



SPECTRUM

Galileo™

Display Processor
Technical Reference Guide
Installation and Configuration

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DOCUMENT

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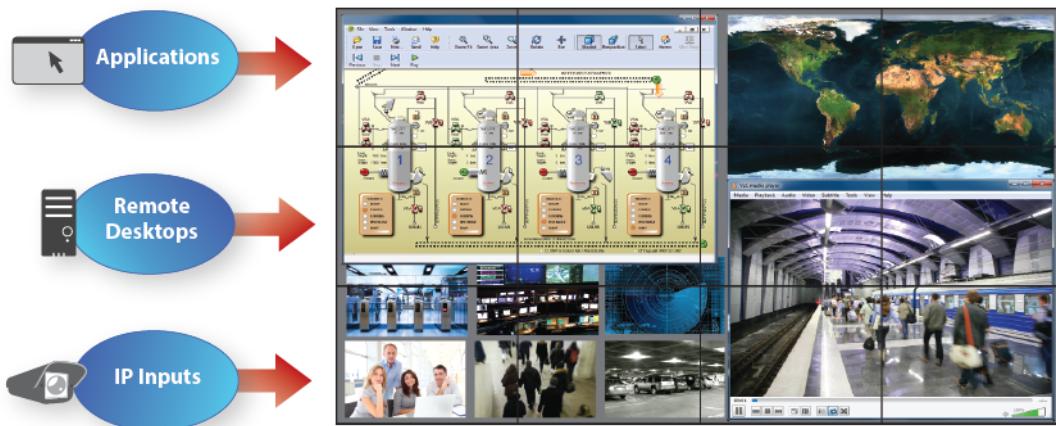
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CHAPTER

1

INTRODUCTION

The innovative Galileo Display Processor is a powerful video wall control system with remote desktop capabilities designed around a PC-based architecture. The video wall processor adds the benefits of PC-based systems, such as IP inputs and the ability to run applications natively, to the 24/7 level of reliability and real-time performance of all of RGB Spectrum's solutions.



The Galileo system supports a full range of input and output types including IP, analog, DVI/HDMI, and 3G/HD-SDI. A proprietary driver enables the Galileo Display Processor system to deliver real-time throughput and superb image quality, unlike other PC-based systems that can drop frames or cause image tearing. The video wall controller's solid state drive and dual-redundant power supplies add an extra level of reliability.

Galileo supports H.264 IP decodes for IP-based motion video. In addition, our exclusive VDA Remote Desktop technology with integrated KVM over IP capabilities provides operators with low-latency control over remote systems via a LAN or WAN. VDA Remote Desktop performance is demonstrably superior to the industry standard VNC, particularly at low bandwidth or with high-motion graphics and video.

Galileo is easy to set up and control. Its advanced GUI allows you to “drag and drop” inputs and applications, such as VMS, SCADA and videoconferencing, to the video wall. For details on this interface, refer to the *Galileo Video Wall Control Software User’s Guide*. In addition, an API allows operators to monitor remote alarms and create advanced scripts to recall layouts and control third-party equipment. A Web Client interface is also available.

The Galileo Display Processor is ideal for a range of applications including mission-critical operations centers, command centers and control rooms, as well as boardroom video walls, corporate lobby displays, and large-scale digital signage. Combining enhanced reliability with the flexibility of a PC system, the new IP-enabled Galileo Display Processor is a *PC wall done right*.

1.1 Key Features

- IP camera and codec compatibility (MPEG2, MPEG4, MJPEG and H.264)
- Advanced remote desktop technology
- Up to 56 displays
- Real-time processing
- Bezel compensation and edge blending
- Dynamic scaling, panning and zooming
- Scripting interface for system control
- Transparency and color keying
- Tablet-based control interface
- Transitions, animations, and image rotation (optional)
- User- and group-based feature access control (optional)



1.2 System Overview

The Galileo Display Processor system consists of the following hardware and software components.

1.2.1 Hardware

BASE PLATFORM

The Galileo hardware platform is a rack-mount computer available in a 4RU (7 in. high) chassis.

The chassis houses three (3) or four (4) power supplies, a solid state drive (SSD), backplane, and motherboard that accepts a system host board (SHB) and up to 18 I/O cards.

[**Table 1-1**](#) lists the available Galileo base system configurations.

Table 1-1 Galileo Base System Configurations

Model Number	Chassis Height	Maximum Output Count (Note 2)	Processor	Available I/O Card Slots	
				Digital/ Analog	Analog- only (Note 3)
GO 16	4RU	16	Intel® Core™ i7	4	0
GO 40		40		10	1
GO 56		56		17	1

Notes:

1. All base configurations include 8 GB of RAM, a 500 GB SSD, the Galileo Server software and a single-user Galileo Client software license.
2. The number of installed I/O cards determines the output count. **Base configurations do not include I/O cards.** These must be purchased separately.
3. Analog-only card slots accept only analog input cards. The other slots accept either analog input or digital I/O cards.

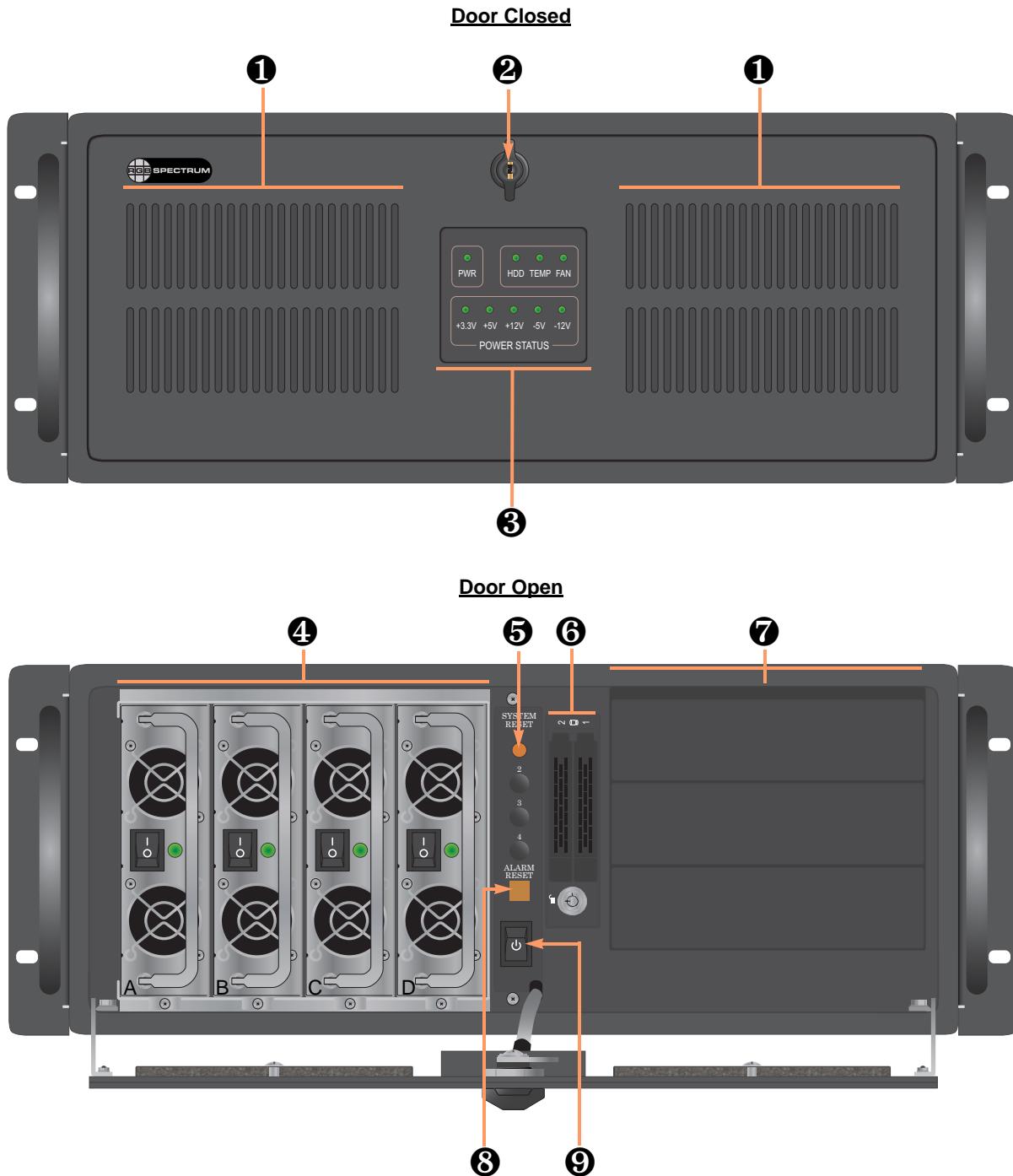


Figure 1-1 GO 40 and GO 56 Chassis – Front View

1. Air Intake Vents and Filter

Fans behind these vents draw cool air into the chassis. To ensure adequate air flow and maintain a proper operating temperature, provide a minimum of 4 to 6 inches (101 to 152 mm) of free air space around the chassis.

To prevent overheating the Galileo Display Processor, check the front panel filter once a month. If the Galileo is used where dust and dirt are an issue, it is recommended that you inspect the filter more frequently.

2. Front Door Lock

You can lock the front door to prevent unauthorized access to the front-panel switches and drive bays.

3. LED Panel

Nine (9) LEDs on the front door provide operating status information, as follows:

Table 1-2 GO 40 Front-Panel LED Indications

LED Label	Description
PWR	Lights green to indicate normal AC power supply operation. Lights red to indicate that an AC power supply has failed.
HDD	Blinks green to indicate that data is being written to or read from the SSD.
TEMP	Lights green to indicate normal operating temperature inside the chassis. Lights red to indicate that the chassis is overheated.
FAN	Lights green to indicate normal cooling fan operation. Lights red to indicate that a cooling fan has failed.
+3.3V	These LEDs light green to indicate that the internal, working, DC voltages are present. If any of these LEDs are off, that working voltage is not present.
+5V	
+12V	
-5V	
-12V	

4. Redundant Power Supplies

Each power supply has its own on/off switch and an LED that lights **green** to indicate that it is receiving AC power. The power supplies connect to AC power via two (2) AC inlets at the rear of the chassis. See [Figure 1-4](#).

5. System Reset Switch

Press and momentarily hold this switch to reset the display processor.

6. Drive Bay

A 3.5-inch bay housing the SSD. A second SSD and RAID support are available as options.

7. Optical Drive Bays (empty)



8. Alarm Reset Button

Press and momentarily hold this button to silence the audible alarm that sounds in the event of a power supply failure, fan failure, or overheated chassis. Then, take the necessary corrective action(s) to eliminate the cause of the alarm:

- Have the failed power supply replaced;
- Have the failed fan replaced;
- Ensure that the vents are not blocked; and/or
- Clean or replace the air filters.

Caution

Only service technicians who have been trained and authorized by RGB Spectrum, Inc. should service your Galileo Display Processor. Service by non-authorized personnel will void the product warranty.

9. Main Power Switch

Use this switch to turn the display processor on or off.

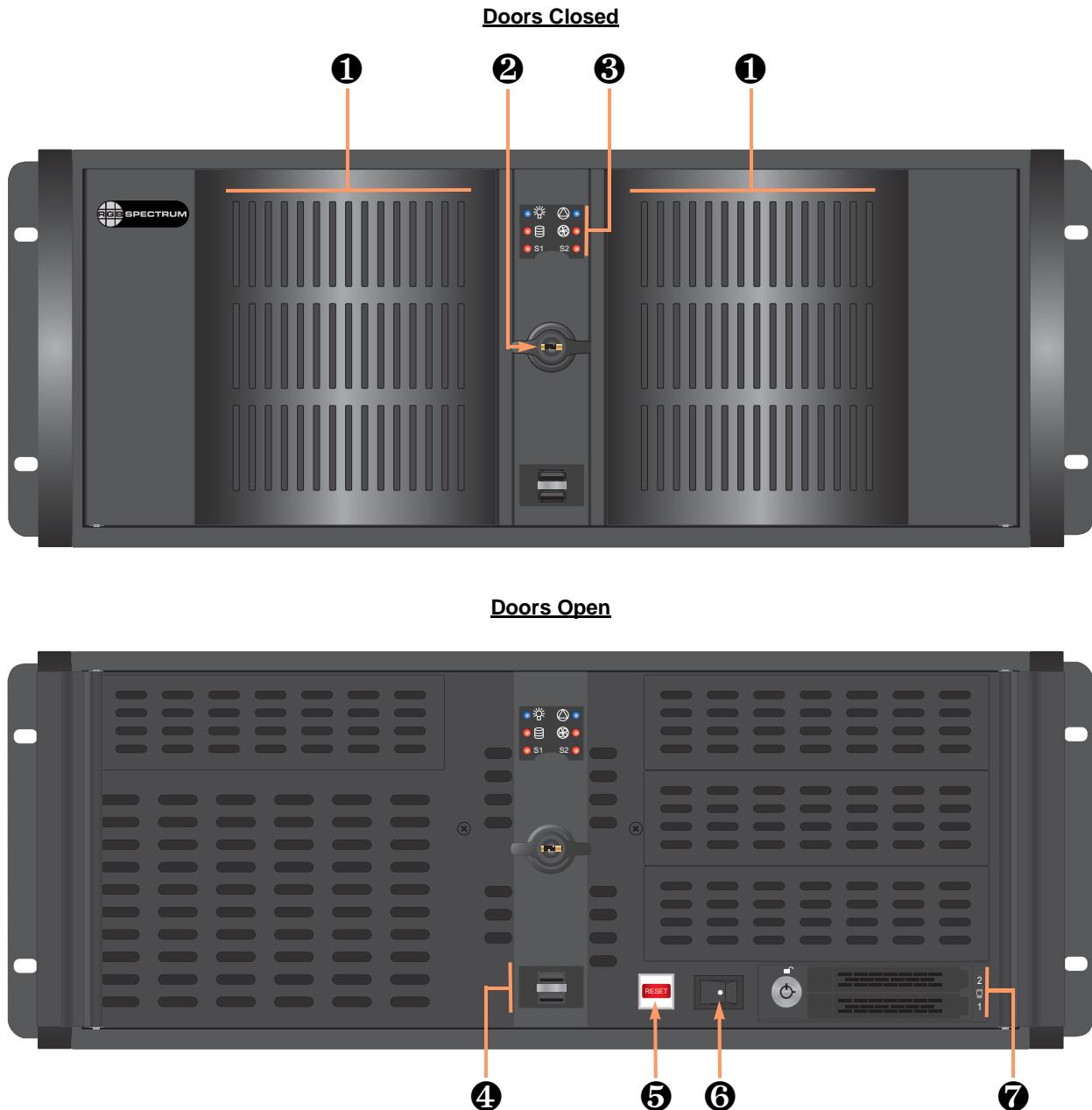


Figure 1-2 GO 16 Chassis – Front View



1. Air Intake Vents and Filter

Fans behind these vents draw cool air into the chassis. To ensure adequate air flow and maintain a proper operating temperature, provide a minimum of 4 to 6 inches (101 to 152 mm) of free air space around the chassis.

To prevent overheating the Galileo Display Processor, check the front panel filter once a month. If the Galileo is used where dust and dirt are an issue, it is recommended that you inspect the filter more frequently.

2. Front Door Lock

You can lock the front door to prevent unauthorized access to the front-panel switches and drive bays.

3. LED Panel

Six (6) LEDs on the front panel provide operating status information (power, alarm, disk activity and fan status).

4. USB 2.0 Ports (2)

Additional USB ports are located on the rear panel (see [Figure 1-5](#)).

5. System Reset Switch

Press and momentarily hold this switch to reset the display processor.

6. Main Power Switch

Use this switch to turn the display processor on or off.

7. Drive Bay

A 3.5-inch bay housing the SSD.

