Crestron **UPX-2**
Universal Presentation Processor
Reference Guide

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Contents

Universal Presentation Processor: UPX-2

Introduction

This programming manual contains SIMPL Windows® programming instructions, VisionTools® Pro-e (VT Pro-e) programming instructions, and related information for the UPX-2 Universal Presentation Processor. For specifications, installation, and setup information, refer to the latest version of the UPX-2 Operations Guide (Doc. 6276), available from the Crestron® website (http://www.crestron.com/manuals).

What You Should Know Before Starting

This manual is written for the experienced Crestron programmer. Before programming this product, the reader should be familiar with the following Crestron development tools:

- SIMPL Windows
- VT Pro-e

For information on SIMPL Windows, refer to the latest version of the SIMPL Windows Primer (Doc. 6253). Crestron also recommends the latest version of the 2-Series Control Systems Reference Guide (Doc. 6256). Both of these documents are available for download from the Crestron website.

SIMPL Windows and VT Pro-e feature context-specific help to guide the programmer with device-specific information. To view the help file at any time, press **F1**.

Demo Program

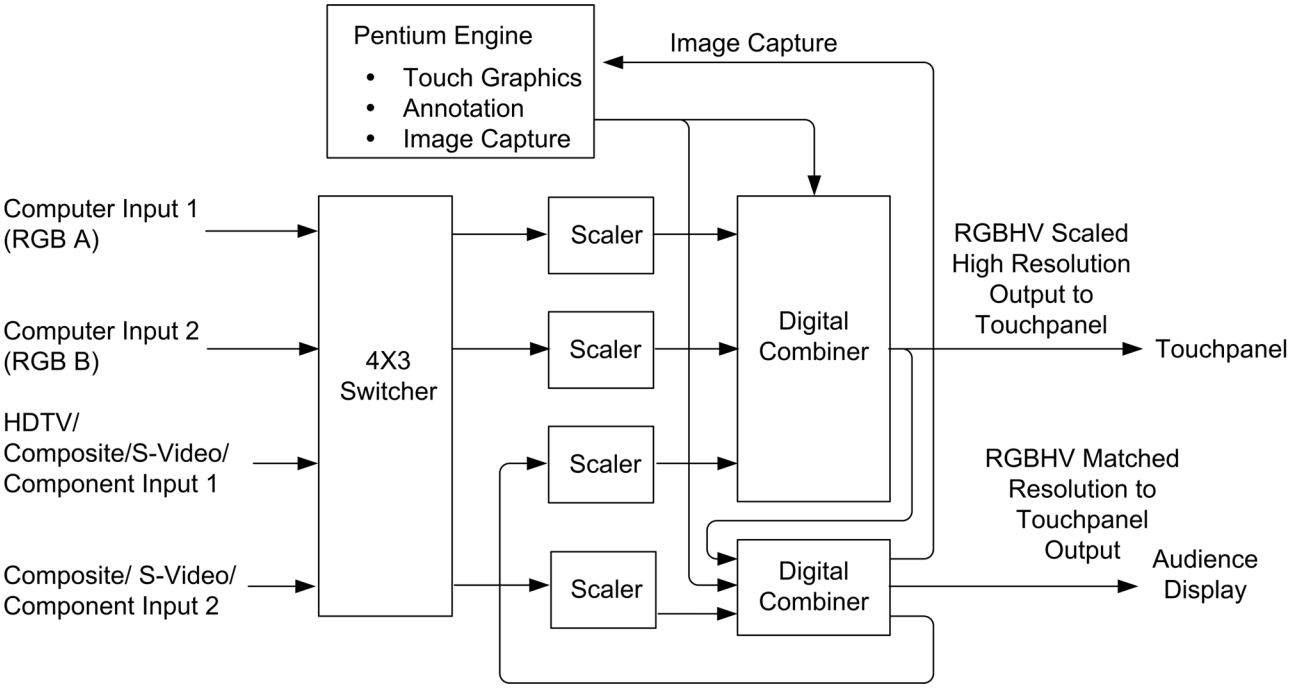
The UPX-2 is shipped with a two-window user interface in the demo program. For information on loading and using the demo program, refer to the latest revision of the UPX-2 Operations Guide (Doc. 6276).

Internal Block Diagram

The UPX-2 is a Cresnet® or Ethernet network device and has all the same features as a touchpanel, plus video processing features. The UPX-2 has the ability to

simultaneously display up to three sources; two video sources and one RGB source, or two RGB and one video source. The following diagram illustrates the video processing capabilities of the UPX-2.

UPX-2 Video Processing Block Diagram



Additional Capabilities

Touchpanel and Audience Display

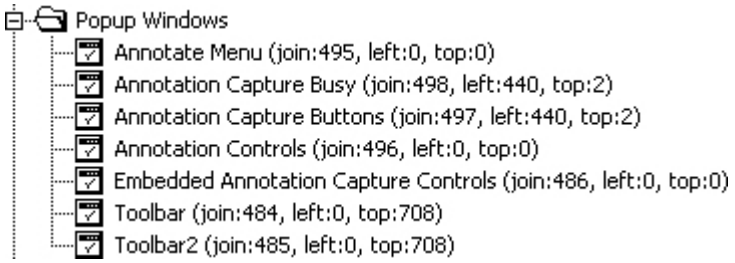
The UPX-2 has two outputs. Output A for the presenter touchpanel, and output B for the audience display. Each output may display a different source or the same source.

NOTE: The output resolution of both output A and B must match the resolution of the touchpanel display.

Popup Windows

Popup windows (menus, controls, and toolbars) appear on the DualTouch™ Technology touchpanel (output A) and can be displayed or hidden on the audience display device (output B). Popup windows are similar to a subpage, but unlike a subpage, there is no reference to the popup on any of the pages. If the popup is set to display, it will show up on top of each page in the project. Refer to "Popup Windows" on page 18 for additional popup information. The following illustration shows a list of popup windows in the demo program.

Demo Program Popup Windows as Displayed in VT Pro-e



NOTE: You cannot annotate over popup windows.

Embedded Applications

Embedded applications (Word, Excel, NetMeeting, Adobe Reader, MediaMarker, PowerPoint, Windows Media Player, etc.) require an assigned join number to start the application. The default path can be any resident file or web page. Refer to "Embedded Applications" on page 21 for additional information.

Edit Object Box

The Edit Object Box allows you to enter text from the UPX-2 and send a serial string to the control system (Edit Object Box is not yet supported and will be available in a future release).

Combo Box

The Combo Box allows you to create a list of serial strings that will be listed in a pull down box and send a serial string to the control system (Combo Box is not yet supported and will be available in a future release).

Translucent Objects

All UPX-2 objects may be assigned a translucent property. Refer to "Translucent Objects" on page 17 for additional information.

Annotation and MediaMarker

You can annotate over RGB, streaming video, PowerPoint presentations, web pages, and any other viewable documents using a wide variety of tools and colors. Also, in addition to saving for future presentation, you might also save it for future editing. The screen image can be exported in a variety of file formats for distribution and publishing purposes. In addition, the presenter can devise an entire program and save it in the MediaMarker Notebook for future presentation. Refer to "Annotation" on page 25 for more information.

Programming Software

Have a question or comment about Crestron software?

Answers to frequently asked questions (FAQs) can be viewed in the Online Help section of the Crestron website. To post a question or view questions you have submitted to Crestron's True Blue Support, log in at http://support.crestron.com. First-time users will need to establish a user account.

Earliest Version Software Requirements for the PC

NOTE: Crestron recommends that you use the latest software to take advantage of the most recently released features. The latest software is available from the Crestron website.

Crestron has developed an assortment of Windows®-based software tools to develop a Cresnet system. The following are the minimum recommended software versions for the PC:

Software

TASK	REQUIRED SOFTWARE VERSION
Program control system to operate the UPX-2	SIMPL Windows version 2.06.20 or later with SIMPL+ Cross Compiler version 1.1 or later; Also requires Crestron Database version 17.4.4 or later
Create user interface for UPX-2	Vision Tools Pro-e (VT Pro-e) version 3.3 or later.
Uploading program and firmware	Crestron Toolbox 1.2.10 or later

Programming with SIMPL Windows

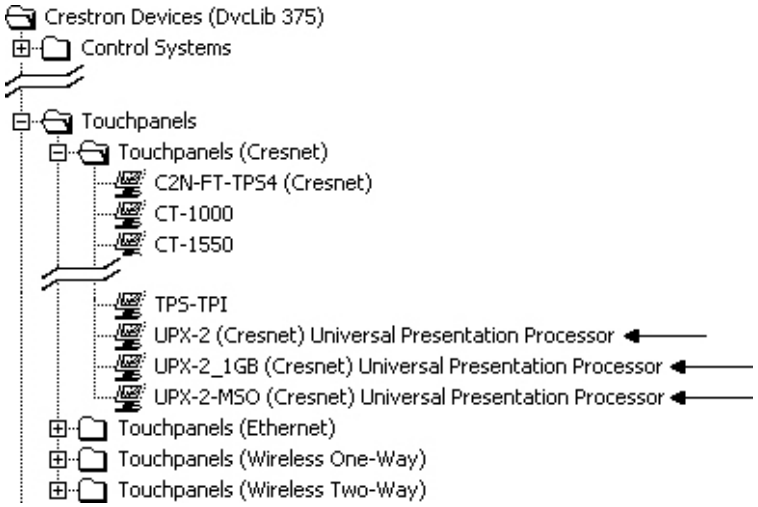
SIMPL Windows is Crestron's premier software for programming Crestron control systems. It is organized into two separate, but equally important "Managers".

Configuration Manager

Configuration Manager is the view where programmers "build" a Crestron control system by selecting hardware from the *Device Library*. The UPX-2 can connect to a control system over Cresnet or Ethernet.

