

# SpreadNet®

## Model SN910-RCVI/O SN912-RCV RF Receiver/ SN913-I/O Interface Board Installation Instructions

The SpreadNet® Model SN912-RCV and SN913-I/O are the heart of C&K's Spread Spectrum RF family of products. The package includes both the RF Receiver (Model # SN912-RCV) and the Interface Board (Model # SN913-I/O).

The RF Receiver detects alarm/tamper, low battery, and no check-in from the various transmitters (sensors) and sends them to the Interface Board as serial data. The Interface Board then takes the serial data input and converts it to Zone input information for the Control Panel. The Interface Board is designed to be compatible with UL Listed Household Fire & Burglary Warning Control Units. A DIP switch on the Interface Board allows the installer to custom configure the system. Refer to the Switch Setup and UL Compliance sections for additional information on these settings.

The Interface Board comes equipped with EOL resistor packs (networks) to simulate control panel EOLs. The EOL resistor networks are interchangeable to allow the use of alternate values (1 K and 2.2 K-Ohm are provided), as well as being able to set up zones as Normally Open.

### Features

- Simple Installation
- Interfaces With Most Popular Control Panels
- Individual Zone Alarm/Trouble indication
- Uses Spacial Diversity Antennas for Improved Reception
- 900 MHz Spread Spectrum
- No Check-In and Low Battery Supervision by Zone
- Up to 16 Zones
- Watchdog Reset
- EEPROM Memory
- Noise & RFI Immunity
- Wall/Cover Tamper
- Receiver-to-Interface Line Supervision
- Jam Detection
- Suitable for Grade A Service

### Mounting Location

The RF Receiver may either be mounted on the wall or the Control Panel Housing. For optimum performance, the Receiver should be mounted on the wall. When mounted on the wall, the SN912-RCV must be located in the *same room* as the SN913-I/O. The distance between the Receiver and Interface Board *must not exceed 25 ft. or 7.6 m.*

Receiver orientation is not a problem, as the unique antenna design of the SpreadNet RF Receiver automatically compensates for variations in signal direction. Two antennas orientated at right angles virtually eliminate problems associated with noise and signal fading.

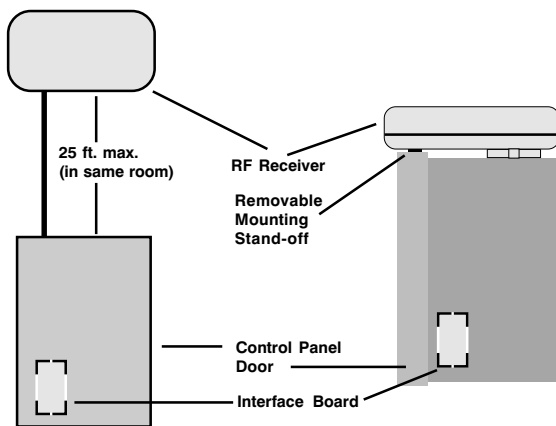


Figure 1 - Mounting Location

When choosing a location to install the RF Receiver, you should avoid areas near screens, metal window frames, circuit breaker boxes, metal air conditioner and heater ducts. These areas interfere with the receiver's ability to pick up signals or, are sources of high noise and radio frequency interference.

### Mounting Procedure - Receiver (SN912-RCV)

To mount the RF Receiver, orient the unit as shown in Figure 2. Loosen the captive screw on the front of the Receiver and open the front panel. The front and rear housings may be separated for easier installation. Remove the knock-outs for wiring the Receiver to the Interface Board.

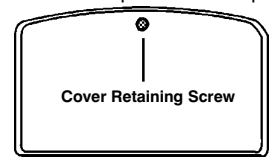
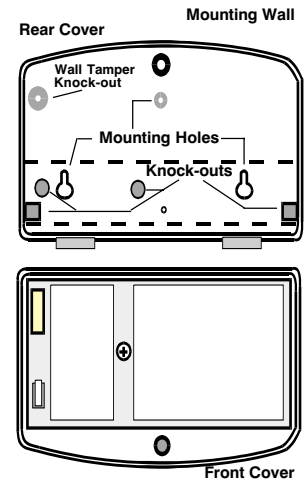


Figure 2 - Receiver Housing

Use the rear cover as a template to mark the mounting holes (see Figure 2). Drill the holes as necessary. The hole at the top center of the rear housing is designed for mounting the Receiver to the wall. The tab also serves as a removable stand-off when mounting the Receiver to the top of the Control Panel housing. The plastic tab should be removed as it will interfere with the proper closing of the control panel door.