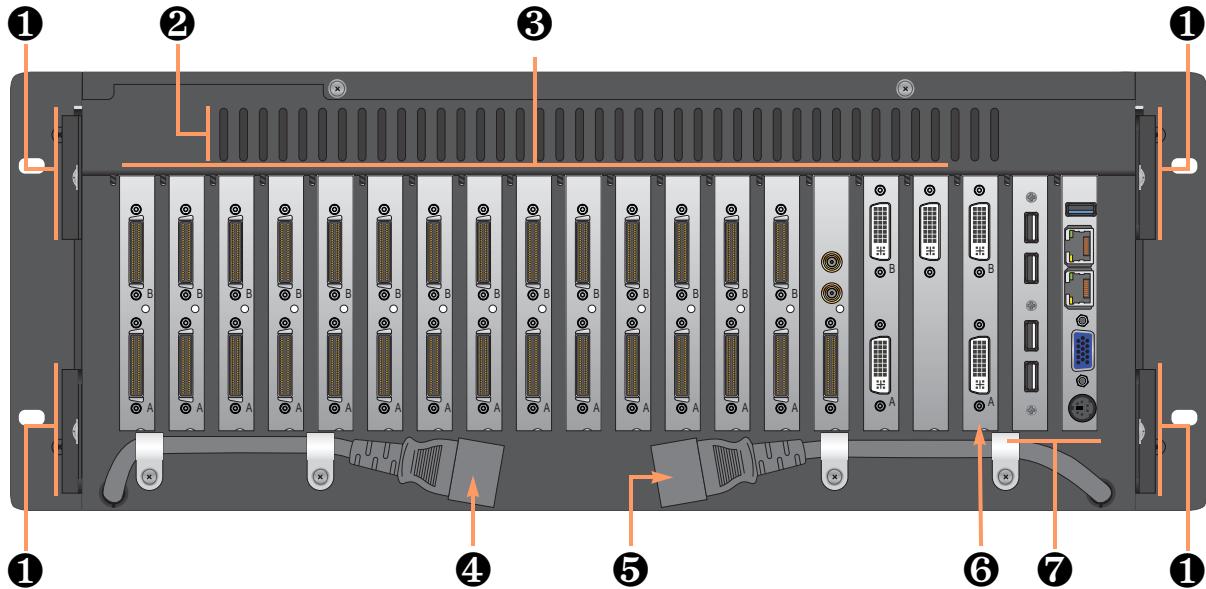


Figure 1-3 GO 56 Chassis – Rear View

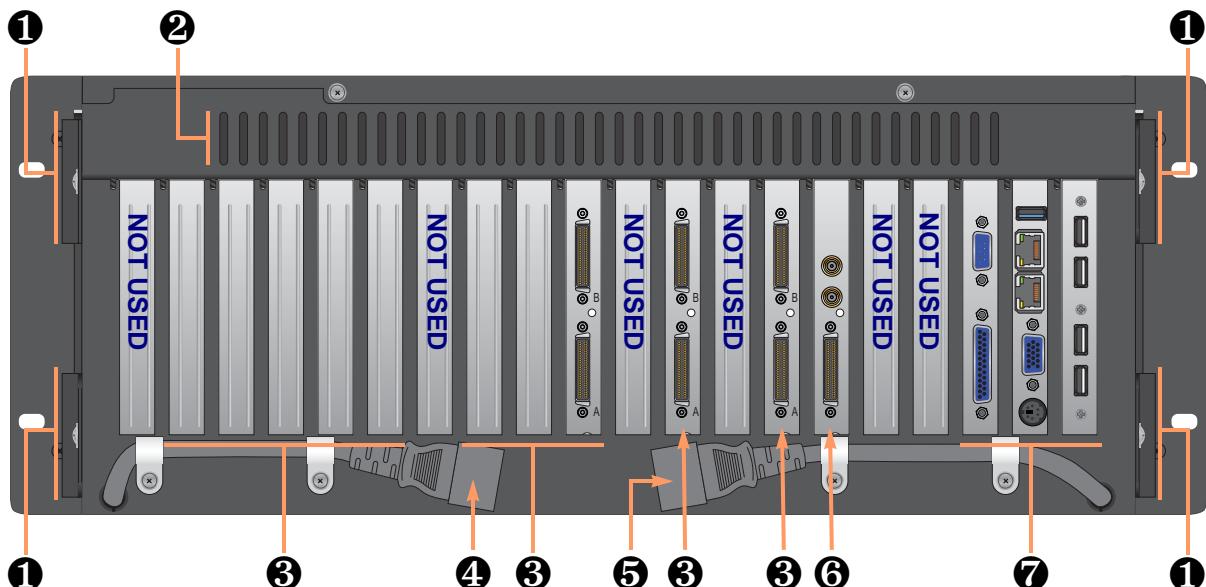


Figure 1-4 GO 40 Chassis – Rear View



1. Air Intake Vents and Filter

Fans behind these vents draw cool air into the chassis. To ensure adequate air flow and maintain a proper operating temperature, provide a minimum of 4 to 6 inches (101 to 152 mm) of free air space around the chassis.

To prevent overheating the Galileo Display Processor, inspect the filters once a month. If the Galileo is used where dust and dirt are an issue, it is recommended that you inspect the filter more frequently.

2. Exhaust Vents

Warm air exits the chassis through these vents. To ensure adequate air flow and maintain a proper operating temperature, provide a minimum of 4 to 6 inches (101 to 152 mm) of free air space around the chassis.

3. Digital (PCIe x16) I/O Card Slots

4. AC Inlet – Power Supplies A and B (see [Figure 1-1](#))

5. AC Inlet – Power Supplies C and D (see [Figure 1-1](#))

6. Analog I/O Card Slot

7. System Host Board (SHB)

The SHB is the heart of the Galileo Display Processor system. It contains the CPU, RAM and other system components, and provides two 10/100/1000BaseT Ethernet ports, a USB 3.0 port and four USB 2.0 ports. (The other connectors are not currently used.)

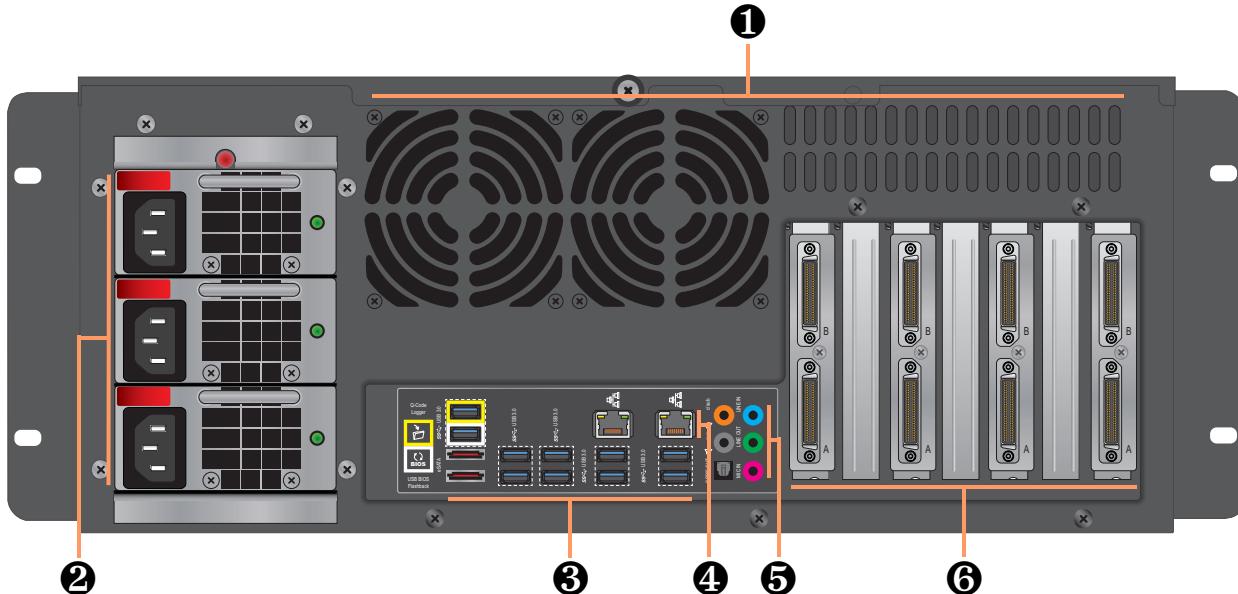


Figure 1-5 GO 16 Chassis – Rear View

1. Exhaust Vents

Warm air exits the chassis through these vents. To ensure adequate air flow and maintain a proper operating temperature, provide a minimum of 4 to 6 inches (101 to 152 mm) of free air space around the chassis.

2. Power Supplies

Connect all three power supplies to AC power sources to provide redundancy should one of the power supplies fail. Note that when a power supply is not connected to AC power, an audible alarm sounds when the display processor is turned on.

3. USB 3.0 and eSATA Ports

Ten (10), USB 3.0 ports and two (2), eSATA ports are provided.

4. Network Ports

Two (2), 10/100/1000BaseT Ethernet ports are provided for connection to a local area network.



5. Audio Connectors

An optical S/PDIF port provides stereo, digital audio output. The other audio connectors support two-, four-, six-, and eight-channel analog audio configurations, as follows:

Table 1-3 GO 16 Audio Configurations

	Connector	Headset/ 2-channel	4-channel	6-channel (5.1)	8-channel (7.1)
	Blue		Line In		Side Speaker Out (L+R)
	Green	Line Out (L+R)		Front Speaker Out (L+R)	
	Pink			Microphone In	
	Orange		—	Center (tip) + Subwoofer (ring)	
	Black	—		Rear Speaker Out (L+R)	

6. Digital/Analog I/O Card Slots

INPUT AND OUTPUT CARDS

[Table 1-4](#) lists the available I/O cards for Galileo.

Table 1-4 Galileo I/O Cards

	Model Number	Inputs (number × type)	Outputs (number × type)	Included Cables (refer to Table 1-5)
	GO D44	4 × DVI/Analog (RGB, YPbPr, S-Video or Composite)	4 × DVI/VGA	2 × GO ACD4
	GO D24	2 × DVI/Analog (RGB, YPbPr, S-Video or Composite)	4 × DVI/VGA	1 × GO ACD4 1 × GO ACD2
	GO D04	None	4 × DVI/VGA	1 × GO ACD4
	GO A08	8 × Analog (S-Video or Composite)	None	1 × GO ACA8
	GO A16	16 × Analog (S-Video or Composite)		2 × GO ACA8



Table 1-4 Galileo I/O Cards (Continued)

	Model Number	Inputs (number × type)	Outputs (number × type)	Included Cables (refer to Table 1-5)
	GO IP4K	4 × Mini-HDMI (Type C) 1 × 100/1000BaseT RJ45 Ethernet	None	—
	GO S22	2 × 3G-SDI	2 × DVI/VGA	1 × GO ACD2

CABLES AND ACCESSORIES

[Table 1-5](#) lists available cables and accessories for Galileo.

Table 1-5 Galileo Cables, Accessories, Upgrades, and Replacement Parts

Model Number	Description
GO ACA8	Analog Breakout Cable, DVI-I male to 8 BNC pairs for Galileo Analog Inputs
GO ACAB	Video Adapter Cable, DIN 1.0/2.3 (SDI) to BNC, for GO S22 I/O Card
GO ACD2	Video Breakout Cable, KX-20 (HDI) male to 2 × DVI female, for GO D24 I/O Card
GO ACD4	Video Breakout Cable, KX-20 (HDI) male to 4 × DVI female, for Galileo Inputs or Outputs
GO ACDS	Video Breakout Cable, KX-20 (HDI) male to 2 × DVI female, for GO S22 I/O Card
GO RS26	26" Rack slide set for GO 16 chassis
GO GUI	Additional Single-User Client Control Software allowing an additional user to control the same Galileo chassis
MS GO	One Year Software Maintenance Agreement fee for years 2 and beyond
WAR GO	Extended Hardware Warranty for years 2 through 5
GO D44S	Spare GO D44 I/O Card
GO D24S	Spare GO D24 I/O Card
GO D04S	Spare GO D04 I/O Card
GO A08S	Spare GO A08 I/O Card
GO A16S	Spare GO A16 I/O Card
GO S22S	Spare GO S22 I/O Card



1.2.2 Galileo Software

Galileo Video Wall Control Software consists of four components:

GALILEO SERVER

Galileo Server runs under Microsoft® Windows® 7 Professional (64-bit), on the Display Processor. It starts automatically when Windows starts. Galileo Server manipulates windows and other video wall elements in response to commands it receives from Galileo Client. It also logs system and user activity, and controls access to Display Processor features and functions based on user/group privileges defined by a Galileo Client operator.

GALILEO CLIENT

The Galileo Client can be installed on any Windows PC and controls all aspects of the Video Wall operation. A Galileo base configuration includes a single-user Client license. You may purchase as many additional Client licenses as you require.

GALILEO WEB CLIENT

The Galileo Web Client provides access to many of the same features available through Galileo Client, using a standard Web browser on a computer, tablet or smartphone.

GALILEO REMOTE HOST

Galileo Remote Host runs in the taskbar of any source computer you would like to display on the video wall, or view/control from other clients. The Remote Host has no user interface and cannot be used to control the video wall directly.

Note

[System Requirements in Chapter 5](#) describes the hardware and software environment required to run Galileo Client and Galileo Remote Host.

1.2.3 Third-Party Software

In addition to the Galileo Video Wall Control Software suite, your Galileo system includes PowerDesk software for configuring your I/O cards according to the requirements of your video wall application.



1.3 Product Specifications

[Table 1-6](#) lists the Galileo Display Processor specifications.

Table 1-6 Galileo Specifications

Parameter	Specification
Inputs	
Format	2-channel, 4-channel, 8-channel, 16-channel (modular)
Signal Type	DVI/HDMI, 3G-SDI, Analog
Resolutions	Mini-HDMI (GO IP4K card only): Up to 4096 × 2160 @60 Hz (4:2:0) DVI/HDMI: Up to 1920 × 1200 @60 Hz; up to 2560 × 1600 @30Hz 3G-SDI: 1920 × 1080 @60 Hz
Color Space	YUV (YCbCr), 4:4:4, 4:2:2, 4:2:0
Capacity (maximum)	GO 16: 16 Digital, 48 Analog GO 40: 40 Digital, >100 Analog GO 56: 56 Digital, >100 Analog
Outputs	
Format	2-channel, 4-channel (modular)
Signal Type	DVI/HDMI, VGA
Resolution	Up to 2048 × 1152 @60 Hz; up to 2560 × 1600 @30Hz
Capacity (maximum)	GO 16: 16 GO 40: 40 GO 56: 56
Row/Column Count (maximum)	Because Windows 7 limits the Desktop width and height to 32,768 pixels, the maximum row and column counts vary depending on the wall display resolution (and output count); for example: <ul style="list-style-type: none"> ◆ 30 rows OR 17 columns at 1920 × 1080 ◆ 27 rows OR 17 columns at 1920 × 1200 ◆ 28 rows OR 16 columns at 2048 × 1152 ◆ 20 rows OR 12 columns at 2560 × 1600
HDCP	<ul style="list-style-type: none"> ◆ High-bandwidth Digital Content Protection (HDCP) is supported by Galileo systems equipped with 10 or fewer I/O cards ◆ Each HDCP-encrypted source can appear on up to 11 display devices; enlarging or rotating a window containing an HDCP source may increase the number of outputs required to display that source ◆ All video wall display devices must be HDCP-compliant, turned on, and connected to Galileo outputs directly, not through an HDCP repeater (A/V receiver or distribution amplifier)

Table 1-6 Galileo Specifications (Continued)

Parameter	Specification
GO IP4K IP Video Decoder Card	
Codec Engine	H.264/MPEG-4 Part 10 (AVC), up to Level 5.2
Stream Protocol	Real-time Transport Protocol (RTP) or Real Time Streaming Protocol (RTSP)
H.264 Profiles	Baseline profile (BP), Main Profile (MP), High Profile (HiP), High 10 Profile (Hi10P), High 4:2:2 Profile (Hi422P), High 4:4:4 Predictive Profile Separate Plane (Hi444PP)
H.264 Decode	Up to twelve (12) streams at 1920 x 1080 @ 30Hz, one stream at 3840 x 2160 @ 60 Hz or other equivalent data rate via each GO IP4K card Note: The GO IP4K card supports progressive-scan video signals only.
Bit Rates	100 kbps to 500 Mbps
Processor, Memory, Storage and Connectivity	
CPU	Intel® Core™ i7
Memory	8 GB (2 x 4 GB) DDR3
Storage	500 GB SSD
USB	GO 16: 10 x USB 3.0 Type A GO 40 and GO 56: 1 x USB 3.0 Type A, 4 x USB 2.0 Type A
Network	2 x 10/100/1000 Base-T Ethernet
Power	
Power Supplies	Universal 100-240 VAC, 50-60 Hz, redundant
Power Consumption (maximum)	GO 16: 800 Watts GO 40 and GO 56: 810 Watts
Environmental	
Cooling	GO 16: Two (2), 80-mm ball bearing fans, 31 CFM each; Two (2), 120-mm ball bearing fans, 110 CFM each GO 40 and GO 56: Three (3), 120-mm ball bearing fans, 114 CFM each
Temperature	Operating (nominal): 41 °F to 104 °F (5 °C to 40 °C) Non-Operating: -4 °F to 158 °F (-20 °C to 70 °C)
Relative Humidity	Operating: 5% to 90% non-condensing
Altitude	Operating: Up to 13,123 ft (4 km)
Physical	
Dimensions (h x w x d)	GO 16: 7.0 x 19.0 x 20.0* in. (177.8 x 482.6 x 508.0* mm) GO 40 and GO 56: 7.0 x 19.0 x 26.0* in. (177.8 x 482.6 x 660.4* mm) * Excludes handles
Weight**	GO 16: 36.7 lbs. (16.6 kg) GO 40 and GO 56: 57.3 lbs. (26.0 kg) ** Excludes I/O cards and storage
Specifications are subject to change without notice.	

