

Crestron **MT-500C**

MiniTouch Color RF Wireless Handheld

Operations Guide



CRESTRON

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MiniTouch Color RF Wireless Handheld: MT-500C

Introduction

Features and Functions

Crestron's MiniTouch Color RF Wireless Handheld (MT-500C) can be used for small screen control of large-scale Crestron systems. Its easy-to-use touchscreen (256 colors) and intuitive interface makes it the perfect remote for every user. With a wireless range of up to 180-feet, the MiniTouch can be used with Crestron's CNRFGWA-418 RF Gateway and any Crestron 2-Series control system. Powered by fast-charging Nickel Metal Hydride (NiMh) batteries, the unit comes with a docking station and is programmed using Crestron's VisionTools™ Pro-e (VT Pro-e) software.

Functional Summary

- Easy-to-use 256 color (240 x 320 pixels) LCD touchscreen
- 240 x 219 pixel area on LCD screen for user programming
- Up to 999 digital joins available
- 180-foot RF wireless range (line of sight)
- Intuitive interface
- 9 programmable push buttons
- Programming cable included

The user interface includes a Remote icon  that you can use to access the unit's system settings (refer to page 9 for system setting information).

A Low Battery icon  appears on the Remote icon when the battery charge is low (refer to page 6 for charging information).

Specifications

The following table lists specifications for the MT-500C.

Specifications for the MT-500C

SPECIFICATION	DETAILS
Battery Power	4.8 VDC (NiMh, 600mAh)
Battery Rating	Up to 3 hours of continuous use, up to 1 week of normal use
Docking Station Power Requirements	12 VDC (400mAh)
RS-232 Baud Rate	115.2K baud
RF Output	418 MHZ, Bandwidth: +/- 100KHz
RF Range (min/max)	2 to 180 ft.
Control System Update Files ^{1,2} 2-Series Control System Update	Version C2-2004.CUZ or later
Memory	8 MB non-volatile flash memory
LCD screen	240 x 320 ³ (3.6" diagonal), 256 color, passive matrix, backlit
Operation Temperature	0°C to 50°C (32°F to 122°F)
Dimensions	Height: 5.60 in (14.23 cm) Width: 3.70 in (9.40cm) Depth: 1.30 in (3.31 cm) Weight: 9 oz (.28 kg)

1. The latest versions can be obtained from the Downloads | Software Updates section of the Crestron website (www.crestron.com). Refer to NOTE after last footnote.
2. Crestron 2-Series control systems include the AV2, PAC2, PRO2, and RACK2.
3. 240 x 219 user programmable area.

NOTE: Crestron software and any files on the website are for Authorized Crestron dealers only. New users may be required to register to obtain access to certain areas of the site (including the FTP site).

Physical Description

The MT-500C (refer to illustrations on next two pages) includes the RF wireless handheld (with battery, Part No. OEMX-A0012-1-4), a docking station 12VDC power supply for the docking station and a RS-232 cable (supplied) for loading project files (refer to page 16). The wireless handheld includes a color LCD touch screen, hardkeys, contrast and backlight buttons, a serial port, and a docking station connector. The docking station includes a serial port, adapter connector, connector for the wireless handheld, and charging LED indicators.

Physical Views of MT-500C

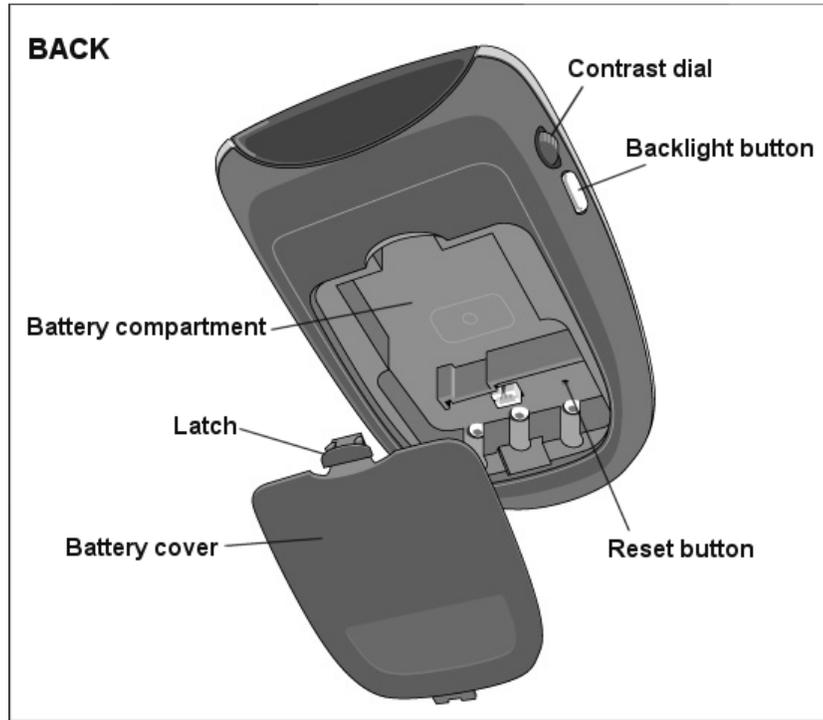


Physical View of RF Wireless Handheld (Front)

