SC3100

Radio Communicator

Operation and Installation Guide

Security Systems

BOSCH

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1.0 SAFECOM Telemetry Communications System

SAFECOM is a long range telemetry communications system for monitoring life safety security alarm panels which are remotely located at a customer site. The SAFECOM system utilizes specially designed telemetry transmitters and receivers to provide a secure and reliable radio communications link between remote alarm panels and a Central Monitoring Station. The information provided to the Central Monitoring Station allows security personnel or local authorities to respond immediately and appropriately to all alarm events detected at the customer site (see the following figure).
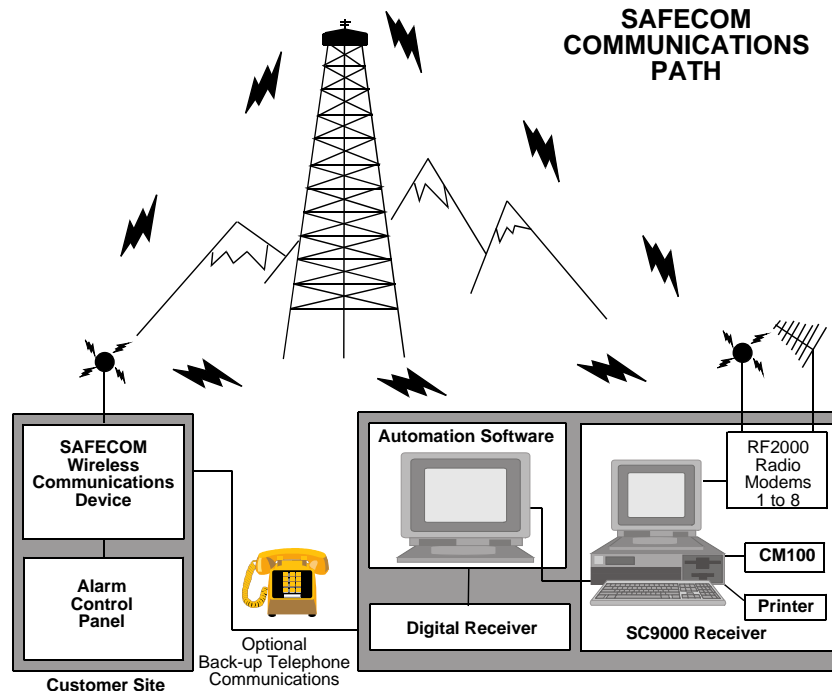
Figure 1: SAFECOM System

1.1 SAFECOM Communications Paths

The SC9000 Receiver acts as the nerve center of the SAFECOM Base Station. The SC9000 Receiver uses a personal computer to operate the ST1000 Receiver Software and provide radio communications with remote Radio Communicators via the RF2000 Radio Modem.

A Radio Communicator is a SAFECOM Communications Panel which is located at a customer site; commercial or residential. The SC9000 SAFECOM computer can supervise, monitor, and control up to 2,500 Radio Communicators through two-way telemetry radio communications.

The receipt of each message or poll that is transmitted is validated by the receiving site; SC9000 computer or Radio Communicator. The receiving site will then transmit an acknowledge message in response.

Supervisory polling is performed by the SC9000 computer for each Radio Communicator to verify two-way telemetry radio communications and the operational condition of the Radio Communicator. The supervisory polling interval is individually programmable for each Radio Communicator in the SC9000 computer account base.

The SAFECOM radios can be configured to transmit (TX) and receive (RX) on a single frequency pair directly to the Central Station. When the SAFECOM system is set up for Direct Mode, the SC9000 computer communicates directly with the Radio Communicators in the field. No repeater is used for this type of SAFECOM system (usually found in smaller proprietary systems like those found on a military base, university, or factory/commercial plant).

The SAFECOM radios can also be configured to transmit and receive on a frequency pair to a repeater located on a mountain, tower, or high building in the desired coverage area. When the SAFECOM system is set up for repeater mode, the SC9000 computer communicates with the Radio Communicators through a, UL Listed, SAFECOM SC801 or SC802 Data Repeater, **or** a commercial grade voice repeater that has been configured with a SAFECOM DP1000PWA Controller Board. The SC801/SC802 or equivalent repeater is normally installed at a Commercial Repeater Site.

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Introduction

The use of a SAFECOM type or equivalent repeater significantly increases the coverage area (range). Radio area coverage and reception ranges are also dependent on the extent of a number of environmental effects, e.g., propagation losses due to atmospheric conditions, and the proximity of the radio transmission and reception paths to dense foliage and metal structures.

The majority of SAFECOM Radio Communicators are ordered to TX and RX in the 450-470 MHz UHF frequency range. Other frequency bands currently supported by Bosch Security Systems include the 403-430 MHz, 470-512 MHz, 136-174 MHz VHF range and the 900 MHz band. Additional frequency ranges are available upon request. The SC9000 computer can communicate with all Radio Communicators assigned to that specific SAFECOM network on a single RF "channel" through one SAFECOM RF2000 Radio Modem. A single RF channel is one radio frequency pair for either direct OR repeater communications.

With the installation of a SAFECOM 4 or 8 port Expander Board, the SC9000 computer can communicate on 1 to 8 independent and addressable RF channels. Each RF channel communicates through a separate RF2000 Radio Modem. The addition of RF channels can be used to achieve backup redundancy in an area, or greater RF coverage range.

The SAFECOM IT1500 Installation Tester allows the installer to test for a standardized signal level from the remote radio site to the SC9000 computer and back, full two-way. Through this testing by a sales or service representative, a two-way communications link can be confirmed between a Radio Communicator and the Central Station Receiver PRIOR to the installation of a SAFECOM system.

1.2 Overview of SAFECOM Radio Communicators

Bosch Security Systems manufactures the following SAFECOM Radio Communicators:

- SC4000, Full Data Transfer, Eight Zones, Four Outputs, Radio Communicator
    - UL Listed
    - Radio communications as primary path, phone line backup
    - Full data transfer of all alarm panel signals
    - Eight zones on board for Open/Closure/Voltage/Bell Out/Ground
    - Relay outputs for remote control, signaling, and/or automatic switching on-site
- SC4000F, SSWF Fire Reporting Radio Communicator
    - UL Listed for Supervisory, Sprinkler and Water Flow applications, reporting via radio only
    - Four on board SSWF inputs
    - Relay Outputs for remote control, signaling, and/or automatic switching on-site
- SC3100, Full Data Transfer Radio Communicator
    - Radio communications as primary path, phone line backup
    - Full data transfer of all alarm panel signals
- SC2104, Eight Zones, Phone line Monitor, Radio Communicator
    - Radio communications as primary or backup path
    - Phone line monitoring (line sniffing)
    - Eight zones on board for Open/Closure/Voltage/Bell Out/Ground
- IT1500 SAFECOM Sales/Installation RF Tester
    - Two-way radio communications tester for radio communicator site installations
- SC801/SC802 SAFECOM Digital Data Repeater
    - UL Listed for long range alarm reporting via radio
    - Fully addressable to allow up to eight independent repeaters in the same coverage area
    - Full battery backup and lockable cabinet, with tamper reporting via radio

1.3 SC3100, Full Data Transfer, Radio Communicator

The SC3100 Radio Communicator is a derivative of the capabilities and features found on the SAFECOM SC4000. The SC3100 and the SC4000 share the same two-way communications characteristics and receiving-and-sending functions of host alarm panel signals. However, the SC3100 is a non-UL Listed device and is not configured with inputs or output relays.

The SC3100 is normally configured as a stand-alone device for interface with the customer's existing alarm panel. It is located at a customer site; commercial or residential. The smaller physical dimensions of the SC3100 permits installation inside of many existing alarm panels. The antenna can be mounted directly on the alarm panel enclosure, or remotely positioned for optimum radio reception and transmission.

