

Crestron **CNRFHT-15/30 & CNIRHT-15/30** Hand-Held Wireless Transmitters

Operations Guide

A supplement to the Cresnet II Technical Manual



CRESTRON
REMOTE CONTROL SYSTEMS

TABLE OF CONTENTS

	<u>PAGE</u>
DESCRIPTION.....	1
Functional Description.....	1
CNRFT-15/30.....	1
CNIRHT-15/30	1
Sleep Mode	1
Physical Description.....	2
Configuration Differences	3
LEADING SPECIFICATIONS	3
CONTROLS AND INDICATORS.....	3
Controls	3
Indicators.....	3
INSTALLATION/SETUP.....	4
Identity Code	4
RF Receiver/Transmitter Tuning.....	6
RF Receiver.....	6
RF Transmitter	6
PROGRAMMING	7
TESTING/TROUBLESHOOTING	10
SYNTAX	11
APPENDIX	11

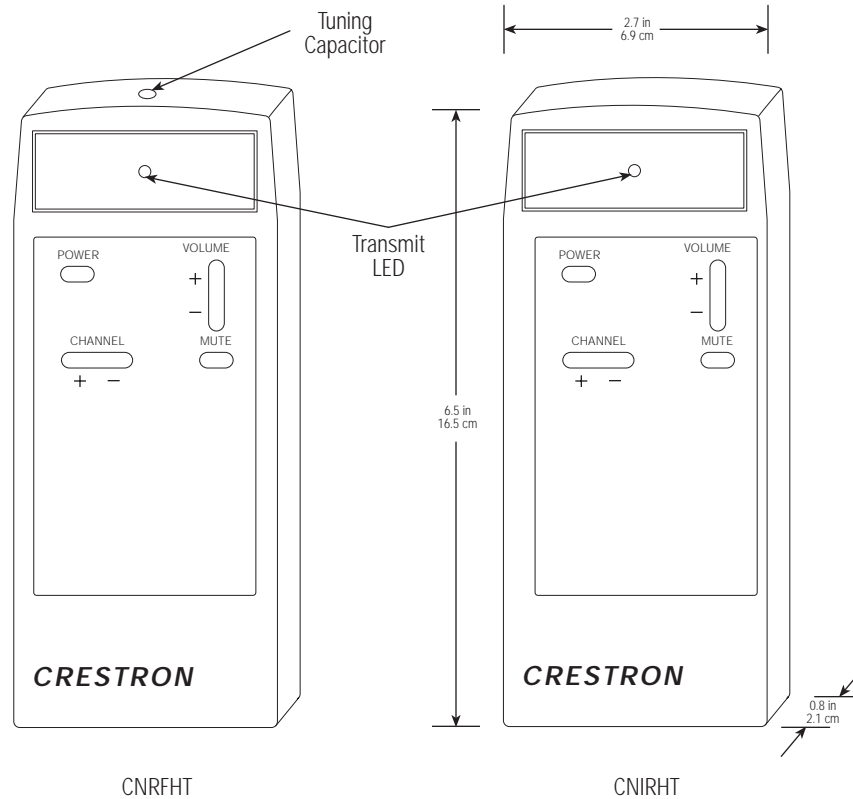


Figure 1. CRESTRON Hand-held Wireless Transmitters

DESCRIPTION:

Functional Description

CNRFHT-15/30:

The CNRFHT, illustrated in figure 1, is a hand-held radio-frequency (RF) transmitter. The unit is designed to operate with the CRESNET II remote control system (herein referred to as the CRESNET II system) via a RF wireless receiver, CNRFGW Wireless Gateway. The CNRFHT is available with 15 or 30 button controls. Depression of any button on the CNRFHT customized 15- or 30-button panel initiates a RF signal transmission to the CNRFGW.

CNIRHT-15/30:

The CNIRHT, illustrated in figure 1, is a hand-held infrared (IR) transmitter. The unit is designed to operate with the CRESNET II system via an IR wireless receiver, CNIRGW Wireless Gateway. The CNIRHT is available with 15 or 30 button controls. Depression of any button on the CNIRHT customized 15- or 30-button panel initiates an IR signal transmission to the CNIRGW.

