Crestron **MTX-3**
Isys™ 2.8” Handheld Wireless Touchpanel
Featuring infiNET EX® Technology
Operations Guide

CRESTRON®

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

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Regulatory Compliance

As of the date of manufacture, the MTX-3 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

Operation is subject to the following two conditions:

1. This device may not cause interference, and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

To satisfy RF exposure requirements, this device and its antenna must operate with a separation distance of at least 20 centimeters from all persons and must not be colocated or operating in conjunction with any other antenna or transmitter.

Contents

Isys™ 2.8” Handheld Wireless Touchpanel Featuring infiNET EX® Technology: MTX-3

Introduction

The MTX-3 Isys™ Handheld Wireless Touchpanel from Crestron® delivers an exceptional remote control for home theater and AV presentation, marrying style and ergonomics with rock solid wireless performance and customizability. Its sleek form factor is easy to hold, with large tactile pushbuttons, electroluminescent backlighting and a fully customizable touchscreen for a wireless control solution that is both intuitive and fun to use.

Featuring two-way wireless communications, the MTX-3 offers seamless interaction with AV and environmental systems, providing true feedback for all of your settings and displaying metadata for all your digital media. Whether watching TV, choosing a movie or music title, adjusting room temperature and lighting or checking the security system, the MTX-3 affords a user experience only Crestron can deliver.

Features and Functions

- Sleek and ergonomic handheld design
- Elegant gloss black finish
- Instant-Waking™ behavior
- Works like an IR remote - with all the benefits of 2-way RF
- Ultra-reliable infiNET EX® wireless communications
- 75 feet (23 meters) RF range (typical)
- Easy range extension using infiNET EX expanders
- Built-in speaker for customizable WAV file audio feedback
- Widely spaced tactile pushbuttons
- White EL backlit button text
- 2.8” (72 mm) active matrix color touchscreen display
- High display brightness and contrast
- Wide 150 degree viewing angle
- Customizable 16-bit color graphics
- 240 x 320 resolution
- Dynamic text capability
- Programmable via SystemBuilder™ and Adagio® Composer software
- Long lasting lithium polymer rechargeable battery pack
- Low profile tabletop docking station included

infiNET EX® Wireless Technology

Crestron's groundbreaking infiNET EX wireless technology provides ultra-reliable two-way communications throughout a residence or commercial structure utilizing a 2.4 GHz mesh network. A complete infiNET EX network uses the lighting dimmers and other devices throughout the structure as wireless relay stations, each receiving and passing on wireless commands to the central gateway. Each device that is added to the network effectively increases the range, strength and reliability of the entire network by providing redundant signal paths, ensuring that every button press is executed instantly and consistently.

Of course, the MTX-3 can also communicate directly with the gateway if no other infiNET EX devices are installed. Up to six MTX-3s can be assigned to a single gateway. Wireless range for each MTX-3 is 75 feet (23 meters) typical indoors, which can easily be extended using infiNET EX Expanders*.

Instant-Waking™

To ensure the most transparent user experience possible, the MTX-3 has been engineered to wake instantly at the press of a button or touch of the touchscreen. Button presses are sent immediately just like an IR remote but with none of IR's limitations. So spontaneous actions like muting the audio, pausing the video or changing the channel can be executed on the fly with just a single button press.

Extended Battery Life

Instant waking also allows the MTX-3 to be put to sleep within seconds of putting it down, helping to extend its battery life for several days of typical usage on a single charge. Even under continuous use at full brightness, the MTX-3 lasts an incredible five hours. Its fast charging, field replaceable lithium polymer battery pack delivers optimum power in a very small, lightweight package.

Tactile Pushbuttons with Backlit Text

A complement of tactile pushbuttons makes for a very intuitive user interface, providing easy access to everything needed for watching TV and movies, listening to music and controlling the entire room. Large, widely spaced buttons accommodate hands and fingers of all sizes, minimizing the chance of an unintended button press. Electroluminescent backlit button text affords excellent legibility for use in a darkened room.

The pushbuttons are comprised of 17 buttons designated for the most common functions, plus a 5-way navigation pad, three context assignable "hard keys" beneath the touchscreen, a thumb operated "More" button for advancing through the available touchscreen pages and a system power button. Every button on the MTX-3 is fully programmable to allow precisely the control desired, whether simply adjusting audio volume and flipping through channels, controlling a DVR or DVD player, navigating onscreen setup menus or operating a pan/tilt camera.

* Requires CEN-RFGW-EX or equivalent infiNET EX gateway, which supports up to 100 infiNET EX network devices inclusive of up to six MTX-3 remotes. Additionally, up to five CLW-EXPEX infiNET EX Expanders may be added to the network for extended range. All gateways and expanders sold separately.

Handheld Touchpanel Control

Custom touchpanel versatility is afforded through a brilliant 2.8” (72 mm) active matrix touchscreen displaying stunning 16-bit color. Onboard graphics and dynamic text capability enable the display of all kinds of useful data, from channel preset icons, to room temperature and lighting levels, to digital media playlists complete with metadata. Full motion animations, multimode objects, PNG translucency and transition effects enhance the palette for creating GUIs that are both eye catching and easy to use.

Audio Feedback

Customized WAV files can be loaded on the MTX-3 to add dimension to its touchscreen graphics using personalized sounds, button feedback and voice prompts.

