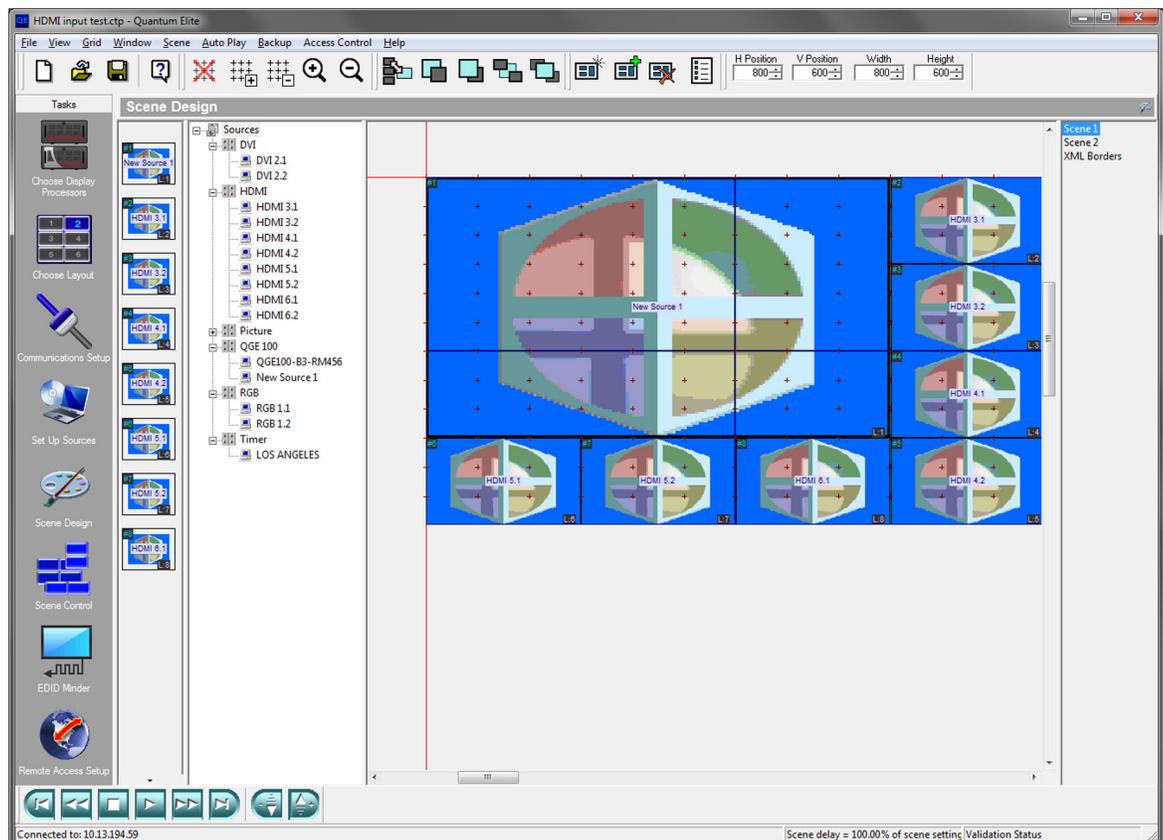


# Quantum Control Software

Quantum Elite Control Software  
Quantum Connect Control Software



# Safety Instructions

## Safety Instructions • English

**WARNING:** This symbol, ⚠, when used on the product, is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

**ATTENTION:** This symbol, ⚠, when used on the product, is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

For information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics, see the Extron Safety and Regulatory Compliance Guide, part number 68-290-01, on the Extron website, [www.extron.com](http://www.extron.com).

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**ATTENTION:** Ce pictogramme, ⚠, lorsqu'il est utilisé sur le produit, signale à l'utilisateur des instructions d'utilisation ou de maintenance importantes qui se trouvent dans la documentation fournie avec le matériel.

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**ATENCIÓN:** Este símbolo, ⚠, cuando se utiliza en el producto, avisa al usuario de la presencia de importantes instrucciones de uso y mantenimiento recogidas en la documentación proporcionada con el equipo.

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Для получения информации о правилах техники безопасности, соблюдении нормативных требований, электромагнитной совместимости (ЭМП/ЭДС), возможности доступа и других вопросах см. руководство по безопасности и соблюдению нормативных требований Extron на сайте Extron: [www.extron.com](http://www.extron.com), номер по каталогу - 68-290-01.

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**注意:** ⚠ 产品上的这个标志意在提示用户设备随附的用户手册中有重要的操作和维护(维修)说明。

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## Korean

**경고:** 이 기호 ⚠ 가 제품에 사용될 경우, 제품의 인클로저 내에 있는 접지되지 않은 위험한 전류로 인해 사용자가 감전될 위험이 있음을 경고합니다.

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## Conventions Used in this Guide

### Notifications

The following notifications are used in this guide:

**ATTENTION:**

- Risk of property damage.
- Risque de dommages matériels.

**NOTE:** A note draws attention to important information.**TIP:** A tip provides a suggestion to make working with the application easier.

### Software Commands

Commands are written in the fonts shown here:

```
^ARMerge Scene, ,Op1 scene 1,1 ^B 51 ^W^C  
[Ø1] RØØØ4 ØØ3ØØ ØØ4ØØ ØØ8ØØ ØØ6ØØ [Ø2] 35 [17] [Ø3]
```

```
Esc[X1 *X17* X20* X23* X21]CE ←
```

**NOTE:** For commands and examples of computer or device responses mentioned in this guide, the character “Ø” is used for the number zero and “O” is the capital letter “o.”

Computer responses and directory paths that do not have variables are written in the font shown here:

```
Reply from ØØ8.132.18Ø.48: bytes=32 times=2ms TTL=32  
C:\Program Files\Extron
```

Variables are written in slanted form as shown here:

```
ping xxx.xxx.xxx.xxx -t  
SOH R Data STX Command ETB ETX
```

Selectable items, such as menu names, menu options, buttons, tabs, and field names are written in the font shown here:

```
From the File menu, select New.  
Click the OK button.
```

## Specifications Availability

Product specifications are available on the Extron website, [www.extron.com](http://www.extron.com).

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# Introduction

This section gives an overview of the guide and features of the Quantum Elite Control Software and Quantum Connect Control Software. Topics include:

- **About this Guide**
- **Overview of the Quantum Control Software**
- **Features**

## About this Guide

This guide provides detailed information about the Quantum Elite Control Software and Quantum Connect Control Software, including software installation and configuration. This guide also describes how these applications control the Quantum Elite and Quantum Connect videowall processors.

The features and functionality described in this guide are based on using version 1.8 of the Quantum control software applications with Quantum Elite and Quantum Connect firmware version 9.0 and later. For the latest details on firmware and software, visit [www.extron.com](http://www.extron.com).

In this guide, the term “Quantum Control Software” refers to both the Quantum Elite Control Software and Quantum Connect Control Software. The terms “Quantum” and “Quantum processor” refer to both the Quantum Elite and Quantum Connect videowall processors. Notes distinguish where features differ between the Quantum Elite and Connect Control Software programs and between the Quantum Elite and Connect processors.

## Overview of the Quantum Control Software

Quantum Elite Control Software and Quantum Connect Control Software are Microsoft® Windows®-based applications that are used to control the Quantum Elite and Quantum Connect videowall processors. These products form part of the Extron Quantum series.

With the Quantum Control Software, the Quantum Elite and Connect can display multiple image sources on a single target display or multiple target displays. External analog and digital video sources (such as PAL or NTSC) and external analog and digital graphics sources are supported. The Quantum processors also support the use of internal image files (such as BMP, JPG, GIF, or PNG formats) or RGB computer graphics captured using the QGE 100 Quantum Graphics Encoder.

The feature set supported by the Quantum Elite Control Software differs slightly from the Quantum Connect Control Software. These differences are distinguished in this user guide.

**NOTE:** Quantum Elite Control Software is not compatible with the Quantum Connect processor and vice versa.

## Features

Features of the Quantum Control Software include:

- The user interface is organized into a series of tasks so that you can easily navigate through them and set up the videowall.
- A virtual canvas provides an on-screen layout for the videowall where windows can be added, sized, and positioned.
- Custom videowall configurations can be saved as window presets for future recall.
- The software lets you create a custom user interface so that the system operator can easily recall the presets (scenes).

### Scene control

Each source is displayed in a resizable window within the Quantum Control Software, allowing multiple sources to be placed in any position on the display.

The Quantum Control Software stores different source layouts for the display as *scenes*, which are presets that include the size, position, and contents of one or more windows. Scenes can be recalled in any order using a customizable user interface or in a predefined order at specific time intervals using the Auto Play function (see the [Creating a Project](#) section beginning on page 41 and the [Viewing a Project](#) section beginning on page 61).

Scenes can also be recalled remotely via RS-232 (see [Serial Commands](#) beginning on page 70).

# Installation and Operation

This section describes the software installation and communication setup for the Quantum Control Software and describes the software operation. Topics include:

- [Requirements](#)
- [Software Installation](#)
- [Configuring the Hardware](#)
- [Using the Quantum Control Software](#)

## Requirements

### System Requirements

To ensure that the Quantum Control Software functions correctly and reliably, you must install it on a computer that meets or exceeds the following criteria:

	Minimum	Recommended
Operating System	Windows XP®	Windows 7 or Windows 8 (32-bit or 64-bit)
Processor Speed	1 GHz	1 GHz or higher
Memory (RAM)	1 GB	1 GB or higher
Hard Disk Free Space	30 MB	More than 30 MB
Graphics	1024x768, 65K colors (16-bit)	1920 x 1080, 16.7M colors (32-bit)
Network Card (Ethernet)	10Base-T	100BASE-T

## Network Requirements

The Quantum Elite and Quantum Connect use specific network ports for communication. Ensure that these ports are accessible.

### Quantum Elite

The Quantum Elite uses the following port numbers:

	Port Number	Use
<b>Control</b>	1237	Quantum discovery (UDP)
	7004	System configuration (TCP)
	7005	Scene control (TCP)
	7006	System events (TCP)
<b>Media 1 and Media 2</b>	5000	Multicast reception of QGE 100 data stream (UDP)
	37533	Discovery via Extron QGE 100 Computer Screen Capture IP Encoder (UDP)
	37532	Reception of QGE 100 data stream (TCP)

### Quantum Connect

The Quantum Connect uses the following port numbers:

	Port Number	User
<b>Control</b>	1238	Quantum discovery (UDP)
	7007	System configuration (TCP)
	7008	Scene control (TCP)
	7006	System events (TCP)

## Image Processing Hardware

The Quantum Control Software is used in conjunction with a Quantum Elite or Quantum Connect videowall processor. Quantum Elite hardware consists of a 4U or 6U card frame into which various input and output cards are installed. The Quantum Connect is available only as a 4U frame. See the *Quantum User Guide* for more information about the Quantum Elite and Quantum Connect, including connector pinouts and processing capability.

Except for defining an IP address, it is not necessary to perform any setup procedures on the Quantum processor itself. System configuration is done through the control software.

## Software Installation

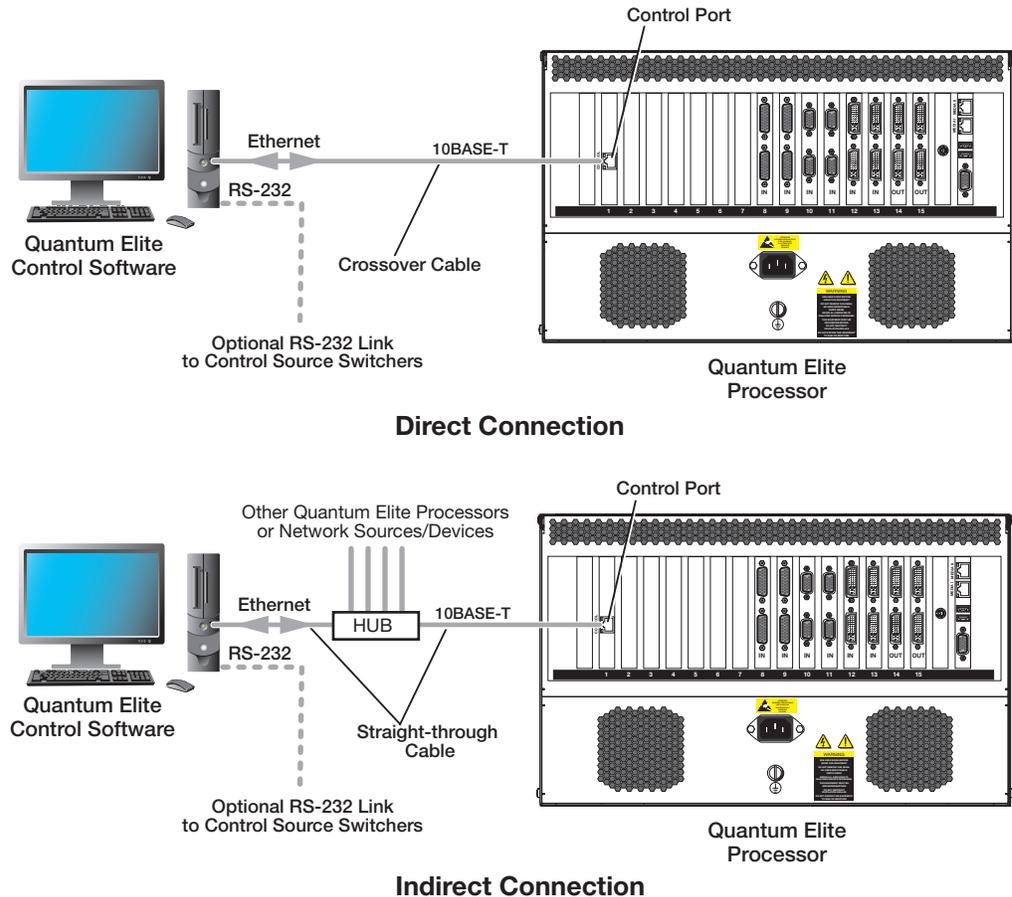
To install the Quantum Control Software from the Extron Videowall Processing disc:

1. Insert the Extron Videowall Processing disc into the CD or DVD drive of your computer.
2. From the Windows desktop, open **My Computer** and select the appropriate disk drive.
3. Open the Quantum Connect or the Quantum Elite folder, depending on your device.
4. Open the appropriate software subfolder for your Quantum processor.
5. Run the `Quantum Connect_Setupvn.nnn.exe` file (for the Quantum Connect) or the `Quantum Elite_Setupvn.nnn.exe` file (for the Quantum Elite).
6. Follow the remaining system prompts to complete the installation.

## Configuring the Hardware

### Connecting to a Quantum Elite or Quantum Connect

The computer with the installed Quantum Control Software communicates with the Quantum via Ethernet. This can either be a direct or indirect connection, as shown in figure 1. Connection to a single videowall processor can use either method, but multiple videowall processors must use the indirect method (for example, via a hub).



**Figure 1. Methods of Connecting the Quantum Elite Control Software Computer to a Quantum Elite Processor**

- A **direct connection** uses a single cable that is connected between the network port of the computer and the Quantum Elite or Quantum Connect. You must use a crossover cable; a straight-through cable does not work. The network port on the computer must be capable of supporting a 10BASE-T connection as required by the Quantum.
- An **indirect connection** is made via a hub, switch, or local area network, using a straight-through cable. A crossover cable does not work. The hub or switch connected to the computer must be capable of supporting a 10BASE-T connection as required by the Quantum.

Extron recommends using only CAT 5 shielded twisted pair cables. A 16-foot crossover cable is supplied with the Quantum processor.

See the *Quantum User Guide* for further details on cable requirements and connector pinouts.

## Setting the IP Address of the Computer

The network port on the computer must be configured to use the same communications protocol as the Quantum, which is TCP/IP. The computer must also be allocated an IP address on the same subnet as the Quantum (see [IP Addressing](#) on page 95).

To change the IP address for your computer, follow the instructions provided in your Windows program help file.

**NOTE:** If the computer is already connected to (and configured for) an existing network, consult the network administrator before making any changes. In addition, you need to be logged on with administrative rights before you can change Windows network settings.

## Testing the Ethernet Link

To test the operation of the Ethernet link between the computer and the Quantum, you can use the Ping utility as follows:

1. Enter a ping command from your desktop.
  - **Windows XP, 2000, and NT:**
    - a. On the desktop, click **Start > Run**. The Run dialog box opens.
    - b. In the Run dialog box, type the following command:  
`ping nnn.nnn.nnn.nnn -t`  
where `nnn.nnn.nnn.nnn` is the IP address of the Quantum that you want to test.
    - c. Click **OK** or press the <Enter> key.
  - **Windows 7:**
    - a. On the desktop, click **Start**.
    - b. In the **Search programs and files** field at the bottom of the **Start** menu, enter `ping nnn.nnn.nnn.nnn -t` and press <Enter>.
  - **Windows 8:**
    - a. Search for CMD.
    - b. Double-click the cmd.exe application icon.
    - c. On the command line, type the following command:  
`ping nnn.nnn.nnn.nnn -t`  
where `nnn.nnn.nnn.nnn` is the IP address of the Quantum that you want to test.
    - d. Click **OK** or press the <Enter> key. A command window opens.

One of the following response messages is displayed, indicating the state of the communications link:

- Reply from `nnn.nnn.nnn.nnn`: bytes=`nn` times=`nms` TTL=`nn`

This is the desired response, which indicates that the device at the specified address is communicating directly. The response time value may vary according to network traffic.

**Example:** If you send a ping command to a Quantum with the address 208.132.180.48, you should get a message similar to the following:

Reply from `208.132.180.48`: bytes=32 times=2ms TTL=32

- **Request timed out**

There has been no response from the specified address. Either the videowall processor is not receiving data from the computer or is not sending data back. Check that the Quantum Elite or Quantum Connect is powered up and set to the same address to which you sent the ping command. Also, check that you are using the correct type of connecting cables for your setup (straight-through or crossover) and that they are not damaged or faulty.

- **Reply from *nnn.nnn.nnn.nnn*: Destination host unreachable,**

The IP address of the computer is not in the same class as that of your Quantum (see **IP Addressing** on page 95). See your Windows program help file for instructions for changing your computer IP address.

2. To close the ping utility, press <Ctrl + C> on your keyboard or click the **X** button in the upper-right corner of the command window.

## Using the Quantum Control Software

### Starting and Exiting the Quantum Control Software

You can run the Quantum Control Software using any of the following methods:

- Double-click the **Quantum Elite** or **Quantum Connect** icon on the desktop.
- From the desktop, click **Start > All Programs > Extron Electronics > Quantum Elite** (or **Quantum Connect**).
- Double-click a project file (the file name has a CTP extension) in Windows Explorer.

If the Access Control feature has been enabled, a **Login** dialog box is displayed. Select an appropriate logon level and enter a password (see the **Access Control** section beginning on page 81).

The Quantum Control Software splash screen appears for a few seconds followed by the main application window (see **Main Application Window** on the next page).

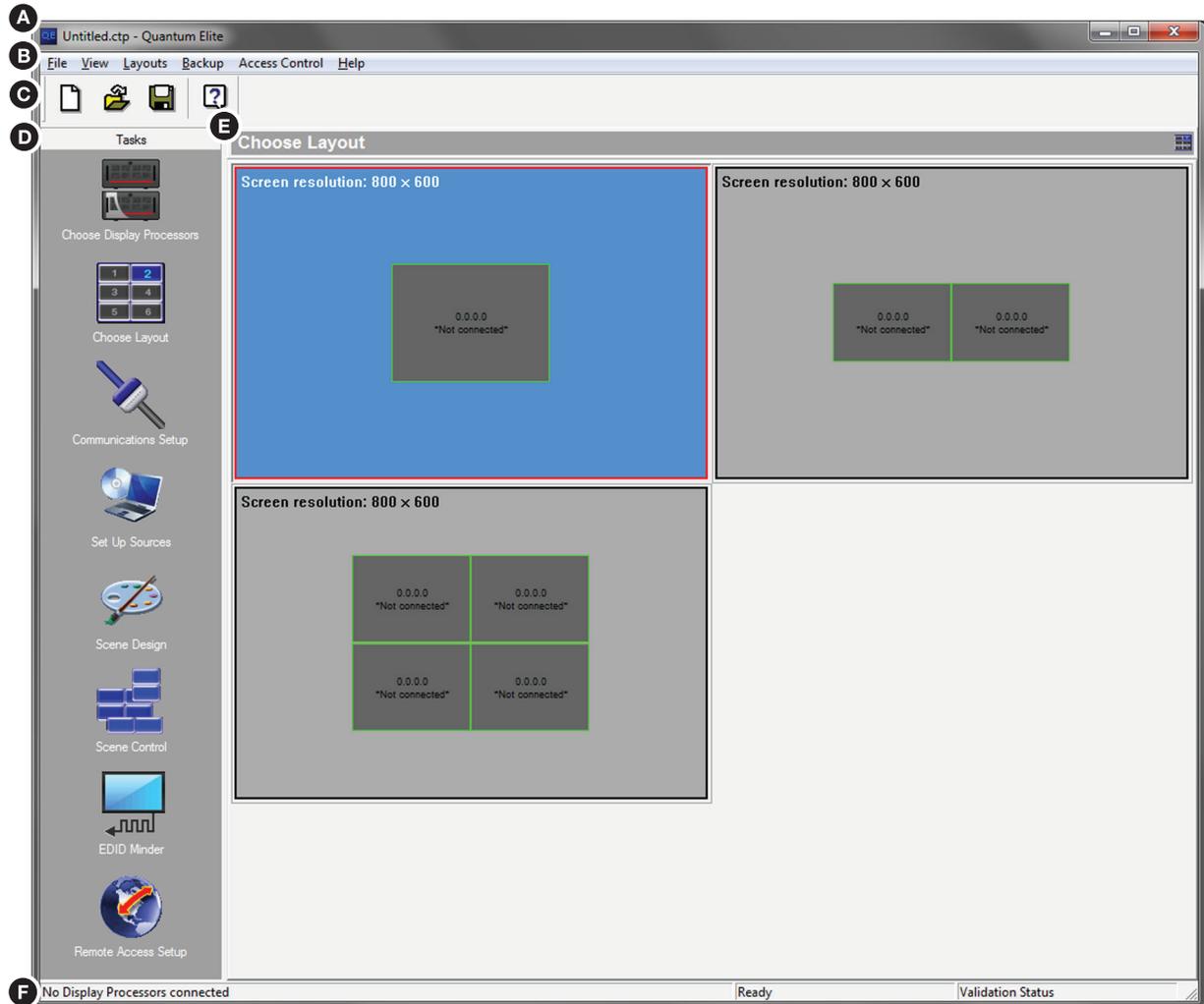
You can exit the Quantum Control Software using any of the following methods:

- From the **File** menu, select **Exit**.
- Click the  button at the top right corner of the application window.
- Double-click the  icon in the top left corner of the application window, or single-click the same icon and select **Close** from the drop-down menu.

If you have not saved your project, a message is displayed asking whether you want to save any changes. Click **Yes** or **No** to close the prompt.

## Main Application Window

The Quantum Control Software application window contains the following elements:



**Figure 2. Elements of the Main Application Window**

- |          |                  |          |                   |
|----------|------------------|----------|-------------------|
| <b>A</b> | <b>Title bar</b> | <b>D</b> | <b>Taskbar</b>    |
| <b>B</b> | <b>Menu bar</b>  | <b>E</b> | <b>Workspace</b>  |
| <b>C</b> | <b>Toolbar</b>   | <b>F</b> | <b>Status bar</b> |

- A Title bar** — Shows the name of the currently loaded project.
- B Menu bar** — Provides a selection of drop-down menus to access various functions in the Quantum Control Software. Most of the menu functions can also be performed by buttons on the toolbars. The available menus change according to which task is currently selected in the taskbar.
- C Toolbars** — The various toolbars within the Quantum Control Software allow quick access to the most commonly used functions within the currently selected task. Most of these functions can also be performed using the menu bar. To hide or show a toolbar for the current task, open the **View** menu and select the desired toolbar. A check mark beside the menu option denotes that the toolbar is open in the application. You can also click and drag open toolbars to rearrange them in the application window.

- D Taskbar** — Each major task within the Quantum Control Software is represented by an icon in the taskbar. To select a task, click the appropriate button. This displays the workspace, menus, and toolbars associated with the selected task.

The standard set of tasks includes:

- Choose Display Processors
- Choose Layout
- Communications Setup
- Set Up Sources
- Scene Design
- Scene Control
- Remote Access Setup
- EDID Minder

Fewer tasks may be displayed depending on security settings.

- E Workspace** — Each task in the taskbar has its own workspace. The workspace contains the controls and functionality needed to complete the task.
- F Status bar** — Shows information about the current status of the Quantum Control Software. From the **View** menu, select **Status Bar** to hide or show the status bar.

## Starting a New Project

When you run the Quantum Control Software for the first time after installation, a new untitled project (presentation) is created with no system configuration settings (see [figure 2](#) on the previous page).

Thereafter, you can start a new untitled project by either of the following methods:

- Retain the existing system configuration (for example, to create a new project for the same system) by one of the following methods:
  - Click the  button on the main toolbar.
  - From the **File** menu, select **New**.
  - Press <Ctrl + N> on the keyboard.
- Create a completely new project with no system configuration (for example, to make a new project for a different system). To create a new project:
  3. Exit the Quantum Control Software (see [Starting and Exiting the Quantum Control Software](#) on page 7 for instructions).
  4. While holding down the <Shift> key on the keyboard, run the Quantum Control Software (see [Starting and Exiting the Quantum Control Software](#)). When the Quantum Control Software main screen opens, release the <Shift> key.

To give your untitled project a name, save it as the desired name (see [Saving a Project](#) on page 10).

See the [System Configuration](#) section beginning on page 12 if you are creating a project for a new system or need to make changes to the existing configuration.

See the [Creating a Project](#) section beginning on page 41 for information about placing sources on the target display.

## Loading an Existing Project

1. Click the  button on the main toolbar  
- or -  
From the **File** menu, select **Open**  
- or -  
Press <Ctrl + O> on the keyboard.  
The **Open** dialog box appears.
2. Locate the file to be loaded and click **Open**.

## Saving a Project

To save the current project:

1. Click the  button on the main toolbar. You can also select **Save** from the **File** menu or press <Ctrl + S> on the keyboard.
2. If the project has not been saved previously (untitled), the **Save As** dialog box opens, allowing you to specify a name.

To save a copy of the open project:

1. From the **File** menu, select **Save As**. The **Save As** dialog box opens.
2. In the **File Name** field, enter a name for the project copy. A CTP extension is automatically appended to the file name.
3. Click **Save** to save the file.

When creating a project, save your work regularly. You can also have the Quantum Control Software automatically create backup files at regular intervals (see “Using Auto-Backup”).

## Using Auto-backup

The Quantum Control Software can automatically back up your project at specific intervals. In the event that any changes are lost before saving (such as due to a power outage), you may be able to limit the amount of work you lost by restoring the last auto-backup file.