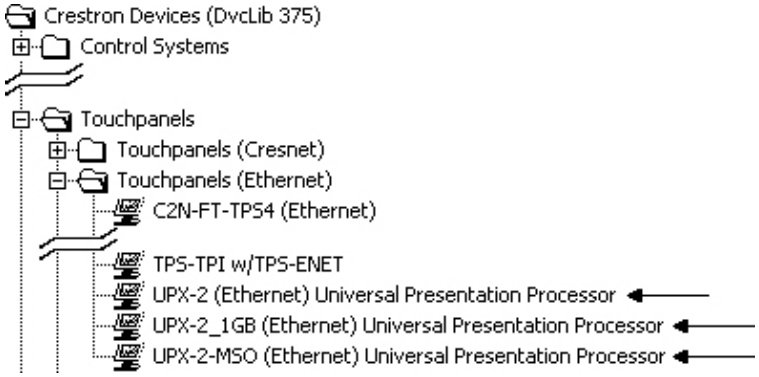
- To incorporate the UPX-2 into a system using Cresnet, drag the UPX-2 from the Touchpanels | Touchpanels (Cresnet) folder of the *Device Library* and drop it in the *System Views*.

Locating the UPX-2 for a Cresnet System in the Device Library



- To incorporate the UPX-2 into a system using Ethernet, drag the UPX-2 from the Touchpanels | Touchpanels (Ethernet) folder of the *Device Library* and drop it in the *System Views.*

Locating the UPX-2 for an Ethernet System in the Device Library



There are several variations of the UPX-2 to choose from. The following table illustrates the difference between the models.

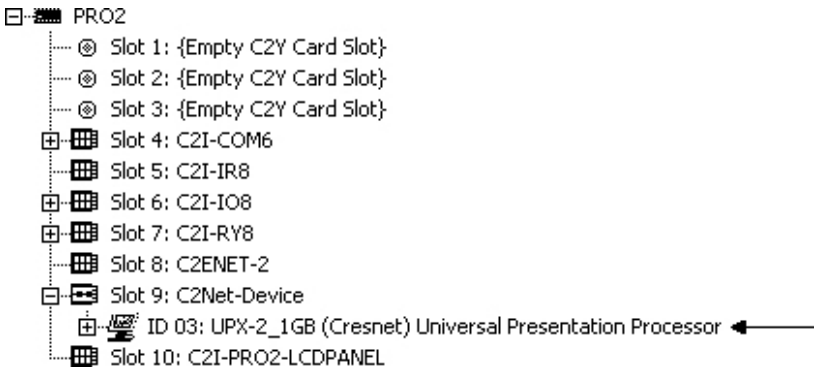
UPX-2 Model Lineup

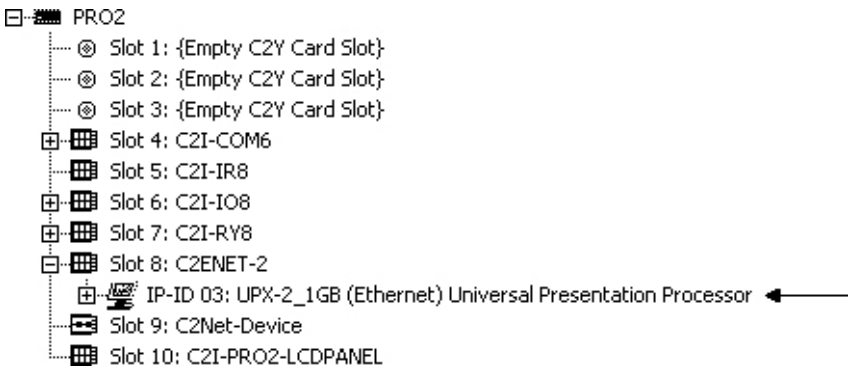
MODEL	FIRMWARE FLASH CARD SIZE	EMBEDDED APPLICATIONS	NOTES
UPX-2*	512MB	Internet Explorer, Windows Media® Player, Netmeeting, Adobe® Acrobat Reader, and viewers for Word®, Excel®, PowerPoint®	Can be upgraded to UPX-2-1GB or UPX-2-MSO by purchasing UPX-OS1GB or UPX-OS1GB-MSO respectively. Additional features may be available from free downloads from the Crestron website.
UPX-2-1GB	1GB	MediaMarker™, Microsoft® Internet Explorer, Windows Media® Player, RealPlayer®, Remote Desktop, NetMeeting®, Java™ Runtime, Macromedia® Flash® Plug-In, Axis ActiveX® controls, DirectX®, and viewers for Microsoft Word, Microsoft Excel, Microsoft PowerPoint®, and Adobe® Acrobat®	Can be upgraded to UPX-2-MSO by purchasing UPX-OS1GB-MSO. Additional features may be available from free downloads from the Crestron website.
UPX-2-MSO	1GB	All of the embedded applications of the UPX-2-1GB with the addition of Microsoft Picture Manager and full versions of Microsoft Word, Microsoft Excel and Microsoft PowerPoint (replace viewers).	Additional features may be available from free downloads from the Crestron website.

* This model has been replaced by the UPX-2-1GB. For upgrade information, contact Crestron at 1-888-CRESTRON.

- The system tree of the control system displays the device in the appropriate slot with a default Net ID of 03 (Cresnet) or IP ID of 03 (Ethernet) as shown in the following illustrations.

From top to bottom; C2Net Device, Slot 9 and C2Enet Device, Slot 8

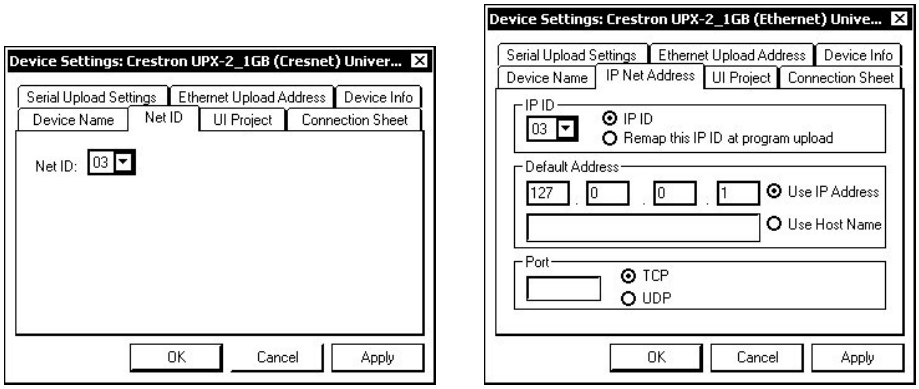




- Additional UPX-2 devices are assigned different Net ID or IP ID numbers as they are added.

- Use the "Device Settings" window to change the Net ID or IP ID, as shown in the following figures.

From Left to Right; "UPX-2 Device Settings" Windows for Cresnet & Ethernet



- The ID code specified in the SIMPL Windows program must match the Net ID of each unit.

Programming Manager

Programming Manager is the view where programmers "program" a Crestron control system by assigning signals to symbols. The symbol can be viewed by double clicking on the icon or dragging it into *Detail View*. A description for each signal in the symbol is described in the SIMPL Windows help file (**F1**).

Once a program has been written, it can be compiled and uploaded to the control system. Refer to the latest version of the 2-Series Reference Guide (Doc. 6256) for instructions.

Programming with VisionTools Pro-e

The layout and functionality of the UPX-2 user interface is created in VisionTools Pro-e (VT Pro-e). The user interface can be created to take advantage of all of the UPX-2's presentation processing capabilities and built-in PC applications.

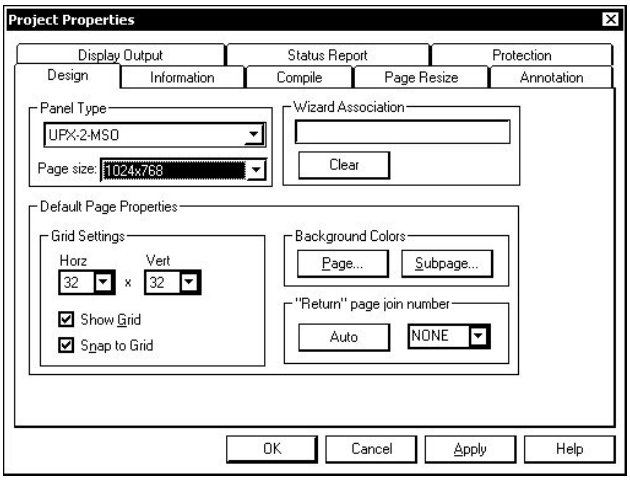
When creating a new VT Pro-e project for the UPX-2, select the appropriate UPX-2 model as the panel type.

Project Resolution

The resolution of the project must be set to match the native resolution of the display device. In VT-Pro-e, go to **Edit | Project Properties** and select the *Design* tab.

- Set the Panel size (horizontal/vertical pixels) to the native resolution of your DTT-15V2/DTT-17 touchpanel device. This should be done *before* any pages are created. The output resolution of the UPX-2 must match the native resolution of your touchpanel device, and the VT Pro-e project must match the output resolution of the UPX-2. These resolutions must match for video windows to function properly. Current resolutions supported include: 800 x 600, 1024 x 768, 1280 x 720, 1280 x 960, 1280 x 1024, 1600 x 1200.

"Project Properties" Design Tab



Once a project has been created, it can be compiled and uploaded to the UPX-2. Refer to the latest version of the UPX-2 Operations Guide (Doc. 6276) for instructions.

Programming Concepts

This section includes reference material that can be used to take advantage of the UPX-2's capabilities.

Touch-the-PC

The UPX-2 is compatible with the Crestron serial mouse driver, which enables Touch-the-PC capabilities. Touch-the-PC allows the end user to control the cursor and functions of an external PC, by touching a video or RGB window that has been programmed for "touch output". Using a control system as the interface between the external PC and the UPX-2, the PC can be connected to the UPX-2 via the UPX-2's connection (Ethernet or Cresnet) to a control system.

Hardware/Software Requirements

A null modem RS-232 cable is required to connect the 2-Series control system with a PC that has a COM port dedicated to Touch-the-PC. A USB port cannot be used as the computer COM port.