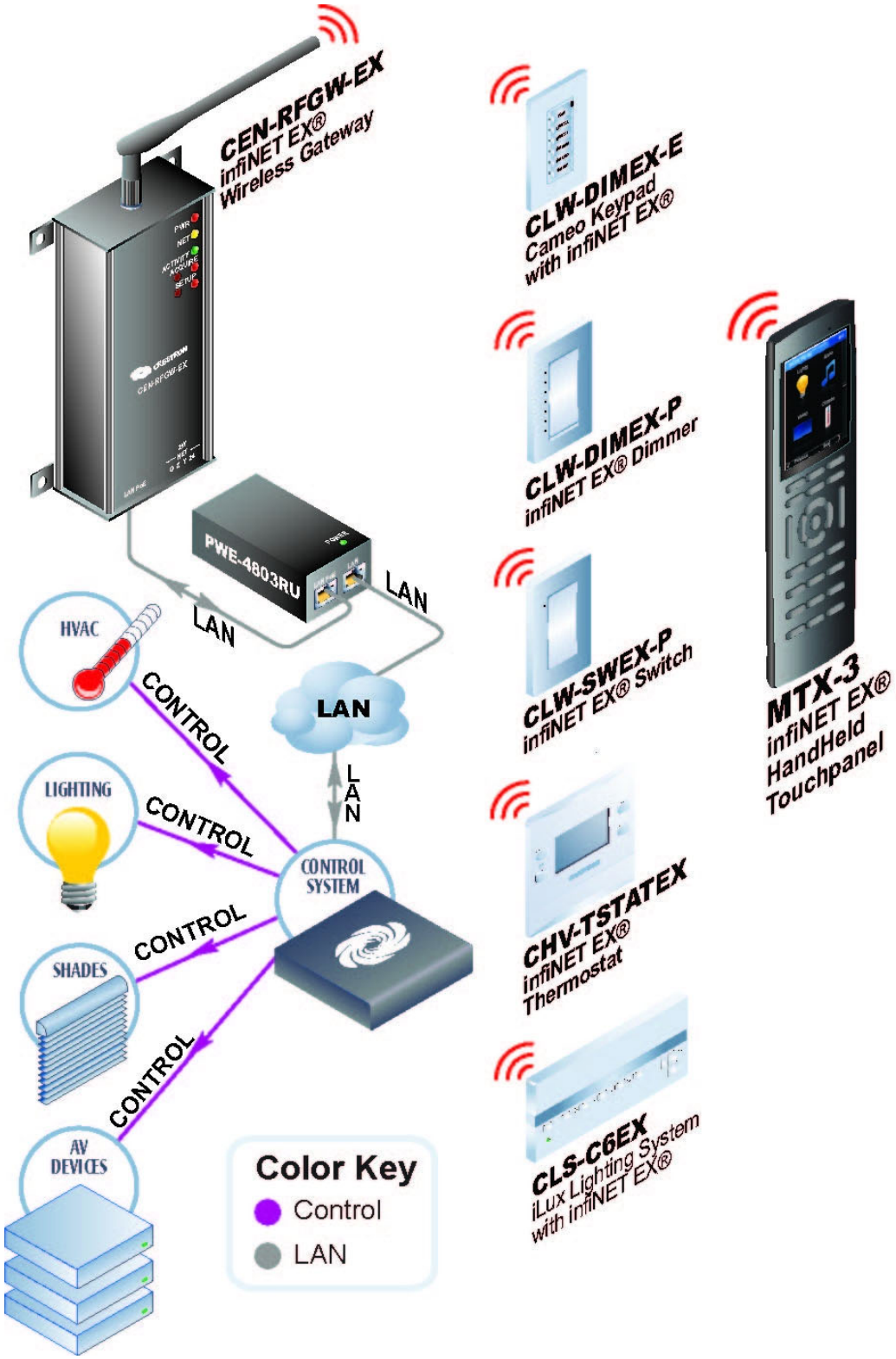
TableTop Docking Station/Charger

Placed on its stylish docking station/charger (MTX-3-DS, included), the MTX-3 sits at the ready, able to be used as a stationary tabletop controller while charging.

Applications

The following diagram illustrates a MTX-3 touchpanel in a system with other infiNET EX devices.

MTX-3 in a Simple Network



Specifications

Specifications for the MTX-3 are listed in the following table.

MTX-3 Specifications

SPECIFICATION	DETAILS
Touchscreen Display	
Display Type	Transmissive TFT active matrix color LCD
Size	2.8 inch (72 mm) diagonal
Aspect Ratio	3:4 QVGA (portrait orientation)
Resolution	240 x 320 pixels
Brightness	350 nits typical
Contrast	500:1 typical
Color Depth	16-bit, 64k colors
Viewing Angle	±75º horizontal, +75º/-55º vertical
Illumination	LED backlit
Touchscreen	Resistive membrane
Memory	
SDRAM	128 MB
Flash	256 MB
Maximum Project Size	20 MB
Graphic Engine	16-bit non-palette graphics; 65,536 colors; multi-mode objects; PNG translucency; full motion (60 fps) animation; subpage transition effects
RF Wireless	
RF Transceiver	infiNET EX two-way RF, 2.4 GHz ISM Channels 11-26 (2400 to 2483.5 MHz); IEEE 802.15.4 compliant
Range (typical)	75 feet (23 meters) to the gateway or nearest mesh network device[1], subject to site specific conditions; Range is increased by adding additional devices or CLW-EXPEX Wireless Expander (sold separately)
Gateway	Requires a CEN-RFGW-EX infiNET EX Gateway[2] (sold separately)
Audio	
Hardware Features	Built-in speaker
Audio Feedback (WAV)	8 and 16-bit PCM, mono & stereo, 8-44.1kHz sampling rates
Battery	
Battery Type	Lithium polymer, 3.7 Volt, 1000 mAh (included)
Usage per Charge	5 hours continuous at full brightness
Charging Time	2 hours
Cycle Life	>300 cycles (80% capacity)

(Continued on following page)

MTX-3 Specifications (Continued)

SPECIFICATION	DETAILS
Power Requirements[3]	
Power Pack (included)	1.2 Amps @ 5 Volts DC; 100-240 Volts AC, 50-60 Hz
Default RF ID	09
Minimum 2-Series Control System Update File[4, 5]	Version 3.155.1240 or later
Environmental	
Temperature	32º to 104º F (0º to 40º C)
Humidity	10% to 90% RH (non-condensing)
Heat Dissipation	20 BTU/Hr
Enclosure	
Construction	Injection molded plastic, integral docking station port
Dimensions	
Height	1.04 in (27 mm) 2.22 in (57 mm) docked
Width	2.55 in (65 mm) 2.99 in (76 mm) docked
Depth	7.94 in (202 mm) 7.84 in (199 mm) docked
Weight	7 oz (185 g) including battery
Included Accessories	
Power Supply	5 Volt Power Pack, 1.2 Amps
MTX-3-DS	Docking Station/Charger
TPMC-3X-BTP	Internal Battery Pack
Available Accessories	
CEN-RFGW-EX	InfiNET EX Wireless Gateway

1. Any infiNET EX mesh network device that supports expander functionality will effectively extend the range of the MTX-3 beyond the gateway, provided it is associated with the same gateway as the MTX-3. Most infiNET EX devices do support extender functionality; exceptions include the CHV-TSTATEX, HTT-B10EX and the MTX-3.
2. Requires CEN-RFGW-EX or equivalent infiNET EX gateway, which supports up to 100 infiNET EX network devices inclusive of up to six MTX-3 remotes. Additionally, up to five CLW-EXPEX infiNET EX Expanders may be added to the network for extended range. All gateways and expanders sold separately.
3. Power connection made via the included MTX-3-DS Docking Station/Charger. Refer to the latest revision of the MTX-3-DS Docking Station/Charger guide (Doc. 7077) for additional details. It is available from the Crestron website (www.crestron.com/manuals).
4. The latest software versions can be obtained from the Crestron website. Refer to the NOTE following these footnotes.
5. 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 website are for authorized Crestron dealers and Crestron Authorized Independent Programmers (CAIP) only. New users may be required to register to obtain access to certain areas of the site (including the FTP site).

