

Exhibit 2. Instruction manual

Crestron **CNRFT/CNIRT** One-Way Wireless Panels

Operations Guide

A supplement to the Cresnet II Technical Manual

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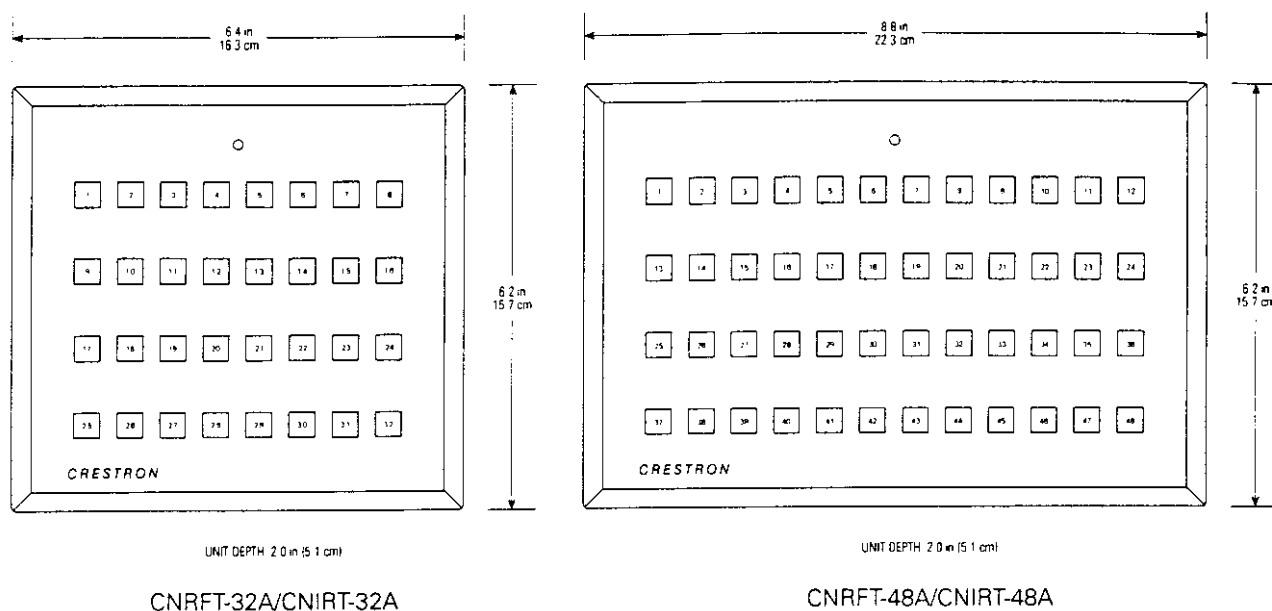


Figure 1. CNRFT/CNIRT, One-Way Wireless Panels

DESCRIPTION:

The CNRFT-32A/CNIRT-32A and CNRFT-48A/CNIRT-48A are a new improved version of CRESTRON's one-way wireless panels. The new "A" units are functionally identical to the non-"A" units, but the newer units have been completely redesigned for greater ease of installation and maintenance. The manual rotary switches for ID code setting have been eliminated and replaced by a software utility program available from CRESTRON's Workshop. The radio-frequency (RF) code packets have been updated to include error detection for higher reliability reception. The new improved one-way wireless panels must be used with CRESTRON's new CNRFGWA or CNIRGWA receiver. The standard, high-quality non-"A" version transmitters must continue to use the CNRFGW or CNIRGW.

Functional Description

CNRFT-32A/-48A

The CNRFT series of portable RF wireless panels, figure 1, is designed to operate with the CRESNET II system with the use of a wireless receiver such as the CNRFGWA network unit. Up to 32 miniature pushbuttons reside on the CNRFT-32A to provide direct user interface. The CNRFT-48A offers up to 48 miniature pushbuttons.

