DX-700

User's Guide

- Manual #: 26-0601000-00
- Revision: 02

BARCO

Visibly yours

Copyright

Notice

Barco provides this manual "as is" without warranty of any kind, either expressed or implied, including but not limited to the implied warranties or merchantability and fitness for a particular purpose. Barco may make improvements and/or changes to the product(s) and/or the program(s) described in this publication at any time without notice.

This publication could contain technical inaccuracies or typographical errors. Changes are periodically made to the information in this publication; these changes are incorporated in new editions of this publication.

Federal Communications Commission (FCC) Statement

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 may cause harmful interference, in which case the user will be responsible for correcting any interference.

Guarantee and Compensation

Barco provides a guarantee relating to perfect manufacturing as part of the legally stipulated terms of guarantee. On receipt, the purchaser must immediately inspect all delivered goods for damage incurred during transport, as well as for material and manufacturing faults Barco must be informed immediately in writing of any complaints.

The period of guarantee begins on the date of transfer of risks, in the case of special systems and software on the date of commissioning, at latest 30 days after the transfer of risks. In the event of justified notice of compliant, Barco can repair the fault or provide a replacement at its own discretion within an appropriate period. If this measure proves to be impossible or unsuccessful, the purchaser can demand a reduction in the purchase price or cancellation of the contract. All other claims, in particular those relating to compensation for direct or indirect damage, and also damage attributed to the operation of software as well as to other services provided by Barco, being a component of the system or independent service, will be deemed invalid provided the damage is not proven to be attributed to the absence of properties guaranteed in writing or due to the intent or gross negligence or part of Barco.

If the purchaser or a third party carries out modifications or repairs on goods delivered by Barco, or if the goods are handled incorrectly, in particular if the systems are commissioned operated incorrectly or if, after the transfer of risks, the goods are subject to influences not

agreed upon in the contract, all guarantee claims of the purchaser will be rendered invalid. Not included in the guarantee coverage are system failures which are attributed to programs or special electronic circuitry provided by the purchaser, e.g. interfaces. Normal wear as well as normal maintenance are not subject to the guarantee provided by Barco either.

The environmental conditions as well as the servicing and maintenance regulations specified in this manual must be complied with by the customer.

Trademarks

Brand and product names mentioned in this manual may be trademarks, registered trademarks or copyrights of their respective holders. All brand and product names mentioned in this manual serve as comments or examples and are not to be understood as advertising for the products or their manufactures.

Company Address

Barco, Inc.
11101 Trade Center Drive
Rancho Cordova, California 95670
USA

- Phone: (916) 859-2500
- Fax: (916) 859-2515
- Website: **www.barco.com**

Barco N.V.
Noordlaan 5
8520 Kuurne
BELGIUM

- Phone: +32 56.36.82.11
- Fax: +32 56.35.16.51

Technical Support

- **Customer Service Portal** — **www.barco.com/esupport**
- **(866) 374-7878** — Events (24/7)
- **(866) 469-8036** — Digital Cinema (24/7)

Operators Safety Summary

The general safety information in this summary is for operating personnel.

Do Not Remove Covers or Panels

There are no user-serviceable parts within the unit. Removal of the top cover will expose dangerous voltages. To avoid personal injury, do not remove the top cover. Do not operate the unit without the cover installed.

Power Source

This product is intended to operate from a power source that will not apply more than 230 volts rms between the supply conductors or between both supply conductor and ground. A protective ground connection by way of grounding conductor in the power cord is essential for safe operation.

Grounding the Product

This product is grounded through the grounding conductor of the power cord. To avoid electrical shock, plug the power cord into a properly wired receptacle before connecting to the product input or output terminals. A protective-ground connection by way of the grounding conductor in the power cord is essential for safe operation.

Use the Proper Power Cord

Use only the power cord and connector specified for your product. Use only a power cord that is in good condition. Refer cord and connector changes to qualified service personnel.

Use the Proper Fuse

To avoid fire hazard, use only the fuse having identical type, voltage rating, and current rating characteristics. Refer fuse replacement to qualified service personnel.

Do Not Operate in Explosive Atmospheres

To avoid explosion, do not operate this product in an explosive atmosphere.

Terms In This Manual and Equipment Marking

WARNING

Highlights an operating procedure, practice, condition, statement, etc., which, if not strictly observed, could result in injury to or death of personnel.

Note

Highlights an essential operating procedure, condition or statement.

CAUTION

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

AVERTISSEMENT!

Le point d´exclamation dans un triangle equilatéral signale à alerter l´utilisateur qu´il y a des instructions d´operation et d´entretien tres importantes dans la litérature qui accompagne l´appareil.

VORSICHT

Ein Ausrufungszeichen innerhalb eines gleichwinkeligen Dreiecks dient dazu, den Benutzer auf wichtige Bedienungs-und Wartungsanweisungen in der Dem Great beiliegenden Literatur aufmerksam zu machen.

Change History

The table below lists the changes to the DX-700 User's Guide.

Table 0-1. Change History

Rev	Date	ECP #	Description	Approved By
A	6/14/07	(ECO) 1846	DX-700 User's Guide	Kent Vogel
02	5/19/10	578655	DX-700 User's Guide Revisions: • Addition of Genlock options • Addition of the Expert Menu • Implementation of stacking • Implementation of output grouping • Implementation of new delay features • Revision of all menu trees	Kent Vogel

Table of Contents

1. Introduction

In This Chapter

This chapter is designed to introduce you to the DX-700 User's Guide. Areas to be covered are:

Firmware Version

This version of the DX-700 User's Guide is based on firmware version 2.30.

Chapter Structure

The following chapters provide instructions for all aspects of DX-700 operations:

- Chapter 1, "**Introduction**" provides a system overview, a list of features, and a system connectivity diagram.
- Chapter 2, "**Hardware Orientation**" on page 33 provides detailed diagrams of the DX-700's front and rear panels.
- Chapter 3, "**Installation**" on page 61 provides comprehensive system installation instructions.
- Chapter 4, "**Operation**" on page 69 provides menu trees, plus comprehensive DX-700 operating instructions.
- Chapter 5, "**Upgrading Firmware**" on page 167 outlines procedures for upgrading DX-700 firmware.
- Appendix A, "**Specifications**" on page 171 lists the DX-700's specifications.
- Appendix B, "**Remote Control Protocol**" on page 185 provides information regarding remote control commands and protocol.
- Appendix C, "**Contact Information**" on page 203 lists important Barco contact, RMA, warranty and technical support details.
- Appendix D, "**Fiberlink NNI Installation**" on page 205 provides setup and operating instructions for the optional Fiberlink NNI Multi-mode Transmitter and Receiver.

How to Use This Guide

This section provides important tips for streamlining the use of this User's Guide in its electronic PDF form.

Navigating

Use Acrobat Reader's "bookmarks" to navigate to the desired location. All chapter files have the same bookmark structure for instant navigation to any section. Please note:

- Extensive hyperlinks are provided within the chapters.
- Use Acrobat's "**Go to Previous View**" and "**Return to Next View**" buttons to trace your complete navigational path.
- Use the "**Previous Page**" and "**Next Page**" buttons to go to the previous or next page within a file.
- Use Acrobat's extensive search capabilities, such as the "**Find**" tool and "**Search Index**" tool to perform comprehensive searches as required.

Table of Contents and Index

Use the **Table of Contents** bookmarks to navigate a desired topic. Click any item to instantly jump to that section of the guide. You can also use the **Index** to jump to specific topics within a chapter. Each page number in the **Index** is a hyperlink.

Conventions

The following conventions are used throughout this guide:

- The symbol ■ denotes an operations procedure.
- The symbol ▲ denotes an example.
- Entries written in bold-face capital letters denote physical buttons or connectors.

  ▲ Press **ENTER** to ...
- Button labels on the **Touch Screen** are shown in bold letters between braces.

  ▲ Press **{Input Wizard}** to …
- A sequence of steps is represented by the menu names, separated by arrows (**>**).

  ▲ Press **{DX-700 Management}** > **{Test Patterns}** > **{Bank 2}**

  ... indicates the following sequence:

  a. From the **Home Menu**, press **{DX-700 Management}**.

  b. On the **DX-700 Management Menu**, press **{Test Patterns}**.

  c. On the **Output Selection Menu**, select **{Bank 2}**.

About the DX-700

The following topics are discussed in this section:

Overview

The DX-700 is a multi-window video processor designed as a versatile front-end to all Barco LED products.

- Current LED products such as MiPIX, MiTRIX, MiSTRIP, DLite, OLite, SLite and ILite are supported via the DVI LED interface on the **DVI output module**.
- Next generation LED products such as NX-4 are supported via the NNI LED interface on the DX-700's **NNI output module**.

Image processing and LED wall configuration and control functions are adjusted from the DX-700 front panel, or from Barco's **Director Toolset**. Refer to the "**Basic Features**" section on page 17 for additional details.

Important	Director Toolset version 2.0 or later is required.

Please note:

- To ensure trouble-free installation and operation of your DX-700, please follow all procedures in the following two sections:
  - ~ Chapter 3, "**Installation**" on page 61.
  - ~ Chapter 4, "**Operation**" on page 69.
- Should you have any questions regarding the installation or operation of the DX-700, please consult with the factory. Refer to Appendix C, "**Contact Information**" on page 203 for contact details.

Basic Features

Basic features of the DX-700 system are listed below:

- **System Features**
  - ~ Basic configuration is performed using front panel controls on the DX-700. Advanced configuration is performed using **Director Toolset**.
  - ~ Seven rear panel slots are provided for input and output modules. All modules are fully shielded and field-installable.
  - ~ Input and output modules can be configured into “banks” of functionality — essentially, independent video processors capable of driving one or more LED walls.
  - ~ The System Module provides Ethernet, diagnostic, DMX and genlock ports. Analog and digital monitor outputs are provided. DX-700 can be genlocked to an external reference, to a selected input, or set to free-run.
  - ~ Rack-mountable chassis (5RU).
- **Input Features**
  - ~ Input modules provide “universal” connections for DVI (RGB or YCbCr), Dual-DVI (RGB), Component Analog (RGB or YPbPr), NTSC/PAL, CVBS or Y/C, SD-SDI, HD-SDI, and Dual HD-SDI formats. Multiple input modules can be assigned to a bank.
  - ~ All inputs except DVI provide a minimum 10-bit color depth, in either 4:4:4 or 4:2:2 format. An advanced motion-adaptive de-interlacer converts interlaced or progressive segmented frame (PSF) inputs to progressive format.
  - ~ Processing is performed with a 12-bit minimum color depth.
  - ~ Input balancing can be applied to any input.
- **Output Features**
  - ~ Output modules are available in two formats: DVI (for legacy Barco tiles), and NNI (for next-generation Barco tiles).
  - ~ Each output module has three output connections that can be driven independently or “grouped.” When there are two output modules in a bank, all six output connections can be driven independently or grouped.
  - ~ Up to two output modules can be included in a bank. Refer to the “**Understanding Banks**” section on page 24 for details.
  - ~ Video layers can be alpha-blended (e.g., assigned an attribute of invisible, opaque, or any level in between), regardless of layer priority.
  - ~ Color-keying is supported, using any input module as a key source.
  - ~ A variety of digital video effects are supported, including freeze, strobe, and linear color transformations (e.g., monochrome and inverted video).
- **Operational Modes**
  - ~ Setup and Input wizards
  - ~ Preset save and recall
  - ~ Input, display and system management
  - ~ Input source adjustments (saturation, input balance, sharpness, etc.)

New Features

The following topics are discussed in this section:

Firmware Version 2.10 Features

The following features and functions were implemented in firmware version 2.10:

- **External Stacking** — This mode enables multiple DX-700 units to be joined together to increase the overall canvas size, either horizontally or vertically. For details, refer to the "**External Stacking**" section on page 26.
- **Cross-bank Stacking** — This mode enables multiple banks to be connected together within a single DX-700 chassis, using the expansion links on an input module. Cross-bank stacking supports synchronizing inputs in multiple banks. For more information, refer to the "**Cross-bank Stacking**" section on page 26.
- **Input Formats** — The following additional input formats are now detected:
  - 1920 x 1080pSF @ 30 and 29.97
  - 1280 x 720 @ 60
  - 1280 x 800 @ 60
  - 1360 x 768 @ 60
  - 1440 x 900 @ 60, 75 and 85
  - 1680 x 1050 @ 60
- **Autosave** — a check box has been added on the **Expert Menu** to turn the Autosave mode on or off. In Chapter 4, refer to the "**Using the Expert Menu**" section on page 158.
- **Tiles and Modules** — Support has been added for the following LED tiles and modules:
  - TF-20
  - T-20
  - I6 BK
- **Apply Over Black** — On the **Preset Recall Menu**, an **Apply over Black** checkbox has been added. In Chapter 4, refer to the "**Preset Management Operations**" section on page 104.
- **Z-Order Support** — On the **Input Management Menu**, support has been added for **Z-Order**. In Chapter 4, refer to the "**Input Management Menu Operations**" section on page 109.
- **Luma Keying** — The luma keying function has been implemented for control by **Director Toolset** only. Refer to the "**Director Toolset User's Guide**."
- **Input Sharpness** — On **Image Processing Tab 1** (**I.P. 1**), a sharpness adjustment has been implemented. In Chapter 4, refer to the "**Adjusting Image Processing Parameters**" section on page 115.
- **Cable Equalization** — On **Image Processing Tab 1** (**I.P. 1**), a cable equalization adjustment has been implemented. In Chapter 4, refer to the "**Adjusting Image Processing Parameters**" section on page 115.
- **Soft Reset** — Users can now perform both **Factory** and **Soft** system resets. In Chapter 4, refer to the "**Resetting the System**" section on page 145 for details.

- **Output Timing** — Controls for output timing have been added to the **Expert Menu**. In Chapter 4, refer to the "**Using the Expert Menu**" section on page 158.
- A **Minimum Delay Mode** has been added. Refer to the "**DX-700 Video Processing Delay**" section on page 28 for details.
- **Restore Scaling** — In the **Output Display Menu**, buttons have been added to allow users to reset tile H/V scaling parameters. In Chapter 4, refer to the "**Display Management Operations**" section on page 126 for details.
- **PTRANS Command** — This remote command allows users to select the Preset transition type. In Appendix B, refer to the "**Remote Commands**" section on page 186 for details.

Firmware Version 2.30 Features

The following features have been implemented in firmware version 2.30:

- A **Reduced Delay Mode** has been added, which provides a significant reduction in video processing delay. Refer to the "**DX-700 Video Processing Delay**" section on page 28 for details.
- **Tiles and Modules** — support has been added for the following LED tiles and modules:
  - T-16 tiles
  - TF-16 tiles
  - FLX series modules

Theory of Operation

The following topics are discussed in this section:

- **Introduction to the Canvas**
- **Introduction to the Wizards**
- **Sample DVI Output Module Configurations**
- **Sample NNI Output Module Configurations**

Introduction to the Canvas

The DX-700 processor enables you to set up video walls, and define input sources and LED outputs with precision. The DX-700's input and output modules are configured into "banks," consisting of one or more input modules, and either one or two output modules.

Each bank enables you to combine inputs and outputs into independent video processors, capable of driving one or more LED walls. Refer to the "**Understanding Banks**" section on page 24 for additional information on banks.

The DX-700's overall workspace is called the "canvas," the region in which you configure inputs and outputs. Each bank provides a maximum canvas size of 2048 x 1080 pixels (or 1080 x 2048 pixels). By default, the canvas appears as a black background in both the LED and monitor outputs.

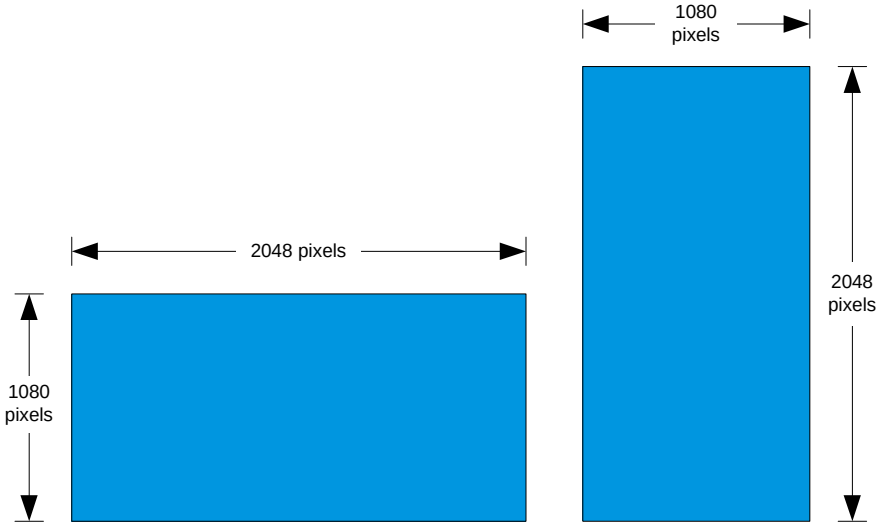


Figure 1-1. DX-700 Canvas Examples

Within the canvas, you can place up to six output regions, provided that the selected bank includes two output modules. For input flexibility, you can scale input sources to fit LED outputs precisely, or you can select just a *portion* of an input to fit a wall.

Output modules are extremely versatile:

- Each module's three outputs can be driven independently — each connected to a different type of LED wall.
- Two or more outputs can be grouped together, in order to form a larger overall video wall comprised of the same type of tiles.

Please note:

- When using DVI output modules, the maximum output resolution (e.g., 2048 x 1080) is achieved with two DVI output modules. With NNI output modules, only one module is required.
- In a dual-bank system, two canvases are available for use — but each bank does not have knowledge of the other bank's configuration.

Introduction to the Wizards

The DX-700 includes two special "wizards" that facilitate the overall setup:

- When you run the **Setup Wizard**, the DX-700 detects all tiles that are connected to each output module, and then takes you through the output setup and grouping steps. Once each output is set up, the DX-700 places its rectangular "pixel region" on the canvas. At the conclusion of the Setup Wizard, you can automatically enter the Input Wizard.
- When you run the **Input Wizard**, the DX-700 asks you to choose an output, choose an input *module*, and then choose a specific input. Next, the system leads you through the setup and scaling steps. When complete, you will store a "preset," and then repeat the procedure for all remaining inputs.

Note

A DX-700 "preset" is a non-volatile file that stores bank-specific configurations for all inputs and outputs, including LED wall settings.

If the Setup Wizard is used, the placement of output "regions" on the canvas is automatic. If Director Toolset is used, outputs can be placed anywhere on the canvas. The DX-700 starts output placement at coordinate **H0**, **V0**, and continues by placing each subsequent region based on the previous output's horizontal width and vertical size — without overlapping, and without leaving gaps. If the DX-700 can't place output regions adjacent horizontally, it attempts to place them vertically. This canvas placement is visible on the monitor output.

Important

If the DX-700 determines that the canvas' available pixel space will be exceeded, you are asked to use the **Director Toolset** for further configuration. Similarly, if "creative" LEDs are used (such as MiTRIX and MiSTRIP), you will also be asked to use the **Director Toolset**.

Output modules have a *limited* pixel capacity per output, as outlined in the following two sections.

Sample DVI Output Module Configurations

For **DVI** output modules, each output is limited to the following parameters:

- A rectangular shape
- Up to **480,000** pixels
- Any orientation up to **2048** pixels on a side

Using one DVI output module (3 outputs), the following sample configurations are possible, without exceeding pixel capacity:

- **Example 1**: 3 x (600 x 800 pixels)
- **Example 2**: 3 x (230 x 2048 pixels)

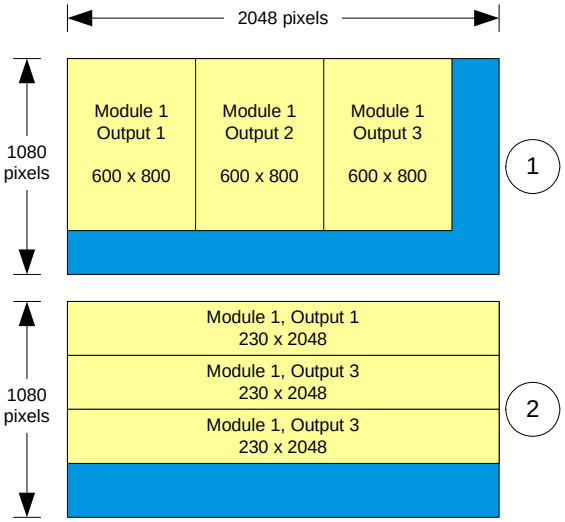


Figure 1-2. Sample DVI canvases that use one output module

In the following illustration, using two DVI output modules (with 6 available outputs), the following sample configurations are possible without exceeding pixel capacity:

- **Example 1**: 4 x different resolutions and aspect ratios
- **Example 2**: 6 x (340 x 1080 pixels)

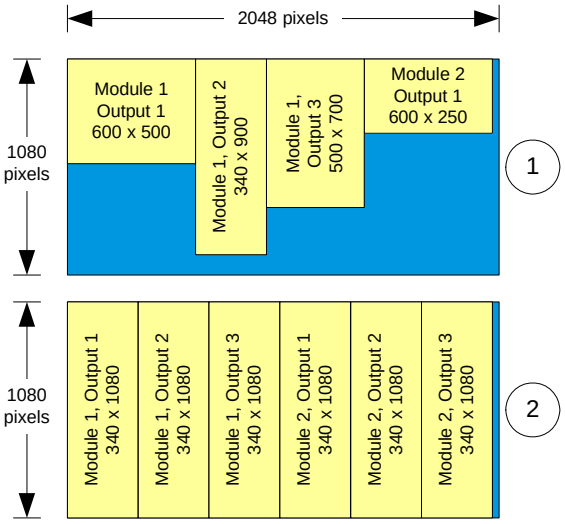


Figure 1-3. Sample DVI canvases that use two output modules

Note

Remember that LED walls do not have to be the same size and aspect ratio, and that the outputs can be used individually or grouped to form larger walls.

Sample NNI Output Module Configurations

For **NNI** output modules, each output is limited to the following parameters:

- A rectangular shape
- Up to **786,432** pixels
- Any orientation up to **2048** pixels on a side

Using one NNI output module (3 outputs), the following sample configuration is possible, without exceeding pixel capacity:

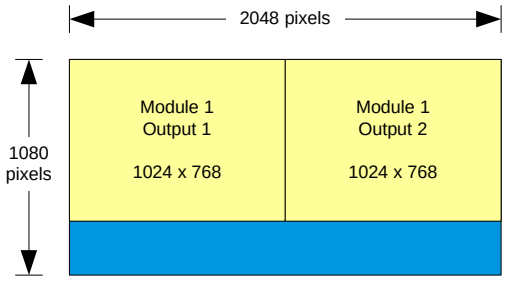


Figure 1-4. Sample canvas using one NNI output module

Please note the following important points regarding the canvas:

- For both NNI and DVI output modules, if smaller tile arrays are used, more output regions can be placed on the canvas — up to the maximum of 6 outputs.
- You cannot mix tile categories (DVI interface and NNI interface) within a bank.
- If your specific tile configuration exceeds the capacity of DX-700's wizards, you must use the **Director Toolset**. For more information, refer to the "**Director Toolset User's Guide.**"

Understanding Banks

DX-700 supports a wide number of flexible system configurations. Input and output modules are installed in "banks," consisting of one or more input modules and either one or two output modules (with two being the maximum allowed in a bank). By definition, a **bank** is a way of combining inputs and outputs into independent video processors that are capable of driving one or more LED walls.

A single DX-700 supports both single and multi-bank configurations, as detailed below.

- **Single Bank Configurations**
- **Multiple Bank Configurations**

Single Bank Configurations

The figure below illustrates two examples of single bank configurations:

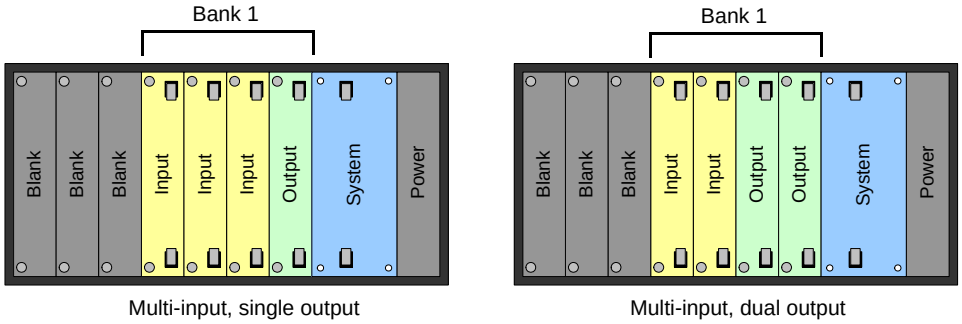


Figure 1-5. Single bank configuration examples

Please note the following points regarding single bank configurations:

- A single bank has a maximum "canvas" size of 2048 x 1080 pixels (or 1080 x 2048 pixels). This overall region can be divided as required between three outputs (using one output module), or six outputs (using two output modules).
- From two to six physical outputs can be "grouped" electronically to form a larger "logical" output. This grouping enables you to control a larger LED display — larger than is possible with a single output. Refer to the "**Grouping Outputs**" section on page 26 of this chapter for more information.
- Based on seven slots for input and output modules, you can use up to six input modules in a bank with one output module, or up to five input modules in a bank with two output modules.

Numerous output combinations are possible within a single bank — because each output can be driven independently or grouped with other outputs. Remember that a maximum of two output modules can be included in a bank.

- A single output module can drive up to three attached displays from any portion of the canvas.
- The LED displays driven by the outputs can be configured with any type of tile within a single tile category. For example:
  - ~ All legacy tiles used: Output 1 (MiPIX), Output 2 (DLite 7), Output 3 (OLite 612)

~ All new tiles used: Outputs 1, 2 and 3 (NX-4)

Important

You cannot mix tile categories within a bank. Thus, the following combination is *not allowed*:

- **Output Module 1**: MiPIX, DLite 7
- **Output Module 2**: NX-4

- Remember that output "grouping" is supported within a single bank. This means that each output can be configured to drive a portion of a larger overall display.

In Chapter 2, refer to the "**Input Module**" section on page 41 for important information on the configuration of modules and banks.

Multiple Bank Configurations

The figure below illustrates two examples of multi-bank configurations:

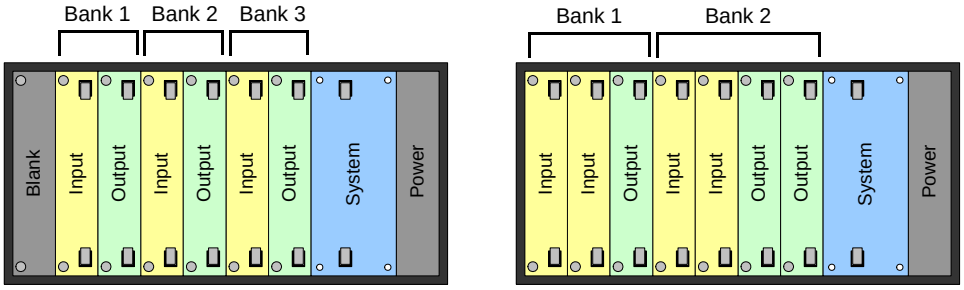


Figure 1-6. Multi-bank configuration examples

Please note the following points regarding multi-bank DX-700 configurations:

- Each bank in a multi-bank configuration has a maximum canvas size of 2048 x 1080 pixels. Each canvas can be divided as required between three outputs (using one output module), or six outputs (using two output modules).
- Each input module within a bank can add its video image to that bank's canvas.
- A single output module within a bank can drive one or more attached displays from any portion of that bank's canvas. The displays can be any type of tile within the "new" or "legacy" categories, but you cannot mix tile categories within a bank.

Note

One bank can be assigned to drive NNI interface tiles, while another bank can be assigned to drive DVI interface tiles.

- Numerous output combinations are possible within a multi-bank system, similar to those combinations described and illustrated in the "**Single Bank Configurations**" section on page 24.

In Chapter 2, refer to the "**Input Module**" section on page 41 for important information on the configuration of modules and banks.

Grouping Outputs

Within a single bank of a DX-700, you can group up to six physical outputs in a bank to form a larger logical output display. This grouping enables you to control an LED display that is larger than can be controlled with a single output.

The **Display Layout Menu** within the **Setup Wizard** is used to implement grouping, after you have set up two or more outputs in a single bank. In Chapter 4, refer to the "**Using the Setup Wizard**" section on page 80 for more information about grouping outputs.

DX-700 Stacking

Stacking is the practice of increasing the canvas size in order to display video output across a larger area, either horizontally or vertically. The DX-700 provides two types of stacking:

- **"External" stacking** occurs across DX-700 machines. In this configuration, you create physical connections across two or more DX-700s. Each machine's inputs are made available to the next DX-700(s). A "lock" signal must also be sent from the "master" frame to all "slave" frames in the stack.
- **"Cross-bank" stacking** occurs across banks in a single DX-700 unit. In this type of stacking, one bank's input connectors are linked to the corresponding input connectors of another bank. This function allows a single input source to be visible on the canvas of both banks.

The following topics are discussed in this section:

External Stacking

The external stacking function enables multiple DX-700 units to be joined together in order to increase the overall canvas size — either horizontally or vertically. When working in this mode, all DX-700 units must have the same configuration, as follows:

- Video sources are all connected to input modules of the "master" DX-700.
- On each of the master's input modules, the **Expansion Out** DVI port is connected to the **DVI Input** port on the first slave unit's input modules. Similarly, the first slave connects to the second, etc.
- A **Sync** output on the master unit's System module allows slave units to genlock. This signal can also be daisy-chained to several DX-700 units.

Note	Use **Director Toolset** to set up external stacking.

Cross-bank Stacking

The expansion links on a DX-700 input module can be used to connect multiple banks together within a single DX-700 chassis — a feature called cross-bank stacking. The advantage is that a single input can be displayed across multiple banks.

For cross-bank stacking, the linked banks must all have the same configuration, as follows:

- Video sources are all connected to the first bank's input modules.

- For input modules in the first bank, expansion link cables from the **Expansion Out** DVI ports are connected to the second bank's DVI inputs.

Note	Use **Director Toolset** to set up cross-bank stacking.

Stacking and Video Delay

An additional benefit of both cross-bank and external stacking is that a system configuration requiring vertical output stacking (in a single bank) can be built without incurring video delay.

▲ Consider a configuration that uses two outputs within a bank, each driving a wall section, and the two wall sections comprise the overall image. If the two sections are oriented horizontally, there is no additional delay. If the two sections are vertically oriented, extra delay is added. Here, moving to either a cross-bank or external stacking configuration may alleviate the extra delay.

Expansion Links

When multiple DX-700 units (or multiple DX-700 banks) are linked to create a final output image that's larger than is possible using only one unit, all DX-700 units must process each input *identically*. This guarantees that there are no discontinuities in color balance, sample phase and other parameters at boundaries between each DX-700 output image.

To satisfy this requirement, the input module in the first DX-700 unit (or bank) receives the original video source and processes it in preparation for scaling. The video stream is then digitally transmitted via the input module's **Expansion Port** to the remaining DX-700 units (or banks) — exactly as presented to the first module's scaler.

Please note:

- The input module's dedicated **Expansion Output** is a standard dual-link DVI-I connector.
- The input module's **DVI Input** port doubles as the **Expansion Input**, using a standard dual-link DVI-I connector.
- Dual-link DVI-I cables (customer-supplied) are required for these connections. Contact your Barco sales representative for details.

DX-700 Scaling

The DX-700 utilizes scalers on each input module and on the System module. Each scaler uses a triple-buffered frame memory to minimize motion artifacts such as frame tearing due to asynchronous frame rates.

- On the input module, the scaler output provides a maximum horizontal active size of 2048 pixels and a maximum vertical active size of 2048 lines.
  - ~ The maximum *input* to the scaler cannot exceed 2048 x 1536 pixels.
  - ~ The scaler's *output* cannot exceed the DX-700's overall canvas size of 2048 x 1080 (or 1080 x 2048) pixels.
- On the System module, the scaler receives the image on the canvas. For monitoring purposes, this scaler enables you to size the output to the resolution of your selected monitor (DVI or analog). You can monitor individual LED outputs, groups or the full canvas. Video from output modules is not affected.

DX-700 Video Processing Delay

The DX-700 has three video processing delay modes:

- **Minimum Delay Mode**

  Use this mode when you require the absolute minimum delay, and you are willing to forego some quality. The mode is very good for content that contains low details. Please note:

  - **Delay**: 2ms for interlaced sources and 2ms for progressive sources.
  - **Image Quality**: There is a slight loss in quality compared to the Reduced and Standard delay modes.
  - **Functionality**: The DX-700 processes only one input field of video versus two input fields (that compose a full frame). One field is still greater than the resolution of the LED wall, and all pixels on the wall are functioning.

- **Reduced Delay Mode**

  Use this recommended mode for most applications. This mode creates no processing artifacts and is best suited for live events. Please note

  - **Delay**: 23ms for interlaced sources and 2ms for progressive sources.
  - **Image Quality**: This mode provides the highest and best image quality.
  - **Functionality**: The DX-700 processes both input fields using Barco's proprietary scaling technology, thus producing the best image quality.

- **Standard Delay Mode**

  Use this mode for very large LED walls. Please note:

  - **Delay**: 80ms for interlaced sources and 40-60ms for progressive sources.
  - **Image Quality**: This mode also provides the highest and best image quality, identical to the **Reduced Delay Mode**.
  - **Functionality**: The DX-700 processes both input fields using Barco's proprietary scaling technology, thus producing the best image quality.

Please note the following important points:

- To select the delay mode via the DX-700 front panel, you must first "pre-select" the desired mode on the **Reduced/Minimum Delay Menu**. This menu is accessed via the **Expert Menu** under the **DX-700 Management Menu**. Once the mode is selected, you must use the **Setup Wizard** to activate the selected mode.
- To select the delay mode via **Director Toolset**, use the **Synchronization Section** on the **Configuration Menu**.
- All delay modes are set up on a "per bank" basis. This means that one bank can be set to **Standard**, while another can be set to **Reduced**. If you are using the DX-700 front panel for setup, the "pre-selection" and **Setup Wizard** *must* be used to apply (or change) modes for any bank.
- On a particular output module, If you set output 1 to the minimum or reduced delay mode, the remaining outputs default to standard mode. However, if you group outputs, the assigned delay mode applies to the entire group.

In Chapter 4, refer to the "**Pre-selecting the Delay Mode**" section on page 159 for instructions on setting and changing the delay mode. In Appendix A, refer to the "**Delay Specifications**" section on page 178 for delay specifications at 50 Hz and 60 Hz.

DX-700 Input Identification

With digital inputs (DVI or SDI), the DX-700 can accurately identify the source's format and resolution. Typically, no user adjustments will be required to fully acquire the image. Please note:

- DVI inputs are typically RGB; however, some sources can provide DVI in the YC_bC_r colorspace. Because there is no clear way to distinguish between RGB and YC_bC_r DVI inputs, the colorspace defaults to RGB for computer resolutions, and YC_bC_r for HD video resolutions. If the default colorspace is incorrect, the user can select the correct colorspace.
- Analog inputs cannot always be accurately identified, but the DX-700 will sufficiently acquire any valid source and provide a visible image at the output. User input may be required to set the exact input timing and colorspace details.

Note

The HD-15 (**RGB IN**) connector on the input module only supports computer resolutions. It does not support SD / HD resolutions. The three BNC connectors (**YUV**) can accept composite, S-Video or Component input.

- Automatic input identification may not always be accurate for some modes of dual HD-SDI input. In this configuration, user selection will be required.

DX-700 Input Switching

The DX-700 enables you to switch inputs. Please note:

- Using the internal mixer on each input module, seamless transitions can be performed between inputs, as long as the new (incoming) source is valid and stable. Transitions through black can also be performed.
- External source switching can also be performed:
  - ~ During the "external" switching process, any video output derived from the source goes black if the sources being switched are asynchronous.
  - ~ When sources are synchronous (such as genlocked cameras), the switch through black will be minimal.

Firmware Upgrades

The DX-700 enables you to upgrade its operating firmware via the **Director Toolset**. For details, refer to Chapter 5, "**Upgrading Firmware**" on page 167.

Application Questions

At Barco, we take pride in offering unique solutions to demanding technical problems. If you have application questions, require further information or would like to discuss your application requirements in more detail, please call (916) 859-2500. Our Customer Support Engineers will be happy to supply you with the support you need. Refer to Appendix C, "**Contact Information**" on page 203 for details.

Connectivity Diagrams

This section provides several sample “single bank” connectivity diagrams.

- **Single Bank, Single Input Source, Single Output**
- **Single Bank, Triple Input Sources, Ungrouped Output**
- **Single Bank, Single Input Source, Grouped Output**

Single Bank, Single Input Source, Single Output

The figure below illustrates a sample DX-700 “single bank” configuration. In this configuration, the bank consists of a single input module and a single output module. One input source is mapped to one of the output module’s three output connectors, and is used to drive a single video wall.

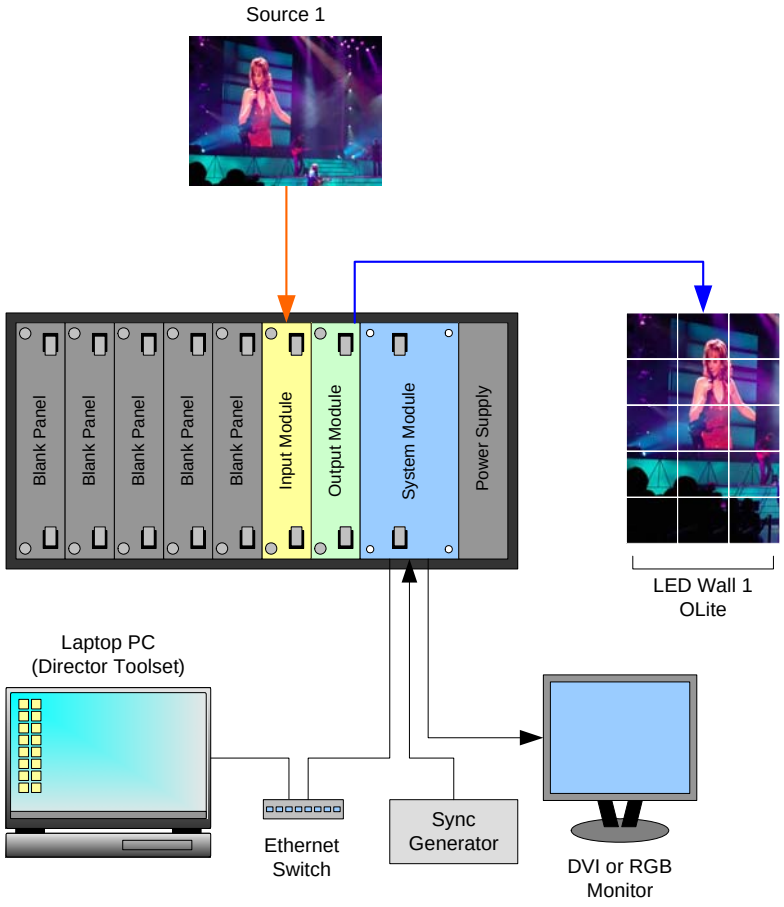


Figure 1-7. Sample system configuration: single input, single output

Single Bank, Triple Input Sources, Ungrouped Output

The figure below illustrates another sample DX-700 “single bank” configuration. In this diagram, the bank consists of one output module and three input modules. Three different input sources are mapped to the output module’s three output connections, and are used to drive three video walls of different sizes and aspect ratios.

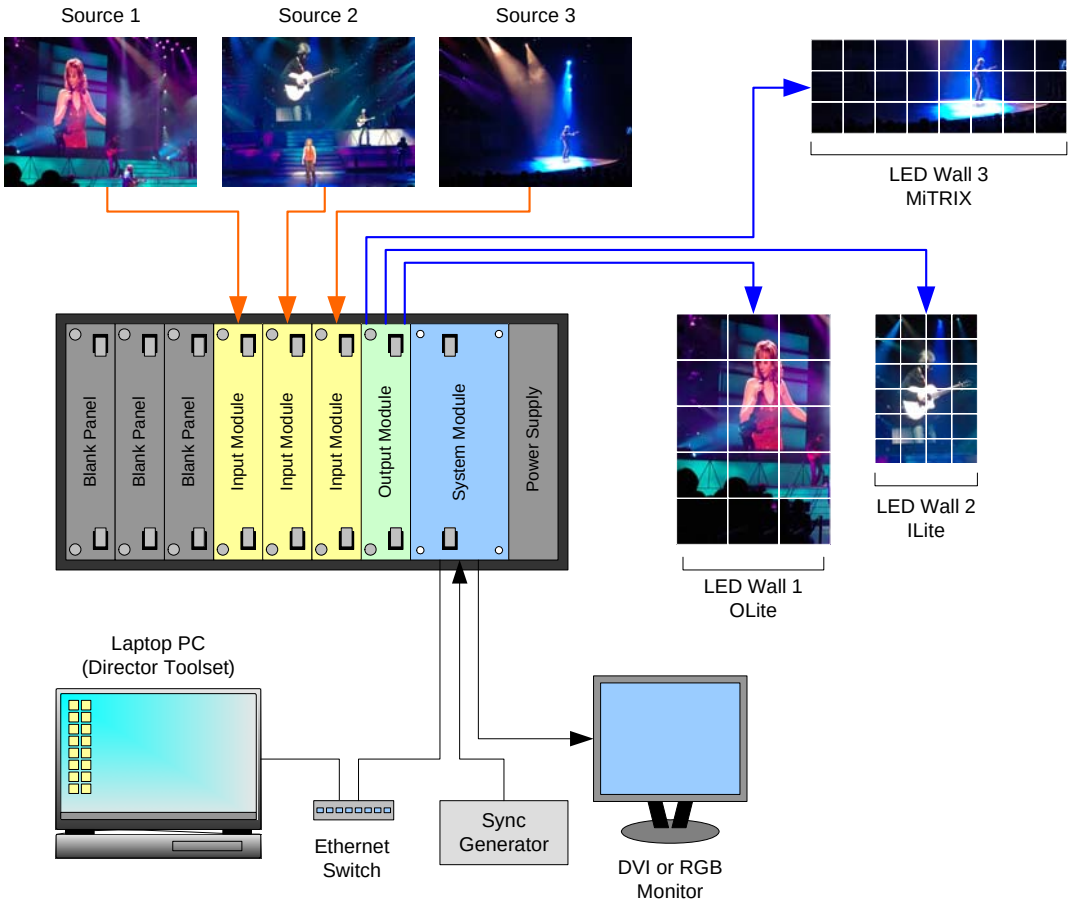


Figure 1-8. Sample system configuration: triple input, triple output (ungrouped)

Single Bank, Single Input Source, Grouped Output

The figure below illustrates a sample DX-700 “single bank” configuration. In this diagram, the bank consists of a single input module and a single output module. A single input source is mapped to all three of the output module’s output connectors. These outputs are grouped to display three LED walls simultaneously, creating one large canvas on which to display the video.

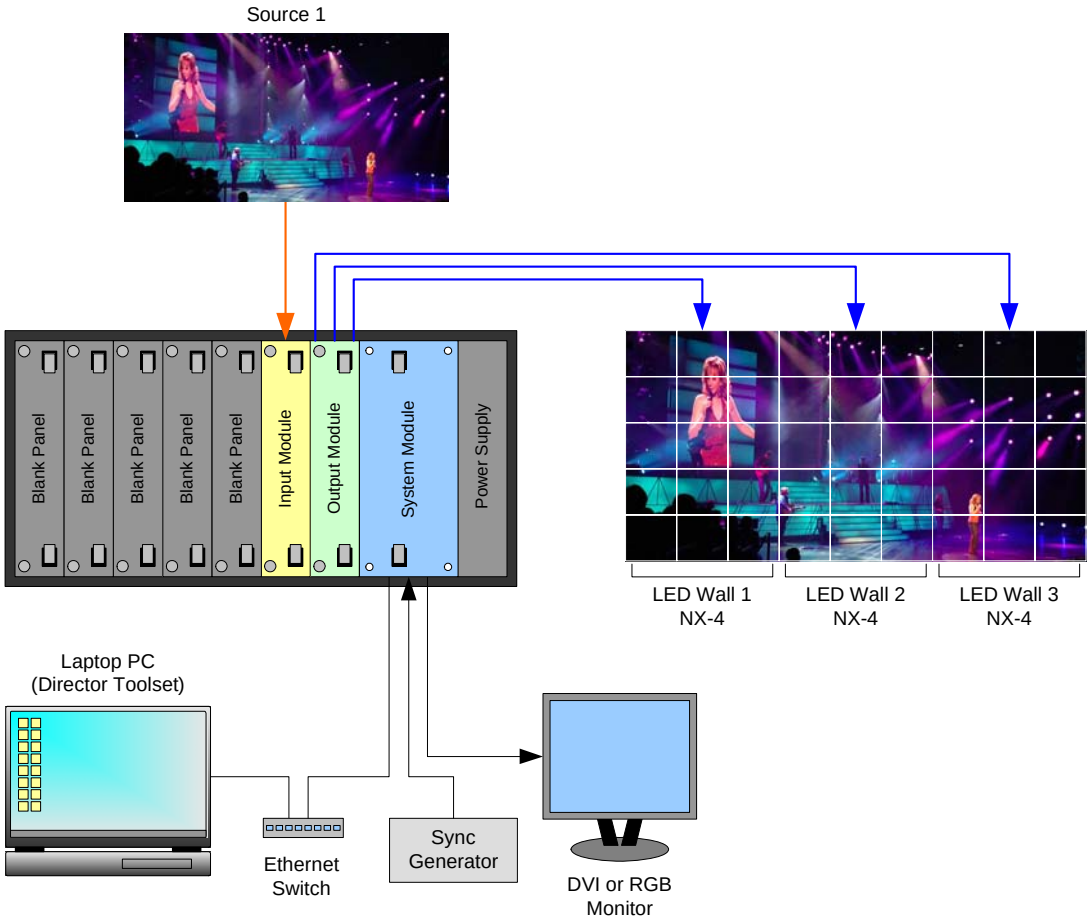


Figure 1-9. Sample system configuration: single input, triple output (grouped)

2. Hardware Orientation

In This Chapter

This chapter provides detailed diagrams of the DX-700's front and rear panels, along with comprehensive explanations of each.

The following topics are discussed:

DX-700 Front Panel

The figure below illustrates the DX-700 front panel:

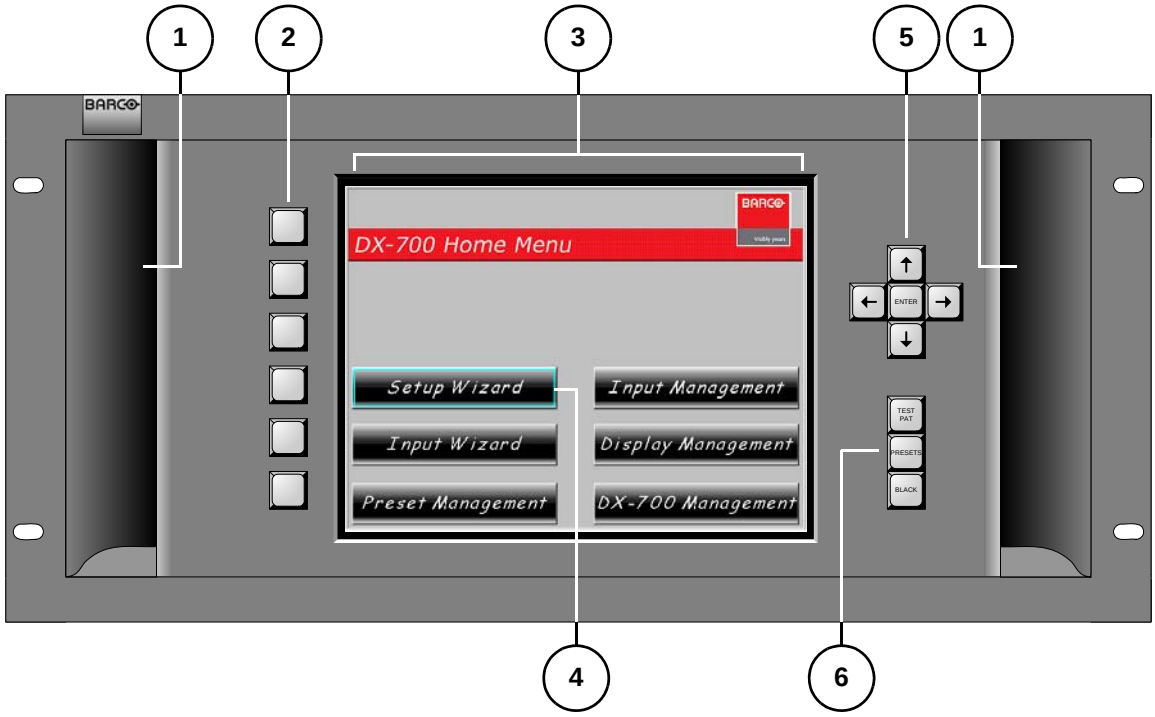


Figure 2-1. DX-700 Front Panel, with Home Menu

1)	**Handles**	4)	**Focus**
2)	**Softkeys**	5)	**Navigation Section**
3)	**Touch Screen**	6)	**Function Section**

Following are descriptions of each front panel section:

1) Handles

The front panel includes two recessed **handles** that enable you to easily insert or withdraw the chassis from a rack. Chassis weight varies depending on the number of input and output modules installed. In Appendix A, refer to the "**Physical and Electrical Specifications**" section on page 176 for details.

2) Softkeys

Six un-labeled buttons called "**softkeys**" are located to the left of the Touch Screen. Softkey labels (when present) appear as **blue buttons** in the Touch Screen's left-hand column, indicating an associated function. To activate the function or access the indicated menu, press the blue button on the Touch Screen, or press the adjacent softkey.

3) Touch Screen

The **Touch Screen** is the DX-700's primary user interface, which enables you to access (or activate) all menus and functions in a variety of ways. Refer to the "**Touch Screen**" section on page 36 for details.

4) Focus

The cyan-colored "**focus**" highlight indicates a button that can be activated by pressing **ENTER** in the **Navigation Section**. The Navigation buttons are also used to move the focus. Refer to the Navigation Section below for details.

5) Navigation Section

The **Navigation Section** includes four "arrow" buttons (left, right, up and down), plus a central **ENTER** button.

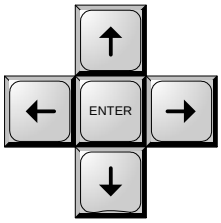


Figure 2-2. Navigation Section

On screen, the arrow buttons are used to move the "**focus**" from button to button, and they are also used to scroll lists up and down. To activate a function using the navigation keys, move the focus to the desired button and press **ENTER**.

6) Function Section

The **Function Section** includes three buttons dedicated to single functions.

Figure 2-3. Function Section

~ Press **TEST PAT** to access the **Test Pattern Menu**, which enables you to assign an internal test pattern to selected outputs. Refer to the "**Test Patterns**" section on page 38 for additional details.

~ Press **PRESETS** to access the **Preset Management Menu**, which allows you to recall and manage presets. In Chapter 4, refer to the "**Using the Preset Management Menu**" section on page 103 for details.

Important

The **TEST PAT** and **PRESETS** buttons are not accessible from all menus (e.g., when you are in a Wizard).

