



QuadPlex™

HD Multi-Display Processor

User Guide

April, 2020

RGB Spectrum
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DOCUMENT

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This document describes the features and functions of the following products and software versions:

- *QuadPlex* firmware: V1.01.00
- RGB Spectrum *QuadPlex* for Windows (Application): V1.1.9

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- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Install and use this apparatus in accordance with the manufacturer's instructions.



-
- Do not expose this apparatus to rain or moisture. Do not place liquid-filled objects, such as vases, on the apparatus.
 - Do not block any of the ventilation openings.
 - Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
 - Do not place any sources of open flames, such as candles, on the apparatus.
 - Clean only with a dry cloth.
 - Do not defeat the safety purpose of the polarized or grounding type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. When the provided plug does not fit into your outlet, consult an electrician for the replacement of the obsolete outlet.
 - Unplug this apparatus during lightning storms or when unused for long periods of time.
 - Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the point where they exit from the apparatus.
 - Only use the attachments/accessories specified by the manufacturer.
 - Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
 - Keep the packing material in case the equipment should ever need to be shipped.



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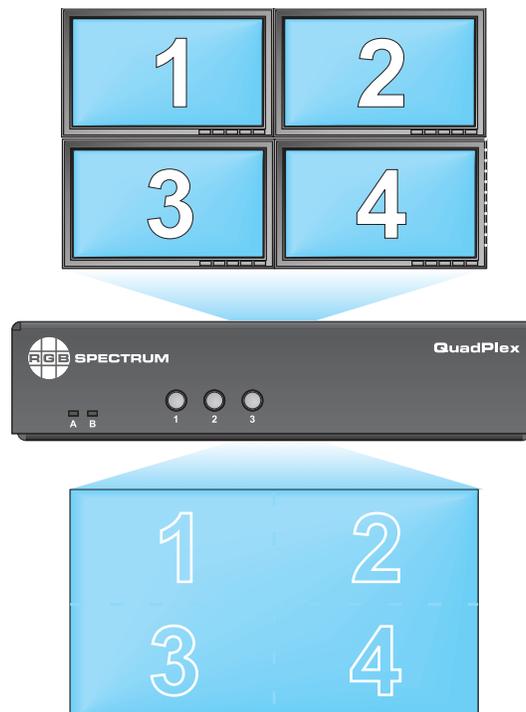
CHAPTER 1

INTRODUCTION

The RGB Spectrum *QuadPlex* is a high-performance multi-display processor that drives a single DisplayPort or HDMI video source on up to four HDMI displays. *QuadPlex* is available as either:

- A standalone unit (QPX DIN or QPX HIN).
- A PCIe card (QPX HIN-C or QPX DIN-C) installed in an RGB Spectrum Galileo or Zio W4000 video wall processor.

Three buttons on the front of standalone *QuadPlex* units allow you to select the video source and output layout configuration, and view device information. Connecting a *QuadPlex* unit or PCIe card to a network and installing the *QuadPlex* application on a remote computer provides additional layout configuration options using an intuitive interface.





1.1 Features and Benefits

QuadPlex provides these key features and functions:

1.1.1 System Features

- Drives up to four (4) displays simultaneously from a single source up to 4Kp60 resolution.
- Available with either a single DisplayPort 1.2 or a single HDMI 2.0 input port.
- Supports 7.1-channel audio.
- The **Layout** button on standalone *QuadPlex* units allows you to select a variety of predefined display configurations.
- The *QuadPlex* application allows you to configure custom layouts as well as crop, upsample, or downsample content as needed. You may also rotate each output independently to support artistic wall configurations, and control and fine-tune display bezel corrections for seamless output.
- Supports multiple HDMI output resolutions up to 1900 × 1200 @60Hz.

1.1.2 Inputs

- **Standalone Units:** Either 1 x DisplayPort 1.2 (QPX DIN) or 1 x HDMI 2.0 (QPX HIN).
- **PCIe Cards:** Either 1 x Mini DisplayPort 1.2 (QPX DIN-C) or 1 x Mini HDMI 2.0 (QPX HIN-C).
- HDMI or DisplayPort input supports input resolutions up to either 4Kp60 or 8K in one dimension.
- Supports High-definition Digital Content Protection (HDCP) to allow the display of protected content.

1.1.3 Outputs

- Up to either 4 x HDMI (standalone units) or 4 x Mini HDMI (PCIe cards).
- Supports multiple independent HDMI output resolutions up to 1900 × 1200 @60Hz.
- Supports High-definition Digital Content Protection (HDCP) to allow the display of protected content.

1.1.4 Control

- Easy-to-use controls located on the front panel (standalone *QuadPlex* units only).
- A simple and intuitive *QuadPlex* remote configuration application.



1.2 System Control

The Ethernet port provides system control for *QuadPlex* by connecting to either:

- A network.
- Directly to a PC.

This connection allows you control the system using the *QuadPlex* application installed on a remote PC.

1.3 Controls, Indicators, and Connectors (Standalone)

This section describes the front and rear panel controls and indicators on a standalone *QuadPlex* unit.

1.3.1 Front Panel Controls and Indicators

[Figure 1-1](#) shows the front panel controls and indicators on a standalone *QuadPlex* unit, and [Table 1-1](#) describes them.

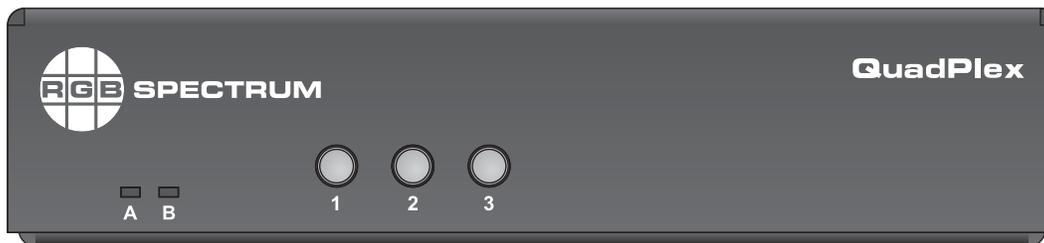


Figure 1-1 Front Panel Controls and Indicators

Table 1-1 *QuadPlex* Front Panel Controls and Indicators - Standalone

ID	Name	Description
A	LED A	Along with LED B , displays unit status, as follows: <ul style="list-style-type: none">◆ Not lit: Unit is powered off.◆ Green (solid): Unit is active.◆ Green (slow blink): Unit is rebooting.◆ Green (fast blink): Device is selected.◆ Amber (solid): Firmware update in progress.◆ Amber (slow blink): No network detected.◆ Red (solid, along with LED B): Error.



Table 1-1 QuadPlex Front Panel Controls and Indicators - Standalone (Continued)

ID	Name	Description
B	LED B	Along with LED A , displays unit status as follows: <ul style="list-style-type: none">◆ Not lit: Either the unit is off or has been selected.◆ Green (solid): Unit is active with no errors◆ Green (slow blink): Input or output signal does not match configuration.◆ Amber (solid): No input signal detected.◆ Amber (slow blink): Firmware update in progress.◆ Red (solid, along with LED A): Error.◆ Red (solid, only when a button is pressed): Buttons have been disabled.
If LED A and LED B both illuminate red, this indicates a fatal unit error. Try powering the <i>QuadPlex</i> unit off and on. If the LEDs are still red, then contact RGB Spectrum for support. See “Technical Support” on page 51 .		
1	Source Selection	Selects the input source. The available options are: <ul style="list-style-type: none">◆ Video input◆ Logo◆ Nature background◆ Bezel adjustment grid◆ Red◆ Green◆ Blue◆ Gray gradient
2	Layout Configuration	Selects the layout. The currently-selected layout is highlighted in the list. The available layouts depend on the currently-installed firmware version and can be modified using the <i>QuadPlex</i> remote application.



Table 1-1 QuadPlex Front Panel Controls and Indicators - Standalone (Continued)

ID	Name	Description
3	Device Information	<p>Shows the device information such as:</p> <ul style="list-style-type: none"> ◆ Output ID (1, 2, 3, or 4). ◆ Model number. ◆ IP address. ◆ MAC address. ◆ If IP addressing is dynamic (DHCP) or static. ◆ Active layout. ◆ Input mode. ◆ Output mode. ◆ If bezel management is enabled. ◆ If HDCP is enabled. ◆ If there is an input mismatch between the configuration and the actual signal. ◆ If there is an output mismatch between the configuration and the actual display mode. ◆ Serial number. ◆ Firmware version. ◆ FPGA version. ◆ Whether or not the buttons are locked.

1.3.2 Rear Panel Controls and Indicators

[Figure 1-2](#) shows the rear panel connectors on a standalone *QuadPlex* unit, and [Table 1-2](#) describes them.

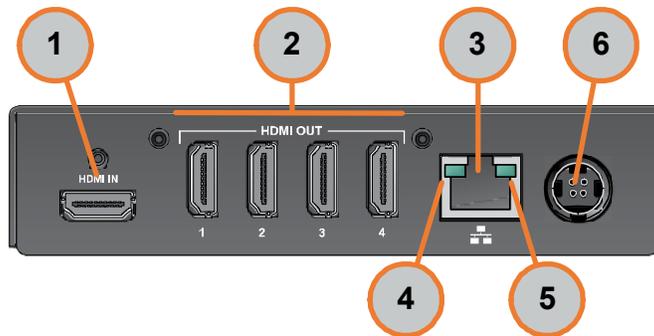


Figure 1-2 Rear Panel Connectors

Table 1-2 QuadPlex Rear Panel Controls and Indicators - Standalone

ID	Name	Description
1	Video input	This will be either: <ul style="list-style-type: none"> ◆ HDMI 2.0 (QPX HIN) ◆ DisplayPort 1.2 (QPX DIN)
2	HDMI outputs	Connect up to four HD monitors to these outputs.
3	LAN	Connect this port to a network to use IP control.
4	Network activity LED (green)	Indicates network activity as follows: <ul style="list-style-type: none"> ◆ Not lit: No network activity detected. ◆ Green (fast blink): Network activity detected.
5	Network speed LED (amber)	Indicates network speed as follows: <ul style="list-style-type: none"> ◆ Not lit: Speed below 1 Gbps ◆ Green (solid): Transmitting at 1 Gbps
6	Power connector	Connect the 12VDC 3.5A power supply to this port.

1.4 Connectors (PCIe Card)

This section describes the connectors a *QuadPlex* PCIe card.

1.4.1 Connectors and Indicators

[Figure 1-3](#) shows the connectors and indicators on a *QuadPlex* PCIe card, and [Table 1-3](#) describes them.

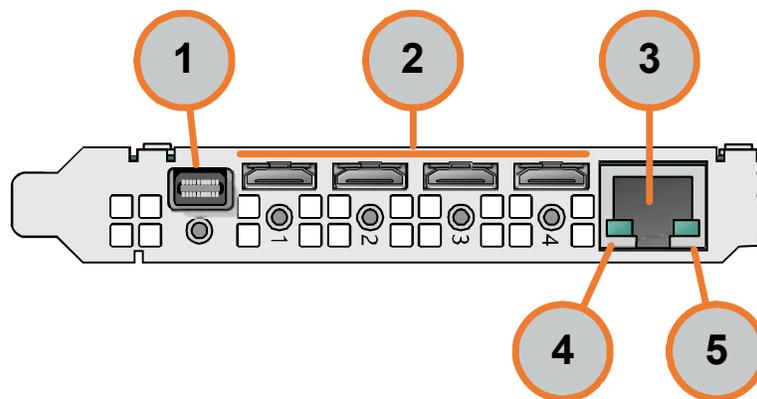


Figure 1-3 Connectors and Indicators - PCIe Card



Table 1-3 QuadPlex Connectors and Indicators - PCIe

ID	Name	Description
1	Video input	This will be either: <ul style="list-style-type: none"> ◆ Mini HDMI 2.0 (QPX HIN-C) ◆ Mini DisplayPort 1.2 (QPX DIN-C)
2	Mini HDMI outputs	Connect up to four HD monitors to these outputs.
3	LAN	Connect this port to a network to use IP control.
4	Network activity LED (green)	Indicates network activity as follows: <ul style="list-style-type: none"> ◆ Not lit: No network activity detected. ◆ Green (fast blink): Network activity detected.
5	Network speed LED (amber)	Indicates network speed as follows: <ul style="list-style-type: none"> ◆ Not lit: Speed below 1 Gbps ◆ Green (solid): Transmitting at 1 Gbps

1.5 Specifications

This section provides the following specifications for *QuadPlex* standalone units and PCIe cards.

1.5.1 Standalone

[Table 1-4](#) lists the specifications for a *QuadPlex* standalone unit.

