

Crestron **DGE-2**
Digital Graphics Engine with HDMI[®]
and DigitalMedia[™] CAT Connectivity

Operations Guide



This document was prepared and written by the Technical Documentation department at:



Regulatory Compliance

This product is Listed to applicable UL Standards and requirements by Underwriters Laboratories Inc.



As of the date of manufacture, the DGE-2 has been tested and found to comply with specifications for CE marking and standards per EMC and Radiocommunications Compliance Labelling.



Federal Communications Commission (FCC) Compliance Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following conditions:

(1) This device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

CAUTION: Changes or modifications not expressly approved by the manufacturer responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

Industry Canada (IC) Compliance Statement

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

The specific patents that cover Crestron products are listed at patents.crestron.com.

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Digital Graphics Engine with HDMI[®] and DigitalMedia[™] CAT Connectivity: DGE-2

Introduction

Designed for use with a Crestron[®] V-Panel[™] HD Touch Screen Display (sold separately)¹, the DGE-2 Digital Graphics Engine (DGE) allows for a very streamlined touch screen installation by placing the bulk of the electronics out of sight at the central equipment location. Mounted in an equipment rack, the DGE-2 connects directly to the head end AV sources, switchers and control network, while the touch screen display can be up to 450 feet (137 meters) away with just a single cable between them.²

The DGE-2 delivers the ultimate touch screen experience with the latest high definition graphics technology powered by our groundbreaking Core 3 UI[™]. Additional features include extensive connectivity for displaying HD video from external AV and computer sources, plus high performance H.264 streaming video, onboard multimedia and Web browsing, IP Intercom³ and built-in annotation. The DGE-2 supports HDCP and enables full integration with a complete range of digital and analog devices via HDMI[®], DigitalMedia[™], Ethernet and various analog connections.

1. The V-Panel touch screen must be equipped with a DM CAT type interface for direct connection to the DGE-2. Other V-Panel touch screens having a DM 8G+[™] interface may be connected to the DGE-2 through a DM 8G+ transmitter or DigitalMedia switcher. Third-party touch screens may be connected directly to the DGE-2 via HDMI and USB or remotely via a DM CAT receiver or through a DigitalMedia system. Contact a Crestron representative for additional design assistance.
2. For DigitalMedia CAT wiring, use DM-CBL DigitalMedia cable. Maximum cable length is 450 feet (137 meters). Up to two DM CAT Repeaters (model DM-DR) may be required. All cable and repeaters sold separately. Refer to the Crestron DigitalMedia Design Guide (Doc. 4546) for DM system design guidelines. It is available from the Crestron Web site at www.crestron.com/dmresources.
3. Intercom is only supported using a V-Panel model V12 or V15. For IP Intercom, the V-Panel must connect directly to the DGE-2 via DM CAT with no repeaters or switchers in line.

Features and Functions

- Touch screen graphics and HD video processing for V-Panels
- Also compatible with third-party touch screens¹
- High definition 24-bit graphics powered by Core 3™
- Onboard PC applications for Web browsing, playing digital media and viewing digital documents
- VNC viewer for remotely accessing and controlling external computers
- Native H.264 streaming video display
- Dual window full motion HD video display
- Allows touch screen viewing of HDCP protected content
- Handles video sources up to HD 1080p60
- Handles high res computer up to UXGA/WUXGA
- HDMI, RGB, composite, S-video and component video inputs
- Presentation output via HDMI or DigitalMedia
- Built-in annotation
- WAV file customizable audio feedback
- Crestron IP intercom and wired analog intercom capability²
- HDMI output allows direct connection to a third-party display or touch screen¹
- Audio input and output via HDMI, DM[®] and balanced line level
- Crestron Home[®] (CH) CAT5 bidirectional audio port
- USB keyboard/mouse ports
- Onscreen keyboard and mouse capability
- High speed Ethernet and Cresnet[®]
- One wire DigitalMedia connection to V-Panel or DM switcher^{1,3}
- Two space rack mountable

Powered by Core 3

Crestron touch screens have always offered the ultimate user experience. With Core 3 UI, they also deliver the ultimate value, enabling the creation of dynamically rich user interfaces with incredible efficiency and unparalleled functionality. Using Core 3 UI, programmers can swiftly integrate fluid gesture driven controls, animated feedback, metadata, embedded apps and full motion video for a deeply engaging and ultra-intuitive touch screen experience.

1. The V-Panel touch screen must be equipped with a DM CAT type interface for direct connection to the DGE-2. Other V-Panel touch screens having a DM 8G+™ interface may be connected to the DGE-2 through a DM 8G+ transmitter or DigitalMedia switcher. Third-party touch screens may be connected directly to the DGE-2 via HDMI and USB or remotely via a DM CAT receiver or through a DigitalMedia system. Contact a Crestron representative for additional design assistance.
2. Intercom is only supported using a V-Panel model V12 or V15. For IP Intercom, the V-Panel must connect directly to the DGE-2 via DM CAT with no repeaters or switchers in line.
3. For DigitalMedia CAT wiring, use DM-CBL DigitalMedia cable. Maximum cable length is 450 feet (137 meters). Up to two DM CAT Repeater (model DM-DR) may be required. All cable and repeaters sold separately. Refer to the Crestron DigitalMedia Design Guide (Doc. 4546) for DM system design guidelines.

Some Core 3 UI enhancements:

- Cool looking graphical buttons, sliders, knobs and gauges are intuitive and fun to use.
- Kinetic effects enhance the feeling of realism with lists and toolbars that scroll with momentum at the flick of a fingertip.
- Drag and drop objects snap into place offering an easy way to assign assets to rooms.
- Desktop widgets personalize the touch screen with animated clocks, calendars, weather, news and other information.
- Customizable themes allow a completely different look and feel for every user, event or season.
- Fully developed SmartObjects™ enable sophisticated control over complex devices with minimal programming.
- Smart Sizing™ scales objects perfectly and instantly for faster GUI development, even across different sized touch screens.

Embedded PC Applications

The DGE-2 provides everything needed to enjoy online music and videos, browse the Internet and even review digital documents, all on a touch screen display without a separate computer. With Microsoft® Internet Explorer® embedded, there is full access to the entire World Wide Web including sites that use Flash® or Java™. Windows Media® Player ensures broad compatibility for playing most types of digital media. Adobe® Acrobat® Reader and Microsoft® PowerPoint®, Word and Excel® document viewers complete the online experience, allowing downloading and viewing of documents and presentations.

In addition, VNC Viewer support delivers enhanced cross-platform interaction with computers over the network or Internet, allowing remote access and control of desktop applications to unleash a host of possibilities for system integration and multimedia presentation.

HD Streaming Video

High definition streaming video capability makes it possible to view security cameras and other video sources over the network right on the touch screen. Native support for H.264 and MJPEG formats allow the DGE-2 to display live video images from Web cameras and servers such as the Crestron CEN-NVS200 Network Video Streamer (sold separately). Also, through its embedded Web browser and media player, it supports a wide variety of other streaming and downloadable video formats, enabling access to all kinds of content from media servers and Web sites like YouTube® and Netflix®*.

* Accessing Netflix content requires an active Netflix account. Refer to www.netflix.com for details.

HDMI and Analog Video

In addition to handling streaming video, the DGE-2 also provides extensive connectivity for more conventional types of sources including HDMI. The DGE-2 can simultaneously generate two fully scalable, full motion video windows, each supporting SD or HD video and high resolution computer signals from external digital and analog sources.

Input connections include two HDMI, two RGB and two multi-format analog video. The HDMI inputs support digital HD sources including HDMI, DVI and DisplayPort Multimode¹. The RGB inputs handle high resolution analog VGA computer sources and the multi-format video inputs accept analog composite, S-video and component HD video sources. External audio signals are handled by the HDMI inputs and by a single analog line input.

HDCP Support

Industry leading support for HDCP (High-bandwidth Digital Content Protection) ensures seamless compatibility with content protected DVD, Blu-ray Disc[®], digital HDTV and multimedia computer sources.

IP Intercom

Using the microphone and speakers built into the V-Panel display (sold separately), the DGE-2 supports 2-way voice communication via a choice of IP or Crestron Home (CH) CAT5 wired intercom. Crestron IP intercom eliminates the need for dedicated audio wiring, enabling 2-way speech and room monitoring over Ethernet with other compatible Crestron touch screens.² Wired analog intercom is also supported through a dedicated CAT5 audio connection to a C2N-IADS30X24 (sold separately) or other CH CAT5 switcher or processor.

Keyboard/Mouse Options

On-screen keyboard and mouse capabilities enable complete control of the DGE-2's embedded Web browser and other applications and can also be used to control computers running TouchPoint[®] Virtual Mouse & Keyboard Software (VMK-WIN). USB ports are also provided on the front and rear of the DGE-2 and on the V-Panel display (sold separately), allowing for the connection of a physical keyboard and mouse.

Real Time Annotation

Whether conducting a high level boardroom meeting, training seminar or watching sports in a home theater, annotation helps put the fine point on any presentation. Native to the DGE-2, annotation provides the ability to illustrate thoughts on the fly, allowing drawing and writing over high definition video and computer images and sketching out of ideas on a whiteboard screen, without leaving the podium or a favorite chair while other viewers watch on the big screen.

Remote Annotation

Remote annotation capability allows multiple touch screen users to draw with their fingertips over the same video image or whiteboard screen, enabling enhanced interaction between several participants in a courtroom, classroom or council chamber.

1. HDMI requires an appropriate adapter or interface cable to accommodate a DVI or DisplayPort Multimode signal. CBL-HD-DVI interface cables available separately.
2. Intercom is only supported using a V-Panel model V12 or V15. For IP Intercom, the V-Panel must connect directly to the DGE-2 via DM CAT with no repeaters or switchers in line.

Presentation Output

Through its HDMI output or via a DigitalMedia system, the DGE-2 allows the touch screen image to be sent to additional display devices, allowing videos, PowerPoint presentations, annotation and other on-screen media to be shared with a live audience.

DigitalMedia

DigitalMedia (DM[®]) connectivity opens up new ways to configure a touch screen control system. For instance, using a DM switcher such as the DM-MD8X8 (sold separately), multiple touch screens can be connected to a single DGE-2, providing a simple, cost effective way for multiple participants to view and control the same graphical interface. DigitalMedia also provides a versatile means for distributing touch screen content to a larger audience, routing the DGE-2's DM output to feed additional video displays and sound equipment.

V-Panel Connectivity

The DGE-2 features a DM CAT type output, supporting the direct connection to V-Panel touch screen models V12 and V15 (both sold separately). It can also connect to any DM switcher or receiver equipped with a DM CAT input. A single DigitalMedia cable carries all video, audio, Ethernet, USB, control and power signals up to 450 feet (137 meters) between the V-Panel and DGE-2.^{1,2}

The DGE-2 is also compatible with the V24R-C series of V-Panel 24" HD Touch Screen Displays (sold separately). A DigitalMedia 8G+™ Transmitter (DM-TX-201-C or equivalent, sold separately) provides the interface between the DGE-2's HDMI output and the DM 8G+™ input of a V24R-C. Alternately, when feeding a V24R-C display through a DM switcher, the DM 8G+ transmitter is not required.

1. The V-Panel touch screen must be equipped with a DM CAT type interface for direct connection to the DGE-2. Other V-Panel touch screens having a DM 8G+™ interface may be connected to the DGE-2 through a DM 8G+ transmitter or DigitalMedia switcher. Third-party touch screens may be connected directly to the DGE-2 via HDMI and USB or remotely via a DM CAT receiver or through a DigitalMedia system. Contact a Crestron representative for additional design assistance.
2. For DigitalMedia CAT wiring, use DM-CBL DigitalMedia cable. Maximum cable length is 450 feet (137 meters). Up to two DM CAT Repeaters (model DM-DR) may be required. All cable and repeaters sold separately. Refer to the Crestron DigitalMedia Design Guide (Doc. 4546) for DM system design guidelines.

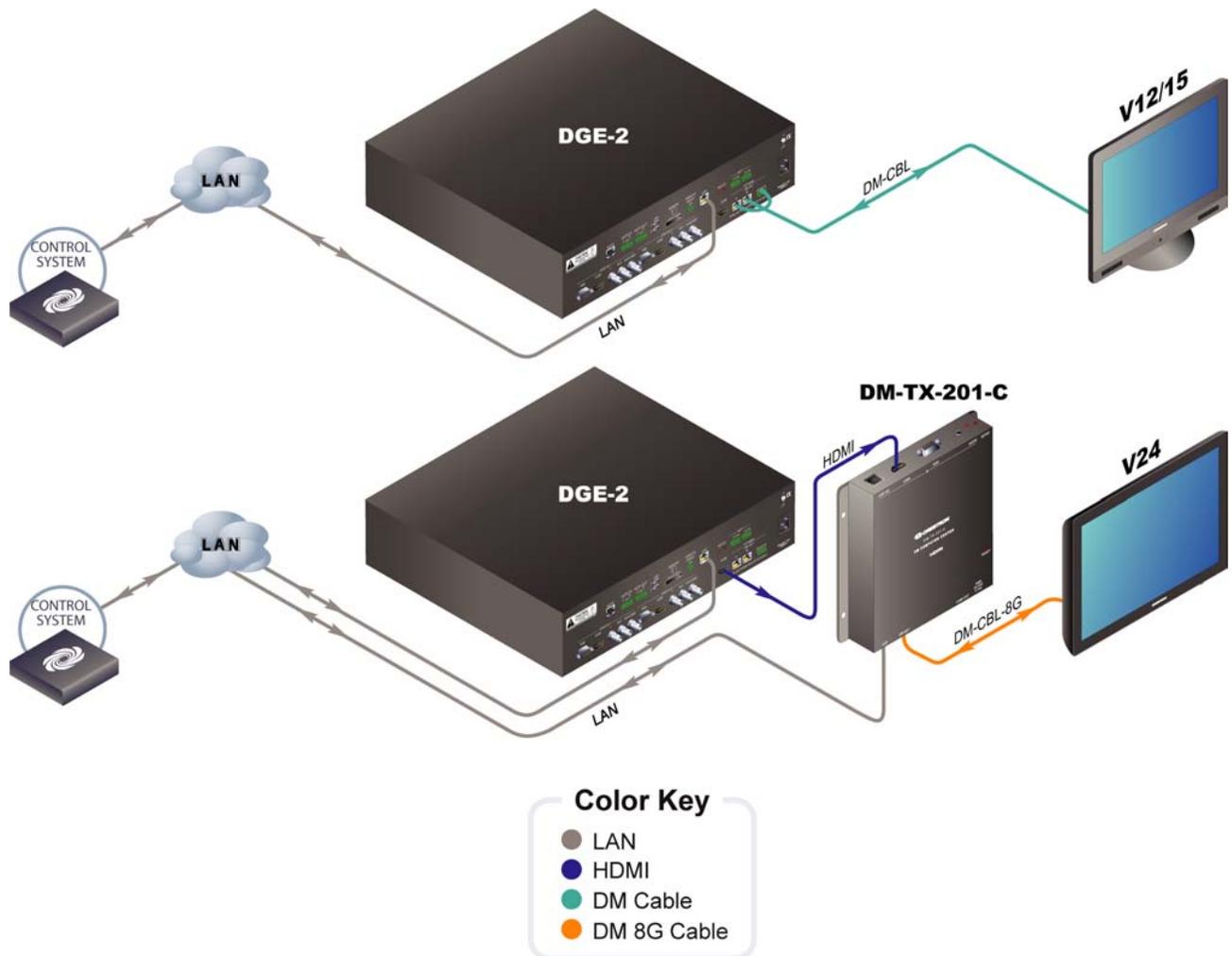
Applications

The following diagram illustrates use of a DGE-2 with either a V12, V15 or V24R-C V-Panel touch screen display.

When used with a V12 or V15, the DGE-2 connects to the V-Panel via DM-CBL cable.

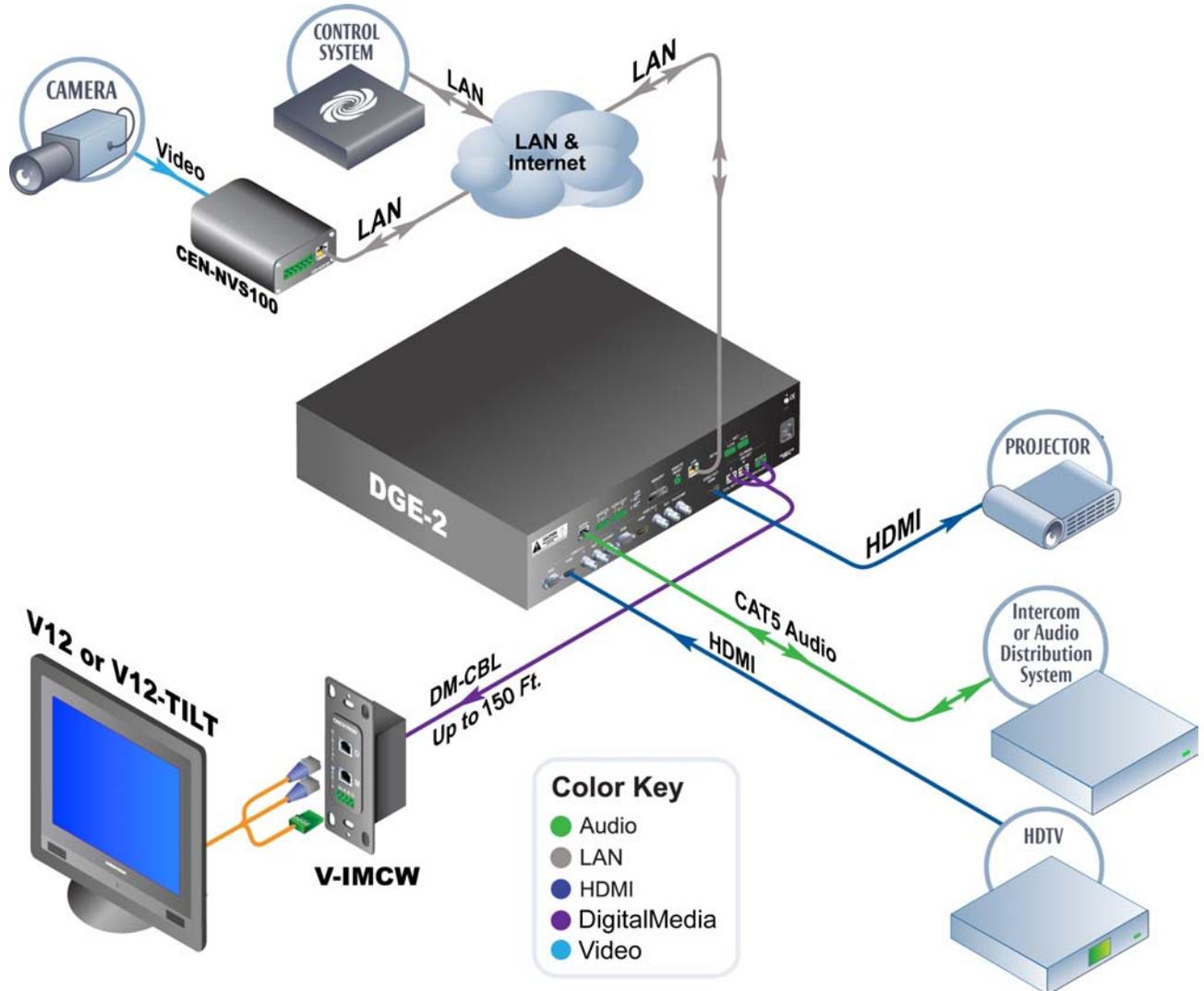
Using a DGE-2 with a V24R-C requires the use of a DigitalMedia 8G+ Transmitter (DM-TX-201, C or equivalent, sold separately). The DM-TX-201-C connects to the V24R-C via DM-CBL-8G. Alternatively, when feeding a V24R-C display through a DM switcher, the DM 8G+ transmitter is not required.

DGE-2 & V-Panel Compatibility



The following diagram shows a DGE-2 in a typical application.

DGE-2 in a Typical Application



Specifications

Specifications for the DGE-2 are listed in the following table.