~ The **BLACK** button is a toggle. Press once to take all outputs to black. The button lights when pressed, and the DX-700 displays a black test pattern on all enabled outputs. Press again to restore the previous output video configuration.

Touch Screen

The **Touch Screen** is a 640 x 480 color LCD that shows all menus and functions. You can use the Touch Screen in a variety of ways:

- Press the desired button on the Touch Screen itself.
- Press a softkey that is directly adjacent to a blue Touch Screen button.
- Use the four arrow buttons in the **Navigation Section** to move the cyan-colored "focus" highlight to a particular button on screen. Then, press **ENTER** to access the highlighted menu or activate the selected function.

Touch Screen Conventions

The following conventions apply to the Touch Screen:

- **Black buttons** are used to activate functions and access various menus and "wizards." These buttons can only be pressed on the Touch Screen, or accessed via the navigation keys.

Figure 2-4. Sample Black Button

- **Blue buttons** are softkey labels *only*. These buttons can either be pressed on the Touch Screen, or activated by pressing the adjacent softkey.

Figure 2-5. Sample Blue "Softkey" Button

- **Green buttons** appear in pop-up menus or dialogs. These buttons typically offer a choice (**Yes** or **No**), or a confirmation such as **OK**.

Figure 2-6. Sample Green "Choice" Button

- **Red backgrounds** in a pop-up indicate a warning, caution, or error condition.

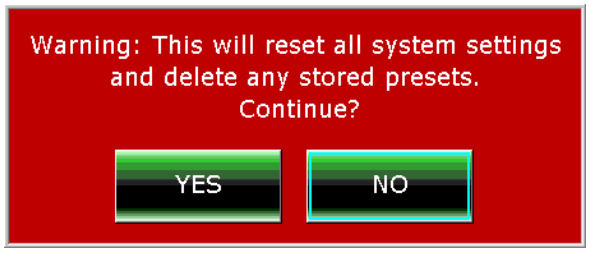


Figure 2-7. Sample Warning Pop-up

- **Lists** are used to display a variety of stored information, including Presets and resolution formats.

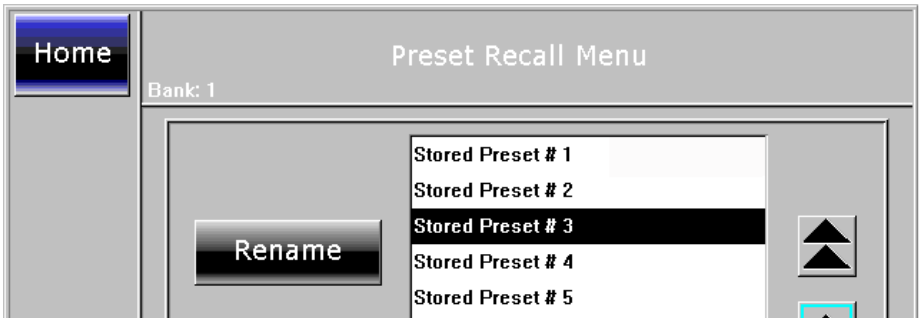


Figure 2-8. Sample Preset List

- **Sliders** are used to adjust various display parameters, and each includes a variety of individual controls:

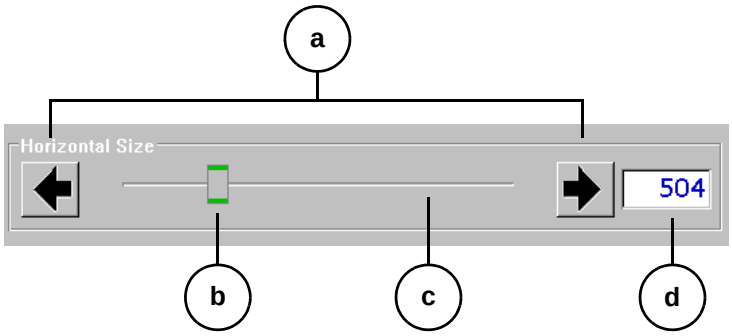


Figure 2-9. Sample Slider

a)	Arrows	c)	Slider Bar
b)	Slider Button	d)	Value Box

Following are descriptions of each slider section:

a) Arrows

Press the left or right **Arrows** to increase or decrease the selected value (or parameter) by one digit with each press. This is a “fine” adjustment.

b) Slider Button

Press and drag the **Slider** button left or right to increment or decrement the selected value. This is a “course” adjustment.

c) Slider Bar

Touch the **Slider Bar** at any location (to the left or right of the **Slider Button**) to instantly move the button to that location. This is also a “course” adjustment.

d) Value Box

The **Value Box** always displays the selected parameter's current value, and the box updates as you make adjustments. For *direct* numeric entry, press the **Value Box** to display a keypad, a sample of which is shown below:

Figure 2-10. Sample keypad

- ~ Press the desired number buttons for the selected parameter. Entries shift left in the register.
- ~ Press **Clear** to clear the entire register.
- ~ Press **< Bksp** to clear the last digit entered.
- ~ Press **Cancel** to cancel numeric entry, and clear the keypad from the screen. The previous value is retained.
- ~ Press **OK** to accept the new value and clear the keypad.

Test Patterns

The DX-700 includes several locations where internal test patterns can be enabled:

- In the **Input Management Menu**, select an input card, then select the **{Window Settings Tab}**. Next, press **{Test Pattern}** to display the **Input Test Pattern Menu**. These patterns are used to test a source within its assigned output region on the canvas.
- In the **DX-700 Management Menu**, press **{Monitor Setup}** to display the **Monitor Output Menu**. Next, press **{Test Pat}** to display the **Test Pattern Menu**. These patterns enable you to display a test pattern on the monitor (that is connected to the System Module).
- In the **DX-700 Management Menu**, press **{Test Patterns}** to display the **Output Selection Menu**. Next, select an output to display the **Output Test Pattern Menu**. This menu enables you to display a test pattern for the selected output (or group of outputs).

Note

Within the **Display Management Menu**, a wall's internal test patterns can be enabled, but these patterns are not generated by DX-700.

The following internal test patterns are provided:

- H Gray Ramp
- V Gray Ramp
- Color Bars
- 16 x 16 Grid
- 32 x 32 Grid
- Burst
- 75% Bars
- 50% Gray
- H Gray Steps
- V Gray Steps
- Adj (Adjust) Grid
- Black
- White
- Adj (Adjust) Color

Test patterns can be programmed in any of three forms:

- Each output port contains a test pattern sized to that port's output resolution.
- A single test pattern is created that fills the entire area of all stacked outputs within an output bank.
- A single test pattern is created that fills the entire area of all outputs when stacking multiple DX-700 units.

Please note the following additional points:

- The test pattern generator can also be programmed to individually enable or disable each RGB primary. This feature allows the programmable gray level pattern to generate any intensity of any primary.
- Any test pattern can be put into diagonal motion.
- The test pattern generator can create raster boxes, which encompass an individual output's pixel area, the entire stacked output or the source's perimeter.

In Chapter 4, refer to the "**Using the Test Pattern Menu**" section on page 148 for additional information.

DX-700 Rear Panel

The figure below illustrates the DX-700 rear panel:

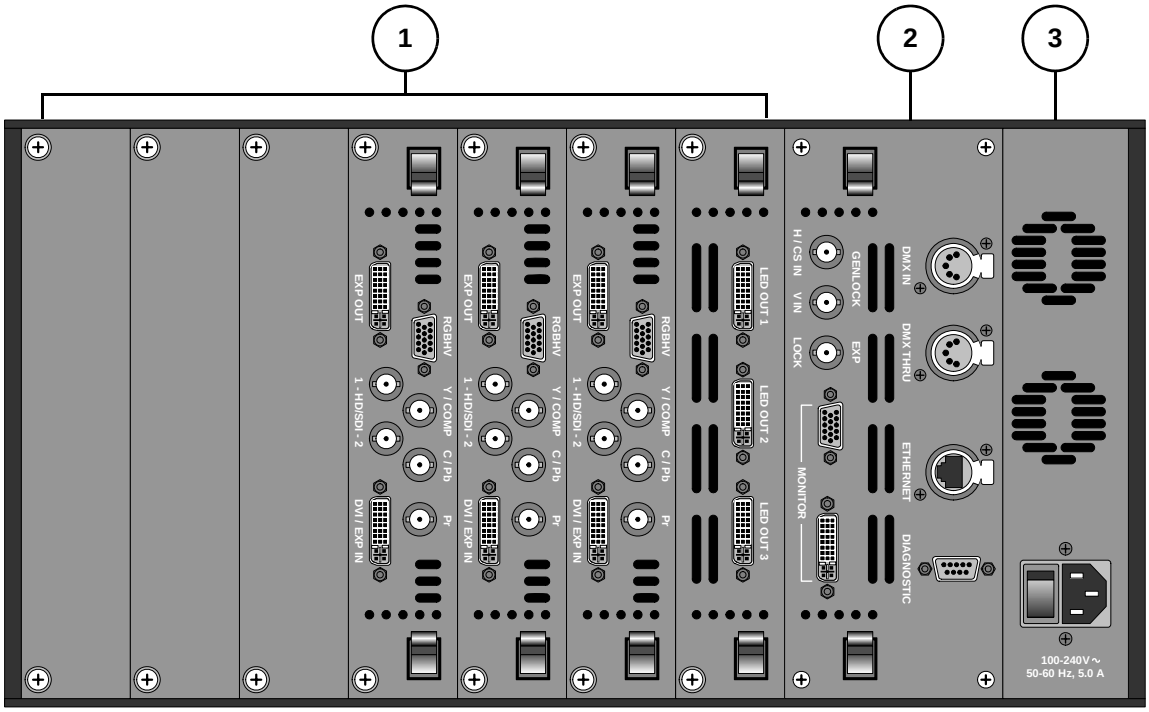


Figure 2-1. DX-700 Rear Panel, with sample DVI I/O configuration

1)	Input / Output Section	3)	Power Supply
2)	System Module		

Following are descriptions of each rear panel connector:

1) Input / Output Section

The **Input / Output Section** provides seven slots for both input and output modules, which can be arranged in a variety of configurations and "banks." Each module is fully shielded and field-installable.

- A single "universal" input module is available. Refer to the "Input Module" section on page 41 for details.
- Two different output modules are available (**DVI** and **NNI**). Refer to the "Output Modules" section on page 45 for details.
- Refer to the "Input Module" section on page 41 for important rules governing the configuration and placement of modules.

2) System Module

The **System Module** is standard on all DX-700 units. It provides connections for synchronization, monitoring, control and diagnostics. Refer to the "System Module" section on page 51 for details.

3) Power Supply

The **Power Supply** connects the DX-700 to your facility's AC power source. The integral switch turns the unit on and off. Twin fans are provided for cooling. In Appendix A, refer to the "**Physical and Electrical Specifications**" section on page 176 for power details.

Input Module

The following topics are discussed in this section:

- **Input Module Block Diagram**
- **Input Module Description**

Input Module Block Diagram

The figure below illustrates a simplified block diagram of the Input Module:

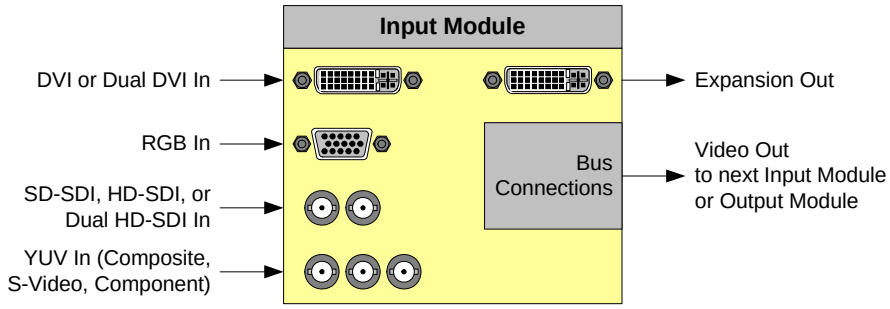


Figure 2-2. Block Diagram - Input Module

Input Module Description

DX-700 **Input Modules** provide the system's input, scaling, and mixing functions. Within each module, the input source is selected from among the various input connectors and scaled to the required size and position in the final display. The module is fully shielded and field-installable.

The figure below illustrates the DX-700's universal **Input Module**.

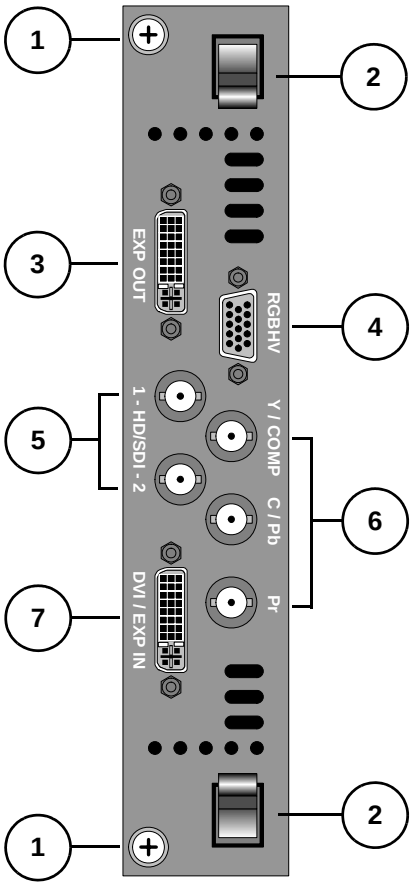


Figure 2-3. DX-700 Input Module

1)	**Thumb Screws**	5)	**HD / SDI Input**
2)	**Latches**	6)	**Component Input**
3)	**Expansion Out**	7)	**DVI / Expansion Input**
4)	**RGBHV Input**		

1) Thumb Screws

Two captive, spring-loaded **Thumb Screws** are provided to secure the module to the DX-700 chassis.

2) Latches

Two **Latches** are provided to ensure precise module insertion and extraction. Care is required when inserting or removing modules. Refer to the "**Module Insertion and Extraction**" section on page 57 for instructions.

3) Expansion Out

One DVI-I connector is provided for the **EXP OUT** (**Expansion Out**) port, which is used only with external and cross-bank stacking configurations. The port connects input modules together, guaranteeing that inputs are identical across banks or units. Input 1 on the "master" must connect to input 1 on the slave, etc.

~ For **external** stacking configurations between units, the **EXP OUT** port (on the "master") connects to the **DVI / EXP IN** port on the first slave unit's input module. Additional units can be stacked in this manner.

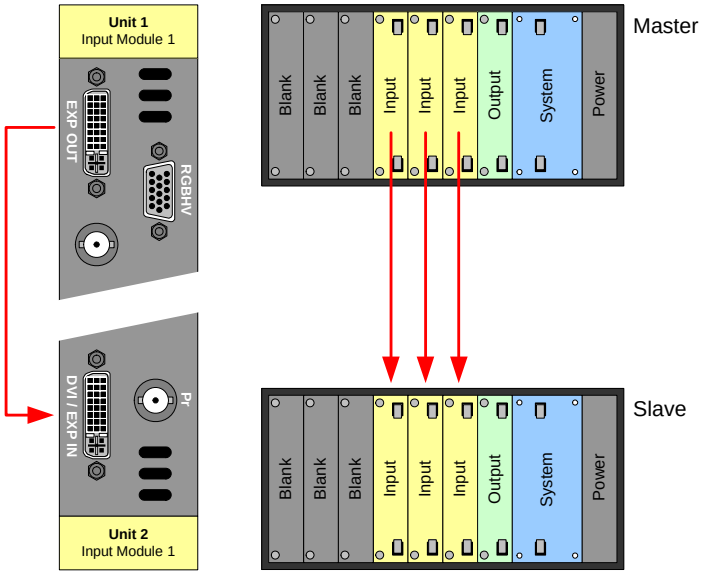


Figure 2-4. Sample Expansion Port configuration, external stacking

~ For **cross-bank** stacking configurations in one unit, the **EXP OUT** port (on bank 1) connects to the **DVI / EXP IN** port (on bank 2). Additional banks can be stacked in this manner.

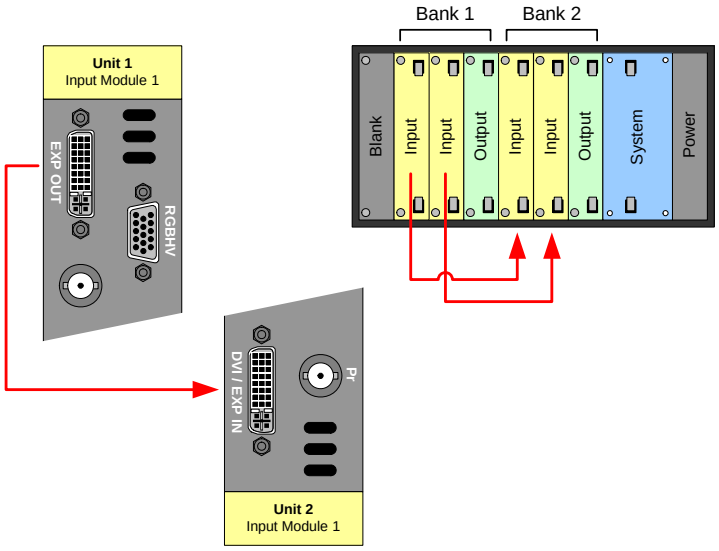


Figure 2-5. Sample Expansion Port configuration, cross-bank stacking

In Chapter 1, refer to the "**DX-700 Stacking**" section on page 26 for additional information about stacking and expansion links. In Appendix A, refer to the "**DVI-I Connector Pinouts**" section on page 180 for pinout information.

4) RGBHV Input

One 15-pin D connector is provided for the **RGBHV** input. This port accepts RGBHV inputs up to QXGA, with a maximum 240 MHz pixel clock. The pixel clock is the speed at which pixels are drawn or refreshed. In Appendix A, refer to the "**Analog 15-pin D Connector**" section on page 179 for pinout information.

5) HD / SDI Input

Two BNC connectors (labelled **1** and **2**) are provided for the **HD / SDI** input. A variety of input combinations are possible:

- 2 x **SD-SDI** — Connect one SD-SDI source to connector **1**, and a second SD-SDI source to the connector **2**.
- 2 x **HD-SDI** — Connect one HD-SDI source to connector **1**, and a second HD-SDI source to connector **2**.
- 1 x **SD-SDI**, 1 x **HD-SDI** — Connect one SD-SDI source to either connector **1** or **2**, and one HD-SDI source to the other connector.
- 1 x **Dual HD-SDI** — Connect the (two-wire) Dual HD-SDI source to connectors **1** and **2**.

In all cases, the DX-700 auto-detects which inputs have video present.

6) Component Input

Three BNC connectors (**Y / Comp**, **C / Pb** and **Pr**) are provided for either a composite, S-Video or Component input. In Chapter 3, refer to the "**Format Connection Table**" section on page 68 for a table of format combinations.

7) DVI / Expansion Input

One DVI-I connector is provided for the **DVI / EXP IN** port. This port accepts single or dual DVI inputs, with resolutions up to QXGA (2048 x 1536) with a maximum 240 MHz pixel clock. In Appendix A, refer to the "**DVI-I Connector Pinouts**" section on page 180 for pinout information.

Output Modules

The following topics are discussed in this section:

Output Module Description

The DX-700 offers two output modules:

- The **DVI Output Module** is designed for existing (legacy) LED products such as MiPIX, DLite 7 and OLite 612.
- The **NNI Output Module** is designed for next generation LED products, such as the NX-4, NX-6, FLX, and any future NNI-based LED tiles.

Each output module (regardless of type), provides three outputs. These outputs can drive one or more attached displays from any portion of a selected source image. In Chapter 1, refer to the "**Understanding Banks**" section on page 24 for more information. Each output module is fully shielded and field-installable.

Please note:

- A maximum of two output modules is allowed per bank.
- Each individual output is limited to a maximum resolution, depending on the type of module:
  - For **DVI** output modules, each output is limited to 800x600 pixels.
  - For **NNI** output modules, each output is limited to 1024x768 pixels.
- If a single output exceeds the maximum parameter, outputs can be "grouped" in order to increase the size of the output image. In Chapter 1, refer to the "**Theory of Operation**" section on page 20 for additional information on maximum output resolution and the DX-700's "canvas."

Note

The output aspect ratio is flexible. For example, for DVI modules, you can set the ratio to 800 x 600, 600 x 800, 300 x 1600, etc.

Important

You cannot mix tile categories within a bank. Thus, the following combination is *not allowed*:

- **Output Module 1**: MiPIX, DLite 7 (legacy tiles)
- **Output Module 2**: NX-4 (next generation tiles)

Output Module Block Diagrams

The figure below illustrates a simplified block diagram of the DVI Output Module:

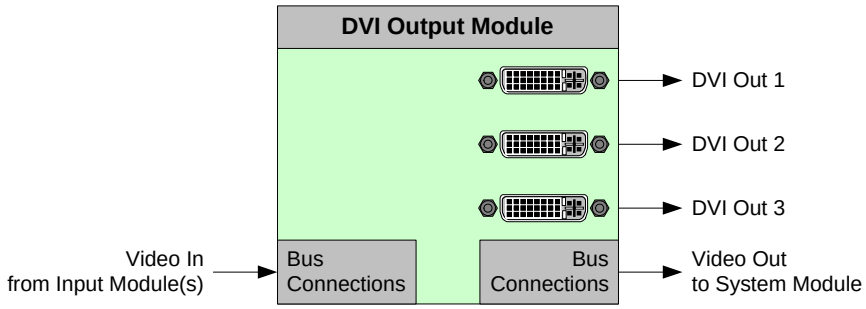


Figure 2-6. Block Diagram - DVI Output Module

The figure below illustrates a simplified block diagram of the NNI Output Module:

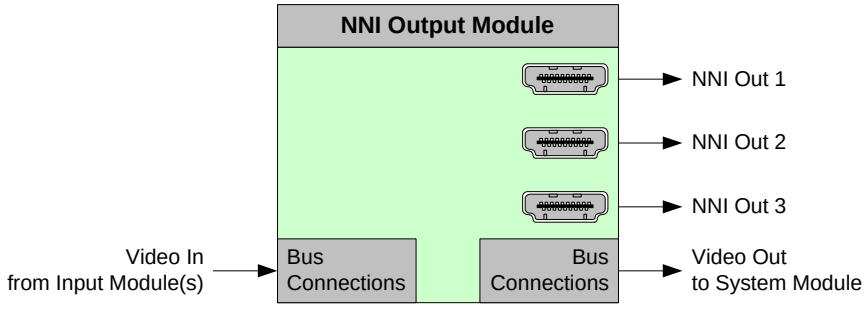


Figure 2-7. Block Diagram - NNI Output Module

DVI Output Module

The figure below illustrates the DX-700's **DVI Output Module**.

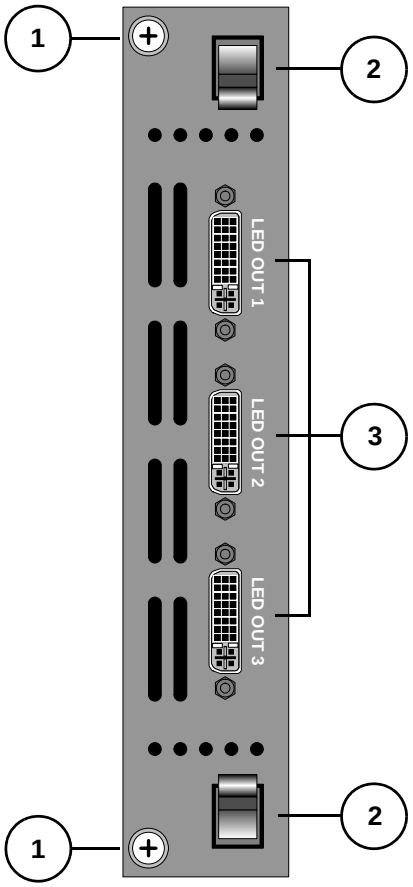


Figure 2-8. DX-700 DVI Output Module

1)	**Thumb Screws**	3)	**DVI Outputs**
2)	**Latches**		

1) Thumb Screws

Two captive, spring-loaded **Thumb Screws** are provided to secure the module into the DX-700 chassis.

2) Latches

Two **Latches** are provided to ensure precise module insertion and extraction. Care is required when inserting or removing modules. Refer to the "**Module Insertion and Extraction**" section on page 57 for instructions.

3) DVI Outputs

Three DVI-I connectors are provided for **DVI Outputs**, which connect to existing (legacy) LED products such as MiPIX and OLite 612. Each output can drive one attached display from any portion of a selected source image. Each output is

limited to a maximum resolution of 800 x 600. In Appendix A, refer to the "**DVI-I Connector Pinouts**" section on page 180 for pinouts.

Warning

The DVI-I connectors on the DVI output module use proprietary signals and pinouts.

Do not connect the output of a DVI output module to anything other than the input of a Barco DVI LED tile. Even though the connector is a DVI-I type connector, it is not a DVI signal, and serious damage could result if, for example, the output was plugged into a DVI-type monitor.

NNI Output Module

The figure below illustrates the DX-700's **NNI Output Module**.

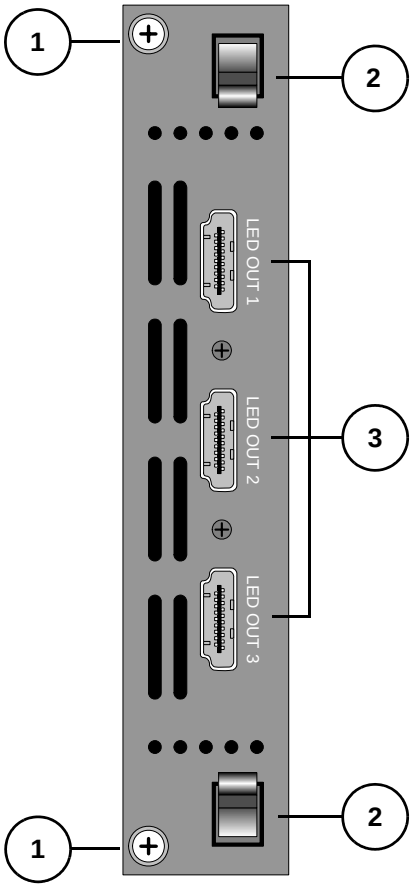


Figure 2-9. DX-700 NNI Output Module

1)	**Thumb Screws**	3)	**NNI Outputs**
2)	**Latches**		

1) Thumb Screws

Two captive, spring-loaded **Thumb Screws** are provided to secure the module into the DX-700 chassis.

2) Latches

Two **Latches** are provided to ensure precise module insertion and extraction. Care is required when inserting or removing modules. Refer to the "**Module Insertion and Extraction**" section on page 57 for instructions.

3) NNI Outputs

Three HDMI-type connectors are provided for **NNI Outputs**, which connect to new LED products such as NX-4. Each output can drive one attached display from any portion of a selected source image, and each output is limited to a maximum resolution of 1024 x 768.

In Appendix A, refer to the "NNI Connector" section on page 184 for pinout information.

Warning

The HDMI-type connectors on the NNI Output Module use proprietary signals and pinouts.

Do not connect the output of an NNI Output Module to anything other than the input of a Barco NNI LED tile. Even though the connector is an HDMI-type connector, it is not an HDMI signal, and serious damage could result if, for example, the output was plugged into an HDMI monitor.

System Module

One **System Module** is a requirement in all DX-700 units, and its location is always to the left of the **Power Supply**. The module provides the real-time OS (Operating System), as well as connections for synchronization, monitoring, control and diagnostics.

The figure below illustrates the System Module:

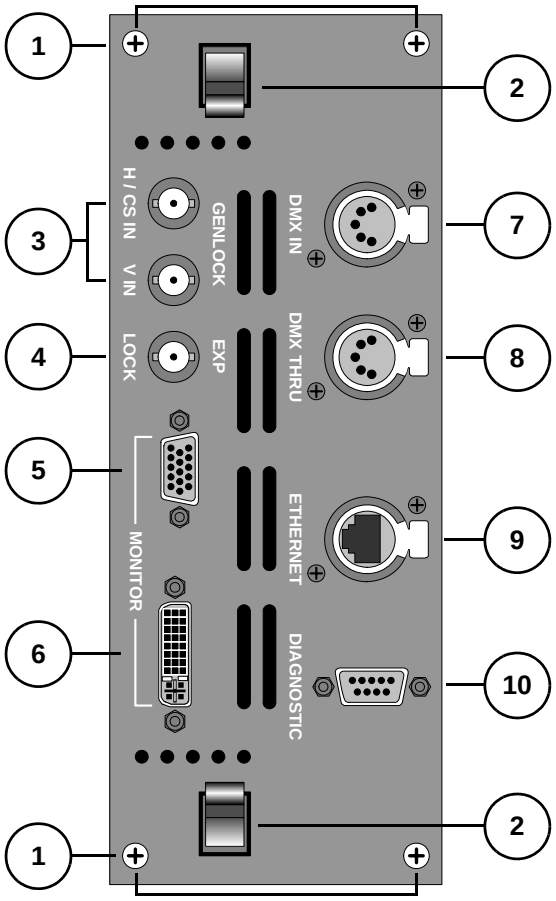


Figure 2-10. DX-700 System Module

1)	Screws	6)	DVI Monitor Out
2)	Latches	7)	DMX In
3)	Genlock Inputs	8)	DMX Thru
4)	Expansion Lock Output	9)	Ethernet
5)	RGBHV Monitor Out	10)	Diagnostic Port

1) Screws

Four standard **Screws** are provided to secure the module into the DX-700 chassis. The System Module does not use thumb screws.

2) Latches

Two **Latches** are provided to ensure precise module insertion and extraction. Care is required when inserting or removing modules. Refer to the "**Module Insertion and Extraction**" section on page 57 for instructions.

3) Genlock Inputs

Two BNC connectors are provided for the DX-700's **Genlock Inputs**, one each for **H / CS IN** and **V IN**. These connections enable the DX-700 to lock to an external black burst or composite sync signal.

4) Expansion Lock Output

One BNC connector is provided for the DX-700's **Expansion Lock Output** (**EXP LOCK**), a signal that enables the DX-700 to synchronize additional DX-700 units — when external stacking is used. The **EXP LOCK** port (on the "master") connects to the **H / CS IN** connector on the first slave unit. Additional units can be synchronized in this manner.

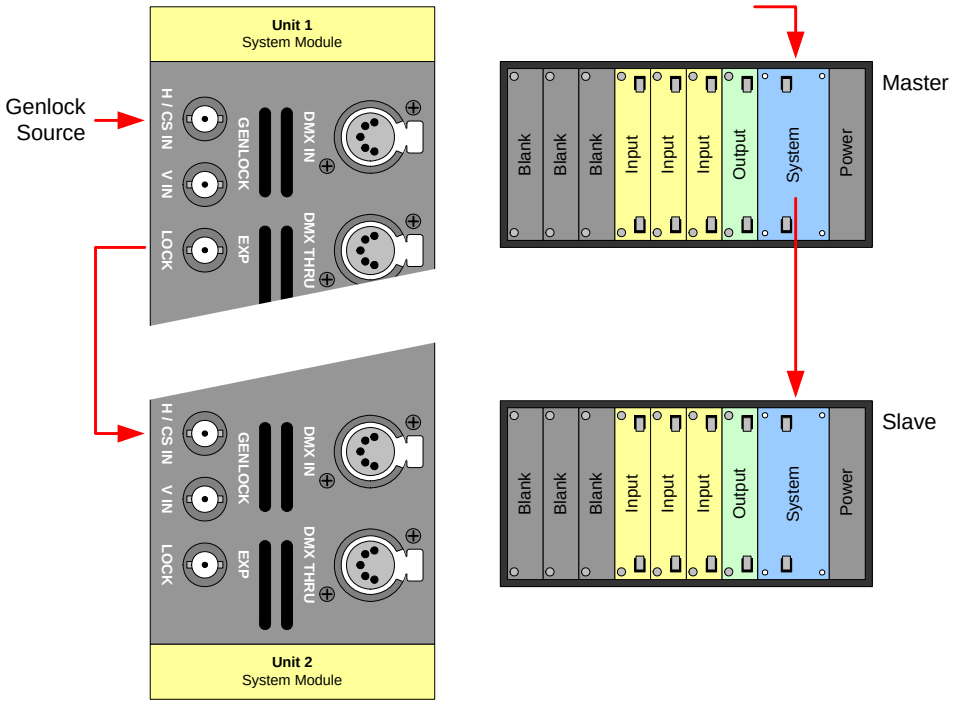


Figure 2-11. Sample genlock configuration, external stacking

Note that when the **EXP LOCK** signal connects to a slave DX-700, it also serves as a serial communication link between units to provide real-time command execution across all connected DX-700s.

5) RGBHV Monitor Out

One 15-pin D connector is provided for the **RGBHV Monitor Output**. In Appendix A, refer to the "**Analog 15-pin D Connector**" section on page 179 for RGB connector pinouts. Refer to the "**DX-700 Monitor Outputs**" section on page 54 for additional information on both monitor output ports.

6) DVI Monitor Out

One DVI-I connector is provided for the **DVI Monitor Output**. In Appendix A, refer to the "**DVI-I Connector Pinouts**" section on page 180 for DVI-I connector pinouts. Refer to the "**DX-700 Monitor Outputs**" section on page 54 for additional information on both monitor output ports.

7) DMX In

One XLR5 connector is provided for **DMX Input**. This port enables you to control the DX-700 from a lighting console or other DMX-capable device. In Appendix A, refer to the "**DMX Connector**" section on page 184 for pinouts.

Note	DMX control is currently not implemented.

8) DMX Thru

One XLR5 connector is provided for **DMX Thru**. This port enables you to loop control from the "master" DX-700 to additional slave units. In Appendix A, refer to the "**DMX Connector**" section on page 184 for pinouts.

Note	DMX control is currently not implemented.

9) Ethernet

One RJ-45 connector is provided for 100BaseT **Ethernet** communications with DX-700, using a socket connection over TCP/IP. The port is typically used for communications with Barco's **Director Toolset** Graphical User Interface (GUI).

The DX-700 defaults to DHCP operation. The default static IP address is **192.168.000.200**. Please note:

- The DX-700 returns to the DHCP mode after a factory reset.
- This address can be changed using the **Ethernet Menu**. In Chapter 4, refer to the "**Using the Ethernet Menu**" section on page 142 for details.

In Appendix A, refer to the "**Ethernet Connector**" section on page 183 for pinouts.

10) Diagnostic Port

One 9-pin D connector (**Diagnostic**) is provided for RS-232 serial communications with the DX-700. The port is reserved for factory and technical support use only.

In Appendix A, refer to the "**Diagnostic Connector**" section on page 183 for a connector illustration.

DX-700 Monitor Outputs

The DX-700 provides two identical monitor outputs, one each in RGB and DVI formats. Both outputs show the same video. Please note:

- Each port's output resolution can be selected, from 640 x 480 up to 2048 x 1080.
- Each monitor port enables you to view any of the active primary outputs, or the ports can be configured to display the overall output image (all wall sections) of a selected bank.
- A scaler within the System Module scales the selected video to fit into the monitor's output resolution.
- The output that you wish to monitor is selected on the **Monitor Output Menu**, and the selection applies to both the RGB and DVI monitor outputs. In Chapter 4, refer to the "**Using the Monitor Output Menu**" section on page 150 for details.

Module Installation and Configuration

The following topics are discussed in this section:

- **Module Configuration Rules**
- **Module Insertion and Extraction**
- **Storing Spare Modules**

Module Configuration Rules

DX-700 input and output modules can be configured in a variety of ways, but important sets of rules apply to their placement. As a prerequisite, ensure that you are familiar with the "**Understanding Banks**" section, on page 24 in Chapter 1.

Please note the following important "module" rules:

- In the most basic of DX-700 "single bank" configurations, you must have at least one input module and one output module — to route video to an LED wall.
- As you face the rear of the chassis, the right-most module within the entire **Input / Output Section** must always be an Output Module, and it must always be right-justified against the System Module.

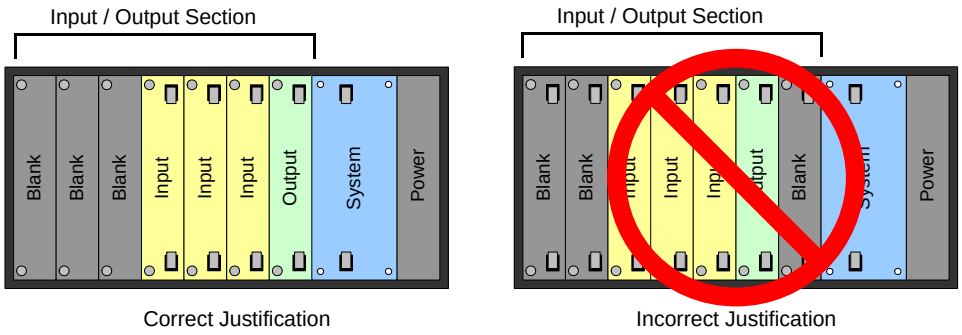


Figure 2-12. Right justification of Output Modules against the System Module

- Within any bank, all modules must be adjacent to each other — with no blank panels in-between, and all **Output Module(s)** are always right-justified.

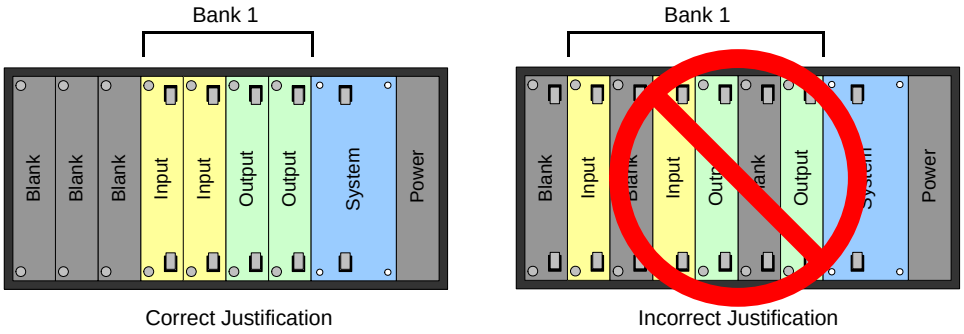


Figure 2-13. Adjacent modules within a bank

- In multi-bank configurations, all banks must be directly adjacent to one another, with no blank panels in between.

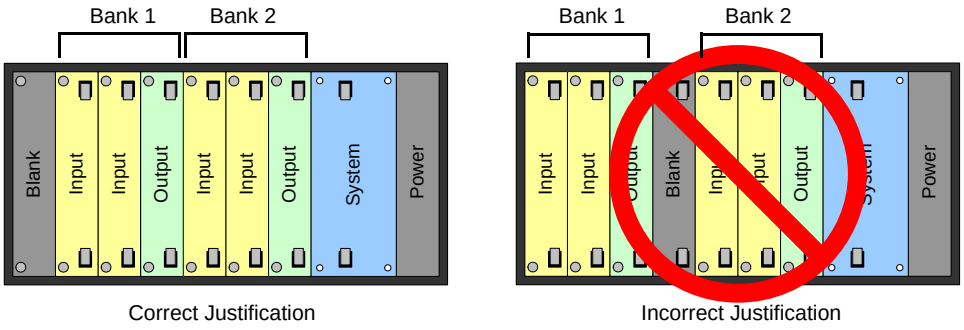


Figure 2-14. Adjacent banks

Important

With the exception of “spare” modules, if the DX-700 determines that any modules are incorrectly installed (or missing), a **Startup Diagnostic Menu** appears which prompts you to power down the DX-700 and re-configure your modules properly.

If the above prompt occurs, and provided that a System Module is properly installed, on the **Startup Diagnostic Menu** you will be able to press the **{DX-700 Management}** button, and access a subset of management functions. In Chapter 4, refer to the “**Power-Up Initialization**” section on page 77 for details.

Important

The DX-700 will not recognize modules that are installed to the left of a blank panel. They will be treated as spares. Refer to the “**Storing Spare Modules**” section on page 59 for additional details.

Important

Multi-bank configurations are currently not implemented.

Important

For proper chassis cooling, slots that do not contain input or output modules must always have blank panels installed.

Module Insertion and Extraction

The following procedures apply to input, output, and system modules.

Module Insertion

- To insert a module:

1. Ensure that the DX-700 power is off.
2. Orient the module so that the power connector is at the bottom.

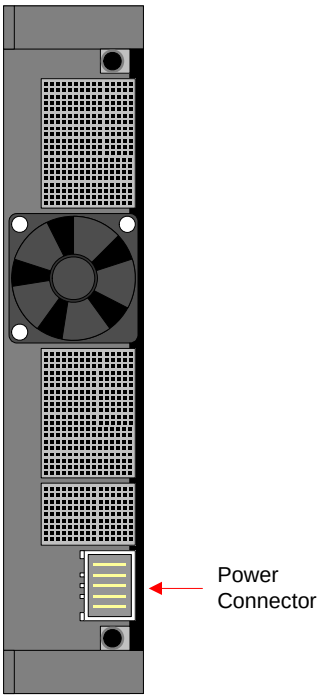


Figure 2-15. Rear view of module: correct orientation of power connector

3. Carefully insert the module, and push it into the chassis until the module's top latch is stopped against the chassis.

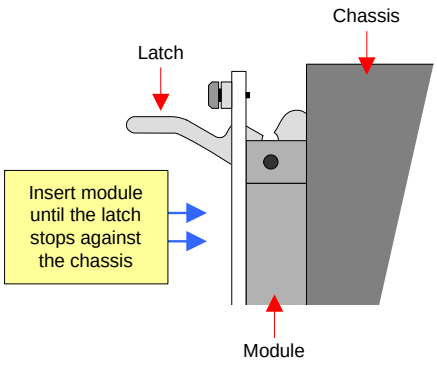


Figure 2-16. Module latch stopped against chassis

4. Raise the top latch until you can slide the module farther into the chassis — up to the latch's pivot point.

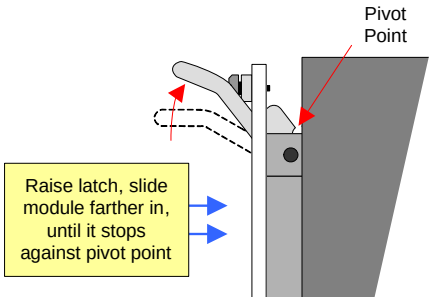


Figure 2-17. Latch raised, module inserted to pivot point

5. Simultaneously push both latches towards the center of the module, until the module is fully seated against the chassis.

Caution

Always push both latches simultaneously. If you use one latch only, you can damage the module.

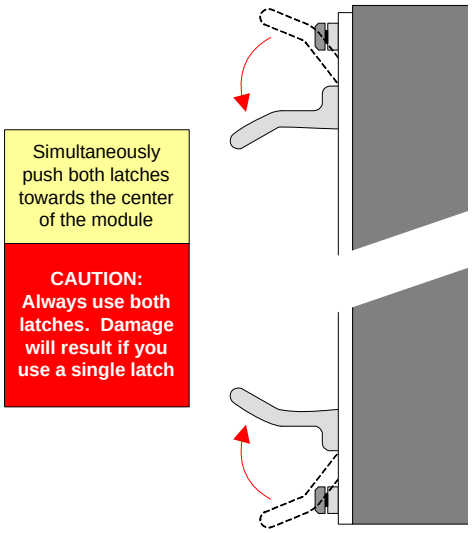


Figure 2-18. Latches pushed simultaneously towards center

6. Tighten both retaining screws to secure the module.

Module Extraction

- To extract a module:

1. Ensure that the DX-700 power is off.
2. Loosen both retaining screws on the module.
3. Simultaneously push both latches away from the center of the module.

Caution	Always push both latches simultaneously. If you use one latch only, you can damage the module.

4. When both latches are clear of the chassis, remove the module.

Storing Spare Modules

The DX-700 enables you to store spare modules within a chassis.

- Use the following steps to store spare modules in your DX-700 chassis:

1. Configure a bank properly, according to the rules outlined in the "**Module Configuration Rules**" section on page 55.
2. Install a blank panel immediately to the left of the bank's left-most input module.
3. In the remaining slots, insert spare input and output modules as desired. The DX-700 will ignore these modules during initialization, and treat them as spares.

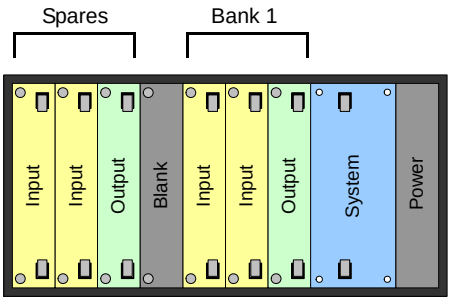


Figure 2-19. Spare Modules

3. Installation

In This Chapter

This chapter provides detailed instructions for installing the DX-700 hardware. The following topics are discussed:

Safety Precautions

For all DX-700 installation procedures, observe the following important safety and handling rules to avoid damage to yourself and the equipment:

- To protect users from electric shock, ensure that the power supplies for each unit connect to earth via the ground wire provided in the AC power cord.
- The AC Socket-outlet should be installed near the equipment and be easily accessible.

Unpacking and Inspection

Before opening the DX-700 box, inspect it for damage. If you find any damage, notify the shipping carrier immediately for all claims adjustments. As you open the box, compare its contents against the packing slip. If you find any shortages, contact your Barco sales representative.

Once you have removed all the components from their packaging and checked that all the listed components are present, visually inspect each unit to ensure there was no damage during shipping. If there is damage, notify the shipping carrier immediately for all claims adjustments.

Site Preparation

The environment in which you install your DX-700(s) should be clean, properly lit, free from static, and have adequate power, ventilation, and space for all components.

Cable and Adapter Information

The table below provides information regarding supplied cables and adapters:

Table 3-1. DX-700 cables and adapters

Cable / Adapter	Description	Quantity
AC Power Cord	7 foot, 10A	1 US, 1 EU
Ethernet Cable	15M	1
Crossover adapter		1
DVI Cable	5 M. One cable provided with each DVI output module	1
NNI Cable	Latching cable, 7.5 M. One cable provided with each NNI output module	1

Please note:

- No cables are supplied with input modules. Customers must provide their own DVI-I, RGB, and SDI cables. Some cables (e.g., DVI-I) can be purchased from Barco. Please contact your Barco sales representative for details.

Rack-Mount Installation

DX-700 units are designed to be rack mounted and are supplied with front rack-mount hardware. Please note the following important points:

- Rear rack-mount brackets are installed on the base unit, as shipped.
- When rack mounting the unit, remember that the maximum ambient operating temperature for the unit is 40 degrees C.
- Leave sufficient front and rear space to ensure that the airflow through the fan and vent holes is not restricted.
- When installing equipment into a rack, distribute the units evenly to prevent hazardous conditions that may be created by uneven weight distribution.
- Connect the unit only to a properly rated supply circuit.
- Reliable grounding (earthing) of rack-mounted equipment should be maintained.
- Rack mount the unit from the front rack ears using four rack screws (not supplied). Rack threads may be metric or otherwise — depending upon the rack type.
- Install the *lower* of the two mounting holes first.

Power Installation

- Use the following steps to install power to the DX-700:

  1. Connect an AC power cord to the AC Power Connector on the rear of the DX-700, and then to an AC outlet.
  2. Connect AC Power cords (or AC adapters) to all peripheral equipment, such as video sources and PCs. Please note:
     - ~ Connect each unit only to a properly rated supply circuit.
     - ~ Reliable grounding of rack-mounted equipment should be maintained.
  3. Ensure that your LED wall(s) are properly assembled, and that all power cords are distributed and connected to all tiles — in the proper sequence. Refer to your specific LED tile's User's Guide for details.

Power Cord/Line Voltage Selection

DX-700 is rated to operate with the following specifications:

- Input Power: 100-240 VAC, 50-60 Hz
- Power Consumption: 500 watts maximum

DX-700 performs line voltage selection automatically, and no user controls are required. The AC power cords must be accessible so that they can be removed during field servicing.

Warning

When the DX-700 is used in the 230-volt mode, a UL listed line cord rated for 250 volts at 15 amps must be used and must conform to IEC-227 and IEC-245 standards. This cord will be fitted with a tandem prong-type plug.

The rear panel ON/OFF switch does not disconnect the unit from input AC power. To facilitate disconnection of AC power, the power cord must be connected to an accessible outlet near the unit.

Building Branch Circuit Protection: For 115 V use 20 A, for 230 V use 8 A.

Figure 3-1. Tandem Prong-type Plug

Avertissement

La choix de la ligne de voltage se réalise automatiquement par le DX-700 Transformateur Graphique. On n'a pas besoin du controller usager pour la choix de la ligne de voltage.

Warnung

Das DX-700 gerät mu beim Anschlu an 240V ~ mit einer vom VDE auf 250V/10A geprüften Netzleitung mit einem Schukostecker ausgestattet sein.

Signal Connection

This section provides basic instructions for connecting physical sources and signals, to and from the DX-700.

Note — Setup instructions are provided in Chapter 4, "**Operation**."

- Use the following steps to connect signals to/from the DX-700:

1. **Input module connections**

   a. Connect outputs from your selected sources to DX-700's inputs. The "universal" input module accepts inputs in analog, component, DVI, Dual-DVI, HD-SDI, SD-SDI, and Dual HD-SDI formats.

   - In Chapter 2, refer to the "**Input Module**" section on page 41 for details on all input module connectors.
   - For analog connections, refer to the "**Format Connection Table**" section on page 68 for connection details using a customer supplied breakout cable.

   Note — There are no looping inputs on the input module.

   b. Repeat step **1a** for all additional input modules in your configuration.

2. **Stacking connections**

   Note — Cross-bank stacking and external stacking functions are currently not implemented.

3. **DVI output module connections**

   Each DVI output module provides three identical outputs, each limited to a maximum resolution of 800 x 600.

   a. Ensure that your "legacy" LED wall(s) are properly assembled, and that all data cables are connected to all tiles — in the proper sequence. Refer to your specific LED tile's User's Guide for details.

   b. Per your configuration, connect the DVI output(s) to the data input(s) of your LED wall(s). In Chapter 2, refer to the "**DVI Output Module**" section on page 47 for details on all module connectors.

   c. (**Option**) If you are using a fiber optic link:

   - Ensure that power is properly connected to all Fiberlink units.
   - Per your configuration, connect DVI outputs to the inputs of the Fiberlink Transmitter(s).
   - Per your configuration, connect fiber optic cables from the outputs of the Fiberlink Transmitter(s) to the inputs of the Fiberlink Receiver(s).
   - Connect the output of the Fiberlink Receiver(s) to the data input of your LED wall(s).

d. Repeat steps **2a** through **2c** for all additional DVI output modules in your system configuration.

Important

You cannot mix output module types within a bank.

Warning

The DVI-I connectors on the DVI output module use proprietary signals and pinouts.

Do not connect the output of a DVI output module to anything other than the input of a Barco DVI LED tile. Even though the connector is a DVI-I type connector, it is not a DVI signal, and serious damage could result if, for example, the output was plugged into a DVI-type monitor.