### Receiver Wall Tamper

Both a cover and a wall tamper are provided. The same switch is used for both the cover and wall tamper. To *activate the wall tamper*, remove the knock-out in the rear housing and install a screw in the wall, leaving enough of the screw head exposed to depress the tamper switch when the cover is closed.



### Mounting Procedure - Interface (SN913-I/O)

The Interface Board must be mounted inside the Control Panel Enclosure. The board is held in place by the double-faced tape provided on the wide flange of the plastic mounting bracket. Remove the tape backing and attach the Interface Board mounting bracket to the rear surface of the control panel enclosure as shown in Figure 3.

The interface board may also be attached with screws (not supplied) by using the slots provided in the flange of the board mounting bracket.

**IMPORTANT:** Leave a space of **at least 1/2"** between Interface Board (solder side) and side of enclosure (see Figure 3).

**NOTE:** Be sure to mount Interface Board close enough to control panel to allow the 12" flying leads (power and zones) to be connected.

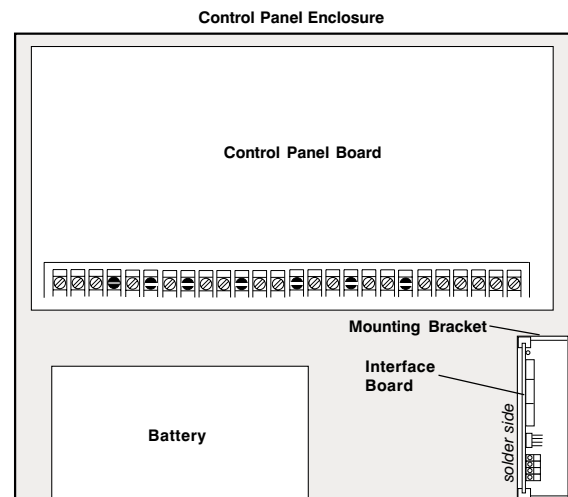
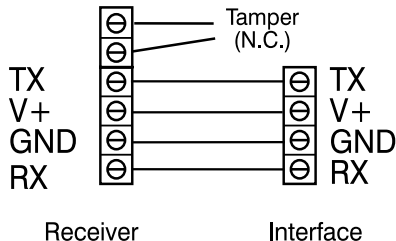


Figure 3 - Interface Board Mounting

## Wiring - Receiver

Pull the 4-wire cable (comm/power) and 2-wire cable (tamper) through the rear cover and mount the Receiver in the desired location as shown in Figure 1. Connect the RF Receiver to the Interface Board as shown in Figure 4. Be sure to observe polarity. The RF Receiver derives its power from the Interface Board, which in turn, gets its power from the Control Panel via the Red and Black leads (VC and GND, respectively). Both the RF Receiver and the Interface Board are electronically protected against reverse polarity.

**NOTE:** Use 18 to 22 AWG wire

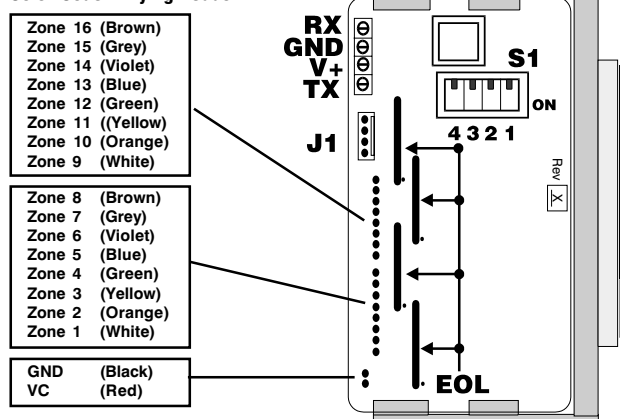


**Figure 4 Receiver / Interface Wiring**

## Wiring - Interface Board

Only one wire per zone is required to connect the Interface Board to the Control Panel. All zones share a common ground connection. The common for each zone is the same as the power supply ground (black wire). As shown in Figure 5, the Red and Black wires are VC and Ground (respectively). The leads for zones 1 - 8 and 9 - 16 are color coded as shown in Figure 5. See the section on **Switch Settings** for optional configurations of zones 15 and 16.