CNIRT-32A/-48A

The CNIRT series of portable infrared (IR) wireless panels, figure 1, is designed to operate with the CRESNET II system with the use of a wireless receiver such as the CNIRGWA network unit. Up to 32 miniature pushbuttons reside on the CNIRT-32A to provide direct user interface. The CNIRT-48A offers up to 48 miniature pushbuttons.

Physical Description

CNRFT-32A/48A and CNIRT-32A/48A electronic hardware is housed in a high-impact molded plastic enclosure (refer to figures 1 and 2 for front and back views, respectively). The 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. Refer to the latest version of the CRESNET II Engraving Worksheet for the wireless transmitters (Doc. 5242 and Doc. 5243) to design a unique button panel. Omission of unused buttons is standard. A red transmit LED is located above the button panel cover.

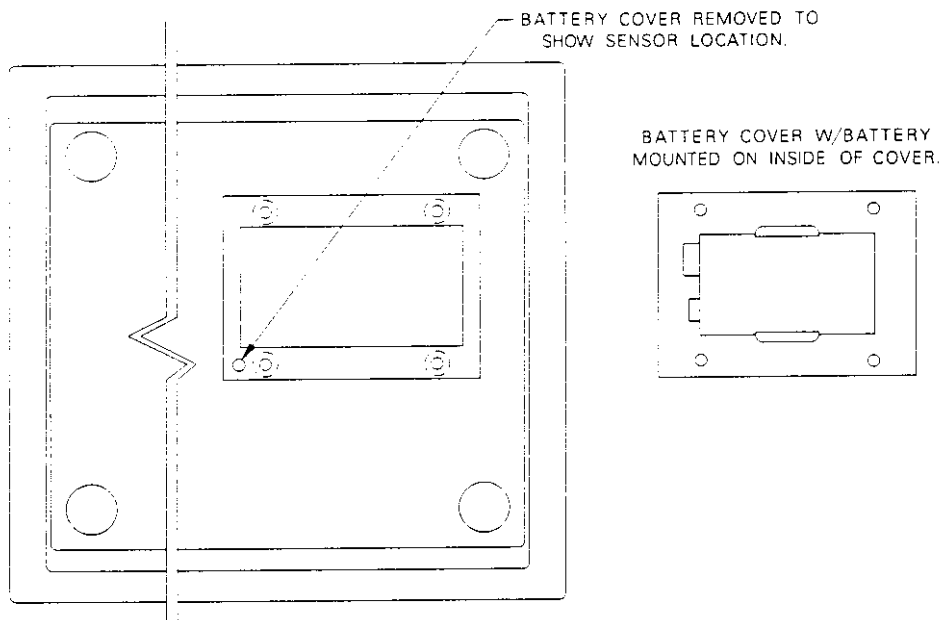


Figure 2. CNRFT/CNIRT, Back View

A standard 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. A sensor (photo transistor) used to program an identity code is also located in the battery compartment.

Configuration Differences

The RF and IR one-way wireless transmitters have two different configurations based on the maximum number of buttons available on the customized panel. They are depicted in table 1.

Table 1. CNRFT-32A/48A and CNIRT-32A/48A Configurations

CONFIGURATION		DESCRIPTION	
CNRFT-32A	8	CNIRT-32A	32 buttons on a customized panel
CNRFT-48A	8	CNIRT-48A	48 buttons on a customized panel

LEADING SPECIFICATIONS:

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

Table 2. Leading Specifications

SPECIFICATION	DETAILS
Battery	9V DC
CRESNET II Workshop	Version 5.0 or later
CRESNET II Operating System	SR30160.OPS or later
CNRFT-32A & CNIRT-32A	Height: 6.2 in (15.7 cm)
Dimensions & Weight	Width: 6.4 in (16.3 cm)
	Depth: 2.0 in (5.1 cm)
	Weight: 0.7 lb (0.3 kg)
CNRFT-48A & CNIRT-48A	Height: 6.2 in (15.7 cm)
Dimensions & Weight	Width: 8.8 in (22.3 cm)
	Depth: 2.0 in (5.1 cm)
	Weight: 1.0 lb (0.5 kg)

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.*

CONTROLS AND INDICATORS:

Controls

Button controls are custom designed. The wireless transmitters are available with a maximum of 32 to 48 functional buttons (depending on the model). 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.

