
INTRODUCTION

The SG-SLR is a single line multi-format digital receiver. The SG-SLR includes many features, all designed to make the receiver more powerful and easier to use. The SG-SLR can decode a variety of popular and widely used communication formats; refer to Appendix D SG-SLR Communication Formats for a list of the available communication protocols.

The SG-SLR's real-time clock and calendar stamps all information received with the time and date, and all information is displayed on the receiver's LCD screens and may be printed or forwarded to a computer. To ensure security, adjustment of the clock, calendar and other programming is protected by password codes.

The SG-SLR features a 256-event non-volatile memory buffer. The buffer may be examined on the LCD screen or printed. If the printer or computer is off-line, the SG-SLR will retain events in the buffer and will automatically send the events to the computer or printer when communications are restored.

The SG-SLR is equipped with a 256-event non-volatile memory to record events and corresponding telephone numbers. Caller Identification (Call Display) capability is built-in and telephone numbers can be displayed, printed out, and stored in memory. Events and information stored in memory may be printed at any time.

Power and Supervision

The SG-SLR requires 16V_{AC} from a 115V or 230V_{AC} 50/60Hz transformer. The receiver is equipped with 12V rechargeable stand-by battery connections and automatic battery charger. Low current consumption allows more than 12 hours of operation from a 6Ah battery.

The stand-by battery voltage and connections are supervised. Any trouble conditions are reported on the LCD screens and may be sent to the printer and the computer.

The printer is supervised for loss of power, off-line, paper out and other trouble conditions. The communication link to the computer through the RS-232 port can be monitored by the supervisory heartbeat test transmissions.

Compatibility

Most central station automation software packages, such as, ABM, ALARMSOFT, APROPOS, MICRO KEY, SIMS, SIS and CSM support the Sur-Gard interface. The receiver also provides a basic communication protocol similar to the RADIONICS 6500 interface for other software packages that have yet to be updated to include the Sur-Gard interface.

System Overview

- Caller Identification (Call Display) ability
- Non-Volatile RAM for programming and event buffer
- Communication Formats:
 - 3-1, 3-1 extended, 4-1, 4-2 formats with or without Checksum, 10, 14, 20, or 40 baud
 - 4-1, 4-2, 4-3, and 4-3 DTMF formats with Checksum
 - Optional* Formats: 3-2, with Baud Rates from 10 to 40
 - ACRON DTMF format
 - Contact ID (DTMF) format
 - Super Fast or High Speed DTMF format
 - DTMF 4-1 Express format (optional)
 - DTMF 4-2 Express format
 - FBI Super Fast format
 - Radionics Modem II format
 - Scantronics DTMF format
 - SIA level 1 and 2: 110 and 300 baud, tonal and data acknowledge, with and without separators
- Large, easy to read 2-line 16-characters-per-line Liquid Crystal Display (LCD) screens
- Plain language message display capability
- Input on SG-SLR for ring simulation
- 256-event memory buffer
- Real-time clock
- SG-SLR features multiprocessor with 16-bit microcontroller
- 1 parallel printer port; 1 serial RS-232 port
- Programmable serial port configuration: Wait for Acknowledge Time, Baud Rate, Data Bits, Parity
- Programmable system functions: Computer and printer, computer only, computer with printer as stand-by, and printer only
- Fast transmission of multiple alarms to the computer and printer to ensure operator's quick response
- Continuous verification of the computer-receiver link with the heartbeat function
- 3 switched-negative programmable outputs (for future use)
- Outputs on SG-SLR for Acknowledge, Buzzer, Line fault, Ring on line, Tape recorder
- AC-loss detection and stand-by battery supervision
- Low battery detection and automatic low battery disconnect to prevent deep-discharge damage to battery
- Operator acknowledge option
- Telephone line supervision

* Optional formats can be selected through the keypad.

SG-SLR SINGLE LINE RECEIVER

General Information

The SG-SLR 16-bit microcontroller running at 16MHz allow the system to quickly and efficiently execute several tasks at the same time. The use of a unique menu display system enhances the system's ease of use for the operator and makes system configuration and programming simple and efficient. Several diagnostics modes are available to assist the operator in troubleshooting and maintenance.

Features

- Multi-tasking allows the receiver to perform functions that might otherwise be delayed by a slow computer acknowledgement response
- 256-event printer alarm message buffer
- 256-event computer alarm message buffer
- LCD contrast easily adjusted
- Cold Boot option allows easy installation of default configuration
- Serial port COM1 features LED indicators for Transmit (Tx) and Receive (Rx) functions
- Available COM1 baud rates: 64, 110, 150, 300, 600, 1200, 2400, 4800, 9600, 19200
- COM1 Data bits: 7, 8 or 9
- COM1 Parity: Even, odd or none
- COM 1 Stop Bits: fixed at 1
- Built-in Serial Communication Diagnostic Mode for COM1. The technician can test the communication with the central station computer and monitor what is being transmitted to and from the receiver and computer
- Three programmable outputs
- Buzzer mute option for system testing
- System menu for easy programming and diagnostics

NEW FEATURES FOR SG-SLR SOFTWARE VERSION 1.20

New Format

Version 1.20 can now receive the SIA FSK level 2. To allow the receiver to send the information on the RS-232 serial communication port, the new Option 35 has to be enabled.

Improvements

The space character has been added to the event codes selection in Options 25 to 27.

Two-way audio support.

New Printer Library

The Contact ID format will print the plain English words along with the alarm code received.

QUICK START

Receiver Setup and Operation Without Programming

Unpacking

Carefully unpack the receiver and inspect for shipping damage. If there is any apparent damage, notify the carrier immediately.

Bench Testing

It is suggested that the receiver be tested before actual installation; becoming familiar with the connections and setup of the unit on the work bench will make final installation more straightforward.