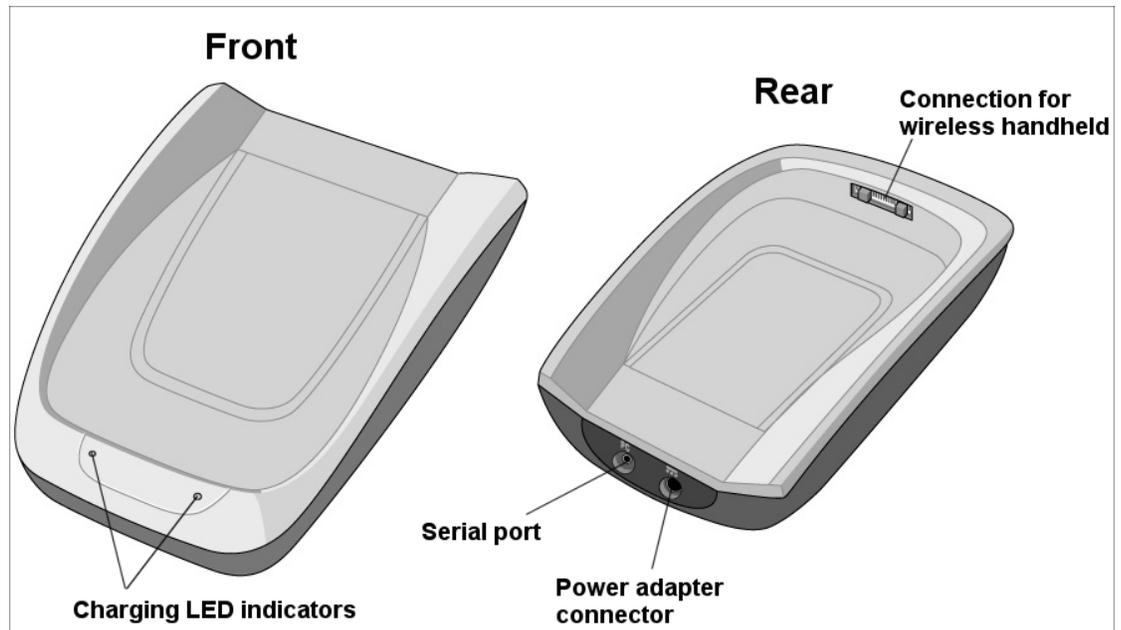


* Pushing the backlight button (refer to graphic on next page) illuminates the right hardkeys ONLY. To adjust how long the backlight stays on, refer to “Adjusting System Settings” on page 9.

Physical View of RF Wireless Handheld (Back)

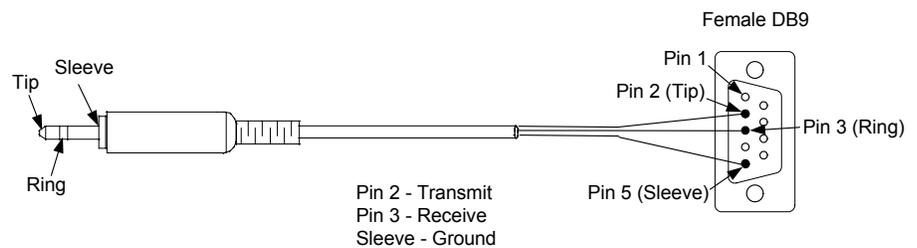


Physical View of Docking Station



RS-232 Cable

RS-232 Cable Pinouts



Industry Compliance

This device complies with part 15 of the FCC rules. Operation is subject to the following two 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.

Setup

This section contains hardware installation and setup instructions.

Installing the Battery Pack

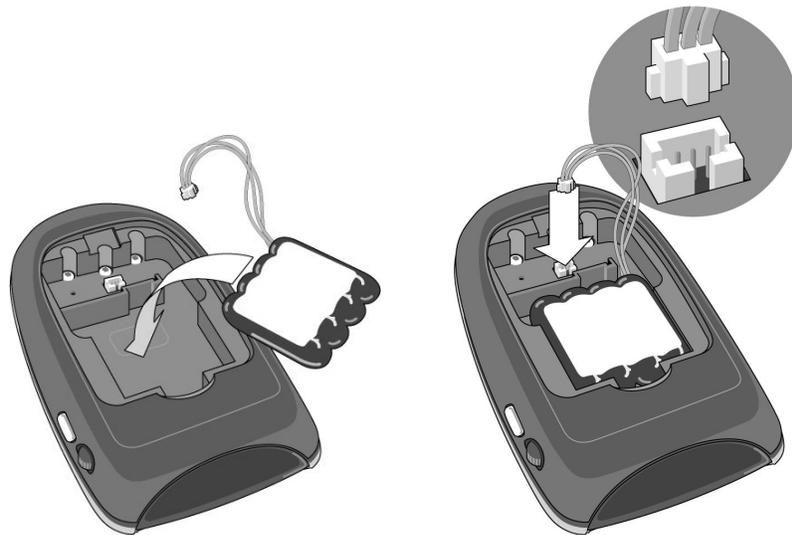
1. On back of MT-500C, press the latch on the battery cover and remove it (refer to illustrations below).

