

Crestron **DGE-1**
Digital Graphics Engine
with DigitalMedia™ CAT Connectivity

Operations Guide



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



Regulatory Compliance

As of the date of manufacture, the DGE-1 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 DigitalMedia™ CAT Connectivity: DGE-1

Introduction

Designed for use with a Crestron® V-Panel™ HD Touch Screen Display¹ (sold separately), the DGE-1 Digital Graphics Engine allows for a very streamlined touch screen installation by placing the bulk of the electronics at the central equipment location. Mounted in an equipment rack, the DGE-1 connects directly to the head end AV sources, switchers and control network, while the V-Panel display can be up to 150 feet (45 meters) away with just a single cable between them².

The DGE-1 features 24-bit graphics, with single window video display, embedded PC applications and Web browsing, streaming video and audio and IP intercom. Connectivity includes one composite or S-video input, balanced stereo audio in/out, Crestron Home® CAT5 balanced audio, Cresnet® and high speed Ethernet. A DigitalMedia™ CAT output provides the connection to the V-Panel display.

Features and Functions

- Touch screen graphics and video processing for V-Panels
- Installs out of sight at the central equipment location
- Eliminates bulky, unsightly wiring at the V-Panel location
- Connects to the V-Panel via a single DigitalMedia cable^{1,2}
- High definition 24-bit touch screen graphics
- DNav menu objects with gestures
- WAV files customizable audio feedback
- Multi-format streaming video and audio
- Single window full motion video
- Auto-sensing composite or S-video input

(Continued on following page)

1. The V-Panel touch screen must be equipped with a DM CAT type interface for connection to the DGE-1. Contact a Crestron representative for additional design assistance.
2. For wiring between the DGE and V-Panel, use DM-CBL DigitalMedia Cable. The maximum allowable cable length is 150 feet (45 meters).

Features and Functions

(Continued)

- 2-way intercom over IP or Crestron Home wiring
- Embedded PC applications for Web browsing, playing or streaming digital media, viewing digital documents and accessing and controlling external computers
- Supports interactive annotation among multiple touch screens
- Provides power to the V-Panel touch screen display
- USB keyboard/mouse port plus on-screen keyboard and mouse capability
- Balanced stereo audio input and output
- Crestron Home (CH) CAT5 bidirectional audio port
- High speed Ethernet and Cresnet
- Single rack space mountable

Gestures Navigation

Adjust AV and lighting settings, surf the Internet and browse music and movie libraries with a natural sweep of the finger using DNav gestures. Crestron DNav technology affords enhanced touch screen functionality, providing dynamic navigation control objects for scrolling effortlessly through all touch screen apps, cover art and favorite channels.

Embedded PC

The DGE-1's embedded PC engine combines rock solid touch screen graphics performance with built-in Windows Media® Player and RealPlayer®, Internet Explorer®, Adobe® Acrobat® Reader and Microsoft® Word, Excel® and PowerPoint® document viewers. While simultaneously controlling the home, boardroom or lecture hall, the DGE-1 provides everything needed for enjoying online music and movies, viewing Web pages and accessing most types of digital media without necessitating a separate computer. 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 all kinds of new presentation and system integration possibilities.

Full Motion Video

The DGE-1 supports the display of standard definition video from an external composite or S-video source. The video image can be displayed full screen or in a fully scalable window anywhere on the V-Panel touchscreen. External audio signals are handled by a single analog line input.

Streaming Video

Through its embedded Web browser and media players, the DGE-1 supports streaming and downloadable video in a variety of formats, enabling access to all kinds of media from online sources and network servers. Additional support for the motion JPEG streaming format allows the display of live video from a Web camera or network video streamer (Crestron CEN-NVS200 sold separately) or equivalent.

IP Intercom

Using the microphone and speakers built into the V-Panel display (sold separately), the DGE-1 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. Wired 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-1's embedded Web browser and other applications and can also be used to control external network devices like a Crestron ADMS Intermedia Delivery System™ (sold separately) as well as computers running TouchPoint® Virtual Mouse & Keyboard Software (VMK-WIN). USB ports are also provided on the DGE-1 and on the V-Panel display (sold separately), allowing for connection of a physical keyboard and mouse.

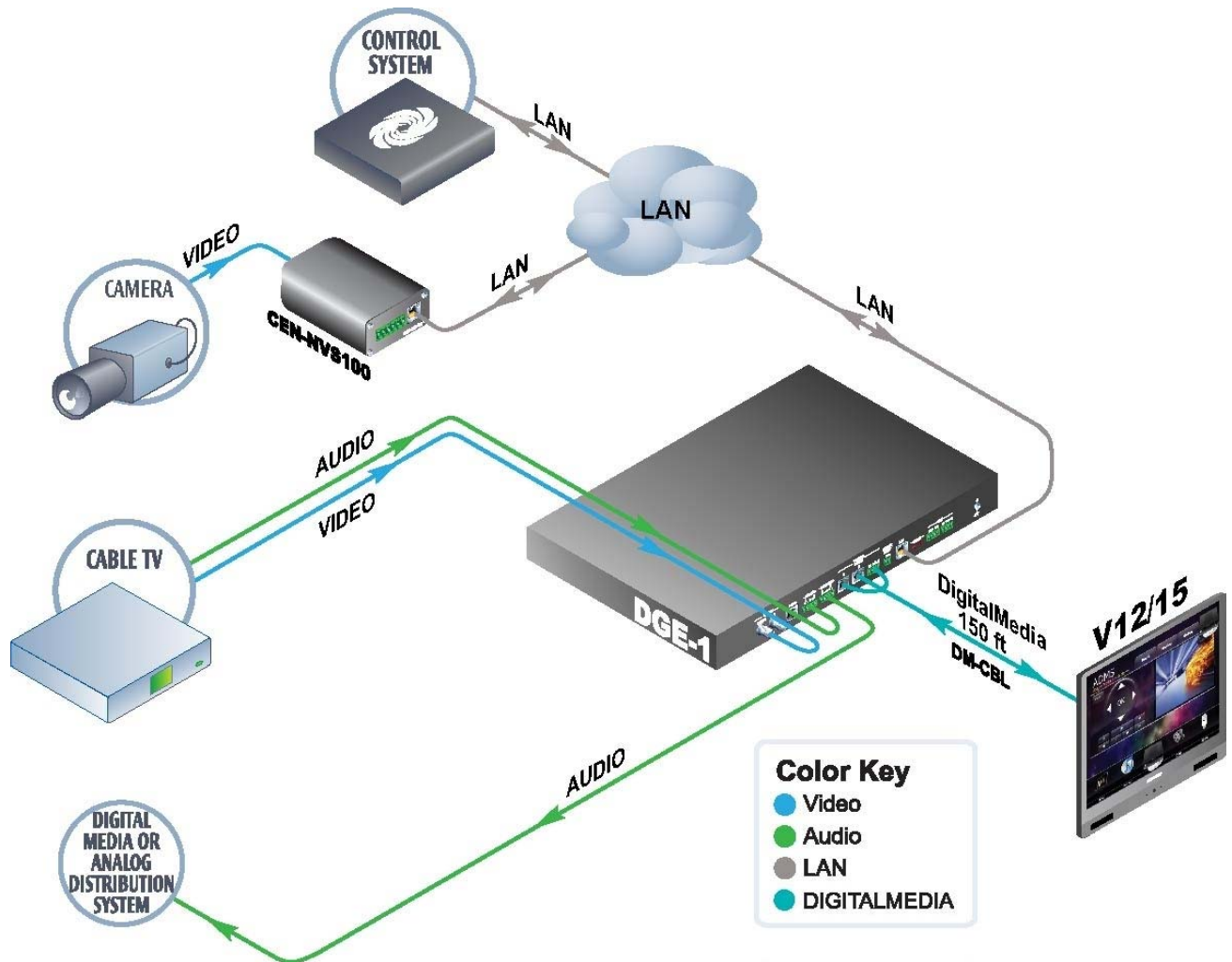
Remote Annotation

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.

Applications

The following diagram shows a DGE-1 in a typical application.

DGE-1 in a Typical Application



Specifications

Specifications for the DGE-1 are listed in the following table.

DGE-1 Specifications

SPECIFICATION	DETAILS
Graphic Engine	24-bit non-palette graphics + 8-bit alpha channel transparency, 16.7 million colors, DNav dynamic menu objects, multi-mode objects, dynamic graphics and text, PNG translucency, full motion (60 fps) animation, transition effects, color key video windowing, remote annotation
Embedded PC Applications ¹	Microsoft Internet Explorer with Adobe Flash [®] plug-in and Java [™] Runtime plug-in, Windows Media Player, RealPlayer, Crestron MJPEG Viewer, NetMeeting [®] , Remote Desktop, VNC Viewer, Crestron MediaMarker [™] Notebook, Crestron Keyboard, Adobe Acrobat Reader, WordPad, MS Word Viewer 2007, Excel Viewer 2007, PowerPoint Viewer 2007
Memory	
SDRAM	512 MB
Flash	2 GB
Maximum Project Size	120 MB
Communications	
Ethernet	10/100 Mbps, auto-switching, auto-negotiating, auto-discover, full/half duplex, TCP/IP, UDP/IP, CIP, 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 and USB flash drives ¹
DigitalMedia	DM CAT and DMNet [®] , for connection to a single V-Panel display only
Video	
Input Signal Types	S-video (Y/C), composite
Output Signal Type	DM CAT (to V-Panel display)
Formats	NTSC or PAL
Input Resolutions	480i, 576i
Output Resolutions	800 x 600 @ 60 Hz, 1280 x 768 @ 60 Hz
Color Depth	24-bit, 16.7 million colors
Streaming/File Formats	MJPEG via Crestron MJPEG viewer, plus all formats supported by the embedded media player applications ¹
Audio	
Hardware Features	Internal volume control and audio mixer, IP Intercom
Input Signal Types	Analog stereo, CH CAT5

(Continued on following page)

DGE-1 Specifications (Continued)

SPECIFICATION	DETAILS
Audio (Continued)	
Output Signal Types	Analog stereo, CH CAT5
Streaming/File Formats	All formats supported by the embedded media player applications ¹
Audio Feedback (WAV)	8 and 16-bit PCM, 8-44.1 kHz sampling rates, mono & stereo
Power Requirements	
Cresnet Power Usage	16 Watts (0.67 Amps @ 24 Volts DC) 46 Watts (1.92 Amps @ 24 Volts DC) with V12 display 58 Watts (2.42 Amps @ 24 Volts DC) with V15 display
Default Net ID	03
Minimum 2-Series Control System Update File ^{2, 3}	Version 3.155.1240 or later
Environmental	
Temperature	41° to 113° F (5° to 45° C)
Humidity	10% to 90% RH (non-condensing)
Heat Dissipation	55 BTU/Hr
Enclosure	
Chassis	Metal, matte black finish, vented top and sides
Faceplate	Extruded aluminum, matte black finish, polycarbonate label overlay
Mounting	Freestanding or 1U 19-inch rack mountable (adhesive feet and rack ears included)
Dimensions	
Height	1.80 in (46 mm) 1.70 in (44 mm) without feet
Width	17.07 in (434 mm) 19.00 in (483 mm) with ears
Depth	10.70 in (272 mm)
Weight	4.3 lbs (2.0 kg)
Available Accessories	
CEN-NVS200	Network Video Streamer
Cresnet	Cresnet Control Cable
DM-CBL	DigitalMedia Cable
DM-CONN	DigitalMedia Cable Connector
V12	V-Panel 12" HD Touch Screen Display
V15	V-Panel 15" 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. The latest software versions can be obtained from the Crestron Web site. Refer to the NOTE following these footnotes.
3. 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.