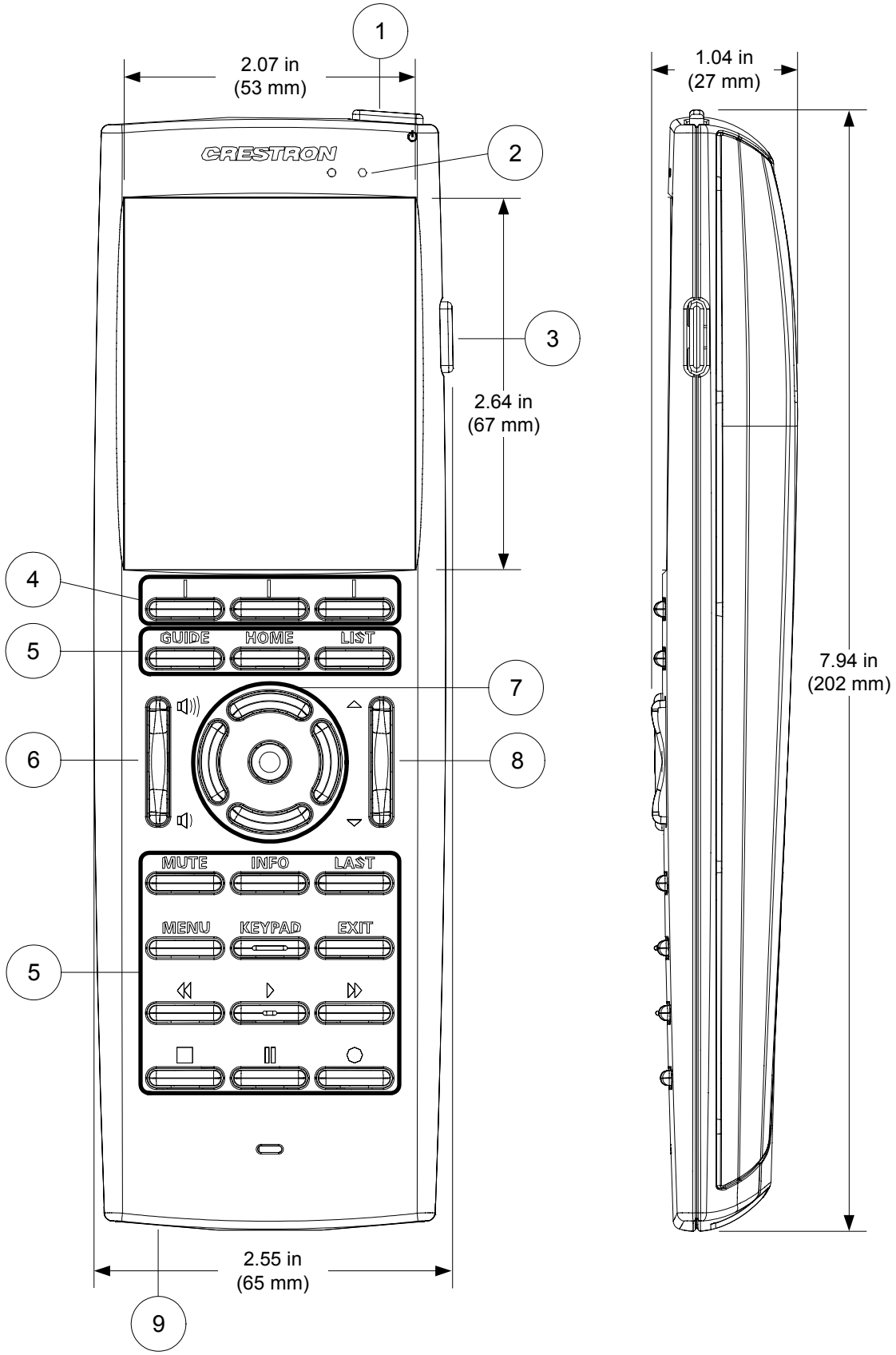
Battery must be recycled. Deliver the battery to an appropriate recycling facility.

Physical Description

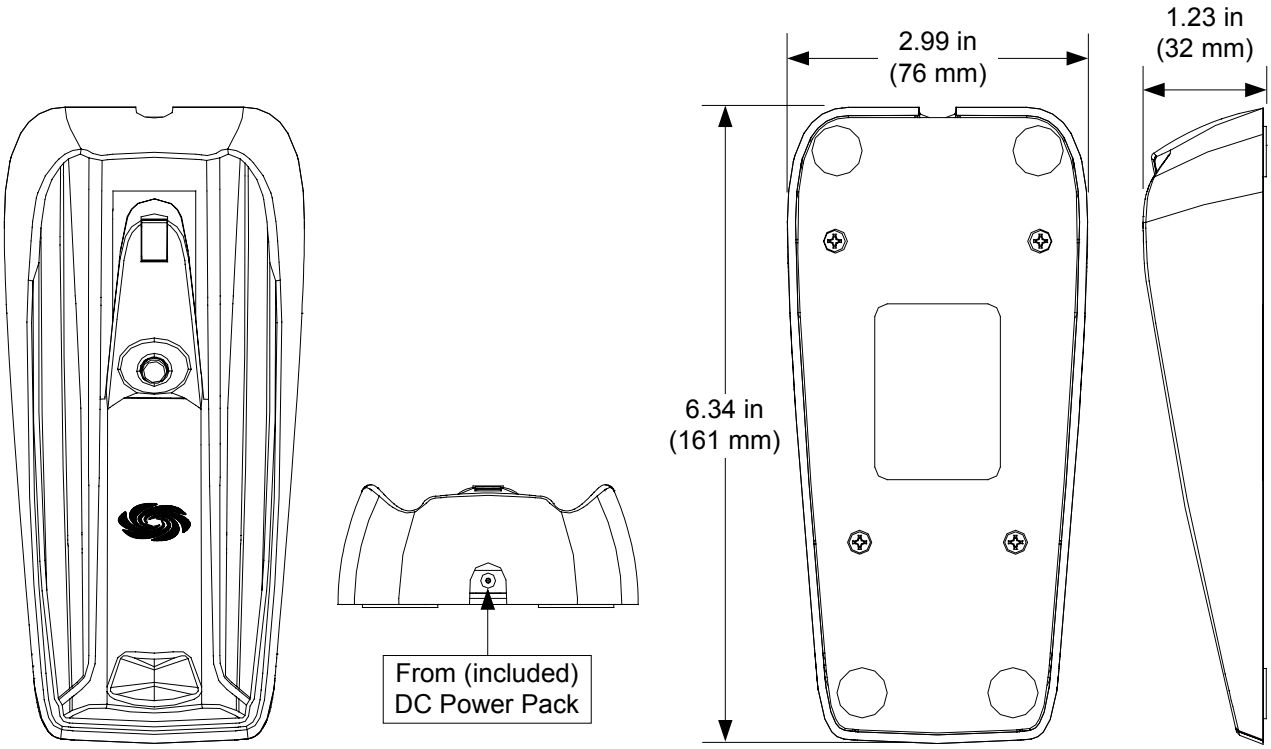
This section provides information on the connections, controls and indicators available on your MTX-3.

MTX-3 Physical View (Shown on MTX-3-DS Docking Station/Charger)

MTX-3 Overall Dimensions (Front and Side Views)



MTX-3-DS Docking Station/Charger Dimensions (Top, Rear, Bottom and Side Views)



Connectors, Controls & Indicators

#	CONNECTORS[1], CONTROLS & INDICATORS	DESCRIPTION
1	Power (top)	(1) Programmable pushbutton, performs hardware reset if held for >10 seconds
2	Charge	(1) Green LED, indicates charging status when docked
3	More (right side)	(1) Programmable thumb operated side button
4	Hard Keys	(3) Programmable pushbuttons below touchscreen
5	Functions	(15) Programmable pushbuttons with white backlit labeling for **GUIDE**, **HOME**, **LIST**, **MUTE**, **INFO**, **LAST**, **MENU**, **KEYPAD**, **EXIT** and icons for Rewind, Play, Forward, Stop, Pause, Record
6	Volume	(1) Programmable rocker button with white backlit volume "Raise" and "Lower" icons
7	Navigation Pad	(5) Programmable pushbuttons comprising a 5-way thumbpad (4-way navigation plus "Enter")
8	Up/Down	(1) Programmable rocker button with white backlit "Up" and "Down" arrows
9	USB (bottom)	(1) Mini Type AB female (behind battery cover); USB 1.1 computer console port, for installer use only

Setup

Identity Code

Every MTX-3 touchpanel communicating via RF with a control system through a CEN-RFGW-EX gateway requires a unique RF ID. The RF ID is a two-digit hexadecimal number that can range from 09 to 0E. The RF ID of the unit, set using the internal setup menu (refer to "RF Setup" which starts on page 14) or in Crestron Toolbox™, must match the RF ID specified in the SIMPL™ Windows program.

Battery Installation

Perform the following procedure to install the TPMC-3X-BTP battery pack in a MTX-3 touchpanel:

1. Place the touchpanel screen side down on a clean, soft surface.
2. Remove the battery compartment cover on the rear of the touchpanel.
3. Carefully connect the multi-pin connector of the TPMC-3X-BTP with the corresponding connector inside the battery compartment. The pin side of the connector should be facing upward (toward the rear of the touchpanel). Red wires should be above black wires (toward the top of the touchpanel). Ensure the connector is fully seated.
4. Place the TPMC-3X-BTP in the battery compartment, oriented so the wires for the multi-pin connector are on the bottom. Refer to the photo on the following page.