### Setting the backup timer

1. From the **Backup** menu, select **Setup Backup Timer**. The **Backup Setup Dialog** box opens.



**Figure 3. Backup Setup Dialog Box**

2. Ensure that the **Disable Backup** check box is cleared to enable auto-backup.

**NOTE:** If you do not want to use auto-backup, ensure that the **Disable Backup** check box is selected.

3. In the **Hours** and **Minutes** fields, enter the values to set the desired interval between each backup.
4. In the **Backup Folder** field, enter the full path of the Windows folder where the backup files are to be saved (by default, these are saved in the Quantum Elite or the Quantum Connect folder)  
  
- or -  
  
In the **Backup Folder** field, click **Browse** to navigate to the folder where the files are to be saved.
5. Click **OK**.

### Restoring an auto-backup file

1. From the **Backup** menu, select **Restore**. If you made changes to the current file, you are prompted to save the file first.
2. In the Save prompt, click **Yes** to save the current file. The **Save As** dialog box opens if it is an untitled file.  
  
- or -  
  
Click **No** to exit the current file without saving.  
  
The **Open** dialog box is displayed.

**NOTE:** Backup files are contained within folders according to the date they were created. The files are named with the project title and the time they were created.

3. Double-click the folder for the desired date to open it.
4. Select the backup file that you want to restore and click **Open**.

# System Configuration

This section describes the four procedures or tasks associated with configuring the Quantum Control Software to work correctly with a Quantum videowall processor. Topics include:

- [Choosing a Display Processor](#)
- [Layout Configuration](#)
- [Communications Setup](#)
- [Setting Up Sources](#)
- [Defining EDID](#)

The tasks described in this section can be completed in any order but the order in which they are listed above is recommended. Unless otherwise stated, all configuration settings described in this section are saved in the project (CTP) file.

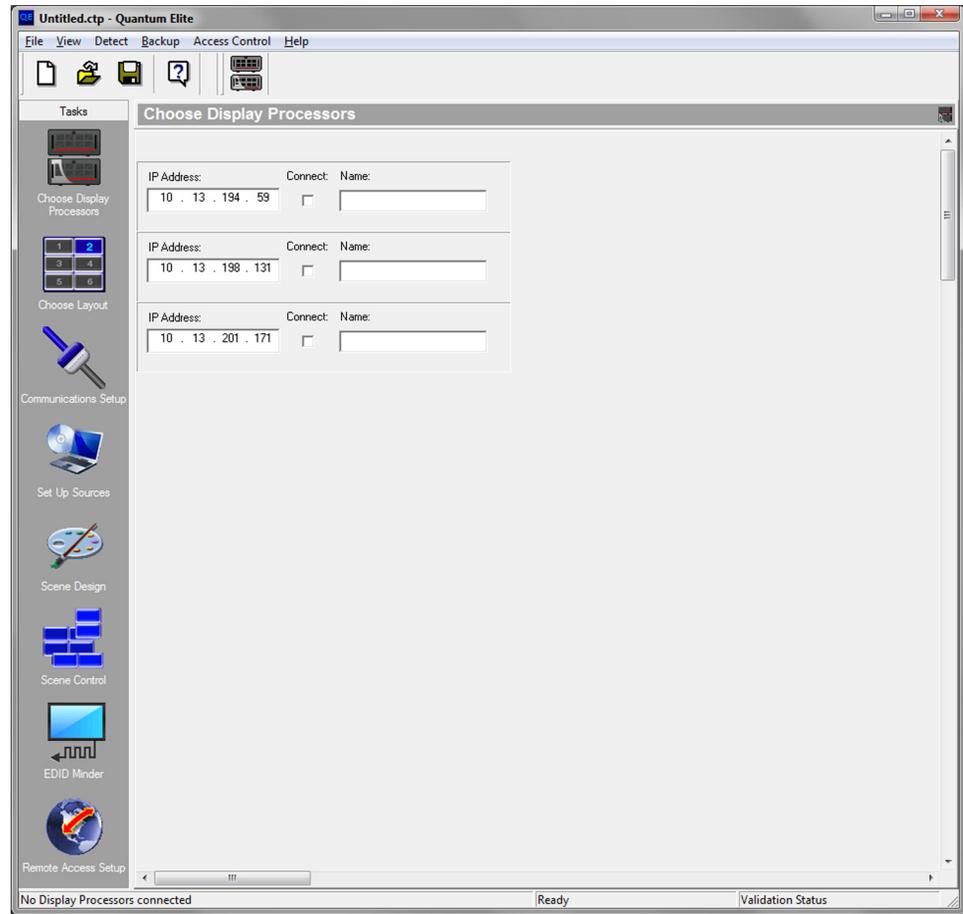
## Choosing a Display Processor

Before the Quantum Control Software can control a Quantum, it must detect and be connected to the processor via the Choose Display Processors task.

**NOTE:** Quantum Connect does not support the use of multiple processors.

1. Click the **Choose Display Processors** button in the taskbar (see **figure 2**, **D**, on page 8).

The Choose Display Processors workspace opens.



**Figure 4. Choose Display Processors Workspace**

2. Click the  button on the main application window toolbar (see figure 4) - or -

From the **Detect** menu, select **Detect**.

The Quantum Control Software polls for any Quantum processors accessible via its Ethernet port. An information panel is displayed for each processor detected, as shown in figure 4.

3. Select the **Connect** check box to the right of the IP address of the desired processor. If you are using more than one Quantum, connect to each one in the same manner.

**NOTE:** If the check box does not stay selected, this indicates that the Quantum Control Software is unable to establish or maintain a connection (for instance, due to a faulty cable or the Quantum processor and PC not being on the same IP subnet).

You can disconnect from a Quantum processor by clearing its **Connect** check box.

## Assigning a Name to a Quantum Processor

If you are using the Quantum Control Software to control more than one processor, you can give a name to each Quantum that easily identifies its role within the system. This is especially useful when you are assigning processors to the target display screens.

For example, if you are using two processors driving the left and right sides of the target display array, you can name the two processors `Left` and `Right`, respectively.

To assign a name, enter a suitable name in the **Name** field for the processor.

## Layout Configuration

### Choosing a Display Layout

The target display can be a single screen or several screens interlocked to form a larger display area. Therefore, you need to define the layout within the Quantum Control Software.

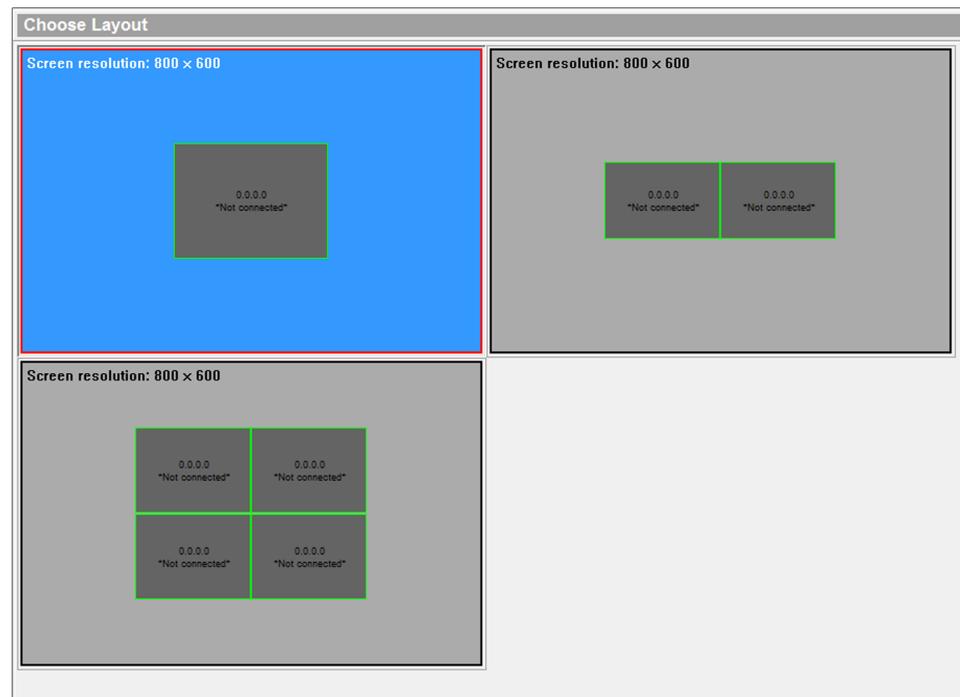
The selected layout appears as the virtual display in the Scene Design task (see the [Creating a Project](#) section beginning on page 41). This allows you to place sources exactly where you want them to appear on the actual display array.

Use the Choose Layout task to choose and configure the display layout.

To choose and configure a layout:

1. Click the **Choose Layout** button on the taskbar.

The Choose Layout workspace opens.

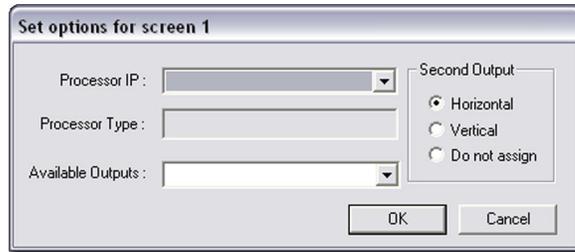


**Figure 5.** Choose Layout Workspace

2. In the Choose Layout workspace, click the display layout diagram that matches the arrangement of your target display screens. The currently selected layout is highlighted with a blue background and red outline.

**TIP:** If the default layouts do not match your display configuration, see [Designing a New Layout](#) on page 17 or [Modifying an Existing Layout](#) on page 18.

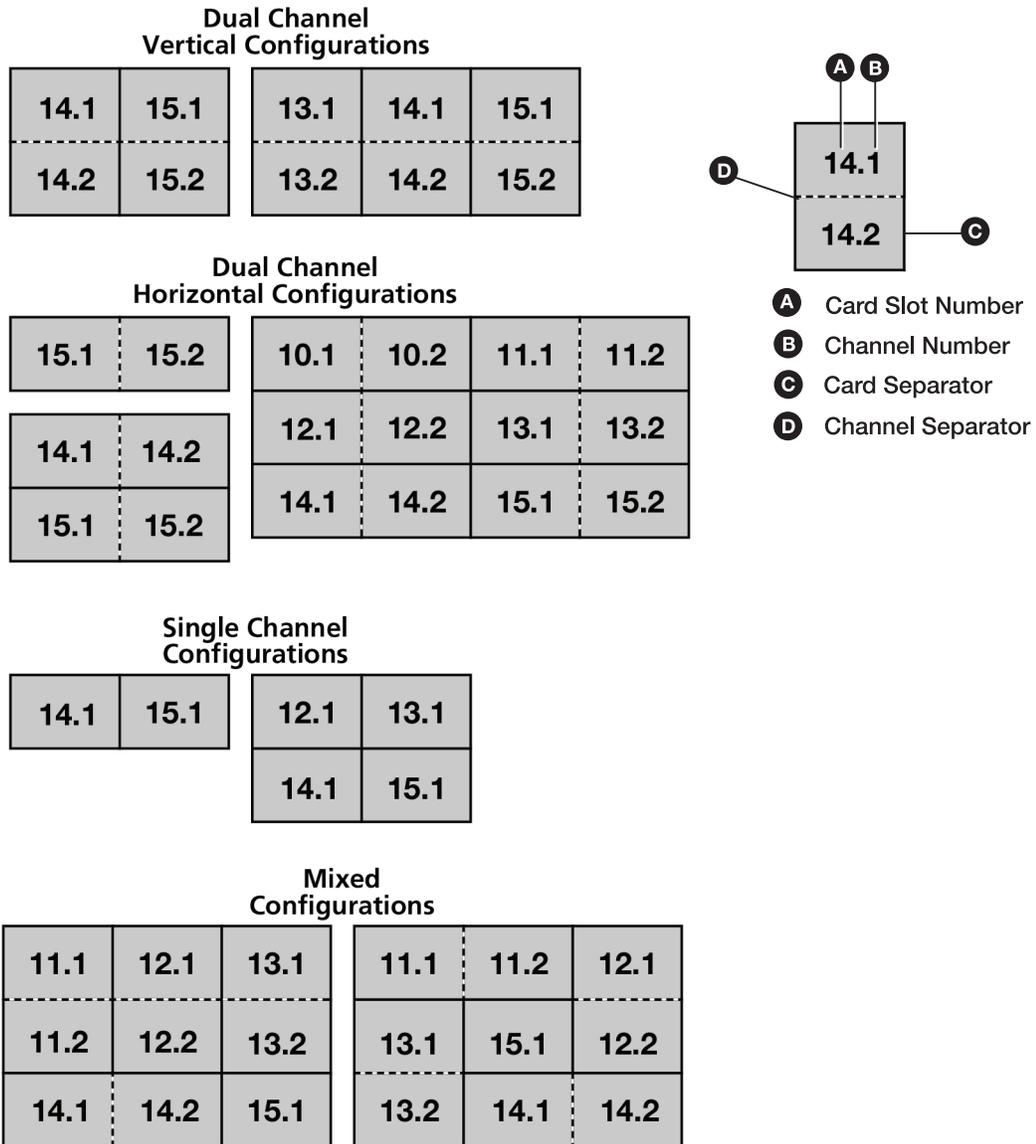
3. Right-click a dark gray screen rectangle (usually starting with the top left screen) in the chosen layout and select **Change Screen Processor IP** from the drop-down list. The following dialog box opens:



**Figure 6. Set Options Dialog Box**

4. From the **Processor IP** drop-down list, select the IP address of the processor you are using. The **Processor IP** drop-down list displays all processors currently connected to the Quantum Control Software via the Choose Display Processors task. If no processors are listed, connect to one (see [Choosing a Display Processor](#) on page 12).
5. The **Available Outputs** drop-down list displays currently unassigned output cards (by slot number). Select one to assign to this screen.

**NOTE:** There are two output channels on each output card. Selecting from the **Available Outputs** list assigns the primary output (channel 1) to the screen. The secondary output (channel 2) is assigned automatically using the Second Output setting (see [figure 7](#) on the next page for examples).



**Figure 7. Example Display Layouts and Channel Configurations**

6. In the Second Output panel, select how the secondary output should be assigned (see [figure 6](#) on the previous page). Choose from:
  - **Horizontal** — The secondary output is assigned to the screen immediately to the right of the primary output (when viewed from the front of the display).
  - **Vertical** — The secondary output is assigned to the screen immediately below the primary output.
  - **Do not Assign** — The secondary output is not assigned; only the primary output is used.
7. Click **OK** to confirm the assignments.

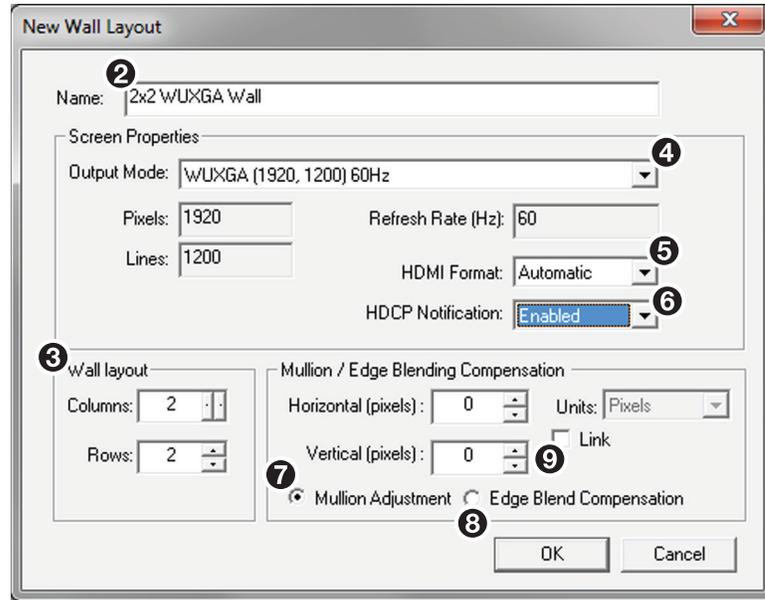
**NOTE:** Screens that have been assigned or mapped appear with green backgrounds in the layout diagram. Unassigned screens have gray backgrounds.

8. Repeat steps 3 through 7 for each remaining screen in the layout.

## Designing a New Layout

If the desired target display layout is not one of the options available by default, you can create rectangular layouts as follows:

1. From the **Layouts** menu on the main application window menu bar (see [figure 2](#), **B**, on page 8), select **New**. The New Wall Layout dialog box opens.



**Figure 8. New Wall Layout Dialog Box**

2. In the **Name** field, enter a name or brief description for the layout.
3. In the Wall layout panel, set the overall horizontal and vertical size of the target display (measured in whole screens) by clicking the **Left** and **Right Arrows** in the **Columns** field and the **Up** and **Down Arrows** in the **Rows** field. Alternatively, you can enter the desired values in the **Columns** and **Rows** fields.
4. From the **Output Mode** drop-down list, select the desired resolution of each screen.
5. From the **HDMI Format** drop-down list, select whether to transmit HDMI data as part of the digital output.
  - Select **Automatic** (the default) to automatically detect if the connection is to a display that is compatible with HDMI.
  - Select **DVI RGB 444** to specify that the signal does not contain the Info frame or other ancillary data.
  - Select **HDMI RGB 444** to force the Quantum to transmit the Info frame in the digital output signal.
6. From the **HDCP Notification** drop-down list, select whether to enable or disable HDCP Notification. If HDCP notification is enabled, the display indicates when HDCP content restrictions are preventing a video signal from passing.
  - Select **Enabled** to display a green screen with the text **HDCP Content** in the window if the connected device is not HDCP-capable and an HDCP input has been selected.
  - Select **Disabled** to mute the window to black if the connected device is not HDCP-capable and an HDCP input has been selected.

7. To enable mullion compensation, select the **Mullion Adjustment** radio button in the Mullion/Edge Blending Compensation panel. Mullion is the area of frame border that exists between two displays. This area must be taken into account so that when an image is spread across two or more displays, the image flow is not distorted.
8. If you are using projectors that support soft edge blending, select the **Edge Blend Compensation** radio button and use the controls in the Mullion/Edge Blending Compensation panel to set the required amount of overlap.

**NOTES:**

- The Quantum Elite compensates for the edge blend area but does not adjust the brightness in the area.
- The Quantum Connect does not support the use of edge blended displays.

9. Select the **Link** check box to link the horizontal and vertical adjustment values. When the check box is selected, the **Vertical** field is grayed out and equals the horizontal value.  
- or -  
If you clear the **Link** check box, you can enter separate values for the horizontal and vertical adjustment.
10. Click **OK** to save the new layout.

## Modifying an Existing Layout

1. Right-click a screen in the chosen layout and select **Edit Wall Layout** from the drop-down list. The **Wall Layout Properties** dialog box opens.
2. Edit the various settings as needed (see [Designing a New Layout](#) on the previous page).
3. Click **OK** to save the layout.

## Importing a Layout

To import display layouts from another Quantum Control Software file (with a CTP file extension):

1. From the **Layouts** menu, select **Import**. The **Import Wall Layout** dialog box opens.
2. Locate the file that contains the desired layout and click **Open**.

**NOTE:** This imports all layouts from the selected file that are not already in the existing file.

## Deleting a Layout

To delete any of the display layouts that appear in the Choose Layout workspace:

1. Click on the layout to be deleted.
2. From the **Layouts** menu, select **Delete**.

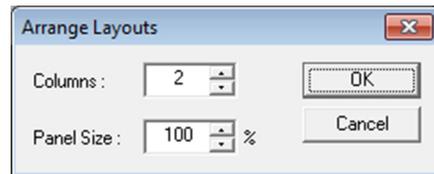
**NOTE:** If you want to undo this operation, exit the program without saving the layout.

## Arranging Layouts

Changing the way layouts are presented in the Choose Layout workspace can be helpful if there are a large number of layouts and you want to be able to see them more easily.

To arrange layouts:

1. From the **View** menu, select **Arrange Layouts**. The Arrange Layouts dialog box opens.



**Figure 9. Arrange Layouts Dialog Box**

2. In the **Columns** field, click the **Up** and **Down Arrows** or enter a value to set the number of icon columns to be displayed.
3. In the **Panel Size** field, click the **Up** and **Down Arrows** or enter a value to set the relative panel size for the display layout.
4. Click **OK**.

## Restoring Default Layouts

You can restore the default layouts that were present when you first installed the Quantum Control Software. Performing this operation deletes any user-defined layouts.

To restore a default layout, select **Default** from the **Layouts** menu.

## Communications Setup

Ensure that the serial ports of the computer are correctly configured if:

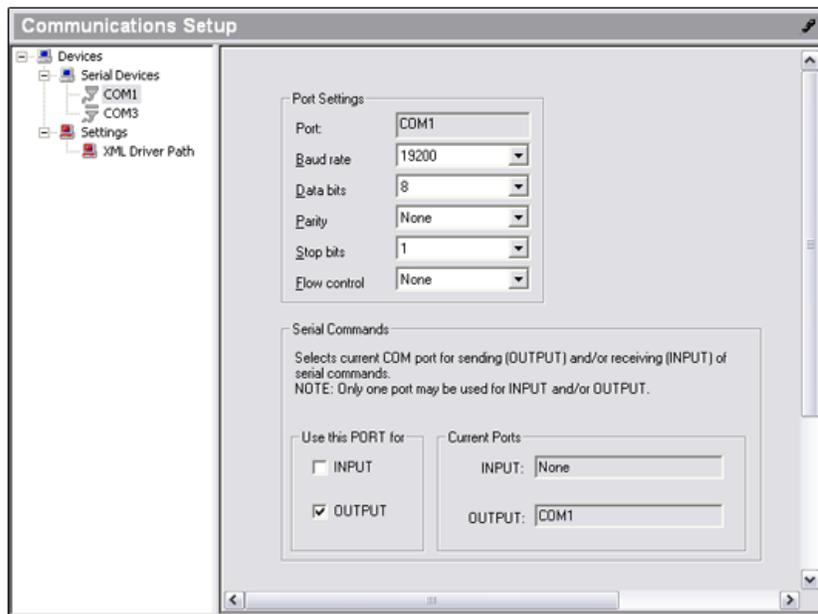
- You are using the Quantum Control Software to control external devices such as source switchers
- or -
- You wish to remotely control the Quantum System using serial data strings.

To open the Communications Setup workspace:

Click the **Communications Setup** button on the main application window taskbar (see [figure 2, D](#), on page 8).



The Communications Setup workspace opens (see [figure 10](#) on the next page).



**Figure 10. Communications Setup Workspace**

The left side of the Communications Setup workspace contains a Devices tree, similar to Windows Explorer. There are two main folders:

- **Serial Devices** — Lists any serial device drivers that are currently loaded. Alternatively, if no device drivers are found, any available serial (COM) ports detected by the Quantum Control Software are listed.
- **Settings** — Allows XML device drivers to be enabled or disabled for serial or Ethernet control (see [XML Device Drivers](#) on the next page).

The details displayed in the main area of the workspace change according to the type of item selected in the device tree.

## Configuring Serial Ports

Any unused serial ports (serial ports not used by a device driver) are listed in the Serial Devices folder. These can be configured manually as follows:

1. Select the appropriate port number (such as COM1 or COM3) in the Serial Devices folder of the Devices tree. The Port Settings and Serial Commands sections appear in the workspace.
2. In the Port Settings panel, adjust the various parameters as required.
3. In the Serial Commands panel, selecting the appropriate check box to specify whether the port will be used for incoming (input) or outgoing (output) data.

**NOTE:** Only one port can be used for input data and only one for output data. The Current Ports panel shows which ports are currently in use. You can use the same port for both input and output data.

## XML Device Drivers

Device drivers are defined by an XML file, located in the following folder on the hard disk of the computer:

### Windows NT, XP, and 2000:

C:\Program Files\Extron\Quantum Elite\XML\Device Drivers

- or -

C:\Program Files\Extron\Quantum Connect\XML\Device Drivers

### Windows 7 and 8:

C:\Program Files (x86)\Extron\Quantum Elite\XML\Device Drivers

- or -

C:\Program Files (x86)\Extron\Quantum Connect\XML\Device Drivers

Contact the Extron S3 Sales & Technical Support Hotline for further advice on creating an XML device driver file.

To enable XML device drivers:

1. In the Settings folder of the Devices tree, click **XML Driver Path**. An **Enable XML Device Drivers** check box appears on the right side of the workspace.
2. Select the **Enable XML Device Drivers** check box to load the device drivers. A dialog box opens while the Quantum Control Software loads the drivers. Then, the driver names appear in the Ethernet Devices and Serial Devices folders of the Devices tree.

## Setting Up Sources

Each source that you need to use in a project must have a corresponding source definition within the Quantum Control Software.

A source definition contains full details of the source, such as its signal format (NTSC, PAL, RGB, DVI, and so on) and to which input channel on the Quantum processor the source is connected.

If you are using an external source switcher (such as to give access to multiple sources on one input), the source definition can also include a serial command string used to operate the switcher. A separate source definition is required for each of the sources that can be connected to the Quantum processor.

**NOTE:** You need to set up communications with a switcher before you can define any sources selected via the switcher (see [Communications Setup](#) on page 19).

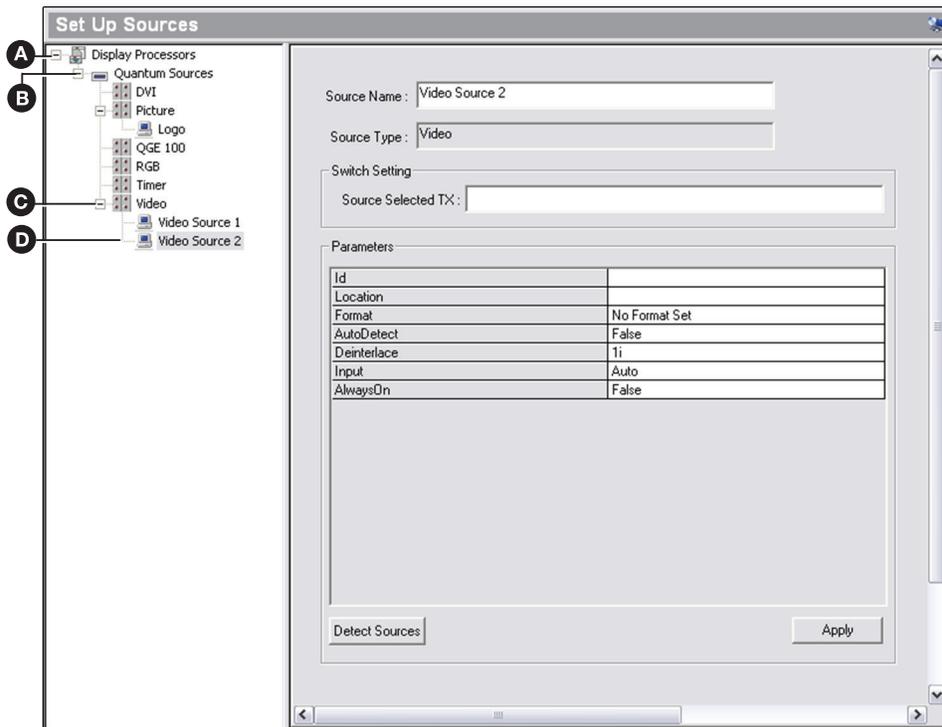
When the Quantum Control Software needs to display a particular source, it uses the parameters in the source definition to configure the appropriate input channel for the source.