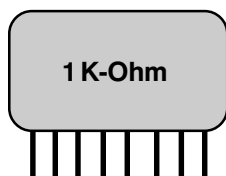
### Color Code - Flying Leads



**Figure 5 Interface PCB Layout & Connections**

## EOL Resistor Installation and Set-up

The Interface Board has space to plug in End-Of-Line (EOL) resistors for all 16 zones. The EOL resistors are packaged in groups of 4 resistors each, with the resistor value and part number printed on the package. (See Figure 6.) To order replacement resistor packs, use P/N 5-162-023-00 for the 1 K-Ohm resistor or P/N 5-162-024-00 for the 2.2 K-Ohm resistors. Orientation is not critical when installing the resistors, as each resistor is wired individually inside the package. The 2.2 K-Ohm resistors are installed at the factory.



**Figure 6 EOL Resistor Network Package**

## Normally Open Zone Configuration

The SN913-I/O may be configured to support control panels requiring Normally Open (N.O.) zone inputs. With this configuration, the SN913-I/O zone output (to the control panel) will be "Open" in the normal condition and provide a "Short" to the panel in an alarm condition. To configure the SN913-I/O for this type of input, the EOL for the zone must be removed for the N.O. zone. The Resistor packages are in blocks of four zones each (i.e. zones 1 - 4, 5 - 8, 9 - 12, or 13 - 16). This provides the ability to have Normally Open and Supervised Zones with the same SN913-I/O.

**NOTE:** Zones designated as Normally Open zones cannot be monitored for Trouble (Low Battery/ Supervisory Failure) status.

**NOTE:** Replace the Resistor Networks with C&K Parts Only.

## Interface Board - Switch Setup

### Zone Output Logic - S1 (1)

Switch S1 (1) selects the type of zone output from the SN913-I/O. With S1 (1) ON, the output provides an Open in an alarm condition and a Short in a trouble condition. With S1 (1) OFF, the output provides a Short in an alarm condition and an Open in a trouble condition.

S1 (1) Position	Condition	Zone State
OFF	Alarm	Short
	Trouble	Open
ON	Alarm	Open
	Trouble	Short

**Table 1**  
Zone Output Logic

**NOTE:** Version E and later of the SN913-I/O Interface Board does not require changing S1 (1) for programming, as required on previous versions. Refer to Figure 5 to determine the version level of your PCB.

### Trouble By Zone Disable - S1 (2)

Switch S1 (2) determines whether or not Trouble conditions are reported by the individual zones. If S1 (2) is in the OFF position, individual "Trouble by Zone" will be indicated. If S1 (2) is in the ON position, "Trouble By Zone" is disabled. With S1 (2) ON, distinguishing Trouble indications (Low Battery or Supervisory Failure) is determined by the setting of S1 (4) (see **Zone 16 Options**).

S1 (2) Position	Condition	Zone State
OFF	Tx Alarm	Alarm
	Tx Trouble	Trouble
ON	Tx Alarm	Alarm
	Tx Trouble	Disabled

**Table 2**  
Trouble By Zone

### Zone 15 Options - S1 (3)

Switch S1 (3) allows Zone 15 of the SN913-I/O to be used to monitor the communications status between the receiver (SN912-RCV) and the interface board (SN913-I/O). This output also provides jam detection and tamper reporting. In the ON position, a communication failure between the SN912-RCV and the SN913-I/O or detection of RF noise above 25dB for a period of 20 seconds will cause Zone 15 to indicate an alarm. Any transmitter Tamper detected while S1 (3) is in the ON position will cause Zone 15 to indicate a Trouble condition. Alternately, with S1 (3) in the OFF position, Zone 15 to operate as a normal zone.

S1 (3) Position	Condition	Zone State
ON	Tx Tamper	Trouble
	Comm Fail / Jam Detect	Alarm
OFF	Normal Zone operation	

**Table 3**  
Zone 15 Options

#### Zone 16 Options - S1 (4)

S1 (4) controls the operation of Zone 16. In the OFF position, Zone 16 may be programmed as a normal zone.

Placing S1 (4) in the ON position, dedicates Zone 16 to indicating Low Battery/Supervisory Failure. In this position, any transmitter having a Low Battery will cause Zone 16 to indicate a Trouble condition. A transmitter which has failed to check-in with the Receiver will cause Zone 16 to indicate an alarm condition. The affected zone (transmitter) experiencing the low battery/failure to check-in condition will also display a Trouble/Alarm condition, provided S1 (2) "Trouble By Zone" is OFF. (See **Trouble By Zone Disable**).

S1 (2) Position	Condition	Zone State
OFF	Normal Zone Operation	
ON	Any Transmitter Supervisory Failure	Alarm
	Any Transmitter Low Battery	Trouble

**Table 4**  
Zone 16 Options



**WARNING:** If **Trouble By Zone** is disabled [S1 (2) is ON] and **Zone 16 Option** is also disabled [S1 (4) is OFF], Low Battery and Supervisory Failure states will **NOT** be indicated.

