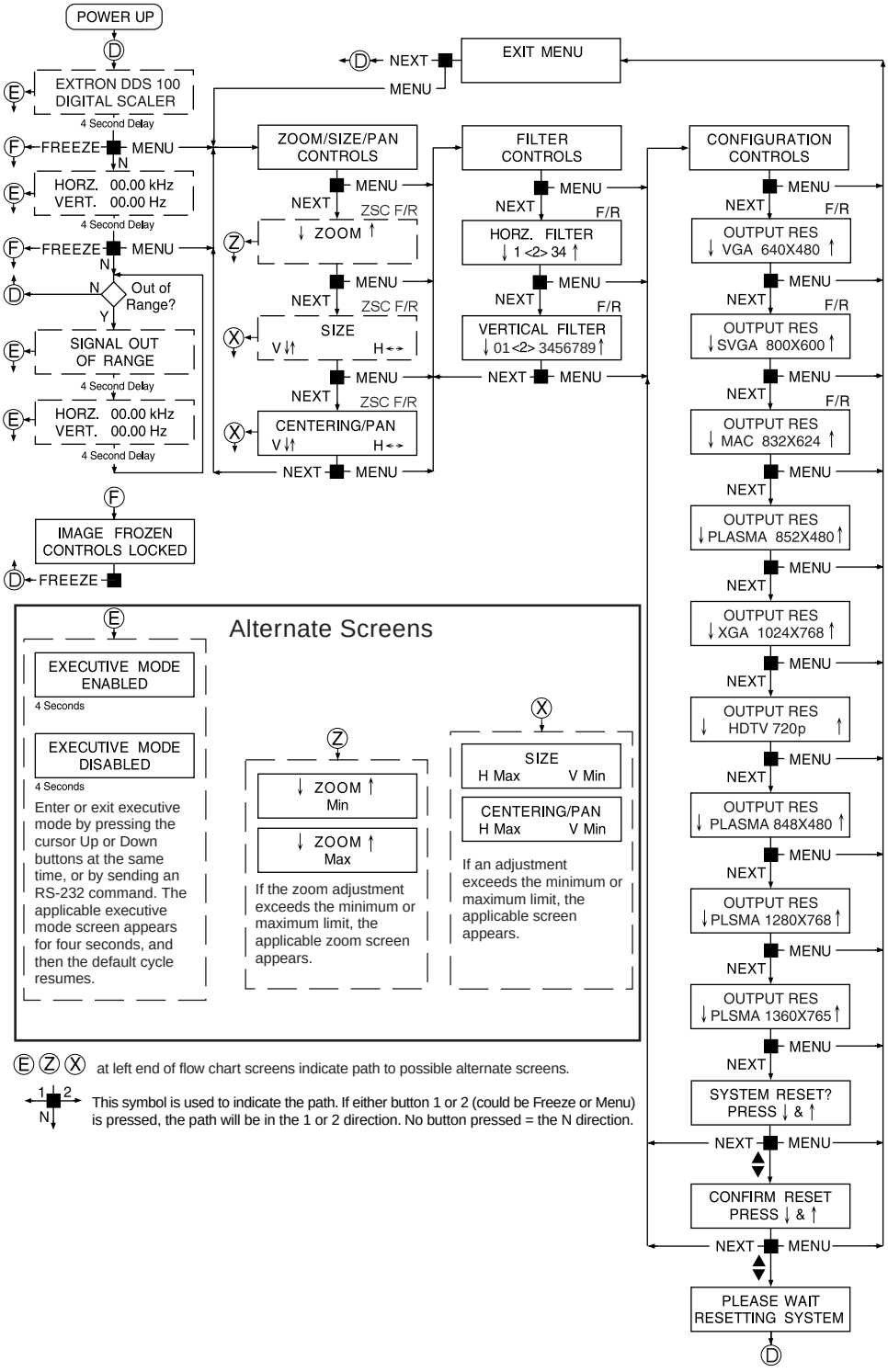



***Figure 8 — DDS 100 flow chart***

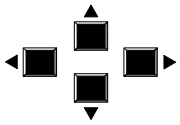
- To reset adjustments made from within the zoom / size / pan menus, press and release the Freeze / reset button from with any zoom / size / pan menu.

• To reset the selection or adjustment from a menu screen on which *F/R* appears above the upper right corner of the flow chart box, press and release the Freeze/reset button while that screen is displayed. In the zoom, size, and centering/pan menus, pressing the Freeze/reset button resets the adjustments for all three of those screens, as indicated by *ZSC F/R* in the flow chart.

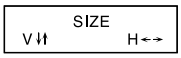
## Adjusting an image

The LCD menus and front panel controls allow you to make adjustments to the displayed image. This section describes the adjustments.

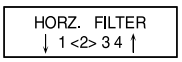
You can press the front panel cursor buttons (Up, Down, Left, and Right) to make adjustments or selections from the menu screens. The menu screens display arrows to indicate the cursor buttons that apply to that adjustment or selection.



For example, the size screen indicates that the Up and Down buttons increase or decrease the vertical (V) size, and the Left and Right buttons decrease and increase the horizontal (H) size.




The horizontal filter screen indicates that you can press the Up and Down buttons to change the filter selection. The current selection appears in brackets.




You can press the cursor buttons in the default cycle to center the displayed scaler output image.

### Zoom/size/pan controls menu

**Zoom —** Changes the image between near and far views. Press the Up cursor button to zoom in, or press the Down button to zoom out.

**Size —** Increases or decreases the dimensions of the displayed image vertically and horizontally. Press the Up cursor button to increase the vertical size of the image, or press the Down button to decrease the vertical size. Press the Left cursor button to decrease the horizontal size of the image, or press the Right button to increase the horizontal size.