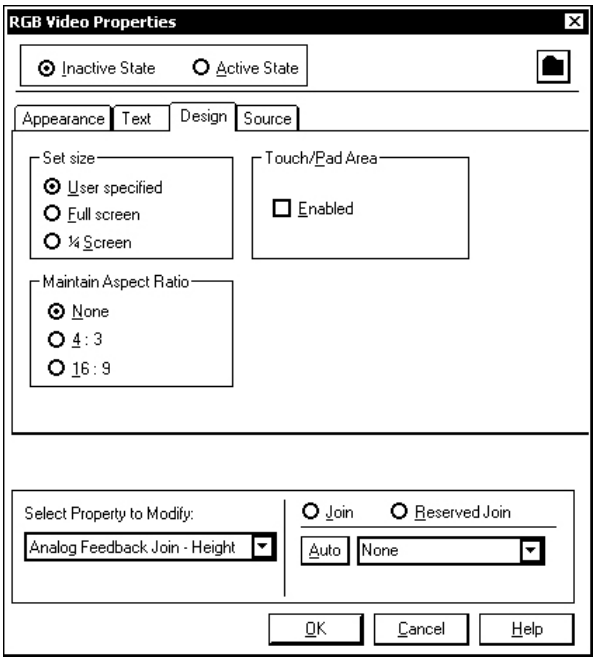
Touch-the-PC requires the following files:

- New Touch-the-PC driver program version 03.08.34P
- Vision Tools Pro-e 3.3 or later
- UPX-2 firmware version 1.09.0.02.zip or higher
- SIMPL Windows version 2.06.20 or later with library update file 345 or later. Requires SIMPL+ Cross Compiler version 1.1.
- Crestron Database 17.4.4 or later

Procedure

1. Install VT Pro-e version 3.3 and Crestron Database 17.4.4.
2. Load version 1.09.0.02.zip or higher firmware into the UPX-2.
3. Unzip the Touch.zip file. This file contains the UPDD file which is to be installed on the PC that will be running Touch-the-PC.
4. Run the setup program to install the UPDD (Universal Pointer Device Driver) into the computer to be used. If a mouse driver is already installed, uninstall it before installing this new mouse driver. The only option that should be changed in the setup program is the COM port that will be used if COM port 1 is not to be used. Accept all other defaults.
5. Create an RGB window in VT Pro-e and configure for Touch-the-PC by opening the "RGB Video Properties" window. Select the *Design* tab and click the box to enable the *Touch/Pad Area*. Save and compile the project.

RGB Video Properties for Touch-the-PC



6. In SIMPL Windows, right-click on slot 1 of the UPX-2 in *Program View* and select **Insert Device Extender**, then select **UPX-2/UPX-2-MSO/UPX-2_1GB Touch Out** to begin programming.

Symbol Programming

The following is a "touch out" programming example for RGB-1. A description for each signal in the symbol is described in the SIMPL Windows help file (**F1**).

NOTE: The current UPX-2 firmware release only supports UPDD formats.

1. Add an analog initialize 0d to the **Touchout Format RGB-1** signal.
2. Add an analog value to **Touchout Destination RGB-1** to specify the "touch out" destination.

   0X02 – via Cresnet
   0X03 through 0XFE – via Ethernet where 03 to FE are Device ID numbers.

   Assigning Device ID numbers allows multiple touchpanels to be attached to a control system using the same Device ID for Touch-the-PC. Therefore, a TPS touchpanel that has an IP ID of 04 and a UPX-2 with an IP ID of 03 can both have the same Device ID of 04. The IP Tables in the control system and the UPX-2 must be modified to have the Device ID. For example, an IP table entry with IP ID 03 and IP address 188.148.124.5, will need the Device ID number 04. After the Device ID has been added to the entry, the device will be listed as 03 188.148.124.5 04 where 03 is the IP ID, 188.148.124.5 is the IP address, and 04 is the Device ID.
3. Take serial string **Touchout String RGB-1** to the COM port of the 2-Series control system **TX$**.

Graphics

The UPX-2 features PNG image support, which enables translucent objects to be placed over still images (such as background). The dynamic graphics feature enables the display of images (pictures, CD cover art, etc.) that are hosted externally on a flash memory card or media server.

PNG Graphics

The PNG file format utilizes lossless compression, meaning image data is not lost when saving or viewing the image.

PNG format uses an alpha channel (one byte of extra data per pixel) to represent the pixel's transparency level. A PNG image with alpha is capable of 256 levels of transparency. Text and images can be antialiased so that sharp curves will look good against any background. You can apply a true drop shadow that fades into the background, and create images that take any shape or form. There are many possibilities with alpha transparency.

PNG images are displayed with full translucency in VT Pro-e and on the panel.

Dynamic *Graphics*

Dynamic graphics allow an image to be dynamically updated at run time.

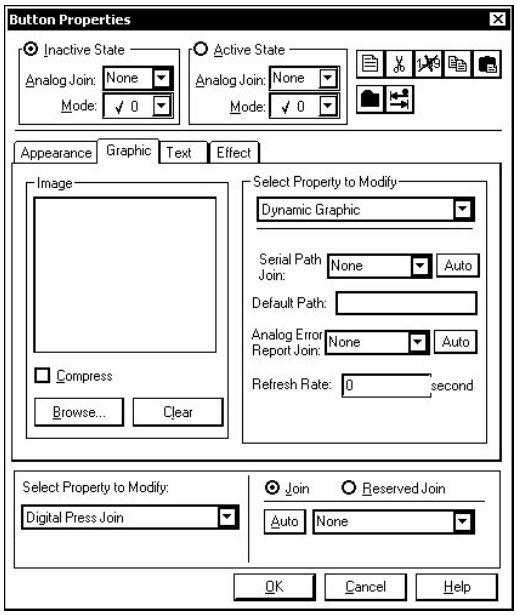
Dynamic graphics are updated either automatically, based on the specified refresh rate, or by sending a new file path to the panel from the control system. The following UPX-2 objects can have dynamic graphics:

- Images
- Buttons
- Page backgrounds
- Subpage backgrounds
- Popup Window backgrounds

The image size and position set at design time will be applied to the dynamic graphics. Dithering and transparent (bleeding) color are not supported by dynamic graphics. To help configure the dynamic image position and size at design time, a "dummy" image (e.g., Crestron Dynamic Graphic.jpg) will be used for previewing the image layout if no image is selected. Dynamic graphics on an image object will always be stretch-fitted.

Dynamic graphic properties are assigned in VT Pro-e by double-clicking on the object.

"Button Properties" – Graphic Tab



The following dynamic graphics properties can be assigned to an object in VT Pro-e:

- A serial join for file path
- An analog join for error reporting
- A default file path
- An auto refresh rate (1 to 65535) in seconds

At design time, either a serial path join or a default path can be assigned. If a serial join is assigned, the default path will be disabled.

At run time, if a default file path is assigned, the file will be loaded when the project is loaded. Whenever a file path is sent to the panel from the control system via the serial join, the image file will be loaded immediately and the image will be displayed right away if the object is currently visible.

If an auto refresh rate is set, the image will be automatically refreshed periodically.

The following four image types are supported:

- .bmp
- .jpg
- .png
- .gif

Resource Management

For best results in displaying the dynamic graphics, the original image size should be the same as the desired display size.

Note that dynamic graphics resource management will not affect the original project. Thus, rebooting the device will trigger the original project to load.

Dynamic Graphic File Locations

The dynamic graphic files can be accessed from the following sources:

- A public drive (e.g., e:\user\) on the device;
- An external flash drive attached to the device;
- A UNC server (e.g., \\myserver\\users\) on a LAN;
- A URL server on a LAN (e.g., 192.168.121.22/);
- Internet Server (web server or ftp server)

Analog Output

All dynamic graphic errors (invalid path/filename, failure to download) are sent to the defined analog join number with the analog value indicating the specific error.

The analog output associated with the dynamic graphic has four defined values.

- 0 = no error
- 1 = invalid path or file name
- 2 = failed to download the file
- 3 = file size is too big

Security Issues

To load files from a UNC network server that requires a password, the required drives need to be pre-mapped. The user can do this from the SETUP MENU. By making the connection persistent, the connection will be re-established after the device is rebooted.

Video Windows

Video windows created on a page in a VT Pro-e project can be configured using the "Video Properties" window. Once a video window is created using the **Draw | RGB Window** or **Draw | Video Window** options, double-click the video window to open "RGB Video Properties" or "Video Properties" window so you can configure the source, position, and size using the input selection.

Assigning a default input always displays that video or RGB source. To change a video or RGB source in the window, assign an analog join number for input selection. Once an analog value is assigned, it overrides the default input.

The following sources may be displayed on output A.

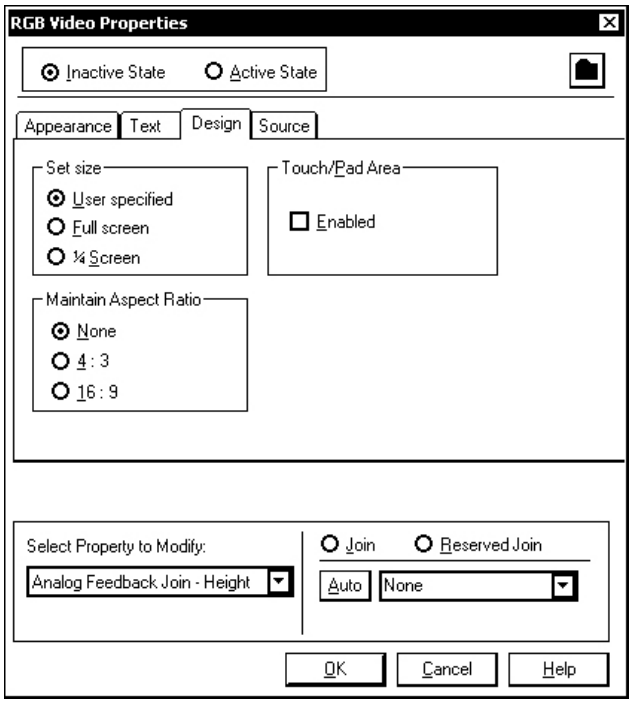
- Maximum of two video sources per page
- Maximum of two RGB sources per page
- Maximum of two video & one RGB source
- Maximum of two RGB & one video source

Changing Size and Position with Analog Joins

The UPX-2 has the ability to change the size and position of any video or RGB window on command. To change the window size and position on-the-fly by using programming, use VT Pro-e analog join numbers for height, width, left, and top. These selections are under the *Select Property to Modify* located in the lower left corner of the "RGB Video Properties" window. This property affects any source directed to this object: RGB, composite, S-video and component video.