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-1.

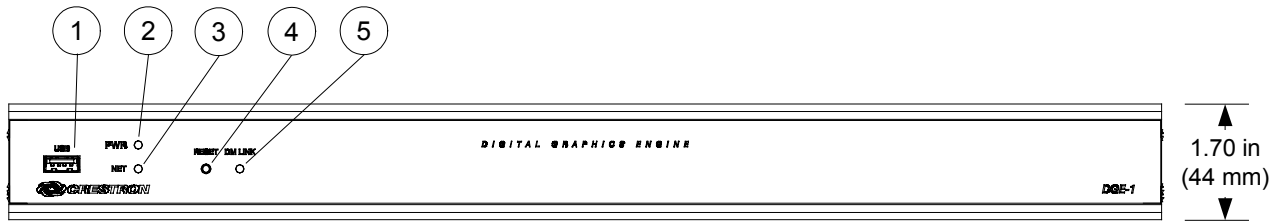
DGE-1 Physical View (Front View)



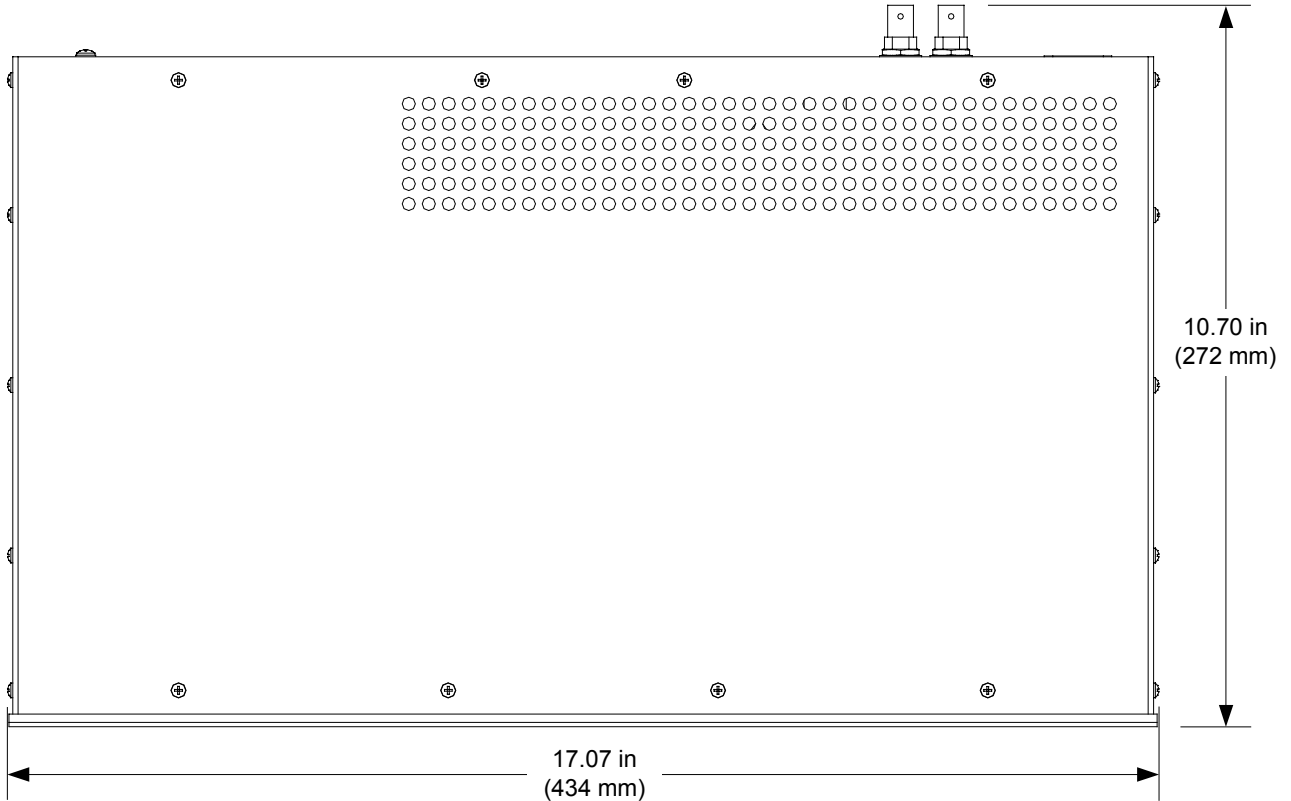
DGE-1 Physical View (Rear View)



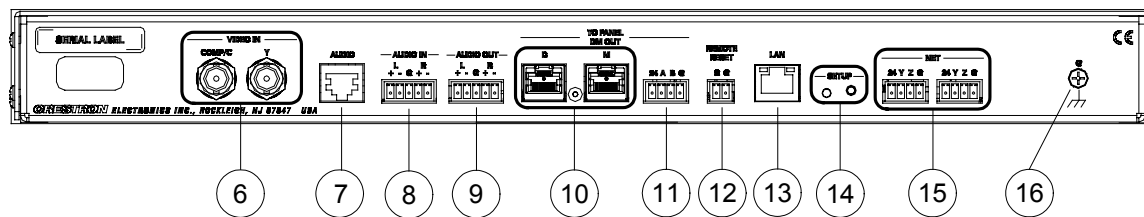
DGE-1 Overall Dimensions (Front View)




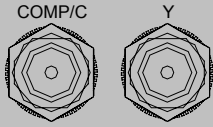
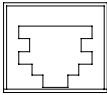
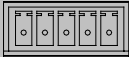

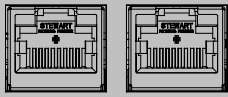
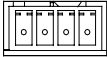
DGE-1 Overall Dimensions (Top View)



DGE-1 Overall Dimensions (Rear View)


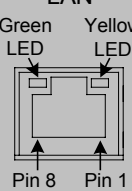




Connectors, Controls & Indicators

#	CONNECTORS ¹ , CONTROLS & INDICATORS	DESCRIPTION
1	<p>USB</p> 	(1) USB Type A female; USB 2.0 host port for connection of a USB HID compliant mouse/keyboard or USB flash drive ²
2	PWR LED	(1) Green LED, indicates DC power supplied from Cresnet control network
3	NET LED	(1) Amber LED, indicates communication with Cresnet system
4	RESET	(1) Recessed miniature push button, resets the DGE-1
5	DM LINK LED	(1) Green LED, indicates connection to a V-Panel
6	<p>VIDEO IN</p> <p>COMP/C Y</p> 	(1) Auto-sensing analog video input comprised of (2) BNC female; Signal types: S-video (Y/C) or composite input; Input level: 1 V _{p-p} nominal; Input impedance: 75 Ω nominal
7	<p>AUDIO</p> 	(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; Maximum length: 1000 feet (305 meters)
8	<p>AUDIO IN</p> <p>L R</p> <p>+ - G + -</p> 	(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
9	<p>AUDIO OUT</p> <p>L R</p> <p>+ - G + -</p> 	(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
10	<p>TO PANEL, DM OUT</p> <p>D & M³</p> <p>D M</p> 	(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 ^{4, 5}
11	<p>TO PANEL, DM OUT</p> <p>24 A B G⁶</p> <p>24 A B G</p> 	(1) 4-pin 3.5 mm detachable terminal block, DMNet port; Connects to DMNet port of a V-Panel display via DB-CBL ^{4, 5}


(Continued on following page)

Connectors, Controls & Indicators (Continued)

#	CONNECTORS ¹ , CONTROLS & INDICATORS	DESCRIPTION																				
12	<p>REMOTE RESET</p> 	(1) 2-pin 3.5 mm detachable terminal block; Contact closure sensing input for hardware reset																				
13	<p>LAN</p> 	<p>(1) 8-pin RJ-45 with two LED indicators; 10BASE-T/100BASE-TX Ethernet port, Green LED indicates link status; Yellow LED indicates Ethernet activity</p> <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																			
14	<p>SETUP Button and LED</p>	(1) Recessed miniature push button and red LED for Ethernet auto-discovery and TSID																				
15	<p>NET</p> 	<p>(2) 4-pin 3.5 mm detachable terminal blocks; Cresnet slave ports, paralleled;</p> <p>24: Power (24 Volts DC) Y: Data Z: Data G: Ground</p>																				
16	<p>G</p> 	(1) 6-32 screw, chassis ground lug																				

1. Interface connectors for **AUDIO IN**, **AUDIO OUT**, **24 A B G**, **REMOTE RESET** and **NET** ports are provided with the unit.
2. 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.
3. 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

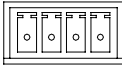


PIN #	WIRE COLOR	PIN #	WIRE COLOR
1	Orange/White	5	Blue/White
2	Orange	6	Green
3	Green/White	7	Brown/White
4	Blue	8	Brown

4. For wiring between the DGE and V-Panel, use DM-CBL DigitalMedia Cable. The maximum allowable cable length is 150 feet (45 meters).
5. DMNet wiring is not compatible with Cresnet wiring. DMNet wiring cannot be daisy chained.

6. Refer to the following table for the **24 A B G** connector pinouts.

24 A B G Port

24 A B G 			
PIN #	SIGNAL	DESCRIPTION	WIRE COLOR
24	24V DC	DC Power	Red
A	DMNet+	DMNet	White
B	DMNet-	DMNet	Blue
G	Ground	DC Ground	Black

Setup

Network Wiring

When wiring the Cresnet 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 wiring between the DGE-1 and V-Panel, use DM-CBL DigitalMedia Cable. The maximum allowable cable length is 150 feet (45 meters).

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 56.

The DGE-1 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-1 has been factory set to **03**. The Net IDs of multiple DGE-1 devices in the same system must be unique. The Net ID is set using the internal setup menu (refer to “Cresnet” on page 17). Net ID may also be set from a personal computer (PC) via Crestron Toolbox™ (refer to “Establishing Communication” on page 51).

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-1'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-1 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-1. Refer to "Hardware Hookup" which starts on page 39 for details.

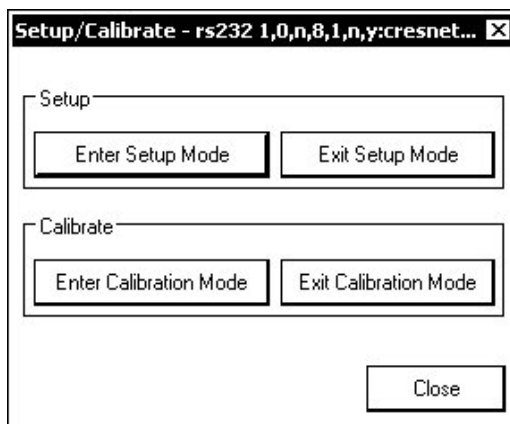
The DGE-1 and V-Panel are configured from the setup menu.