Source definitions are created and set up using the Set Up Sources task.

**NOTE:** The Quantum Connect Control Software does not support the use of QGE 100, Clock, and picture source types.

To access the Set Up Sources task:

Click the **Set Up Sources** button on the main application window taskbar (see [figure 2](#), **D**, on page 8). The Set Up Sources workspace opens.



**Figure 11. Set Up Sources Workspace**

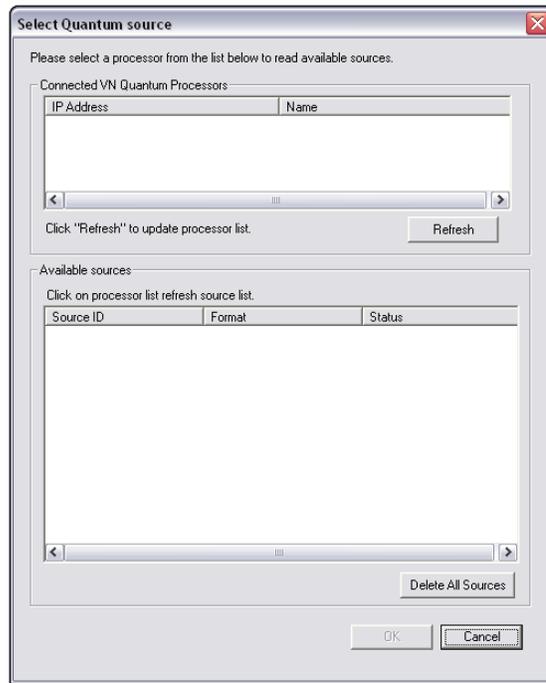
- A** All display processors
- B** Quantum processor
- C** Source type
- D** Source definition

The source explorer tree, in the left panel of the Set Up Sources workspace, shows a list of source types supported by the Quantum processor. Source definitions are listed under the relevant source type. The source tree expands up to four levels as shown in figure 11. When you open the source explorer after creating an entirely new project (or for the first time after installation), no source definitions are listed.

## Creating Quantum Source Types and Source Definitions

1. In the source explorer of the Set Up Sources workspace, right-click **Display Processors** and select the desired option. Available options include:
  - **Create Quantum Sources** — This option adds a list of the supported source types to the source tree. Then, you need to create source definitions.
  - **Detect Sources** — Selecting this option is the easiest method to create source types. To detect sources, the Quantum must be connected to a PC with the Quantum Control Software installed. The software communicates with the processor, detects the number and type of input cards that are present, and builds the source type list. If sources are connected to the processor, the source definitions are also created.
  - **Update Sources** — Selecting this option when the PC is connected to a Quantum processor updates the source tree details.
  - **Remove All Devices** — Deletes all devices listed under Display Processors. (If no devices have been detected, this option is grayed out.)

2. Right-click the appropriate source type heading in the source explorer (**RGB**, **QGE 100**, **Video**, and so on) and select **Create New Source** from the drop-down menu. An empty source definition screen opens in the workspace (see [figure 11](#) on the previous page for an example of a new video definition).
  3. In the **Source Name** field, enter a name for the source.
  4. If a serial string is required for the source (for instance, to operate an external switcher), enter the appropriate control string in the **Source Selected TX** field.
  5. In the Parameters panel, enter the required settings for the source. These settings vary according to the source type and are detailed in [Source Parameters](#) on the next page.
- If you click **Detect Sources** within a source definition, The following dialog box opens:



**Figure 12. Quantum Source Selection Dialog Box**

6. Select a source from the list and click **OK** to create a source definition for it.

## Deleting Source Definitions

### To delete a single source definition:

1. Right-click the appropriate source definition in the source explorer and select **Delete Source** from the drop-down menu.
2. In the Delete Source dialog box, click **Yes** to confirm the deletion.

### To delete all source definitions:

Right-click **Display Processors** in the source explorer and select **Remove All Devices** from the drop-down menu.

## Refreshing Source Data

The DVI, HDMI, SDI, and Video source definition windows each contain a **Refresh Status** button. Click this button to update the information displayed for the selected source.

## Source Parameters

This section describes source parameters for each Quantum source type, along with functionality descriptions and available options. These parameters are displayed in the Set Up Sources workspace when you select a source definition in the source explorer (see [figure 12](#) on the previous page).

### Source parameters – Composite video and S-video

Click a composite video or S-video source name listed under Video to view the source connected to a Quantum Video Input Card.

Parameters	
Id	
Location	
Format	No Format Set
AutoDetect	False
Deinterlace	1i
Input	Auto
AlwaysOn	False

**Figure 13. Video Source Parameters**

Video or S-video Source Parameter	Parameter Value	Description
Source Name	<Enter name for source>	Descriptor to identify the source
Source Type	<Read-only field>	Displays the type of source.
Source Selected TX	<Enter RS-232 string to be transmitted to a connected matrix switcher>	(Optional) Transmits an RS-232 command to a matrix switcher.
ID	<ul style="list-style-type: none"> <li>&lt;Enter source input number&gt;</li> <li>&lt;Automatically detect source input number&gt;</li> </ul>	<p>Displays the source input number on the Quantum identified by the card slot number and card input number.</p> <p>To detect this value, click the <b>Detect Sources</b> button (see <a href="#">Creating Quantum Source Types and Source Definitions</a> on page 22).</p> <p>For example, 5.3 is the source connected to input 3 of the card in slot 5.</p>

Video or S-video Source Parameter	Parameter Value	Description
Location	<ul style="list-style-type: none"> <li>• &lt;Enter IP address&gt;</li> <li>• &lt;Automatically detect IP address&gt;</li> </ul>	<p>Displays the IP address of the Quantum card frame where the source is connected.</p> <p>To detect the IP address, use the <b>Detect Sources</b> button (see <b>Creating Quantum Source Types and Source Definitions</b> on page 22).</p>
Format	<ul style="list-style-type: none"> <li>• &lt;Read-only field&gt;</li> <li>• &lt;Select an option from the drop-down list of format types&gt;</li> </ul>	<p>This parameter depends on the AutoDetect setting.</p> <ul style="list-style-type: none"> <li>• If AutoDetect is set to <b>True</b>, this parameter is read-only, showing the current source format as detected by the Quantum processor.</li> <li>• If AutoDetect is set to <b>False</b>, you can select an available source format.</li> </ul>
AutoDetect	<ul style="list-style-type: none"> <li>• <b>True</b>: Allows the Quantum processor to automatically detect the current source type.</li> <li>• <b>False</b>: Allows you to manually select the source type from the <b>Format</b> drop-down list.</li> </ul>	<p>Enables and disables automatic detection of the current source type.</p>
Deinterlace	<ul style="list-style-type: none"> <li>• <b>1i</b>: Single Field Interpolation</li> <li>• <b>3i</b>: Three Field Interpolation</li> </ul>	<p>Sets the deinterlace mode to be applied to the source.</p> <p>See the <i>Quantum User Guide</i> for further information about deinterlacing.</p>
Input	<ul style="list-style-type: none"> <li>• <b>Auto</b>: Automatically discovers the format.</li> <li>• <b>SVideo</b>: Forces S-video mode.</li> <li>• <b>Composite</b>: Forces composite video mode.</li> </ul>	<p>Sets the input format.</p>
Always On	<ul style="list-style-type: none"> <li>• <b>False</b> (default): The source is not always displayed.</li> <li>• <b>True</b>: The source is always displayed.</li> </ul>	<p>Sets whether the source is always displayed, regardless of whether it is locked to a valid sync.</p> <p>When Always On is set to <b>True</b>, video can be seen while VCR sources are being rewound or fast-forwarded.</p>

## Source parameters – RGB

Use the RGB source type to view an RGB graphics or HD video source connected to a Quantum RGB Input Card.

Figure 14. RGB Source Parameters

Parameter Group	RGB Source Parameter	Parameter Value	Description
	Source Name	<Enter name for source>	Descriptor to identify the source
Switch Setting	Source Selected TX	<Enter RS-232 string to be transmitted to a connected matrix switcher>	(Optional) Transmits an RS-232 command to a matrix switcher.
Source Properties	Source ID	<ul style="list-style-type: none"> <li>&lt;Enter source input number&gt;</li> <li>&lt;Automatically detect source input number&gt;</li> </ul>	<p>Displays the slot and channel number of the RGB card in the Quantum frame.</p> <p>To detect this value, click the <b>Detect Sources</b> button (see <a href="#">Creating Quantum Source Types and Source Definitions</a> on page 22).</p> <p>For example, 5.3 is the source connected to input 3 of the card in slot 5.</p>
	Source Location	<ul style="list-style-type: none"> <li>&lt;Enter IP address&gt;</li> <li>&lt;Automatically detect IP address&gt;</li> </ul>	<p>Displays the IP address of the Quantum card frame where the source is connected.</p> <p>To detect the IP address, use the <b>Detect Sources</b> button (see <a href="#">Creating Quantum Source Types and Source Definitions</a>).</p>

Parameter Group	RGB Source Parameter	Parameter Value	Description
Source Format	Format	<ul style="list-style-type: none"> <li>• <i>&lt;Read-only field&gt;</i></li> <li>• <i>&lt;Select an option from the drop-down list of format types&gt;</i></li> </ul>	<p>This parameter depends on the AutoDetect setting.</p> <ul style="list-style-type: none"> <li>• If AutoDetect is selected, this parameter is read-only, showing the current source resolution as detected by the Quantum processor.</li> <li>• If AutoDetect is not selected (radio button is cleared), you can select an available source format.</li> </ul>
	Colour Space	<ul style="list-style-type: none"> <li>• <b>RGB</b> (default): Default mode</li> <li>• <b>Component HD</b>: Option for component HD inputs</li> <li>• <b>Component SD</b>: Option for component SD inputs</li> </ul>	Lets you select the required color space.
	Auto Detect	<ul style="list-style-type: none"> <li>• <b>True</b> (select <b>Auto Detect</b> radio button): Allows Quantum processor to automatically detect the current source type.</li> <li>• <b>False</b> (select <b>Manual</b> radio button): Allows you to manually select the source type from the <b>Format</b> drop-down list.</li> </ul>	Enables and disables automatic detection of the current source format.
	Manual	<ul style="list-style-type: none"> <li>• <b>True</b> (select <b>Manual</b> radio button): Allows you to manually select the source type from the <b>Format</b> drop-down list.</li> <li>• <b>False</b> (select <b>Auto Detect</b> radio button): Allows the Quantum processor to automatically detect the current source type.</li> </ul>	<p>When this mode is enabled, the input mode can be forced to a known format.</p> <p>In addition, new custom input modes can be built (see <a href="#">Creating a custom input mode</a> on the next page).</p>
Adjustments	Brightness, Contrast	<i>&lt;Enter values for brightness and contrast&gt;</i>	Adjusts the brightness and contrast of a source
	Phase, Pixel Clock	<i>&lt;Enter values for phase and pixel clock&gt;</i>	Adjusts the sample clock parameters. Ensure that the <b>Auto Phase</b> check box is <u>not</u> selected.
	Auto Phase	<ul style="list-style-type: none"> <li>• <i>&lt;Select Auto Phase check box&gt;</i>: Enables Auto Phase and adjusts the clock phase automatically.</li> <li>• <i>&lt;Clear Auto Phase check box&gt;</i>: Disables Auto Phase.</li> </ul>	Enables and disables automatic adjustment of clock phase.

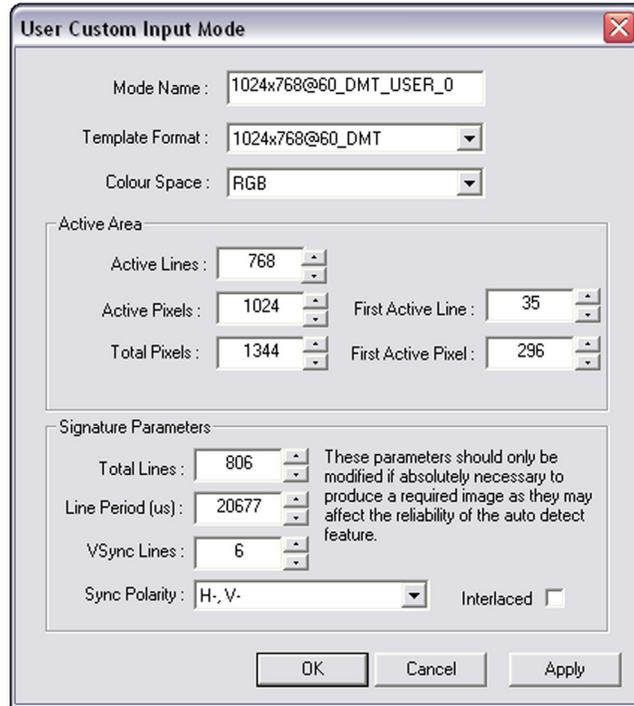
Parameter Group	RGB Source Parameter	Parameter Value	Description
Source Viewporting	X Pixels, Y Pixels, H pos, V pos	<Enter values for size ( <b>X pixels</b> and <b>Y pixels</b> ) and position ( <b>H pos</b> and <b>V pos</b> )>.	These controls allow a section of the captured source to be isolated as a viewport. There is only one viewport for each input channel.
	Image Auto Centre	<ul style="list-style-type: none"> <li>• <b>Off:</b> No automatic centering</li> <li>• <b>Once:</b> Centers source image as part of the Detect process</li> <li>• <b>Continuous:</b> Continually monitors and centers input source</li> </ul>	Sets whether to automatically center the input source image and at what frequency.
Keep Scene		<p>&lt;<b>Select Keep Scene check box</b>&gt;: Displays the current scene, not the source.</p> <p>&lt;<b>Clear Keep Scene check box</b>&gt;: Displays the source on output 1.1.</p>	Sets whether to display the current scene or the source.

### Creating a custom input mode

To create custom input formats for RGB sources in the Set Up Sources workspace:

1. In the source explorer on the Set Up Sources workspace, select an RGB source (or create a new RGB source type and definition (see [Creating Quantum Source Types and Source Definitions](#) on page 22)). The definition screen for the selected source opens in the workspace (see [figure 11](#) on page 22 for an example).
2. In the Source Format panel, select the **Manual** radio button (see [figure 14](#) on page 26). This disables Auto Detect mode and lets you choose a known source format.
3. From the **Format** drop-down list, select the resolution to use as a starting point.

- In the Source Format panel of the RGB Set Up Sources dialog box (see [figure 14](#) on page 26), click **New**. The User Custom Input Mode dialog box opens.



**Figure 15. User Custom Input Mode Dialog Box**

- In the **Mode Name** field of the User Custom Input Mode dialog box (see [figure 15](#)), enter a name for the custom mode.
- From the **Template Format** drop-down list, select the desired template for the customized format (this should already be selected).
- From the **Colour Space** drop-down list, select the color space to use (such as **RGB**, **Component SD**, or **Component HD**).
- In the Active Area panel, adjust the settings as needed by manually entering values into the appropriate fields. Alternatively, click the **Up** and **Down Arrows** to adjust the values. You can adjust the following settings:

Active Lines	Active Pixels	Total Pixels
First Active Line	First Active Pixel	

- In the Signature Parameters panel, adjust the following settings if needed:

Total Lines	Line Period	VSync Lines
Sync Polarity	<b>Interlaced</b> check box	

**ATTENTION:**

- Adjust the parameters in the Signature Parameters panel only if absolutely necessary to produce the required image. Changes to these settings may affect the reliability of the Auto Detect feature.
- Réglez les paramètres dans la section Paramètres de Signature, seulement s'il est absolument nécessaire de montrer l'image requise. Changer ces paramètres peut affecter la fiabilité de la fonction « Détection Automatique ».

- Click **Apply** to save the changes and continue making other modifications. Alternatively, click **OK** to save the changes and close the User Custom Input Mode dialog box.

### ***Editing an input mode***

To adjust the settings of custom input modes and existing factory formats:

1. Within the source explorer of the Set Up Sources workspace, select an RGB source (or create a new RGB source type and definition (see [Creating Quantum Source Types and Source Definitions](#) on page 22). The definition screen for the selected source opens in the workspace.
2. In the Source Format panel, ensure the **Manual** radio button is selected.
3. From the **Format** drop-down list, select the format to be modified.
4. Click **Edit**. The **User Custom Input Mode** dialog box opens.
5. Adjust the settings as necessary.
6. Click **Apply** to save the changes and continue making other modifications. Alternatively, click **OK** to save the changes and close the **User Custom Input Mode** dialog box.

**NOTE:** When adjusting input modes provided with this application, you are making changes to the original factory formats. Any changes made cannot be undone.

### ***Deleting a custom input mode***

To delete a custom format:

1. In the source explorer on the Set Up Sources workspace, select an RGB source (or create a new RGB source type and definition (see [Creating Quantum Source Types and Source Definitions](#))). The definition screen for the selected source opens in the workspace.
2. In the Source Format panel, ensure that the **Manual** radio button is selected.
3. From the **Format** drop-down list, select the format to be deleted.
4. Click **Delete**. The format is removed from the **Format** drop-down list and the **No Format Set** option is selected.

## Source parameters – DVI

Use the DVI source type to view a source connected to a Quantum DVI Video Input Card.

Source Name :

Source Type :

Switch Setting

Source Selected TX :

Parameters

Id	2.1
Location	10.13.198.131
Format	

Figure 16. DVI Source Parameters

DVI Source Parameter	Parameter Value	Description
Source Name	<Enter name for source>	Descriptor to identify the source
Source Type	<Read-only field>	Displays the type of source
Source Selected TX	<Enter RS-232 string to be transmitted to a connected matrix switcher>	(Optional) Transmits an RS-232 command to a matrix switcher.
ID	<ul style="list-style-type: none"> <li>&lt;Enter source input number&gt;</li> <li>&lt;Automatically detect source input number&gt;</li> </ul>	<p>Displays the source input number on the Quantum identified by the card slot number and card input number.</p> <p>To detect this value, use the <b>Detect Sources</b> button (see <a href="#">Creating Quantum Source Types and Source Definitions</a> on page 22).</p> <p>For example, <b>5.2</b> is the source connected to input <b>2</b> of the card in slot <b>5</b>.</p>
Location	<ul style="list-style-type: none"> <li>&lt;Enter IP address&gt;</li> <li>&lt;Automatically detect IP address&gt;</li> </ul>	<p>Displays the IP address of the Quantum card frame where the source is connected.</p> <p>To detect the IP address, use the <b>Detect Sources</b> button (see <a href="#">Creating Quantum Source Types and Source Definitions</a>).</p>
Format	<Read-only field>	Reports the source resolution as detected by the Quantum processor.

## Source parameters – HDMI

Use the HDMI source type to view a source connected to an HDMI Video Input Card.

Source Name :

Source Type :

Switch Setting

Source Selected TX :

Parameters

Id	3.1
Location	10.13.198.131
Format	1280x720@60
HDCP Status	Unencrypted
HDCP Authorized	On

**Figure 17. HDMI Source Parameters**

HDMI Source Parameter	Parameter Value	Description
ID	<ul style="list-style-type: none"> <li>&lt;Enter source input number&gt;</li> <li>&lt;Automatically detect source input number&gt;</li> </ul>	<p>Displays the source input number on the Quantum identified by the card slot number and card input number. For example, <b>5.2</b> is the source for input <b>2</b> of the card in slot <b>5</b>.</p> <p>To find this value, click the <b>Detect Sources</b> button (see <a href="#">Creating Quantum Source Types and Source Definitions</a> on page 22).</p>
Location	<ul style="list-style-type: none"> <li>&lt;Enter IP address&gt;</li> <li>&lt;Automatically detect IP address&gt;</li> </ul>	<p>Displays the IP address of the Quantum card frame where the source is connected.</p> <p>To detect the IP address, click the <b>Detect Sources</b> button.</p>
Format	<Read-only field>	<p>Reports the source resolution as detected by the Quantum processor. Click the <b>Refresh Status</b> button to update this field.</p>
HDCP Status	<Read-only field>	<p>Reports the input HDCP encryption status. Click the <b>Refresh Status</b> button to update this field.</p>
HDCP Authorized	<ul style="list-style-type: none"> <li><b>On</b>: Outputs do not display content if the system is not fully HDCP-compliant</li> <li><b>Off</b>: Video is displayed on all outputs despite the system not being fully HDCP-compliant</li> </ul>	<p>Lets you select whether to enable or disable HDCP authorization if the system is not fully HDCP-compliant and digital sources need to be displayed on all outputs.</p>

## Source parameters – SDI

Use the SDI source type to view a source connected to an SDI Video Input Card.

Id	Value
Id	4.2
Location	10.13.198.131
Format	No Format Set
Film Mode	Automatic
Deinterlace	Enabled

**Figure 18. SDI Source Parameters**

SDI Source Parameter	Parameter Value	Description
ID	<ul style="list-style-type: none"> <li>&lt;Enter source input number&gt;</li> <li>&lt;Automatically detect source input number&gt;</li> </ul>	<p>Displays the source input number on the Quantum identified by the card slot number and card input number. For example, <b>4.2</b> is the source for input <b>2</b> of the card in slot <b>4</b>.</p> <p>To find this value, click the <b>Detect Sources</b> button (see <a href="#">Creating Quantum Source Types and Source Definitions</a> on page 22).</p>
Location	<ul style="list-style-type: none"> <li>&lt;Enter IP address&gt;</li> <li>&lt;Automatically detect IP address&gt;</li> </ul>	<p>Displays the IP address of the Quantum card frame where the source is connected.</p> <p>To detect the IP address, click the <b>Detect Sources</b> button.</p>
Format	<Read-only field>	<p>Reports the source resolution as detected by the Quantum processor. Click the <b>Refresh Status</b> button to update this field.</p>
Film Mode	<ul style="list-style-type: none"> <li><b>Automatic:</b> Detects the presence of a film mode cadence (default).</li> <li><b>Disabled:</b> No film mode detection is performed.</li> </ul>	<p>Lets you enable or disable automatic film mode detection (PAL, NTSC, and 1080i).</p>
Deinterlace	<ul style="list-style-type: none"> <li><b>Enabled:</b> Deinterlaces NTSC, PAL, and 1080i sources (default).</li> <li><b>Disabled:</b> Deinterlacing is not done.</li> </ul>	<p>Selects whether sources are deinterlaced before being placed on the RAPT bus. Selecting <b>Disabled</b> saves bandwidth on the RAPT bus when deinterlacing is not a priority.</p>

## Source parameters – QGE 100

Use the QGE 100 source type to display a source derived from a QGE 100.

**NOTE:** The Quantum Connect does not support the use of QGE 100 sources.

**Figure 19. QGE 100 Source Parameters**

QGE 100 Source Parameter	Parameter Value	Description
Source Name	<Enter name for source>	Descriptor to identify the source
Source Type	<Read-only field>	Displays the type of source
Source Selected TX	<Enter RS-232 string to be transmitted to a connected matrix switcher>	This is optional. Transmits an RS-232 command to a matrix switcher.
Server	<Enter name or IP address of host or source computer>	Specifies the network name* or IP address of the QGE 100 source *To use names, the network must support DNS (Dynamic Name Services). For example, to select a QGE 100 source called “QGE100” with an IP address of 178.28.229.101, enter either QGE100 or 172.28.229.101.
IPAddress	<Enter IP address>	Displays the IP address of the QGE 100 where the source is connected. <b>This field must be left blank if the adapter is using DHCP.</b>
Multicast Address	<Enter multicast address of the connected QGE 100>	If the source is a QGE 100 operating in Multicast mode, enter its multicast address here. For example, enter 234.5.6.183.
Multicast Port	<Enter multicast port number of the connected QGE 100>	The default port is 5000.

## Source parameters – Picture

Use the Picture source type to display an image file (in JPG, GIF, PNG, or BMP format). The file can be on the Quantum hard drive (in the `d:/pictures` folder) or on the network.

**NOTE:** The Quantum Connect does not support the use of Picture sources.

**Figure 20.** Picture Source Parameters

Picture Source Parameter	Parameter Value	Description
Source Name	<Enter name for source>	Descriptor to identify the source
Source Type	<Read-only field>	Displays the type of source
Source Selected TX	<Enter RS-232 string to be transmitted to a connected matrix switcher>	This is optional. Transmits an RS-232 command to a matrix switcher.
Filename	<Enter path and filename of the desired image>	Indicates the path and filename of the desired image. For example: <ul style="list-style-type: none"> <li>To select a file on the Quantum, use the format <code>d:/pictures/companylogo.jpg</code></li> <li>To select a file on a network computer or server, use the format: <code>\\imageserver\companylogo.jpg</code></li> </ul>
Location	<ul style="list-style-type: none"> <li>&lt;Enter IP address&gt;</li> <li>&lt;Automatically detect IP address&gt;</li> </ul>	Displays the IP address of the Quantum card frame where the image file is located. To detect the IP address, use the <b>Detect Sources</b> button (see <b>Detect Sources</b> on page 22).
GraphicsOverlay	<ul style="list-style-type: none"> <li><b>True:</b> Makes the specified key color in the image transparent.</li> <li><b>False:</b> Disables transparency (key color is opaque).</li> </ul>	Makes the specified key color transparent or opaque.
KeyColour	<Enter three values each, 0 to 255>	<ul style="list-style-type: none"> <li>If GraphicsOverlay parameter is set to <b>True</b>, these values set the color in the image that will be transparent. Example: <code>0, 0, 255</code> = Blue</li> <li>If Graphics Overlay is set to <b>False</b>: these values set the red, green, and blue levels.</li> </ul>

## Source parameters – Timer

Use the Timer source type to create an on-screen clock or count-down or count-up timer.

**NOTE:** The Quantum Connect does not support the use of Clock or Timer sources.

Parameters	
Id	
GraphicsOverlay	False
Size	Medium
ForeColour	255,255,255
BackColour	0,0,0
Font	Verdana
TimeFormat	24
ShowSeconds	True
ShowDate	True
DateFormat	dd/mm/yyyy
ShowWeekDay	True
TimerStartTime	00:00:00
ClockMode	Clock
TimeZone	(GMT) Greenwich Mean Time : Dublin, Edinburgh
Alignment	Center
TimerCountDirection	Up

**Figure 21. Timer Source Parameters**

Timer Source Parameter	Parameter Value	Description
Source Name	<Enter name for source>	Descriptor to identify the source
Source Type	<Read-only field>	Displays the type of source
Source Selected TX	<Enter RS-232 string to be transmitted to a connected matrix switcher>	This is optional. Transmits an RS-232 command to a matrix switcher.
ID	<Enter an alphanumeric label>	User-defined alphanumeric label (such as the source name) that is unique to the project
GraphicsOverlay	<ul style="list-style-type: none"> <li><b>True:</b> Makes the specified background color in the image transparent.</li> <li><b>False:</b> Disables transparency (background color is opaque).</li> </ul>	Makes the background color of the image transparent or opaque.
Size	<ul style="list-style-type: none"> <li><b>Small</b></li> <li><b>Medium</b> (default)</li> <li><b>Large</b></li> <li><b>Extra Large</b></li> </ul>	Sets the size of text on the clock or timer display.