Indicators

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

INSTALLATION/SETUP:

Every wireless transmitter communicating with either the CNRFGWA or CNIRGWA 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 254 possible two-digit hexadecimal alphanumeric codes ranging from 01 to FE. The CNRFT/CNIRT ID CODE is factory set to 11, but may be changed from a PC via CRESTRON's CRESNET II Workshop. An ID CODE may need to be changed if more than one transmitter is placed on the network. 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 wireless transmitters is factory set to 11.*
2. *If an ID CODE needs to be changed, do not use 00 or FF as an RF/IR ID.*
3. *Do not confuse RF/IR ID with network (NET) ID.*

The following items are required to change the wireless transmitter ID CODE:

- PC running CRESNET II Workshop, version 5.0 or later.
- CNIDC - Identity Code cable.

Complete the following steps in the order provided to ensure proper ID CODE assignment of the unit.

1. Start up the CRESNET II Workshop with the following DOS commands.
CD\CN2 (depress ENTER)
CNWS (depress ENTER)
2. The Workshop commences with an opening screen. Depress any key to open the MAIN MENU, illustrated in figure 3.

- From the MAIN MENU, highlight Utilities and depress ENTER. The UTILITY MENU, illustrated in figure 4, appears on the display.

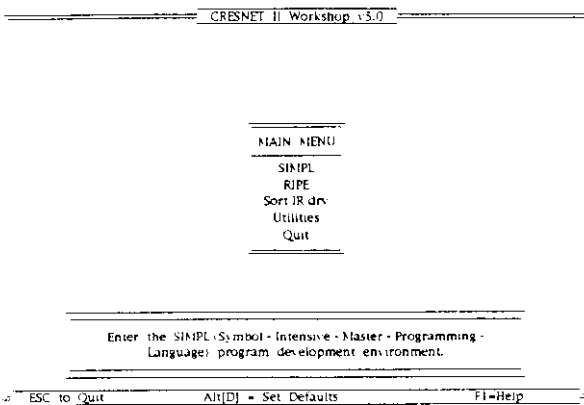


Figure 3. MAIN MENU, Workshop

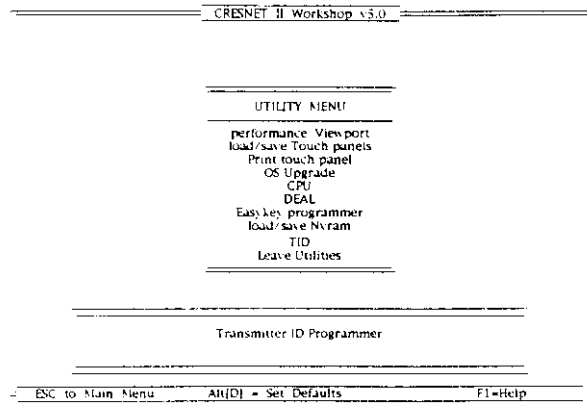


Figure 4. UTILITY MENU, Workshop

- From the UTILITY MENU, highlight TID and depress ENTER. The Transmitter ID Programmer, illustrated in figure 5, appears on the display.

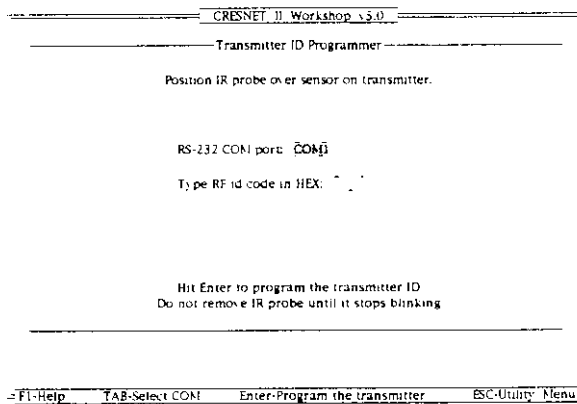


Figure 5. Transmitter ID Programmer, Workshop

- From the Transmitter ID Programmer screen, specify the PC's COM port with the TAB key.
- Connect the 9-pin DIN connector from the CNIDC to the proper COM port on the back of the PC. Use the same port as that assigned in the previous step.
- Position the transmitter button-side down so the battery compartment is accessible.
- Remove the battery cover to expose the battery compartment. Refer to figure 2.
- Place LED probe from the CNIDC over the exposed sensor (photo transistor) as shown in figure 6. The probe should rest in the corner of the battery compartment so that it completely covers the sensor.