DGE-2 Specifications

SPECIFICATION	DETAILS
Graphic Engine	Core 3 UI, 24-bit color depth (non-palette), 8-bit alpha channel transparency, color key video windowing, real time and remote annotation, VT Pro-e [®] programmable, supports pre-Core 3 projects
Embedded PC Applications ¹	Microsoft Internet Explorer with Adobe Flash plug-in and Java Runtime plug-in, Windows Media Player, Remote Desktop, VNC Viewer, Adobe Acrobat Reader, WordPad, MS Word Viewer 2007, Excel Viewer 2007, PowerPoint Viewer 2007
Languages ²	Arabic, Chinese Simplified, Chinese Traditional, Croatian, Czech, Danish, Dutch, English, 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
Memory	
SDRAM	2 GB
Flash	4 GB
Memory Card	Expandable up to 32 GB using MMC compatible card (not included)
Maximum Project Size	240 MB
Communications	
Ethernet	10/100 Mbps, auto-switching, auto-negotiating, auto-discovery, full/half duplex, DHCP, for control and console
Cresnet [®]	Cresnet slave mode for control and console
USB	USB 2.0 host, supports USB HID (Human Interface Device) class devices, touch screens and USB flash drives
DigitalMedia	DM CAT, DMNet [®] , HDCP, EDID, 100 Mbps Ethernet
HDMI	HDCP, EDID, CEC
Touch Screen Device Support ³	In addition to Crestron V-Panels, compatible touch screen products are offered by (but not limited to) the following manufacturers: CyberTouch [®] Elo TouchSystems [®]

(Continued on following page)

DGE-2 Specifications (Continued)

SPECIFICATION	DETAILS
Video	
Input Signal Types	HDMI, DVI ⁴ , DisplayPort Multimode ⁴ , RGB, component (YP _b P _r), S-video (Y/C), composite
Output Signal Type	DM CAT (DigitalMedia over dual shielded twisted pair copper wire), HDMI, DVI ³
Formats	HDMI, DVI, HDCP content protection support, computer up to UXGA/WUXGA, HDTV up to 1080p60, NTSC or PAL
Input Resolutions	
HDMI, Progressive	640 x 480 @ 60 Hz 720 x 480 @ 60 Hz (480p) 720 x 576 @ 50 Hz (576p) 800 x 600 @ 60 Hz 848 x 480 @ 60 Hz 852 x 480 @ 60 Hz 854 x 480 @ 60 Hz 1024 x 768 @ 60 Hz 1024 x 852 @ 60 Hz 1024 x 1024 @ 60 Hz 1280 x 720 @ 50 Hz (720p50) 1280 x 720 @ 60 Hz (720p60) 1280 x 768 @ 60 Hz 1280 x 800 @ 60 Hz 1280 x 960 @ 60 Hz 1280 x 1024 @ 60 Hz 1360 x 768 @ 60 Hz 1365 x 1024 @ 60 Hz 1366 x 768 @ 60 Hz 1400 x 1050 @ 60 Hz 1440 x 900 @ 60 Hz 1600 x 900 @ 60 Hz 1600 x 1200 @ 60 Hz 1680 x 1050 @ 60 Hz 1920 x 1080 @ 24 Hz (1080p24) 1920 x 1080 @ 25 Hz (1080p25) 1920 x 1080 @ 50 Hz (1080p50) 1920 x 1080 @ 60 Hz (1080p60) 1920 x 1200 @ 60 Hz
HDMI, Interlaced	720 x 480 @ 30 Hz (480i) 720 x 576 @ 25 Hz (576i) 1920 x 1080 @ 25 Hz (1080i25) 1920 x 1080 @ 30 Hz (1080i30)

(Continued on following page)

DGE-2 Specifications (Continued)

SPECIFICATION	DETAILS
Input Resolutions (Continued)	
RGB	640 x 480 @ 60 Hz 720 x 480 @ 60 Hz (480p) 720 x 576 @ 50 Hz (576p) 800 x 600 @ 60 Hz 1024 x 768 @ 60 Hz 1280 x 720 @ 50 Hz (720p50) 1280 x 720 @ 60 Hz (720p60) 1280 x 768 @ 60 Hz 1280 x 800 @ 60 Hz 1280 x 960 @ 60 Hz 1280 x 1024 @ 60 Hz 1360 x 768 @ 60 Hz 1400 x 1050 @ 60 Hz 1440 x 900 @ 60 Hz 1600 x 1200 @ 60 Hz 1920 x 1080 @ 50 Hz (1080p50) 1920 x 1080 @ 60 Hz (1080p60) 1920 x 1200 @ 60 Hz
Component	480i, 576i, 480p, 576p, 720p50, 720p60, 1080p24, 1080i25 (1125 lines), 1080i30, 1080p30, 1080p50 (1125 lines), 1080p60
Composite and S-video	480i, 576i
Output Resolutions, HDMI & DM	800 x 600 @ 60 Hz 1024 x 768 @ 60 Hz 1280 x 720 @ 50 Hz (720p50) 1280 x 720 @ 60 Hz (720p60) 1280 x 768 @ 60 Hz 1280 x 960 @ 60 Hz 1280 x 1024 @ 60 Hz 1600 x 1200 @ 60 Hz 1920 x 1080 @ 50 Hz (1080p50) 1920 x 1080 @ 60 Hz (1080p60) 1920 x 1200 @ 60 Hz
Color Depth	24-bit, 16.7 million colors
Streaming/File Formats	H.264 (MPEG-4 part 10 AVC), MJPEG, plus all formats supported by Windows Media Player
Audio	
Features	Internal volume control and audio mixer, Crestron IP intercom ⁵
Input Signal Types	HDMI, DisplayPort Multimode ⁴ , analog stereo, Crestron Home (CH) CAT5
Output Signal Types	DM CAT, HDMI, analog line level, CH CAT5
Formats, DM & HDMI	2-channel PCM
Formats, Analog	Stereo 2-channel
A-D/D-A Conversion	24-bit, 48 kHz
Streaming/File Formats	As supported by Windows Media Player
Audio Feedback (WAV)	WAV format, 8 and 16-bit PCM, 8-44.1 kHz sampling rates, mono & stereo

(Continued on following page)

DGE-2 Specifications (Continued)

SPECIFICATION	DETAILS
Power Requirements	
Main Power	1.8 Amps @ 100-240 Volts AC, 50/60 Hz
Power Consumption	120 Watts maximum
Cresnet Power Usage	Does not draw Cresnet power
Available DMNet Power	50 Watts (2.08 Amps @ 24 Volts DC)
Default Net ID	03
Minimum 2-Series Control System Update File ^{6,7}	Version 3.155.1240 or later
Environmental	
Temperature	32° to 113° F (0° to 45° C)
Humidity	10% to 90% RH (non-condensing)
Heat Dissipation	410 BTU/Hr
Enclosure	
Chassis	Metal, matte black finish, vented sides, fan cooled
Faceplate	Extruded aluminum, matte black finish, polycarbonate label overlay
Mounting	Freestanding or 2U 19-inch rack mountable (adhesive feet and rack ears included)
Dimensions	
Height	3.56 in (91 mm) 3.47 in (89 mm) without feet
Width	17.03 in (433 mm) 19.00 in (483 mm) with ears
Depth	12.19 in (310 mm)
Weight	8.6 lbs (3.9 kg)
Available Accessories	
CBL Series	Crestron Certified Interface Cables
CEN-NVS200	Network Video Streamer
CRESNET	Cresnet Control Cable
DM-CBL	DigitalMedia Cable
DM-CONN	DigitalMedia Cable Connector
DM-DR	DigitalMedia CAT Repeater
DM-TX-201-C ⁸	DigitalMedia 8G+ Transmitter
V12	V-Panel 12" HD Touch Screen Display
V15	V-Panel 15" HD Touch Screen Display
V24R-C ⁹	V-Panel 24" HD Touch Screen Display
VMK-WIN	TouchPoint Virtual Mouse & Keyboard Software for Windows [®]

1. Consult Crestron for a current list of compatible devices and embedded applications. To ensure reliable performance, new device drivers and applications are available only from Crestron through firmware updates.
2. Refer to "Additional Language Fonts" on page 57.
3. Please contact the respective manufacturer for further details. For latest touch screen and mouse device support information, refer to Crestron True Blue Online Help Answer ID 4666 or contact Crestron True Blue Support at www.crestron.com/true_blue_support.
4. HDMI requires an appropriate adapter or interface cable to accommodate a DVI or DisplayPort Multimode signal. CBL-HD-DVI interface cables available separately.

5. Intercom is only supported using a V-Panel model V12 or V15. For IP Intercom, the V-Panel must connect directly to the DGE-2 via DM CAT with no repeaters or switchers in line.
6. The latest software versions can be obtained from the Crestron Web site. Refer to the NOTE following these footnotes.
7. Crestron 2-Series control systems include the AV2 and PRO2. Consult the latest Crestron Product Catalog for a complete list of 2-Series control systems.
8. Required for use with V24R-C displays.
9. Requires a DM-TX-201-C or equivalent (sold separately).

NOTE: Crestron software and any files on the Web site are for authorized Crestron dealers and Crestron Authorized Independent Programmers (CAIPs) only. New users must register to obtain access to certain areas of the site (including the FTP site).

Physical Description

This section provides information on the connections, controls and indicators available on the DGE-2.

DGE-2 Physical View (Front View)



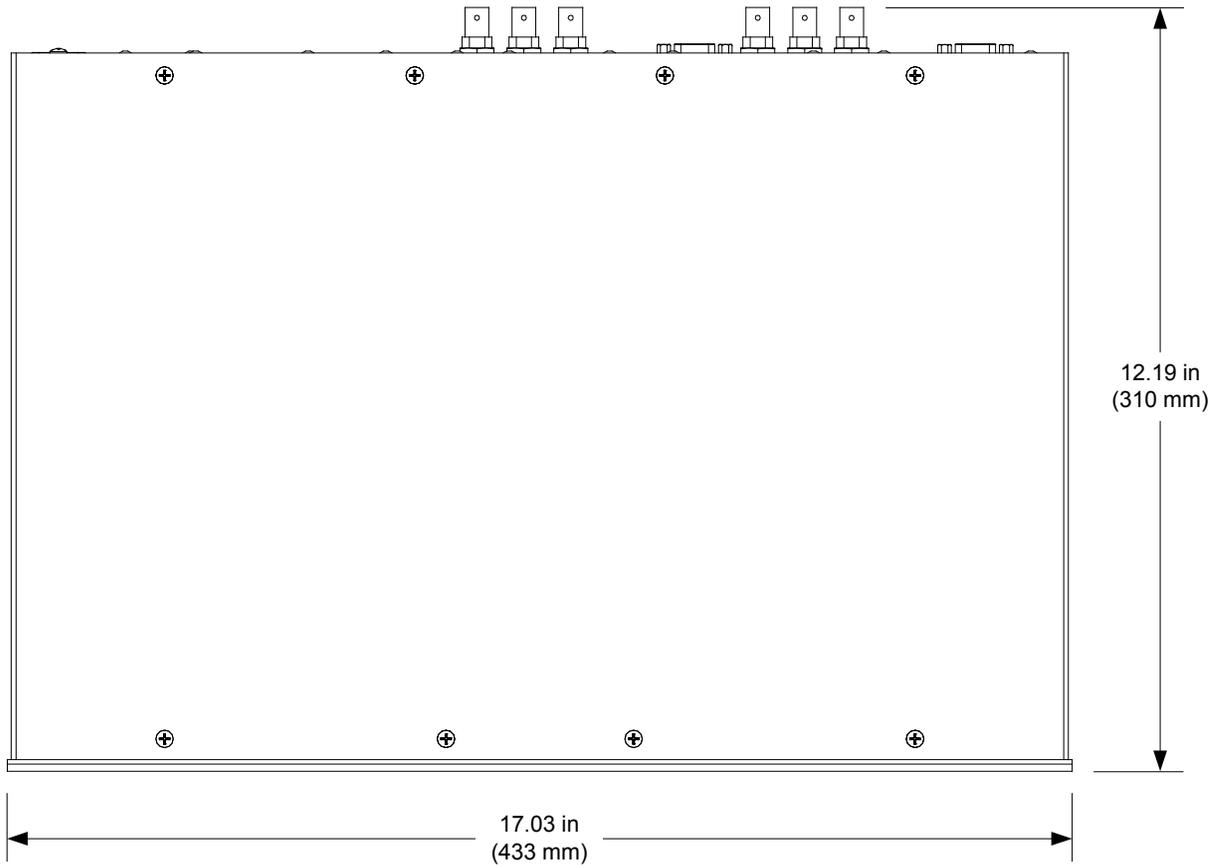
DGE-2 Physical View (Rear View)



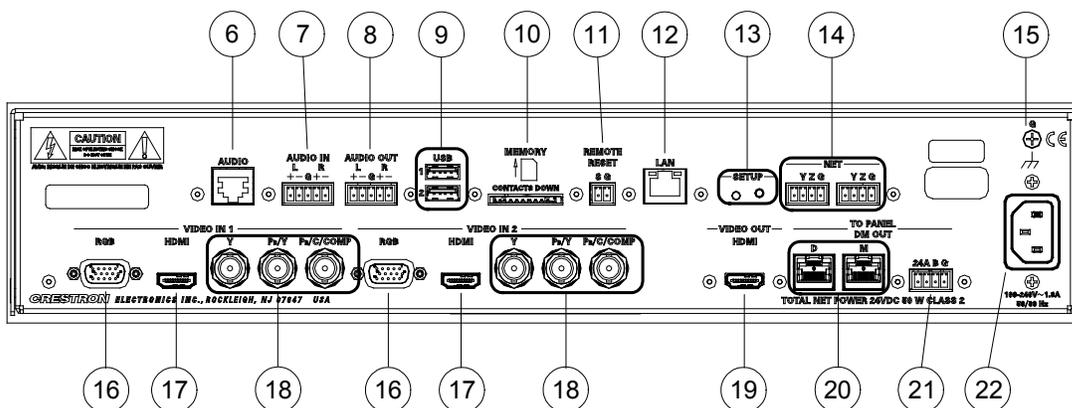
DGE-2 Overall Dimensions (Front View)



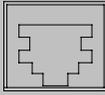
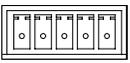
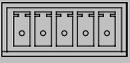
DGE-2 Overall Dimensions (Top View)



DGE-2 Overall Dimensions (Rear View)

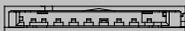
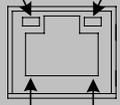
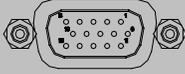
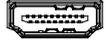


Connectors, Controls & Indicators

#	CONNECTORS ¹ , CONTROLS & INDICATORS	DESCRIPTION
1	USB (front) 	(1) USB Type A female; USB 2.0 host port for connection of a USB HID-compliant mouse/keyboard, touch screen or USB flash drive
2	PWR LED	(1) Green LED, indicates AC line power is connected
3	NET LED	(1) Amber LED, indicates communication with Cresnet system
4	RESET	(1) Recessed miniature push button, resets the DGE
5	DM LINK LED	(1) Green LED, indicates connection to a V-Panel or other DM device
6	AUDIO 	(1) 8-pin RJ-45 female, shielded; Bidirectional CAT5 balanced stereo audio port; Paralleled to AUDIO IN and AUDIO OUT connectors; Connects to any other Crestron “CH” CAT5 balanced audio port via CresCAT cable (sold separately); Maximum length: 1000 feet (~305 meters)
7	AUDIO IN L R +- G +- 	(1) 5-pin 3.5 mm detachable terminal block; Balanced/unbalanced stereo line level input; Input impedance: 20 kΩ balanced, 10 kΩ unbalanced; Maximum input level: 4 V _{rms} balanced, 2 V _{rms} unbalanced
8	AUDIO OUT L R +- G +- 	(1) 5-pin 3.5 mm detachable terminal block; Balanced/unbalanced stereo line level output; Output impedance: 200 Ω balanced, 100 Ω unbalanced; Maximum output level: 4 V _{rms} balanced, 2 V _{rms} unbalanced

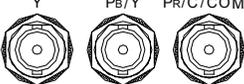
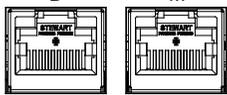
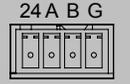
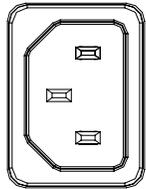
(Continued on following page)

Connectors, Controls & Indicators (Continued)

#	CONNECTORS ¹ , CONTROLS & INDICATORS	DESCRIPTION																				
9	USB (1 – 2) 	(2) USB Type A female; USB 2.0 host ports for connection of a USB HID-compliant mouse/keyboard, touch screen or USB flash drives																				
10	MEMORY 	(1) MMC compatible card slot; Accepts Multimedia Memory Cards (MMC) up to 32 GB for memory expansion ²																				
11	REMOTE RESET S G 	(1) 2-pin 3.5 mm detachable terminal block; Contact closure sensing input for hardware reset																				
12	LAN Green LED Yellow LED  Pin 8 Pin 1	(1) 8-pin RJ-45 with two LED indicators; 10BASE-T/100BASE-TX Ethernet port; Green LED indicates Ethernet link status; Amber LED indicates Ethernet activity																				
		<table border="1"> <thead> <tr> <th>PIN</th> <th>SIGNAL</th> <th>PIN</th> <th>SIGNAL</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>TX +</td> <td>5</td> <td>N/C</td> </tr> <tr> <td>2</td> <td>TX -</td> <td>6</td> <td>RX -</td> </tr> <tr> <td>3</td> <td>RX +</td> <td>7</td> <td>N/C</td> </tr> <tr> <td>4</td> <td>N/C</td> <td>8</td> <td>N/C</td> </tr> </tbody> </table>	PIN	SIGNAL	PIN	SIGNAL	1	TX +	5	N/C	2	TX -	6	RX -	3	RX +	7	N/C	4	N/C	8	N/C
PIN	SIGNAL	PIN	SIGNAL																			
1	TX +	5	N/C																			
2	TX -	6	RX -																			
3	RX +	7	N/C																			
4	N/C	8	N/C																			
13	SETUP Button and LED	(1) Recessed miniature push button and red LED for Ethernet auto-discovery and TSID																				
14	NET Y Z G 	(2) 4-pin 3.5 mm detachable terminal blocks; Cresnet slave ports, paralleled; Y: Data Z: Data G: Ground																				
15	G 	(1) 6-32 screw, chassis ground lug																				
16	VIDEO IN (1 – 2) RGB 	(2) DB15HD female, RGB (VGA) video inputs; Formats: RGBHV, RGBS, RG _S B; Input levels: 0.5 to 1.5 V _{p-p} with built-in DC restoration; Input impedance: 75 Ω; Sync input type: Autodetect RGBHV, RGBS, RG _S B; Sync input level: 3 to 5 V _{p-p} ; Sync input impedance: 1 kΩ																				
17	VIDEO IN (1 – 2) HDMI 	(2) 19-pin Type A HDMI female; HDMI digital video/audio inputs; Also supports DVI and DisplayPort Multimode ²																				

(Continued on following page)

Connectors, Controls & Indicators (Continued)

#	CONNECTORS ¹ , CONTROLS & INDICATORS	DESCRIPTION
18	VIDEO IN (1 – 2) Y P _B /Y P _R /C/COMP 	(2) Auto-sensing, multi-format analog video inputs, each comprised of (3) BNC female; Signal types: component (YP _b P _r), S-video (Y/C) or composite; Input level: 1 V _{p-p} nominal; Input impedance: 75 Ω nominal
19	VIDEO OUT HDMI 	(1) 19-pin Type A HDMI female; HDMI digital video/audio output; Also supports DVI ² Carries same audio and video signals as DM OUT
20	TO PANEL DM OUT, D & M ³ 	(1) DM CAT output comprised of (2) 8-pin RJ-45 female, shielded; Connects to DM CAT input of a V-Panel display via DB-CBL cable ^{4, 5}
21	TO PANEL DM OUT, 24 A B G ^{6, 7, 8} 	(1) 4-pin 3.5 mm detachable terminal block, DMNet port; Connects to DMNet port of a V-Panel display via DB-CBL cable ^{4, 5}
22	100-240V ~1.8A 50/60 Hz 	(1) IEC C14 male chassis plug; Mates with detachable power cord, included

- Interface connectors for **AUDIO IN**, **AUDIO OUT**, **24 A B G**, **REMOTE RESET** and **NET** ports are provided with the unit.
- HDMI requires an appropriate adapter or interface cable to accommodate a DVI or DisplayPort Multimode signal. CBL-HD-DVI interface cables available separately.
- The **DM OUT** port consists of two separate RJ-45 connectors labeled **D** and **M**. The **D** port carries HDMI signal. The **M** port carries data. Refer to the following table for the connector pinouts.