Battery Cover Removal



2. Place the battery pack in the battery compartment (refer to illustration on the next page).
3. Connect the battery pack cable to the battery connector.

Battery Pack Installation



4. Replace battery cover.

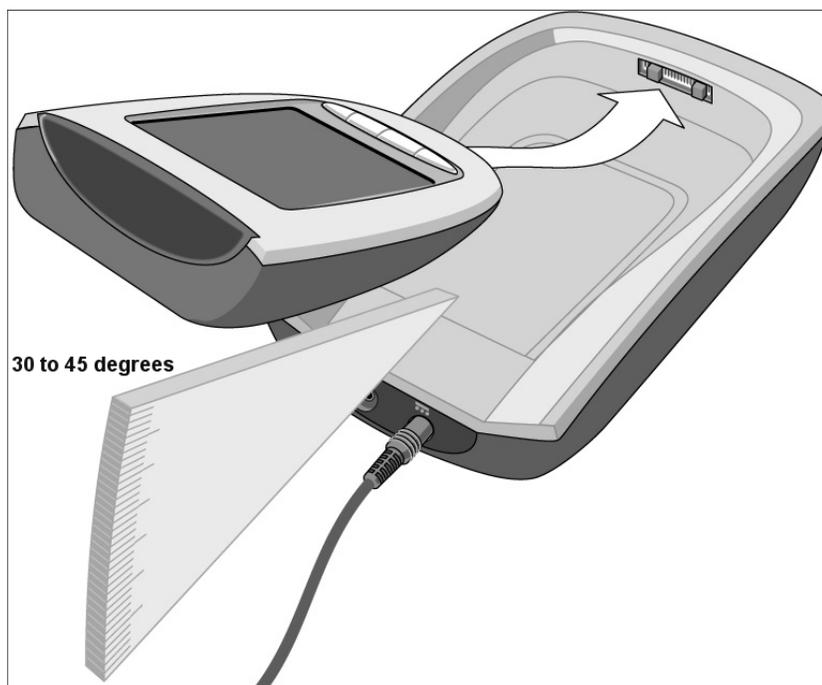
NOTE: Make sure battery cable does not get pinched between battery cover and mold.

Charging the Battery

NOTE: The docking station is used in the following procedure.

1. Plug the power adapter in the docking station and the wall outlet.
2. Place the MT-500C in the docking station.

NOTE: Make sure you hold the unit at an angle of 30 to 45 degrees while placing it in the docking station for proper connection.

Wireless Handheld Connection

NOTE: Charging starts immediately after the MT-500C is installed in the docking station. The green charging LEDs on the front of the unit (refer to illustration on page 4) illuminate to indicate that charging is taking place. When the unit is fully charged, the LEDs go out. The battery indicator in Setup (refer to page 9) shows full (while the unit is in the docking station) during the charge cycle.

NOTE: Normal charging time is 2 to 3 hours, depending on the charged state of the battery pack. The unit can be operated while it is being charged. The battery pack does not need to be fully discharged before recharging. The unit can be placed in the docking station at any time. The battery allows the MT-500C to operate for about 3 hours of continuous use and about 1 week of normal use.

NOTE: When the battery pack has a low charge, the Low Battery icon  flashes on the Remote icon . Recharge the battery as soon as possible to ensure optimal performance.

NOTE: If battery power runs out, the unit still retains all settings with the exception of the clock. Refer to “Adjusting System Settings” on page 9 for more information on adjusting clock settings.

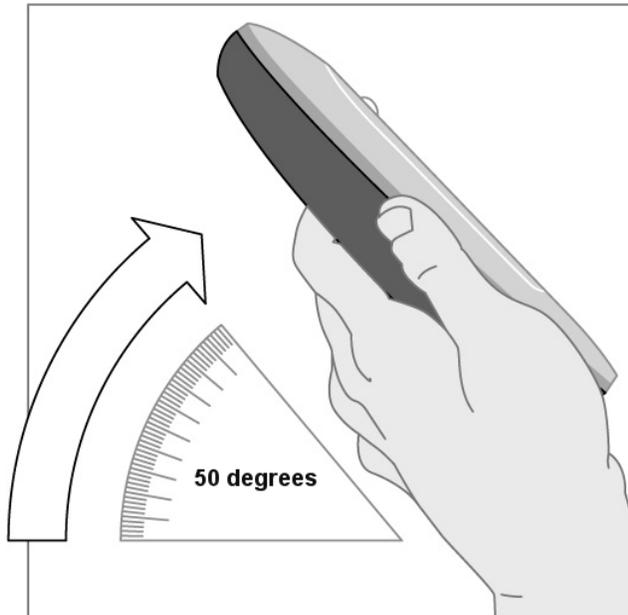
Activating the MT-500C

You can activate the MT-500C four ways.

