Crestron **CNIRHT-MM**
30 Function Hand-Held IR Transmitter

Operations Guide

CRESTRON

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

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30 Function Hand-Held IR Transmitter: CNIRHT-MM

Description

Functional Description

The CNIRHT-MM is a 30 function, hand-held infrared (IR) transmitter designed to work with the CEN-TVAV and/or CN-TVAV. By setting an IR transmitter identification (ID) code in the CNIRHT-MM and using the keypad buttons, any television or audio-visual (TV/AV) device attached to the CEN/CN-TVAV may be controlled remotely. The functions of the individual buttons are determined by the CEN/CN-TVAV and/or the Crestron remote control system (herein referred to as the Cresnet system) SIMPL™ Windows® program.

To prevent interference from fluorescent lighting and most standard IR frequencies, the CNIRHT-MM operates at 455 kilohertz (kHz). The CNIRHT-MM must have an unobstructed line-of-sight to the CEN/CN-TVAV being controlled. A light-emitting diode (LED) on the front of the CNIRHT-MM indicates IR transmission when any keypad button is pressed, is used to display the IR transmitter ID code that is set into the unit, and flashes continuously when the CNIRHT-MM battery voltage is low.

Physical Description

The CNIRHT-MM, shown on the next page, is housed in a slim, high-impact ABS plastic black enclosure. The front contains one LED and 30 keypad buttons. At the rear of the unit is the battery compartment that contains one 9-volt alkaline battery (included) and a sensor (photo transistor) that is used to set the IR transmitter ID code.

Physical Views and Dimensions

Front View   *Side View*   *Rear View*
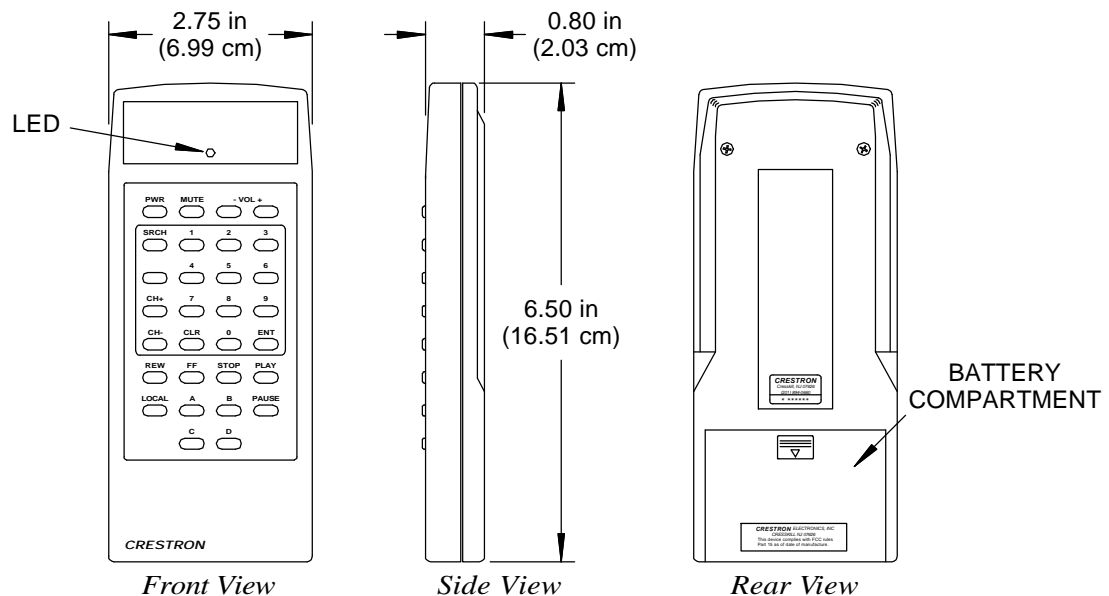
Leading Specifications

The table below provides a summary of leading specifications for the CNIRHT-MM. Dimensions and weight are rounded to the nearest hundredth unit.

