Extron Quantum Ultra Expansion System User Guide

Extron

Quantum Ultra Expansion System
Setup Guide

IMPORTANT:
Go to www.extron.com for the Complete user guide, Installation Instruction, and specification before connecting the product to the Power source.

Contents

Quantum Ultra Expansion System

A Quantum Ultra Expansion System consists of Expansion IN and Expansion OUT cards that link multiple Quantum Ultra and Quantum Ultra II videowall processors together, simplifying the design, integration, and operation of large videowalls. To link processors, an Expansion OUT card is installed in one processor and an Expansion IN card is installed in another. Three fiber optic cables link the two cards. This extends the high-speed HyperLane® bus between the processors to create a common shared bus, making each input source available to all video outputs. Once configured, the processors operate as a system with a single point of control, without the need for front-end switching or distribution amplifiers. Up to five processors can be linked using four pairs of expansion cards, so that a Quantum Ultra Series system can be expanded to up to 42 input and output cards.

Quantum Ultra Series outputs are genlocked across all processors, maintaining image synchronization and eliminating video tearing.
All chassis in an expansion system are connected to the same network via their LAN A ports. The first (primary) chassis in the signal chain is always a Quantum Ultra or Quantum Ultra II 610 and controls all the other (secondary) chassis in the chain. The last unit in the chain can be either a Quantum Ultra or Quantum Ultra II 305 or 610.

NOTES:

- Expansion cards are not supported by the Quantum Ultra Connect models.
- A mixture of Quantum Ultra and Quantum Ultra II units cannot be used for expansion systems.

A maximum of five chassis can be configured as an expansion system. The units in the expansion system must have the same firmware, from the same generation.
This setup guide provides instructions for an experienced user to set up and configure a Quantum Ultra Series device in an expansion system. In this guide, the terms "Quantum Ultra Series," "Quantum Ultra Series device," "unit," and "processor" are used interchangeably to refer to all models in the series.

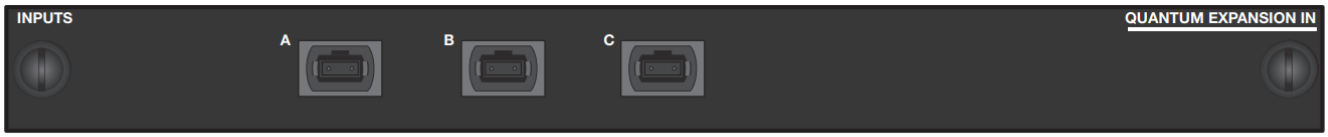


Figure 1. Expansion IN Card

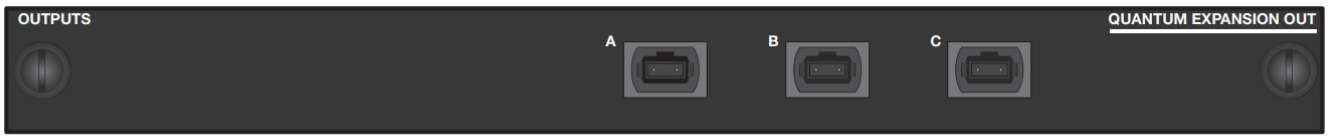


Figure 2. Expansion OUT Card

Each input and output expansion card contains three MPO connectors, labeled A, B, and C. The chassis in the system are linked to each other through these connectors. Three lengths of MPO M-M cables are available: 1 meter (3.3 feet), 10 meters (32.8 feet), and 100 meters (328 feet). Three cables of any length are needed for each pair of output-input expansion cards to be connected together.

Expansion Card Locations in the Chassis

In the expansion units, cards are factory-installed in the chassis in the order described below.
NOTES:

- The last chassis in the chain cannot contain an Expansion OUT card.
- Install all input cards of the same type (IN SMD 100, HDMI, and HDMI 4K PLUS), and all output cards of the same type (HDMI, DTP, and HDMI 4K PLUS), in adjacent slots. Do not intersperse different card types.
- Install the cards in this order: IN SMD 100, IN4HDMI, IN4HDMI 4K PLUS, OUT4HDMI, OUT4DTP, OUT4HDMI 4K PLUS.
- Do not leave empty slots between cards in the chassis. Empty card slots must be at the bottom of the card stack.
- Except for the expansion cards, output cards must always follow input cards. Therefore, a secondary chassis can contain input cards only if the primary chassis and any secondary chassis ahead of it in the chain contain only input cards (plus the Expansion OUT card).

In the primary chassis:
The Expansion OUT card is installed in the last occupied slot of the primary chassis to enable connection to the first secondary chassis (see 1 in the image at right).

In secondary chassis:

- The Expansion IN card is installed in the first slot (slot 1) to accept the connection from the Expansion OUT card in the previous chassis (see figure 3, 1).

Figure 3. Primary and Secondary Chassis Card Installation Examples

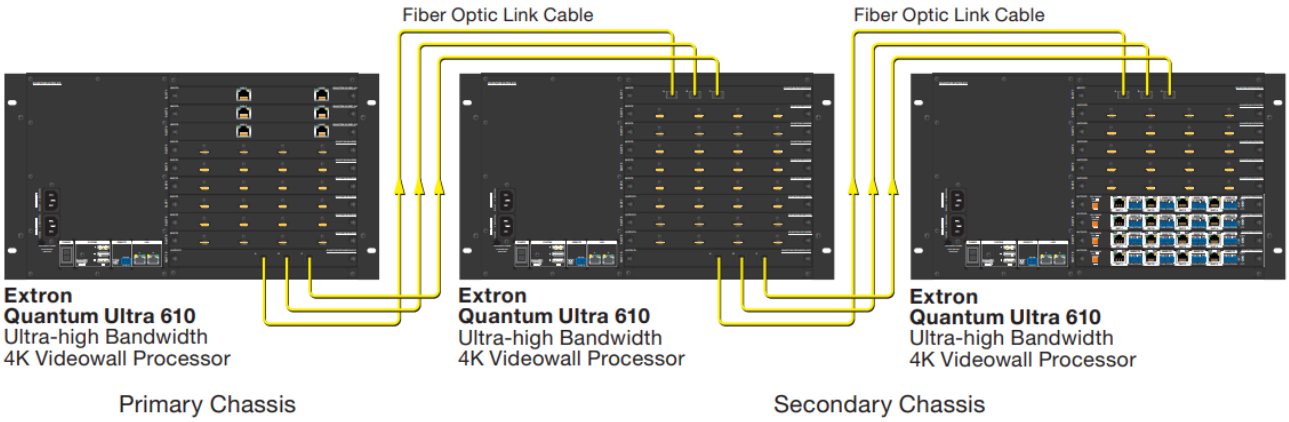
- An Expansion OUT card must be installed in the last slot being used if another secondary chassis follows it in the chain.