- Tap the screen with your finger or a blunt, soft object (like a pencil eraser). The display activates.

- If the pickup sensor is activated (refer to page 10), activate the unit by tilting it more than 50 degrees (refer to illustration below). The display and backlight for the direct-access buttons activate.
- Press the backlight button (refer to page 4). The display and backlight for the direct-access buttons activate.
- Press and release bottom hardkeys (after they have been programmed to do page flips).

Tilting MT-500C to Activate Unit



NOTE: If the screen does not illuminate or becomes blank, adjust contrast using the contrast dial (refer to illustration on page 4).

Power Down Feature

The MT-500C has an automatic power down feature to save power. This feature powers down the unit after a period of time when it is not being used. You can set the power down time using the “Adjusting System Settings” section on page 9.

Adjusting System Settings



To access the MT-500C's setup panels, hold a finger on the Remote icon until setup panel 1 appears (refer to graphic below). The symbol 1/3 in the panel refers to panel 1 of 3. Only setup panels 1 and 2 are used in this section. Tap **up** or **down** (at bottom of display) to toggle between setup screens. Panel 3 allows the user to view firmware version numbers (tap **Show Specs** in panel to view numbers).

Setup Panel 1



NOTE: The **-** **+** buttons appear on the bottom of the panel when some of the options are selected. Tap to return the display to the logo page (exits setup).

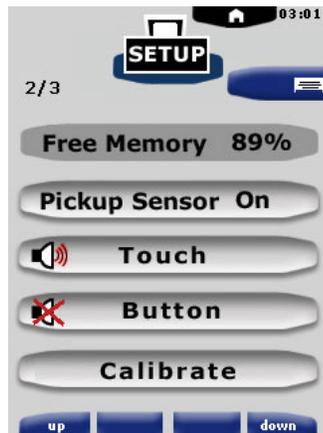
Setup Panel 1 Functions/Adjustments

Setting	Function	Adjustment
Battery	Shows battery level.	Not applicable.
	Turns the clock display on or off. Lets you set 12 or 24-hour display.	Tap button to toggle function.
03:01pm	Sets the clock time.	Tap button and use - or + buttons (adjusts in one minute increments). Hold + to ramp up, hold - to ramp down.
Wed	Sets the day of the week.	Tap button and use - or + buttons.
LCD 10 sec	Sets how long the touchscreen/backlight of touchscreen stays on. Default is 10 sec.	Tap button and use - or + buttons (adjusts in one second increments, 1-240). Hold + to ramp up, hold - to ramp down.
Button Light 4 sec	Sets how long the hardkey's (only the buttons to the right of display) backlight stays on. Default is 1 sec.	Tap button and use - or + buttons (adjusts in one second increments, 1-240). Hold + to ramp up, hold - to ramp down.
Brightness	Adjusts brightness of touchscreen (4 levels, default is level 2).	Tap button and use - or + buttons.

NOTE: You cannot adjust the Button Light delay to be greater than the LCD delay. You cannot adjust the LCD delay to be less than the Button Light delay. For example, if the LCD delay is 10 sec. and the Button Light delay is 4 sec., once you try and increase the Button Light delay to be greater than the LCD delay, the LCD delay will automatically increase to match the Button Light delay.

Press the **down** button to display setup panel 2 (refer to graphic below).

Setup Panel 2



Setup Panel 2 Functions/Adjustments

Setting	Function	Adjustment
Free Memory 89%	Indicates free memory available.	Not applicable.
Pickup Sensor On	Turns on or off the option to activate MT-500C by picking it up.	Tap button to toggle function.
Touch	Adjusts sound level (3 levels, default is level 2) or turns off touchscreen beep.	Tap button to change level.
Button	Adjusts sound level (3 levels) or turns off fixed button beep. Default is off.	Tap button to change level.
Calibrate	Activates calibration screen	Tap button. Follow directions on screen.

NOTE: Activating the pickup sensor option can result in reduced battery operating time. Tap  to return the display to the logo page (exits setup).

Maintaining the MT-500C

The following lists important information to help you maintain the MT-500C.

Take care not to scratch the touchscreen. Use your finger to tap the touchscreen or use plastic-tipped pens intended for use with a touchscreen.

Keep the MT-500C away from heat sources.

Do not expose MT-500C to rain or excessive moisture. If you spill water on the MT-500C, remove battery pack and allow unit to dry for 48 hours before replacing battery pack.

Do not drop MT-500C or subject unit to hard impact.

Use a **soft, damp cloth to clean the unit**. If the touchscreen is dirty or soiled, clean it using a soft cloth moistened with a diluted window cleaning solution.

NOTE: Do not use a corrosive detergent or abrasive cleaning pad.

Establishing Communication with the MT-500C

Before uploading a program to the MT-500C, you must connect the control system to the PC. This connection is through a serial port on the PC and the RS-232 port on the MT-500C (or the RS-232 port on the docking station with a docked MT-500C).