CHAPTER

2

INSTALLATION

This chapter provides installation and initial setup information for the Galileo Display Processor. The following topics are discussed:

- [Shipment Contents](#)
- [Installation Considerations](#)
- [Rack-Mounting the Display Processor](#)
- [Connections to the Galileo Display Processor](#)
- [Applying Power to the Galileo Display Processor](#)
- [Network Configuration Settings](#)
- [Stopping and Starting Galileo Server](#)

2.1 Shipment Contents

Your Galileo shipment includes the following items:

- Display Processor Chassis, equipped with one or more I/O Cards
- AC Power Cord, 10 ft. (3.05m) (2 (GO 40 or GO 56) or 3 (GO 16))
- Cables and adapters for installed I/O Cards, per each of the following card types:
 - GO D04: KX20-to-quad DVI cable, DVI-to-HD15 adapter (4)
 - GO D24: KX20-to-quad DVI cable, KX20-to-dual DVI cable, DVI-to-HD15 adapter (6)
 - GO D44: KX20-to-quad DVI cable (2), DVI-to-HD15 adapter (8)
 - GO A08: DVI-to-16 x BNC cable
 - GO A16: DVI-to-16 x BNC cable (2)
 - GO S22: KX20-to-dual DVI cable, DVI-to-HD15 adapter (2), DIN-to-BNC adapter (2)
- *Galileo Display Processor Technical Resources USB Stick*



2.2 Installation Considerations

Proper installation of your Galileo Display Processor will enhance product performance and extend the life of the product. Consider the following when planning and carrying out your video wall installation.

2.2.1 Ventilation

To ensure adequate air flow and maintain a proper operating temperature, provide a minimum of 4 to 6 inches (101 to 152 mm) of free air space around the chassis. Any front cabinet doors or access aisles must accommodate a front chassis clearance of at least 6 inches (152 mm) in order to provide proper cable clearances for any front-panel USB port connections, and allow access to the system air filter for maintenance. Ideally, a chassis clearance of 0.5 to 1.5 inches (13 to 38 mm) above the Display Processor is desirable, but not required.

2.2.2 Ambient Heat

Keep the ambient temperature constant and below 35 °C (95 °F). Keep the Display Processor away from heating and/or air conditioning vents.

2.2.3 Ambient Light

In general, minimize or eliminate light sources directed at the video wall. Contrast ratio will be noticeably reduced if light directly strikes a screen, such as when a shaft of light from a window or floodlight falls on the image. Images may then appear washed out and less vibrant.

2.2.4 Displays

RGB Spectrum recommends that, whenever possible, your video wall is composed of a single brand and model of displays.

2.2.5 Network Implementation Guidelines

RGB Spectrum recommends that, whenever possible, you follow these network implementation guidelines to ensure the best possible performance of your Galileo installation.

SET PERMANENT IP ADDRESSES

Configure the Galileo Display Processor, Galileo Client PCs and Galileo Remote Host PCs to use permanent IP addresses. If you use DHCP addressing, the DHCP server may assign an IP address that expires after a period of time. If this occurs, you will need to change the network settings on the Display Processor and/or all Client and Remote Host PCs. If you have a large number of these, this could be very time-consuming.



You can either set permanent IP addresses manually or have the DHCP server assign IP addresses that do not expire. Consult your network administrator for the best way to go about this.

USE SAME SUBNET (RECOMMENDED)

Ideally, the Galileo Display Processor, Galileo Client PCs and Galileo Remote Host PCs are all on the same IP subnet. While it is possible to distribute Galileo system elements among multiple subnets, overall performance may be compromised and/or require network reconfiguration or optimization measures.

2.3 Rack-Mounting the Display Processor

The Galileo Display Processor can be placed on any flat, stable surface such as a shelf or table, or it can be rack-mounted. Place it in a location that provides easy access to the power connectors.

Before rack-mounting the Galileo Display Processor, attach the rack mounting ear/handle assemblies to the front of the chassis, using the supplied hardware.

Note

The illustrations in this section show a GO 40/GO 56 chassis; the procedure for rack-mounting a GO 16 is similar.

To mount the chassis in a standard, 19-inch equipment rack:

1. Attach the chassis mounting rails to the rear rack supports. See [Figure 2-1](#), which shows an “inside” mount. Depending on the type of rack you are using, an “outside” mount may also be possible.

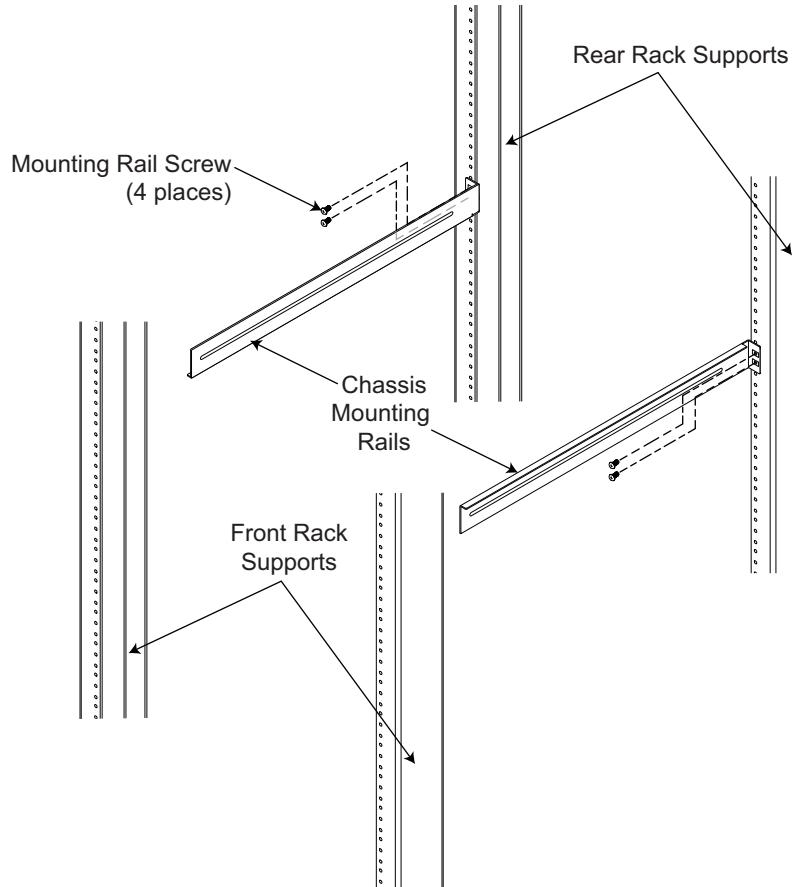


Figure 2-1 Attaching the Chassis Mounting Rails to the Rear Rack Supports (Inside Mount)

2. Remove the five (5) screws shown in [Figure 2-2](#) from each side of the chassis. You will use these to attach the mounting rails to the chassis later.

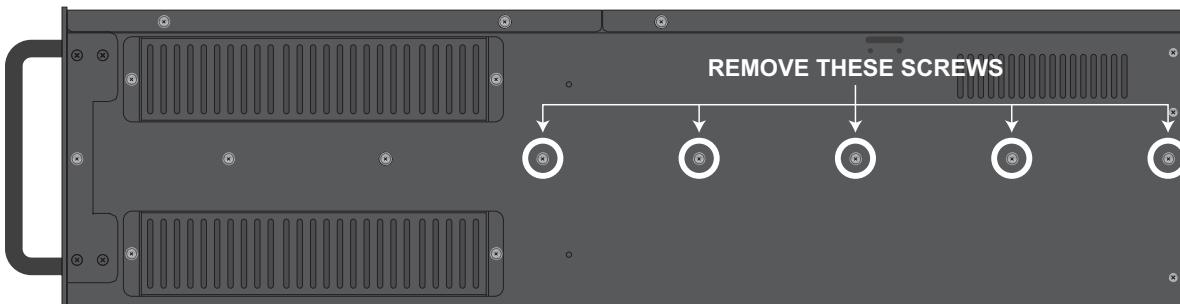


Figure 2-2 Removing the Mounting Rail Attaching Screws from the Chassis

3. **With the help of an assistant**, lift the chassis and position it between the rails. **Support the chassis from below as you do this.**



4. Attach the rack mounting ears at the front of the chassis to the front rack supports.

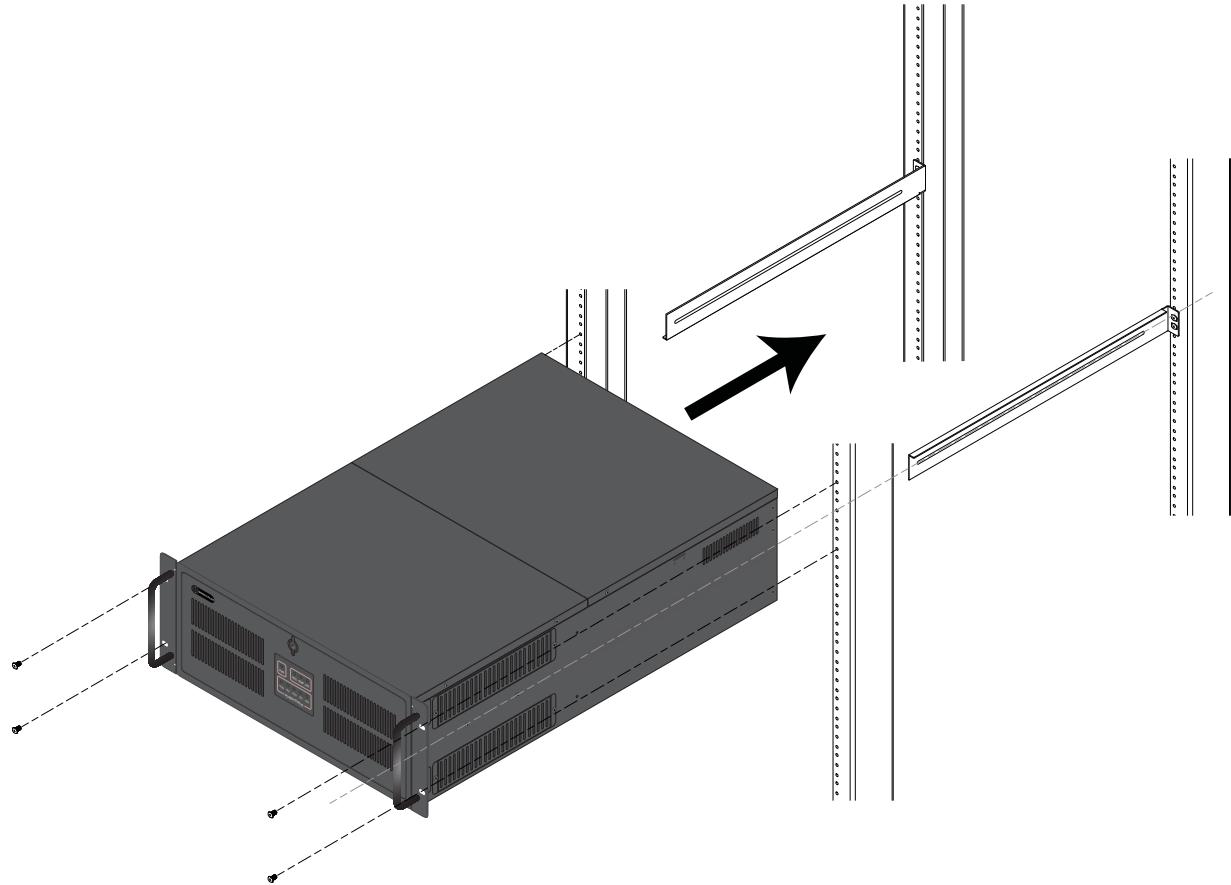


Figure 2-3 Securing the Chassis Mounting Ears to the Front of the Rack

5. Attach the mounting rails to the sides of the chassis, using the screws that you removed in Step 2.

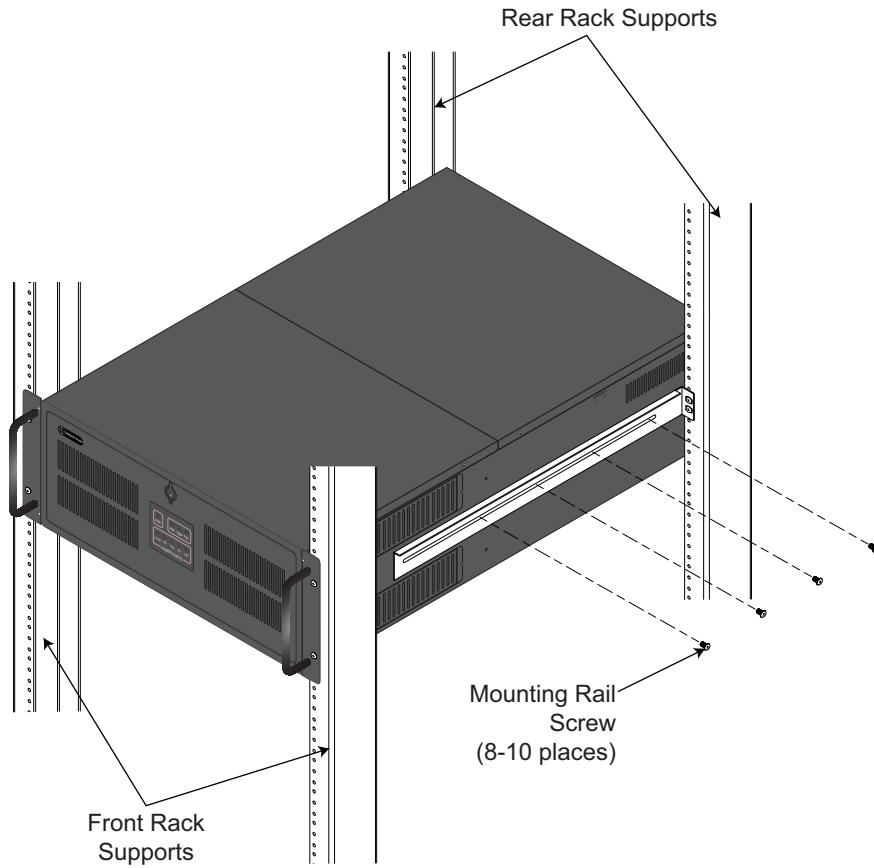


Figure 2-4 Securing the Chassis to the Mounting Rails



2.4 Connections to the Galileo Display Processor

Proceed as follows to connect the Galileo Display Processor to your sources, displays, network and AC power.