4. NNI output module connections

Each NNI output module provides three identical outputs, each limited to a maximum resolution of 1024 x 768.

a. Ensure that your "new generation" LED walls (such as the Barco NX-4 and FLX) are properly assembled and cabled. Refer to your specific LED tile's **User's Guide** for details.

b. Per your configuration, connect the NNI output(s) to the data input(s) of your LED wall(s). In Chapter 2, refer to the "**NNI Output Module**" section on page 49 for details on all module connectors.

c. (**Option**) If you are using a fiber optic link:

- Ensure that power is properly connected to all Fiberlink units.
- Per your configuration, connect NNI outputs to the inputs of the Fiberlink Transmitter(s).
- Per your configuration, connect fiber optic cables from the outputs of the Fiberlink Transmitter(s) to the inputs of the Fiberlink Receiver(s).
- Connect the output of the Fiberlink Receiver(s) to the data input of your LED wall(s).

d. Repeat steps **3a** through **3c** for all additional NNI output modules in your system configuration.

Warning

The HDMI-type connectors on the NNI output module use proprietary signals and pinouts.

Do not connect the output of an NNI output module to anything other than the input of a Barco NNI LED tile. Even though the connector is an HDMI-type connector, it is not an HDMI signal, and serious damage could result if, for example, the output was plugged into an HDMI monitor.

5. Genlock connections

In Chapter 2, refer to the "**System Module**" section on page 51 for details on all module connectors.

a. To genlock the DX-700 using a single sync connection, connect a composite sync or black burst signal to the **H / CS IN** connector.

b. To genlock the DX-700 using separate connections, connect horizontal and vertical sync signals to the **H / CS IN** and **V IN** connectors.

Note

To “freerun” DX-700, no sync connections are required. Use the **Genlock Menu** to select freerun. In Chapter 4, refer to the “**Understanding Genlock Options**” section on page 153.

6. Director Toolset connections

Director Toolset is required for LED wall calibration and certain advanced LED configurations, but it is not required for initial setup. The DX-700 Setup Wizard is used for “basic” setups.

a. Connect the **Ethernet** port on your laptop PC to the **Ethernet** port on DX-700. Use a crossover cable for a direct connection, or use a standard Ethernet cable in conjunction with an Ethernet switch.

b. Ensure that the **Director Toolset** is properly installed on the laptop PC.

7. Monitor connections

a. Connect an analog monitor to the **RGB Monitor** output, and/or a DVI monitor to the **DVI Monitor** output, per your requirements. Both outputs show the same monitor signal.

8. DMX connections

Note

DMX control is currently not implemented.

This completes system signal connection. Please continue with system setup, menu orientation and operations, as outlined in Chapter 4, “**Operation**” on page 69.

Format Connection Table

Use the following table to connect various source formats to the DX-700, using the system's **YUV** input (3 x BNC connectors) on the input module. Please note:

- **RGB format** — typical devices: Computers
- **S-Video (Y/C) format** — typical devices: S-Video DVD or VCR
- **YUV or YP_bP_r (Betacam) format** — typical devices: DVD player, Betacam deck
- **Composite format** — typical devices: NTSC/PAL DVD or VCR

Cells with checks denote the connections required for the indicated format.

Table 3-2. Analog Input Combinations using YUV input

Input Connector	Composite Video	S-Video (Y/C)	YUV (YP_bP_r)	RGB Sync on G
Y	✓	✓ (Luma)	✓ (Luma)	✓ (G)
U		✓ (Chroma)	✓ (P_b)	✓ (B)
V			✓ (P_r)	✓ (R)

4. Operation

In This Chapter

This chapter provides comprehensive menu descriptions and detailed operating instructions for the DX-700. The following topics are discussed:

Quick Setup and Operations

For the optimum speed in system setup and operations, this section provides a quick "recipe" for system setup and operations. Links are provided for each complete procedure outlined below.

Important

This quick start procedure works for Barco (legacy) LED products such as MiPIX, DLite 7 and OLite 612, and newer NNI-based LED products such as NX-4 and NX-6.

The procedure does *not* work for "creative" LED products such as MiTRIX, MiSPHERE and MiSTRIP. For those products, please refer to the "**Director Toolset User's Guide**" for instructions.

- Use the following "recipe" for quick system setup and operations:

1. Ensure that your LED wall(s) are properly installed and cabled.
2. Ensure that the DX-700 is properly installed in your equipment rack. In Chapter 3, refer to the "**Rack-Mount Installation**" section on page 63 for instructions.
3. Ensure that all DX-700 modules are firmly seated and installed in the proper configuration. In Chapter 2, refer to the "**Module Installation and Configuration**" section on page 55 for instructions.
4. Ensure that all sources and signals are properly connected to/from the DX-700. In Chapter 3, refer to the "**Signal Connection**" section on page 65 for instructions.
5. Turn on power to your LED walls and Fiberlink connections.
6. Turn on power to the DX-700. Refer to the "**Power-Up Initialization**" section on page 77 for details.
7. If you are using the DX-700 for the first time, or if it has just returned from a show, perform a factory reset to remove saved presets and restore system default settings. Refer to the "**Performing a Factory Reset**" section on page 146 for more information.
8. Calibrate the Touch Screen. Refer to the "**Using the Front Panel Display Adjustments Menu**" section on page 145 for details.
9. If you wish to set a specific delay mode (other than Standard delay mode), access the **Reduced/Minimum Delay Menu** and "pre-select" the desired mode. Refer to the "**Pre-selecting the Delay Mode**" section on page 159 for instructions on setting and changing the delay mode.
10. Run the **Setup Wizard** to set up your LED wall outputs and create "groups." Refer to the "**Using the Setup Wizard**" section on page 80 for instructions.

Important

Ensure that you set up all outputs, and configure all your output groups.

11. Run the **Input Wizard**. Refer to the "**Using the Input Wizard**" section on page 93 for complete instructions.

Important	Ensure that you save a system "preset" after you configure each input.

12. Fine tune your inputs as required. Refer to the "**Using the Input Management Menu**" section on page 107 for instructions.
13. Fine tune your displays as required. Refer to the "**Using the Display Management Menu**" section on page 124 for instructions.
14. Recall the desired preset, and you're ready to go. Refer to the "**Using the Preset Management Menu**" section on page 103 for instructions.

This completes the "quick setup" procedure.

Quick Function Reference

Use the following table to quickly access the proper menu for a specific function. Both hyperlinks and page numbers are provided.

Table 4-1. DX-700 Quick Function Reference Table

How to:	Use the Following:	Page
Adjust clip to sub-black	Adjusting Image Processing Parameters	115
Adjust color space	Adjusting Viewport Settings	114
Adjust display brightness	Using the Front Panel Display Adjustments Menu	145
Adjust image freeze	Adjusting Video Effects	119
Adjust image polarity	Adjusting Video Effects	119
Adjust image processing	Adjusting Image Processing Parameters	115
Adjust image strobe	Adjusting Video Effects	119
Adjust image to monochrome	Adjusting Video Effects	119
Adjust input balance	Adjusting Input Balance	118
Adjust input brightness	Adjusting Image Processing Parameters	115
Adjust input contrast	Adjusting Image Processing Parameters	115
Adjust input H position	Adjusting Input Timing	121
Adjust input H total	Adjusting Input Timing	121
Adjust input hue	Adjusting Image Processing Parameters	115
Adjust input opacity	Adjusting Video Effects	119
Adjust input size and position	Using the Input Wizard	93
Adjust input pixel phase	Adjusting Input Timing	121
Adjust input RGB brightness	Adjusting Input Balance	118
Adjust input RGB contrast	Adjusting Input Balance	118
Adjust input saturation	Adjusting Image Processing Parameters	115
Adjust input sharpness	Adjusting Image Processing Parameters	115
Adjust input timing	Adjusting Input Timing	121
Adjust input V Position	Adjusting Input Timing	121
Adjust input view port	Using the Input Wizard	93
Adjust luma tracking	Adjusting Image Processing Parameters	115
Adjust RGB color key values	Adjusting Color Effects	120
Adjust RGB threshold and mask values	Adjusting Color Effects	120
Adjust video effects	Adjusting Video Effects	119

Table 4-1. DX-700 Quick Function Reference Table (Continued)

How to:	Use the Following:	Page
Adjust viewport settings	Adjusting Viewport Settings	114
Adjust wall contrast	Using the Input Wizard	93
Adjust wall contrast	Managing LED	126
Adjust wall gamma	Using the Input Wizard	93
Adjust wall gamma	Managing LED	126
Adjust wall OSD	Managing LED	126
Adjust window settings	Adjusting Window Settings	112
Auto acquire the input	Adjusting Viewport Settings	114
Calibrate the display	Using the Front Panel Display Adjustments Menu	145
Change the canvas orientation	Refreshing the Canvas Size	160
Change IP address	Using the Ethernet Menu	142
Change monitor video	Using the Monitor Output Menu	150
Change Z-Order	Changing Z-Order	110
Check the firmware version	Using the DX-700 Status Menu	138
Control the DX-700	Controlling the DX-700	76
Delay processing pre-selection	Pre-selecting the Delay Mode	159
Delete a single preset	Delete a Preset	106
Delete all presets	Delete All Presets	106
Display a single output on the monitor	Using the Monitor Output Menu	150
Display an input test pattern	Adjusting Window Settings	112
Display Fiberlink properties	Managing Fiberlink Settings	130
Display monitor raster box	Using the Monitor Output Menu	150
Display monitor test patterns	Using the Monitor Output Menu	150
Display output raster box	Using the Test Pattern Menu	148
Display output test patterns	Using the Test Pattern Menu	148
Display the canvas (bank) on the monitor	Using the Monitor Output Menu	150
Display wall internal test patterns	Managing LED	126
Enable a color key	Adjusting Color Effects	120
Force display power on/off	Forcing the Display	133
Freeze an input	Adjusting Video Effects	119
Generate Fiberlink receiver test patterns	Managing Fiberlink Settings	130
Generate Fiberlink transmitter test patterns	Managing Fiberlink Settings	130
Group outputs	Using the Setup Wizard	80

Table 4-1. DX-700 Quick Function Reference Table (Continued)

How to:	Use the Following:	Page
Lock / Unlock front panel	Front Panel Lockout	165
Manage a display	Using the Display Management Menu	124
Manage an LED display	Managing LED	126
Manage Ethernet	Using the Ethernet Menu	142
Manage Fiberlink	Managing Fiberlink Settings	130
Manage Inputs	Using the Input Management Menu	107
Perform a factory reset	Performing a Factory Reset	146
Perform a system save	Global Input Management Functions	109
Perform a system save	Saving DX-700 Management Settings	164
Perform front panel tests	Using the Diagnostics Menu	143
Perform key tests	Using the Diagnostics Menu	143
Perform system diagnostics	Using the Diagnostics Menu	143
Perform system tests	Using the Diagnostics Menu	143
Power on DX-700	Power-Up Initialization	77
Reboot the system	Rebooting the System	145
Recall a preset	Recall a Preset	104
Rename a preset	Rename a Preset	105
Restore default system configurations	Performing a Factory Reset	146
Save a preset	Using the Input Wizard	93
Save the system	Global Input Management Functions	109
Save the system	Saving DX-700 Management Settings	164
Select an input	Using the Input Wizard	93
Set delay mode processing	Pre-selecting the Delay Mode	159
Set EDID parameters for any input	Using the EDID Menu	151
Set EDID parameters for the active input	Adjusting Image Processing Parameters	115
Set monitor format	Using the Monitor Output Menu	150
Set monitor test patterns	Using the Monitor Output Menu	150
Set output test patterns	Using the Test Pattern Menu	148
Set static IP or DHCP	Using the Ethernet Menu	142
Set up inputs	Using the Input Wizard	93
Set up monitor	Using the Monitor Output Menu	150
Set up outputs	Using the Setup Wizard	80
Strobe an input	Adjusting Video Effects	119

Table 4-1. DX-700 Quick Function Reference Table (Continued)

How to:	Use the Following:	Page
Test communications	Using the Diagnostics Menu	143
Test the display	Using the Diagnostics Menu	143
Test the system	Using the Diagnostics Menu	143
Use the DX-700 Management Menu	Using the DX-700 Management Menu	134
Use the EDID menu	Using the EDID Menu	151
Use the Genlock menu	Understanding Genlock Options	153
Use the Home Menu	Using the Home Menu	78
Use the Input Wizard	Using the Input Wizard	93
Use the Setup Wizard	Using the Setup Wizard	80
View Ethernet status	Using the Ethernet Menu	142
View system status	Using the DX-700 Status Menu	138

Controlling the DX-700

This section reviews the methods by which you can control the DX-700. The front panel is ideal for all "basic" system configurations, while the Director Toolset is required for more advanced system configurations. All control methods are discussed below.

- **Touch Screen**

  Use the **Touch Screen** to access (activate) all menus and functions. "Touchable" controls include buttons, arrows, sliders, value boxes, lists, keypads, and graphic displays of DX-700 modules (with integral buttons). In Chapter 2, refer to the "**Touch Screen Conventions**" section on page 36 for additional information.

- **Softkeys**

  Six un-labeled buttons called **Softkeys** are located to the left of the Touch Screen. Softkey labels (when present) appear as **blue buttons** in the Touch Screen's left-hand column, indicating an associated function. To activate a function, press the blue button on the Touch Screen or press the adjacent softkey.

- **Navigation Buttons**

  On the front panel, the **Navigation Section** includes four "arrow" buttons plus an **ENTER** button. As an alternate to pressing Touch Screen buttons, use the arrows to move the cyan-colored "**focus**" from button to button. To activate a highlighted function, press **ENTER**.

- **Function Section**

  Below the **Navigation Section**, the **Function Section** includes three buttons.

  ~ Press **TEST PAT** to access the **Test Pattern Menu**. Refer to the "**Using the Test Pattern Menu**" section on page 148 for details.

  ~ Press **PRESETS** to access the **Preset Management Menu**. Refer to the "**Using the Preset Management Menu**" section on page 103 for details.

  ~ Press **BLACK** to take all outputs to black. Press again to restore the previous output video configuration.

- The **Director Toolset** (version 2.0 or later) is required for more "advanced" system configurations, including those involving Barco's "creative" series of tiles and modules. The **Director Toolset** is a software application used to control the DX-700 and provide it with information concerning tile setup and configuration.

Note

Operations of the **Director Toolset** are not covered in this guide. Refer to the "**Director Toolset User's Guide**" for more information.

- The DX-700 can be controlled remotely. Refer to Appendix B, "**Remote Control Protocol**" on page 185 for details.

Power-Up Initialization

- Use the following steps to power-up the DX-700:

1. After connecting AC to the DX-700, locate the **Power Switch** on the rear of the chassis, and turn the power **ON**. While the system is initializing, the DX-700 splash screen appears.

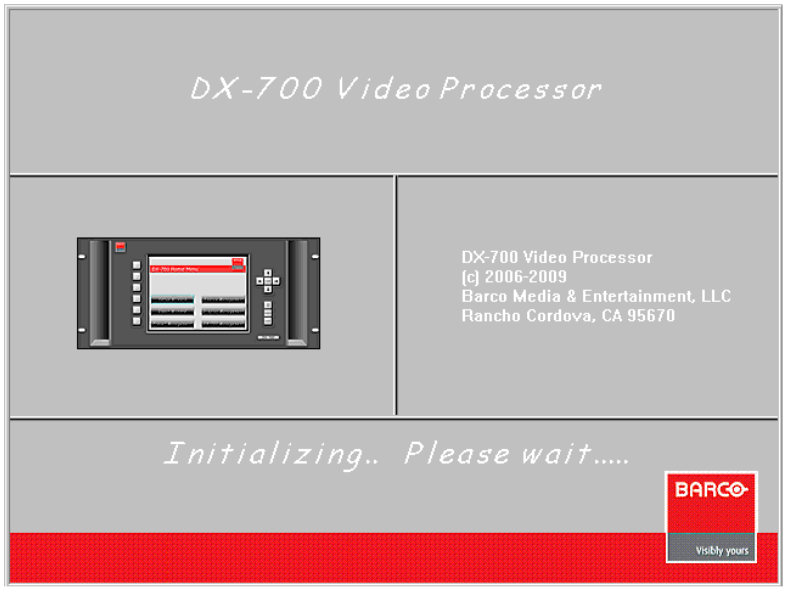


Figure 4-1. DX-700 Splash Screen

During this interval, the DX-700 discovers how your system's banks and modules are configured. After a brief pause, the **Home Menu** appears.

2. When using the DX-700 for the first time or when using a system that has just returned from a show, perform a **Factory Reset**. For details, refer to the "**Performing a Factory Reset**" on page 146.

Important	With the exception of "spare" modules, if the system determines that any modules are incorrectly installed or missing, a **Startup Diagnostic Menu** appears which prompts you to power down the system and re-configure the modules.

If the above prompt occurs, and provided that a System Module is properly installed, on the **Startup Diagnostic Menu** you can press **{DX-700 Management}** and access a subset of management functions:

- {Properties}
- {Ethernet}
- {Diagnostic}
- {System Reset}

Refer to the "**Using the DX-700 Management Menu**" section on page 134 for details on all DX-700 management functions.

Using the Home Menu

The figure below illustrates the **Home Menu**.

Figure 4-2. DX-700 Home Menu

Use the **Home Menu** to run setup wizards and manage all aspects of DX-700 operations. On this menu:

- Press **{Setup Wizard}** to run the **Setup Wizard** for outputs, followed by the **Input Wizard** for input setup. Refer to the "**Using the Setup Wizard**" section on page 80 for instructions.
- Press **{Input Wizard}** to run the input wizard, which includes input setup and preset creation. Refer to the "**Using the Input Wizard**" section on page 93 for instructions.
- Press **{Preset Management}** to recall presets. Refer to the "**Using the Preset Management Menu**" section on page 103 for instructions.
- Press **{Input Management}** to adjust properties of any active input — such as wall position, brightness, and effects. Refer to the "**Using the Input Management Menu**" section on page 107 for instructions.
- Press **{Display Management}** to manage output display (LED) parameters and Fiberlink module parameters. The **Fiberlink NNI Multi-mode Transmitter** and **Receiver** are used to connect the DX-700 to NNI-based LED tiles via a fiber optic cable. Refer to the "**Using the Display Management Menu**" section on page 124 for instructions. Refer to Appendix D, "**Fiberlink NNI Installation**" on page 205 for more information about the Fiberlink modules.
- Press **{DX-700 Management}** to view system properties, configure your monitor, run diagnostics and test patterns, adjust Ethernet properties, save a system "start-up" file, reset the system, set genlock parameters, or configure "expert" modes such as delay processing. Refer to the "**Using the DX-700 Management Menu**" section on page 134 for instructions.

Output Table Description

For your reference, an “output table”' is provided at the top of various DX-700 menus, such as the **Output Selection Menu** shown in the illustration below.

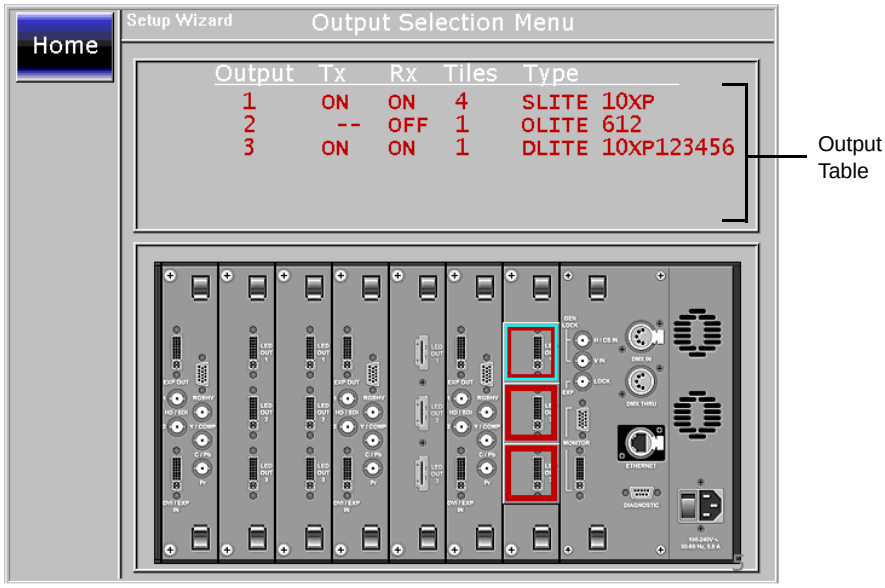


Figure 4-3. Output Selection Menu (sample)

The table lists the following information from left to right:

- **Output**: DX-700 Output #. Numbering within a bank is as follows:

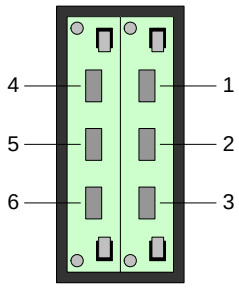


Figure 4-4. Output numbering

- **Tx**: Fiberlink transmitter status: **ON**, **OFF**, or **--** (n/a).
- **Rx**: Fiberlink receiver status: **ON**, **OFF**, or **--** (n/a).
- **Tiles**: # of tiles detected, as connected to the specific output.
- **Type**: Type of Barco LED tile.

In the table, the color of the text is significant:

- **White** text indicates “tiles not detected.”
- **Red** text indicates “tiles detected,” but the output is not set up.
- **Green** text indicates the output is set up.

In the rear panel graphic, the color of the output buttons mirrors that of the text:

- A **Green** button indicates that tiles are detected and the output is set up.
- A **Red** button indicates that tiles are detected, but the output is not set up.
- A **Gray** button indicates an output on which tiles are not detected.
- **Cyan** indicates “focus.”

For the **Tx** and **Rx** columns in the table, different combinations of status provide important Fiberlink information, as shown below:

Table 4-2. Tx and Rx status combinations

Tx Column	Rx Column	Description
ON	**ON**	Fiberlink NNI Transmitter is detected. Receiver is detected. The system will list tile quantities and type — provided that tiles are properly connected to the receiver.
ON	**OFF**	Transmitter is detected. Receiver is detected, but it is off. The system will not list tile quantities and type.
ON	– –	Transmitter is detected. Receiver is not detected. The system will not list tile quantities and type.
– –	– –	Transmitter is not detected. Receiver is not detected. The system will not list tile quantities and type.
– –	– –	Transmitter is not detected. Receiver is not detected. Fiberlink is not used. Instead, a direct connection is used between DX-700 and the tiles. The system will list tile quantities and type — provided that tiles are properly connected to DX-700.
– –	– –	Transmitter is not detected. Receiver is not detected. Fiberlink is not used. Instead, CompactLink is used, but it is transparent to DX-700.

Using the Setup Wizard

The following topics are discussed in this section:

Setup Wizard Menu Trees

The Setup Wizard menu tree varies slightly, depending on the type of output module that you are setting up. The figure below illustrates the Setup Wizard menu tree for **DVI Output Modules**:

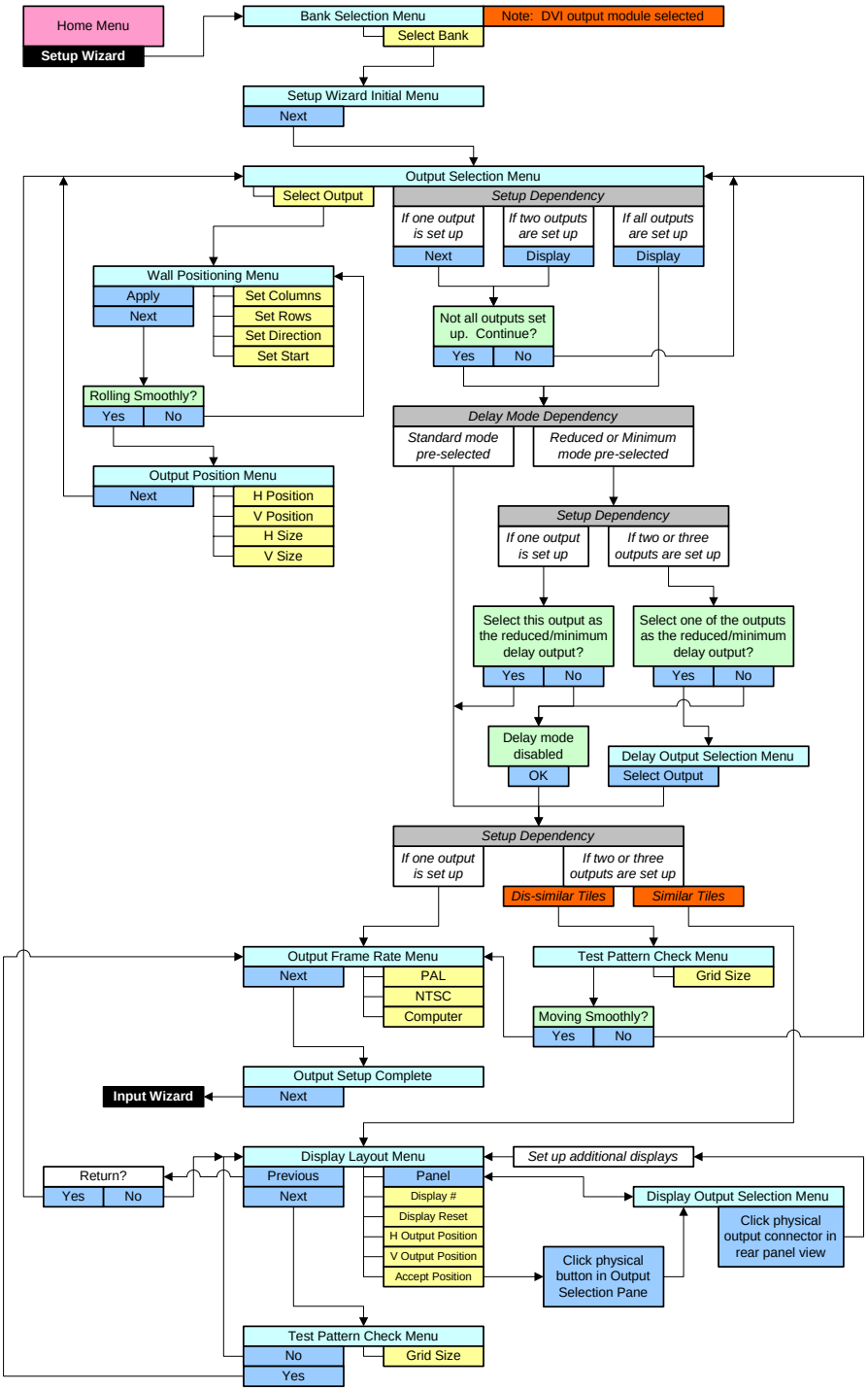


Figure 4-5. Setup Wizard Menu Tree for DVI Output Modules

The figure below illustrates the Setup Wizard menu tree for **NNI Output Modules**:

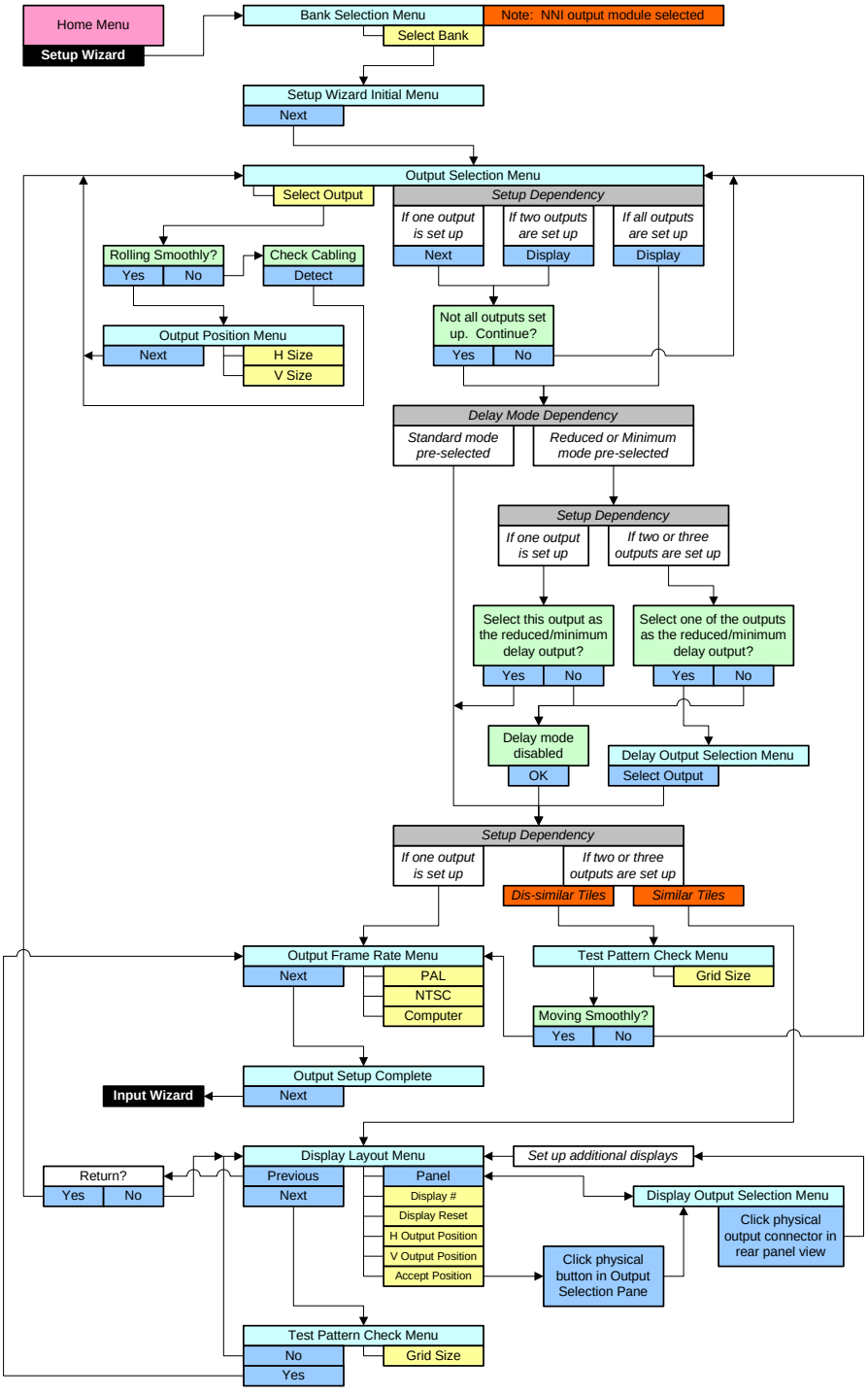


Figure 4-6. Setup Wizard Menu Tree for NNI Output Modules

Note

In the previous two menu trees, the **{Previous}** and **{Home}** buttons have been omitted for simplicity.

Setup Wizard Operations

The Setup Wizard steps you through the process of setting up outputs, setting up output groups (if required), and then takes you directly to the Input Wizard to set up inputs.

The first portion of the Setup Wizard, which starts below, deals exclusively with output and group setup. In this procedure (for each output), you will set the size of the output raster to match the size of your LED wall.

Before you begin, be sure that all LED walls are connected to the DX-700.

- Use the following steps to use the Setup Wizard:

1. Ensure that all your LED wall(s) are properly installed and cabled.
2. Ensure that all outputs from all output modules are properly connected to the inputs of your wall(s).

Important

This step is critical. Once you enter the Setup Wizard, all LED walls that you wish to set up must be connected to the various DX-700 outputs. If you forget to set up an output and you opt to set it up after concluding the wizard, you will be required to set up *all* walls again after you re-enter the wizard.

3. On the **Reduced/Minimum Delay Menu**, ensure that you pre-select the desired type of delay processing you want for a selected output: standard, reduced, or minimum delay mode. Refer to the "**Pre-selecting the Delay Mode**" section on page 159 for instructions on setting and changing the delay mode.
4. From the **Home Menu**, press **{Setup Wizard}** to display the **Bank Selection Menu**:

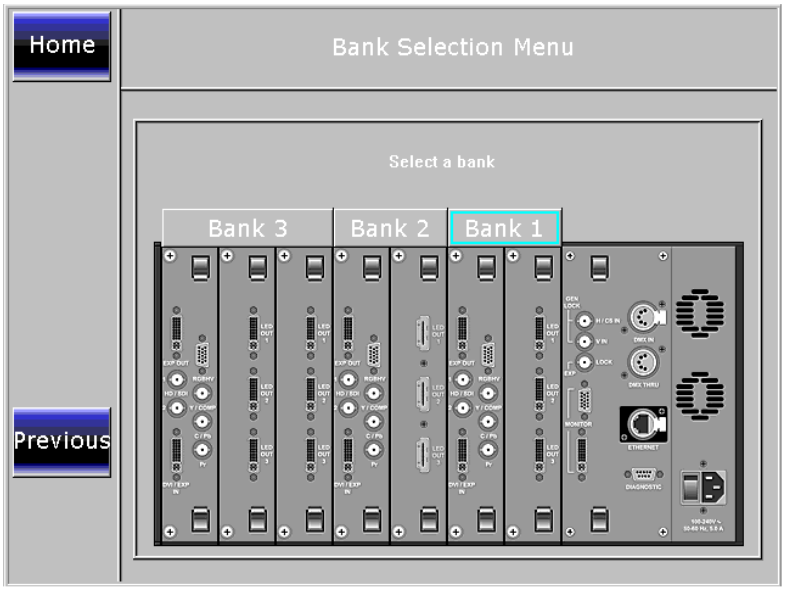


Figure 4-7. Setup Wizard: Bank Selection Menu (sample)

5. Directly above the rear-panel graphic, press the button for the **bank** whose outputs you wish to set up.

The **Setup Wizard Initial Menu** appears.

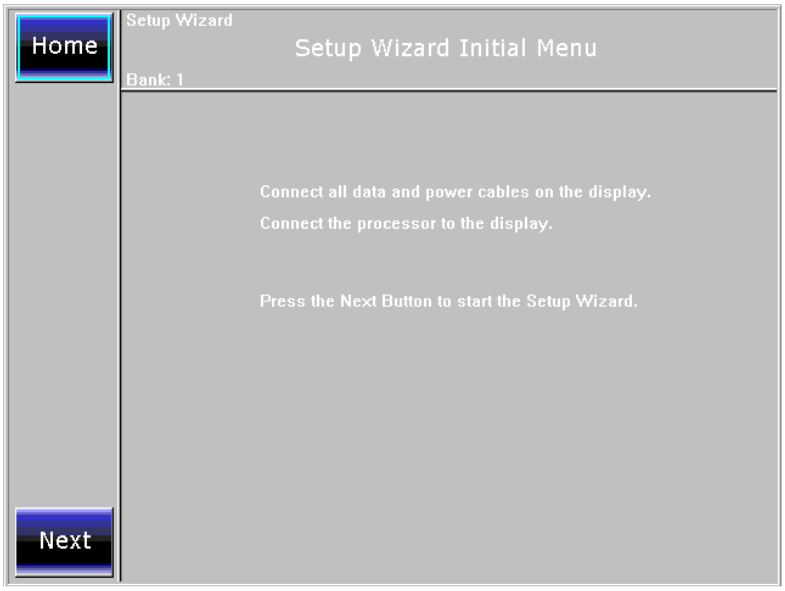


Figure 4-8. Setup Wizard: Initial Menu (sample)

This menu reminds you to verify all of your data, power and processor connections. At the top of the menu, the label **Bank: [n]** indicates the bank on which you are configuring outputs.

6. Press **{Next}**. The system discovers the system configuration, including all input and output modules, and all LED connections to all outputs. At the conclusion of the discovery process, the **Output Selection Menu** appears, which includes a graphic of the rear panel and a representation of the installed modules.

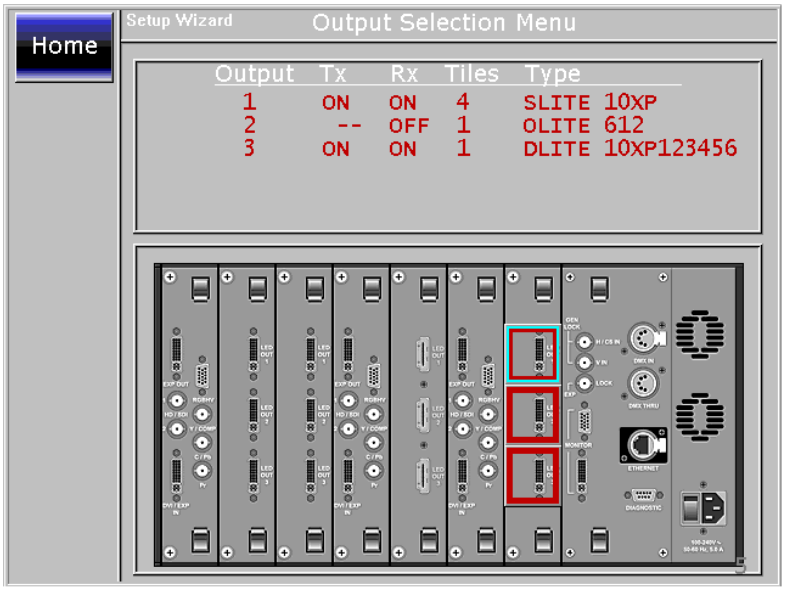


Figure 4-9. Setup Wizard: Output Selection Menu (sample)

At the top of the **Output Selection Menu**, the output table lists current system information. Refer to the "**Output Table Description**" section on page 79 for a description of the data. Below the table is the rear panel graphic. Please note:

- ~ Each output is a button.
- ~ Color is significant:
  - **Red** indicates "tiles detected," but the output is not set up.
  - **Green** indicates the output is set up.
  - **Gray** indicates "tiles not detected."
  - **Cyan** indicates "focus."

7. Press the button for the output that you wish to set up.

Note

If you press a gray button for an output in which tiles have not been detected, the system provides a series of intelligent troubleshooting tests for power, cables and Fiberlink connections.

8. Depending on the type of output module(s), the following options are available:

- ~ For a bank that uses **NNI output modules**, the **Test Pattern Rolling** prompt appears. Please continue with step **14**.
- ~ For a bank that uses **DVI output modules**, the **Wall Positioning Menu** appears. Please continue with step **9** below.

9. For tiles connected to **DVI output modules**, the **Wall Positioning Menu** enables you to set dimensions, direction, and the starting point. The number of "detected" tiles is shown. The figure below shows the **Set Dimensions Section** of the menu.

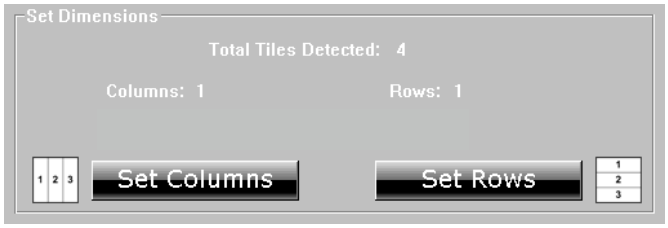


Figure 4-10. Wall Positioning Menu: Set Dimensions Section (sample)

- ~ Press **{Set Columns}**, and use the keypad to enter the number of columns in the wall. The **Set Start Section** of the menu updates.
- ~ Press **{Set Rows}**, and use the keypad to enter the number of rows in the wall. Both the **Set Direction** and **Set Start** sections update.

10. In the **Set Direction Section**, press the button for the direction in which your tiles are wired — either **{Horizontal}** or **{Vertical}**.

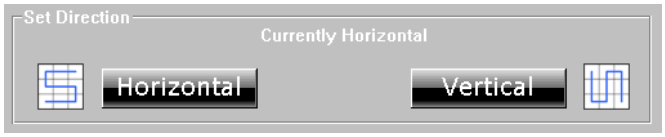


Figure 4-11. Wall Positioning Menu: Set Direction Section (sample)

11. In the **Set Start Section**, press the button for the point at which your wiring starts — either **{Top Left}**, **{Bottom Left}**, **{Top Right}**, or **{Bottom Right}**.

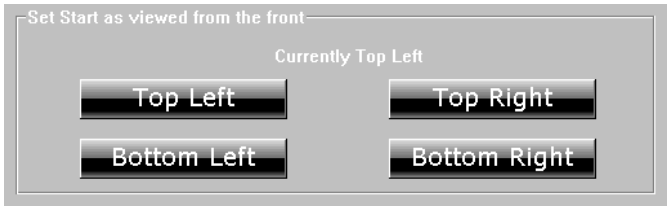


Figure 4-12. Wall Positioning Menu: Set Start Section (sample)

12. Press **{Apply}**.

~ If all parameters have been properly set, the **{Next}** button appears.

~ If the system detects a mismatch between the number of tiles detected and the number entered, a pop-up message appears. You will need to start the procedure again from step **9**.

13. Press **{Next}**.

14. The **Test Pattern Rolling** prompt appears.

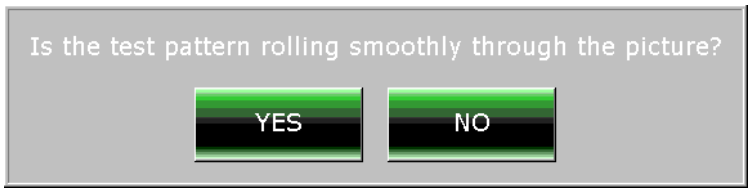


Figure 4-13. Test Pattern Rolling Prompt

~ Press **{Yes}** if the test pattern is rolling smoothly. The **Output Position Menu** is displayed. Please continue with step **15**.

~ Press **{No}** if the test pattern is not rolling smoothly:

- For DVI tiles, the system remains on the **Wall Positioning Menu**, enabling you to re-enter correct tile information.
- For NNI tiles, you will be asked to check all cabling, and then click the **{Detect}** button.

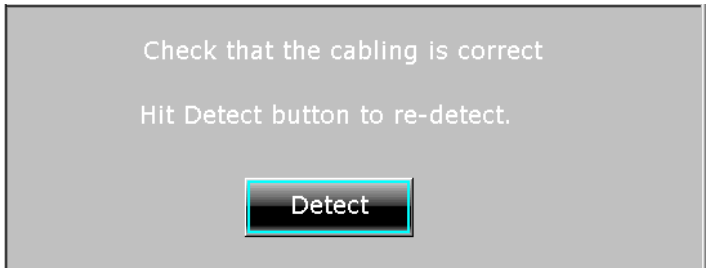


Figure 4-14. Detect function for NNI tiles

After clicking **{Detect}**, the system returns to the **Output Selection Menu** at the beginning of the wizard.

15. The **Output Position Menu** enables you to precisely adjust image size and position until all four sides of the raster box are visible.

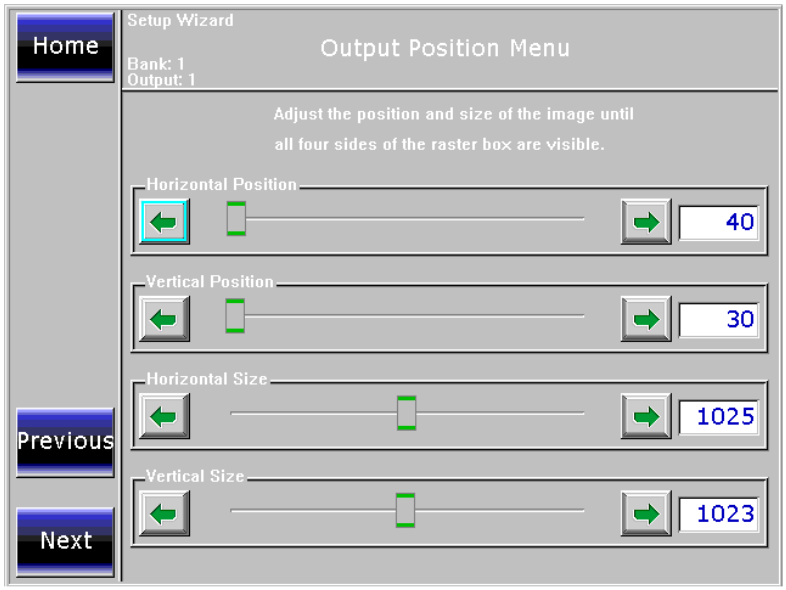


Figure 4-15. Setup Wizard: Output Position Menu (sample)

To adjust the raster box (in pixels):

- For DVI tiles, use the **{Horizontal Position}**, **{Vertical Position}**, **{Horizontal Size}** and **{Vertical Size}** controls.
- For NNI tiles, use the **{Horizontal Size}** and **{Vertical Size}** controls. The other sliders do not appear.

16. Press **{Next}** to display the **Output Selection Menu** again. Several options are available:
    - To set up any remaining outputs, select an output and repeat the setup procedure from step 7.
    - If you have only one output set up, press **{Next}**. Please continue with step 17.
    - If two or more outputs have been set up, press **{Display}**. Please continue with step 18.
17. (**One output is set up**) If there are remaining outputs to set up, you will be prompted to continue. If you elect to continue, and if you have pre-selected the "reduced" or "minimum" delay modes on the **Reduced/Minimum Delay Menu**, you will be prompted to assign the current output as the delay output.

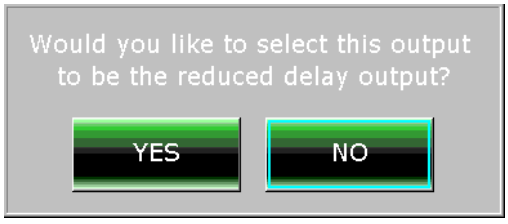


Figure 4-16. Select current output as the delay mode output

- Select **{Yes}** to assign the output to operate in the selected delay mode.
- Select **{No}** to disable the selected delay mode in the DX-700.

Important

Choosing **{Yes}** does *not* enable the selected delay mode immediately. The mode will be enabled once an input is selected and routed to the designated output, from within the **Input Wizard** routine.

Once a selection is made (either **{Yes}** or **{No}**), the **Output Frame Rate Menu** appears. Please continue with step **22**.

18. (**Two or more outputs are set up**) If there are remaining outputs to set up, you will be prompted to continue. If you elect to continue, and if you have pre-selected the "reduced" or "minimum" delay modes, you will be prompted to select a specific output as the reduced or minimum delay output.

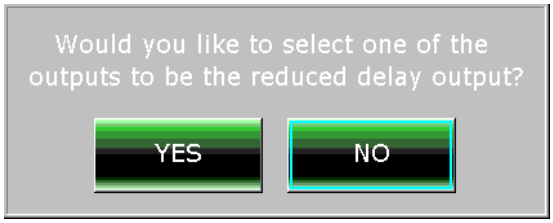


Figure 4-17. Select specific output as the delay mode output

- Select **{Yes}** to display the **Delay Output Selection Menu**, which is essentially identical to the **Output Selection Menu**. Select an output and press **{OK}** in the confirmation dialog.
- Select **{No}** to disable the selected delay mode in the DX-700.

Important

Choosing **{Yes}** and selecting an output does *not* enable the selected delay mode immediately. The mode will be enabled once an input is selected and routed to the designated output, from within the **Input Wizard** routine.

Once a selection is made (either **{Yes}** or **{No}**), two branches are available:

~ If dissimilar types of tiles were set up on each output, the **Test Pattern Check Menu** appears. Please continue with step **19**.

~ If similar types of tiles were set up on each output, the **Display Layout Menu** appears, which enables you to group outputs if desired. Please continue with step **20**.

19. The **Test Pattern Check Menu** generates a rolling test pattern for all outputs.

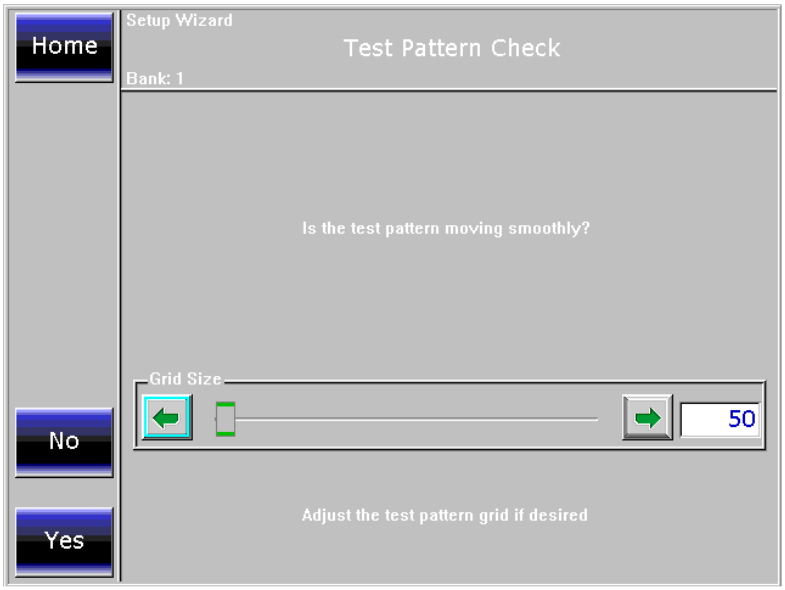


Figure 4-18. Setup Wizard: Test Pattern Check Menu (sample)

Verify that the test pattern is moving smoothly, and if required, adjust the grid size (in pixels).

- Press **{Yes}** if the test pattern is moving smoothly. The **Output Frame Rate Menu** appears. Please continue with step **22**.
- Press **{No}** if the pattern is not moving smoothly. The system returns to the **Output Selection Menu**, from which you must repeat or modify the setup process. Please continue with step **7**.

20. The **Display Layout Menu** enables you to configure output groups (if desired), provided that similar types of tiles were set up on two or more outputs. On the menu itself, a group is referred to as a "**display**," which is essentially an array comprised of two our more outputs, and which is treated as one by the system. Please note:

- If you ***do not*** want to group a particular output, select an arbitrary display number (from 1 to 6), and set it's output position as 1 (Horizontal) by 1 (Vertical).
- If you ***do*** want to group two or more outputs, select an arbitrary display number (from 1 to 6), and set the desired Horizontal by Vertical array.

Important It is strongly recommended that you set up all of your outputs, prior to accessing the **Display Layout Menu**. If you return to the **Output Selection Menu** at any point by pressing **{Previous}**, all group information for the bank is cleared.

Important Remember that if you group outputs, the assigned delay mode (e.g., minimum or reduced) applies to the entire group.

The **Display Layout Menu** is arranged into four sections:

~ The top section shows the current bank, and provides help text.

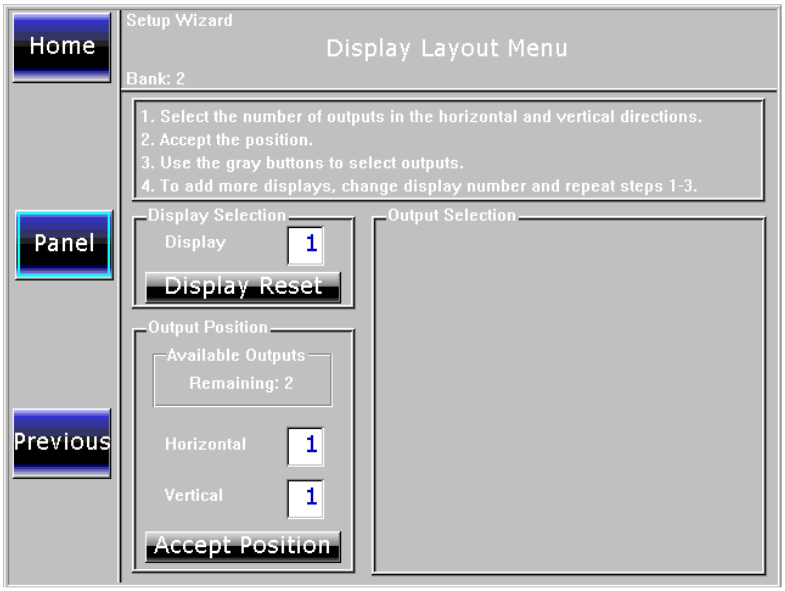


Figure 4-19. Setup Wizard: Display Layout Menu (sample)

~ The **Display Selection Section** enables you to choose an arbitrary display number (from 1 to 6), for the group you wish to create.