  The example at right shows the first of multiple secondary chassis. The input cards (2) are installed below the

Expansion IN card. Output cards (3) follow the input cards. The Expansion OUT card (4) is in the last slot.

Connecting Expansion Cards

1. Connect three MPO cables between Expansion OUT card connectors A, B, and C of the primary chassis and Expansion IN card connectors A, B, and C of the first secondary chassis in the chain. Always connect output A to input A, output B to input B, and output C to input C (see figure 4).
2. Connect the three expansion outputs of each subsequent secondary chassis to the expansion inputs of the next chassis until all the desired chassis (up to five) are connected (see figure 4).



3. Connect the LAN A port of each chassis in the chain to the same network.
4. If desired, connect the LAN B port of all of the chassis to a different network for VNC or RSS sources.
5. Use VCS to configure the videowall using the multi-chassis system (see Starting the VCS Program with Expansion Cards on page 3, and the VCS Help File for more information).

Starting the VCS Program with Expansion Cards

The procedure for starting a VCS project for a system containing expansion cards differs in some ways from the startup procedure for a non-expansion system. To set up a project:

1. Configure the network settings of each chassis using the Quantum Ultra Control Panel (see the Quantum Ultra Series User Guide, “Modifying Network Settings from the Control Panel” or SIS commands via USB or RS-232 (see the Quantum Ultra Series User Guide, “IP Setup” commands section.

   NOTE: You must configure the IP addresses of the units before continuing.
2. Open VCS.
3. On the Start screen, select the New tab (see figure 5, 1).
4. On the Create New Project screen, select the Quantum Ultra/Quantum Ultra II radio button (2), then click Create (3).

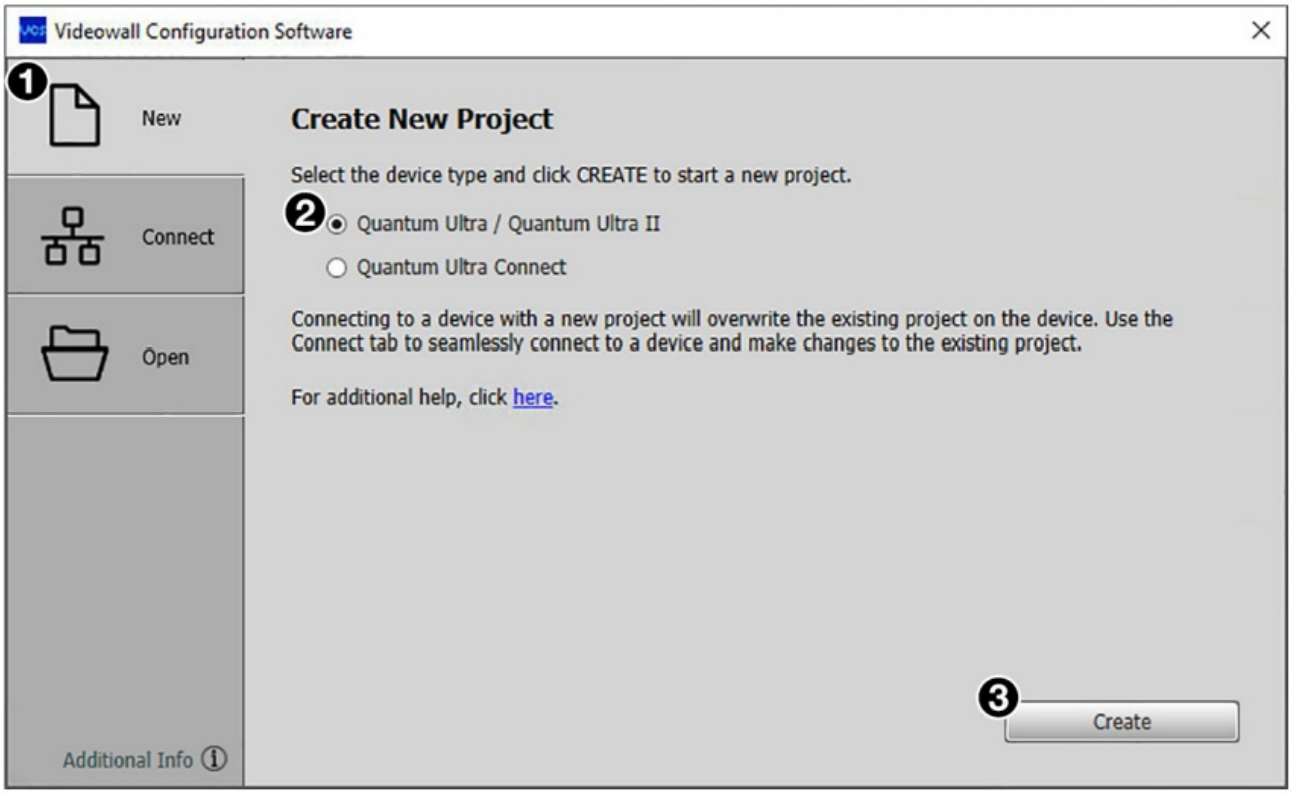
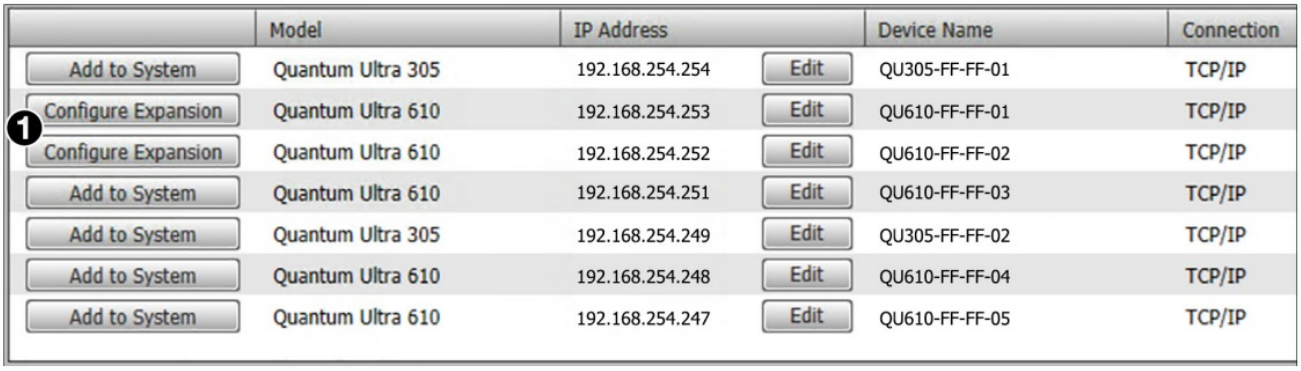