1. Draw a video or an RGB window and double-click the window to open "RGB Video Properties" or "Video Properties" window.
2. In the lower left hand corner of the window use the pull-down menu under *Select Property to Modify* and assign an analog value for height, left, top and width.

"RGB Video Properties" Window



- **Analog Feedback Join - Height** adjusts the vertical size of the video/RGB image. Place an analog join number in the box.

  The maximum analog height value that can be assigned in the SIMPL Windows program is the vertical resolution of the UPX-2 output in pixels, not the input resolution of the source. If an analog value of zero is sent to this analog join number, the UPX-2 will not display the video; it is too small to see. You cannot have a value less than zero.

- **Analog Feedback Join - Left** adjusts the horizontal position of the video.

  The minimum analog left value that can be assigned in the SIMPL Windows program is zero. This positions the video image on the left edge of the display. The maximum analog value is the horizontal resolution minus the horizontal size of the image displayed. As you move the image to the right edge of the display, the UPX-2 rescales the image to fit the new size. The UPX-2 will not allow the image to be off screen.

- **Analog Feedback Join - Top** adjusts the vertical position of the video.

  The minimum analog top value assigned in the SIMPL Windows program is zero. An analog value of zero places the video image on the top edge of the display. The maximum analog value is the vertical resolution minus the vertical size of the image displayed.

  As you move the image past the bottom edge of the display, the UPX-2 rescales the image to fit the new size and does not allow the image to move off the screen. You cannot have a value less than zero.

  NOTE: The video size must fit within the horizontal and vertical position. If, for example, you set the video image value to full screen, but set a horizontal and vertical offset value of ten, the video image on the screen will not be full screen.

  The UPX-2 moves the image ten pixels down and ten pixels to the right. Then the UPX-2 scales the image to fit on the reminder of the screen. In this case, set the horizontal and vertical offset to zero.

- **Analog Feedback Join - Width** adjusts the horizontal size of the video.

  The UPX-2 will not display the video if you enter an analog value of zero. The maximum value assigned to width is the horizontal resolution of the UPX-2 output, not the input resolution.

  When you assign an analog value to height and width, you must also assign an analog initialize value to that analog join number in SIMPL Windows. Without an analog initialize value, video will not be present when you do a page flip or subpage.

  An analog value of zero has an image size of zero pixels for height and width.

  If you also want the video to appear in a particular position on the screen, you must set the top and left position values in an analog initialize. If no analog value is assigned, the UPX-2 defaults to the upper left corner of the screen, regardless of where you have drawn the window location in VT Pro-e. For additional software information, consult the VT Pro-e help file.

Aspect Ratios

Maintain the proper aspect ratio when setting the analog values. Refer to the latest version of the Crestron UPX-2 Operations Guide (Doc. 6276), available from the Crestron website for additional information on aspect ratios.

1. To maintain a 4 X 3 aspect ratio, multiply the height by 1.33 to get the width.
2. To maintain a 16 X 9 aspect ratio, multiply the height by 1.78 to get the width.

Example: Assuming the height is 100

Aspect Ratio	Height	Width
4 X 3	100	133
16 X 9	100	178

Source Assignment

There are two ways to assign a source for video windows and display output B.

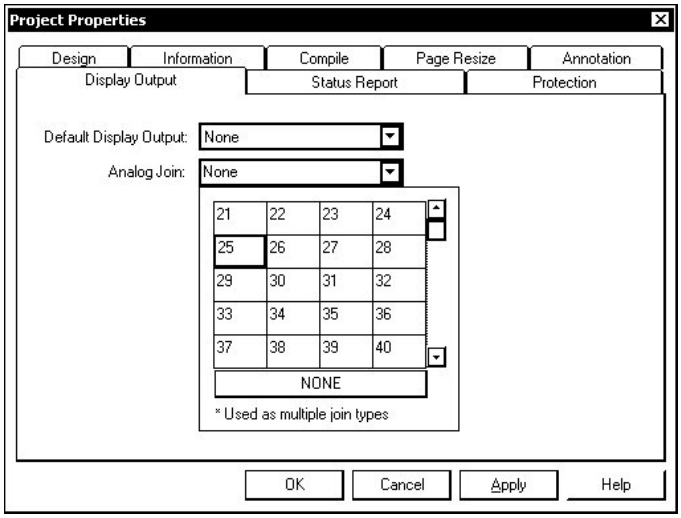
Defaults
Defaults allow the user to assign the video source to be used when the video object is displayed. The selection can be overwritten with an analog join.

Joins
Joins allow the user to select the source of a video window via analog joins.

Procedure

1. Draw a video or an RGB window.
2. Double-click the window to view the window's properties.
3. In the lower left hand corner of the window use the pull-down menu under *Select Property to Modify* and assign an analog value for height, left, top and width. Refer to "*Changing Size and Position with Analog Joins*" on page 14.
4. Select the source for the audience (Output B) by selecting the *Display Output* tab of the "Project Properties" window in VT Pro-e and choose an analog join number.

"Project Properties" Display Output Tab



In this example, analog join 25 is assigned in the "Project Properties" window. The analog value assigned to this join will determine the output to the audience display on output B.

5. In SIMPL Windows, select the appropriate analog value to select the input source.

NOTE: When used with video windows, invalid values (out of 0-13d range) are not treated as 0d but instead black-out the display. The behavior is the same as if a valid source value was sent and there was no source connected to that input.

NOTE: Graphics = Same as output A
None = Black. Values out of 0-13d range black-out the display.

Analog Values for Output Selection

ANALOG VALUE	VIDEO OUTPUT TYPE
0	Same as Output A
1	RGB_1
2	RGB_2
3	HDTV_1
4	SVIDEO_1
5	SVIDEO_2
6	CVBS_1A
7	CVBS_1B
8	CVBS_1C
9	CVBS_2A
10	CVBS_2B
11	CVBS_2C
12	YPBPR_1
13	YPBPR_2
14	None

To display annotation, embedded applications, and multiple video sources from output A to output B, use an analog value of zero to the analog join 25.

NOTE: If popup windows are displayed on output A and if the "Show To Display Output" digital join assigned in VT Pro-e is held high, the popup window will be displayed identical to display output A.

NOTE: If popup windows are displayed on output A and if the "Show to Display Output" digital join signal is low, then the popup window will be hidden from display output B when it is on a video/rgb window and displayed black when it is on graphics, such as an embedded applications or a page.

Picture-In-Picture (PIP)

With multiple sources available to the user, a project including PIP can be created to preview connected sources. To use PIP in a VT Pro-e project, the following conditions must be met:

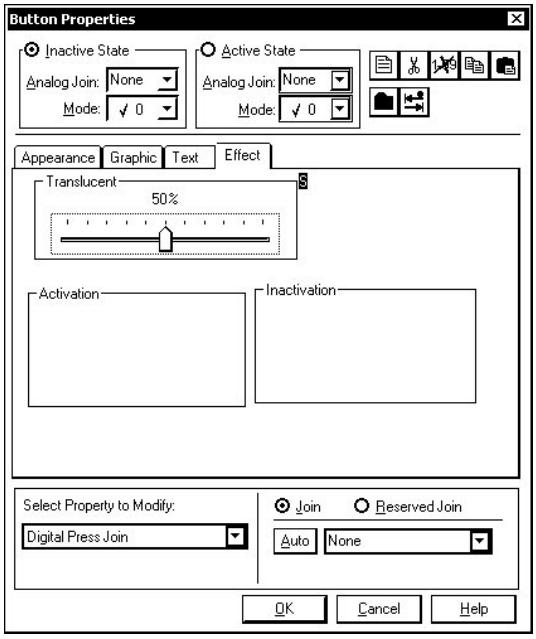
- PIP must be set to the top layer in VT Pro-e at design time.
- The PIP source cannot be simultaneously displayed full-screen on display output B.
- PIP can only be displayed on the local touchpanel but not display output B unless under annotation mode in which both outputs would be identical.
- A PIP window will have a black border when it is displayed.

Translucent Objects

Translucency allows any object in a project to be seen through. This object property is selected in VT Pro-e.

To program the translucency of an object in VT Pro-e, double click on the object to be made translucent. The properties window for the object appears.

"Button Properties" – Translucent Setting



Select the *Effect* Tab and move the slider to adjust the level of translucency from 0% (none), to 100% (invisible). Save and compile the project and upload to the UPX-2.

NOTE: Translucent objects are translucent over graphic elements and backgrounds only. The background cannot be translucent.

Layering Backgrounds, Video Windows, Objects, Subpages, and Popup Windows

The following are guidelines for layering backgrounds, video windows and objects in a UPX-2 VT Pro-e project.

Backgrounds – A background on a page is always the back layer. It cannot be moved in front of video windows or objects.

Video Windows and Objects (buttons, etc.) – The depth of video windows and objects are specified in VT Pro-e at design time.

Subpages – Subpage background and objects are always on top of other objects but below popups. The subpages are displayed in the order in which the digital feedback occurs. This allows a subpage to be placed on top of any other subpage.

Popup Windows – Popup windows are the top-most layer. Unlike subpages, popup windows do not require a reference and will draw on top of the current page when activated.

For additional information, consult the VT Pro-e help file.