Note

Each group that you create is assigned a unique color. These colors are used on various menus and buttons to denote the groups. Refer to the "**Group Color Scheme**" section on page 92 for details.

~ The **Output Position Section** indicates the number of remaining outputs, enables you to set the selected group's physical dimensions, and allows you to "accept" the group's position.

~ Finally, the **Output Selection Section** enables you to associate each output position with a physical DX-700 output.

■ Use the following steps to configure a group:

a. In the **Display Selection Section**, select an arbitrary display number that you wish to configure (from 1 to 6). Display **1** is the default.

Note

You can also use this control to switch between groups that have already been set up, to view their configurations.

b. In the **Output Position Section**, indicate how the group is arranged — in terms of your physical walls. For example:

- If you have three walls constructed side by side, each connected to an output, your output position is **H3** x **V1**.
- If you have four walls constructed in a square, then your output position is **H2** x **V2**.

Press the **{Horizontal}** value box, and use the keypad to enter the number of horizontal outputs. Press the **{Vertical}** value box, and use the keypad to enter the number of vertical outputs.

If required, press **{Display Reset}** to reset the **H** and **V** values to 1 x 1.

c. Press **{Accept Position}** to display a graphic in the **Output Selection Section** that represents your selected **H** and **V** arrangement. Each gray square represents an output position.

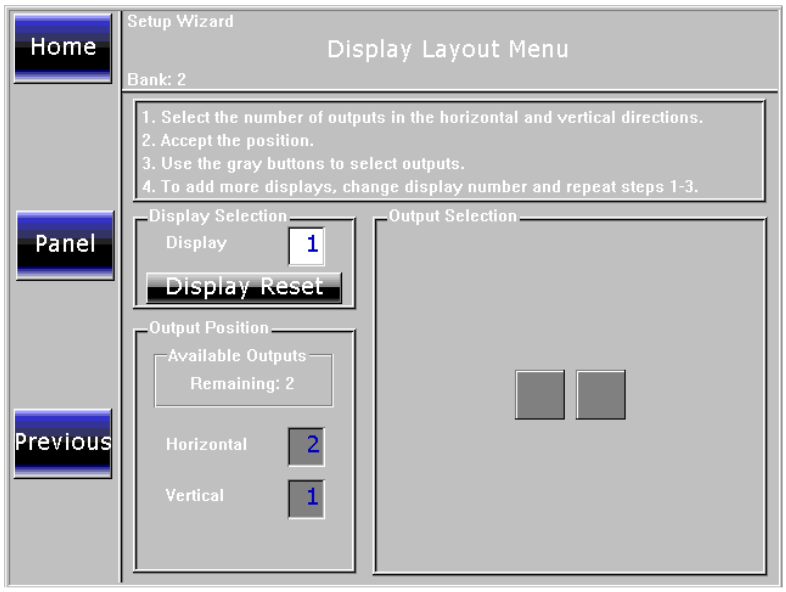


Figure 4-20. Display Layout Menu: Output Position Arrangement (sample)

d. To associate each logical output position with a physical DX-700 output, press a gray "output" square. The **Display Output Selection Menu** appears, with a representation of the rear panel, and buttons for each physical output that you have set up.

e. On the **Display Output Selection Menu**, press the button for the output you want to associate. The system returns to the **Display Layout Menu**, and in the **Output Selection Section**, the assignment appears on the selected button — along with the group's unique color. Refer to the "**Group Color Scheme**" section on page 92 for color details.

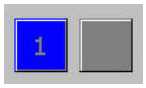


Figure 4-21. Output Assignment

f. Repeat steps **d** and **e** for all remaining outputs, if desired.

Important

At least *one* output must be configured as a group (even in a 1 x 1 array), in order to proceed to the next step. However, you do not have to configure groups for all outputs. Depending on your wall configurations, you can configure groups only for those outputs that you wish to combine into larger arrays, and leave the remaining outputs "ungrouped."

Note that two additional options are available prior to completing the "group" configuration procedure:

- If you want to review the available physical outputs, press **{Panel}** to display the **Display Output Selection Menu**.
- Press **{Previous}** to return to the **Output Selection Menu**.

Caution

If you return to the **Output Selection Menu**, all group information for the bank will be cleared.

g. With all desired groups configured, press **{Next}**. If you have not set up all outputs, you will be prompted to continue. When **{Yes}** is selected, the **Test Pattern Check Menu** appears.

21. On the **Test Pattern Check Menu**, verify that the system-generated test pattern is moving smoothly, and if required, adjust the grid size (in pixels).

~ Press **{Yes}** if the test pattern is moving smoothly. The **Output Frame Rate Menu** appears. Please continue with step **22**.

~ Press **{No}** if the pattern is not moving smoothly. The system returns to the **Display Layout Menu**, where you must modify the group(s).

22. On the **Output Frame Rate Menu**, select the desired output frame rate, then select **{Next}** to display the **Output Setup Complete Menu**. This completes the output setup wizard.

~ Press **{Next}** to enter the Input Wizard. You will be prompted to enter the Input Wizard; press **{OK}** at the prompt. Please continue with the "**Using the Input Wizard**" section on page 93.

~ Press **{Home}** to exit the Setup Wizard completely.

Note

If you exit the wizard, it is strongly recommended that you run the Input Wizard next.

Group Color Scheme

When you create a group on the **Display Layout Menu**, unique colors are assigned to each group, to enable you to identify groups easily and quickly. Once a group is created, from that point forward, these colors appear on buttons in the **Output Selection Menu**, the **Status Menu**, and the buttons in the **Display Layout Menu**.

The figure below illustrates the group color scheme:

Figure 4-22. Group colors

Remember that group numbers are *arbitrary* reference numbers (from 1 to 6), for the various groups you can create.

Using the Input Wizard

The following topics are discussed in this section:

- **Input Wizard Menu Tree**
- **Input Wizard Operations**

Input Wizard Menu Tree

The figure below illustrates the Input Wizard menu tree:

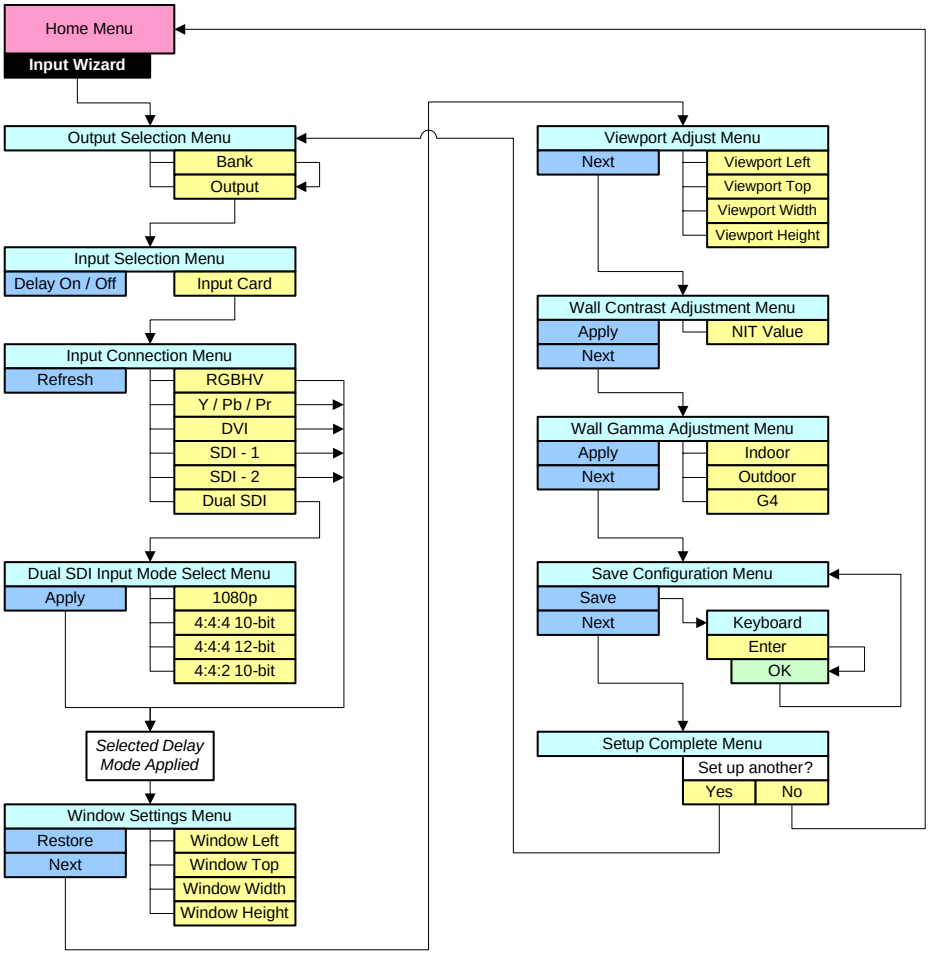


Figure 4-23. Input Wizard Menu Tree

Note

In the menu tree above, the **{Previous}** and **{Home}** buttons have been omitted for simplicity.

Input Wizard Operations

During the output setup procedure (as described in the "**Setup Wizard Operations**" section) you set the raster size for each output to match the size of your wall. That procedure created a specific "pixel space" or output region for each output on the canvas.

The **Input Wizard** enables you to place an input inside each output region, and adjust its size, position, contrast and gamma.

Note

These parameters can also be fine-tuned outside of the Input Wizard, by using the tools in the **Input Management Menu**. Refer to the "**Using the Input Management Menu**" section on page 107 for details.

- Use the following steps to use the Input Wizard:

  1. There are two ways to enter the Input Wizard:

  ~ From the **Home Menu**, press **{Input Wizard}**.

  ~ From the Setup Wizard, the Input Wizard starts automatically upon completion of the Setup Wizard's output setup and grouping steps.

  2. Upon entering the Input Wizard, the **Output Selection Menu** appears.

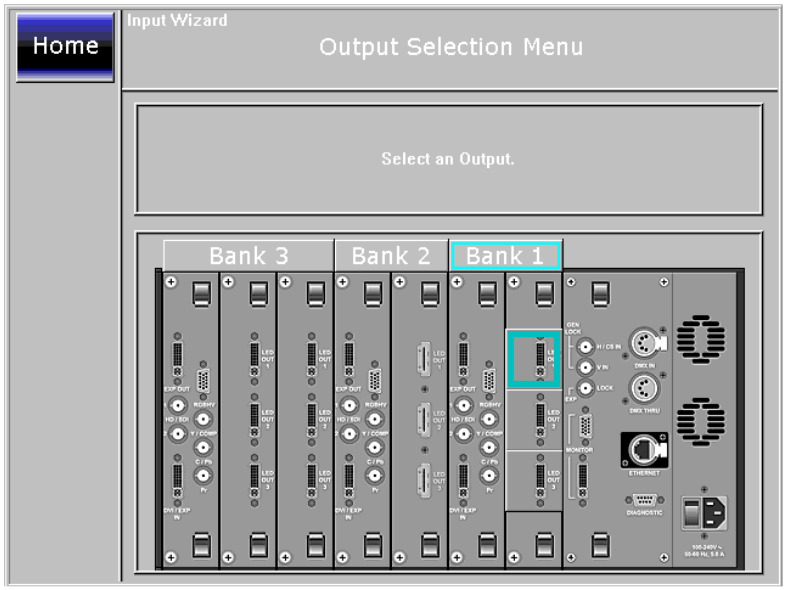


Figure 4-24. Input Wizard: Output Selection Menu (sample)

The rear panel graphic shows which banks are present, and which outputs (and groups) have been set up within those banks. Color is significant:

~ **Cyan** indicates "focus"

~ **Gray** indicates an output that has been set up, but not grouped.

~ **Group colors** are identical to those in the Setup Wizard. Refer to the "**Group Color Scheme**" section on page 92 for color details.

Select the bank, then select the output (or output group) to which you want to assign a specific input.

3. The **Input Selection Menu** appears with an input card in focus. If there are multiple input cards installed for the bank, you can select the desired input card. The green connector indicates the “currently” selected input, or the “default” input (if this is the first time the Input Wizard has been used).

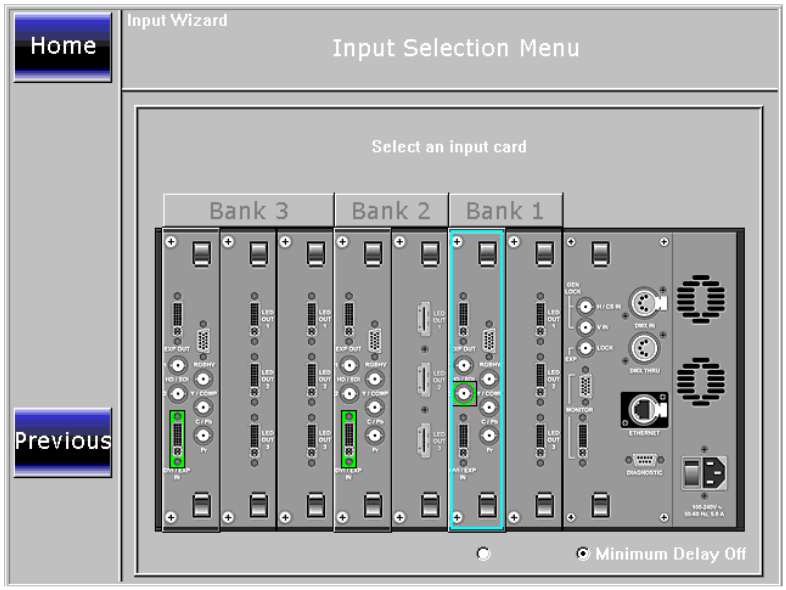


Figure 4-25. Input Wizard: Input Selection Menu (sample)

   a. Select the input card that contains the input that you wish to set up.

   b. Use the radio buttons to enable or disable the selected delay mode. This function provides a final opportunity to enable/disable delay, before the mode is actually applied.

4. The **Input Connection Menu** appears for the selected input card.

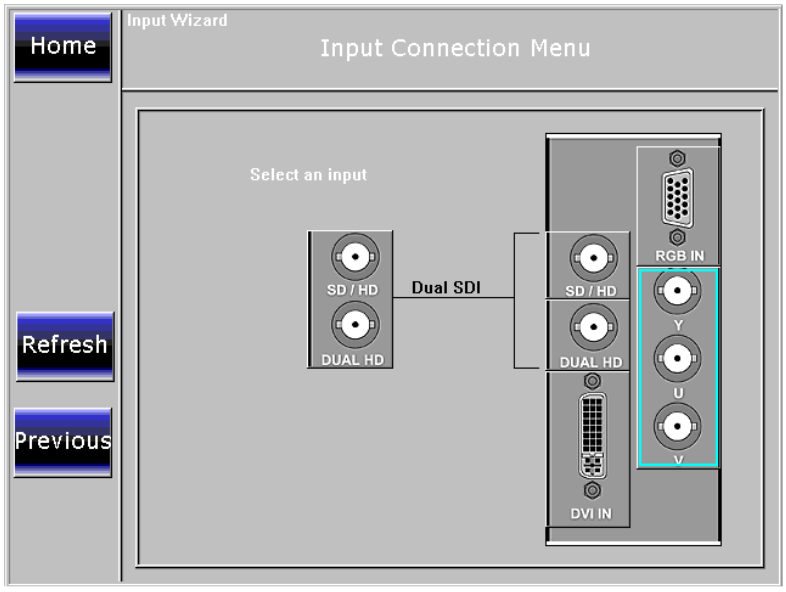


Figure 4-26. Input Wizard: Input Connection Menu (sample)

This menu provides a simplified graphic of the selected input module.

- ~ If the system detects sync for an input, its button is active.
- ~ If the system does not detect sync, the button is inactive.
- ~ The system must detect HD sync on *both* HD/SDI inputs, in order for the Dual SDI button to appear.
- ~ If you connect an input source to the input module at this point in the wizard, press **{Refresh}**. The system will search for sync, and re-draw the screen with new (updated) button status.

Select the input that you wish to set up.

5. One of the following two actions occurs:
   - ~ When the **Dual SDI** input is selected, the **Dual SDI Data Mode Select Menu** appears. Please continue with step **6**.
   - ~ When either of the **HD/SDI 1**, **HD/SDI 2**, **DVI**, **RGBHV** or **YPbPr** inputs are selected, the **Window Settings Menu** appears. Please continue with step **7**.
6. When a **Dual SDI** input is selected, the **Dual SDI Data Mode Select Menu** appears.

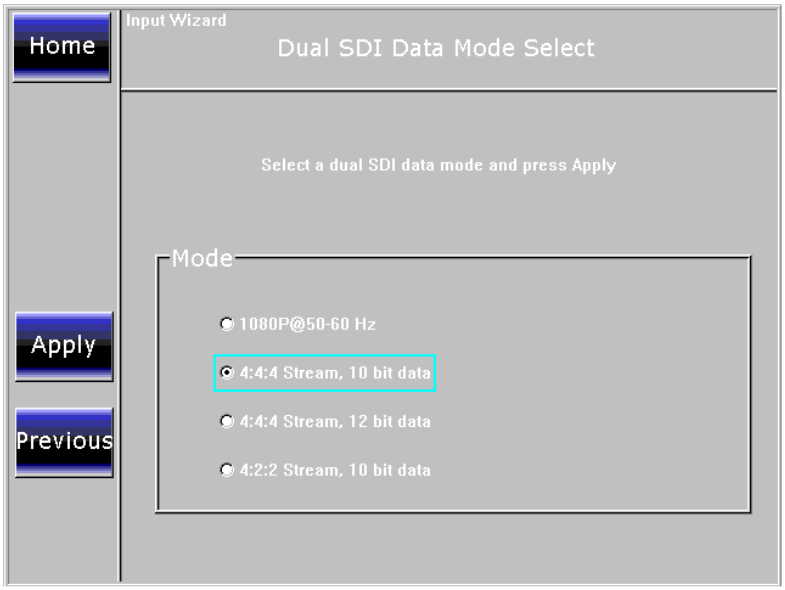


Figure 4-27. Input Wizard: Dual SDI Data Mode Menu (sample)

Select the exact type of dual SDI data that is connected and press **{Apply}** to display the **Window Settings Menu**. Please continue with step **7**.

7. After you select an input from the **Input Connection Menu** (or the **Dual SDI Data Mode Select Menu**), the **Window Settings Menu** appears with the selected input resolution displayed at the top.

Note

At this point in the Input Wizard, the selected delay mode is applied.

Figure 4-28. Input Wizard: Window Settings Menu (sample)

The **Window Settings Menu** scales the selected input source to precisely fit the selected output region.

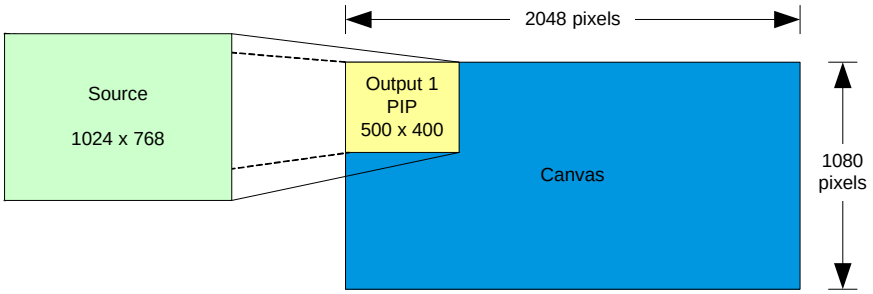


Figure 4-29. Window Settings Adjustment

▲ **Example**: If your output region is 500x400 and your input resolution is 1024x768, the system scales the input down to fit the 500x400 wall.

The following controls are available (all adjustments are in pixels):

~ Use the **Window Left** slider to adjust horizontal position. This slider moves the image left or right.

~ Use the **Window Top** slider to adjust the input's vertical position. This slider moves the image up or down.

- ~ Use the **Window Width** slider to adjust horizontal size. This slider expands or contracts the image from the left edge.
- ~ Use the **Window Height** slider to adjust the input's vertical size. This slider expands or contracts the image from the bottom edge.
- ~ If required, press **{Restore}** to return the source to its default values.

8. Press **{Next}** to display the **Viewport Adjust Menu**.

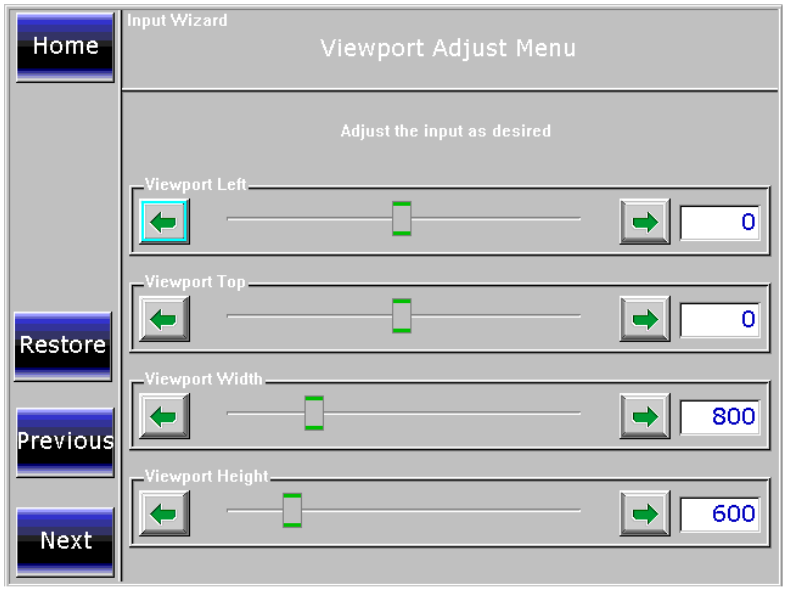


Figure 4-30. Input Wizard: Viewport Adjust Menu (sample)

The **Viewport Adjust Menu** enables you to select (or "isolate") a *portion* of the input source to fit within the selected output region. It adjusts the scale of the image within the viewport — essentially sizing and positioning the input.

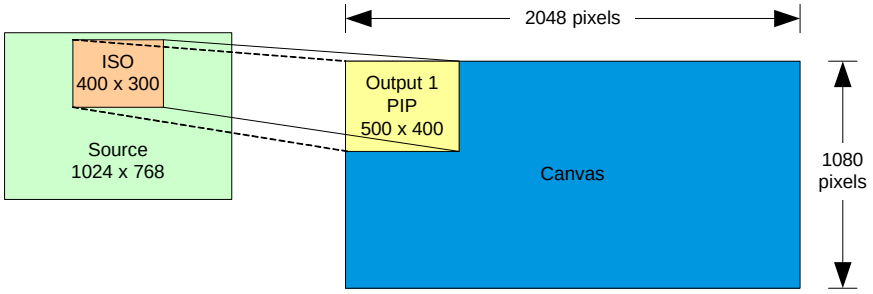


Figure 4-31. Viewport Adjustment

▲ **Example**: Your 1024x768 input is scaled down to fit the 500x400 region. Using viewport settings, you zoom in (or "isolate") a portion of the input, adjusting it as desired to fill the output region.

The following controls are available (all adjustments are in pixels):

- ~ Use the **Viewport Left** slider to adjust horizontal position.
- ~ Use the **Viewport Top** slider to adjust the input's vertical position.
- ~ Use the **Viewport Width** slider to adjust horizontal size.

~ Use the **Viewport Height** slider to adjust the input's vertical size.

~ If required, press **{Restore}** to return the source to its default values.

9. Press **{Next}** to display the **Wall Contrast Adjustment Menu**.

Figure 4-32. Input Wizard: Wall Contrast Adjustment Menu (sample)

The **Wall Contrast Adjustment Menu** enables you to set the wall contrast by adjusting the white values.

~ Use the **NIT Value** slider to adjust the wall's contrast.

~ Press **{Apply}** to update the wall with the new settings.

10. Press **{Next}** to display the **Wall Gamma Adjustment Menu**.

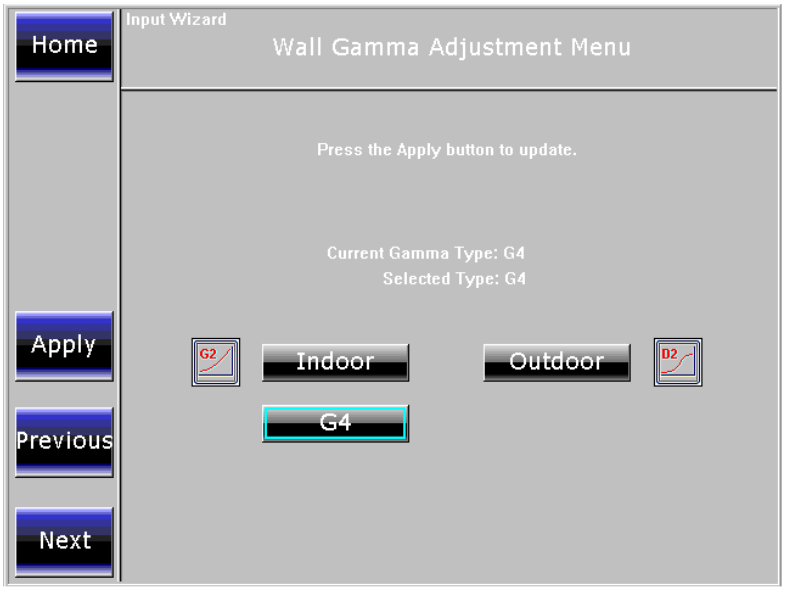


Figure 4-33. Input Wizard: Wall Gamma Adjustment Menu (sample)

The **Wall Gamma Adjustment Menu** enables you to adjust the wall's gamma curve. Two gamma "presets" are provided as standard: **{Indoor}** and **{Outdoor}**. If another curve was stored in the wall and detected by the system, that "stored" curve will be shown as a button.

Note

Additional gamma curves can be selected. Refer to the "**Managing LED**" section on page 126 for details.

11. Press the button for the desired gamma curve, then press **{Apply}** to update the wall with the new gamma settings.

Important

The selected gamma curve will be applied to all tiles in the LED wall, even if the tiles have different gamma curves.

12. Press **{Next}** to display the **Save Configuration Menu**, shown in the following illustration.

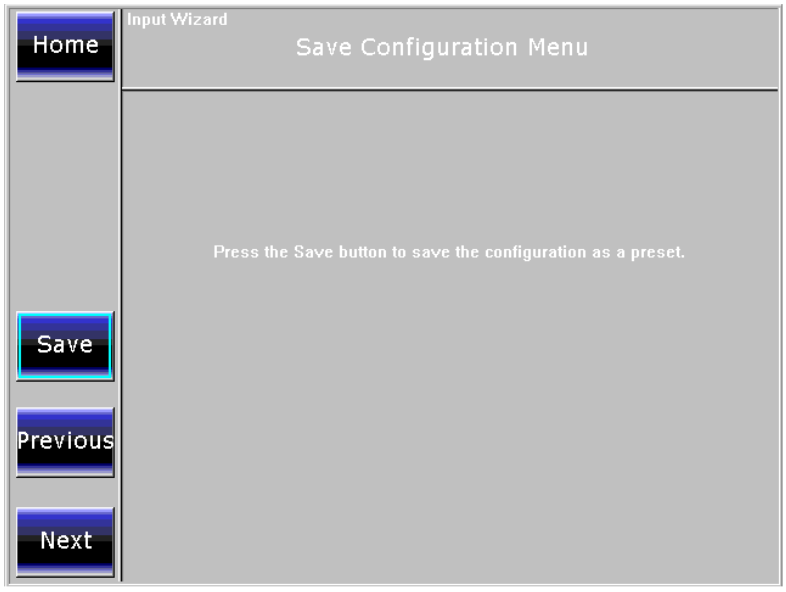


Figure 4-34. Input Wizard: Save Configuration Menu

The **Save Configuration Menu** enables you to save a preset configuration.

Note

A DX-700 "preset" is a file that stores bank-specific input configurations and wall settings in non-volatile memory. Each preset is a snapshot of *all outputs* in the selected bank.

▲ **Example**: The bank has three ungrouped outputs and three input modules. You have already assigned a DVI input (from input module 1) to output 1, and you have just used the Input Wizard to assign an RGBHV input (from input

module 2) to output 2. Output 3 has yet to be assigned. When you store a preset at this point in the Input Wizard, it has the following attributes:

Table 4-1. Sample Preset Attributes

Bank	Selected Input ↓	... on Input Module ↓	... is assigned to Output ↓
1	DVI	1	1
	RGBHV	2	2
	Not Assigned	Not Assigned	3

Important

The preset's attributes, as stored, will be applied to the bank whenever the preset is recalled.

13. Press **{Save}** to display the **Keyboard**.

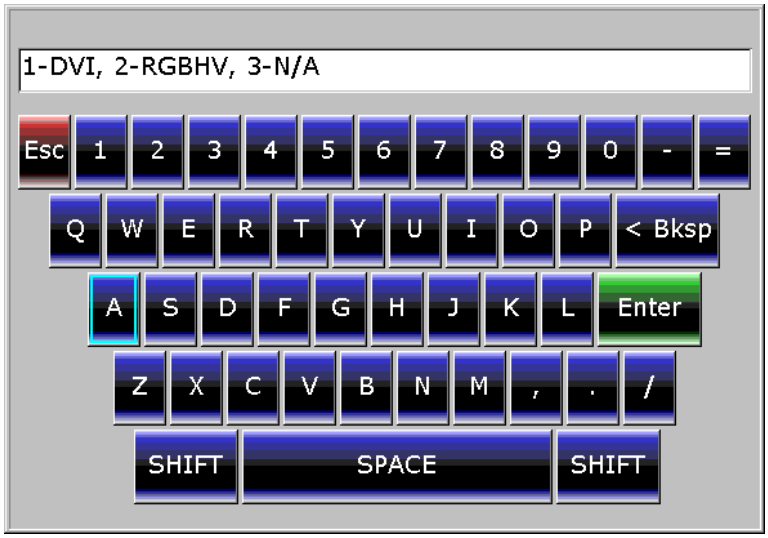


Figure 4-35. Keyboard (sample)

~ Enter a preset name up to 29 characters in length.

Tip

Because presets are "bank" specific, use a name that not only identifies the current input that you are saving, but the state of the entire bank and all of its outputs.

~ Press **{Enter}** to accept the name. The system confirms the preset name, and returns you to the **Save Configuration Menu**. If desired, you can save another preset (for the same current system configuration).

~ If required, press **{Esc}** to return to the **Save Configuration Menu** without saving a preset.

14. When you are finished saving presets for this configuration, press **{Next}** to display the **Input Wizard Complete Menu**.

Figure 4-36. Input Wizard Complete Menu

At this point, you can run the Input Wizard for another output/input combination, or exit the procedure.

- Press **{Yes}** to return to the **Output Selection Menu**. Repeat the entire procedure from step **1**.
- Press **{No}** to return to the **Home Menu**.

Using the Preset Management Menu

A DX-700 “preset” is a file that stores bank-specific input configurations and wall settings in non-volatile memory. The **Preset Management Menu** enables you to recall, rename, delete, or delete all presets. The following topics are discussed in this section:

Preset Management Menu Tree

The figure below illustrates the Preset Management menu tree:

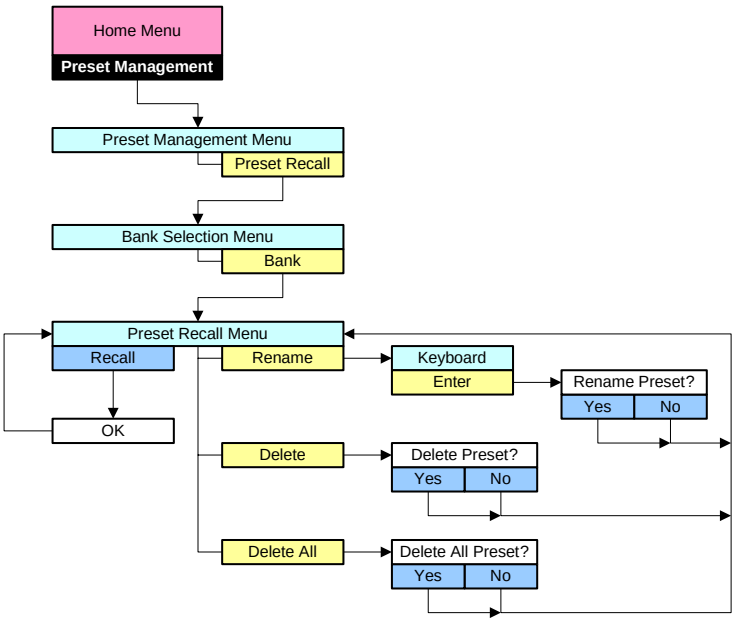


Figure 4-37. Preset Management Menu Tree

Note

In the menu tree above, the **{Previous}** and **{Home}** buttons have been omitted for simplicity.

Preset Management Operations

The following topics are discussed in this section:

Recall a Preset

This procedure enables you to recall a preset, which is a snapshot of all outputs and their assigned inputs within a selected DX-700 bank.

- Use the following steps to recall a preset:

1. From the **Home Menu**, press **{Preset Management}** to display the **Preset Management Menu**:

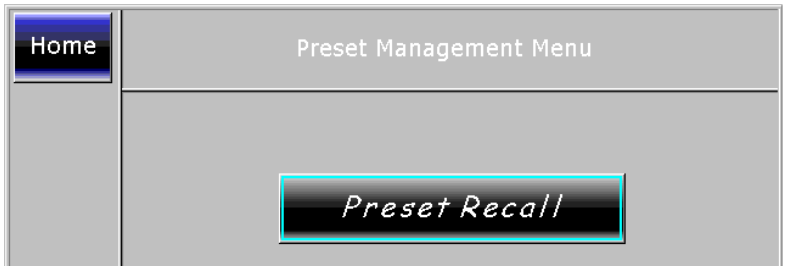


Figure 4-38. Preset Management Menu (upper portion)

2. Press **{Preset Recall}** to display the **Bank Selection Menu**.

Figure 4-39. Bank Selection Menu

3. Press the button for the bank on which you want to recall a preset. The **Preset Recall Menu** appears.

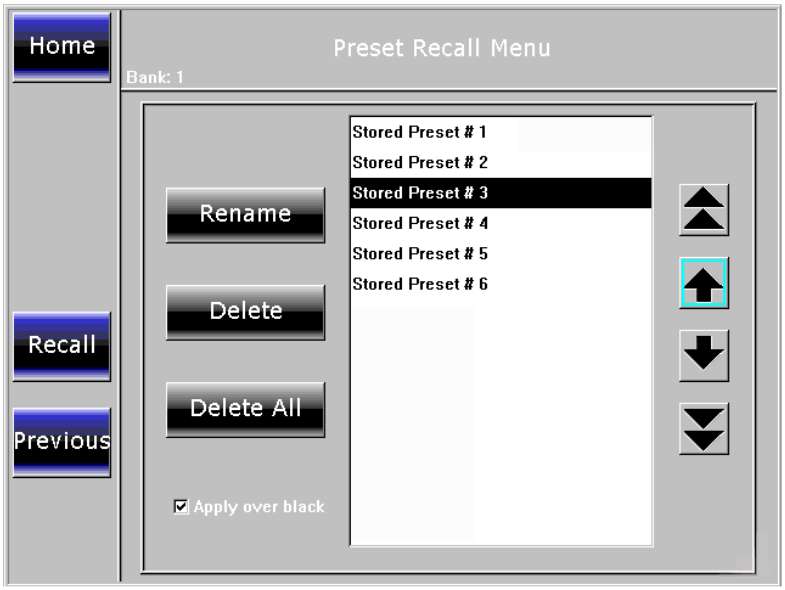


Figure 4-40. Preset Recall Menu

4. In the **Preset List**, navigate to the preset that you wish to recall, using the controls to the right of the list, or simply press the preset to highlight it.
5. By default, the **{Apply over black}** check box is selected.
   - ~ When this check box is checked, the output goes to black momentarily when you recall a preset.
   - ~ When the option is un-checked, the system cuts to the new preset, with the possibility of a visible glitch between the previous and new preset — depending on the recalled parameters.

Tip

For presets that include multiple changes, use the **{Apply over black}** option to hide the changes by having the wall momentarily go black — for example, if a preset will re-lock to a new source and change the wall contrast.

6. Press **{Recall}** to recall the selected preset to the bank. All output and input assignments (as stored in the preset for the selected bank) are restored.

   A pop-up message confirms that the preset has been restored, and the system remains on the **Preset Recall Menu**, enabling you to recall additional presets.

Rename a Preset

- Use the following steps to rename a preset:

1. From the **Home Menu**, press **{Preset Management}** to display the **Preset Management Menu**.
2. Press **{Preset Recall}** to display the **Bank Selection Menu**.
3. Press the button for the bank on which you want to rename a preset. The **Preset Recall Menu** appears.

4. In the **Preset List**, navigate to the preset that you wish to rename using the controls to the right of the list, or simply press the preset to highlight it.
5. Press **{Rename}** to display the **Keyboard**.
6. Enter a *new* preset name, up to 29 characters in length, and press **{Enter}** to accept the name.
7. In the “Rename” pop-up, press **{Yes}** to accept the new name, or **{No}** to cancel the procedure without renaming the preset. In each case, the system returns to the **Preset Recall Menu**.

Delete a Preset

- Use the following steps to delete a preset:

1. From the **Home Menu**, press **{Preset Management}** to display the **Preset Management Menu**.
2. Press **{Preset Recall}** to display the **Bank Selection Menu**.
3. Press the button for the bank on which you want to delete a preset. The **Preset Recall Menu** appears.
4. In the **Preset List**, navigate to the preset that you wish to delete using the controls to the right of the list, or simply press the desired preset to highlight it.
5. Press **{Delete}** to display “Delete” pop-up.
6. In the “Delete” pop-up, press **{Yes}** to delete the preset, or **{No}** to cancel the procedure without deleting the preset. In each case, the system returns to the **Preset Recall Menu**.

Delete All Presets

- Use the following steps to delete all presets:

1. From the **Home Menu**, press **{Preset Management}** to display the **Preset Management Menu**.
2. Press **{Preset Recall}** to display the **Bank Selection Menu**.
3. Press the button for any bank. The **Preset Recall Menu** appears.
4. Press **{Delete All}** to display “Delete All” pop-up.
5. In the “Delete All” pop-up, press **{Yes}** to delete all presets, or **{No}** to cancel the procedure without deleting all presets. In each case, the system returns to the **Preset Recall Menu**.

Using the Input Management Menu

The following topics are discussed in this section:

Input Management Menu Tree

The figure below illustrates the Input Management menu tree:

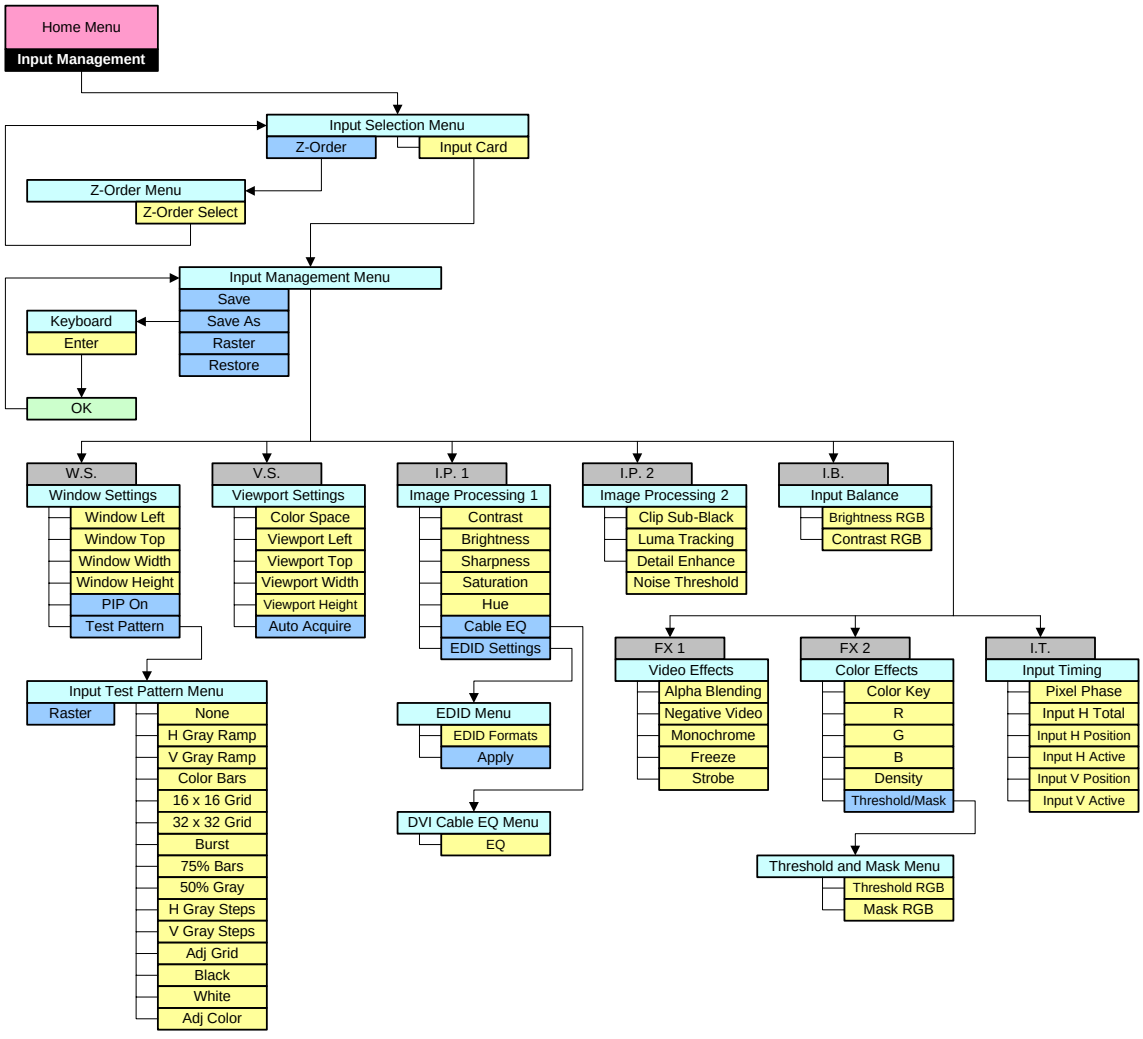


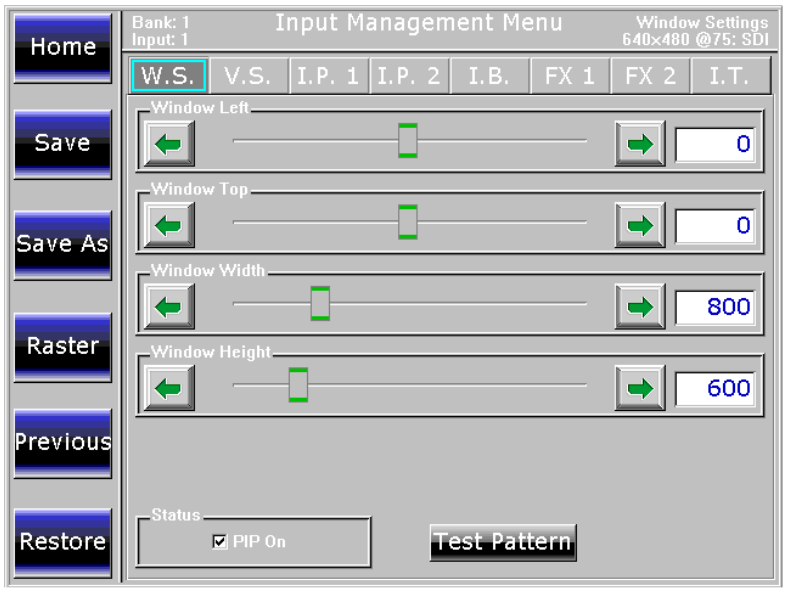
Figure 4-41. Input Management Menu Tree

Note

In the menu tree above, the **{Previous}** and **{Home}** buttons have been omitted for simplicity.

Input Management Operations Overview

The **Input Management Menu** is a multi-tab menu that provides tools to adjust the *active input* on a selected input module (card).



At the top of the menu, labels indicate the following information:

- Bank in which the selected input card resides
- Selected input module (card). Modules are numbered right to left.
- Active input on the selected card.
- Active **Input Management Menu** tab (the one with “focus”).

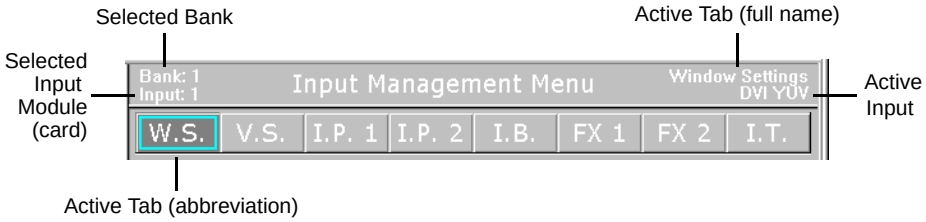


Figure 4-42. Input Management Labels (sample)

To adjust a particular parameter, select its tab and use the controls. Note that tab names are abbreviated on the tabs themselves, but full names are listed in the upper right corner of the menu.

Input Management Menu Operations

The **Input Management Menu** enables you to adjust any active input on a selected input module, and create presets.

Note

Within the **Input Management Menu**, adjustments are made to the *active input* on a selected input module. If you want to adjust an input that is not currently active, you must first "activate" it by recalling a preset.

The following topics are discussed:

Global Input Management Functions

The following global functions are available on the **Input Management Menu**:

- Press **{Save}** to perform a "system save," which saves the state of all banks, inputs and outputs in a single register. This register is recalled when you power up the DX-700, enabling you to boot the system in the same configuration as when you last saved the settings.
- Press **{Save As}** to display the **Keyboard**, which enables you to name and save a preset.
- Press **{Raster}** to display the source's raster box.
- Press **{Restore}** to restore default values. This function is context specific:
  - For **Window Settings**, the input is restored to default scaling.
  - For **Viewport Settings**, the input is restored to its default size.
  - For **Image Processing**, **Input Balance**, **Effects** and **Timing**, the *menu* is restored to its default (system) values.

Changing Z-Order

Z-Order is a function that assigns priorities to input modules in a bank. The higher the priority, the further "forward" the output region appears on the canvas. The following important rules apply:

- Six (6) is the highest priority — visually in front of all other output regions.
- One (1) is the lowest priority (in a configuration with six input modules) — visually behind all other output regions in the bank.
- Priority assignments are mutually exclusive. If you change the priority of one module, all other modules change accordingly.
- Priority is bank-specific. In a system with two banks, each bank will have its own highest and lowest priority modules.

When you run the Input Wizard, Z-order is *automatic*, based on the configuration of the input modules in the selected bank:

- The right-most input module (directly adjacent to an output module) is automatically assigned the highest priority.
- Subsequent input modules are assigned priority sequentially, in descending order.

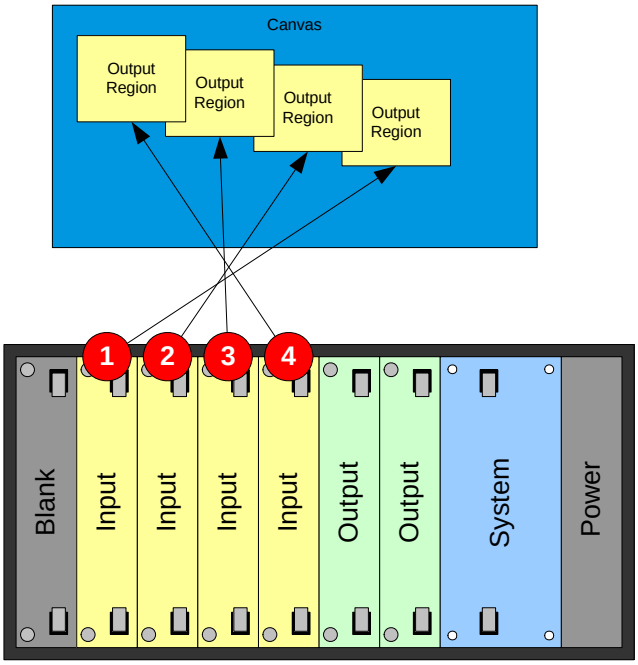


Figure 4-43. Automatic Z-Order priority assignments (using a sample bank)

Use the following steps to change Z-Order:

1. (**Optional**) If required, use the **Preset Management Menu** to recall a preset that includes the input that you wish to adjust. This step "activates" an input. Refer to the "**Recall a Preset**" section on page 104. If the input is *already* active, no action is required in this step.

2. From the **Home Menu**, press **{Input Management}** to display the **Input Selection Menu**.

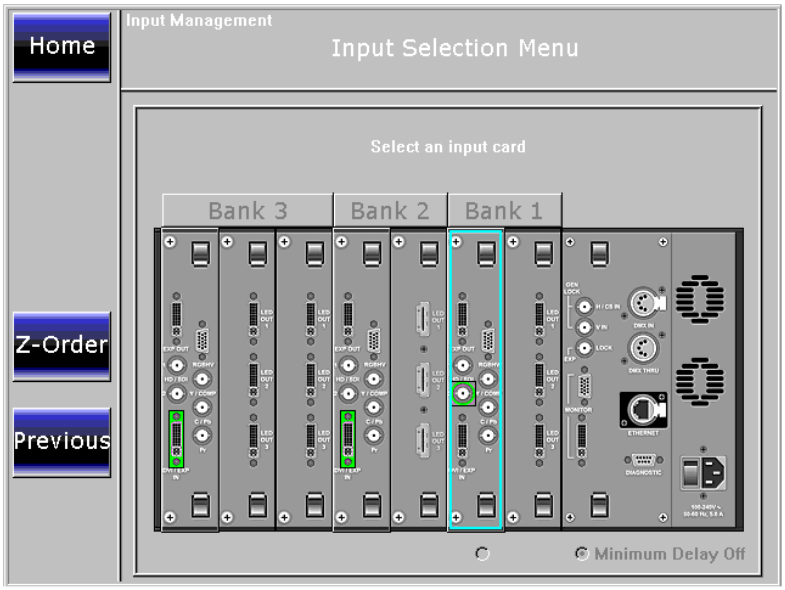


Figure 4-44. Input Selection Menu (sample)

3. Press **{Z-Order}** to display the **Z-Order Menu**. Each input module's current priority is shown in bright green letters, on top of the modules themselves.

Figure 4-45. Z-Order Menu (sample)

4. To change priority, press the **Up** or **Down Arrow** for a selected module as required. All modules shift priority *immediately*.
5. Press **{Previous}** to return to the **Input Selection Menu**, where you can continue with input management functions as required.

Adjusting Window Settings

For the selected input, **Window Setting** adjustments enable you to scale the source to precisely fit the selected output region. Note that this adjustment is the same as the one performed on the **Window Settings Menu** in the Input Wizard.