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 51 for details).
 - b. Right-click on the device and select **Functions | Setup Mode....**

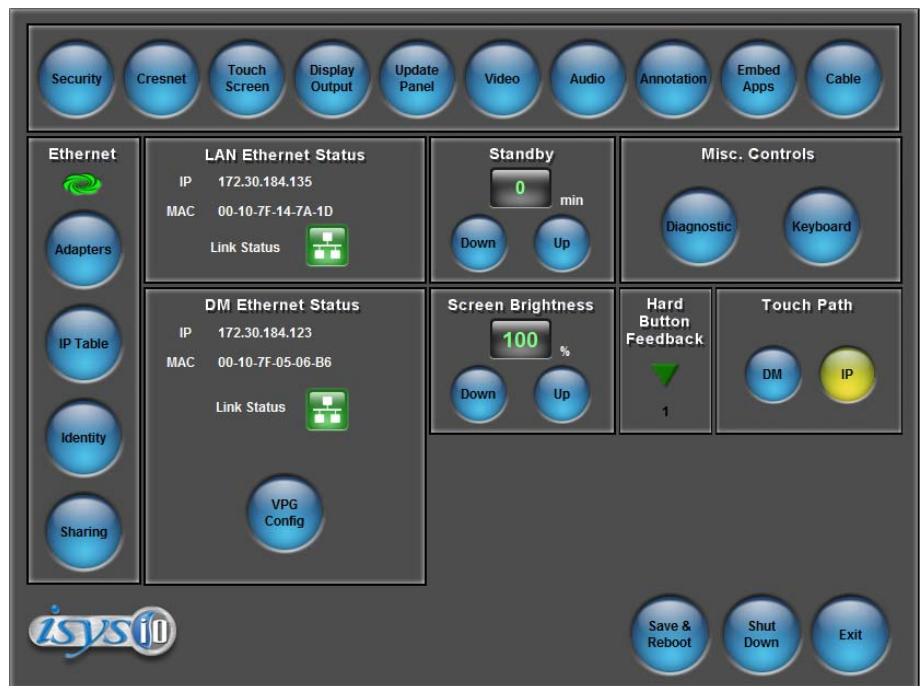
"Setup/Calibrate" Window



- 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-1/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*, *DM Ethernet Status*, *Screen Brightness*, *Hard Button Feedback* and *Touch Path* sections. There are also buttons for **Save & Reboot**, **Shut Down** and **Exit**.

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, annotation, embedded applications and diagnostics. The setup menu also has a button that toggles the on-screen keyboard on and off.

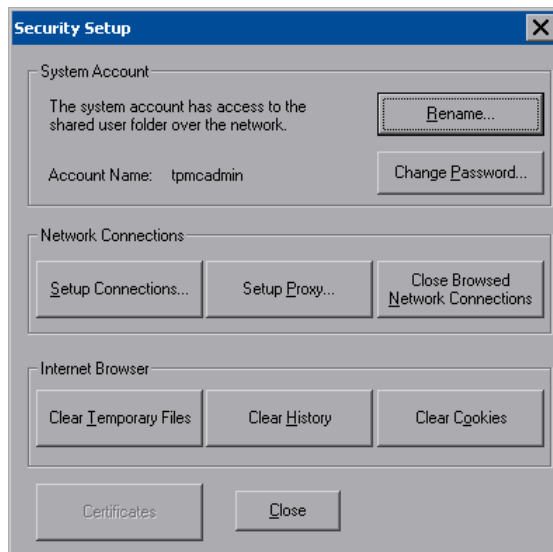
NOTE: When in *Annotation* mode, the setup menu is still available but all setup windows are disabled (i.e., setup windows can not be opened via a digital join). For more information about *Annotation* mode, refer to "About Annotation Mode" in the Crestron VisionTools® (VT Pro-e®) Help file.

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.

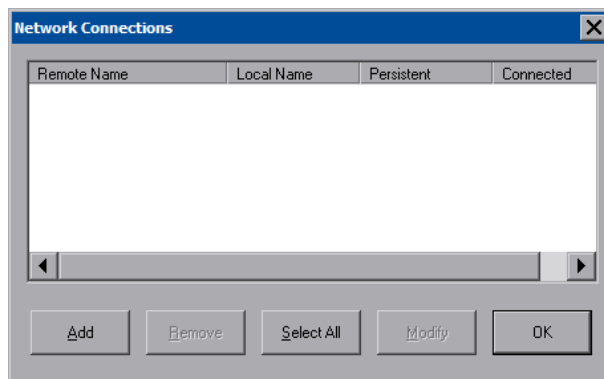
NOTE: To use the on-screen keyboard for security settings, touch **Keyboard** on the startup menu before touching **Security**.

“Security Setup” Window

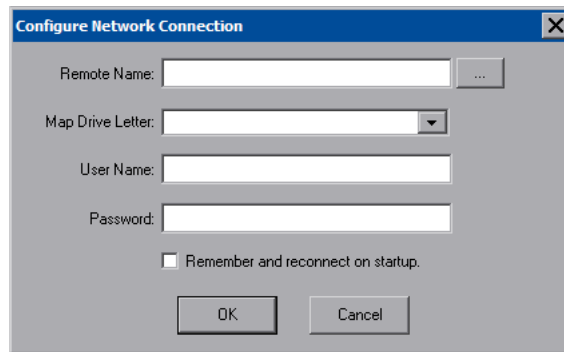


Touch **Setup Connections...** to open the “Network Connections” window. This window is used to map to a network drive. A mapped network drive permits easy access to embedded application files (Word, Excel, PowerPoint, MediaMarker, etc.) and provides a location to save files. To further customize the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


“Network Connections” Window



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

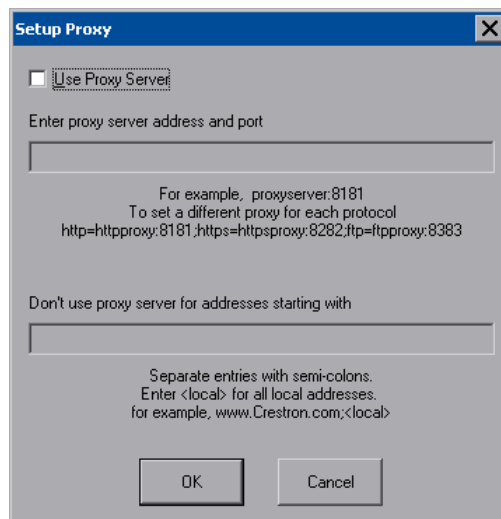
“Configure Network Connection” Window

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*.

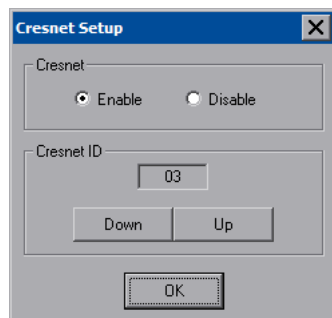
1. Enter the IP address or name of the proxy server.
2. If desired, specify addresses that should not use the proxy server (i.e., intranet addresses).

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 **Enable**.

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-1 is factory set to 03. No two devices in the same system can have the same Net ID.

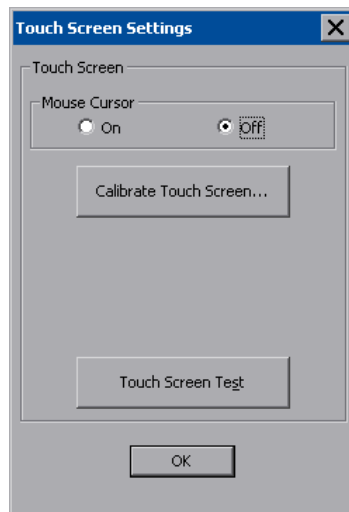
Two buttons below the hexadecimal display, **Down** and **Up**, decrease and increase the Cresnet ID by one, respectively.

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 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.

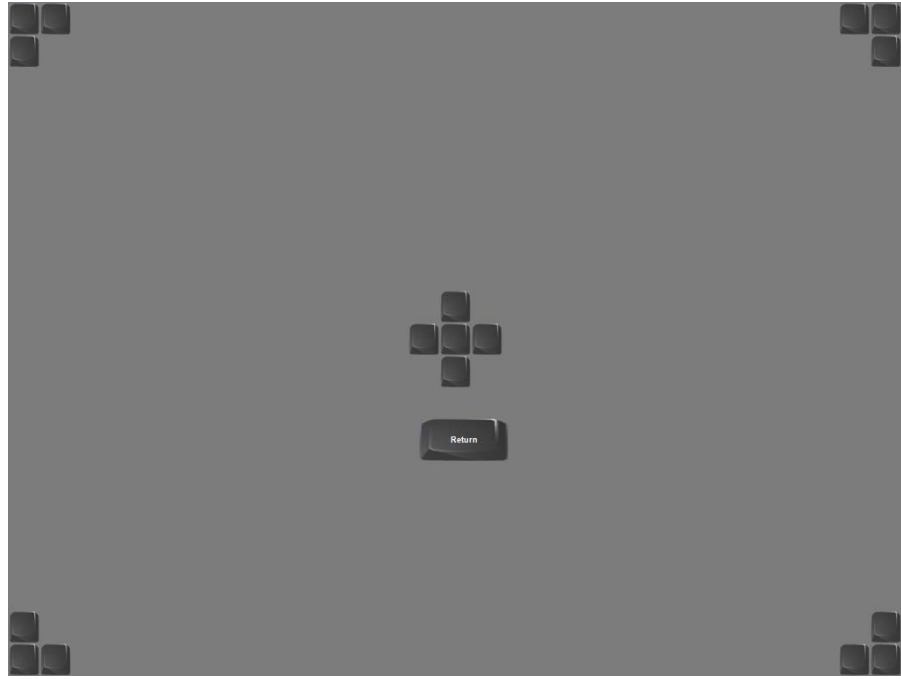
If the screen is touched before the sixty second timeout, the screen instructs the user to touch the center of each target as it appears. There is a series of crosshairs on the screen, starting near the upper left corner. Touch the center of the first crosshair to initiate calibration. As each new crosshair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

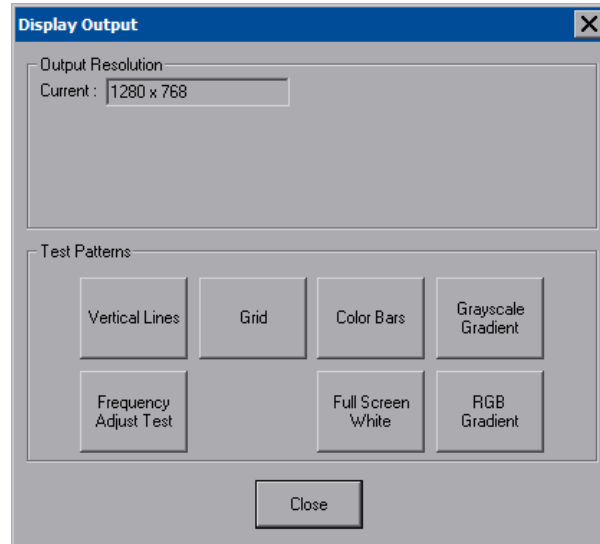
Touch Screen Test Window



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



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.