#### NOTES:

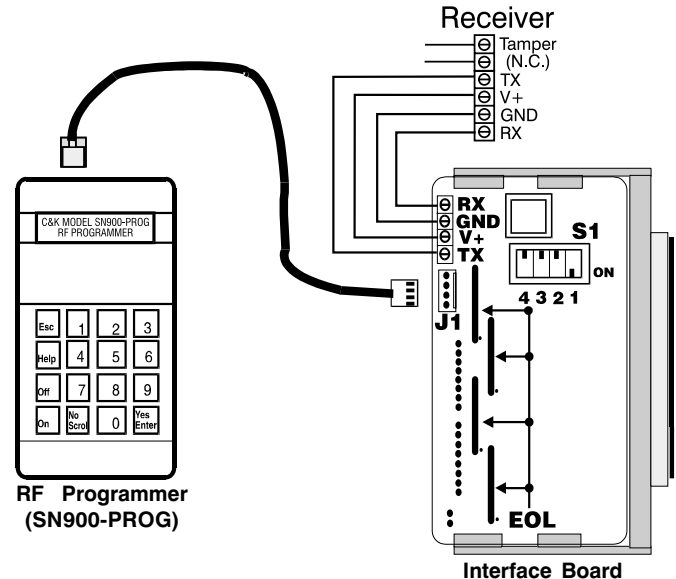
1. On control panels where troubles are also reported as Alarm conditions (usually only when panel is armed), S1 (2) [Trouble By Zone] should be in the ON position (Disabled). Disabling the Trouble By Zone will minimize the possibility of a false alarm report being sent should a transmitter go into a Low Battery or Supervisory Failure condition. In such installations, should a Trouble condition be suspected, the Service Technician can place S1 (2) in the OFF position temporarily to determine the location of the faulted transmitter. **Be sure to allow sufficient time for all transmitters to send their Supervisory Reports to indicate the Trouble condition.** This option may be used independently or in conjunction with the option described in Note #2 below.
2. On systems using all outputs as detection loops, S1 (4) may be temporarily set to ON by the Service Technician to determine the specific type of transmitter fault. The fault condition will immediately be indicated by Zone 16 upon changing S1(4) to ON. This option may be used independently or in conjunction with the option in Note #1.
3. Panel loops must be configured as supervised, with 250 mS loop response time, for Trouble conditions to be accurately reported.

#### Set-up and Programming

Both the RF Receiver and the Interface Board are programmed via the SN900-PROG unit. Connect the SN900-PROG Programmer to connector J1 on the Interface Board using the Interconnect Cable supplied with the SN900 Programmer. Refer to Figure 7 for the connector location. The Programmer must be connected to the Receiver via the Interface Board to determine the Channel # and Property Code to be used (refer to SN900-PROG RF Programming Manual) prior to programming any of the transmitters.

When selection of the Channel and Property Code has been successfully completed, the transmitters may be programmed. Refer to the Installation Instructions included with each Transmitter for proper setup.

**IMPORTANT:** The Interface Board should **not** be programmed until all Transmitters have been installed and programmed.



**Figure 7 - Connecting the RF Programmer**

#### Programming the Interface Board

After all Zone transmitters have been installed, programmed, and tested, the Interface Board **must** be programmed. Next, insure that the Programmer is connected to J1. Finally, program the Interface Board in accordance with the instructions outlined in the SN900-PROG RF Programmer Manual.

**NOTE:** Version E and later of the SN913-I/O Interface Board does not require changing S1 (1) for programming, as required on previous versions. Refer to Figure 5 to determine the version level of your PCB.

#### Programming the Receiver

Connect the RF Programmer to the I/O Board via the Interconnect Cable, as shown in Figure 7. Program the RF Receiver following the instructions outlined in the SN900-PROG RF Programmer Programming Manual (P/N 5-051-136-00).

#### Testing the Transmitter and Receiver

After the individual transmitters have been installed and programmed, the SN900-PROG RF Programmer must be used with the RF Receiver to measure transmitter reception characteristics. For further information, refer to the SN900-PROG RF Programmer Programming Manual (P/N 5-051-136-00).

#### U.L. Compliance

For Grade A household burglar alarm and household fire warning system applications using the C&K System 2316E Control Panel:

All Transmitters must be programmed as Supervised Devices.

Only one transmitter per zone.

Trouble Information Label (P/N 5-040-299-00) must be completed and located on keypad.