Sleep Mode:

CNRFHT and CNIRHT have a power-saving mode, known as sleep mode, to extend battery life. If the unit remains inactive (no buttons are depressed) for approximately six hours, the unit enters a default setting, sleep mode. Actual inactivity duration to initiate sleep mode may vary. To reactivate the unit from sleep mode, depress and hold

a button on the unit until it begins transmitting. Transmission is indicated by the illumination of a red LED located above the button panel cover.

Physical Description

NOTE

CRESTRON does not recommend designing large button caps for single functions. Depressing the center of a large button cap can cause the unit to transmit incorrectly which may result in the control system misinterpreting the user's intent. Therefore, design large button caps for dual functions, such as a volume up/volume down rocker-type button.

CNRFHT and CNIRHT electronic hardware is housed in a slim, high-impact molded ABS black plastic enclosure (refer to figure 2). A 30-button array on the printed circuit board is covered by a customized button panel. All button panels include custom engraving, colored button caps, choice of button configurations, and panel finishes. Small and large button caps are available. A small button cap covers one button. A large button cap covers two buttons. Refer to the latest version of the CRESNET II Engraving Worksheet for CNRFHT and CNIRHT (Doc. 5344) to design a unique button panel. Omission of unused buttons is standard. A red LED is located above the button panel cover.

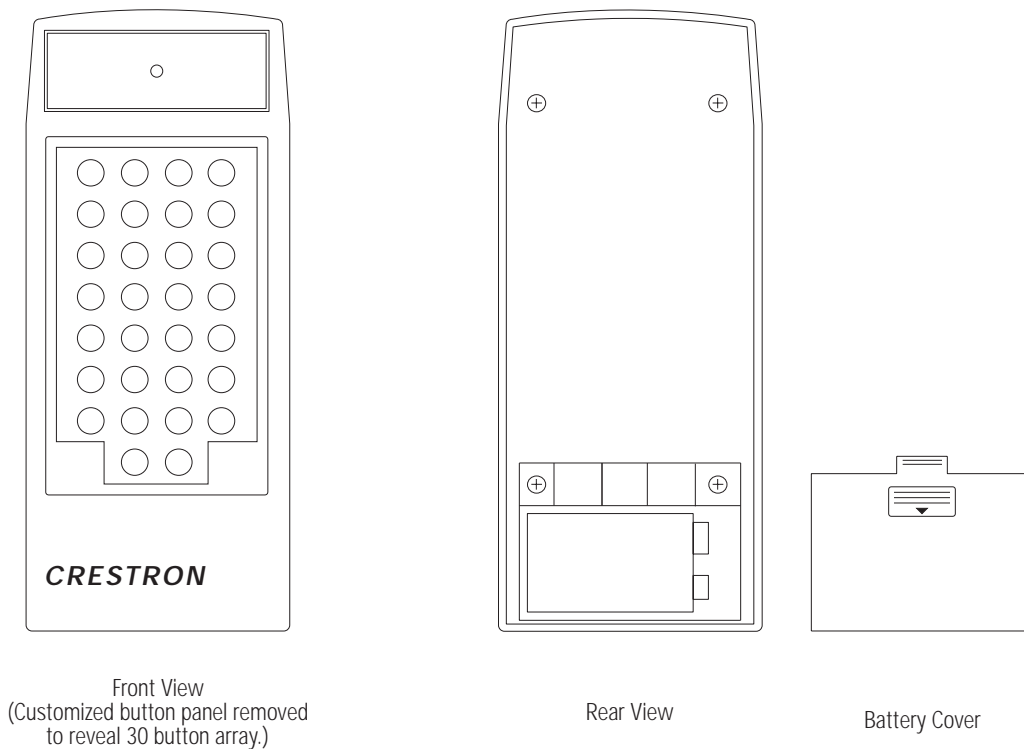


Figure 2. Physical Views of CNRFHT and CNIRHT

Aside from the diversity in button panel configuration, the only external difference between CNRFHT and CNIRHT is the type of plastic material at the pointing end of each unit. CNRFHT has a black plastic cover with a tuning hole (refer to figure 1) and CNIRHT has a ruby-colored IR signal filter.