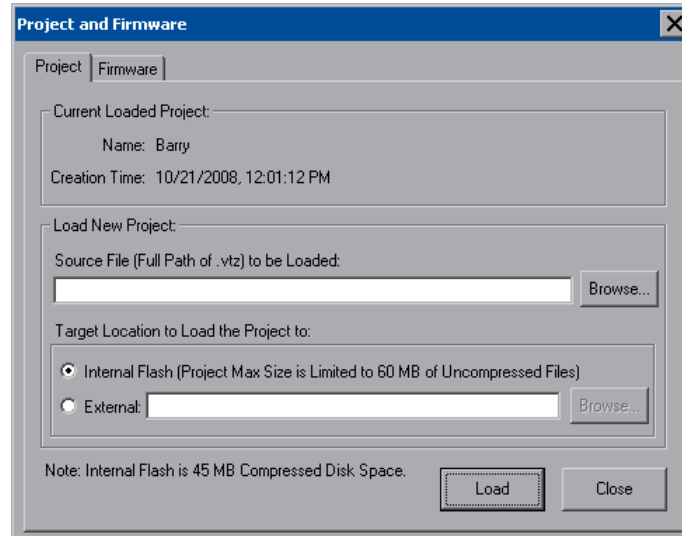
NOTE: When selecting **Browse**, the contents of the “Recent” folder is not available.

NOTE: Projects can also be loaded via Crestron Toolbox.

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

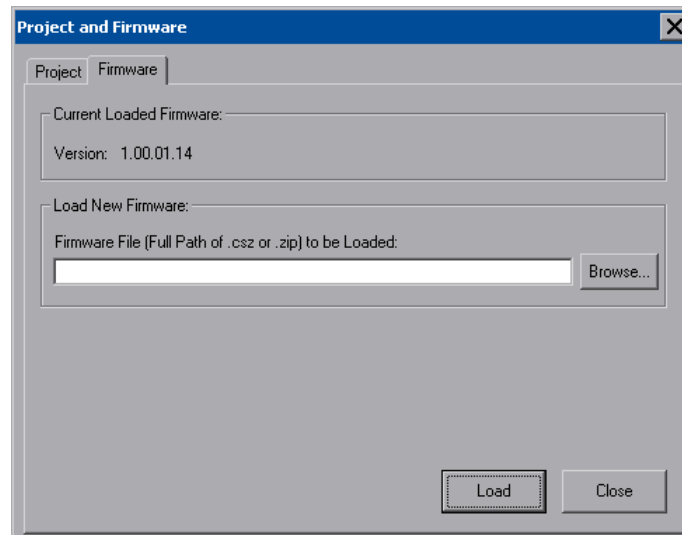
NOTE: When loading a project to an external storage device (e.g. MMC card or flash drive), a subdirectory, not the root, must be used as the working path. Otherwise, the upload may fail.

“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.

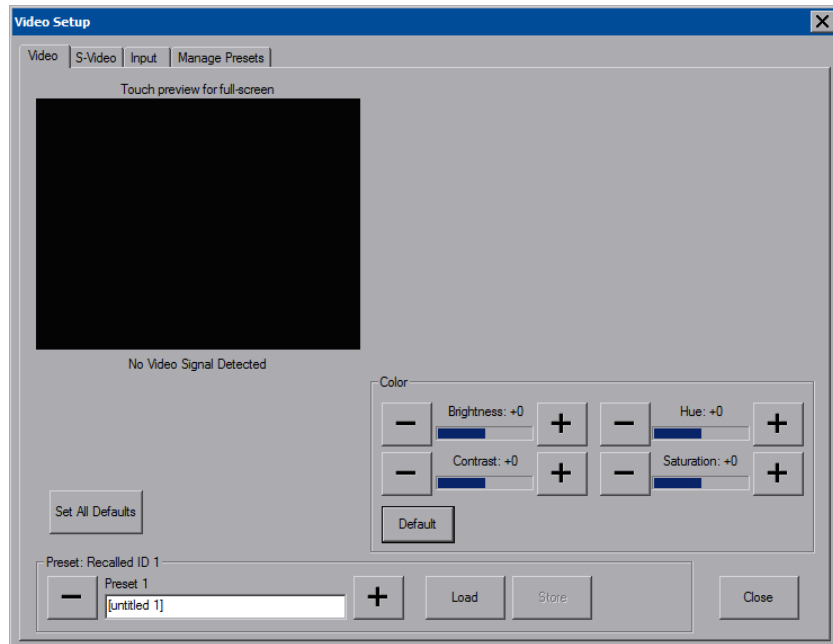
Video

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 as displayed in the following illustration. Changes are made in real time.

“Video Setup” Window (Video Tab)



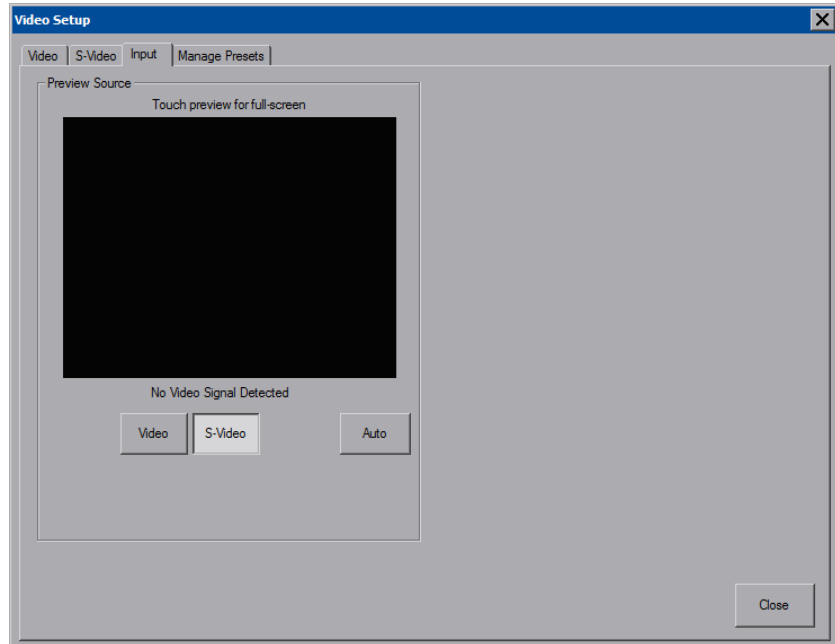
Video is setup using the *Color* controls. Up to 30 presets may be stored for future retrieval.

The *S-Video* tab provides the same controls for S-video inputs.

Input

The *Input* tab of the “Video Setup” window provides previews for the video and S-video inputs.

“Video Setup” Window (*Input Tab*)

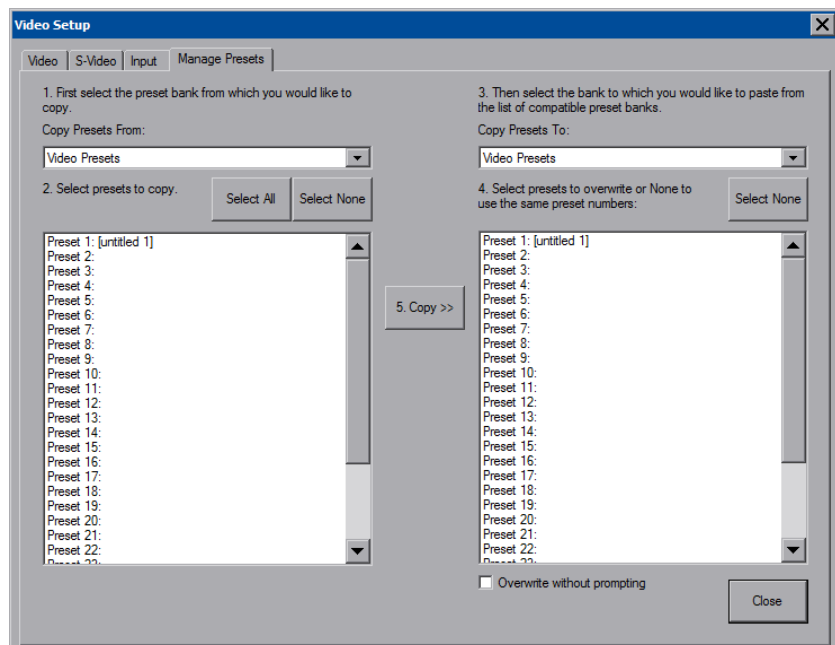


The **Auto** button can be used to auto detect video when a single video source (per input) is connected.

Manage Presets

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

“Video Setup” Window (*Manage Presets Tab*)



Audio

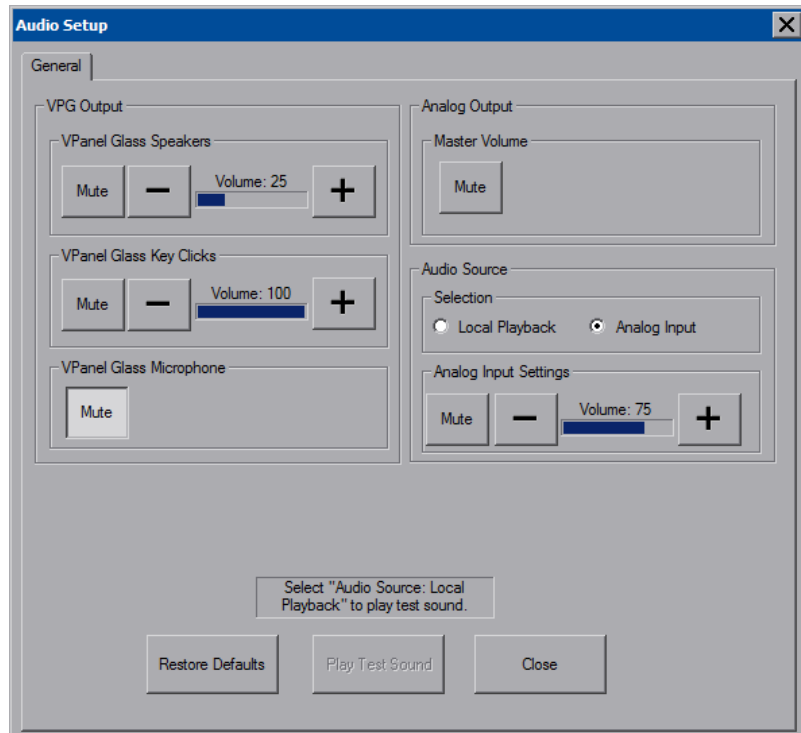
Touch **Audio** to open the “Audio Setup” window, shown in the illustration below.

Volume controls and **Mute** buttons are available for the *VPanel Glass Speakers* and *VPanel Glass Key Click*, as well as a **Mute** button for the *VPanel Glass Microphone*. A **Mute** button is provided for the Master Volume, and there are volume controls and a **Mute** button for the analog inputs.

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

Changes to audio settings are made in real time.