**Centering/pan —** Shifts the physical position of the displayed image vertically and horizontally. Press the Up cursor button to pan up the image, or press the Down button to pan down. Press the Left cursor button to shift the image to the left, or press the Right button to shift the image to the right.

### Filter controls menu

**Horizontal filter —** Applies one of four available filters to improve the detail of the image. Press the Up or Down cursor buttons to move through the filters. Choose the filter that provides the most improvement to the image detail.

**Vertical filter —** Applies one of ten available filters to decrease flicker in the image. Press the Up or Down cursor buttons to move through the filters. Choose the filter that provides the greatest reduction of flicker while maintaining image sharpness.

### Configuration controls menu

**Output resolutions —** Specifies the resolution used by the output device. Press the Up or Down cursor buttons to move through the resolutions. The available resolutions and their characteristics are shown in the table below.

**Scaled output resolutions**

| | 640x480 VGA | 800x600 SVGA | 832x624 Mac | 852x480 Plasma | 1024x768 XGA | 480p HDTV | 720p HDTV | 848x480 Plasma | 1280x768 Plasma | 1360x765 Plasma |
|---|---|---|---|---|---|---|---|---|---|---|
| Pixel clock (MHz) | 25.18 | 40 | 57.3 | 33.28 | 65 | TBD | 74.25 | 33.75 | 76.15 | 85.5 |
| Horizontal rate (kHz) | 31.475 | 37.879 | 49.740 | 31.816 | 48.363 | TBD | 45.000 | 31.020 | 45.104 | 47.712 |
| Vertical rate (Hz) | 59.95 | 60.32 | 74.57 | 60.14 | 60.00 | TBD | 60.00 | 60.00 | 56.25 | 60.015 |

**System reset —** Erases all user preset memory. This has no effect on the factory preset memory. Press the Up and Down cursor buttons simultaneously to reset the system, and the confirm reset screen appears. Or, press the Next cursor button to cancel the system reset.

**Confirm reset —** Allows you to confirm that you want to erase all user preset memory. Press the Up and Down cursor buttons simultaneously to reset the system, or press the Next button to cancel the system reset. If you press the Up and Down buttons, the user preset memory is erased.

### Front panel controls

**Centering/pan controls —** Shifts the physical position of the displayed image vertically and horizontally if the default cycle or the centering / pan screen is active.


**Freeze/reset —** Locks the output display to the current image if the default cycle is active. When the freeze function is active, the freeze LED is lit. To freeze the image, press the Freeze / reset button once. To unfreeze the image, press the Freeze / reset button again.

If the zoom, size, or centering / pan screen is active, pressing the Freeze / reset button resets adjustments for all three of the screens.

If the horizontal filter, vertical filter, or any output resolution screen is active, pressing the Freeze / reset button resets the setting for only the active screen.

**Executive mode —** Makes the LCD menus unavailable. This is useful for situations in which many end users operate the scaler, and you want to prevent them from changing the adjustments you have made. To enable executive mode, press the Up and Down cursor buttons simultaneously. To disable executive mode, press the Up and Down buttons simultaneously again.

When executive mode is enabled, the centering / pan controls and the RS-232 port remain active.

## Preset Memory

The DDS 100 preset memory contains 130 locations that store scan rates and associated size, zoom, pan, centering, and filter controls. The 30 user presets can be changed or erased. The remaining locations are factory-loaded, permanent presets that cannot be changed or erased.

When a video input is connected, the scaler automatically scans the user presets and then, if necessary, the factory presets, looking for a match to the input scan rate. If a match is found, the stored settings become the active settings. If no match is found, a user preset is created automatically using the default settings. If the user preset memory is full, the new user preset overwrites the oldest user preset.

If a user preset is active and changes are made to the zoom, size, pan, or filter controls, the changed settings are stored automatically in the preset memory for the active scan rate. If a factory preset is used and changes are made to the zoom, size, pan, or filter controls, a new user preset that includes the new settings is created.

**NOTE** *Preset memory does not include selections from the configuration controls menu. The scaler uses only the most recently applied configuration controls selections.*

## Serial Communication

The DDS 100 RS-232 connector can be connected to the serial port output of a host device such as a computer or control panel. This connection makes software control of the scaler possible. Figure 9 shows a DDS 100 RS-232 connection to a host serial port connector.

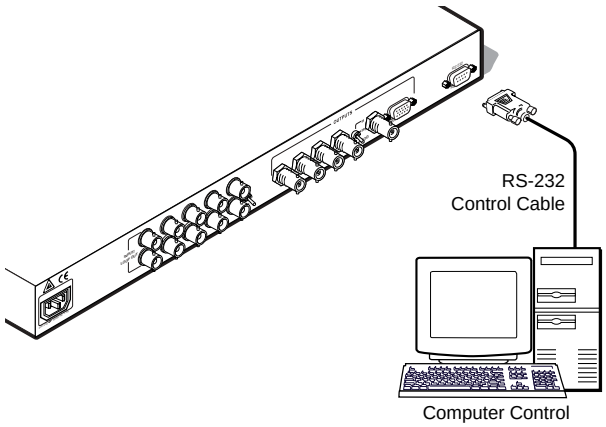



***Figure 9 — DDS 100 scaler RS-232 to host connection***

***Continued on the next page***

The RS-232 connector on the DDS 100 is a 9-pin D female with the following pin assignments:

| Pin | RS-232 | Description |
|---|---|---|
| 1 | — | Not used |
| 2 | Tx | Transmit data |
| 3 | Rx | Receive data |
| 4 | — | Not used |
| 5 | Gnd | Signal ground |
| 6 | — | Not used |
| 7 | — | Not used |
| 8 | — | Not used |
| 9 | — | Not used |

The protocol is 9600 baud, 8-bit, 1 stop bit, no parity, and no flow control.