Note

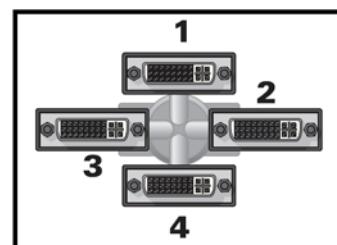
To make some of the connections described in this section, you will need one or more of the following items, in addition to what is provided with your Galileo Display Processor:

- BNC-to-Composite (RCA[®]) adapter
- BNC-to-S-video adapter
- DVI cable (male-to-male)
- DVI-to-Component adapter
- DVI-to-Composite (RCA) adapter
- DVI-to-S-video adapter
- HDMI-to-DVI adapter

When connecting your equipment:

- **Turn off all equipment** before making any connections.
- Use the correct signal cables for each source.
- For best performance and to minimize cable clutter, **use high-quality cables** that are only as long as necessary to connect two devices. (Don't use a 20-foot cable when a 6-foot cable will suffice.)
- **Do not use HDCP repeaters on the Display Processor outputs.** Connect your displays to the Display Processor outputs directly.
- **Ensure that the cables are securely connected.** Tighten the thumbscrews on connectors that have them.

You can connect up to four (4) displays at a time to each Galileo I/O card, depending on the model. Displays are numbered consecutively based on the connector to which each is attached. For example, the monitor attached to the connector labeled **1** on the cable is identified as **1**, the monitor attached to the connector labeled **2** on the cable is identified as **2**, and so on.



Tip

To facilitate the setup of your video wall, we recommend connecting your monitors consecutively and arranging your displays in pairs.



2.4.1 Understanding Your Multi-Card Setup

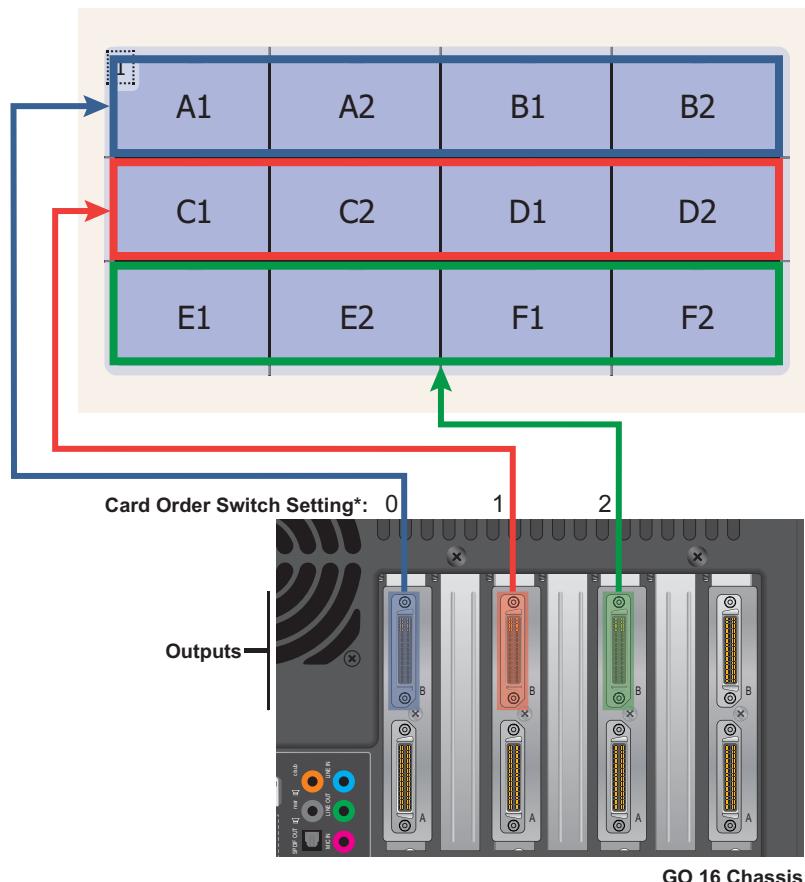
The Galileo Display Processor system includes PowerDesk software, a set of tools for configuring your I/O cards.

When used with Galileo, PowerDesk assigns letters to each Graphics Processing Unit (GPU) on the card and numbers to the outputs associated with that GPU. Quad-output cards (GO D04, GO D24, and GO D44) have two (2) GPUs; the dual-output card (GO S22) has one GPU. The first GPU on the first quad-output card is labeled **A** and its first output is labeled **A1**. The second GPU on the first quad-output card is labeled **B** and its first output is labeled **B1**.

In the examples that follow, only quad-output I/O cards are used.

VIDEO WALL DISPLAY NUMBERING – EVEN NUMBER OF COLUMNS

Figure 2-5 shows a 4×3 video wall. In this case, monitors are paired and follow each other sequentially from left to right and top to bottom.



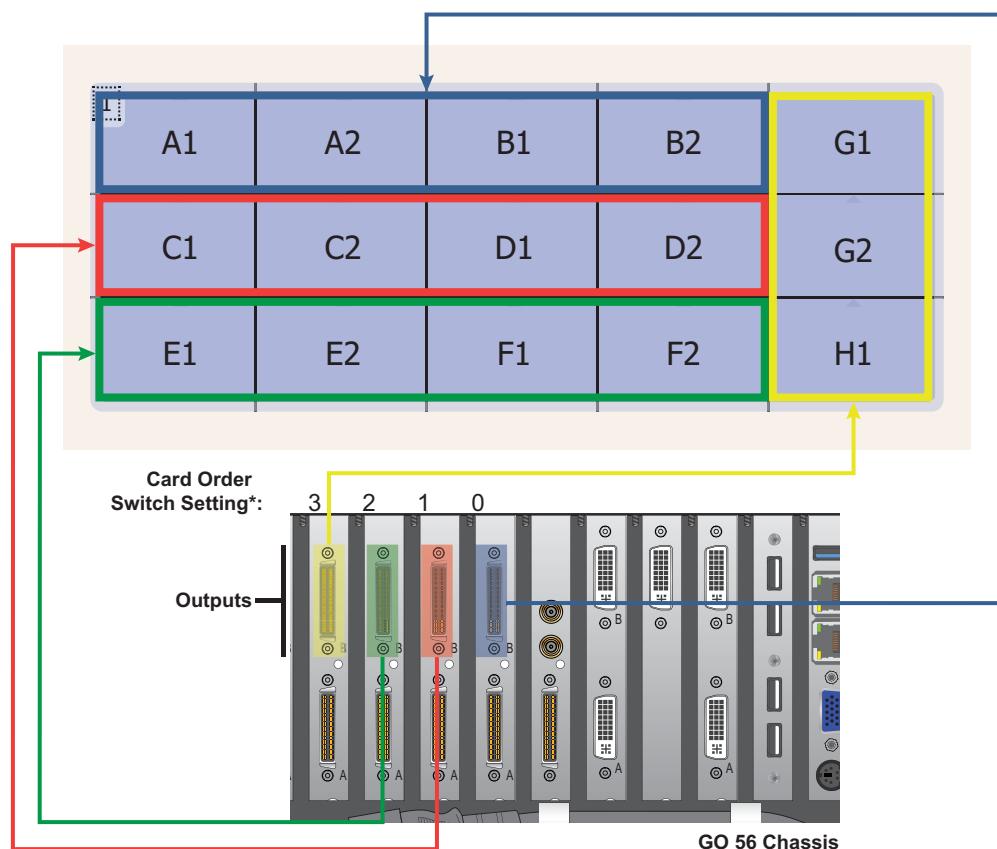
* Factory-configured; starting from 0 and ascending from left to right

Figure 2-5 Display Numbering with an Even Number of Columns



VIDEO WALL DISPLAY NUMBERING – ODD NUMBER OF COLUMNS

Figure 2-6 shows a 5×3 video wall. In this case, monitors in columns 1 through 4 are paired and follow each other sequentially from left to right and top to bottom. The GPUs associated with the last card are placed in the last column of the layout.



* Factory-configured, starting from 0 and ascending from right to left

Figure 2-6 Display Numbering with an Odd Number of Columns

You may need to manually rearrange the outputs of your multi-display layout in PowerDesk to match the physical layout of your video wall, or physically connect your displays in such a way as to match your multi-display layout in PowerDesk.

[Chapter 3, Configuring Your Video Wall and I/O Cards](#), provides detailed instructions for setting up your video wall, changing certain display settings and accessing other PowerDesk features.



2.4.2 Connections to the GO D44, GO D24, and GO D04 I/O Cards

Proceed as follows to connect your displays and image sources to your GO D44, GO D24 or GO D04 I/O card.

CONNECTING DISPLAYS

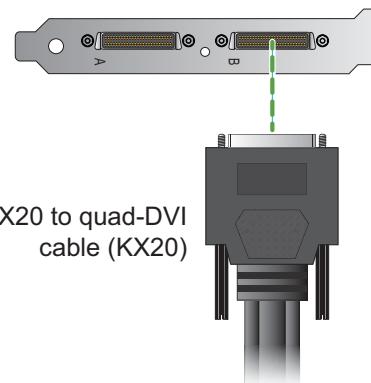
Important

In order to display HDCP-encrypted sources on the video wall, ALL video wall displays must be HDCP-compliant and connected directly to Galileo outputs.

1. **GO D44 and GO D24:** Connect the KX20-to-quad DVI cable to connector **B** on the bracket of the card.

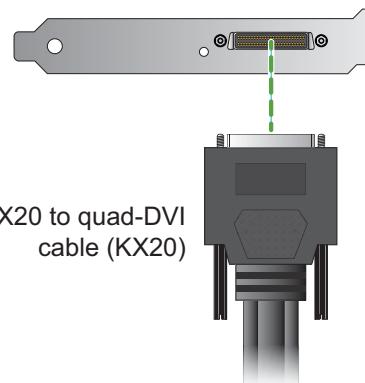
GO D04: Connect the KX20-to-quad DVI cable to the connector on the bracket of the card.

GO D44 and GO D24



KX20 to quad-DVI cable (KX20)

GO D04

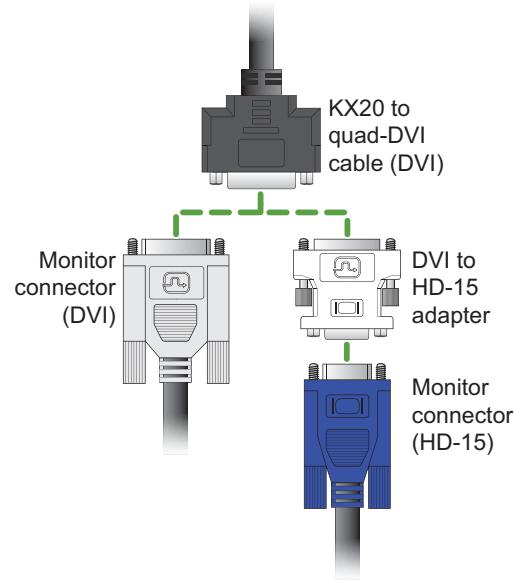


KX20 to quad-DVI cable (KX20)



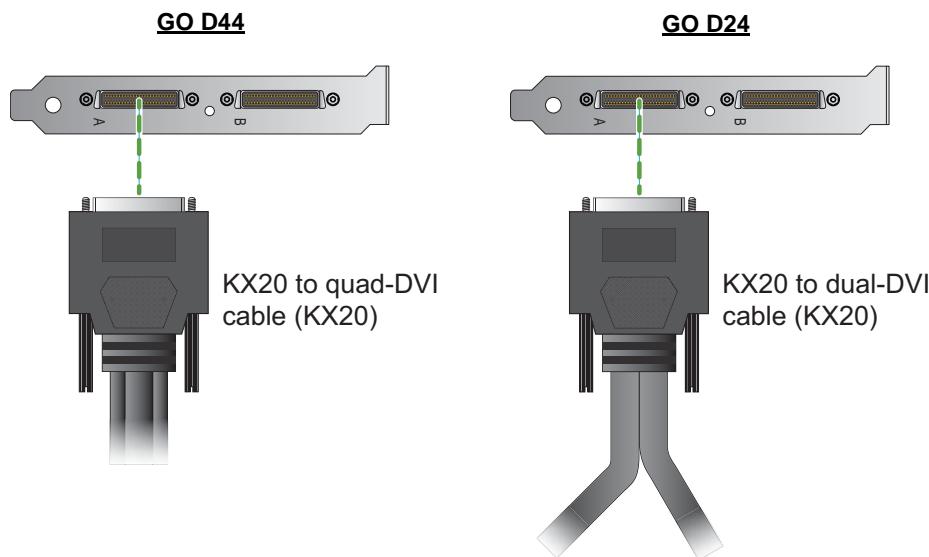
2. If your display has a DVI connector, connect your display cable directly to your KX20-to-quad DVI cable.

If your monitor has an HD-15 connector, use a DVI-to-HD-15 adapter to connect your monitor cable to your KX20-to-quad DVI cable.



CONNECTING SOURCES

1. **GO D44:** Connect the KX20-to-quad DVI cable to connector **A** on the bracket of the card.
- GO D24:** Connect the KX20-to-dual DVI cable to connector **A** on the bracket of the card.

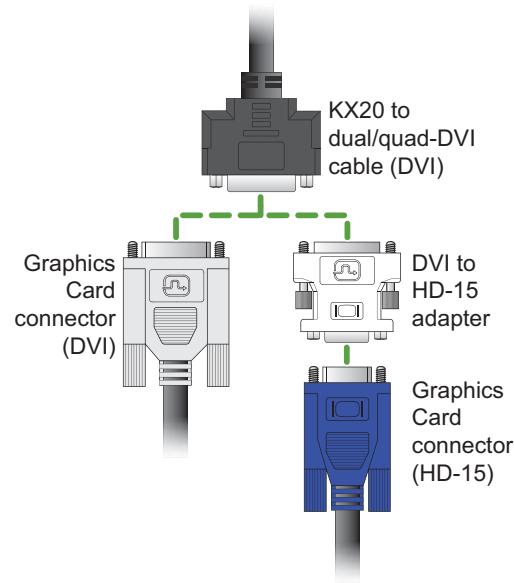




2. If your source is a graphics card with a DVI connector, connect your graphics card cable directly to your KX20-to-quad DVI (or KX20-to-dual DVI) cable.

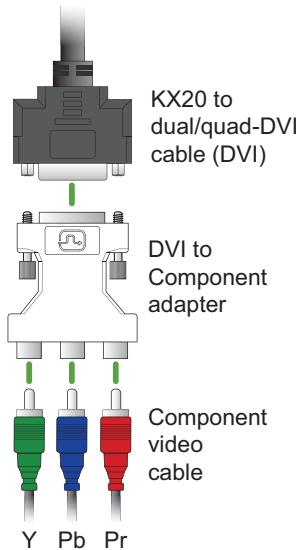
If your source is a graphics card with an HD-15 connector, use a DVI-to-HD-15 adapter to connect your graphics card cable to your KX20-to-quad DVI (or KX20-to-dual DVI) cable.

For video sources, refer to the following steps.



3. For connecting **component** video sources, you need a DVI-to-component video (RCA) adapter.

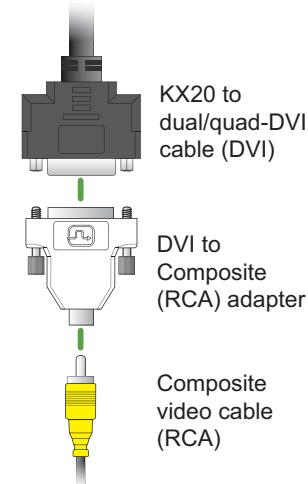
Connect the adapter to a DVI connector on your KX20-to-quad DVI (or KX20-to-dual DVI) cable. Connect your source to the Y, Pb and Pr (RCA) connectors on the adapter.





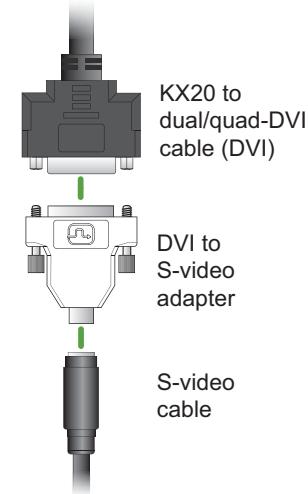
4. For connecting **composite** video sources, you need a DVI-to-composite video (RCA) adapter.