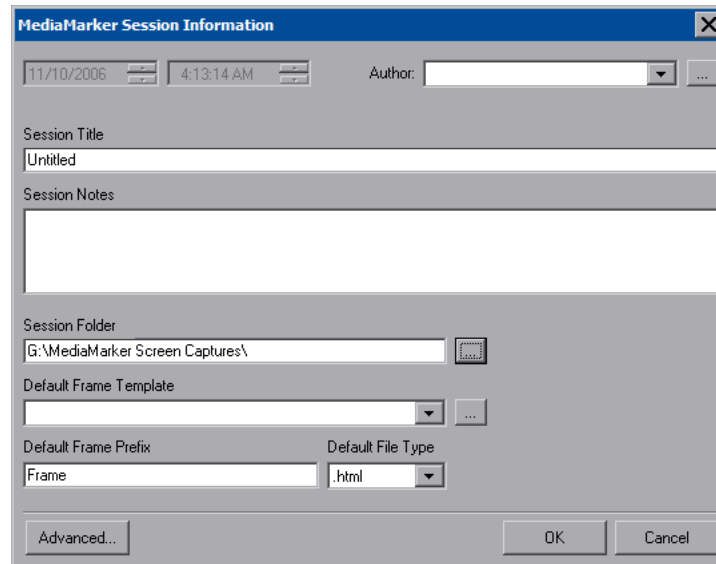
“Audio Setup” Window



Annotation

The **Annotation** button displays the “MediaMarker Session Information” window.

“MediaMarker Session Information” Window



The “MediaMarker Session Information” window allows the date, time, author name, session title and session notes to be stored for the current frame. The *Author* dropdown list box contains all the authors available on the system. Authors can be added and removed from the **Edit | Preferences | Authors** menu within MediaMarker, or by touching .

The *Session Folder* browse button permits searching other folders. A flash memory card, a network drive or a USB drive can be selected.

The *Default Frame Template* browse button permits searching for templates. For Crestron provided templates, choose from the pulldown list.

Frames created during the annotation session use a default annotation template file, frame prefix and frame output file type.

Each new frame title contains the frame prefix followed by a sequential frame number.

The frame template serves as a starting point for each new frame. Crestron supplies some ready-made templates or the user can select one of their own.

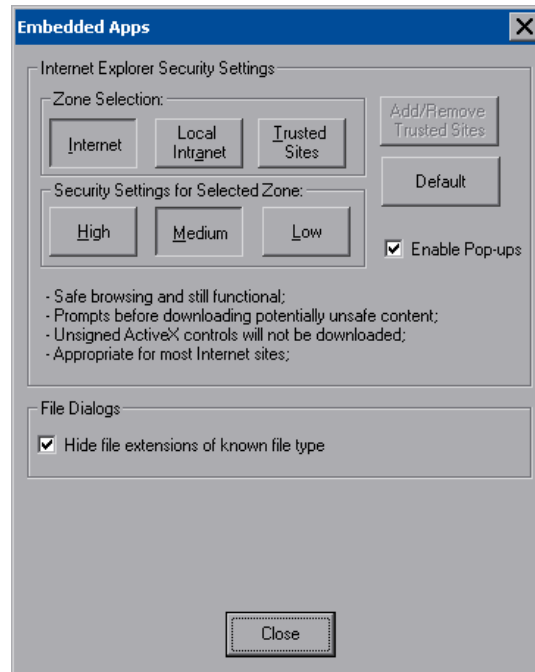
Screen captures can automatically save the contents of the current annotation frame to an image file. The file is saved as the *Default File Type* (.html, .jpg, .bmp, .png or .tif) as specified in the session folder.

For additional information, refer to “MediaMarker” on page 53 and the help file included with the MediaMarker software.

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**.

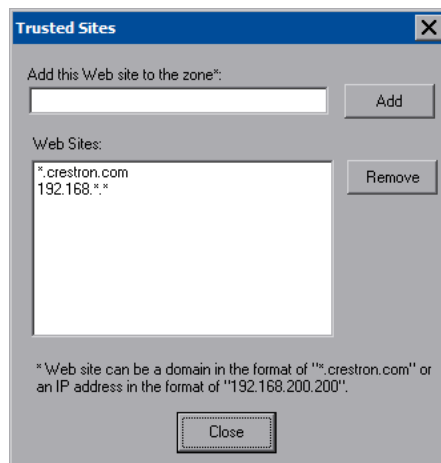
The “Embedded Apps” window also permits enabling the popup windows (child windows) that open when in Internet Explorer (not the popup windows of the embedded applications).

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-1/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-1/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.

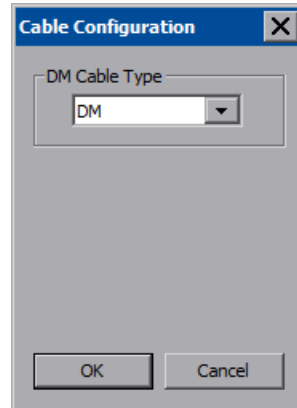
NOTE: When using the embedded applications, only one document window can be open at a time. Opening a second document window causes the first document window to close.

NOTE: For NetMeeting to work properly, the *Enable full-duplex audio so I can speak while receiving audio* option needs to be de-selected (i.e., unchecked) in the *Audio* tab of the “Options” window. The window can be accessed by selecting **Tools | Options**. This needs to be done for NetMeeting each time the touch screen is rebooted.

Cable


Touch **Cable** to open the “Cable Configuration” window which permits selection of the *DM Cable Type*. Options are *DM*, *Cat6* and *Cat5e*.

“Cable Configuration” Window



ETHERNET Details

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

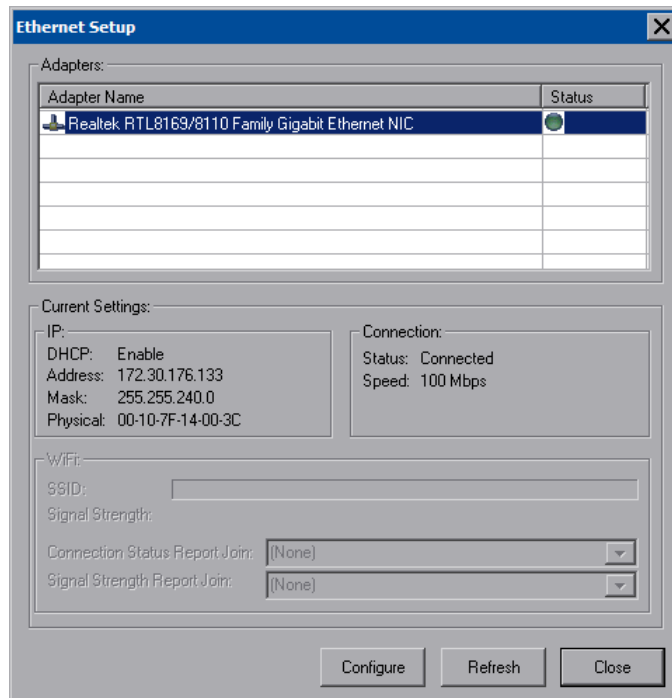
The Crestron Swirl logo  at the top of the Ethernet portion of the setup menu illuminates to indicate the status of the connection to the control system(s):

- 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.

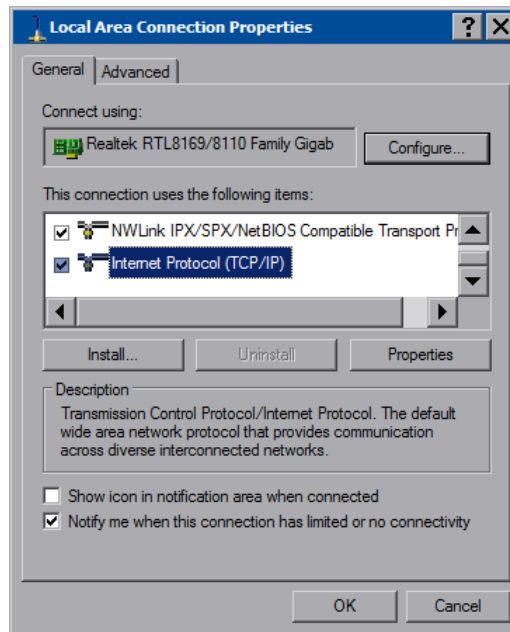
Adapters

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.

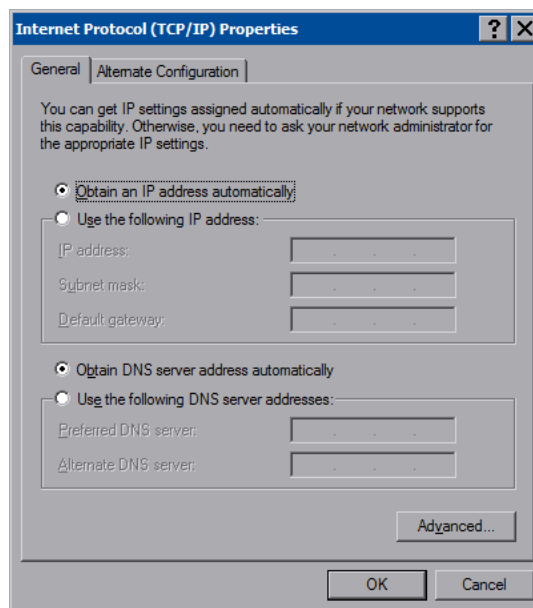
“Ethernet Setup” Window

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-1 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: [dropdown] Type: [dropdown] IP Address or Hostname: [text] Dev ID (JNR) *: [dropdown] Port (41794)*: [text]

[Update Selected] [Remove] [Add]

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

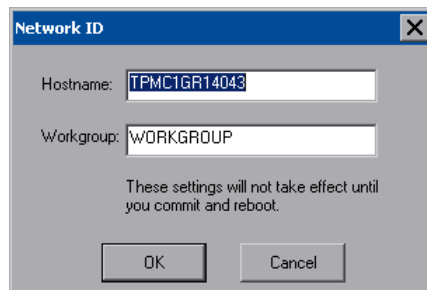
Autodiscovery [OK]

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

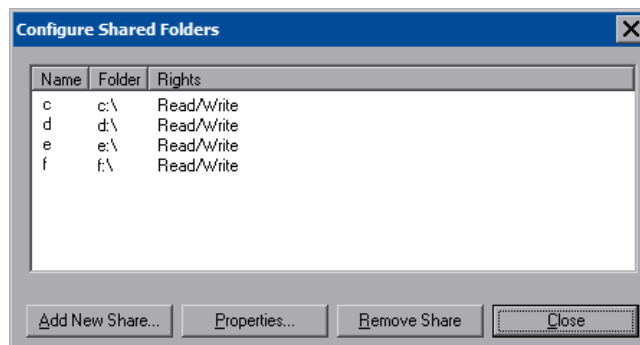


NOTE: The hostname is required for Ethernet communication.

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 touch 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.