The SC3100 is normally installed to Intercept all of the alarm panel signals from the host alarm panel (also known as a dialer). The dialer message is then digitally encoded and sent to the Central Station SAFECOM SC9000 computer via the SAFECOM network. When SAFECOM is installed, it is the primary means of alarm panel communication (the phone line serves as the backup route). The SC3100 is capable of interfacing with most alarm panels that use industry standard pulse formats (3+1, 4+2, FBI Superfast, Radionics Slow, etc.) or Dual Tone Multiple Frequency, DTMF (ADEMCO Contact ID, ADEMCO High Speed, or ADEMCO 4+2 Express), or SIA-R, or Radionics Modem and Modem IIe, or BFSK formats.

The SC3100 can be thought of as "a digital receiver in a box", in that it has the ability to receive the signals from the host alarm panel, and then generate an ACK and kissoff to the alarm panel, while sending the signal to the Central Station SC9000 computer. The SC3100 sends all the necessary (ACK) tones to the host alarm panel in response to the Dialer seizing the phone line. These ACK tones can be programmed at the Central Station SAFECOM Computer to short and long durations, frequencies of 1400 or 2300 Hz, as well as low/high (Contact ID) and the Bosch Security Systems D6500 Modem ACK. The SC3100 has the ability to emulate the following digital receivers: ADEMCO 685, Bosch Security Systems D6500, Silent Knight, ADCOR, Veritech, Morse, and ITI. In addition, the SC3100 can be programmed at the Central Station to send a 440 Hz tone to the Dialer to simulate dial tone. This tone comes in two bursts lasting one second each, and is usually enough to satisfy alarm panels that "sniff" the phone line for line fail.

The host alarm panel signals are sent to the Central Station SC9000 computer. Then, the signals are displayed on the SC9000 computer and transferred to the Central Station's Automation Software (BOLD, SIS, SIMS, DICE, MAS, or most industry standard software package). Primary routing of the digital alarm messages is conducted along the SAFECOM network that exists between a SC3100 in the field and the Central Station SC9000 Receiver. The primary routing then moves the message to an automation software system.

The SAFECOM SC9000 computer can monitor all of the unique alarm panel signals from each SC3100. The SC3100 functions strictly in a supervisory capacity when interfaced with an existing alarm system. The SC3100 is an intercept/delivery system which is designed for easy installation and interface with any alarm system. The alarm panel dialer cable is simply connected to the SC3100 phone jack "DIALER" connector and the house phone cable from the RJ31X jack, to the SC3100 RJ31X connector.

No modifications to the existing alarm system are required. The normal operation of the existing alarm panel and security system is not affected in any way. The existing detectors and initiating circuits still report the status of their circuits directly to the host alarm panel. When the host alarm panel goes to send a signal, it no longer uses the phone line. The SAFECOM network is used to send all signals that will continue to be received at the Central Station regardless of the phone line's status. The house phones will normally not be interrupted by the alarm panel.

The SC3100 requires an 11 - 15 VDC (12 VDC), 350 mA, power source. This 12 VDC power source is normally provided by the auxiliary power terminal of the host alarm panel. However, an 11 -15 VDC auxiliary power supply or external battery is an acceptable power source for the SC3100.

The SC3100 is configured with a 12VDC internal gel cell battery. This internal battery provides all of the necessary peak current (ampere) requirements when the SAFECOM Radio Transceiver is transmitting (TX) and receiving (RX). The Battery is mounted inside of the SC3100 Radio Communicator and is accessible by removing the SC3100 cover and internal battery plate.

Each SC3100 is configured with a Fallback life safety feature. The Fallback mode of SAFECOM communications ensures that all alarm event messages sent by the host alarm panel will be routed to the Central Station in case of a SC3100 or SAFECOM network failure. It also provides the ability to perform alarm panel programming and downloading via the telephone line.

Alarm panel signals are normally routed to the Central Station by SAFECOM radio communications as the primary mode of transportation. In the event that the SC3100 cannot send the Dialer message via the SAFECOM network because of some type of failure, the message is automatically routed to the backup phone line and on to a digital receiver at the Central Monitoring Station (Fallback Mode).

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Introduction

1.4 SAFECOM SC3100 Radio Communicator Specifications

- Size: 4.5" W x 4.1 " H x 2.5" D (11.4 cm W x 10.4 cm H x 6.4 cm D)
- Weight: About 1 lb. (0.5 kg) with internal 12VDC battery
- Temperature: Operating: -20° to +50°C (-4° to +122°F)
- Temperature: Storage: -40° to +75°C (-40° to +167°F)
- Operating Voltage: 11 - 15 VDC, 350 mA, from an alarm panel auxiliary power, separate power supply, or external 12VDC battery (11 - 15 VDC, 850mA peak if internal battery is not used)
- Internal Battery: 12VDC, 0.8 AHr, sealed gel cell
- Panel Indicators: System Status LED and Radio Status LED
- Interface: TELCO line from RJ31X jack
    - 12VDC power, flying leads
    - RF cable, RG-58, for antenna
    - Alarm panel TELCO line - dialer

1.5 Standard Radio Specifications

Note: *Specifications may vary in other frequency bands or with the use of various makes of radio transceiver modules.*

1.5.1 Receiver

- Frequency range: 440 - 470 MHz
- Minimum Sensitivity: -113dBm (0.5 mV) for –12dB SINAD
- Selectivity: 70 dB at 12.5 kHz Channel Spacing
- Frequency stability: ± 5 Part Per Million (PPM)

1.5.2 Transmitter

- Frequency range: 440 - 470 MHz
- Frequency stability: ± 5 ppm
- RF output power: 2 watts ± 0.2 W
- Deviation: ± 2 kHz ± 0.2 kHz
- Modulation: FM

1.5.3 Factory supplied Antenna

14-16 inch (frequency specific), rubber duck vertical 1/2 Wave

1.6 Notices

1.6.1 Copyright Notice

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1.6.2 Trademarks

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1.6.3 Notice

The technical information in this manual has been carefully checked for accuracy and is presumed to be reliable and correct. However, Bosch Security Systems assumes no responsibility for any inaccuracies and reserves the right to modify and revise this manual without notice. Changes are periodically made to the information herein; these changes will be incorporated in new editions of this publication.

Please contact our Technical Support Department to request copies of this publication, technical information, and product support for all of the SAFECOM product lines.

Bosch Security Systems

130 Perinton Parkway, Fairport, NY 14450-9199

Customer Service: (800) 289-0096

Technical Support: (888) 886-6189

1.6.4 Federal Communications Commission (FCC) Statement

This equipment generates and uses radio frequency (RF) energy. If not installed and used properly, that is, in strict accordance with the manufacturer's instructions, it may cause interference to radio or television reception. This equipment has been tested and certified to comply with the specifications for a Class B digital device, pursuant to Subpart J of Part 15 of FCC rules. These specifications are designed to provide reasonable protection against such interference. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment on and off, the user is encouraged to correct the interference by one or more of the following measures:

- Reorient the radio/television receiving antenna.
- Move the antenna leads away from any wire runs to the SAFECOM system.
- If using an indoor antenna, have a quality outdoor antenna installed.
- Relocate the SAFECOM system with respect to the radio/television receiver.
- Connect the host alarm panel's AC transformer to a different outlet so the SAFECOM system and the radio/television are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user might find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems". This booklet is available from the US Government Printing Office, Washington D.C. 20402. **Stock No. 004-000-00345-4.**

Properly shielded and grounded cables and connectors must be used for connection to peripherals in order to meet FCC emission limits. Bosch Security Systems is not responsible for any radio or television interference caused by using other than recommended cables or by unauthorized modifications to this equipment. It is the responsibility of the user to correct such interference.