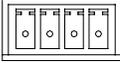
D and M Ports

			
PIN #	WIRE COLOR	PIN #	WIRE COLOR
1	Orange/White	5	Blue/White
2	Orange	6	Green
3	Green/White	7	Brown/White
4	Blue	8	Brown

- The V-Panel touch screen must be equipped with a DM CAT type interface for direct connection to the DGE-2. Other V-Panel touch screens having a DM 8G+ interface may be connected to the DGE-2 through a DM-TX-201-transmitter or DigitalMedia switcher. Contact a Crestron representative for additional design assistance.

5. For DigitalMedia CAT wiring, use DM-CBL DigitalMedia cable. Maximum cable length is 450 feet (137 meters). Up to two DM Repeaters (model DM-DR) may be required. All cable and repeaters sold separately. Refer to the Crestron DigitalMedia Design Guide (Doc. 4546) for DM system design guidelines.
6. DMNet wiring is not compatible with Cresnet wiring. DMNet wiring cannot be daisy chained.
7. Refer to the following table for the **24 A B G** connector pinouts.

24 A B G Port

<div style="display: flex; justify-content: center; align-items: center;"> <div style="margin-right: 10px;">24 A B G</div>  </div>			
PIN #	SIGNAL	DESCRIPTION	WIRE COLOR
24	24V DC	DC Power	Red
A	DMNet+	DMNet	White
B	DMNet-	DMNet	Blue
G	Ground	DC Ground	Black

8. If a DM Switcher or other DM device supplying power is connected to the DGE-2, the wire to the **24** pin between the DM device and the DGE-2 must be disconnected. The wires to the **A**, **B** and **G** pins must remain connected.

Setup

Network Wiring

When wiring the Cresnet[®] and network, consider the following:

NOTE: DMNet[®] wiring and Cresnet wiring are not compatible.

- Use Crestron Certified Wire.
- Use Crestron power supplies for Crestron equipment.
- Provide sufficient power to the system.
- For DigitalMedia CAT wiring, use DM-CBL DigitalMedia cable. Maximum cable length is 450 feet (137 meters). All cable sold separately.

CAUTION: Insufficient power can lead to unpredictable results or damage to the equipment. Please use the Crestron Power Calculator to help calculate how much power is needed for the system (www.crestron.com/calculators).

For networks with 20 or more devices, use a Cresnet Hub/Repeater (CNXHUB) to maintain signal quality.

For more details, refer to “Check Network Wiring” which starts on page 65.

The DGE-2 can also use high-speed Ethernet for communications between the device and a control system, computer, digital media server and other IP-based devices.

For information on connecting Ethernet devices in a Crestron system, refer to the latest version of the Crestron e-Control[®] Reference Guide (Doc. 6052), which is available from the Crestron Web site (www.crestron.com/manuals).

Identity Code

Net ID

The Net ID of the DGE-2 has been factory set to **03**. The Net IDs of multiple DGE-2 devices in the same system must be unique. The Net ID is set using the internal setup menu (refer to “Cresnet” on page 23). Net ID may also be set from a personal computer (PC) via Crestron Toolbox™ (refer to “Establishing Communication” on page 61).

When setting the Net ID, consider the following:

- The Net ID of each unit must match an ID code specified in the SIMPL Windows program.
- Each network device must have a unique Net ID.

For more details, refer to the Crestron Toolbox help file.

IP ID

The IP ID is set within the DGE-2's IP table using Crestron Toolbox. For information on setting an IP table, refer to the Crestron Toolbox help file. The IP IDs of multiple DGE-2 devices in the same system must be unique.

When setting the IP ID, consider the following:

- The IP ID of each unit must match an IP ID specified in the SIMPL Windows program.
- Each device using IP to communicate with a control system must have a unique IP ID.

Configuring the Touch Screen

NOTE: The only connection required to configure the touch screen is power, supplied from the DGE-2. Refer to "Hardware Hookup" which starts on page 48 for details.

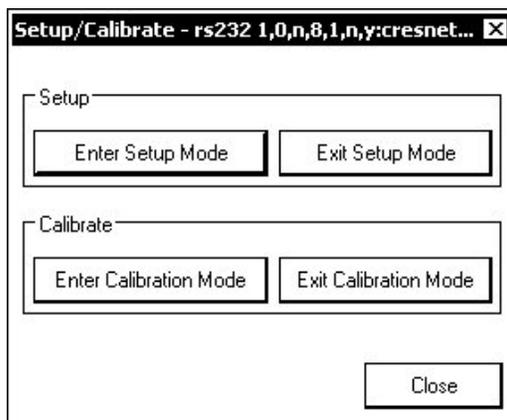
The DGE-2 and V-Panel are configured from the setup menu.

NOTE: If no project has been loaded or if an invalid project has been loaded, the touch screen displays an error message and defaults to the setup menu screen.

If a project is running, the setup menu can be accessed using one of three methods:

1. Touch the screen during boot up when the "Preparing to Load Project" message is displayed. Maintain touch until after the countdown, when the message changes to "Loading Setup Screen".
2. If the project has a button defined for this purpose, touching the button provides entry into the setup menu.
3. Crestron Toolbox can be also used to enter the setup menu:
 - a. Establish communication with the touch screen (refer to "Establishing Communication" on page 61 for details).
 - b. Right-click on the device and select **Functions | Setup Mode....**

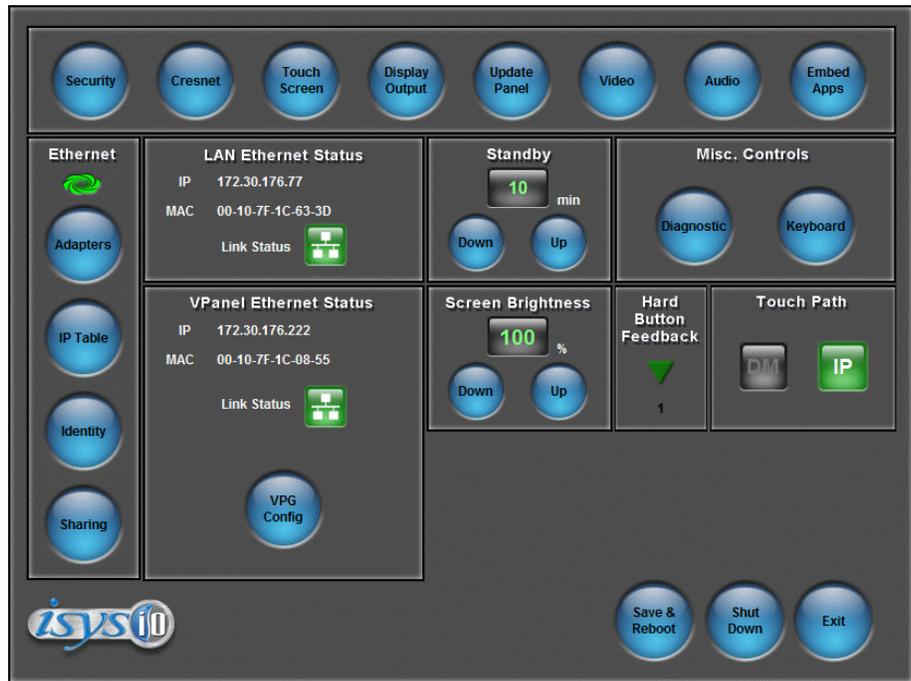
"Setup/Calibrate" Window



- c. Select **Enter Setup Mode**. The setup menu is displayed as shown in the following illustration.

NOTE: Select **Exit Setup Mode** to exit the setup menu.

DGE-2/V-Panel Setup Menu



The setup menu provides access to all basic functions and parameters. It is divided into *Setup*, *Ethernet*, *LAN Ethernet Status*, *Standby*, *Misc. Controls*, *VPanel Ethernet Status*, *Screen Brightness*, *Hard Button Feedback* and *Touch Path* sections. There are also buttons for **Save & Reboot**, **Shut Down** and **Exit**.

NOTE: *VPanel Ethernet Status*, *Screen Brightness*, *Hard Button Feedback* and *Touch Path* are displayed unless there is a V-Panel connected directly to the DGE-2 **DM OUT** ports.

NOTE: To allow the touch screen to upload projects, standby is disabled until approximately five minutes after the project is loaded.

To exit the setup menu and return to the program, touch **Exit**, located at the bottom of the setup menu. To save any changes and reboot the touch screen, touch **Save & Reboot**, located at the bottom of the setup menu. Use the **Shut Down** button to turn off the touch screen.

Setup Menu Details

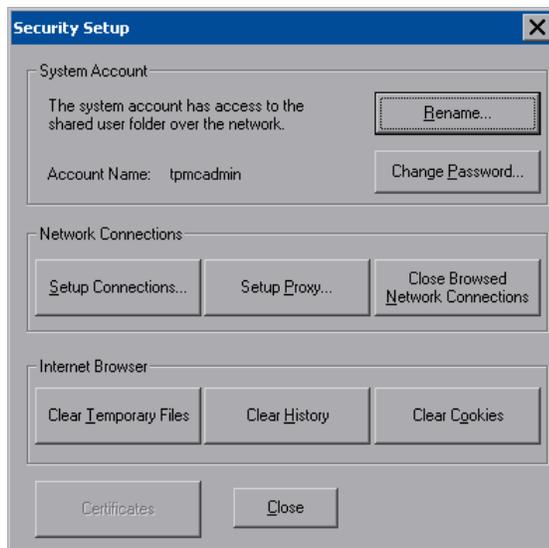
The setup menu allows configuration of the touch screen's settings for security, Cresnet ID, touch screen calibration, runtime project, video, audio, embedded applications and diagnostics. The setup menu also has a button that toggles the on-screen keyboard on and off.

Security

The **Security** button opens the “Security Setup” window, which allows the user to change the username and password of the system account, setup and close network connections, setup a proxy server, close network connections and clear Internet browser temporary files, history and cookies.

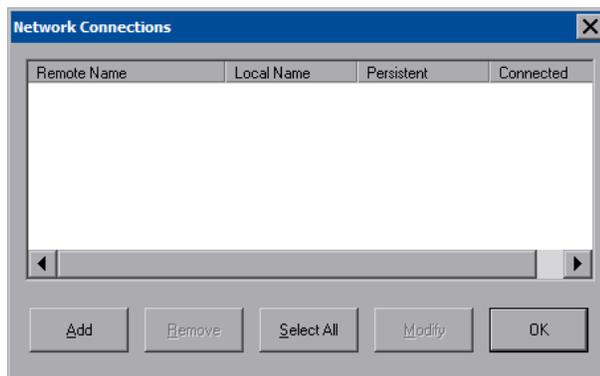
NOTE: To use the on-screen keyboard for security settings, touch **Keyboard** on the startup menu before touching **Security**.

“Security Setup” Window

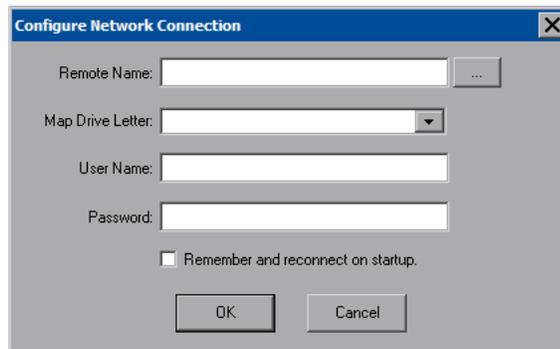


Touch **Setup Connections...** to open the “Network Connections” window. This window is used to map to a network drive. A mapped network drive permits easy access to embedded application files (Word, Excel, PowerPoint, MediaMarker, etc.) and provides a location to save files. To further customize the installation, network drives containing compiled touch screen project files can also be mapped.

“Network Connections” Window



To add a new network connection, touch **Add...**

“Configure Network Connection” Window

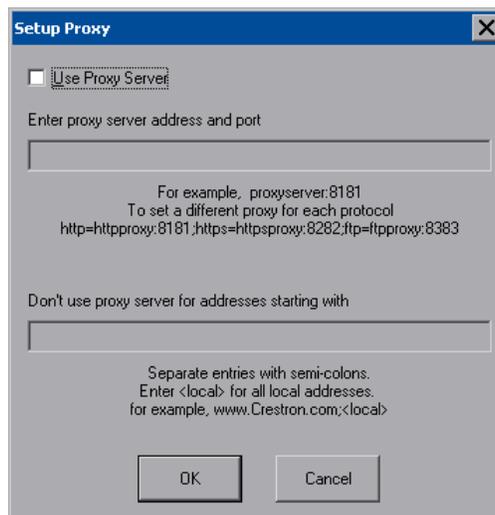
To add a network drive, perform the following procedure:

1. Touch  to browse for the new network connection. If the remote shareable folder name does not appear on the list, it can be entered manually in the *Remote Name* field, using the following format:

```
\\Remote host name\Shareable folder name
```
2. Map this connection by selecting a drive letter from the *Map Drive Letter* drop box.
3. Enter a User Name and Password.
4. Touch the *Remember and reconnect on startup* checkbox if so desired.
5. Touch **OK** to enable the new network connection and return to the “Network Connections” window.

Once all changes to network connections have been completed, touch **OK** to return to the “Security Setup” window.

Touch **Setup Proxy...** to open the “Setup Proxy” window. This window is used to point to a proxy server for Internet access. A proxy server acts as an intermediary between an internal network (intranet) and the Internet, retrieving files from remote Web servers.

“Setup Proxy” Window

To setup a proxy server, select *Use Proxy Server*.

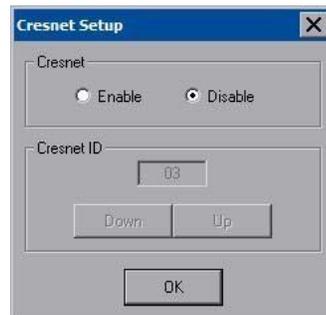
1. Enter the IP address or name of the proxy server.
2. If desired, specify addresses that should not use the proxy server (i.e., intranet addresses).

Touch **OK** to enable the proxy server connection and return to the “Security Setup” window. Then touch **Close** to return to the setup menu.

Cresnet

The **Cresnet** button opens the “Cresnet Setup” window, which allows enabling or disabling Cresnet and permits changing the Cresnet ID.

“Cresnet Setup” Window



Select **Enable** for normal Cresnet communication mode and **Disable** when the touch screen is connected to a control system via Ethernet. Communication mode is factory set to **Disable**.

The Cresnet network identity number (*Cresnet ID*) is displayed in the “Cresnet Setup” window. Cresnet ID is a two-digit hexadecimal number. The hexadecimal number can range from 03 to FE and must correspond to the Net ID set in the SIMPL Windows program of the Cresnet system. Matching IDs between touch screen and SIMPL Windows program is required if data is to be successfully transferred. The Net ID for the DGE-2 is factory set to 03. No two devices in the same system can have the same Net ID.

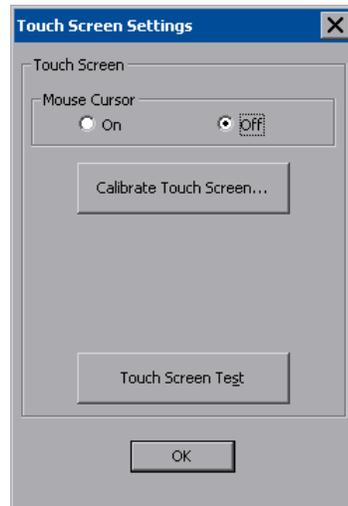
Two buttons below the hexadecimal display, **Down** and **Up**, decrease and increase the Cresnet ID by one, respectively.

Select **OK** to accept the changes and return to the setup menu.

Touch Screen

The **Touch Screen** button opens the “Touch Screen Settings” window, which provides access to touch screen calibration when **Calibrate Touch Screen...** is touched.

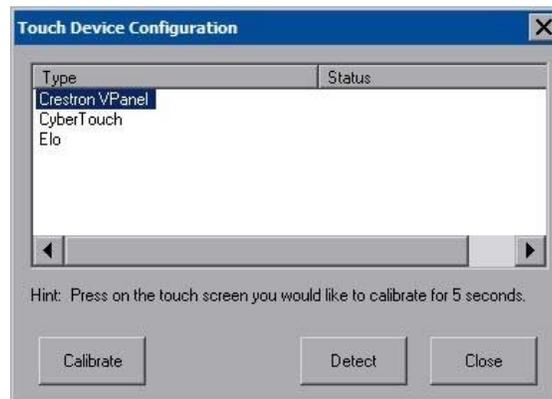
“Touch Screen Settings” Window



To view the mouse cursor on the touch screen, select **On** in the *Mouse Cursor* section of the window. The mouse cursor is displayed only if a mouse is connected to the touch screen.

When **Calibrate Touch Screen...** is touched, the “Touch Device Configuration” window opens.

“Touch Device Configuration” Window



Touch the device *Type*, then touch **Calibrate** to initiate calibration. Touch **Detect** to search for attached touch devices.

When **Calibrate** is touched, the calibration screen is displayed. Touch the screen to begin the calibration process. If the screen is not touched within sixty seconds, the calibration sequence stops and the screen returns to the “Touch Screen Settings” window.

If the screen is touched before the sixty second timeout, the screen instructs the user to touch the center of each target as it appears. There is a series of crosshairs on the screen, starting near the upper left corner. Touch the center of the first crosshair to

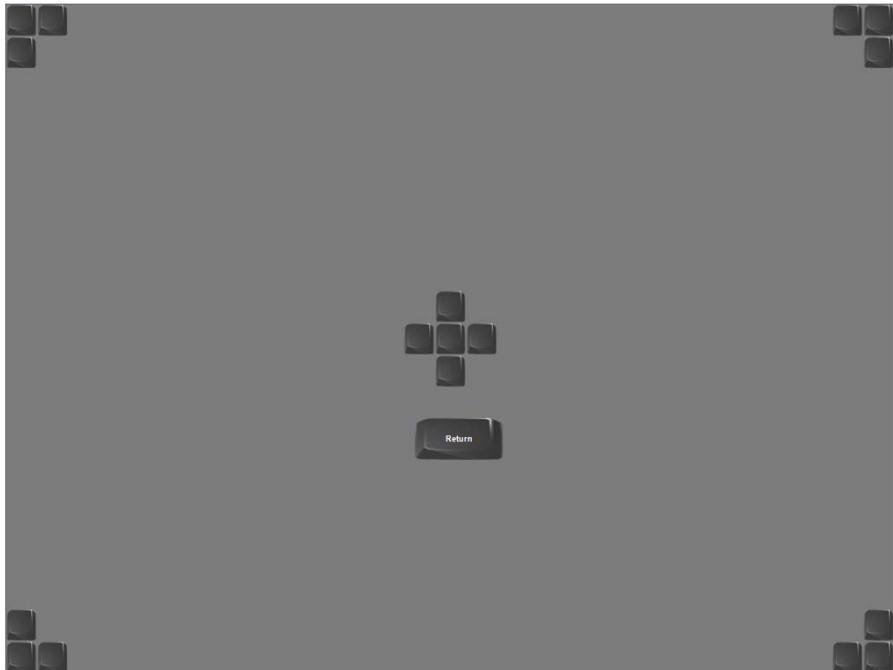
initiate calibration. As each new crosshair is touched, the next appears. After the upper left, crosshairs appears in the upper center, upper right, middle left, screen center, middle right, lower left, lower center and finally lower right. Touch the center of the crosshair in the lower right of the screen to conclude calibration and return to the “Touch Screen Settings” window. Touch **OK** to accept the changes and return to the setup menu.

NOTE: When touching the screen during calibration, be as accurate as possible. Use the tip of a capped pen or the eraser end of a pencil. To cancel calibration and return to the “Touch Screen Settings” window without saving calibration data, create a calibration error by touching the screen in the same spot for each calibration point.

NOTE: The touch screen’s calibration routine can also be accessed through Crestron Toolbox if the touch screen is connected to a control system via Cresnet and/or TCP/IP by selecting the device from the Network Device Tree and right-clicking the device to select **Functions | Setup Mode...** Select **Enter Calibration Mode** to begin calibration.

When **Touch Screen Test** is touched, the test screen is displayed (refer to illustration below). This screen allows the user to test the touch screen response at 17 points on the screen. Each button on the screen lights when touched. Touch **Return** to exit the test screen.