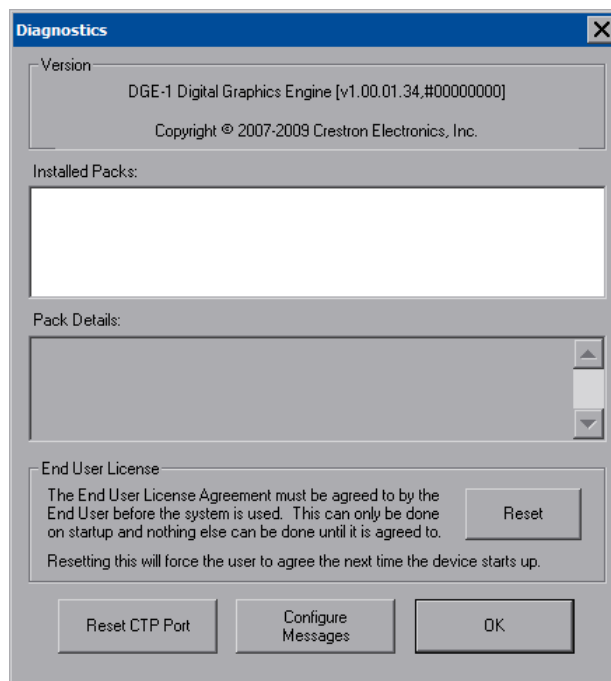
Misc. Controls Details

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

Diagnostics

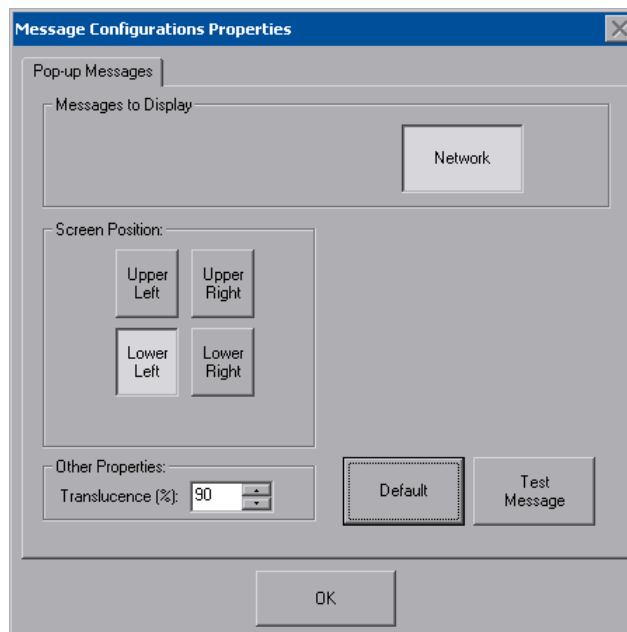
Touch **Diagnostic** to display the firmware version number, see *Installed Packs* and to reset the end user license from the “Diagnostics” window.

“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.

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



Volume down



Volume up



Right click: simulates right-click of mouse



Size: toggles on-screen keyboard size (small, medium, large)

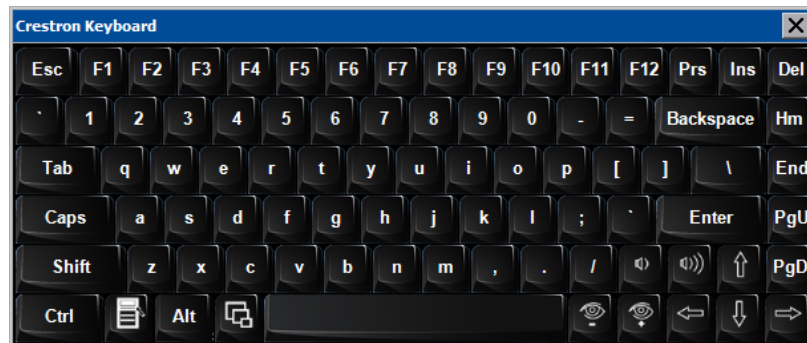


Keyboard translucence down: decreases keyboard translucence



Keyboard translucence up: increases keyboard translucence

On-Screen 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 remain 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 “X” 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 it to exit the keyboard.

DM Ethernet Status Details

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

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

“V-Panel Ethernet Configuration” Window

The screenshot shows a configuration window titled "V-Panel Ethernet Configuration". It has a blue header bar with a close button (X). The main area is light gray and contains four text input fields stacked vertically. The first field is labeled "IP Address:" and contains "172 . 30 . 184 . 123". The second is "IP Mask:" with "255 . 255 . 240 . 0". The third is "Default Router:" with "172 . 30 . 176 . 1". The fourth is "MAC Address:" with "00-10-7F-05-06-B6". Below these fields is a section titled "DHCP On/Off" containing two radio buttons: "DHCP ON" (which is selected) and "DHCP OFF". At the bottom of the window are two buttons: "Cancel" on the left and "OK" on the right.

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

Screen Brightness Details

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

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

Touch Path

The *Touch Path* indicators show whether data from the V-Panel is sent to the DGE-1 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-1 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-1 can be mounted in a rack or stacked with other equipment. Two “ears” are provided with the DGE-1 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:

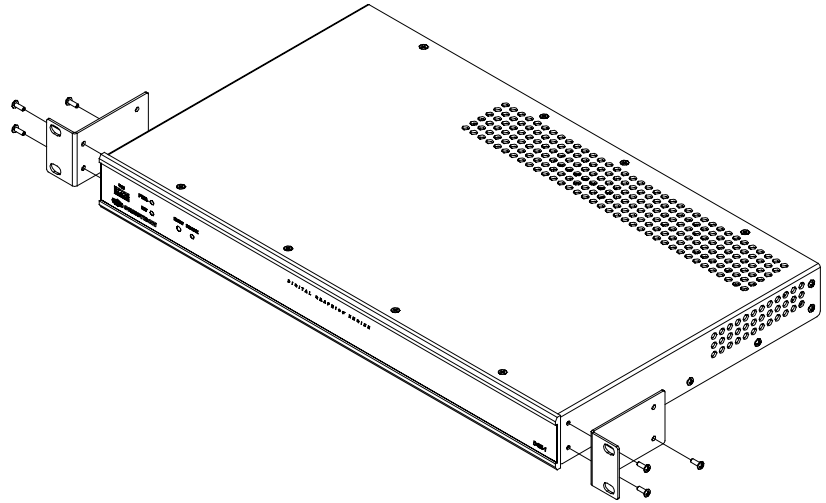
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

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:

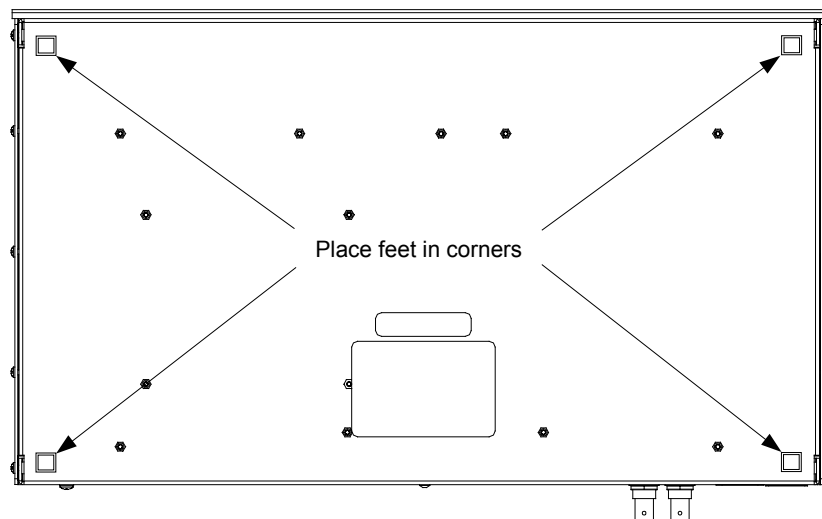
1. There are screws that secure each side of the DGE-1 top cover. Using a #1 or #2 Phillips screwdriver, remove the three screws closest to the front panel from one side of the unit. Refer to the illustration following step 3 for a detailed view.
2. Position a rack ear so that its mounting holes align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

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-1 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-1

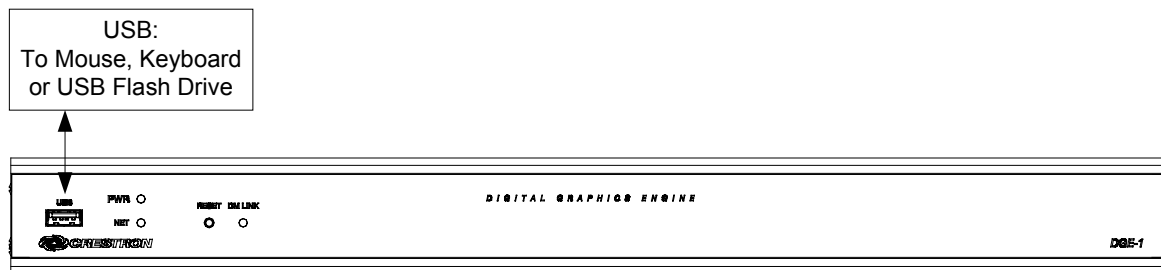
NOTE: No more than two DGE-1 units should be stacked.

Hardware Hookup

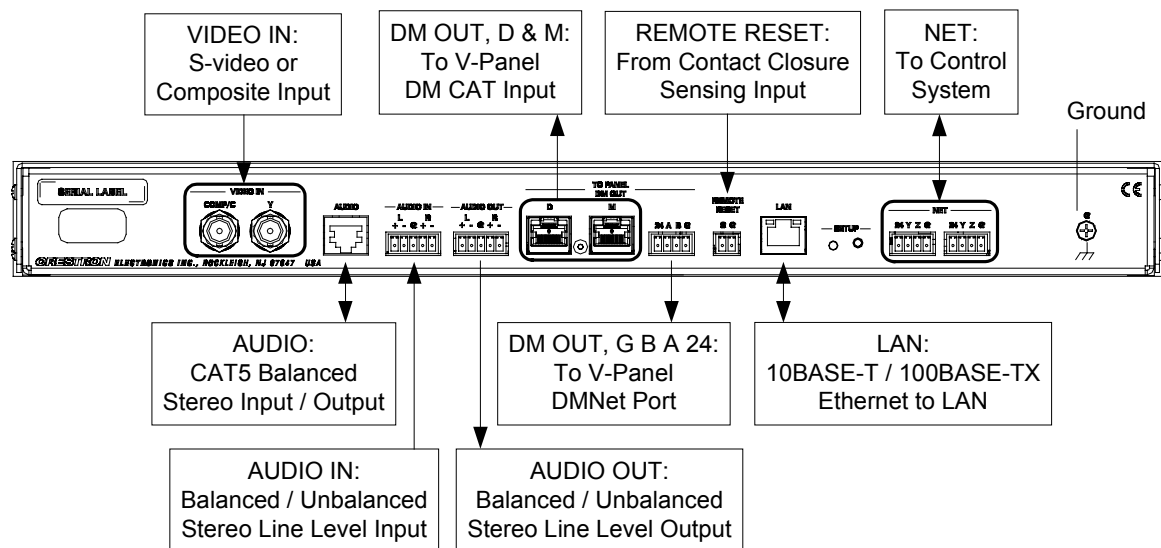
Make the necessary connections as called out in the illustration that follows this paragraph. Refer to “Network Wiring” on page 12 before attaching the 4-position terminal block connector. Apply power after all connections have been made.

When making connections to the DGE-1, use Crestron power supplies for Crestron equipment.

Hardware Connections for the DGE-1 (Front View)



Hardware Connections for the DGE-1 (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 allowable cable length is 150 feet (45 meters).