- Use the following steps to adjust window settings:

1. (**Optional**) If required, use the **Preset Management Menu** to recall a preset that includes the input that you wish to adjust. This step "activates" an input. Refer to the "**Recall a Preset**" section on page 104 for details. If the input is *already* active, no action is required in this step.
2. From the **Home Menu**, press **{Input Management}** to display the **Input Selection Menu**.
3. On any bank, select the input card (module) that includes the *active input* that you wish to adjust. On the display, note that all input cards are buttons. The **Input Management Menu** appears.
4. Select the **Window Settings Tab** to display all parameters for window settings.

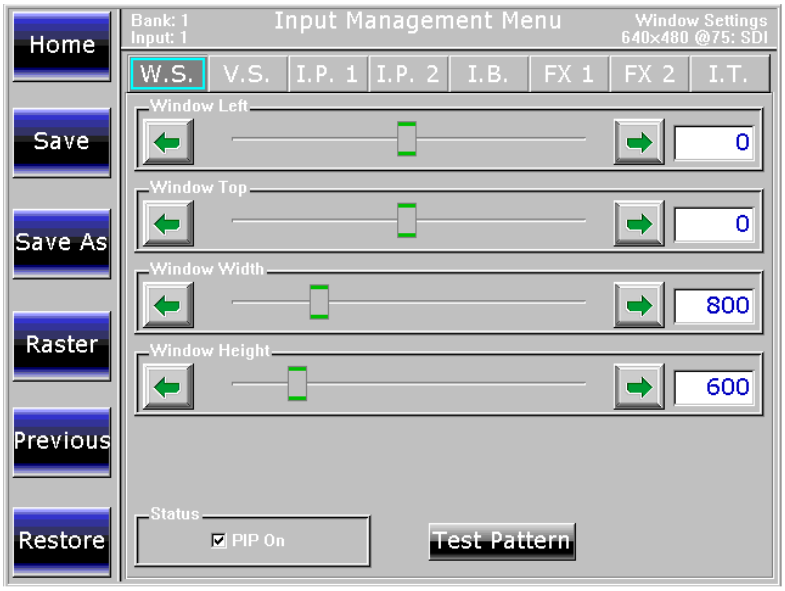


Figure 4-46. Input Management Menu: Window Settings Tab (sample)

Perform the following adjustments as required:

5. Use the following controls to fit the selected input into its associated output region. All adjustments are in pixels.
   - ~ Use the **Window Left** slider to adjust the input's horizontal position.
   - ~ Use the **Window Top** slider to adjust the input's vertical position.
   - ~ Use the **Window Width** slider to adjust horizontal size.
   - ~ Use the **Window Height** slider to adjust the input's vertical size.
6. Enable or disable the **PIP On** check box:
   - ~ When **enabled**, the PIP is visible.
   - ~ When **disabled**, the PIP is hidden, and the canvas is visible.

7. Press **{Test Pattern}** to display the **Input Test Pattern Menu**. This menu lets you display a test pattern to assist with input management.

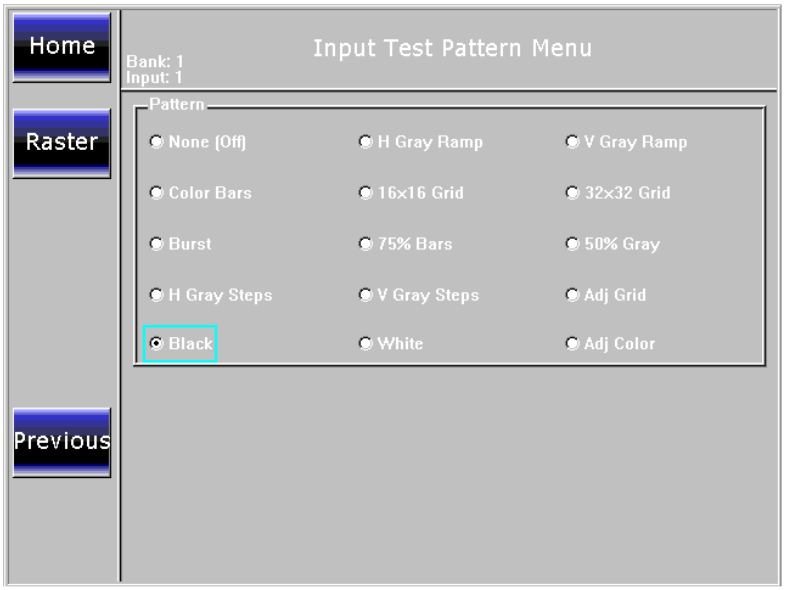


Figure 4-47. Input Test Pattern Menu

At the top of the menu, labels indicate the bank in which the selected input card resides and the selected input module (card) .

8. Select a test pattern, which replaces the active input. Patterns include:

~ None (Off)	~ H Gray Ramp	~ V Gray Ramp
~ Color Bars	~ 16 x 16 Grid	~ 32 x 32 Grid
~ Burst	~ 75% Bars	~ 50% Gray
~ H Gray Steps	~ V Gray Steps	~ Adj Grid
~ Black	~ White	~ Adj Color

9. If you select **Adj Grid**, the **Grid Size** section appears at the bottom of the menu, enabling you to change grid size.
10. If you select **Adj Color**, the **RGB Color** section appears, enabling you to adjust the colors using the sliders.
11. Prior to returning to the **Input Management Menu**, it is recommended that you select **{None}** to restore the previous active input.

This completes the **Window Settings** adjustment procedure.

Adjusting Viewport Settings

For the selected input, **Viewport Setting** adjustments enable you to select (or "isolate") a *portion* of the input source to fit within the selected output region. Here, you are essentially sizing and positioning the input. Note that this adjustment is the same as the one performed on the **Viewport Adjust Menu** in the Input Wizard.

- Use the following steps to adjust viewport settings:

1. (**Optional**) If required, use the **Preset Management Menu** to recall a preset that includes the input that you wish to adjust. This step "activates" an input. Refer to the "**Recall a Preset**" section on page 104.

   If the input is *already* active, no action is required in this step.

2. From the **Home Menu**, press **{Input Management}**.
3. On any bank, select the input module that includes the *active input* that you wish to adjust. The **Input Management Menu** appears.
4. Select the **Viewport Settings (V.S.) Tab**.

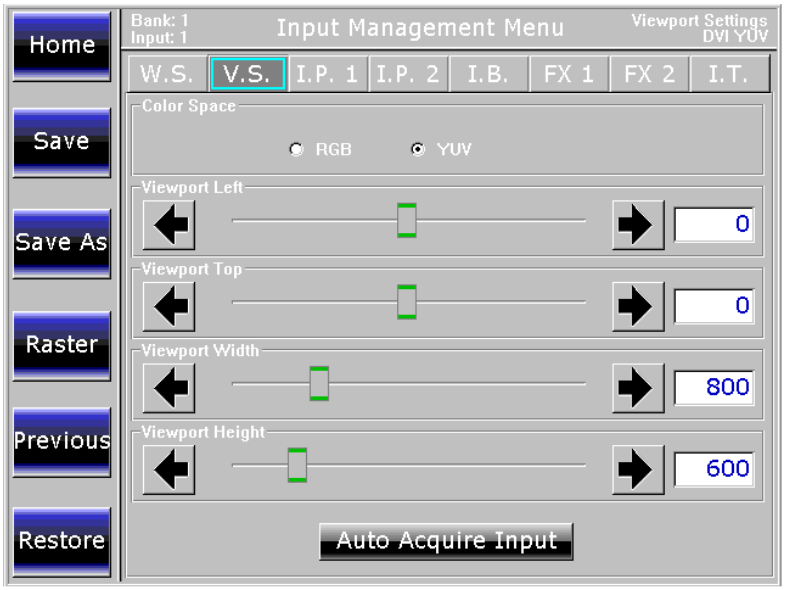


Figure 4-48. Input Management Menu: Viewport Settings Tab (sample)

Perform the following adjustments as required:

5. In the **Color Space** section, select either **RGB** or **YUV** color space.
6. Use the following controls to select (or "isolate") a *portion* of the input source to fit within the selected output region. All adjustments are in pixels.
   - ~ Use the **Viewport Left** slider to adjust the input's horizontal position.
   - ~ Use the **Viewport Top** slider to adjust the input's vertical position.
   - ~ Use the **Viewport Width** slider to adjust horizontal size.
   - ~ Use the **Viewport Height** slider to adjust the input's vertical size.
7. Press **{Auto Acquire Input}** to re-acquire the input, if for example, the input was lost, if you changed inputs, or if the image does not appear correct.

This completes the **Viewport Settings** adjustment procedure.

Adjusting Image Processing Parameters

For the selected input, **Image Processing** adjustments enable you to adjust the input's contrast, brightness, sharpness, saturation, hue, clip to sub-black and luma tracking. You can also set EDID parameters.

Note

Image processing adjustments are shown on two different tabs: **I.P. 1** and **I.P. 2**.

- Use the following steps to adjust input contrast, brightness, sharpness, saturation, hue, EDID and cable equalization:

1. (**Optional**) If required, use the **Preset Management Menu** to recall a preset that includes the input that you wish to adjust. This step "activates" an input. Refer to the "**Recall a Preset**" section on page 104.

   If the input is *already* active, no action is required in this step.

2. From the **Home Menu**, press **{Input Management}** to display the **Input Selection Menu**.
3. On any bank, select the input card (module) that includes the *active input* that you wish to adjust. The **Input Management Menu** appears.
4. Select **Image Processing Tab 1** (**I.P. 1**).

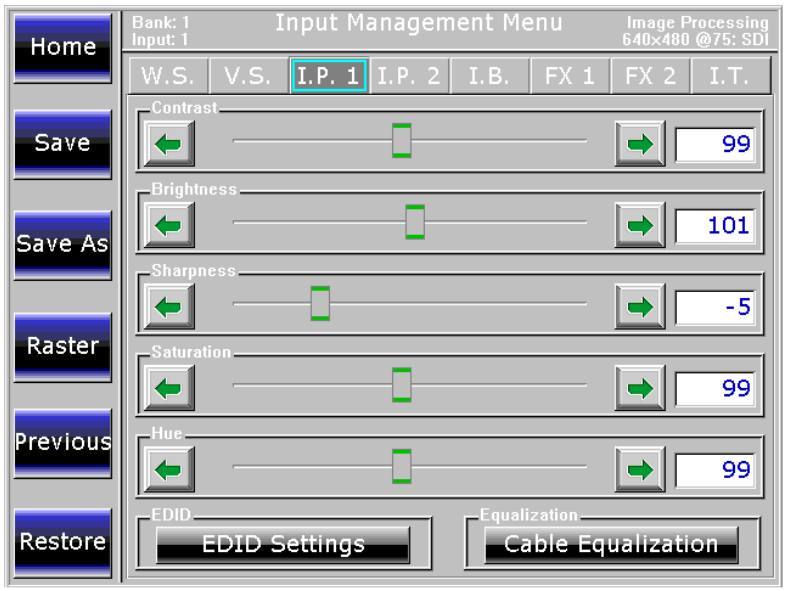


Figure 4-49. Input Management Menu: Image Processing Tab 1 (sample)

Perform the following adjustments as required:

- ~ Use the **Contrast** slider to adjust the contrast of the input.
- ~ Use the **Brightness** slider to adjust input brightness.
- ~ Use the **Sharpness** slider to adjust the sharpness of the input.
- ~ Use the **Saturation** slider to adjust the input's color saturation.
- ~ Use the **Hue** slider to adjust the input's hue.

5. Press **{EDID}** to display the **EDID Menu**, a sample of which is shown below. The selected input connector's current EDID format is shown above the format list.

Figure 4-50. Input Management Menu: EDID Menu (sample)

Extended Display Identification Data (EDID) is a VESA standard data format that contains information about a display device and its resolution, both preferred and allowed. Each input module contains two EDID files (one for digital, one for analog), which are both stored in the module's non-volatile memory. These EDID files may be read by an external computer's graphics card when the computer's output is connected to DX-700 via the DVI-I or HD-15 connector during boot-up.

6. To change EDID, select a format from the list and press **{Apply}**. The new values are stored in the input module's non-volatile memory.

Note

The above procedure sets EDID for an *active* input. To set EDID for any DVI-I or HD-15 input connector (even ones that have not been set up), use the DX-700 **Management Menu**. Refer to the "**Using the EDID Menu**" section on page 151.

7. Press **{Previous}** to return to **Image Processing Tab 1**.

8. Press **{Cable Equalization}** to display the **DVI Cable Equalization Menu**.

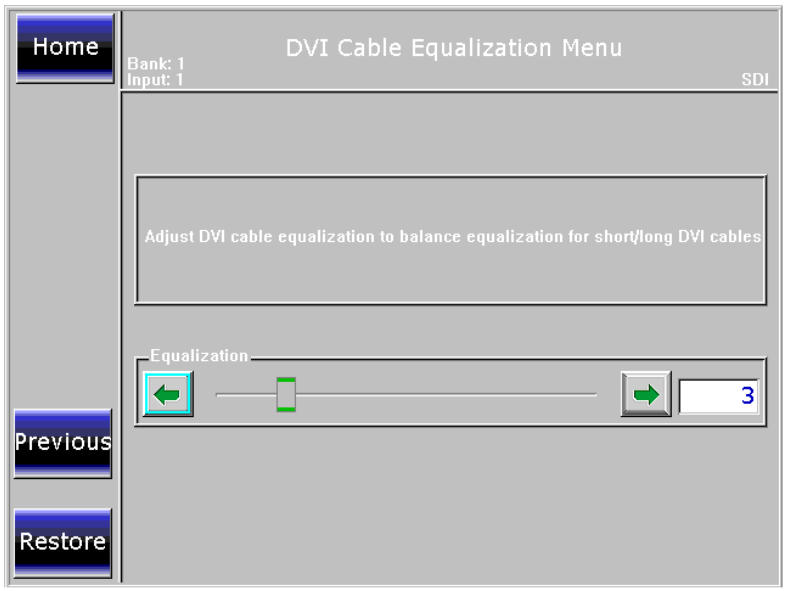


Figure 4-51. Input Management Menu: DVI Cable Equalization Menu (sample)

9. Use the **Equalization** slider to adjust DVI cable equalization as required.

This completes all adjustments on **Image Processing Tab 1**.

- Use the following steps to adjust clip to sub-black and luma tracking:

1. On the **Input Management Menu**, select **Image Processing Tab 2** (**I.P. 2**) to display the second set of image processing adjustments.

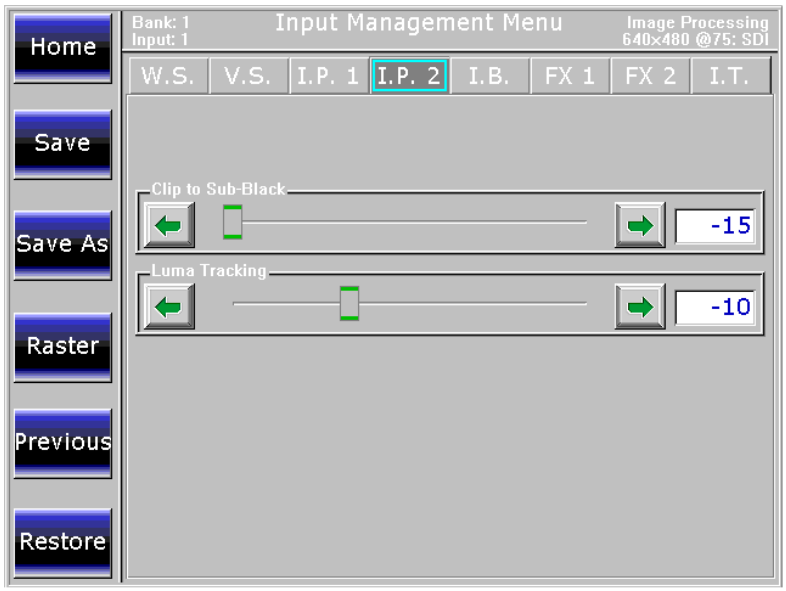


Figure 4-52. Input Management Menu: Image Processing Tab 2 (sample)

2. Use the **Clip to Sub-Black** slider to adjust the sub-black clip. **Clip to Sub-Black** eliminates low-level noise in the black regions of the image.

3. Use the **Luma Tracking** slider to adjust luma tracking. **Luma Tracking** prevents green haze from appearing in regions of low light.

This completes the **Image Processing** adjustment procedure.

Adjusting Input Balance

For the selected input, **Input Balance** adjustments enable you to *fine tune* the individual RGB brightness and contrast values, as opposed to the brightness and contrast adjustments on the **Image Processing Menu** — which adjust RGB values simultaneously.

- Use the following steps to adjust input balance parameters:

1. (**Optional**) If required, use the **Preset Management Menu** to recall a preset that includes the input that you wish to adjust. This step "activates" an input. Refer to the "**Recall a Preset**" section on page 104. If the input is *already* active, no action is required in this step.
2. From the **Home Menu**, press **{Input Management}** to display the **Input Selection Menu**.
3. On any bank, select the input card (module) that includes the *active input* that you wish to adjust. The **Input Management Menu** appears.
4. Select the **Input Balance Tab (I.B.)** to display all parameters for input balance.

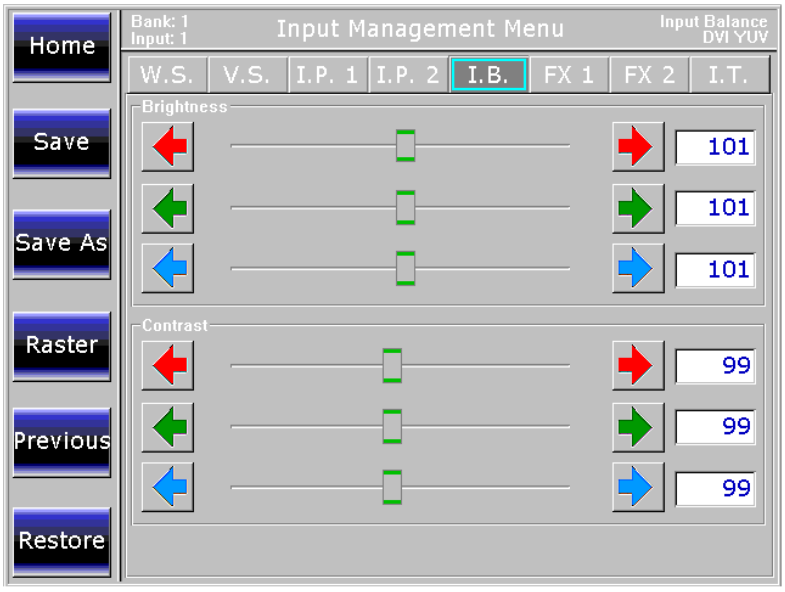


Figure 4-53. Input Management Menu: Input Balance Tab (sample)

Perform the following adjustments as required:

5. In the **Brightness** section, use the individual **RGB** sliders to adjust the brightness of the selected input.
6. In the **Contrast** section, use the individual **RGB** sliders to adjust the contrast of the selected input.

This completes the **Input Balance** adjustment procedure.

Adjusting Video Effects

For the selected input, **Video Effects** adjustments enable you to adjust input opacity, negative video, monochrome, freeze and strobe effects.

- Use the following steps to adjust input video effects:

1. (**Optional**) If required, use the **Preset Management Menu** to recall a preset that includes the input that you wish to adjust. This step activates an input. Refer to the "**Recall a Preset**" section on page 104.

   If the input is *already* active, no action is required in this step.

2. From the **Home Menu**, press **{Input Management}** to display the **Input Selection Menu**.
3. On any bank, select the input card (module) that includes the *active input* that you wish to adjust. The **Input Management Menu** appears.
4. Select the **Video Effects Tab** (**FX 1**) to display video effects parameters.

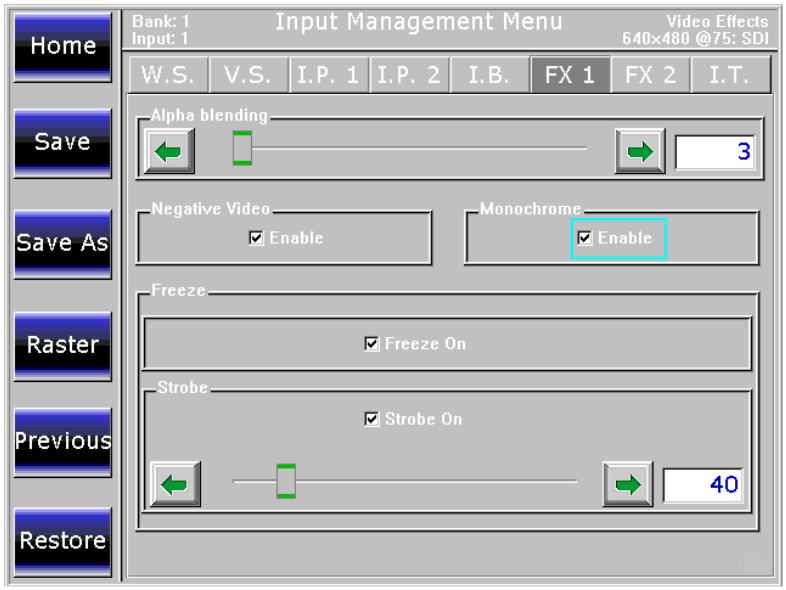


Figure 4-54. Input Management Menu: Video Effects Tab (sample)

Perform the following adjustments as required:

5. Use the **Alpha blending** slider to adjust the opacity of the input.
6. Enable or disable the **Negative Video** check box to reverse the polarity of the image.
7. Enable or disable the **Monochrome** check box to remove or enable the image's chroma information.
8. Enable or disable the **Freeze On** check box to freeze and un-freeze the input.
9. Enable or disable the **Strobe On** check box, which when enabled, acts as a programmable freeze. Use the **Strobe Slider** to set the freeze interval (in frames).

This completes the **Video Effects** adjustment procedure.

Adjusting Color Effects

A color key is one in which the hole-cutting information is derived from a specific RGB value — including luminance. For the selected input, **Color Effects** adjustments enable you to "color key" the input, adjust the key's RGB and density values, and adjust the key's threshold and mask.

- Use the following steps to adjust input color effects:

1. (**Optional**) If required, use the **Preset Management Menu** to recall a preset that includes the input that you wish to adjust. This step "activates" an input. Refer to the "**Recall a Preset**" section on page 104.

   If the input is *already* active, no action is required in this step.

2. From the **Home Menu**, press **{Input Management}** to display the **Input Selection Menu**.
3. On any bank, select the input card (module) that includes the *active input* that you wish to adjust. The **Input Management Menu** appears.
4. Select the **Color Effects Tab** (**FX 2**) to display color effects parameters.

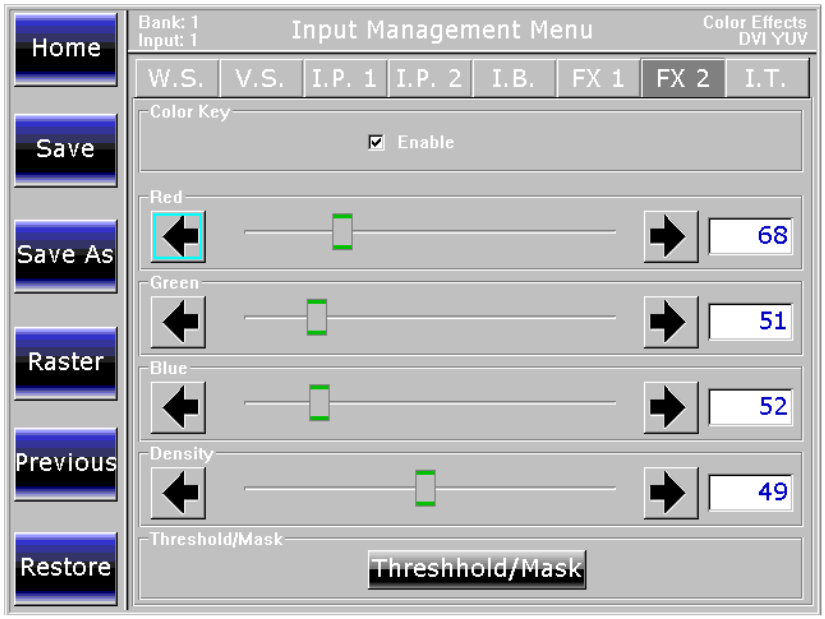


Figure 4-55. Input Management Menu: Color Effects Tab (sample)

5. Perform the following adjustments as required:
   - **a.** Enable or disable the **Color Key** check box as required.
   - **b.** Use the **Red**, **Green** and **Blue** sliders to adjust the red, green and blue components of the selected key color.
   - **c.** Use the **Density** slider to adjust the opacity of the keyed image, from fully opaque to fully transparent.
6. Press the **{Threshold/Mask}** button box to display the **Threshold and Mask Menu**.

The figure below illustrates the **Threshold and Mask Menu**.

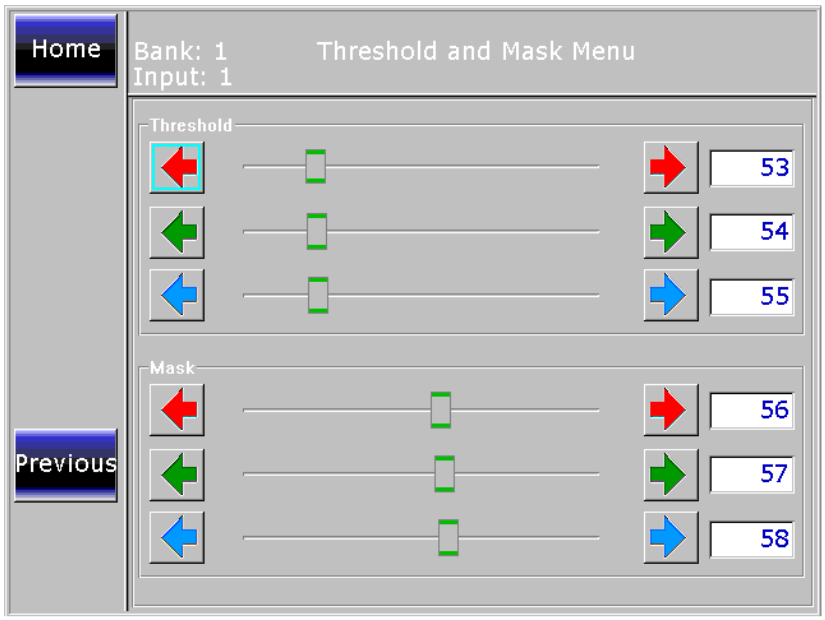


Figure 4-56. Input Management Menu: Threshold and Mask Menu (sample)

7. Use the **Red Threshold** slider to adjust the key's clip along the Cyan vector (as demonstrated using a CIE color chip chart).
8. Use the **Green Threshold** slider to adjust the key's clip along the Magenta vector.
9. Use the **Blue Threshold** slider to adjust the key's clip along the Yellow vector
10. Use the **Red Mask** slider to adjust the background mask to/from black along the Cyan vector.
11. Use the **Green Mask** slider to adjust the background mask to/from black along the Magenta vector.
12. Use the **Blue Mask** slider to adjust the background mask to/from black along the Yellow vector.

This completes the **Color Effects** adjustment procedure.

Adjusting Input Timing

Input timing adjustments enable you to adjust input pixel phase, input H total, H position, H Active, V Position and V Active.

- Use the following steps to adjust input timing:

1. (**Optional**) If required, use the **Preset Management Menu** to recall a preset that includes the input that you wish to adjust. This step "activates" an input. Refer to the "**Recall a Preset**" section on page 104.

   If the input is *already* active, no action is required in this step.
2. From the **Home Menu**, press **{Input Management}** to display the **Input Selection Menu**.
3. On any bank, select the input card (module) that includes the *active input* that you wish to adjust. The **Input Management Menu** appears.

4. Select the **Input Timing Tab (I.T.)** to display input timing parameters.

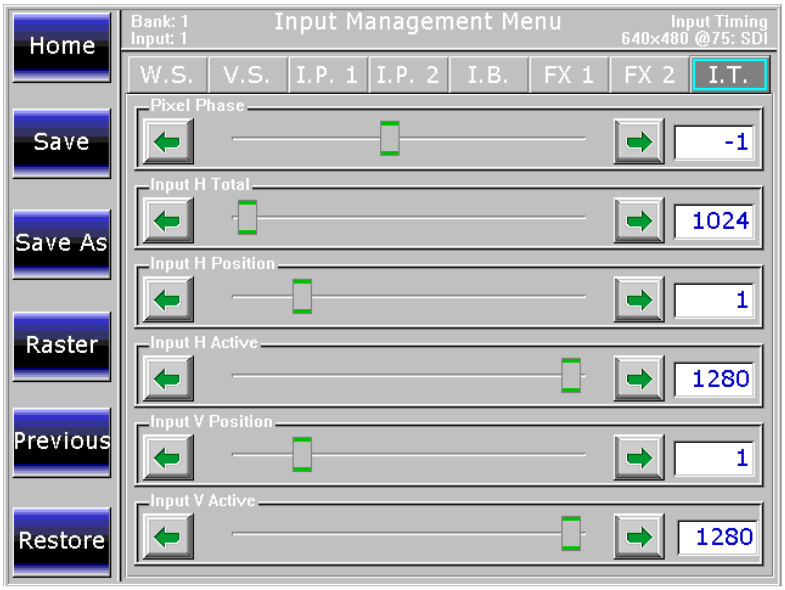


Figure 4-57. Input Management Menu: Input Timing Tab (sample)

5. Perform the following adjustments as required:

   a. Use the **Pixel Phase** slider to select where pixels are sampled (ideally, on the pixel's peak). For optimum visual results when adjusting high-resolution sources, project a burst test pattern and adjust the sampling for the minimum noise.

   b. Use the **Input H Total** slider to set the total pixel count per line.

   c. Use the **Input H Position** slider to set the start of the active area's horizontal offset from H sync.

   d. Use the **Input H Active** slider to set the active H region.

   e. Use the **Input V Position** slider to set the start of the active area's vertical offset from V sync.

   f. Use the **Input V Active** slider to set the active V region.

This completes the **Input Timing** adjustment procedure.

Saving Input Management Settings

You can save your input settings in two ways:

- Press **{Save}** after making changes on any **Input Management Menu** tab. The current system state is saved, and that state is restored the next time you power up the DX-700.

  When you press **{Save}**, The following prompt appears:

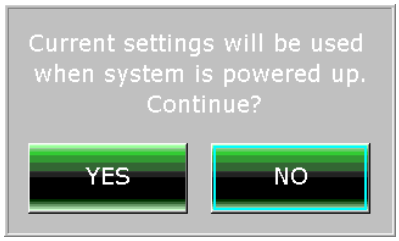


Figure 4-58. Input Management Save Prompt

  ~ Press **{Yes}** to continue the save.

  ~ Press **{No}** to cancel.

Note This function is the same as pressing **{Save}** on the **DX-700 Management Menu**.

- Press **{Save As}** after making changes on the **Input Management Menu**. This option lets you save your changes as a preset — a file that stores bank-specific input configurations and wall settings in non-volatile memory. You can recall a preset at any time the DX-700 is in use. For more information about presets, refer to "**Preset Management Operations** on page 104 of this chapter.

  When you press **{Save As}**, the **Keyboard** appears. Type a name for your preset and press **{Enter}**.

Note Remember that this is a bank-specific "save" procedure.

Using the Display Management Menu

The following topics are discussed in this section:

Display Management Menu Tree

The figure below illustrates the **Display Management** menu tree:

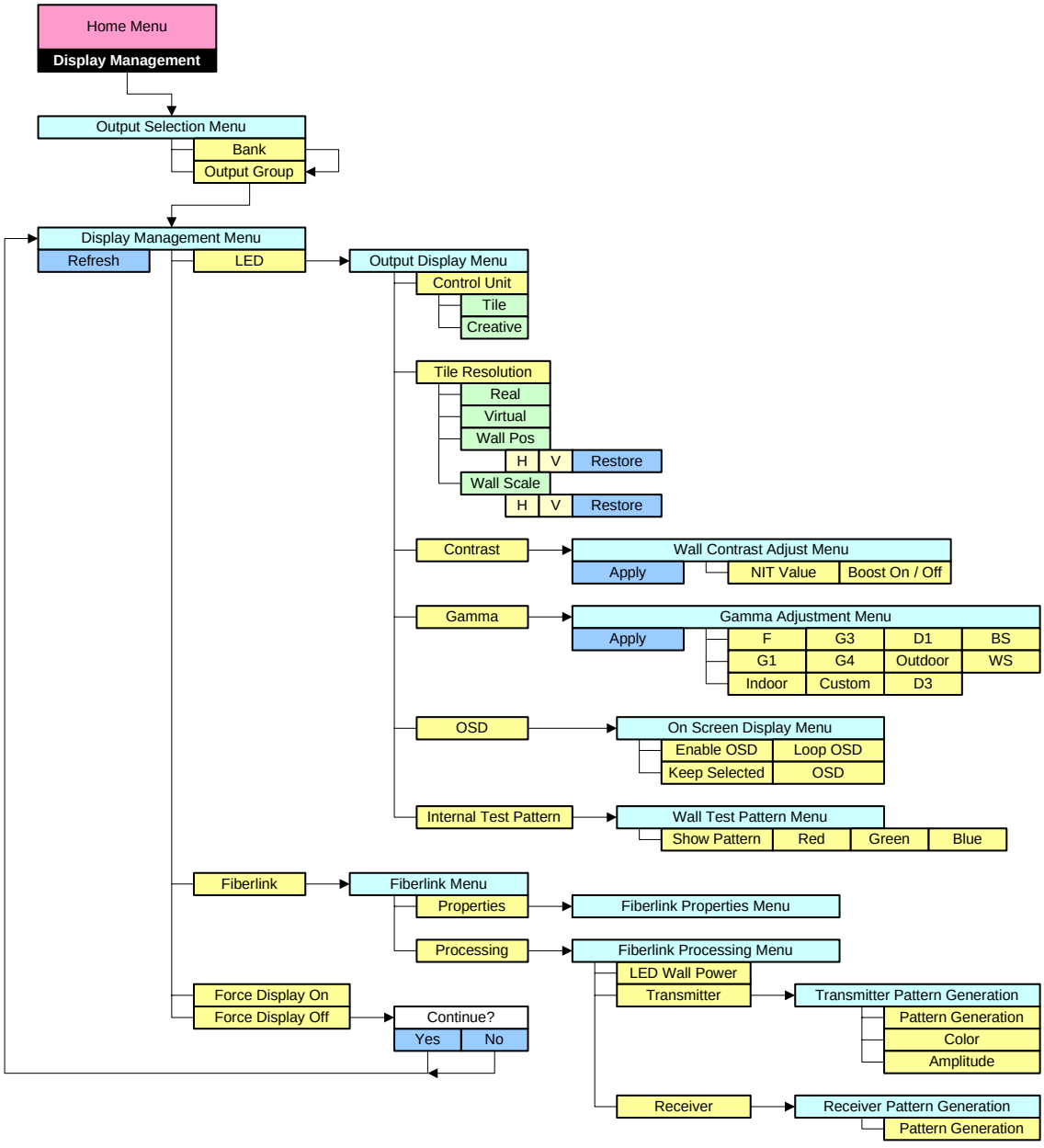


Figure 4-59. Display Management Menu Tree

Note

In the menu tree above, the **{Previous}** and **{Home}** buttons have been omitted for simplicity.

Display Management Operations

The **Display Management Menu** enables you to adjust output display (LED) parameters and Fiberlink parameters. The following topics are discussed:

- **Managing LED**
- **Managing Fiberlink Settings**
- **Forcing the Display**

Managing LED

For a selected output (or group of outputs), **Display Management** functions enable you to set the control unit, tile resolution, contrast, gamma, on screen display (OSD), the tile's internal test pattern and Fiberlink parameters.

- Use the following steps to manage LED settings:

1. From the **Home Menu**, press **{Display Management}** to display the **Output Selection Menu**.

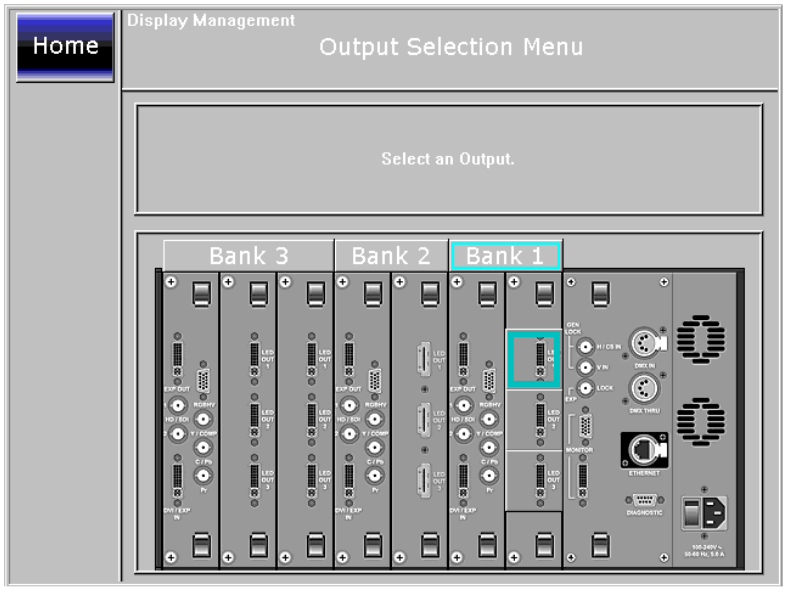


Figure 4-60. Output Selection Menu (sample)

2. Immediately above the graphic, press the button for the **bank** that contains the output whose LED display you wish to manage.
3. On the selected bank, press the output that you wish to manage. The **Display Management Menu** appears.

The figure below illustrates the **Display Management Menu**. The **{Fiberlink}** button appears only if a Fiberlink connection has been set up.

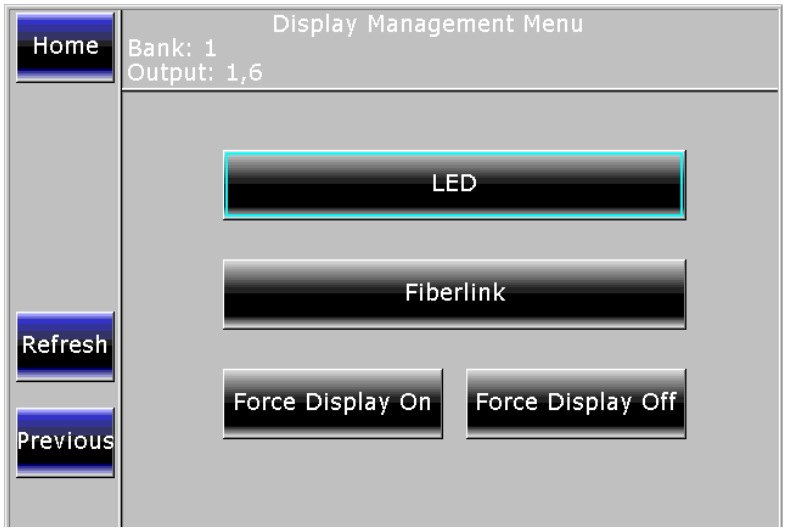


Figure 4-61. Display Management Menu (sample)

4. Press **{LED}** to display the **Output Display Menu**.

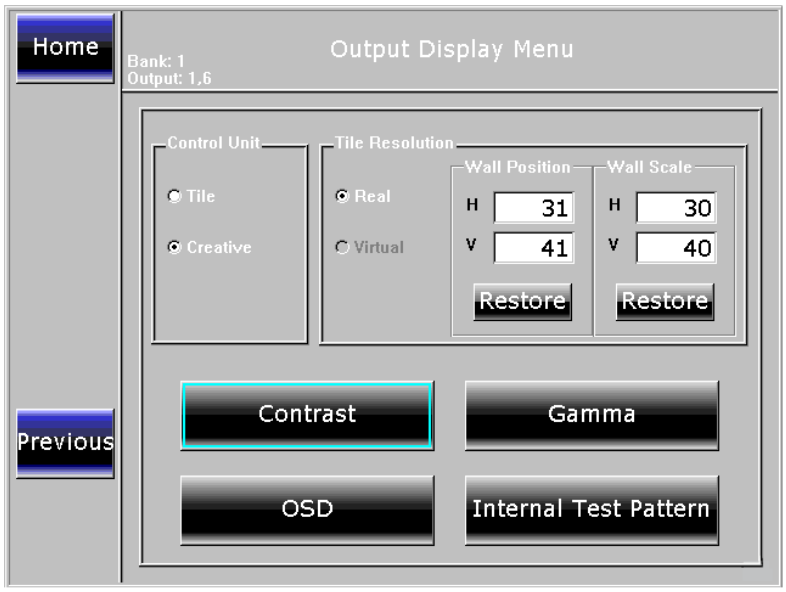


Figure 4-62. Output Display Menu (sample)

5. To set the control unit, select either the **Tile** or the **Creative** radio button.

6. To change the tile resolution (different from the default 1:1 values as shown):

- Select either the **Real** or **Virtual** radio button. Note that "virtual" resolution is only supported by certain tiles. If virtual is not supported, the button is grayed out.
- Press the **H** value box, and use the keypad to enter the desired horizontal resolution. For vertical resolution, repeat for **V**.

7. To adjust LED contrast:

   a. Press **{Contrast}** to display the **Wall Contrast Adjustment Menu**:

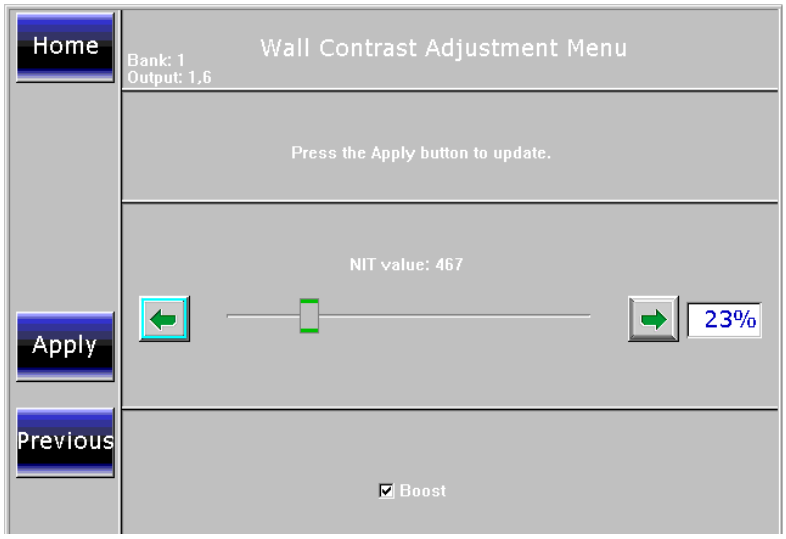


Figure 4-63. Wall Contrast Adjustment Menu (sample)

   b. Use the **NIT Value** slider to adjust the wall's contrast.

   c. Enable the **Boost** check box to boost contrast as required.

   d. Press **{Apply}** to update the wall with the new settings.

   e. Press **{Previous}** to return to the **Output Display Menu**.

8. To adjust LED gamma:

   a. Press **{Gamma}** to display the **Wall Gamma Adjustment Menu**, which indicates both the current and "selected" gamma curves.

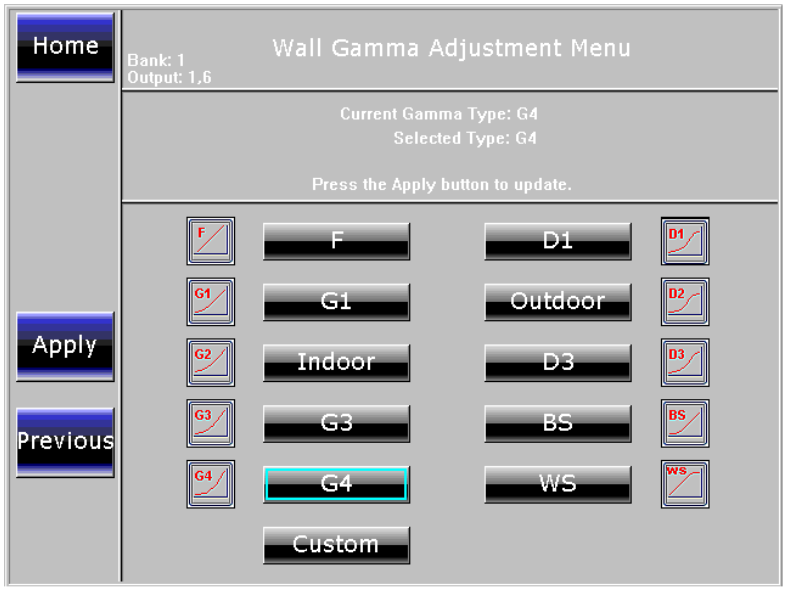


Figure 4-64. Wall Gamma Adjustment Menu (sample)

b. Select the desired gamma curve — **F**, **G1**, **Indoor**, **G3**, **G4**, **Custom**, **D1**, **Outdoor**, **D3**, **BS** or **WS**.

c. Press **{Apply}** to update the wall with the new settings.

d. Press **{Previous}** to return to the **Output Display Menu**.

9. To adjust the tiles' OSD (on screen display):

a. Press **{OSD}** to display the **On Screen Display Menu**.

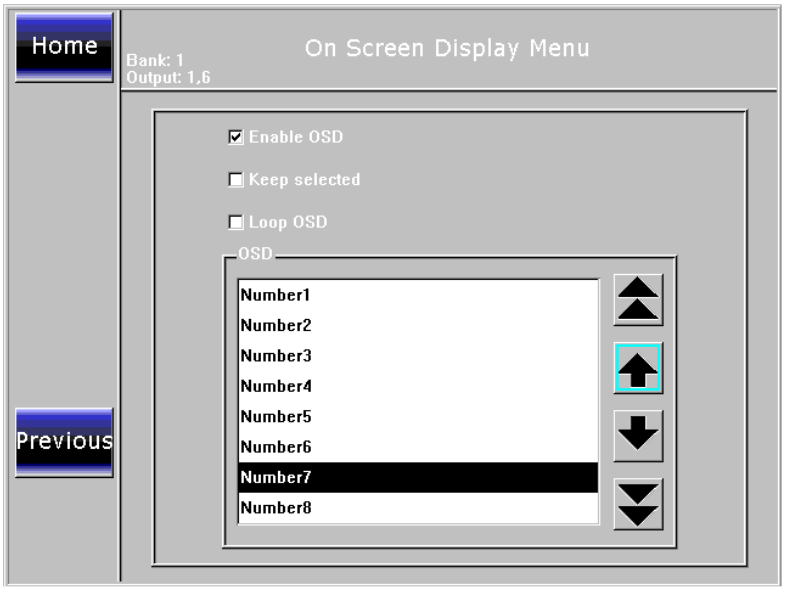


Figure 4-65. On Screen Display Menu (sample)

b. Enable or disable the **Enable OSD** check box, as required.

c. Select an OSD from the list. This display can include the version number, temperature, and other information that can be displayed on the tile.

d. As required, enable or disable the **Keep Selected** check box. When enabled, the on screen display does not "time out" after a short interval.

e. As required, enable or disable the **Loop OSD** check box. When enabled, the OSD loops between all nine OSD display types.

f. Press **{Previous}** to return to the **Output Display Menu**.

10. To adjust the internal test pattern of the tiles themselves:

a. Press **{Internal Test Pattern}** to display the **Wall Test Pattern Menu**.

The figure below illustrates the **Wall Test Pattern Menu**.

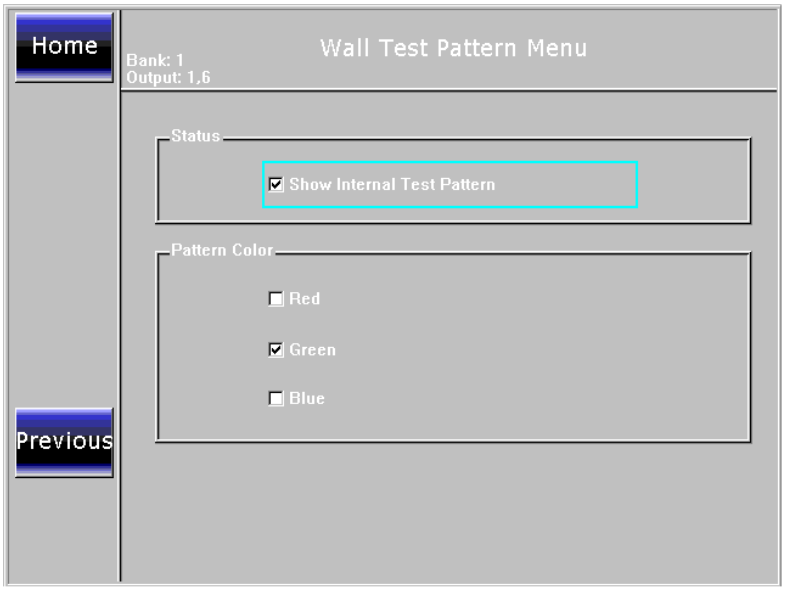


Figure 4-66. Wall Test Pattern Menu

b. To set status, enable or disable the **Show Internal Test Pattern** check box, as required.

c. To set the pattern color, enable or disable the **Red**, **Green** and/or **Blue** check boxes.

Note

If a wall's "internal" test pattern is enabled, it overrides all other video, including video inputs, input test patterns and Fiberlink test patterns.

d. Press **{Previous}** to return to the **Output Display Menu**.

This completes the **LED** management procedure.

Managing Fiberlink Settings

The following procedure applies to Barco "legacy" tiles, such as the MiPIX and the OLite Series. For these tiles, Fiberlink management functions enable you to view Fiberlink module properties, set LED wall power, and control test pattern generation through the **Fiberlink NNI Multi-mode Transmitter** and **Receiver**.

This section does not apply to Barco's NNI-based LED tiles, such as the NX-4 and NX-6, when using the **Fiberlink NNI Transmitter** and **Receiver**. For more information about the Fiberlink Transmitter and Receiver modules, refer to Appendix D, "**Fiberlink NNI Installation**" on page 205.

Use the following steps to manage Fiberlink settings for Barco legacy tiles:

1. From the **Home Menu**, press **{Display Management}** to display the **Output Selection Menu**.
2. Immediately above the graphic, press the button for the **bank** that contains the output whose Fiberlink settings you wish to manage.
3. On the selected bank, press the output that you wish to manage. The **Display Management Menu** appears.
4. Press **{Fiberlink}** to display the **Fiberlink Menu**.

   The figure below illustrates the **Fiberlink Menu**.