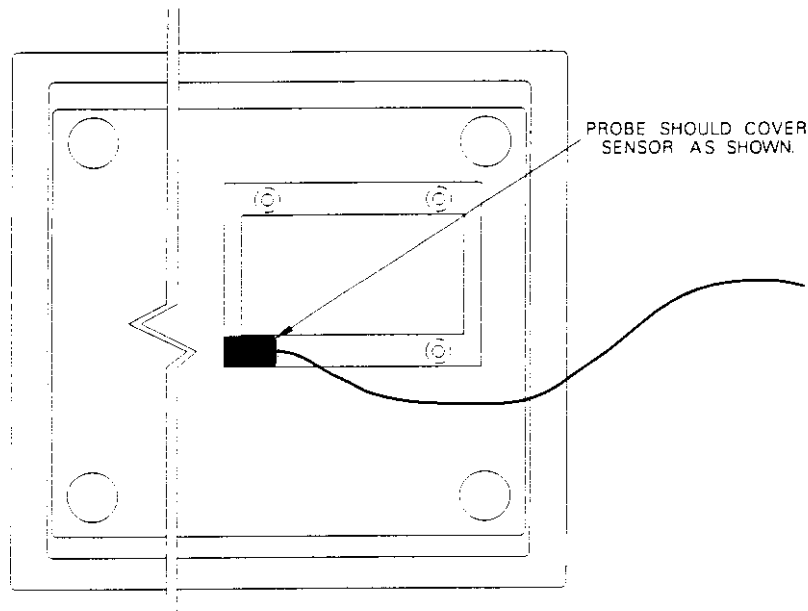
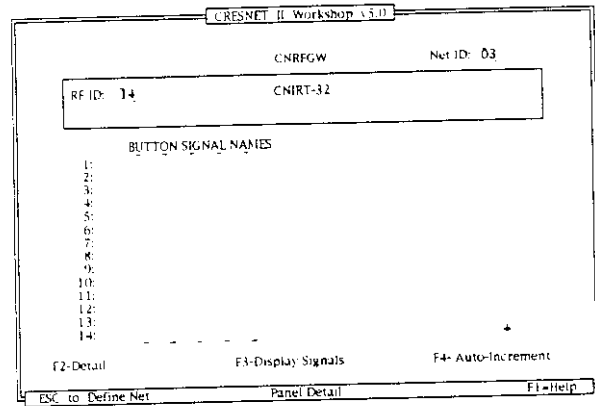
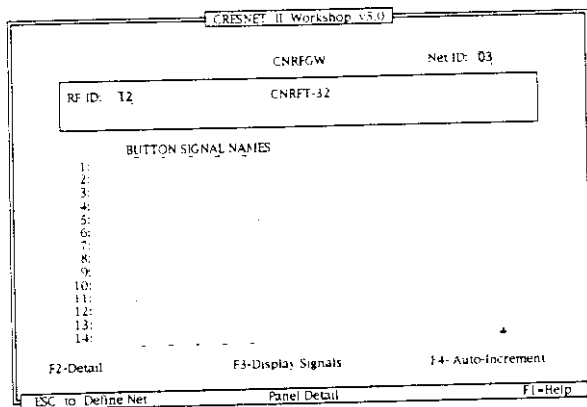
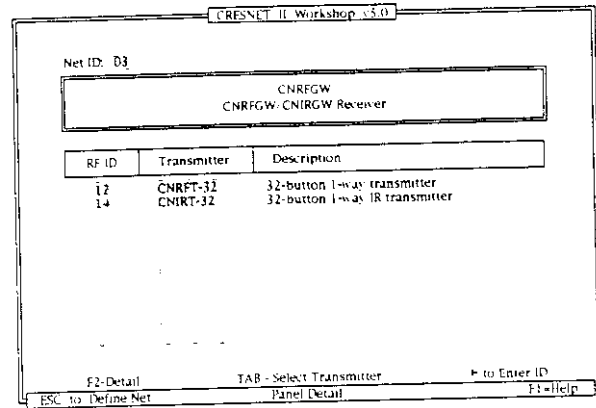
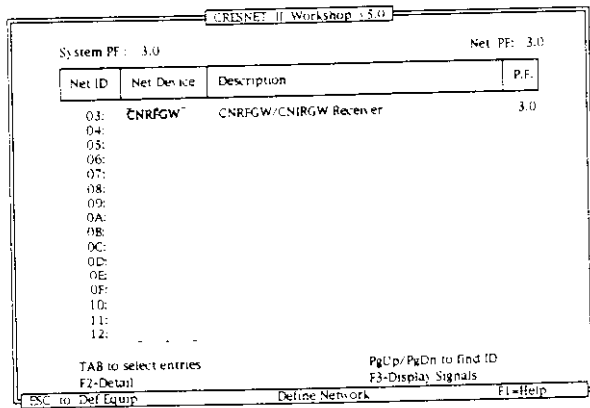