Serial Connection

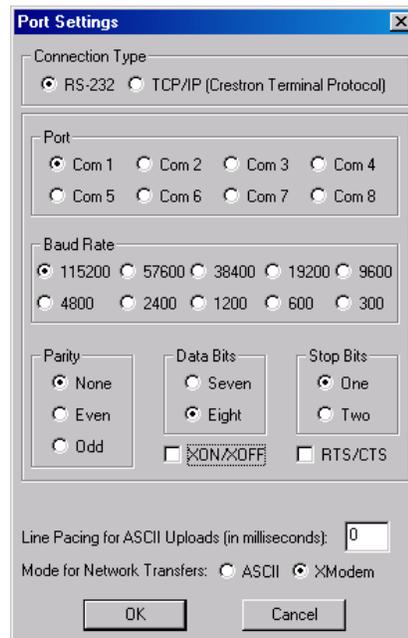
Connect the RS-232 port to the MT-500C serial port (or docking station serial port) and to one of the COM ports (usually COM 1) on the PC using the supplied cable.

Open the Crestron Viewport and click **Setup | Communication Settings** to display the “Port Settings” window (refer to graphic below). Then click **RS-232** as the connection type.

The PC communication settings specified below should match the protocol that the MT-500C expects:

- Port = COM 1 through COM 8. Select the correct COM port on the PC.
- Baud rate = 115200 (Fixed).
- Parity = None.
- Number of data bits = 8.
- Number of stop bits = 1.
- Hardware handshaking (RTS/CTS) not enabled.
- Software handshaking (XON/XOFF) not enabled.

“Port Settings” Window: Settings for RS-232 Communication with the MT-500C



To verify communications, load a project file (refer to “Loading a VT Pro-e Project”) on page 16.

Programming

The MT-500C provides a wireless RF user interface in a Cresnet 2-Series control system.

You can create a program that allows you to set up the MT-500C to operate a Crestron control system using the Crestron programming tool SIMPL™ Windows®. This tool is intended for users with different levels of programming knowledge. The flexibility of this tool is proportional to the degree of programming expertise (i.e., the more flexible, the more a programmer needs to know and account for).

The following are recommended software version requirements for the PC:

- SIMPL Windows version 2.03 or later. Requires SIMPL+ Cross Compiler version 1.1.
- Crestron Database version 15.8 or later.
- VisionTools Pro-e version 2.5. Used for graphical touchscreen design.

SIMPL Windows

NOTE: The following assumes that the reader has knowledge of SIMPL Windows. If not, refer to the extensive help information provided with the software.

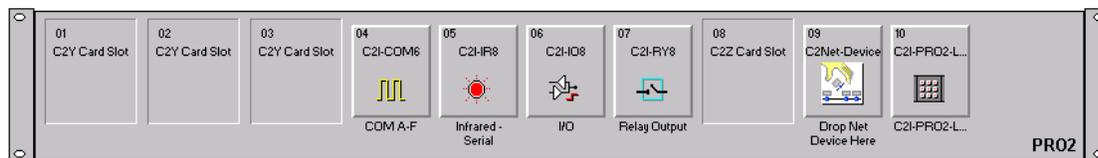
NOTE: In the following description, the PRO2 control system is used.

SIMPL Windows is Crestron's software for programming Crestron control systems. It provides a well-designed graphical environment with a number of workspaces (i.e., windows) in which a programmer can select, configure, program, test, and monitor a Crestron control system. SIMPL Windows offers drag and drop functionality in a familiar Windows® environment.

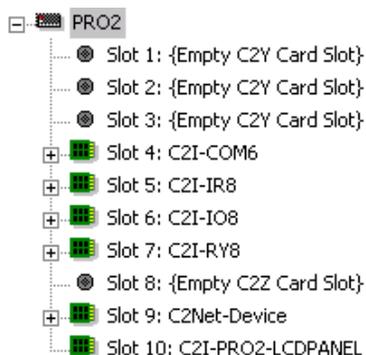
This section describes a sample SIMPL Windows program that includes a MT-500C.

Configuration Manager is where programmers “build” a Crestron control system by selecting hardware from the *Device Library*. In Configuration Manager, drag the PRO2 from the Control Systems folder of the *Device Library* and drop it in the upper pane of the *System Views*. The PRO2 with its associated communication ports is displayed in the *System Views* upper pane (refer to graphic below).

PRO2 System View



The *System Views* lower pane displays the PRO2 system tree. This tree can be expanded to display and configure the communications ports (refer to graphic on next page).

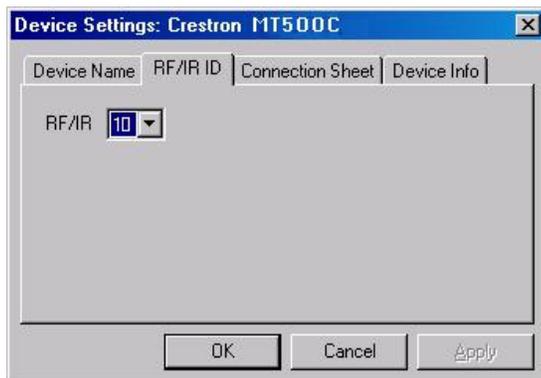
Expanded PRO2 System Tree**C2Net-Device Slot in Configuration Manager**

To incorporate a MT-500C into the system, a gateway device is required. The C2Net-Device Slot can accept a gateway such as the CNRFGWA-418. Once a gateway is configured in a C2Net-Device Slot, the slot allows Cresnet communication between the MT-500C and the control system.