1.6.5 Federal Communications Commission (FCC) Notice To Users

1. Upon request only, the telephone company (TELCO) must be provided with a notice of intention to install or permanently remove the SC3100, along with the following information:
   a) Manufacturer: Bosch Security Systems
   b) Model Number: SC3100
   c) FCC Registration Number: 1 L3USA-73968-MO-N
   d) Ringer equivalence: 0.0A
   e) Type of Jack: (USOC) RJ31 X, RJ32X, or equivalent

Note: *The SC3100 is intended to be used in conjunction with Alarm Dialing Systems, and makes use of the RJ31X, RJ32X, or equivalent jack required for such systems. An equivalent jack is one which, when the system is disconnected from the jack, will continue to allow proper operation of the customer's telephone equipment.*

2. The SC3100 may not be connected to a TELCO-operated coin telephone line. Connection to privately-operated coin telephones is subject to local or state regulation, but is not recommended by the manufacturer.

3. The TELCO may, under certain circumstances, temporarily discontinue service and/ or make changes in its facilities or its service which may influence the operation of the SC3100. However, the telephone company is required to give adequate notice in writing of such changes or service interruptions.

4. In case of operational problems, disconnect the SC3100 (and Alarm Dialing System) from the TELCO line by removing the modular plug from the TELCO jack:

- If, after disconnecting the equipment from the TELCO jack, the customer's regular phone operation has not been restored, notify the telephone company that they may have a problem, and request prompt service at **no cost to the user**. If a problem is found in premises wiring not installed by the TELCO, the customer will be subject to a service charge. If a fault is found in wiring installed by the TELCO, the customer may be subject to a service call charge.

- If, after disconnecting the equipment from the TELCO jack, the customer's regular phone operation returns to normal, the equipment must remain disconnected until the SC3100, Alarm Dialing Equipment, or related wiring is serviced or replaced.

Unless otherwise noted in the Installation Guide (e.g., battery replacement, etc.), the SC3100 may not under any circumstances (in or out of warranty) be adjusted or repaired in the field. The location and phone number of the manufacturer, Bosch Security Systems, is listed in this guide.

Notes:

2.0 Circuit Board

2.1 SC3100 Circuit Board Components

The following describes the function of the headers, LEDs, and some of the significant components located on the SC3100 Communications Panel circuit board.
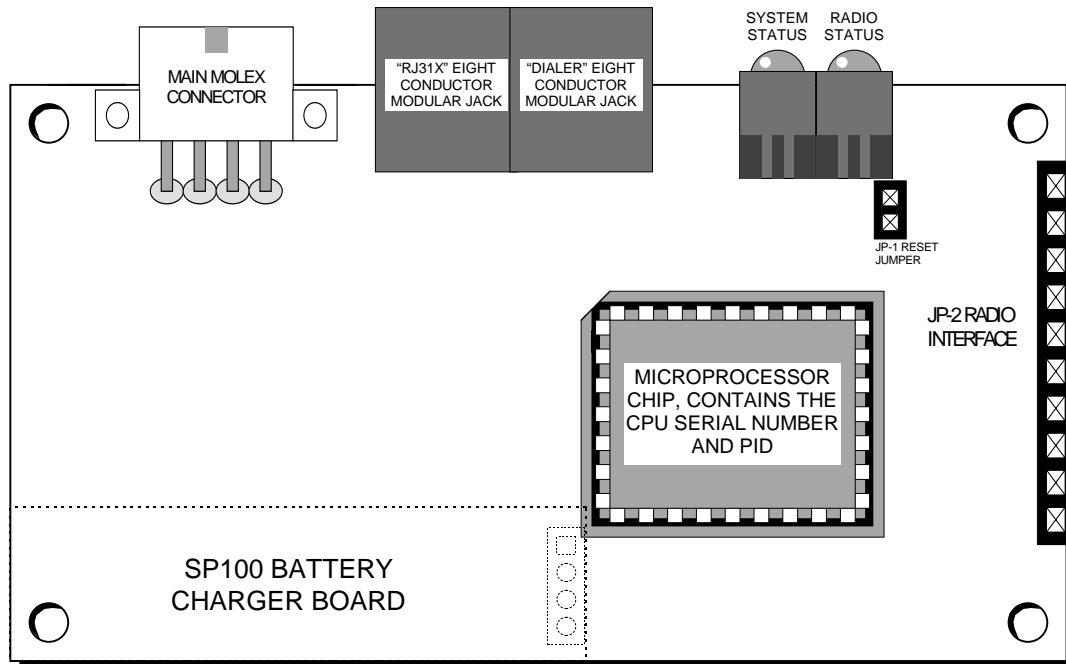

Figure 2: SC3100 Circuit Board

System Status LED

The System Status LED is a bi-color (red & green) LED. It illuminates to indicate the status of radio communications between the SC3100 Radio Communicator and the Central Station. It also is used to indicate a LOW INTERNAL BATTERY condition, and/or identify a hardware failure on the SC3100 during system initialization.

Radio Status LED

The Radio Status LED is a bi-color (red & green) LED. It illuminates to indicate transmit (red) and receive (green) Status of the SC3100 internal radio module. This indication is helpful when sending and receiving signals.

RJ31X Modular Jack

This is a standard 8 pin RJ31X compatible female modular phone jack which is used for connecting the SC3100 to the premises RJ31X telephone jack (Tip & Ring on PINS 4 & 5 and House Phone return from the alarm panel on Pins 1 & 8).

Dialer Modular Jack

This is a standard eight-pin RJ31X compatible female modular phone jack which is used for connecting the SC3100 to the alarm panel "phone line in & house phone out" (Tip & Ring to alarm panel on Pins 4 & 5 and house phone return from the alarm panel on Pins 1 & 8).

Main Interface Molex Connector

This is a specially keyed, female Molex connector. This connector is provided for interfacing the required 12VDC power from the host alarm panel auxiliary power supply. The SC3100 comes supplied with a mating male Molex connector with a flying lead wiring harness for wiring the 12VDC power. The 12 VDC power is provided by the Red (+) and the Black (-) wire leads on the Molex connector wiring harness.

SC3100

SC3100 Circuit Board

JP1 - CPU Reset (Reboot)

This allows system reset or initialization of the Central Processor Unit (CPU). Shorting the two pins on this header and cycling the system power will erase the program from the SC3100, making it operate as if it was a "new, out of the box" unit.

Radio

This header is to connect the interface cable from the internal RA500 Radio Module to the radio adapter board inside the SC3100.

JP-3-SP100 Charger Header

This four-pin header is used to interface the main SC3100 board to the SP100 Battery Charger board. The SP100 is mounted "piggy-back" on this header, and is secured in place with a single ¼-inch standoff.

Note: *To operate the SC3100 without the supplied internal battery, remove the SP100 Battery Charger Board and battery, and place a jumper across the two pins closest to the CPU on Header XX. This requires a stable well-regulated power source for operation without the internal battery.*

Battery Cut-Off Relay

This relay disconnects the internal 12VDC battery from the SC3100 circuitry when the external DC power source is removed.

Note: *Once the SC3100 is programmed and brought on-line, this relay is disabled.*

R42 - TX Dev Adj

This is the adjustment for the Radio Transmitter Modulation Deviation set by Bosch Security Systems at the factory. **Do not make field adjustments**.

⚠️ CAUTION

> **Do not make field adjustments. Field adjustments of the Radio Transmitter Deviation made by unauthorized personnel may violate FCC regulations.**

U1 - Microprocessor

This contains the system program the SC3100 needs to operate. This program is downloaded into the microprocessor from the SAFECOM computer via the SAFECOM radio network when the SC3100 is first powered up. The label on the microprocessor specifies the CPU S/N and PID # of this particular SC3100.

U3 - Modem Chip

This is the SC3100 Modem used for converting the Serial Data stream from the SC3100 main board to an audio signal that can be transmitted via the SAFECOM radio network.

2.2   System Status LED Indications

The System Status LED lights up to indicate the status of radio communications between the SC3100 and the Central Station SC9000 computer. It also can indicate a low internal battery condition. The System Status LED also functions as a hardware fault indicator.