You can control the DDS 100 directly in one of two ways:

- From a host system connected to the RS-232 port. See chapter 4, "RS-232 Programmer's Guide".
- Using Extron's control software for Microsoft® Windows®. See chapter 5, "Control Software for Windows".

DDS 100

# Chapter Four

## RS-232 Programmer's Guide

Host to DDS Communications

## Host to DDS Communications

The DDS 100 accepts SIS™ (Simple Instruction Set™) commands through the RS-232 port. SIS commands consist of one or more characters per command field. They do not require any special characters to begin or end the command character sequence. Each scaler response to an SIS command ends with a carriage return and a line feed (CR / LF = ↵), which signals the end of the response character string. (A string is one or more characters.)

### DDS-initiated messages

When a local event occurs, such as a front panel operation, the DDS 100 responds by sending a message to the host. The DDS-initiated messages are listed below (underlined).

(C) COPYRIGHT 1999, EXTRON ELECTRONICS, DDS 100, Vx.xx ↵

The copyright message is initiated by the DDS 100 when it is first powered on. Vx.xx is the firmware version number.

RECONFIG ↵

The Reconfig message is initiated by the DDS 100 when the resolution of the input signal is changed and when exiting the front panel LCD menus, which indicates that there may have been a change to the adjustments or parameters.

The scaler does not expect a response from the host but, for example, the host program might want to request a new status.

### DDS error response

When the DDS 100 receives an SIS command and determines that it is valid, it performs the command and sends a response back to the host device. If the DDS 100 is unable to perform the command because the command is invalid or contains invalid parameters, the DDS 100 returns an error response to the host. The error response codes are:

E09 — Invalid function number (too large)
E10 — Invalid command
E13 — Invalid value (out of range)

### Using the command/response table

The command / response table is shown on the following page. Lower case characters are acceptable in the command field only where indicated. Symbols are used throughout the table to represent variables in the command / response fields. Symbol definitions are shown at the beginning of the table, as is an ASCII-to-hexadecimal (HEX) conversion table. Command and response examples are shown throughout the table.

## Command/response table

| ASCII to HEX Conversion Table | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2Ø | ! | 21 | " | 22 | # | 23 | $ | 24 | % | 25 | & | 26 | ' | 27 | ( | 28 | ) | 29 | * | 2A | + | 2B | , | 2C | - | 2D | . | 2E | / | 2F |
| Ø | 3Ø | 1 | 31 | 2 | 32 | 3 | 33 | 4 | 34 | 5 | 35 | 6 | 36 | 7 | 37 | 8 | 38 | 9 | 39 | : | 3A | ; | 3B | < | 3C | = | 3D | > | 3E | ? | 3F |
| @ | 4Ø | A | 41 | B | 42 | C | 43 | D | 44 | E | 45 | F | 46 | G | 47 | H | 48 | I | 49 | J | 4A | K | 4B | L | 4C | M | 4D | N | 4E | O | 4F |
| P | 5Ø | Q | 51 | R | 52 | S | 53 | T | 54 | U | 55 | V | 56 | W | 57 | X | 58 | Y | 59 | Z | 5A | [ | 5B | \ | 5C | ] | 5D | ^ | 5E | _ | 5F |
| ` | 6Ø | a | 61 | b | 62 | c | 63 | d | 64 | e | 65 | f | 66 | g | 67 | h | 68 | i | 69 | j | 6A | k | 6B | l | 6C | m | 6D | n | 6E | o | 6F |
| p | 7Ø | q | 71 | r | 72 | s | 73 | t | 74 | u | 75 | v | 76 | w | 77 | x | 78 | y | 79 | z | 7A | { | 7B | \| | 7C | } | 7D | ~ | 7E | DEL | 7F |

Esc 1B CR ØD LF ØA

Symbol definitions: ↵ = CR/LF, • = space
[X1] = Horizontal filtering level, 1-4
[X2] = Vertical filtering level, 0-9
[X4] = Scaled output resolution = 3 = 640x480
4 = 800x600
5 = 832x624
6 = 852x480
7 = 1024x768
8 = 720p
9 = 848x480
10 = 1280x768
11 = 1360x765
[X5] = 1 = on, 0 = off
[X6] = xxx.xx Hrt = Horizontal rate = kHz,
Vrt = Vertical rate = Hz

| COMMAND | ASCII | RESPONSE | DESCRIPTION |
|---|---|---|---|
| **Horizontal Shift** | | | |
| Shift right | {H | Hph+ ↵ | Shift image right one step |
| Shift left | }H | Hph– ↵ | Shift image left one step |
| **Vertical Shift** | | | |
| Shift down | {/ | Vph+ ↵ | Shift image down one step |
| Shift up | }/ | Vph– ↵ | Shift image up one step |
| **Horizontal Size** | | | |
| Increase size | {: | Hsz+ ↵ | Increase horizontal size by one step |
| Decrease size | }: | Hsz– ↵ | Decrease horizontal size by one step |
| **Vertical Size** | | | |
| Increase size | {; | Vsz+ ↵ | Increase vertical size by one step |
| Decrease size | }; | Vsz– ↵ | Decrease vertical size by one step |
| **Zoom** | | | |
| Zoom in | {+ | Zom+ ↵ | Increase image size by one step |
| Zoom out | }+ | Zom– ↵ | Decrease image size by one step |
| **Horizontal Filter (Detail)** | | | |
| Specific value | [X1]D | Dhz[X1] ↵ | Select horizontal filter [X1] (Dhz) |
| Increment up | {D | Dhz[X1] ↵ | Select next higher horizontal filter (Dhz + 1) |
| Increment down | }D | Dhz[X1] ↵ | Select next lower horizontal filter (Dhz – 1) |
| **Vertical Filter (Detail)** | | | |
| Specific value | [X2]d | Dvt[X2] ↵ | Select vertical filter [X2] (Dvt) |
| Increment up | {d | Dvt[X2] ↵ | Select next higher vertical filter (Dvt + 1) |
| Increment down | }d | Dvt[X2] ↵ | Select next lower vertical filter (Dvt – 1) |
| **Scaler Rate** | | | |
| Set scaler rate | [X4]= | Rte[X4] ↵ | Set video scaled output resolution |
| **Freeze** | | | |
| Enable | F | Frz1 ↵ | Set freeze mode to on (freeze current displayed image) |
| Disable | f | FrzØ ↵ | Set freeze mode to off |
| **Executive Mode** | | | |
| Enable | X | Exe1 ↵ | Set executive mode to on |
| Disable | x | ExeØ ↵ | Set executive mode to off |