Timer Source Parameter	Parameter Value	Description
ForeColour	<Enter three values each, from 0 to 255>	Sets the foreground (text) color for the clock or timer display. These values set the red, green, and blue levels. For example: <ul style="list-style-type: none"> <li>• 255, 255, 255 = White (default)</li> <li>• 128, 0, 0 = Mid-red</li> <li>• 255, 255, 0 = Bright yellow</li> </ul>
BackColour	<Enter three values each, from 0 to 255>	Sets the background color for the clock or timer display. These values set the red, green, and blue levels. For example: <ul style="list-style-type: none"> <li>• 0, 0, 0 = Black (default)</li> <li>• 128, 0, 0 = Mid-red</li> <li>• 0, 0, 75 = Dark blue</li> </ul>
Font	<ul style="list-style-type: none"> <li>• <b>Arial</b></li> <li>• <b>Verdana</b> (default)</li> <li>• <b>Microsoft Sans Serif</b></li> <li>• <b>Tahoma</b></li> </ul>	Sets the font for the clock or timer display
TimeFormat	<ul style="list-style-type: none"> <li>• <b>12</b>: Sets 12-hour time format.</li> <li>• <b>24</b> (default): Sets 24-hour time format.</li> </ul>	Sets the time format for the clock or timer display
ShowSeconds	<ul style="list-style-type: none"> <li>• <b>True</b>: Displays hours, minutes, and seconds.</li> <li>• <b>False</b>: Displays only hours and minutes.</li> </ul>	Displays or hides the seconds in the time.
ShowDate	<ul style="list-style-type: none"> <li>• <b>True</b>: Displays the date and time.</li> <li>• <b>False</b>: Displays only the time.</li> </ul>	Sets whether to display the date along with the time.
DateFormat	<ul style="list-style-type: none"> <li>• <b>dd/mm/yyyy</b> (default)</li> <li>• <b>mm/dd/yyyy</b></li> <li>• <b>20 June 2006</b></li> <li>• <b>June 20 2006</b></li> </ul>	Sets the format to use when displaying the date.
ShowWeekDay	<ul style="list-style-type: none"> <li>• <b>True</b>: Displays the day of the week (Monday to Sunday) and the date</li> <li>• <b>False</b>: Displays only the date</li> </ul>	Sets whether to display the day of the week along with the date.
TimerStartTime	<Enter the time from which the timer begins>	When the Quantum is operating in timer mode, this value defines the start time in <i>hh:mm:ss</i> . The default is <b>00:00:00</b> .  In countdown mode, when the timer reaches zero, the timer reloads with the preset value and starts again.
ClockMode	<ul style="list-style-type: none"> <li>• <b>Clock</b> (default)</li> <li>• <b>Timer</b></li> </ul>	Selects a standard clock or a timer to display. For timer mode, set the TimerCountDirection parameter as needed.

Timer Source Parameter	Parameter Value	Description
TimeZone	<Select an option from the drop-down list of time zones>	Sets the time zone for the clock and date.  <b>NOTE:</b> The time zone that was set on the control software PC must match the time zone set on the Quantum card frame. The default is Greenwich Mean Time (GMT), London.
Alignment	<ul style="list-style-type: none"> <li>• <b>Left</b></li> <li>• <b>Center</b> (default)</li> <li>• <b>Right</b></li> </ul>	Sets the horizontal alignment of the text relative to the window in which it is placed.
TimerCountDirection	<ul style="list-style-type: none"> <li>• <b>Up</b> (default)</li> <li>• <b>Down</b></li> </ul>	When using timer mode, use this parameter to set the direction in which the timer will count.

## Defining EDID

EDID information (display resolution, refresh rate, and pixel clock rate), when read from an output display or selected by a user, is stored in memory on each input, allowing the source to perform as if connected to the display, even when it is not.

The EDID Minder screen enables you to set the Extended Display Identification Data (EDID) for each of the RGB, DVI, and HDMI inputs on the cards installed in your Quantum processor. It also provides status on the current EDID resolution that has been set for each input. The default EDID setting of 1920x1200 at 60 Hz is used for each input.

### Selecting an EDID

To specify a display EDID for an input (see [figure 22](#) on the next page):

1. Click the **EDID Minder** icon on the taskbar (see [figure 2](#), **D**, on page 8).
2. In the EDID Minder workspace (right panel), click the **Refresh Status of Input EDID** button. The installed input connectors are displayed in the input channel list (left column).



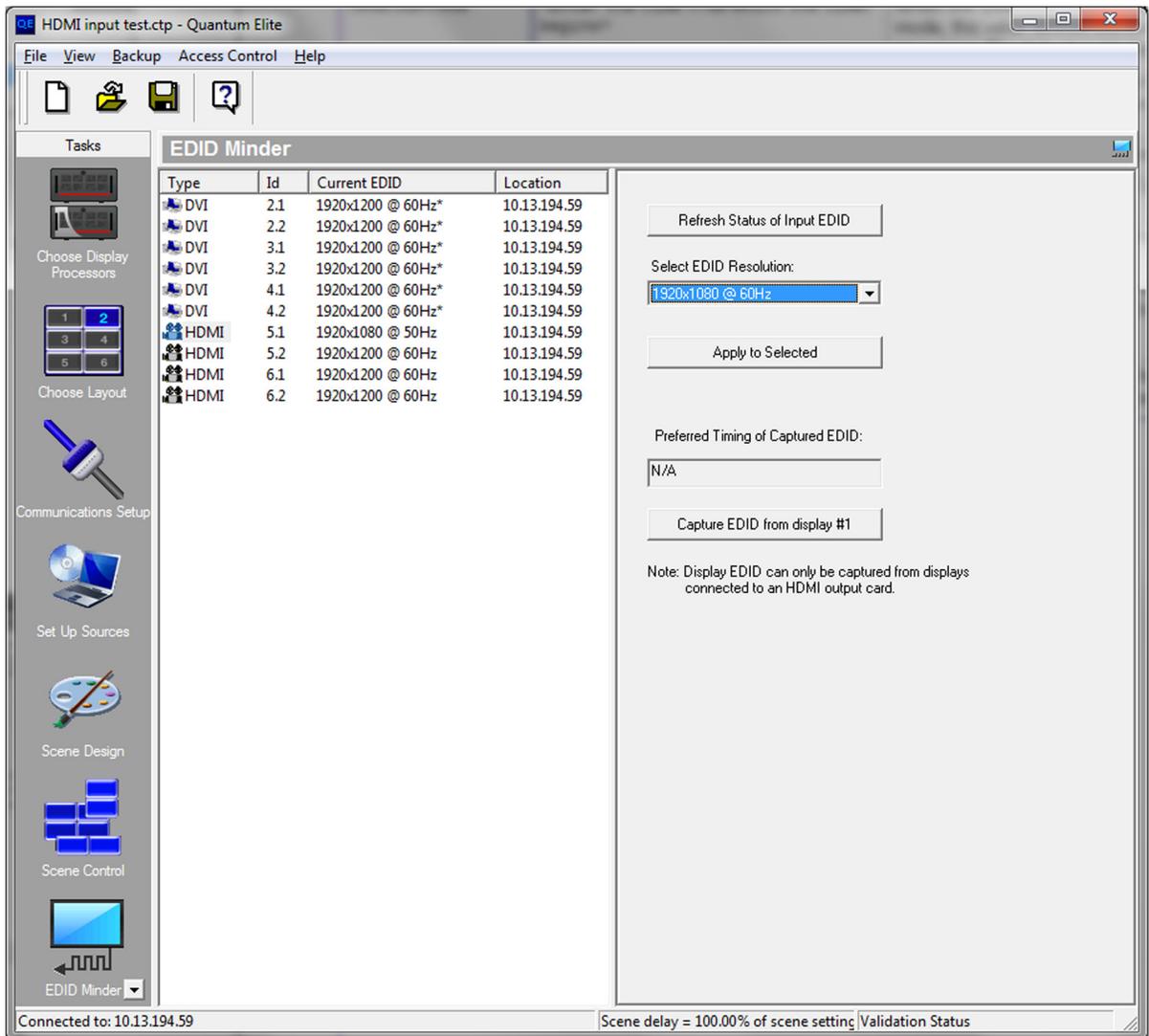
You can sort the input channels on this list by signal type (DVI, HDMI, and RGB), connector ID, EDID currently assigned to the input, or IP address of the Quantum (Location). Click the desired column heading to toggle between sorting and inverse sorting.

3. On the channels list, select an input by clicking on its signal type to highlight it. To select multiple individual inputs, hold down <CTRL> while clicking each one. To select a group of consecutive inputs, hold down <Shift> while selecting the first and last input in the range.

- From the **Select EDID Resolution** drop-down menu, select the EDID to apply to the selected input. The menu contains the following resolutions at 50 Hz and 60 Hz.

<b>Use Display's EDID*</b>	<b>1280x768</b>	<b>1400x1050</b>
<b>640x480</b>	<b>1280x800</b>	<b>1680x1050</b>
<b>800x600</b>	<b>1280x1024</b>	<b>1600x1200</b>
<b>848x480</b>	<b>1360x768</b>	<b>1920x1080 (1080p)</b>
<b>1024x768</b>	<b>1366x768</b>	<b>1920x1200</b>
<b>1280x720 (720p)</b>	<b>1440x900</b>	

\*This option does not appear on the menu unless an EDID has been captured from display 1 (see [Capturing an EDID \(HDMI Displays Only\)](#) on the next page.



**Figure 22. EDID Minder Screen**

- Click **Apply to Selected**. The new EDID appears in the input channels list for the selected input.

## Capturing an EDID (HDMI Displays Only)

An alternative method of assigning an EDID to an input is to “capture” the EDID information from the output to which display 1 is connected.

**NOTE:** Display 1 is the display located at the **top left** of your selected layout. Click the **Choose Layout** icon on the taskbar to view the current layout.

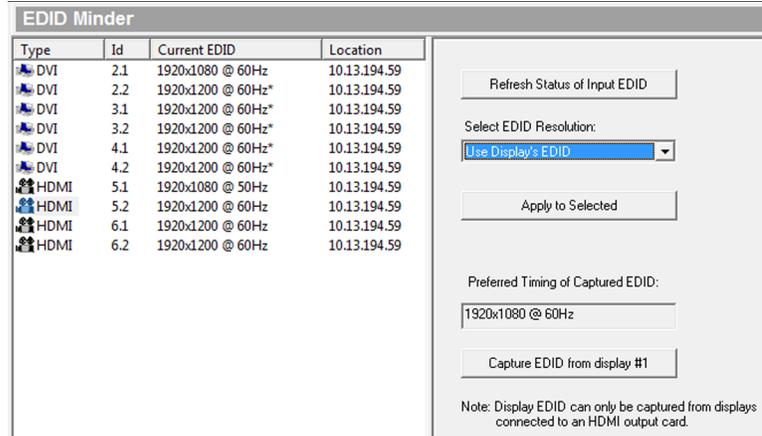
For this procedure, display 1 must be connected to a Quantum HDMI output card.

To capture and apply the EDID of display 1 to an input:

1. Click the **Capture EDID from display #1** button in the EDID Minder workspace. The display 1 EDID is displayed in the Preferred Timing of Captured EDID box above the button.
2. Select an input from the input channels list.
3. From the **Select EDID Resolution** drop-down menu, select **Use Display's EDID**.

**NOTE:** This selection may not be available the first time you perform this procedure. If it does not appear on the menu, skip this step. The option is added to the menu and appears in the **Select EDID Resolution** box after you capture and apply the display 1 EDID.

**Example:** In figure 23, HDMI input 5.2 has been selected on the input channels list and **Use Display's EDID** has been selected from the **Select EDID Resolution** menu. The captured display 1 resolution of 1920x1200 @ 60 Hz appears in the Preferred Timing of Captured EDID box. The **Apply to Selected** button has not yet been clicked, so the selected input is not shown with the captured EDID.



**Figure 23. Capturing the EDID of Display #1**

4. Click **Apply to Selected**. The captured EDID of display 1 appears beside the selected input on the input channels list.

**NOTE:** On the EDID Minder input channels list, the asterisk (\*) following an EDID indicates that the EDID was captured.

# Creating a Project

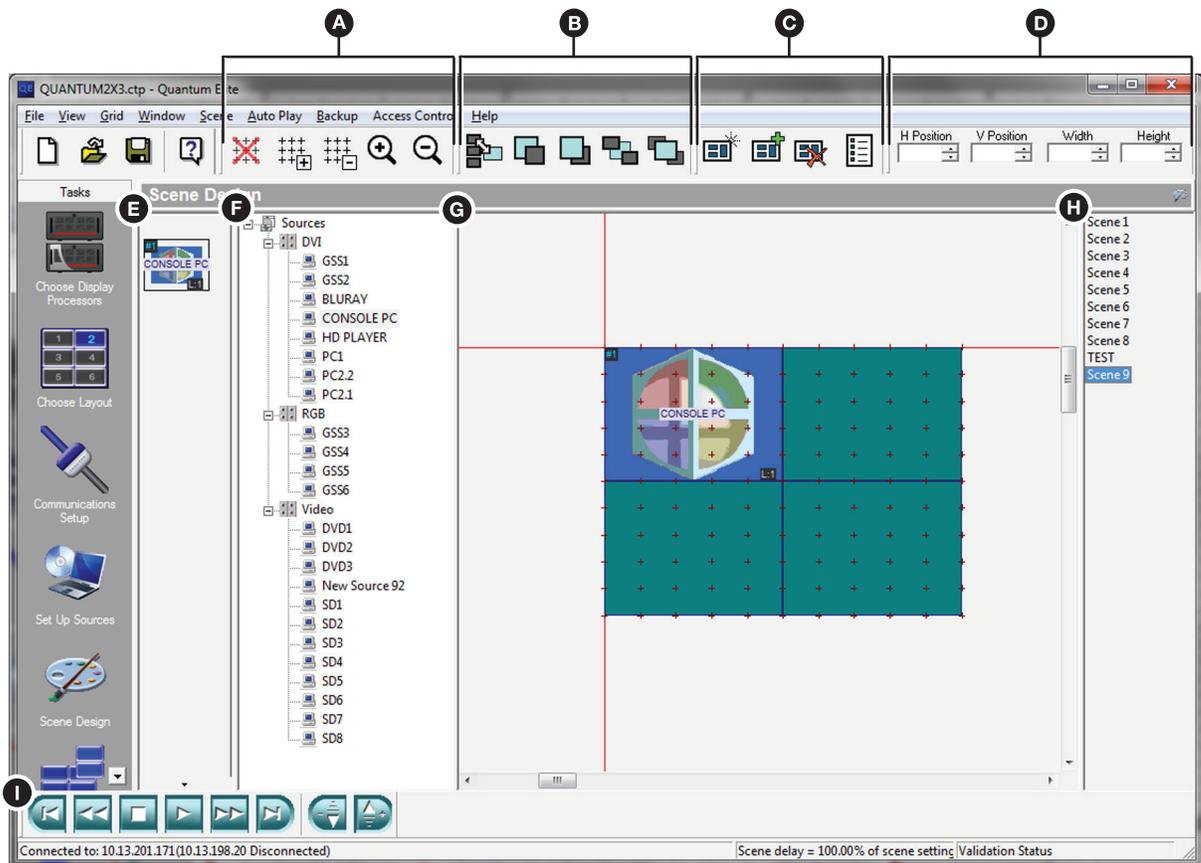
This section describes the Scene Design task and creating a project using scenes and windows. Topics that are covered include:

- [Working with Scenes](#)
- [Working with Windows](#)

## Working with Scenes

A scene is a preset that contains the size, position, and contents of one or more windows. You can create scenes, save them, and recall them to display.

### Scene Design Task



**Figure 24. Main Features and Toolbars of the Scene Design Task**

- |                                  |                                    |                                |
|----------------------------------|------------------------------------|--------------------------------|
| <b>A</b> Virtual Display toolbar | <b>D</b> Window Properties toolbar | <b>G</b> Virtual display area  |
| <b>B</b> Window toolbar          | <b>E</b> Window palette            | <b>H</b> Scene list            |
| <b>C</b> Scene toolbar           | <b>F</b> Source Explorer           | <b>I</b> Scene Control toolbar |

To view a source on the target display, place a window (containing the appropriate source) on the display. Windows and scenes are created and edited in the Scene Design task. You can store the size, position, and contents of one or more windows as a scene. Each scene can have a different arrangement of windows and sources.

To open the Scene Design task:

1. Click the **Scene Design** button on the taskbar (see [figure 2](#), **D**, on page 8).



The Scene Design Workspace opens (see [figure 24](#) on the previous page).

## Creating a New Scene

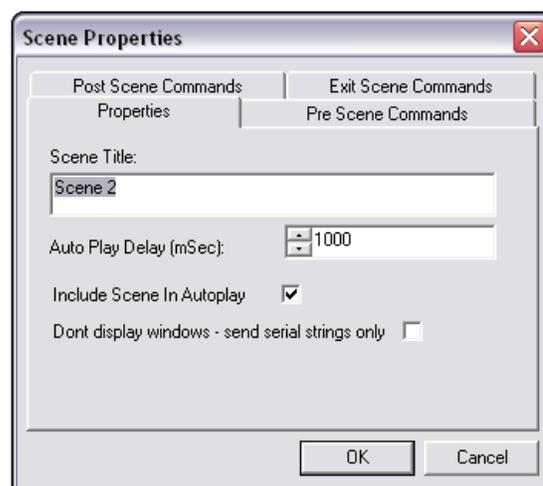
New scenes are added to the end of the scene list. A new scene has no attributes copied from the currently selected scene.

**NOTE:** The number of windows allowed within a scene depends on the Quantum processor hardware. The maximum is 128 windows per output card. See the *Quantum User Guide* for more details.

To create a new scene:



1. Click the  button on the Scene Properties toolbar (see [figure 24](#), **C**). The Scene Properties dialog box opens.



**Figure 25. Scene Properties Dialog Box**

2. Modify the default scene title as desired. To change other settings follow the procedure described in [Changing Scene Properties](#) on the next page.
3. Click **OK**. In the Scene Control workspace, a new **Scene Selection** button is also added for the new scene (see [Using the Scene Control](#) on page 61).
4. Add a window to the scene (see [Adding Windows to the Window Palette](#) on page 48).

## Copying an Existing Scene

You can create an exact copy of any scene that exists in your project. This is useful when you are creating a number of scenes that only have slight variations from each other.

The copied scene is inserted immediately after the original scene. It has the same window palette, window layout, control commands, and Auto Play settings as the original.

To copy an existing scene:

1. In the scene list of the Scene Design workspace, select the name of the scene to be copied.
2. Click the  button on the Scene Properties toolbar. The **Scene Properties** dialog box opens for the copied scene (see [figure 25](#) on the previous page).
3. Modify the default scene title and other settings as needed.
4. Click **OK**. In the Scene Control workspace, a new **Scene Selection** button is also added for the copied scene (see [Using the Scene Control](#) on page 61).

## Deleting a Scene

1. In the scene list of the Scene Design workspace, select the scene to be deleted. The selected scene is displayed in the workspace.

2. Click the  button on the Scene Properties toolbar. In the Scene Control, the corresponding **Scene Selection** button is also deleted (see [Using the Scene Control](#)).

## Changing Scene Properties

1. Select a scene in the scene list of the Scene Design workspace and click the  button on the Scene Properties toolbar

- or -

For any scene, right-click the scene title in the scene list.

The **Scene Properties** box opens (see [figure 25](#)).

2. Modify the settings as needed. These settings include:
  - **AutoPlay Delay (mSec)** — Set the amount of time that the scene is displayed during Auto Play (see [Changing the Display Time for a Scene](#) on page 68).
  - **Include Scene in Autoplay** — Select this check box to include this scene in an AutoPlay project. Clear this check box to exclude the scene (see [Changing the Display Time for a Scene](#)).
  - **Don't display windows - send serial strings only** — By selecting the **Don't display windows** check box on the **Scene Properties** dialog box, only the serial strings (if any) associated with the scene are executed. Any source or layout changes in the scene are ignored. This allows the scene to transmit a serial command without changing the current layout of the target display, such as to operate an external source switcher.
3. Click **OK**.

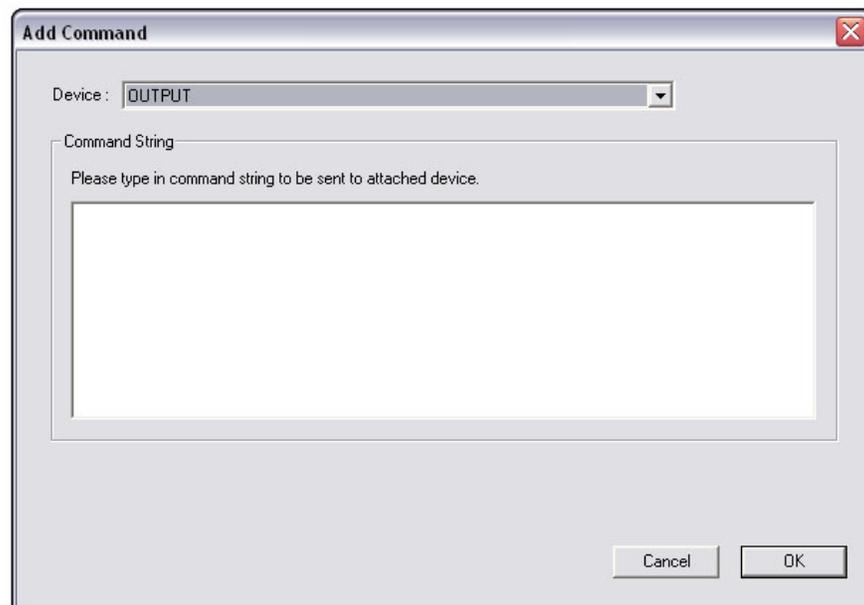
## Scene Commands

### Adding a scene command

1. Select a scene in the scene list of the Scene Design workspace and click the  button on the Scene Properties toolbar (see [figure 24](#), , on page 41)  
- or -  
For any scene, right-click the scene title in the scene list.  
The Scene Properties dialog box opens (see [figure 25](#) on page 42).
2. Select the appropriate **Scene Commands** tab. The available tabs include:
  - **Pre Scene Commands** — Commands that occur as soon as the scene is selected but not yet fully displayed
  - **Post Scene Commands** — Commands that occur when the scene display is fully complete
  - **Exit Scene Commands** — Commands that occur when another scene is selected but before the pre-scene commands of the new scene

**NOTE:** The procedure to add, edit, or remove commands is the same for each tab.

3. Click **Add** to display the Add Command box.



**Figure 26. Add Command Dialog Box**

4. From the **Device** drop-down list, select the device for which you want to add a command.
5. In the Commands panel, select the desired command name from the list.  
If you select a non-XML defined serial port (which is shown on the Device list as **OUTPUT**), a text box is displayed for you to enter a free format text string command.
6. Click **OK** to add the command to the scene.

## Changing the order of scene commands



1. Select a scene in the scene list of the Scene Design workspace and click the button on the Scene Properties toolbar (see [figure 24](#), , on page 41)  
- or -  
For any scene, right-click the scene title in the scene list.  
The **Scene Properties** dialog box opens (see [figure 25](#) on page 42).
2. Select the appropriate **Scene Commands** tab.
3. In the command list, select the command to be moved.
4. In the Command Ordering panel, click the **Move Up** or **Move Down** button to move the command to the desired position in the list.

## Removing a scene command



1. Select a scene in the scene list of the Scene Design workspace and click the button on the Scene Properties toolbar (see [figure 24](#), )  
- or -  
For any scene, right-click the scene title on the scene list.  
The **Scene Properties** dialog box opens (see [figure 25](#)).
2. Select the appropriate **Scene Commands** tab.
3. In the command list, select the command to be removed.
4. Click **Remove**.

## Editing a serial (output) scene command



1. Select a scene in the scene list of the Scene Design workspace and click the button on the Scene Properties toolbar  
- or -  
For any scene, right-click the scene title in the scene list.  
The **Scene Properties** dialog box opens (see [figure 25](#)).
2. Select the appropriate **Scene Commands** tab.
3. In the command list, select the output name.
4. Click **Edit**.
5. Edit the free format text string as needed.
6. Click **OK**.

## Changing the Order of Scenes and Scene Navigation

You can change the order of the scenes in the scene list. When using the Auto Play option, scenes are recalled in the order that they appear in this list. You can use the Scene Control toolbar, scene list, and keyboard to navigate to the scene you want to view or edit. To move a scene in the scene list, drag and drop the scene title to a new position in the scene list (see [figure 24](#), ①, on page 41).

To go to...	Click...
A specific scene	The scene title in the scene list
The next scene	The  button or press the <Down Arrow> key on the keyboard
The previous scene	The  button or press the <Up Arrow> key on the keyboard
The first scene	The  button or press the <Home> key on the keyboard
The last scene	The  button or press the <End> key on the keyboard

The **Play** button  plays all the scenes in order in a loop until the **Stop**  button is clicked.

## Working with Windows

In the Scene Design workspace, the target display is represented by the virtual display area and each window that can be placed on the display is represented by a virtual window (see [figure 24](#), ⑥). Each window that appears on the display has a source associated with it. On the Scene Design page, you can create windows and add them to the display as desired. The contents of each window can be the same or can differ between scenes.

When you create a window, it is added to the window palette, located between the taskbar and the source explorer panels on the Scene Design page. You can drag windows from the palette to the Scene Design workspace and place them where desired on the display.

**NOTE:** The window palette may not be visible when you open the Scene Design workspace. To display it, drag the left edge of the source explorer panel to the right until the palette appears.

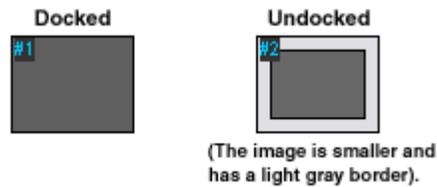
Each virtual window has a unique number (automatically assigned by the Quantum Control Software) and a user-definable label that is typically used to identify the source.



**Figure 27. Virtual Window with Label**

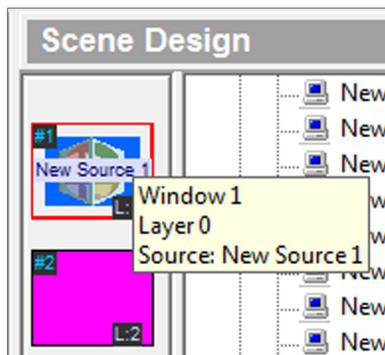
- A** Window number
- B** Window label

The appearance of a window in the window palette differs depending on whether the window is docked (not used in the scene) or undocked (used in the scene). If the window is undocked, it has a light gray border (see figure 28). All windows that have been added to the virtual display have this border. Docked windows exist only in the window palette.



**Figure 28. Docked and Undocked Windows in the Window Palette**

When you hover the mouse pointer over a window in the palette, a pop-up opens showing the window number and its source type. For example:



**Figure 29. Window Details Pop-up**

## Adding Windows to the Window Palette

When you create a new project, the window palette is empty and you need to add windows to it. The methods of adding windows are described in the following sections.

### Creating a window with a source

This method is the simplest and therefore recommended. To create a window with a source displayed:

1. Click on a source name in the Source Explorer tree and drag it to the desired location in the virtual display area (see [figure 24](#), , on page 41). A window with the source selected appears in the workspace and on the palette. The size of the window matches the current grid spacing.

