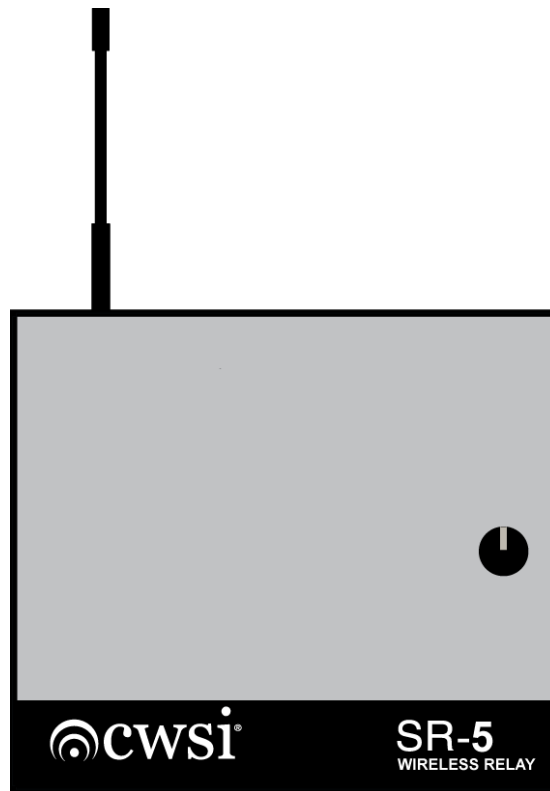




SR-5 WIRELESS RELAY

OPERATING and INSTALLATION INSTRUCTION MANUAL



CWSI by Tyco Fire & Security GmbH

P/N CWSI-IM-SR-5 Rev. E

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Introduction

This manual is intended for persons involved with the installation, maintenance and operation of the SR-5 wireless relay. It is a comprehensive guide that provides details on product operation and should be kept for future reference. This manual consists of separate sections. Each section contains information in a manner as to be clear as possible. It is designed to provide all the information necessary to install, program and operate the equipment. Read and understand this manual prior to installing or operating the equipment. It is imperative that the installer understand the requirements of the Authority Having Jurisdiction (AHJ) and be familiar with the standards set forth by Underwriters Laboratories, NFPA 72 National Fire Alarm Code, and NFPA 70 National Electrical Code.

The model SR-5 is a wireless relay manufactured by CWSI. The wireless relay was designed and tested to comply with **NFPA 72 National Fire Alarm Code and UL 864 standard.**

FCC Statements

FCC Warning

Important: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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.

FCC Warning – RF Exposure

Important: When using this device, a certain separation distance between antenna and nearby persons has to be kept to ensure RF exposure compliance. In order to comply with the RF exposure limits established in the ANSI C95.1 standards, the distance between the antennas and the user should not be less than [20cm].

Section 1 - Description and Features

1.1 Product Description

The CWSI SR-5 is an intelligent addressable wireless relay unit containing 5 programmable form C dry contact relays and 3 trouble inputs.

1.2 Features

- Bi-Directional RF communication
- 900 MHz Frequency Hopping Spread Spectrum format
- CRC data validation
- Rechargeable Lithium battery supplies 24 hour backup time
- Built in alert sounder
- 5 Form C dry contact relay outputs
- 3 Trouble inputs
- Powered by Class 2 transformer or UL1481 listed power supply
- Hinged locked enclosure

1.3 Specifications

Power Source: 120Vac 60Hz .5 Amp / 24Vdc 100ma.

Battery: 3.7Vdc 2.8Ah lithium ion battery CWSI P/N BA-3.7V-2.8AH supervised

Operating Temperature: 32 to 120 degrees F

Operating Humidity: 85% non-condensing

Transceiver Operating Frequency: 900 MHz band

Signal to Noise Ratio: Minimum Signal -100.2dBm Maximum Noise -115.3dBm

Antenna Type: Omni/Yagi

Transmission Format: Frequency Hopping – Spread Spectrum.

Relays dry contact rating: 30Vdc 5A non-power limited or 30Vdc 3.25A power limited

Dimensions: 7" high, 8" wide, 2 ¼" deep

Enclosure: Powder coated steel

Weight: 1 Lbs.

SR-5 Ratings @ 3.7 Vdc:	Standby 50ma.	Alarm 400ma.
@ 24Vdc	Standby 17ma.	Alarm 85ma.

Section 2 - Compatibility

2.1 Compatible Equipment and Accessories

Refer to the CWSI control panel manual for compatibility information.