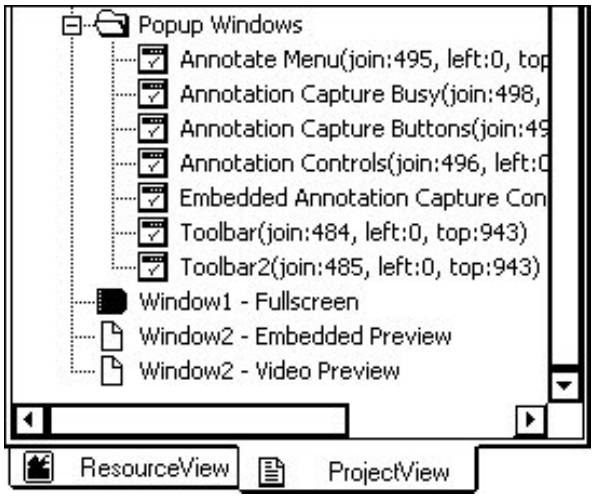
Popup Windows

Popup windows (which contain control buttons and other objects) are not normally visible to the audience display (output B) unless specifically assigned.

Unlike subpages (where you draw the location on any main page), a popup window's position is either a default position or assigned by join numbers.

Up to 24 popup windows (controls, menus, toolbars, etc.) can be created within a UPX-2 project. These popup windows are listed in theVT Pro-e workspace as shown in the following illustration.

Popup Windows in VT Pro-e "Project View"



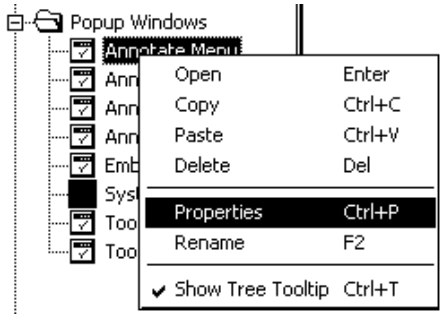
Create a Popup Window

1. Right-click on the *Popup Windows* folder. If the folder does not exist, right-click on the project name and select **Create Popup Window**.
2. Select **Create Popup Window** and assign a name.

Edit a Popup Window

Right-click on the popup window name and select **Properties**. Alternatively, you can select the popup window name and press **Ctrl + P**.

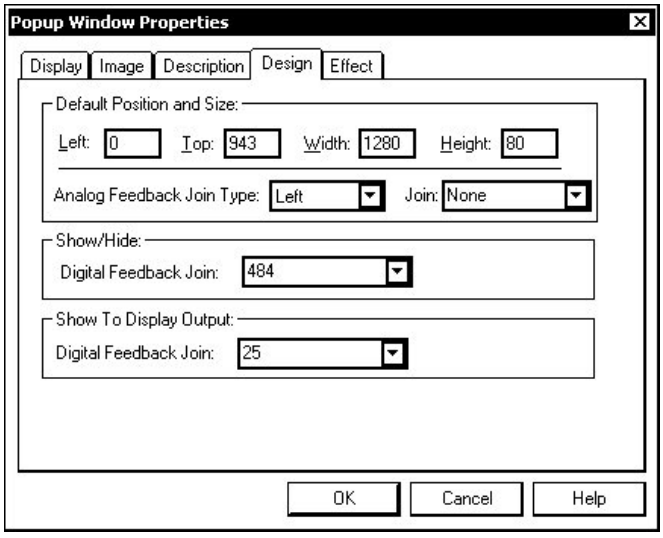
Popup Window Right-Click Menu



Design a Popup Window

The position of the popup window is either fixed or dynamically assigned by an analog join number. Design the window by selecting the height; width, size and digital join number.

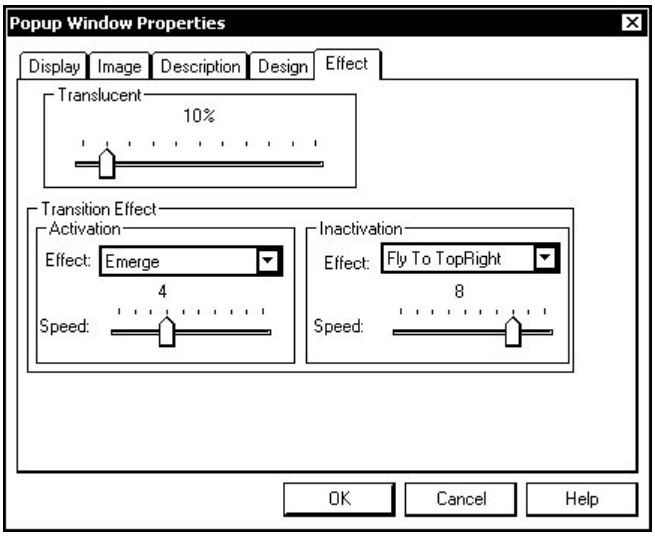
"Popup Window Properties" – Design Tab



NOTE: The *Show/Hide* digital feedback join is seen on output A only, and displays the popup on top of all objects and subpages. The *Show To Display Output* digital feedback join determines if the popup window will be displayed normal, hidden, or black on output B (refer to notes on page 17).

- Popup windows are created at the project level and can be viewed from any page. At run time, the popup window is created as the top-most window – above the page and all embedded applications. You can assign the popup to appear anywhere on the screen.
- Default position and size can be assigned to each popup window. Unlike a subpage reference, default position can only be changed from the "Popup Window Properties" window. Alternatively, four analog joins can be assigned to dynamically change left, top, width and height.
- One digital feedback join must be assigned to trigger the popup window to show/hide. Assigning digital join 0 will prevent the popup window from being compiled.
- Use the *Effect* tab to select: the amount of translucency, the transition effect (none, dissolve, emerge, fly from top, fly from left), and the speed of the transition. Different effects can be assigned for opening and closing a popup window.

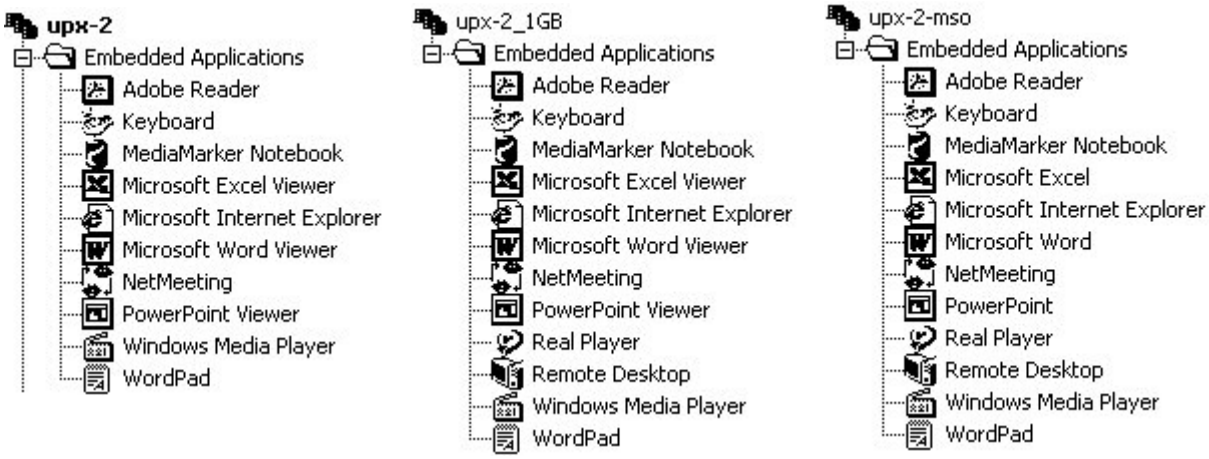
"Popup Window Properties" – Effect Tab



Embedded Applications

A number of third party or in-house applications are embedded in a UPX-2 project. For a list of embedded applications, refer to "UPX-2 Model Lineup" on page 6.

Embedded Applications for UPX-2, UPX-2_1GB, and UPX-2-MSO as shown in "Project View"



Embedded applications have the following features:

- All embedded applications listed in the VT Pro-e workspace are created by default for a new UPX-2 project.
- All applications are created at project-level – one instance per project.
- Each application can be assigned a static position and size that is used when a respective analog join is not assigned.
- Each application can be viewed from any page at runtime.
- Up to four analog joins can be assigned to each application to dynamically change position and size.
- One feedback digital join must be assigned to dynamically show/hide the application. (In the initial release this is a digital join. Future releases can use an analog or digital join number).

NOTE: The UPX-2 and UPX-2-1GB are presentation tools and not content creation devices. Because of this limitation, only one PowerPoint, Word, or PDF file can be opened and viewed at a time by each of their respective viewers (however, multiple Excel files can be opened at one time). These viewers access the files from a flash card located in the front port A or B, a USB drive, or from a network drive.

NOTE: Only the UPX-2-MSO is supplied with Word, Excel, and PowerPoint for creating content on the UPX-2.

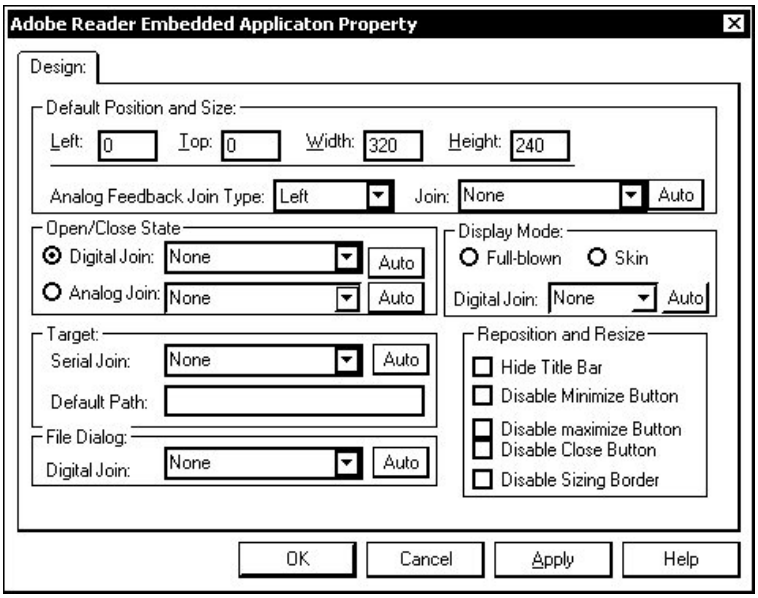
NOTE: Launching Windows Media Player may cause a Java Script Error window to appear. This occurs due to the restrictions imposed by virus prevention. Click the **Yes** button to allow the media to play.