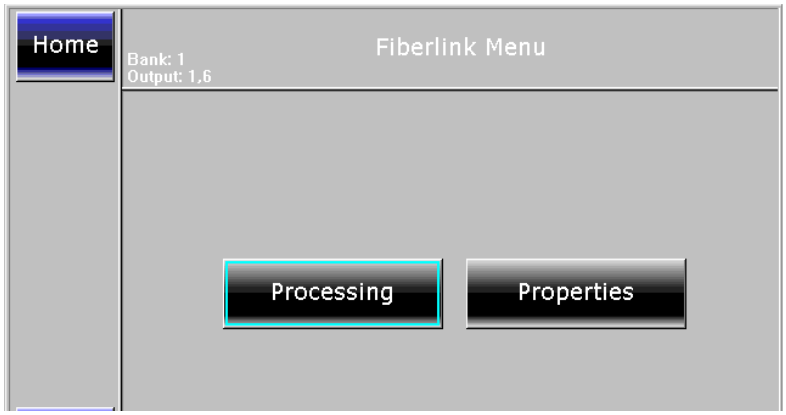


Figure 4-67. Fiberlink Menu (sample)

5. Press **{Processing}** to display the **Fiberlink Processing Menu**:

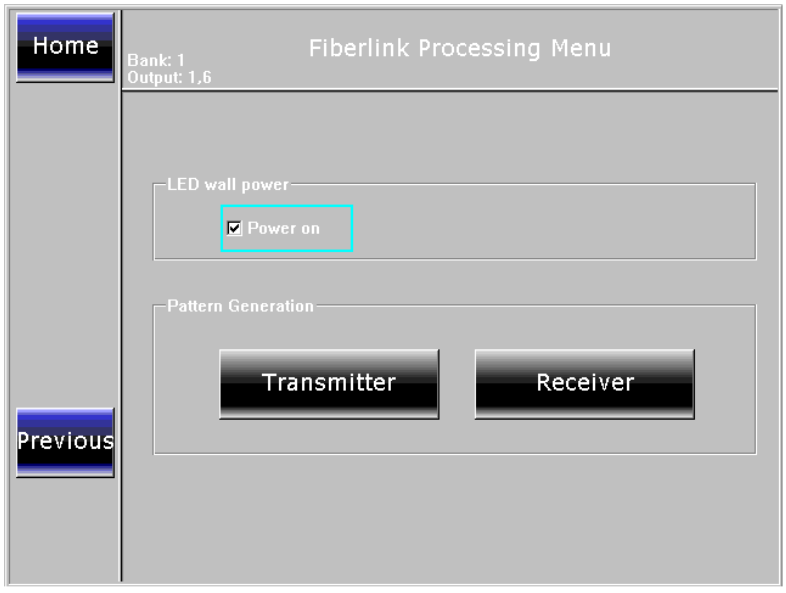


Figure 4-68. Fiberlink Processing Menu

6. To turn LED wall power on or off, enable or disable the **Power On** check box, as required.

7. To generate a test pattern from the Fiberlink transmitter, press **{Transmitter}** to display the **Transmitter Pattern Generation Menu**.

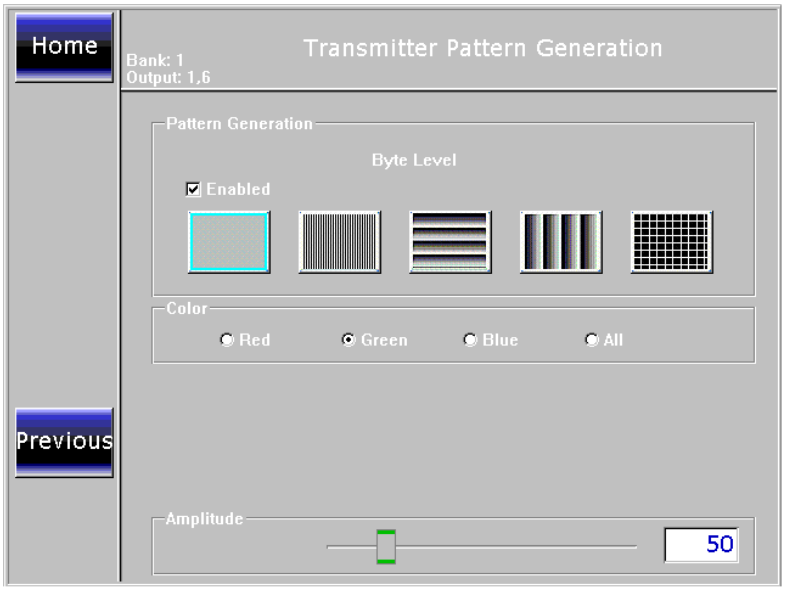


Figure 4-69. Transmitter Pattern Generation Menu

   a. In the **Pattern Generation** section, check the **Enabled** check box to enable transmitter test patterns.

   b. Select a test pattern. Each pattern has additional options:
      - When **Byte Level** is enabled:
        - Select the desired color: **Red**, **Green**, **Blue** or **All**.
        - Adjust the **Amplitude** with the slider.
      - When **Multiburst** is selected:
        - Select the desired color: **Red**, **Green**, **Blue** or **All**.
        - Select the horizontal motion: **Still**, **Left** or **Right**.
        - Adjust the **Burst Type** with the slider.
      - When **Vertical Ramps** is selected:
        - Select the desired color: **Red**, **Green**, **Blue** or **All**.
        - Select the vertical motion: **Still**, **Up** or **Down**.
      - When **Horizontal Ramps** is selected:
        - Select the desired color: **Red**, **Green**, **Blue** or **All**.
        - Select the horizontal motion: **Still**, **Left** or **Right**.
      - When **Cross Hatch** is selected:
        - Select the desired color: **Red**, **Green**, **Blue** or **All**.
        - Select the horizontal motion: **Still**, **Left** or **Right**.
        - Select the vertical motion: **Still**, **Up** or **Down**.
        - Adjust the **Pixel Width** with the slider.

   c. Press **{Previous}** to return to the **Fiberlink Processing Menu**.

8. To generate a test pattern from the Fiberlink receiver, press **{Receiver}** to display the **Receiver Pattern Generation Menu**.

   a. In the **Pattern Generation** section, check the **Enabled** check box to enable receiver test patterns.

b. Select the desired test pattern and its associated parameters. Receiver test pattern options are identical to transmitter test pattern options.

Note

If both the **Transmitter** and **Receiver** test patterns are enabled, only the test patterns from the Receiver will be displayed on the LED wall.

9. To view current Fiberlink properties:

a. Press **{Properties}** to display the **Fiberlink Properties Menu**:

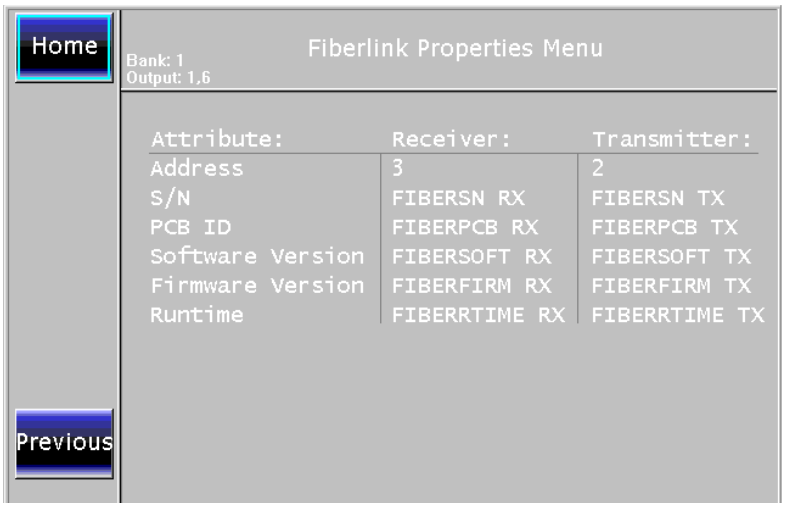


Figure 4-70. Fiberlink Properties Menu (sample)

b. Press **{Previous}** to return to the **Fiberlink Menu**.

c. Press **{Previous}** to return to the **Fiberlink Processing Menu**.

This completes the **Fiberlink** management procedure.

Forcing the Display

An LED wall's power can be forced on or off, as required.

- Use the following steps to force the display:

1. From the **Home Menu**, press **{Display Management}**.

2. Immediately above the graphic, press the button for the **bank** that contains the output whose display you wish to force on or off.

3. On the selected bank, press the output that you wish to manage. The **Display Management Menu** appears.

~ Press **{Force Display On}** to turn the selected LED wall's power on.

~ Press **{Force Display Off}** to turn the selected LED wall's power off. When the confirmation message appears:

- Press **{Yes}** to turn wall power off.
- Press **{No}** to leave the wall's power on.

Both options return you to the **Display Management Menu**.

This completes the **Force Display** procedure.

Using the DX-700 Management Menu

The DX-700 **Management Menu** enables you to view system properties, manage Ethernet properties, run diagnostics and test patterns, reset the system, configure your monitor, save a system “start-up” file, and configure EDID parameters.

The following topics are discussed in this section:

DX-700 Management Menu Tree

The following figure illustrates the **DX-700 Management** menu tree:

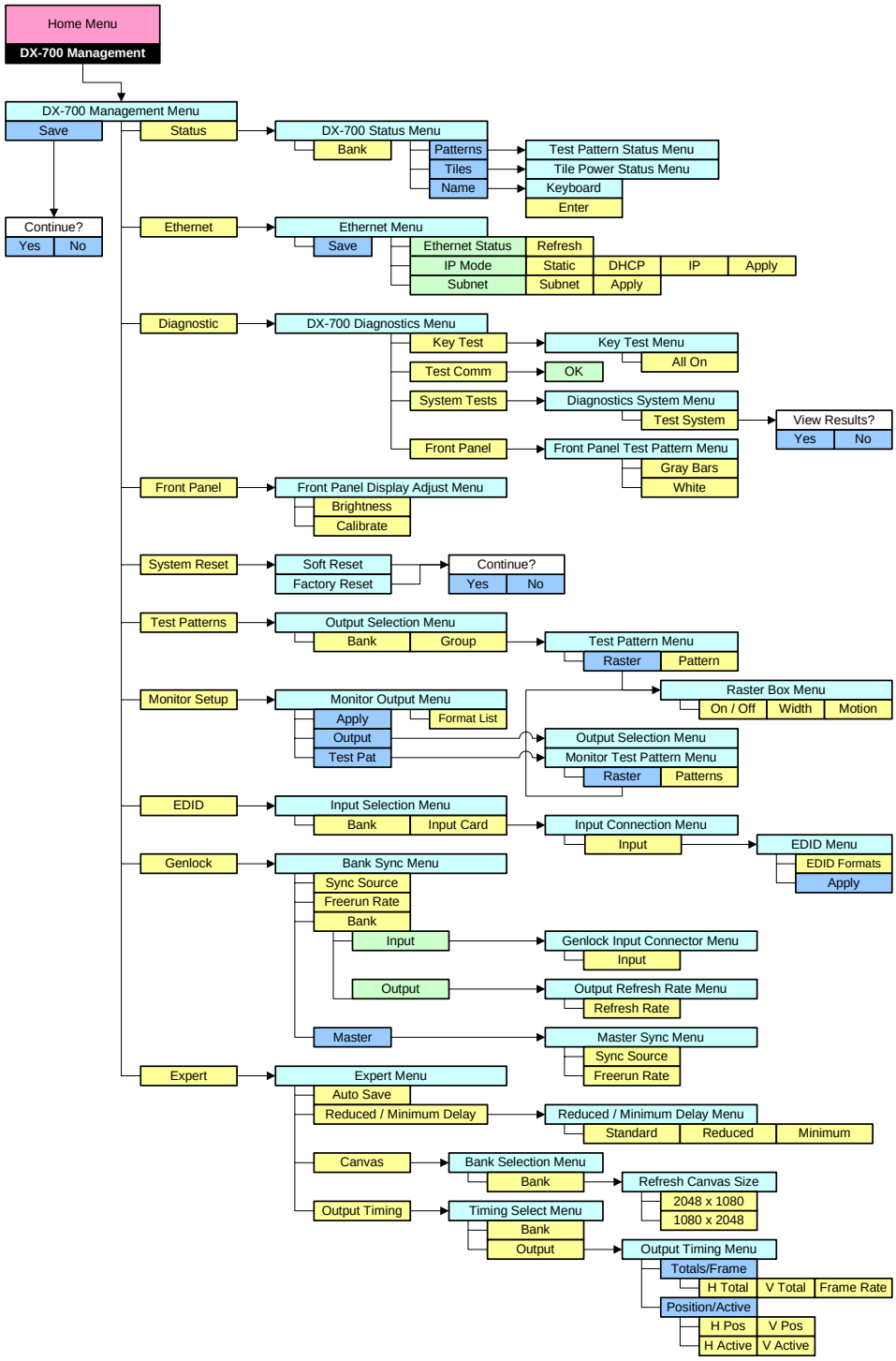


Figure 4-71. DX-700 Management Menu Tree

DX-700 Management Menu Operations

The **DX-700 Management Menu** provides access to management functions such as viewing the status of banks, outputs and tiles, running diagnostic checks, performing genlock functions, resetting the system and various “expert” modes.

- Use the following steps to use the DX-700 **Management Menu**:

  1. From the **Home Menu**, press **{DX-700 Management}**.

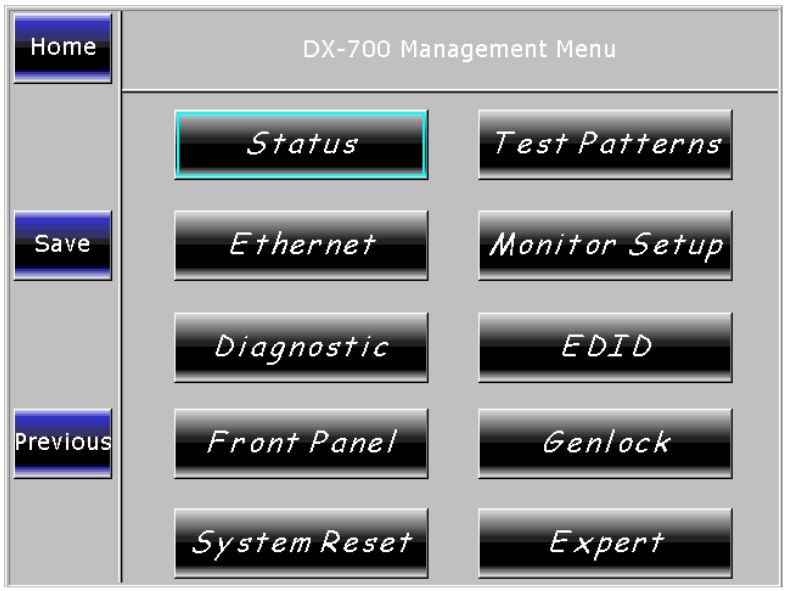


Figure 4-72. DX-700 Management Menu

2. Select the desired function:

~ Press **{Status}** to display the **DX-700 Status Menu**, which is used to view the status of bank outputs, the power status of the tiles, and the test pattern status for each bank, output and tile. You can also use this function to name your DX-700 unit. Refer to the “**Using the DX-700 Status Menu**” section on page 138 for instructions.

~ Press **{Ethernet}** to display the **Ethernet Menu**, which is used to change Ethernet modes, the IP address and the Subnet Mask. Refer to the “**Using the Ethernet Menu**” section on page 142 for instructions.

~ Press **{Diagnostic}** to display the DX-700 **Diagnostics Menu**, which is used to test keys, communications and system functions. Refer to the “**Using the Diagnostics Menu**” section on page 143 for instructions.

~ Press **{Front Panel}** to display the **Front Panel Display Adjustments Menu**, which is used to calibrate and adjust touch screen brightness. Refer to the “**Using the Front Panel Display Adjustments Menu**” section on page 145.

~ Press **{System Reset}** to display the **System Reset Menu**, which enables you to reboot the system or restore it to factory defaults. Refer to the “**Resetting the System**” section on page 145 for instructions.

- Press **{Test Patterns}** to access the **Test Pattern Menu**, which allows you to display test patterns for a single output or a group. Refer to the "**Using the Test Pattern Menu**" section on page 148 for instructions.
- Press **{Monitor Setup}** to display the **Monitor Output Menu**, which is used to set a variety of monitor attributes. Refer to the "**Using the Monitor Output Menu**" section on page 150 for instructions.
- Press **{EDID}** to access the **EDID Menu**, which is used to program EDID parameters. Refer to the "**Using the EDID Menu**" section on page 151 for instructions.
- Press **{Genlock}** to display the **Bank Sync Menu**, which enables you to set genlock parameters. Refer to the "**Understanding Genlock Options**" section on page 153 for instructions.
- Press **{Expert}** to display the **Expert Menu**, which allows users to set delay modes, canvas orientation, and output timing.

Note

It is recommended that you use the DX-700's default settings for these "Expert" options, but if you need to adjust these parameters, refer to the "**Using the Expert Menu**" section on page 158.

- Press **{Save}** to save system configurations to a "startup" file. Refer to the "**Saving DX-700 Management Settings**" section on page 164 for instructions.

Using the DX-700 Status Menu

The **DX-700 Status Menu** gives you an overview of system status. The following functions are available:

- View the current status of each system bank.
- View the firmware version.
- Check the status of test patterns, raster box settings and Black settings for each bank's input, output and tile.
- Check the power status for each tile and get help for any tiles that are experiencing low power, power failure, hardware failure and other issues.
- Name the DX-700.

Use the following steps to use the **Status Menu**:

1. From the **Home Menu**, press **{DX-700 Management}**.
2. Press **{Status}** to display the **DX-700 Status Menu**.

Figure 4-73. Status Menu (sample)

3. Select the desired status function:
   - ~ To view bank status, press the desired bank button above the graphic. The top "**Output Table**" changes to display status for the selected bank. Refer to the "**Output Table Description**" section on page 79 for a description of the table.
   - ~ To check the test pattern status, press **{Patterns}** to display the **Test Pattern Status Menu**. Refer to the "**Viewing Test Pattern Status**" section on page 139 for details.
   - ~ To check the output power status, press **{Tiles}** to display the **Tile Power Status Menu**. Refer to the "**Viewing Tile Power Status**" section on page 140 for details.
   - ~ To name the DX-700, press **{Name}** to display the **Keyboard**. Refer to the "**Naming the DX-700 Unit**" section on page 141 for details.

Viewing Test Pattern Status

- Use the following steps to view status for each system input, output and tile:

  1. From the **Home Menu**, press **{DX-700 Management}** to display the **DX-700 Management Menu**.
  2. Press **{Status}** to display the **DX-700 Status Menu**.
  3. Press **{Patterns}** to display the **Test Pattern Status Menu**.

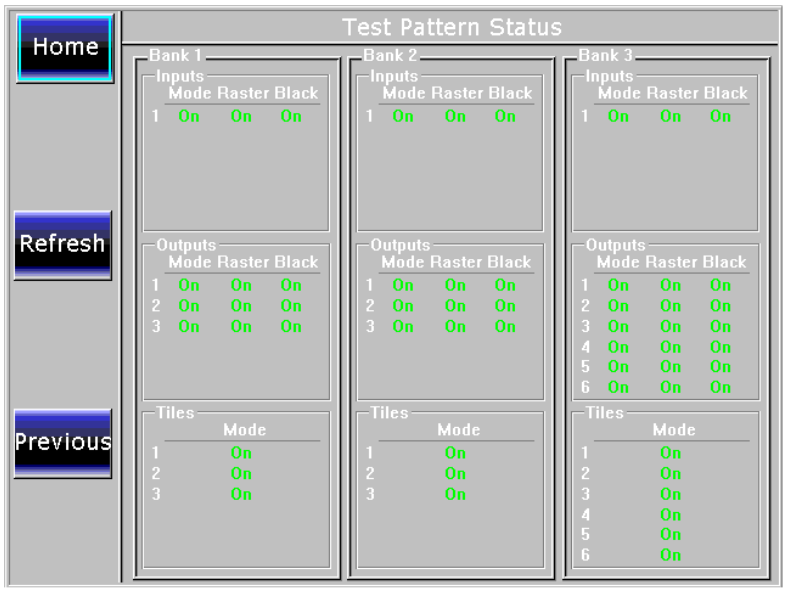


Figure 4-74. Test Pattern Status Menu (sample)

For each bank, this menu shows the On/Off mode, the Raster Box setting and the Black setting for each input, output and attached tile. This information is provided for troubleshooting purposes only — you cannot change the settings here.

- Press **{Refresh}** to update the menu if you made changes to these settings before accessing the menu.

This concludes the **Test Pattern Status** procedure.

Viewing Tile Power Status

The **Tile Power Status Menu** provides power status for each system output. Here, you can also get information and "help" for any output that may be experiencing problems.

- Use the following procedure to view output power status:

1. From the **Home Menu**, press **{DX-700 Management}**.
2. Press **{Status}** to display the **DX-700 Status Menu**.
3. Press **{Tiles}** to view the **Tile Power Status Menu**.

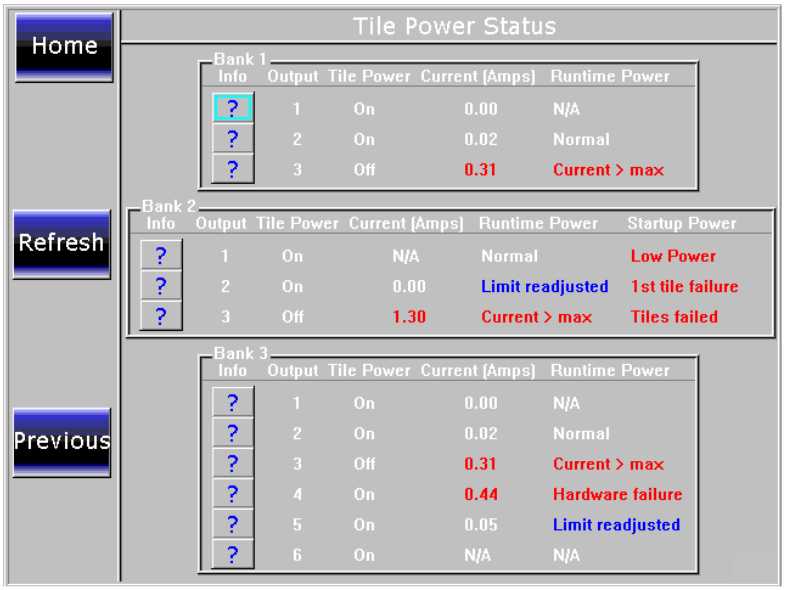


Figure 4-75. Tile Power Status Menu (sample)

On the menu, tables are provided for each bank's outputs. Columns are provided for **Output**, **Tile Power**, **Current (Amps)**, and depending on the tile type, **Runtime Power** and **Startup Power**. Field color is significant:

- ~ White indicate normal power conditions.
- ~ Red indicates an error condition with regard to output power.
- ~ Blue indicates a warning condition with regard to output power.

In addition, an "**Info**" button in the form of a question mark **{?}** is provided for each output.

4. For any output exhibiting a red or blue error condition, press the **{?}** button to display the **Tile Power Help Menu**.

5. The **Tile Power Help Menu** provides brief explanations of the associated output problem, along with its possible causes and steps you can take to resolve it.

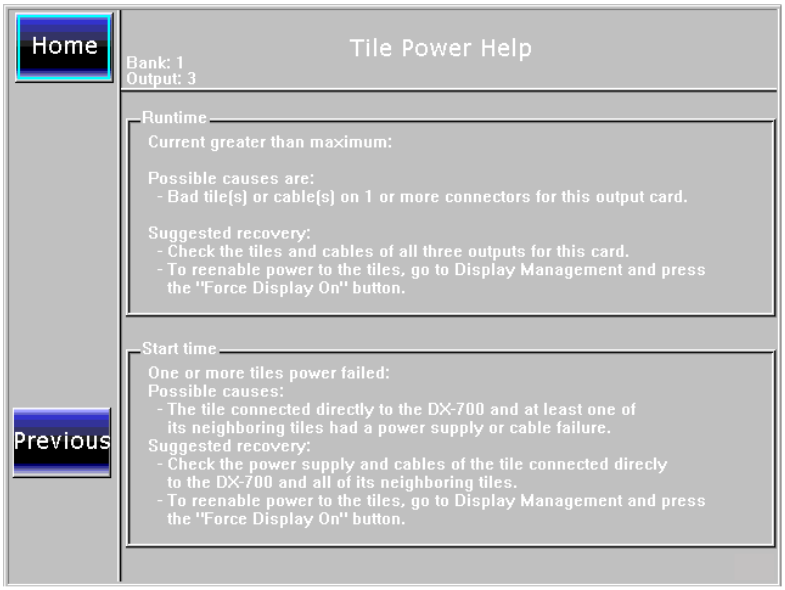


Figure 4-76. Tile Power Help Menu (sample)

6. If you cannot resolve the problem, please contact **Barco Customer Service**. In Appendix C, refer to the "**Contact Information**" section on page 204 for details.
7. Press **{Previous}** to return to the **Tile Power Status Menu**.
8. Press **{Previous}** again to return to the DX-700 **Status Menu**.

Naming the DX-700 Unit

Naming the DX-700 enables the unit to be easily recognized on a network, particularly when there are multiple DX-700 units in use for a particular event.

- Use the following steps to name your DX-700:

1. From the **Home Menu**, press **{DX-700 Management}** to display the **DX-700 Management Menu**.
2. Press **{Status}** to display the **Status Menu**.
3. Press **{Name}** to display the **Keyboard**.
4. Type a name of up to 29 characters.
   - ~ To save the name, press **{Enter}** on the Keyboard.
   - ~ To exit the Keyboard without saving, press **{Esc}**.
5. The DX-700 **Status Menu** appears again. Press **{Previous}** to return to the DX-700 **Management Menu**.

Using the Ethernet Menu

The **Ethernet Menu** enables you to view Ethernet status and manage Ethernet properties.

- Use the following steps to view and manage Ethernet properties:

1. From the **Home Menu**, press **{DX-700 Management}**.
2. Press **{Ethernet}** to display the **Ethernet Menu**.

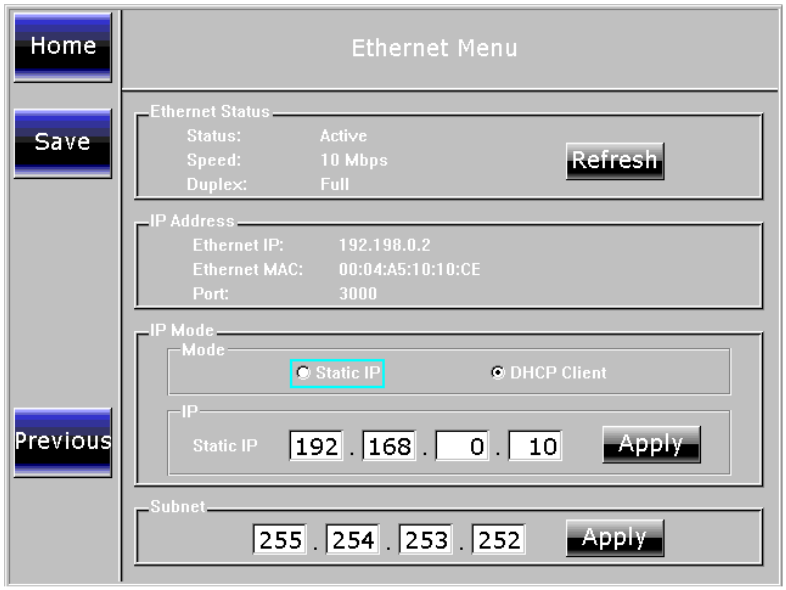


Figure 4-77. Ethernet Menu (sample)

3. The top **Ethernet Status** section lists the status, the speed and the duplex mode. If required, press **{Refresh}** to update the status.

   The middle **IP Address** section lists the current IP address, the MAC address, and the port.
4. In the **IP Mode** section, press either the **Static IP** or **DHCP Client** radio button to change the system's current Ethernet mode.
5. To change the static IP address:
   a. In the **IP** section, press any of the four quads to display a **Keypad**.
   b. Enter the new value for the quad and press **OK**.
   c. Press **{Apply}** to accept the new value, then in the **Mode** section, press the **Static IP** radio button to activate the new address.
6. To change the subnet mask:
   a. In the **Subnet** section, press any of the four quads to display a **Keypad**.
   b. Enter the new value for the quad and press **OK**.
   c. Press **{Apply}** to accept the new value.
7. Press **{Save}** to save any changes you made on the **Ethernet Menu**.
8. Press **{Previous}** to return to the DX-700 **Management Menu**. If any changes were made but not saved, you will be prompted to save changes.

This completes the **Ethernet Management** procedure.

Using the Diagnostics Menu

The DX-700 **Diagnostics Menu** enables you to perform front panel tests and system tests.

- Use the following steps to perform system diagnostic tests:

1. From the **Home Menu**, press **{DX-700 Management}**.
2. Press **{Diagnostic}** to display the **DX-700 Diagnostics Menu**.

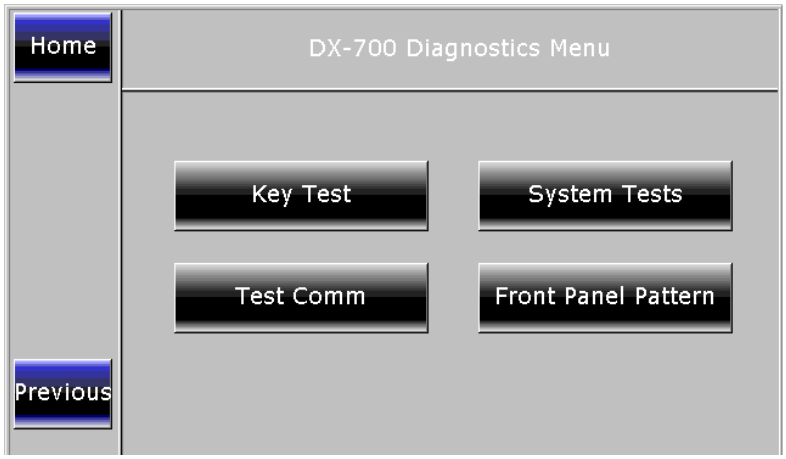


Figure 4-78. DX-700 Diagnostics Menu

3. To perform key tests, press **{Key Test}** to display the **Key Test Menu**.

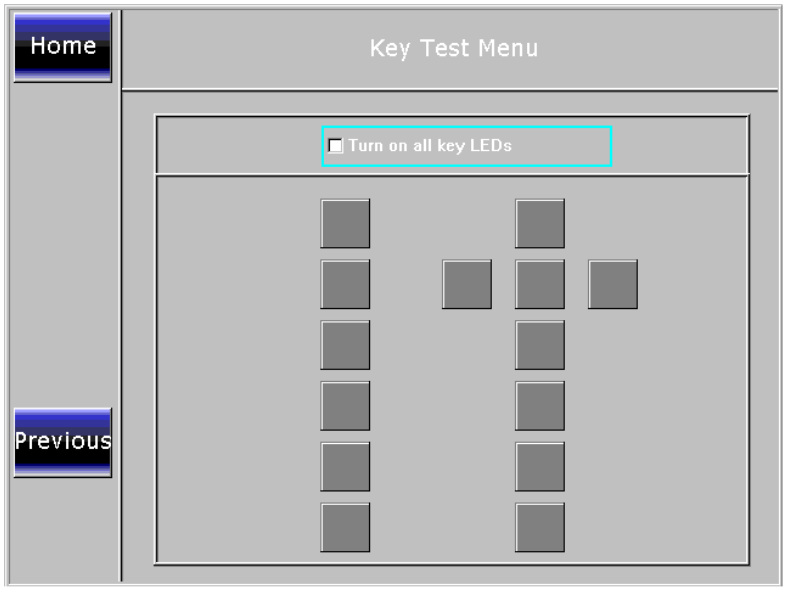


Figure 4-79. Key Test Menu

a. Press any front panel key (button). The associated button on the menu will light.

b. Enable or disable the **{Turn on all key LEDs}** check box to turn all front panel LEDs on or off, as required.

c. Press **{Previous}** to return to the **DX-700 Diagnostics Menu**.

4. To test communications between the front panel and the rest of the system, press **{Test Comm}**, then click **{OK}** to begin the test. A message will appear when the test is complete.
5. To perform system tests, press **{System Tests}** to display the **System Test Confirmation Dialog**.

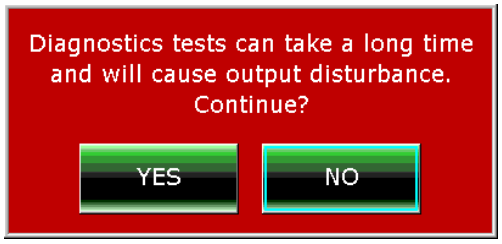


Figure 4-80. System Test Confirmation Dialog

   a. Because the tests can be time consuming, this dialog offers a choice.
      - Press **{Yes}** to continue.
      - Press **{No}** to cancel the procedure.
   b. If you pressed **{Yes}** you will be prompted to view test results.
      - Press **{Yes}** to view the **Diagnostics Test Results Menu**.
      - Press **{No}** to return to the **DX-700 Diagnostics Menu**.
6. On the **DX-700 Diagnostics Menu**, press **{Front Panel Pattern}** to display the **Front Panel Test Pattern Menu**.

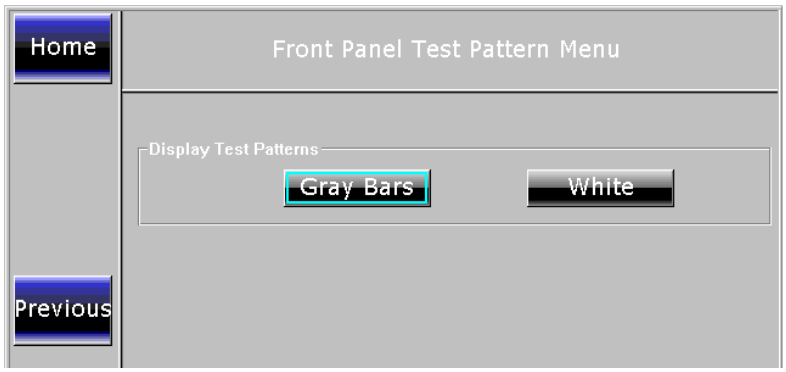


Figure 4-81. Front Panel Test Pattern Menu

   a. Press **{Gray Bars}** or **{White}** to display the associated test pattern on the touch screen. To clear the pattern, press any softkey.
   b. Press **{Previous}** to return to the **DX-700 Diagnostics Menu**.

This completes the DX-700 **Diagnostics** procedure.

Using the Front Panel Display Adjustments Menu

The **Front Panel Display Adjustments Menu** enables you to adjust and calibrate the Touch Screen display.

- Use the following steps to adjust and calibrate the display:

1. From the **Home Menu**, press **{DX-700 Management}**.
2. Press **{Front Panel}** to show the **Front Panel Display Adjustment Menu**.

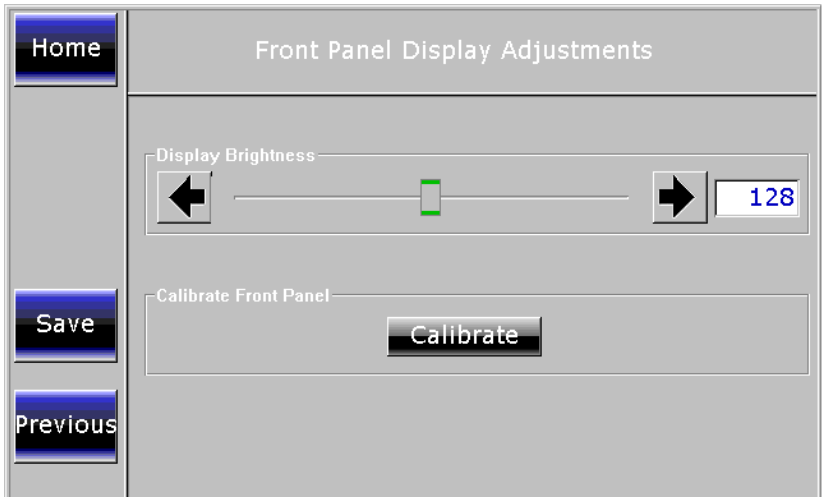


Figure 4-82. Front Panel Display Adjustments Menu

   a. In the **Display Brightness** section, use the slider to adjust the display's brightness.
   b. To permanently save the new brightness setting, press **{Save}**.
   c. In the **Calibrate Front Panel** section, press **{Calibrate}** to calibrate the touch screen. Follow the prompts on screen to complete the procedure.
   d. Press **{Previous}** to return to the **Front Panel Test Select Menu**.

3. Press **{Previous}** to return to the **DX-700 Management Menu**.

This completes the **Display Adjust** and **Calibration** procedures.

Resetting the System

There are two ways to reset the DX-700:

- A "soft reset" reboots the system without deleting saved presets.
- A "factory reset" reboots the system and returns all system settings to their default values, including all output and input setups. All saved presets are deleted.

Rebooting the System

- Use the following steps to reboot the system:

1. From the **Home Menu**, press **{DX-700 Management}**.

2. Press **{System Reset}** to display the **System Reset Menu**.

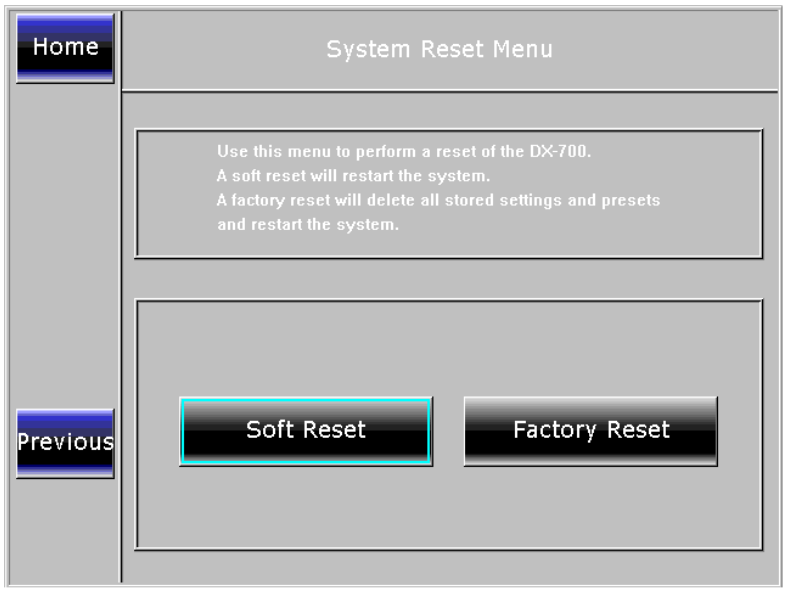


Figure 4-83. System Reset Menu

3. Press **{Soft Reset}**. The following warning appears:

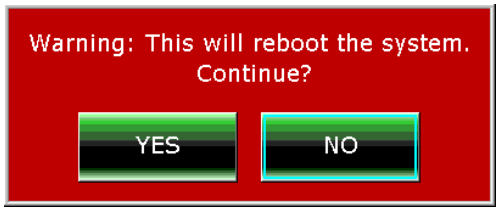


Figure 4-84. Soft Reset Warning

~ Press **{Yes}** to reboot the system without deleting saved presets. Upon completion, the **Home Menu** appears.

~ Press **{No}** to cancel the procedure. The **System Reset Menu** is restored.

This completes the **Soft Reset** procedure.

Performing a Factory Reset

- Use the following steps to perform a complete factory reset:

1. From the **Home Menu**, press **{DX-700 Management}**.
2. Press **{System Reset}** to display the **System Reset Menu**.

3. Press **{Factory Reset}**. The following warning appears:

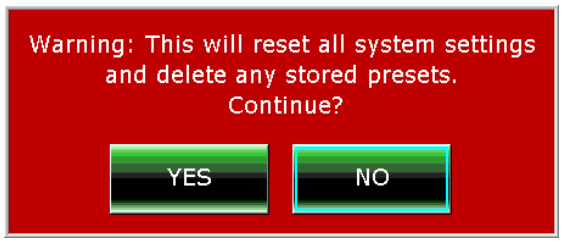


Figure 4-85. Factory Reset Warning

- Press **{Yes}** to reset the system to factory default values and delete saved presets. Upon completion, the **Home Menu** will appear.
- Press **{No}** to cancel the procedure. The system remains at the **System Reset Menu**.

Note

Performing a factory reset updates the tile refresh rate to 59.94Hz, to match the DX-700's refresh rate.

This completes the **Factory Reset** procedure.

Using the Test Pattern Menu

The **Test Pattern Menu** enables you to apply a test pattern and a raster box to a selected bank and output.

- Use the following steps to display output test patterns:

1. From the **Home Menu**, press **{DX-700 Management}**.
2. Press **{Test Patterns}** to display the **Output Selection Menu**.
3. Select a bank and an output to display the **Test Pattern Menu**. You can view this same menu by pressing the **TEST PAT** button on the front panel.

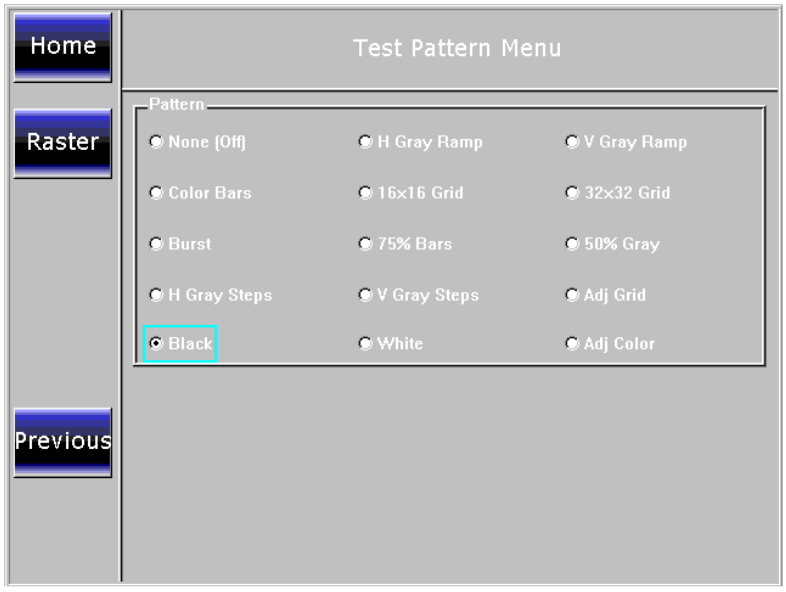


Figure 4-86. Test Pattern Menu

4. Select a test pattern, which replaces the active input when selected. Patterns include:

~ None (Off)	~ H Gray Ramp	~ V Gray Ramp
~ Color Bars	~ 16 x 16 Grid	~ 32 x 32 Grid
~ Burst	~ 75% Bars	~ 50% Gray
~ H Gray Steps	~ V Gray Steps	~ Adj Grid
~ Black	~ White	~ Adj Color

5. If you select **Adj Grid**, the **Grid Size** section appears at the bottom of the menu, enabling you to change grid size.
6. If you select **Adj Color**, the **RGB Color** section appears, enabling you to adjust the colors using the sliders.

7. Press **{Raster}** to enable/disable the output raster box. The **Raster Box Menu** appears.

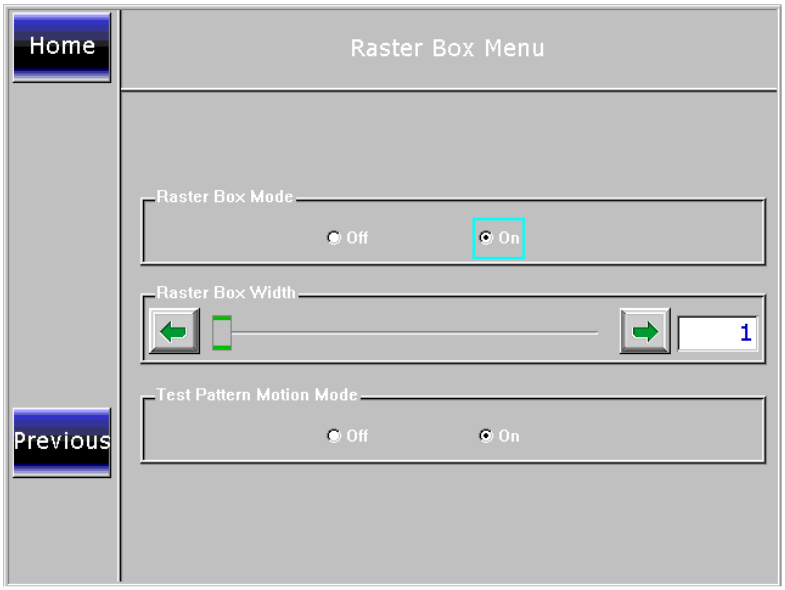


Figure 4-87. Raster Box Menu

8. Perform any of the following raster box functions:
   a. In the **Raster Box Mode** section, use the **Off** / **On** radio buttons to enable or disable the mode.

Note A raster box can be enabled, even if test patterns are off.

   b. In the **Raster Box Width** section, use the slider to adjust the width of the raster box (in pixels).
   c. In the **Test Pattern Motion Mode** section, use the **Off** / **On** radio buttons to enable or disable the motion mode. When enabled, the selected test pattern moves diagonally.
   d. Press **{Previous}** to return to the **Test Pattern Menu**.
9. (**Optional**) Prior to exiting the **Test Pattern Menu**, it is recommended that you select **{None}** to restore the previous active input.
10. Press **{Previous}** to return to the **Output Selection Menu**.
11. Repeat the procedure from step **3** to place a test pattern (and/or raster box) on another output.
12. When you are finished with test patterns, press **{Previous}** to return to the **DX-700 Management Menu**.

Tip To turn off all test patterns and raster boxes on all outputs, press the **BLACK** button on the front panel. When pressed again, all previous inputs are restored.

This completes the **Test Pattern** procedure.

Using the Monitor Output Menu

The DX-700 provides two identical monitor outputs, one each in RGB and DVI formats. Both outputs show the same video. The **Monitor Output Menu** enables you to set the format of your system's monitor, select the monitor video (either an individual output or the entire bank), and display a test pattern and/or raster box on the monitor.

- Use the following steps to manage the monitor.

1. From the **Home Menu**, press **{DX-700 Management}**.
2. Press **{Monitor Setup}** to display the **Monitor Output Menu**.

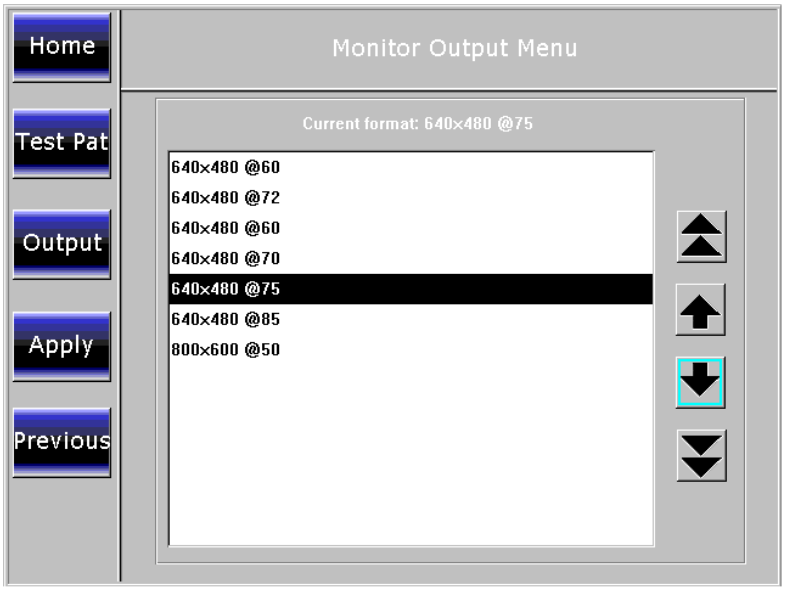


Figure 4-88. Monitor Output Menu (sample)

3. To change the monitor output format, highlight the desired format in the list and press **{Apply}**.
4. To place a test pattern (and/or raster box) on the monitor, press **{Test Pat}** to display the **Monitor Test Pattern Menu**. Refer to the "**Using the Test Pattern Menu**" section on page 148 for details. The menus are identical.

Note

Prior to exiting the **Monitor Test Pattern Menu**, it is recommended that you select **{None}** to restore the previous video on your monitor.

Press **{Previous}** to return to the **Monitor Output Menu**.

5. To change the video that is shown on the monitor, press **{Output}** to display the **Output Selection Menu**:

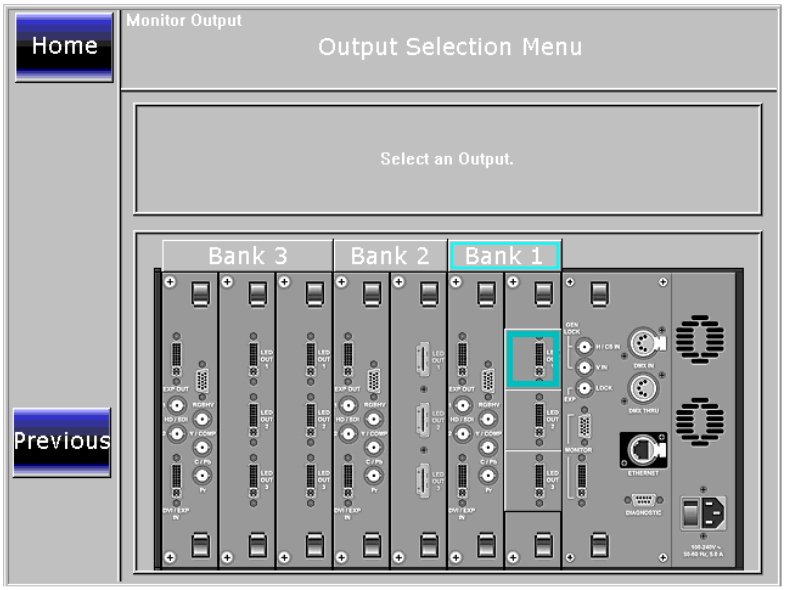


Figure 4-89. Output Selection Menu

- ~ To display the entire bank on the monitor (essentially, the canvas), press the **Bank** button (above the chassis graphic).
- ~ To display a single output, scaled to fit the monitor, press the output connector.

6. Press **{Previous}** to return to the **Monitor Output Menu**.
7. Press **{Previous}** again to return to the **DX-700 Management Menu**.

This completes the **Monitor Setup** procedure.

Using the EDID Menu

Extended Display Identification Data (EDID) is a VESA standard data format that contains information about a display device and its resolution, both preferred and allowed. Each input module contains two EDID files (one for digital, one for analog), which are both stored in non-volatile memory. These EDID files may be read by an external computer's graphics card when the computer's output is connected to DX-700 via the DVI-I or HD-15 connector during boot-up.

This procedure enables you to set EDID for any DVI-I or HD-15 input connector (even ones that have not been set up).

- Use the following steps to set EDID:

1. From the **Home Menu**, press **{DX-700 Management}**.
2. Press **{EDID}** to display the **Input Selection Menu**. On the menu, all input modules are active buttons, regardless of banks.

3. Select an input module to display the **Input Connection Menu**.

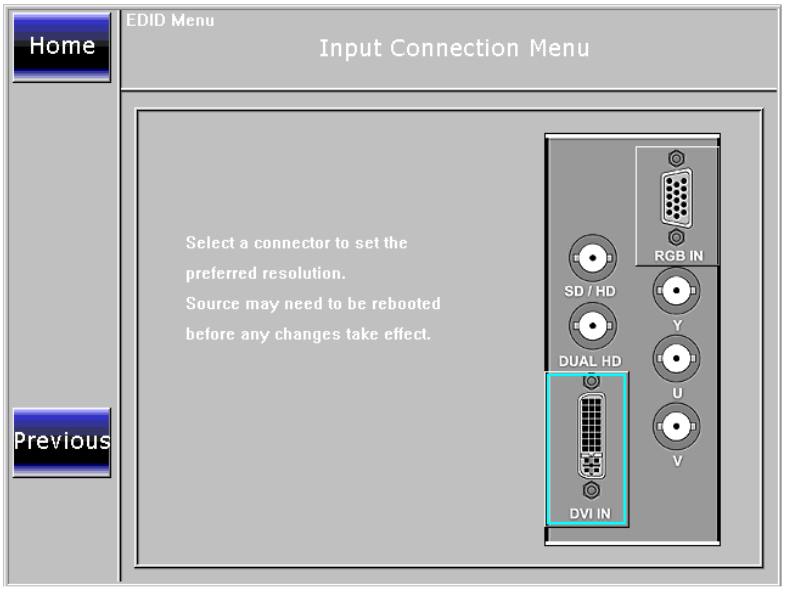


Figure 4-90. Input Connection Menu (sample)

4. Select the connector (either **DVI** or **RGBHV**) on which you want to set up EDID, and note that the source may need to be rebooted before any EDID changes take effect. The **EDID Menu** appears. The selected input connector's current EDID format is shown above the format list, and the format is highlighted in the list.