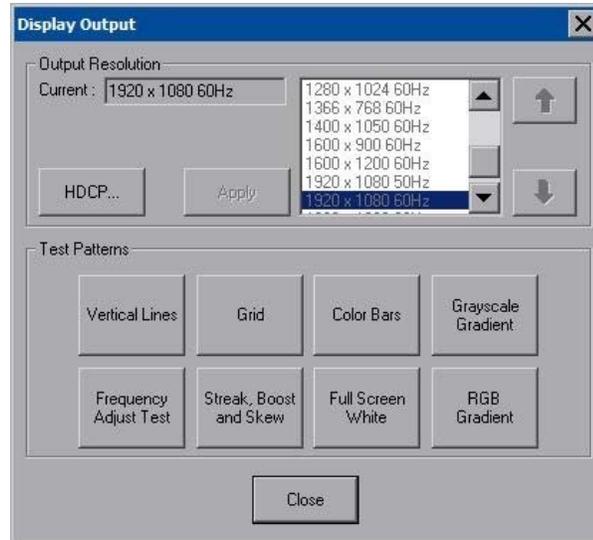
Touch Screen Test Window



Display Output

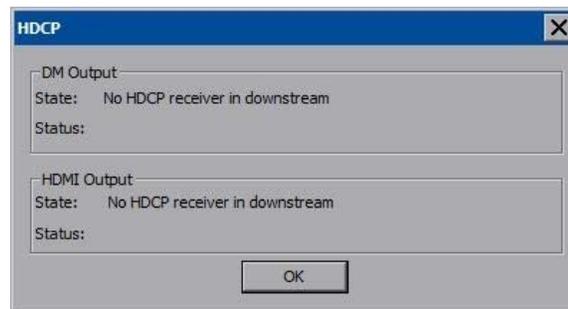
Touching **Display Output** shows the display resolution of the touch screen and provides charts for testing the V-Panel glass.

“Display Output” Window



For devices that require HDCP compliance, an informational “HDCP” window opens when **HDCP...** is touched. This can be useful when troubleshooting failure to display HDCP content on some display devices.

“HDCP” Window



NOTE: HDCP content sent to a display that does not support HDCP results in the display going black. If other displays, which do support HDCP are attached, they continue to display video.

Update Panel

The **Update Panel** button permits the selection of the touch screen program, a .vtz file. It is also used to upgrade firmware.

The *Project* tab of the “Project and Firmware” window is divided into two sections: *Current Loaded Project* and *Load New Project*.

In the *Target Location to Load the Project to* section, the location where the uncompressed project files are stored can be chosen. The default file location is the internal flash.

In the *Load New Project* section, touch **Browse** and select the compiled project (i.e., the .vtz file) to be loaded from a network drive, USB device or flash drive, then touch **Open** to show the source file in the “Project and Firmware” window. Touch **Load** to uncompress the project file, place it in the destination selected in *Target Location to Load the Project to* and display it on the touch screen.

NOTE: If there is a mapped network drive on the touch screen, the first time **Browse** is selected, it may take some time for the “Open” window to appear.

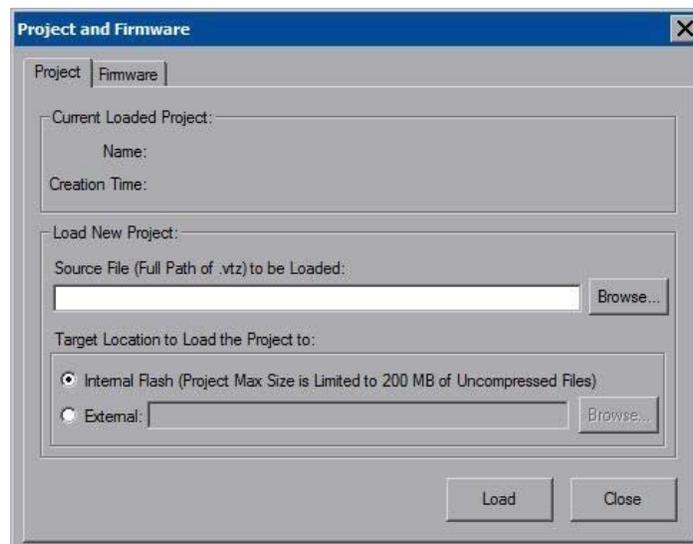
NOTE: When selecting **Browse**, the contents of the “Recent” folder is not available.

NOTE: Projects can also be loaded via Crestron Toolbox.

NOTE: If **External** is checked, the display list cannot be viewed via Crestron Toolbox.

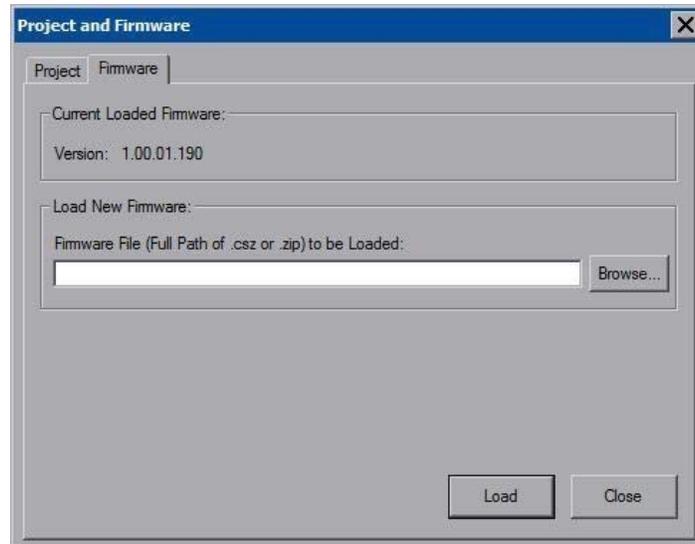
NOTE: When loading a project to an external storage device (e.g. MMC card or flash drive, a subdirectory (not the root) must be used as the working path. Otherwise, the upload may fail.

“Project and Firmware” Window – Project Tab



The *Firmware* tab of the “Project and Firmware” window (refer to illustration below) displays the *Current Loaded Firmware* and also has a *Load New Firmware* section.

“Project and Firmware” Window – Firmware Tab



Current Loaded Firmware displays the version of the current firmware.

In the *Load New Firmware* section, touch **Browse** and select the firmware file (i.e., the .csz or .zip file) to be loaded from a network drive, USB device or flash drive. Touch **Load** to load the new firmware.

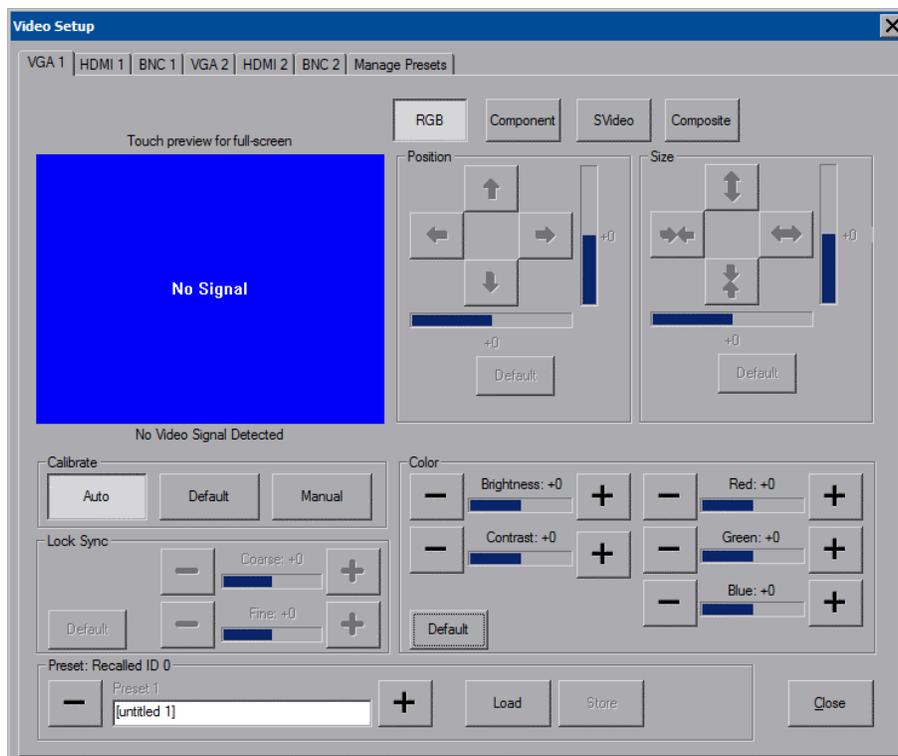
Video

Each one of the video inputs is selected and adjusted from this window. Touch an input tab and adjust the settings for the selected input.

Video Setup

The setup screen for each video source contains the settings appropriate to that video format, as displayed in the following illustrations. Changes are made in real time.

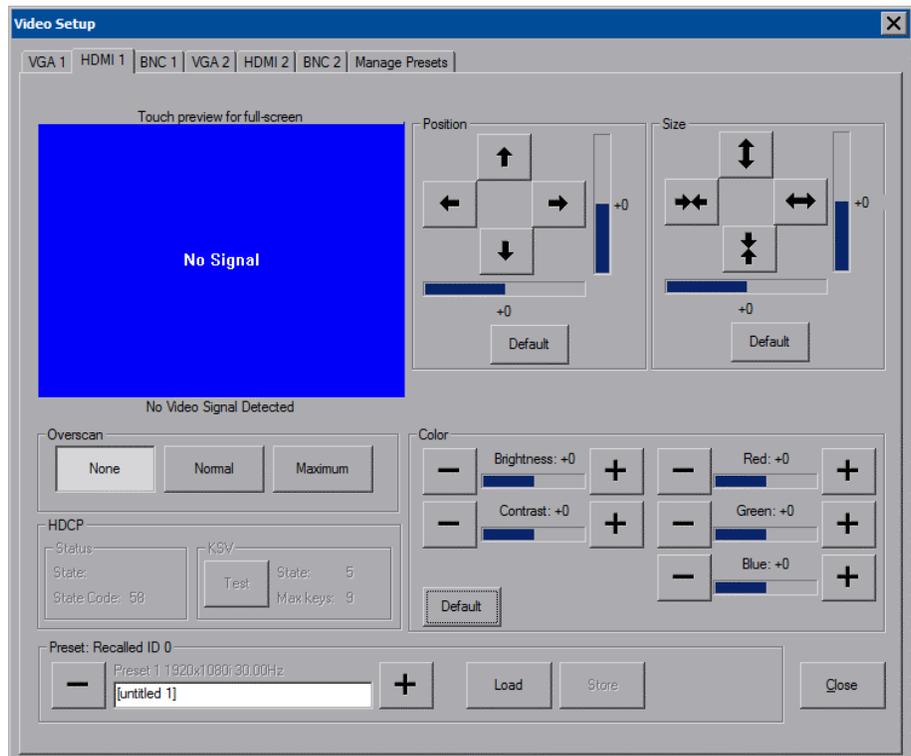
“Video Setup” Window (VGA 1 Tab)



VGA/RGB video is setup using the *Position*, *Size*, *Calibrate* and *Color* controls (for *Brightness*, *Contrast*, *Red*, *Green* and *Blue*). Up to 30 presets may be stored for future retrieval.

NOTE: Depending on RGB source, when the video position and/or size is adjusted beyond a certain value, the video display is black. Reversing the setting restores the video.

NOTE: The DGE-2 uses chroma key color (with RGB values 4,4,4) for rendering video. Any elements in a project (e.g., controls) that use the same color appear transparent on the display.

“Video Setup” Window (HDMI 1 Tab)

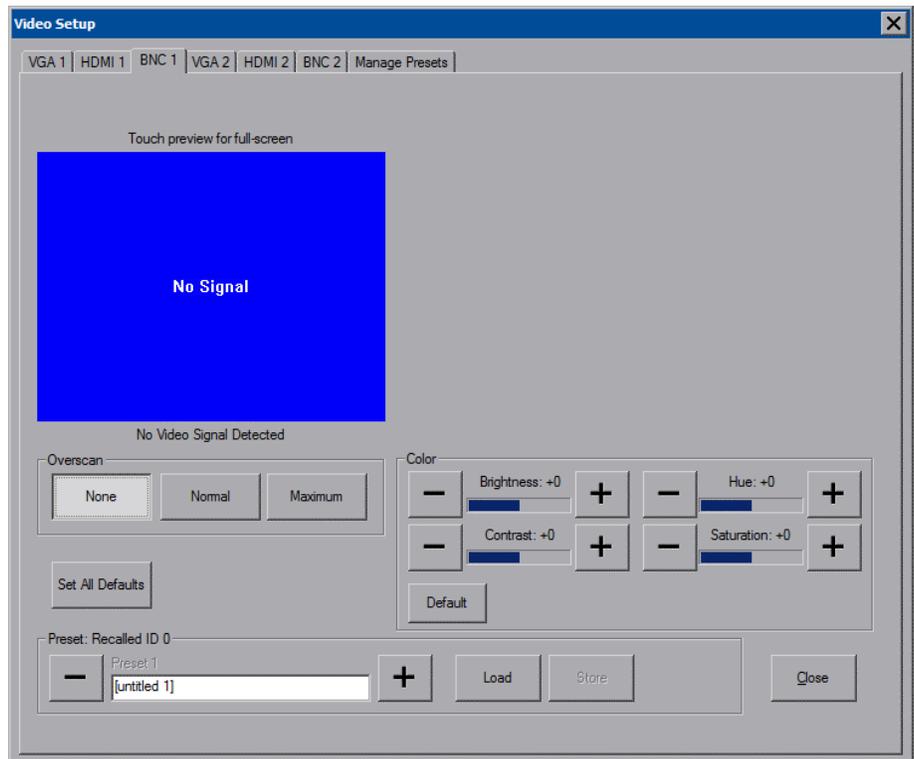
HDMI video is setup using the *Position*, *Size*, *Overscan* and *Color* controls (for *Brightness*, *Contrast*, *Red*, *Green* and *Blue*). Up to 30 presets may be stored for future retrieval.

NOTE: Depending on HDMI source, when the video position and/or size is adjusted beyond a certain value, the video display is black. Reversing the setting restores the video.

NOTE: HDMI audio is heard only if the accompanying video source is locked.

Overscan is the active image area in a video picture that is outside the edges of the display device. Overscan adjustment first came about because of noise and other artifacts at the beginning and end of the scan lines. To reliably eliminate the noise and fill the screen with a picture, the outside edge of the active picture area was pushed out past the edge of the display area. The average or targeted overscan loss is about 5 to 10% of the image on each edge. Digital images have nearly eliminated the noise and other artifacts at the edge of the picture, so more of the video image can be safely shown. The **Normal** setting is usually the correct choice for most video inputs.

“Video Setup” Window (BNC 1 Tab)

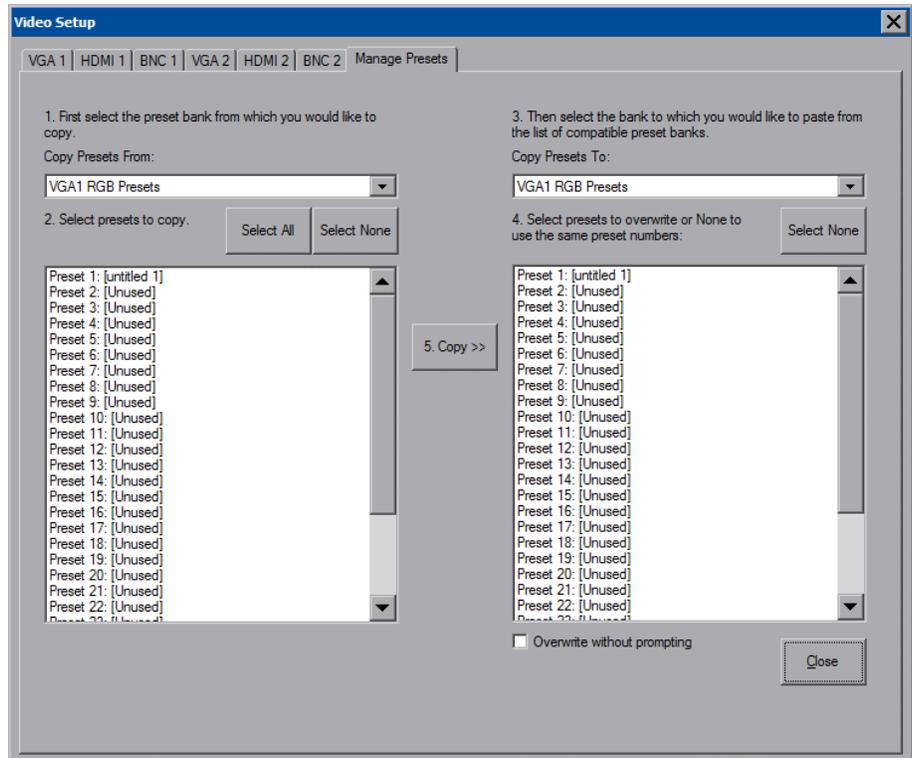


BNC video is setup using the *Overscan* and *Color* controls (for *Brightness*, *Contrast*, *Hue* and *Saturation*). Up to 30 presets may be stored for future retrieval.

Manage Presets

Use the *Manage Presets* tab to copy presets for one source to other sources.

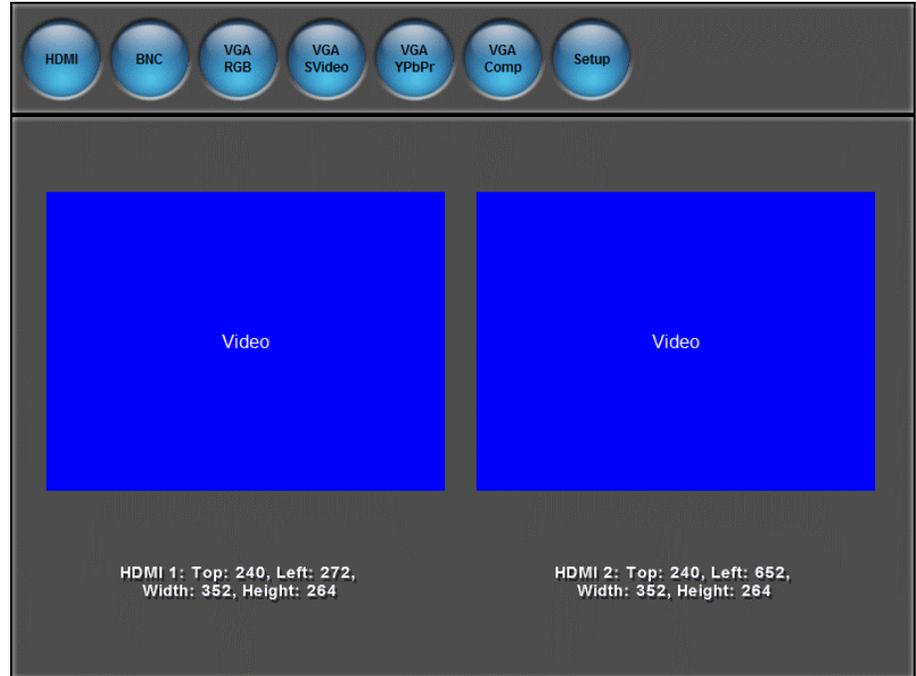
“Video Setup” Window (Manage Presets Tab)



Dual Window Preview

The DGE-2 also offers a dual window preview of its various video inputs. To access the preview window, touch the **Isys i/o** logo in the lower left corner of the main setup menu.

Dual Window Preview Screen



Use the **HDMI**, **BNC**, **VGA RGB**, **VGA SVideo**, **VGA YPbPr** and **VGA Comp** buttons to select the format of the video inputs to preview. Touch **Setup** to return to the main setup menu.