TPMC-3X-BTP in Battery Compartment of MTX-3

5. Re-attach the battery compartment cover.

Power

To charge its internal battery pack, the MTX-3 must be placed on the included MTX-3-DS docking station/charger. Connect the included power pack to the MTX-3-DS docking station/charger.

NOTE: Before using the MTX-3 for the first time, charge its internal battery for at least two hours by placing on the MTX-3-DS docking station/charger. The green LED on the front of the MTX-3 will blink while the battery is charging. Charging is complete when the LED remains on without blinking.

It takes the MTX-3 about two hours to recharge while in use. A fully charged battery can provide up to five hours of use at the full screen brightness setting.

The MTX-3 has a removable battery pack. With a properly maintained battery, the design should retain 80% of its original capacity at 300 full charge and discharge cycles. You may choose to replace your battery when it no longer holds sufficient charge to meet your needs.

NOTE: When not using the MTX-3, store the unit on its docking station/charger.

NOTE: The MTX-3 can become unresponsive when battery strength is low.

Battery Calibration

For optimum performance after shipping or any time the unit's power has been off for an extended period of time, Crestron recommends the following procedure be performed:

1. Place the unit on its docking station/charger and connect AC power.
2. Allow the unit to charge completely. (The green LED should be steady on for 15 minutes.)
3. Remove panel from the docking station/charger.
4. From the main setup screen, touch **Diagnostics**, then touch **Battery Diags** to go to the *Battery Diagnostics* screen. Touch **Recondition Battery**, then touch **YES, Recondition Battery** to confirm. (Refer to "Configuring the Touchpanel" which starts on page 13.)
5. Wait for the unit to shut off. This takes approximately five hours. Leave the unit off the dock the entire time. During this operation, the *Battery Reconditioning* screen shown on page 25 will be displayed until the unit shuts off.
6. Place the unit back on the docking station and allow it to charge completely.
7. Unit is now ready for normal operation.

Optimizing Battery Life

In order to maximize battery life, use the following settings:

1. From the main setup screen, touch **Standby Setup** to enter the *Standby Timeouts* screen (refer to "Standby Setup" on page 18). Use an *Undocked Standby* setting of 30 and an *Undocked Power Off* setting of 45.
2. From the main setup screen, touch **LCD Settings** to enter the *Display Settings* screen (refer to "LCD Settings" on page 22). Use an *Undocked Brightness* setting of 50.

Configuring the Touchpanel

When power is applied to the unit for the first time, the following screen appears.

Initial Opening Screen

Touch the screen to display the "Panel Setup Options" screen.

"Panel Setup Options" Screen

The "Panel Setup Options" screen enables basic configuration procedures prior to regular operation of the touchpanel.

NOTE: During regular operation of the touchpanel, there are two ways to activate the setup functions:

1. Place a button on the project main page and assign the reserved join number (17242) that activates setup.
2. Press hard keys 1, 2, 3, and 4 in sequence twice (i.e. press 1, 2, 3, 4, 1, 2, 3, 4) within a five second period. For hard key locations, refer to "Pushbutton Programming" on page 30.

Indicators

The top of the setup screen contains the system bar, which includes bar graph indicators for battery strength and RF signal strength.

Panel Setup Options

These setup options control the basic operation of the MTX-3 and are discussed in subsequent paragraphs.

RF Setup

Touch **RF Setup** to go to the "RF Setup" screen, which displays information about your RF *Signal Strength*, *Gateway EUID*, *Gateway Connection*, *Control Connection*, *RF ID, Client EUID* and to gain access to the **Acquire Gateway** button. Touch **Back** to return to the "Panel Setup Options" screen.

"RF Setup" Screen

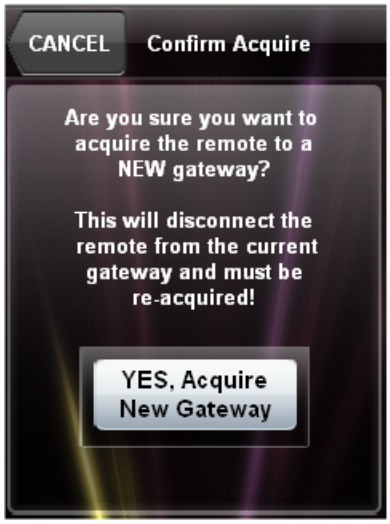
Before the MTX-3 can be used, it must first be acquired by a CEN-RFGW-EX gateway that is connected to an infiNET EX system.

NOTE: An infiNET EX device can be acquired by only one gateway.

To acquire the MTX-3, perform the following procedure:

1. Put the CEN-RGFGW-EX in *Acquire* mode by pressing its **ACQUIRE** button (on the unit itself or from Crestron Toolbox, as described in the latest revision of the CEN-RFGW-EX infiNET EX Gateway Operations & Installation Guide (Doc. 6706), which is available for download from the Crestron website (www.crestron.com/manuals). The gateway **ACQUIRE** LED will light.
2. From the "RF Setup" screen ,shown in the illustration above, put the MTX-3 in *Acquire* mode by touching **Acquire Gateway**. The "Confirm Acquire" screen will be displayed, as shown in the illustration that follows.

"Confirm Acquire" Screen



3. Touch **YES, Acquire New Gateway** to begin the process. The "RF Gateway Acquisition In Progress" screen will be displayed, as shown in the illustration below.

"RF Gateway Acquisition In Progress" Screen

4. When the acquire process is complete, the "RF Setup" screen will show the gateways EUID, the channel number and RF ID, as shown in the illustration that follows.

"RF Setup" Screen (After Acquire)

5. Take the CEN-RFGW-EX out of the *Acquire* mode by pressing its **ACQUIRE** button.

Audio Setup

From the "Panel Setup Options" screen, touch **Audio Setup** to display the "Audio Settings" screen, with controls for *Master Volume* and *Mute* as well as buttons providing access to the **Key Click Settings** and **Wav Settings** screens. Touch **Back** to return to the "Panel Setup Options" screen.

"Audio Settings" Screen

Key Click Settings

Touch **Key Click Settings** to display the "Key Click Settings" screen, which has controls for *Key Click Volume* and *Mute*, as well as controls to turn the key click sound that occurs when the panel is docked on or off. Touch **Back** to return to the "Audio Settings" screen.

"Key Click Settings" Screen

Wav Settings

Touch **Wav Settings** to display the "Wav Settings" screen, which has controls for *Wav Volume* and *Mute* as well as a **Play Test Wav** button. Touch **Back** to return to the "Audio Settings" screen.

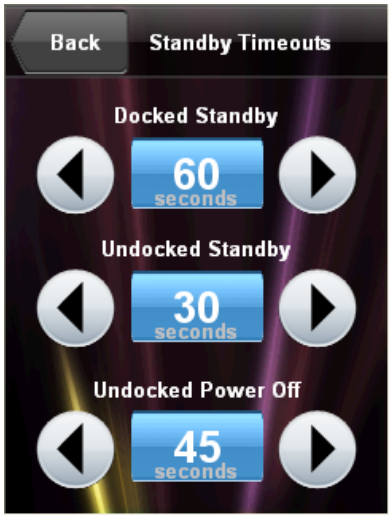
"Wav Settings" Screen

Standby Setup

From the "Panel Setup Options" screen, touch **Standby Setup** to display the "Standby Timeouts" screen, which has controls for adjusting standby timeout when the MTX-3 is docked and undocked, as well as a **Power Off** timeout when the touchpanel is undocked. Touch **Back** to return to the "Panel Setup Options" screen.