Connect the adapter to a DVI connector on your KX20-to-quad DVI (or KX20-to-dual DVI) cable. Connect your source to the composite connector on the adapter.



5. For connecting **S-video** sources, you need a DVI-to-S-video adapter.

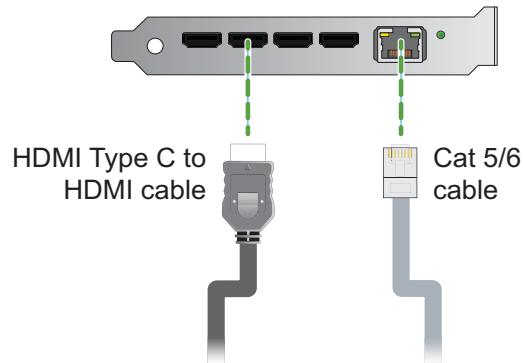
Connect the adapter to a DVI connector on your KX20-to-quad DVI (or KX20-to-dual DVI) cable. Connect your source to the S-Video connector on the adapter.





2.4.3 Connections to the GO IP4K Card

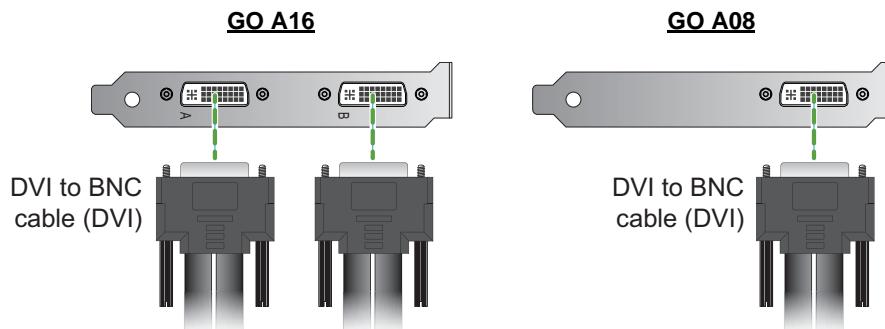
1. Use a standard, Cat 5 or Cat 6 network cable with an RJ-45 plug to connect a network hub, router or gateway to the Ethernet port on the card.



2. Use HDMI Type C-to-HDMI cables to connect your video/graphics sources to the mini (Type C) HDMI connectors on the card. If a source has a DVI connector, use an HDMI-to-DVI adapter.

2.4.4 Connections to the GO A16 and GO A08 Cards

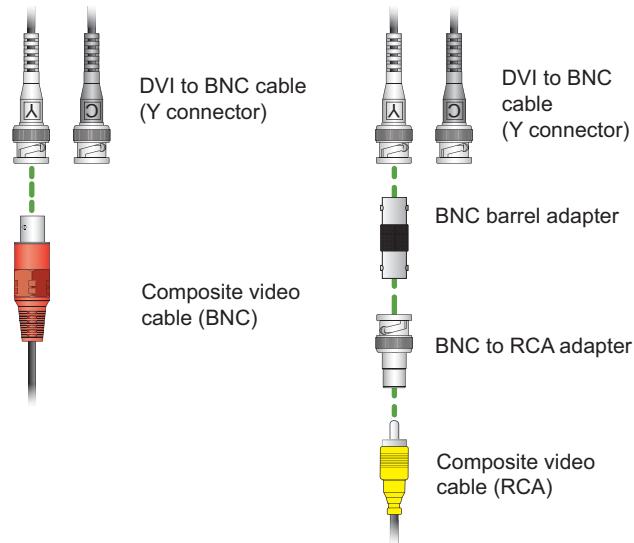
1. Connect the DVI-to-BNC cable(s) to the connector(s) on the bracket of the card.



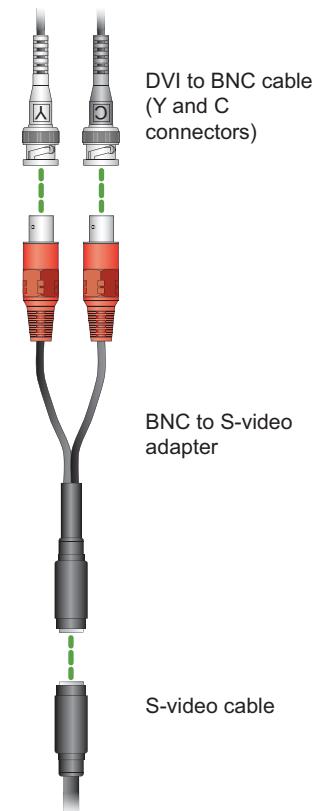


- 2.** Connect a **composite** video source to a **Y** connector on the DVI-to-BNC cable.

If the Composite video cable has RCA connectors, you need a BNC-to-composite video (RCA) adapter. Connect the adapter to a **Y** connector on the DVI-to-BNC cable. Connect your source to the RCA connector on the adapter.



- 3.** For an **S-video** source, connect a BNC-to-S-video adapter to a **Y/C** connector pair on the DVI-to-BNC cable. Connect your source to the S-video (mini-DIN) connector on the adapter.

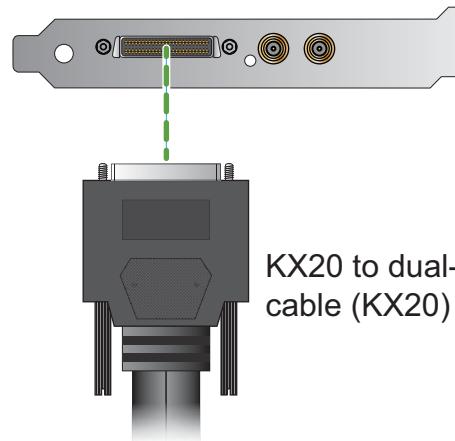




2.4.5 Connections to the GO S22 I/O Card

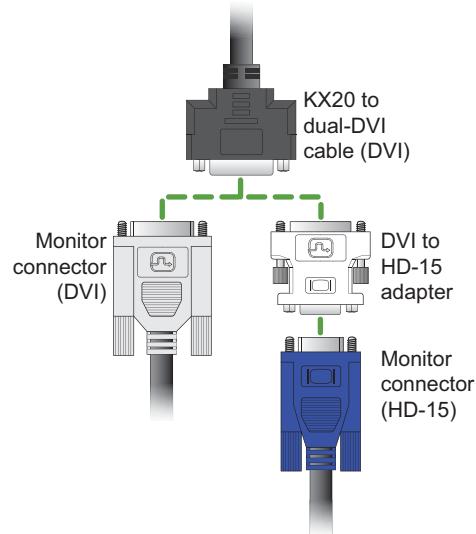
CONNECTING DISPLAYS

1. Connect the KX20-to-dual DVI cable to the connector on the bracket of the card.



2. If your display has a DVI connector, connect your display cable directly to your KX20-to-dual DVI cable.

If your monitor has an HD-15 connector, use a DVI-to-HD-15 adapter to connect your monitor cable to your KX20-to-dual DVI cable.

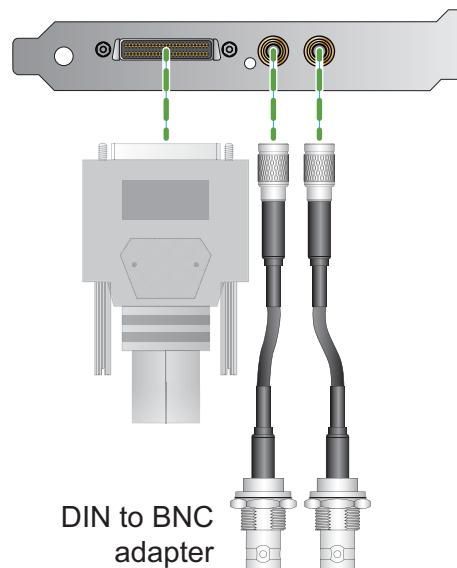




CONNECTING SOURCES

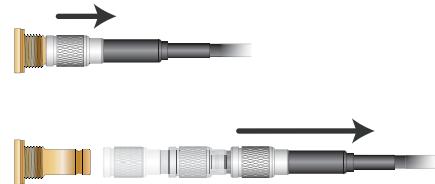
Connect DIN-to-BNC adapters to the DIN connectors on the bracket of the card.

Connect your SDI sources to the BNCs on the adapters.



Note

To disconnect an SDI source from the GO S22 I/O card, firmly hold the adapter, pull back the metal ring around the DIN connector on the cable, then carefully remove the adapter. This will prevent damage to the DIN connector on the DIN-to-BNC adapter or on the I/O card.





2.4.6 Connection to a Network

Use a standard, Cat 5 or Cat 6 network cable with an RJ-45 plug to connect a network hub, router or gateway to the primary Ethernet port on the Display Processor; see [Figure 2-7](#).

Optionally, connect the second Ethernet port in the same manner (for example, if you need to configure one interface for a static IP address and the other for a dynamic IP address).

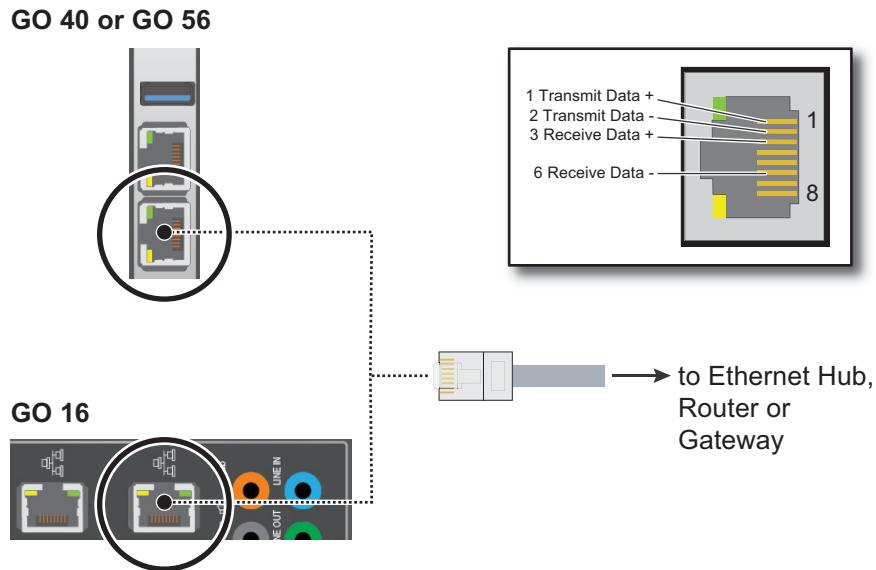


Figure 2-7 Connecting the Display Processor to a Network



2.5 Applying Power to the Galileo Display Processor

Important

1. Whenever you turn on or reset the Display Processor, make sure your monitors are already turned on. Otherwise, the system may have difficulty detecting your monitors.
2. If you do not connect all power supplies in a GO 16 to AC power, an audible alarm occurs when the display processor is turned on.

1. Turn on your displays.
2. Connect a mouse and keyboard to available USB ports on the Galileo Display Processor.
3. Turn on your source components.
4. Plug the female end of one of the supplied power cords into an AC power inlet at the rear of the Display Processor (AC 100V ~ 240V). See [Figure 1-3](#), [Figure 1-4](#) or [Figure 1-5](#).
5. Connect the other end to an AC power source.
6. Repeat Steps 4 and 5 for the other AC power inlet(s).
7. Press the power (black) switch on the front of the Display Processor (see [Figure 1-1](#) or [Figure 1-2](#)). The power indicator lights green.
8. After a brief period, the Display Processor should display the Windows desktop.
9. If a logon screen appears, log on to Windows as user **rgb**, with no password.

2.6 Network Configuration Settings

To enable communication between Galileo Server and Galileo Client (or Galileo Remote Host), ensure that the Windows network adapter settings on the Display Processor are compatible with your network.

Then, if you connected more than one network adapter on the Display Processor to a network (as described in [Connection to a Network on page 34](#)), select the adapter that you want Galileo Server to use. Both tasks are described below.

2.6.1 Windows Network Adapter Settings

The Galileo Display Processor is factory-configured to obtain network configuration settings from a Dynamic Host Configuration Protocol (DHCP) server. If you want your Display Processor to have a fixed IP address (because your network does not use DHCP or for some other reason), use the Windows **Network and Sharing Center** Control Panel item to change these settings. For assistance, consult your network administrator and/or Windows Help.



2.6.2 Choosing a Network Adapter for Use With Galileo

If you connected more than one network adapter on the Display Processor to a network, right-click on the Galileo Server icon in the Windows taskbar. Then, select **Set IP Address** from the pop-up menu. Select the IP address of the network adapter you want Galileo Server to use for communicating with clients and remote hosts. See [Figure 2-8](#).

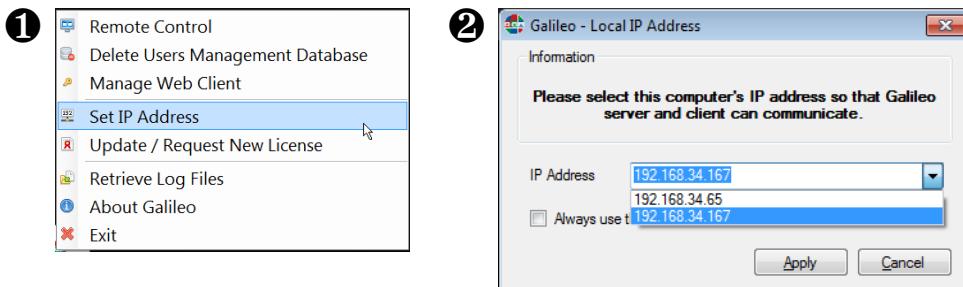
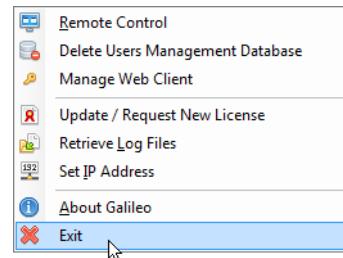


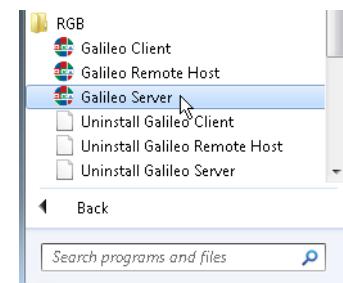
Figure 2-8 Galileo Server – Choose Network Adapter IP Address

2.7 Stopping and Starting Galileo Server

Galileo is factory-configured to launch Galileo Server when Windows starts. If for any reason you need to stop Galileo Server, right-click on the Galileo Server icon in the Windows taskbar. Then, select **Exit** from the pop-up menu.



To restart Galileo Server after it has been stopped, choose **Start > All Programs > RGB > Galileo Server**.



CHAPTER 3

CONFIGURING YOUR VIDEO WALL AND I/O CARDS

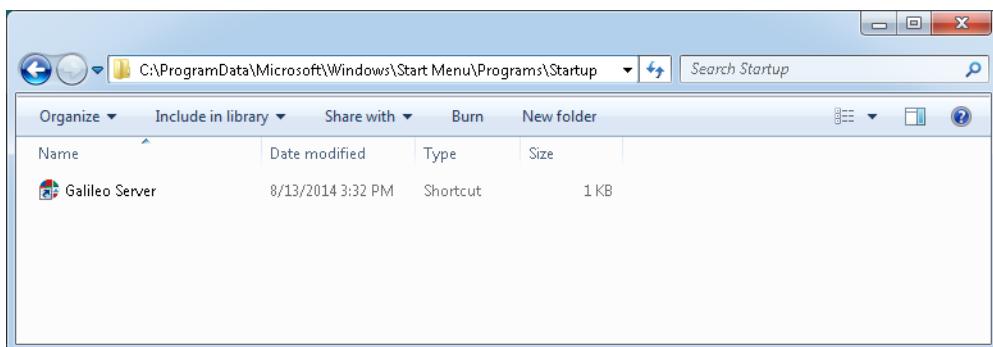
Important

Because the PowerDesk configuration utility provided with Galileo requires exclusive access to the graphics cards, you must end all other processes that access them before launching the utility. If you do not, your wall configuration changes will not be applied.