Audio

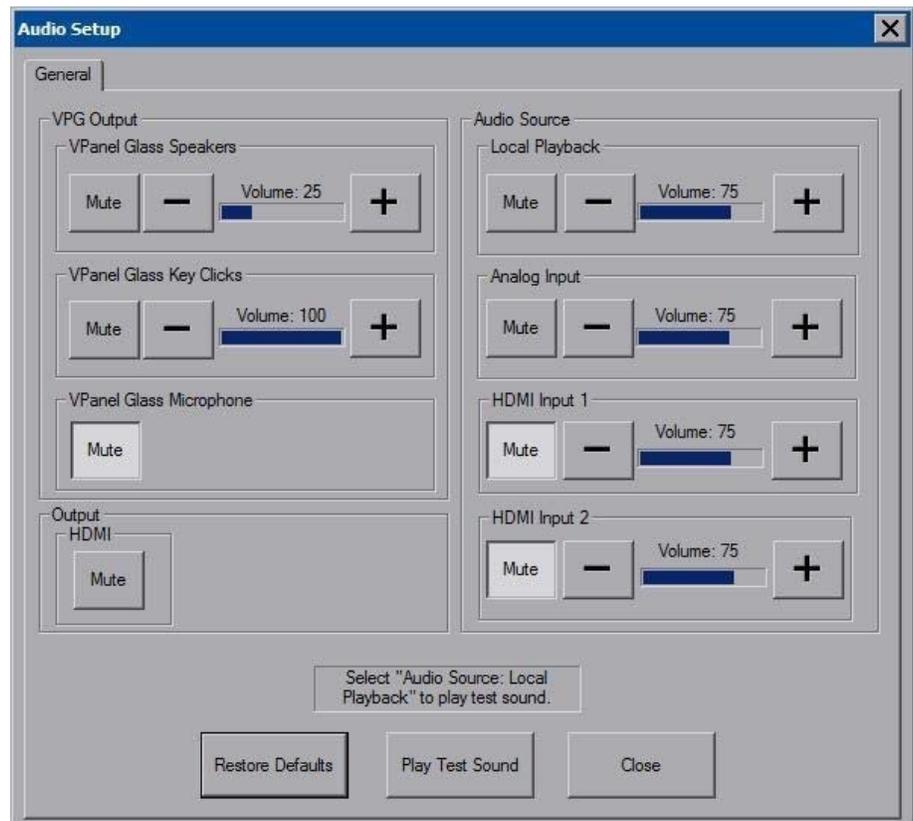
Touch **Audio** to open the “Audio Setup” window, shown in the illustration below.

Volume controls and **Mute** buttons are available for the *VPanel Glass Speakers* and *VPanel Glass Key Clicks*, as well as a **Mute** button for the *VPanel Glass Microphone*. Volume controls and a **Mute** buttons are also provided for *Local Playback*, the *Analog Input*, *HDMI Input 1* and *HDMI Input 2* along with a **Mute** button for HDMI output.

When *Local Playback* is selected, touching **Play Test Sound** plays a short internal audio file.

Changes to audio settings are made in real time.

“Audio Setup” Window

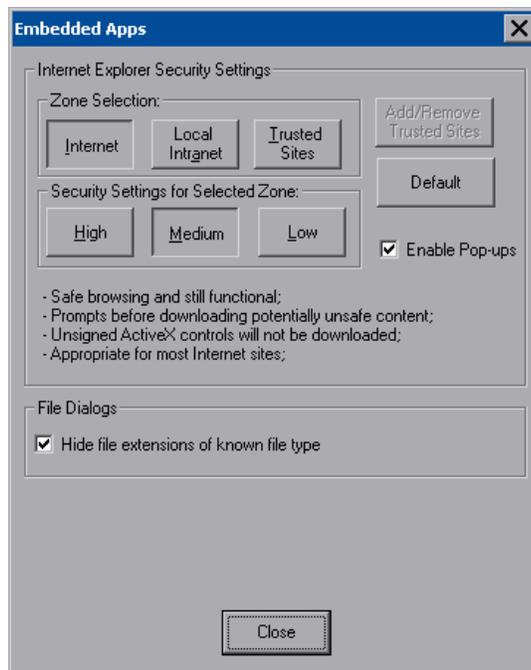


NOTE: V-Panel specific items are not displayed unless there is a V-Panel connected directly to the DGE-2 **DM OUT** ports.

Embed Apps (Embedded Applications)

Touch **Embed Apps** to open the “Embedded Apps” window, which permits setting Internet security to different levels for different types of Internet sites.

“Embedded Apps” Window



For each of the three zones (**Internet**, **Local Intranet**, and **Trusted Sites**), one of three security levels (**High**, **Medium** or **Low**) can be selected. The security levels are defined as:

- **High:** The safest way to browse but also the least functional. Less secure features are disabled. Appropriate for sites that may have harmful content.
- **Medium:** Safe browsing and still functional. Prompts before downloading potentially unsafe content. Unsigned ActiveX controls are not downloaded. Appropriate for most Internet sites.
- **Low:** Minimal safeguards and warning prompts are provided. Most content is downloaded and run without prompts. All active content can run. Appropriate for sites which are absolutely trusted.

Touch **Default** to restore the default security settings. By default, security is set to **Medium** for **Internet** and **Local Intranet** and **Low** for **Trusted Sites**.

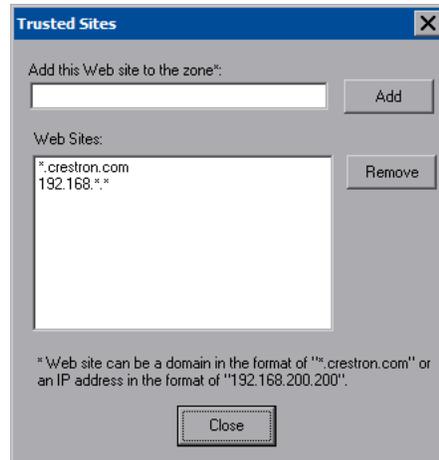
The “Embedded Apps” window also permits enabling the popup windows (child windows) that open when in Internet Explorer (not the popup windows of the embedded applications).

NOTE: Refer to the Crestron Web site (www.crestron.com), Online Help Answer ID 4190, for information on the latest versions of the software.

Touch **Close** after all changes have been made. The touch screen must be rebooted for changes to take effect. Touch **Save & Reboot**, located in the shutdown section of the setup menu.

A list of trusted sites can be created and edited by touching **Add/Remove Trusted Sites**. Touching this button opens the “Trusted Sites” window. From here, trusted sites can be added and edited. Sites are listed by domain name or IP address. Once all sites have been entered, touch **Close**.

“Trusted Sites” Window



NOTE: **Save & Reboot** on the setup menu must be selected for Embedded Apps changes to take effect.

NOTE: While browsing the Internet with the DGE-2/V-Panel, clicking on a link may cause a message box titled “Restrictions” to appear that contains the text “This operation has been cancelled due to restrictions in effect on this computer. Please contact the system administrator.” If this message appears, checking *Enable Pop-ups* in the “Embedded Apps” window may correct this error. Other restrictions may also cause this error, so this may not prevent all occurrences.

NOTE: The DGE-2/V-Panel supports automatic connection to the VNC server when the VNC View application is opened. For automatic connection without having to enter the server location and password every time the VNC viewer is opened, launch the application and using a USB mouse, right-click on the VNC viewer window, then select **Save configuration info as....**

NOTE: Refer to the Crestron Web site, Online Help Answer ID 4627, for information on how to set up the VNC viewer. Refer to Answer ID 3345 for information on how to program the MJPEG viewer. Refer to Answer ID 4640 for information about the default paths for embedded applications and dynamic graphics.

NOTE: When using the embedded applications, only one document window can be open at a time. Opening a second document window causes the first document window to close.

ETHERNET Details

The Ethernet portion of the setup menu allows configuration of the touch screen settings for Ethernet communications.

The Crestron Swirl logo  at the top of the Ethernet portion of the setup menu illuminates to indicate the status of the connection to the control system(s):

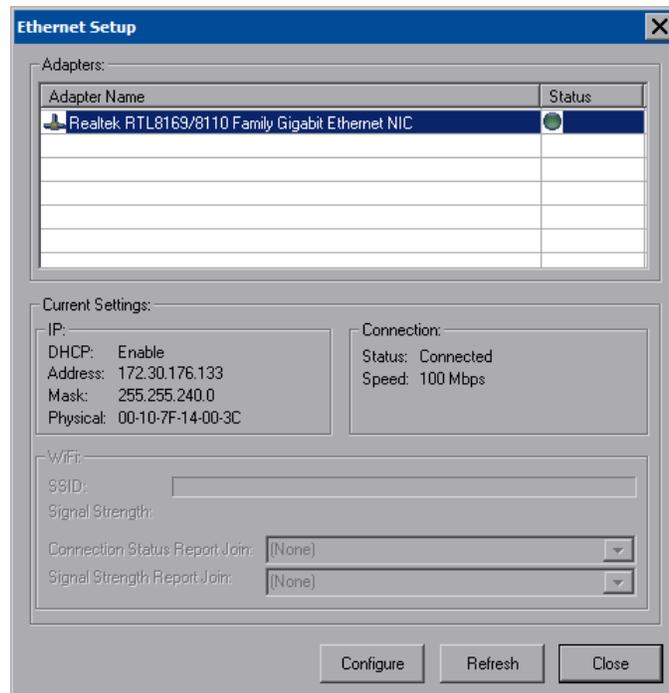
- Green Connected
- Yellow Network trouble
- Orange Connected to some but not all of the control systems (listed in IP table)
- Red Not connected to any control system (listed in the IP table)

NOTE: After configuring Ethernet settings (e.g. changing IP address, etc.), wait at least five seconds after seeing the change in the *LAN Ethernet Status* section of the main setup menu before initiating a **Save & Reboot** to save the new settings.

Adapters

Touch the **Adapters** button to access the “Ethernet Setup” window, shown in the illustration on the following page. Changes are made in real time and there is typically no need to reboot. The Ethernet address and mask are displayed on this screen.

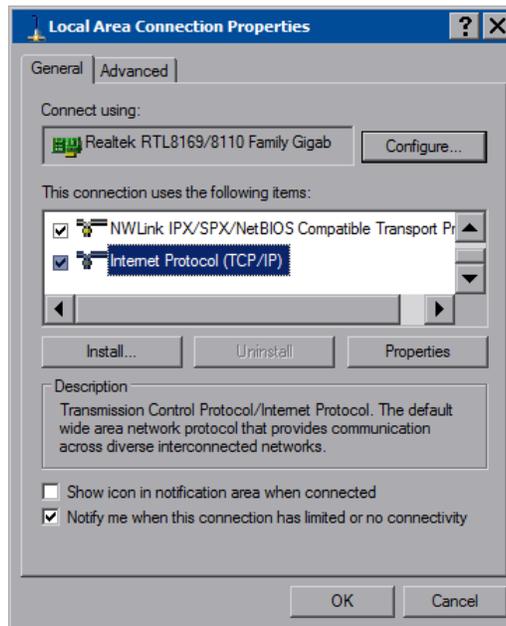
“Ethernet Setup” Window



To configure the Ethernet adapter, touch its name once to select it in the *Adapter Name* list. Then, touch **Configure** to open the “Local Area Connection Properties” window. This window displays the connection and related required items.

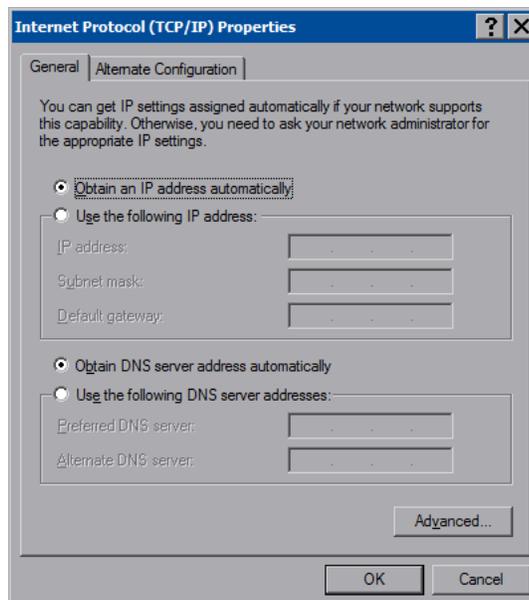
NOTE: When configuring an adapter, only one item can be modified at a time. For example, to modify an IP address and also change authentication, touch **Configure** and modify the IP address, then touch **OK** (to return to the “Ethernet Setup” window). Touch **Configure** again, change authentication, then touch **OK**. The order in which modifications are performed does not matter.

“Local Area Connection Properties” Window



To establish dynamic or static processing, select **Internet Protocol (TCP/IP)** and touch **Properties**.

“Internet Protocol (TCP/IP) Properties” Window



Transmission Control Protocol/Internet Protocol (TCP/IP) is a set of protocols that defines how to transfer data between two computers. TCP monitors and ensures

correct transfer of data. IP receives the data from TCP, breaks it up into packets and ships it off to a network. The IP address is a unique number consisting of four parts (called “octets”) separated by dots, e.g., 165.113.245.2.

Dynamic Host Configuration Protocol (DHCP) is a protocol for assigning dynamic IP addresses to devices on a network. With dynamic addressing, a device can have a different IP address every time it connects to the network. In some systems, the IP address of the device can even change while it is still connected. DHCP also supports a mix of static and dynamic IP addresses.

Dynamic addressing simplifies network administration because the software keeps track of IP addresses rather than requiring an administrator to manage the task. New computers can be added to a network without manually assigning each one a unique IP address.

NOTE: The DGE-2 ships with DHCP enabled.

Static IP addresses on a dedicated AV/control system allow the integrator to have a fixed/controllable network. This helps maintain communication stability between Ethernet devices.

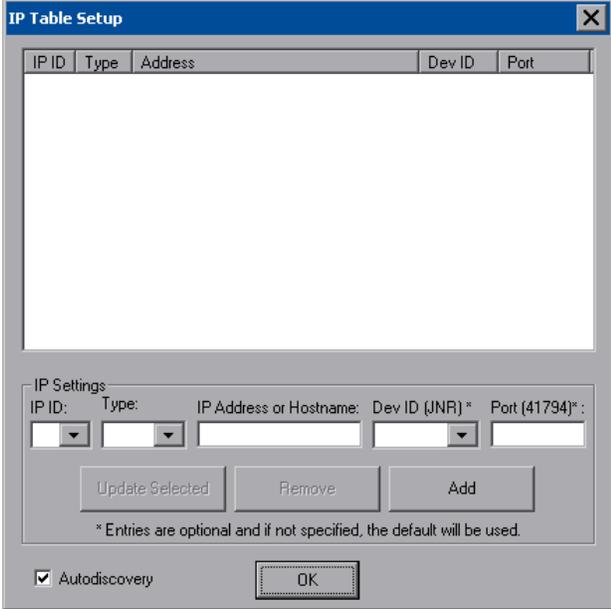
IP Table

Touch **IP Table** on the setup menu to open the “IP Table Setup” window.

Edit, remove or enter a control system’s IP address in the IP table to enable communication between the touch screen and a control system. The touch screen can communicate with multiple control systems.

For more information on IP tables, refer to the latest version of the Crestron 2-Series Control Systems Reference Guide (Doc. 6256).

“IP Table Setup” Window



IP ID	Type	Address	Dev ID	Port

IP Settings

IP ID: Type: IP Address or Hostname: Dev ID (JNR)*: Port (41794)*:

Update Selected Remove Add

* Entries are optional and if not specified, the default will be used.

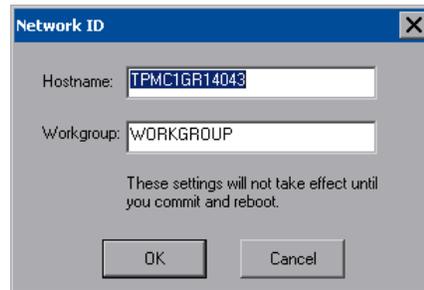
Autodiscovery

The IP ID is the ID number that is used to identify the touch screen in the control system’s IP table. The IP ID should match the IP ID set in the SIMPL Windows program.

Identity

Touch **Identity** to open the “Network ID” window. The “Network ID” window displays the hostname and workgroup that identify the touch screen on the network. The hostname may be used when transferring a program over Ethernet using Crestron Toolbox. This window permits editing of the hostname and workgroup.

“Network ID” Window

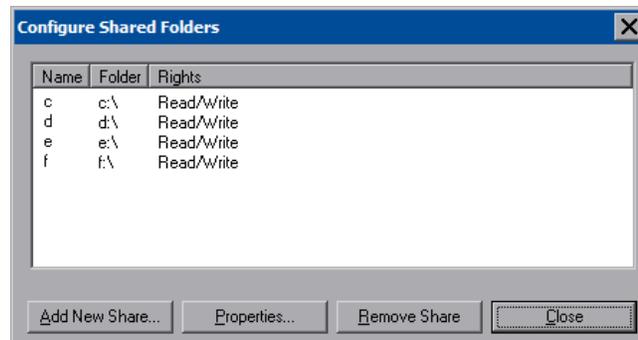


NOTE: The hostname is required for Ethernet communication.

Sharing

Touch **Sharing** to open the “Configure Shared Folders” window. This window is used to set up shared folders. Sharing enables remote computers to view and/or modify files stored on the touch screen.

“Configure Shared Folders” Window



Touch **Add New Share...** to browse and add directories with permission to read-only or read/write. Touch **Close** after adding all folders to be shared.

NOTE: For security reasons, there is no persistence of the shared drive(s) after the screen is rebooted.

LAN Ethernet Status Details

The *LAN Ethernet Status* section of the setup menu provides a *Link Status* light to indicate a LAN Ethernet connection and displays the current LAN IP and MAC addresses.

Standby Details

The *Standby* function turns off the backlight when the touch screen is inactive for a specified time. Use the **Up** and **Down** buttons to set the *Standby* from 0 through 120 minutes, where 0 disables the timeout. Touch the screen to reactivate the touch screen from standby mode. When the touch screen is reactivated, the last screen to be displayed reappears.

NOTE: The hard buttons still function when the touch screen is in standby mode but do not cause it to awaken from standby. The screen must be touched to reactivate the touch screen.

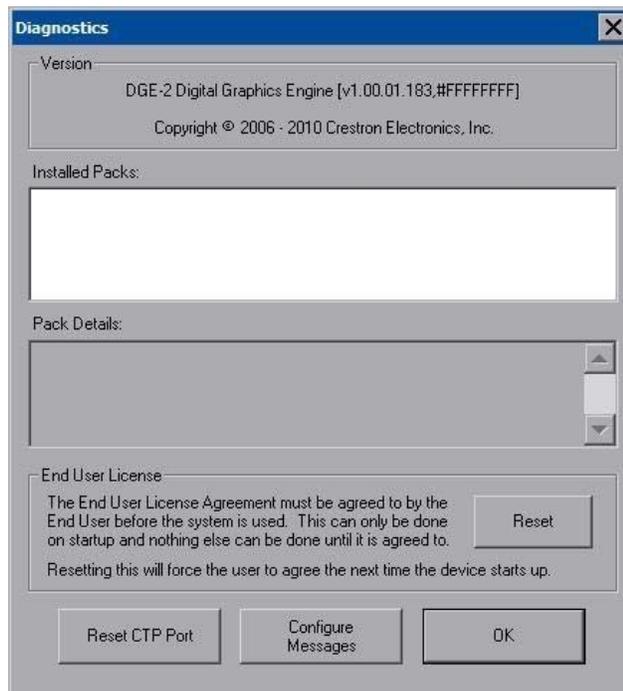
Misc. Controls Details

The *Misc. Controls* section of the setup menu contains the **Diagnostics** and **Keyboard** buttons.

Diagnostics

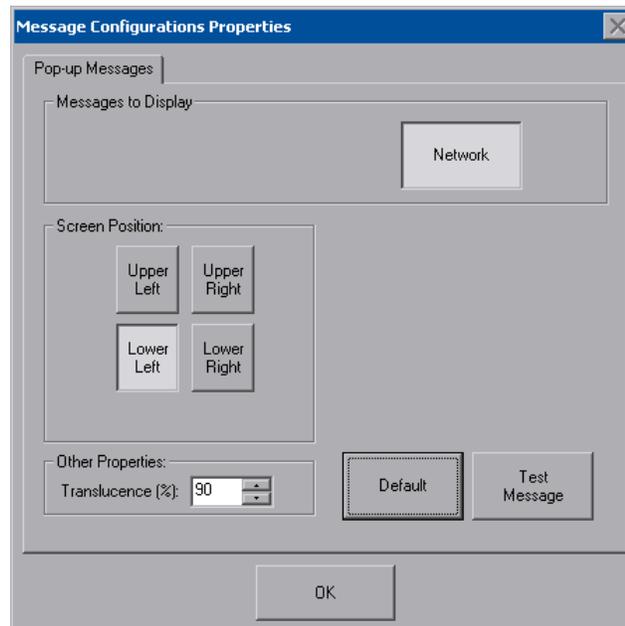
Touch **Diagnostic** to display the firmware version number, see *Installed Packs* and to reset the end user license from the “Diagnostics” window.