NOTE: A USB connection to a powered PC, as used to load projects, will keep the unit awake and prevent it from going into standby.

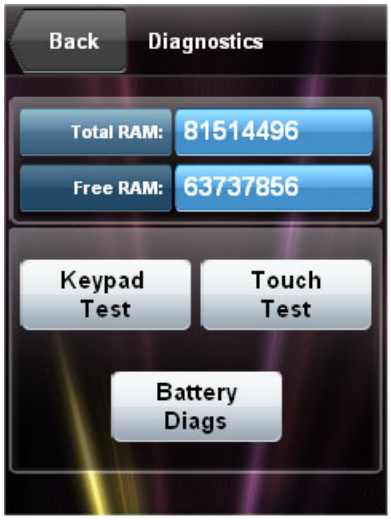
"Standby Timeouts" Screen



Diagnostics

From the "Panel Setup Options" screen, touch **Diagnostics** to display the "Diagnostics" screen. This screen will display *Total RAM*, *Free RAM* and provide buttons for access to other screens, such as **Keypad Test**, **Touch Test** and **Battery Diags**. Touch **Back** to return to the "Panel Setup Options" screen.

"Diagnostics" Screen



Keypad Test

Touch **Keypad Test** to view the "Keypad Test" screen. Pressing the corresponding button on the MTX-3 will cause its likeness on the screen to light up. Touch **Back** to return to the "Diagnostics" screen.

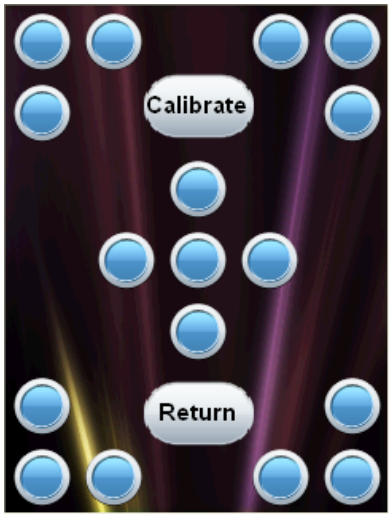
"Keypad Test" Screen

Touch Test

From the "Diagnostics" screen, the **Touch Test** button takes you to a screen for calibrating the MTX-3 touchscreen. Touch **Calibrate** to begin screen calibration.

The calibration screen will show a crosshair in the center. Touch the crosshair and it will move to another location on the screen. Continue to touch the crosshair as it appears at each new location. When the process is finished, a "Calibration Complete" message will appear. Touch the screen to return to the Touch Test screen. Then touch **Return** to go back to the "Diagnostics" screen.

Touch Test Screen

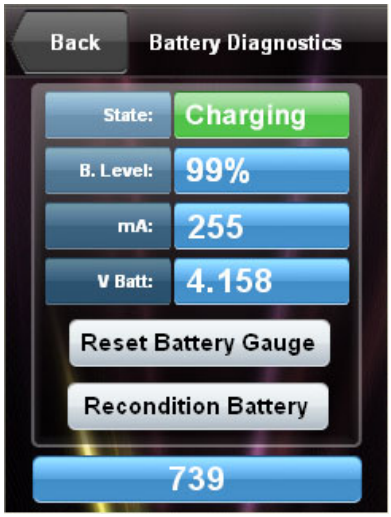


Battery Diags

From the "Diagnostics" screen, touch **Battery Diags** to display the "Battery Diagnostics" screen. This screen displays the battery's state (e.g. charging), level (in percent), amount of current remaining and amount of voltage remaining. In addition, it contains controls to **Reset Battery Gauge** and **Recondition Battery**. Touch **Back** to return to the "Diagnostics" screen.

NOTE: The field at the bottom of the screen is to be used when under the supervision of a Crestron technical support representative during telephone support.

"Battery Diagnostics" Screen



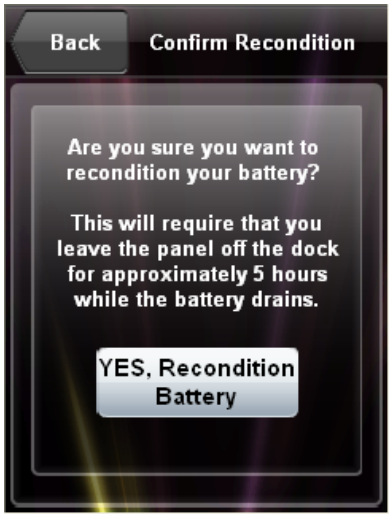
Touch **Reset Battery Gauge** to recalibrate the battery gauge. The "Confirm Reset" screen will appear. Touch **YES, Reset Gauge** to reset the gauge or touch **Back** to return to the "Battery Diagnostics" screen.

NOTE: The gauge should be reset after any battery replacement.

"Confirm Reset" Screen

Touch **Recondition Battery** to drain and recondition the MTX-3's battery. The "Confirm Recondition" screen will appear.

"Confirm Recondition" Screen



Touch **YES, Recondition Battery** to start the process. The "Battery Reconditioning" screen will appear.

"Battery Reconditioning" Screen

System Msgs Enabled

From the main setup screen, touch **System Msgs Enabled** to toggle the display of system messages on and off. Button text will change to **System Msgs Disabled**.

About

From the main setup screen, touch **About** to display a screen that shows firmware and OS version information. Touch **Back** to remove the "About" screen.

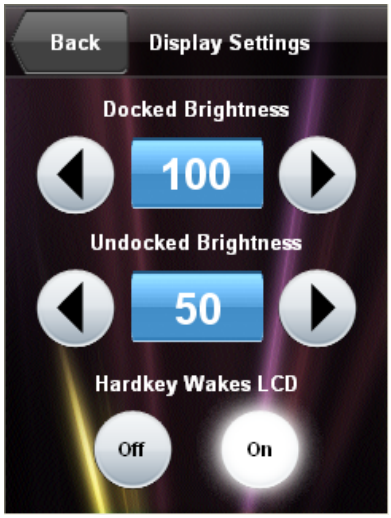
Brightness Options

These setup options control the appearance of the MTX-3.

LCD Settings

From the "Panel Setup Options" screen, touch **LCD Settings** to enter the "Display Settings" screen, with controls for screen brightness when the MTX-3 is docked and when it is undocked. Lower brightness settings extend battery life. This screen also allows you to turn the *Hardkey Wakes LCD* option **On** or **Off**. When **On**, pressing a hard key or tilting the panel will turn on the LCD display if the display is off. Touch **Back** to return to the "Panel Setup Options" screen.

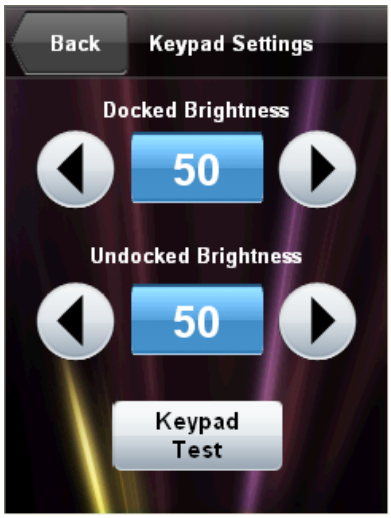
"Display Settings" Screen



Keypad Settings

From the "Panel Setup Options: screen, touch **Keypad Settings** to display the "Keypad Settings" screen, with controls for keypad brightness when the MTX-3 is docked and when it is undocked. Lower brightness settings extend battery life. This screen also provides a **Keypad Test** button, which is the same as the one described earlier (refer to "Diagnostics" which starts on page 18). Touch **Back** to return to the "Panel Setup Options" screen.