***Continued on next page***

| COMMAND | ASCII | RESPONSE | DESCRIPTION |
|---|---|---|---|
| **Query software version** | | | |
| | q | (Same as Q below) | |
| | Q | Verx.xx ↵ | Example response: Ver1.23 ↵ |
| **Request part number** | | | |
| | n | (Same as N below) | |
| | N | N6Ø-3Ø5-Ø1 ↵ | Display Extron part number |
| **Request information** | | | |
| | i | (Same as I below) | |
| | I | Dhz[X1] • Dvt[X2] • Rte[X4] • Frz[X5] • Exe[X5] • Hrt[X6] • Vrt[X6] ↵ | |

5

# Chapter Five

## Control Software for Windows

Installing the Software

Using the Software

# Control Software for Windows

The *VSC and DDS Control Program* (Extron part number (29-038-01), which is used by the DDS 100, is compatible with Windows 3.1, 3.11, 95/98, and above. It provides remote control of scaler settings.

## Installing the Software

The program is contained on a single 3.5-inch diskette, and it can run from the floppy drive. However, it is usually more convenient to load and run the program from the hard drive.

To install the software from the floppy disk onto the hard drive, run SETUP.EXE from the floppy disk, and follow the instructions that appear on the screen. The program occupies approximately 1 MB (megabyte) of hard-drive space.

By default, the Windows installation creates a C:\VSC200 directory, and it places two icons (VSC + DDS Control Pgm and VSC + DDS Help) into a group or folder named “Extron Electronics”.

## Using the Software

1. To run the VSC and DDS Control Program, double-click on the VSC + DDS Control Pgm icon in the Extron Electronics group or folder.

   VSC + DDS Control Pgm

   The Comm menu appears on the screen.

2. Click on the comm port that is connected to the DDS 100 RS-232 port.

   The Extron VSC and DDS Control Program window appears. It displays the current settings and the detected input scan rate.

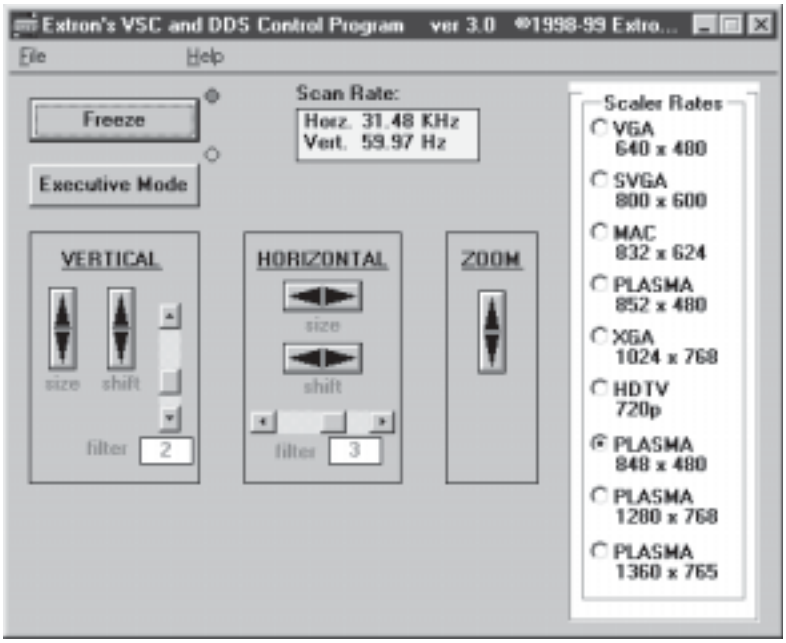



***Figure 10 — VSC and DDS Control Program window***

3. Using normal Windows controls, you can perform the same adjustments as from the front panel.

For information about program features, you can access the help program in any of the following ways:

- From the Extron Electronics program folder or group, double-click on the VSC + DDS Help icon.

VSC + DDS Help

- From within the VSC and DDS Control Program, click on the Help menu on the main screen.
- From within the VSC and DDS Control Program, press the F1 key.

## Control Software for Windows, cont'd

# Chapter Six

## Troubleshooting

Banding

Bending

Blooming

Wrap Around

# Troubleshooting

This section gives examples and descriptions for some problems you might encounter in using the DDS 100.

The “probable solutions” are listed for ease of implementation, as well as the order of probability. For example, it’s easier to flip a switch than it is to change cables, so you may want to try the switch first. It may be easier to check cables and other devices than to go through a lengthy convergence procedure, so you might check those components first. Also, if an adjustment procedure doesn’t solve the problem, it may make it more complex.

Following are some tips to help you in troubleshooting.