**NOTE:** Windows created by this method appear in the workspace and on the window palette with the source icon (shown at right) because they already have sources selected.



2. Resize or move the window on the palette as desired (see [Moving and Resizing a Window](#) on page 50).

### Creating an empty window

If you have not determined the source you want to display in a window, or the source has not been added to the Source Explorer, you can create an empty window and add the source to it later (see [Adding or Changing a Source for a Window](#) on the next page).

You can create a window without a source in either of the following areas:

- **Window palette:** Right-click anywhere in the window palette, then click the **Add Window** pop-up. A new window is added to the window palette and is given the next available window number.
- **Virtual display:** Right-click anywhere in the virtual display or workspace (but not in an existing window), then select **Add Window** from the drop-down menu. A new window is both added to the window palette and placed in the workspace area.

Initially, each window created by this method has a pink background (see [figure 29](#) on the previous page), which indicates that no source is selected for the window.

## Adding a Docked Window to a Scene

To add a docked window in the window palette to a scene:

1. In the window palette, select the window to be added to the current scene. The window is outlined in red.
2. Drag the window into the virtual display area. The light gray border is added to the window on the window palette.
3. Modify the window as desired (see [Selecting the Window Style \(Quantum Elite Models Only\)](#) on page 52).

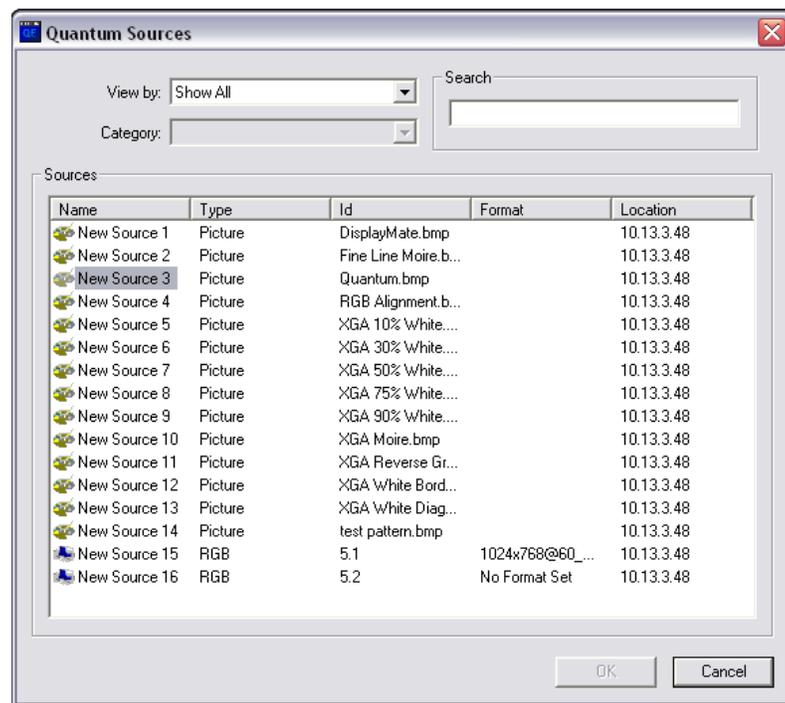
## Adding or Changing a Source for a Window

To select or change a source for a window on the virtual display, use one of the following procedures.

- **Right-clicking and dragging:** In the Source Explorer, right-click on the desired source and drag it onto a window in the virtual layout (see [figure 24](#), **G**, on page 41).

If the window already has a source, the source you are dragging replaces it. If the window has no source, the selected source is added to it. A light gray border appears around the window on the window palette to indicate that it has a source.

- **Using the Quantum Sources window:**
  1. Select a window in the window palette or in the virtual display area of the currently selected scene.
  2. Right-click the selected window and select **Window Source** from the drop-down menu. The Quantum Sources dialog box opens.



**Figure 30. Quantum Sources Dialog Box**

3. In the Sources panel of the dialog box, select the desired source. You can filter the listed sources by selecting an option from the **View By** or **Category** drop-down lists. You can also search for sources using the **Search** field.

**NOTE:** The **Search** field is case-sensitive.

4. Click **OK**.

## Deleting a Window

To remove a window from the scene or the window palette:

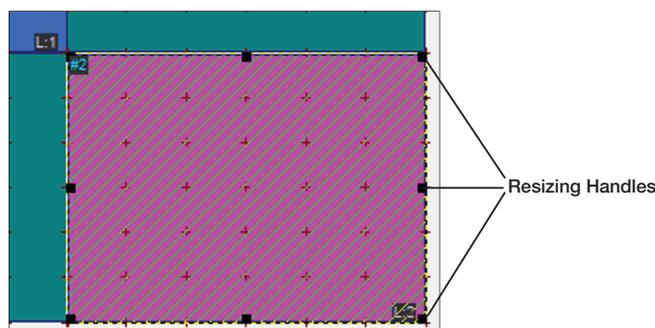
1. In the window palette or in the virtual display area, select the window to be removed from the currently selected scene.
2. Do one of the following:
  - Press the <Delete> key on your keyboard.
  - Right-click on the window and select **Delete Window** from the drop-down menu.
  - Click the  button on the Window Properties toolbar.

## Moving and Resizing a Window

The simplest way to resize and reposition a window is to use the dragging procedure described below. To perform finer adjustments to the size and placement of the window, see [Using the Window Properties toolbar](#) or [Using the Window Size & Position dialog box](#) on the next page.

To move or resize a window in the virtual display area:

1. Select a window in the virtual display area or select an undocked window in the window palette of the currently selected scene. In the virtual display area, the window is highlighted as shown below:



**Figure 31. Selecting a Window**

2. Perform the following as needed:
  - **To resize the window**, drag one of the resizing handles on the window border until the window is the desired size. The mouse pointer changes to a double arrow symbol, showing which direction the border can be moved.  
To size the window to fit the entire display array, right-click the window and select **Full Screen** from the drop-down menu.
  - **To move the window**, click the window and drag it to a new location. The mouse pointer changes to two crossed arrows while hovering over the selected window.

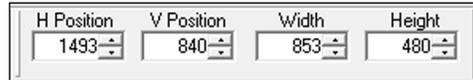
With the layout grid turned on, window borders automatically align or snap to the grid lines. You can temporarily disable this feature by holding down the <Shift> key on your keyboard while moving or resizing the window.

If necessary, you can hide the layout grid or change its spacing (see [Changing the Virtual Display Properties](#) on page 59).

## Using the Window Properties toolbar

If you need to position or resize a window with pixel accuracy, you can use the Window Properties toolbar (see [figure 24](#), **D**, on page 41), as follows:

1. If the Window Properties toolbar is not currently displayed, select **Window Properties Toolbar** from the **View** menu. A check mark appears in front of the menu option and the following toolbar is displayed:



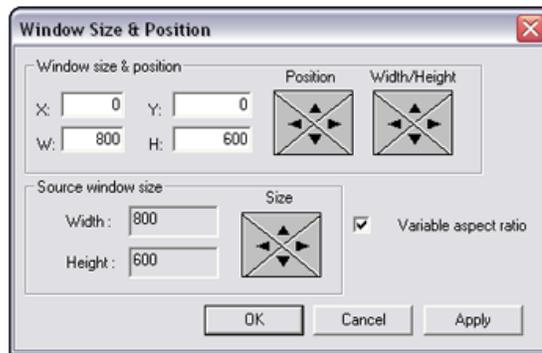
**Figure 32. Window Properties Toolbar**

2. In the virtual display area, click on the window to be adjusted.
3. On the Window Properties toolbar, click the **H Position** and **V Position Arrows** to adjust the window position, or enter positive or negative pixel values in the **H Position** and **Y Position** fields and press <Enter> on your keyboard.
4. Click the **Width** and **Height Arrows** to adjust the window size, or enter pixel values in the **Width** and **Height** fields and press <Enter> on your keyboard.

## Using the Window Size & Position dialog box

If you need to position or resize a window with pixel accuracy, you can use the Window Size & Position dialog box.

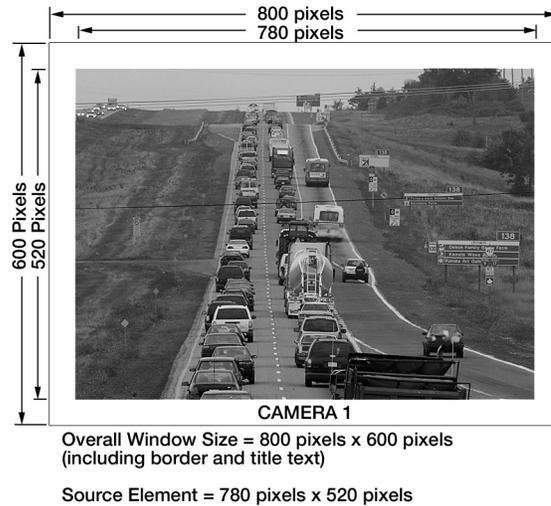
1. Right-click a window in the virtual display area of the currently selected scene and select **Adjust Position and Size** from the drop-down menu. The Window Size & Position dialog box opens.



**Figure 33. Window Size & Position Dialog Box**

2. Set the **Variable aspect ratio** check box as needed.
  - **Cleared** — The vertical and horizontal sizes are locked together. The viewport maintains the aspect ratio of the original source.
  - **Selected** — The vertical and horizontal size can be adjusted independently.
3. Click the **Position Arrows** to adjust the window position or enter pixel values in the **X** (left edge) and **Y** (top edge) fields.
4. Click the **Width and Height Arrows** to adjust the overall window size or enter pixel values in the **W** (width) and **H** (height) fields.

- To set the actual source element to a specific size (rather than the overall window size), click the **Size Arrows** to make the necessary adjustments. Width and height values in the Source Window Size panel show the size of the source, allowing for the width of any border or title text (see figure 34).



**Figure 34. Example of Window Sizing**

- Click **Apply** to update the display with the new settings and leave the dialog box open. Click **OK** to save the new settings and close the dialog box or click **Cancel** to keep the existing settings.

## Selecting the Window Style (Quantum Elite Models Only)

**NOTE:** The Quantum Connect Control Software does not support the use of window styles.

Using the Quantum Elite, you can give each window a text label to identify the source on the target display and a colored border if desired. Two types of text labels can be applied to a window:

- Overlay text** — Text is placed over the source.
- Title text** — Text is placed above or below the source on a colored background.

The appearance of window text and borders is defined by a style. A style specifies the font, size, color, and position of label text, as well as border width and color. **Figure 35** on the next page shows examples of different window styles.

By default, if a style that adds a border or title text is applied to a window, the overall window size does not increase. The window source is scaled down to allow the border or title text to fit within the same overall window size.

If you want the source to remain a specific size, manually set it to the required size using the Window Position dialog box (see **Moving and Resizing a Window** on page 50 for more information).

**NOTE:** Window styles are defined in an XML file called ESQuantumConfig.xml. To change or add to the default styles provided in this version of the Quantum Control Software, you can edit the parameters of this file (see **Modifying Window Styles** on page 84).



**Window with Source Only**



**Window with Overlay Text**

You can change the Overlay Text font, size, and color. Text can be aligned vertically (top, middle, or bottom) and horizontally (left, middle, or right).



**Window with Border**



**CAMERA 1**

**Window with Title Text**

You can change the Title Text font, size, and color. Background color is defined by the border color. Text can be aligned vertically (top or bottom) and horizontally (left, middle, or right).



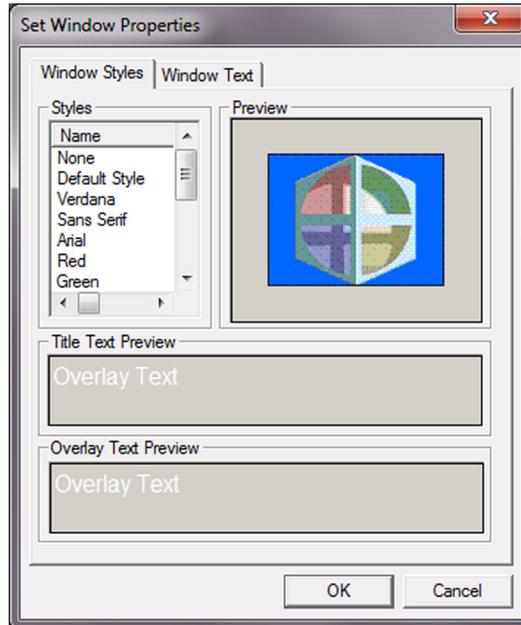
**Window with Border and Title Text**

**Figure 35. Examples of Different Window Styles**

## Changing the window style

To change the window style:

1. In the window palette or in the virtual display area of the currently selected scene (see [figure 24](#), **E** or **G**, on page 41), select a window.
2. Right-click the window and select **Window Properties** from the drop-down menu. The Set Window Properties dialog box opens.
3. Select the **Window Styles** tab and choose a style from the Styles list:



**Figure 36. Window Styles Dialog Box**

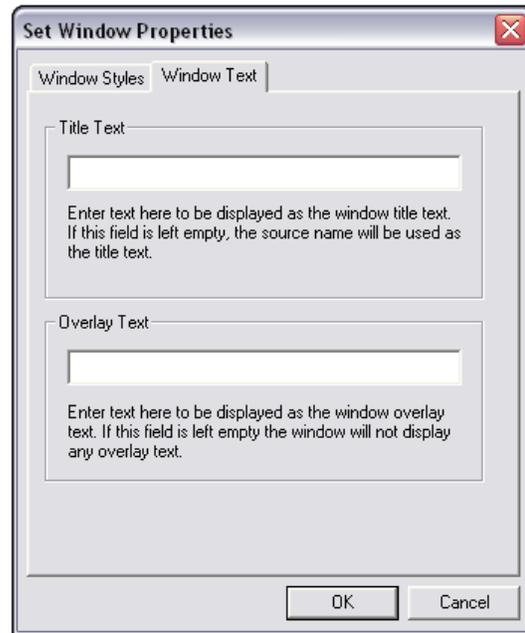
The Title Text Preview and Overlay Text Preview sections of this tab show the appearance of text for the selected style. Selecting **None** produces a plain source window with no border or title text.

**NOTE:** Only the size, font, and position of the label text and the size of the window border are reflected on the virtual display. The text and border colors can be viewed only in the Preview panel of the `Window Styles` dialog box and on the actual display.

## Changing the window text

To change the text content of the window label:

1. In the window palette or in the virtual display area of the currently selected scene, select a window.
2. Right-click the window and select **Window Properties** from the drop-down menu. The **Set Window Properties** dialog box opens (see figure 37).



**Figure 37. Window Text Dialog Box**

**NOTE:** The content of text labels and overlays can be viewed only on the display.

3. Select the **Window Text** tab and enter the desired text in the **Title Text** and **Overlay Text** fields.

**NOTE:** If the **Title Text** field is empty, the source name is displayed as the title text. If the **Overlay Text** field is empty, no overlay text is displayed.

4. When finished entering properties on both tabs, click **OK** to close the window and implement your changes.

## Changing the Zoom Properties

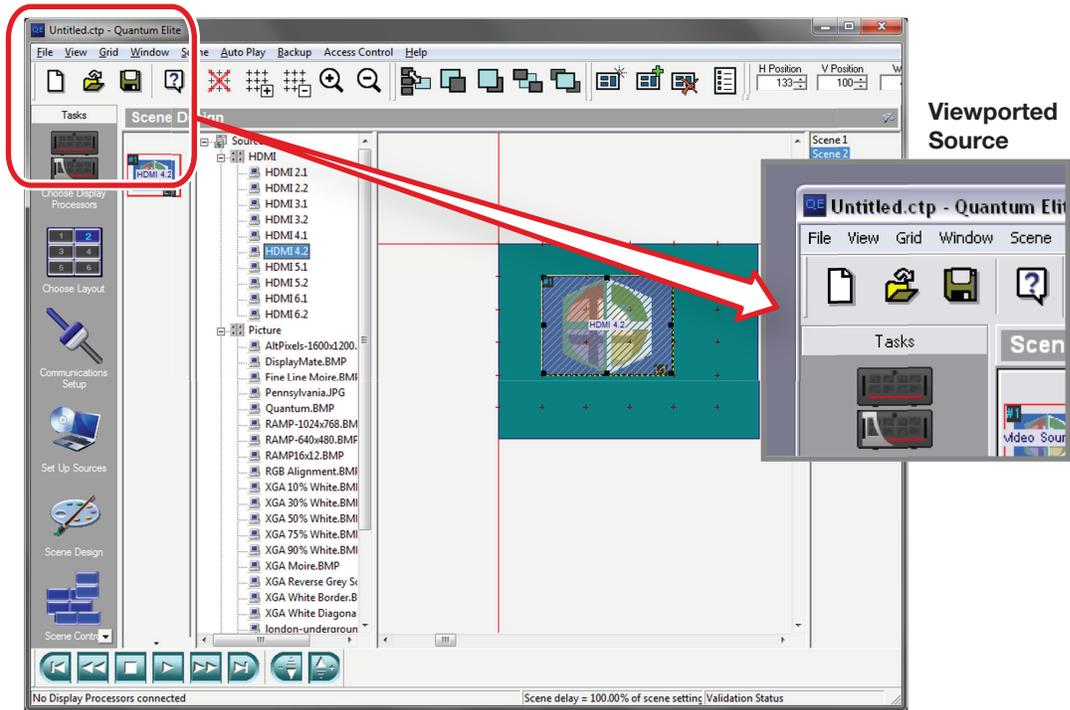
By default, a window that contains a source displays the entire source frame. The source is automatically scaled to fit within the window. However, if needed, you can zoom into any part of the source frame, such as to exclude unwanted or irrelevant material.

The portion of the image that you can zoom into is called a “viewport” (see the example in [figure 38](#) on the next page). A viewport can:

- Be as small as 6 percent of the active source frame.
- Have the same aspect ratio as the source or be stretched in either the horizontal or vertical direction.
- Be positioned (or panned) to view any part of the source frame.

Regardless of the size, shape, or position of the viewport, the portion of the source image that it contains fills the entire window (see figure 38).

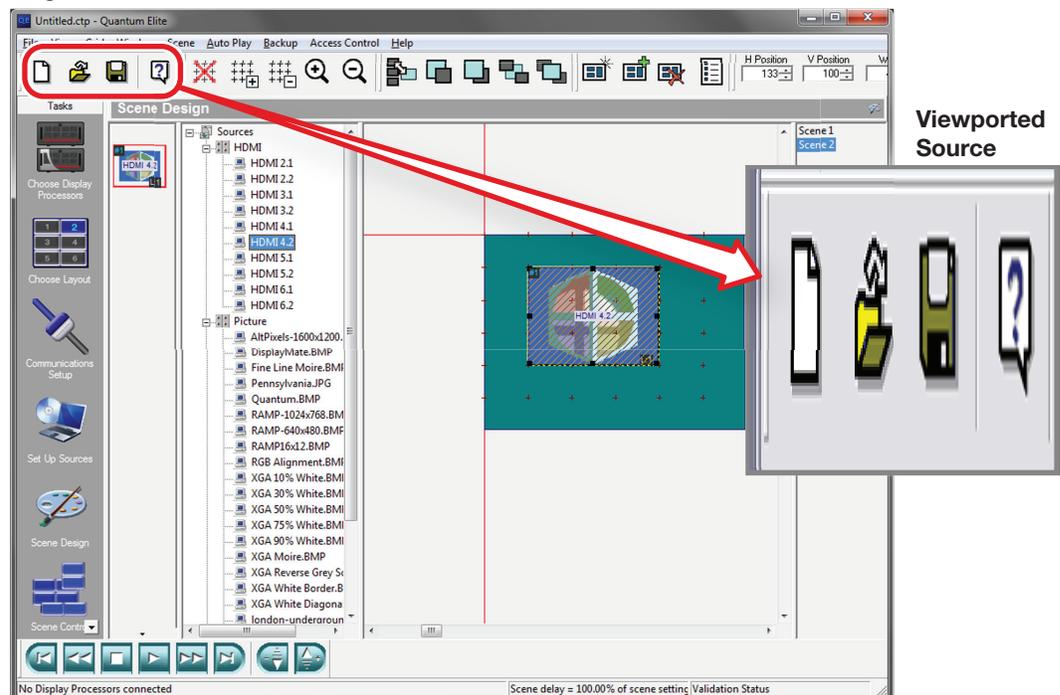
### Original Source



**Figure 38. Example of a Standard Viewport that Preserves the Aspect Ratio of the Original Source**

If the window does **not** have the same aspect ratio as the original source, the viewported image is compressed or stretched to fit the window (see figure 39). To retain the aspect ratio of the viewport, the window needs to be the same shape as the viewport.

### Original Source



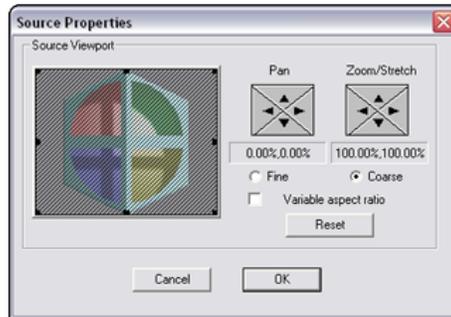
**Figure 39. Example a Stretched Viewport**

The number of viewported windows that can be present within one scene is dependent on source types as well as the size and shape of the windows.

**NOTE:** Zooming in on part of a source only enlarges the image detail that is already present in the source signal. If the image detail is not of good quality, zooming in does not increase the level of detail.

To change the viewport:

1. Right-click the window in the virtual display area (see [figure 24](#), **G**, on page 41) and select **Zoom Properties** from the drop-down menu. The **Source Properties** dialog box opens.



**Figure 40. Source Properties Dialog Box**

2. Set the **Variable aspect ratio** check box as needed.
  - **Cleared** — The vertical and horizontal zoom percentages are locked together. The viewport maintains the aspect ratio of the original source.
  - **Selected** — The vertical and horizontal zoom percentages can be adjusted independently.
3. Select fine or coarse adjustment by clicking the appropriate radio button (**Fine** or **Coarse**).
4. Click the **Zoom/Stretch Arrows** to change the size of the viewport
  - or -
  - Click and drag the handles of the viewport area to adjust the size.
  - To quickly return the Zoom and Stretch settings back to 100 percent (no viewport), click **Reset**.
5. Click the **Pan Arrows** to change the position of the viewport
  - or -
  - Click and drag the viewport area to the desired position.
  - The target display updates in real time as you make changes to the zoom and pan settings.
6. Click **OK** to accept the new viewport settings or click **Cancel** to retain the previous settings.

## Changing the Layer of a Window

The layer of a window determines whether it appears in front of or behind other windows. Only one window can exist on a layer. A layer is also known as a Z order or priority.

Layers are identified by a number and the higher the number, the further forward the window. For example, a window on layer 3 appears in front of a window on layer 2, but behind a window on layer 4. The farthest back is layer 0.

To see the current layer number of a window, hover over the window in the window palette. A pop-up opens showing the window number, its current layer, and source type.

**NOTE:** The maximum number of windows allowed within a scene is dependant on the Quantum processor hardware. The maximum is 128 windows per output card (see the *Quantum User Guide* for more information).

To change the layer:

1. Select a window in the window palette or in the virtual display area of the currently selected scene.
2. Using the Window Properties toolbar, click one of the following buttons to change the layer of the window. You can also use the **Window** menu to change the layer.

Buttons and Menu Options	Window Movement
Click  - or - From the <b>Window</b> menu, select <b>Send Back</b> .	Send backward by one layer.
Click  - or - From the <b>Window</b> menu, select <b>Bring Forward</b> .	Bring forward by one layer.
Click  - or - From the <b>Window</b> menu, select <b>Send to Back</b> .	Send to the back of all layers (such as layer 1).
Click  - or - From the <b>Window</b> menu, select <b>Bring to Front</b> .	Bring to the front of all layers.

## Changing the Virtual Display Properties

Various properties of the virtual display area can be altered based on personal preference or to assist in creating scenes in the Scene Design workspace. Most of these properties can be changed using the Virtual Display Properties toolbar (see [figure 24](#), **A**, on page 41).

### Layout grid

The layout grid in the Scene Design workspace assists you in accurately placing windows on the target display. When the grid is visible, the borders of all windows snap to the grid.

**NOTE:** When the grid is hidden, the snap to grid feature is disabled.

You can change the following grid properties:

- **To show the grid:**

Click the  button

- or -

From the **Grid** menu, select **Snap Grid**. A check mark appears on the menu in front of the option. This option is listed when no grid is visible.

- **To hide the grid:**

Click the  button

- or -

On the **Grid** menu, deselect **Snap Grid**.

- **To temporarily disable the snap to grid feature:**

Hold down the <Shift> key while placing or resizing the window.

You can change the number of vertical and horizontal lines in the layout grid.

- **To increase the number of grid lines:**

Click the  button

- or -

Press the <Page Down> key.

- **To decrease the number of grid lines:**

Click the  button

- or -

Press the <Page Up> key.

## Virtual display zoom

You can zoom in on the virtual display area to assist with accurately placing windows or you can zoom out to see more of the target display (see [figure 24](#), **A**, on page 41).

- **To zoom in on the display:**

Click the  button

- or -

From the **View** menu, select **Zoom In**

- or -

Press the <+> key.

- **To zoom out of the display:**

Click the  button

- or -

From the **View** menu, select **Zoom Out**

- or -

Press the <-> key.

**NOTE:** Zooming in on or out of the virtual display does not affect the content of the real display.

## Background color

In the virtual display area, you can change the color of the background and the virtual display itself (see [figure 24](#), **G**).

**NOTE:** Changing the color of the virtual display has no effect on the content of the real display.

To change the background or virtual display color:

1. Right-click anywhere in the layout area (but not on a window) of the Scene Design workspace and select either **Change Background Color** or **Change Virtual Display Color** from the drop-down menu. The **Color** dialog box opens.
2. Select a predefined or newly defined color.
3. Click **OK**.

# Viewing a Project

This section describes the Scene Control task and procedures for setting views of scenes in a project. Topics that are covered include:

- [Using the Scene Control](#)
- [Using Auto Play](#)

## Using the Scene Control

The Scene Control task lets you recall specific scenes in your project by clicking a scene control button on the computer screen. The layout and design of the buttons can be customized to suit the end user.

To access the Scene Control:

1. Click the **Scene Control** button on the main application window taskbar (see [figure 2](#), **D**, on page 8).

The Scene Control workspace and Views toolbar open.

2. If the Views toolbar does not open, select its name from the **Views** menu.



## Run View and Design View

There are two modes for viewing the Scene Control workspace:

- Run view
- Design view

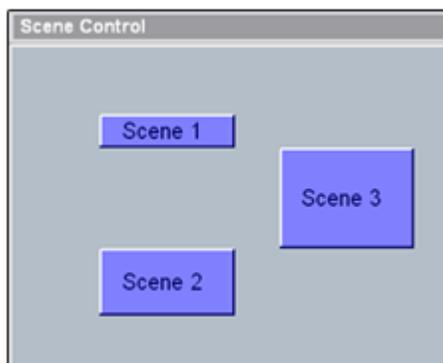
To change modes, click the **Toggle Design/Run Modes** button on the Views toolbar.