There are 5 types of System LED indications for various conditions of a properly programmed SC3100 in the field:

- **Rapid blinking green:** The System LED blinks green continuously at a rate of 5 times per second. After 90 seconds of power-up, this LED indicates that the SC3100 is in radio communication with the Central Station SC9000 computer and is online. This LED also indicates that the charge on the SC3100 internal battery is Good (~ 11.5-14 VDC). Communications = Good, Battery = Good

- **Rapid blinking red:** The System LED blinks red continuously at a rate of 5 times per second. After 90 seconds of power-up, this LED indicates that the SC3100 is not in radio communication with the Central Station SC9000 computer and is offline. This LED also indicates that the charge on the SC3100 internal battery is good (~ 11.5-14 VDC). Communications = Bad, Battery = Good

- **Slow blinking red:** The System LED blinks red slowly 5 times, then pauses for one second, then returns to the 5 slow red blinks. This LED indicates that the SC3100 system has shut down because the charge on the SC3100 internal battery is so low that it cannot activate the radio transmitter to send a message. Communications = Bad, Battery = Bad

The SC3100 will attempt to re-establish communications with the Central Station every 15 minutes after the low battery shutdown condition occurs. If the charge on the SC3100 Battery has not reached a minimum of 11.5 VDC, then the SC3100 will remain in the shutdown condition for another 15 minute period. It will continue this attempt then shutdown cycle until the battery charge has reached the minimum level.

The battery restore message will NOT be sent by the SC3100 until the charge on the SC3100 Battery has reached a minimum of 11.5 VDC during transmit TX ACTIVE.

Note: *The SC3100 battery voltage is only tested when the radio transceiver is transmitting.*

Note: *The SC3100 internal battery is shipped from Bosch Security Systems disconnected. The installer MUST open the SC3100 enclosure and connect the internal battery connector. It is then recommended that the SC3100 be programmed into the SC9000 computer and brought ONLINE for a minimum of 3 hours prior to installation to charge the internal battery to a sufficient level. The SC3100 internal battery may NOT be charged to full capacity after an idle, no-charge period, such as during shipping from Bosch Security Systems.*

2.3 Radio Status LED Indications

The Radio Status LED illuminates to indicate the current transmit and receive status of the SC3100 Radio Communicator. This is a bi-color (red & green) LED. It illuminates to indicate the current transmit (red) and receive (green) status of the SC3100 internal radio module. This indication is helpful when sending and receiving signals.

This LED will illuminate red when the SC3100 is Transmitting a signal to the Central Station.

This LED will illuminate green when the SC3100 is receiving any radio signals (Carrier Detect - CD) on the Radio Receiver frequency. This green indication can mean the SC3100 is receiving a signal from the Central Station, is hearing another SAFECOM Radio Communicator in the field, is being interfered with due to a high level of RF noise in the area, or is being intentionally jammed on the RX frequency.

Notes:

3.0   Pre-Installation Requirements

3.1   SC3100 Pre-Installation Requirements

Prior to the installation of the SC3100 Radio Communicator, several conditions must be satisfied and physical phenomena considered to insure trouble free operation.

3.2   SC3100 Wiring Requirements

All wiring utilized for the installation of the host alarm panel and the SC3100 Radio Communicator shall be in accordance with local building codes. The following is recommended gauge and type wiring for installation of the host alarm panel and the SC3100:

- Alarm panel dialer phone lines: in accordance with industry installation standards.
- SAFECOM antenna RF cable: It is always preferred to utilize the RF cable provided by Bosch Security Systems for installations of SC3100 Radio Communicators.
- SAFECOM antenna RF cable for remote antenna installation: The antenna should be located remotely away from the SC3100. For distances of 15 ft. (4.6 m) or less, use RG-58 or equivalent. For distances up to 30 ft. (9.1 m), use RG-8 or equivalent. For distances exceeding 30 ft. (9.1 m), contact a Bosch Security Systems SAFECOM Applications Engineer for recommendations.
- 12 VDC power from host alarm panel auxiliary power: Minimum 20 AWG (distance dependent).

3.3   DC Power Requirements of the SC3100 Radio Communicator

The SC3100 requires an 11-15 VDC (12 VDC), 350 mA, power source capable of providing 850 mA during transmission if the internal battery is not used. The 12 VDC power source supplies the operating voltage requirements for the SC3100 circuit board and charging the internal SC3100 battery. This 12 VDC power source is normally provided by the auxiliary power terminal of the host alarm panel. However, an 11-15 VDC stand alone DC power supply or external battery is an acceptable power source for the SC3100.

CAUTION

The SC3100 should not be connected to the battery terminal or smoke detector power of the host alarm panel.

3.4   SC3100 Internal Battery

The SC3100 is provided with a 12VDC battery. This battery provides all of the necessary peak current (amperes) requirements for the SAFECOM Radio Transceiver. This battery is mounted inside of the SC3100 Radio Communicator and is accessible by removing the enclosure cover. Primary 12 VDC operating power for the SC3100 is normally supplied by the host alarm panel.

Note: *The SC3100 internal battery might not be at full capacity after an idle no-charge period during shipping from Bosch Security Systems. The SC3100 battery must be connected internally and charged for a minimum of 3 hours prior to initialization for radio communications. This will ensure that the SC3100 internal battery charge is a minimum 11.5V DC when the SC3100 is initially powered up for operation.*

3.4.1   SC3100 Internal Battery Replacement

The SC3100 is provided with an internal 12VDC, 0.8 AHr, sealed gel cell battery. A replacement battery may be purchased from Bosch Security Systems, (800) 289-0096.

3.4.2   Replacing the SC3100 Battery

1. Remove the external 12 VDC power source from the host alarm panel.
2. Loosen the four retaining screws on the SC3100 main enclosure cover.
3. Locate and remove the battery from the battery plate.
4. Disconnect the battery two pin Molex connector between the battery and the SP100 Battery Charger Board.
5. Connect the two pin Molex connector to the new battery.
6. Reverse the above procedures to install the new battery and replace the SC3100 enclosure cover.
7. Re-connect the host alarm panel auxiliary 12 VDC power source.

SC3100

Pre-Installation Requirements

3.5   SC3100 Radio Communicator Location

The SC3100 Radio Communicator is designed to be installed inside of the host alarm panel. If the size of the host alarm panel will not permit mounting the SC3100 inside or for special SC3100 configurations, then the SC3100 enclosure can be mounted directly to a vertical surface, like a wall, using the keyhole mounting holes provided on the rear of the SC3100 enclosure. This type of mounting will also require the use of an L bracket to mount the factory supplied antenna. This L bracket is provided with all SC3100 units sold by Bosch Security Systems. The L antenna mount bracket is Bosch Security Systems part number #80072-101.

CAUTION

The SC3100 is not environmentally sealed. Do not mount the SC3100 where it can be exposed to the elements.

If the antenna is mounted directly on the exterior of the host alarm panel enclosure, the alarm panel should be mounted on the inside of an exterior wall, for optimum radio transmission and reception. However, it should not be mounted in close proximity to:

- A cable bundle and/or wiring harness that is routed vertically and in close proximity to the SAFECOM antenna.
- A computer, PA, entertainment, or sound system.

The following should be considered when determining the location for mounting the SC3100:

- Space restrictions of the host alarm panel.
- Distance to the antenna from the SC3100 Radio Communicator.
- Antenna proximity to a cable bundle and/or wiring harness.
- Antenna proximity to computer, PA, entertainment, or sound systems.
- Easy access by a service technician.

3.6   Antenna Location

Improper antenna location is the single most common problem found in SAFECOM installations. The only way to properly determine the best location for the SAFECOM antenna installation is to use the SAFECOM IT1500 Tester.

IMPORTANT

The SAFECOM IT1500 Tester must have a **minimum** *of 9dB of attenuation installed between the Tester and the Tester's antenna. If the Tester, along with the 9dB attenuator does not produce a minimum of 10 "pass" indications following the tests, then the SAFECOM SC3100 Radio Communicator cannot be installed in this location. Refer to the SC9000 Operations Manual section titled "Using the IT1500 Tester" for more information on finding another location within this building and testing possible antenna locations. For information on ordering an external attenuator for your SAFECOM IT1500 Tester, contact a SAFECOM Applications Engineer at (800) 538-5807.*

If the SC3100 Radio Communicator is installed inside of a host alarm panel, then the antenna must be mounted externally to the host alarm panel. Do not mount the antenna inside of the host alarm panel enclosure.