Figure 5. New Tab on the Start Screen

5. On the New Project connection screen, each listed device with expansion cards is preceded by a Configure Expansion button (instead of an Add to System button [see figure 6, 1). Click the Configure Expansion button for one of the desired expansion devices. (Figure 6 shows an expansion system with two chassis. There can be up to five chassis in an expansion system.)

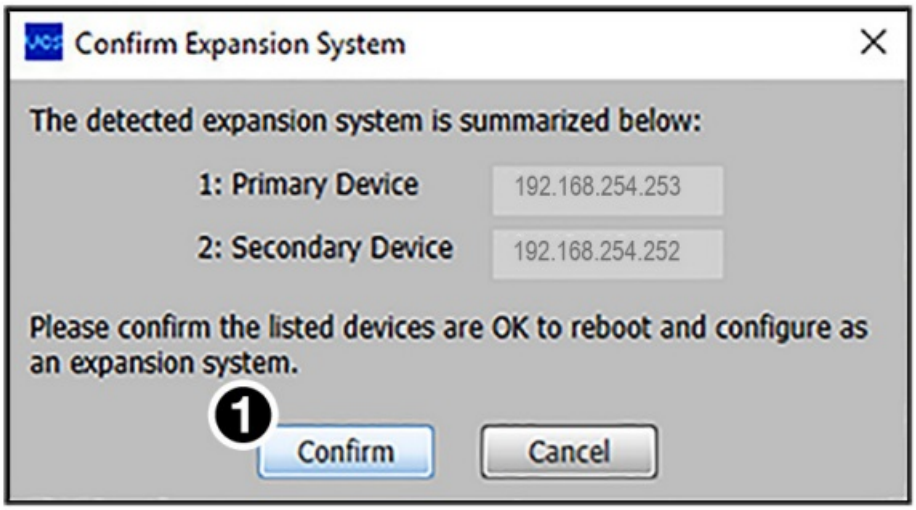


	Model	IP Address		Device Name	Connection
Add to System	Quantum Ultra 305	192.168.254.254	Edit	QU305-FF-FF-01	TCP/IP
Configure Expansion	Quantum Ultra 610	192.168.254.253	Edit	QU610-FF-FF-01	TCP/IP
Configure Expansion	Quantum Ultra 610	192.168.254.252	Edit	QU610-FF-FF-02	TCP/IP
Add to System	Quantum Ultra 610	192.168.254.251	Edit	QU610-FF-FF-03	TCP/IP
Add to System	Quantum Ultra 305	192.168.254.249	Edit	QU305-FF-FF-02	TCP/IP
Add to System	Quantum Ultra 610	192.168.254.248	Edit	QU610-FF-FF-04	TCP/IP
Add to System	Quantum Ultra 610	192.168.254.247	Edit	QU610-FF-FF-05	TCP/IP

Figure 6. Connection Screen for an Expansion System

The Confirm Expansion System window opens, showing the IP addresses of all Quantum Ultra Series devices in the expansion system, listed in their order in the chain, with the primary device at the top (see the example at right).

6. If all the information on this screen is correct, click the Confirm button at the bottom of the screen.



NOTE: If the IP address of a connected device in the chain is not found, this window indicates which device is missing. Click Cancel to return to the New Project connection screen.

A prompt window appears, indicating that the initial configuration is complete and the system will reboot.

7. Click OK on the prompt to close it. The reboot starts automatically and takes a few minutes to complete. When the connection screen is displayed, the device list contains the primary chassis, representing the expansion system and showing Quantum Ultra Expansion in the Model column (see figure 7, 1 on the next page). The information in the rest of the columns (IP Address, Device Name, and Connection columns) applies to the primary device in the chain.
8. Click the Add to System button in front of the Quantum Ultra Expansion line (see figure 7, 2) to add the expansion chain to the System Devices panel.

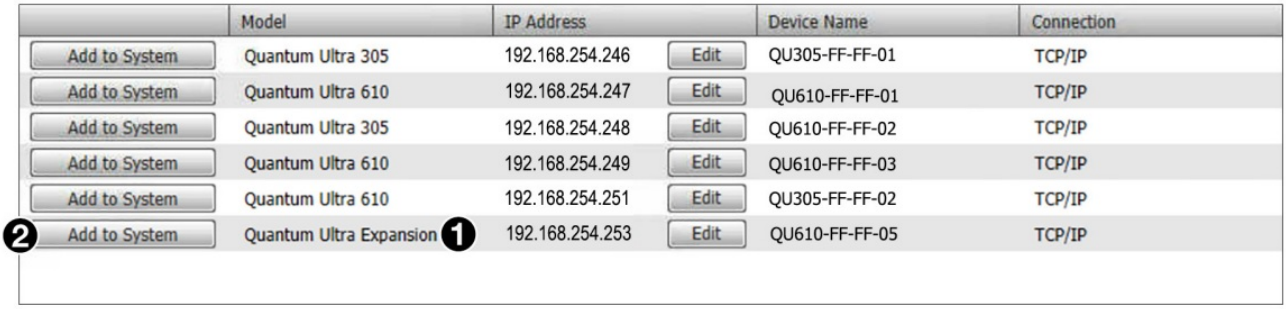


Figure 7. Quantum Ultra Expansion Chain on the Connection Screen

9. Configure the videowall as described in the Quantum Ultra Series Setup Guide, provided with your system.

Manually Adding an Expansion System

If the desired expansion device does not appear on the New Project discovery screen, configure the expansion system manually as follows:

1. On the New Project connection screen, click the Manually Add Device button (see figure 9, 1).
2. On the Manually Add Device screen, click the Manually Configure Expansion button (see figure 8, 1). Ensure that the Pull from hardware radio button (2) is selected. Ignore the other fields.