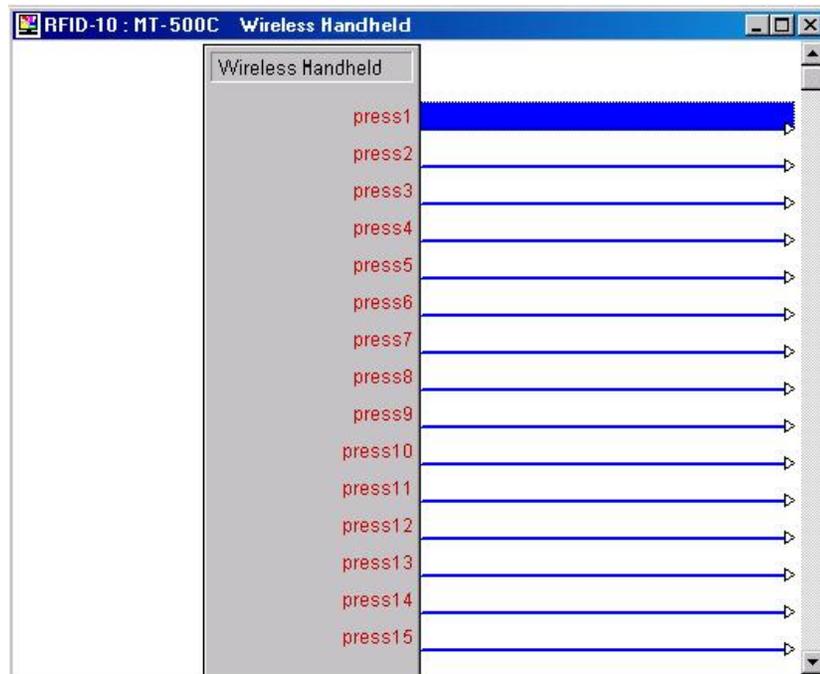
In Configuration Manager, drag the CNRFGWA-418 gateway from the Wireless Receivers (RF) folder of the *Device Library*. Also, drag and drop the MT-500C from the Wireless remotes folder on the CNRFGWA-418.

Expand the system tree in the lower pane and double-click the MT-500C icon to open the “Device Settings” window for the wireless handheld (refer to graphic below). Select the RF/IR ID tab to change the handheld’s RF ID, as shown in the following figure.

NOTE: The hardware and software settings of the RF ID must match. Although the device setting window in SIMPL Windows allows choices through the range of two-digit Hexadecimal numbers from 01 through FE, the RF ID setting for the hardware is limited to numbers in increments of the most significant digit (i.e., 00, 10, 20). Since 00 is not a valid selection in SIMPL Windows, the RF ID number is limited to the fifteen numbers 10, 20, 30, 40, . . .F0 (if you need to use multiple units).

“Device Settings” Window**MT-500C Symbol in Programming Manager**

Programming Manager is where programmers “program” a Crestron control system by assigning signals to symbols. The following diagram shows the MT-500C symbol in the SIMPL Windows’ Programming Manager.

Detail View of the MT-500C in SIMPL Windows' Programming Manager

The table below lists and gives functional descriptions for the handheld outputs.

Symbol Output Signal Descriptions

OUTPUT	DESCRIPTION
press 1 through press 999	Notifies control system of button press (1 – 999). High/1 = press On Low/0 = press Off

VT Pro-e

Unlimited control screen variations incorporating two and three-dimensional graphics and text are possible and can be created with VT Pro-e, a design and programming Windows®-based software. A set of pages that make up a project can be designed for each application. Each wireless handheld can be organized with the ideal, color-oriented control environment with custom control graphics: icons, two and three-dimensional buttons, and floor plans. The project is uploaded to the handheld and programmed into the flash memory. The wireless handheld uses the programmed project until another is uploaded from the PC. The PC may be disconnected from the control processor except when loading a program.

The latest software version can be obtained from the Downloads | Software Updates section of the Crestron website (www.crestron.com). For additional software information, refer to the help file provided with the software.

NOTE: The MT-500C is a one-way RF touchpanel without local logic. Therefore, analog and serial signals do not exist, i.e. gauges, sliders, indirect text, and multi-mode are not available for this panel. Subpages also do not exist for this panel. Converting projects from other panel types to an MT-500C will convert all subpages into corresponding pages. The transparency option is not available for buttons or graphics in a project. Animation effects are also not available in a project.