Leading Specifications of the CNIRHT-MM

SPECIFICATION	DETAILS
Power Requirements	one 9-volt battery (alkaline recommended)
Operating Range	2 - 30 ft [1]
Default Transmitter ID	10
SIMPL Windows	Version 1.52.01 and library update files version 110 or later [2]
CEN/CN-TVAV Update File	Version 51140V.UPZ or later [3]
CNMSX-AV/Pro Update File	Version 51140X.UPZ or later [3]
CNRACKX/-DP Update File	Version 51140W.UPZ or later [3]
Dimensions & Weight	Height: 6.50 in (16.51 cm)
	Width: 2.75 in (6.99 cm)
	Depth: 0.80 in (2.03 cm)
	Weight: 5.00 oz (0.15 kg)

1   Within the specified range, IR signals are outputted in a 120° angular cone. The effective angle of the signal narrows as the CNIRHT-MM approaches its maximum range of 30 feet.

2 The latest software version can be obtained from the What's New page (SIMPL Windows section) or Downloads page (SIMPLWIN Library) of Crestron's website (www.crestron.com). New users are required to register in order to obtain access to the FTP site.

3 Filenames for update files have a UPZ extension and can be obtained from the What's New page (Control Systems Update Files section) or Downloads page (OPSYS Library) of Crestron's website. Update files are specifically designed for certain control systems. If an update file is loaded into a control system other than the device for which it was intended, it may lockup the control system which would then have to be returned to Crestron. Update files with an "**S**" designator are for the ST-CP, "**V**" designator for CEN/CN-TVAV, "**W**" for CNRACKX/-DP, and "**X**" for CNMSX-AV/Pro control systems. Control systems are able to recognize and reject incorrect update files. However, when updating control systems, do not ignore any Crestron Viewport warning prompts or messages.

As of the date of manufacture, this unit has been tested and found to comply with specifications for CE marking.

$$C\mathcal{E}$$

NOTE: 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.

Transmitter ID Code

Every CNIRHT-MM communicating with the CEN/CN-TVAV requires a unique IR transmitter ID code that matches an ID code specified in the SIMPL Windows program in the CEN/CN-TVAV. Multiple CNIRHT-MMs may be used with a single CEN/CN-TVAV but each unit needs a unique Transmitter ID. This code is a two-digit hexadecimal number and to maintain diversity within a Cresnet system, codes from 10 to FE are used for the transmitters. The Transmitter ID of the CNIRHT-MM is factory set to **10**.

NOTE: Do not confuse Transmitter ID with network (NET) ID used by all Cresnet system equipment and user interfaces.

NOTE: If the CNIRHT-MM is within line-of-sight of multiple CEN/CN-TVAVs, the Transmitter ID must be unique only to the device for which it is intended. Otherwise, the CNIRHT-MM will control multiple CEN/CN-TVAVs simultaneously.

There are two methods to set the Transmitter ID code of the CNIRHT-MM, by pressing keypad buttons that represent a Transmitter ID code or via the CNIDC Identity Code Cable and a local personal computer (PC) that contains SIMPL Windows or VisionTools™ Pro-e (VT Pro-e).

Set or Display Transmitter ID via Keypad Buttons

The Transmitter ID of the CNIRHT-MM may be accessed by using the keypad buttons. This allows the Transmitter ID to be set or displayed without using a CNIDC and PC.

Numeric Cross Reference Table

HEX	BINARY	MORSE	HEX	BINARY	MORSE
0	0000	- - - - -	8	1000	- - - . .
1	0001	. - - - -	9	1001	- - - - .
2	0010	. . - - -	A	1010	. -
3	0011	. . . - -	B	1011	- . . .
4	0100	. . . . -	C	1100	- . - .
5	0101	. . . . .	D	1101	- . .
6	0110	-	E	1110	.
7	0111	- - . . .	F	1111	. . - .
NOTE: Morse code is displayed as short-flashes of the LED to represent dots and longer-flashes to represent dashes.					

1. Remove the CNIRHT-MM battery compartment cover.

2. At the battery compartment, disconnect the battery.

3. To establish a "0" key for displaying or setting the Transmitter ID, press and hold any button for at least **five** seconds while re-connecting the battery. Note that the LED of the CNIRHT-MM will illuminate as the battery is connected, and will remain lit until **five** seconds have expired as an indication that the button has been held long enough to enter programming mode.