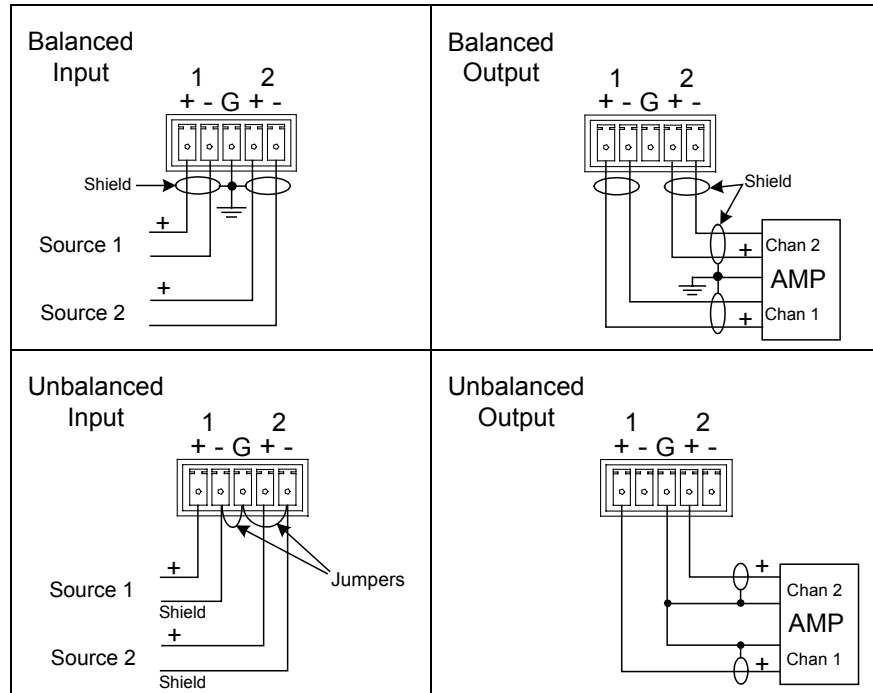
NOTE: For audio connections, use either the RJ-45 **AUDIO** connector or the 5-pin **AUDIO IN** and **AUDIO OUT** connectors but not both.

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

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 customized system. Use SystemBuilder™ or SIMPL Windows to create a program to control the DGE-1

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

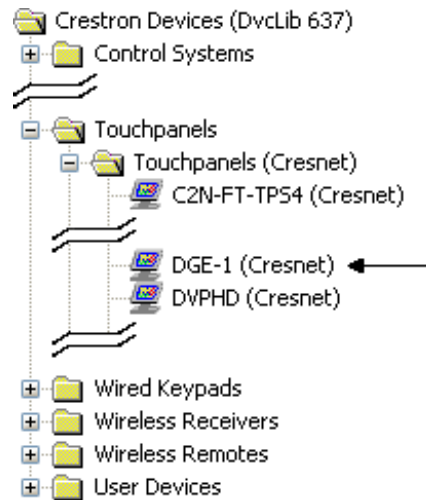
NOTE: While SIMPL Windows can be used to program the DGE-1, it is recommended to use SystemBuilder for configuring a system.

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.

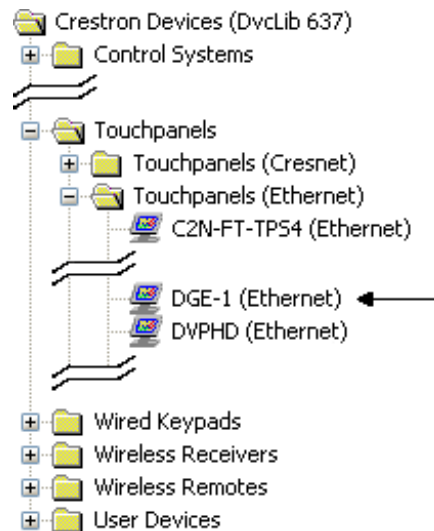
Configuration Manager

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

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

Locating the DGE-1 (Cresnet) in the Device Library

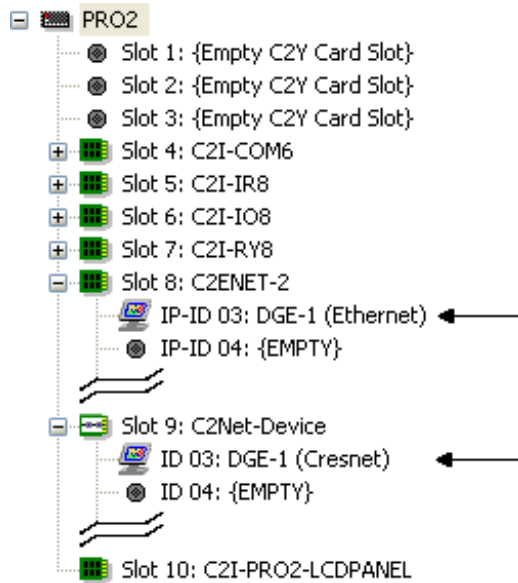
- b. To incorporate the DGE-1 (Ethernet) into the system, drag the DGE-1 from the Touchpanels | Touchpanels (Ethernet) folder of the *Device Library* and drop it in the *System Views*.

Locating the DGE-1 (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.

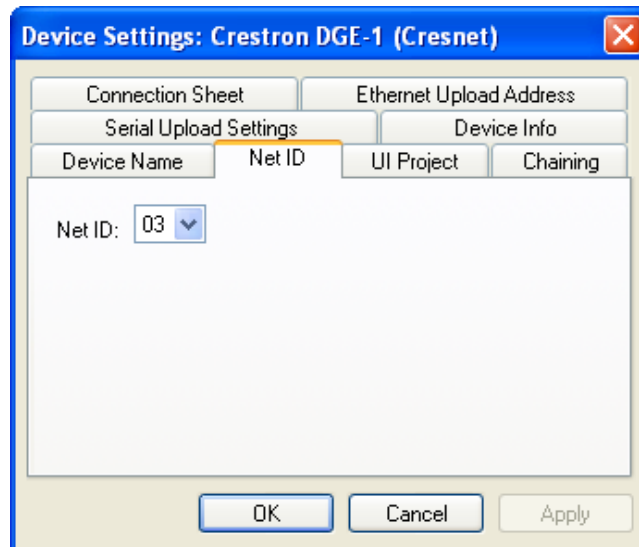
NOTE: In the following illustration, there is both an Ethernet device in Slot 8 and a Cresnet device in Slot 9. It is possible to have both types of device attached to a control system as long as the control system has either a built-in or expansion Ethernet interface.

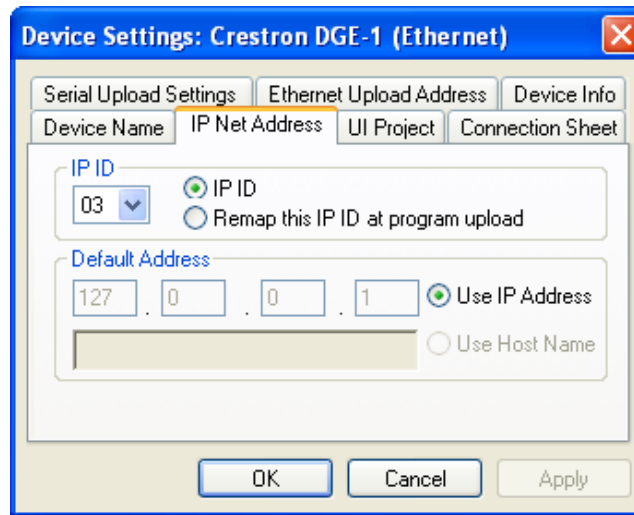
C2ENET-2 and C2Net Devices, Slot 8 and 9



2. If additional DGE-1 devices are to be added, repeat step 1 for each device. Each DGE-1 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-1 (Cresnet)” Window



“Device Settings: Crestron DGE-1 (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 12.

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

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-1 in a room control system.

Multi-Mode Objects

Multi-mode objects offer high-performance programming!

The single most advanced VT Pro-e high performance programming technique involving the DGE-1 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-1 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-1 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-1 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 screen s, 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

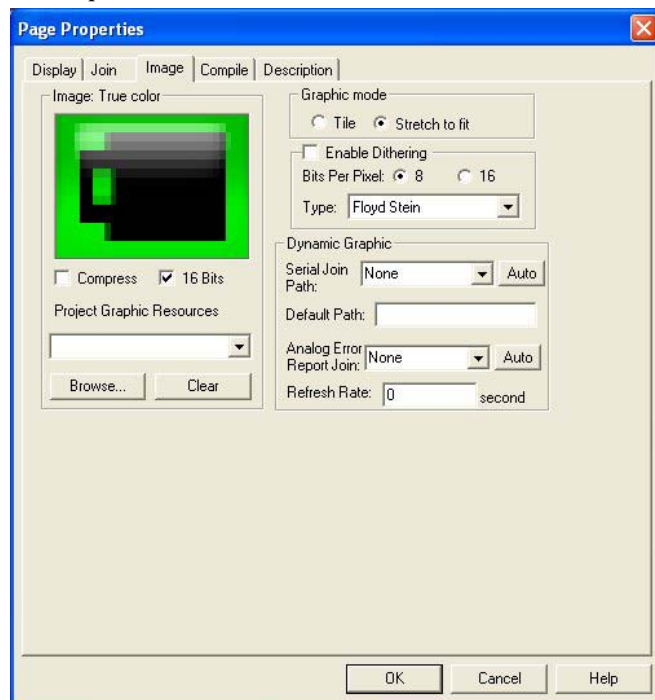
NUMBER OF BITS	NUMBER OF COLORS
1 bit	Black and White
2 bits	4 Colors
4 bits	16 Colors
8 bits	256 Colors
16 bits	65,536 Colors (Highcolor)
24 bits	16.7 million Colors (Truecolor)
32 bits	16.7 million Colors plus Transparency

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.

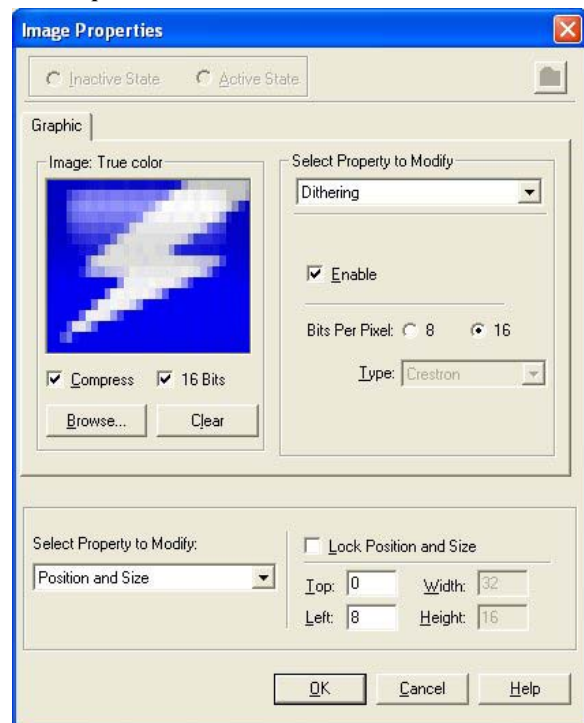
In VT Pro-e, the **Compress** checkbox permits the image to be compressed when compiling. The **16 Bits** checkbox converts a 24-bit or 32-bit image to 16 bits. This conversion to a 16-bit image may cause the loss of some subtle shading. To compensate for this, use the dithering to simulate the original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

Embedded Applications

NOTE: Installations and downloads from within embedded applications are not supported by the DGE-1.