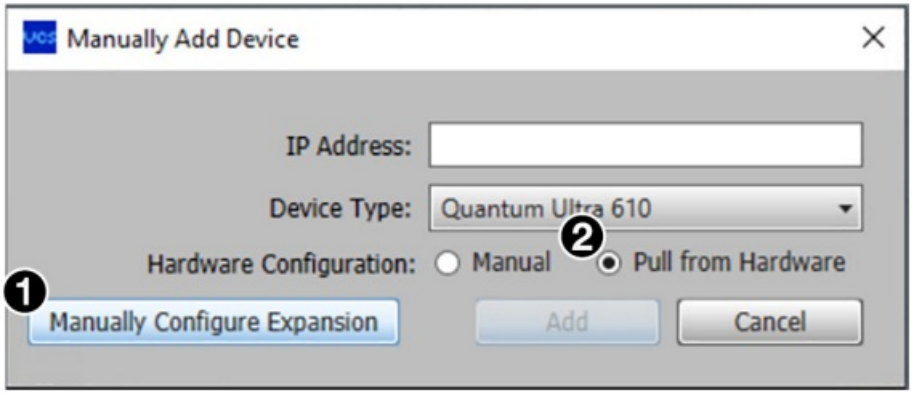
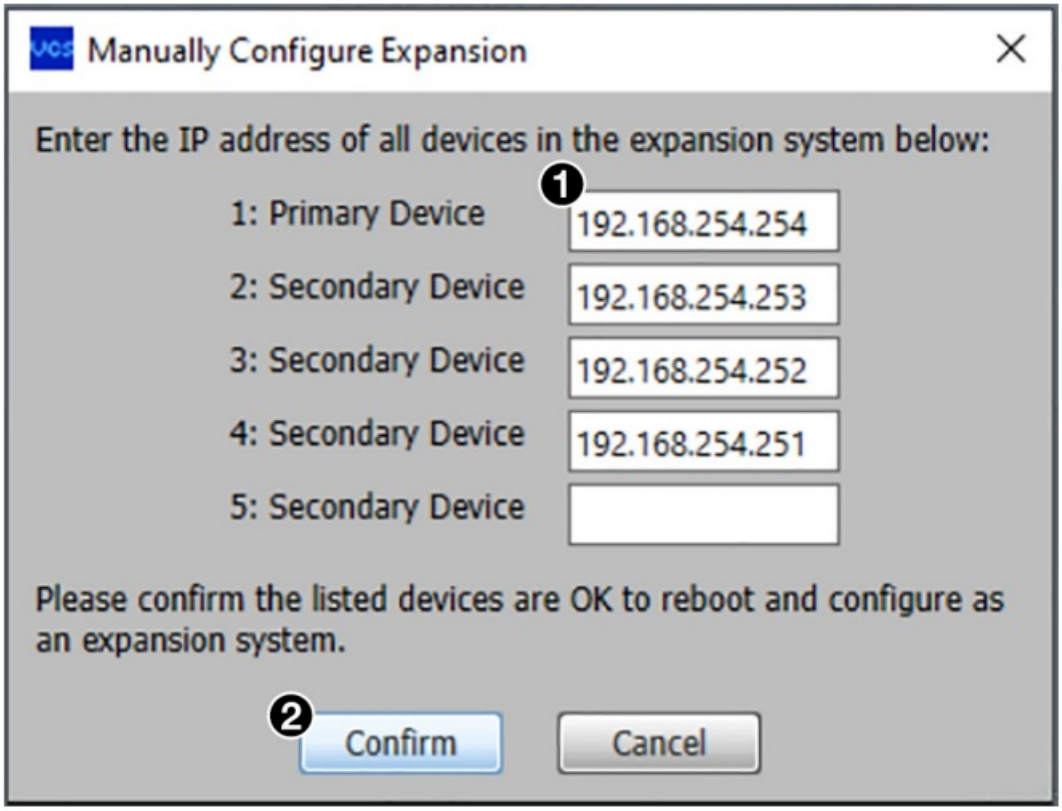


Figure 8. Manually Add Device Screen

3. On the Manually Configure Expansion screen (see the image at right), enter the IP addresses of the devices in the expansion system. Be sure to enter the addresses in the order the devices are connected in the chain, with the primary device address in the top (first) field (see 1 in the example at right).



4. Click Confirm (2). The system restarts, then after approximately 2 minutes, displays the expansion system as a single item on the device list with the model name Quantum Ultra Expansion (see figure 7, 1).
5. Click the Add to System button in front of the Quantum Ultra Expansion line (2) to add the expansion chain to the System Devices panel.
6. Configure the videowall as described in the Quantum Ultra Series Setup Guide, provided with your system.

Creating an Expansion Project Offline

If your Quantum Ultra or Ultra II units have not yet been installed, or if you are temporarily unable to connect to it, you can create your expansion project offline and upload it when the unit is ready.

1. On the Connect to Device screen, select the New side tab.
2. On the Create New Project screen, select the Quantum Ultra / Quantum Ultra II radio button, then click Create.
3. On the VCS Connection screen, click the Manually Add Device button (see figure 9, 1).