4. Release the "0" key and observe the LED of the CNIRHT-MM blink **once** to indicate the keypad programming mode.

5. To set or display a Transmitter ID, perform the appropriate step below.

   5a. To **set** a Transmitter ID, press any button other than the "0" key to establish a "1" key. To enter the desired Transmitter ID code, use the "0" and "1" keys, enter any non-weighted zeros, and enter the most significant bit first. For example, to set the transmitter code to 12, press 0001 0010. After the Transmitter ID code has been entered, it will be verified via Morse code flashes of the LED. The unit then returns to the normal operating mode.

   5b. To **display** the current Transmitter ID, press the "0" key. The Transmitter ID will be displayed via Morse code flashes of the LED, most significant bit first. The unit returns to the normal operating mode when the display is complete. To set another Transmitter ID, repeat this procedure from step 2.

Set Transmitter ID via CNIDC and PC

To set the Transmitter ID of the CNIRHT-MM via the CNIDC and PC, the PC must have the Crestron Viewport that is available in SIMPL Windows or VT Pro-e. To set the Transmitter ID, perform the following procedure.

1. Connect the 9-pin connector of the CNIDC to an available COM port on the PC.

2. Position the CNIRHT-MM button-side down so the battery compartment is accessible.

3. Remove the battery compartment cover.

4. Refer to the diagram on the next page. Place and hold the IR probe of the CNIDC over the sensor (photo transistor) of the CNIRHT-MM. The probe should be positioned between the battery compartment and the sensor opening so that it completely covers the sensor.

CNIRHT-MM Sensor
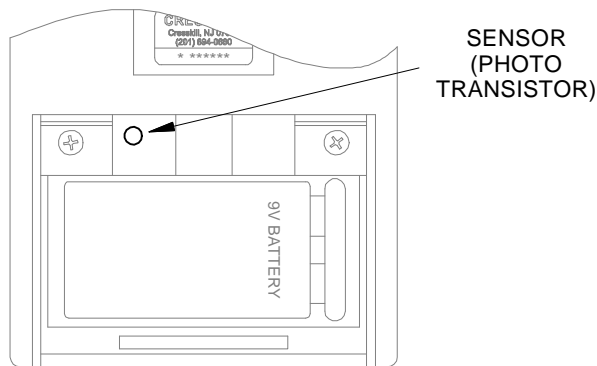
5. At the PC, start SIMPL Windows or VT Pro-e.