A nine-volt battery is included with all units. Access to the battery is permitted after the battery cover, located on the underside of the unit, is removed.

Configuration Differences

The CNRFHT and CNIRHT each have two different configurations which are depicted in table 1.

Table 1. CNRFHT and CNIRHT Configurations

CONFIGURATION			DESCRIPTION
CNRFHT-15	&	CNIRHT-15	15 buttons on a customized panel
CNRFHT-30	&	CNIRHT-30	30 buttons on a customized panel

LEADING SPECIFICATIONS:

Table 2 provides a summary of leading specifications for the CNRFHT and CNIRHT. Dimensions and weight are approximations rounded to the nearest tenth unit.

Table 2. Leading Specifications

SPECIFICATION	DETAILS
Battery	9V DC
Dimensions & Weight	Height: 6.5 in (16.5 cm)
	Width: 2.7 in (6.9 cm)
	Depth: 0.8 in (2.1 cm)
	Weight: 0.3 lb (0.2 kg)

CONTROLS AND INDICATORS:

Controls

Button controls are custom designed. CNRFHT and CNIRHT are available with 15 to 30 functional buttons. Function definition is determined by application of the unit within the CRESNET II system. The customized button controls correspond to signal names that are defined in the SIMPL program.

A tuning hole is located on the pointing end of the CNRFHT. This control mechanism permits the user to adjust the frequency. Refer to Installation/Setup for tuning techniques.

Indicators

There is only one indicator located on the CNRFHT and CNIRHT. The indicator is a red LED and resides on the face of the unit above the button panel cover. The LED indicates IR/RF transmission and illuminates when a button is depressed.

INSTALLATION/SETUP:

Identity Code

Every hand-held wireless transmitter communicating with either the CNRFGW or CNIRGW requires a unique identity code (ID CODE). For RF devices the ID CODE is referred to as RF ID. For IR devices the ID CODE is referred to as IR ID. There are 256 possible two-digit hexadecimal alphanumeric codes ranging from 00 to FF. To maintain code diversity within the CRESNET II system, use codes between 10 and FE for the transmitters.

NOTES

1. *The ID CODE on the CNRFHT and CNIRHT is factory set to 20.*
2. *Do not use 00 or FF as an RF/IR ID.*
3. *Do not confuse RF/IR ID with network (NET) ID.*

To set an ID CODE complete the following steps.

1. Position the unit button-side down so the battery compartment is accessible.
2. Remove the battery cover.
3. Remove four screws from the unit (two screws are located within the battery compartment).
4. Gently lift the rear cover off the unit.
5. Refer to figure 3 and locate an eight-position SIP switch on the printed circuit board. Switches labeled 1 through 4 represent the least-significant digit or letter of the ID CODE. Switches labeled 5 through 8 represent the most-significant digit or letter of the ID CODE.