Table 1-4 QuadPlex Specifications - Standalone

Parameter	Description
Inputs	
Video Inputs	Either: <ul style="list-style-type: none"> ◆ 1 x HDMI 2.0 (QPX HIN) ◆ 1 x DisplayPort 1.2 (QPX DIN)
Color Sampling and Conversion	<ul style="list-style-type: none"> ◆ RGB: 8;8;8 (24-bit) ◆ YUV: 4:4:4, 4:2:2 (8-bit)
Supported Resolutions	<ul style="list-style-type: none"> ◆ 1920 × 4320 @ 60 Hz ◆ 1920 × 4320 @ 30 Hz ◆ 3840 × 2160 @ 30 Hz ◆ 3840 × 2160 @ 60 Hz ◆ 7680 × 1080 @ 30 Hz ◆ 7680 × 1080 @ 60 Hz ◆ Other resolutions, on request
HDCP Compliant?	Yes
Audio	Embedded audio from HDMI or DisplayPort source
Outputs	
Video Outputs	4 x HDMI Type A with 16-bit stereo L-PCM audio



Table 1-4 QuadPlex Specifications - Standalone (Continued)

Parameter	Description
Supported Resolutions	<ul style="list-style-type: none"> ◆ 1920 × 1080 @ 30Hz ◆ 1920 × 1080 @ 60Hz ◆ 1920 × 1200 @ 30Hz ◆ 1920 × 1200 @ 60Hz ◆ Other resolutions, on request
Audio	<ul style="list-style-type: none"> ◆ 1 x HDMI (embedded) or 1 x DisplayPort (embedded) ◆ PCM 7.1 or PCM stereo output format
HDCP Compliant?	Yes
Control	
Command Protocols	UPnP, HTTPS
Network	100/1000 Base-T RJ45 Ethernet port for control via the <i>QuadPlex</i> application
Buttons	<ul style="list-style-type: none"> ◆ Source Selection ◆ Layout Configuration ◆ Device Information
Power	
Power Supply	<ul style="list-style-type: none"> ◆ Input: Universal 100-240 VAC, 50-60 Hz ◆ Output: +12 VDC, 42 W, 3.5 A ◆ Output Connector: DIN 4 male (4-pin) with lock
Power Requirements	+12 VDC, 3.5 A
Power Connector	DIN 4 female (4-pin)
Power Consumption	15 Watts (maximum)
Environmental	
Temperature	<ul style="list-style-type: none"> ◆ Operating (nominal): 32 °F to 113 °F (0 °C to 45 °C) ◆ Non-Operating: -40 °F to 158 °F (-40 °C to 70 °C)
Relative Humidity	<ul style="list-style-type: none"> ◆ Operating: 20% to 80% non-condensing ◆ Non-Operating: 5% to 95% non-condensing
Altitude (Operating)	<ul style="list-style-type: none"> ◆ Maximum: 9,842 feet (3 km) ◆ Minimum: 0 feet (0 m)
Altitude (Non-Operating)	<ul style="list-style-type: none"> ◆ Maximum: 39,370 feet (12 km) ◆ Minimum: -164 feet (-50 m)
Physical	
Type	Standalone appliance
Form Factor	1RU, third width
Memory	1 GB



Table 1-4 QuadPlex Specifications - Standalone (Continued)

Parameter	Description
Dimensions	5.50" x 1.25" x 7.13" (13.97 cm x 3.18 cm x 18.11 cm)
Regulatory Compliance	Class A: RCM, CE, FCC, KC
Specifications are subject to change without notice.	

1.5.2 PCIe Card

[Table 1-4](#) lists the specifications for a *QuadPlex* PCIe card.

Table 1-5 QuadPlex Specifications - PCIe Card

Parameter	Description
Inputs	
Video Inputs	Either: <ul style="list-style-type: none"> ◆ 1 x Mini HDMI 2.0 (QPX HIN-C) ◆ 1 x Mini DisplayPort 1.2 (QPX DIN-C)
Color Sampling and Conversion	<ul style="list-style-type: none"> ◆ RGB: 8;8;8 (24-bit) ◆ YUV: 4:4:4, 4:2:2 (8-bit)
Supported Resolutions	<ul style="list-style-type: none"> ◆ 1920 × 4320 @ 60 Hz ◆ 1920 × 4320 @ 30 Hz ◆ 3840 × 2160 @ 30 Hz ◆ 3840 × 2160 @ 60 Hz ◆ 7680 × 1080 @ 30 Hz ◆ 7680 × 1080 @ 60 Hz ◆ Other resolutions, on request
HDCP Compliant?	Yes
Audio	Embedded audio from HDMI or DisplayPort source
Outputs	
Video	4 x Mini HDMI Type C with 16-bit stereo L-PCM audio
Supported Resolutions	<ul style="list-style-type: none"> ◆ 1920 × 1080 @ 30Hz ◆ 1920 × 1080 @ 60Hz ◆ 1920 × 1200 @ 30Hz ◆ 1920 × 1200 @ 60Hz ◆ Other resolutions, on request
Audio	<ul style="list-style-type: none"> ◆ 1 x HDMI (embedded) or 1 x DisplayPort (embedded) ◆ PCM 7.1 or PCM stereo output format
HDCP Compliant?	Yes
Control	
Command Protocols	UPnP, HTTPS
Network	100/1000 Base-T RJ45 Ethernet port for control via the <i>QuadPlex</i> application



Table 1-5 QuadPlex Specifications - PCIe Card (Continued)

Parameter	Description
Power	
Power Consumption	15 Watts (maximum)
Environmental	
Temperature	◆ Operating (nominal): 32 °F to 113 °F (0 °C to 45 °C) ◆ Non-Operating: -40 °F to 158 °F (-40 °C to 70 °C)
Relative Humidity	◆ Operating: 20% to 80% non-condensing ◆ Non-Operating: 5% to 95% non-condensing
Altitude (Operating)	◆ Maximum: 9,842 feet (3 km) ◆ Minimum: 0 feet (0 m)
Altitude (Non-Operating)	◆ Maximum: 39,370 feet (12 km) ◆ Minimum: -164 feet (-50 m)
Physical	
Type	PCIe card (x1 electrical, x16 mechanical-power only)
Form Factor	Full Height
Memory	1 GB
Dimensions	0.85" x 5.00" x 6.21" (2.16 cm x 12.70 cm x 15.77 cm)
Regulatory Compliance	Class A: RCM, CE, FCC, KC
Specifications are subject to change without notice.	



CHAPTER 2

INSTALLATION

This chapter describes the *QuadPlex* installation process in the following sections:

- [“Mounting a QuadPlex Standalone Unit” on page 11.](#)
- [“Connections \(Standalone Unit\)” on page 14.](#)
- [“Connections \(PCIe Card\)” on page 17.](#)
- [“Powering On” on page 19.](#)

2.1 Mounting a *QuadPlex* Standalone Unit

This section describes how to mount one or more standalone *QuadPlex* units in a variety of ways.

2.1.1 Rack Mount

The optional rack mounting shelf (p/n QPX RAK) allows you to mount up to three (3) horizontal *QuadPlex* units in a 1RU space or 10 vertical *QuadPlex* units in a 3RU space. See [Figure 2-1](#).

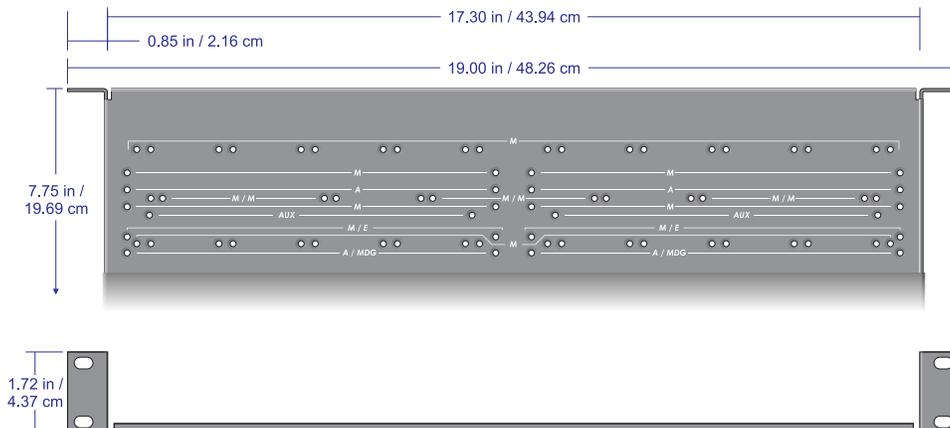


Figure 2-1 Rack Mounting Shelf



Important

When rack-mounting one or more *QuadPlex* units:

- ◆ Never stack anything directly over the unit(s).
- ◆ Make sure that all cables are properly secured and that no tension is applied to them.
- ◆ Make sure that the ambient air temperature does not exceed the maximum listed in [Table 1-4](#).

HORIZONTAL

To horizontally mount up to three (3) *QuadPlex* units on the rack mounting shelf:

1. Fasten the shelf to the rack in accordance with the instructions for your rack. The shelf includes screws that are compatible with most rack mounts. If needed (such as for clearance), you may mount the *QuadPlex* unit(s) first, and then mount the shelf and units to the rack.
2. Remove the four (4) rubber pads at the bottom of each *QuadPlex* unit that you are going to mount.
3. On the rack mounting shelf, locate the three sets of mounting holes labeled **M/M**. These holes are 2" (5.08 cm) from the front edge of the mounting shelf.
4. Place the first *QuadPlex* unit on the rack mounting shelf, being sure to line the mounting holes on the bottom of the casing with one of the sets of holes labeled **M/M**.
5. Secure the *QuadPlex* unit to the rack mounting shelf using two (2) M3 x 6 flat-head screws (included in the rack mounting kit) and a hand screwdriver. Do not over-tighten the screws.
6. Repeat Steps 3-5 for up to two (2) more *QuadPlex* units.
7. Connect the input, output, network, and power cables to the mounted unit(s), as described in [“Connections \(Standalone Unit\)” on page 14](#).

VERTICAL

To vertically mount up to 10 *QuadPlex* units on the rack mounting shelf:

1. Fasten the shelf to the rack in accordance with the instructions for your rack. The shelf includes screws that are compatible with most rack mounts. If needed (such as for clearance), you may mount the *QuadPlex* unit(s) first, and then mount the shelf and units to the rack.
2. On the rack mounting shelf, locate the 10 sets of mounting holes labeled **M**. These holes are 1.25" (3.18 cm) from the front edge of the mounting shelf.
3. Place the first *QuadPlex* unit on the rack mounting shelf, being sure to line the mounting holes on the side of the casing with one of the sets of holes labeled **M**.
4. Secure the *QuadPlex* unit to the rack mounting shelf using two (2) M3 x 6 flat-head screws (included in the rack mounting kit) and a hand screwdriver. Do not over-tighten the screws.
5. Repeat Steps 3-5 for up to nine (9) more *QuadPlex* units.



6. Connect the input, output, network, and power cables to the mounted unit(s), as described in [“Connections \(Standalone Unit\)” on page 14.](#)

2.1.2 VESA Mount

You can mount *QuadPlex* units on standard 75 mm, 100 mm, or 200 mm VESA mounts, or on the back of devices with VESA-compliant mounting holes. The optional angle bracket kit (p/n 920 12325) includes two (2) brackets and mounting screws.

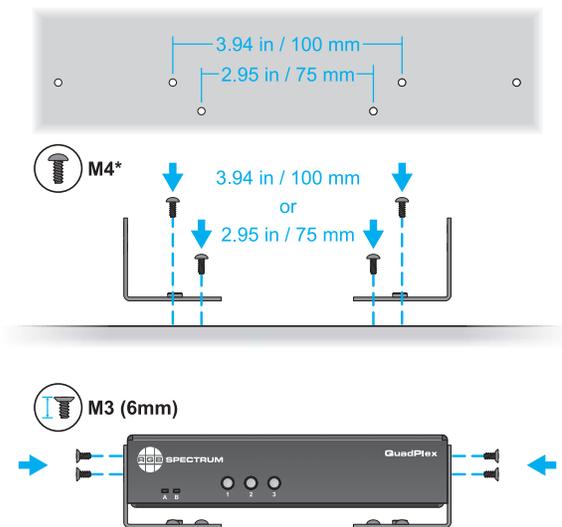
Note Each VESA mount can only accommodate a single device. If you use a VESA mount for a *QuadPlex* unit, that mount cannot be used to attach a second device.

75-100 MM

To mount a *QuadPlex* unit on a 75 or 100 mm mounting space:

1. Attach the brackets to the VESA mount using two (2) M4 screws (sold separately) inserted through a slot in each bracket, as shown in [Figure 2-2](#). Do not over-tighten.
2. Use four (4) M3 x 6 flat-head screws (included in your kit) to attach the *QuadPlex* unit to the brackets. Do not over-tighten.