The following items are required:

- 16V transformer
- 12V 4 to 24 Ah rechargeable battery (gell-type)
- 1 telephone line
- One or more dialers or digital dialer control panels

Direct connection testing without the use of telephone lines is possible by using the ring simulator switch input connections on the back of the receiver. Dialers and control panels using an optocoupler phone line interface will require a connection method providing a DC current for direct connection testing, **refer to the illustration below.**

Power Up

When power is applied, the receiver will beep and will indicate one or more trouble conditions on the LCD message screen. If the SG-SLR has no telephone line connected, the receiver will beep and the "ALARM" light will FLASH.

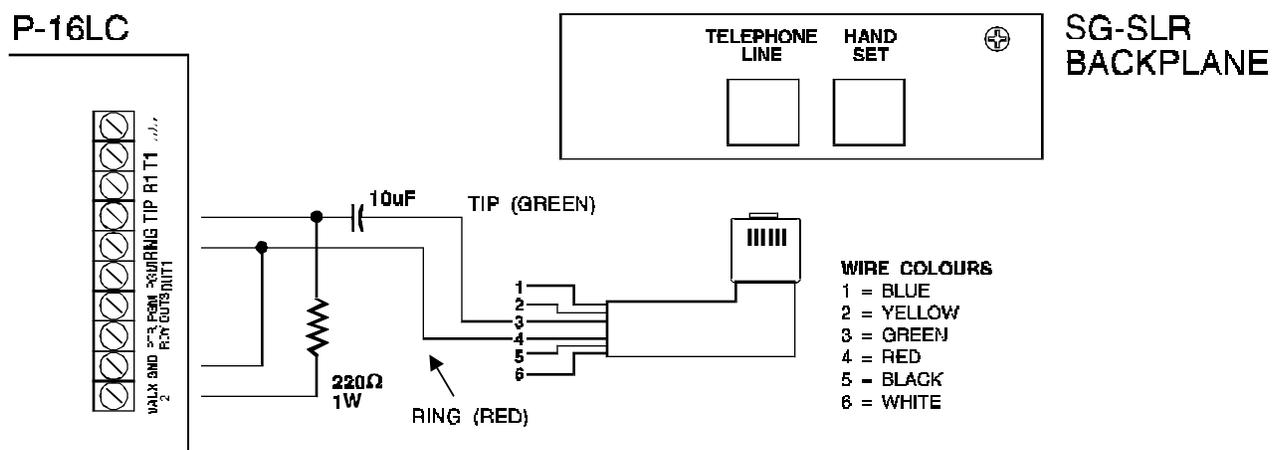
Press the flashing [SELECT] button to silence the buzzer. If there is no computer or printer connected, a trouble message will be displayed on the SG-SLR LCD and the "ACK" light will FLASH. Press the [SELECT] button to silence the SG-SLR buzzer.

Operation with Default Program

Without any changes to the factory default programming, the receiver operates as follows:

- The master ID password is "C-A-F-E".
- Answers incoming calls on the first ring
- Sends dual tone as the **first** handshake 1
Sends 2300 Hz as the **second** handshake 2
Sends 1400 Hz as the **third** handshake 3
Sends SIA FSK tone as the **fourth** handshake 4
Sends 2000 Hz as the **fifth** handshake 5
Sends 1600 Hz as the **sixth** handshake 6
Sends Modem II as the **seventh** handshake 7
- Signals received will be displayed on the LCD as they are received. The signals are then sent to the parallel printer and computer connected to serial port COM1. The default event codes described in the "SG-SLR Library Decoding and Event Codes Table" will be used with the Sur-Gard RS-232 Communication Protocol to send signals to the computer, if connected.
- If a computer is not connected, press the [SELECT] button on the SG-SLR module to silence the buzzer. The time and date of the Acknowledgment will be printed.

Direct Connect Testing Wiring Diagram Shown with P-16LC Control Panel



INSTALLATION

Mounting the Receiver

The LCD screen on the receiver are designed to be viewed below eye level. If the unit must be mounted where the screens are above eye level, angle the unit downwards to improve visibility. The following items are recommended for a complete installation:

Printer Connections

Connect and apply power to the printer before applying power to the receiver.

Most Centronics compatible printers can be used with the SG-SLR. Tandy Model DMP-206 (Sur-Gard part number CPUDMP206) and Panasonic Model KX-P1150 (Sur-Gard part number CPUP1150) can be used with the SG-SLR.

The Star DP8340 printer (Sur-Gard part number DCDP8340) with the SG-1220P power supply is ULC listed for use with the SG-SLR. Both items are available from Sur-Gard distributors.

IMPORTANT: Do not use a printer cable which has only 1 common ground wire.

The SG-1220P (Sur-Gard part number XP1220) is a 12V 2A power supply housed in a metal case with a tamper switch. It requires one 12VDC sealed rechargeable battery (6 to 25 Ah rating) and one 16VAC 40VA Class 2 wire-in transformer (Frost FTC3716 in Canada, Basler BE116240 in USA or equivalent).

Connect the parallel printer to the SG-SLR printer output port using a parallel printer cable.

Computer Connections

Connect the computer to the SG-SLR RS-232 port (COM1) using a serial cable to COM1.

IMPORTANT: Do not use a null modem cable (Rx and Tx reverse cable).

Telephone Line Connections

With 6-pin modular cable (MCBL6), connect the receiver output to its corresponding telephone line.

Grounding

For maximum resistance to static and electrical noise, the cabinet frame should be connected to earth ground through the AC utility box.

Power Supply

Ensure that all electrical connections are made correctly. After verifying all connections, connect the RED and BLACK leads to a 12VDC sealed rechargeable battery (4 to 24 Ah rating). Be sure to observe polarity when connecting the battery. When the battery is connected, test the system under battery power only.