NOTE: VT Pro-e permits you to disable the minimize/maximize/close options in the title bar of embedded applications. In the case of Media Player, a second title bar containing these options cannot be disabled.

Configuring Embedded Applications

- Right-click on the application in the "Work Space" window and select **Properties** to open the "Embedded Application Property" window.

"Embedded Application Property" Window



- Enter the position, width, and height of the application.

  There is a minimum width and height value for the analog join that controls the display of the embedded applications. You cannot send a width or a height of zero to make an embedded application disappear. The title bar is always displayed and the minimum width is the standard windows limit. Be

sure to use the Open/Close feature, and not a width or height of zero, to make the application disappear.

- Edit the *Default Path* in the "Embedded Application Property" window to point to your new location.

  The UPX-2 supports removable storage devices such as compact flash via PC-Card or USB interface. When a device is inserted (for example, a PC-Card in the front port of the UPX-2), a drive letter is automatically assigned by the UPX-2 for access to that storage. The first device is assigned the drive letter G. Allowable drive letters are G through L.

  If the assigned drive letter is for temporary use, no further steps are required.

  If one or more devices are added to the UPX-2 for continuous use, ensure they are connected and then reboot the UPX-2. The assigned drive letters will not change unless you change the connected devices or reboot without the device(s) connected. From this point forward, you can connect and disconnect other temporary use devices without rebooting. This is only a configuration step and not required for normal use. The device will function even if this step is not performed. However, this will guarantee the drive assignment letter will remain consistent for long-term use.

NOTE: The flash card can also be used to save and retrieve MediaMarker presentations.

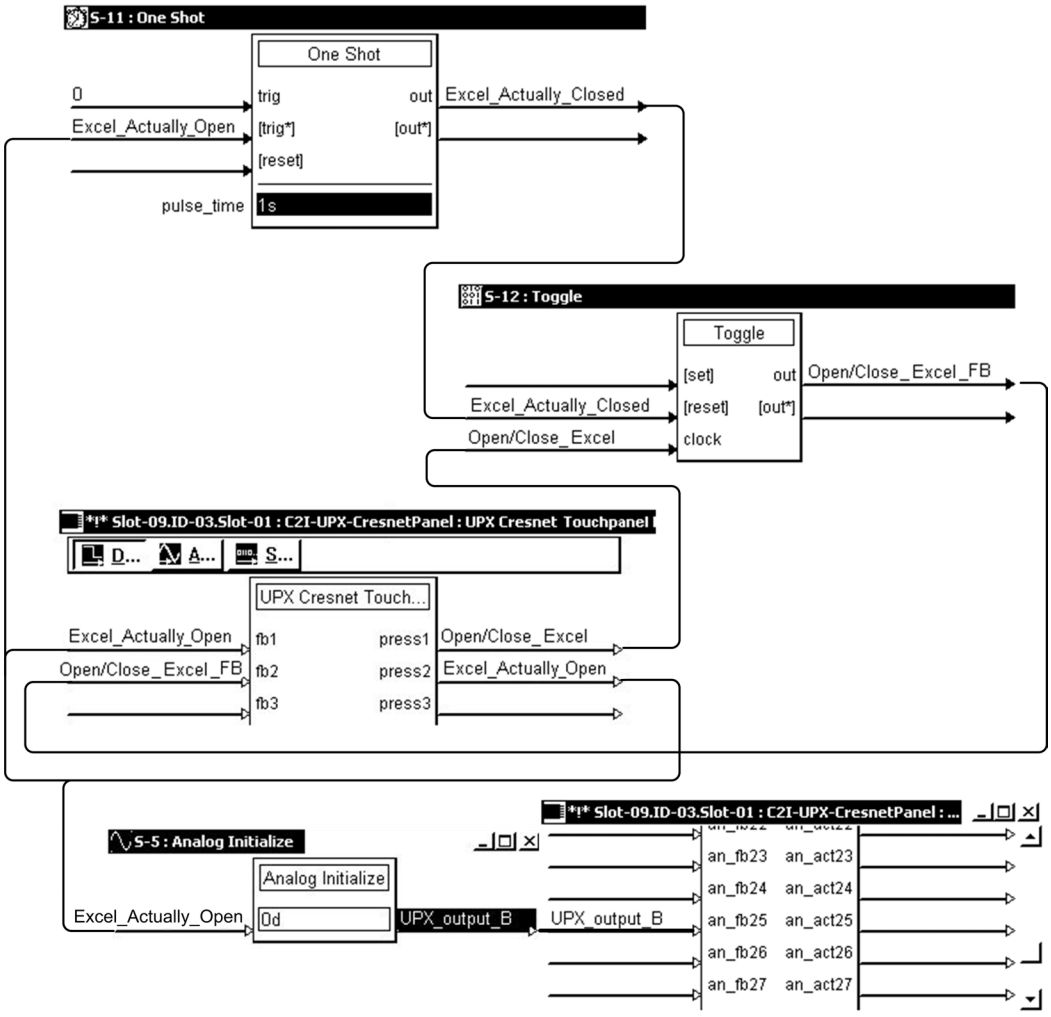
Programming Example

The following programming example represents one possible solution for a typical embedded application.

1. In VT Pro-e, open the "Embedded Application Property" window, enter a digital join number and select the default path that includes the filename. This can be one of the drives on the front of the UPX-2 (drive G through L) or a network drive.
2. In SIMPL Windows, setup the following **logic that allows** you to open and close an embedded application, and **report** the open/close state of the application.

NOTE: The following example requires the touchpanel interface symbol, a one-shot symbol, and a toggle symbol.

SIMPL Windows Programming, Embedded Applications – Excel On/Off Example



This example has join #1 assigned to a button that is used to toggle the state of Excel. **Press 1** is routed to the clock line of a toggle symbol. The output of the toggle is routed to **fb 2**. Join #2 is referred to as the "Open/Close Excel" state digital join. The feedback signal of the Open/Close state digital join is used to open and close the application. In this example, when **fb 2** goes high, Excel opens, and when **fb 2** goes low, Excel closes.

Because clicking the "X" in the upper right corner can close the application, the toggle must be kept synchronized with the actual state of the application. So a one-shot is used to reset the state of the toggle.

The "Press" signal of the Open/Close state digital join can be used to determine the true state of the application. In this example, when **Press 2** goes high Excel is open. When **Press 2** goes low, Excel is closed. Here we use the falling edge of **Press 2** through a one-shot symbol to reset the state of the toggle symbol. Now the toggle will remain properly synchronized if the user closes the application using the "X"(close window) control.

Route the embedded application to the audience display using this logic. The touchpanel symbol (digital and analog joins), and an analog initialize symbol are used in this example.

The **0d** entry in the Analog Initialize symbol routes the application to the audience display.

The touchpanel analog join is selected in the VT Pro-e project using the *Display Output* tab (in this example, join 25).

Annotation

Annotation tools can be created to annotate video windows, RGB windows, and embedded application files.

General Procedure

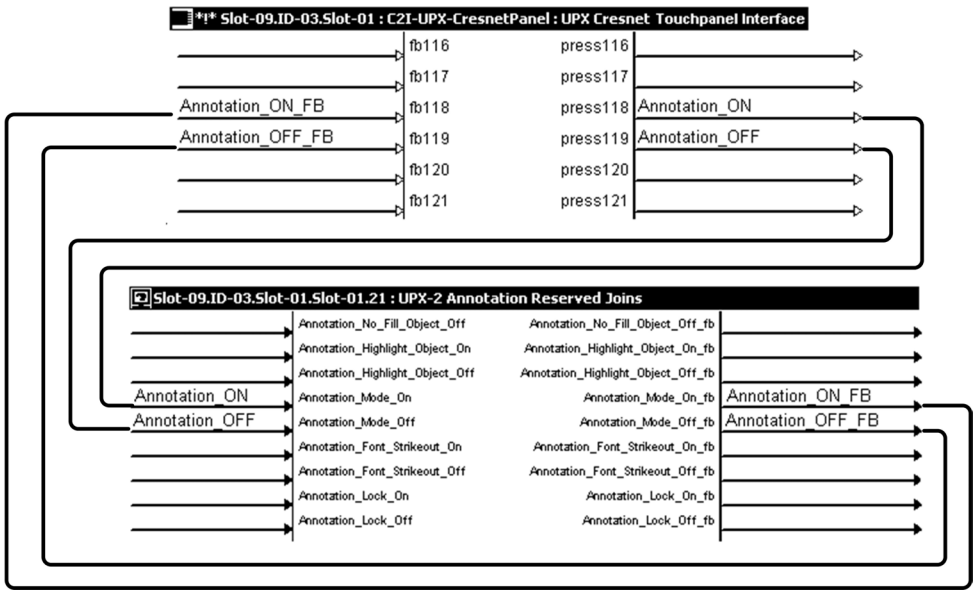
To create an annotation function in a UPX-2 program:

- Add device extenders for annotation in SIMPL Windows.
- Create a full-page video window in VT Pro-e for annotation. Annotation cannot be created with a small video window that is to be displayed at full-screen on output B.
- Either do a page flip or logic page full to the full screen video window, when annotating.
- Add a delay of one second before switching output B to display output A. (This will allow the UPX-2 to send the source and switch to annotation mode while minimizing screen flicker.)

Programming Example

Use the following logic to turn Annotation on and off. The touchpanel interface and the Annotation device extender (helper symbol) are required. Refer to the SIMPL Windows help file for information on device extenders and specific information about the Annotation Reserved Joins.

SIMPL Windows Annotation On/Off Logic



Saving Annotations

Annotations can be saved as graphics files (JPG, BMP) or MediaMarker files. The file format is specified in the "Media Marker Session Information" window (accessed from the SETUP MENU).

Native Fonts

The UPX-2 includes a variety of native (built-in) fonts that are listed below. These fonts are all anti-aliased via the hardware, and produce good results in a VT Pro-e project. The UPX-2 does not support anti-aliasing of non-native fonts.