“Diagnostics” Window



Reset CTP Port resets the default value of the CTP port to 41795, for terminal connection using Crestron Toolbox.

To configure the appearance of popup messages, touch **Configure Messages**. The “Message Popup Configuration” window opens.

“Message Popup Configuration” Window

There are three types of **Network** popup messages. Following are definitions of each message type:

- **Connected:** A green popup message appears when the touch screen is connected to the control system.
- **Checking Connection:** A yellow popup message appears when the touch screen is experiencing network issues.
- **Disconnected, Trying to Reconnect...:** A red popup message appears when the touch screen loses connection with the control system.

A control for popup message *Translucence* is also provided. Translucence ranges from 25% to 100%, with a default value of 90%.

The **Default** button restores the original *Screen Position* and *Translucence* settings, as well as enabling display of *Network* messages. A **Test Message** button displays the changes to popup message position and translucence. Touch **Close** to close the popup window.

NOTE: The default value for *Screen Position* is *Lower Left*.

Keyboard

Touch the **Keyboard** button to display the on-screen keyboard.

The on-screen keyboard can be used in an identical manner to a physically connected keyboard. It can be used in any of the embedded applications, for example, to enter a Web address or to enter data into a spreadsheet, etc.

On-Screen Keyboard



The on-screen keyboard also has a few special keys:

Touch the **123** key to change to a numeric keyboard, as shown in the illustration that follows.

On-Screen Keyboard - Numeric



Touch the **#+=** key to change to a symbol keyboard, as shown in the illustration that follows.

On-Screen Keyboard - Symbols



From either the numeric or the symbol keyboard, touch the **ABC** key to return to the alpha keyboard.

The initial position of the on-screen keyboard is determined by the VT Pro-e[®] program or SIMPL Windows settings. The on-screen keyboard defaults to its largest size.

In use, when the on-screen keyboard is moved and/or resized and then closed, it re-opens in the same position it was in and at the same size it was when closed. This position and size remains in memory until the touch screen is re-booted or it is re-set by the SIMPL Windows program. After reboot, the position of the on-screen keyboard reverts to the defaults set in the VT Pro-e or SIMPL Windows program. The size reverts to the largest as determined by the firmware installed in the touch screen.

Exit the on-screen keyboard by selecting by touching the red close button in the upper right corner of the keyboard window. If the **Keyboard** button on the start menu is still visible, it can be touched to exit the keyboard.

VPanel Ethernet Status Details

NOTE: *VPanel Ethernet Status* is not displayed unless there is a V-Panel connected directly to the DGE-2 **DM OUT** ports.

The *VPanel Ethernet Status* section of the setup menu provides a *Link Status* light to indicate an Ethernet connection and displays the current IP and MAC addresses.

Touch **VPG Config** to open the “V-Panel Ethernet Configuration” window, shown in the illustration below.

“V-Panel Ethernet Configuration” Window



The screenshot shows a window titled "V-Panel Ethernet Configuration". At the top, there are two radio buttons: "DHCP ON" (which is selected) and "DHCP OFF". Below these, there are three input fields: "IP Address:", "IP Mask:", and "Default Router:". These fields are currently disabled (grayed out). Below these fields is a "MAC Address:" field with the value "00-10-7F-05-05-F0". At the bottom of the window, there are two buttons: "Cancel" and "OK".

When *DHCP OFF* is selected, *IP Address*, *IP Mask*, *Default Router* and *MAC Address* can be entered manually.

Screen Brightness Details

NOTE: *Screen Brightness* is not displayed unless there is a V-Panel connected directly to the DGE-2 **DM OUT** ports.

The *Screen Brightness* can be varied from 0 to 100. To increase the brightness, touch **Up**. To decrease the brightness, touch **Down**.

Hard Button Feedback Details

NOTE: *Hard Button Feedback* is not displayed unless there is a V-Panel connected directly to the DGE-2 **DM OUT** ports.

The *Hard Button Feedback* section of the setup menu provides visual feedback for a hard button press. Pressing a the hard button results in the icon on the screen illuminating in bright green.

Touch Path

NOTE: *Touch Path* is not displayed unless there is a V-Panel connected directly to the DGE-2 **DM OUT** ports.

The *Touch Path* indicators show whether is data from the V-Panel is sent to the DGE-2 via the DM connection (“Touch Over DM”) or via the LAN connection (“Touch Over IP”).

Save & Reboot and Shutdown Details

To save any changes and reboot the touch screen, touch **Save & Reboot**, located in the lower right section of the setup menu.

To turn off the touch screen, touch **Shut Down**, located in lower right section of the setup menu. This is the recommended method for shutting down the touch screen. After the touch screen has shut down, the power supply can be safely removed from the touch screen.

Exit Details

Touch **Exit** to leave the setup menu and return to the project. If no project has been loaded, the touch screen displays an error message and return to the setup menu.

Installation

Ventilation

The DGE-2 should be used in a well-ventilated area. The venting holes should not be obstructed under any circumstances.

To prevent overheating, do not operate this product in an area that exceeds the environmental temperature range listed in the table of specifications. Consider using forced air ventilation and/or incrementing the spacing between units to reduce overheating. Consideration must be given if installed in a closed or multi-unit rack assembly since the operating ambient temperature of the environment may be greater than the room ambient temperature. Contact with thermal insulating materials should be avoided on all sides of the unit.

Rack Mounting

The DGE-2 can be mounted in a rack or stacked with other equipment. Two “ears” are provided with the DGE-2 so that the unit can be rack mounted. These ears must be installed prior to mounting. Complete the following procedure to attach the ears to the unit. The only tool required is a #1 or #2 Phillips screwdriver.

WARNING: To prevent bodily injury when mounting or servicing this unit in a rack, observe the following guidelines:

- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

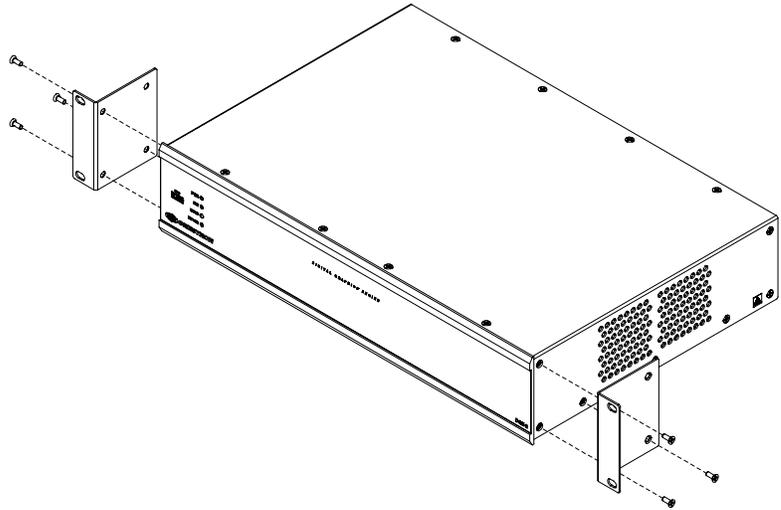
NOTE: If rack mounting is not required, rubber feet are provided for tabletop mounting or stacking. Apply the feet near the corner edges on the underside of the unit.

NOTE: Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

To install the ears:

1. There are screws that secure each side of the DGE-2 top cover. Using a #1 or #2 Phillips screwdriver, remove the three screws closest to the front panel from one side of the unit. Refer to the diagram following step 3 for a detailed view.
2. Position a rack ear so that its mounting holes align with the holes vacated by the screws in step 1.
3. Secure the ear to the unit with three of the six #06-32 x 3/8” screws included with the DGE-2, as shown in the following diagram.

Ear Attachment for Rack Mounting

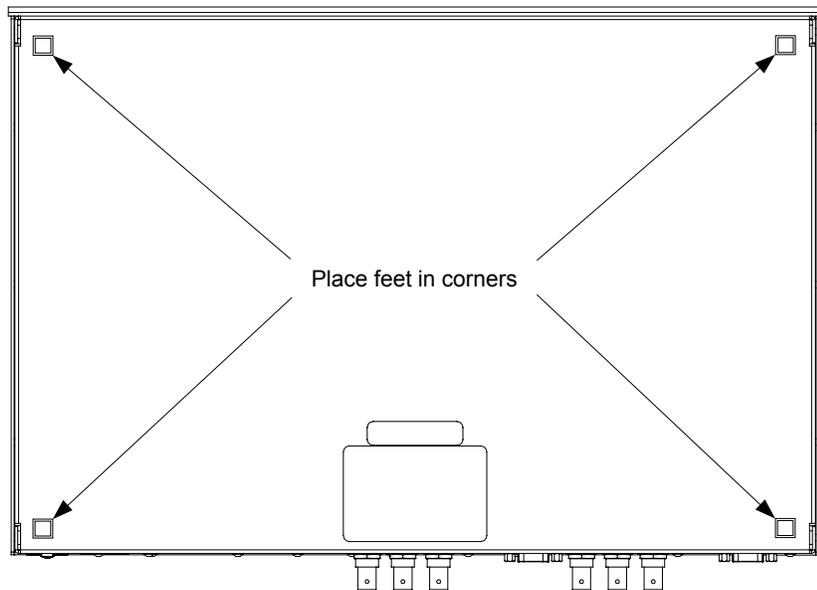


4. Repeat procedure (steps 1 through 3) to attach the remaining ear to the opposite side.

Stacking

Four “feet” are provided with the DGE-2 so that if the unit is not rack mounted, the rubber feet can provide stability when the unit is placed on a flat surface or stacked. These feet should be attached prior to the hookup procedure. Refer to the following illustration for placement of the feet.

Foot Placement for the DGE-2



NOTE: No more than two DGE-2 units should be stacked.

Hardware Hookup

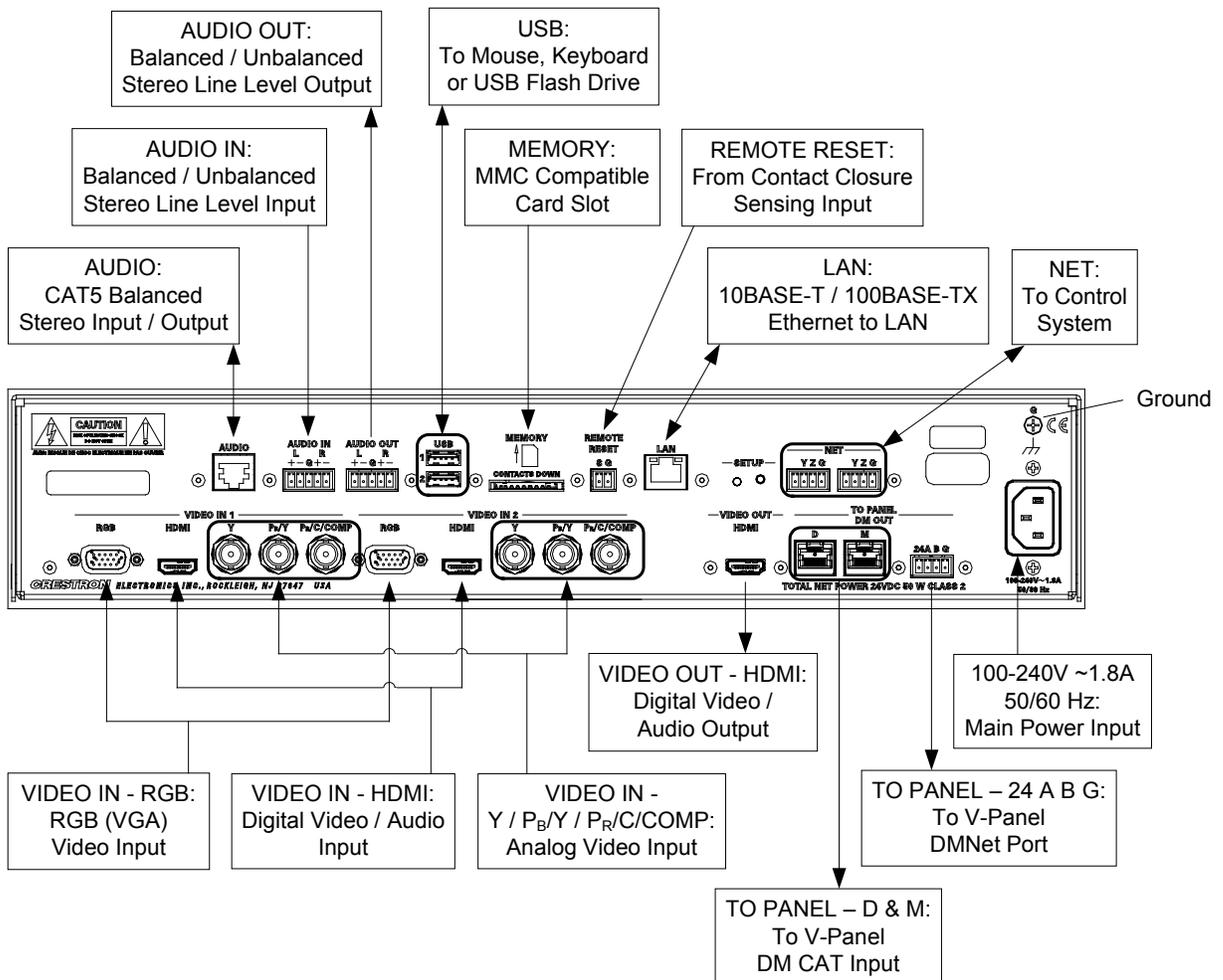
Make the necessary connections as called out in the illustration that follows this paragraph. Refer to “Network Wiring” on page 18 before attaching the 4-position terminal block connector. Apply power after all connections have been made.

When making connections to the DGE-2, use Crestron power supplies for Crestron equipment.

Hardware Connections for the DGE-2 (Front View)



Hardware Connections for the DGE-2 (Rear View)



NOTE: Ensure the unit is properly grounded by connecting the chassis ground lug to an earth ground (building steel).

NOTE: To prevent overheating, do not operate this product in an area that exceeds the environmental temperature range listed in the table of specifications.

NOTE: For wiring between the DGE and V-Panel, use DM-CBL DigitalMedia Cable. The maximum cable length is 450 feet (137 meters).

NOTE: When repeaters are used, make sure all D and M cables are connected before connecting DMNet.

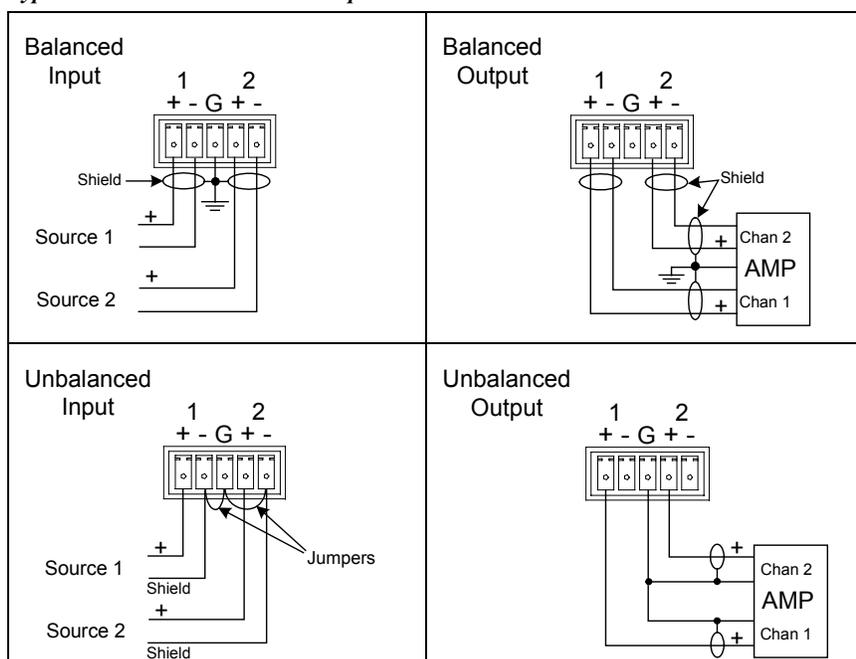
NOTE: For audio connections, use either the RJ-45 **AUDIO** connector or the 5-pin **AUDIO IN** and **AUDIO OUT** connectors but not both.

Balanced/unbalanced audio inputs and outputs are provided, utilizing five-pin terminal block connectors. For connection details, refer to the following table and diagrams.

Audio Connections

SIGNAL NAME	BALANCED AUDIO INPUT	BALANCED AUDIO OUTPUT	UNBALANCED AUDIO INPUT	UNBALANCED AUDIO OUTPUT
+	1 +	1 +	1 + In	1 + Out
-	1 -	1 -	1 – signal return, jumper to GND	Open
G	Shield/Ground	Shield/Ground	Ground	Common ground
+	2 +	2 +	2 + In	2 + Out
-	2 -	2 -	2 – signal return jumper to GND	Open

Typical Balanced/Unbalanced Outputs



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 Web site. To post a question or view questions submitted to Crestron's True Blue Support, log in at www.crestron.com/onlinehelp. First-time users must establish a user account to fully benefit from all available features.

Software Requirements for the PC

NOTE: The latest software can be downloaded from the Crestron Web site (www.crestron.com/software).

Crestron has developed an assortment of Windows[®]-based software tools to develop a Cresnet system. Use SystemBuilder™ or SIMPL Windows to create a program to control the DGE-2.

Programming with SystemBuilder

SystemBuilder is a comprehensive programming environment. Appropriate for most systems, it can quickly and easily generate a complete working program including both control processor logic and touch screen graphics.

Programming with SIMPL Windows

NOTE: While SIMPL Windows can be used to program the DGE-2, it is recommended to use SystemBuilder for configuring a system.

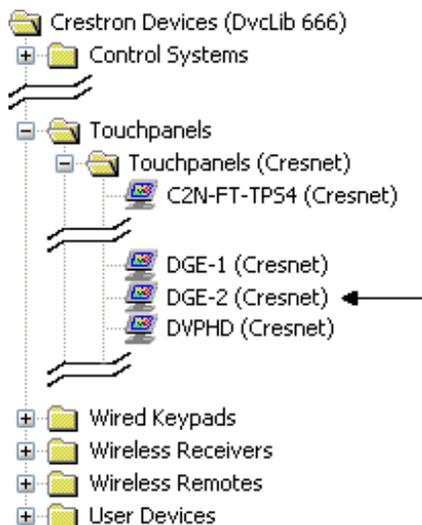
SIMPL Windows is Crestron's premier software for programming Crestron control systems. It is organized into two separate but equally important "Managers": Configuration and Program.

Configuration Manager

Configuration Manager is the view where programmers "build" a Crestron control system by selecting hardware from the *Device Library*.

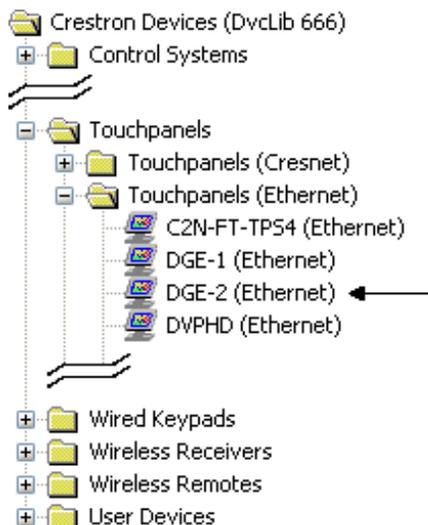
1. The DGE-2 must first be incorporated into the system.
 - a. To incorporate the DGE-2 (Cresnet) into the system, drag the DGE-2 from the Touchpanels | Touchpanels (Cresnet) folder of the *Device Library* and drop it in the *System Views*.

Locating the DGE-2 (Cresnet) in the Device Library



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

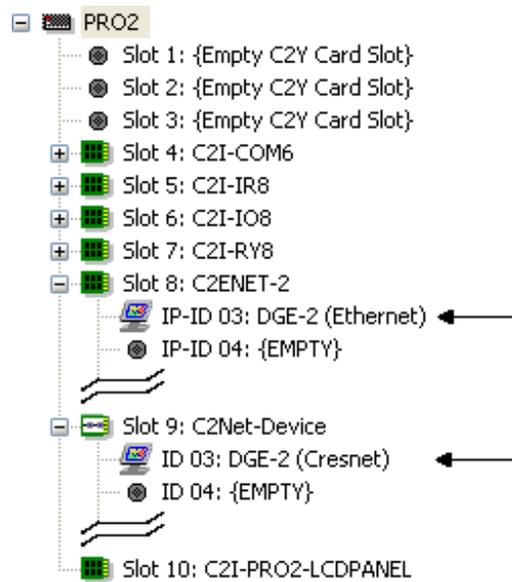
Locating the DGE-2 (Ethernet) in the Device Library



The system tree of the control system displays the device in the appropriate slot(s) with a default Net ID or IP ID as shown in the following illustration.