6. From the SIMPL Windows or VT Pro-e menu bar, select **Tools | Viewport** to open the Crestron Viewport.

7. From the Viewport **Functions** menu, select **Set Transmitter ID** as shown below.
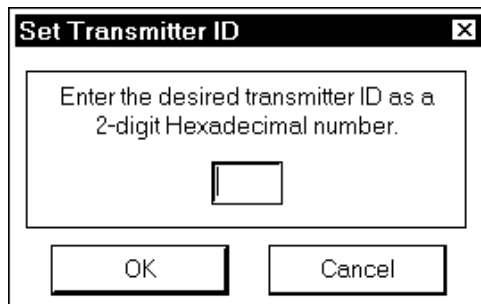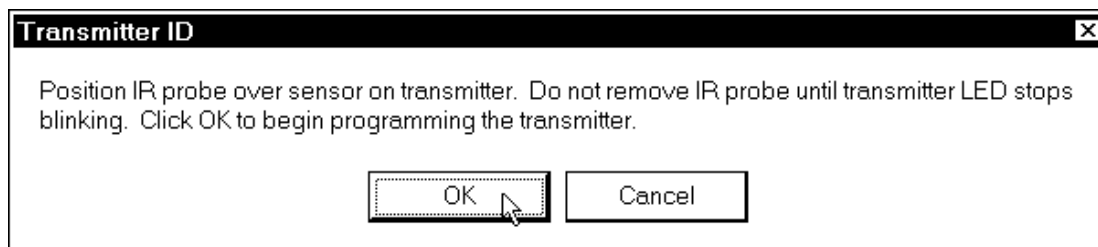
Select Set Transmitter ID
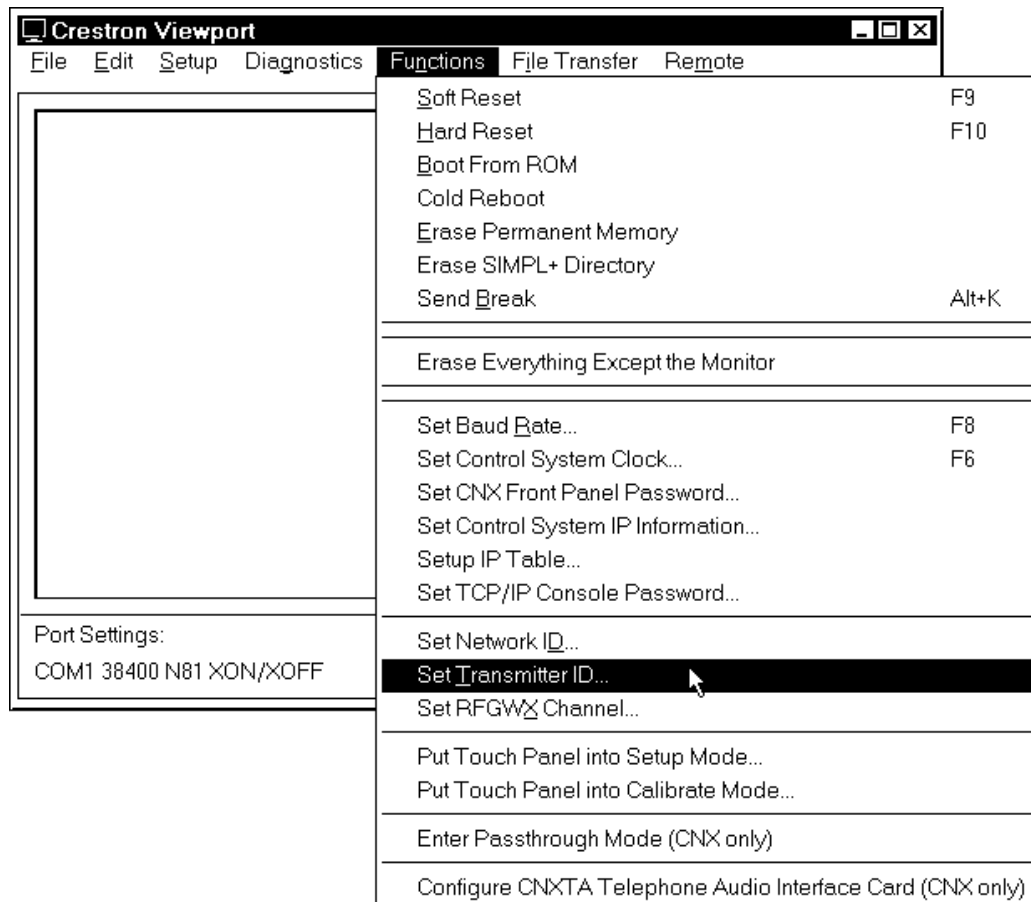
8. When the Set Transmitter ID window (shown below) appears, enter a two-digit hexadecimal number ranging from 10 to FE and click **OK**.

"Set Transmitter ID" Window

```
┌─────────────────────────────────────────┐
│ Set Transmitter ID                    ☒ │
├─────────────────────────────────────────┤
│  ┌───────────────────────────────────┐  │
│  │  Enter the desired transmitter ID │  │
│  │  as a 2-digit Hexadecimal number. │  │
│  │                                   │  │
│  │            ┌─────┐                │  │
│  │            │     │                │  │
│  │            └─────┘                │  │
│  └───────────────────────────────────┘  │
│   ┌───────────┐      ┌───────────┐       │
│   │    OK     │      │  Cancel   │       │
│   └───────────┘      └───────────┘       │
└─────────────────────────────────────────┘
```

9. Making sure that the IR probe of the CNIDC remains positioned over the CNIRHT-MM sensor, lift and rotate the CNIRHT-MM so that the front LED is visible.