Figure 2-2 75 or 100 mm VESA Mount

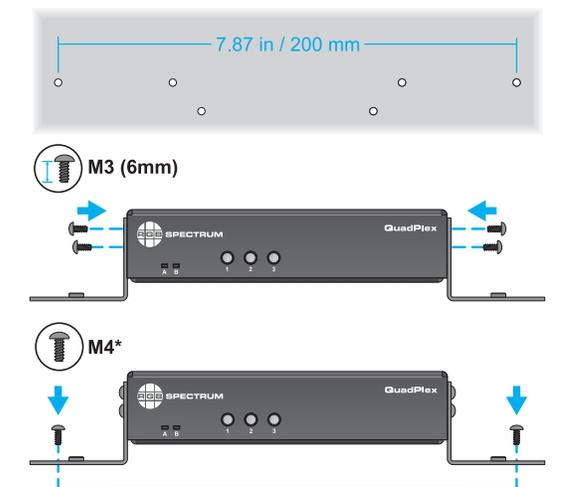


200 MM

To mount a *QuadPlex* unit on a 200 mm mounting space:

1. Use four (4) M3 x 6 flat-head screws (included in your kit) to attach the *QuadPlex* unit to the brackets with the angles facing away from each other, as shown in [Figure 2-3](#). Do not over-tighten.
2. Attach the brackets to the VESA mount using two (2) M4 screws (sold separately) inserted through a slot in each bracket. Do not over-tighten.

Figure 2-3 200 mm VESA Mount





2.2 Connections (Standalone Unit)

Note

See [“Connections \(PCIe Card\)” on page 17](#) for instructions on connecting a *QuadPlex* PCIe card.

Note

If needed, you may use Mini DisplayPort to DisplayPort adapters (p/n 520 12178; sold separately) and/or Mini HDMI to HDMI adapters (p/n 520 12233; sold separately).

This section describes how to connect a standalone *QuadPlex* unit to:

- A video source.
- Up to four displays.
- Your network.
- Power supply.

Important

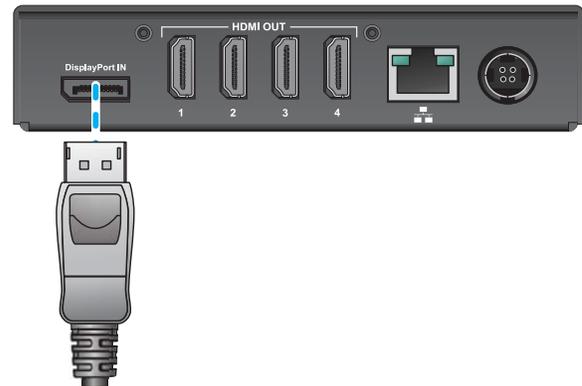
Use only DisplayPort 1.2 and/or HDMI 2.0-compatible “Premium Certified”, high-bandwidth cables to connect the video source and displays.

2.2.1 Connecting the Source

Connect one of the following video sources to your *QuadPlex* unit, as appropriate:

- **QuadPlex QPX DIN:** Connect a single 8K UHD, 4K UHD, or 2K/HD DisplayPort source to the **DisplayPort IN** port.

Figure 2-4 DisplayPort Input - Standalone

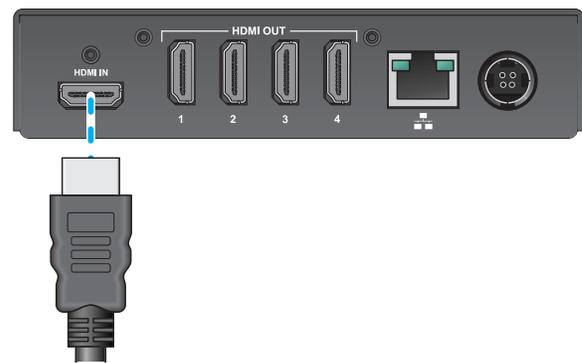


Important

Always press the latch on the top of the DisplayPort connector when removing the connector.

- **QuadPlex QPX HIN:** Connect a single 8K UHD, 4K UHD, or 2K/HD HDMI source to the **HDMI IN** port. For DVI sources, you use a DVI-to-HDMI cable or adapter.

Figure 2-5 HDMI - Standalone





2.2.2 Connecting Displays

To connect displays to the *QuadPlex* unit, connect up to four (4) 2K/HD displays to the **HDMI OUT** ports.

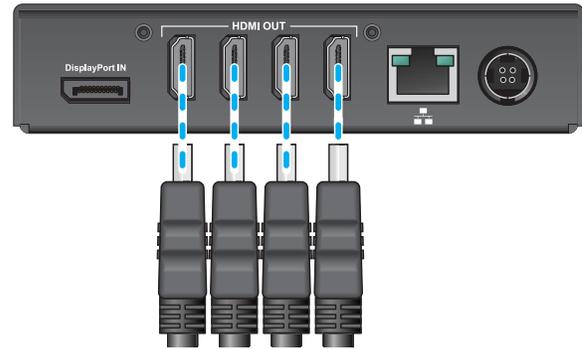


Figure 2-6 HDMI Outputs - Standalone

Note

The overmold (or boot) of each HDMI connector must be no more than the 0.823" (20.9 mm) width and 0.452" (11.5 mm) thickness stated in the HDMI specifications.

2.2.3 (Optional) Securing the Cables - Standalone

If desired, you may secure the input and output cables to the standalone *QuadPlex* unit using the following brackets, sold separately:

- **Single HDMI bracket:** Part number QPX BRK-1H, if you are using a QPX HIN unit. This bracket is not used with the QPX DIN.
- **Quadruple HDMI bracket:** Part number QPX BRK-4H. Secures the HDMI output cables.

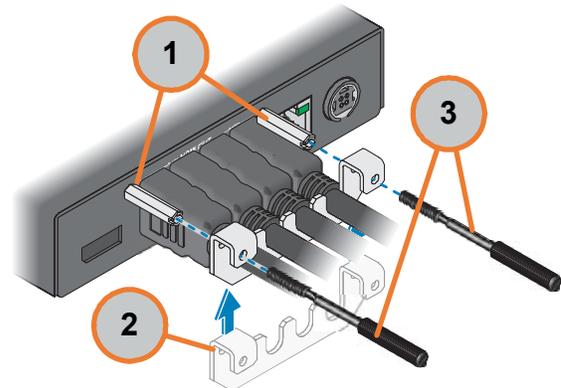


Figure 2-7 Securing the HDMI Cables - Standalone

To secure the cables to the standalone *QuadPlex* unit:

1. Fasten two screw post extenders (1) to the threaded holes on either side of the HDMI OUT ports.
2. Place the QPX BRK-4H HDMI cable bracket (2) over the HDMI cables, and then slide it toward the *QuadPlex* unit until it touches the screw post extenders.
3. Secure each end of the QPX BRK-4H HDMI cable bracket to the screw post extenders using two (2) 2 9/16" (6.51 cm) screw posts. Do not use 1 15/16" (4.92 cm) screw posts.
4. If you are using an HDMI standalone *QuadPlex* unit (p/n QPX HIN), then secure the HDMI input cable to the port using a single screw post extender (1), QPX BRK-1H (2), and a single 2 9/16" screw post (3).

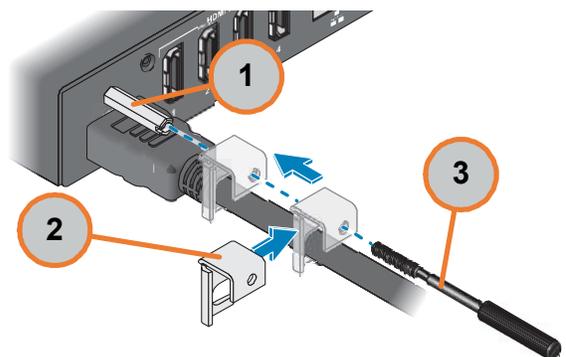


Figure 2-8 Securing the HDMI Input - Standalone

2.2.4 Connecting to a Network

Use a standard Cat 5, 5e, 6, or 7 network cable with an RJ-45 plug to connect a control PC, network hub, router, or gateway to the **LAN** port on the *QuadPlex* unit.

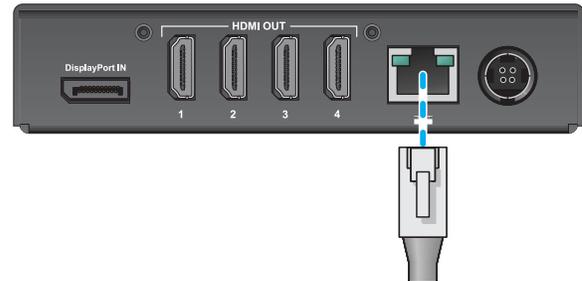


Figure 2-9 Ethernet Connection- Standalone

Important

Always press the latch on the top of the Ethernet connector when removing the connector.

2.2.5 Connecting Power

Connect the 12 VDC cable from the *QuadPlex* power supply to the DIN **POWER** port on the back of the *QuadPlex* unit.

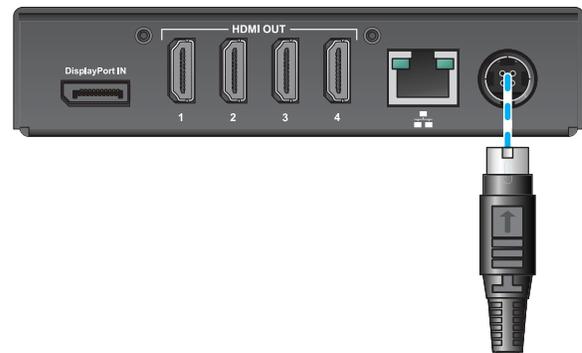


Figure 2-10 Power Connection - Standalone

Important

Never pull on the power cable to disconnect the power connector. Always grasp the connector firmly, slide the connector back, and then carefully remove the power cable.



2.3 Connections (PCIe Card)

Note

See [“Connections \(Standalone Unit\)” on page 14](#) for instructions on connecting a standalone *QuadPlex* unit.

Note

If needed, you may use Mini DisplayPort to DisplayPort adapters (p/n 520 12178; sold separately) and/or Mini HDMI to HDMI adapters (p/n 520 12233; sold separately).

This section describes how to connect a *QuadPlex* PCIe card:

- A video source.
- Up to four displays.
- Your network.

Important

Use only DisplayPort 1.2 and/or HDMI 2.0-compatible “Premium Certified”, high-bandwidth cables to connect the video source and displays.

2.3.1 Connecting the Source

Connect one of the following video sources to your *QuadPlex* PCIe card, as appropriate:

- **QuadPlex QPX DIN-C:** Connect a single 8K UHD, 4K UHD, or 2K/HD Mini DisplayPort source to the **DisplayPort IN** port.

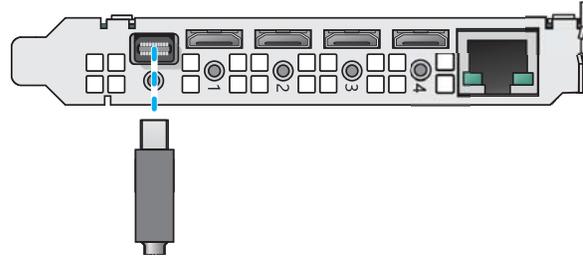


Figure 2-11 DisplayPort Input - PCIe Card

Important

Always press the latch on the top of the DisplayPort connector when removing the connector.

- **QuadPlex QPX HIN-C:** Connect a single 8K UHD, 4K UHD, or 2K/HD mini HDMI source to the **HDMI IN** port. For DVI sources, use a DVI-to-HDMI cable or adapter.

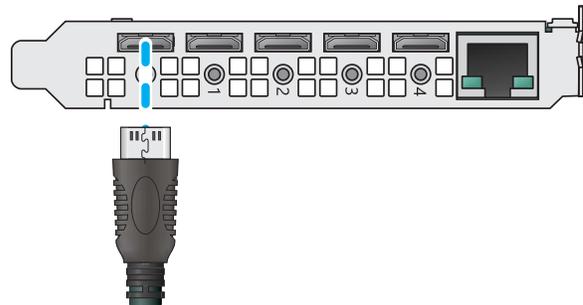


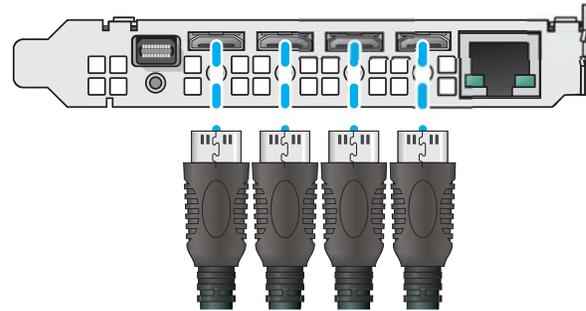
Figure 2-12 HDMI Input - PCIe Card



2.3.2 Connecting Displays

Connect up to four (4) 2K/HD mini HDMI displays to the **HDMI OUT** ports.