3.1 Before You Start

Follow these steps to ensure that no other running process or service prevents the configuration utility from working properly:

1. From the Windows **Start** menu, choose **All Programs**.
2. Right-click on **Startup** and choose **Open All Users**.



3. Drag the **Galileo Server** shortcut from this folder to the desktop. (You will move the shortcut back to this folder after you have performed the steps listed in the following sections.)
4. Restart the Galileo Display Processor and log on to Windows.



3.2 Accessing PowerDesk

To launch PowerDesk, click **Start > All Programs (or Programs) > Matrox® Graphics > Matrox PowerDesk**. Or, right-click anywhere on the Windows desktop and select **Launch Matrox PowerDesk**.

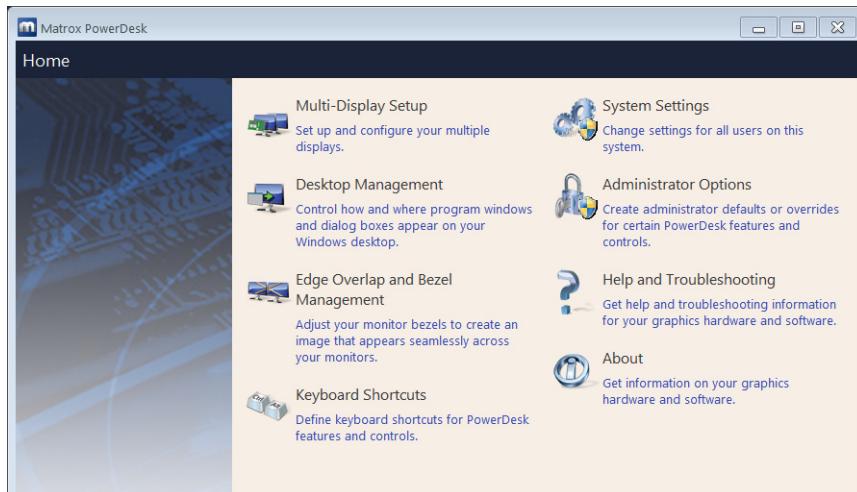


Figure 3-1 PowerDesk Home Screen

3.3 Setting Up Your Video Wall Layout

Setting up your video wall layout with PowerDesk involves entering the number of columns and rows for your layout and adjusting certain output settings, such as rotation, resolution, color palette, and refresh rate.

To begin setting up your video wall layout, select **Multi-Display Setup** from the **Home** screen.

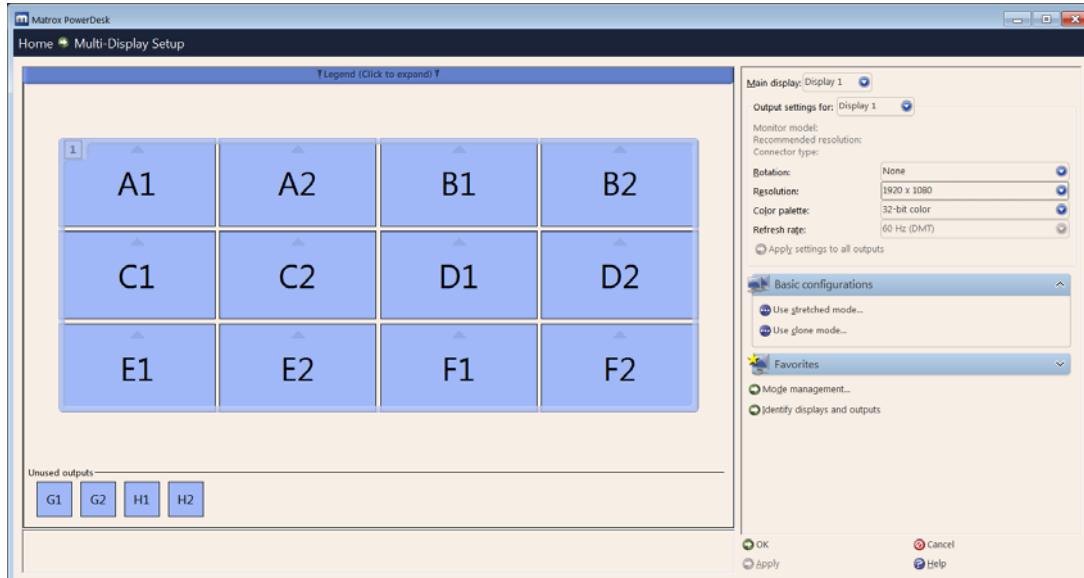


Figure 3-2 Multi-Display Setup

3.3.1 Using Stretched Mode

- Under **Basic configurations**, select **Use stretched mode...**

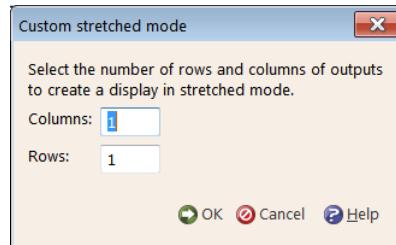


Figure 3-3 Stretched Mode Settings

- Enter the number of **Columns** and **Rows** in your video wall, then click **OK**.

Important

Refer to [Table 1-6](#) for row and column count limitations.

- Preview your setup in the work area. If you're satisfied, click **OK** or **Apply** to apply your video wall layout. Otherwise, click **Cancel**.

You may need to manually rearrange the outputs of your multi-display layout in PowerDesk to match the physical layout of your video wall(s). Or, use the suggested PowerDesk layout to configure your wall.



3.3.2 Output Settings

Use the following controls to change the video wall output settings. In most cases, PowerDesk will automatically set these to the appropriate values.

To change settings for all displays in the wall, choose **Display 1** from the **Output Settings for:** drop-down list. Or, choose a specific display output (for example, **Output A1**) from the list to change settings for that output only.

- **Rotation:** Set this to **None** (default), **90 degrees clockwise**, **180 degrees**, or **90 degrees counterclockwise**, to match the video wall display device orientation.
- **Resolution:** If necessary, set this to the native resolution of your video wall display devices.
- **Color palette:** To limit output color depth to 16-bit color (65,536 colors), set this to **16-bit color**. Or, use the default setting (**32-bit color**) which supports over four billion colors.
- **Refresh rate:** If necessary, set this to the native refresh rate of your video wall display devices.

3.4 Bezel Management and Edge Overlap

When using a multi-display stretched desktop, the image can sometimes appear misaligned and distorted due to the space between your monitors or projectors. To mitigate this, the Galileo Display Processor provides bezel management and edge overlap controls.

3.4.1 Bezel Management

With bezel management, you can adjust the image to compensate for the physical space created by the bezels of your monitors. The result is an image that appears seamlessly across your monitors. This feature is available only while using stretched mode.

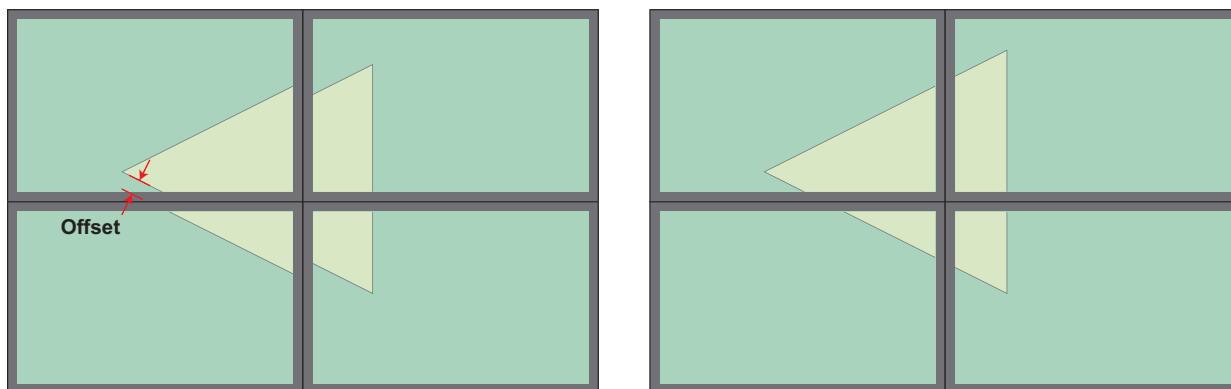


Figure 3-4 Bezel Management



3.4.2 Edge Overlap

Using Bezel Management, you can correct a distortion in the final image due to the offset caused by the bezel surrounding individual display devices. An opposite issue can occur when implementing walls using front or rear projection. This requires a feature known as Edge Overlap.

With Edge Overlap, you can adjust the number of overlapping pixels between displays to create a seamless transition between the images from adjacent projectors.



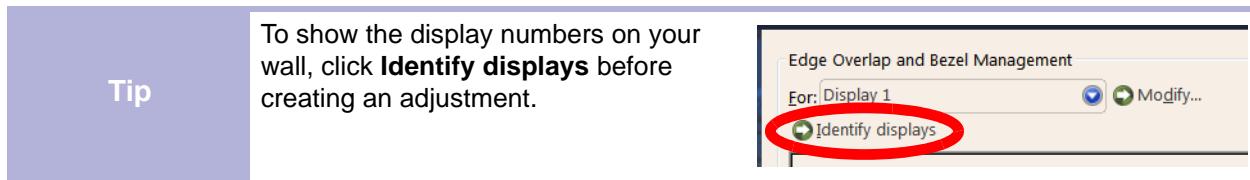
Figure 3-5 Edge Overlap



3.4.3 Bezel Management/Edge Overlap Settings

To apply bezel management or edge overlap to your video wall:

- From the home screen, select **Edge Overlap and Bezel Management**.



- Select the display to be adjusted, then click **Modify...**. A square appears in the selected display and all areas are highlighted in green.
- Select **Bezel management** to adjust the number of hidden pixels or **Edge overlap** to create an overlap between displays.



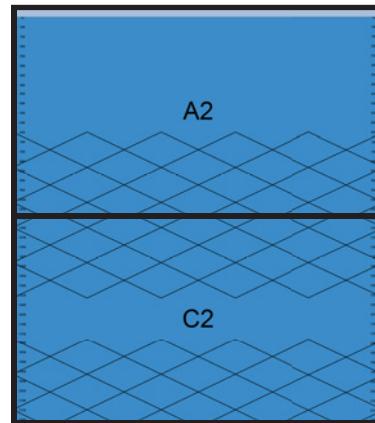
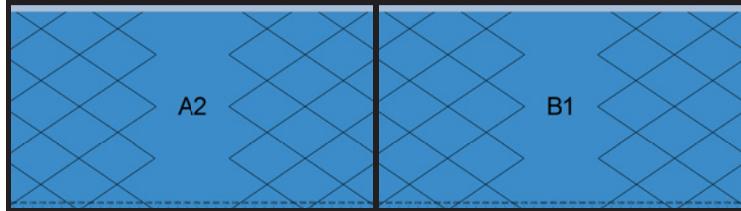
Figure 3-6 Bezel Management and Edge Overlap Controls



4. Use the adjustment options to increase the vertical and/or horizontal seams, or click to specify the number of pixels. As you do this, the lines move to form a perfectly aligned grid.

Note

For bezel management or edge overlap, the maximum adjustment is 40% of your display resolution. For example, on a 1920×1080 display, the maximum settings are 768 pixels (horizontal) and 432 pixels (vertical).



5. When you're done, click **OK**.

3.5 Restarting the Display Processor

After you have finished setting up PowerDesk, move the **Galileo Server** shortcut from the desktop back to the folder you opened in Step 2 of the “Before You Start” procedure (page 37).

Then, restart the Galileo Display Processor and log on to Windows. Galileo Server will restart automatically.

Note

For more help using PowerDesk, please refer to the help file included with the software.

CHAPTER 4

WINDOWS FIREWALL SETTINGS

4.1 Ports

Galileo uses the TCP port numbers listed in [Table 4-1](#) for communication between the client and the server, and with the Network API. The Galileo Setup program automatically creates the necessary inbound firewall rules when you install Galileo Client or Galileo Remote Host, unless you choose otherwise.

Table 4-1 TCP Ports Used by Galileo

TCP Port	Description
Galileo Server	
23	Network API
46272	HTTPS and Preview Surfaces
50000	Galileo Core Services
50001	Network Scripting API (TCP/IP Command)
50002	Virtual MousePad Image Receiver (Clients being displayed on the video wall)
50004	Virtual MousePad Keyboard / Mouse Control and Remote View
50080, 50081	HTTP Services and Notifications
Galileo Web Server	
80, 81	Galileo Web Server (for Galileo Web Client)
Galileo Client	
50005	Virtual MousePad Image Receiver
50006 and above	Concurrent Video Wall Connections. This is for connecting to multiple video walls from the same Client PC. Each new Video Wall (opened in tabs) requires its own TCP port in order to connect.
Galileo Remote Host	
50003	Virtual MousePad Keyboard / Mouse Control and Remote View

CHAPTER 5

INSTALLING GALILEO CLIENT AND GALILEO REMOTE HOST

This chapter describes the installation procedures for Galileo Client and Galileo Remote Host.

5.1 System Requirements

Galileo Client and Galileo Remote Host require the following software and hardware to operate correctly:

- Windows XP SP3, Windows 7 or Windows 8
- .NET Framework 4 Runtime Extended
- Recommended CPU: Intel Core i5 or above
- Recommended RAM: 4 GB or more

Note

Windows XP 64-bit requires the “Windows Imaging Component” for the .NET 4 Runtime to install.



5.2 Client Installation

To install the Galileo Client on the computer(s) from which you want to control the video wall:

1. Locate the Galileo Setup program, **Setup.exe**, on the *Galileo Display Processor Technical Resources* USB Stick. (Optionally, copy the Setup program to your desktop or other convenient location.)
2. Double-click on the **Setup** program file.



Figure 5-1 Galileo Setup – Welcome

3. Click **Next**.



Figure 5-2 Galileo Setup – License Agreement



4. Click **I accept the agreement**, then click **Next**.

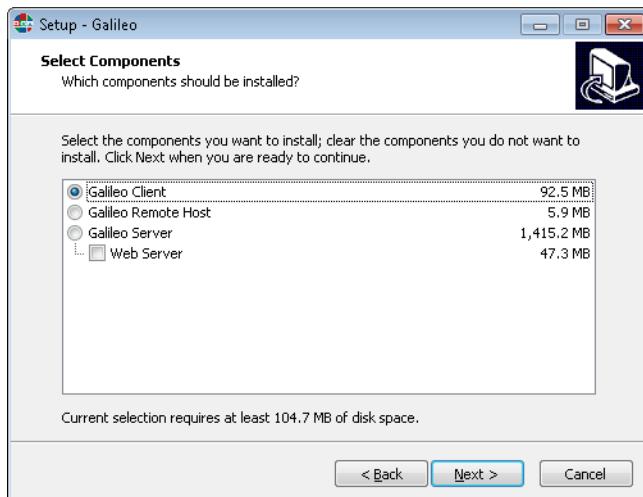


Figure 5-3 Galileo Setup – Select Client

5. Select **Galileo Client**, then click **Next**.

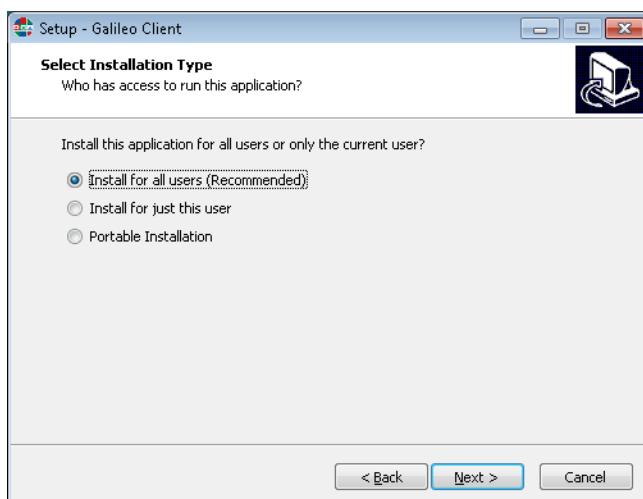


Figure 5-4 Galileo Client Setup – Install for All Users

6. Select **Install for all users (Recommended)**, then click **Next**.

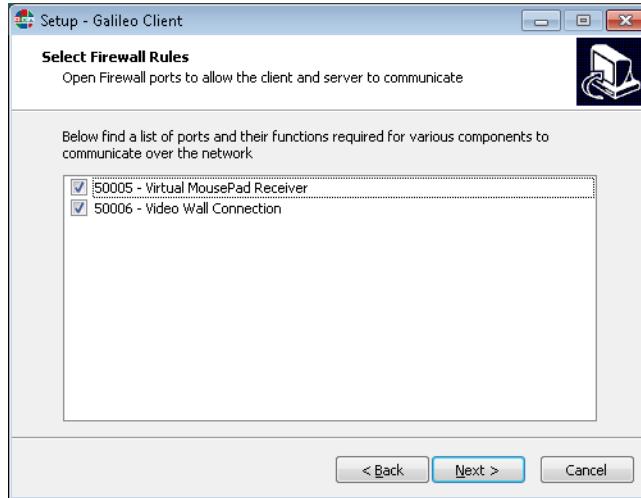


Figure 5-5 Galileo Client Setup – Create Firewall Rules

7. To have Galileo Client Setup automatically create the required, inbound Windows Firewall rules, click **Next**.

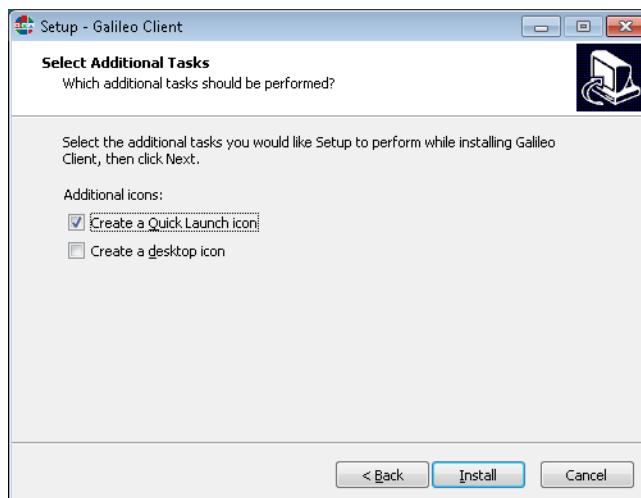


Figure 5-6 Galileo Client Setup – Create Icons

8. If you would like Setup to create desktop and/or Quick Launch icons, check the boxes so labeled. Then, click **Install**.