UPX-2 Native Fonts

Arial	Arial Bold	Arial Bold Italic
Arial Italic	BudHand	Comic Sans MS
Comic Sans MS Bold	Courier New	Courier New Bold
Courier New Bold Italic	Courier New Italic	Crestron Transport
Crestron Transport Outline	Lucida Console	Marlett
Microsoft Sans Serif	MS Sans Serif	MS Sans Serif
Palatino Linotype	ST Bd Cn	ST Bd Ex
ST Black	ST Md Cn	Symbol
Tahoma	Tahoma Bold	Terminal
Times New Roman	Times New Roman Bold	Times New Roman Bold Italic
Times New Roman Italic	TP Black Condensed	TP Black Extended
TP Gui Cons 01	TP Gui Transports	TP LCD
Verdana	Webdings	Wingdings

MultiByte International Characters

Most languages use a single byte of 8 bits to represent a character, e.g. English, French, German, Hebrew, Russian, Thai, etc.

Multibyte character fonts require more than the usual 8 bits to specify a character. This occurs when a language has more than 256 characters (2^8) in a font. For example, Chinese fonts contain several thousand characters. Other multibyte languages include Japanese and Korean.

There are two separate issues with multibyte characters - static text on buttons and indirect text on buttons. No firmware changes are required in either case.

To place static text on a button, you must use VT Pro-e 3.0 or later.

Indirect text on a button is entered in VT Pro-e and the actual string to be displayed is entered in SIMPL Windows. You must use VT Pro-e 3.0 or later to guarantee that the full set of characters in the font is stored on the UPX-2. You must use SIMPL Windows 2.03.11 or later to enter Chinese characters directly. As of this publication date, only completely single byte or completely multibyte strings may be entered or they will not be compiled correctly in SIMPL Windows. In other words, you cannot enter Chinese character interspersed with numbers. You can enter Chinese characters or numbers in separate strings. Crestron is scheduling time to fix this in the near future and the release notes for SIMPL Windows will mention it.

For now, the workaround of showing a graphic that displays the string can be used, but it is not dynamic.

WAV File Audio Messages

The UPX-2 is capable of playing audio messages as system prompts and responses. These files are recorded as WAV files on a PC using an audio utility such as Sound Recorder that is packaged with Microsoft Windows 95/98/Me/XP/NT/ 2000™. Files from other sources may also be converted to an acceptable format by using this or a similar utility. Many other audio utilities are available commercially or as shareware. The UPX-2 only accepts the following WAV file format: **PCM, 8KHz to 44KHz, mono or stereo, 8 bit or 16 bit**. For more information about how to use Sound Recorder, refer to its User's Guide and extensive help information provided with the software.

Pre-recorded WAV files for voice prompts and responses are available from Crestron. These files can be stored into and programmed for use in the UPX-2

directly or may be edited with the Sound Recorder. For example, the individual files can be combined to create custom messages.

NOTE: WAV files (for the UPX-2) can be obtained from the Sound Files section of the Crestron FTP site (ftp://ftp.crestron.com/sound_files/).

NOTE: WAV files reside in the UPX-2's Flash memory and will affect the amount of available space for project screens.

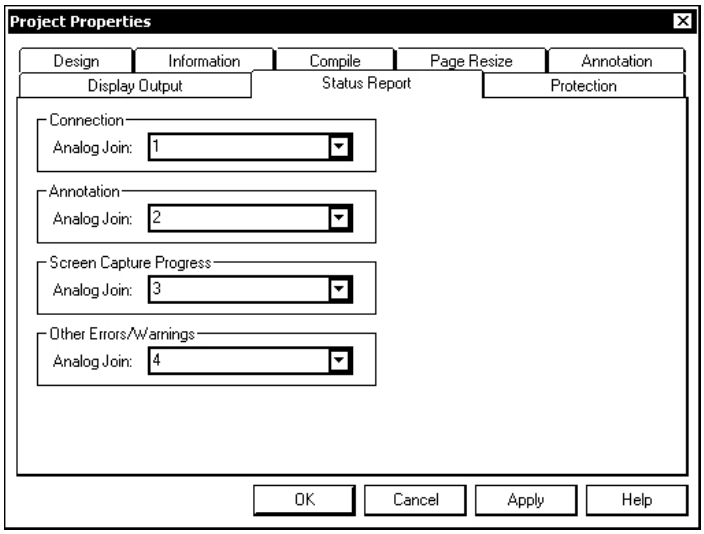
For information on using WAV files in a UPX-2 project, refer to the VT Pro-e help file.

Status Reports

A VT Pro-e project can be configured to report certain aspects of the UPX-2's operation to a SIMPL Windows program during runtime.

Open the "Project Properties" window and select the *Status Report* tab to specify analog joins that will receive status reports from the UPX-2.

"Project Properties" Window, Status Report Tab



Select an analog join(s) as the destination(s) for information about the Ethernet connection's status, annotation process, screen capture progress, and other system errors and/or warnings.

Analog values are defined in the following table.

Analog Output Definitions

SECTION	ANALOG VALUE DEFINITION
Connection	1: Ethernet network traffic slowdown 2: Ethernet connection re-established
Annotation	100: Session folder is valid 101: Session folder invalid 102: Session folder disk space sufficient 103: Session folder disk space full

Continued on following page

Analog Output Definitions (Continued)

SECTION	ANALOG VALUE DEFINITION
Screen Capture Progress	1: Ready 2: Busy 3: Success 4: Failed; Invalid file path 5: Failed; Write error 6: Failed; Unknown error 7: Session folder invalid
Other Errors/Warnings	1: Embedded Application; Default file will be used when the application opens 2: Embedded Application; No valid file selected-User canceled File dialog 3: Embedded Application; Invalid File 51: Invalid video source 121: Invalid .vtz file 122: Invalid MediaMarker template file 151 through 156: Unexpected error; Refer to UPX-2 error log

Programming Tips

The UPX-2 is a complex product requiring knowledge in many areas. This section is intended to shed light in certain areas to help the developer speed up development and optimize run-time performance.

Restoring UPX-2 Default Settings

To restore the default settings of UPX-2:

1. Connect to the UPX-2 as described in the latest version of the UPX-2 Operations Guide (Doc. 6276).
2. Open a console window in Crestron Toolbox and type the command **RESTORE**. This command will affect the following parameters:
   - IP Table: All IP table entries are deleted.
   - Video/RGB settings: Settings are reset to "0"
   - Net ID: Reset Net ID to 03
   - Display Output B will be set to 1024 x 768
   - Project Working Path: The Project Working Path will be set to user\display
   - Internet Security settings: High for Internet sites, Medium for Intranet, Low for Trusted sites. Trusted sites list is restored to crestron.com and 192.168.*.*.
   - Standby Timeout: Standby Timeout will be reset to 10 minutes
   - Console settings: Restored to factory defaults (115200 Baud, no parity, 8 data bits, 1 stop bit)
   - Mouse cursor show/hide status: Restored to factory default setting: "Hidden"
   - Ethernet Settings: TCP/IP properties will change to DHCP
   - Mapped Drives: All mapped drives will be cleared.

- Admin Username and Password: Admin Username and Password will be set to upxadmin.
- Hostname and Workgroup name: The hostname and workgroup name of the UPX-2 will reset to their factory defaults.

Language Support

The UPX-2 supports English. The following languages are supported when the firmware upgrade upx-2-mso_mlp_2.0.csz is installed.

UPX-2 Languages

Arabic Simplified	Arabic Traditional	Chinese Simplified
Chinese Traditional	Croatian	Czech
Danish	Dutch	Estonian
Finnish	French	German
Greek	Hebrew	Hungarian
Icelandic	Indonesian	Italian
Japanese	Korean	Latvian
Lithuanian	Norwegian	Polish
Portuguese	Romanian	Russian
Serbian	Slovak	Slovenian
Spanish	Swedish	Turkish

SETUP MENU

Always press the **Save & Reboot** button on the SETUP MENU to commit changes made in the SETUP MENU. Using the reset button to reboot may not save all of the changes.

Users can change the default screen capture file location from the Annotation section of the SETUP MENU.

Embedded Applications

Always initialize an application's serial path, position analog values, and size analog values before sending the digital/analog value to open the application. The application window will be created at the desired location with the file already loaded and without excessive flashing on the screen. Otherwise, the application will load, then close, then load with the correct file.

To optimize system performance, try not to leave multiple applications open simultaneously.

To programmatically open files on network resources (via serial join) that require a password, map the required drives as described in "Network Connections", shown in the next section.

Users can browse the network using the "File Open" windows but may need to enter a user name and password when browsing network drives.

Typing a full path name into a file path will not work if a connection has not been mapped. The server and share name should be mapped first before adding subfolder names. Ex. \\my_server\some_share will prompt for a username and password but \\my_server\some_share\a_folder\mydoc.doc will only say the resource is unknown.

For the default file path and file dialog of an embedded PowerPoint application to work properly, the default path assigned in VTPro-e should contain a single "\" rather than a double "\\" before a folder name or file name. For example, "g:\embedded apps\crestron.ppt.

Network Connections

From the Security section of the SETUP MENU, commonly used network drives can be mapped. All mapped network connections are displayed for convenience, but only those labeled “persistent” will be reconnected if the UPX-2 is rebooted.

A username and password can be stored to automatically logon to a network resource. This username and password will be stored as encrypted data on the UPX-2. If a username and password are not stored (or if the username/password entered is incorrect), the user will be prompted upon restarting the UPX-2. If the user is immediately prompted with a second request for a password, the correct username/password was not entered.

Mapped connections can be verified by clicking on the "Close Browsed Network Connections" button. This will close all non-persistent connections and remap all persistent connections.

If the error message “A specified logon session does not exist. It may have already been terminated.” is displayed, a domain or workgroup name may be required as part of the username. For example, domain\username.

The Close Network Connections join (or button on the Security section of the SETUP MENU) will close ALL connections and then attempt to reconnect persistent drives. This will require the user to enter the username and password if it is not stored.