The following antennas are for use with the SR-5:

CWSI:

Models: OM-1 Omni – Isotropic gain 2.5 dBi, OM-2 Omni – Isotropic gain 1 dBi, OM-3 Omni – Isotropic gain 5 dBi, YA-1 Yagi – Gain 15.2 dBi

The following accessories are for use with the SR-5:

CWSI-BPF-915 Optional Band Pass Filter for Antenna SMA Connector

Section 3 - Installation

3.1 Preparing the Installation Site

A signal survey must be performed by a factory trained technician or authorized dealer prior to the installation of the SR-5 wireless relay. The signal survey determines an acceptable location to mount the SR-5 in order to communicate with the repeaters and control panel. Refer to the Signal Survey section in this manual for the proper method to conduct a signal survey for this product.

During the survey, try to locate the SR-5 wireless relay close to available 120 Vac uninterruptible power. The SR-5 can be powered from CWSI model TR-12V-2A plug in transformer or a UL1481 listed power supply. The power connection must be installed in conduit. **Warning: The SR-5 wireless relay input power is 12Vac from the secondary of the TR-12V-2A or 24Vdc from a UL1481 power supply. Do not connect 120Vac directly to the SR-5 or the unit will be damaged.**

When connecting primary A/C power always follow:

- 1- National Fire and Electrical Codes (NFPA 72 and NFPA 70)
- 2- Local Electrical and Fire Code requirements
- 3- Local AHJ (Authority Having Jurisdiction) requirements

3.2 Receiving and Unpacking the Equipment

Upon receiving the equipment, the carton should be inspected for damage, which may have occurred during shipment. Each package should be checked against the packing slip for completeness. Differences should be reported to CWSI immediately. If any product is suspected of damage it should be checked for proper operation or returned to CWSI.

3.3 Installing the SR-5 Wireless relay

WARNING: This equipment must be professionally installed by factory trained personnel. Use of an antenna other than listed in the compatibility section of this manual may be harmful to persons, void FCC or damage the equipment.

The SR-5 wireless relay must be enrolled into a control panel and programmed in order to function properly. Enrollment can only be accomplished with the SR-5 within reception range of the control panel or an enrolled AR-5 repeater. Follow the enrollment instructions in the manual. After enrollment,

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it is recommended to hold the wireless relay in the intended mounting location and verify a good signal survey prior to permanently mounting the unit. Upon enrollment and conducting a signal survey the unit can be mounted in its intended location. **Note: Always attach a compatible antenna to the sma connector prior to applying power, enrolling or conducting a signal survey with the SR-5.** There are three antennas available for use with the SR-5. The differences are the type and gain. The OM-1 Omni antenna should be used except where installation space restrictions are an issue. The OM-2 Omni will have slightly lower gain and is shorter which may be helpful in space restricted areas. The OM-3 will have increased range over the OM-1&2 where longer omni directional reception is needed. The YA-1 is a directional Yagi antenna with high gain for signal reception at longer distances.

When using the YA-1 Yagi antenna follow these steps

1. Perform a signal survey to determine an acceptable indoor location.
2. Attach the mounting brackets to a suitable surface.
3. Fasten the 24" mast to the mounting brackets and tighten the nuts.
4. Attach the YA-1 to the top of the mast and **make sure the elements are in a vertical position.**
5. Aim the antenna towards the desired reception location making sure none of the elements make contact with any surrounding surfaces or objects then tighten the antenna bracket.
6. Connect the supplied cable between the repeater and the antenna. The cable should be within the same room and not routed near electrically noisy sources such as fluorescent lights or electrical outlets.
7. Perform a signal survey after the antenna is mounted.

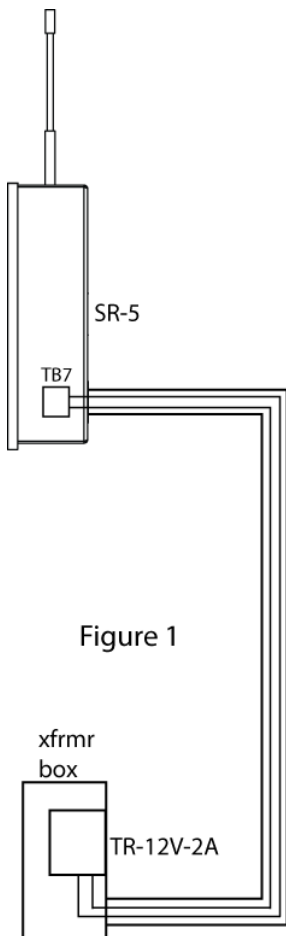
When choosing a mounting location and during installation adhere to the following:

- 1 – **All wiring should comply with national and/or local electrical codes. Unless otherwise specified, wire should be 18 gauge copper with 600 Volt insulation. Shielded wire is preferred.**
- 2 – **This unit is intended to be mounted in indoor dry areas. Avoid dusty, wet and corrosive locations.**
- 3 – **Provide adequate space surrounding the unit to allow for;**
 - a - **The hinged cover to be completely opened for easy access to internal components and wiring.**
 - b - **The connection of conduit to the desired cabinet location.**
 - c – **The attachment of the antenna to the antenna sma connector.**
- 4 – **Avoid electrically noisy locations such as main electrical and transformer rooms, computer rooms, telephone switching rooms, etc.**
- 5 – **Never bring a voltage source higher than 30V into the SR-5 enclosure.**
- 6 – **Always maintain a minimum of ¼" between power limited and non-power limited wiring within the enclosure.**
- 7- **Never run power limited and non-power limited wires in the same conduit.**

Unlock the SR-5 cover and open the unit. Carefully verify that the unit is not damaged and the printed circuit board is secured in the enclosure. Hold the SR-5 in its intended position, verify leveling then mark the location of the upper corner mounting keyholes. Using adequate mounting screws and anchors, secure the SR-5 wireless relay to the mounting surface. Be sure to install screws in the two lower mounting holes. **WARNING: Make sure A/C supply is turned OFF prior to proceeding with A/C connection.**

Power connection to the SR-5 can be accomplished either by using a CWSI p/n TR-12V-2A low voltage transformer or by connecting it to a UL 1481 listed power supply. The two methods are described below.

3.4 Power connection to a TR-12V-2A



The required supply to the TR-12V-2A primary is 120 VAC 60Hz .5A. The A/C supply is supervised by the SR-5. Follow all applicable electrical codes during installation. Install conduit from the SR-5 to a Honeywell model 4165 transformer enclosure attached to a 120Vac unswitched outlet located in the same room (Figure 1). Follow the instructions provided with the transformer enclosure. Run a two conductor wire from the TR-12V-2A secondary screw terminals to the terminal block TB7 on the SR-5 board. Set SW2 input power selection switch to the 12VAC position (Figure 2). **Note: A charge fault trouble will be reported to the panel if SW2 is in the 24VDC position.** Attach the antenna to the SMA1 antenna connector. Do not over tighten the antenna. Place the control panel in enrollment mode, then plug the TR-12V-2A transformer into an outlet and connect the backup battery to the BT1 connector on the SR-5. The wireless relay A/C power and trouble leds will light and the sounder will beep for 15 seconds. Within one minute the wireless relay should enroll. The sounder will beep twice and a Power Up Reset trouble signal will be displayed on the control panel when the SR-5 enrolls. If the wireless relay doesn't enroll within 60 seconds:

1. Make sure the wireless relay is in reception range of a repeater or the control panel.
 2. Confirm the control panel is in enrollment mode.
 3. Clear the wireless relay base code as described in the info and maintenance section of this manual and power cycle the unit.
- After the wireless relay is enrolled it will transmit a power up reset trouble to the control panel. This is expected on power up and does not indicate trouble with the wireless relay.

3.5 Power connection to a UL1481 power supply

The SR-5 can be powered from a UL1481 24Vdc power supply. The power supply should have a minimum of one general trouble output for connection to the SR-5 trouble inputs (TB6). A trouble condition with the power supply will be reported to the CWSI control panel as an SR-5 trouble when the trouble output(s) of the power supply are connected to the SR-5. Refer to the operation section of the manual for more information. Connect primary power to the UL1481 power supply as instructed in the power supply manual. All connections from the power supply to the SR-5 are to be in conduit and contained within one room. Refer to figure 3 for the wiring diagram. Connect the 24VDC output from the power supply to TB7 on the SR-5. There is no polarity to this connection. Set SW2 to the 24VDC position (Figure 2). **Note: A charge fault trouble will be reported to the panel if SW2 is in the 12VAC position.** Three trouble inputs are available on the SR-5 connector TB6. These trouble inputs are N.C. and only active when SW2 is in the 24VDC position. Any unused trouble input(s) must be shorted at TB6 or they will report a trouble condition at intervals not exceeding 200 seconds.