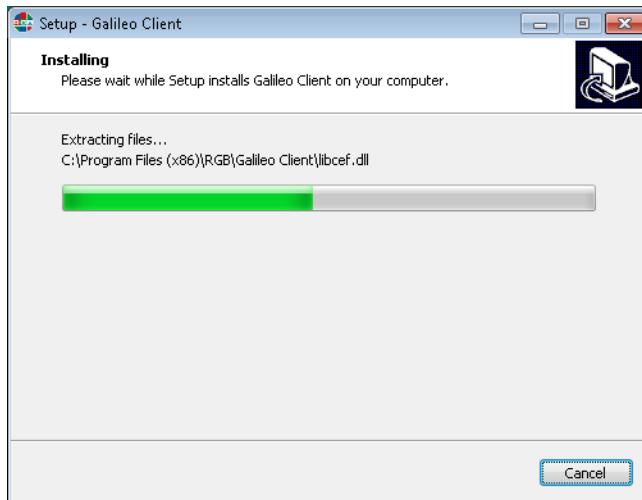


Figure 5-7 Galileo Client Setup – Installation in Progress

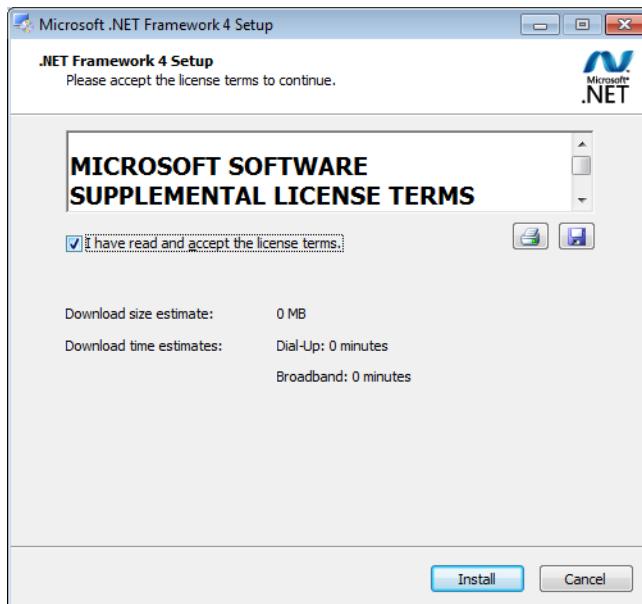


Figure 5-8 Microsoft .NET Framework 4 Setup – Accept License Terms and Install

9. If Microsoft .NET Framework 4 is already installed on the Client PC, continue with Step 11. Otherwise, check the **I have read and accept the license terms** box and click **Install**.

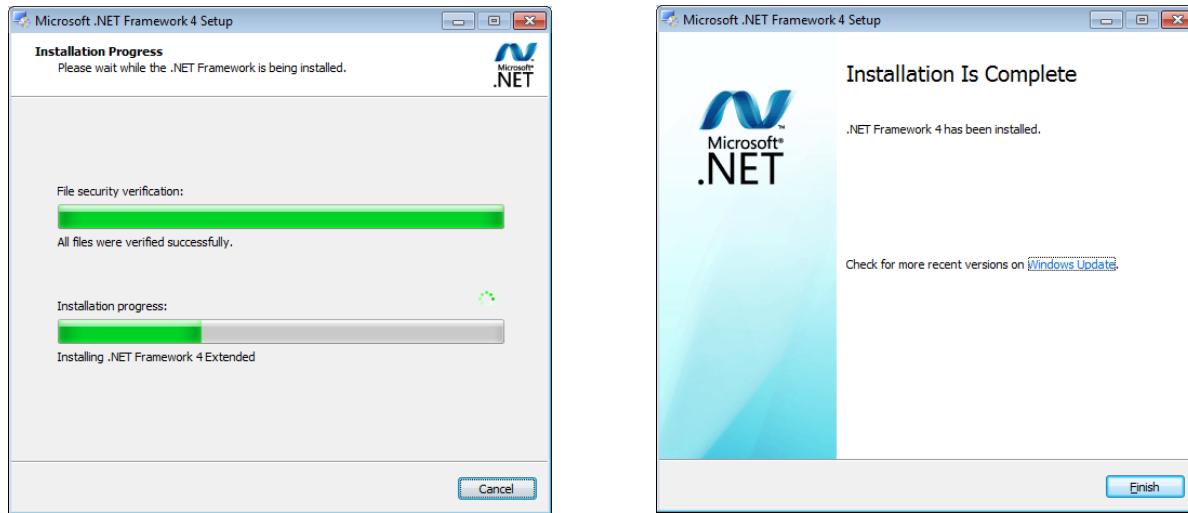


Figure 5-9 Microsoft .NET Framework 4 Setup – Installation Complete

10. Click **Finish**.

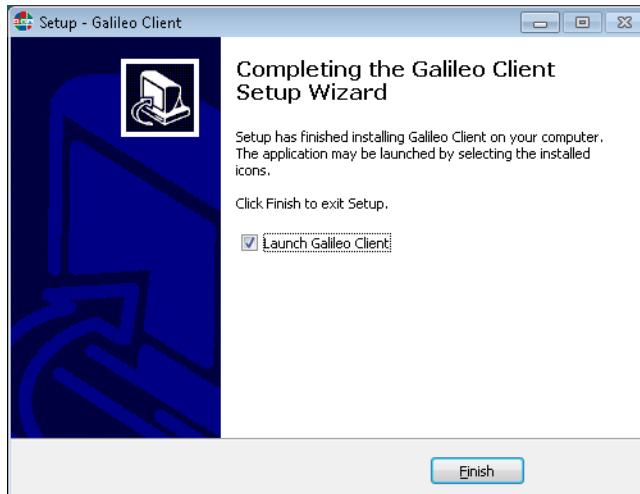


Figure 5-10 Galileo Client Setup – Installation Successful

11. Click **Finish** to again exit the Setup program.

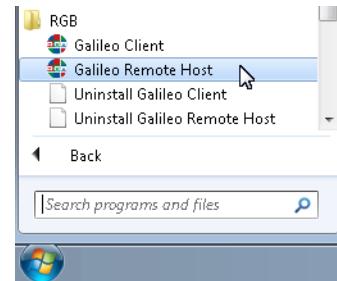
12. Repeat Steps 2 through 11 as needed, on other Client PCs.

5.3 Remote Host Installation

The Galileo Remote Host enables control and viewing of a computer by other Galileo Clients on the network, and display of its output on the Video Wall.

To install the Galileo Remote Host on a computer you want to be “seen” on the network by the server, follow the [Client Installation](#) procedure. In Step 5 ([Figure 5-3](#)), select **Galileo Remote Host** instead of **Galileo Client**.

To launch Galileo Remote Host (if it does not do so automatically), choose **Start > All Programs > RGB > Galileo Remote Host**.



To configure Galileo Remote Host, right-click on its taskbar icon () and select **Remote Control**. For instructions on how to connect and configure a Remote Host, refer to the chapter entitled “*Managing Remote Clients and Hosts*” in the *Galileo Video Wall Control Software User’s Guide*.

CHAPTER 6

MAINTENANCE AND TROUBLESHOOTING

This chapter provides routine maintenance instructions and troubleshooting guidelines for the Galileo Display Processor.

6.1 Maintenance

6.1.1 Air Filter

The Galileo Display Processor includes one or more foam air filters that can be accessed through the front panel. Clean or replace the air filter(s) on a regular basis to prevent overheating of the system. If the Galileo Display Processor is used in a dusty environment, weekly inspections of the filter(s) are recommended.

Caution

Never operate the Galileo Display Processor without the filter(s) installed.

You can visually inspect the filter without removing the front-panel grill. If you notice that dust and dirt have accumulated on the intake vents or the filter itself, follow these steps to remove and wash the filter:

1. Loosen the thumbscrews on either side of the front-panel grill.
2. Remove the grill.
3. Remove the filter.
4. Wash the filter in mild detergent. **Do not use alcohol or other solvents.**
5. Rinse the filter in clear water to remove the detergent.
6. Press the filter between paper towels to remove excess moisture.
7. Allow the filter to air-dry.
8. Re-install the filter and the front-panel grill.

If this does not correct the problem, the filter may have to be replaced. To order a replacement air filter, [contact RGB Spectrum](#).

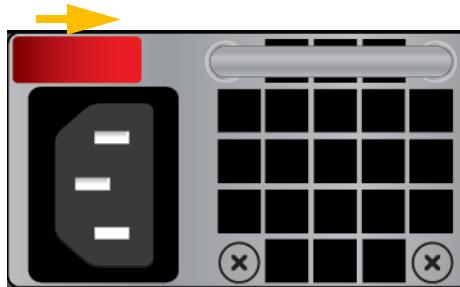
6.1.2 Replacing a Power Supply

The Galileo Display Processor has three (model GO 16) or four (model GO 40 and GO 56) redundant power supplies. You can replace a power supply while the Display Processor remains on.

REPLACING A GO 16 POWER SUPPLY

To replace a GO 16 power supply:

1. Disconnect the power cord from the supply to be replaced.
2. Slide the retaining latch to the right, as shown below. As you do so, grasp the handle firmly and pull the power supply straight out.



3. On the new power supply, slide the retaining latch to the right, as shown above. Then, while holding the latch in that position, slide the module into the power supply bay until it makes contact with the internal power supply connector.
4. Push the handle firmly to seat the power supply in the connector.
5. Release the retaining latch.
6. Pull gently on the handle to confirm that the latch is engaged.
7. Re-connect AC power to the new power supply.

REPLACING A GO 40 OR GO 56 POWER SUPPLY

To replace a GO 40 or GO 56 power supply:

1. Disconnect the power supply to be replaced from the AC power source (see [Figure 1-4](#)).
2. If an audible alarm sounds, press the **ALARM RESET** button to silence it (see [Figure 1-1](#)).
3. Remove the retaining screw below the power supply handle.



4. Grasp the handle firmly and pull the power supply straight out.
5. Slide the module into the power supply bay until it makes contact with the internal power supply connector.
6. Push the handle firmly to seat the power supply in the connector.
7. Pull gently on the handle to confirm that the power supply is properly seated.
8. Secure the power supply to the chassis with the retaining screw that you removed in Step 3.
9. Re-connect AC power to the new power supply.

6.1.3 Keeping Your Display Processor Software Up-to-Date

RGB Spectrum strongly recommends that you update your Galileo Display Processor operating system on a regular basis with the latest security patches, updates, and drivers. This will ensure that your Display Processor is up-to-date and will help keep it free from viruses and other security threats.

Note

If your Display Processor is connected to a Domain Network in which operating system updates are controlled by a Group Policy, the instructions that follow do not apply.

The easiest way to keep your operating system up-to-date is to configure the Display Processor to download and install critical updates automatically, as follows:

1. From the Display Processor desktop, Choose **Start > All Programs > Windows Update**. The Windows Update control panel item opens.
2. In the **Windows Update** window, click **Change Settings**.

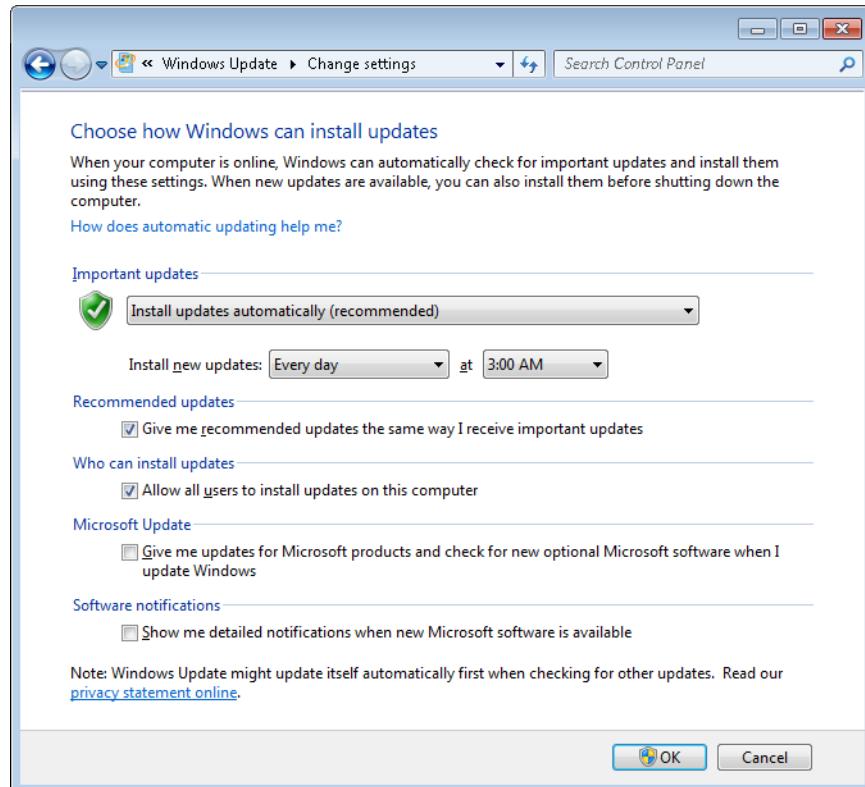


Figure 6-1 Recommended Windows Update Settings

3. Under **Choose how Windows can install updates**, from the **Important updates** drop-down menu, select **Install updates automatically**. This will ensure that future updates are downloaded and installed automatically.
4. Under **Recommended updates**, check the box next to **Give me recommended updates the same way I receive important updates**.
5. Under **Who can install updates**, check the box next to **Allow all users to install updates on this computer**.
6. Click **OK**.

6.1.4 Obtaining and Activating a Galileo License

If (and **ONLY** if) you purchase a Galileo system and subsequently add more I/O cards, Remote Hosts, or Control Clients, you will need to obtain and activate a license for Galileo Server.