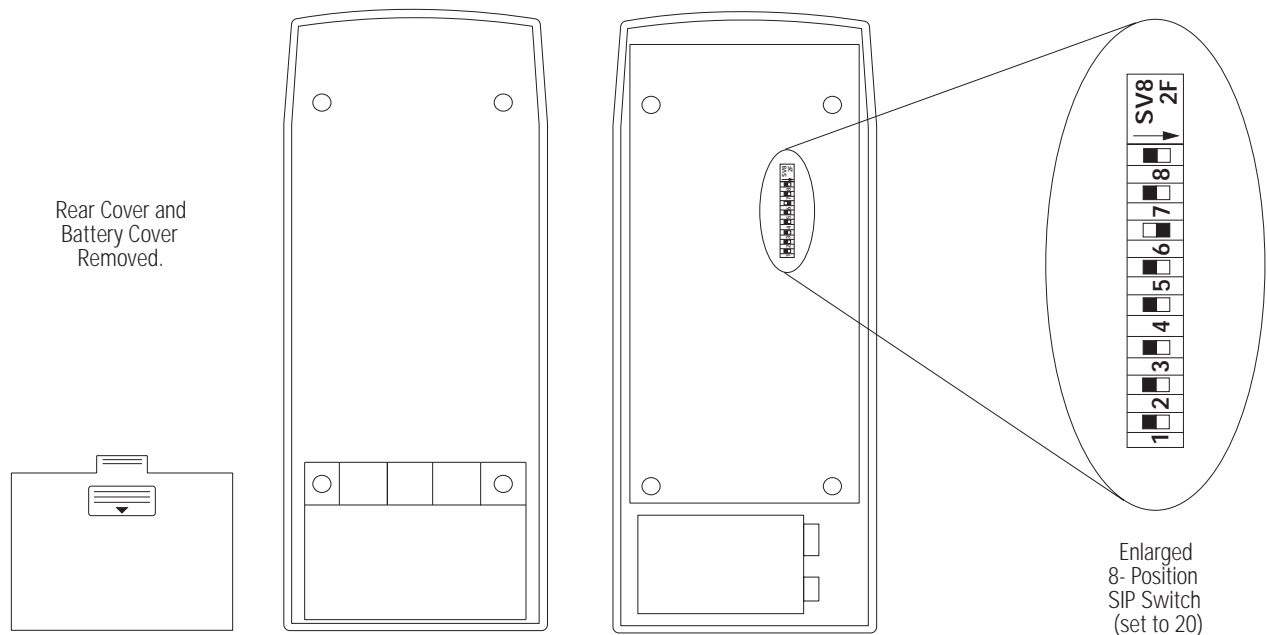


Figure 3. SIP Switch Location

- Refer to table 3 and translate the ID CODE two-digit hexadecimal number or letter into an eight-digit SIP switch code.

NOTES

- The ID CODE of the unit is factory set to 20. This hexadecimal setting corresponds to an eight-digit SIP switch code of 00000100, with respect to SIP switches 1 through 8.
- A "1" in the table indicates that the switch should be set in the direction of the arrow head located on the SIP switch. A "0" in the table above indicates that the switch should be set in the opposite direction of the arrow head.

Table 3. CNRFHT and CNIRHT SIP Switch Settings

Hexadecimal NUMBER OR LETTER	Most-Significant SIP Switch Digit				Least-Significant SIP Switch Digit			
	8	7	6	5	4	3	2	1
0	0	0	0	0	0	0	0	0
1	0	0	0	1	0	0	0	1
2	0	0	1	0	0	0	1	0
3	0	0	1	1	0	0	1	1
4	0	1	0	0	0	1	0	0
5	0	1	0	1	0	1	0	1
6	0	1	1	0	0	1	1	0
7	0	1	1	1	0	1	1	1
8	1	0	0	0	1	0	0	0
9	1	0	0	1	1	0	0	1
A	1	0	1	0	1	0	1	0
B	1	0	1	1	1	0	1	1
C	1	1	0	0	1	1	0	0
D	1	1	0	1	1	1	0	1
E	1	1	1	0	1	1	1	0
F	1	1	1	1	1	1	1	1

- Use a small screwdriver or a small pair of pliers and adjust the switch, appropriately.
- Ensure all screw standoffs are properly situated and place the rear cover onto the unit.
- Secure the rear cover by tightening the four screws.
- Secure the battery cover over the battery compartment.

RF Receiver/Transmitter Tuning

NOTE

The following installation instructions are for the CNRFHT only.

The CNRFHT and CNRFGW are factory tuned and normally do not require tuning. However, in some cases it may be necessary to tune the CNRFHT transmitter for the CNRFGW to receive signals properly. Complete the following steps to tune the transmitter and receiver.

RF Receiver

1. Verify CNRFGW power is on. The green LED marked NET PWR on the receiver illuminates when power is on.
2. Position the CNRFGW on its side so that the silk-screened face is visible.
3. To optimize reception extend the CNRFGW antenna vertically to a height of nine to 10 inches.

CAUTION

Do not force the tuning adjustment on the receiver. Over exerting the tuning adjustment may damage the unit.