The trouble signals sent when the inputs are opened are as follows:

TB6 Terminals	Signal on Control Panel
1+2	A/C Loss
3+4	Low Battery
5+6	Trouble

When using the SR-5 with a UL1481 power supply the lithium backup battery in the SR-5 is not needed and should not be connected.

After the wiring between the SR-5 and the power supply are complete attach the antenna to the SMA1 antenna connector. Do not over tighten the antenna. Place the control panel in enrollment mode, then plug apply power to the power supply. The wireless relay A/C power and trouble leds will light and the sounder will beep for 15 seconds. Within one minute the wireless relay should enroll. The sounder will beep twice and a Power Up Reset trouble signal will be displayed on the control panel when the SR-5 enrolls. If the wireless relay doesn't enroll within 60 seconds:

1. Make sure the wireless relay is in reception range of a repeater or the control panel.
2. Confirm the control panel is in enrollment mode.
3. Clear the wireless relay base code as described in the info and maintenance section of this manual and power cycle the unit.

After the wireless relay is enrolled it will transmit a power up reset trouble to the control panel. This is expected on power up and does not indicate trouble with the wireless relay.

3.6 The Backup Battery

Note: This section only applies when using the TR-12V-2A transformer to power the SR-5. The wireless relay uses a 3.7Vdc 2.8Ah (CWSI p/n BA-3.7V-2.8AH) lithium ion battery for backup power in the event of primary A/C power failure. The battery will supply a minimum of 24 hours of standby operation followed by 5 minutes of alarm. The battery plugs into the BT1 connector (figure 3). The battery is periodically tested under load. The battery is supervised and a low battery trouble will be transmitted to the control panel every 90 seconds if the battery is low or disconnected. If the battery is low or bad the low battery trouble will keep reporting until it is charged or replaced with a charged battery. **Note: The battery is to be replaced only by a trained technician.**

To replace the battery:

1. Disconnect the battery from connector BT1
2. Cut the tie wraps securing the battery.
3. Replace the battery with a CWSI p/n BA-3.7V-2.8AH battery only. **Warning: Use of any other battery may cause damage/harm to the unit, battery or user.**
4. Secure the new battery with new tie wraps supplied with the replacement battery and cut the excess length of the tie wrap.
5. Connect the battery to the BT1 connector and reset the control panel.

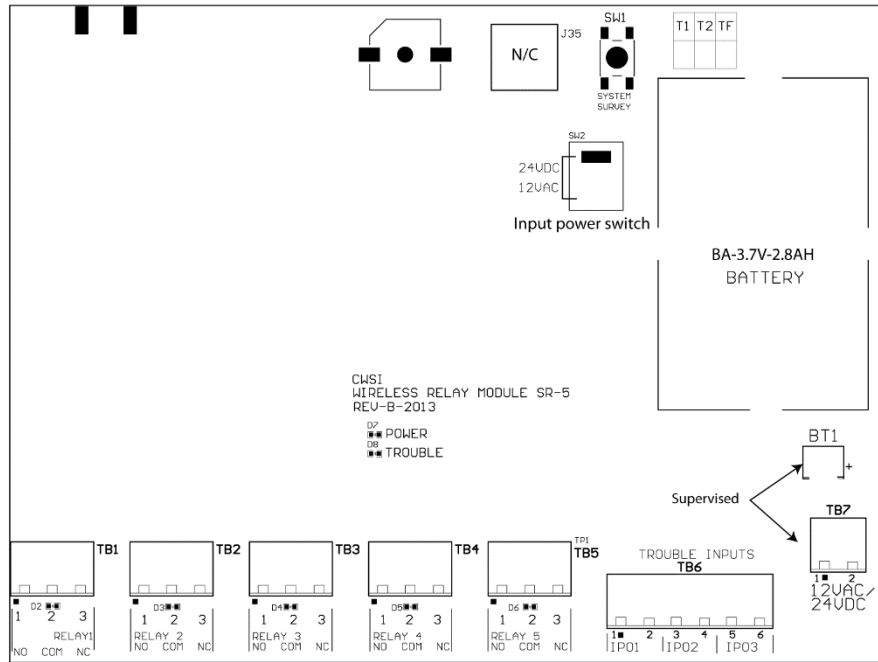


Figure 2

Section 4 – User Interface

This section will explain LED, Sounder and Switch functions. Use figure 2 for reference.