### Run view

In run view mode, the **Scene Selection** buttons are active. To recall a scene, click the appropriate **Scene Selection** button.

Here is an example of the Scene Control workspace in run view:



**Figure 41. Scene Control Workspace in Run View**

## Design view

In design view mode, you can customize the layout and design of the **Scene Selection** buttons. To assist with button sizing and positioning, a layout grid is displayed.

Here is an example of the Scene Control workspace in design view:

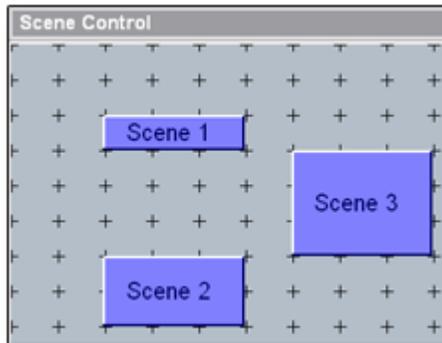


Figure 42. Scene Control Workspace in Design View

## Full Screen Mode

The Scene Control task can also be operated in full screen mode, in which only the workspace area, which contains the **Scene Selection** buttons, is visible.

When full screen mode is active, the Scene Control automatically switches to run view and access to all setup tasks is disabled. This mode is useful when the Quantum Control Software will be controlled via a touch screen.

- To activate full screen mode from the Scene Control task, click the  button on the Views toolbar.
- To return to normal screen mode, press the <Esc> key on your keyboard.

## Starting up in full screen mode

The Quantum Control Software can also open directly to full screen mode at startup. To do this, create a Windows shortcut and specify a “switch” on the command line.

To start the Quantum Control Software in full screen mode:

1. Minimize (or close) the Quantum Control Software and any other Windows applications so that you can see the desktop.
2. Create a new shortcut by right-clicking the desktop and selecting **New > Shortcut** from the drop-down menu. The **Create Shortcut** dialog box opens.
3. Enter the command line. You can enter the path to the program or locate it by clicking the **Browse** button. In a typical installation, the command line is:

### Windows NT, 2000, and XP:

C:\Program Files\Extron\Quantum Elite\Quantum Elite.exe **or**  
C:\Program Files\Extron\Quantum Connect\Quantum Connect.exe.

### Windows 7 and 8:

C:\Program Files (x86)\Extron\Quantum Elite\Quantum Elite.exe **or**  
C:\Program Files (x86)\Extron\Quantum Connect\Quantum Connect.exe.

4. Select the mode in which to open the application by adding one of the following to the command that you entered in step 3:
  - **For user mode:** Add a **space** followed by -u to the end of the command line.
  - **For administrator mode:** Add a **space** followed by -f at the end of the command line.
5. Click **Next**.
6. Enter the name for the shortcut or accept the default name and click **Finish**.
7. If you want the new shortcut to execute when the operating system starts, copy or move the shortcut to the Windows Startup folder. See the Windows Help system for more information on how to do this.

## Creating a Default Layout

You can have the Quantum Control Software create a default layout, comprised of a button for each scene in your project. Generally, this function is used to create a new layout and customize the layout as needed. Any customized settings that you have already created are lost by using this function. To create a default layout:

1. Ensure that the Scene Control workspace is in Design View (the layout grid is visible).



2. Click the  button on the Views toolbar. A Warning dialog box opens with a reminder that any existing layout settings will be lost if you proceed.
3. In the Warning dialog box, click **Yes** to create a default layout or **No** to retain the existing one.

## Customizing the Layout

### Changing background properties

You can set the background of the Scene Control workspace to be a solid color or a bitmap image. To change the background:

1. Ensure that the Scene Control workspace is in Design View (with the layout grid visible).
2. Right-click anywhere on the workspace background (but not on a **Scene Selection** button). The **Background Properties** dialog box opens.

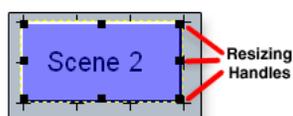


**Figure 43.** Background Properties Dialog Box

3. Apply a solid color or a bitmap image.
  - **To apply a solid color:**
    - a. In the **Background Properties** dialog box, click **Colour**. The **Color** dialog box opens.
    - b. Select a predefined color from the Basic Colors palette or define a custom color.
    - c. Click **OK**. This returns you to the **Background Properties** dialog box.
    - d. Click **OK** on the **Background Properties** dialog box to apply the chosen color.
  - **To apply a bitmap image:**
    - a. In the **Background Properties** dialog box, click **Bitmap Manager**. The **Bitmap Manager** dialog box opens.
    - b. In the Available Bitmaps list, select an image name. If there are no bitmaps listed or to add a new bitmap, see [Using the Bitmap Manager](#) on page 66.
    - c. Click **OK** to return to the **Background Properties** dialog box.
    - d. Click **OK** on the **Background Properties** dialog box to apply the chosen image.

### Moving and resizing a button

1. Ensure that the Scene Control workspace is in Design View (with the layout grid visible).
2. Click a **Scene Selection** button. It is highlighted with a dotted outline and resizing handles.



**Figure 44.** Selecting a Scene Selection Button

3. Move and resize the button as needed.
  - **To resize the button**, position the mouse pointer over one of the resizing handles and drag the button border to the desired position. The mouse pointer changes to a double arrow symbol, showing which direction the border can be moved.
  - **To move the button**, position the mouse pointer within the button, hold down the left mouse button, and drag the button to a new location. The mouse pointer changes to a crossed arrow symbol.

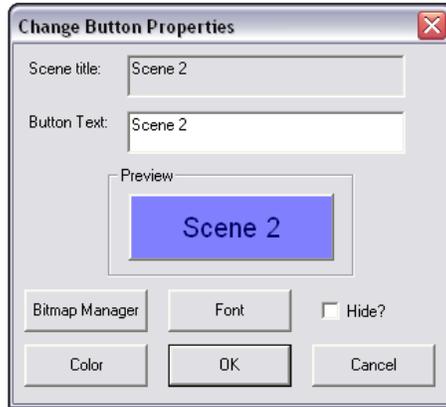
By default, the button borders snap to the layout grid. You can temporarily disable grid snap by holding down the <Shift> key on your keyboard while moving or resizing the button.

### Changing the properties of a button

You can set the button background to be a solid color or bitmap image. You can also change the text displayed on the button, including the font style, size, and color.

#### To open the Change Button Properties dialog box:

1. Ensure that the Scene Control workspace is in Design View (with the layout grid visible).
2. Right-click the **Scene Selection** button. The **Change Button Properties** dialog box opens (see [figure 45](#) on the next page).



**Figure 45. Change Button Properties Dialog Box**

**To change the text and font displayed on the button:**

1. In the **Button Text** field of the Change Button Properties dialog box, enter the desired text.

**NOTE:** When the button is first created, the button text is copied from the scene title. Any subsequent change to the scene title does not update the text.

2. Click **Font** to change the size, style, or color of the font. The Font dialog box opens.
3. Change the font settings as desired.
4. Click **OK** to return to the Change Button Properties dialog box.
5. Click **OK** to apply the new text and font settings.

**To apply a solid color to the button:**

1. In the Change Button Properties dialog box, click **Color**. The Color dialog box opens.
2. Select a predefined color from the Basic Colors palette or define a custom color.
3. Click **OK** to return to the Change Button Properties dialog box.
4. Click **OK** to apply the selected color.

**To apply a bitmap image to the button:**

1. In the Change Button Properties dialog box, click **Bitmap Manager**. The Bitmap Manager dialog box opens.
2. In the Available Bitmaps list, select an image name. If there are no bitmaps listed or to add a new bitmap, see [Using the Bitmap Manager](#) on the next page.
3. Click **OK** to return to the Change Button Properties dialog box.
4. Click **OK** to apply the selected image.

**TIPS:**

- The edge color of a button is determined by the color applied to the entire button and remains visible when an image is used.
- To improve the appearance of the button, first apply a color to the button that matches the color of the image, then apply the image.

If you want to hide the button during Run View, select the **Hide?** check box in the Change Button Properties dialog box.

## Changing the properties of multiple buttons

You can change certain properties (such as color and font size) of more than one button simultaneously; however, you cannot move or resize several buttons at the same time. To simultaneously change the properties of multiple buttons:

1. Ensure that the Scene Control workspace is in Design View (with the layout grid visible).
2. In the workspace, ensure that the mouse pointer is not over a **Scene Selection** button, then click and drag to draw a rectangle around the buttons you want to change. When you release the mouse button, all **Scene Selection** buttons within the rectangle are selected (with resizing handles).
3. Right-click on a button, if you want to copy the properties from that button

- or -

Right-click anywhere else in the workspace, if you want to obtain the default properties.

The **Change Button Properties** dialog box opens and **Multiple selection** is shown in the preview panel.

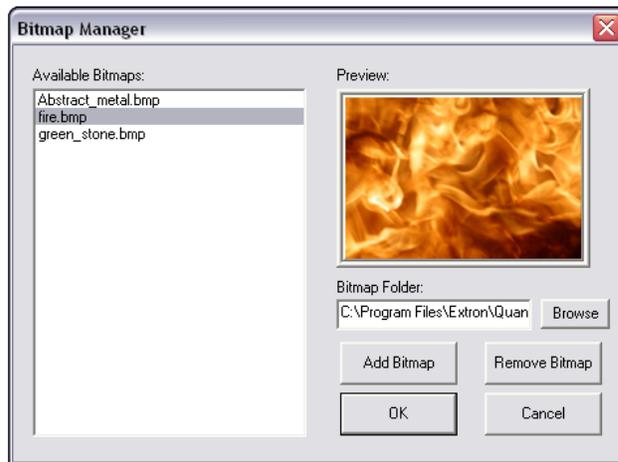
4. In the **Change Button Properties** dialog box, make the necessary modifications to the font color, font typeface, button color and image.

**NOTE:** You cannot change the button text when selecting multiple buttons.

5. In the **Change Button Properties** dialog box, click **OK** to apply the new properties to all buttons in the selection.

## Using the Bitmap Manager

Clicking **Bitmap Manager** in either the **Background Properties** dialog box or the **Change Button Properties** dialog box opens the **Bitmap Manager** dialog box.

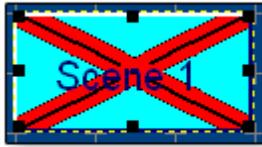


**Figure 46. Bitmap Manager Dialog Box**

Bitmaps (BMP files) that are applied to the buttons or background of the Scene Control workspace are **not** saved with the project file. Instead, these files are copied to a separate folder on the hard drive from which the Quantum Control Software accesses them.

**NOTE:** If you copy a project from one computer to another, you must remember to copy the bitmaps as well.

Any missing bitmaps are indicated on the appropriate button or background with a red X on a blue background as shown below.



**Figure 47. Missing Bitmap**

**To change the bitmap folder:**

1. In the **Bitmap Folder** field of the **Bitmap Manager** dialog box, click **Browse**. The **Browse for Folder** dialog box opens.
2. Select the appropriate folder.
3. Click **OK**.

**To select an existing bitmap:**

1. In the **Available Bitmaps** list of the **Bitmap Manager** dialog box, select the appropriate file.
2. Click **OK**.

**Adding, removing, or restoring a bitmap**

**To add a new bitmap:**

1. In the **Bitmap Manager** dialog box, click **Add Bitmap**. The **Open** dialog box appears.
2. Locate the desired bitmap (BMP) file.
3. Click **OK**. The bitmap file is copied to the directory specified in the **Bitmap Folder** field and appears on the **Available Bitmaps** list.

You can also copy files directly to the **Bitmap** folder using **Windows Explorer**. However, you need to close the **Bitmap Manager** dialog box and reopen it to update the **Available Bitmaps** list.

When the **Quantum Control Software** is first installed, the default location for storing bitmaps is:

C:\Program Files (Program Files (x86) for Windows 7 and 8)\Extron\Quantum Elite\Bitmaps

- or -

C:\Program Files (Program Files (x86) for Windows 7 and 8)\Extron\Quantum Connect\Bitmaps.

**To remove a bitmap:**

1. From the **Available Bitmaps** list of the **Bitmap Manager** dialog box, select the file to be deleted.
2. Click **Remove Bitmap**.

If the file is currently in use, a **Warning** dialog box opens asking whether to delete the file. Click **Yes** to proceed.

The file is deleted from the list and the **bitmap** folder. If the **bitmap** was in use by any buttons, those buttons now display a red X on a blue background (see **figure 47**).

### To restore a deleted bitmap:

- Follow the instructions for adding a new bitmap (see [To add a new bitmap](#) on the previous page). If the file name of the restored bitmap is the same as the missing bitmap, the image is restored to the appropriate button or background.  
- or -
- Copy the missing file to the bitmap folder using Windows Explorer. You must restart the Quantum Control Software to fully restore the bitmap image to the appropriate button or background.

## Using Auto Play

When using the Auto Play function, the Quantum Control Software displays each scene for a specified period, then switches to the next scene. The period of time that a scene is displayed can be different for each scene.

When the project starts, it plays continuously until it is stopped. When the last scene is reached, Auto Play cycles back to the first scene.

To use Auto Play, click the **Scene Design** button on the taskbar (see [figure 2, D](#), on page 8 and [Taskbar](#) on page 9) to open the Scene Design task. The Scene Design workspace opens.



The main features and toolbars associated with the Scene Design workspace are shown in [figure 24](#) on page 41.

## Changing the Order of Scenes

In an Auto Play project, scenes are recalled in the order that they appear in the scene list on the Scene Design workspace.

To move a scene on the scene list, drag and drop the scene title to a new position in the list (see [Working with Scenes](#) on page 41).

## Changing the Display Time for a Scene

Using the **Scene Properties** dialog box, you can choose whether or not a scene is included in an Auto Play project and the length of time that it is displayed. To change the display time:

1. Click the **Scene Design** button on the taskbar. The Scene Design workspace opens (see [figure 24](#)).



2. For the currently selected scene in the scene list, click the  button on the Scene toolbar

- or -

For any other scene, right-click a scene title in the scene list.

The **Scene Properties** dialog box opens. Ensure that the **Properties** tab is selected (see [figure 25](#) on page 42).

3. Modify the **Auto Play Delay (mSec)** setting, the **Include Scene in Autoplay** setting, and other settings as needed. The value in the **Auto Play Delay (mSec)** field is the amount of time that the scene is displayed in a project. The **Include Scene in AutoPlay** check box, if selected, includes the scene in an Auto Play project.
4. Click **OK**.

## Starting and Stopping the Project

### To start (play) the project:

1. Click the **Scene Design** button on the taskbar (see [figure 2](#), **D**, on page 8 and [Taskbar](#) on page 9). The Scene Design workspace opens (see [figure 24](#) on page 41).



2. Click the  button on the Scene Control toolbar. The Autoplay mode dialog box opens while Auto Play is active:



**Figure 48. Autoplay Mode Dialog Box**

The project plays continuously until it is stopped. When the project reaches the last scene, Auto Play returns to the first scene.

### To stop the project:

Click the  button on the Scene Control toolbar.

## Changing the Playback Speed

When using Auto Play, the duration of displaying each scene is controlled by the Auto Play Delay setting in the Scene Properties dialog box (see [Changing the Display Time for a Scene](#) on the previous page). However, it is possible to speed up or slow down the rate of display across the entire project.

To change the playback speed:

Use the following buttons on the Scene Properties toolbar in the Scene Design task:

Button	Function
	Increases playback speed. Each click decreases the normal delay time* of each scene by 10 percent, thus increasing playback speed.
	Decreases the playback speed. Each click increases the normal delay time* of each scene by 10 percent, thus decreasing the playback speed.

\*The normal delay time is defined by the Auto Play delay value on the Scene Properties screen.

The current Auto Play time adjustment is displayed on the status bar, with the normal speed being 100 percent. For example:

Scene delay = 90.00% of scene setting

**Figure 49. Scene Delay Information on the Status Bar**

# Serial Commands

This section describes the format of the serial data strings that can be transmitted or received by the Quantum Control Software. Topics include:

- [Control of External Devices](#)
- [Remote Control of a Project](#)
- [Command Table](#)
- [ASCII Character Chart](#)

## Control of External Devices

To enable the control of external devices, those devices need to be connected to the Data Tx output of the computer serial (RS-232) port.

The serial ports are usually identified as COM $n$ , where  $n$  is a number from 1 through 4 (for example, COM2). You must ensure that the appropriate serial port is configured correctly by following the instructions in [Communications Setup](#) on page 19.

Serial data strings can be included within scenes (see [Scene Commands](#) on page 44). In a scene, three strings can be transmitted:

- **Pre Scene Commands** — Commands that are performed as soon as the scene is selected but not yet fully displayed.
- **Post Scene Commands** — Commands that are performed when the scene display is fully complete.
- **Exit Scene Commands** — Commands that are performed when another scene is selected but before the pre-scene commands of the new scene.

These commands can be used to control external source switchers or other RS-232 controllable devices.

## Format of External Control Strings

The exact content of the serial data string depends on the device you are controlling. See the device user guide for information on supported commands.

A serial data string can comprise of ASCII text, hexadecimal data, and control characters. Pauses can also be inserted as necessary to adjust the timing of the messages (see the chart below).

Data String	Transmitted Information
Text characters using the computer keyboard	Text Character
A caret (^) followed by the control character Example: ^M effectively sends a “carriage return.” For letters, use only uppercase characters.	Control Character
The hex pair preceded by a caret (^) and an “at” sign (@) Example: ^@4B^@24 transmits hex 4B and hex 24 (ASCII characters K and \$)	Hex Data
A caret (^) followed by a comma. This delays transmission of subsequent characters in the string by 100 milliseconds. Pauses can be stacked to create longer delays. <b>Example:</b> ^, ^, ^, ^, ^, gives a delay of 500 milliseconds (0.5 seconds).	A Pause

### Examples of external control strings

#### Example 1: AUXB12^M

Transmits AUXB12 out of the serial port and terminates with a ^M (carriage return).

#### Example 2: ^@C0^@00^@02^@00^@15^, ^, ^, 2!^C

Transmits the hex characters C0 00 02 00 15, pauses for 300 milliseconds, and then sends the ASCII character 2! followed by a ^C (break).

#### NOTES:

- Most devices expect some kind of termination character at the end of a control string. ^C (break) or ^M (carriage return) are used most frequently. However, this is dependant on the hardware you are controlling. There is no standard for termination characters.
- Any spaces entered within the data string are transmitted just like any other character. Therefore, avoid entering or leaving spaces in a data string unless they are specifically required by the receiving device.

## Remote Control of a Project

Remote control of a project is achieved by sending R-type messages to the Data Rx input on one of the serial (RS-232) ports of the computer.

Alternatively, R-type messages can be created as simple ASCII text strings and transmitted using suitable software, such as a terminal emulation program or a control system.

You can use the external control capability of a project. See [Control of External Devices](#) on page 70 for information about remotely controlling another project running on a different computer.

### R-type Message Format

The standard R-type message structure is shown below with examples in ASCII format, hexadecimal format, and mixed hex and ASCII format (see the [ASCII Character Chart](#) on page 80 for reference).

A command string is constructed in the following format:

`S0H R Data STX Command ETB ETX`

Portions of the command string are defined as follows:

<code>S0H</code>	(Start of Header) In hex, this is <code>01</code> . In ASCII, this is <code>^A</code> .
<code>R</code>	This portion of the command string signifies that the message is an R-Type command. In hex, this is <code>02</code> .
<code><i>Data</i></code>	This portion consists of the information to be executed. This information is optional and is only required if the specific remote control command requires additional information, such as a project name, to properly execute the command.
<code>STX</code>	(Start of Transmission) In hex, this is <code>02</code> . In ASCII, this is <code>^B</code> .
<code><i>Command</i></code>	This portion contains the remote command type.
<code>ETB</code>	(End of Block) In hex, this is <code>17</code> . In ASCII, this is <code>^W</code> .
<code>ETX</code>	(End of Transmission) In hex, this is <code>03</code> . In ASCII, this is <code>^C</code> .

The contents of the portions denoted by `Data` and `Command` vary according to the required function and can be determined from the [command table](#). Hex portions in a command string are denoted in brackets.

**NOTE:** The spaces between characters are included for clarity only and must not appear in the transmitted message. The only permitted spaces within a string are in scene names.

The following example is a remote control string in ASCII format. This example runs a scene with the name "ATTRACT":

`^A RATTRACT ^B 07 ^W ^C`

- The hex version of the above command string is:  
`[01][52][41][54][54][52][41][43][54][02][30][37][17][03]`
- A more common approach (compared to creating a string entirely in hex pairs or in ASCII), is to mix hex and ASCII data. This makes the string more readable.

The mixed version of the above command string is:

`[01] RATTRACT [02] 07 [17] [03]`

## Command Symbol Definitions

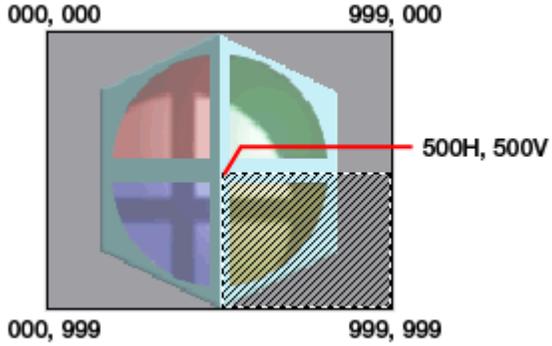
- X1** = Scene location in list (1 to 999)
- X2** = Scene name (ASCII, case-sensitive)
- X3** = Window number (0000 to 0998, zero-based, leading zeros required)  
Example: Window 25 = 0024
- X4** = Zoom percentage (000 to 999, leading zeros required)  
000 = No zoom  
500 = Zoom into 50 percent of image
- X5** = Pan horizontal location (000 to 999, leading zeros required)  
000 = Left-most edge of input video  
500 = Middle of image horizontally
- X6** = Pan vertical location (000 to 999, leading zeros required)  
000 = Top-most edge of input video  
500 = Middle of image vertically
- X7** = Window horizontal position (-9999 to 99999, leading zeros required)  
-0500 = 500 pixels off screen to the left  
01920 = 1920 pixels to the right of the left-most border
- X8** = Window vertical position (-9999 to 99999, leading zeros required)  
-0500 = 500 pixels above the top edge of the screen  
01080 = 1080 pixels below the top border
- X9** = Window horizontal size (00000 to 99999, leading zeros required)  
00400 = 400 pixels wide
- X10** = Window vertical size (00000 to 99999, leading zeros required)  
00300 = 300 pixels tall
- X11** = Input source name (ASCII, case-sensitive)
- X12** = Window style name (ASCII, case-sensitive)
- X13** = Border or overlay onscreen text (ASCII, case-sensitive)
- X14** = Merge scene name (ASCII, case-sensitive)
- X15** = Window layer number (0 to 999)
- X16** = File location including the full directory path.  
Example: C:\Files\TestProject

# Command Table

Command	ASCII-Hexadecimal	Description
<b>Recall Scene</b>		
Recall by list position	[ 01 ] R <u>X1</u> [ 02 ] 05 [ 17 ] [ 03 ]	Recall scene number <u>X1</u> according to the scene list.
<i>Example:</i>	[ 01 ] R04 [ 02 ] 05 [ 17 ] [ 03 ]	Recall the fourth scene in the list in the Scene Design task.
Recall by scene name	[ 01 ] R <u>X2</u> [ 02 ] 07 [ 17 ] [ 03 ]	Recall scene <u>X2</u> .
<i>Example:</i>	[ 01 ] RPRESET 2 [ 02 ] 07 [ 17 ] [ 03 ]	Recall scene named "PRESET 2."
Recall next scene	[ 01 ] R [ 02 ] 0n [ 17 ] [ 03 ]	Recall next scene in the list.
Recall previous scene	[ 01 ] R [ 02 ] 0p [ 17 ] [ 03 ]	Recall previous scene in the list.
<b>Window Source</b>		
Select input	[ 01 ] R <u>X3</u> <u>X11</u> [ 02 ] 36 [ 17 ] [ 03 ]	Select input <u>X11</u> to be shown in window <u>X3</u> .
<i>Example:</i>	[ 01 ] R0004 Laptop Input [ 02 ] 36 [ 17 ] [ 03 ]	Set window 5 to display source named "Laptop Input."
Select input in named scene	[ 01 ] R <u>X2</u> , <u>X3</u> , <u>X11</u> [ 02 ] 52 [ 17 ] [ 03 ]	Route input <u>X11</u> to window <u>X3</u> in scene <u>X2</u> .
<b>NOTE:</b> If you are using merge scenes, <u>X2</u> must be remerged for the change to occur.		
<b>Autorun Controls</b>		
Begin from 1st scene	[ 01 ] R [ 02 ] 0= [ 17 ] [ 03 ]	Begin the autorun sequence with first scene in the list.
Begin from current scene	[ 01 ] R [ 02 ] 0> [ 17 ] [ 03 ]	Begin the autorun sequence from currently displayed scene.
Increase autorun speed	[ 01 ] R [ 02 ] 0+ [ 17 ] [ 03 ]	Increase the duration by 10 percent for each scene to be displayed.
Decrease autorun speed	[ 01 ] R [ 02 ] 0- [ 17 ] [ 03 ]	Decrease the duration by 10 percent for each scene to be displayed.
Stop autorun sequence	[ 01 ] R [ 02 ] 0< [ 17 ] [ 03 ]	Halt the autorun sequence.
<b>Window Visibility</b>		
Hide Window	[ 01 ] R <u>X3</u> 0 [ 02 ] 33 [ 17 ] [ 03 ]	Set window <u>X3</u> to be hidden.
<i>Example:</i>	[ 01 ] R00050 [ 02 ] 33 [ 17 ] [ 03 ]	Set window 6 to be hidden
Hide Multiple Windows	[ 01 ] R <u>X2</u> , <u>X3</u> , <u>X3</u> , 0 [ 02 ] 63 [ 17 ] [ 03 ]	Set window <u>X3</u> through <u>X3</u> in scene <u>X2</u> to be hidden.
<b>NOTE:</b> If you are using merge scenes, <u>X2</u> must be remerged for the change to occur.		
Show Window	[ 01 ] R <u>X3</u> 1 [ 02 ] 33 [ 17 ] [ 03 ]	Sets window <u>X3</u> to be shown.
<i>Example:</i>	[ 01 ] R00051 [ 02 ] 33 [ 17 ] [ 03 ]	Sets window 6 to be shown.
Show Multiple Windows	[ 01 ] R <u>X2</u> , <u>X3</u> , <u>X3</u> , 1 [ 02 ] 63 [ 17 ] [ 03 ]	Sets window <u>X3</u> through <u>X3</u> in scene <u>X2</u> to be shown.
<b>NOTE:</b> If you are using merge scenes, <u>X2</u> must be remerged for the change to occur.		
<b>NOTE:</b> <u>X1</u> = Scene number <u>X2</u> = Scene name <u>X3</u> = Window number <u>X11</u> = Input source name		
Scene location in list (1 to 999) ASCII, case-sensitive 0000 to 0998, zero-based, leading zeros required ASCII, case-sensitive		

Command	ASCII-Hexadecimal	Description
<b>Window Size and Position</b>		
Set size and position	[ 01 ] R <u>X3</u> <u>X7</u> <u>X8</u> <u>X9</u> <u>X10</u> [ 02 ] 35 [ 17 ] [ 03 ]	Set window <u>X3</u> to position ( <u>X7</u> , <u>X8</u> ) and size <u>X9</u> by <u>X10</u> .
<i>Example:</i>	[ 01 ] R 0004 00300 00400 00800 00600 [ 02 ] 35 [ 17 ] [ 03 ]	Set window 5 to position (300, 400) and size 800x600.
Set parameters in named scene	[ 01 ] R <u>X2</u> , <u>X3</u> <u>X7</u> <u>X8</u> <u>X9</u> <u>X10</u> [ 02 ] 57 [ 17 ] [ 03 ]	Set window <u>X3</u> in scene <u>X2</u> to position ( <u>X7</u> , <u>X8</u> ) and size <u>X9</u> by <u>X10</u> .
<b>NOTE:</b> If you are using merge scenes, <u>X2</u> must be remerged for the change to occur.		
<b>Window Priority</b>		
Bring window to front	[ 01 ] R <u>X2</u> , <u>X3</u> , 1 [ 02 ] 78 [ 17 ] [ 03 ]	Bring window <u>X3</u> to be in front of all windows.
Send window to back	[ 01 ] R <u>X2</u> , <u>X3</u> , 0 [ 02 ] 78 [ 17 ] [ 03 ]	Send window <u>X3</u> behind all windows.
<i>Example:</i>	[ 01 ] R PRESET 2, 0004, 1 [ 02 ] 78 [ 17 ] [ 03 ]	Set window 5 in scene "PRESET 2" to be in front.
Bring window forward	[ 01 ] R <u>X2</u> , <u>X3</u> , <u>X15</u> , 1 [ 02 ] 79 [ 17 ] [ 03 ]	Bring window <u>X3</u> forward <u>X15</u> layers.
Send window backward	[ 01 ] R <u>X2</u> , <u>X3</u> , <u>X15</u> , 0 [ 02 ] 79 [ 17 ] [ 03 ]	Send window <u>X3</u> backward <u>X15</u> layers.
<i>Example:</i>	[ 01 ] R PRESET 2, 0004, 3, 0 [ 02 ] 79 [ 17 ] [ 03 ]	Send window 5 in scene "PRESET 2" backward 3 layers.
<b>Zoom and Pan</b>		
Set zoom and pan	[ 01 ] R <u>X3</u> <u>X4</u> <u>X5</u> <u>X6</u> [ 02 ] 34 [ 17 ] [ 03 ]	Set window <u>X3</u> to have a zoom of <u>X4</u> and pan of <u>X5</u> and <u>X6</u> .
<i>Example 1:</i>	[ 01 ] R 0004 500 000 000 [ 02 ] 34 [ 17 ] [ 03 ]	Set window 5 to zoom in to 50 percent of the image and to display the top left panel.
<i>Example 2:</i>	[ 01 ] R 0004 750 750 750 [ 02 ] 34 [ 17 ] [ 03 ]	Set window 5 to zoom in to 25% of the image and to display the bottom right panel.