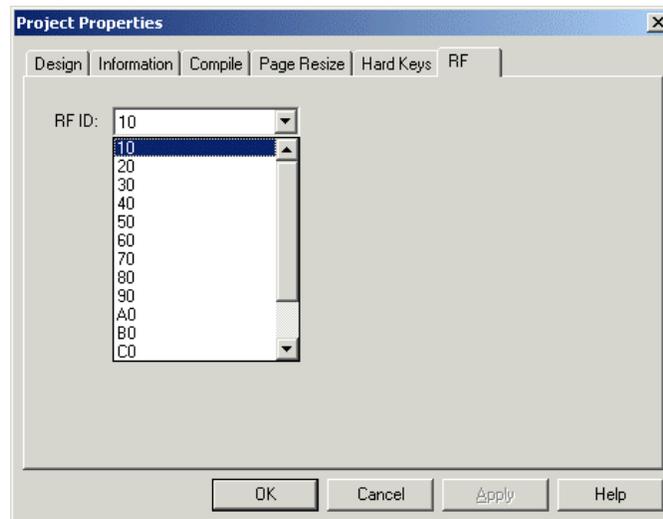
The MT-500C supports the following:

- Three objects: button, border and image
 - Objects can have background color, a face, frame, and text colors
- 2D and 3D styles
- 2D shapes
- Standard graphics such as jpg, bmp and pcx

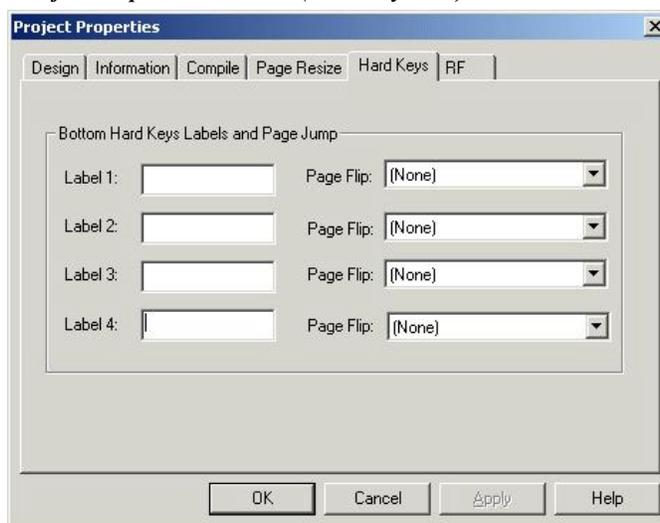
NOTE: If you use a **Return** button in a project, selecting it will always return the display to the first page of the project. For more information on new features and enhancements in VT-Pro-e, refer to the VT Pro-e online help.

NOTE: The RF ID in a project must match the RF ID in the SIMPL Windows project. Select the *RF* tab of “Project Properties” to select the correct RF ID.

“Project Properties” Window (RF Tab)



NOTE: You can program the bottom four hard keys on the MT-500C to perform page flips by using the *Hard Keys* tab of “Project Properties”. You can also use this tab to label the four blue buttons (labels) at the bottom of the display that represent the four hard keys.

“Project Properties” Window (Hard Keys Tab)

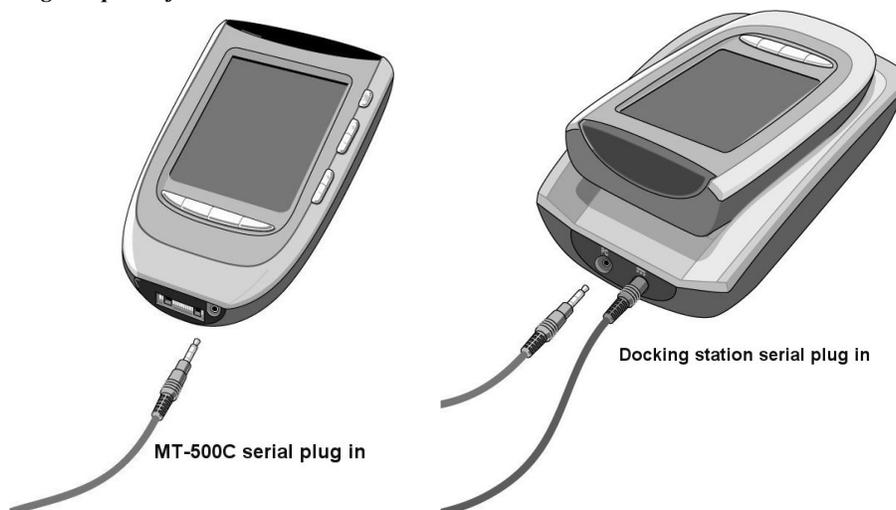
The graphic below shows the digital join numbers for each hardkey. Hardkeys 5 – 9 can be programmed in SIMPL Windows to perform, for example, volume up/down or power on functions for a device, but cannot be programmed in VT Pro-e to do page flips. For more information on digital joins for the MT500C, refer to the SIMPL Windows online help.

Digital Joins for Hardkeys**Loading a VT Pro-e Project**

Before loading a VT Pro-e project, the serial cable supplied with the MT-500C must be connected to the unit and the PC's serial port. The graphics on the next page show the two ways to plug the serial cable: directly in the MT-500C or in the docking station that has a MT-500C docked to it.