To change a drive letter of an existing connection, or to add a drive letter to an existing connection, the connection must be removed and recreated. When recreating the connection, you can change the username, password, and specify whether the username/password is to be remembered on existing connections.

Device Extender

If joins in the device extender need to be routed to joins assigned to UPX-2 controls, the same reserved join (instead of regular joins) should be assigned to these controls to reduce network traffic.

Project

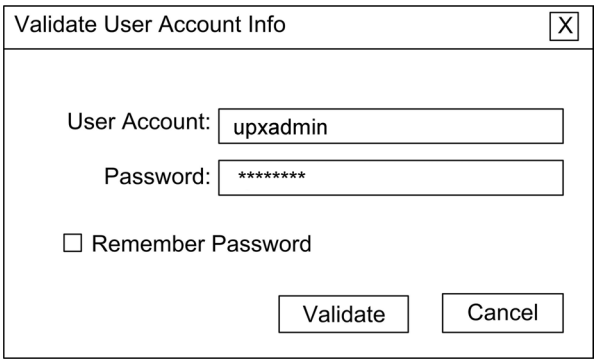
When uploading a project to an external CF card, a sub-directory instead of the root should be used as the project working path. Uploading projects directly to the root directory may fail.

UPX Debug Output Window

The "Upx Debug Output" window is used to view messages, errors, and network traffic. This information can be used to troubleshoot the UPX-2.

- Access the "Upx Debug Output" window by pressing **Ctrl+Alt+Shift** on the PS/2® keyboard connected to the UPX-2.
- When prompted, enter the user account *upxadmin*, and the password *upxadmin* and click **Validate**.

"Security" Window



When the "Upx Debug Output" window is open, all of the visible buttons on the screen will display their assigned join numbers.

Three tabs are displayed when the "Upx Debug Output" window opens.

⇒ *Message Log* tab

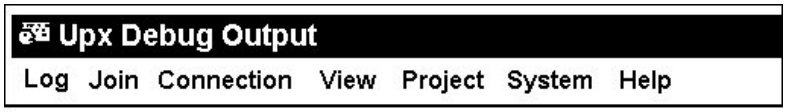
⇒ *Join Info* tab

⇒ *Connections* tab

UPX Debug Window Menus

The "UPX Debug Output" window contains seven pull-down menus.

"UPX Debug Output" Window



Log – The message log permits you to copy, save to file, clear error messages and enable automatic scrolling.

Join – The Join menu permits you to clear join trace and join watch.

Connection – The Connection menu allows you to copy the log in the left column, turn off the trace function, and allow the log to automatically scroll.

View – Enables you to view the toolbar and set the translucency level. Translucency level can be set from 50 to 100% in 10% increments.

Project – This menu allows you to hide the system bar and open the SETUP MENU.

System – Allows you to show/hide the cursor, display the command prompt, exit the debug mode, close all applications, or shut down and reboot the UPX-2.

Help – Provides debug version information of the "Upx Debug Output" window.

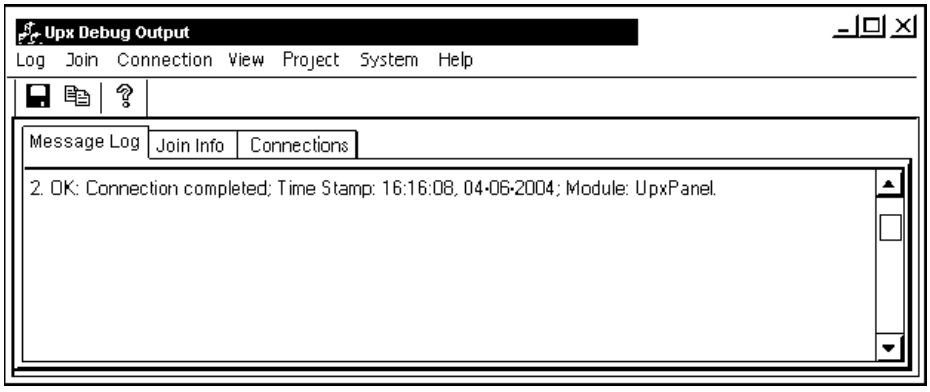
UPX Debug Window Tabs

Message Log Tab

The *Message Log* tab and *Log* menu perform the following functions:

- Log and display all connection status messages and error messages.
- In the debug mode, log messages are displayed in the *Message Log* pane and saved to the log file. When not in debug mode, the log message are only saved to the log file.
- At any time, the message log can be saved to a specified location by selecting **Log | Save to File** menu item.
- Selecting **Log | Clear Error Message** clears log message in both the debug output window and log file.
- Selecting **Log | Automatic Scrolling** automatically scrolls the log message in the debug output window.

Message Log Tab on the "Upx Debug Output" Window

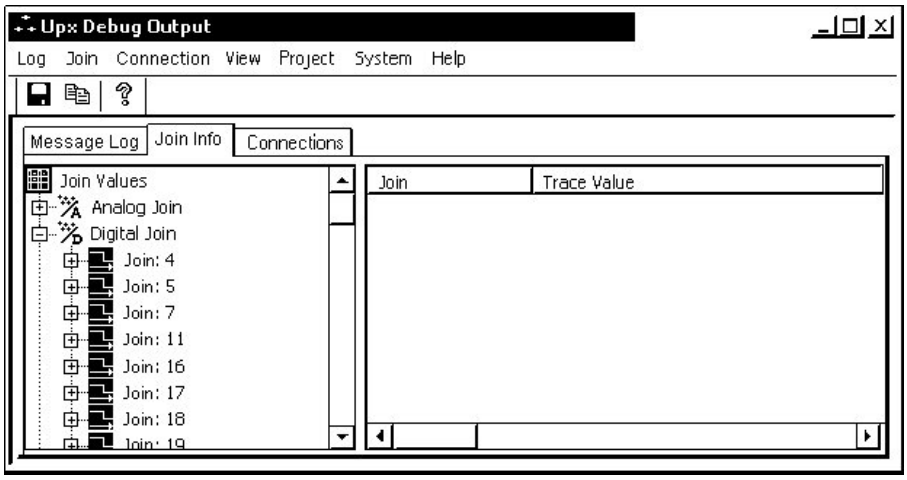


Join Info Tab

The *Join Info* tab provides the following features:

- All join values are continually updated in the *Join Info* pane of the "Upx Debug Output" window.
- All join numbers can be watched.
- A button click can be simulated on all digital joins (Reserve joins do not simulate for initial release).
- All analog and serial join values can be changed on-the-fly (available in future release).

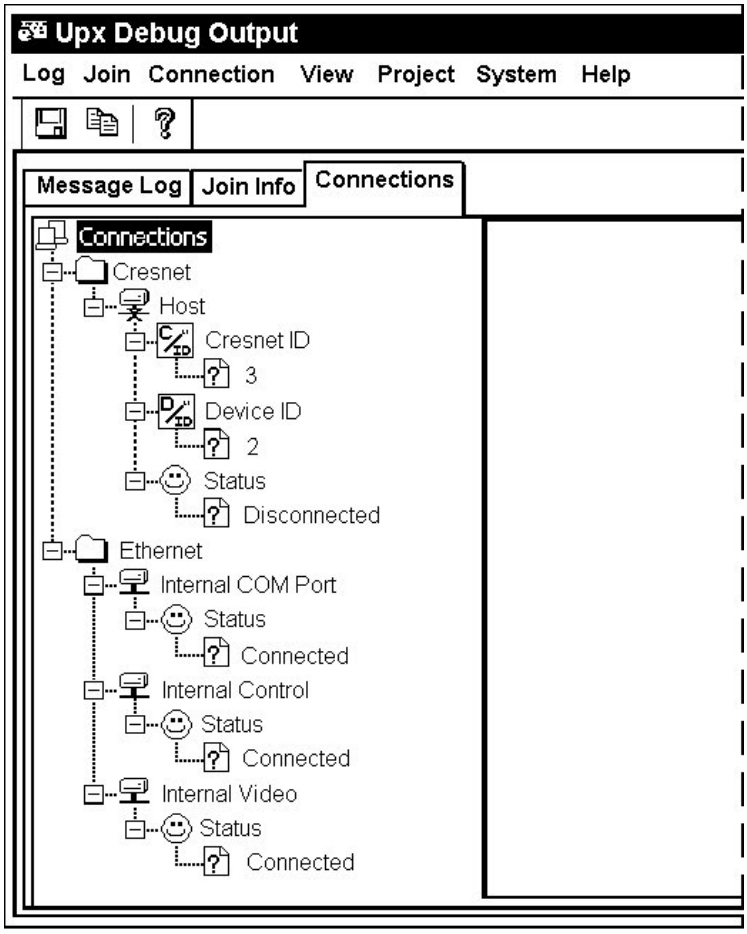
Join Info Tab on the "Upx Debug Output" Window



Connections Tab

The *Connections* tab lists all connections to the UPX-2 and their associated properties.

Connections Tab on "Upx Debug Output" Window



Problem Solving

Reference Documents

The latest version of all documents mentioned within the guide can be obtained from the Crestron website (http://www.crestron.com/manuals). This link will provide a list of product manuals arranged in alphabetical order by model number.

List of Related Reference Documents

DOCUMENT TITLE
2-Series Control Systems Reference Guide
SIMPL Windows Primer
UPX-2 Operations Guide

Further Inquiries

If you cannot locate specific information or have questions after reviewing this guide, please take advantage of Crestron's award winning customer service team by calling the Crestron corporate headquarters at 1-888-CRESTRON [1-888-273-7876]. For assistance in your local time zone, refer to the Crestron website (http://www.crestron.com/) for a listing of Crestron worldwide offices.

You can also log onto the online help section of the Crestron website to ask questions about Crestron products. First-time users will need to establish a user account to fully benefit from all available features.

Future Updates

As Crestron improves functions, adds new features, and extends the capabilities of the UPX-2, additional information may be made available as manual updates. These updates are solely electronic and serve as intermediary supplements prior to the release of a complete technical documentation revision.

Check the Crestron website periodically for manual update availability and its relevance. Updates are identified as an “Addendum” in the Download column.

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