<b>NOTE:</b> <u>X2</u> = Scene name	ASCII, case-sensitive
<u>X3</u> = Window number	0000 to 0998, zero-based, leading zeros required
<u>X4</u> = Zoom percentage	000 to 999, leading zeros required
<u>X5</u> = Pan horizontal location	000 to 999, leading zeros required
<u>X6</u> = Pan vertical location	000 to 999, leading zeros required
<u>X7</u> = Window horizontal position	-9999 to 99999, leading zeros required
<u>X8</u> = Window vertical position	-9999 to 99999, leading zeros required
<u>X9</u> = Window horizontal size	00000 to 99999, leading zeros required
<u>X10</u> = Window vertical size	00000 to 99999, leading zeros required
<u>X15</u> = Window layer number	0 to 999

Command	ASCII-Hexadecimal	Description
<b>Zoom and Pan (continued)</b>		
Set horizontal and vertical zoom and horizontal and vertical pan	[01] R <u>X3</u> <u>X7</u> <u>X8</u> <u>X5</u> <u>X6</u> [02] 40 [17] [03]	Set window <u>X3</u> to have a zoom of <u>X7</u> horizontally and <u>X8</u> vertically, and a pan of <u>X5</u> and <u>X6</u> .
<i>Example:</i>	[01] R 0004 500 750 000 000 [02] 34 [17] [03]	Set window 5 to zoom in to 50% of the image horizontally and 25% vertically, and to display the top left panel.
Set parameters in named scene	[01] R <u>X2</u> , <u>X3</u> <u>X4</u> <u>X5</u> <u>X6</u> [02] 58 [17] [03]	Set window <u>X3</u> in scene <u>X2</u> to have a zoom of <u>X4</u> and a pan of <u>X5</u> and <u>X6</u> .
<p><b>NOTE:</b> If you are using merge scenes, <u>X2</u> must be remerged for the change to occur.</p>		
<b>Coordinate system:</b>		
The horizontal and vertical pan settings allow you to position the upper left corner of the zoomed region on a 1000 x 1000 grid that represents the original image.		
		
Set zoom and pan in named scene	[01] R <u>X2</u> , <u>X3</u> <u>X7</u> <u>X8</u> <u>X5</u> <u>X6</u> [02] 59 [17] [03]	Set window <u>X3</u> in scene <u>X2</u> to have a zoom of <u>X7</u> and <u>X8</u> and a pan of <u>X5</u> and <u>X6</u> .
<b>Window Style</b>		
Select style	[01] R <u>X3</u> <u>X12</u> [02] 37 [17] [03]	Set window <u>X3</u> to use predefined style <u>X12</u> .
<i>Example:</i>	[01] R 0004 Arial 2 [02] 37 [17] [03]	Set window 5 to use window style named "Arial 2."
Select style in named scene	[01] R <u>X2</u> , <u>X3</u> , <u>X12</u> [02] 53 [17] [03]	Set window <u>X3</u> in scene <u>X2</u> to use style <u>X12</u> .
<p><b>NOTE:</b> If you are using merge scenes, <u>X2</u> must be remerged for the change to occur.</p>		
Define border text	[01] R <u>X3</u> <u>X13</u> [02] 38 [17] [03]	Set window <u>X3</u> to have border text which states <u>X13</u> .
<i>Example:</i>	[01] R 0004 Auxiliary Input [02] 38 [17] [03]	Set window 5 to have border text stating "Auxiliary Input."

<b>NOTE:</b>	<u>X2</u> = Scene name	ASCII, case-sensitive
	<u>X3</u> = Window number	0000 to 0998, zero-based, leading zeros required
	<u>X4</u> = Zoom percentage	000 to 999, leading zeros required
	<u>X5</u> = Pan horizontal location	000 to 999, leading zeros required
	<u>X6</u> = Pan vertical location	000 to 999, leading zeros required
	<u>X7</u> = Window horizontal position	-9999 to 99999, leading zeros required
	<u>X8</u> = Window vertical position	-9999 to 99999, leading zeros required
	<u>X12</u> = Window style name	ASCII, case-sensitive
	<u>X13</u> = Border or overlay onscreen text	ASCII, case-sensitive

Command	ASCII-Hexadecimal	Description
<b>Window Style (continued)</b>		
Set border text in named scene	[01] R[x2],x3,x13 [02] 54 [17] [03]	Set window x3 in scene x2 to have border text x13.
<b>NOTE:</b> If you are using merge scenes, x2 must be remerged for the change to occur.		
Define overlay text	[01] R[x3]x13 [02] 39 [17] [03]	Set window x3 to have overlay text stating x13.
<i>Example:</i>	[01] R0004 CONFIDENTIAL [02] 39 [17] [03]	Set window 5 to have overlay text stating "CONFIDENTIAL."
Set overlay text in named scene	[01] R[x2],x3,x13 [02] 55 [17] [03]	Set window x3 in scene x2 to have overlay text x13.
<b>NOTE:</b> If you are using merge scenes, x2 must be remerged for the change to occur.		
<b>Batch Execute Commands</b>		
Begin command collection	[01] R [02] 41 [17] [03]	All commands after this string are collected but not executed.
Execute collected commands	[01] R [02] 42 [17] [03]	Execute all commands issued between the <b>Begin</b> and <b>Execute</b> strings.
<i>Example:</i>	[01] R [02] 41 [17] [03] [01] RPRESET 2 [02] 07 [17] [03] [01] R0004 Laptop Input [02] 36 [17] [03] [01] R0004 CONFIDENTIAL [02] 38 [17] [03] [01] R [02] 42 [17] [03]	Begin collecting commands. The following three commands are executed simultaneously after the last line is sent: <ul style="list-style-type: none"> <li>• Recall the scene named "PRESET 2."</li> <li>• Set window 5 to display the source named "Laptop Input."</li> <li>• Set window 5 to have overlay text stating <b>CONFIDENTIAL</b>.</li> </ul>
<b>Merge Scene Controls</b>		
Create merge scene	[01] R[x14],, , 1 [02] 51 [17] [03]	Create new merged scene x14.
Add or remerge scene	[01] R[x14],x2, 1 [02] 51 [17] [03]	Add or remerge existing scene x2 to merge scene x14.
Delete scene	[01] R[x14],x2, , 1 [02] 51 [17] [03]	Remove scene x2 from scene x14.
Purge merge scene	[01] R [02] 56 [17] [03]	Remove all windows from the current merge scene.
	[01] R[x14],, , 1 [02] 51 [17] [03]	Refresh merge scene x14 to have all windows removed.

**NOTE:** x2 = Scene name ASCII, case-sensitive  
x3 = Window number 0000 to 0998, zero-based, leading zeros required  
x13 = Border or overlay onscreen text ASCII, case-sensitive  
x14 = Merge scene name ASCII, case-sensitive

Command	ASCII-Hexadecimal	Description
<b>Save Current Project to File</b>		
Save current project	[01] R[X16] [02] 11 [17] [03]	Save current project to location X16 (includes the full directory path).
<i>Example:</i>	[01] RC:\Files\ TestProject [02] 11 [17] [03]	Save current project to C:\Files with a filename of "TestProject."
<b>NOTE:</b> The folder in which the file will be saved must already be created.		

## Examples of R-type Messages

The following examples of R-type messages assume that there are five scenes in the currently loaded project and that they appear in the scene list as:

- Intro
- Video
- Demo
- Conference
- Finish

**NOTE:** The spaces between characters are included for clarity only and must not appear in the transmitted message.

To select the Conference scene by its name:

```
^ARConference ^B 07 ^W^C
```

To select the Demo scene by its position in the scene list:

```
^AR 3 ^B 05 ^W^C
```

To select the next scene in the scene list:

```
^AR ^B 0n ^W^C
```

To start AutoPlay from the first scene (in this case, the Intro scene):

```
^AR ^B 0= ^W^C
```

To stop AutoPlay:

```
^AR ^B 0< ^W^C
```

To increase AutoPlay playback speed by 10 percent:

```
^AR ^B 0+ ^W^C
```

To hide or show window 7 in the current scene:

```
^AR 0006 0 ^B 33 ^W^C (hides the window)
```

```
^AR 0006 1 ^B 33 ^W^C (shows the window)
```

To set window 4 to the "Warning" style:

```
^AR 0003 Warning ^B 37 ^W^C
```

To set the overlay text of window 4 to read "Incident Reported":

```
^AR 003 Incident Reported ^B 39 ^W^C
```

To set the viewport of window 5 to show a magnified area from the center of the source image:

```
^AR 0004 500 250 250 ^B 34 ^W^C
```

## Merge Scene Commands

Merge scene commands (51-56) provide independent control of areas on a display wall that are driven from a Quantum processor or array of processors. This is useful for installations where more than one operator needs access to the display wall (see [Working with Merge Scenes](#) on page 90 for more information about merge scene functions).

A merge scene allows sources on different areas of the display wall to be merged into the overall scene.

To create a merge scene called “Merge Scene”:

```
^ARMerge Scene,,,1 ^B 51 ^W^C
```

To add a scene called “Op 1 scene 1” in “Merge Scene”:

```
^ARMerge Scene,,Op1 scene 1,1 ^B 51 ^W^C
```

**NOTE:** “Op1 scene 1” must already be created in the Quantum Control Software.

To remove the “Op1 scene 1” scene and add the “Op1 scene 2” scene to the merge scene:

```
^ARMerge Scene,,Op1 scene 1,Op1 scene 2,1 ^B 51 ^W^C
```

To change the source that is applied to a certain window in a scene, two commands are sent:

```
^AROp1 scene 2,0,New Source 1 ^B 52 ^W^C (applies “New Source 1”  
source to window “0” in the “Op1 scene 2” scene)
```

```
^ARMerge Scene,,Op1 scene 2,1 ^B 51 ^W^C (refreshes the merged  
scene)
```

To change the window style, use command 53 and refresh the merge scene:

```
^AROp1 scene 2,0,Arial 1 ^B 53 ^W^C
```

```
^ARMerge Scene,,Op1 scene 2,1 ^B 51 ^W^C
```

To change the border text on a window, use command 54 and refresh the merge scene:

```
^AROp1 scene 2,0,Camera 15 ^B 54 ^W^C
```

```
^ARMerge Scene,,Op1 scene 2,1 ^B 51 ^W^C
```

To change the overlay text on a window, use command 55 and refresh the merge scene:

```
^AROp1 scene 2,0,Camera 15 ^B 55 ^W^C
```

```
^ARMerge Scene,,Op1 scene 2,1 ^B 51 ^W^C
```

To remove all of the windows from the merge scene, use the Purge scene command (56) and refresh the scene:

```
^AR ^B 56 ^W^C
```

```
^ARMerge Scene,,,1 ^B 51 ^W^C
```

## ASCII Character Chart

The ASCII character chart below is provided as a reference for creating your serial data strings.

Dec	Hex	ASCII	CTRL Key	Dec	Hex	ASCII	Dec	Hex	ASCII	Dec	Hex	ASCII
0	0	NULL	^@	32	0x20	<SPACE>	64	0x40	@	96	0x60	`
1	1	SOH	^A	33	0x21	!	65	0x41	A	97	0x61	a
2	2	STX	^B	34	0x22	"	66	0x42	B	98	0x62	b
3	3	ETX	^C	35	0x23	#	67	0x43	C	99	0x63	c
4	4	EOT	^D	36	0x24	\$	68	0x44	D	100	0x64	d
5	5	ENQ	^E	37	0x25	%	69	0x45	E	101	0x65	e
6	6	ACK	^F	38	0x26	&	70	0x46	F	102	0x66	f
7	7	BEL	^G	39	0x27	'	71	0x47	G	103	0x67	g
8	8	BS	^H	40	0x28	(	72	0x48	H	104	0x68	h
9	9	HT	^I	41	0x29	)	73	0x49	I	105	0x69	i
10	A	LF	^J	42	0x2A	*	74	0x4A	J	106	0x6A	j
11	B	VT	^K	43	0x2B	+	75	0x4B	K	107	0x6B	k
12	C	FF	^L	44	0x2C	,	76	0x4C	L	108	0x6C	l
13	D	CR	^M	45	0x2D	-	77	0x4D	M	109	0x6D	m
14	E	SO	^N	46	0x2E	.	78	0x4E	N	110	0x6E	n
15	F	SI	^O	47	0x2F	/	79	0x4F	O	111	0x6F	o
16	10	DLE	^P	48	0x30	0	80	0x50	P	112	0x70	p
17	11	DC1	^Q	49	0x31	1	81	0x51	Q	113	0x71	q
18	12	DC2	^R	50	0x32	2	82	0x52	R	114	0x72	r
19	13	DC3	^S	51	0x33	3	83	0x53	S	115	0x73	s
20	14	DC4	^T	52	0x34	4	84	0x54	T	116	0x74	t
21	15	NAK	^U	53	0x35	5	85	0x55	U	117	0x75	u
22	16	SYN	^V	54	0x36	6	86	0x56	V	118	0x76	v
23	17	ETB	^W	55	0x37	7	87	0x57	W	119	0x77	w
24	18	CAN	^X	56	0x38	8	88	0x58	X	120	0x78	x
25	19	EM	^Y	57	0x39	9	89	0x59	Y	121	0x79	y
26	1A	SUB	^Z	58	0x3A	:	90	0x5A	Z	122	0x7A	z
27	1B	ESC	^[	59	0x3B	;	91	0x5B	[	123	0x7B	{
28	1C	FS	^\ ^_	60	0x3C	<	92	0x5C	\ ^	124	0x7C	
29	1D	GS	^] ^_	61	0x3D	=	93	0x5D	] ^	125	0x7D	}
30	1E	RS	^^	62	0x3E	>	94	0x5E	^	126	0x7E	~
31	1F	US	^_	63	0x3F	?	95	0x5F	_	127	0x7F	<Del>

# Access Control

This section describes access control that is incorporated in the Quantum Control Software, allowing different operators to gain access to different tasks. Topics that are covered include:

- [Login Procedure](#)
- [Enabling and Disabling Access Control](#)
- [Changing Level Passwords](#)

## Login Procedure

The Quantum Control Software incorporates an access control system that allows different operators to have access to different tasks according to their needs and responsibilities. This feature helps to prevent end users from being able to make unauthorized changes to the setup of the Quantum Control system.

The following table lists the three available access levels and the tasks that are accessible to each level.

Task	Access Level		
	Administrator	Designer	User
Choose Display Processors	X	X	
Choose Layout	X		
Communications Setup	X		
Set Up Sources	X		
Scene Design	X	X	
Scene Control	X	X	X (See the note below.)
Remote Access Setup	X	X	
EDID Minder	X		

**NOTE:** When you log in as a User, the Scene Control task opens in full screen mode (run view only, not design view). To return to normal screen mode (such as to adjust the brightness setting), press the <Esc> key on the keyboard. To return to full screen mode, click the **Scene Control** button on the taskbar.

With the access control feature enabled, a **Login** dialog box opens each time you start the Quantum Control Software (see [figure 50](#) on the next page).



**Figure 50. Login Dialog Box**

To log in to the Quantum Control Software:

1. From the **User** drop-down list, select the desired role.
2. In the **Password** field, enter the required password for the chosen role.
3. Click **OK** or press the <Enter> key on the keyboard to continue. The Quantum Control Software splash screen appears for a few seconds, followed by the main application window (see [Main Application Window](#) on page 8).

**NOTES:**

- By default, the password for each operator role is the same as the user name. For example, for the User role, the password is User.
- Passwords are case-sensitive.

## Enabling and Disabling Access Control

Following a new installation of the Quantum Control Software, the access control system is disabled. Anyone using the application has access to all areas of functionality.

**NOTE:** Access control can be enabled by any user. However, after it has been enabled, it can only be disabled by an Administrator.

To enable access control:

From the **Access Control** menu, select **Enable Access Control**. Access control is enabled the next time you close and restart the Quantum Control Software.

To disable access control:

1. Start the Quantum Control Software application and log in as an Administrator (see [Login Procedure](#) on page 81).
2. From the **Access Control** menu, select **Disable Access Control**. Access control is disabled the next time that the Quantum Control Software is closed and restarted.

## Changing Level Passwords

By default, the password for each access level is the same as the level name. For example, for the User level, the password is **User**.

**NOTE:** Passwords are case-sensitive. For example, if the password is **User**, entering **user** or **USER** is not recognized.

It is recommended that the default passwords are changed as soon as possible after installation. A password can contain any standard keyboard letters, numbers, or symbols and can be any length.

Passwords can be changed only by an Administrator, following the login procedure.

To change a role password:

1. Start the Quantum Control Software and log in as an Administrator.
2. From the **Access Control** menu, select **Change Access Passwords**. The Change Passwords dialog box opens.



**Figure 51. Change Passwords Dialog Box**

3. From the **Role** drop-down list, select the appropriate operator role.
4. The current password for that role appears in the **Password** field. Change the password as needed.
5. Click **OK** to save the new password or click **Cancel** to retain the existing password. The new password takes effect the next time you close and restart the Quantum Control Software.

# Reference Information

This section discusses how to apply window styles to source windows on a Quantum display by modifying the XML file installed with the Quantum Control Software. This section also explains merge scene functionality and how to assign IP addresses for your devices. Topics include:

- [Modifying Window Styles](#)
- [Working with Merge Scenes](#)
- [IP Addressing](#)

## Modifying Window Styles

### Overview

The Quantum Control Software allows you to apply window styles to source windows on a Quantum display. Styles specify the following features for source windows:

- Border of a specified color and width
- Title bar of a specified font, size, and color
- Text overlay of a specified font, size, and color

Title text displays on a solid background that is the same color as the border. Overlay text is placed on top of the source image and does not have a background.

**NOTE:** Although a window can have both overlay text and title text at the same time, typically only one of these is used.

Styles are defined by an XML file that is installed on the PC hard disk when you install the Quantum Control Software. You can add new styles or modify existing styles by editing the XML file.

#### NOTES:

- The XML file is a separate file and is not part of the project (CTP) file. Always keep a backup copy of the XML file. Any time you reinstall the Quantum Control Software, the XML file is overwritten with the default version, and any changes that were made to the file are lost. Copying projects from one computer to another requires both the CTP and the XML files to be copied.
- After reinstalling the Quantum Control Software, always replace the default XML file with your customized XML file **before** starting the Quantum Control Software. Otherwise, if you start the application with a project file that references nonexistent styles, the missing styles are removed from all affected windows. If the project file is saved at this point, it is saved without the required styles. If you reinstall the correct XML file at this point, you must manually reapply the missing styles to each affected window in the project file.

## Locating and Opening the XML File

You can edit the XML file using Microsoft Notepad or a proprietary XML editor if available. To edit the file using Notepad:

1. From the desktop, click **Start > All Programs > Accessories > Notepad**. This opens the Notepad application.
2. From the **File** menu, select **Open**. The Open dialog box is displayed.
3. From the **Files of type** drop-down list, select **All Files**.
4. Browse to and select the XML file. By default, the file is located in the following folder on the computer hard disk:

C:\Program Files\Extron\Quantum Elite [or Connect]\XML\Quantum Source Types

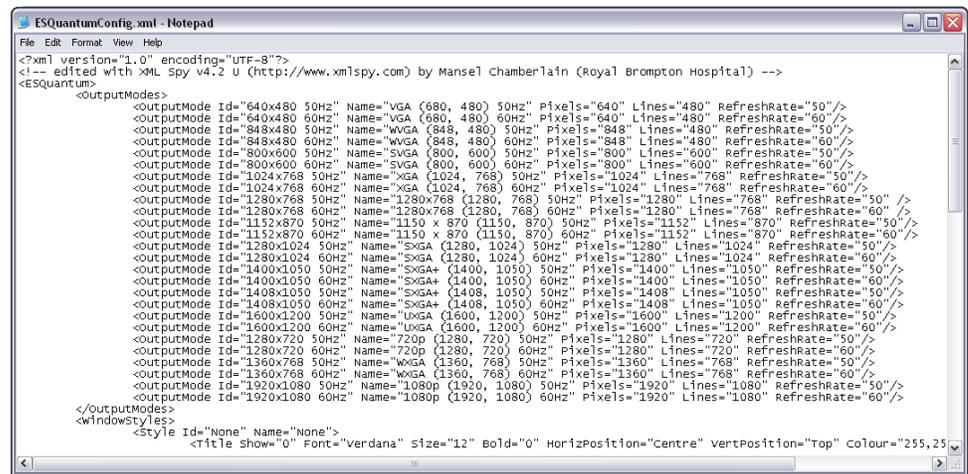
- or -

C:\Program Files (x86)\Extron\Quantum Elite [or Connect]\XML\Quantum Source Types

The file is named ESQuantumConfig.xml.

5. Click **Open**.

The XML file looks similar to the following:



```
ESQuantumConfig.xml - Notepad
File Edit Format View Help
<?xml version="1.0" encoding="UTF-8"?>
<!-- edited with XML Spy v4.2 U (http://www.xmlspy.com) by Mansef Chamberlain (Royal Brompton Hospital) -->
<ESQuantum>
  <outputModes>
    <outputMode Id="640x480 50Hz" Name="VGA (680, 480) 50Hz" Pixels="640" Lines="480" RefreshRate="50"/>
    <outputMode Id="640x480 60Hz" Name="VGA (680, 480) 60Hz" Pixels="640" Lines="480" RefreshRate="60"/>
    <outputMode Id="848x480 50Hz" Name="WVGA (848, 480) 50Hz" Pixels="848" Lines="480" RefreshRate="50"/>
    <outputMode Id="848x480 60Hz" Name="WVGA (848, 480) 60Hz" Pixels="848" Lines="480" RefreshRate="60"/>
    <outputMode Id="800x600 50Hz" Name="SVGA (800, 600) 50Hz" Pixels="800" Lines="600" RefreshRate="50"/>
    <outputMode Id="800x600 60Hz" Name="SVGA (800, 600) 60Hz" Pixels="800" Lines="600" RefreshRate="60"/>
    <outputMode Id="1024x768 50Hz" Name="XGA (1024, 768) 50Hz" Pixels="1024" Lines="768" RefreshRate="50"/>
    <outputMode Id="1024x768 60Hz" Name="XGA (1024, 768) 60Hz" Pixels="1024" Lines="768" RefreshRate="60"/>
    <outputMode Id="1280x768 50Hz" Name="SXGA (1280, 768) 50Hz" Pixels="1280" Lines="768" RefreshRate="50"/>
    <outputMode Id="1280x768 60Hz" Name="SXGA (1280, 768) 60Hz" Pixels="1280" Lines="768" RefreshRate="60"/>
    <outputMode Id="1152x870 50Hz" Name="1150 x 870 (1150, 870) 50Hz" Pixels="1152" Lines="870" RefreshRate="50"/>
    <outputMode Id="1152x870 60Hz" Name="1150 x 870 (1150, 870) 60Hz" Pixels="1152" Lines="870" RefreshRate="60"/>
    <outputMode Id="1280x1024 50Hz" Name="SXGA (1280, 1024) 50Hz" Pixels="1280" Lines="1024" RefreshRate="50"/>
    <outputMode Id="1280x1024 60Hz" Name="SXGA (1280, 1024) 60Hz" Pixels="1280" Lines="1024" RefreshRate="60"/>
    <outputMode Id="1400x1050 50Hz" Name="SXGA+ (1400, 1050) 50Hz" Pixels="1400" Lines="1050" RefreshRate="50"/>
    <outputMode Id="1400x1050 60Hz" Name="SXGA+ (1400, 1050) 60Hz" Pixels="1400" Lines="1050" RefreshRate="60"/>
    <outputMode Id="1408x1050 50Hz" Name="SXGA+ (1408, 1050) 50Hz" Pixels="1408" Lines="1050" RefreshRate="50"/>
    <outputMode Id="1408x1050 60Hz" Name="SXGA+ (1408, 1050) 60Hz" Pixels="1408" Lines="1050" RefreshRate="60"/>
    <outputMode Id="1600x1200 50Hz" Name="UXGA (1600, 1200) 50Hz" Pixels="1600" Lines="1200" RefreshRate="50"/>
    <outputMode Id="1600x1200 60Hz" Name="UXGA (1600, 1200) 60Hz" Pixels="1600" Lines="1200" RefreshRate="60"/>
    <outputMode Id="1280x720 50Hz" Name="720p (1280, 720) 50Hz" Pixels="1280" Lines="720" RefreshRate="50"/>
    <outputMode Id="1280x720 60Hz" Name="720p (1280, 720) 60Hz" Pixels="1280" Lines="720" RefreshRate="60"/>
    <outputMode Id="1360x768 50Hz" Name="WXGA (1360, 768) 50Hz" Pixels="1360" Lines="768" RefreshRate="50"/>
    <outputMode Id="1360x768 60Hz" Name="WXGA (1360, 768) 60Hz" Pixels="1360" Lines="768" RefreshRate="60"/>
    <outputMode Id="1920x1080 50Hz" Name="1080p (1920, 1080) 50Hz" Pixels="1920" Lines="1080" RefreshRate="50"/>
    <outputMode Id="1920x1080 60Hz" Name="1080p (1920, 1080) 60Hz" Pixels="1920" Lines="1080" RefreshRate="60"/>
  </outputModes>
  <windowStyles>
    <style Id="None" Name="None">
      <Title Show="0" Font="Verdana" Size="12" Bold="0" HorizPosition="Centre" VertPosition="Top" colour="255,255,255"/>
    </style>
  </windowStyles>
</ESQuantum>
```

**Figure 52.** ESQuantumConfig.xml File

**NOTE:** Before you make any changes to this file, it is strongly recommended that you create a backup copy. From the **File** menu, select **Save As** to open the Save As dialog box and save a backup copy.