10. As shown below, observe the Transmitter ID window and then click **OK** to set the Transmitter ID.

Click OK in "Transmitter ID" Window

```
┌──────────────────────────────────────────────────────────────────────────┐
│ Transmitter ID                                                          ☒ │
├──────────────────────────────────────────────────────────────────────────┤
│ Position IR probe over sensor on transmitter.  Do not remove IR probe     │
│ until transmitter LED stops blinking.  Click OK to begin programming the   │
│ transmitter.                                                              │
│            ┌───────────────┐      ┌───────────────┐                       │
│            │     OK        │      │    Cancel     │                       │
│            └───────────────┘      └───────────────┘                       │
└──────────────────────────────────────────────────────────────────────────┘
```

11. When the LED of the CNIRHT-MM stops flashing, the Transmitter ID has been set. Remove the IR probe of the CNIDC from the sensor and the LED flashes **three** times to indicate the unit has resumed normal operating mode.

12. Re-install the battery compartment cover onto the battery compartment.

13. At PC, exit the Viewport and SIMPL Windows or VT Pro-e.

14. Disconnect the 9-pin connector of the CNIDC from the COM port on the PC.

Programming with SIMPL™ Windows® or SIMPL+

SIMPL (Symbol Intensive Master Programming Language) is an easy-to-use programming language that is completely integrated and compatible with all Crestron system hardware. The objects that are used in SIMPL are called symbols. SIMPL Windows offers drag and drop functionality in a familiar Windows® environment.

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.

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

Within a Cresnet system, a CEN/CN-TVAV may be accessed as a Local Processing peripheral, a Remote Processing peripheral, or a "mixed mode" peripheral. To utilize the CNIRHT-MM, a SIMPL Windows program must be loaded into a Local Processing or Mixed Mode CEN/CN-TVAV. If using a Mixed Mode CEN/CN-TVAV, the program must also be loaded into the host control system. Refer to the documentation supplied with the CEN/CN-TVAV for further details.

Configure CNIRHT-MM Program

To create a program with a CNIRHT-MM in the Configuration Manager of SIMPL Windows, refer to the table on the next page for initial configuration information.

NOTE: Multiple CNIRHT-MMs may be used with a single CEN/CN-TVAV. To use multiple CNIRHT-MMs, refer to "Transmitter ID Code" that begins on page 3.

Configure CNIRHT-MM Program

DEVICE LIBRARY	SYMBOL REQUIRED	DROP WHERE	ADDITIONAL SETUP
Control Systems	CEN-TVAV Local Processing *or* CN-TVAV Local Processing	System Views	Refer to the documentation supplied with CEN-TVAV or CN-TVAV for additional information.
Wireless Remotes (IR)	CNIRHT-MM	CEN-TVAV or CN-TVAV Local Processing, Slot 02 TVAVIRGW	CHANGE IR ID (OPTIONAL) - Single-click on TVAVIRGW. In the Systems View Detail Window, double-click (or single-click, right mouse-click, select Configure) on name of CNIRHT-MM in TVAVIRGW address text window. Select RF ID then select desired hexidecimal ID.

CNIRHT-MM Symbol

The diagram below and continued on the next page shows the CNIRHT-MM symbol in the SIMPL Windows Programming Manager. The table and diagram on page 11 show the outputs and provides reference information for programming.