If a separate DC input is used to power the LCD backlighting during AC power failures, connect it to the BLGT terminal. Connect the positive lead from the DC supply to the BLGT terminal; connect the negative lead from the DC supply to the GND terminal.

CAUTION: Connecting a positive (+) terminal to a negative (-) terminal may cause a fire and possibly serious personal harm.

Battery Charging Current

The maximum battery charging current is factory set at 600mA. Set the jumpers as shown below to obtain other charging currents:

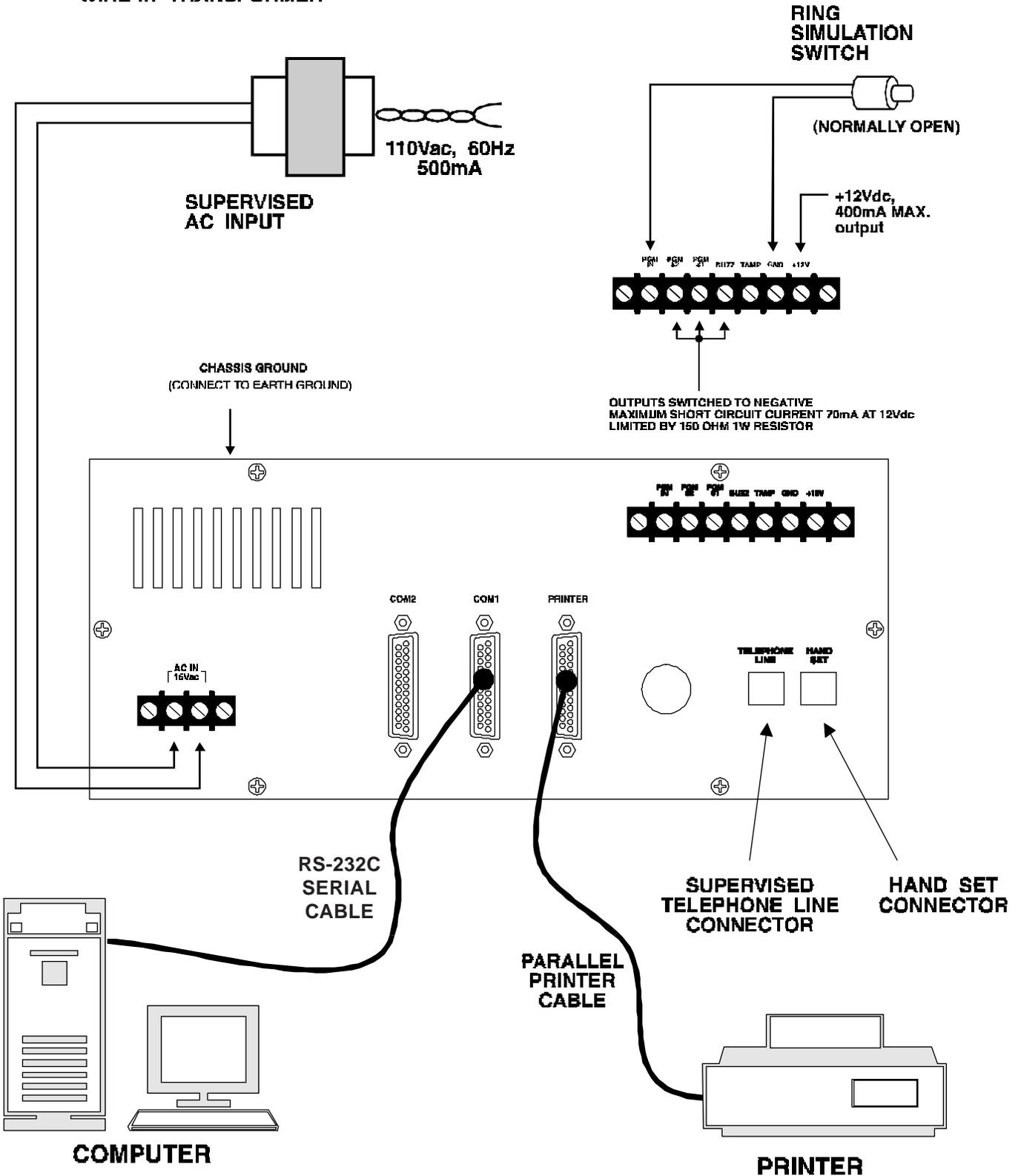
<i>Jumper Position</i>	<i>Charge Current</i>
A (first and second pins shorted)	600mA (factory setting)
B (second and third pins shorted)	800mA
No pins shorted	1A

Installation Checklist

- | <i>Complete</i> | <i>Operation</i> |
|--------------------------|--|
| <input type="checkbox"/> | SG-1220B Printer Power Supply installed (with transformer and battery) if DP8340 printer is used |
| <input type="checkbox"/> | 6-pin modular cable connected to SG-SLR and telephone line |
| <input type="checkbox"/> | Parallel Printer Cable connected to SG-SLR Parallel Printer Port |
| <input type="checkbox"/> | Parallel Printer power connected |
| <input type="checkbox"/> | Computer connected to SG-SLR COM1 port using serial cable |