There are two parts to this procedure, which are described in detail in the sections that follow:

- [Requesting a License File](#)
- [Activating a New License or Reactivating an Existing License](#)

Important

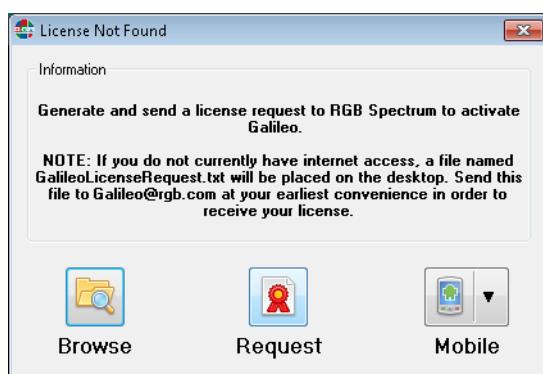
Disconnect the Display Processor from the network before performing this procedure.

REQUESTING A LICENSE FILE

Caution

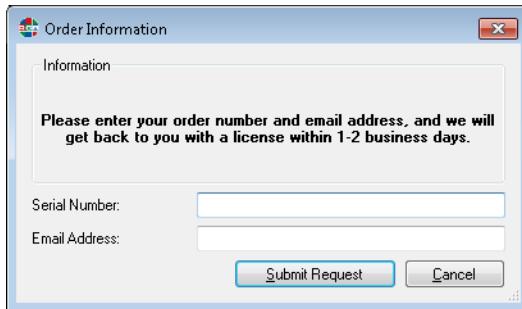
DO NOT request a Galileo license unless specifically instructed to do so by RGB Spectrum Technical Support. Doing so may make the Galileo system unusable.

1. When you launch an unlicensed copy of Galileo Server, this screen appears:



When it does, select **Request**.

2. On the Order Information screen, enter the product Serial Number and your e-mail address.



3. Click **Submit Request**. A file called **GalileoLicenseRequest.txt** is placed on the Display Processor desktop.
4. Send the **GalileoLicenseRequest.txt** file to galileo@rgb.com.

RGB Spectrum will send a License File to the e-mail address provided in Step 2.

ACTIVATING A NEW LICENSE OR REACTIVATING AN EXISTING LICENSE

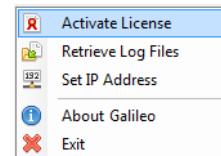
1. When you receive the new License File, copy it to the Galileo Display Processor hard drive and place it in the following directory:

C:\Program Files (x86)\RGB\Galileo Server

Tip

Retain a backup copy of your license file. This will be handy in the event you need to reactivate an existing license for some reason and cannot locate the original.

2. Launch Galileo Server, if isn't already running.
3. Right-click on the Galileo Server tray notification icon in the bottom-right corner of the screen and select **Activate License**.



4. Select **Browse** to locate and select the license file.

To reactivate an existing license, follow Steps 2 through 4 above.

Your copy of Galileo Server is now licensed and activated. You can now re-connect your Display Processor to the network.

If you need further assistance with activating your Galileo product, [contact RGB Spectrum Technical Support](#).

6.2 Troubleshooting

Table 6-1 provides some general guidelines for troubleshooting problems you may encounter with Galileo. If the suggested corrective actions fail to resolve the problem or if you encounter an issue not described here, please [contact RGB Spectrum](#) Technical Support, or your authorized RGB Spectrum dealer.

Table 6-1 Troubleshooting Guide

Symptom	Possible Cause(s)	Corrective Action
The Display Processor does not turn on.	<ul style="list-style-type: none"> ◆ The Display Processor is not plugged in or the AC outlet is not active. ◆ The main power switch is off. ◆ One or more power supplies are improperly seated. 	<ul style="list-style-type: none"> ◆ Ensure that at least one power supply is plugged in and that the AC outlet is active. ◆ Set the main power switch (see Figure 1-1 or Figure 1-2) to the on position. ◆ Confirm that the power supplies are fully inserted and properly seated.
The Display Processor turns on, but an audible alarm sounds (GO 16 only).	<ul style="list-style-type: none"> ◆ One or more power supplies is not connected to AC power. 	<ul style="list-style-type: none"> ◆ Connect all power supplies to an AC power source.
You cannot log on to Windows on the Display Processor.	<ul style="list-style-type: none"> ◆ Incorrect user name. 	<ul style="list-style-type: none"> ◆ Log on to Windows with the user name rgb.
The Display Processor is on, but there is no picture on one or more video wall tiles.	<ul style="list-style-type: none"> ◆ Display is not turned on. ◆ Display is connected incorrectly or not at all. 	<ul style="list-style-type: none"> ◆ Turn on the display. ◆ Check connections from the Display Processor output to the display. Refer to Connections to the Galileo Display Processor on page 23.
One or more sources does not display on the video wall.	<ul style="list-style-type: none"> ◆ Source device is not turned on. ◆ Source is connected incorrectly or not at all. ◆ The input incorrectly reported its resolution to the Display Processor when it was initialized. 	<ul style="list-style-type: none"> ◆ Turn on the source device. ◆ Check connections from the source device to the Display Processor input. Refer to Connections to the Galileo Display Processor on page 23. ◆ In Galileo Client, under the Inputs tab, right-click the input in question and choose Edit. Set the Cropping area (in pixels) to the intended resolution of the source. Do the same for the Zoom area. For detailed instructions, refer to the sections entitled "<i>Editing an Input</i>" and "<i>Input Zoom</i>" in the <i>Galileo Video Wall Control Software User's Guide</i>. If this does not resolve the issue, disconnect and re-connect the source, then restart the Display Processor.

**Table 6-1 Troubleshooting Guide (Continued)**

Symptom	Possible Cause(s)	Corrective Action
All video wall tiles display an empty (blue) screen.	<ul style="list-style-type: none"> ◆ An HDCP-encrypted source is occupying 12 or more displays. ◆ One or more video wall display devices is not HDCP-compliant. ◆ One or more video wall display devices is connected to a Galileo output through an HDCP repeater (A/V receiver or distribution amplifier). ◆ The Display Processor is equipped with 11 or more I/O cards. 	<ul style="list-style-type: none"> ◆ Reduce the HDCP source's window size so that it occupies 11 or fewer displays. ◆ Ensure that all video wall display devices are HDCP-compliant. ◆ Remove the HDCP repeater(s) from the signal path. Connect the display devices to Galileo outputs directly. ◆ <u>Contact RGB Spectrum Technical Support</u>.
Images on adjacent video wall tiles (monitors) are not aligned correctly (see Figure 3-4).	<ul style="list-style-type: none"> ◆ Bezel Management settings are incorrect. 	<ul style="list-style-type: none"> ◆ Adjust Bezel Management settings (refer to Bezel Management/Edge Overlap Settings on page 42).
Images on adjacent video wall tiles (projectors) are not aligned correctly (see Figure 3-5).	<ul style="list-style-type: none"> ◆ Edge Overlap settings are incorrect. 	<ul style="list-style-type: none"> ◆ Adjust Edge Overlap settings (refer to Bezel Management/Edge Overlap Settings on page 42).
Galileo Client cannot connect to a video wall.	<ul style="list-style-type: none"> ◆ The Display Processor and/or Client PC are not physically connected to an IP network. ◆ The Display Processor and Client PC are not connected to the same IP sub-network. ◆ IP address setting (network adapter selection) in Galileo Server is incorrect. 	<ul style="list-style-type: none"> ◆ Confirm that the Display Processor and the Client PC are physically connected to an IP network. ◆ Confirm that the Display Processor and Client PC are connected to the same IP sub-network. To do this, run Windows Command Prompt (cmd.exe) and type <pre>ping xxx.xxx.xxx.xxx</pre> where <code>xxx.xxx.xxx.xxx</code> is the destination IP address. Do this from both the Display Processor and the Client PC. If the ping test fails, you will see a "Request timed out" or "Destination unreachable" message. Check the network configuration settings on both the Display Processor and Client PC. ◆ On the Display Processor, right-click the Galileo Server taskbar icon (Galileo icon) and choose Set IP Address. Verify that this address is on the same IP sub-network as the Galileo Client.

Table 6-1 Troubleshooting Guide (Continued)

Symptom	Possible Cause(s)	Corrective Action
Galileo Client cannot connect to a video wall. (cont.)	<ul style="list-style-type: none"> ◆ The Client is using an incorrect Display Processor IP address. ◆ Galileo Server is not running on the Display Processor. ◆ Windows Firewall is not allowing incoming connections on one of the TCP ports used by Galileo. ◆ User Management has been implemented and the user's privileges do not allow connecting to the video wall. 	<ul style="list-style-type: none"> ◆ Verify the correct Display Processor IP address. ◆ Start Galileo Server on the Display Processor. ◆ Refer to Chapter 4, Windows Firewall Settings. ◆ Refer to the section entitled "Managing User Groups" in the <i>Galileo Video Wall Control Software User's Guide</i>.
A Remote Host PC is unavailable to Galileo Client.	<ul style="list-style-type: none"> ◆ Galileo Remote Host is not running. ◆ The Remote Host PC is not connected to the video wall. ◆ The Remote Host PC does not allow remote access or control of its desktop. 	<ul style="list-style-type: none"> ◆ On the Remote Host PC, check the taskbar. If you do not see the Galileo Remote Host icon (), choose Start > All Programs > Startup > Galileo Remote Host. ◆ On the Remote Host PC, right-click the Galileo Remote Host taskbar icon () and select Connect. ◆ On the Remote Host PC, right-click the Galileo Remote Host taskbar icon () and select Remote Control. Confirm that at least one of the Allowed Functions (Control, View, or View Mouse) is selected.
A Remote Client responds slowly (or not at all) to mouse/keyboard input from Galileo Client.	Heavy CPU usage and/or network utilization by the Remote Host.	<p>On the Remote Host PC, right-click the Galileo Remote Host taskbar icon () and select Remote Control. Then, do one or more of the following:</p> <ul style="list-style-type: none"> ◆ Set the Windows Desktop Background to a solid color (preferably black). ◆ Reduce the Allowed Region, Maximum Refresh Rate and/or Image Quality. ◆ Set the Text Readability to Low. <p>For detailed instructions, refer to the section entitled "General Recommendations to Reduce CPU and Network Bandwidth" in the <i>Galileo Video Wall Control Software User's Guide</i>.</p> <p>You can also improve Remote Host performance by using Windows Task Manager to end any non-essential, CPU-intensive tasks and/or processes.</p>
A Galileo Client feature is unavailable to one or more users.	<ul style="list-style-type: none"> ◆ User Management has been implemented and the user's or group's privileges do not allow access to that feature. 	<ul style="list-style-type: none"> ◆ Change the user's or group's privileges to allow access. Refer to the section entitled "Managing User Groups" in the <i>Galileo Video Wall Control Software User's Guide</i>.



CHAPTER 7

LICENSE AGREEMENT

RGB SPECTRUM SOFTWARE END USER LICENSE AGREEMENT

1. Grant of License.

RGB Spectrum hereby grants to You a limited, perpetual, non-exclusive, non-transferable license to Use the Software on the terms and conditions set forth in this End User License Agreement ("Agreement").

2. Introduction.

(a) RGB Spectrum ("RGB") is willing to grant to You a license of the scope described herein to Use the Software (comprised of the Program and the Documentation) only upon the conditions that You or someone acting on Your behalf and at Your direction, such as Your Distributor has:

- (1) placed an order with RGB for either an initial license or an upgrade (such as for more users, additional modules, etc.), or a service plan for future maintenance releases ("Maintenance Software") and/or for customer support, and RGB Spectrum has accepted such order and Enabled Use of the Software; and
- (2) accepted all of the terms and conditions of this Agreement either before or during installation of the Program.

(b) YOU WILL INDICATE YOUR ACCEPTANCE OF THIS AGREEMENT AND ALL OF ITS TERMS AND CONDITIONS BY DOING ONE OR MORE OF THE FOLLOWING OR ALLOWING OR AUTHORIZING A THIRD PARTY TO DO IT FOR YOU:

- (1) ACTIVATING THE GALILEO CONTROL SOFTWARE LICENSE BY ENTERING THE ACTIVATION KEY ON THE GALILEO PROCESSOR.

- (2) USING THE PROGRAM (THE SERVER OR THE CLIENT PORTION).

(c) IF YOU DO NOT AGREE TO BE LEGALLY BOUND BY THIS AGREEMENT (IN ITS ENTIRETY AND WITHOUT CHANGE TO OR ADDITION TO ITS TERMS AND CONDITIONS), THEN YOU DO NOT HAVE A LICENSE TO USE THE SOFTWARE.



3. Definitions.

As used herein, the following terms have the following meanings:

- (a) **"Affiliate"** means any entity that controls You, that You control or that is under common control with You where "control" means the ownership, directly or indirectly, of equity securities or other ownership interests which represent more than 50% of the voting power of such affiliate.
- (b) **"Distributor"** means the reseller that You have chosen to be Your reseller of record.
- (c) **"Documentation"** means the Program specifications that are set forth in the users manual of the Program and any release-related notes, guides or manuals RGB Spectrum publishes specific to the current version of the Program.
- (d) **"Enabled Use"** means RGB Spectrum's having fulfilled the applicable software delivery process (whether by shipping tangible goods including pre-installed Software, enabling downloading of the Software, delivering activation codes for the Software, or otherwise), thereby enabling Use of the Software.
- (e) **"Program"** means the computer program, it includes the Server and the Client portions.
- (f) **"Server Program"** means the server portion of the program.
- (g) **"Client Program"** means the client portion of the program.
- (h) **"RGB Spectrum"** means the company that publishes the Software.
- (i) **"Software"** means collectively, the Program and the Documentation, and any part thereof.
- (j) **"Supplemental License Terms"** means the additional terms and restrictions that are specific to the Program licensed by You under this Agreement.
- (k) **"Use"** means to install and execute the Program, provided that:
 - (1) You install the Program only on a computer system that You own or only on a computer system not owned by You if You will be the only party with access to the installed Program; and
 - (2) You execute the Program
 - (i) for its intended purpose solely in connection with the management of the business that You and Your Affiliates conduct, and
 - (ii) solely to the extent of any and all applicable limitations (whether as to specific modules or other parts of the Program, or number of production or backup server computers) set forth in this Agreement and the Supplemental License Terms;
- (l) **"You"** or **"Your"** means or refers to the company or person that RGB Spectrum has registered as the licensee for the Software.

4. Limits of License.

The license process activates the Server Program on a determined computer and allows an agreed number of Client Programs to run simultaneously on different computers and communicate with the Server Program.

The license contained in this Agreement does not include the right to perform, and You agree to refrain from performing, any of the following:

- (a) Distributing any copy of the Software (whether by renting, leasing, lending, sublicensing, time-sharing, or otherwise), except that, if RGB Spectrum consents in writing, which consent will not be unreasonably denied, You may transfer the Software to a purchasing party after the close of a sale of either Your entire business, or all, or substantially all, of the assets of Your business, provided that the purchasing party reads and accepts (in writing to RGB Spectrum) the terms and conditions of this Agreement, the purchasing party agrees to other reasonable transfer requirements, and You do not retain a copy of the Software.
- (b) Using the Software for personal, family, household, or other non-business purposes;



- (c) Altering, modifying, translating, decompiling, disassembling or reverse-engineering the Software or creating any derivative work based upon the Software;
- (d) Removing or obscuring any copyright or trademark notices from the Software.
- (e) Using the Software in excess of
 - (i) the limitations set forth in this Agreement and Supplemental License Terms
 - (ii) the number and types of users, seats or licenses You purchase or rightfully acquire.

5. Additional Restrictions.

- (a) Any report-writing software contained within the Program may be subject to a restriction such that its use may be limited to accessing only the data that is created by, or used by, the Program;
- (b) You may not Use, export, re-export or otherwise transfer the Software in violation of any domestic or foreign laws or regulations in effect from time to time in the jurisdiction in which You are a resident or in which the Software is Used. You represent and warrant that You are not located in, under the control of, a national or resident of, any restricted country or of any entity or person designated as restricted.

6. Limited Warranty and Disclaimers.

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CHAPTER 8

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