1. Some symptoms may resemble others, so you may want to look through all of the examples before attacking the problem.
2. Be prepared to backtrack in case the action taken doesn’t solve the problem.
3. It may help to keep notes and sketches in case the troubleshooting process gets lengthy. This will also give you something to discuss if you call for technical support.
4. Try simplifying the system by eliminating components that may have introduced the problem or made it more complicated.
5. For sync-related problems: Portable digital projectors are designed to operate close to the video source. Sync problems may result from using long cables or from improper termination. A sync adapter, such as Extron’s ASTA (active sync termination adapter), may help solve these problems.
6. For LCD and DLP projectors and plasma displays: In addition to the sync-related information above, check the user’s manual that came with the projector for troubleshooting tips, as well as for settings and adjustments. Each manufacturer may have its own terms, so look for terms such as “auto setup”, “auto sync”, “pixel phase”, and “tracking”.

# Banding

## Description

An overall decrease in intensity, with darker bars across the screen that begin in a light area, and bands of normal intensity that begin in a dark area. Because most of the image is darker, the normal bands appear brighter.


## Probable cause

The image has shifted too far to one side, and has been driven into the blanking area, causing the display to clamp its black level to the video signal instead of to the back porch.

## Possible solutions

Use the horizontal shift control to adjust the image toward the center of the screen. See “Adjusting an image” on page 3-5.

## Bending

### Description

The image hooks, bends, or tears toward the right side of the screen. This is noticeable on vertical lines near the top of the screen.


### Probable cause

This problem is related to sync. The display device is not locking onto the video as it comes out of the vertical blanking.

### Possible solutions

1. Use the vertical shift control to lower the position of the image. See "Adjusting an image" on page 3-5.
2. Use separate horizontal and vertical sync output.
3. Try using a sync termination adapter (ASTA).

## Blooming

### Description

The displayed image is bright and unfocused.


### Probable cause

The brightness level of the display is at or beyond the maximum level.

### Possible solutions

1. Make sure that the input to the display device is terminated properly (75 ohms).
2. Make sure the input to the DDS 100 is terminated properly (75 ohms).

## Wrap Around

### Description

The left side of the image appears at the right side of the screen, and the right side of the image appears on the left side of the screen.


### Probable cause

The sync timing and video information are locked, but are not in phase, or the display device may be locking in on the wrong edge of the sync.

### Possible solutions

Adjust the horizontal shift on either the DDS 100 or the display device.

# Appendix A

## Specifications

# Specifications

## Video input

| | |
|---|---|
| Number / signal type | 2 RGBHV, RGBS, RGsB |
| Connectors | 2 x 5 BNC female (5 for input, 5 for passive local monitor output) |
| Maximum level | Analog ..... 2.0V p-p with no offset |
| Impedance | 75 ohms or High Z (switch selectable) |
| Horizontal frequency | Autoscan 24 kHz to 100 kHz |
| Vertical frequency | Autoscan 50 Hz to 120 Hz |
| Resolution range | Autoscan 560 x 384 to 1600 x 1280 |

## Video processing

| | |
|---|---|
| Digital sampling | 24 bit, 8 bits per color; 80 MHz standard |
| Colors | 1.6 million |
| Horizontal filtering | 4 levels |
| Vertical filtering | 10 levels |

## Video output

| | |
|---|---|
| Number / signal type | 1 RGBHV, RGBS, RGsB |
| Connectors | 5 BNC female or 1 VGA-XGA 15-pin HD female |
| Minimum / maximum levels | 0.0V to 0.7V p-p |
| Impedance | 75 ohms |
| Scaled VGA resolution | 640x480, 480p, 800x600, 832x624, 848x480, 852x480, 1024x768, 720p, 1280x768, 1360x765 |

## Sync

| | |
|---|---|
| Input type | Autodetect RGBHV, RGBS, RGsB, RsGsBs |
| Output type | RGBHV, RGBS, RGsB |
| Input level | 1.5V to 5.0V p-p |
| Output level | 5.0V p-p |
| Input impedance | 75 ohms or High Z (switch-selectable) |
| Output impedance | 75 ohms |
| Polarity | Negative |

## Control/remote — scaler

| | |
|---|---|
| Serial control port | 1 RS-232, 9-pin female D connector |
| Baud rate and protocol | 9600, 8-bit, 1 stop bit, no parity |
| Serial control pin configurations | 2 = TX, 3 = RX, 5 = GND |
| Program control | Extron's control program for Windows®<br>Extron's Simple Instruction Set™ — SIS™ |

## General

| | |
|---|---|
| Power | 100VAC to 240VAC, 50 / 60 Hz, 40 watts, internal, auto-switchable |
| Temperature / humidity | Storage -40° to +158°F (-40° to +70°C) / 10% to 90%, non-condensing<br>Operating +32° to +122°F (0° to +50°C) / 10% to 90%, non-condensing |
| Rack mount | Yes, with included rack ears |
| Enclosure type | Metal |
| Enclosure dimensions | 1.75" H x 17.5" W x 9.4" D (1U high, full rack width)<br>4.4 cm H x 44.4 cm W x 23.9 cm D |
| Product weight | 5.6 lbs (2.5 kg) |
| Shipping weight | 9 lbs (4.1 kg) |
| Vibration | ISTA / NSTA 1A in carton (International Safe Transit Association) |

| | |
|---|---|
| Listings | UL, CUL |
| Compliances | CE, FCC Class A |
| MTBF | 30,000 hours |
| Warranty | 3 years parts and labor |

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

# Appendix B

## Reference Information

Updates and Repairs

Part Numbers

Glossary

# Reference Information

## Updates and Repairs

You can perform the following updates and repairs to the DDS 100 in the field:

- Installing a firmware update (see below).
- Replacing the AC fuse (see page B-4)

Before completing either of these procedures, follow the instructions in "Internal access", below.