SG-SLR Backplane Connection Diagram

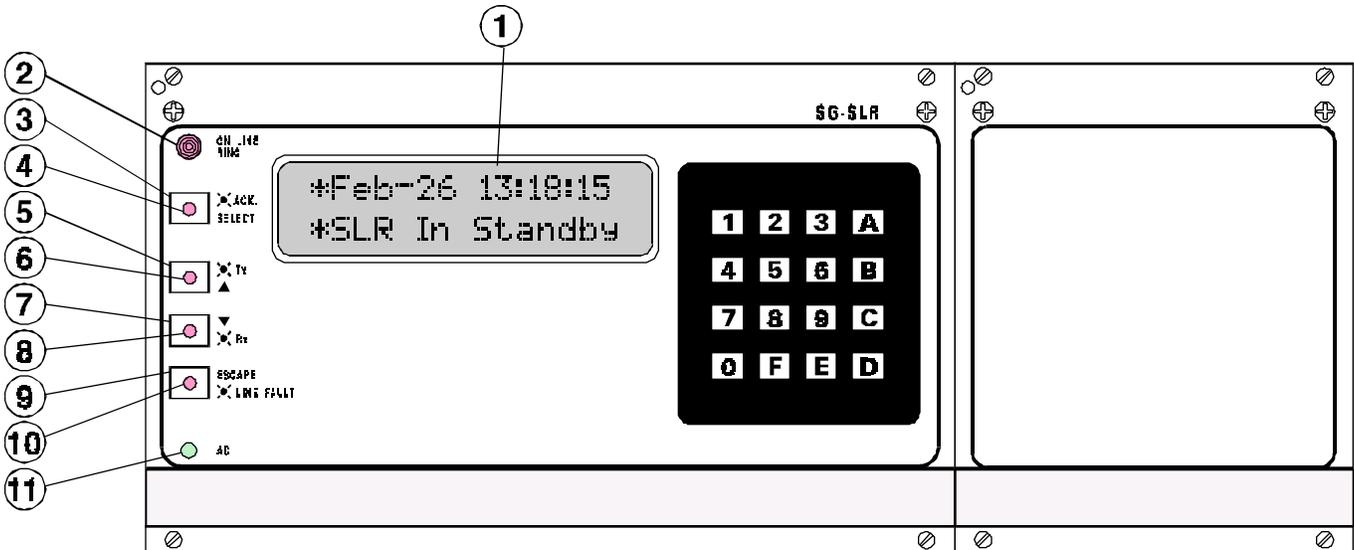
110Vac/16Vac, 60Hz, 37.5 VA
WIRE-IN TRANSFORMER



Installation

It is recommended that a **Cold Start-up** be performed when the unit is updated with a new program version. Refer to SG-SLR Operating Mode Cold Start-up (Cold Boot) on page 9, for information.

After the cold start-up, check the configuration information listed in the Quick Reference Guide to make any required changes for your particular application.



SG-SLR Controls

Momentarily depressing and releasing a button will register as a single input or keystroke. Pressing and holding a button for approximately 1 second will register as a repeating input or keystroke. For example, to quickly scroll through a list of items, you press and hold the appropriate button, rather than pressing the button repetitively.

- ① **Liquid Crystal Display:** Displays incoming data, programming and other information. The display is backlit for visibility in low light environments.
- ② **RING ON LINE:** The "ON LINE RING" monitors the line status, the light flashes when a ring is incoming, turns **ON** when SG-SLR is on line, turns OFF when the SG-SLR is waiting to receive an alarm.
- ③ **[SELECT] button:** Press this button to acknowledge an alarm in emergency manual mode. In the programming mode, press this button to select the menu item that is displayed.
- ④ **ACK:** The "ACK" light is located inside the [ACK/SELECT] button. The "Ack" light will flash if an alarm is received. The "ACK" light will turn OFF when the alarm is successfully communicated to the computer, or when the operator acknowledges the alarm by pressing the [ACK/SELECT] button.
- ⑤ **The [▲] button:** The [▲] button is used to scroll the display to the next message.
- ⑥ **Tx:** The "Tx" light monitors the COM1 transmission signal (on RS-232 cable).
- ⑦ **The [▼] button:** The [▼] button is used to scroll the display to the previous message.
- ⑧ **Rx:** The "Rx" light monitors the signal received from the computer connected to COM1 (on RS-232 cable).
- ⑨ **[ESCAPE] button:** When in normal mode, press the access program mode. The "ESCAPE" button is used to save changes and exit a mode. It's also used for other functions when indicated on the display screen.
- ⑩ **LINE FAULT:** The "Line Fault" light will come **ON** if the telephone line is disconnected or if the periodic dial tone test fails. The "Line Fault" light will turn **OFF** automatically when the telephone line or dial tone is restored. In stand-by mode, this light flashes at 2 second intervals to indicate that system operating system is running.
- ⑪ **AC:** The "AC" light monitors the AC power supply.

SG-SLR OPERATING MODE

SG-SLR Cold Start-up (Cold Boot)

When the SG-SLR software is upgraded, a **cold boot** will have to be performed to install the default system software. Follow the procedure described here to perform a **cold boot**.

- Remove the SG-SLR from the card cage
- Turn the “PROGRAM EN” (Program Enable) switch **ON**. The Program Enable switch is located on the left side of the SG-SLR unit; use a small screwdriver to turn the switch **ON**.
- Replace the SG-SLR in the cabinet but do not fasten the mounting screws. The SG-SLR should power up and this message will be displayed:

```
SYST COLD BOOT?  
Up=Yes   Down=No
```

- Press the [▲] button to perform the **cold boot**. This message will be displayed:

```
SYST COLD BOOT  
Executing!
```

After approximately 1 second, this message will be displayed:

```
Please Turn Off  
Program Switch!
```

The SG-SLR will remain in an inoperable mode until the Program Enable switch is turned **OFF**.

- Pull the SG-SLR part way out of the card cage
- Use a small screwdriver to turn the Program Enable switch **OFF**
- Re-install the SG-SLR in the card cage and secure the faceplate screws

The SG-SLR is now ready for operation. Set the clock and calendar and configure the SG-SLR (Refer to SG-SLR Configuration Mode).

SG-SLR in Stand-By Mode

When the SG-SLR is in Stand-By mode, a message similar to this will be displayed:

```
*FEB-03 07:30:45  
SLR In Standby
```

This indicates that the system is ready to receive data from the dialer and input from the numeric keypad and push buttons.