Figure 6. Probe Placement

10. With a finger over the probe to hold it in place, lift and rotate transmitter so that the red LED located above the button panel is visible.
11. From the PC, type the two-digit hexadecimal ID CODE.
12. Depress the ENTER key and observe the flashing red LED on the front of the transmitter.
13. When the red LED stops flashing, remove the probe from the back of the unit. The ID CODE is programmed into the transmitter.
14. Secure the battery cover over the battery compartment.
15. Disconnect the CNIDC from the PC.

PROGRAMMING:

The button array is located beneath the custom button panel of each wireless transmitter. Refer to figure 1 for the location of the SIMPL-C button numbers and their corresponding button positions for the CNIRT and CNRFT transmitters. 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. The following example illustrates button definition of the CNRFT-32A and CNIRT-32A in the CRESNET II Workshop. Access the following tables from the "Define Network" section of the SIMPL-I Menu. Aside from difference in nomenclature, the Workshop menus of the CNRFT-48A and CNIRT-48A are identical.



TEST/TROUBLESHOOTING:

Table 3 provides corrective action for possible trouble situations. If further assistance is required, please contact a CRESTRON technical support representative.

Table 3. 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.
Intermittent response during transmission.	Refer to cause when LED does not illuminate.	Refer to corrective action when LED does not illuminate.
	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.
	CNRFGWA is in vicinity of metal.	Verify that large amount of metal is not blocking transmission.

Table 3. Troubleshooting Guide (Continued)

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
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 II 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 CNRFGWA/CNIRGWA 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. NOTE: NET ID and RF ID or IR ID are separate parameters. ALT-R in Workshop (v5.0) shows RF or IR transmitter button presses.
	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.

FURTHER INQUIRIES:

If after reviewing this Operations Guide you still have additional questions, please contact a CRESTRON technical support representative by dialing (888) CRESTRON [(888) 273-7876] or (201) 894-0660.

SYNTAX:

The following syntax codes are provided for compatibility purposes only.

NET.ID <10 o FE>: CNRFGW \CNRFT talking to a CNRFGWA

TRANSMITTER <RF IDCODE >: CNRFT \ID # and transmitter type.

i1 = <signal name> \Independent button.

i2 = <signal name>

i3 = <signal name>

" = " "

NET.ID <10 o FE>: CNIRGW \CNIRT talking to a CNIRGWA

TRANSMITTER <IR IDCODE >: CNIRT \ID # and transmitter type.

i1 = <signal name> \Independent button.

i2 = <signal name>

i3 = <signal name>

" = " "



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