"Keypad Settings" Screen



Save & Exit

From the "Panel Setup Options" screen, touch **Save & Exit** to save any setup changes you have made and exit to normal operation mode.

General Use and Safety

CAUTION: To avoid possible damage to the unit, do not use the touchpanel in the rain or expose to unnecessary moisture.

Recommended Cleaning

Keep the surface of the touchscreen free of dirt, dust or other materials that could degrade optical properties. Long-term contact with abrasive materials can scratch the surface, which may detrimentally affect image quality.

For best cleaning results, use a clean, damp, non-abrasive cloth with any commercially available non-ammonia glass cleaner. Bezels may not provide a complete watertight seal. Therefore, apply cleaning solution to the cloth rather than the surface of the touchscreen. Wipe touchscreen clean and avoid getting moisture beneath the bezels.

Programming Software

Have a question or comment about Crestron software?

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

Earliest Version Software Requirements for the PC

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

Crestron has developed an assortment of Windows®-based software tools to develop a controlled system. For the minimum recommended software versions, visit the Version Tracker page of the Crestron website (www.crestron.com/versiontracker).

Programming with Crestron SystemBuilder

Crestron SystemBuilder is the easiest method of programming but does not offer as much flexibility as SIMPL Windows. For additional details, download SystemBuilder from the Crestron website and examine the extensive help file.

Programming with SIMPL Windows

NOTE: While SIMPL Windows can be used to program the MTX-3, it is recommended to use SystemBuilder for configuring a system.

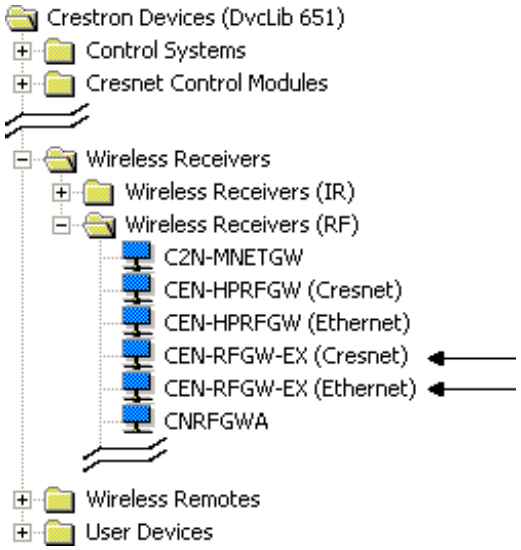
SIMPL Windows is Crestron's premier software for programming Crestron control systems. It is organized into two separate but equally important "Managers".

Configuration Manager

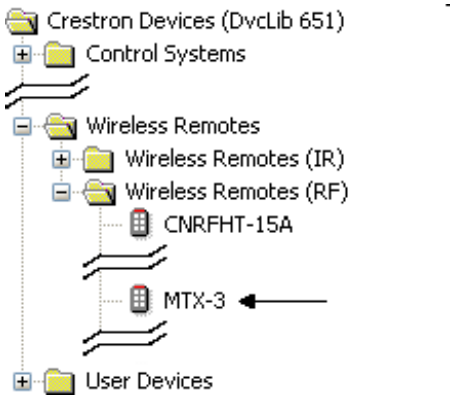
Configuration Manager is the view where programmers "build" a Crestron control system by selecting hardware from the *Device Library*.

1. To incorporate the MTX-3 into the system, first drag the CEN-RFGW-EX (gateway) from the Wireless Receivers | Wireless Receivers (RF) folder of the *Device Library* and drop it in the *System Views.* Then drag the MTX-3 from the Wireless Remotes | Wireless Remotes (RF) folder of the *Device Library* and drop it on the CEN-RFGW-EX.

Locating the CEN-RFGW-EX in the Device Library

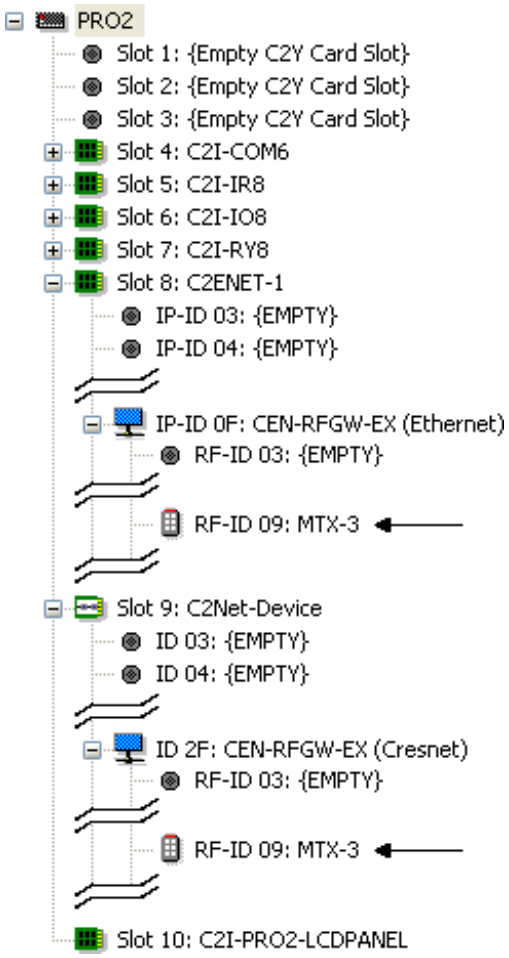


Locating the MTX-3 in the Device Library



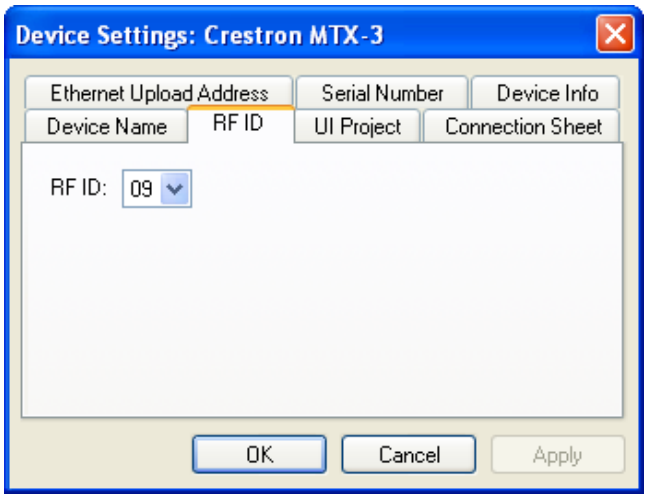
2. The system tree of the control system displays the device in the appropriate slot with an RF ID as shown in the following illustration.

C2Net Device, Slot 8



3. Additional MTX-3 devices are assigned different RF ID numbers as they are added.
4. If necessary, double click a device to open the "Device Settings" window and change the RF ID, as shown in the following figure.

"Device Settings: Crestron MTX-3" Window



5. The ID code specified in the SIMPL Windows program must match the RF ID of each unit.

Program Manager

Program Manager is the view where programmers "program" a Crestron control system by assigning signals to symbols.

The symbol can be viewed by double clicking on the icon or dragging it into *Detail View*. Each signal in the symbol is described in the SIMPL Windows help file (**F1**).

Programming with VisionTools Pro-e

Touchpanel screens should be created in VisionTools® Pro-e (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 MTX-3 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 MTX-3 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 touchpanel files and SIMPL Windows files that illustrate the high-performance capabilities of multi-mode objects.