A successful RF communications link between the SC3100 and the Central Station SC9000 computer may be subject to external interference. Several environmental effects must be considered when determining the proper location for mounting the SC3100 antenna.

Transmission and receipt of radio signals may be blocked by metal, mountains, hills, foliage and other natural and man-made obstructions.

Some extent of radio signal degradation may be seasonal. Weather may significantly degrade reception ranges due to propagation from temperature layers and reflection from the moisture content in the atmosphere. Transmission and reception ranges may be reduced by dense foliage on trees and shrubs, or by snow. This degradation is normally experienced during the spring and summer months when the presence of leaves tends to block the signal path.

For optimum transmission and reception of radio signals, position the antenna as high as is possible within the structure. Mounting the antenna on an elevated structure will enhance the line-of-sight Tx/Rx range and communications link effectiveness. The antenna should NOT normally be mounted inside metal buildings or enclosures. The proper antenna location is site specific for each installation.

IMPORTANT

All sales personnel must be required to utilize the IT1500 Tester with a minimum of 9dB attenuator installed between the IT1500 Tester and the Tester Antenna to determine if two-way radio communication between the prospective customer site and the Central Station SC9000 computer is possible before the job is sold.

After the initial testing is performed by the salesperson, the installer must be required to utilize the IT1500 Tester, with a minimum of 9dB attenuator installed between the IT1500 Tester and the Tester Antenna, to determine the proper antenna location within the customer site for installation.

The IT1500 is a portable tester which transmits a radio signal from the remote customer site to the Central Station SC9000 computer and receives an acknowledge (ACK) message to verify a successful two-way communications link for that particular geographic location and antenna position.

REMEMBER! Moving the antenna location as little as 4 in. (10.2 cm) in either direction can mean the difference between a trouble-free site, or an angry customer who requires multiple service calls.

3.7 SC3100 Acceptable Antenna Types

The SC3100 is usually installed using the factory supplied omnidirectional (OMNI) antenna. However, if testing using the IT1500 Tester, with a minimum of 9dB external attenuator installed between the Tester and the Tester antenna, shows that the factory supplied omnidirectional antenna is not sufficient, the installer may choose to use a direction, gain antenna. This type of antenna is usually referred to as a beam or Yagi type antenna. The following is a partial listing of acceptable types of antennas for installation on or external to the SC3100 Radio Communicator. Both the omnidirectional and Yagi type antennas are available to order directly from Bosch Security Systems. Call (800) 289-0096 for more information.

Bosch Security Systems factory supplied SAFECOM omni-directional antenna:

Bosch Security Systems Part Number	Description	Frequency Range
SC921-xx	½ wave, 2.5 dB gain, RUBBER DUCK	400-512 MHz
C740A	3.0 dB gain, Omni Whip	450-470 MHz
C742	10.0 dB gain, Directional (Yagi)	450-470 Mhz

Table 1: SC3100 Antenna Types

Notes:

4.0   Installation Procedures

This section describes the installation procedures for the SC3100 Radio Communicator.

4.1   SC3100 Radio Communicator

Mount the SC3100 at the location determined from the considerations discussed in Section 3.0. The total weight of the SC3100 is about one pound (0.5 kg) with the internal 12 VDC battery installed.

The SC3100 is normally installed in an upright position in the bottom and inside of the host alarm panel enclosure (see Figure 3).
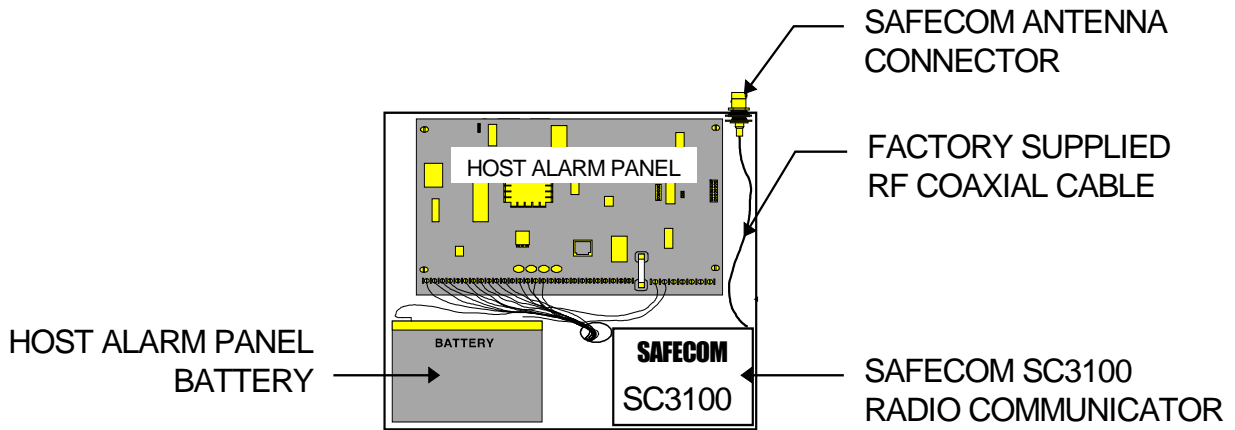

SAFECOM ANTENNA CONNECTOR

FACTORY SUPPLIED RF COAXIAL CABLE

HOST ALARM PANEL

HOST ALARM PANEL BATTERY

BATTERY

SAFECOM SC3100

SAFECOM SC3100 RADIO COMMUNICATOR

Figure 3: SC3100 Radio Communicator

4.2   Antenna

Each SC3100 Radio Communicator unit is shipped from Bosch Security Systems with a 20 in. (50.8 cm) antenna coaxial cable assembly to mount the antenna directly on the host alarm panel enclosure (as shown above). The unit is also shipped with a 2" x 2" antenna mounting L-bracket for mounting the antenna directly on the side of the host alarm panel or for remote installation of the antenna.

If mounting the antenna directly on the host alarm panel, use the attached antenna coaxial cable assembly to connect the SC3100 radio communicator to the antenna (on the top of the host alarm panel enclosure). See the following figure:
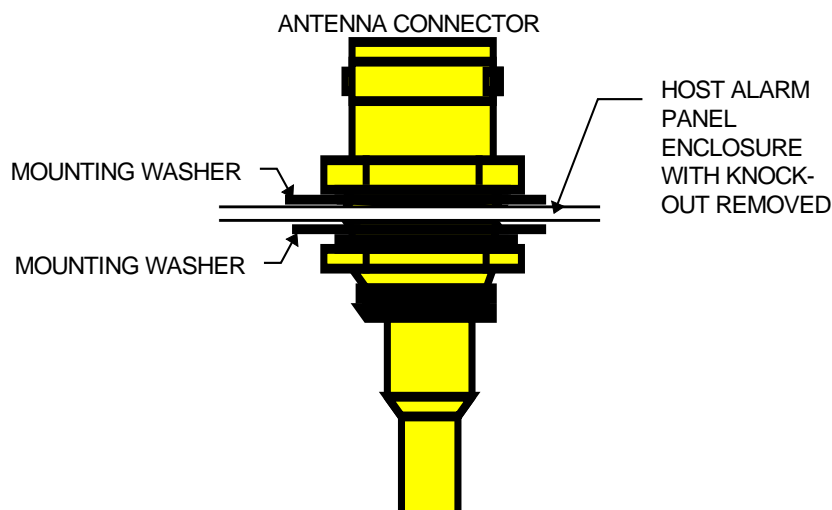

ANTENNA CONNECTOR

HOST ALARM PANEL ENCLOSURE WITH KNOCK-OUT REMOVED

MOUNTING WASHER

MOUNTING WASHER

Figure 4: SC3100 Antenna

SC3100

Installation

The RF bulkhead connector, on the end of the factory supplied coaxial cable, may be installed directly on the host alarm panel enclosure by using one of the following methods:

1. An existing knock-out port (on the top of the host alarm panel enclosure).

2. A ½ in. diameter hole, carefully drilled into the top of the host alarm panel enclosure.

3. The 2" x 2" factory supplied antenna mounting L-Bracket (P/N 80072-101).

Use the 1.5 inch diameter antenna mounting washers (P/N 80074-101), with the antenna coaxial cable assembly to provide an adequate ground and physical support for the antenna when mounting the antenna on the top of the host alarm panel enclosure. The L-bracket installation does NOT require using the antenna mounting washers.