Figure 2-13 HDMI Outputs - PCIe Card



Note

The overmold (or boot) of each HDMI connector must be no more than the 0.551" (14 mm) width and 0.331" (8.4 mm) thickness stated in the HDMI specifications.

2.3.3 (Optional) Securing the Cables - PCIe

If desired, you may secure the input and output cables to the QuadPlex PCIe card using up to five (5) QPX BRK-1H brackets. These brackets and corresponding screw posts are sold separately as a 5-pack (p/n QPX BRK-5DH) that is suitable for both the QPX DIN-C and QPX HIN-C cards.

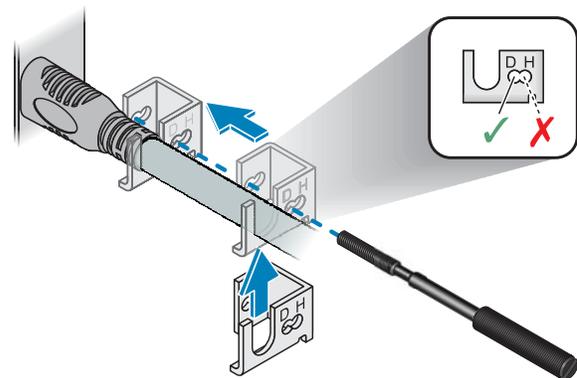


Figure 2-14 Securing the Cables - PCIe

To secure the cables to the QuadPlex PCIe card:

1. Fasten a single screw post extender to each of the five threaded holes on the card next to each input/output port.
2. Place a QPX BRK-1H cable bracket over a cable, and then slide it toward the QuadPlex PCIe card until it touches the screw post extender.
3. Secure the bracket to the screw post extender using a single 2 9/16" (6.51 cm) screw post. Do not use a 1 15/16" (4.92 cm) screw post.
4. Repeat Steps 2-4 for the remaining cables that are connected to the QuadPlex PCIe card.



2.3.4 Connecting to a Network

Use a standard Cat 5, 5e, 6, or 7 network cable with an RJ-45 plug to connect a control PC, network hub, router, or gateway to the **LAN** port on the *QuadPlex* PCIe card. The *QuadPlex* PCIe card have its own dedicated Ethernet connection in addition to the other Ethernet connection(s) used by the host Galileo or Zio W4000 device.

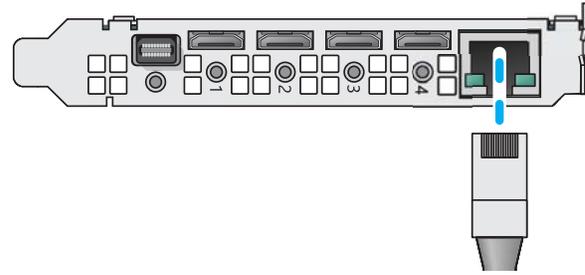


Figure 2-15 Ethernet Connection - PCIe Card

Important

Always press the latch on the top of the Ethernet connector when removing the connector.

2.4 Powering On

Important

Turn on the input source and output display(s) before turning on the *QuadPlex* unit or PCIe card to ensure proper display detection.

2.4.1 Standalone Unit

To power on a *QuadPlex* standalone unit:

1. Turn on your output display(s).
2. Turn on the video source component.
3. Plug the female end of the supplied power cord into the AC power inlet at the rear of the *QuadPlex* (AC 100V ~ 240V).
4. Connect the other end to an AC power source.

LED A and LED B illuminate solid green.

Your *QuadPlex* standalone unit is now ready for use.

2.4.2 PCIe Card

To power on a *QuadPlex* PCIe card:

1. Turn on your output display(s).
2. Turn on the video source component.
3. Turn on the Galileo or Zio W4000 device that contains the *QuadPlex* card(s) and wait for the device to boot.

Your *QuadPlex* PCIe card is now ready for use.



2.5 Configuration

All *QuadPlex* devices are configured as follows:

- **Standalone unit:**
 - ◆ Receives power from the external power supply.
 - ◆ Is controlled by the *QuadPlex* application that is installed on a remote PC.
- **PCIe card:**
 - ◆ Receives power from the Galileo or Zio W4000 device in which it is installed.
 - ◆ Requires its own Ethernet connection that is separate from and in addition to the Galileo or Zio W4000 Ethernet connection.
 - ◆ Is controlled by the *QuadPlex* application that is installed on a remote PC. You cannot control a *QuadPlex* PCIe card from the Galileo or Zio W4000 device that includes that card.
- **IP address:** By default, *QuadPlex* devices receive IP address assignments via Dynamic Host Control Protocol (DHCP). You may configure *QuadPlex* devices to use static IP addresses.
- **Multiple subnet support:** All *QuadPlex* devices within the same subnet are detected using the Universal Plug and Play (UPnP) protocol. Devices installed across multiple subnets must be verified on a subnet-by-subnet basis.
- **Firmware:** Be sure to update the firmware on your *QuadPlex* device(s) before use, as described in [“Firmware Updates” on page 47](#).

2.6 Installing the *QuadPlex* Application

This section describes the *QuadPlex* application system requirements, and then guides through installing the software on a remote PC.

2.6.1 System Requirements

The remote PC on which you are installing the *QuadPlex* application must meet all of the following requirements:

- **Operating System:** Windows® Server® 2019, Windows® Server® 2016, Windows® 10 Standard (64-bit), Windows® 10 Professional (64-bit), Windows® 10 Enterprise (64-bit), or Windows® 10 IoT.
- **Network:** The remote PC must be connected to the same subnet as the *QuadPlex* device(s) that it will be controlling, and those devices must be reachable from the host PC.
- **Rights:** You may need administrator rights to install or uninstall certain software. See your Windows documentation or contact your system administrator for assistance, if needed.



2.6.2 Installation

To install the *QuadPlex* application on the remote PC:

1. Connect and power on your *QuadPlex* devices, and then verify that all devices have been discovered by the network. If needed, contact your network administrator for help.
2. Verify that all of the *QuadPlex* devices can be reached from the remote PC by opening a command prompt and then executing a `ping <device_ip_address>` command for each *QuadPlex* device, where `<device_ip_address>` is the IP address of either a standalone *QuadPlex* unit or a *QuadPlex* PCIe card.
3. Either download the ***QuadPlex.msi*** installer to the remote PC or insert a drive containing this file into the remote PC.

4. Double-click the installer icon.

The **Welcome** window appears.

5. Click **Next**.

The **End-User License Agreement** window appears.

6. Read the license, then check the **I accept the terms...** checkbox, and then click **Next**.

The **Destination Folder** window appears.

7. Decide whether or not to create a desktop shortcut for the application by either checking or clearing the **Do you want to create a Desktop shortcut?** radio button, and then either:

- ◆ Click **Next** to accept the default installation folder.
- ◆ Enter a new path to a custom installation folder in the field, and then click **Next**.
- ◆ Click **Change** to browse to the desired installation folder, and then click **Next**.

The **Ready to install *QuadPlex*** window appears.

8. Either:

- ◆ Click **Install** to finish the installation.
- ◆ Click **Back** to go back to review/change your installation settings.
- ◆ Click **Cancel** to exit without installing the *QuadPlex* application.



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CHAPTER 3

OPERATION

This chapter describes how to control your standalone and/or PCIe *QuadPlex* device(s) by:

- [“Using the Buttons” on page 23.](#)
- [“Using the QuadPlex Application” on page 24.](#)
- This chapter also describes some of the many screen layouts that can be achieved using up to ten *QuadPlex* devices. See [“Sample Layouts” on page 36.](#)

3.1 Using the Buttons

Standalone *QuadPlex* units include three buttons on the top of the unit, as shown and described in [“Front Panel Controls and Indicators” on page 3.](#) To use a button:

1. Press the desired button once.

An on-screen menu appears.

Note

If **LED B** turns red, then the buttons are disabled. See [“Device Management Tab” on page 35](#) for information on enabling/disabling buttons.

2. Press the button repeatedly to cycle through the menu until your desired selection is highlighted.
3. Release the button.

3.2 Using the *QuadPlex* Application

The *QuadPlex* application simplifies configuring and creating wall designs for *QuadPlex* devices. This application works in offline mode to customize configurations of any type and size without needing an active connection to the *QuadPlex* device(s), including:

- Independently rotating each output in 90-degree increments (90, 180, and 270) for artistic video wall configurations.
- Using preset images to control and fine-tune bezel corrections to ensure seamless image displays.
- Optimize visuals by cropping, upscaling, or downscaling the content as desired.

Starting the *QuadPlex* application for the first time creates a new, blank *design*. A design contains both the devices in a video wall and their settings.

3.2.1 Interface

[Figure 3-1](#) displays the *QuadPlex* application interface.

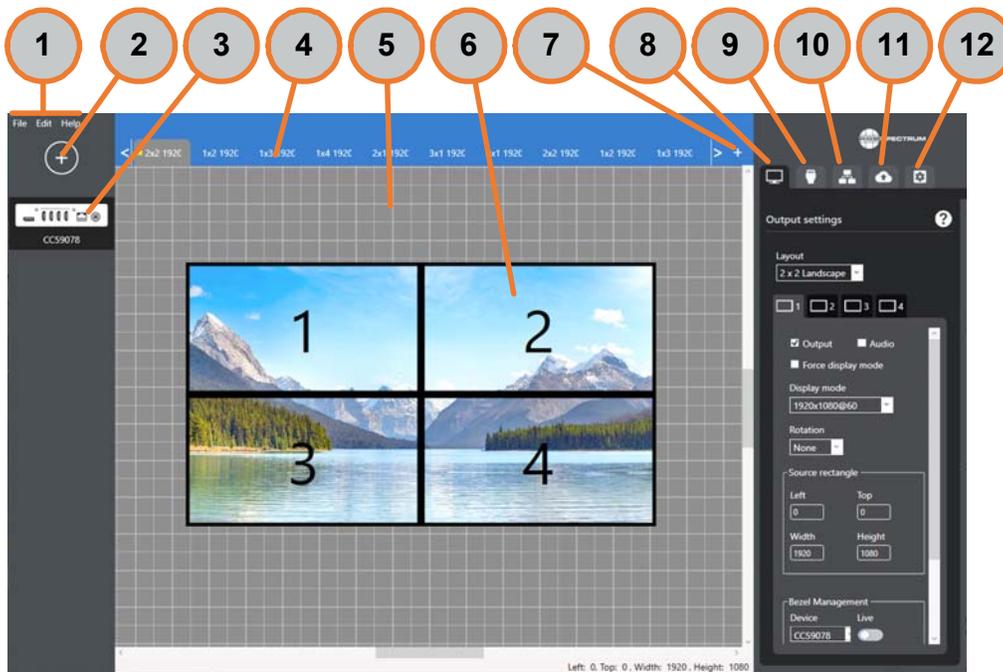


Figure 3-1 *QuadPlex* Application Interface

The numbered callouts in this figure depict the following components:

- **Menus (1):** The *QuadPlex* application contains three menus:
 - ◆ **File:** Create, open, and close designs, and exit the *QuadPlex* application. See [“Creating a New Design” on page 26](#), [“Opening an Existing Design” on page 26](#), [“Closing a Design” on page 27](#), and [“Exiting the QuadPlex Application” on page 26](#).



- ◆ **Edit:** Rename or delete a design. See [“Renaming the Current Design” on page 27](#) and [“Deleting a Design” on page 27](#).
- ◆ **Help:** Accesses online documentation for the *QuadPlex* application and provides application information.
- **Add Device button (2):** Clicking this button adds a virtual *QuadPlex* device to the current design. See [“Adding a New Virtual Device” on page 28](#).
- **Virtual device list (3):** Lists the virtual *QuadPlex* device(s) in the current design. Selecting a device loads the saved layouts and configuration for that device. See [“Working with Virtual Devices” on page 27](#).
- **Layout tabs(4):** Each tab corresponds to a different layout for the currently-selected device. Each device includes a number of default layouts. You can add, sort, and remove layouts. See [“Managing Layouts” on page 28](#).
- **Canvas (5):** Displays the location and size of each output for the currently-selected layout, as well as a representation of the input image. You can move, rotate, and resize the four outputs as desired to configure the layout. See [“Managing Layouts” on page 28](#).
- **Displays (6):** Each layout includes four displays that correspond to each of the four outputs on a *QuadPlex* unit. See [“Managing Layouts” on page 28](#).
- **Add Layout button (7):** Clicking this button creates a new layout for the currently-selected device. See [“Creating a New Layout” on page 29](#).
- **Output settings tab (8):** Allows you to specify the layout and configure displays for the currently-selected device. See [“Output Settings Tab” on page 30](#).
- **Input settings tab (9):** Allows you to specify the input resolution, refresh rate, and copy protection settings for the device input. See [“Input Settings Tab” on page 32](#).
- **Network settings tab (10):** Allows you to specify the network settings for the currently-selected device. See [“Network Settings Tab” on page 33](#).
- **Device data transfer tab (11):** Uploads the configuration from the selected virtual device to the selected physical *QuadPlex* device on the subnet or downloads the configuration from a physical device on the subnet to the selected virtual device in the *QuadPlex* application. See [“Device Data Transfer Tab” on page 34](#).
- **Device management tab (12):** Configures various options for the currently-selected device. See [“Device Management Tab” on page 35](#).