4. Use a nylon (non-conductive) tuning tool and gently turn the tuning adjustment on the face of the CNRFGW clockwise, until it comes to a stop.
5. Hold the tuning tool firmly; gently turn the tuning adjustment counterclockwise, two complete turns. This sets the receiver frequency to 300 MHz, which is the factory standard setting. Frequencies ranging between 270 and 330 MHz can be used by turning the tuning adjustment to different positions.

RF Transmitter

CAUTION

Do not force the tuning adjustment on the transmitter. Over exerting the tuning adjustment may damage the unit.

1. Place the tuning tool into the tuning hole located at the pointing end of the CNRFHT; gently turn the tuning adjustment clockwise until it comes to a stop.
2. With CNRFHT in hand, stand approximately six feet from the CNRFGW.
3. Insert the tuning tool into the CNRFHT; gently turn the tuning adjustment counterclockwise, approximately two full turns.
4. Aim the CNRFHT at the CNRFGW antenna; depress any button on the transmitter.
5. While aiming and depressing any button, gently turn the tuning tool in either direction, until the red LED marked SIGNAL on the CNRFGW illuminates.

- Once the frequency is located, it may be necessary to fine tune the device by slowly turning the tuning tool in either direction, until the red LED marked SIGNAL is brightly illuminating. The LED must be at its brightest setting to confirm the unit is tuned to the highest lobe of the frequency range.
- Move to a different location within the room; depress any button on the transmitter to verify proper frequency setting.

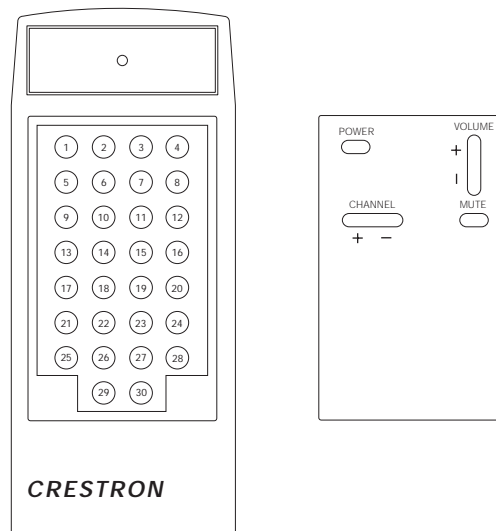
NOTE

The red LED on the CNRFGW will not illuminate when it is approximately 10 to 15 feet from the CNRFHT. The system is still functioning, but the threshold to illuminate the signal is too low. However, the red LED on the CNRFHT illuminates when a button is depressed, indicating the remote is transmitting.

- If "dead" spots are found within the room, insert the tuning tool into the CNRFHT and carefully make further adjustments in either direction to fine tune the system.

PROGRAMMING:

A 30-button array is located beneath the custom button panel of each CNRFHT and CNIRHT. Refer to figure 4 for an illustrative layout of transmitter button numbers beneath a sample button panel. The numbering for each button is constant. For each button input, a signal name must be defined in the SIMPL program. Unused buttons need not be assigned signal names. An example following figure 4 illustrates button definition in the CRESNET II Workshop. Access the following tables from the "Define Network" section of the SIMPL-I Menu. An example of SIMPL-C programming for the same custom button panel design is shown in the Appendix.



Customized button panel removed.
Each button is illustrated with its corresponding number.

Figure 4. Button Number Layout

CRESTRON CNRFHT-15/30 & CNIRHT-15/30 Hand-Held Wireless Transmitters

System PF: 4.5 Net PF: 3.0

Net ID	Net Device	Description	P.F.
03:	CNRFGW	CNRFGW/CNIRGW Receiver	3.0
04:			
05:			
06:			
07:			
08:			
09:			
0A:			
0B:			
0C:			

TAB to select entries

PgUp/PgDn to find ID

F2-Detail

F3-Display Signals

ESC to Def Equip

Define Network

F1 = Help

Net ID: 03

CNRFGW		
CNRFGW/CNIRGW Receiver		

RF ID	Transmitter	Description
12	CNRFHT	16/32/56 - button hand-held panel
14	CNIRHT	16/32/56 - button hand-held panel