If a remote antenna location is required, mount the antenna in a suitable location as best determined by the results of IT1500 Tester. Use the 2-inch x 2-inch antenna mounting L-bracket to attach the antenna to a beam or supporting structure.

For remote antenna installations, Bosch Security Systems recommends using RG-58 for distances up to 15 ft. (4.2 m). RG-8 for distances up to 30 ft. (9.1 m).

4.3 Connecting Wires to the SC3100

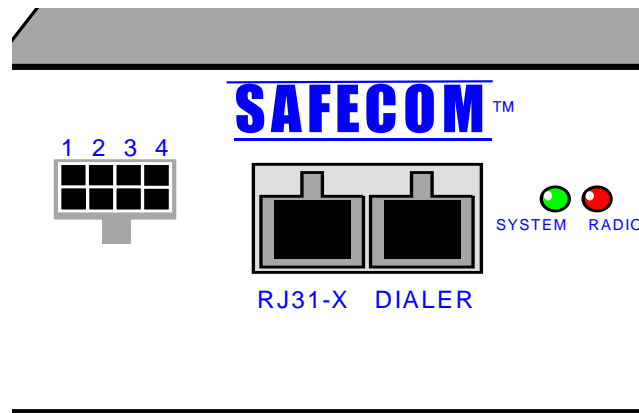Refer to the following illustration of the SAFECOM SC3100 Radio Communicator:

Figure 5: SC3100

4.3.1 Dialer

Connect the alarm panel Tip and Ring to this connector. The SC3100 DIALER connector is an 8 pin RJ31X compatible female modular jack.

4.3.2 R131X

Connect the premises RJ31X telephone jack to this connector. The SC3100 RJ31X connector is an eight-pin RJ31X compatible female modular phone jack.

4.3.3 Main Molex Connector

The SC3100 Main Molex connector is to be installed with the factory supplied 6 conductor wiring harness. This wiring harness contains the wires necessary for connecting the 12 VDC power source. The wires are identified as described in the following paragraph.

The following wires are supplied with the SAFECOM SC3100 wiring harness:

- **Black (-) Ground:** Connect the black wire to the negative (-) side of the Host alarm panel auxiliary power 12 VDC SUPPLY.

- **Red (+) 12 VDC:** Connect the red wire to the positive (+) side of the 12 VDC power source.

Note: *The SC3100 is shipped from the factory with the internal 12V DC battery installed, but not connected. The battery might not be at full capacity after an idle, no-charge period during storage or shipping. The SC3100 Battery should be charged for a minimum of three hours prior to installation. This will ensure that the SC3100 battery charge is sufficient when the SC3100 is initially powered up for operation.*

5.0 System Initialization

The following describes the System Initialization Procedures for the SC3100 Radio communicator.

5.1 System Initialization Procedures

Contact the Central Station SAFECOM computer operator. Then verify that the following information is entered in the SAFECOM SC9000 computer account for the specific SC3100 you are working on.

You must build an account into the SAFECOM SC9000 computer before the computer will recognize and place on-line a unit in the field. Below is a summary of the parameters necessary to program an SC3100 account into the SAFECOM computer. This is the first setup menu. These parameters must be entered, then "PG DOWN" to the second menu. A summary of the second setup menu can be found on the following page. The parameters that must be programmed by the Central Station are denoted in the following illustration and are summarized below:
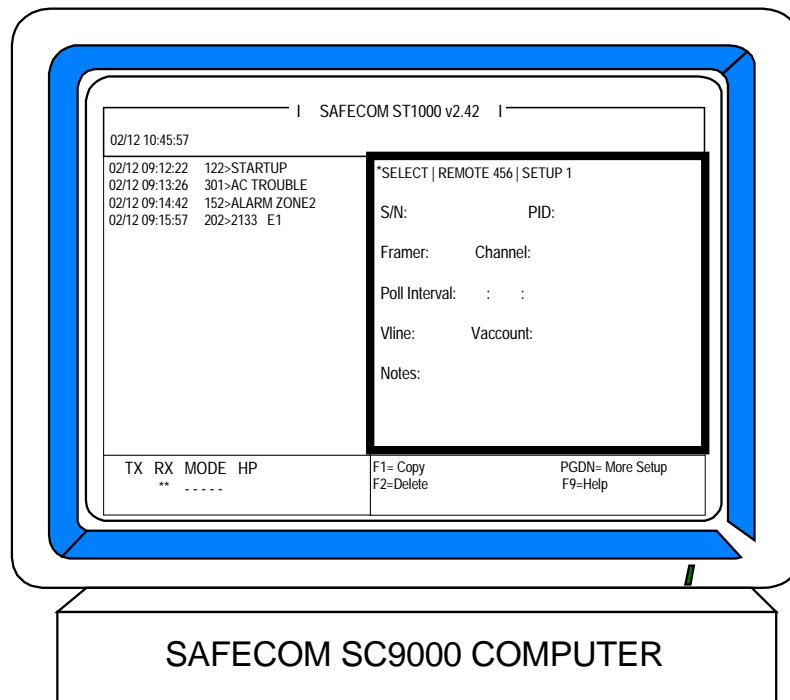

Figure 6: System Parameters

- **S/N:** This number must match the CPU Serial Number listed on the label of the SAFECOM SC3100.
- **PID:** This number must match the PID number on the label of the SAFECOM SC3100.
- **Framer:** This should correspond to the framer that is to be assigned to this unit.
- **Poll Interval:** This is the time in hours : minutes : seconds that the unit in the field is to be polled by the Central Station.
- **Vline:** The number placed here will report to the Automation System as coming in from "line XX"
- **Vaccount:** The number placed here will report to the Automation System as signal coming from "account XXXX".
- **Notes:** This area is used to note the account information such as: Address, Customer, Account #, Install date, etc.

SC3100

System Initialization

The following illustrates the second setup menu in the SC9000 computer for programming an SC3100 account. Below is a summary of the parameters necessary to complete the programming of an SC3100 account into the SAFECOM computer. This is the second setup menu. These parameters must be entered, then the operator will escape out and save the data to complete the building of the account. The parameters required to be programmed are shown in the illustration and described below:
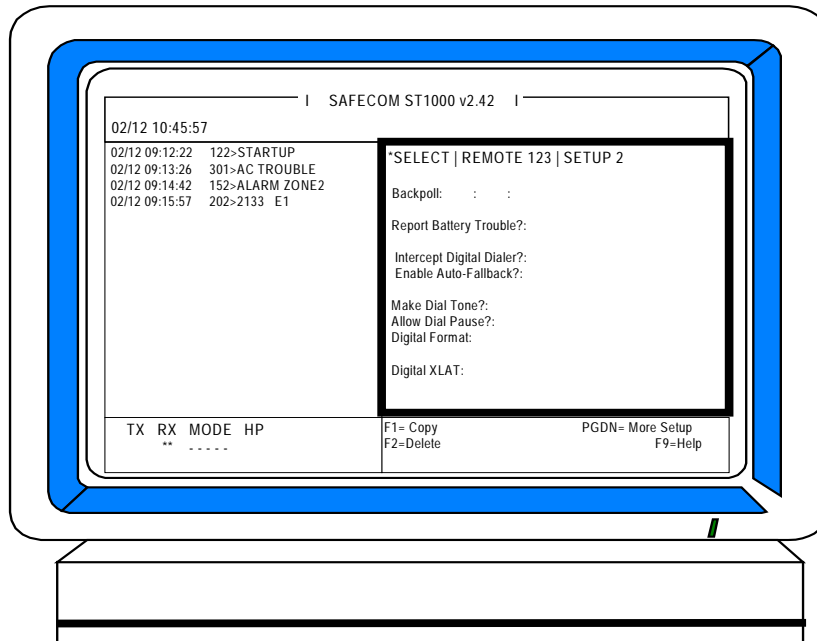

Figure 7: Programming Parameters

- **Backpoll:** Backpoll specifies the maximum amount of time a SC3100 will tolerate no radio communications with the SC9000 computer.