Figure 4-91. EDID Menu (sample)

5. To change EDID settings, select a format from the list and press **{Apply}**. The new values are stored in the input module's non-volatile memory.

6. Press **{Previous}** to return to the **Input Connection Menu**. Here, you can set up EDID for the module's other connector, or press **{Previous}** to return to the **Input Selection Menu**.
7. As required, repeat the procedure from step **3** to set up other input modules.
8. When EDID setup is complete, press **{Previous}** to return to the **DX-700 Management Menu**.

This completes the **EDID Setup** procedure.

Understanding Genlock Options

Genlock is the practice of synchronizing the video output of one device to a reference source signal, thus ensuring flicker-free video transmission across multiple input and output devices. The DX-700 provides a number of genlock options:

- You can lock a single output (or group) to the same signal as the bank's genlock source, or to a different source, or set it to freerun at a specified freerun rate. The default setting locks an output to the bank's sync source.
- You can synchronize an entire bank's signal to the master genlock source for the system, or a different source, or set it to freerun at a specified freerun rate.
- You can lock the entire DX-700 to a single internal or external signal, or set the DX-700 to freerun at a specified freerun rate.
- You can set individual outputs or output groups on different banks to the same sync source.

This section explains these options in the following topics:

- **Setting Genlock Using the Bank Sync Menu**
- **Setting the Master Sync Source**

Setting Genlock Using the Bank Sync Menu

The **Bank Sync Menu** enables you to select the source to which the LED and monitor outputs in a bank are genlocked. Three different methods are available:

- When **Freerun** is selected, the bank is locked to its own internal timing generator — and *not* to an external source. In this mode, the system is *not* synchronous with other equipment in your video system, but you can set the refresh rate.
- When **Input** is selected, the bank is locked to a specific input on a selected input module. In this mode, the system *is* synchronous with external equipment.
- When **Master Sync** is selected, the bank is locked to the master sync source. You use the **Master Sync Menu** to set the master sync source.

Important

Video processing delay through the DX-700 is affected by the selected genlock mode, the type of input, and the selected delay mode. In Chapter 1, refer to the "**DX-700 Video Processing Delay**" section on page 28 for details.

- Use the following steps to set the genlock source for the outputs in a bank:

1. From the **Home Menu**, press **{DX-700 Management}**.
2. Press **{Genlock}** to display the **Bank Sync Menu**.

Figure 4-92. Bank Sync Menu (sample)

Below the menu title, the **Source Frame Rate** field shows the DX-700's currently selected sync source frame rate. This value changes dynamically when you select different sources and/or frame rates.

3. In the **Sync Source** section, select the radio button for the desired genlock source. Three options are available:

   ~ If **Freerun** is selected, the system immediately locks to the DX-700's internal timing generator, and the **Freerun Rate** section is activated.
   - Select a freerun frame rate using the radio buttons in the **Freerun Rate** section (50, 59.94, or 60), or set a custom rate.
   - Please continue with step **6**.

   ~ If **Input** is selected, focus jumps to one of your input modules.
   - Select an input module and an associated input connector.
   - Please continue with step **4**.

   ~ If **Master Sync** is selected, the bank locks to the master sync source. You set this source by pressing **{Master}** and using the **Master Sync Menu**. Refer to the "**Setting the Master Sync Source**" section on page 156 for instructions.

4. When **Input** is selected (in step **3**), focus jumps to one of your input modules. To set the input genlock source, select an input card to display the **Genlock Input Connector Selection Menu**, shown in the following illustration.

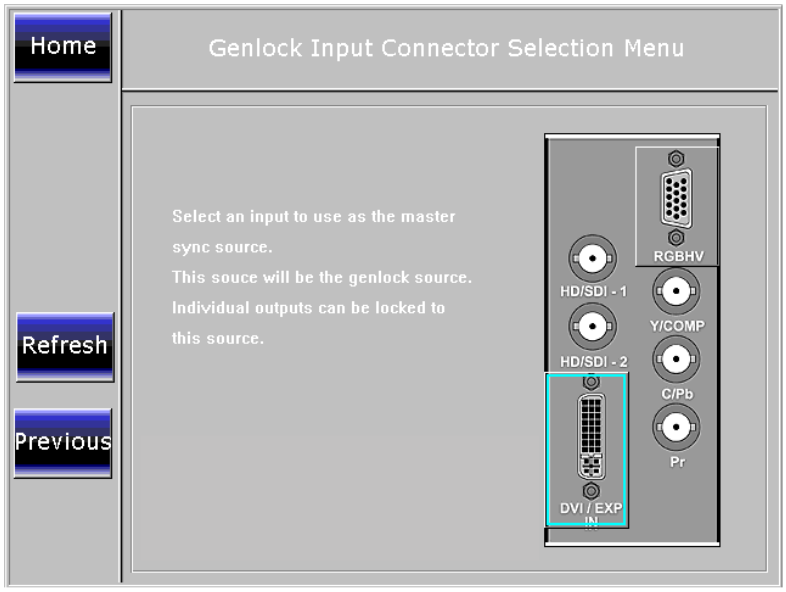


Figure 4-93. Genlock Input Connector Selection Menu (sample)

This menu displays a graphic of the selected input module.

- ~ If the system detects sync for an input, its button is active.
- ~ If the system does not detect sync, the button is inactive.
- ~ If you connect an input source to the module at this point, press **{Refresh}**. The system searches for sync, and re-draws the screen with new (updated) button status.

5. Select the input that you want to use as the genlock source. The system immediately locks to the selected input and returns to the **Bank Sync Menu**.

6. To sync an output to the input connector, select the desired output. The **Output Refresh Rate Menu** appears.

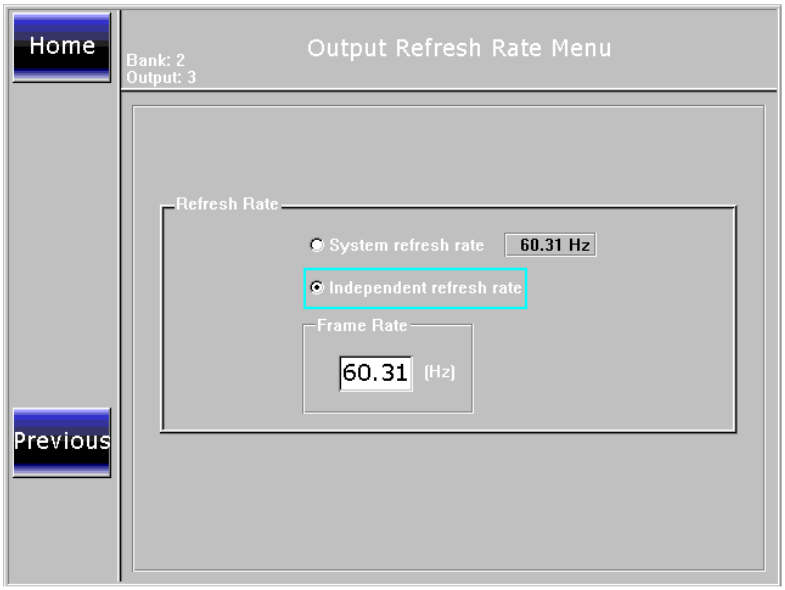


Figure 4-94. Output Refresh Rate Menu (sample)

~ Select **{System refresh rate}** to lock the output or the group signal to the bank's refresh rate.

~ Select **{Independent refresh rate}**, then select the **Frame Rate** box. When the **Keypad** appears, enter a new rate. The output or group is no longer locked to the bank's refresh rate.

7. Press **{Previous}** to return to the **Bank Sync Menu**.

Setting the Master Sync Source

The **Master Sync Menu** enables you to perform the following functions:

- Lock the entire system to a single sync source.
- Lock outputs in different banks to the same sync source. To do so, set the master sync source using the **Master Sync Menu**, then go to the **Bank Sync Menu** and lock individual outputs in one or more banks to the master sync source.

The master sync source can be an external signal, the signal for a specified input, or can be set to freerun at a specified rate.

■ Use the following procedure to set the master sync source.

1. From the **Home Menu**, press **{DX-700 Management}**.
2. Press **{Genlock}** to display the **Bank Sync Menu**.
3. Press **{Master}** to display the **Master Sync Menu**.

   This menu is similar to the **Bank Sync Menu**, but in the **Sync Source** section, the **Master Genlock** button has changed to **Ext Genlock**. In the lower graphic section, the **Genlock** connector on the System Module is an available button.

4. In the **Sync Source** section, select the desired master genlock source. Three options are available:
   - ~ If **Freerun** is selected, the system immediately locks to the DX-700's internal timing generator, and the **Freerun Rate** section is activated.
     - Select a freerun frame rate using the radio buttons, or set a custom rate.
     - Please continue with step **7**.
   - ~ If **Input** is selected, focus jumps to one of your input modules.
     - Select an input module and an associated input connector.
     - Please continue with step **5**.
   - ~ If **Ext Genlock** is selected, focus jumps to the **Genlock** connector on the System Module, and the system immediately locks to external sync. Please continue with step **7**.
5. When **Input** is selected (in step **4**), focus jumps to one of your input modules. To set an input as the master genlock source, select an input card to display the **Genlock Input Connector Selection Menu**. This menu displays a graphic of the selected input module.
   - ~ If the system detects sync for an input, its button is active.
   - ~ If the system does not detect sync, the button is inactive.
   - ~ If you connect an input source to the module at this point, press **{Refresh}** to re-draw the screen with new (updated) button status.
6. Select the input connector that you want to set as the master. The system immediately locks to the input and returns to the **Master Sync Menu**.
7. To sync an output to the selected master input, use the **Bank Sync Menu**. Refer to the "**Setting Genlock Using the Bank Sync Menu**" on page 153 for details.
8. When complete, press **{Previous}** to return to the **Master Sync Menu**, or press **{Home}** to return to the **Home Menu**.

This completes the **Master Sync Rate** selection procedure. Please note the following important points regarding master sync:

- When you select a new Master Sync source and the signal is not present, the system switches back to the previously selected Master Sync source.
- The DX-700 monitors the Master Sync signal periodically. If the selected Master signal is invalid, the system automatically switches the sync source to Freerun.
- The system supports genlocking to an interlaced HD-SDI/SDI input source.

Using the Expert Menu

The figure below illustrates the **Expert Menu**.

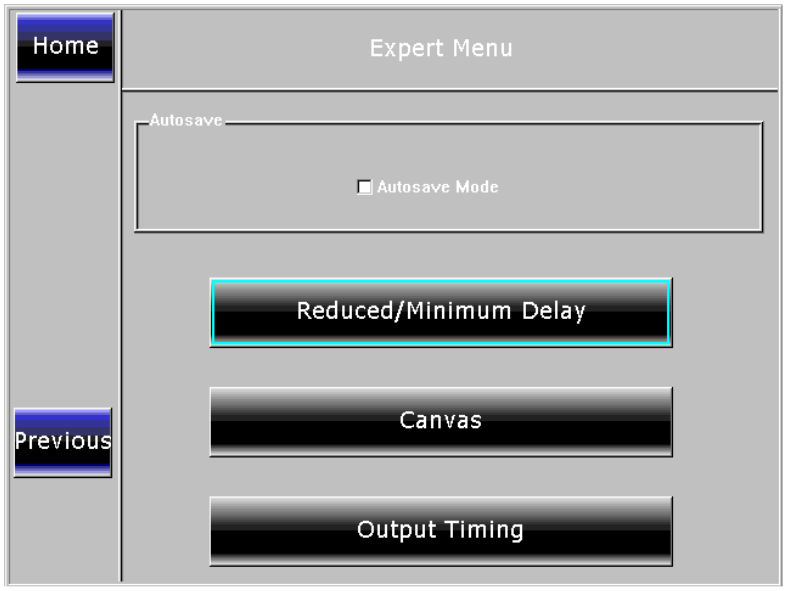


Figure 4-95. Expert Menu

The **Expert Menu** enables you to perform the following functions:

- Pre-select one of three delay modes, which affect the Input and Setup wizards. Refer to the "**Pre-selecting the Delay Mode**" section on page 159 for details.
- Reset the canvas orientation. Refer to the "**Refreshing the Canvas Size**" section on page 160 for details.
- Change the output timing. Refer to the "**Setting Output Timing**" section on page 161 for details.
- Enable the **{Autosave}** check box to automatically save the state of all banks, inputs and outputs in a single register after 15 seconds of inactivity. This register is recalled when you power up the DX-700.

Note	That this is the same function as pressing the **{Save}** button on the **DX-700 Management Menu**.

When the check box is un-checked, autosave is disabled and all "saves" must be performed manually.

Pre-selecting the Delay Mode

The **Reduced/Minimum Delay Menu** enables you to "pre-select" one of three delay modes that will be implemented when you run the Setup Wizard and Input Wizard. In Chapter 1, refer to the "**DX-700 Video Processing Delay**" section on page 28 for a complete explanation of all three modes.

- Use the following procedure to pre-select the delay mode.

1. From the **Home Menu**, press **{DX-700 Management}**.
2. Press **{Expert}** to display the **Expert Menu**.
3. Press **{Reduced/Minimum Delay}** to display the **Reduced/Minimum Delay Menu**.

Figure 4-96. Reduced/Minimum Delay Menu

4. Select the radio button for the desired mode:
   - ~ Select **Standard Mode** for very large LED walls. Delay will be 80ms for interlaced sources and 40-60ms for progressive sources.
   - ~ Select **Reduced Delay Mode** for most applications. This mode creates no processing artifacts and is best suited for live events. Delay will be 23ms for interlaced sources and 2ms for progressive sources.
   - ~ Select **Minimum Delay Mode** when you require the absolute minimum delay, and you are willing to forego some quality. The mode is very good for content that contains low details. Delay will be 2ms for interlaced sources and 2ms for progressive sources.

   Remember that this is a "pre-select" only. The mode will not take effect until both the Setup Wizard and Input Wizard are run.
5. Press **{Previous}** to return to the **Expert Menu**, or press **{Home}** to return to the **Home Menu**.

This completes the **Delay** pre-select procedure.

Refreshing the Canvas Size

Using the **Refresh Canvas Size Menu**, you can change the orientation of the canvas (for a selected bank) to either 2048 x 1080 or 1080 x 2048.

Important | After you refresh the canvas size for a bank, you will need to run the Setup Wizard again.

- Use the following procedure to change a bank's canvas size:

1. From the **Home Menu**, press **{DX-700 Management}**.
2. Press **{Expert}** to display the **Expert Menu**.
3. Press **{Canvas}** to display the **Bank Selection Menu**.
4. Select a bank. Once selected, the **Refresh Canvas Size Menu** appears.

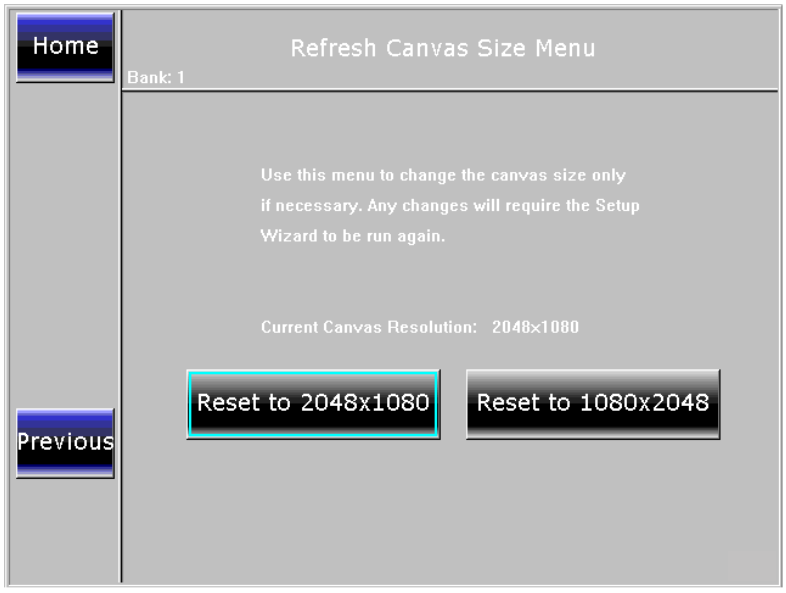


Figure 4-97. Refresh Canvas Size Menu

5. Press the button for the desired canvas orientation. Once pressed, the **Canvas Size Warning** appears, alerting you that the Setup Wizard must be run again:

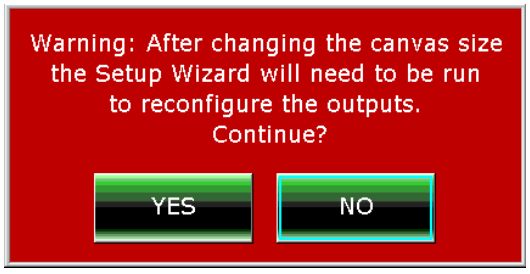


Figure 4-98. Canvas Refresh Warning

~ Press **{Yes}** to change the canvas size.

~ Press **{No}** to stop the process.

6. Press **{Previous}** to return to the **Expert Menu**, or press **{Home}** to return to the **Home Menu**.

This completes the **Refresh Canvas Size** procedure.

Setting Output Timing

Using the **Output Timing Menu**, you can make adjustments to the timing parameters of a selected output group. The settings apply to every output in the group.

- Use the following procedure to set output timing parameters:

1. From the **Home Menu**, press **{DX-700 Management}**.
2. Press **{Expert}** to display the **Expert Menu**.
3. Select **{Output Timing}** to display the **Timing Output Select Menu**.

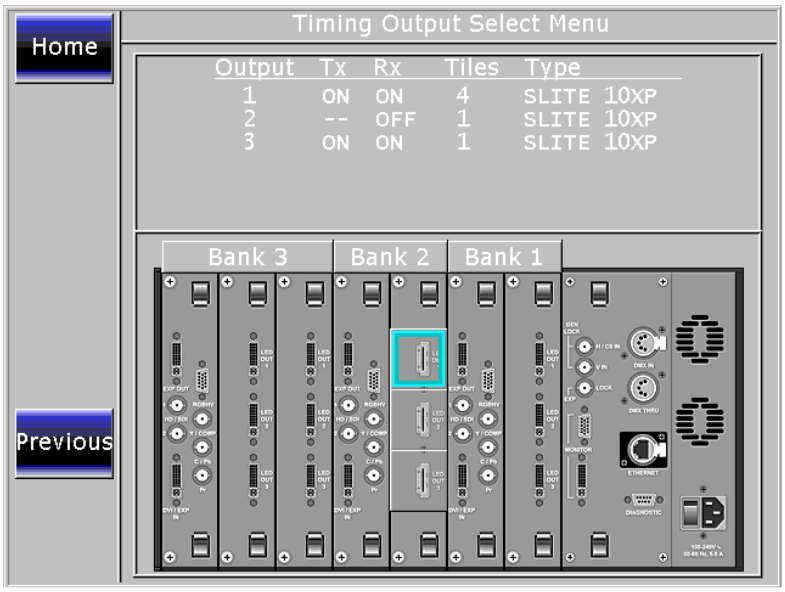


Figure 4-99. Timing Output Select Menu (sample)

4. On the menu, select a bank and an output (or output group). Once selected, the **Output Timing Menu** appears.

The figure below illustrates the **Output Timing Menu**, with the **Totals/Frame Rate Tab** selected.

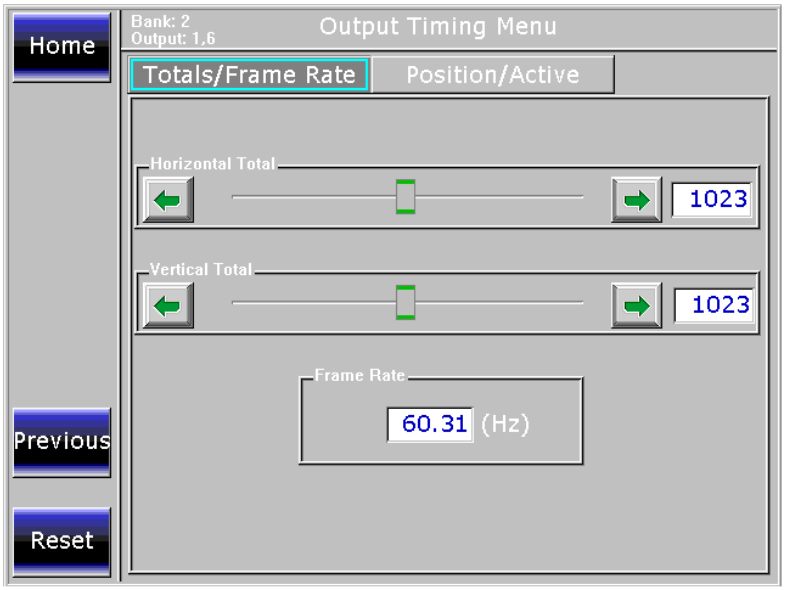


Figure 4-100. Output Timing Menu — Totals/Frame Rate Tab

5. Use the **Horizontal Total** slider to adjust the total pixel count per line for the selected output. The adjustment is in pixels.
6. Use the **Vertical Total** slider to adjust the total line count per frame. The adjustment is in lines.
7. Select the **Frame Rate** field and enter a frame rate on the keypad. This value is the number of times per second that the frame refreshes. The horizontal and vertical totals adjust accordingly.
8. If you want to restore the default settings, press **{Reset}**.
9. Press **{Position/Active}** to display the **Position/Active Tab**.

The figure below illustrates the **Position/Active Tab**.

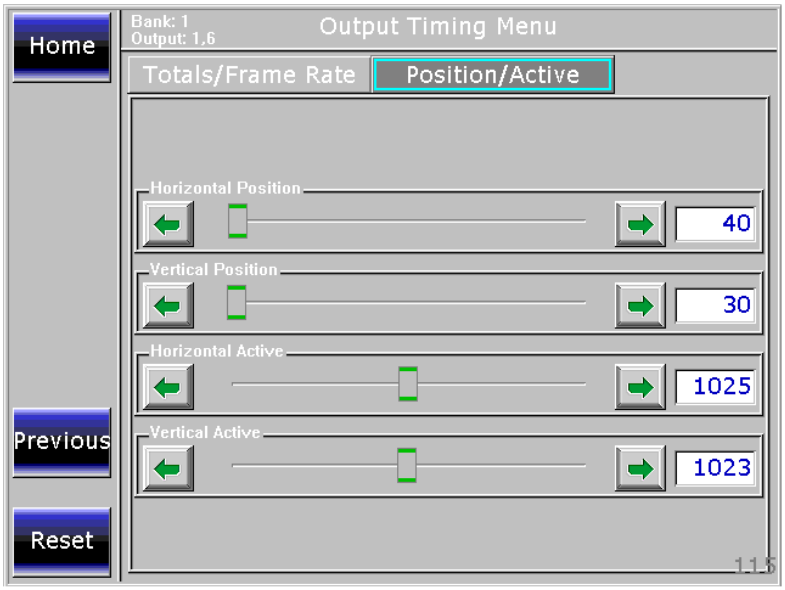


Figure 4-101. Output Timing Menu — Position/Active Tab

Note

Depending on the selected output, not all sliders are available on the tab.

10. Use the **Horizontal Position** slider to adjusts the offset of the start of the active area from H sync. The adjustment is in pixels.
11. Use the **Vertical Position** slider to adjust the offset of the start of the active area from V sync. The adjustment is in lines.
12. Use the **Horizontal Active** slider to adjust the size of the active area. The adjustment is in pixels.
13. Use the **Vertical Active** slider to adjust the size of the active area. The adjustment is in pixels.
14. To restore the default settings, press **{Reset}**.
15. Press **{Previous}** to return to the **Timing Output Select Menu** to set up timing for another output group. Or, press **{Previous}** twice to return to the **Expert Menu**.

This concludes the **Output Timing** procedure.

Saving DX-700 Management Settings

After you make changes on the **DX-700 Management Menu**, you can save the state of all banks, inputs and outputs in a single register. This register is recalled when you power up the DX-700.

Note

This function is the same as pressing **{Save}** on the **Input Management Menu**. If you wish to store bank-specific information as a preset, instead, use the **{Save As}** function on the **Input Management Menu**. Refer to the "**Saving Input Management Settings**" section on page 123 for details.

- Use the following steps to save the system configuration:

  1. From the **Home Menu**, press **{DX-700 Management}**.
  2. On the **DX-700 Management Menu**, press **{Save}** to display the following prompt.

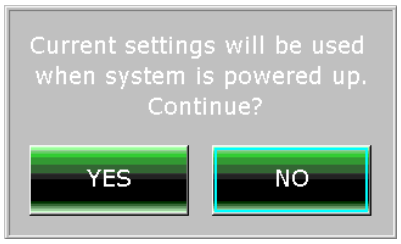


Figure 4-102. Save Prompt

  - ~ Press **{Yes}** to save the system settings. A confirmation pop-up appears. Press **{OK}** to return to the **DX-700 Management Menu.**
  - ~ Press **{No}** to cancel the procedure.

This completes the **Save** procedure.

Front Panel Lockout

The DX-700 front panel can be locked out to prevent inadvertent use by unauthorized personnel. Note that any menu can be active when you lock the front panel.

- Use the following steps to lock and unlock the front panel.

1. On the front panel, press and hold the following four buttons in turn:

- **Softkey 2**
- **Softkey 4**
- **Arrow Down**
- **BLACK**

Tip

Press and hold the first, then the second, then the third, then the fourth button.

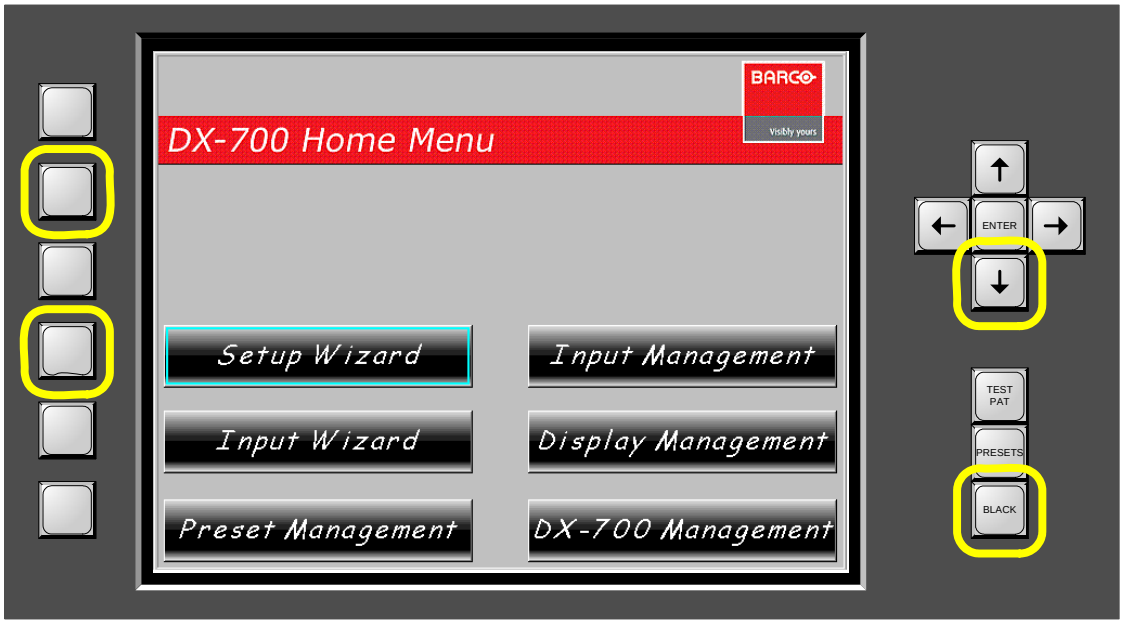


Figure 4-103. Lock / Unlock Buttons

With the proper sequence pressed, the message "**Front Panel Locked**" replaces the menu selections on the touch screen.

2. To unlock the panel, repeat step **1**. The system returns to the same menu that was active when the system was locked.

5. Upgrading Firmware

In This Chapter

This chapter provides instructions for upgrading DX-700 system firmware. The following topics are discussed:

Firmware Upgrade Overview

Firmware files for the DX-700 system are loaded into the hardware at power-up. These files are stored in the unit's onboard flash memory. They can be upgraded using an Ethernet connection to a PC (or laptop) that is running **Director Toolset**. The PC connection is made through the **Ethernet** port on DX-700's rear panel.

Hardware Requirements

The following hardware items are required for upgrading DX-700:

- IBM compatible computer with an available Ethernet port.

Computer and Download Requirements

The following list outlines computer and download requirements for upgrading the DX-700:

- Ensure that your laptop uses the Windows® 2000 or XP operating systems.
- Ensure that the **Director Toolset** is installed on the PC or laptop.
- Contact **Barco Technical Support** for information on the location from which the DX-700 upgrade files can be downloaded, and the proper filename. In Appendix C, refer to the "**Contact Information**" section on page 204 for details.

Upgrading Firmware

- Use the following steps to upgrade DX-700 firmware using the **Director Toolset**:

1. Ensure that your PC uses the Windows® 2000 or XP operating systems.
2. Ensure that Director Toolset is version 2.0 or later.
3. Connect the DX-700's Ethernet port to a Switch.
4. Connect the Switch to your PC. Remember that a totally "local" network is recommended, without IP connections to the outside world.
5. Power-up the DX-700 and use the **Ethernet Menu** to note its IP address.
6. Change the IP address if required. In Chapter 4, refer to the procedure outlined in the "**Using the Ethernet Menu**" section on page 142.
7. To upgrade firmware:
   a. Using Director Toolset, start the **Flash Update** module. On the Menu Bar, click **Modules** and select **Flash Update**. This action opens the **Flash Update Window**.
   b. For DX-700, create a package folder as follows:

```
<install directory>\Flashfiles\DX700 package <version>
```

... where <version> is the version of the main code.

▲ **Example**: DX700 package 0.01.f

c. Download all flash files and the script file:

`CustomerCompleteLoad_RevB_Boards.sld`

... and store everything in the created directory.

Note

The **Flashfiles** folder may contain different package folders.

d. Expand the **Config Tree** overview until the DX-700 is visible.

e. Select the digitizer, and note that the version table will be filled out.

f. Use **Reload Versions** to display both the current version and the new version in the **Version Table**.

g. In the **Version Table**, check the flash type that must be updated.

h. Click the **Start Update** button. After the update has completed, a pop-up message will prompt you to restart the DX-700 manually.

For additional information, please use the following resources:

- In the **Director Toolset Reference Manual**, refer to the "**Flash Update**" section for additional information on flash updates.
- Contact **Barco Technical Support** for additional information. In Appendix C, refer to the "**Contact Information**" section on page 204.

5. Upgrading Firmware

Upgrading Firmware

A. Specifications

In This Appendix

This appendix provides detailed technical specifications for the DX-700. The following topics are discussed:

Input Specifications

The table below lists DX-700 input specifications.

Table A-1. DX-700 Input Specifications

Parameter	Detail	Specification
Input Module		Each module provides: • Analog input 1 (HD-15) • Analog input 2 (3 x BNC) • 1 x DVI input • 2 x single SDI, or 1 x dual SDI (2 x BNC) • 1 x DVI output (expansion)
Analog input 1	Connector	HD-15
	Format	Component RGB with separate H/V sync
	Resolutions	All supported to max. pixel rate of 240Mhz
	EDID	Protocol supported, user-selected
	Scan	Progressive or interlaced
	Sampling Depth	10 bits
	Termination: video	75 ohm +/- 0.1%
	Termination: syncs	75 ohm +/- 1.0%
Analog input 2	Connector	3 x BNC
	Input types	Composite NTSC/PAL/SECAM, S-Video (Y/C)
		Component RGB or YP_bP_r with Sync-on-G (Y)
	Tri-level sync	Supported
	Resolutions	All supported to max. pixel rate of 240Mhz
	Scan	Progressive or interlaced
	Sampling Depth	10 bits
	Termination	75 ohm +/- 0.1%
DVI input	Connector	DVI-I
	DVI type	Standard DVI digital, analog inputs not supported.
	Single-link and dual-link DVI	Supported
	EDID	Protocol supported, user-selected
	Input types	RGB or YC_bC_r, progressive or interlaced
	Resolutions	All supported to max. pixel rate of: • 165MHz (single-link) • 240MHz (dual-link)
	Minimum pixel clock input	25MHz

Table A-1. DX-700 Input Specifications (Continued)

Parameter	Detail	Specification
SDI input	Connector	2 x BNC
	Single and dual-channel SDI	Supported
	Supported formats	525/60 (NTSC) and 625/50 (PAL) per SMPTE 259M
		HD 720p per SMPTE 296M
		HD 1080i per SMPTE 292M
		Dual HD-SDI per SMPTE 372M Supported modes: • 1080p, 4:2:2 YC_bC_r, 10-bit up to 60Hz • 1080i up to 60Hz, 1080p/PsF up to 30Hz with: – 10-bit 4:4:4 RGB or YC_bC_r – 12-bit 4:2:2 YCbCr – 12-bit 4:4:4 RGB or YC_bC_r
DVI Output		Output used for system expansion
	Connector	DVI-I

Output Specifications

The tables below list specifications for two different DX-700 output modules:

- **DVI Output Module**
- **NNI Output Module**

DVI Output Module

The table below lists DX-700 DVI output module specifications.

Table A-2. DX-700 DVI LED Output Module Specifications

Parameter	Detail	Specification
Output Module	Legacy	Supports existing Barco LED tile arrays
	Connectors	3 x DVI-I
	Maximum resolution per output	Up to 2048 either horizontally or vertically. Maximum active area: 480,000 pixels (e.g., 600 x 800)
	Legacy output module	Supports all necessary voltages and startup sequences as per Barco specifications.

Warning

The DVI-I connectors on the DVI output module use proprietary signals and pinouts.

Do not connect the output of a DVI output module to anything other than the input of a Barco DVI LED tile. Even though the connector is a DVI-I type connector, it is not a DVI signal, and serious damage could result if, for example, the output was plugged into a DVI-type monitor.

NNI Output Module

The table below lists DX-700 NNI output module specifications.

Table A-3. DX-700 NNI LED Output Module Specifications

Parameter	Detail	Specification
Output Module	NNI	NNI interface, supports next generation Barco LED arrays
	Connectors	3 x HDMI-type
	Maximum resolution per output	Up to 2048 either horizontally or vertically. Maximum active area: 768K pixels (e.g., 768 x 1024)
	Note	Outputs transmit 12 bits per RGB component, per pixel

Warning

The HDMI-type connectors on the NNI output module use proprietary signals and pinouts.

Do not connect the output of an NNI output module to anything other than the input of a Barco NNI LED tile. Even though the connector is an HDMI-type connector, it is not an HDMI signal, and serious damage could result if, for example, the output is plugged into an HDMI-type monitor.

Genlock Specifications

The table below lists DX-700 genlock specifications.

Table A-4. DX-700 Genlock Specifications

Parameter	Detail	Specification
Genlock	Input	Csync (standard or tri-level), or H+V (TTL Level)
	Connector	2 x BNC supporting composite sync, black burst, or separate H and V. No loop-through.
	Termination	75 ohm, +/- 0.1%
Expansion Sync	Output	Connects to H/CS genlock input of slave DX-700 unit
	Connector	1 x BNC

Physical and Electrical Specifications

The table below lists DX-700 physical and electrical specifications.

Table A-5. DX-700 Physical and Electrical Specifications

Parameter	Detail	Specification
Power	Connector	Standard IEC, integral on/off switch
	Input	100-240 VAC, 50-60 Hz
	Power consumption	500 watts maximum
Mechanical	Chassis	**H:** 8.75 inches (22.22 cm)
		W: 17.00 inches (43.18 cm)
		W: 19.00 inches (48.26 cm) with rackmount wings
		D: 17.00 inches (43.18 cm), excluding connectors and latches
Touch Screen	Display size	8.4" Diagonal (6.73" W x 5.05" H)
	Display Technology	TFT Active Matrix
	Colors	262,144
	Resolution	640 x 480
	Backlight	Cold Cathode Fluorescent
Temperature		0-40 degrees C
Cooling	Power supply	Dedicated, integral cooling fan
	System Module	Dedicated, integral cooling fan
	Input module	Dedicated, integral cooling fan
	Output module	Dedicated, integral cooling fan
Humidity		0-95% non-condensing
Mounting		5 RU rack mount
Weight	Chassis, plus Power Supply and System Module	40 lbs. (18.14 kg)
	Input Module	4.35 lbs. (1.97 kg)
	DVI Output Module	3.85 lbs. (1.74 kg)
	NNI Output Module	3.85 lbs. (1.74 kg)

Communications Specifications

The table below lists DX-700 communications specifications.

Table A-6. DX-700 Communications Specifications

Parameter	Detail	Specification
Communications	RS-232 (**Diag**)	DB-9 Female
	Ethernet	RJ-45, 100 Mbps

Agency Specifications

The table below lists DX-700 agency specifications.

Table A-7. DX-700 Agency Specifications

Parameter	Detail	Specification
Agency Specifications	EMI/EMC	EN55103-1 E4, EN55103-2, FCC Part 15 Subpart B Class A
	Safety	EN 60950 Class 1

Delay Specifications

The tables in this section provide DX-700 delay specifications.

Delay Table 50 Hz

The table below summarizes the DX-700's video processing delay at 50 Hz.

Table A-1. DX-700 Video Processing Delay at 50 Hz

Processing Mode	Selected Genlock Mode	Delay for Interlaced Sources	Delay for Progressive Sources
Minimum Delay	Input	2 ms **	2 ms ***
Reduced Delay	Input	23 ms **	2 ms ***
Standard Delay	Free-run	80 ms	60 ms
	External	80 ms *	40 ms *
	Input	80 ms **	40 ms ***

* Value applies to all sources that are also genlocked to the same composite or black burst reference signal as the DX-700.

** For the genlock-selected interlaced source only.

*** For the genlock-selected progressive source only.

Delay Table 60 Hz

The table below summarizes the DX-700's video processing delay at 60 Hz.

Table A-2. DX-700 Video Processing Delay at 60 Hz

Processing Mode	Selected Genlock Mode	Delay for Interlaced Sources	Delay for Progressive Sources
Minimum Delay	Input	2 ms **	2 ms ***
Reduced Delay	Input	20 ms **	2 ms ***
Standard Delay	Free-run	66 ms	50 ms
	External	66 ms *	33 ms *
	Input	66 ms **	33 ms ***

* Value applies to all sources that are also genlocked to the same composite or black burst reference signal as the DX-700.

** For the genlock-selected interlaced source only.

*** For the genlock-selected progressive source only.

Pinouts

The following topics are discussed in this section:

Analog 15-pin D Connector

The figure below illustrates the analog 15-pin D connector:

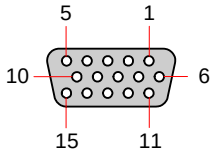


Figure A-1. Analog 15-pin D connector, chassis view

The table below lists Analog 15-pin D connector pinouts.

Table A-3. Analog 15-pin D Connector Pinouts

Pin	Signal	Pin	Signal
1	Red	9	
2	Green	10	GND
3	Blue	11	
4		12	
5		13	H Sync or C Sync
6	Red return	14	V Sync
7	Green return	15	
8	Blue return		

DVI-I Connector Pinouts

The DX-700 uses DVI-I connectors for both inputs and outputs, but pinouts and signals are very different, as follows.

- The following connectors use standard DVI pinouts and signals:
  - ~ Input Module: **EXP OUT** connector
  - ~ Input Module: **DVI / EXP IN** connector
  - ~ System Module: **DVI Monitor Output** connector

  Refer to the "**Standard DVI-I Connector**" section on page 181 for details.
- The following connector uses proprietary DVI pinouts and signals:
  - ~ DVI Output Module: **LED OUT 1**, **2**, and **3** connectors

  Refer to the "**Proprietary DVI-I Connector**" section on page 182 for details.

Standard DVI-I Connector

The figure below illustrates the standard DVI-I connector, which is used for the following connections:

- Input Module: **EXP OUT** connector
- Input Module: **DVI / EXP IN** connector
- System Module: **DVI Monitor Output** connector

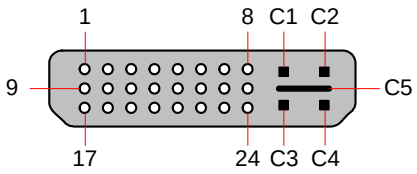


Figure A-2. Standard DVI-I connector

The table below lists standard DVI-I connector pinouts. Please note:

- T.M.D.S = Transition Minimized Differential Signal
- DDC = Display Data Channel

Table A-4. Standard DVI-I Connector Pinouts

Pin	Signal	Pin	Signal
1	T.M.D.S. Data 2-	13	T.M.D.S. Data 3+
2	T.M.D.S. Data 2+	14	+5V Power
3	T.M.D.S. Data 2/4 Shield	15	ground (for +5V)
4	T.M.D.S. Data 4-	16	Hot Plug Detect
5	T.M.D.S. Data 4+	17	T.M.D.S. Data 0-
6	DDC Clock	18	T.M.D.S. Data 0+
7	DDC Data	19	T.M.D.S. Data 0/5 Shield
8	Analog Vertical Sync	20	T.M.D.S. Data 5-
9	T.M.D.S. Data 1-	21	T.M.D.S. Data 5+
10	T.M.D.S. Data 1+	22	T.M.D.S. Clock Shield
11	T.M.D.S. Data 1/3 Shield	23	T.M.D.S. Clock +
12	T.M.D.S. Data 3-	24	T.M.D.S. Clock -
MicroCross Pins			
C1	Analog Red Video	C4	Analog Horizontal Sync
C2	Analog Green Video	C5	Analog Common Ground Return
C3	Analog Blue Video		

Proprietary DVI-I Connector

The figure below illustrates the proprietary DVI-I connector, which is used for the following connection:

- DVI Output Module: **LED OUT 1**, **2**, and **3** connectors

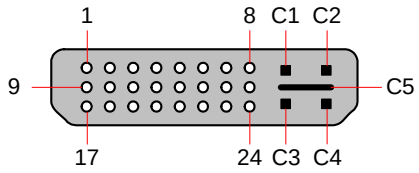


Figure A-3. Proprietary DVI-I connector

Warning

The DVI-I connectors on the DVI output module use proprietary signals and pinouts.

Do not connect the output of a DVI output module to anything other than the input of a Barco DVI LED tile. Even though the connector is a DVI-I type connector, it is not a DVI signal, and serious damage could result if, for example, the output was plugged into a DVI-type monitor.

Ethernet Connector

The figure below illustrates the Ethernet connector:

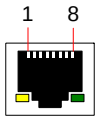


Figure A-4. Ethernet connector

The table below lists Ethernet connector pinouts.

Table A-5. Ethernet Connector Pinouts

Pin	Signal	Wire Color
1	TX Data +	White / Orange
2	TX Data -	Orange
3	RX Data +	White / Green
4		Blue
5		White / Blue
6	RX Data -	Green
7		White / Brown
8		Brown

Diagnostic Connector

The figure below illustrates the **Diagnostic** connector.

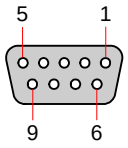


Figure A-5. Diagnostic connector

The diagnostics port is reserved for factory and technical support use only.

DMX Connector

The figure below illustrates the **DMX** connector.

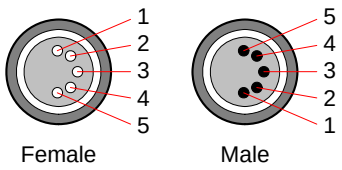


Figure A-6. DMX connector, view from chassis side

The table below lists **DMX** connector pinouts.

Table A-6. DMX Connector Pinouts

Pin	DMX Signal	Description
1	GND	Signal Common
2	RXD -	Received Data Minus
3	RXD +	Received Data Plus
4	Not Used	Loop between connectors
5	Not Used	Loop between connectors

Note

DMX control is not currently implemented.

NNI Connector

The figure below illustrates the proprietary **NNI** connector.

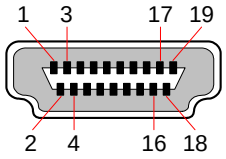


Figure A-7. Proprietary NNI connector, mating face, using HDMI-type A, male

Warning

The HDMI-type connectors on the NNI output module use proprietary signals and pinouts.

Do not connect the output of an NNI output module to anything other than the input of a Barco NNI LED tile. Even though the connector is an HDMI-type connector, it is not an HDMI signal, and serious damage could result if, for example, the output was plugged into an HDMI-type monitor.

B. Remote Control Protocol

In This Appendix

This appendix provides information regarding remote commands. The following topics are discussed:

Remote Commands

The following topics are discussed in this section:

Command Structure

The following topics are discussed in this section:

Overview

Please note the following important points regarding command structure:

- Byte values permitted as fields in this protocol are from 0x20 – 0xff. Other values (0x00 – 0x1f) are reserved or used as **End Of Command/Response** characters.
- Delimiter between fields in the protocol is the "|" character (0x7c.) The delimiter character can only occur in a command as a delimiter. Therefore, no string can have the "|" character.
- A backslash character (0x5c) does not indicate an escape character. A backslash character will simply be interpreted as a backslash character.

Generally, there are two types of commands:

- An **update/set command** is one that is sent to the DX-700 to update its state.
- A **query command** is one that will result in the DX-700 returning information about its current state.

Update/Set Command Format

An update/set command format is as follows (each field in the command is delimited by a "|" character (0x7c.) The user will use a single "\n" character (0x0a) to indicate **End of Command** to the DX-700:

```
<command>|<param1>|<param2>| … <param n><end of command byte>
```

The command is always the first field. No delimiter necessary prior to the command field. All other fields are used as parameters for the command (refer to the "**DX-700 Remote Command List**" section on page 191 for specifics on each command.) Some commands do not have any parameters. Each parameter is separated by the delimiter byte.

Query Command Format

A query command is similar to the update command format except for the addition of a “?” character (0x3f) following the command (no characters between command and “?” character.) Each field in the command is delimited by a “|” character (0x7c.) The user will use a single “\n” character (0x0a) to indicate End of Command to the DX-700.

```
<command>?|<param1>|<param2>| … <param n><end of command byte>
```

For example, the user would like to update the Monitor Output resolution to 1024x768 @ 60. If the Monitor Output resolution command is MORES, and the command has a string parameters, the command would be:

```
MORES | 1024x768 @60
```

... followed by a “\n” character.

To query the current Monitor Output resolution, the command would be:

```
MORES?
```

... followed by a “\n” character.

DX-700 Response to Commands

Every command sent to the DX-700 will result, in the minimum, a 2 field response;

- Command
- Success/error code.

Fields are delimited by a “|” character (0x7c). Two “\n” characters (0x0a) will be used to indicate End of Response from the DX-700.

```
<command>|<error code>|<response1>|<response2>|….<response n>
```

The first field is the command that this particular response is for. The second field is the error code. The first byte in the error code is a sign character. If the error code is positive (0 being a positive number), the ‘+’ character will be displayed. If the error code is negative, the ‘-’ character will be displayed. In DX-700, positive numbers indicate that the command has been successfully executed. Negative numbers indicate that an error occurred while trying to process the command. The error codes are in an enumerated list and can be shared with users to decode what the error codes mean.

If any fields exist after the error code, these fields correspond to the query response for the command. Examples of error codes are listed below:

```
SCRPWR | +0000 (successful execution of command SCRPWR)
SCRPWR | -1954 (error # -1954 occurred on execution of command SCRPWR)
SCRPWR | -0800 (error # -800 occurred on execution of command SCRPWR)
```

A command sent to the DX-700 could generate an error for many reasons:

- Command undefined
- For current system state, command is not applicable
- Command parameters invalid
    - ~ One or more parameter value(s) out of bounds
    - ~ Insufficient parameters (for example, need 3 params, only receive 2)
    - ~ For current system state, parameter not applicable

For example: user would like to update the Monitor Output resolution to 1024x768 @ 60. If the Monitor Output resolution command is MORES, the command would be:

```
MORES | 1024x768 @60
```

If the DX-700 is able to process the command correctly, the response will be

```
MORES | +0000
```

... followed by two “\n” characters (0x0a) to indicate End of Response from the DX-700.

If an error occurred, depending on the error type, the response could be

```
MORES | -1952
```

... followed by two “\n” characters (0x0a) to indicate End of Response from the DX-700.

To query the current Monitor Output resolution, the command is

```
MORES?
```

If no error occurred, the DX-700 will respond with

```
MORES | +0000 | 1024x768 @60
```

... followed by two “\n” characters (0x0a) to indicate End of Response from the DX-700.

Single “\n” character in between fields to indicate new line (for user terminal). To allow the DX-700 response to be terminal friendly (user on serial terminal / telnet terminal), some commands, as an option, would use a single “\n” character to separate the fields in the response.

For example:

- Command: **VFSTDLIST**
- Description: Returns the entire list of supported formats.
- Set format: n/a
- Query format: VFSTDLIST? | Verbose
- Parameters:
  - ~ Verbose: Optional. When 1, this command returns more readable data, separated by the line feed character ’\n’, instead of being ‘|’ separated.