Detail View of CNIRHT-MM Symbol in SIMPL Windows' Programming Manager (1 of 2)
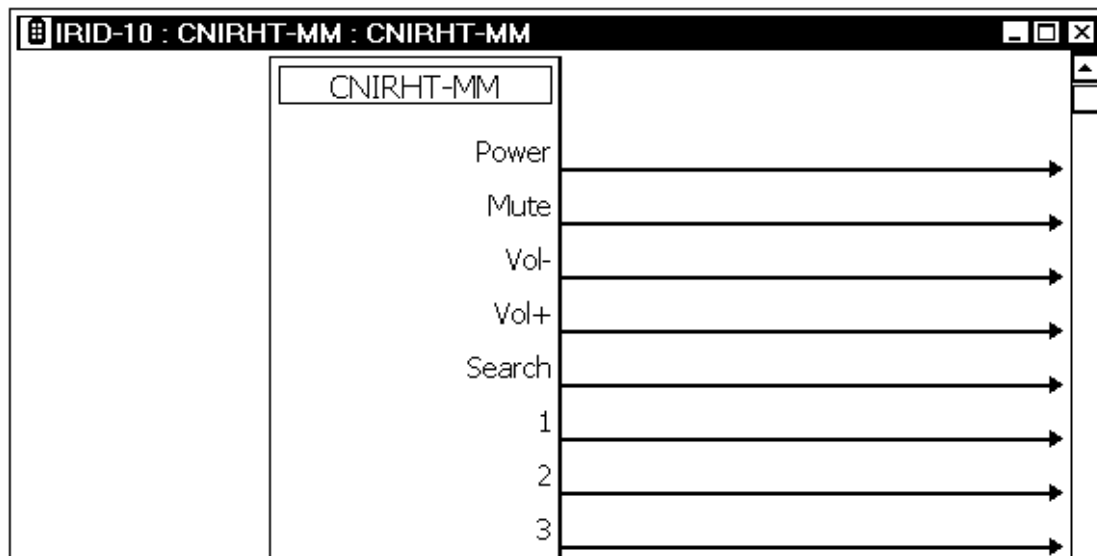
*Detail View of CNIRHT-MM Symbol in SIMPL Windows' Programming Manager (2 of 2)*

```
(Optional) ─────────────────────────►
        4 ─────────────────────────►
        5 ─────────────────────────►
        6 ─────────────────────────►
      Ch+ ─────────────────────────►
        7 ─────────────────────────►
        8 ─────────────────────────►
        9 ─────────────────────────►
      Ch- ─────────────────────────►
      Clr ─────────────────────────►
        0 ─────────────────────────►
      Ent ─────────────────────────►
      Rew ─────────────────────────►
Fast Forward ─────────────────────────►
     Stop ─────────────────────────►
     Play ─────────────────────────►
    Local ─────────────────────────►
 Source A ─────────────────────────►
 Source B ─────────────────────────►
    Pause ─────────────────────────►
 Source C ─────────────────────────►
 Source D ─────────────────────────►
```

NOTE: All symbol outputs listed in the following table are *DIGITAL* signals. The signals are high (logic level of 1) as long as the keypad button is held. Subsequent symbols within the program should be activated on the rising edge (when CNIRHT-MM output goes from low to high) transitions.

CNIRHT-MM Symbol Output Reference Information

SYMBOL OUTPUT	KEYPAD LABEL	PHYSICAL SWITCH	SYMBOL OUTPUT	KEYPAD LABEL	PHYSICAL SWITCH
Power	PWR	SW1	Ch-	CH-	SW17
Mute	MUTE	SW2	Clr	CLR	SW18
Vol-	VOL -	SW3	0	0	SW19
Vol+	VOL +	SW4	Ent	ENT	SW20
Search	SRCH	SW5	Rew	REW	SW21
1	1	SW6	Fast Forward	FF	SW22
2	2	SW7	Stop	STOP	SW23
3	3	SW8	Play	PLAY	SW24
(Optional)	(No Label)	SW9	Local	LOCAL	SW25
4	4	SW10	Source A	A	SW26
5	5	SW11	Source B	B	SW27
6	6	SW12	Pause	PAUSE	SW28
Ch+	CH+	SW13	Source C	C	SW29
7	7	SW14	Source D	D	SW30
8	8	SW15	All symbol outputs & labels are standard		
9	9	SW16	e-Scheduler™ device control functions.		