3.2.2 Overview

To create and configure a design:

1. Either create a new design or open an existing design. See [“Working with Designs” on page 26](#).
2. If needed, add or remove *QuadPlex* devices from the design. These devices are virtual because their settings aren't directly linked to a physical device. See [“Working with Virtual Devices” on page 27](#).

Note

If you open an existing design, then the *QuadPlex* device(s) that are in that design will appear in the *QuadPlex* application. A new design will not have any *QuadPlex* devices until you add them.



3. Configure each *QuadPlex* device using the Network settings and Device management tabs. See both of the following:
 - ◆ [“Network Settings Tab” on page 33](#)
 - ◆ [“Device Management Tab” on page 35](#)
4. Define one or more layouts for each *QuadPlex* device using any or all of the following:
 - ◆ Canvas
 - ◆ **Output settings** tab (see [“Output Settings Tab” on page 30](#))
 - ◆ **Input settings** tab (see [“Input Settings Tab” on page 32](#))
5. For each *QuadPlex* device, specify the active layout, which is the layout that will be used by that device. See [“Setting the Active Layout” on page 29](#).
6. Upload the device configurations from the appropriate virtual *QuadPlex* device(s) in the design to the appropriate physical *QuadPlex* device(s). See [“Device Data Transfer Tab” on page 34](#).

3.2.3 Exiting the *QuadPlex* Application

To quit the *QuadPlex* application, select **File>Quit**.

3.2.4 Working with Designs

This section describes how to create, edit, and delete a design. *QuadPlex* automatically opens the last design when you restart the program and saves each change you make to a design.

CREATING A NEW DESIGN

To create a new design:

1. Select **File>New design**.

The **New design** window appears.

2. Enter a name for the new design in the **New design** field, and then click **OK**.

A new, blank design appears.

3. Begin adding devices, as described in [“Adding a New Virtual Device” on page 28](#). The *QuadPlex* application saves your work in real time; there is no need to manually save your work.

OPENING AN EXISTING DESIGN

To open an existing design:

1. Select **File>Open design**.



A window opens with a list of all existing designs.

2. Click the desired design to open it.

You may now continue working on the selected design from where you previously left off.

CLOSING A DESIGN

Closing a design closes the current design and returns you to the previous design. To close the current design, select **File>Close design**.

RENAMING THE CURRENT DESIGN

To rename the current design:

1. Select **Edit>Rename design**.

The **Rename design** window appears.

2. Enter the new name for the this design in the **New design** field, and then click **OK**.

DELETING A DESIGN

To delete a design:

1. If needed, open the design that you want to delete as described in [“Opening an Existing Design” on page 26](#). Otherwise, you will delete the design that you currently have open.
2. Select **Edit>Delete design**.

A confirmation dialog appears.

3. Click **Yes** to confirm the deletion.

3.2.5 Working with Virtual Devices

This section explains how to select, add, rename, and remove virtual *QuadPlex* devices.

SELECTING A DEVICE

To select a virtual *QuadPlex* device, click the desired device in the **Device List**. Selecting a virtual device opens the **Layout** tabs and populates the **Output settings**, **Input settings**, **Network settings**, and **Device management** tabs with the current configuration for that device. See:

- [“Output Settings Tab” on page 30](#)
- [“Input Settings Tab” on page 32](#)
- [“Network Settings Tab” on page 33](#)
- [“Device Management Tab” on page 35](#)



ADDING A NEW VIRTUAL DEVICE

To add a new virtual *QuadPlex* device, click the **Add Device** button. The new virtual device appears in the **Device List** with the default name *New Device*.

Each new virtual *QuadPlex* device starts with the default number of layouts, each of which has its own **Layout** tab. You can add, edit, and remove layouts for a device, as described in [“Managing Layouts” on page 28](#).

RENAMING A VIRTUAL DEVICE

To rename a virtual device:

1. Right-click the virtual *QuadPlex* device you want to rename, and then select **Rename**.

The **Device Name** field opens for editing.

2. Enter the new name for the virtual device in the field, and then press [ENTER].

DELETING A VIRTUAL DEVICE

To delete a virtual device:

1. Right-click the virtual *QuadPlex* device you want to delete, and then select **Delete**.

A confirmation dialog appears.

2. Click **Yes** to confirm the deletion.

3.2.6 Managing Layouts

Selecting a virtual *QuadPlex* device in the **Device List** displays the layouts that have been created for the selected virtual device. Each layout defines the following:

- Displays that will be receiving video from the *QuadPlex* device (from one to four).
- Position of each output display relative to both the video input being provided to the *QuadPlex* device and the other output display(s).
- Size of each display.
- Orientation (0, 90, 180 or 270 degrees).
- Bezel correction.

To select a layout, click the corresponding **Layout** tab. If needed, you can click the arrows on either side of the tabs to scroll left or right. Once selected, you can work with a layout in two ways:

- By clicking and dragging/resizing a display on the **Canvas**.
- Entering configuration information in the **Output settings** and **Input settings** tabs. See [“Output Settings Tab” on page 30](#) and [“Input Settings Tab” on page 32](#).



CREATING A NEW LAYOUT

To create a new layout, click the **Add Layout** button. A new **Layout** tab appears with a generic name (such as **Config 17**). You may now rename the layout, as described below, or perform any other configuration operation.

RENAMING A LAYOUT

To rename a layout:

1. Right-click the **Layout** tab for the layout you want to rename, and then select **Rename**.

The **Layout Name** field opens for editing.

Enter the new name for the layout in the field, and then press [ENTER].

DELETING A LAYOUT

To delete a layout:

1. Right-click the **Layout** tab for the layout you want to delete, and then select **Delete**.

A confirmation dialog appears.

2. Click **Yes** to confirm the deletion.

SETTING THE ACTIVE LAYOUT

To select which layout is applied to your *QuadPlex* product when uploading a configuration, right-click the desired **Layout** tab, and then select **Set as active layout**. The active layout is identified by a star next to the layout name.

3.2.7 Tabs

The *QuadPlex* application includes five tabs:

- **Output settings:** Configures the number of outputs, and the display mode, resolution, rotation, and bezel correction for each output. See [“Output Settings Tab” on page 30](#).
- **Input settings:** Configures the input mode, resolution, and copy protection. See [“Input Settings Tab” on page 32](#).
- **Network settings:** Configures the network settings for the device. See [“Network Settings Tab” on page 33](#).
- **Device data transfer:** Allows you to transfer designs between the virtual devices in the *QuadPlex* application and the real devices on the network. See [“Device Data Transfer Tab” on page 34](#).
- **Device management:** Allows you to view physical *QuadPlex* device status and manage settings in real time. See [“Device Management Tab” on page 35](#).

OUTPUT SETTINGS TAB

The **Output settings** tab is where you configure the number of outputs to assign to a virtual *QuadPlex* device. Remember that output settings are defined on a per-device, per-layout basis, meaning that you must first select both of the following:

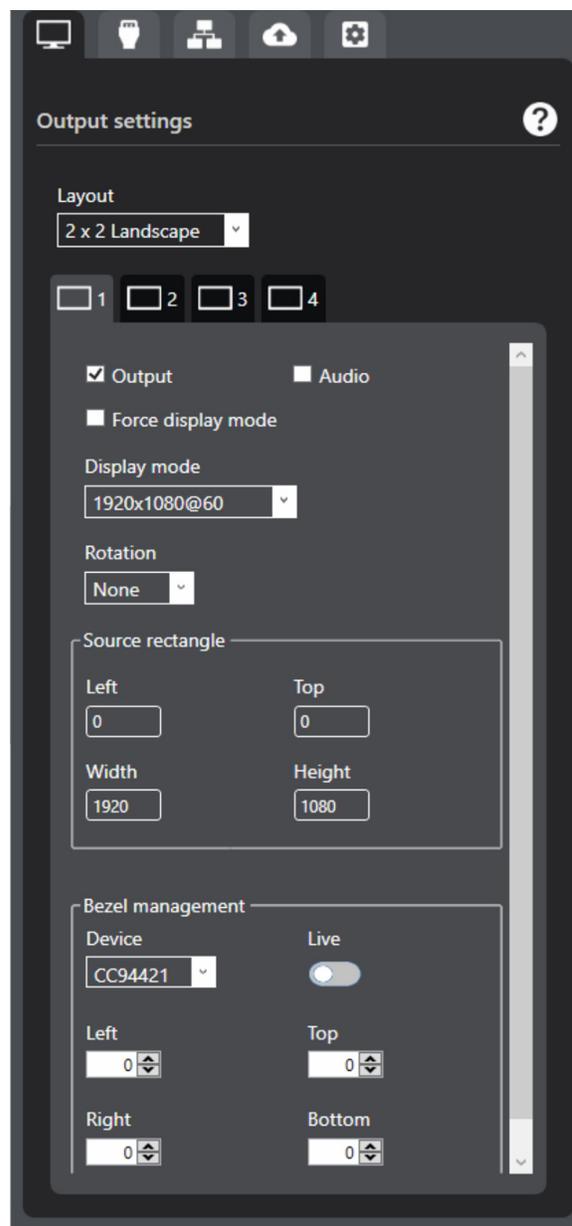
- The virtual device you want to configure (see [“Working with Virtual Devices” on page 27](#)).
- The layout you want to work on (see [“Managing Layouts” on page 28](#)).

You can then configure settings on a per-output basis. From top to bottom, this tab includes the following functions:

- **Layout:** This pull-down menu allows you to select a layout for the outputs on the selected virtual *QuadPlex* device. In general, you may either use a single physical *QuadPlex* device to create a video wall layout with up to four displays, or may use multiple physical *QuadPlex* devices to create larger layouts. See [“Sample Layouts” on page 36](#) for some layout ideas. If you change the number of displays or the position or size of a display, then the **Layout** menu will automatically be set to **Custom**.

Selecting **Clone Landscape** or **Clone Portrait** allows you to clone the input display to each of the output displays. See [“Cloning the Input” on page 36](#) for more information.

- **Output sub-tabs:** There is one sub-tab for each *QuadPlex* device output. Select the output you want to work with by either selecting the desired sub-tab or clicking the desired display in the **Canvas**.
- **Output:** Checking this box enables the selected output for the current layout and vice-versa.
- **Audio:** Checking this checkbox allows you to hear audio on this output, if audio is part of the input signal. *QuadPlex* devices support a single audio input, but can play that audio on all outputs at the same time.
- **Force display mode:** Checking this checkbox forces the *QuadPlex* device to always use the selected display mode regardless of the monitor’s EDID settings. Clearing this checkbox causes the output to use the display mode closest to the mode selected according to the EDID settings of the monitor.





- **Display mode:** Use this pull-down menu to select the resolution (in pixels) and refresh rate (in Hz) of your output. Selecting a different size (width and height) and/or aspect ratio (width/height) of the source rectangle from the size and aspect ratio of the selected resolution will cause scaling to occur.
- **Rotation:** Select the rotation for the content of your output. Possible rotations are 90, 180, and 270 degrees.
- **Source rectangle:** Define the coordinates (**Top** and **Left**) and size (**Width** and **Height**), in pixels, of the region of the canvas shown on this output. The source rectangle is always scaled to use the entire resolution (width and height) of the display mode. If the aspect ratio (width/height) of the source rectangle differs from the aspect ratio of the display mode, then the video may appear stretched or squished.

You can also define the source rectangle of an output by moving and resizing the source rectangle of the output on the canvas with your mouse pointer.

- **Bezel management:** This function allows you to adjust the image to compensate for the physical space created by the bezels of your monitors, thereby creating an image that appears seamlessly across your monitors. For each border of your output (**Left**, **Top**, **Right**, and **Bottom**), enter the number of pixels that are hidden behind the physical space between your monitors to create a continuous image.

If desired, you can test bezel management values on the actual displays in real time. To do this:

- a. From the **Device data transfer** tab, upload the configuration of your virtual device to the physical device on which you want to test your bezel management settings.
- b. Use the **Device** pull-down menu in the **Output settings** tab, and then toggle the **Live** switch to **On** (green). This adds a temporary virtual device to the current design with the same settings as the physical device.