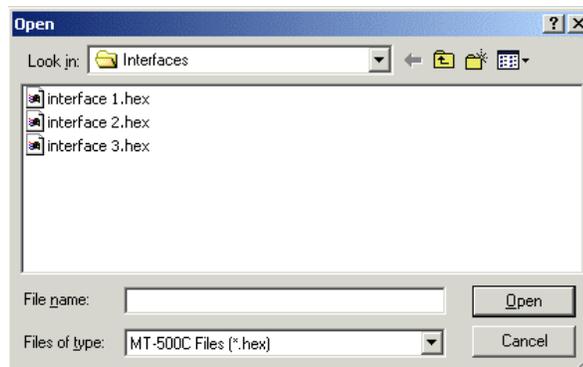
NOTE: You cannot operate the MT-500C while a file is loading.

NOTE: If you load a file using VT-Pro-e, the software automatically sets the baud rate to 115200.

Plug in Options for Serial Cable

To load a VT Pro-e project:

1. Open Viewport.
2. Establish communications between the MT-500C and the PC using Viewport (refer to page 11).
3. Select **File Transfer | Send Touchpanel (MT-500c only)**. An “Open” window appears (refer to graphic below).

“Open” Window

4. Locate file to transfer (for example, interface1.hex) and click **Open**. The file uploads to the MT-500C.

NOTE: The display does not show the status of the upload.

NOTE: The MT-500C reboots (displays an animation sequence) and the Viewport command prompt displays ‘freshly loaded’ to indicate that the file was successfully transferred.

NOTE: If you cancel the transfer before it is complete, the following message may appear on the MT-500C display:

```
Configuration File  
Corrupted
```

If this occurs, reload the project.

Problem Solving

Troubleshooting

The table below and on the next page provides corrective action for possible trouble situations. If further assistance is required, please contact a Crestron customer service representative.

MT-500C Troubleshooting

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Display is black.	Unit not activated.	Refer to "Activating the MT-500C" in this guide for activation instructions.
	Battery pack not properly installed.	Refer to "Installing the Battery Pack" in this guide for proper installation instructions.
	Battery pack not charged.	Refer to "Charging the Battery" in this guide for battery charging instructions.
	Contrast too high and brightness too low.	Adjust contrast dial. Refer to "Adjusting System Settings" in this guide for brightness adjustment instructions.
Display is too light.	Contrast set wrong.	Adjust contrast dial.
	Brightness set too high.	Refer to "Adjusting System Settings" in this guide for brightness adjustment instructions.
LCD goes out quickly after powering up.	LCD option set too low.	Refer to "Adjusting System Settings" in this guide for LCD adjustment instructions.
Touchscreen buttons do not respond properly.	Touchscreen out of calibration.	Refer to "Adjusting System Settings" in this guide for calibration instructions.
Devices do not respond to commands from MT-500C.	Devices not powered up.	Check power to devices. Check that devices are on.
	Battery charge is low.	Recharge battery.
	RF Gateway not functioning.	Check power to RF Gateway.
Battery pack will not charge.	Battery pack not properly installed.	Refer to "Installing the Battery Pack" in this guide for proper installation instructions.
	Power supply defective.	Replace docking station power supply.
LED charging indicators on docking station flash.	Battery pack not properly installed.	Refer to "Installing the Battery Pack" in this guide for proper installation instructions.
	MT-500C not placed properly in docking station.	Make sure unit is mounted properly in docking station.
	Connection for MT-500C in docking station is dirty or has an obstruction.	Clean contacts, remove obstruction.

MT-500C Troubleshooting (Continued)

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
"No panel found" indication when attempting to load project file.	Unit needs to be docked in docking station.	Dock unit in docking station and perform file transfer again.
	Unit is in sleep mode.	Unplug and replug serial cable.
	Unit needs rebooting.	Press Reset button (located within the battery compartment) to reboot.
	RS-232 cable connections bad, or cable damaged.	Check cable connections or replace cable.
	Wrong touchpanel selected for transfer.	Make sure File Transfer Send Touchpanel (MT-500C only) is selected in Viewport.
File transfer fails.	Unit dropped serial communication.	Unplug and replug serial cable.
RF SIG on CNRFGWA-418 illuminates but no device control.	Unit RF ID is not set to match RF ID assigned in the control system program.	Verify the RF IDs match.

Further Inquiries

If after reviewing this Operations Guide, you cannot locate specific information or have questions, please take advantage of Crestron's award winning customer service team by calling:

- In the US and Canada, call Crestron's corporate headquarters at 1-888-CRESTRON [1-888-273-7876] or 1-201-767-3400.
- In Europe, call Crestron International at +32-15-50-99-50.
- In Asia, call Crestron Asia at +852-2341-2016.
- In Latin America, call Crestron Latin America at +5255-5093-2160.
- In Australia and New Zealand, call Creston Pacific at +613-9480-2999

Future Updates

As Crestron improves functions, adds new features, and extends the capabilities of the MT-500C, 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 (www.crestron.com) periodically for manual update availability and its subjective value. Updates are available from the Download | Product Manuals section and are identified as an "Addendum" in the Download column.

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Operations Guide – DOC. 6101
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