4.1 LEDES

The wireless relay has 2 led indicators as follows:

A/C PWR – This green led indicates the status of the incoming A/C voltage. On steady indicates proper A/C voltage is present. Off indicates low or no A/C voltage present. When SW2 is in the 24VDC position this led will be controlled by TB6 terminals 1+2. The led will be on steady if TB6 1+2 are shorted and off if TB6 1+2 are open.

TROUBLE – This yellow led indicates a trouble condition exists. This led will flash when a trouble condition is present on the wireless relay.

RELAY OUTPUT INDICATORS – There is an led indicator under each terminal block TB1-TB5 which indicate if the relay output is active. When the led is on the relay output is active.

4.3 Sounder

The sounder is used as an audible indicator for enrollment, processor failure and signal survey.

4.4 Input power switch SW2

This switch should be selected to match the type of input power supplying the SR-5. Refer to sections 3.4 and 3.5.

4.5 Survey switch SW1

This switch is used for performing a signal survey with the SR-5. Refer to the signal survey section for more information.

4.6 USB J35

This usb connector is for factory use only.

4.7 Relay outputs and trouble inputs

There are 5 dry contact form C relay outputs and three trouble inputs available on the SR-5. The relay outputs are rated 30Vdc@5A when connected to non-power limited or 30Vdc@3.25A when connected to power limited circuits. They are labeled TB1-TB5 in order (relay1-5). The relay outputs can be connected to either power limited or non-power limited circuits. Always maintain a minimum of ¼" space between power limited and non-power limited wires within the enclosure. When connecting both power limited and non-power limited circuits to the terminal blocks keep them grouped together so the ¼" separation can be maintained. Use tie wraps if necessary to help spacing of the wires. Figure 3 shows an example of grouping using tie wraps. There are also three trouble inputs used to monitor the external power supply as described in section 3.5 of this manual.