SG-SLR Configuration Mode

The Configuration Mode allows programming of the various features and options available on the SG-SLR. To enter the Configuration Mode, press the [Escape] button; this message will be displayed:

```
Enter MASTER ID  
■■■■
```

Enter the Master Access Code using the keypad; the default Master Access Code is “**CAFE**” to change the default Master Access Code refer to “*Option 02: Changing System Passwords*”. When the access code is entered, the screen will display the first option in the Options Menu:

```
01:Sys Date/Time  
Ent:+Bs:-Ack:S
```

Press the [▲] button to display the next menu item, or press the [▼] button to display the previous menu item; press the [SELECT] button to select the menu item presently displayed on the screen.

Configuration Options

The SG-SLR features 35 configuration options:

- 01 System Date and Time
- 02 System Passwords
- 03 System Handshakes
- 04 Caller Identification
- 05 Printer Select
- 06 COM1 Configuration
- 07 COM1 Format
- 08 Acknowledge Wait Delay
- 09 Heartbeat Select
- 10 Contrast Adjust
- 11 Line Check
- 12 Erase Memory
- 13 Mute Buzzer
- 14 Keep Last Message
- 15 Debug COM1
- 16 Program Version
- 17 Monitor Battery
- 18 Year / Second
- 19 Force Reset
- 20 Change Receiver Number
- 21 3-2 Format
- 22 4-1 Express Format
- 23 On Line Duration
- 24 Boost Signal
- 25 3-1, 4-1 Event Codes
- 26 4-2 Event Codes
- 27 4-3 Event codes
- 28 Handshakes/Kissoff Duration
- 29 Plain library
- 30 2-Way Audio (Handset) Activation Time
- 31 4-Digit Account Codes to Activate 2-Way Audio
- 32 3-Digit Account Codes to Activate 2-Way Audio
- 33 Alarm Codes to Activate 2-Way Audio
- 34 Audio Event Code
- 35 SIA Option

Option 01: Setting the Clock

Option [01] allows the SG-SLR date and time to be set. Press the [SELECT] button when the “01: Sys Date/Time” message is displayed; this message will be displayed:

(D/M/Y)	23/01/94
(H/M/S)	07:30:45

Enter the date and time using the numbers 0 through 9 only. Press the [▲] button to move the cursor one character to the right; press the [▼] button to move the cursor one space to the left.

When the date and time are entered, press the [ESCAPE] button; when the [ESCAPE] button is pressed, the next Configuration Option will be displayed on the screen.

Note that if “0” or a number greater than “12” is programmed for the month, the screen will display the word “Nul” in place of the month while in the Stand-By mode. “Nul” will also be displayed for the time if the time has not be programmed properly.

Option 02: Changing System Passwords

Option [02] allows the SG-SLR passwords to be changed or erased. Press the [SELECT] button when the “02: Sys Passwords” message is displayed; this message will be displayed:

```
PassID #0:xxxx
Operator: S.G.
```

Sixteen 4-digit passwords are available for use on the SG-SLR. Password 0 is the Master Password, and Passwords 1 through F may be assigned to individual operators. Two letters, representing the initials of the operator, may be assigned to each Password to help in identifying the operator.

When this option is entered, a cursor will appear beneath the first character in the 4-digit Password. Enter a new Password using the 0 through 9 and the A through F keys.

To enter the operator’s initials, use the [0] and [1] keys to scroll forwards and backwards through the alphabet. When the desired letter is displayed, press the [▲] button; the cursor will move to the next character. To move the cursor to the previous character, press the [▼] button.

When the Password and initials have been entered, press the [ESCAPE] button; the next Password will be displayed. When all Passwords have been programmed, the display will advance to the next Configuration Option.

The default setting for each Password is “CAFE”; the default setting for all initials is “S.G.”.

Option 03: System Handshakes

The SG-SLR has the capability to send several handshakes to dialer. Often it is important to select which handshake is sent first. There are 8 handshakes which can be selected **on the option [03]**.

Handshake	Options
0	No handshake
1	Dual tone handshake
2	2300Hz handshake
3	1400Hz handshake
4	SIA FSK Modem handshake
5	2000Hz handshake
6	1600Hz handshake
7	Modem II handshake

To access the option 03, press the [SELECT] button when the “03: Sys Handshakes” message is displayed. The screen will show:

```
1 2 3 4 5 6 7 8:
1 2 3 4 5 6 7 0
```

The first line of display shows the 8 handshakes priority in order. The highest priority is handshake #1 and the lowest is #8. The second line indicates the handshake selection. The cursor starts flashing at the first position on the second line to receive changes. Enter a number from 1 to 7 to select the handshake frequencies as showed in above table. Use [▲] or [▼] key to advance or back the cursor one position.

For above example, the unit will send the handshakes in order: Dual Tone, 2300Hz, 1400Hz, 2000Hz 1600Hz and then SIA in corresponding with 1, 2, 3, 4, 5 and 6 programmed. If all handshakes are set to “0”, the 2300Hz handshake will be selected as default. Once programming is completed, press [ESCAPE] to save the new changes and the next option will be displayed on the LCD display.

Option 04: Caller Identification

This option allows the unit to receive Caller Identification data that is transmitted after the first ring on the telephone line. The "Call Display" service must be available and requested from a telephone company for this feature to be operational. Press the [SELECT] button when the "04:Caller Select:" message is displayed, the following message will be displayed:

```
Caller-ID Select
0 Change to:X
```

Program option 04 with one of the following:

Select	To Obtain
0	No Caller ID reception (by default).
1	Combine alarm codes & Caller ID before sending to the printer (for 10-40 baud and DTMF format)
2	Send Caller ID to the computer only for each call.
3	Send Caller ID to both printer and computer for each call.
4	Send Caller ID with the date/time received from the telephone company to the printer only for each call.