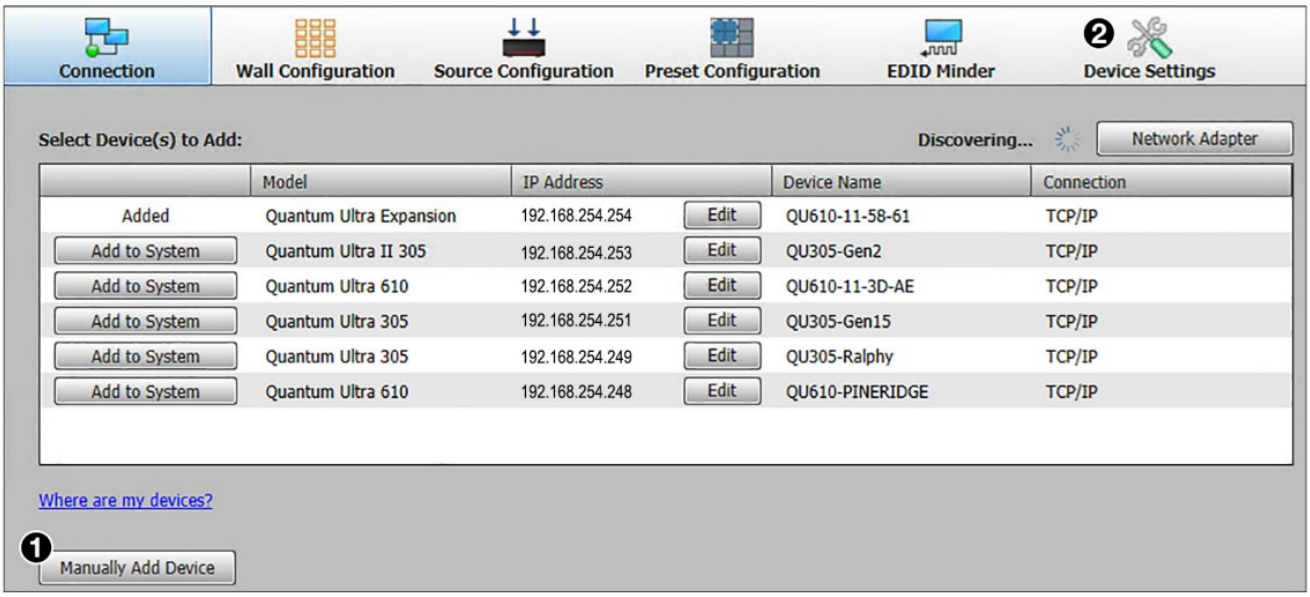


Figure 9. Manually Add Device Button on the Connection Screen

4. In the Manually Add Device dialog box, select the Hardware Configuration: Manual radio button (see figure 10, 1).

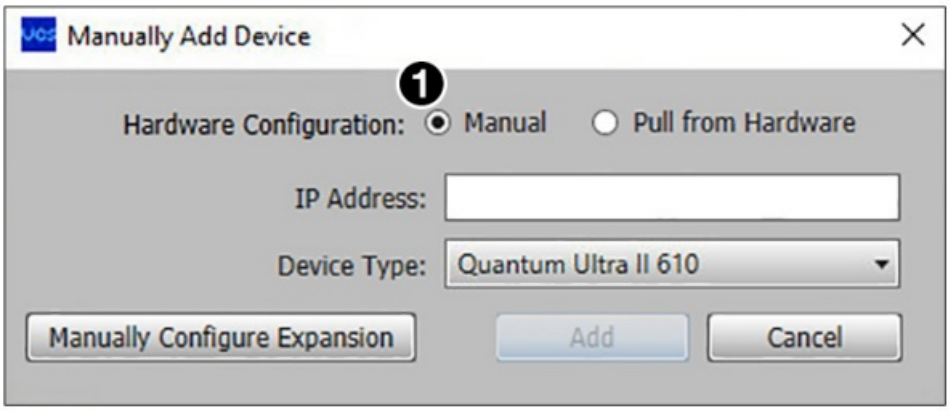
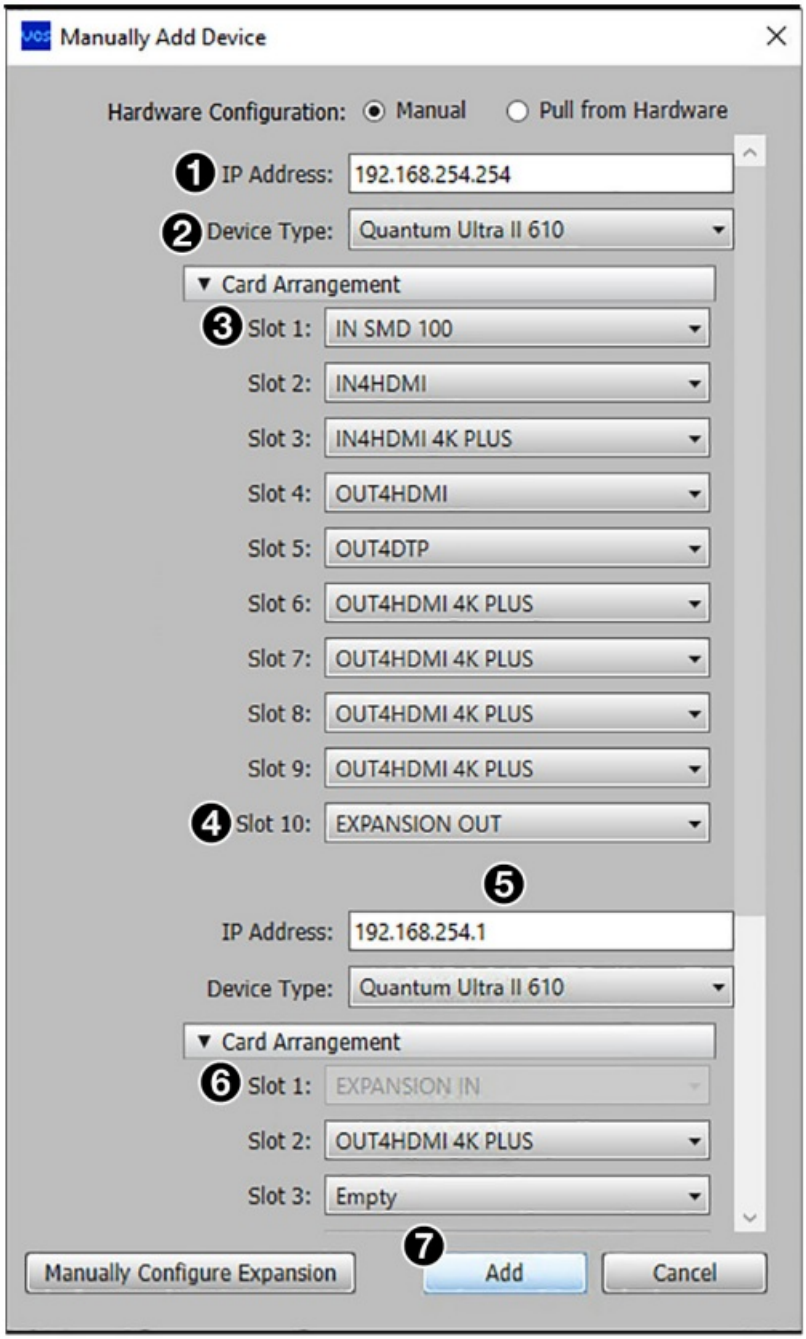


Figure 10. Manually Add Device Dialog Box

The card configuration dialog box opens (see the image at right).