F2-Detail

TAB - Select Transmitter

to Enter ID

ESC to Define Rack

Module Detail

F1 = Help

CNRFGW

Net ID: 03

RF ID	12	CNRFHT	
		CNRFHT-15/30 DEFINITION	

BUTTON SIGNAL NAMES

- 1: POWER
- 2:
- 3:
- 4: VOL_UP
- 5:
- 6:
- 7:
- 8: VOL_DOWN
- 9: CHANNEL_UP
- 10: CHANNEL_DOWN
- 11:
- 12: MUTE

F2-Detail

F3-Display Signals

F4 -Auto-Increment

ESC to Define Net

Panel Detail

F1 = Help

CNRFGW

Net ID: 03

RF ID	14	CNIRHT	
		CNIRHT-15/30 DEFINITION	

BUTTON SIGNAL NAMES

- 1: POWER
- 2:
- 3:
- 4: VOL_UP
- 5:
- 6:
- 7:
- 8: VOL_DOWN
- 9: CHANNEL_UP
- 10: CHANNEL_DOWN
- 11:
- 12: MUTE

F2-Detail

F3-Display Signals

F4 -Auto-Increment

ESC to Define Net

Panel Detail

F1 = Help

TEST/TROUBLESHOOTING:

Table 4 provides corrective action for possible trouble situations. If further assistance is required, please contact a CRESTRON technical support representative.

Table 4. Troubleshooting Guide

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
LED on unit does not illuminate.	No battery in unit or battery is dead.	Install new battery.
	Unit is in sleep mode.	Depress and hold any button until unit transmits.
Intermittent response during transmission.	Refer to causes when LED does not illuminate.	Refer to corrective action when LED does not illuminate.
	CNRFHT is not tuned to CNRFGW.	Refer to Installation/Setup for tuning instructions.
	Receiver antenna not extended to optimum length.	Extend receiver antenna to nine or 10 inches.
	Receiver is blocked or moved.	For IR unit, verify direct line-of-sight. For RF unit, verify that heavy metal is not in vicinity of transmission.
	CNRFHT is in contact with metal.	Verify that heavy metal is not in vicinity of transmission.
No response from CRESNET II system.	Refer to causes when LED does not illuminate and intermittent response during transmission occurs.	Refer to corrective action when LED does not illuminate and intermittent response during transmission occurs.
	NET ID of receiver is incorrectly set.	Enter Performance Viewport in the CRESNET Workshop. Depress the F4 key to poll the network. Verify that the NET ID for the receiver is properly set to match the SIMPL program. NOTE: After changing the CNRFGW identity code, disconnect and reconnect the network connector.
	RF ID or IR ID is incorrectly set.	Verify that the RF ID or IR ID for the transmitter is properly set to match the SIMPL program.
	Program does not match hardware.	Verify correct program is loaded in system via Performance Viewport Workshop.
	Receiver is unplugged (no power).	Verify power to the receiver.
	Two or more receivers are too close together.	Verify that multiple receivers are properly spaced (≥ 50 feet) from each other.
	Wrong transmitter in use.	If multiple transmitters are accessible, verify proper unit is used.

SYNTAX:

The following syntax codes are provided for compatibility purposes only.

NOTE

The CNRFHT and CNIRHT units are defined as CNRFT in SIMPL-C.

NET.ID < 03 to FE > : CNRFGW \ Codes received by a CNRFGW

TRANSMITTER < RF IDCODE > : CNRFT

i1 = <signal name> \ Independent button.

i2 = <signal name>

i3 = <signal name>

"" "" ""

APPENDIX:

The following is a sample of SIMPL-C programming for the CNRFHT and CNIRHT illustrated in figures 1 and 4.

NET.ID 10: CNRFGW \ CNRFGW is at NET ID CODE 10.

TRANSMITTER 20: CNRFT \ CNRFHT-30 is at ID CODE 20.

i1 = POWER \ Small button

i4 = VOL_UP \ Rocker with two functions is treated

i8 = VOL_DOWN \ as two pushbuttons.

i9 = CHANNEL_UP \ Long horizontal keys are treated like

i10 = CHANNEL_DOWN \ large vertical keys.

i12 = MUTE \ Small button.