Note: *Recent changes to the SAFECOM System software have rendered the Backpoll feature obsolete.*

- **Report Battery Trouble ?:** If this parameter is set to "Y" for Yes, then the SC3100 will report a low battery condition to the Central Station if this condition occurs. If "N" for No, the SC3100 will ignore a low battery condition.

- **Intercept Digital Dialer?:** Y or N: Specifies the routing of the host alarm panel signals to the Central Monitoring Station. If "Yes" the alarm panel Dialer messages will be Intercepted by the SC3100 and sent to the Central Monitoring Station via the SAFECOM radio network. If "No" the alarm panel Dialer messages will ALWAYS be routed to the Central Monitoring Station via the telephone line.

- **Enable Auto Fallback?:** Y or N: Specifies whether the SC3100 will automatically revert to the phone line backup in the event of a SAFECOM system failure. If "Yes" the Fallback Mode (telephone backup) will be initiated by the SC3100 if the alarm panel Dialer attempts to send an alarm message via the SAFECOM radio communications system three consecutive times, and for some reason is **not** successful. If "No" the Fallback Mode will **not** be initiated. This type of configuration is usually reserved for applications having no phone lines.

- **Make Dial Tone?**: Y or N: Make Dial Tone specifies whether the SC3100 will send a simulated dial tone to the host alarm panel once the alarm panel prepares to send an alarm signal. If "Yes" the SC3100 will send the Dialer two 440 Hz tones after Line Seizure. Each tone is 1 second in duration. The 2nd tone is sent 2 seconds after the 1st. If "No" the SC3100 will not simulate a dial tone to the alarm panel. Characteristics of the alarm panel Dialer that the SC3100 will be communicating with dictate the selection for this entry.

- **Allow Dial Pause?:** Y or N: Allow Dial Pause sets the amount of time that the SAFECOM SC3100 will tolerate no activity after a digit has been dialed before deciding that the Receiver ACK tone should be transmitted. This sets a timing parameter ,and therefore, must sometimes be experimented with for different alarm panels in order to find the best choice.

- **Digital Format:** Programming of the SC3100 "format" must match the format that the digital dialer is sending. The tables below list the available formats and correct parameters. Please note that the PID (Product Identification Code) in the SC3100 determines how the SC3100 will be programmed.

Note: *For older SC3100s, the programming version required the operator to set two parameters, "Dialer ACK" and "Dialer Format" as shown below.*

"Dialer ACK":

0= Short burst 2300 Hz, short burst 1400 Hz, long burst 2300 Hz, long burst 1400Hz.

1= Short burst 2300 Hz, short burst 2300 Hz.

2= Short burst 1400 Hz, short burst 1400 Hz.

3= Long burst 2300 Hz, long burst 2300 Hz.

4= Long burst 1400 Hz, long burst 1400 Hz.

5= DTMF (ADEMCO Contact ID / 4+2 Express / High Speed).

"Dialer Format":

0= Unknown Dialer Format or any DTMF based format.

4= 3+1 Pulse, double round.

5= 3+1 Pulse with parity.

6= Long burst 2300 Hz, long burst 2300 Hz.

4= Long burst 1400 Hz, long burst 1400 Hz.

5= DTMF (ADEMCO Contact ID / 4+2 Express / High Speed).

"Digital Format":

Note: *For newer SC3100s, please note that the programming for the newest versions required the operator to set only one parameter called "Digital Format" as shown below.*

00= Either 2300 Hz or 1400 Hz ACK Tone, Any digital pulse type format.

01= Either 2300 Hz or 1400 Hz ACK Tone, Radionics BFSK.

02= Either 2300 Hz or 1400 Hz ACK Tone, 0-2 pulse type format.

03= Either 2300 Hz or 1400 Hz ACK Tone, 0-2 pulse type format with parity.

04= Either 2300 Hz or 1400 Hz ACK Tone, 3+1 pulse type format

05= Either 2300 Hz or 1400 Hz ACK Tone, 3+1 pulse type format with parity.

06= Either 2300 Hz or 1400 Hz ACK Tone, 4+2 pulse type format

07= Either 2300 Hz or 1400 Hz ACK Tone, 4+2 pulse type format with parity.

08= Either 2300 Hz or 1400 Hz ACK Tone, FBI Superfast (DTMF)

10= 2300 Hz ACK Tone, Any digital pulse type format.

11= 2300 Hz ACK Tone, Radionics BFSK.

12= 2300 Hz ACK Tone, 0-2 pulse type format.

13= 2300 Hz ACK Tone, 0-2 pulse type format with parity.

14= 2300 Hz ACK Tone, 3+1 pulse type format

15= 2300 Hz ACK Tone, 3+1 pulse type format with parity.

16= 2300 Hz ACK Tone, 4+2 pulse type format

17= 2300 Hz ACK Tone, 4+2 pulse type format with parity.

18= 2300 Hz ACK Tone, FBI Superfast (DTMF)

20= 1400 Hz ACK Tone, Any digital pulse type format.

21= 1400 Hz ACK Tone, Radionics BFSK.

22= 1400 Hz ACK Tone, 0-2 pulse type format.

23= 1400 Hz ACK Tone, 0-2 pulse type format with parity.

24= 1400 Hz ACK Tone, 3+1 pulse type format

25= 1400 Hz ACK Tone, 3+1 pulse type format with parity.

26= 1400 Hz ACK Tone, 4+2 pulse type format

27= 1400 Hz ACK Tone, 4+2 pulse type format with parity.

28= 1400 Hz ACK Tone, FBI Superfast (DTMF)

SC3100

System Initialization

30= Long 2300 Hz ACK Tone, Any digital pulse type format.

31= Long 2300 Hz ACK Tone, Radionics BFSK.

32= Long 2300 Hz ACK Tone, 0-2 pulse type format.

33= Long 2300 Hz ACK Tone, 0-2 pulse type format with parity.

34= Long 2300 Hz ACK Tone, 3+1 pulse type format

35= Long 2300 Hz ACK Tone, 3+1 pulse type format with parity.

36= Long 2300 Hz ACK Tone, 4+2 pulse type format

37= Long 2300 Hz ACK Tone, 4+2 pulse type format with parity.

38= Long 2300 Hz ACK Tone, FBI Superfast (DTMF)

40= 1400 Hz long ACK Tone, Any digital pulse type format.

41= 1400 Hz long ACK Tone, Radionics BFSK.

42= 1400 Hz long ACK Tone, 0-2 pulse type format.

43= 1400 Hz long ACK Tone, 0-2 pulse type format with parity.

44= 1400 Hz long ACK Tone, 3+1 pulse type format

45= 1400 Hz long ACK Tone, 3+1 pulse type format with parity.

46= 1400 Hz long ACK Tone, 4+2 pulse type format

47= 1400 Hz long ACK Tone, 4+2 pulse type format with parity.

48= 1400 Hz long ACK Tone, FBI Superfast (DTMF)

80= Any ADEMCO DTMF format (4+2 Express, ADEMCO High Speed, Contact ID)

81= SIA (RELAXED ONLY)

82= Radionics Modem II (D4112, D6112, D7112, D8112 and equivalent)

83= Radionics Modem 11E (D7212, D9112, and equivalent)

84= Special Contact ID format for Security Dimensions & Australian made alarm panels (NESS, EDM, Solutions, Concepts).