5. Enter the IP address of the primary unit in the IP Address field (see 1 in the image at right). 6. From the Device Type menu (2), select your Quantum Ultra Series model.
6. Configure the primary chassis:

   a. Under Card Arrangement, each card slot has a drop-down list from which to select the type of card that is (or will be) installed in that slot of the primary chassis. When this dialog box opens, only the first card slot has a drop-down list, with Empty selected for Slot 1. b. From the Slot 1 drop-down list (3), select an input card: IN SMD 100, IN4HDMI, or IN4HDMI 4K PLUS.

   NOTE: The primary chassis must contain at least one input card. All input cards must be installed above the first non-expansion output card in the chassis (see the Quantum Ultra Series User Guide for the order in which the different input and output card types must be installed in the chassis).

   c. Select the rest of the input and output cards for the primary chassis.

   The last card in the primary chassis must be an Expansion OUT card, to which the first secondary chassis is connected (4 in the example above right).
7. Configure the first secondary chassis. When the Expansion OUT card is selected for the primary chassis, an additional set of fields drops down for the first secondary chassis (see 5 in the Manually Add Device card

configuration screen image on the previous page).

a. Enter the IP address of the secondary chassis in the IP Address field, and select the secondary chassis type from the Device Type drop-down list.

b. Select input and output cards for the secondary chassis slots as needed.

c. If the system contains another secondary chassis, select EXPANSION OUT for the last slot.

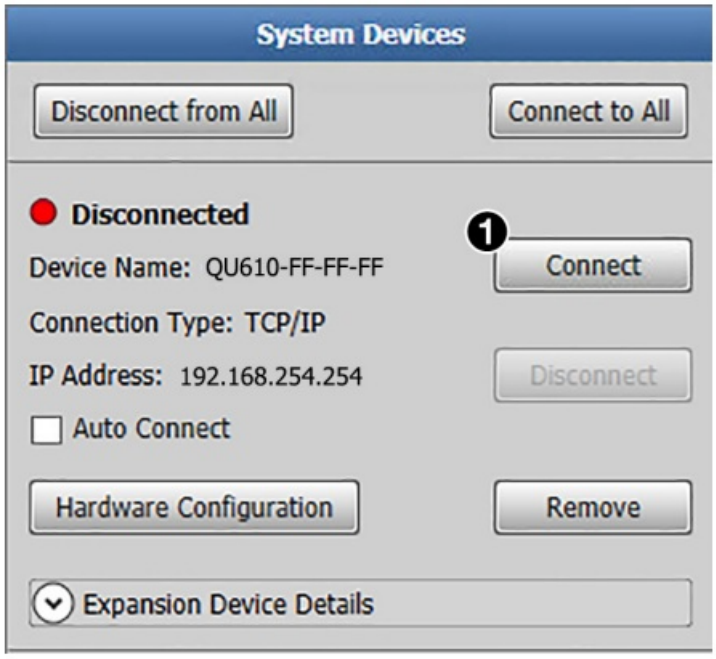
8. Repeat step 8 for each additional secondary chassis in the system (up to four secondary chassis are permitted).

NOTES:

• The first card of each secondary chassis is always an Expansion IN card (6). This card cannot be changed.

• All input cards must be installed above the output cards in the expansion system. Therefore, a secondary chassis can contain input cards only if all chassis above it in the chain contain only input cards.

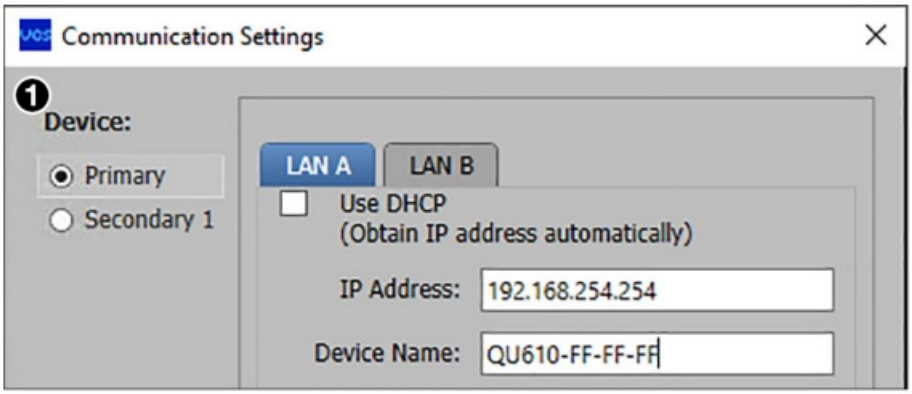
• The last card in an expansion system cannot be an expansion card.



9. When finished configuring primary and secondary chassis, click Add (7). The window closes and the expansion system is added to the System Devices panel.
10. When ready to apply the new project to the expansion system, click Connect in the System Devices panel (see 1 in the image at right).

Editing Network Settings Online

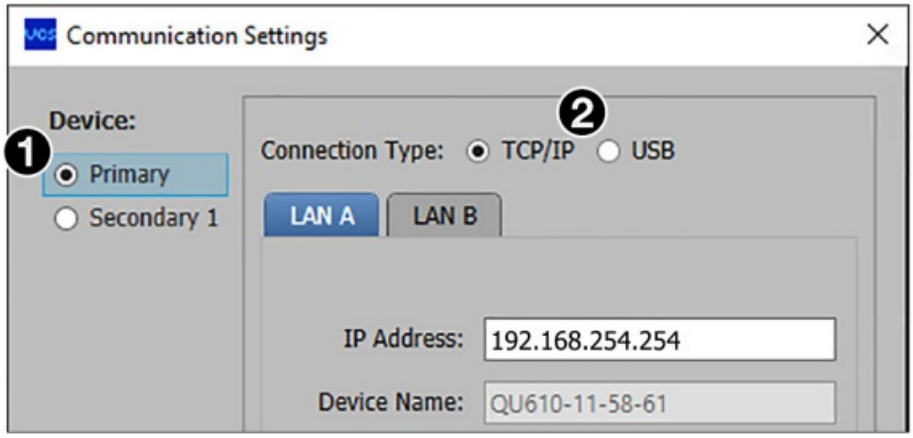
1. While connected to the expansion system in VCS, select the Device Settings tab on the VCS main screen.
2. In the Device Details panel of the Device Settings screen, click the Communication Settings button.
3. On the Communication Settings screen, select the radio button for the device in the expansion system for which you are changing the network settings (Primary or Secondary, see 1 in the example at right).