EXAMPLE: When option 04 is selected as to 1:

Printer: AD42 1234-56 5551212 15:30-30/03/95

The telephone number 5551212 was added with the alarm codes before sending to the printer. The following messages are also used to send **Caller-ID** to the printer:

"PrivateCall" anonymous indication is received instead of the originating telephone number.

"No Call Nb" An out-of-area or unavailable indication is received instead of the originating telephone number.

"UnKnownCal" The originating telephone number has not been received or was not transmitted.

EXAMPLE: When the option 04 is selected as to 2, it will send the telephone number to the computer in the following protocol:

Computer: 4RR1AAAAAALLLTTTTTTT[DC4]

4 : caller-id format code.

RR : receiver number (00-FF).

1 : line number (1).

AAAAAA : account code. If the account code is less than 6 digit, leading spaces will be added. If no account code is received, 6 spaces will be added.

LLL : area code. If no area code is received, "000" will be sent. If a single digit is received for the area code, "001" will be sent.

TTTTTT : telephone number.

[DC4] : terminator code.

EXAMPLE: When option 04 is selected as to 4:

Printer: TEL:1114*1619 5145551212 16:19-14/03/95

The call was received in November 14, at 16H19m and its phone number is 5145551212.

Option 05: Select Printer Function

Option [05] determines how the printer connected to the SG-SLR will operate. Press the [SELECT] button when the "05: PrinterSelect" message is displayed; this message will be displayed:

```
Prter Config As:
Bkup:0 Enable:1
```

Enter a digit from 0 through 1 for both "Bkup" and "Enable" according to the chart below:

Bkup	Enable	Printer Operation
0	0	Bypass printer
0	1	Enable Star 8340 printer (default setting)
1	0	Enable Star 8340 printer only if COM1 is in failure

If "Bkup" is programmed as "1", messages will only be sent to the printer if an acknowledge signal is not received from COM1.

When using the Star 8340 printer, the SG-SLR is able to print in both red and black characters. If an IBM-compatible printer is used, the SG-SLR will print in black characters only.

When programming is complete, press the [ESCAPE] button; when the [ESCAPE] button is pressed, the next Configuration Option will be displayed on the screen.

Option 06: COM1 Configuration

Option [06] determines the baud rate, data bits and parity to be used on COM1. Press the [SELECT] button when the "06: Com#1 Config." message is displayed; this message will be displayed:

```
Com#1 Config as:
Bd:12 Da:7 Pa:2
```

Bd: Baud Rate	Enter...	for baud rate
	64	64
	11	110
	15	150
	03	300
	06	600
	12	1200
	24	2400
	48	4800
	96	9600
	19	19200

Da: Data Bits Enter a number from 7 through 9 to indicate 7, 8, or 9 data bits.

Pa: Parity	Enter	for parity
	0	no parity
	1	odd parity
	2	even parity

NOTE: The stop bit is fixed at 1.

When programming is complete, press the [ESCAPE] button; when the [ESCAPE] button is pressed, the next Configuration Option will be displayed on the screen.

Option 07: COM1 Communication Format

Option [07] determines the communication format to be used on COM1. Press the [SELECT] button when the "07: Com#1 Format" message is displayed; this message will be displayed:

```
Com#1 Format is:
1 Change to x
```

Enter a number from 0 to 4 to select one of the following:

- 0 COM1 disabled
- 1 Sur-Gard format (default setting)
- 2 Sur-Gard format with common event code (The event code sent to computer will always be "A")
- 3 The signal sent to the computer will always be followed by a header [SOH]
- 4 Clock Signal format (refer to Clock Signal Protocol)

When programming is complete, press the [▲], [▼] or [Escape] button; when a button is pressed, the next Configuration Option will be displayed on the screen.

Option 08: Wait Time for Acknowledge on COM1

Option [08] determines the acknowledge wait time, in seconds, to be used for COM1. Press the [SELECT] button when the "08: ACK Wait Delay" message is displayed; this message will be displayed:

```
<ACK>Wait Delay
4.00 Chg to:x.xS
```

Enter a decimal number from 0.0 to 9.9. Use the [▲] and [▼] buttons to move the cursor forwards and backwards when editing the acknowledge time.

When programming is complete, press the [ESCAPE] button; when the [ESCAPE] button is pressed, the next Configuration Option will be displayed on the screen.

Option 09: Heartbeat Time for COM1

Option [09] determines at what time interval, in seconds, the **heartbeat** transmission will be sent to COM1. The **heartbeat** transmission is used to ensure that communications through COM1 are functioning normally. Press the [SELECT] button when the "09: Heartbeat Sel" message is displayed; this message will be displayed:

```
Heartbeat Select
30S Chg to:xxSec
```

Enter a decimal number from 01 through 99 to determine the time interval between heartbeat transmissions. Program this option as "00" to disable the heartbeat transmission.

Use the [▲] and [▼] buttons to move the cursor forwards and backwards when editing the heartbeat time.

When programming is complete, press the [ESCAPE] button; when the [ESCAPE] button is pressed, the next Configuration Option will be displayed on the screen.

Option 10: Adjust LCD Contrast

Option [10] allows the contrast of the message display screen to be adjusted. Press the [SELECT] button when the "10: Contrast Adj" message is displayed; this message will be displayed:

```
Contrast Level
■■■■
```

Press the [▲] button to increase the contrast; press the [▼] button to reduce the contrast.

When the display contrast is adjusted to a desired level, press the [ESCAPE] button; when the [ESCAPE] button is pressed, the next Configuration Option will be displayed on the screen.

Option 11: Line Check

When the option [11] is enabled, the receiver will perform a telephone line fault test at intervals set in this option. Press [SELECT] button when the "11:LineCheck Sel" message is displayed, the following message will be displayed:

```
LineCheck Select
10s Chg to:XXsec
```

A delay from 08 to 99 sec can be programmed. If the line is faulty, a warning message will be displayed on the screen. The "LINE FAULT" light turns **ON** and line fault message will be sent to the printer and computer. Program 00 to disable the message on the screen.