CNIRHT-MM Keypad Button/Switch Layout
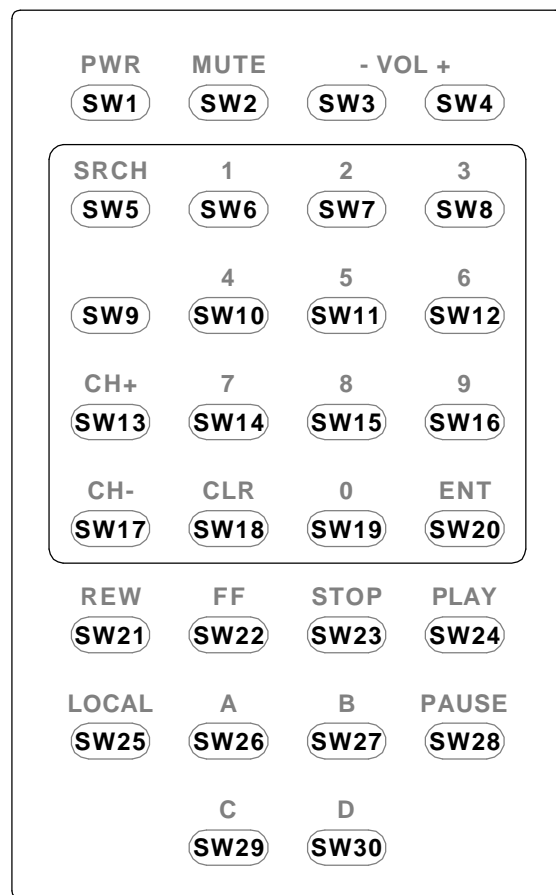
Example Program

The SIMPL Windows program contained in the CEN/CN-TVAV determines the functions for the individual keypad buttons of the CNIRHT-MM. An example program is available from the Downloads page (EXAMPLES Library) of Crestron's website (www.crestron.com). Search for CNIRHTMM.ZIP that contains an example program and associated macros required to complete the program. New users are required to register in order to obtain access to the FTP site.

Problem Solving

Troubleshooting

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

CNIRHT-MM Troubleshooting

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
LED indicator flashes continuously.	Battery voltage low.	Replace battery.
LED indicator does not illuminate.	Battery bad or dead.	Replace battery.
Intermittent response during transmission.	Battery voltage low.	Replace battery.
	CNIRHT-MM not within direct line-of-sight of CEN-TVAV or CN-TVAV.	Make sure that CNIRHT-MM is within direct line-of-sight of CEN-TVAV or CN-TVAV.
CNIRHT-MM does not communicate with CEN-TVAV, CN-TVAV, or host control system.	Wrong transmitter in use.	If multiple transmitters are accessible, verify proper unit is used.
	Transmitter ID not set.	Set Transmitter ID to match code in CEN-TVAV, CN-TVAV or host control system program.
	Transmitter ID set but does not match code in CEN-TVAV, CN-TVAV or host control system.	
	Improper SIMPL Windows programming.	Verify that the CEN-TVAV, CN-TVAV or host control system program.

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 +525-260-4336.

For local support from exclusive Crestron factory-trained personnel call:

- In Australia, call Soundcorp at +613-9488-1555.

- In New Zealand, call Amber Technologies at +649-410-8382.

Future Updates

As Crestron improves functions, adds new features, and extends the capabilities of the CNIRHT-MM, additional information and programming examples 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.

The Downloads page of the Crestron website (www.crestron.com) directs the reader to the location and description of each update. Check the site periodically for update availability and its subjective value.

Return and Warranty Policies

Merchandise Returns / Repair Service

1. No merchandise may be returned for credit, exchange, or service without prior authorization from CRESTRON. To obtain warranty service for CRESTRON products, contact the factory and request an RMA (Return Merchandise Authorization) number. Enclose a note specifying the nature of the problem, name and phone number of contact person, RMA number, and return address.

2. Products may be returned for credit, exchange, or service with a CRESTRON Return Merchandise Authorization (RMA) number. Authorized returns must be shipped freight prepaid to CRESTRON, Cresskill, 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 Cresnet products, denoted by a "CN" prefix model number, to be free from manufacturing defects in materials and workmanship for a period of three (3) years from the date of shipment to purchaser. Disk drives and any other moving or rotating mechanical parts are covered for a period of one (1) year. CRESTRON warrants all its other products for a period of one year from the defects mentioned above, excluding touchscreen display components which are covered for 90 days. Incandescent lamps are completely excluded from Crestron's Limited Warranty. 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.

CRESTRON shall not be liable to honor warranty terms 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 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 makes no other warranties nor authorizes any other party to offer any warranty, expressed or implied, including warranties of merchantability for this product. This warranty statement supersedes all previous warranties.

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