Note

No other operations are supported in Live mode.

- c. Select the outputs in the current layout, and then modify their bezel management settings. Your changes will be visible in real time and will be automatically applied and saved to the physical *QuadPlex* device.
- d. Once your bezel management settings are properly set, toggle the **Live** button to **Off** (gray). This removes the temporary *QuadPlex* virtual device from your design and returns the interface to the previously-selected virtual *QuadPlex* device. To update the bezel management settings on this virtual device, download the configuration of your physical device to your virtual device, as described in [“Device Data Transfer Tab” on page 34](#).

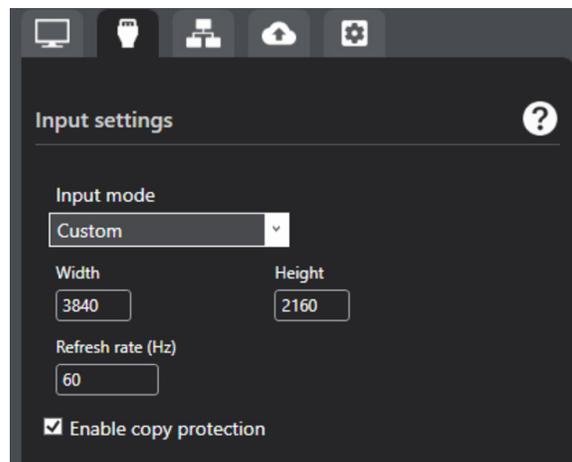


INPUT SETTINGS TAB

The **Input settings** tab is where you configure the input signal settings on the **DisplayPort IN** or **HDMI IN** connector of the selected *QuadPlex* device. Remember that input settings are defined on a per-device, per-layout basis, meaning that you must first select both of the following:

- The virtual device you want to configure (see [“Working with Virtual Devices” on page 27](#)).
- The layout you want to work on (see [“Managing Layouts” on page 28](#)).

From top to bottom, this tab includes the following functions:



- **Input mode:** This pull-down menu allows you to match the resolution and refresh rate used by your video source. Scaling may occur if the input mode is different from the actual input signal. Also, a mismatch between the selected input mode and the actual input signal will be indicated through the On Screen Display (OSD) of *QuadPlex* devices and via the LEDs on a standalone *QuadPlex* unit (see [“Front Panel Controls and Indicators” on page 3](#)).
- **Width:** Width of the input resolution, in pixels.
- **Height:** Height of the input resolution, in pixels.
- **Refresh rate:** Refresh rate of the input signal, in Hz.
- **Enable copy protection:** Check this checkbox if the video source plays copy-protected content.

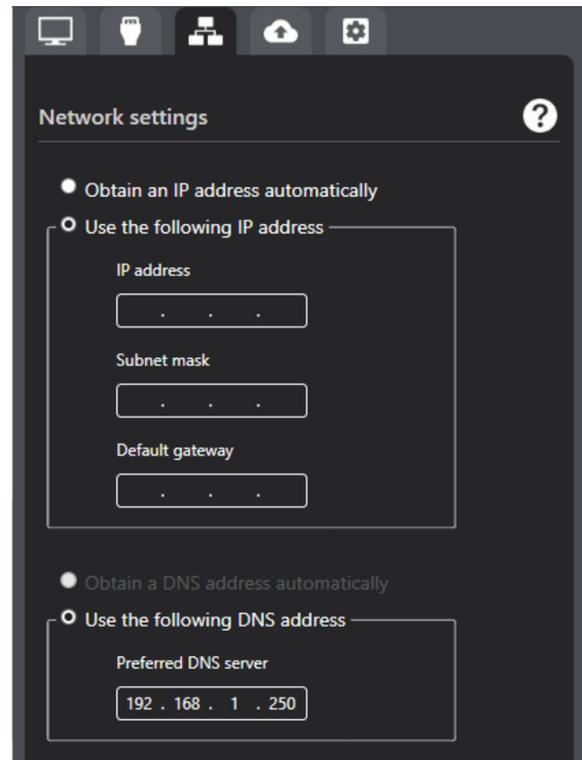


NETWORK SETTINGS TAB

The **Network settings** tab is where you configure the network parameters for a virtual *QuadPlex* device. Remember that network settings are defined on a per-device basis, meaning that you must first select the virtual device you want to configure (see [“Working with Virtual Devices” on page 27](#)).

From top to bottom, this tab includes the following functions:

- **Obtain an IP address automatically:** Check this radio button if you want the selected *QuadPlex* device to automatically obtain its IP address, subnet mask, and default gateway information from the DHCP network.
- **Use the following IP address:** Check this radio button if you want to manually assign the following parameters to the selected *QuadPlex* device:
 - ◆ IP address
 - ◆ Subnet mask
 - ◆ Default gateway
- **Obtain a DNS address automatically:** Check this radio button to have the *QuadPlex* unit obtain the DNS address from the DHCP server.
- **Use the following DNS address:** Select this to manually enter the IP address of the DNS server in the Preferred DNS server field.



Consult your network administrator for assistance, if needed.

Note

Remember that a *QuadPlex* PCIe card must have its own Ethernet connection and network configuration that is separate from that of the Galileo or Zio W4000 unit where that *QuadPlex* card is mounted.

DEVICE DATA TRANSFER TAB

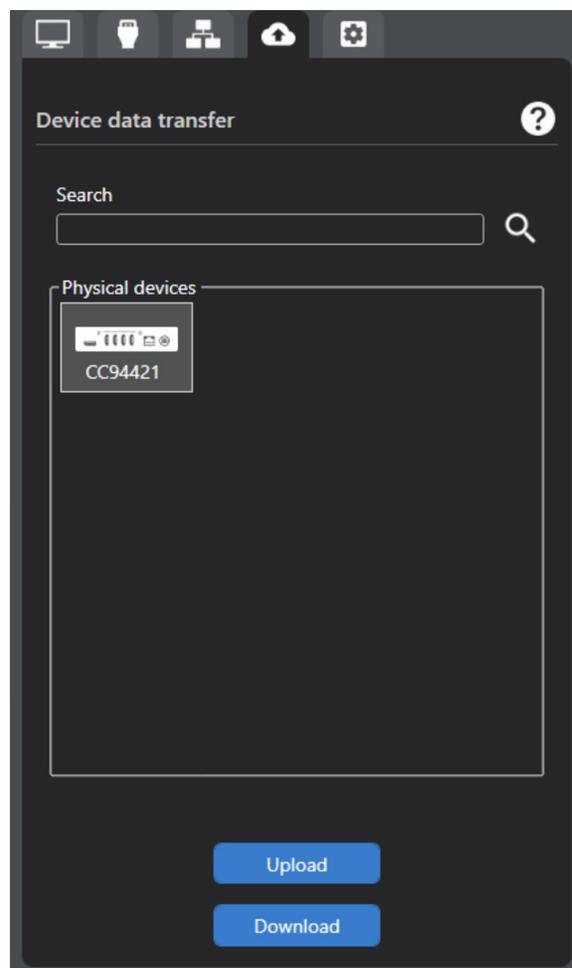
The **Device data transfer** tab is where you upload and download configurations to and from physical *QuadPlex* devices. When downloading or uploading configurations, the order of the layouts shown in the *QuadPlex* application will be the order shown in the on-screen layout selection menu on the physical *QuadPlex* devices.

A configuration consists of the following information:

- Layouts
- Output settings
- Input settings
- Network settings

From top to bottom, this tab includes the following functions:

- **Search:** Enter the serial number or IP address of a physical *QuadPlex* device and then either press [ENTER] or click the Search icon (magnifying glass) to locate the desired device in the list.
- **Physical devices:** List of physical *QuadPlex* devices on the network.
- **Upload:** Uploading replaces the configuration of a physical *QuadPlex* device with the configuration of a virtual *QuadPlex* device. To upload a configuration to a physical device, select a virtual *QuadPlex* device, then select a physical device in the **Device data transfer** tab, and then click **Upload**.
- **Download:** Downloading replaces the configuration of a virtual *QuadPlex* device with the configuration of a physical *QuadPlex* device. To download a configuration from a physical device, select a virtual *QuadPlex* device, then select a physical device in the **Device data transfer** tab, and then click . The name of the virtual device changes to match the name of the physical device from which you downloaded the configuration.
- **Device information:** Hovering the mouse cursor over a *QuadPlex* device in the **Physical devices** list displays the following information for that device:
 - ◆ **Model number:** Model number of that *QuadPlex* device.
 - ◆ **Serial number:** Serial number of that *QuadPlex* device.
 - ◆ **IP address:** IP address of that *QuadPlex* device
 - ◆ **MAC address:** Unique physical address of the network connector on that *QuadPlex* device.





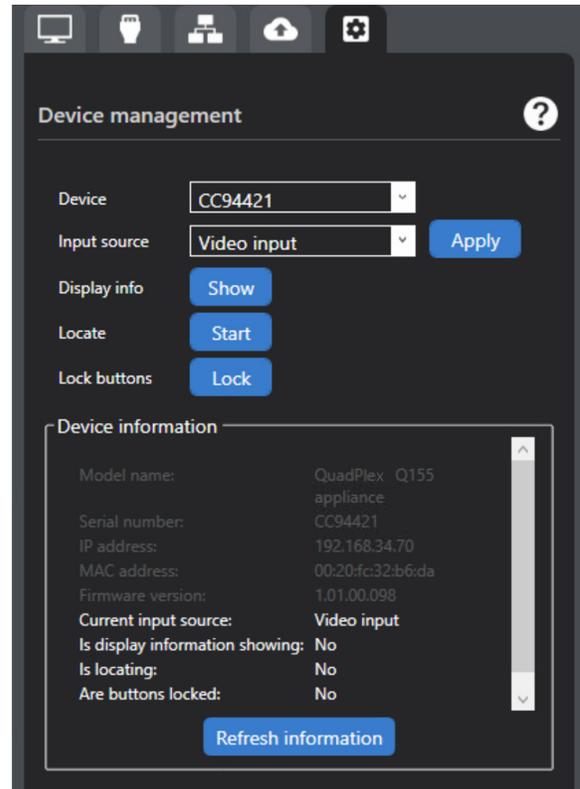
- ◆ **Firmware version:** Version of the firmware package installed on that *QuadPlex* device.

DEVICE MANAGEMENT TAB

The **Device management** tab is where you view the status and manage the settings of the physical *QuadPlex* devices on the subnet. The settings on this tab update the selected physical *QuadPlex* devices in real time; you need not use the **Device data transfer** tab to have these settings take effect.

From top to bottom, this tab includes the following functions:

- **Device:** Use this pull-down menu to select the physical *QuadPlex* device you want to manage.
- **Input source:** Use this pull-down menu to select the desired input source. This is the same as pressing the **Source Selection** button on a standalone *QuadPlex* unit. See the following:
 - ◆ **Standalone *QuadPlex* unit:** [“Front Panel Controls and Indicators” on page 3.](#)
 - ◆ ***QuadPlex* PCIe card:** [“Connectors and Indicators” on page 6.](#)



Select your desired input source, and then click **Apply**.

- **Display info:** Clicking the **Show/Hide** button toggles showing or hiding the physical *QuadPlex* devices information on the display. This is the same as pressing the **Device Information** button on a standalone *QuadPlex* unit. See [“Front Panel Controls and Indicators” on page 3.](#)
- **Locate:** Clicking the **Start/Stop** button toggles flashing **LED A** on a standalone *QuadPlex* device on and off to help you find that device among multiple devices, such as on a rack. The Device information area (see below) will show this device is in locating mode. **LED A** will keep blinking until you click **Stop**.
- **Lock buttons:** Clicking **Lock/Unlock** toggles locking the buttons on a standalone *QuadPlex* unit. When button locking is enabled, **LED B** will illuminate solid red as long as a button is being pressed.
- **Device information:** This area of the screen displays information about the selected physical *QuadPlex* device, including status. You can copy the device information to your clipboard, if desired.

3.2.8 Cloning the Input

In the **Output Settings** tab (see [“Output Settings Tab” on page 30](#)), selecting **Clone Landscape** or **Clone Portrait** in the **Layout** menu clones the input display to the output displays, meaning that the entire content of the input display appears on each of the output displays, as shown in [Figure 3-2](#).