When this option is disabled and a line fault occurred, nothing will be sent to the printer or computer but the line fault light will be turned ON.

Option 12: Erase Alarm Message Buffer

Note: Under normal operating conditions, the buffer should not be erased.

Option [12] is used to erase the SG-SLR alarm message buffer. Press the [SELECT] button when the "12: Erase Memory" message is displayed; this message will be displayed:

```
Erase all MEMORY
Up=Y Dwn=N Esc=X
```

Press the [▼] or [Escape] buttons to cancel this option without erasing the SG-SLR buffer. To erase the buffer, press the [▲] button. When the [▲] button is pressed, this message will be displayed:

```
Are You Sure?
Up=Y Dwn=N Esc=X
```

Again, press the [▼] or [Escape] buttons to cancel this option without erasing the SG-SLR buffer. To erase the buffer, press the [▲] button. When the [▲] button is pressed, all printer and computer messages will be erased. Ensure that a printed record of the alarm messages is made before erasing the buffer.

Option 13: Mute Buzzer

A tone will sound when the SG-SLR receives an alarm and is unable to forward the alarm message to COM1. The tone may be silenced by programming Option [13] as "1". Press the [SELECT] button when the "13: Mute Buzzer" message is displayed; this message will be displayed:

```
Mute Buzzer: 1/0
0 Change to:x
```

When programmed as "1", the buzzer will not sound when an alarm is received and cannot be forwarded to COM1. When programmed as "0", the buzzer will sound when an alarm is received and cannot be forwarded to COM1. The default setting is "0".

Option 14: Display Last Message

When an alarm is received, the alarm message will be displayed on the screen until the message is forwarded to the computer and printer. When the message is sent to the computer and printer, the Stand-By Mode message will be displayed.

The most recent alarm message may be retained on the screen until the next alarm message is received. To retain the most recent alarm message, program Option [14] as "1". Press the [SELECT] button when the "14: Keep Lst Msg" message is displayed; this message will be displayed:

```
Keep Lst Msg: 1/0
0 Change to:X
```

To have the Stand-By Mode message displayed after an alarm is received and sent to the computer or printer, program Option [14] as "0". The default setting is "0". When "0" or "1" has been entered, press the [▲] key.

Option 15: COM1 Diagnostic

The SG-SLR features a diagnostic mode that allows the operator to view all data being communicated through COM1 on the display screen. To enable this feature, press the [SELECT] button when the "15: Debug Com#1" message is displayed; this message will be displayed:

```
Debug Com#1:1/0
0 Change to:X
```

Enter "1" and press the [▲] button to enable the diagnostics feature. All data being sent through COM1 will now be displayed on the screen when the system is in stand-by mode. A typical transmission is shown here:

```
TRR1.....AAAA.X
..YY          N 06
```

- T : Protocol type
- RR : Receiver number
- 1 : Line number
- ... : represent the space character
- AAAA : Account number
- X : Event code
- YY : Alarm code
- N : represents the number of times the SG-SLR tries to re-send the message to COM1; this value should be "1" during normal communication
- 06 : represents the acknowledge received from COM1

To disable the diagnostics feature, program Option 15 as "0". It should only be enabled to test and review the information being sent to COM1; It should be disabled during normal receiver operation.

Option 16: Display Software Version

To display the software version presently installed in the SG-SLR, press the [SELECT] button when the "16: Program Vers#" message is displayed; a message similar to this will be displayed:

```
*SG-SLR RECEIVER
AUG-19-96 V1.20
```

Option 17: Battery Monitor

To check back-up battery voltage, press the [SELECT] button when the "17: Monitor Batt." message is displayed. A message similar to this will be displayed:

```
Battery Monitor:
12V:13.7
```

If the 12V battery is disconnected, approximately 11.2V will be indicated for the battery voltage.

Option 18: Alarm Messages Print Year or Seconds

Alarm messages may be programmed to include either the year in their dates, or the seconds in their times. To program Option 18, press the [SELECT] button when the "18: Year/Second" message is displayed; this message will be displayed:

```
Year/Second: 1/0
0 Change to:X
```

Program Option 18 as "1" to include the year in the alarm message date; alarm messages will be printed as follows:

```
L01-1234-05 AlarmZn#05 21:24-24/11/94
```

NOTE: The time (21:24) is represented with just hours and minutes, and that the year is added to the date (24/11/94).

Program Option 18 as "0" to include the seconds in the alarm message time; alarm messages will be printed as follows:

```
L01-1234-05 AlarmZn#05 21:24:30-24/11
```

NOTE: The time (21:24:30) now includes hours, minutes and seconds; the date (24/11) only indicates the day and the month but not the year

NOTE: This option will affect COM1 if COM1 is programmed with communication format 4.

Option 19: System Reset

To reset the SG-SLR press the [SELECT] button when the “19: Force Reset” message is displayed; this message will be displayed:

```
Force Sys Reset?  
Up=Yes Dwn=No
```

Press the [▼] button to cancel the option without resetting the SG-SLR. To reset the SG-SLR, press the [▲] button. The reset will take approximately 8 seconds to complete. Note that the system’s real-time clock and calendar will be reset by using this option. When the system returns to the Stand-By mode, a message similar to this will be displayed:

```
*Nul-00 00:00:00  
SLR In Standby
```

Press the [▲] or [▼] buttons to move to the next Configuration Option.

Option 20: Change Receiver Number

The receiver number is used to identify the receiver when communicating to COM1. To change the receiver number, press the [SELECT] button when the “20: Chg Receiver#” message is displayed, this message will appear on the screen:

```
Receiver Number:  
01 Chg to:XX
```

Enter a new receiver number using the hexadecimal numbers “01” to “FF”. When a new number is entered, press the [▲] button.