4. Make the desired changes to the network settings.
5. Click Apply at the bottom of the screen.
6. Click OK on the Update Settings prompt to commit the changes and reboot the unit.

Editing Network Settings Offline
An existing project file can be used for multiple expansion systems. To change the network settings of the chassis that is saved in the project file:

1. Open the project file of the expansion system and select the Device Settings tab (see figure 9, 2, on page 5).
2. Click Communication Settings in the Device Details panel of the Device Settings screen.
3. Select the Primary or Secondary radio button (see 1 in the image at right) for the device for which you are changing the network settings.
4. (Optional) Select a Connection Type radio button (2) for the primary device (TCP/IP or USB).
5. Make the desired changes to the network settings.
6. Click Apply on the Communication Settings screen.

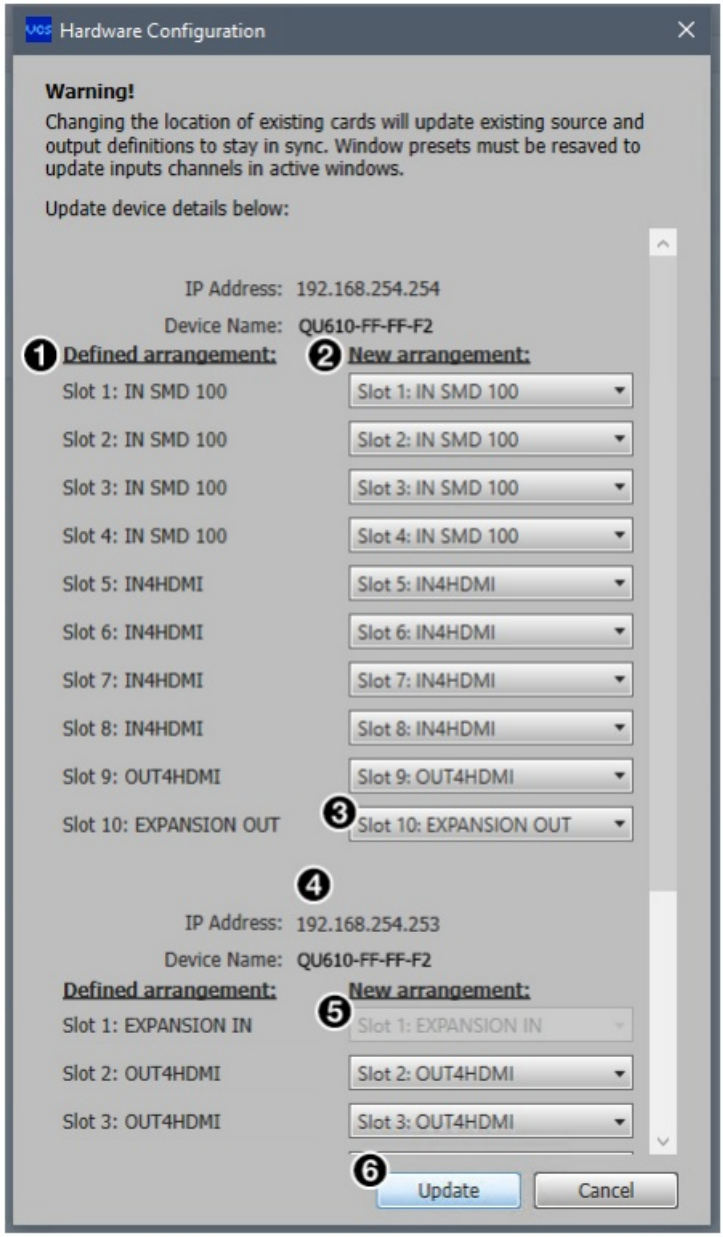


NOTES:

- If the connection type for the primary device is set to TCP/IP, only the IP Address can be changed. If the connection type is set to USB, only the Device Name can be changed.
- For secondary devices, only the IP address can be changed. The connection type cannot be changed.

Editing an Expansion Project File Offline
If any cards in a unit in an expansion system are changed (replaced or moved to a different location within the chassis), the project file must also be modified in VCS to match the new hardware configuration.
NOTE: You cannot change the number of chassis in the system once it has been added to the project. The only edits that can be made are the non-expansion card configuration.

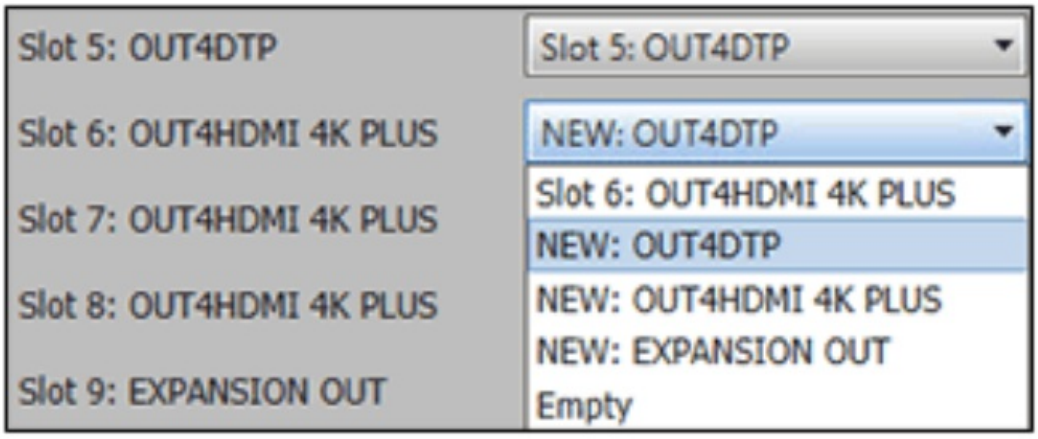
1. Open the project file to be edited by doing one of the following:
   • Select Open from the File menu, and then browse to locate and select the desired project.
   • Open VCS, select the Open tab, and then browse to locate and select the desired project.
2. In the System Devices panel, click the Hardware Configuration button for the primary chassis to display the Hardware Configuration screen (shown at right). This screen contains the following for each chassis in the system:
   • IP Address and Device Name.
   • Defined arrangement column, listing the cards in the order they are installed in the chassis (see 1 in the example at right).
   • New arrangement column (2), containing a drop-down list of available card types for each card slot.
   • Information and drop-down lists for the primary chassis are listed first, followed by each secondary chassis (4).



NOTES:

• The card in the last slot of the primary chassis must be an Expansion OUT card (3).