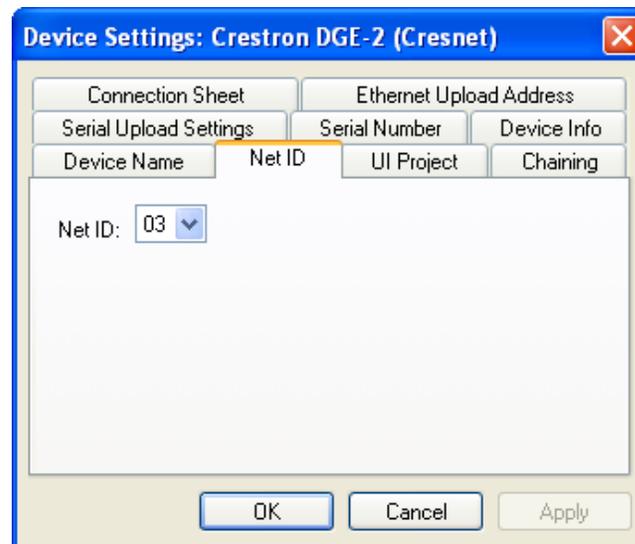
NOTE: In the following illustration, there is both an Ethernet device in Slot 8 and a Cresnet device in Slot 9. It is possible to have both types of device attached to a control system as long as the control system has either a built-in or expansion Ethernet interface.

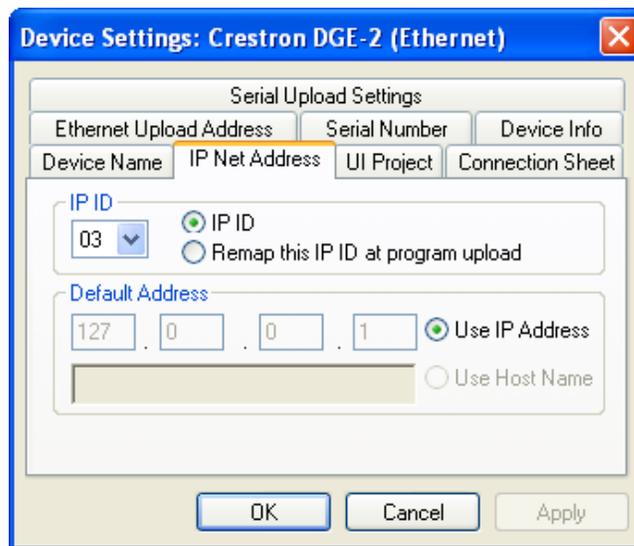
C2ENET-2 and C2Net Devices, Slot 8 and 9



2. If additional DGE-2 devices are to be added, repeat step 1 for each device. Each DGE-2 is assigned a different Net ID or IP ID number as it is added.
3. If necessary, double click a device to open the “Device Settings” window and change the Net ID or IP ID, as shown in the following figure(s).

“Device Settings: Crestron DGE-2 (Cresnet)” Window



“Device Settings: Crestron DGE-2 (Ethernet)” Window

NOTE: The ID code specified in the SIMPL Windows program must match the Net ID or IP ID of each unit. Refer to “Identity Code” which starts on page 18.

Program Manager

Program 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*. Each signal in the symbol is described in the SIMPL Windows help file (**F1**).

Programming with VisionTools Pro-e

Touch screen pages should be created in Crestron VisionTools® (VT Pro-e) to allow accessing the embedded applications, switching of source signals to desired outputs as well as selection of the system mode. There are no special programming requirements to use the functions of the DGE-2 in a room control system.

NOTE: The DGE-2 uses chroma key color (with RGB values 4,4,4) for rendering video. Any elements in a project (e.g., controls) that use the same color appears transparent on the display.

Multi-Mode Objects

Multi-mode objects offer high-performance programming!

The single most advanced VT Pro-e high performance programming technique involving the DGE-2 is the concept of multi-mode objects. A multi-mode object (i.e., button, legend, etc.) is an object drawn on a VT Pro-e page that can have one or more active and inactive visible settings (*modes*).

For examples, refer to www.crestron.com/exampleprograms and search for multi-mode object examples. This file contains the VT Pro-e touch screen files and SIMPL Windows files that illustrate the high-performance capabilities of multi-mode objects.

WAV File Audio Messages

The DGE-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. 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 DGE-2 only accepts the following WAV file formats: **PCM, 8 and 16 bit, 8 – 44.1kHz, mono and stereo**. For more information about how to use Sound Recorder, refer to its User's Guide and extensive help information provided with the software. Also refer to the help file in VT Pro-e to learn how to use its audio tool, Sound Manager, to attach WAV files to a touch screen project.

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

NOTE: Touch screen WAV files can be obtained from the Wave LC Library of the Crestron FTP site.

Bit Depth and File Size

A balance of performance and quality can be achieved by using VT Pro-e to configure the size of graphics in a project. Read this section to learn about bit depth and how to maximize the quality and performance of a DGE-2 project.

Bit depth refers to the number of memory bits used to store color data for each pixel in a raster image. A touch screen raster image consists of a rectangular grid of picture elements (pixels). Each pixel uses the same amount of memory to store its color data. The amount of memory is called the bit depth of the image.

Greater bit depths are required to represent finer gradations of color. Increasing bit depth necessarily increases file size. A black and white drawing requires only one bit per pixel to store all the available color information. Using a 32-bit per pixel bit depth for a black and white image increases the file size 32 times without adding anything to the black and white image quality.

In an 8-bit per pixel system, the associated 8-bits of video memory for every screen pixel contain a value referring to a location in an 8-bit color table. In this way any one of the specific 256 color table locations is assigned to a pixel.

A 16-bit highcolor system is considered sufficient to provide life-like colors. It is encoded using 5-bits to represent red, 5-bits to represent blue and (since the human eye is more sensitive to the color green) 6-bits to represent 64 levels of green. These can therefore be combined to provide 65,536 mixed colors ($32 \times 32 \times 64 = 65,536$).

In a 24-bit graphics display, the video memory allocates 24 bits for each pixel on the screen enabling each pixel to take on any one of a possible 16.7 million colors. Each 24-bit value is composed of 8-bits for red, 8-bits for green and 8-bits for blue. These triplets of 8-bit values are also referred to as the red, green and blue color planes. A 24-bit image is actually composed of three component images which combine to create the truecolor picture. The reason this is called truecolor is that this is near the maximum number of colors the human eye is able to detect.

Truecolor images are sometimes represented by a 32-bit value. The extra 8-bits do not enhance the precision of the color representation but act as an alpha channel that represents pixel translucence. The 32-bit truecolor has become popular on the computer desktop to provide effects such as translucent windows, fading menus and shadows.

In graphics intensive applications such as touch screens, raising or lowering the color depth of the displayed graphics can achieve a balance of performance and quality. Lower color depths do not require as much frame buffer memory or display bandwidth, allowing them to be generated and displayed more quickly. Increasing color depth results in higher color quality at the expense of display speed and responsiveness. By using mostly 8-bit or 16-bit graphics and holding 32-bit graphics to a minimum (e.g. for a family photo, etc.), a sophisticated project can be created that fits in the memory space provided while the touch screen remains very responsive.

Relationship of Bits to Colors

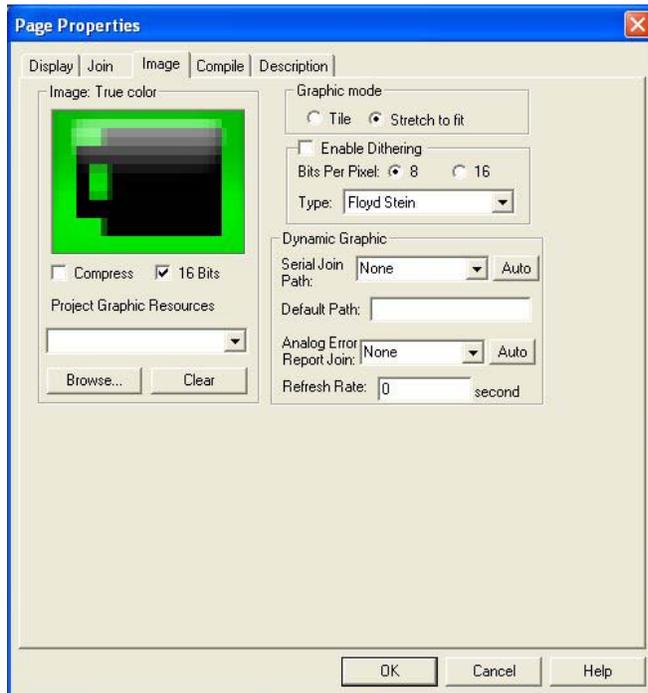
NUMBER OF BITS	NUMBER OF COLORS
1 bit	Black and White
2 bits	4 Colors
4 bits	16 Colors
8 bits	256 Colors
16 bits	65,536 Colors (Highcolor)
24 bits	16.7 million Colors (Truecolor)
32 bits	16.7 million Colors plus Transparency

When creating a VT Pro-e project, the image size can be compressed and reduced in the “Page Properties” dialog box for the entire page. The image size can also be compressed and reduced using the “Image Properties” dialog box. A reduction in image size saves a considerable amount of memory space for the project.

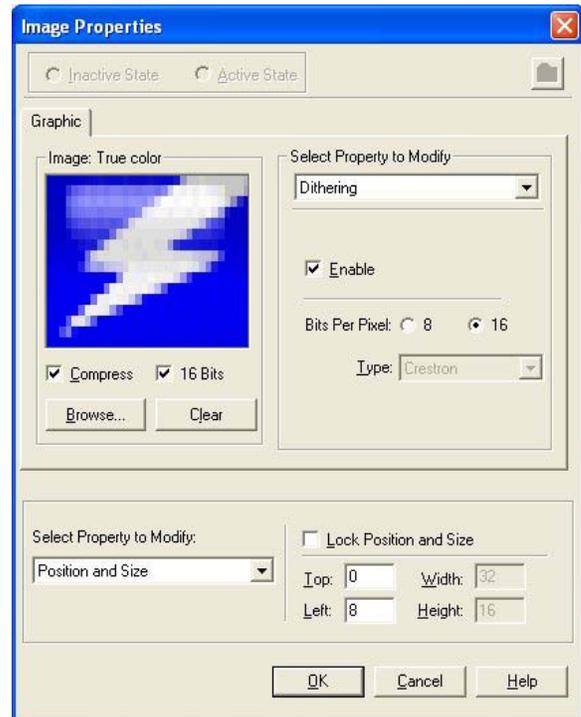
In VT Pro-e, the **Compress** checkbox permits the image to be compressed when compiling. The **16 Bits** checkbox converts a 24-bit or 32-bit image to 16 bits. This conversion to a 16-bit image may cause the loss of some subtle shading. To compensate for this, use the dithering to simulate the original shading. Check the image with each of the available dithering types to determine which delivers the best quality image.

Dithering type selection can be accessed from the “Page Properties” or “Image Properties” dialog boxes in VT-Pro-e. Refer to the following illustrations.

*VT Pro-e “Page Properties” Dialog Box
– Bit Depth Selection*



*VT Pro-e “Image Properties” Dialog Box
– Bit Depth Selection*



MultiByte International Characters

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

Multibyte character fonts require more than the usual eight 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 applications with multibyte characters – static text on buttons and indirect text on buttons. No touch screen firmware changes are required in either case.

Indirect text on a button is entered in VT Pro-e and the actual string to be displayed is entered in SIMPL Windows. As of this publication date only completely single byte or completely multibyte strings may be entered or they can not be compiled correctly in SIMPL Windows. In other words, Chinese characters cannot be interspersed with numbers. Enter Chinese characters or numbers in separate strings or pad each number with “\x00” to make it multibyte and then combine it with Chinese characters in the same string.

Of course, the workaround of showing a graphic that displays the string but which is not dynamic, can always be used. To compile and use multibyte characters it is essential that the operating system understand the language. Some versions of Windows are available in many international languages and add-on software is available for other versions.

Additional Language Fonts

The DGE-2 has fonts in several languages built in. These fonts do not use extra project memory and they are rendered at the highest fidelity. Other languages may be used as well but they use project memory. The fonts for the following languages are built into the DGE-2.

- Arabic
- Chinese Simplified
- Chinese Traditional
- Croatian
- Czech
- Danish
- Dutch
- English
- 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

Embedded Applications

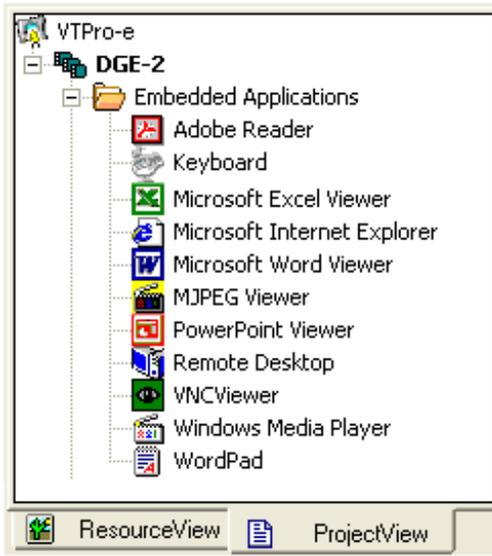
NOTE: Installations and downloads from within embedded applications are not supported by the DGE-2.

A number of third-party or in-house applications are embedded in a VT Pro-e DGE-2/V-Panel project. (Refer to illustration on the following page.)

- Adobe Reader
- Keyboard
- Microsoft Excel Viewer
- Microsoft Internet Explorer
- Microsoft Word Viewer
- MJPEG Viewer
- PowerPoint Viewer
- Remote Desktop
- VNC Viewer
- Windows Media Player
- WordPad

The embedded applications have the following features:

- All embedded applications listed in the VT Pro-e *ProjectView* workspace are created by default for a new DGE-2/V-Panel project.
- All applications are created at project-level – one instance per project.
- The static position and size of each application can be viewed from any page.
- Four analog joins can be assigned to each application to dynamically change position and size.
- One digital feedback join or one analog join can be assigned to dynamically show/hide an application.

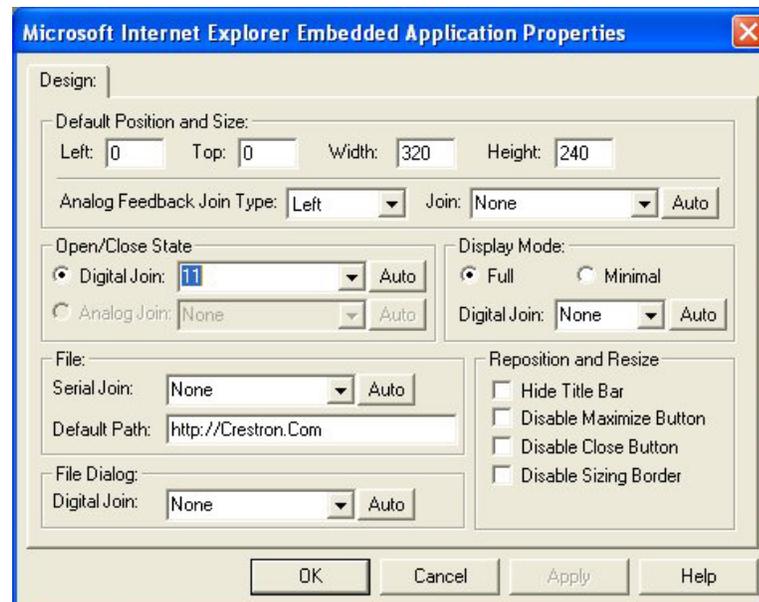
Embedded Applications in ProjectView

Right-click on any of the applications in the *Project View* and select **Properties** to open the “Embedded Application Properties” window (refer to the illustration below). This window permits a choice of positions on the screen, assignment of an analog touch join type and number and a show/hide join number.

Defaults for Embedded Windows Applications

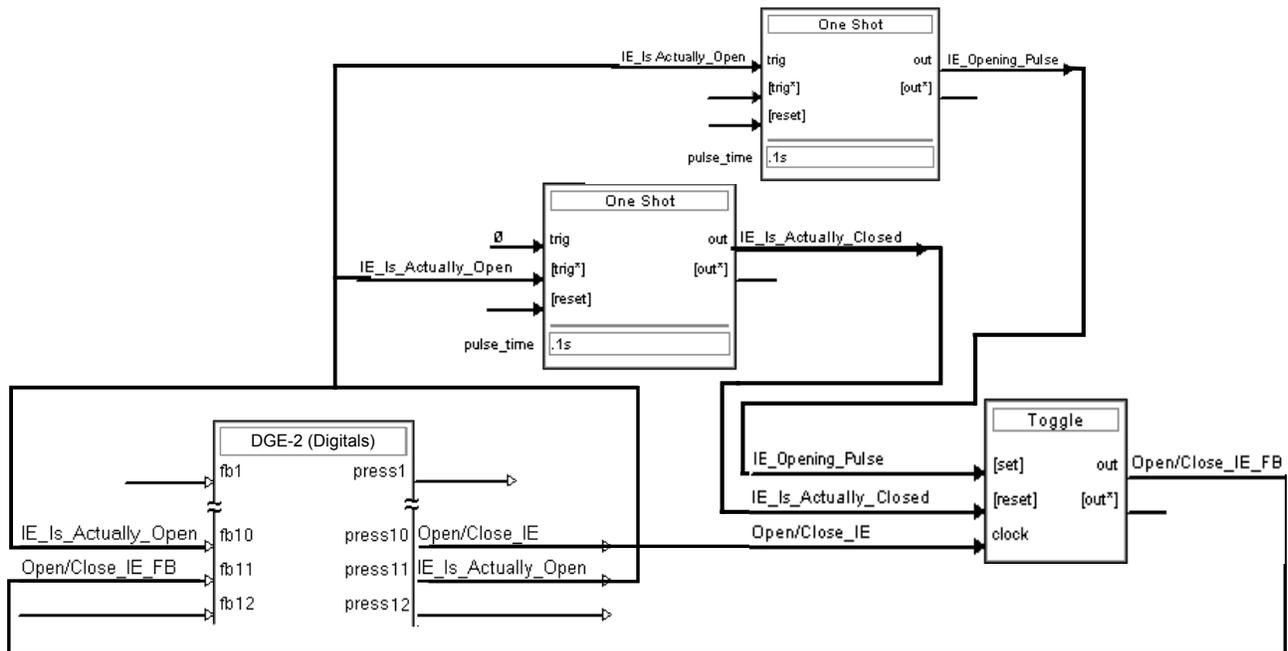
Use the *Default Path* text box in the “Embedded Applications Properties” window to enter the default document for the application.

Edit the *Default Position and Size* in the “Embedded Application Properties” window to point to the new location.

Sample of an “Embedded Application Properties” Window

Programming Embedded Windows Applications

The following diagram is an example of a basic SIMPL program that enables opening/closing an embedded application. The example program is discussed following the diagram.



The example has Join #10 assigned to a button that is used to toggle the state of Internet Explorer. Press10 is routed to the clock line of a Toggle symbol. The output of the toggle is routed to fb11. Join #11 is referred to as the "Open/Close State Digital Join." The feedback signal of the Open/Close State Digital Join is used to Open/Close the application. In this example, when fb11 goes high, Internet Explorer opens, and when fb11 goes low, Internet Explorer closes. However, since the application can also be closed by pressing the "X" in the upper right hand corner of Internet Explorer, we must keep the logic synchronized. If we do not, the toggle gets out of sync. Similarly, using the reserved join to launch the embedded application would result in the application being open, but the state of the toggle remaining low, so a one-shot is used to set the state of the toggle if the embedded application is opened in this way.

For example, the user presses button #10 and the output of the toggle (<Open/Close IE_FB>) is high. If the user presses the "X" on IE, IE closes. The next time they touch button #10, <Open/Close IE_FB> goes low, which tries to close the application. However, the application is already closed. We need to reset the state of the toggle to keep in sync with the actual state of the application.