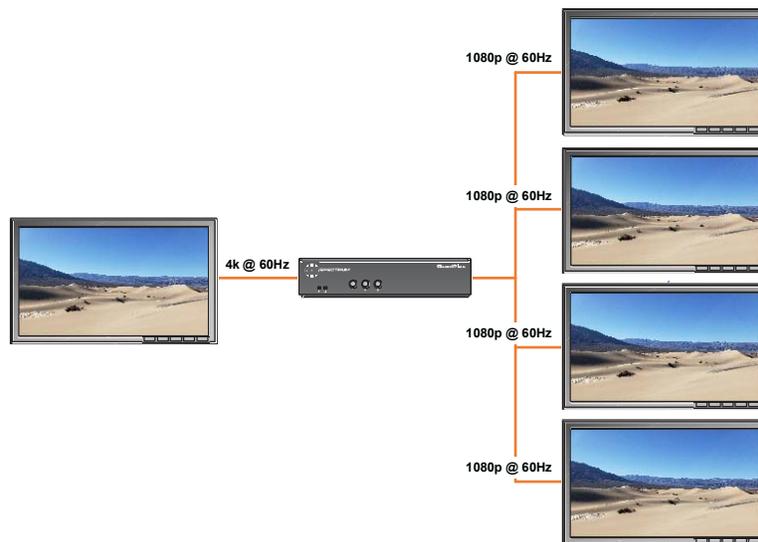


Figure 3-2 Cloning Example

When cloning the input:

- Selecting **Clone Landscape** orients the outputs horizontally. This may cause the output streams to appear sideways, depending on the orientation of the input stream.
- Selecting **Clone Portrait** orients the outputs vertically. This may cause the output streams to appear sideways, depending on the origination of the input stream.
- The QuadPlex device will automatically downsample a 4K input stream to 1080p and will directly pass through a 1080p input stream.
- You may perform any adjustment on any output display (such as display mode, rotation, source rectangle, and bezel management) regardless of cloning.

3.3 Sample Layouts

[Table 3-1](#) lists many common layouts that can be achieved using one or more *QuadPlex* unit(s). The columns in this table provide the following information:

- **Layout:** Layout arrangement in rows x columns of displays. For example, the notation 3 x 2 indicates three (3) rows and two (2) columns of displays. Each layout includes one row for each *QuadPlex* unit that is required to create that layout. In this example, each 3 x 2 layout requires two *QuadPlex* units, and thus each 3 x 2 layout includes two rows.
- **Input:** Resolution of each input. Layouts that require multiple *QuadPlex* units will list the input for each *QuadPlex* unit on a separate row.



- **QuadPlex:** *QuadPlex* unit number. Each layout includes one row for each *QuadPlex* unit that is required to create that layout. This column also includes a colored square that corresponds to the visual depiction of that unit's outputs are arranged in the layout shown in the **Layout** column. The notation *direct* indicates that a video source connects directly to a display without passing through a *QuadPlex* unit.
- **Outputs:** Number of HD displays that are connected to each *QuadPlex* output.
- **Layout:** Visual depiction of each layout. Each colored square corresponds to a single HD display connected to a *QuadPlex* unit. The color of each square corresponds to the *QuadPlex* unit that is driving that display. For example, the first 6 x 1 layout shows three displays being driven by *QuadPlex* Unit 1 and three displays being driven by *QuadPlex* Unit 2. The second 6 x 1 layout shows four displays being driven by *QuadPlex* Unit 1 and two by *QuadPlex* Unit 2.

Note [Table 3-1](#) lists many commonly-used layouts, but this list is far from complete because is impossible to list all of the possible *QuadPlex* layouts. If you need to create a layout that is not in this list, then contact RGB Spectrum Technical Support for assistance. See [“Technical Support” on page 51](#).

Table 3-1 QuadPlex Layouts

Layout	Input	QuadPlex	# Outputs	Layout
x1 Layouts				
2 x 1	3840 x 1080	Unit 1 	2	
3 x 1	5760 x 1080	Unit 1 	3	
4 x 1	7860 x 1080	Unit 1 	4	
5 x 1	7860 x 1080	Unit 1 	4	
	1920 x 1080	direct 	1	
6 x 1	5760 x 1080	Unit 1 	3	
	5760 x 1080	Unit 2 	3	
6 x 1	7860 x 1080	Unit 1 	4	
	3840 x 1080	Unit 2 	2	
x2 Layouts				
1 x 2	1920 x 2160	Unit 1 	2	
2 x 2	3840 x 2160	Unit 1 	4	
3 x 2	5760 x 1080	Unit 1 	3	
	5760 x 1080	Unit 2 	3	
3 x 2	3840 x 2160	Unit 1 	4	
	1920 x 2160	Unit 2 	2	
4 x 2	7860 x 1080	Unit 1 	4	
	7860 x 1080	Unit 2 	4	
4 x 2	3840 x 2160	Unit 1 	4	
	3840 x 2160	Unit 2 	4	



Table 3-1 QuadPlex Layouts

Layout	Input	QuadPlex	# Outputs	Layout
5 x 2	7860 x 1080	Unit 1 	4	
	7860 x 1080	Unit 2 	4	
	1920 x 2160	Unit 3 	2	
5 x 2	3840 x 2160	Unit 1 	4	
	3840 x 2160	Unit 2 	4	
	1920 x 2160	Unit 3 	2	
6 x 2	3840 x 2160	Unit 1 	4	
	3840 x 2160	Unit 2 	4	
	3840 x 2160	Unit 3 	4	
x3 Layouts				
1 x 3	1920 x 3240	Unit 1 	3	
2 x 3	1920 x 3240	Unit 1 	3	
	1920 x 3240	Unit 2 	3	
2 x 3	3840 x 2160	Unit 1 	4	
	3840 x 1080	Unit 2 	2	
3 x 3	5760 x 1080	Unit 1 	3	
	5760 x 1080	Unit 2 	3	
	5760 x 1080	Unit 3 	3	
3 x 3	1920 x 3240	Unit 1 	3	
	1920 x 3240	Unit 2 	3	
	1920 x 3240	Unit 3 	3	
4 x 3	7860 x 1080	Unit 1 	4	
	7860 x 1080	Unit 2 	4	
	7860 x 1080	Unit 3 	4	
4 x 3	3840 x 2160	Unit 1 	4	
	3840 x 2160	Unit 2 	4	
	7860 x 1080	Unit 3 	4	
5 x 3	1920 x 3240	Unit 1 	3	
	1920 x 3240	Unit 2 	3	
	1920 x 3240	Unit 3 	3	
	1920 x 3240	Unit 4 	3	
	1920 x 3240	Unit 5 	3	



Table 3-1 QuadPlex Layouts

Layout	Input	QuadPlex	# Outputs	Layout
5 x 3	7860 x 1080	Unit 1	4	
	7860 x 1080	Unit 2	4	
	7860 x 1080	Unit 3	4	
	1920 x 3240	Unit 4	3	
5 x 3	3840 x 2160	Unit 1	4	
	3840 x 2160	Unit 2	4	
	7860 x 1090	Unit 3	4	
	1920 x 3240	Unit 4	3	
6 x 3	1920 x 3240	Unit 1	3	
	1920 x 3240	Unit 2	3	
	1920 x 3240	Unit 3	3	
	1920 x 3240	Unit 4	3	
	1920 x 3240	Unit 5	3	
	1920 x 3240	Unit 6	3	
6 x 3	3840 x 2160	Unit 1	4	
	3840 x 2160	Unit 2	4	
	3840 x 2160	Unit 3	4	
	5760 x 1080	Unit 4	3	
	5760 x 1080	Unit 5	3	
6 x 3	3840 x 2160	Unit 1	4	
	3840 x 2160	Unit 2	4	
	3840 x 2160	Unit 3	4	
	7860 x 1080	Unit 4	3	
	3840 x 1080	Unit 5	2	
6 x 3	7680 x 1080	Unit 1	4	
	7680 x 1080	Unit 2	4	
	7680 x 1080	Unit 3	4	
	3840 x 2160	Unit 4	4	
	3840 x 1080	Unit 5	2	
x4 Layouts				
1 x 4	1920 x 4320	Unit 1	4	
2 x 4	1920 x 4320	Unit 1	4	
	1920 x 4320	Unit 2	4	



Table 3-1 QuadPlex Layouts

Layout	Input	QuadPlex	# Outputs	Layout
2 x 4	3840 x 2160	Unit 1 	4	
	3840 x 2160	Unit 2 	4	
3 x 4	1920 x 4320	Unit 1 	4	
	1920 x 4320	Unit 2 	4	
	1920 x 4320	Unit 3 	4	
3 x 4	3840 x 2160	Unit 1 	4	
	3840 x 2160	Unit 2 	4	
	1920 x 4320	Unit 3 	4	
4 x 4	1920 x 4320	Unit 1 	4	
	1920 x 4320	Unit 2 	4	
	1920 x 4320	Unit 3 	4	
	1920 x 4320	Unit 4 	4	
4 x 4	3840 x 2160	Unit 1 	4	
	3840 x 2160	Unit 2 	4	
	3840 x 2160	Unit 3 	4	
	3840 x 2160	Unit 4 	4	
4 x 4	7680 x 1080	Unit 1 	4	
	7680 x 1080	Unit 2 	4	
	7680 x 1080	Unit 3 	4	
	7680 x 1080	Unit 4 	4	
5 x 4	1920 x 4320	Unit 1 	4	
	1920 x 4320	Unit 2 	4	
	1920 x 4320	Unit 3 	4	
	1920 x 4320	Unit 4 	4	
	1920 x 4320	Unit 5 	4	
5 x 4	7680 x 1080	Unit 1 	4	
	7680 x 1080	Unit 2 	4	
	7680 x 1080	Unit 3 	4	
	7680 x 1080	Unit 4 	4	
	1920 x 4320	Unit 5 	4	
5 x 4	3840 x 2160	Unit 1 	4	
	3840 x 2160	Unit 2 	4	
	3840 x 2160	Unit 3 	4	
	3840 x 2160	Unit 4 	4	
	1920 x 4320	Unit 5 	4	



Table 3-1 QuadPlex Layouts

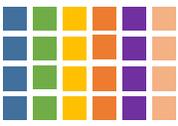
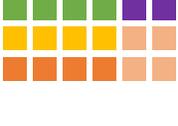
Layout	Input	QuadPlex	# Outputs	Layout
6 x 4	1920 x 4320	Unit 1 	4	
	1920 x 4320	Unit 2 	4	
	1920 x 4320	Unit 3 	4	
	1920 x 4320	Unit 4 	4	
	1920 x 4320	Unit 5 	4	
	1920 x 4320	Unit 6 	4	
6 x 4	3840 x 2160	Unit 1 	4	
	3840 x 2160	Unit 2 	4	
	3840 x 2160	Unit 3 	4	
	3840 x 2160	Unit 4 	4	
	3840 x 2160	Unit 5 	4	
	3840 x 2160	Unit 6 	4	
6 x 4	7680 x 1080	Unit 1 	4	
	7680 x 1080	Unit 2 	4	
	7680 x 1080	Unit 3 	4	
	7680 x 1080	Unit 4 	4	
	1920 x 4320	Unit 5 	4	
	1920 x 4320	Unit 6 	4	
6 x 4	7680 x 1080	Unit 1 	4	
	7680 x 1080	Unit 2 	4	
	7680 x 1080	Unit 3 	4	
	7680 x 1080	Unit 4 	4	
	3840 x 2160	Unit 5 	4	
	3840 x 2160	Unit 6 	4	
x5 Layouts				
2 x 5	3840 x 1080	Unit 1 	2	
	3840 x 1080	Unit 2 	2	
	3840 x 1080	Unit 3 	2	
	3840 x 1080	Unit 4 	2	
	3840 x 1080	Unit 5 	2	
2 x 5	3840 x 2160	Unit 1 	4	
	3840 x 2160	Unit 2 	4	
	3840 x 1080	Unit 3 	2	



Table 3-1 QuadPlex Layouts

Layout	Input	QuadPlex	# Outputs	Layout
2 x 5	1920 x 4320	Unit 1 	4	
	1920 x 4320	Unit 2 	4	
	3840 x 1080	Unit 3 	2	
3 x 5	5760 x 1080	Unit 1 	3	
	5760 x 1080	Unit 2 	3	
	5760 x 1080	Unit 3 	3	
	5760 x 1080	Unit 4 	3	
	5760 x 1080	Unit 5 	3	
3 x 5	1920 x 4320	Unit 1 	4	
	1920 x 4320	Unit 2 	4	
	1920 x 4320	Unit 3 	4	
	5760 x 1080	Unit 4 	3	
3 x 5	3840 x 2160	Unit 1 	4	
	3840 x 2160	Unit 2 	4	
	1920 x 4320	Unit 3 	4	
	5760 x 1080	Unit 4 	3	
4 x 5	7680 x 1080	Unit 1 	4	
	7680 x 1080	Unit 2 	4	
	7680 x 1080	Unit 3 	4	
	7680 x 1080	Unit 4 	4	
	7680 x 1080	Unit 5 	4	
4 x 5	3840 x 2160	Unit 1 	4	
	3840 x 2160	Unit 2 	4	
	3840 x 2160	Unit 3 	4	
	3840 x 2160	Unit 4 	4	
	7680 x 1080	Unit 5 	4	
4 x 5	1920 x 4320	Unit 1 	4	
	1920 x 4320	Unit 2 	4	
	1920 x 4320	Unit 3 	4	
	1920 x 4320	Unit 4 	4	
	7680 x 1080	Unit 5 	4	