▲ Example 1: VFSTDLIST

```
NTSC (480i) | 720x480p | PAL (576i) | 720x575p | 640x480 @59.94 |
640x480 @60 | 640x480 @72 | 640x480 @75 | 640x480 @85 | 800x600 @50 |
800x600 @56 | 800x600 @59.94 | 800x600 @60 | 800x600 @72 | 800x600 @75
| 800x600 @85 | 1024x768 @47.95 | 1024x768 @48 | 1024x768 @50 |
1024x768 @59.94 | 1024x768 @60 | 1024x768 @70 | 1024x768 @71.93 |
1024x768 @72 | 1024x768 @75 | 1024x768 @85 | 1152x864 @75 | 1280x768
@47.95 | 1280x768 @48 | 1280x768 @50 | 1280x768 @59.94 | 1280x768 @75 |
1280x960 @50 | 1280x960 @59.94 | 1280x960 @60 | 1280x960 @85 |
1280x1024 @47.95 | 1280x1024 @48 | 1280x1024 @50 | 1280x1024 @59.94 |
1280x1024 @60 | 1280x1024 @71.93 | 1280x1024 @72 | 1280x1024 @75 |
1280x1024 @85 | 1364x768 @47.95 | 1364x768 @48 | 1364x768 @50 |
1364x768 @59.94 | 1364x768 @75 | 1364x1024 @47.95 | 1364x1024 @48 |
1364x1024 @50 | 1364x1024 @59.94 | 1364x1024 @75 | 1366x768 @50 |
1366x768 @59.94 | 1400x1050 @48 | 1400x1050 @50 | 1400x1050 @59.94 |
1400x1050 @60 | 1400x1050 @75 | 1536x768 @50 | 1536x768 @59.94 |
1680x1050 @60 | 1600x1200 @47.95 | 1600x1200 @48 | 1600x1200 @50 |
1600x1200 @59.94 | 1600x1200 @60 | 1280x720p @48 | 1280x720p @50 |
1280x720p @59.94 | 1280x720p @60 | 1920x1080p @23.98 | 1920x1080p @24 |
1920x1080p @25 | 1920x1080p @29.97 | 1920x1080p @30 | 1920x1080p @48 |
1920x1080p @50 | 1920x1080p II @50 | 1920x1080p @59.94 | 1920x1080p @60
| 1920x1080sF@23.98 | 1920x1080sF@24 | 1920x1080i @50 | 1920x1080i
@59.94 | 1920x1080i @60 | 2048x1080p @48 | 2048x1080p @50 | 2048x1080p
II @50 | 2048x1080p @59.94 | 2048x1080p @60 | 1920x1200p @60 | Apple
1200p @60 | 875p
```

▲ Example 2: VFSTDLIST | 1

```
NTSC (480i) | <"\n" character>
| 720x480p | <"\n" character>
| PAL (576i) | <"\n" character>
    .
    .
    .
| 875p
```

Important Notes

For commands that have multiple parameters, if the returned error code is eERR_PARTIAL_ERROR, it means that the operation is half-done. Some of the parameters have been taken and come into effect, but some of them are not. When this happened, user/sender need to re-query the system to get the current state (determine which parameters that have been taken and which have not) and sync up with it.

For example: Fiberlink Receiver Test Pattern command ("FiberRxTP"). When it returns eERR_PARTIAL_ERROR, there is a possibility that the test pattern type has come into effect, but the color and pixel width have not. The only way to know the current state is by querying the system (sending "FiberRxTP?").

Establishing Communications

- Use the following steps to establish communications with DX-700 via Telnet:

1. Connect a laptop to DX-700 via Ethernet. A totally "local" Ethernet network is recommended, without IP connections to the outside world. Use a crossover cable for a direct connection, or use a standard Ethernet cable in conjunction with an Ethernet hub or switch.
2. On the DX-700, confirm the unit's current IP address using the Ethernet Menu. In Chapter 4, refer to the "**Using the Ethernet Menu**" section on page 142 for details.
3. On your laptop, open up a command prompt window in the normal manner, and access the DX-700 as follows:

   ```
   Telnet [DX-700 IP Address] 3000
   ```

4. When the prompt appears, issue commands in the normal manner, using syntax as described in the "**DX-700 Remote Command List**" section on page 191.

DX-700 Remote Command Table

The table below lists DX-700 remote commands.

Table B-1. DX-700 Remote Commands

Command	Description	Page
BANK	When sent without any parameters, system returns number of Banks available	201
CLOSE	Terminates the user interface connection	201
DISCOVERY	A method used by external user interfaces to detect all network DX-700 systems	200
FIBERFILTER	Set Fiberlink Reconstruction Filter	195
FIBERFIRM	Query Fiberlink firmware version	197
FIBERKEYREF	Set Fiberlink Key Reference	195
FIBERPCB	Query Fiberlink PCB ID	196
FIBERRTIME	Query Fiberlink runtime	197
FIBERRXPWR	Turn on/off all Fiberlink Rx connected to the output ID	194
FIBERSN	Query Fiberlink serial number	196
FIBERSOFT	Query Fiberlink software version	197
MOBANK	Set / Query the current Bank that Monitor Output is displaying	198
MORES	Set / Query the Monitor Output Resolution.	198
MSAVE	Save Monitor Output Setting	198
PSCALL	Recalls a single preset indicated by the preset name to the bank	199
PSNUM	Gets the total number of presets currently being stored by the DX-700	199
PSPRN	Display a space separated list of all Presets saved in the system	199
PTRANS	Select/Query the Preset Transition type	200
SCRPWR	Turn on/off all devices connected to specified output ID	191
WALLCONTR	Set / Query the wall (digital) contrast	191
WALLGAMMA	Set / Query wall gamma	192
WALLOSD	Set wall OSD	193
WALLOSDLIST?	Returns the OSD type list (OSD's string name list)	194
WHOAREYOU	Returns the string "DX-700", its serial number and MAC Address	201

DX-700 Remote Command List

The following command categories are presented in this section:

Output LED Commands

SCRPWR

- **Description**: Turn on/off all devices (tile and Fiberlink) connected to the specified output ID.
- **Set format**: SCRPWR | Bank | Out | Pwr
- **Parameters**:
  - ~ Bank: Bank ID 1 – 3
  - ~ Out: Output ID 1 – 6
  - ~ Pwr: Power mode [0 | 1] .. 0 = OFF, 1 = ON
  - ▲ Example: SCRPWR | 1 | 4 | 1
- **Query format**: SCRPWR? | Bank | Out
- **Query returns**: Pwr | Min | Max
  - ~ Pwr: Power Mode
  - ~ Min: Min Power Mode
  - ~ Max: Max Power Mode
  - ▲ Example: SCRPWR? | 2 | 1

    1 | 0 | 1

WALLCONTR

- **Description**: Set / Query the wall (digital) contrast.
- **Set format**: WALLCONTR | Bank | Out | Contr
- **Parameters**:
  - ~ Bank: Bank ID 1 – 3
  - ~ Out: Output ID 1 – 6
  - ~ Contr: Contrast value [0 – Max Contrast] .. in NIT

Note

Max Contrast can be queried, refer to query format below.

▲ Example: WALLCONTR | 1 | 2 | 200

- **Query format**: WALLCONTR? | Bank | Out
- **Query returns**: Contrast | Min | Max
  - ~ Contrast: Contrast
  - ~ Min: Minimum Contrast
  - ~ Max: Maximum Contrast
  - ▲ Example: WALLCONTR? | 2 | 1

    203 | 0 | 5000

WALLGAMMA

- **Description**: Set / Query wall gamma. Gamma custom is NOT always available/ selectable. Gamma custom type is available only in any of these scenarios:
  - ~ User modified gamma curve manually from Director Toolset (which is connected to the LED Wall via DX-700). The modified gamma curve does NOT match any of the existing gamma type.
  - ~ The wall already has a custom gamma loaded, so that when DX-700 queried it, DX-700 got a valid custom gamma. When the user selects Gamma Custom, the last known custom gamma is loaded to the wall.
- **Set format**: WALLGAMMA | Bank | Out | Color | Type
- **Parameters**:
  - ~ Bank: Bank ID 1 – 3
  - ~ Out: Output ID 1 – 6
  - ~ Color: Gamma color [0 – 3]:
    - 0 = Red
    - 1 = Green
    - 2 = Blue
    - 3 = All (white)
  - ~ Type: Gamma type [0 – 9 | 0 – 10]:
    - 0 = Gamma F
    - 1 = Gamma G1
    - 2 = Gamma G2
    - 3 = Gamma G3
    - 4 = Gamma G4
    - 5 = Gamma D1
    - 6 = Gamma D2
    - 7 = Gamma D3
    - 8 = Gamma BS
    - 9 = Gamma WS

- 10 = Gamma Custom

Note

The gamma type range depends on Custom Gamma availability for a particular color. If “Gamma Custom” is available/selectable, then gamma type range is 0 – 10 (in query, Max = 10). If it is not available, the gamma type range is 0 – 9 (in query, Max = 9). Please refer to the description for further explanation.

▲ Example: WALLGAMMA | 1 | 2 | 0 | 4

- **Query format**: WALLGAMMA? | Bank | Out | Color
- **Query returns**: Gamma | Min | Max
  - ~ Gamma: Gamma
  - ~ Min: Minimum Gamma Type
  - ~ Max: Maximum Gamma Type
  - ▲ Example: WALLGAMMA? | 3 | 2 | 1

    3 | 0 | 9

WALLOSD

- **Description**: Set wall OSD. The OSD index is the index of OSD list. User needs to get the OSD list from “WallOSDList” command.
- **Set format**: WALLOSD | Bank | Out | Mode | Index | KeepSelected | LoopOSD
- **Parameters**:
  - ~ Bank: Bank ID 1 – 3
  - ~ Out: Output ID 1 – 6
  - ~ Mode: OSD mode [0 | 1] .. 0 = OFF, 1 = ON
  - ~ Index: OSD index (required only if mode = 1)

Note

This OSD index is tile dependent. The index used is the sequence of OSD lists returned by WallOSDList command.

  - ~ KeepSelected: Keep displaying the OSD.
  - ~ LoopOSD: Loop OSD in sequence (start from Index).

Note

KeepSelected and LoopOSD are mutually exclusive. However, in a situation when both of them are set, KeepSelected will override LoopOSD.

▲ Example: WALLOSD | 1 | 3 | 1 | 1 | 1 | 0

- **Query format**: WALLOSD? | Bank | Out
- **Query returns**: Mode | MinMode | MaxMode | Index | MinIndex | MaxIndex
  - ~ Mode: OSD Mode
  - ~ Min Mode: Minimum OSD Mode

- MaxMode: Maximum OSD Mode
- Index: OSD Index
- MinIndex: Minimum OSD Index
- MaxIndex: Maximum OSD Index

WALLOSDLIST?

- **Description**: This command will return the OSD type list (OSD's string name list) starting from the first one until the last one. Each tile type has different OSD list. The index used by WallOSD command follows the OSD sequence returned by this command.
- **Set format**: n/a
- **Query format**: WALLOSDLIST? | Bank | Out
- **Parameters**:
  - Bank: Bank ID 1 – 3
  - Out: Output ID 1 – 6
- **Query returns**: OSD List
- **Format**:

  String name 1 | String name 2 | . . . . | String name n

  ▲ Example:

  Address | Temperature | Software Version | Firmware Version …….

Output Fiberlink Commands

FIBERRXPWR

- **Description**: Turn on/off all Fiberlink Rx connected to the output ID.
- **Set format**: FIBERRXPWR | Bank | Out | Index | Pwr
- **Parameters**:
  - Bank: Bank ID 1 – 3
  - Out: Output ID 1 – 6
  - Index: Fiberlink index (starts from 1, use 0 for all Fiberlinks Rx)
  - Pwr: Power mode [0 | 1] .. 0 = OFF, 1 = ON

  ▲ Example: FIBERRXPWR | 1 | 3 | 0 | 0
- **Query format**: FIBERRXPWR? | Bank | Out | Index
- **Query returns**: Pwr | Min | Max
  - Min: Minimum power mode
  - Max: Maximum power mode

▲ Example: FIBERRXPWR? | 2 | 1 | 1

1 | 0 | 1

Important

Be advised that in displays with multiple Fiberlinks, turning on the power using broadcast will not give the same result as turning off the power. In situation when all of the power is off, broadcasting the "power on" command will only turn on the link that is connected directly to the digitizer — up to the next Fiberlink. This occurs because if the next Fiberlink's LED power switch is still off, the broadcast command won't be able to pass through it.

FIBERKEYREF

- **Description**: Set Fiberlink Key Reference.

Note

This command valid for Fiberlink Version 1 only.

- **Set format**: FIBERKEYREF | Bank | Out | Index | Mode
- **Parameters**:
  - ~ Bank: Bank ID 1 – 3
  - ~ Out: Output ID 1 – 6
  - ~ Index: Fiberlink index (starts from 1, use 0 for all Fiberlinks Rx)
  - ~ Mode: Key Reference mode [0 | 1] .. 0 = Synthesized, 1 = Transmitted
  - ▲ Example: FIBERKEYREF | 1 | 3 | 0 | 1
- **Query format**: FIBERKEYREF? | Bank | Out | Index
- **Query returns**: Mode | Min | Max
  - ~ Mode: Key Reference mode
  - ~ MinMode: minimum key reference mode
  - ~ MaxMode: maximum key reference mode
  - ▲ Example: FIBERKEYREF? | 2 | 1 | 1

    1 | 0 | 1

FIBERFILTER

- **Description**: Set Fiberlink Reconstruction Filter.

Note

This command valid for Fiberlink Version 1 only.

- **Set format**: FIBERFILTER | Bank | Out | Index | H | V | DE
- **Parameters**:
  - ~ Bank: Bank ID 1 – 3
  - ~ Out: Output ID 1 – 6
  - ~ Index: Fiberlink index (starts from 1, use 0 for all Fiberlinks Rx)

- ~ H: Horizontal [0 | 1] .. 0 = OFF, 1 = ON
- ~ V: Vertical [0 | 1] .. 0 = OFF, 1 = ON
- ~ DE: Data Enable [0 | 1] .. 0 = OFF, 1 = ON

▲ Example: FIBERFILTER | 1 | 3 | 0

- **Query format**: FIBERFILTER? | Bank | Out
- **Query returns**: H | MinH | MaxH | V | MinV | MaxV | DE | MinDE | MaxDE
  - ~ H: Horizontal
  - ~ MinH: Min Horizontal
  - ~ MaxH: Max Horizontal
  - ~ V: Vertical
  - ~ MinV: Min Vertical
  - ~ MaxV: Max Vertical
  - ~ DE: Data Enable
  - ~ MinDE: Min Data Enable
  - ~ MaxDE: Max Data Enable

  ▲ Example: FIBERFILTER? | 2 | 1

  1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1

FIBERSN

- **Description**: Query Fiberlink serial number
- **Set format**: n/a
- **Query format**: FIBERSN? | Bank | Out | Index | Type
  - ~ Bank: Bank ID 1 – 3
  - ~ Out: Output ID 1 – 6
  - ~ Index: Fiberlink index (starts from 1; 0 is not supported)
  - ~ Type: Fiberlink type (0 = Fiberlink Tx; 1 = Fiberlink Rx)
- **Query returns**: Serial number

  ▲ Example: FIBERSN? | 2 | 1 | 1 | 0

  837564

FIBERPCB

- **Description**: Query Fiberlink PCB ID
- **Set format**: n/a
- **Query format**: FIBERPCB? | Bank | Out | Index | Type
  - ~ Bank: Bank ID 1 – 3
  - ~ Out: Output ID 1 – 6
  - ~ Index: Fiberlink index (starts from 1; 0 is not supported)
  - ~ Type: Fiberlink type (0 = Fiberlink Tx; 1 = Fiberlink Rx)
- **Query returns**: PCB ID

▲ Example: FIBERPCB? | 2 | 1 | 1 | 0

FIBERSOFT

- **Description**: Query Fiberlink software version.
- **Set format**: n/a
- **Query format**: FIBERSOFT? | Bank | Out | Index | Type
  - ~ Bank: Bank ID 1 – 3
  - ~ Out: Output ID 1 – 6
  - ~ Index: Fiberlink index (starts from 1; 0 is not supported)
  - ~ Type: Fiberlink type (0 = Fiberlink Tx; 1 = Fiberlink Rx)
- **Query returns**: Software Version

  ▲ Example: FIBERSOFT? | 2 | 1 | 1 | 0

  01.03

FIBERFIRM

- **Description**: Query Fiberlink firmware version.

Note

Depending on the Fiberlink type and version, this command returns the applicable firmware version.

- **Set format**: n/a
- **Query format**: FIBERFIRM? | Bank | Out | Index | Type
  - ~ Bank: Bank ID 1 – 3
  - ~ Out: Output ID 1 – 6
  - ~ Index: Fiberlink index (starts from 1; 0 is not supported)
  - ~ Type: Fiberlink type (0 = Fiberlink Tx; 1 = Fiberlink Rx)
- **Query returns**:
  - ~ Case 1 - Firmware Version (if Fiberlink Rx)
  - ~ Case 2 – Controller Firmware Version (if Fiberlink1 Tx)
  - ~ Case 3 – Controller and Input Firmware Version (if Fiberlink2 Tx)

  ▲ Example: FIBERFIRM? | 2 | 1 | 1 | 0

  01.00

  FIBERFIRM? | 2 | 1 | 1 | 0

  01.03.16

  FIBERFIRM? | 2 | 1 | 1 | 0

  01.05.02 | 00.01.08

FIBERRTIME

- **Description**: Query Fiberlink runtime.
- **Set format**: n/a

- **Query format**: FIBERRTIME? | Bank | Out | Index | Type
  - ~ Bank: Bank ID 1 – 3
  - ~ Out: Output ID 1 – 6
  - ~ Index: Fiberlink index (starts from 1; 0 is not supported)
  - ~ Type: Fiberlink type (0 = Fiberlink Tx; 1 = Fiberlink Rx)
- **Query returns**: Runtime
  - ▲ Example: FIBERRTIME? | 2 | 1 | 1 | 0

    1378

Monitor Output Commands

MORES

- **Description**: Set / Query the Monitor Output Resolution. With the string parameter, DX-700 will use the string and try to match it to the standard format list. Note that the system will always ignore interlaced formats as interlaced formats are not allowed.
- **Set format**: MORES | Format
- **Parameters**:
  - ~ Format: Format string (refer to VFSTDLIST cmd for valid format strings)
  - ▲ Example: MORES | 1600x1200 @60
- **Query format**: MORES?
- **Query returns**: Format
  - ~ Format: Format string (refer to VFSTDLIST cmd for valid format strings)
  - ▲ Example: MORES?

    1600x1200 @60

MSAVE

- **Description**: Save Monitor Output Setting
- **Set format**: MSAVE
- **Parameters**: n/a
- **Example**: MSAVE
- **Query format**: n/a

MOBANK

- **Description**: Set / Query the current Bank that Monitor Output is displaying.
- **Set format**: MOBANK | Bank
- **Parameters**:
  - ~ Bank: Bank ID 1 – 3
  - ▲ Example: MOBANK | 1
- **Query format**: MOBANK?

- **Query returns**: Bank
  - Example: MOBANK?

    1

Preset Commands

PSCALL

- **Description**: Recalls a single preset indicated by the preset name to the bank.
- **Set format**: PSCALL | PresetName | Bank
- **Query format**: n/a
- **Parameters**:
  - PresetName: Name of Preset (String, 1-19 chars, case sensitive)
  - Bank: Bank ID 1 – 3
  - Example: PSCALL | PresetName | 2

PSNUM

- **Description**: Gets the total number of presets currently being stored by the DX-700. This includes Presets in a Master Preset list.
- **Set format**: n/a
- **Query format**: PSNUM
- **Query returns**: the number of presets stored by the DX-700 (integer)
  - Example: PSNUM

    300

PSPRN

- **Description**: Display a space separated list of all Presets saved in the system.
- **Set format**: n/a
- **Parameters**: verbose is an optional parameter. When set to 1, this command returns a more readable version of the list that is separated by line feed character '\n', instead of being space separated (see example 2 below). Note that names are case sensitive.
- **Query format**: PSPRN | <verbose>
- **Query returns**: PresetName1 | PresetName2 | PresetName3 …. PresetNameX
  - Example 1: PSPRN

    PRESETNUM1 | PRESETNUM2 | PRESETNUM3 | PRESETNUM4
  - Example 2: PSPRN 1

    PRESETNUM1 |

    | PRESETNUM2 |

    | PRESETNUM3 |

    | PRESETNUM4

PTRANS

- **Description**: Select/Query the Preset Transition type. If Black is selected, the DX-700 outputs will show black while the Preset is being recalled and will be unblacked when the Preset recall is complete. If “Live” is selected, the DX-700 outputs will remain live while the Preset is being recalled.
- **Set format**: PTRANS | Type
- **Parameters**:
  - ~ Type: Preset Transition Type (0= Black, 1 = Live)
  - ▲ Example: PTRANS | 0
- **Query format**: PTRANS?
- **Query returns**: Type
  - ▲ Example: PTRANS?

    0

Miscellaneous Commands

DISCOVERY

- **Description**: A discovery command is a method that can be used by external user interface(s) to detect all DX-700 systems available in the network. This command returns enough information to identify the product (MAC address and Product name and device name.) Also returns the TCP Port # for those interested in creating TCP socket connection to the DX-700.

  If the Product name returned is FlashBurner: DX-700, this DX-700 is currently in the boot code. This could mean that:

  - ~ It is currently being upgraded with newer software by a Director Toolset
  - ~ It detected that its main code is corrupt.

  In the boot code, the Device name ID field returned is empty.
- **Set format**: n/a
- **Query format**: DISCOVERY?
- **Query returns**: MAC | TCP_Port | Name | DevNameID
- **Parameters**:
  - ~ MAC: Mac Address
  - ~ TCP_Port: Port number for TCP connection
  - ~ Name: Product name:
    - DX-700 – This DX-700 is currently in main code
    - FlashBurner: DX-700 - This DX-700 is currently in loader (boot) code
  - ~ DevNameID: Device name ID.
  - ▲ Example: DISCOVERY?

    00:04:a5:10:10:d1 | 3000 | DX-700 | Widescreen Backstage

    DISCOVERY?

    00:04:a5:10:10:d1 | 3000 | DX-700

WHOAREYOU

- **Description**: Returns the string “DX-700” and its serial number and MAC address.
- **Set format**: n/a
- **Query format**: WHOAREYOU?
- **Query returns**: DX-700 | Num | MAC
- **Parameters**:
  - ~ DX-700: The string “DX-700”
  - ~ Num: Serial Number of the DX-700
  - ~ MAC: MAC Address
  - ▲ Example: WHOAREYOU?

    DX-700 | 101 | 00:04:a5:10:10:d1

CLOSE

- **Description**: Terminates the user interface connection. Currently useful for TCP Ethernet communication only.
- **Set format**: CLOSE
- **Query format**: n/a

BANK

- **Description**: When the command is sent without any parameters, the system will return the number of Banks available in the system. When the command is sent with a parameter, the parameter indicates which Bank the user would like to query. The system will then return the number of Input(s) and Output(s) available in the system and the type of Output module.
- **Set format**: n/a
- **Query format 1**: BANK?
- **Query returns**: BankNum
- **Parameters**:
  - ~ BankNum: Number of Banks available in the system
  - ▲ Example: BANK?

    1
- **Query format 2**: BANK? BankNum
- **Query returns**: InputNum | OutputNum | OutType
- **Parameters**:
  - ~ InputNum: Number of Inputs available in the specified Bank
  - ~ OutputNum: Number of Outputs available in the specified Bank
  - ~ OutType: Type of Output in the Bank (1 = DVI, 2 = NNI)
  - ▲ Example: BANK? | 1

    1 | 2 | 1

C. Contact Information

In This Appendix

The following topics are discussed in this Appendix:

Warranty

All video products are designed and tested to the highest quality standards and are backed by a full 3-year parts and labor warranty. Warranties are effective upon delivery date to customer and are non-transferable. Barco warranties are only valid to the original purchaser/owner. Warranty related repairs include parts and labor, but do not include faults resulting from user negligence, special modifications, lightning strikes, abuse (drop/crush), and/or other unusual damages.

The customer shall pay shipping charges when unit is returned for repair. Barco will cover shipping charges for return shipments to customers.

Customer Service Portal

Barco's **Customer Service Portal** enables all Barco Media and Entertainment customers to request service and view the status of all service requests for LED, Projection, Image Processing, Creative LED and Digital Cinema products.

The portal provides a range of powerful capabilities to support requests for:

- Technical Assistance and Field Service
- Depot Repair (Return Material Authorization)
- Lamp Refurbishment
- Status of service requests (repair status, tracking numbers, etc.)

The portal is accessible under the following URL:

- **www.barco.com/esupport**

If you are not already signed up, please visit the site and register. Signing up is a simple process, and each user will be promptly provided with a unique password.

Please note:

- The Customer Service Portal is the primary electronic means of communication with Barco, replacing email.
- Barco will continue to provide telephone support for service activities. Refer to the "**Contact Information**" section below for details.

Return Material Authorization (RMA)

In the unlikely event that a product is required to return for repair, please use the **Customer Service Portal** to receive a Return Merchandise Authorization number (RMA).

- **www.barco.com/esupport**

RMA Conditions are listed below:

- Prior to returning any item, you must receive a Return Merchandise Authorization (RMA) number.
- All RMA numbers must appear on their return-shipping label.
- RMA numbers are valid for ten (10) days from issue date.
- All shipping and insurance charges on all RMAs must be prepaid by the customer

Contact Information

Barco, Inc.
11101 Trade Center Drive
Rancho Cordova, California 95670, USA

- Phone: (916) 859-2500
- Fax: (916) 859-2515
- Website: **www.barco.com**

Sales Contact Information

- Direct: (916) 859-2505
- Toll Free: (888) 414-7226
- E-mail: insidesalesna@barco.com

Barco N.V.
Noordlaan 5
8520 Kuurne
BELGIUM

- Phone: +32 56.36.82.11
- Fax: +32 56.35.16.51

Technical Support

- **Customer Service Portal** — **www.barco.com/esupport**
- **(866) 374-7878** — Events (24/7)
- **(866) 469-8036** — Digital Cinema (24/7)

D. Fiberlink NNI Installation

In This Appendix

The following topics are discussed in this appendix:

Important

The Fiberlink NNI **Transmitter** and **Receiver** modules each use a Class I laser, which employs an *invisible* infra-red laser beam. Although Class 1 lasers do not typically pose a hazard, please refer to the "**Laser Safety**" section on page 217 for important information regarding laser safety and precautions.

Overview

The Fiberlink NNI kit consists of two “transceiver” modules — a Transmitter and a Receiver — joined by a dual-channel fiber optic cable:

- The Fiberlink NNI **Multi-mode Transmitter** module connects to the DX-700 via NNI cable, and also connects to the fiber optic cable.
- The Fiberlink NNI **Multi-mode Receiver** module connects to the fiber optic cable, and connects via NNI cable to NNI LED tiles.

Each module includes an NNI cable.

The Fiberlink NNI **Transmitter** and **Receiver** modules are designed to send video across a fiber optic link from the DX-700 to video walls. The modules are designed to work *specifically* with the DX-700’s NNI output modules and Barco’s next-generation LED tiles — the NX-4, NX-6, and future indoor and outdoor NNI-based LED tiles.

Fiberlink NNI **Transmitter** and **Receiver** also can be used to extend the distance between two NNI wall tiles and to connect two NNI LED displays.

Important

An NNI cable is a High Definition Multimedia Interface (HDMI) cable. You should **not** attempt to connect an NNI cable to an HDMI monitor. Connecting directly to a monitor can result in damage to the monitor.

Note

The Fiberlink NNI **Multi-mode Transmitter** and **Receiver** are not packed together. Each is packed and shipped individually.

The figure below illustrates a Fiberlink NNI system, in block diagram form.

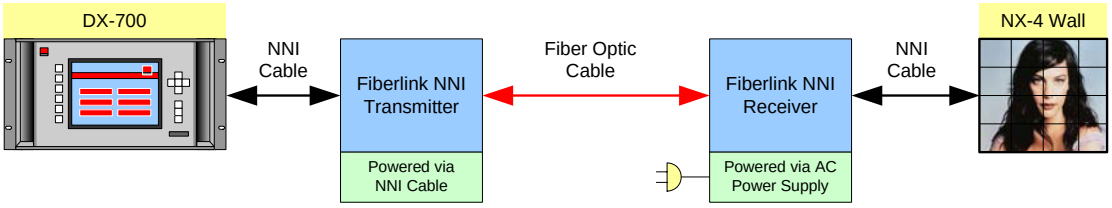


Figure D-1. Fiberlink NNI system block diagram

Please note the following important points:

- Each Fiberlink NNI module is sealed to IP-65 standards, which protects the unit from dust and low-pressure moisture. Cables enter the modules through sealed connectors, and all cables are field-replaceable.

Caution

The Fiberlink NNI modules can be exposed to rain, but do not immerse them in water or allow them to sit in puddles of water. Although the modules are IP-65 rated, they are *not* IP-68 rated, which is an immersion standard.

Note

IP stands for *Ingress Protection*, as defined by the International Electrotechnical Commission. The IP-65 standard represents a dust-tight seal that also protects against ingress from low-pressure water jets against the enclosure. It does not protect against immersion in water.

- Electronically, the Fiberlink NNI **Receiver** and **Transmitter** modules are nearly identical. Each module receives data at one end, and transmits it at the other end. The main difference is in how the modules are powered.
  - ~ The Fiberlink NNI Transmitter receives DC power from the DX-700 processor via the NNI cable.
  - ~ The Fiberlink NNI **Receiver** has an AC line cord for 120/240VAC input. Internally, the receiver includes a power supply to power the unit and provide startup power for the LED tiles.

Note

For safety, the 120/240VAC power supply inside the Fiberlink NNI **Receiver** is enclosed with a sealed and strain relieved captive power cord.

- With the exception of **Status LEDs** on the modules, there are no methods by which the user can communicate with the modules. Each module acts simply as a translator between NNI and fiber optic signaling.
- On their own, the Fiberlink NNI modules do not generate any form of video test patterns. To generate a test pattern through a **Transmitter** and **Receiver** pair, you must be using Barco “legacy” tiles and the DX-700 **Display Management Menu**. For more information, refer to the “**Managing Fiberlink Settings**” section on page 130 of Chapter 4.
- Each module includes sealed LED indicators to show the current state of the link. Refer to the “**Fiberlink NNI Hardware**” section on page 208 for details.

Fiberlink NNI Hardware

The following topics are discussed in this section:

- **Fiberlink NNI Transmitter**
- **Fiberlink NNI Receiver**

Fiberlink NNI Transmitter

The figures below illustrate both sides of the Fiberlink NNI **Transmitter**:

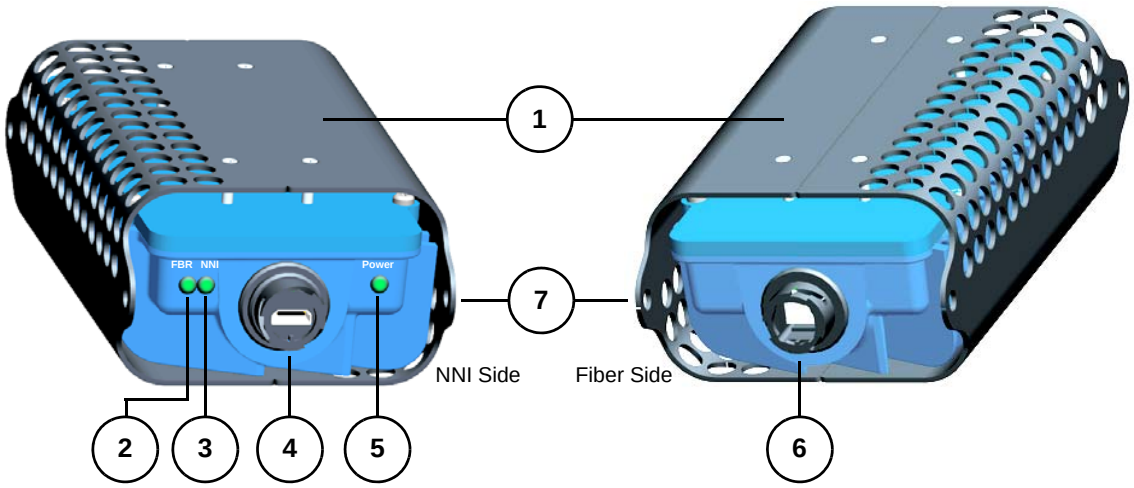


Figure D-2. Fiberlink NNI Transmitter

1)	**Sun Shield**	4)	**NNI Connector**	7)	**Mounting Holes**
2)	**Fiber Connection LED**	5)	**Power LED**		
3)	**NNI Connection LED**	6)	**Fiber Optic Connector**		

Following are descriptions of all Fiberlink NNI **Transmitter** components:

1) Sun Shield

The **Sun Shield** is designed to provide thermal protection from sun-generated overheating, within the recommended operating temperature range: -20° C to 55° C (-4° F to 131° F).

Important

The Fiberlink NNI **Transmitter** can be used in direct sunlight when mounted vertically, as shown on page 214. Do not prevent air from flowing around the unit. To avoid overheating, do not leave the Transmitter in direct sunlight for prolonged periods of time.

2) Fiber Connection LED

The **Fiber Connection LED** indicates the status of the data coming over the fiber optic cable from the Fiberlink NNI **Receiver**. **Green** indicates that a signal is present. **Off** indicates that a signal is not present. There are no other LED states.

3) NNI Connection LED

The **NNI Connection LED** indicates the status of the data coming over the NNI cable from the DX-700. **Green** indicates that a signal is present. **Off** indicates that a signal is not present.

4) NNI Connector

The **NNI Connector** connects the Fiberlink NNI **Receiver** to the Barco LED wall via NNI cable. The connector uses a captive twist-lock dust cap that is rated for IP-65. A captive dust cap is provided.

Important

An NNI cable is a High Definition Multimedia Interface (HDMI) cable. You should **not** attempt to connect an NNI cable to an HDMI monitor. Connecting directly to a monitor can result in damage to the monitor.

Important

Always put the dust cap on securely when the NNI cable is not connected to the unit. The dust cap is secure when it clicks into place.

5) Power LED

The **Power LED** indicates the status of power coming from the DX-700 over the NNI cable. **Green** indicates power is present. **Off** indicates that there is no power to the unit. There are no other LED states.

6) Fiber Optic Connector

The **Fiber Optic Connector** connects the Fiberlink NNI **Transmitter** module to the **Receiver** module via fiber optic cable. It is a twist-lock connector that is rated for IP-65. A captive dust cap is provided.

Important

Always put the dust cap on securely when the fiber optic cable is not connected to the unit. The dust cap is secure when it clicks into place.

7) Mounting Holes

Four **Mounting Holes** (8mm diameter) are provided in the **Sun Shield** to facilitate mounting the unit. Refer to the "**Installing the Fiberlink NNI Modules**" section on page 214 for installation recommendations.

Fiberlink NNI Receiver

The following figures illustrate both sides of the Fiberlink NNI **Receiver**:

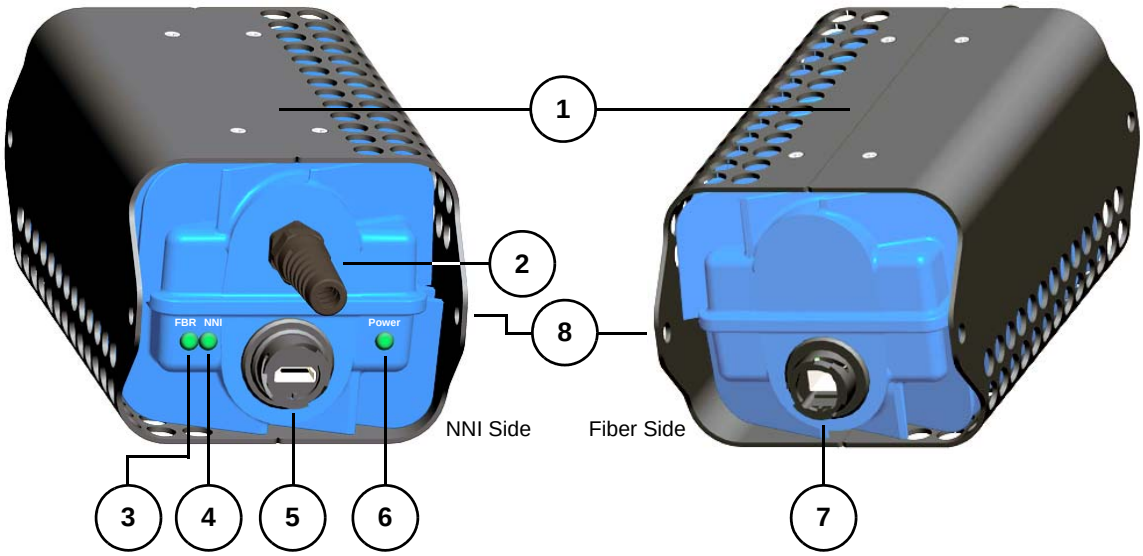


Figure D-3. Fiberlink NNI Receiver

1)	Sun Shield	4)	NNI Connection LED	7)	Fiber Optic Connector
2)	Power Cable	5)	NNI Connector	8)	Mounting Holes
3)	Fiber Connection LED	6)	Power LED		

Following are descriptions of all Fiberlink NNI **Receiver** components:

1) Sun Shield

The **Sun Shield** is designed to provide thermal protection from sun-generated overheating, within the recommended operating temperature range: -20° C to 55° C (-4° F to 131° F).

Important

The Fiberlink NNI **Receiver** can be used in direct sunlight when mounted vertically, as shown on page 214. Do not prevent air from flowing around the unit. To avoid overheating, do not leave the Receiver in direct sunlight for prolonged periods of time.

2) Power Cable

A captive **Power Cable** is provided. Connect to a suitable AC power source.

3) Fiber Connection LED

The **Fiber Connection LED** indicates the status of the data coming over the fiber optic cable from the Fiberlink NNI **Transmitter**. **Green** indicates that a signal is present. **Off** indicates that a signal is not present. Refer to the "**LED Error Conditions**" section on page 211 for important information about LED error indicators.

4) NNI Connection LED

The **NNI Connection LED** indicates the status of the data coming over the NNI cable from the LED wall. **Green** indicates that a signal is present. **Off** indicates that a signal is not present. Refer to the "**LED Error Conditions**" section on this page for important information about LED error indicators.

5) NNI Connector

The **NNI Connector** connects the Fiberlink NNI **Receiver** to the Barco LED wall via NNI cable. It uses a captive twist-lock dust cap that is rated for IP-65.

Important

An NNI cable is a High Definition Multimedia Interface (HDMI) cable. You should **not** attempt to connect an NNI cable to an HDMI monitor. Connecting directly to a monitor can result in damage to the monitor.

Important

Always put the dust cap on securely when the NNI cable is not connected to the unit. The dust cap is secure when it clicks into place.

6) Power LED

The **Power LED** indicates the status of power coming into the unit from the AC power supply. **Green** indicates that power is present. **Off** indicates that there is no power to the unit. Refer to the "**LED Error Conditions**" section on this page for important information about LED error indicators.

7) Fiber Optic Connector

The **Fiber Optic Connector** connects the Fiberlink NNI **Receiver** module to the Fiberlink NNI **Transmitter** module via fiber optic cable. It is a twist-lock connector that is rated for IP-65. A captive dust cap is provided.

Important

Always put the dust cap on securely when the fiber optic cable is not connected to the unit. The dust cap is secure when it clicks into place.

8) Mounting Holes

Four **Mounting Holes** (8mm diameter) are provided in the **Sun Shield** to facilitate mounting the unit. Refer to the "**Installing the Fiberlink NNI Modules**" section on page 214 for installation recommendations.

LED Error Conditions

This section outlines important LED error conditions on the Fiberlink NNI **Receiver** unit.

- **Fast Blink** — All LEDs on the Fiberlink NNI **Receiver** blink fast if more than 1.5 amps of current are drawn from the unit by the NNI LED wall. In this condition, the power from the **Receiver** to the wall is shut down.
- **Slow Blink** — All LEDs on the Fiberlink NNI **Receiver** blink slow if more than .75 amps of current are drawn from the unit by the NNI LED wall. In this condition, the power from the **Receiver** to the wall is shut down.

Each "blinking" condition points to a power supply, connection, or other power-related error on one or more NNI wall tiles.

- To rectify the error:
  1. Remove power to the Fiberlink NNI **Receiver** by disconnecting its AC line cord.
  2. Troubleshoot the tile array, and determine the cause of the power supply problem or the connection-related error — the one that is causing the Fiberlink NNI **Receiver** to draw excessive current.
  3. Once the tile problem has been determined and solved, re-connect power to the Fiberlink NNI **Receiver**, and note the status of the LEDs.
     - ~ If the LEDs light green and do not blink, the problem has been solved.
     - ~ If the LEDs again start to blink (either fast or slow), repeat this troubleshooting procedure from step (**1**).

Installation

The following topics are discussed in this section:

Unpacking and Inspection

Before opening the boxes, inspect them for damage. If you find any damage, notify the shipping carrier immediately for all claims. As you open the box, compare its contents against the packing slip. If you find any shortages, contact your sales representative.

Once you have removed all the components from their packaging and checked that all the components are present, visually inspect each unit to ensure there was no damage during shipping. If there is damage, notify the shipping carrier immediately for all claims.

Site Preparation

The environment in which you install your Fiberlink NNI units should be clean, properly lit, free from static electricity, and have adequate power, ventilation, and space for all components.

Cable and Adapter Information

The table below provides information regarding cables and adapters:

Table D-1. Fiberlink NNI cables and adapters

Cable / Adapter	Description	Quantity
HDMI NNI cable	(Supplied) 3M cables, 1 for transmitter, 1 for receiver	2
Fiber optic cables	(Per order) 50, 100, and 150 meter cables are available *	Order separately
Power (US)	(Supplied) 18GA 10A 7.5	1
Power (EUR)	(Supplied) VIIPLUG EUR 2.5M	1

* **NOTE**: Custom fiber optic cable lengths up to 300 meters are available. Contact your sales representative for details.

Securing the Dust Cap on the Fiber Optic Cable

The fiber optic cable for the Fiberlink NNI modules comes with an IP-65 dust cap at each end to protect the cable ends from dust and moisture contamination. Each dust cap consists of two threaded twist-lock halves, as shown in the following illustration.

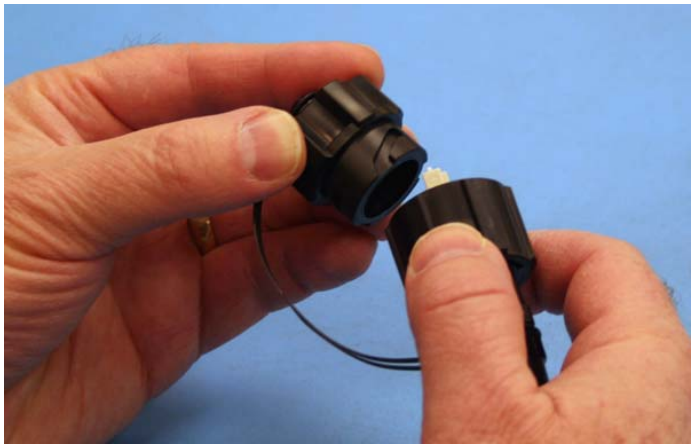


Figure D-4. Securing the dust cap on the fiber optic cable

- To secure the dust cap on the fiber optic cable:

  1. Grasp the lower half of the dust cap — the half that is attached to the cable — and raise it toward the end of the cable.
  2. Bring the two halves of the cap together and twist to close. The dust cap is secure when the halves click into place.

Installing the Fiberlink NNI Modules

The Fiberlink NNI units can be mounted in different ways, depending on your specific site requirements. Using the 8mm mounting holes provided in the unit's **Sun Shield**, you can secure the modules with tie wraps or mounting screws as required. Please note:

- If you lay the units flat on the ground, *do not* immerse them in water or allow them to sit in puddles of water.
- If you mount the units to a wall, frame, rack, or other solid structure, please observe the following recommendations:
  - ~ Mount the units vertically, not horizontally.
  - ~ Ensure that the status LEDs on the NNI side of the modules are visible.

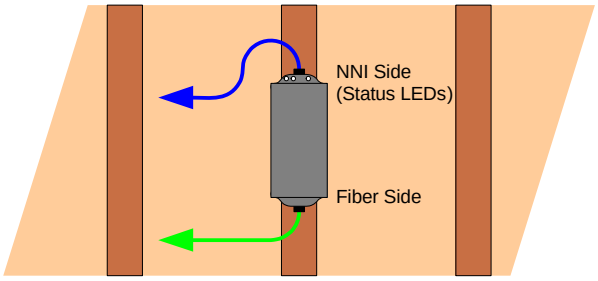


Figure D-5. Fiberlink NNI module vertical mounting

Signal Connection

This section provides instructions for connecting signals to the Fiberlink NNI modules.

Use the following steps to connect signals to the Fiberlink NNI modules:

1. Ensure that the LED wall is properly set up and cabled for data and power, and that the tiles are Barco NNI LED tiles.
2. Ensure that the DX-700 is properly set up to communicate with the NNI LED wall.
3. Ensure that the Fiberlink NNI **Transmitter** is located within 3m of the DX-700.
4. Ensure that the Fiberlink NNI **Receiver** is located within 3m of the NNI LED wall.
5. Ensure that the fiber optic cable is properly run between the Fiberlink NNI **Transmitter** and Fiberlink NNI **Receiver**, and that all fiber optic cable maintenance procedures are strictly followed. Refer to the "**Proper Fiber Optic Cable Maintenance**" section on page 216 for details.
6. Connect the supplied NNI cable from the DX-700 to the **NNI Connector** on the Fiberlink NNI **Transmitter**.

Warning

The HDMI-type connectors on the DX-700 NNI output module and the DX-700 modules use proprietary signals and pinouts.

Do not connect the output of an NNI output module to anything other than the input of a Barco NNI LED tile (i.e., NX-4 and NX-6) or a Fiberlink NNI **Transmitter or Receiver**. Even though the connector is an HDMI-type connector, it is not an HDMI signal, and serious damage could result if, for example, the output is plugged into an HDMI monitor.

7. Connect one end of the supplied fiber optic cable to the **Fiber Optic Connector** on the Fiberlink NNI **Transmitter**.
8. Connect the other end of the supplied fiber optic cable to the **Fiber Optic Connector** on the Fiberlink NNI **Receiver**.
9. Connect the supplied NNI cable from the Fiberlink NNI **Receiver** to the input connector of your NNI LED wall.

   For a diagram showing the cabling between these units, see "**Fiberlink NNI system block diagram**" on page 206.
10. Connect power to the Fiberlink NNI **Receiver**.
11. On MatrixPRO, use the Setup Wizard or Director Toolset 2.0 to set up your outputs and detect the tiles.
12. From the **Home Menu**, press **{Display Management}** to display the **Output Selection Menu**.
13. Immediately above the graphic, press the button for the **Bank** that contains the output whose LED display you wish to force on.
14. On the selected bank, press the output that you wish to manage. The **Display Management Menu** appears.
15. Press **{Force Display On}** to turn on the selected wall's power.
16. Check the status of the LEDs on the Fiberlink NNI **Transmitter** and **Receiver** modules. All LEDs should be green, to indicate signal continuity throughout the entire data path. LEDs should not be blinking on the Fiberlink NNI **Receiver**.

Power Handling

The Fiberlink NNI has the ability to "start up" the LED tiles. When the DX-700 is connected to the tiles directly, this is accomplished by switching on the DC supply output on the NNI interface. Likewise, the tiles are shut down by turning off the DC supply.

This capability is maintained when the Fiberlink NNI system is connected between the MatrixPRO and the NNI LED tiles. By using the **{Force Display On}** and **{Force Display Off}** feature in the **Display Management Menu**, you have the ability to control the wall "remotely."

Please note:

- The Fiberlink NNI **Transmitter** acts similarly to a directly connected tile: It is turned on by the DC supply from the MatrixPRO, and it turns off when the supply is turned off.
- The Fiberlink NNI **Receiver** is powered by the AC mains, and will always be on if the mains are connected.
- The Fiberlink NNI **Receiver** supplies the power that starts up the tiles. The unit monitors the fiber cable input. If a carrier is detected, the receiver supplies power to the tiles. If no carrier is detected, the power remains off.

Proper Fiber Optic Cable Maintenance

To maintain the optimum operating conditions, fiber optic cable requires proper care and handling. Please follow these basic guidelines:

- Do not stretch, puncture, or crush the fiber optic cable.
- Always maintain the minimum bend radius that is specified by the fiber optic cable manufacturer. To avoid fractures of the glass, do not exceed these limits!

Note	The minimum bend radius is usually 10-20 times the cable's outer diameter.

- Avoid overtightening tie wraps that are placed around the cable. This action may result in micro-bends, which in turn results in excess attenuation.
- Always keep the dust caps on the cable ends until you make the connections. Re-connect the dust caps when the cable is disconnected. Refer to the "**Securing the Dust Cap on the Fiber Optic Cable**" section on page 213 for more information.
- Do not polish the fiber optic connectors with a cloth made of synthetic fibers. This action will charge up the fiber and attract dust.
- Protect the exposed ends from contact with all surfaces. Contact with hard surfaces may scratch or chip the end, causing permanent damage.
- Do not touch the exposed fiber ends with your finger, as this action will leave oil residue on the fiber.
- Do not use canned or compressed air to clean the connectors.
- Clean each connector each time it is inserted into an adapter. Dirty connectors will contaminate adapters. Clean all suspect surfaces with a Reel Cleaner, Stick Cleaner, or optic grade alcohol and wipes.
- To reduce condensation, ensure that the fiber end is dried after cleaning. Wipes should be used once, and then discarded.
- To ensure proper alignment, avoid tilting the connector during insertion. This action also prevents damage or scratching to the fiber end.
- Use the connector strain relief whenever pulling on the fiber cable. Pulling on the fiber may damage the glass.
- Always store protective covers in a clean container. Always clean contaminated protective covers prior to use.

Laser Safety

The Fiberlink NNI **Transmitter** and **Receiver** modules use a Class I laser, which employs an invisible infra-red laser beam. Although Class 1 lasers typically do not pose a hazard, you should always exercise caution when handling devices that use lasers. Please review the following important safety information:

- Laser beams can be very hazardous, particularly for the eye — because the beams have high optical intensities even after travelling long distances.
- Laser radiation can be focused to a small spot on the retina, where it can cause serious and *permanent* damage within a fraction of a second.
- Even low power lasers can be hazardous to your eyesight. A person exposed to laser radiation (especially invisible radiation) may be unaware that damage is occurring.
- Eye damage may occur if you stare directly at the active fiber end, or observe the fiber via a microscope. Prior to inspection, *always* ensure that fibers are disconnected (at both ends) or that the laser source is turned off.
- Infrared lasers are particularly hazardous, since the body's protective "blink reflex" response is triggered only by visible light. If your eye is damaged, you may not feel pain or notice immediate damage to your eyesight.

Caution

Never look directly into the **Fiber Optic Connector** of a Fiberlink NNI module, when the unit is powered. **Never** look directly into an un-capped end of a fiber optic cable.

Technical Specifications

The table below lists Fiberlink NNI module specifications.

Table D-2. Fiberlink NNI Module Specifications

Parameter	Detail	Specification
Fiber cable	Distance	Up to 300 meters (depends on cable quality)
	Connectors	Duplex LC
NNI cable	Distance	3 meters
	Connectors	19-pin HDMI style with integrated locking mechanism
Power	Transmitter	DC from processor unit
	Receiver	90 to 260 VAC, 50-60Hz, 5w internal
Temperature	Operating	-20° C to 55° C, (-4° F to 131° F)
	Non-operating	-20° C to 85° C, (-4° F to 185° F)
Environmental	Housing	IP-65 enclosure
Physical	Transmitter *	**H:** 3.0 inches (76mm)
		W: 4.8 inches (122mm)
		D: 8.66 inches (220mm)
	Receiver *	**H:** 4.3 inches (109mm)
		W: 4.8 inches (122mm)
		D: 9.0 inches (227.3mm)
LED Indicators	Transmitter / Receiver	Power
		NNI signal detect
		Optical signal detect
Certifications	RoHS	RoHS compliant
	Safety	(art 3.1.a): EN 60950:2001
	EMC	(art 3.1.b): EN 55103-1 (1996), EN 55103-2 (1996)

* **NOTE**: Dimensions do not include strain relief on cables.

Index

Softkeys

Numerics

A

B

C

D

E

F

G

H

I

K

L

M

N

O

P

Q

R

S

T

U

V

W

Y

Z

Index