WAV File Audio Messages

The MTX-3 touchpanels are capable of playing audio messages as system prompts and responses. These files are recorded as WAV files on a PC using an audio utility such as Sound Recorder that is packaged with Microsoft Windows 95/98/Me/XP/NT/2000/Vista/7™. 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 MTX-3 touchpanels only accept 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 touchpanel 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 touchpanel directly or may be edited with the Sound Recorder. For example, the individual files can be combined to create custom messages.

NOTE: Touchpanel 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 MTX-3 project.

Bit depth refers to the number of memory bits used to store color data for each pixel in a raster image. A touchpanel 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 x 32 x 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. 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 touchpanels, 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.), you can create a sophisticated project that will fit in the memory space provided and have the touchpanel remain very responsive.

Relationship of Bits to Colors

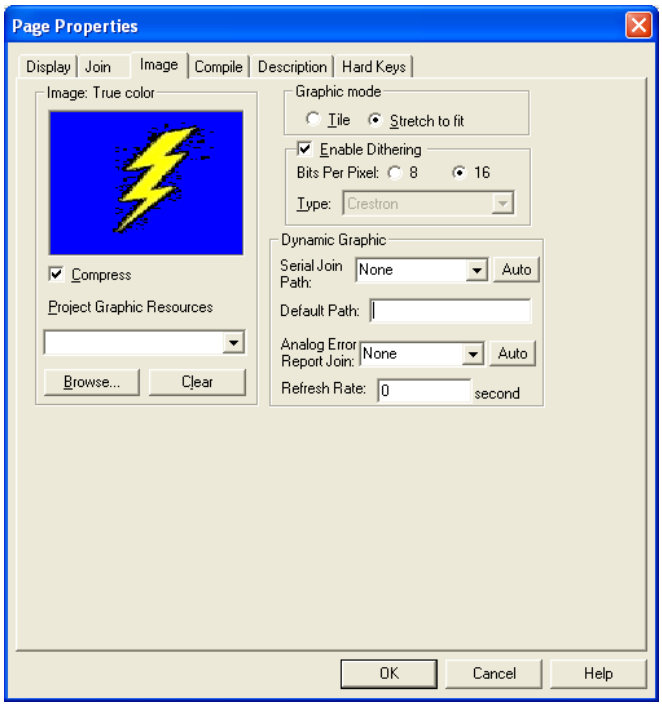
NUMBER OF BITS	NUMBER OF COLORS
1 bit	Black and White
2 bits	4 Colors
4 bits	16 Colors
8 bits	256 Colors
16 bits	65,536 Colors (Highcolor)
24 bits	16.7 million Colors (Truecolor)
32 bits	16.7 million Colors plus Transparency

When creating a VT Pro-e project you can elect to compress and reduce the image size in the "Page Properties" window for the entire page and/or perform the same function of reducing the image size using the "Image Properties" window. A reduction in image size will save a considerable amount of memory space for your project.

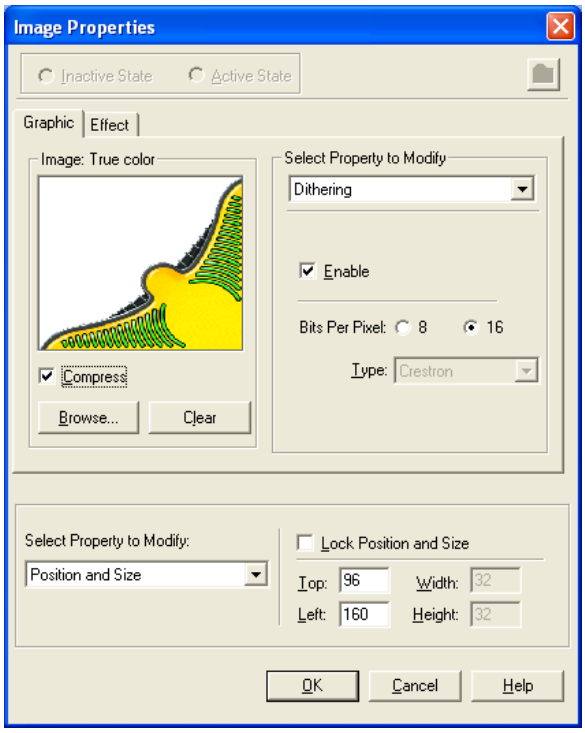
In VT Pro-e, the **Compress** checkbox permits the image to be compressed when compiling. The **16 Bits** checkbox converts a 24-bit or 32-bit image to 16 bits. This conversion to a 16-bit image may cause the loss of some subtle shading. To compensate for this, use the dithering to simulate the original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

Dithering type selection can be accessed from the "Page Properties" or "Image Properties" windows in VT-Pro-e. Refer to the following illustrations.

VT Pro-e "Page Properties" Window – Bit Depth Selection



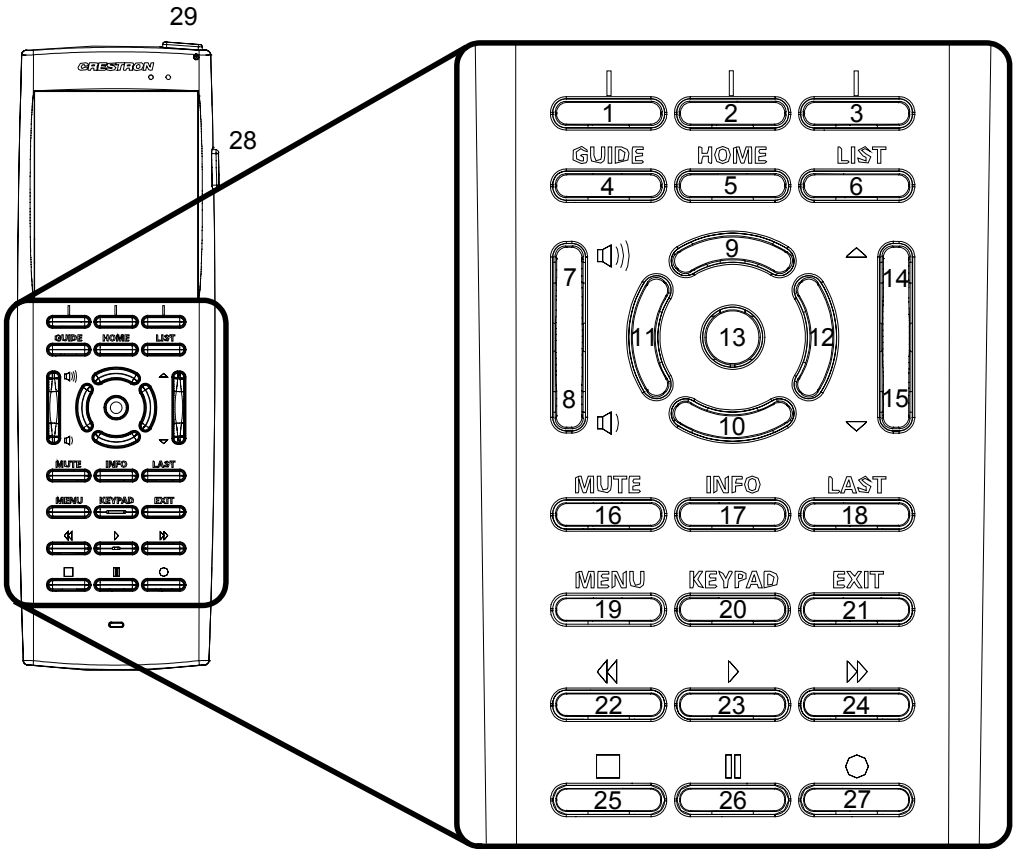
VT Pro-e "Image Properties" Window – Bit Depth Selection



Pushbutton Programming

The buttons can be programmed to access any frequently used command. Refer to the following illustration for their default join numbers. A description for each button signal is described in the SIMPL Windows help file (**F1**).