**TIP:** To make the text easier to read in Notepad, it is recommended that you turn off the Wordwrap feature (via the **Format** menu).

6. In the file, scroll down to the **<WindowStyles>** (opening) tag. The lines of information between this tag and the **</WindowStyles>** (closing) tag define all of the styles that appear in the Quantum Control Software.

## Overview of the Style Tag

Each style is defined with a separate `<Style>` tag. For example, the tag for the default style is defined by:

```
<Style Id="Default" Name="Default Style">
<Title Show="1" Font="Verdana" Size="14" Bold="1" HorizPosition="Centre"
VertPosition="Bottom" Colour="153,204,255" Flash="0"/>
<Overlay Show="1" Font="Verdana" Size="14" Bold="1" HorizPosition="Left"
VertPosition="Bottom" Colour="153,204,255" Flash="0"/>
<Border Show="0" Colour="51,51,51" Thickness="2" Flash="0"/>
</Style>
```

- In the `<Style Id="Default" Name="Default Style">` line of the example:
  - Name is the name of the style as it will appear on the **Window Styles** tab of the Window Properties dialog box in the Quantum Control Software.
  - Id is a short name or reference for the style and identifies the style in RS-232 control messages.
- The `<Title>` tag defines the attributes of the title bar, including font style, size, and color:

```
<Title Show="1" Font="Verdana" Size="14" Bold="1"
HorizPosition="Centre" VertPosition="Bottom" Colour="153,204,255"
Flash="0"/>
```
- The `<Overlay>` tag defines the attributes of the border:

```
<Overlay Show="1" Font="Verdana" Size="14" Bold="1"
HorizPosition="Left" VertPosition="Bottom" Colour="153,204,255"
Flash="0"/>
```
- The `<Border>` tag defines the attributes of the border:

```
<Border Show="0" Colour="51,51,51" Thickness="2" Flash="0"/>
```
- The `</style>` tag is the closing tag.

Many of the attributes are common to each tag and are listed in the [Summary of Style Attributes](#) table on the next page.

## Summary of Style Attributes

Attribute	Function	Values
Show	Sets the text or border as visible or hidden.	<ul style="list-style-type: none"> <li>• 0 = hidden</li> <li>• 1 = visible</li> </ul>
Font	The font name chosen from the fonts that are installed on the Quantum processor	Default fonts are: <ul style="list-style-type: none"> <li>• Arial</li> <li>• Verdana</li> <li>• Microsoft Sans Serif</li> <li>• Tahoma</li> </ul>
Size	Sets the size of the font. The larger the number, the bigger the text.	Depends on display resolution and size. Typically, a value from 10 through 40 provides readable results.
Bold	Sets the font weight.	<ul style="list-style-type: none"> <li>• 0 = normal</li> <li>• 1 = bold</li> </ul>
HorizPosition	Defines the horizontal alignment of the text.	<ul style="list-style-type: none"> <li>• Left</li> <li>• Centre</li> <li>• Right</li> </ul>
VertPosition	Defines the vertical alignment of the text.	<ul style="list-style-type: none"> <li>• Top</li> <li>• Centre</li> <li>• Bottom</li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>NOTE:</b> Center alignment is not applicable to title text.</p> </div>
Thickness	Defines the width of the border.	Width in pixels. Typically 1 through 10 are acceptable values.
Colour	Defines the color of the text or border using RGB colors.	Values between 0 and 255: <ul style="list-style-type: none"> <li>• 0,0,0 = black</li> <li>• 255,255,255 = white</li> <li>• 255,0,0 = red</li> <li>• 0,255,0 = green</li> <li>• 0,0,255 = blue</li> </ul>
Flash	Defines whether the text or border is static or flashing.	<ul style="list-style-type: none"> <li>• 0 = static</li> <li>• 1 = flashing</li> </ul>

## Modifying an Existing Style

To modify an existing style:

1. Edit the appropriate attributes as needed.

For example, to change the default style to use Arial font on the title bar with the text aligned to the left, change the attribute values shown in italics:

```
<Style Id="Default" Name="Default Style">  
<Title Show="1" Font="Arial" Size="14" Bold="1" HorizPosition="Left"  
VertPosition="Bottom" Colour="153,204,255" Flash="0" />  
<Overlay Show="1" Font="Verdana" Size="14" Bold="1"  
HorizPosition="Left" VertPosition="Bottom" Colour="153,204,255"  
Flash="0" />  
<Border Show="0" Colour="51,51,51" Thickness="2" Flash="0" />  
</Style>
```

2. From the **File** menu in Notepad, select **Save** to save any changes that you made.
3. Restart the Quantum Control Software to load the new style.

## Adding a New Style

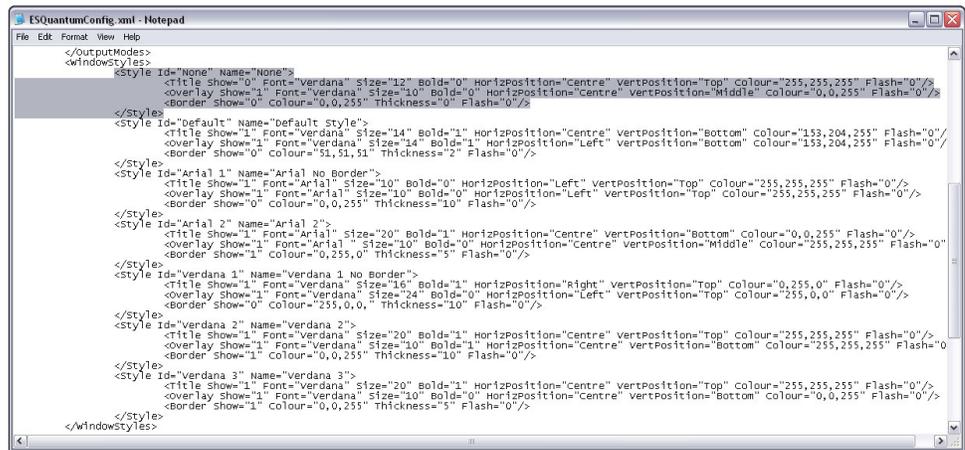
The easiest way to add a new style is to copy and paste an existing style, then modify it.

For example, to create a new style called "My Style" with the following attributes:

	Attribute	Value
<b>Title Bar Text</b>	Font	Tahoma
	Size	12
	Bold	No
	Position	Top Right
	Colour	240,240,0 (Yellow)
<b>Overlay Text</b>	Font	Tahoma
	Size	12
	Bold	No
	Position	Centre
	Colour	240,0,0 (Red)
<b>Border</b>	Width	3
	Colour	128,128,128 (Gray)

1. Select an existing style in the XML file.

**NOTE:** You must include the opening and closing Style tag.



**Figure 53. Selecting an Existing Style in the XML File**

2. Right-click the selected text and select **Copy** from the drop-down menu.
3. Paste the selected text between Style tags (after a `</Style>` tag and before the `<Style>` tag that follows it). To do so:
  - a. Click behind a `</Style>` tag.
  - b. Press the `<Enter>` key. The cursor moves to a new line above the next `<Style>` tag.
  - c. Press the `<Tab>` key on your keyboard to align the cursor with the previous `</Style>` tag.
  - d. Right-click in the blank line and select **Paste** from the drop-down menu.
4. Modify the copied style to reflect the necessary attributes (see the [Adding a New Style table](#) on the previous page). The text for the new style appears as follows:
 

```
<Style Id="MyStyle" Name="My Style">
<Title Show="1" Font="Tahoma" Size="12" Bold="0" HorizPosition="Right"
VertPosition="Top" Colour="240,240,0" Flash="0" />
<Overlay Show="1" Font="Tahoma" Size="12" Bold="0"
HorizPosition="Centre" VertPosition="Centre" Colour="240,0,0"
Flash="0" />
<Border Show="0" Colour="128,128,128" Thickness="3" Flash="0" />
</Style>
```
5. From the **File** menu in Notepad, select **Save** to save any changes that you made.
6. Restart the Quantum Control Software to load the new style.



## Programming Subscenes

After you define the display groups, create the subscenes that belong to each group. In the following examples, scene group 1 has eight subscenes titled “Videowall1” through “Videowall8” (see [figure 54](#) on the previous page). Each subscene has a unique layout.

### Scene group 1

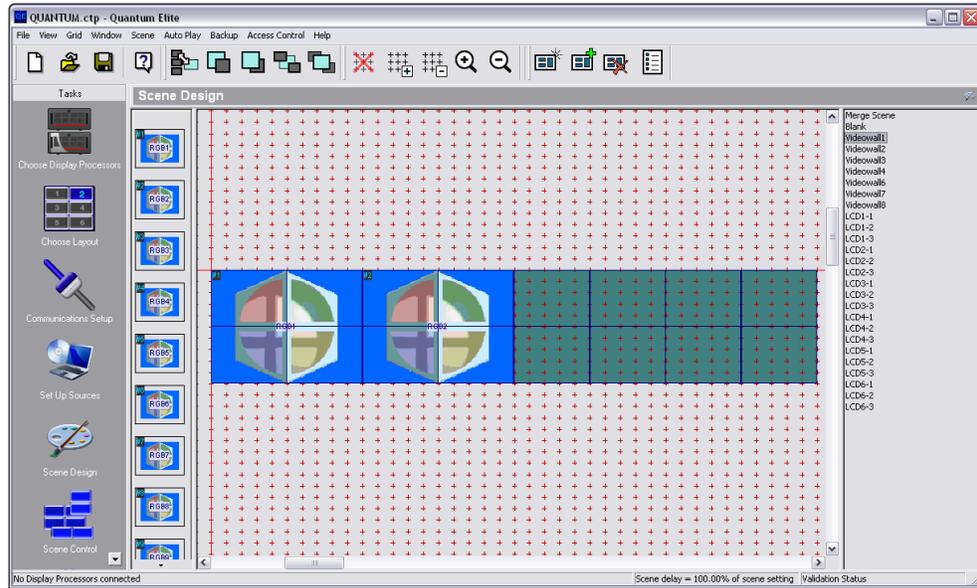


Figure 55. Videowall1 Subscene

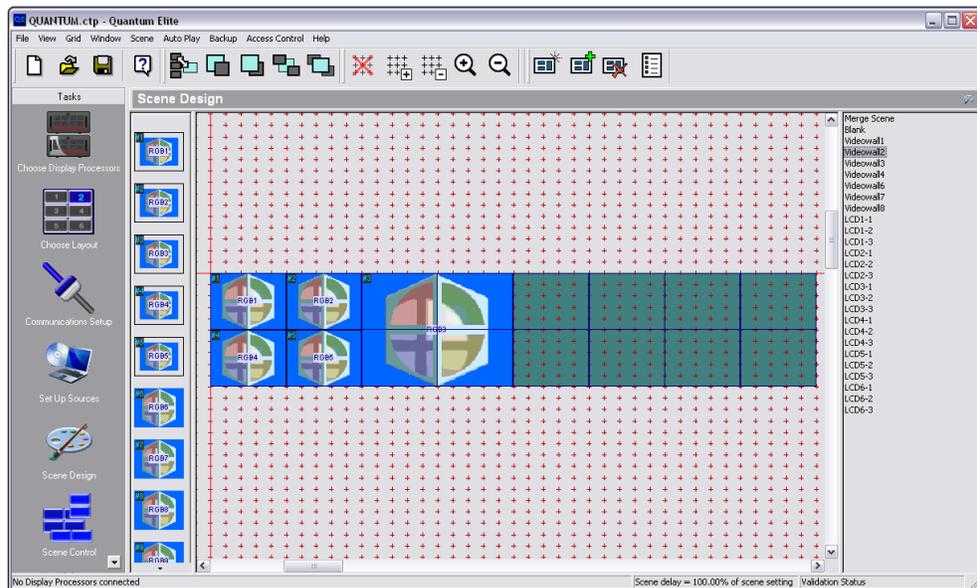
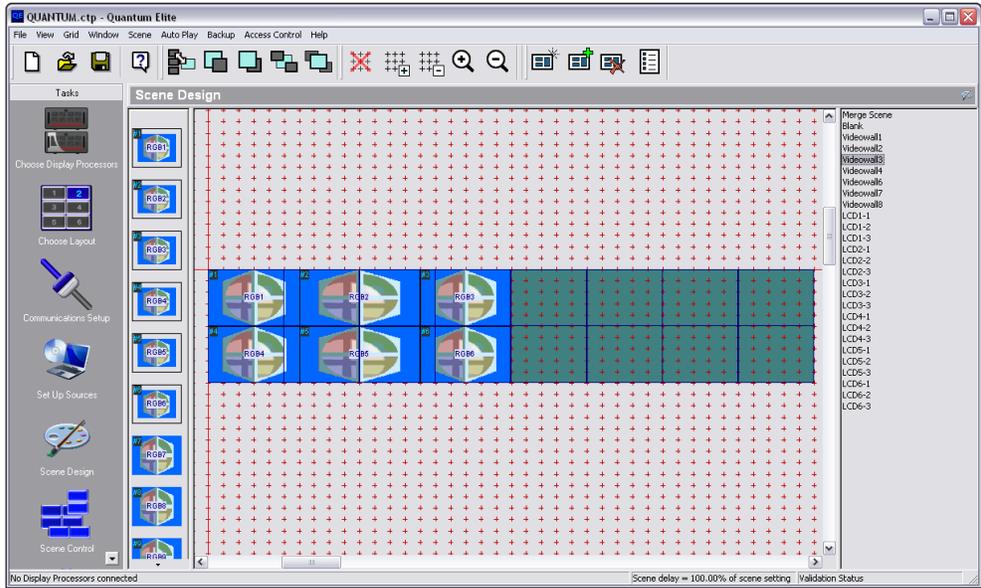


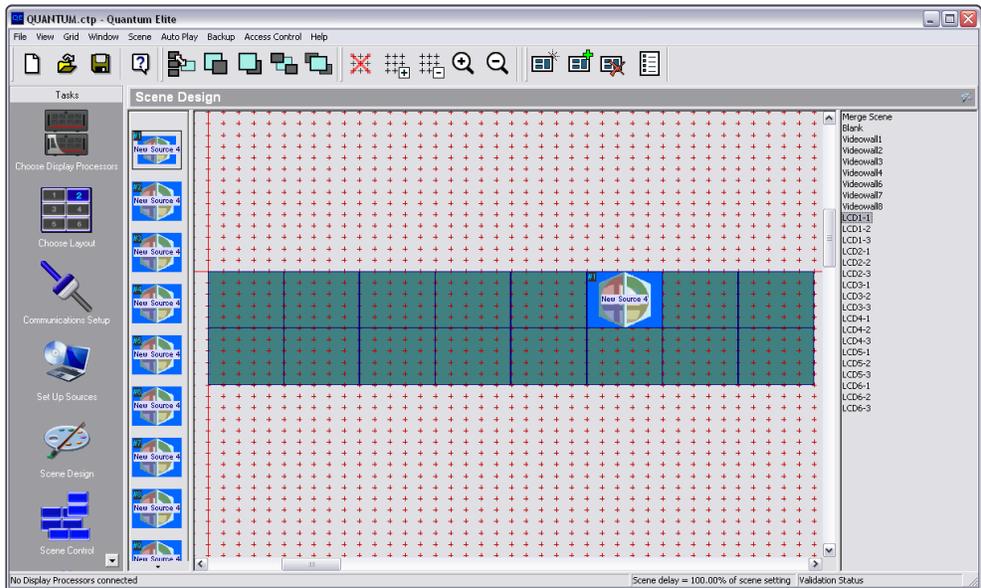
Figure 56. Videowall2 Subscene



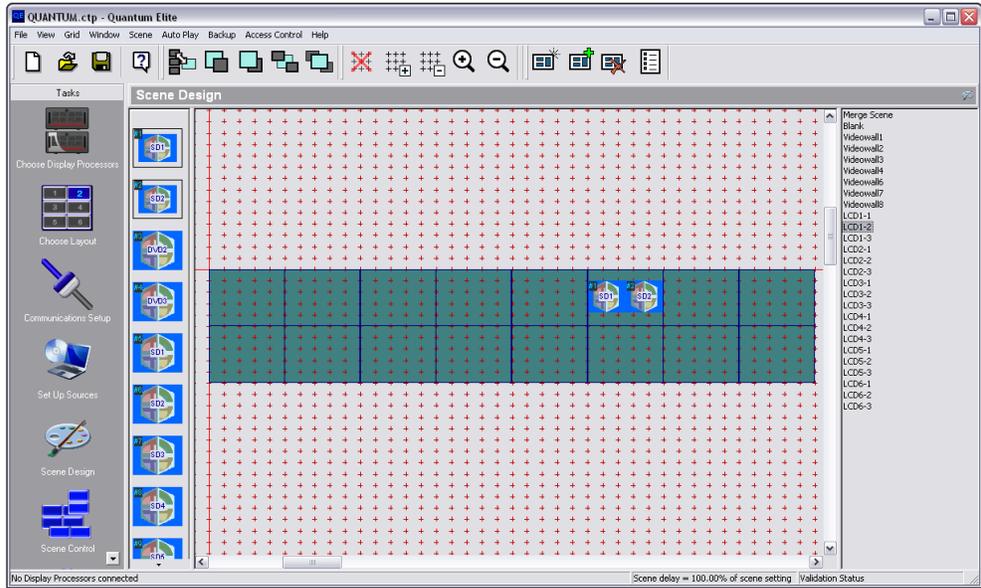
**Figure 57. Videowall3 Subscene**

## Scene group 2

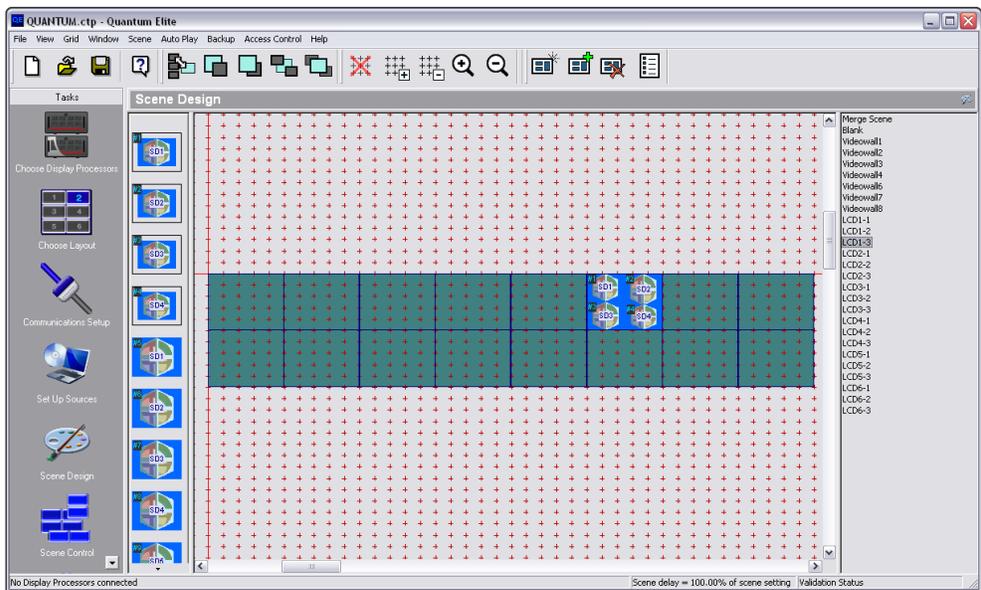
Screen group 2 has three subscenes, LCD1-1 through LCD1-3, allocated to it. Each subscene is programmed to have a unique layout as shown in the following examples.



**Figure 58. LCD1-1 Subscene**



**Figure 59. LCD1-2 Subscene**



**Figure 60. LCD1-3 Subscene**

The remaining subscenes (subscene 3 through subscene 9), are allocated to the remaining LCD displays (LCD2 through LCD8). These subscenes follow the same convention as subscene 2 (LCD1).

## Workflow

The merge scene should be the only scene that is running (active) in the Quantum Control Software. The merge scene is highlighted in the scene list to indicate that it is the currently active scene.

**NOTE:** Direct all control commands to a specific subscene, **not** to the merge scene.

The following sample workflow uses the previous subscene examples.

1. Add a subscene to a merge scene. This essentially calls or runs the subscene.

For example, add Videowall1 to Merge Scene:

```
[Ø1] RMerge Scene,,Videowall1,1 [Ø2] 51 [17] [Ø3]
```

2. Make the desired changes to a subscene.

For example, set Videowall1/Window1 to SourceRGB1:

```
[Ø1] RVideowall1,Ø,RGB1 [Ø2] 52 [17] [Ø3]
```

3. Update the merge scene with the changed information from step 2, above.

**NOTE:** This step is required in order for changes to take effect.

For example, the following adds Videowall1 to the merge scene and applies updated subscene information:

```
[Ø1] RMerge Scene,,Videowall1,1 [Ø2] 51 [17] [Ø3]
```

4. Change one scene to the next scene.

For example, remove Videowall1 and add Videowall2:

```
[Ø1] RMerge Scene,Videowall1,Videowall2,1 [Ø2] 51 [17] [Ø3]
```

The window index numbers in the merge scene increment dynamically. The window index numbers in the subscene are left unchanged.

When making several changes to a subscene, it may be more efficient to wait until all of the changes have been made before executing a final refresh of the merge scene.

For example:

```
Videowall1/Window1 set to SourceRGB1
Videowall1/Window2 set to SourceRGB2
Videowall1/Window3 set to SourceRGB3

[Ø1] RVideowall1,Ø,RGB1 [Ø2] 52 [17] [Ø3]
[Ø1] RVideowall1,1,RGB3 [Ø2] 52 [17] [Ø3]
[Ø1] RVideowall1,3,RGB3 [Ø2] 52 [17] [Ø3]
[Ø1] RMerge Scene,,Videowall1,Ø [Ø2] 51 [17] [Ø3]
[Ø1] RMerge Scene,,,1 [Ø2] 51 [17] [Ø3]
```

It may be beneficial to write a subroutine that tracks which subscene is currently running when you are changing scenes. The subroutine indicates the subscene that needs to be removed from the merge scene before the next subscene can be added.

# IP Addressing

## What is an IP Address?

A full explanation of IP addressing is beyond the scope of this user guide. However, the following details provide enough information to get started.

An IP address is a 32-bit binary number that is used to identify each device on an Ethernet network. This number is usually represented by four decimal numbers (each in the range of 0 to 255) separated by dots, such as 198.123.34.240. This is called “dotted decimal notation.”

An IP address is divided into two parts:

- Network identifier
- Host identifier

Each address on a given network must have the same network identifier value but have a unique host identifier. As a result, there are different classes that define the range of valid addresses and the parts of the address that are used for the network and host identifiers.

The most common IP address classes are:

Class Name	Valid Address Range	Identifier Arrangement
Class A	0.0.0.1 to 127.255.255.254	<i>NNN . HHH . HHH . HHH</i>
Class B	128.0.0.1 to 191.255.255.254	<i>NNN . NNN . HHH . HHH</i>
Class C	192.0.0.1 to 223.255.255.254	<i>NNN . NNN . NNN . HHH</i>

*NNN* refers to the network identifier and *HHH* refers to the host identifier.

## Choosing IP Addresses

If the Quantum Control Software computer and Quantum processors are directly connected or connected via their own independent network, follow the guidelines below for choosing the IP addresses.

However, if you intend to connect your computer and Quantum processors to an existing network, you need to advise the network administrator and ask the administrator to allocate suitable IP addresses.

On an independent network, it is generally recommended that you use the Class C format (from 192.0.0.1 to 223.255.255.254).

There are two rules for choosing IP addresses:

- Network identifier must be the same for each IP address
- Host identifier must be unique for each address.

Applying these rules to Class C addresses, the first three decimal values of your IP address must all be the same while the last value is used to uniquely identify each device.

The following is an example of a valid Class C addressing scheme:

Device	IP Address
Quantum Control Software Computer	208.132.180.41
Quantum processor 1	208.132.180.42
Quantum processor 2	208.132.180.43

**NOTE:** The host identifiers (41, 42, and 43 in the above example) do not need to be sequential or in any particular order. However, it is recommended that you group the numbers for simplicity.

The following is an example of an invalid Class C addressing scheme:

Device	IP Address
Quantum Control Software Computer	208.132.180.41
Quantum processor 1	192.157.180.42
Quantum processor 2	209.100.123.43

**NOTE:** The above addresses are invalid because the network identifier for each address is not the same even though each IP address is unique.

You can perform a test from your computer to check that a device at a particular address is responding correctly (see [Testing the Ethernet Link](#) on page 6).

### Subnet mask

The subnet mask is another 32-bit binary number that is used to “mask” certain bits of the IP address. This provides a method of extending the number of network options for a given IP address. It works by allowing part of the host identifier to be used as a subnet identifier.

It is important that you set the correct value for the subnet mask. The basic values depend on the class of IP address being used.

Class Name	Subnet Mask
Class A	255.0.0.0
Class B	255.255.0.0
Class C	255.255.255.0

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

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

Extron Electronics  
1230 South Lewis Street  
Anaheim, CA 92805  
U.S.A.

**Japan:**

Extron Electronics, Japan  
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Chiyoda-ku, Tokyo 102-0082  
Japan

**Europe and Africa:**

Extron Europe  
Hanzeboulevard 10  
3825 PH Amersfoort  
The Netherlands

**China:**

Extron China  
686 Ronghua Road  
Songjiang District  
Shanghai 201611  
China

**Asia:**

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

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

**NOTE:** If a product is defective, please call Extron and ask for an Application Engineer to receive an RA (Return Authorization) number. This will begin the repair process.

**USA:** 714.491.1500 or 800.633.9876  
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**Europe:** 31.33.453.4040  
**Japan:** 81.3.3511.7655

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