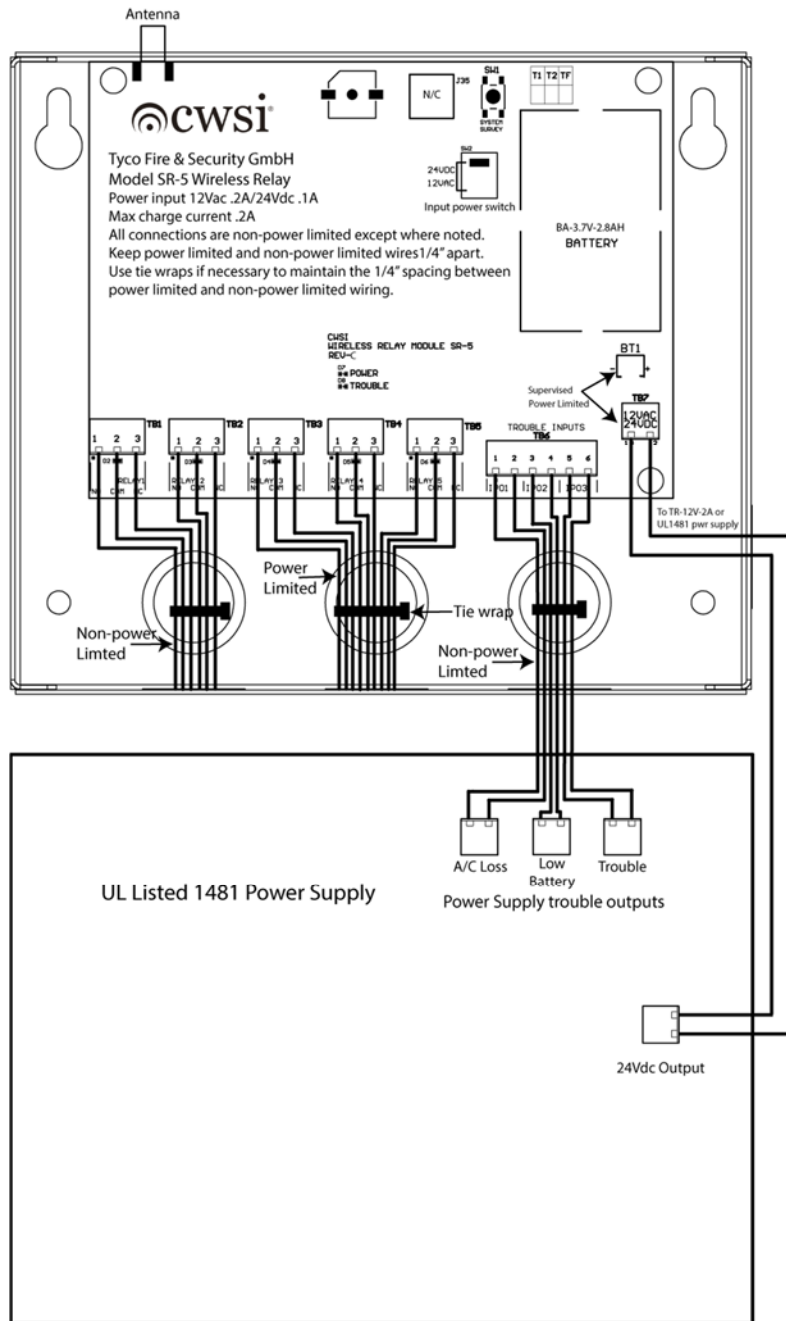


Figure 3

Section 5 – Operation

5.1 Overview

The SR-5 wireless relay provides 5 individually programmable form C outputs activated when the programmed zone is active. Both alarm and trouble zones can be programmed to activate the relays. The SR-5 is fully supervised for troubles as listed in this section. Some of the trouble signals are self-restoring and will clear the control panel when the trouble is fixed without operator intervention*.

*Only on control panels which support trouble self restoring.

5.2 Normal standby

When the installation has no off normal conditions the wireless relay outputs will be in the normal condition with the relay outputs off. The SR-5 will check in to the control panel every 90 seconds to report its status.

5.4 Trouble signals

This section contains a list of trouble signals that can be transmitted by the wireless relay. Possible causes are given to help the technician quickly solve the issue. The wireless relay is continuously monitored for proper operation. If a problem arises then a trouble signal will be sent to the control panel within 200 seconds indicating the trouble condition. The trouble will be retransmitted every 200 seconds until the problem is resolved. Some of the troubles are self-restoring as listed below.

1. **Power Up Reset** - Caused when the wireless relay processor resets its program. This signal is normal the first time the wireless relay is powered up. It should not reoccur after the wireless relay has power applied. If it does then the unit requires factory service.
2. **Low Battery** – Caused by battery voltage being too low, battery failing to pass load test or TB6 3+4 terminals open when SW2 is in the 24VDC position. Charge or change the battery or check the external power supply.
3. **Hardware Fault** – Caused by a fault with the internal circuitry of the wireless relay. Power cycle the unit. If the fault repeats then factory service will be required.
4. **Charger Failure** – Caused by a problem in battery charging circuit or SW2 does not match the connected input power source. Correct the setting of SW2. If the fault repeats then factory service is required.
5. **Low Battery** – Caused by battery voltage being too low, battery failing to pass load test or TB6 3+4 terminals open when SW2 is in the 24VDC position. Charge or change the battery or check the external power supply.
6. **Power Loss*** – Caused by low or no A/C voltage present at the TB7 terminal block or trouble input TB6 1+2 are open when SW2 is in the 24VDC position. Check for proper A/C supply from the TR-12V-2A or the external power supply if used.
7. **Test Failure*** – Displayed by the control panel when the wireless relay polling transmission is not received within 200 seconds. Possible causes are missing antenna, break in wireless relay network communications or component failure in the wireless relay. Check the unit for proper communication with the network.
8. **Trouble*** – Caused by TB6 5+6 are open when SW2 is in the 24VDC position. Check the wiring to the terminals or the external power supply.

* **Self Restoring on control panels supporting this feature.**

Section 6 – Programming

6.1 General

The wireless relay must be enrolled and programmed for the relays to activate. Up to three zones can be assigned to each relay along with specific deactivation control. Refer to the control panel manual for detailed programming instructions.

Section 8 - Signal Survey

8.1 Installation Survey

The test must be performed before and after mounting the wireless relay. The signal survey will insure the wireless relay has good communication signal strength with the network. The wireless relay must be enrolled to a control panel and in communication range of an enrolled AR-5 repeater or the control panel. Follow the enrollment procedure in this and the control panel manual. A survey can also be performed with an AR-5 repeater in survey mode. Refer to the repeater manual for more information. Once the SR-5 is linked to a AR-5 in survey mode or for existing installations momentarily press the survey button on the SR-5 board. In 5-10 seconds the sounder will beep either once or twice. Two beeps is a passing survey and one long beep is a failing survey. Five consecutive surveys indicate the unit is in an acceptable mounting location.

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