Pushbutton Layout and Join Number Assignment



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 Isys touchpanel 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 will not be compiled correctly in SIMPL Windows. In other words, you cannot enter Chinese characters interspersed with numbers. You can enter Chinese characters or numbers in separate strings or you can pad each number with "\x00" to make it multibyte and then combine it with Chinese characters in the same string.

Of course you can always use the workaround of showing a graphic that displays the string but it is not dynamic. To compile and use multibyte characters it is essential that the operating system understand the language. Windows XP, Vista and 7 are available in many international languages and add-on software is available for other versions of Windows.

Example Program

An example program for the MTX-3 is available from the Crestron website (www.crestron.com/exampleprograms).

Uploading and Upgrading

The installer should use the latest programming software and ensure 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.

NOTE: Upgrades should be performed only by the installer.

Establishing Communication

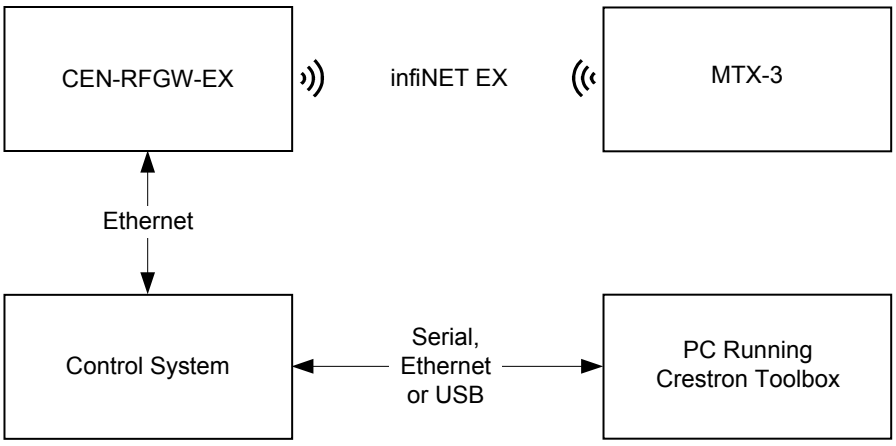
NOTE: For PCs running Windows 2000 or XP, ActiveSync 4.5 or later is required for Toolbox to communicate with the MTX-3 via USB to upload firmware and display lists. Download and install ActiveSync from the Microsoft website (www.microsoft.com/windowsmobile/en-us/help/synchronize/device-synch.mspx).

PCs running Windows Vista or 7™ require Windows Mobile Device Center™ for communication with Toolbox. Download and install Windows Mobile Device Center (WMDC) from the Microsoft website (www.microsoft.com/windowsmobile/devicecenter.mspx).

Use Crestron Toolbox for communicating with the MTX-3; refer to the Crestron Toolbox help file for details. There are two methods of communication.

Indirect

Indirect Communication



MTX-3 connects to the CEN-RFGW-EX (Gateway), which connects to control system via Ethernet.

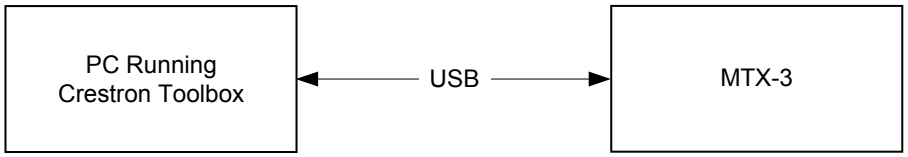
Establish communication between the PC and the control system as described in the latest version of the 2-Series Control Systems Reference Guide (Doc. 6256).

NOTE: A USB connection between the PC and the MTX-3 is required to load projects or firmware.

USB

NOTE: Required for loading projects and firmware.

USB Communication



The **COMPUTER** port on the MTX-3 connects to the USB port on the PC via the included Type A to Type B USB cable:

1. Use the Address Book in Crestron Toolbox to create an entry using the expected communication protocol (USB). When multiple USB devices are connected, identify the MTX-3 by entering "MTX-3" in the *Model* textbox, the unit's serial number in the *Serial* textbox or the unit's hostname in the *Hostname* textbox. The hostname can be found in the "System Info" window in the section marked *Ethernet* however, communications must be established in order to see this information in the "System Info" window.
2. Display the MTX-3's "System Info" window (click the icon); communications are confirmed when the device information is displayed.

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 website 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 touchpanel using VT Pro-e or Crestron Toolbox.

Firmware

Check the Crestron website 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 MTX-3 firmware via Crestron Toolbox.

1. Establish communication with the MTX-3 and display the "System Info" window.
2. Select **Functions | Firmware…** to upgrade the MTX-3 firmware.

NOTE: When loading projects or firmware, keep the MTX-3 on its docking station.

Program Checks

For infiNET connections, using Crestron Toolbox, display the network device tree (**Tools | Network Device Tree**) to show all network devices connected to the control system and all infiNET devices that have been acquired by the CEN-RFGW-EX gateway. Right-click on the MTX-3 (CEN-RFGW-EX) to display actions that can be performed on the MTX-3 (CEN-RFGW-EX).

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.

MTX-3 Troubleshooting

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Touchpanel does not turn on.	Battery was not charged or is discharged.	Place the MTX-3 on the docking station/charger and charge the battery using the provided power supply.
	Battery connector is not fully seated.	Verify battery is properly connected.
	Power pack connector is not fully seated in docking station.	Verify power pack is properly connected.
Cannot upload VT Pro-e project or firmware from Toolbox via USB.	MTX-3 is off or has no power.	Verify the MTX-3 has power and is on.
MTX-3 shows unexpected or intermittent feedback and/or has intermittent device control.	MTX-3 is out of range or has poor access to the gateway.	Move back within range of gateway. For detailed information, refer to the latest version of the Best Practices for Installation and Setup of Crestron RF Products Reference Guide (Doc. 6689).
MTX-3 boots up in setup screens every time.	Invalid VT Pro-e project or no VT Pro-e project is loaded.	Load/reload VT Pro-e project using the Toolbox.

Reference Documents

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

List of Related Reference Documents

DOCUMENT TITLE
2-Series Control Systems Reference Guide
Best Practices for Installation and Setup of Crestron RF Products Reference Guide
CEN-RFGW-EX infiNET EX Gateway
MTX-3-DS Docking Station/Charger

Further Inquiries

If you cannot locate specific information or have questions after reviewing this guide, please take advantage of Crestron's award winning customer service team by calling Crestron at 1-888-CRESTRON [1-888-273-7876].

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

Future Updates

As Crestron improves functions, adds new features and extends the capabilities of the MTX-3, additional information may be made available as manual updates. These updates are solely electronic and serve as intermediary supplements prior to the release of a complete technical documentation revision.

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

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2. Products may be returned for credit, exchange or service with a CRESTRON Return Merchandise Authorization (RMA) number. Authorized returns must be shipped freight prepaid to CRESTRON, 6 Volvo Drive, Rockleigh, N.J. or its authorized subsidiaries, with RMA number clearly marked on the outside of all cartons. Shipments arriving freight collect or without an RMA number shall be subject to refusal. CRESTRON reserves the right in its sole and absolute discretion to charge a 15% restocking fee plus shipping costs on any products returned with an RMA.
3. Return freight charges following repair of items under warranty shall be paid by CRESTRON, shipping by standard ground carrier. In the event repairs are found to be non-warranty, return freight costs shall be paid by the purchaser.

CRESTRON Limited Warranty

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

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

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

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

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

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

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