#### SN913-I/O Configuration Requirements:

S1-2 must be OFF - Trouble By Zone enabled.

S1-3 must be ON - Receiver Interface Connection/Jam Detection. This is required when used in a household fire system application.

S1-4 must be ON - Low Battery/Supervisory Identification.

#### System 2316E Programming Requirements:

CL 1F - 26 and 49 - 4F (Loop Control, Zones 1 - 15)

Digit 2 (Loop Response Time) must be set to 1 (250 mS)

Digit 6 (Loop Circuit Type) must be set to 5 (Supervised, Bell not Latched)

CL 50 (Loop Control, Zone 16) Digits 2 and 6 same as above.

Digit 5 (Loop Bell Type) must be set to 5 (Silent with LED).

After the system has been installed, programmed and tested, the installer is ready to complete the Termination Summary Label, which is included with the installation kit. The information contained on the label is outlined below:

- Property Code & Channel # - This information identifies the Transmitter and Receiver as belonging to a particular system.
- Transmitter Location - The physical location of the Transmitter within the premises.
- TX (Transmitter) Type - Which of the various SpreadNet Transmitters is used in that particular location. (i.e. Door, PIR, Smoke, etc.)
- Check-In Interval - The Supervisory Rate of the Transmitter (in seconds). May range from 30 to 300 seconds in 10 second intervals, or 0 for unsupervised.
- SNR - The Signal-to-Noise Ratio of the Transmitter showing Signal strength and Noise level in dB.
- Battery Date - The date the batteries were installed or last replaced.

A partial sample of the Termination Label is shown below with an assortment of zones filled out.

PROPERTY CODE: 1 2 3 4		CHANNEL: 1		DATE: 10/3/96		
ZONE #	TRANSMITTER LOCATION	TX TYPE	CHECK IN INTERVAL	SNR	BATTERY DATE	
1	Front Door	SN930	20	76 13	10/3/96	
2	Back Door	SN930	20	70 15	10/3/96	
3	Living Room	SN940	300	35 15	10/3/96	
4	Master Bedroom	SN960	0	28 5	10/3/96	
5						
6						
7						
8						

Upon completion, the label may then be placed inside the rear cover of the RF Receiver or inside the Control Panel for future reference.

**NOTE:** The SpreadNet system is suitable for Grade A service.

## SPECIFICATIONS

### Power Requirements:

Rx: 170 mA at 12 VDC (nominal)  
I/O: 30 mA at 12 VDC (nominal)

### Dimensions:

Rx: 7.875" x 4.125" x 1.75"  
20 cm x 10.5 cm x 4.5 cm  
I/O: 4.25" x 2.165" x 1.025"  
10.8 cm x 5.5 cm x 2.6 cm

### Output Ratings (I/O zone switches):

Max current = 50 mA  
Max voltage = 30 VDC

### Operating Environment:

32° to 140° F (0° to 60° C)  
Up to 95% relative humidity  
(non-condensing)

### Operating Frequency:

902 - 928 MHz Spread Spectrum

### Weight:

SN912-RCV: 11 oz. / 311 g  
SN913-I/O: 4 oz. / 113 g

## FCC NOTICE

The Model SN910-RCVI/O generates and uses radio frequency energy. If not installed and used in accordance with the manufacturer's instructions, it may cause interference to radio and television reception. The Receiver and Interface Board have been tested and found to comply with the specifications in Part 15 of FCC Rules for Class B Computing Devices and FCC Part 15 Subpart C, Specifications for Intentional Spread Spectrum Radiators.

If this equipment causes interference to radio or television reception - which can be determined by turning the equipment on and off - the installer is encouraged to correct the interference by one or more of the following measures: 1) Reorient the antenna of the radio/television. 2) Connect the AC transformer to a different outlet so the control panel and radio/television are on different branch circuits. 3) Relocate the control panel with respect to the radio/television.

If necessary, the installer should consult an experienced radio/television technician for additional suggestions, or send for the "Interference Handbook" prepared by the Federal Communications Commission. This booklet is available from the U.S. Government Printing Office, Washington D.C., 20402, stock number 004-000-00450-7.

**CAUTION:** C&K does not support field changes or modifications to any of the SpreadNet RF equipment unless they are specifically covered in this manual. All adjustments must be made at the factory under the specific guidelines set forth in our manufacturing processes. Any modification to the equipment could void the user's authority to operate the equipment and render the equipment in violation of FCC Part 15, Subpart C, 15.247.

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.

## Industry Canada

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil Numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.