### Internal access

Updates and fuse replacement require access to the internal areas of the DDS 100. To access the internal areas, do the following:

1. Remove the power cable from the DDS 100.

   *Do not open the cover of the DDS 100 without unplugging the power cord.*

2. If the DDS 100 is rack mounted, remove the input and output cables from it, remove the unit from the rack, and remove the rack mount brackets (see figure 12). (If the DDS 100 is not rack mounted, you do not need to remove the input and output cables.)

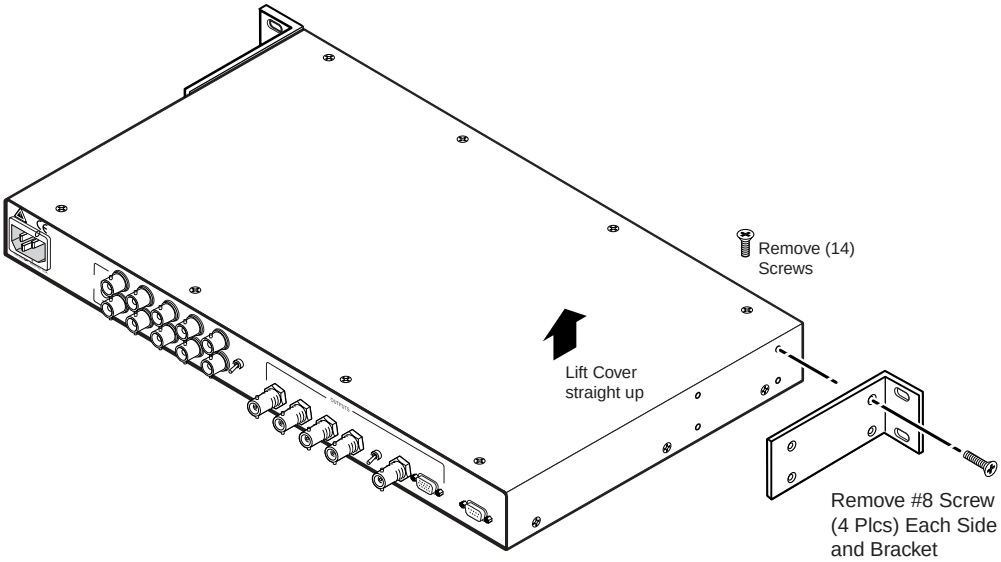



***Figure 12 — Removing the cover***

3. Remove 14 screws from the sides and top of the cover (figure 12).
4. Remove the cover by slightly lifting each side alternately until the cover is free.

Reverse this procedure to reinstall the cover.

### Installing a firmware update

**NOTE** *To install a firmware update, you may need to replace IC (integrated circuit) U41, U69, or U70, or any combination of these. Replacing these ICs may result in loss of presets and other settings.*

1. Remove the cover of the DDS 100. See “Internal access” on he previous page.

**WARNING** *Make sure you are electrically grounded before touching IC chips. Electrostatic discharge (ESD) can damage IC chips, even if you cannot feel, see, or hear the discharge.*

2. Locate the ICs to be replaced (see figure 13). The update kit will list the specific ICs.

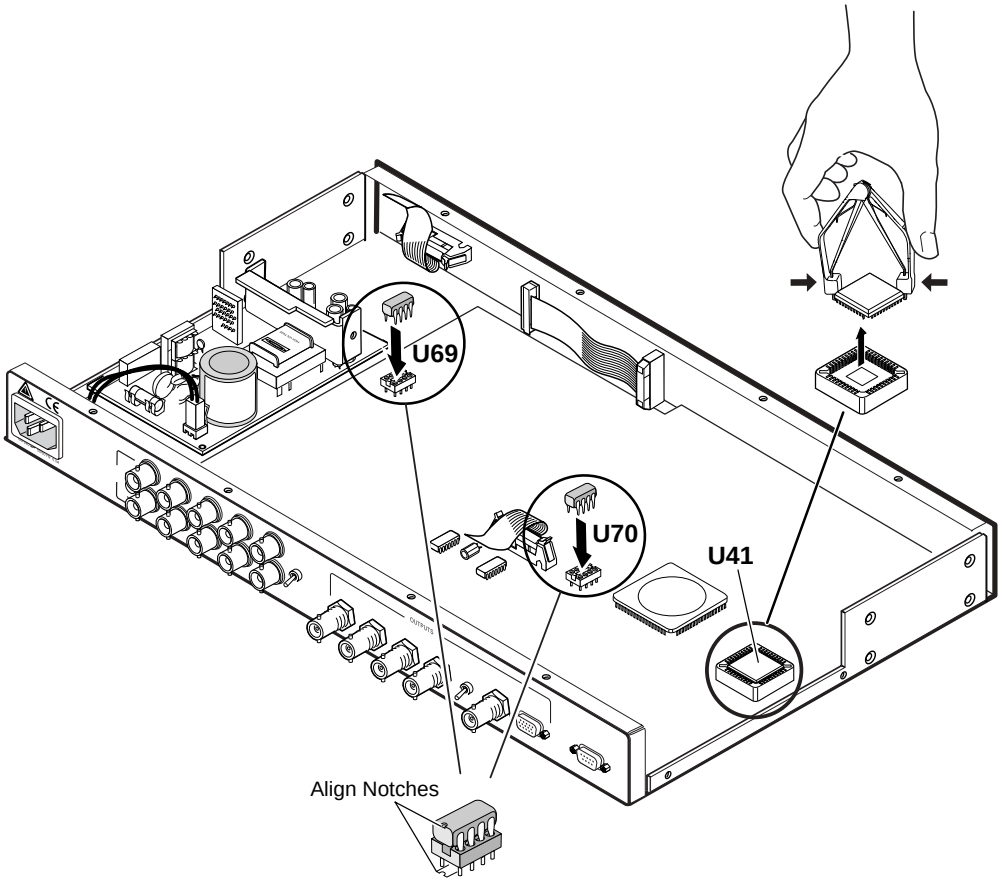



***Figure 13 — Locating and replacing ICs***

3. Remove the existing chip and set it aside.

   To remove IC U41, use the PLCC (plastic leadless chip carrier) IC puller to remove the old IC. Align the hooks on the puller with the slots provided in opposite corners of chip socket U41. Insert the hooks, squeeze gently, and pull the IC straight out of the socket.