- **Digital XLAT:** 0 to 8: The Digital Translation Table (XLAT) parameter tells the SAFECOM SC9000 computer where to look up alarm signals. The translation table (XLAT) gives the operator the ability to assign a table, and then build the table so that usually cryptic alarm signals like "31" will be looked up, in the translation table (XLAT) assigned, and given a brief English text definition like, "BURG Z1". This can be very useful in the unlikely event of an automation failure. The translation table (XLAT) can allow the Central Station Operators to process alarms from the SAFECOM SC9000 directly without looking up codes to understand them. The translation text assigned to the Alarm Event Code is ONLY for display in the SAFECOM SC9000 computer and is NOT part of the Alarm message sent to the Automation software. Each Digital Translation (XLAT) table in the SAFECOM computer has 240 possible entries for alarm event code to text translation/definition. A maximum of 8 characters are available for each alarm event code translation/definition. If "0" is selected for the translation table (XLAT) then all alarm signals from this specific account will be displayed exactly as they are transmitted by the host alarm panel without any translation/ definition.

Note: *The Digital Translation (XLAT) parameter does not have to be set for the SC3100 to operate properly.*

5.2 Establishing Communications with the Central Station SAFECOM SC9000 Computer

To establish radio communications between an SC3100 in the field and the Central Station:

1. Ensure the correct S/N, PID #, Framer #, and RF Channel are entered in the SC3100's account in the SAFECOM computer.

Note: *The SC9000 computer is located at the Central Station.*

2. Connect the positive (+ red) and negative (- black) wires from the SC3100's Power Molex connector to the host alarm panel auxiliary power source. Power On.

3. The Radio Status LED on the SC3100 should illuminate red (TX) and green (RX) to indicate that the SC3100 Radio Communicator is transmitting and receiving. If the Radio LED **does not** illuminate red to indicate that the system is transmitting after system Power On, a hardware component failure is possible. When the SC3100 system detects a hardware failure, the System Status LED on the SC3100 will illuminate

red. The number of blinks indicates a specific type of hardware failure. The blinking cycle will continue until the auxiliary power source is removed from the SC3100.

The following describes the red blinking behavior of the System Status LED during a hardware failure, and **should not** be confused with System Status green LED illumination during normal SC3100 operations:

- **1 blink red, pause, then repeat:** Bad ROM check sum.
- **2 blinks red, pause, then repeat:** Failed RAM verify test.
- **3 blinks red, pause, then repeat:** Invalid CPU serial number.
- **5 blinks red, pause, then repeat:** The SC3100 internal battery is low and must be charged.

5.3 Manual Initialization of an SC3100 Radio Communicator

The SC3100 Radio Communicator may be manually reset/initialized. The reset/initialize function is performed by a sequence involving momentarily shorting pins #1 and #2 on the JP-1 CPU RST Header. The JP-1 Header is located on the main SC3100 circuit board and requires disassembly of the SC3100 Radio Communicator.

Note: *A manual initialization should only be performed if all efforts to initialize the SC3100 via a radio command from the SAFECOM SC9000 Computer have failed. Manual initialization must be performed at the customer site and requires removing the SC3100 panel cover and battery plate.*

CAUTION

The following procedure will erase all the programmed data in the CPU with the exception of the CPU serial number.

To manually initialize the SC3100 Radio Communicator:

1. Remove the auxiliary power source from the SC3100. Power Off.
2. Loosen the 4 retaining screws on the SC3100 panel cover and remove the cover.
3. Loosen and remove the screws and battery mounting shelf, exposing the main SC3100 circuit board.
4. Short the 2 pins on the JP-1 Header together. Keep the short in place.
5. Apply the auxiliary power DC power source to the SC3100. Power On. This step will Initialize the CPU. The System Status LED will blink red three (3) times, pause, then repeat. This indicates that all of the Parameter EEPROM Memory, in the CPU, has been erased.
6. Remove the short between the 2 pins on the JP-1 Header.
7. Remove the auxiliary power from the SC3100. Power Off.
8. Replace the SC3100 battery mounting shelf, panel cover and tighten four retaining screws.

Apply auxiliary power to the SC3100. Power On. This step will initiate a system startup. The SC3100 will behave exactly like a brand new unit.

Notes:

6.0   Programming Worksheet SC3100 Radio Communicator Account Setup

Radio Communicator # (3 digit number assigned by the Central Station Operator):

CPU Serial # (9 digit S/N from the SC3100 label):

Product ID (4 digit PID from the SC3100 label):

Framer (assigned by the Central Station Operator):

Channel (assigned by the Central Station Operator):

Poll Interval (assigned by the Central Station Operator):

Vline (assigned by the Central Station Operator):

Vaccount (assigned by the Central Station Operator):

Notes (account information, name, address, install date):

Backpoll (no longer used)   00:00:00

Report Battery Trouble? (assigned by the Central Station Operator):

Intercept Digital Dialer? (see this manual):

Enable Auto Fallback? (see this manual):

Make Dial Tone? (see this manual):

Allow Dial Pause? (see this manual):

Digital Format (see this manual):

Digital XLAT (see this manual):

Programming Worksheet

Notes:

7.0   Limited Warranty

Warranty Coverage and Duration

Bosch Security Systems warrants to the original purchaser its Bosch Security Systems manufactured "SAFECOM" products ("Product") against **defects** in material and workmanship under normal use and service for a period of one year from the date of purchase.

During the applicable warranty period, at no charge, Bosch Security Systems will, at its option, either repair, replace or refund the purchase price of this Product, provided it is returned in accordance with the terms of this warranty to the place of purchase. Repair, at the option of Bosch Security Systems, may include the replacement of parts, boards or other components with functionally equivalent reconditioned or new parts, boards or other components. Replaced parts, boards or other components are warranted for the balance of the original applicable warranty period. All replaced items shall become the property of Bosch Security Systems.

BOSCH SECURITY SYSTEMS MAKES NO GUARANTY OR WARRANTY THAT THE PRODUCT WILL PREVENT OCCURRENCES, OR THE CONSEQUENCES THEREOF, WHICH THE PRODUCT IS DESIGNED TO DETECT OR COMMUNICATE.

This express limited warranty is extended by Bosch Security Systems to the original end-user purchaser only, and is not assignable or transferable to any other party. This is the complete warranty for SAFECOM products manufactured by Bosch Security Systems, and Bosch Security Systems assumes no obligation or liability for additions or modifications to this warranty. In **no case does** Bosch Security Systems warrant the installation, maintenance or service of the Product.

Bosch Security Systems is not responsible in any way for any ancillary equipment not furnished by Bosch Security Systems which is attached to or used in connection with SAFECOM products, or for operation of the Product with any ancillary equipment, and all such equipment is expressly excluded from this warranty. Because of wide variations in topographical and atmospheric conditions, which may require availability of repeater stations or of particular radio frequencies, Bosch Security Systems assumes no liability for range, coverage or suitability of the Product for any particular application. Buyer acknowledges that Bosch Security Systems does not know a particular purpose for which buyer wants the Product, and that buyer is not relying on Bosch Security Systems' skill and judgment to select or furnish suitable goods.

This warranty applies only within the fifty (50) United States and the District of Columbia.

What this Warranty does NOT Cover

a)   Defects or damage resulting from use of the Product in other than its normal and customary manner.

b)   Defects or damage from misuse, accident or neglect.

c)   Defects or damage from improper testing, operation, maintenance, installation, alteration, modification or adjustment.

d)   Disassembly or repair of the Product in such a manner as to adversely affect performance or prevent adequate inspection and testing to verify any warranty claim.

e)   Any Product which has had its serial number removed or made illegible.

How to Receive Warranty Service

To obtain warranty service, deliver or send the Product, transportation and insurance prepaid, to the place of purchase along with your proof of purchase and Product serial number. Alternatively, call (800) 538-5807 or (408) 757-8877.

General Provision

This warranty sets forth the full extent of Bosch Security Systems' responsibilities regarding the Product. Repair, replacement or refund of the purchase price, at Bosch Security Systems' option, is the exclusive remedy.

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