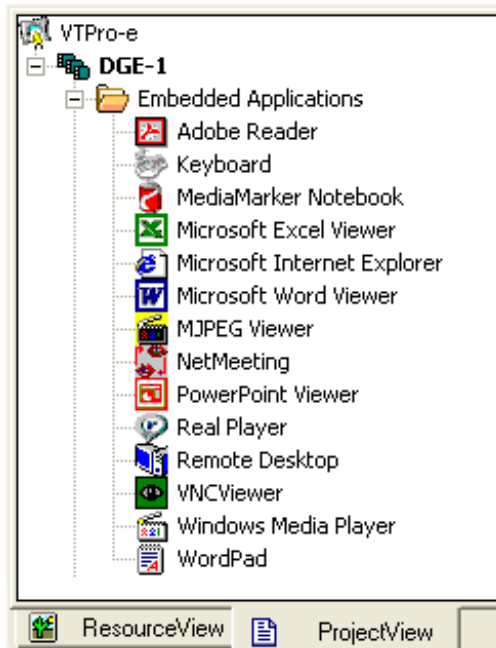
A number of third-party or in-house applications are embedded in a VT Pro-e DGE-1/V-Panel project. (Refer to illustration on the following page.)

- Adobe Reader
- Keyboard
- MediaMarker Notebook
- Microsoft Excel Viewer
- Microsoft Internet Explorer
- Microsoft Word Viewer
- MJPEG Viewer
- NetMeeting
- PowerPoint Viewer
- Real Player
- 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-1/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



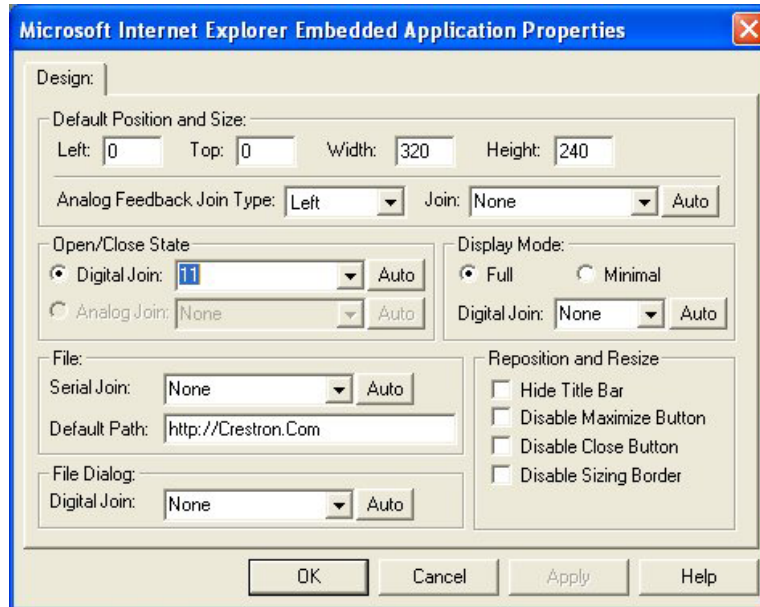
Right-click on any of the applications in the *Project View* and select **Properties** to open the “Embedded Application Properties” window (refer to the illustration on the following page). This window permits a choice of positions on the screen, assignment of an analog touch join type and number and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

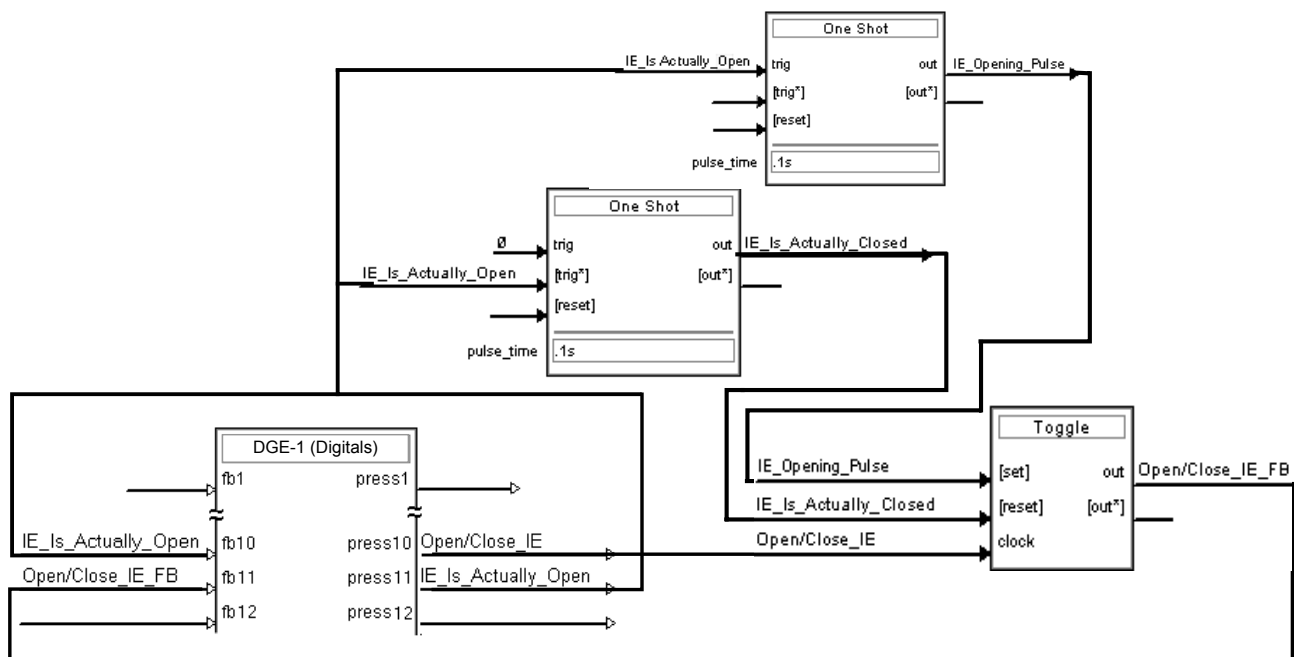
Edit the *Default Position and Size* in the “Embedded Application Properties” window to point to the new location.

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.

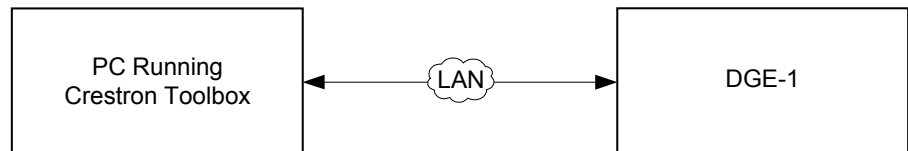
Uploading and Upgrading

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-1; refer to the Crestron Toolbox help file for details. There is a single method of communication: TCP/IP communication.

Ethernet Communication



The DGE-1 connects to PC via Ethernet:

1. Confirm Ethernet connection between DGE-1 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-1 with the DGE-1's TCP/IP communication parameters.
4. Display the "System Info" window (click the **i** icon) and select the DGE-1 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-1 firmware via Crestron Toolbox.

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

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


Program Checks

Actions that can be performed on the DGE-1 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-1 to display actions that can be performed on the DGE-1.

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-1.

Be sure to use Crestron Toolbox to create the DGE-1 IP table.

1. Select **Functions | IP Table Setup**.
2. Add, modify or delete entries in the IP table. The DGE-1 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-1. The entry should list the DGE-1’s IP ID (specified on the DGE-1’s IP table) and the internal gateway IP address 127.0.0.1.

Restore

The `restore` console command restores the DGE-1 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

MediaMarker

Crestron's MediaMarker software is used to create, organize and save presentations. A presenter can devise an entire lecture or demonstration and save it to the notebook. At the presenter's discretion, the audience may view the presentation complete with annotation in real-time.

MediaMarker can be used with the DGE-1/V-Panel or on a personal computer.

In addition to containing the tools required for object creation, MediaMarker can import graphics and text from many other applications. Importable objects include: html, jpg, bmp, png and tif.

MediaMarker projects can be saved to and retrieved from a disk or a "notebook" (Export and Import functions in the **File** menu).

File | Export Project – Archives the project into one file.

File | Import Project – Opens and extracts all files from a previously exported project into an active folder.

NOTE: When saving a project, the background images are stored as external graphic files. The graphic file type (html, jpg, bmp, png and tif) can be set within **Edit | Preferences | Application Settings**.

Additional information is available in the MediaMarker help file.

Security Infrastructure

Since the DGE-1 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-1 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-1, so email-based viruses cannot be executed.
5. Viruses that attack Web/FTP servers
The DGE-1 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-1 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-1.
7. ActiveX and Java
The DGE-1 has ActiveX disabled and has no Java Virtual Machine installed. These applets cannot run on the DGE-1.

NOTE: While browsing the Internet with the DGE-1, 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 26) 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-1 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 18.)
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" on page 22.)
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 18.)

(Continued on following page)

DGE-1 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 22.)
	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

In order 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. Use the Crestron Power Calculator to help calculate how much power is needed for the system (www.crestron.com/calculators).

When calculating the length of wire for a particular Cresnet run, the wire gauge and the Cresnet power usage of each network unit to be connected must be taken into consideration. Use Crestron Certified Wire only. If Cresnet units are to be daisy chained on the run, the Cresnet power usage of each network unit to be daisy chained must be added together to determine the Cresnet power usage of the entire chain. If the unit is home-run from a Crestron system power supply network port, the Cresnet power usage of that unit is the Cresnet power usage of the entire run. The

wire gauge and the Cresnet power usage of the run should be used in the following equation to calculate the cable length value on the equation's left side.

Cable Length Equation

$$L < \frac{40,000}{R \times P}$$

Where: L = Length of run (or chain) in feet
 R = 6 Ohms (Crestron Certified Wire: 18 AWG (0.75 mm²))
 or 1.6 Ohms (Cresnet HP: 12 AWG (4 mm²))
 P = Cresnet power usage of entire run (or chain)

Make sure the cable length value is less than the value calculated on the right side of the equation. For example, a Cresnet run using 18 AWG Crestron Certified Wire and drawing 20 watts should not have a length of run more than 333 feet (101 meters). If Cresnet HP is used for the same run, its length could extend to 1250 feet (381 meters).

NOTE: All Crestron certified Cresnet 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 Y conductor and the Z conductor.

Strip and Tin Wire

When daisy chaining Cresnet units, strip the ends of the wires carefully to avoid nicking the conductors. Twist together the ends of the wires that share a pin on the network connector and tin the twisted connection. Apply solder only to the ends of the twisted wires. Avoid tinning too far up the wires or the end becomes brittle. Insert the tinned connection into the Cresnet connector and tighten the retaining screw. Repeat the procedure for the other three conductors.

Add Hubs

Use of a Cresnet Hub/Repeater (CNXHUB) is advised whenever the number of Cresnet devices on a network exceeds 20 or when the combined total length of Cresnet cable exceeds 3000 feet (914 meters).

Reference Documents

The latest version of all documents mentioned within the guide can be obtained from the Crestron Web site (www.crestron.com/manuals).

List of Related Reference Documents

DOCUMENT TITLE
2-Series Control Systems Reference Guide
Crestron e-Control Reference Guide

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-1, 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.

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