   To remove IC U69 or U70, use a standard IC removal tool.

4. Install the new chip.

   To install IC U41, locate the angled corner of the new chip. Orient the corner to match the angled corner of the socket, and press the IC into place.

   To install IC U69 or U70, locate a notch or a printed dot on top of the IC. Align the notch or dot with the notch on the socket or circuit board. Align the IC pins with the holes in the socket, and gently press the IC into the socket.

5. Reinstall the cover of the DDS 100.
6. If rack mount brackets were removed earlier, reinstall them.
7. Attach the power cord to the DDS 100 and to the AC power source. Make sure the DDS is working correctly.
8. If the DDS 100 is rack mounted, remove the power cable from the unit, and reattach the rack mount brackets. Reattach the unit to the rack, and reconnect the power cord and input and output cables.

## Replacing the AC fuse

If the DDS 100 does not power on, and the AC power source is functioning correctly, the AC fuse may be blown. The fuse is located on the internal power supply.

**WARNING** *Replace the fuse only with a 5 x 20 mm, 2.5A/250V fast blow fuse.*

1. Remove the cover of the DDS 100. See "Internal access" on page B-2.
2. Locate the fuse on the power supply, and remove it from its retaining clips (see figure 14).

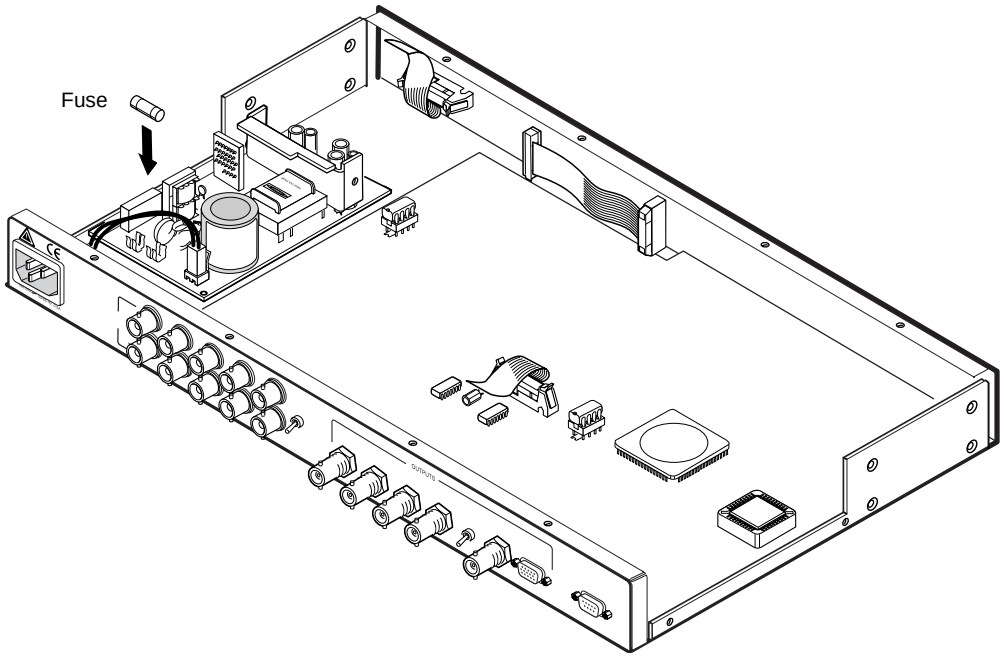



***Figure 14 — Replacing the fuse***

3. If test equipment is available, you can check the fuse's functionality.
4. Place a new fuse in the fuse retaining clips.
5. Reinstall the cover of the DDS 100.
6. If rack mount brackets were removed earlier, reinstall them.
7. Attach the power cord to the DDS 100 and to the AC power source. Make sure the DDS 100 is working correctly.

8. If the DDS 100 is rack mounted, remove the power cable from the unit, and reattach the rack mount brackets. Reattach the unit to the rack, and reconnect the power cord and input and output cables.

*If you choose to check the power before putting the cover back on, make sure that tools and hands are outside the DDS 100, and then connect the power cord to the unit and to an AC source. The unit should power up normally. Unplug the AC power cord, and follow steps 5 – 8 above.*

# Part Numbers

## DDS 100 part numbers

| Extron Part | Part # |
|---|---|
| DDS 100 | 60-305-01 |
| VSC and DDS Control Program | 29-038-01 |
| DDS 100 User's Manual | 68-457-01 |

## Related part numbers

| Extron Part | Part # |
|---|---|
| *BNC 75-ohm termination plug (2) | 26-300-01 |

* These items are supplied with the DDS 100.

## BNC cables

Extron SHR BNC cables are super-high resolution cables. Extron recommends using high-resolution BNC cables for signals with scan frequencies of 15 — 125 kHz to achieve maximum performance.