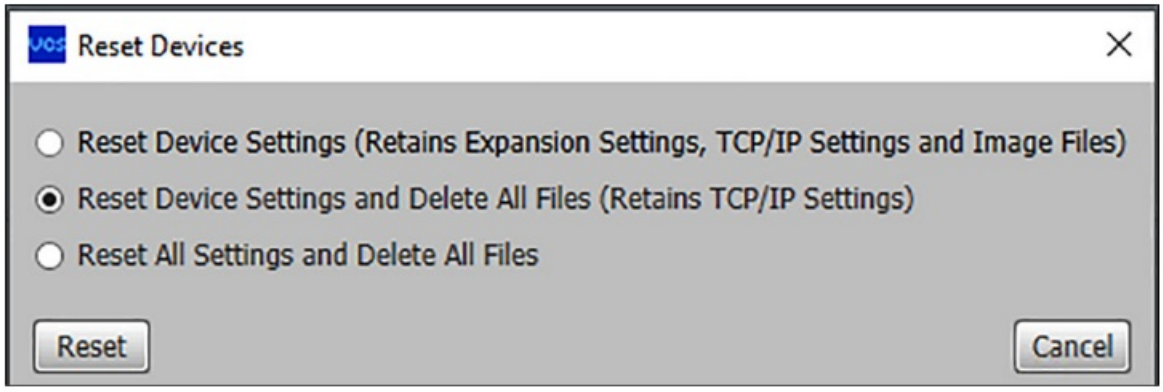
• The card in slot 1 of each secondary chassis must be an Expansion IN card (5). When a new card is selected, its name is preceded by NEW: (see the image below).



3. For each chassis, select the replacement card from the drop-down list for each slot in which a new card will be installed.
4. When finished, click Update (6) to complete the configuration.
5. Verify that the IP addresses of the primary and secondary devices on the Hardware Configuration screen match those shown on the Communication Settings screen (see the image on the previous page).

Reconfiguring an Expansion System
At some point you may need to dismantle the expansion system in order to:

- Use the chassis individually rather than as an expansion system.
- Swap out a chassis (for example, if one of the units breaks due to a hardware failure).
- Create a new expansion system by removing or adding chassis.



To redo the configuration or repurpose the chassis into different systems:

1. Connect to the expansion system and select Reset Devices from the Tools menu.
2. In the Reset Devices window (see the image above right), select the second radio button: Reset Device Settings and Delete All Files (Retains TCP/IP Settings).
3. Click Reset. The system reboots. After approximately 2 minutes, the expansion devices appear listed separately in the device discovery panel, as shown in figure 6 on page 3.

Basic SIS Commands
The Quantum Ultra Series can be controlled with SIS commands via a USB, RS-232, or LAN connection. The following table lists some basic commands. For a full list of SIS commands see the Quantum Ultra Series User Guide, available at **www.extron.com**.
NOTE: Send SIS commands only to the primary chassis. Sending SIS commands to secondary chassis may give incorrect responses or errors.

Command	ASCII Command (Host to Processor)	Response (Processor to Host)	Additional Description
Input Selection			
Select input	X3*X5*X1!	GrpX3•WinX5•In X1↵	Select input X1 for window X5 on Canvas X3.
View current input	X3*X5!	X1↵	View current input X1 in window X5 on Canvas X3.
Window Presets			
Recall window preset	1*X3*X25.	1RprX3*X25↵	Recall window preset X25 on Canvas X3.
Recall preset with audio	3*X3*X25.	3RprX3*X25↵	Recall window preset X25 to Canvas X3 including audio tie.
Window Border Style			
Set window border style	Esc B X3*X5*X75 WNDW←	Wndw B X3*X5*X75↵	Set the border style of window X5 on Canvas X3 to X75.
View window border style	Esc B X3*X5 WNDW←	X75↵	View border style X75 for window X5 on Canvas X3.
IP Configuration			
NOTE: These commands apply only to the LAN A port. A Commit and reboot command is required for changes to persist.			
Set DHCP on and off	Esc X10 DH←	IdhX10↵	Enable or disable DHCP.
View DHCP setting	Esc DH←	X10↵	View DHCP setting X10. Default is 0 (off).
Set IP address	Esc X114 CI←	Ipi•X114↵	Set the IP address for the unit to X114.
View IP address	Esc CI←	X114↵	View IP address X114.
Rebooting the System			
Commit and reboot	Esc 1BOOT←	Boot1↵	Commit changes and reboot Quantum Ultra.
Information Requests			
Query hardware status of chassis in an expansion system	X85 S	X85*X10•X10•X10•X10•X12•X12•X12↵ *In verbose modes 2 and 3:* StsX85*X10•X10•X10•X10•X12•X12•X12↵	View the status of the hardware elements of chassis X85 in an expansion system.

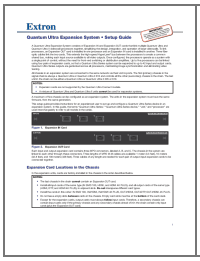
KEY:

- X1 = Input (assigned by VCS): 0001 – 9999. Response is four digits with leading zeros.
  0001 – 0999 = physical video connections on all Quantum chassis in the system.
  1000 – 9999 = Sources defined in the system and not connected to an input card (Picture, RSS, VNC, Text, or Clock).
- X3 = Canvas: 01 – 10 (Ultra 610 models) or 01-05 (Ultra 305 models). Response is two digits with a leading zero.
- X5 = Window: 001 – 999. Response is three digits with leading zeros.
- X10 = On or off: 0 = off (disabled), 1 = on (enabled).
- X12 = Internal temperature in degrees Celsius.
- X25 = Window preset: 001 – 128. Response is three digits with leading zeros.
- X75 = Window border style preset: 000 – 127. 000 = no border. Response is three digits with leading zeros.
- X85 = Chassis position in expansion system
  1 = First chassis, 2 = Second chassis, 3 = Third chassis, 4 = Fourth chassis, 5 = Fifth chassis
- X114 = IP address in the format *nnn.nnn.nnn.nnn*. Default is 192.168.254.254.

For information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics, see the Extron Safety and Regulatory Compliance Guide on the Extron website.

www.extron.com

Documents / Resources



Extron Quantum Ultra Expansion System [pdf] User Guide
Quantum Ultra Expansion System, Quantum Ultra, Expansion System

References

- Extron - The AV Technology Leader