Table 3-1 QuadPlex Layouts

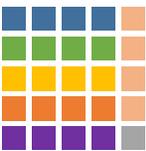
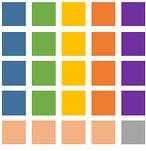
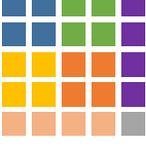
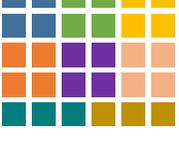
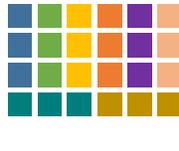
Layout	Input	QuadPlex	# Outputs	Layout
5 x 5	7680 x 1080	Unit 1 	4	
	7680 x 1080	Unit 2 	4	
	7680 x 1080	Unit 3 	4	
	7680 x 1080	Unit 4 	4	
	7680 x 1080	Unit 5 	4	
	1920 x 4320	Unit 6 	4	
	1920 x 1080	direct 	1	
5 x 5	1920 x 4320	Unit 1 	4	
	1920 x 4320	Unit 2 	4	
	1920 x 4320	Unit 3 	4	
	1920 x 4320	Unit 4 	4	
	1920 x 4320	Unit 5 	4	
	7680 x 1080	Unit 6 	4	
	1920 x 1080	direct 	1	
5 x 5	3840 x 2160	Unit 1 	4	
	3840 x 2160	Unit 2 	4	
	3840 x 2160	Unit 3 	4	
	3840 x 2160	Unit 4 	4	
	1920 x 4320	Unit 5 	4	
	7680 x 1080	Unit 6 	4	
	1920 x 1080	direct 	1	
6 x 5	3840 x 2160	Unit 1 	4	
	3840 x 2160	Unit 2 	4	
	3840 x 2160	Unit 3 	4	
	3840 x 2160	Unit 4 	4	
	3840 x 2160	Unit 5 	4	
	3840 x 2160	Unit 6 	4	
	5760 x 1080	Unit 7 	3	
	5760 x 1080	Unit 8 	3	
6 x 5	1920 x 4320	Unit 1 	4	
	1920 x 4320	Unit 2 	4	
	1920 x 4320	Unit 3 	4	
	1920 x 4320	Unit 4 	4	
	1920 x 4320	Unit 5 	4	
	1920 x 4320	Unit 6 	4	
	5760 x 1080	Unit 7 	3	
	5760 x 1080	Unit 8 	3	
x6 Layouts				



Table 3-1 QuadPlex Layouts

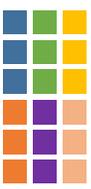
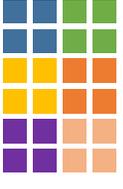
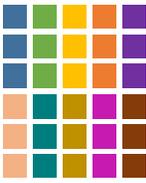
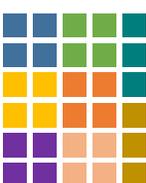
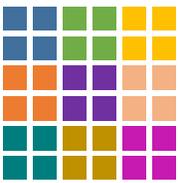
Layout	Input	QuadPlex	# Outputs	Layout
2 x 6	3840 x 2160	Unit 1 	4	
	3840 x 2160	Unit 2 	4	
	3840 x 2160	Unit 3 	4	
2 x 6	1920 x 4320	Unit 1 	4	
	1920 x 4320	Unit 2 	4	
	3840 x 2160	Unit 3 	4	
3 x 6	1920 x 3240	Unit 1 	3	
	1920 x 3240	Unit 2 	3	
	1920 x 3240	Unit 3 	3	
	1920 x 3240	Unit 4 	3	
	1920 x 3240	Unit 5 	3	
	1920 x 3240	Unit 6 	3	
3 x 6	5760 x 1080	Unit 1 	3	
	5760 x 1080	Unit 2 	3	
	5760 x 1080	Unit 3 	3	
	5760 x 1080	Unit 4 	3	
	5760 x 1080	Unit 5 	3	
	5760 x 1080	Unit 6 	3	
3 x 6	3840 x 2160	Unit 1 	4	
	3840 x 2160	Unit 2 	4	
	3840 x 2160	Unit 3 	4	
	1920 x 3240	Unit 4 	3	
	1920 x 3240	Unit 5 	3	
4 x 6	3840 x 2160	Unit 1 	4	
	3840 x 2160	Unit 2 	4	
	3840 x 2160	Unit 3 	4	
	3840 x 2160	Unit 4 	4	
	3840 x 2160	Unit 5 	4	
	3840 x 2160	Unit 6 	4	



Table 3-1 QuadPlex Layouts

Layout	Input	QuadPlex	# Outputs	Layout
5 x 6	1920 x 3240	Unit 1 	3	
	1920 x 3240	Unit 2 	3	
	1920 x 3240	Unit 3 	3	
	1920 x 3240	Unit 4 	3	
	1920 x 3240	Unit 5 	3	
	1920 x 3240	Unit 6 	3	
	1920 x 3240	Unit 7 	3	
	1920 x 3240	Unit 8 	3	
	1920 x 3240	Unit 9 	3	
	1920 x 3240	Unit 10 	3	
5 x 6	3840 x 2160	Unit 1 	4	
	3840 x 2160	Unit 2 	4	
	3840 x 2160	Unit 3 	4	
	3840 x 2160	Unit 4 	4	
	3840 x 2160	Unit 5 	4	
	3840 x 2160	Unit 6 	4	
	1920 x 3240	Unit 7 	3	
	1920 x 3240	Unit 8 	3	
6 x 6	3840 x 2160	Unit 1 	4	
	3840 x 2160	Unit 2 	4	
	3840 x 2160	Unit 3 	4	
	3840 x 2160	Unit 4 	4	
	3840 x 2160	Unit 5 	4	
	3840 x 2160	Unit 6 	4	
	3840 x 2160	Unit 7 	4	
	3840 x 2160	Unit 8 	4	
	3840 x 2160	Unit 9 	4	



3.3.1 Calculating a Custom Layout

The following formula will help you calculate the number of *QuadPlex* devices needed for any given layout:

`(# of displays , 4 outputs/device) + remainder if any`

For example, a 2x7 video wall has 14 displays. Dividing 14 by the 4 outlets per *QuadPlex* device yields 3 plus a remainder of 2. You therefore need four (4) *QuadPlex* devices, where either:

■ **Option A:**

- ◆ Three *QuadPlex* devices will have displays connected to all 4 outputs.
- ◆ One *QuadPlex* device will have displays connected to 2 outputs.

■ **Option B:**

- ◆ Two *QuadPlex* devices will have displays connected to all 4 outputs.
- ◆ One *QuadPlex* device will have displays connected to 3 outputs.

By contrast, a 2x10 layout has 20 displays. Dividing 20 by the 4 outlets per *QuadPlex* device yields 5 with no remainder. All five *QuadPlex* devices in this layout will have displays connected to all 4 ports.

If there is an even number of both rows and columns, then there will never be a remainder, and every *QuadPlex* device will have all four outlets in use.



CHAPTER 4

FIRMWARE UPDATES

RGB Spectrum periodically updates product firmware to add new features or improve product performance. To check for firmware updates for your RGB Spectrum product:

1. Visit the **Partner Portal** section of our web site at <http://www.rgb.com/partners/>.
2. Either:
 - ◆ Click the **Login** button to access the portal with an existing username and password.
 - ◆ Create a new account by clicking the **Register** button and then following the on-screen instructions.
3. After logging in to the portal, select **Product Firmware**.
4. To determine your current firmware version number, either:
 - ◆ In the *QuadPlex* application, hover your mouse cursor over the desired *QuadPlex* device to open a pop-up with device information that includes the firmware version.
 - ◆ At the QuadHead device, press the **Device Information** button once to open the on-screen menu, then look for the **Firmware Version** on the screen.
5. Download the new *QuadPlex* firmware to the remote PC where you have the QuadView application installed, and then extract it to a folder on that system (such as `C:\QuadPlexFW`). The remote PC must have at least 1 GB of available disk space.
6. If needed, download the *QuadPlex* firmware utility to the remote PC where you have the QuadView application installed, and install the updater utility by double-clicking it and then following the on-screen instructions.
7. Proceed to [“Before Updating the Firmware” on page 48](#).



4.1 Before Updating the Firmware

Before updating your *QuadPlex* firmware:

- The firmware update process requires the *QuadPlex* device to reboot at least once. Make sure you are running the *QuadPlex* devices and the *QuadPlex* Firmware Updater on an established network that includes a Dynamic Host Configuration Protocol (DHCP) server that will assign the same IP address to each device as it reappears on the network. Alternatively, consult your network administrator to assign fixed IP addresses to your *QuadPlex* devices.
- If your system does not have access to a Domain Name Service (DNS) server, then configure your system to use a fixed IP address (such as local host – 127.0.0.1) as the DNS server. Otherwise, the firmware update process may take a long time to complete.
- Be sure to only run one instance of the *QuadPlex* Firmware Updater on your network at a time, to avoid potential conflicts with *QuadPlex* devices.

4.2 Updating the Firmware

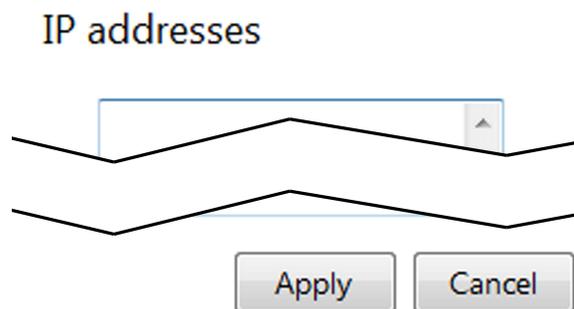
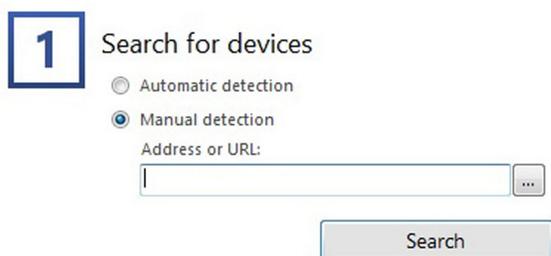
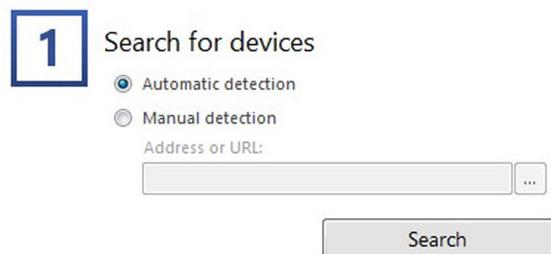
To update the firmware on your *QuadPlex* devices:

1. On the remote PC, navigate to the folder containing the *QuadPlex* Firmware Updater, and then launch the application.

The **1 - Search for devices** window appears.

2. Either:

- ◆ Check the **Automatic** detection radio button to have the updater search for all *QuadPlex* devices on the same subnet as the remote PC.
- ◆ Check the **Manual** detection radio button, then enter the IP address(es) of each *QuadPlex* device you want to locate in the **Address or URL** field. You may enter multiple IP addresses by separating each address with a space (e.g. 192.168.1.100 192.168.1.101 192.168.1.102).
- ◆ Check the **Manual** detection button, then click the **Browse** button (three dots) next to the **Address or URL** field, and then enter the IP addresses of your *QuadPlex* devices. Place each IP address on a separate line by pressing [ENTER] after each IP address, and then click Apply when finished.





3. Click **Search** to begin searching for devices, either automatically or using the IP address(es) you supplied in Step 2.
 - ◆ If needed, you can pause the search by clicking **Stop**.
 - ◆ You can restart paused searches by clicking **Search** again.The system returns a list of discovered *QuadPlex* devices.
4. Select the devices you want to update. During device selection, you may:
 - ◆ Change the sort order of the device tiles by right-clicking the device list box, selecting **Sort by**, and then selecting the sorting order to use.
 - ◆ Deselect all devices by right-clicking the device list box, and then selecting **Unselect all devices**.
5. Click **Update**.



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CHAPTER 5

CONTACT INFORMATION

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Phone: +1-510-814-7000, option 3

5.3 Technical Support

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Phone: +1-510-814-7000, option 1

Web: rgb.com/support

QuadPlex™

4K multi-display processor

User Guide

April, 2020

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