### Bulk cable

| Extron Part | Part # |
|---|---|
| **SHR bulk cable** | |
| Bulk SHR-1, 500' | 22-098-02 |
| Bulk SHR-1, 1000' | 22-098-03 |
| Bulk SHR-4, 500' | 22-099-02 |
| Bulk SHR-5, 500' | 22-100-02 |
| BNC SHR crimp connectors, qty. 50 | 100-075-51 |
| **BNC-4 Mini-HR Bulk Cable** | |
| Bulk BNC 4-500' HR | 22-032-02 |
| Bulk BNC 4-1000' HR | 22-032-03 |
| **BNC 5 Mini-HR Bulk Cable** | |
| Bulk BNC 5-500' HR | 22-020-02 |
| Bulk BNC 5-1000' HR | 22-020-03 |
| **BNC 5 Plenum Mini-HR Bulk Cable** | |
| Bulk BNC 5-500' HRP | 22-103-02 |
| Bulk BNC 5-1000' HRP | 22-103-03 |
| **Install Plenum Bulk Cable** | |
| Bulk Install Plenum, 500' | 22-111-03 |
| Bulk Install Plenum, 1000' | 22-111-04 |

***Continued on the next page***

### Assorted connectors

| BNC Connectors | |
|---|---|
| BNC Mini-HR crimp connectors, qty. 50 | 100-074-51 |
| BNC SHR crimp connectors, qty. 50 | 100-075-51 |
| BNC Bulkhead connectors, qty. 50 (for custom wall plates) | 100-076-51 |

### Pre-cut cables

BNC-4 HR cable is used for RGBS cable runs, and BNC-5 is used for RGBHV cable runs. Either type can also be used for RGsB (sync on green). All Extron BNC cables have male gender connectors at both ends. A plenum version of the BNC-5 HR cable is also available.

| BNC-4 HR Cable | |
|---|---|
| BNC-4-25' HR (25 feet / 7.5 meters) | 26-210-04 |
| BNC-4-50' HR (50 feet / 15.0 meters) | 26-210-05 |
| BNC-4-75' HR (75 feet / 23.0 meters) | 26-210-06 |
| BNC-4-100' HR (100 feet / 30.0 meters) | 26-210-07 |
| BNC-4-150' HR (150 feet / 45.0 meters) | 26-210-08 |
| BNC-4-200' HR (200 feet / 60.0 meters) | 26-210-09 |
| BNC-4-250' HR (250 feet / 75.0 meters) | 26-210-54 |
| BNC-4-300' HR (300 feet / 90.0 meters) | 26-210-53 |
| **BNC-5 HR Cable** | |
| BNC-5-25' HR (25 feet / 7.5 meters) | 26-260-03 |
| BNC-5-50' HR (50 feet / 15.0 meters) | 26-260-04 |
| BNC-5-75' HR (75 feet / 23.0 meters) | 26-260-16 |
| BNC-5-100' HR (100 feet / 30.0 meters) | 26-260-05 |
| BNC-5-150' HR (150 feet / 45.0 meters) | 26-260-12 |
| BNC-5-200' HR (200 feet / 60.0 meters) | 26-260-06 |
| BNC-5-250' HR (250 feet / 75.0 meters) | 26-260-18 |
| BNC-5-300' HR (300 feet / 90.0 meters) | 26-260-14 |

**NOTE** *Bulk cable in lengths up to 5000' rolls is available with or without connectors.*

# Glossary

**BNC — Bayonet Neill-Concelman —** A cable connector used extensively in television and named for its inventor. A cylindrical bayonet connector operates with a twist-locking motion. To make the connection, align the two curved grooves in the collar of the male connector with the two projections on the outside of the female collar, push, and twist. This allows the connector to lock into place without requiring tools.

**Digital display scaler —** See *scaler*.

**Executive mode —** Locks out all menu functions. When executive mode is active, the centering controls and the RS-232 port remain active.

**Freeze —** Locks the output display to the current image. When the freeze function is active, the freeze LED (light emitting diode) is lit.

**High impedance — Hi Z or High Z —** A relative term that is different for each application. In video, when the signal is not terminated it is said to have a Hi Z load. Hi Z is typically 800 — 10k ohms or greater.

**Horizontal filter —** Controls the sampling of the horizontal plane, thereby affecting the sharpness or smoothness of the scaled image.

**Memory presets —** Memory locations for storing preconfigured settings, including size, zoom, pan, centering, and filter control settings for various scan rates. Some presets can be stored by the user, and others are set at the factory. The device automatically loads the control settings from the preset associated with the scan rate of the input video signal.

**Reset —** Erases user-specified settings that are stored in preset memory.

**RS-232 —** An Electronic Industries Association (EIA) serial digital interface standard that specifies the characteristics of the communication path between two devices using either DB-9 or DB-25 connectors. This standard is used for relatively short-range communications and does not specify balanced control lines. RS-232 is a serial control standard with a set number of conductors, data rate, word length, and type of connector to be used. The standard specifies component connection standards with regard to computer interface. It is also called RS-232-C, which is the third version of the RS-232 standard.

**Scaling —** Changes the size of an image without changing its shape. Scaling can be used when the image size does not fit the display device. A digital display scaler converts a 1600 x 1280 resolution image (from a high-resolution computer) to a size that can be displayed through a digital display with limited resolution, such as an LCD (liquid crystal display) projector, DLP (digital light processing) projector, or plasma projector .

**Vertical filter —** Controls the number of lines to process, as well as the way in which they are processed. This affects the sharpness and flicker of a scaled image; as the flicker decreases, so does the sharpness.

# FCC Class A Notice

Note: 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 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.

# 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
1230 South Lewis Street
Anaheim, CA 92805, USA

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

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

**Asia:**

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

**Japan:**

Extron Electronics, Japan
Daisan DMJ Bldg. 6F,
3-9-1 Kudan Minami
Chiyoda-ku, Tokyo 102-0074
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.

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