The "Press" signal of the Open Close State Digital Join can be used to know the true state of the application. When Press11 goes high, in this example, IE is open. When Press11 goes low, IE is closed. Here, we use the falling edge of Press11 through a One-Shot to reset the state of the Toggle symbol. Now the toggle is properly synchronized if the user closes the application from the touch screen itself.

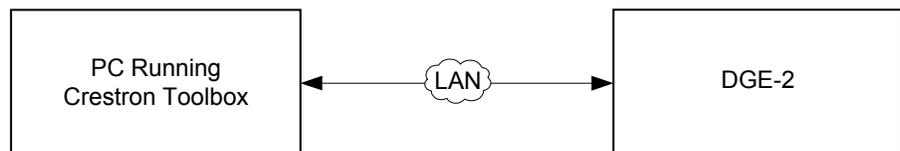
Uploading and Upgrading

Crestron recommends using the latest programming software and that each device contains the latest firmware to take advantage of the most recently released features. However, before attempting to upload or upgrade it is necessary to establish communication. Once communication has been established, files (for example, programs, projects or firmware) can be transferred to the control system (and/or device). Finally, program checks can be performed (such as changing the device ID or creating an IP table) to ensure proper functioning.

Establishing Communication

Use Crestron Toolbox for communicating with the DGE-2; refer to the Crestron Toolbox help file for details. There is a single method of communication: TCP/IP communication.

Ethernet Communication



The DGE-2 connects to PC via Ethernet:

1. Confirm Ethernet connection between DGE-2 and PC. If connecting through a hub or router, use CAT5 straight through cables with 8-pin RJ-45 connectors. Alternatively, use a CAT5 crossover cable to connect the two **LAN** ports directly without using a hub or router.
2. Use the Device Discovery Tool in Crestron Toolbox to detect all Ethernet devices on the network and their IP configuration. The tool is available in Toolbox version 1.15.143 or later.
3. Use the Address Book in Crestron Toolbox to create an entry for the DGE-2 with the DGE-2's TCP/IP communication parameters.
4. Display the "System Info" window (click the  icon) and select the DGE-2 entry from the Address Book or the Address Book drop-down menu.

Programs, Projects and Firmware

Program, project or firmware files may be distributed from programmers to installers or from Crestron to dealers. Firmware upgrades are available from the Crestron Web site as new features are developed after product releases. One has the option to upload programs and projects via the programming software or to upload and upgrade via the Crestron Toolbox. For details on uploading and upgrading, refer to the SIMPL Windows help file, VT Pro-e help file or the Crestron Toolbox help file.

SIMPL Windows

If a SIMPL Windows program is provided, it can be uploaded to the control system using SIMPL Windows or Crestron Toolbox.

VisionTools Pro-e

Upload the VT Pro-e file to the touch screen using VT Pro-e or Crestron Toolbox.

Firmware

Check the Crestron Web site to find the latest firmware. (New users may be required to register to obtain access to certain areas of the site, including the FTP site.)

Upgrade DGE-2 firmware via Crestron Toolbox.

1. Establish communication with the DGE-2 and display the “System Info” window.
2. Select **Functions | Firmware...** to upgrade the DGE-2 firmware.

NOTE: Use an Ethernet connection for loading programs, projects or firmware.

Program Checks

Actions that can be performed on the DGE-2 vary depending on whether it is connected via Cresnet or Ethernet.

Cresnet Connections

For Cresnet connections, using Crestron Toolbox, display the network device tree (**Tools | Network Device Tree View**) to show all network devices connected to the control system. Right-click on the DGE-2 to display actions that can be performed on the DGE-2.

Ethernet Connections

For Ethernet connections, using Crestron Toolbox, display the “System Info window (click the  icon) and select the **Functions** menu to display actions that can be performed on the DGE-2.

Be sure to use Crestron Toolbox to create the DGE-2 IP table.

1. Select **Functions | IP Table Setup**.
2. Add, modify or delete entries in the IP table. The DGE-2 can have only one IP table entry.
3. A defined IP table can be saved to a file or sent to the device.

Edit the control system’s IP table to include an entry for the DGE-2. The entry should list the DGE-2’s IP ID (specified on the DGE-2’s IP table) and the internal gateway IP address 127.0.0.1.

Restore

The `restore` console command restores the DGE-2 to its original factory default settings and also restores the original version of the firmware.

NOTE: Use of the `restore` console command requires all service packs to be re-installed as well.

Operation – Security Infrastructure

Since the DGE-2 does not use a traditional hard drive but rather an image that is restored every time the touch screen is rebooted, any virus infection is cleared immediately after a reboot. However, using the currently available tools and techniques, Crestron has provided an infrastructure that protects against possible virus infections.

1. Executables/Scripts brought in on external media
The implementation of the DGE-2 series has restrictions on starting any application or script. The only applications that can be started are those allowed by Crestron and these can only be started from the Crestron project.
2. Downloaded Program/Script
The browser is customized in such a way that files cannot be downloaded. The only files the browser can open are the files it has plug-ins for, such as PDF, etc. The user cannot change the options, as this window has been disabled.
3. Browser Hijack and Browser vulnerability
Crestron has patched all currently known hijacks and vulnerabilities. Future updates can be downloaded from the Crestron Web site.
4. Email Viruses
There is no e-mail client installed on the DGE-2, so email-based viruses cannot be executed.
5. Viruses that attack Web/FTP servers
The DGE-2 does not run a Web or FTP server and is therefore not listening to port 21 or 80. The only ports the system listens to are the ports registered to Crestron.
6. Virus from other machines on the network
Since drives on the DGE-2 can be shared on the network, it is possible that a virus can write itself to files/folders on these shares. Our recommendation therefore is to share as “Read-Only”, so that viruses cannot attach themselves to files on the DGE-2.
7. ActiveX and Java
The DGE-2 has ActiveX disabled and has no Java Virtual Machine installed. These applets cannot run on the DGE-2.

NOTE: While browsing the Internet with the DGE-2, clicking on a link may cause a message box titled “Restrictions” to appear that contains the text “This operation has been cancelled due to restrictions in effect on this computer. Please contact the system administrator.” If this message appears, checking *Enable Pop-ups* in the “Embedded Apps” window (refer to “Embed Apps (Embedded Applications)” which starts on page 35) may correct this error. Other restrictions may also cause this error, so this may not prevent all occurrences.

Problem Solving

Troubleshooting

The following table provides corrective action for possible trouble situations. If further assistance is required, please contact a Crestron customer service representative.

DGE-2 Troubleshooting

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Touch screen does not function.	Touch screen is not communicating with the network.	Use Crestron Toolbox (via SIMPL Windows or VT Pro-e) to poll the network. Verify network connection to the touch screen.
	Touch screen is incorrectly calibrated.	Enter the setup menu or use Crestron Toolbox to initiate the calibration sequence and recalibrate. (Refer to "Touch Screen" which starts on page 24.)
Touch screen is not responding.	Incorrect network wiring.	Touch the screen to remove any message and verify correct wiring to all connectors.
	Touch screen Cresnet ID is not set to match the Net ID in the SIMPL program.	Use Crestron Toolbox to poll the network. Verify that the Cresnet ID for the touch screen is properly set to match the Net ID in the SIMPL program.
	Touch screen Cresnet ID is not unique; two or more units share the same ID.	Use Crestron Toolbox to poll the network and verify that each ID is used only once.
Touch screen display is dark.	Standby timeout has elapsed.	Touch the screen to reactivate.
	Screen brightness is improperly set.	Adjust screen brightness from the Video Setup" menu. (Refer to "Video Setup" which starts on page 29.)
Unexpected response from the touch screen.	Touch screen is incorrectly calibrated.	Enter the setup menu or use Crestron Toolbox to initiate the calibration sequence and recalibrate. (Refer to "Touch Screen" which starts on page 24.)

(Continued on following page)

DGE-2 Troubleshooting (Continued)

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Video window on touch screen has no display.	Improper video connection.	Verify proper connections on the touch screen.
	Incorrect video cable used.	Verify that the correct video cable is being used.
	Incorrect video format selection.	Select the proper video input configuration in the touch screen configuration setup menu. (Refer to "Video" which starts on page 29.)
	Incorrect VT Pro-e project file loaded.	Make sure that video window object resides in project, re-compile and reload.
Communications via the LAN port is not functioning.	Improper Ethernet connection (IEC).	Verify proper connection at touch screen LAN port.
	Incorrect touch screen selected in SIMPL Windows.	Select "Touchpanel (Ethernet)" instead of "Touchpanel (Cresnet)".
	Another device set to the same IP address.	Obtain new touch screen static IP address.
	Possible bad port on the hub.	Use crossover cable to connect directly to the Ethernet port on a PC and ping the IP address of the touch screen to confirm communication. If it is good, confirm hub port by testing with another Ethernet device.

NOTE: For more advanced diagnostics, use the DM tool in Crestron Toolbox.

Check Network Wiring

Use the Right Wire

To ensure optimum performance over the full range of the installation topology, use Crestron Certified Wire only. Failure to do so may incur additional charges if support is required to identify performance deficiencies because of using improper wire.

Calculate Power

CAUTION: Use only Crestron power supplies for Crestron equipment. Failure to do so could cause equipment damage or void the Crestron warranty.

CAUTION: Provide sufficient power to the system. Insufficient power can lead to unpredictable results or damage to the equipment. The **EIG** connector on the DM switcher is used to bring in external power. Additional power is rarely required as switchers provide enough power for most typical configurations. Please use the DMNet Power Calculator to help calculate how much power is needed for the system (www.crestron.com/calculators).

CAUTION: If a DM Switcher or other DM device supplying power is connected to the DGE-2, the wire to the **24** pin between the DM device and the DGE-2 must be disconnected. The wires to the **A**, **B** and **G** pins must remain connected.

Refer to the following table for maximum cable lengths using various cables.

Maximum DM CAT Cable Length

Cable Type:	DM-CBL DigitalMedia Cable	
Resolution:	Maximum length without, between, before or after repeaters	Maximum total length using up to 2 repeaters
720p	200 ft (60 m)	450 ft (137 m)
800 x 600 @ 60 Hz (V12)	200 ft (60 m)	450 ft (137 m)
1024 x 768 @ 60 Hz	200 ft (60 m)	450 ft (137 m)
1280 x 768 @ 60 Hz (V15)	200 ft (60 m)	450 ft (137 m)
1080p60	150 ft (45 m)	450 ft (137 m)
1280 x 1024 @ 60 Hz	150 ft (45 m)	450 ft (137 m)
1920 x 1200 @ 60 Hz	150 ft (45 m)	450 ft (137 m)
1600 x 1200 @ 60 Hz	125 ft (38 m)	375 ft (114 m)

NOTE: A DM 8G+ transmitter is required when used with a V24R-C touch screen display, supporting a maximum cable length of 330 feet (100 meters). No repeaters are necessary when used with a V24R-C.

NOTE: 1080p60 is the most common resolution used in residential installations.

NOTE: All Crestron certified DMNet wiring must consist of two twisted pairs. One twisted pair is the +24V conductor and the GND conductor and the other twisted pair is the A conductor and the B conductor.

Reference Documents

The latest version of all documents mentioned within the guide can be obtained from the Crestron Web site.

List of Related Reference Documents

DOCUMENT TITLE
2-Series Control Systems Reference Guide (www.crestron.com/manuals)
Crestron DigitalMedia Design Guide (www.crestron.com/dmresources)
Crestron e-Control Reference Guide (www.crestron.com/manuals)

Further Inquiries

To locate specific information or resolve questions after reviewing this guide, contact Crestron's True Blue Support at 1-888-CRESTRON [1-888-273-7876] or refer to the listing of Crestron worldwide offices on the Crestron Web site (www.crestron.com/offices) for assistance within a particular geographic region.

To post a question about Crestron products, log onto the Online Help section of the Crestron Web site (www.crestron.com/onlinehelp). First-time users must 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 DGE-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 Web site periodically for manual update availability and its relevance. Updates are identified as an “Addendum” in the Download column.

Return and Warranty Policies

Merchandise Returns / Repair Service

1. No merchandise may be returned for credit, exchange or service without prior authorization from Crestron. To obtain warranty service for Crestron products, contact an authorized Crestron dealer. Only authorized Crestron dealers may contact the factory and request an RMA (Return Merchandise Authorization) number. Enclose a note specifying the nature of the problem, name and phone number of contact person, RMA number and return address.
2. Products may be returned for credit, exchange or service with a Crestron Return Merchandise Authorization (RMA) number. Authorized returns must be shipped freight prepaid to Crestron, 6 Volvo Drive, Rockleigh, N.J. or its authorized subsidiaries, with RMA number clearly marked on the outside of all cartons. Shipments arriving freight collect or without an RMA number shall be subject to refusal. Crestron reserves the right in its sole and absolute discretion to charge a 15% restocking fee plus shipping costs on any products returned with an RMA.
3. Return freight charges following repair of items under warranty shall be paid by Crestron, shipping by standard ground carrier. In the event repairs are found to be non-warranty, return freight costs shall be paid by the purchaser.

Crestron Limited Warranty

Crestron Electronics, Inc. warrants its products to be free from manufacturing defects in materials and workmanship under normal use for a period of three (3) years from the date of purchase from Crestron, with the following exceptions: disk drives and any other moving or rotating mechanical parts, pan/tilt heads and power supplies are covered for a period of one (1) year; touch screen display and overlay components are covered for 90 days; batteries and incandescent lamps are not covered.

This warranty extends to products purchased directly from Crestron or an authorized Crestron dealer. Purchasers should inquire of the dealer regarding the nature and extent of the dealer's warranty, if any.

Crestron shall not be liable to honor the terms of this warranty if the product has been used in any application other than that for which it was intended or if it has been subjected to misuse, accidental damage, modification or improper installation procedures. Furthermore, this warranty does not cover any product that has had the serial number altered, defaced or removed.

This warranty shall be the sole and exclusive remedy to the original purchaser. In no event shall Crestron be liable for incidental or consequential damages of any kind (property or economic damages inclusive) arising from the sale or use of this equipment. Crestron is not liable for any claim made by a third party or made by the purchaser for a third party.

Crestron shall, at its option, repair or replace any product found defective, without charge for parts or labor. Repaired or replaced equipment and parts supplied under this warranty shall be covered only by the unexpired portion of the warranty.

Except as expressly set forth in this warranty, Crestron makes no other warranties, expressed or implied, nor authorizes any other party to offer any warranty, including any implied warranties of merchantability or fitness for a particular purpose. Any implied warranties that may be imposed by law are limited to the terms of this limited warranty. This warranty statement supersedes all previous warranties.

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Microsoft® Windows XP® Embedded End User License Agreement

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- IF YOU DO NOT AGREE TO THIS END USER LICENSE AGREEMENT (“EULA”), DO NOT USE THE DEVICE OR COPY THE SOFTWARE. INSTEAD, PROMPTLY CONTACT CRESTRON ELECTRONICS FOR INSTRUCTIONS ON RETURN OF THE UNUSED DEVICE(S) FOR A REFUND. **ANY USE OF THE SOFTWARE, INCLUDING BUT NOT LIMITED TO USE ON THE DEVICE, WILL CONSTITUTE YOUR AGREEMENT TO THIS EULA (OR RATIFICATION OF ANY PREVIOUS CONSENT).**
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 - NO WARRANTIES FOR THE SOFTWARE. **THE SOFTWARE IS PROVIDED “AS IS” AND WITH ALL FAULTS. THE ENTIRE RISK AS TO SATISFACTORY QUALITY, PERFORMANCE, ACCURACY, AND EFFORT (INCLUDING LACK OF NEGLIGENCE) IS WITH YOU. ALSO, THERE IS NO WARRANTY AGAINST INTERFERENCE WITH YOUR ENJOYMENT OF THE SOFTWARE OR AGAINST INFRINGEMENT.** IF YOU HAVE RECEIVED ANY WARRANTIES REGARDING THE DEVICE OR THE SOFTWARE, THOSE WARRANTIES DO NOT ORIGINATE FROM, AND ARE NOT BINDING ON, MS.
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 - **SOFTWARE TRANSFER ALLOWED BUT WITH RESTRICTIONS.** You may permanently transfer rights under this EULA only as part of a permanent sale or transfer of the Device, and only if the recipient agrees to this EULA. If the SOFTWARE is an upgrade, any transfer must also include all prior versions of the SOFTWARE.
 - **EXPORT RESTRICTIONS.** You acknowledge that SOFTWARE is subject to U.S. export jurisdiction. You agree to comply with all applicable international and national laws that apply to the SOFTWARE, including the U.S. Export Administration Regulations, as well as end-user, end-use and destination restrictions issued by U.S. and other governments. For additional information, see www.microsoft.com/exporting.
- **Limited Use of Particular SOFTWARE Services.** Provided that the DEVICE continues to comply with the terms of the “Restricted Functionality” paragraph below, without limiting the number of computers or other electronic devices that might connect to the DEVICE to access or utilize other software or SOFTWARE services on the DEVICE, you may permit a maximum of ten (10) computers or other electronic devices to connect to the DEVICE to utilize the services of the SOFTWARE for (a) file and print services, (b) Internet information services, and/or (c) remote access (including connection sharing). The ten (10) connections maximum includes any indirect connections made through “multiplexing” or other software or hardware which pools or aggregates connections.
- If you use the DEVICE to access or utilize the services or functionality of Microsoft Windows Server products (such as Microsoft Windows NT Server 4.0 (all editions) or Microsoft Windows 2000 Server (all editions)), or use the DEVICE to permit workstation or computing devices to access or utilize the services or functionality of Microsoft Windows Server products, you may be required to obtain a Client Access License for the DEVICE and/or each such workstation or computing device. Please refer to the End-User License Agreement for your Microsoft Windows Server product for additional information.
- **Restricted Deployment.** The SOFTWARE is not designed or intended for use or resale in hazardous environments requiring fail-safe performance, such as in the operation of nuclear facilities, aircraft navigation or communication systems, air traffic control, or other devices or systems in which a malfunction of the SOFTWARE would result in foreseeable risk of injury or death to the operator of the device or system, or to others.
- **Restricted Functionality.** You are licensed to use the SOFTWARE to provide only the limited functionality (specific tasks or processes) for which the DEVICE has been designed and marketed by Crestron. This license specifically prohibits any other use of the SOFTWARE, or inclusion of additional software programs or functions, on the DEVICE. Subject to the terms of the “Limited Use of Particular Services” paragraph above, you may use the SOFTWARE on the DEVICE to interact with other computers or electronic devices.

- **Maximum Number of Processors.** The SOFTWARE may not be used by more than two (2) processors at any one time on the DEVICE.
- **Remote Boot Feature.** Your DEVICE may be enabled with a Remote Boot feature which includes Remote Boot Installation Services tool. You may use the Remote Boot Installation Services tool only to deploy the SOFTWARE to one or more DEVICES on which you are licensed to run the SOFTWARE (i.e., DEVICES to which the appropriate Certificate of Authenticity is affixed). Please refer to the DEVICE documentation, if provided with your DEVICE, or contact Crestron for additional information.
- **Security Updates.** Content providers are using the digital rights management technology (“Microsoft DRM”) contained in this SOFTWARE to protect the integrity of their content (“Secure Content”) so that their intellectual property, including copyright, in such content is not misappropriated. Owners of such Secure Content (“Secure Content Owners”) may, from time to time, request MS, Microsoft Corporation, or their subsidiaries to provide security related updates to the Microsoft DRM components of the SOFTWARE (“Security Updates”) that may affect your ability to copy, display, and/or play Secure Content through Microsoft software or third-party applications that utilize Microsoft DRM. You therefore agree that, if you elect to download a license from the Internet, which enables our use of Secure Content, MS, Microsoft Corporation, or their subsidiaries may, in conjunction with such license, also download onto your DEVICE such Security Updates that a Secure Content Owner has requested that MS, Microsoft Corporation, or their subsidiaries distribute. MS, Microsoft Corporation, or their subsidiaries will not retrieve any personally identifiable information, or any other information, from your DEVICE by downloading such Security Updates.
- **Consent to Use of Data.** You agree that MS, Microsoft Corporation, and their affiliates may collect and use technical information gathered in any manner as part of product support services related to the SOFTWARE. MS, Microsoft Corporation, and their affiliates may use this information solely to improve their products or to provide customized services or technologies to you. MS, Microsoft Corporation, and their affiliates may disclose this information to others, but not in a form that personally identifies you.
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Crestron Electronics, Inc.
15 Volvo Drive Rockleigh, NJ 07647
Tel: 888.CRESTRON
Fax: 201.767.7576
www.crestron.com

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