Option 21: 3-2 Format

The 3-2 communication format is a 10 to 20 baud format with 5-digit reporting codes. The first 3 digits represent the account code, and the last 2 digits represent the alarm code. Since 4-1 format is also 5-digit format, it is necessary to choose one or the other. Press [SELECT] when the “21: 3-2 Format” is displayed, the following message will be displayed:

```
3-2 Format :1/0  
0 Change to:X
```

Program “1” to enable this option otherwise, program “0” to get 4-1 format. Press [▲], [▼], or [ESCAPE] to save the new change and the next option will be displayed.

Option 22: 4-1 Express Format

The Ademco 4-1 express format may cause conflicts with the Sur-Gard DTMF 4-3 with checksum format. To prevent conflicts, enable option 22 by programming “1”. Enabling this option will bypass the Surgard 4-3 with checksum format decoding. Press [SELECT] when the “22: 4-1 Express” is displayed, the following message will be displayed:

```
4-1 Express :1/0  
0 Change to:X
```

Program “1” to enable this option otherwise, program “0” to disable it. Press [▲], [▼], or [ESCAPE] to save the new change and the next option will be displayed.

Option 23: Off Hook Time

On line duration delay is built-in to control run-away of dialers. Press [SELECT] when the “23: On Line Time” is displayed, the following message will be displayed:

```
Off Hook Time  
10m Chg to:XXmin
```

A duration delay from 01 to 99 minutes can be programmed. The receiver starts timing when it picks up the line and when the delay expires, the receiver will hang up the call even if the dialer continues sending the data.

If the duration delay is programmed as 00, this features will be disable.

Option 24: Boost Signal

If the receiver is installed in an area out where the telephone line signal strength is poor, this option may help to amplify the weak incoming signal. Press [SELECT] when the "24: Boost Signals" is displayed, the following message will be showed:

```
Boost Signal:1/0
0 Change to:X
```

Program "1" to enable this option or "0" to disable it. Normally, this option is disabled. Press [s], [t], or [ESCAPE] to save the new change and the next option will be displayed.

Option 25: 3-1 / 4-1 Format Event Code

The receiver uses the Surgard communication format to transmit data to the central station computer. Event codes corresponding to alarm codes in 10 to 40 baud formats and DTMF 4-1 to 4-3 formats are used in this unique format to enable the computer software to determine alarm types. Press [SELECT] when the "25: 4-1 EventCode" is displayed, the following message will be displayed:

```
0123456789ABCDEF
AAAAAAAAAAROCART
```

The first line of the display shows the alarm code from 0 to F and the second line shows the corresponding event code. The cursor starts flashing at the beginning of the second line to receive changes. Use the [0] and [1] keys to scroll forwards and backwards through the alpha-numeric characters. When the desired letter or number is displayed, press the [s] button, the cursor will move to the next character. To move the cursor to the previous character, press [t] button. The ASCII value from "0" to "9" and "A" to "Z" will be scanned when pressing [0] or [1] key. Refer to "Library Decoding and Event Codes Table" for the complete set of messages and event codes used by the receiver. When it's done, press [ESCAPE] button to save and the screen will display the next option.

NOTE: The alarm digit codes, 0 or A have the same event code. Since, the changing of the event code for alarm digit "A" has no effect.

EXAMPLE: ALARM RECEIVED

1234 1(ALARM CODE IS 1)

Printer: AD41 1234-1 FIRE ALARM 10:52:30 03/03

Computer: 1011sssss1234sAss1[DC4]

The event code A has been transmitted because it corresponds to the code programmed with the alarm code 1.

Option 26: 4-2 Format Event Code

The receiver will use the fifth digit of data received in 4-2 formats to determine the message and event code. The event code will then be transmitted to the central station computer. Press [SELECT] when the "26: 4-2 EventCode" is displayed, the following message will be displayed:

```
0123456789ABCDEF
AAAAAAAAAAROCART
```

The first line of the display shows the alarm code from 0 to F and the second line shows the corresponding event code. The cursor starts flashing at the beginning of the second line to receive changes. Using the [0] and [1] keys to scroll forwards and backwards through the alpha-numeric characters. When the desired letter or number is displayed, press the [▲] button, the cursor will move to the next character. To move the cursor to the previous character, press [▼] button. The ASCII value from "0" to "9" and "A" to "Z" will be scanned when pressing [0] or [1] key. Refer to "Library Decoding and Event Codes Table" for the complete set of messages and event codes used by the receiver. When it's done, Press [ESCAPE] button to save and the screen will display the next option.

NOTE: The alarm digit code 0 or A have the same event code. Since, the changing event code for alarm digit A has no effect.

Option 27: 4-3 Format Event Code

The receiver will use the fifth digit of data received in 4-3 formats to determine the message and event code. The event code will then be transmitted to the central station computer. Press [SELECT] when the "27: 4-3 EventCode" is displayed, the following message will be displayed:

```
0123456789ABCDEF
TAAACOTAARTCOBHA
```

The first line of display shows the alarm code from 0 to F and the second line shows the event code corresponding. The cursor starts flashing at the beginning of the second line to expect the new changes. Using the [0] and [1] keys to scroll forwards and backwards through the alpha-numeric. When the desired letter or number is displayed, press the [s] button, the cursor will move to the next character. To move the cursor to the previous character, press [t] button. The ASCII value from "0" to "9" and "A" to "Z" will be scanned when pressing [0] or [1] key. Refer to "Library Decoding and Event Codes Table" for the complete set of messages and event codes used by the receiver. When it's done, Press [ESCAPE] button to save and the screen will display the next option.

NOTE: The alarm digit code 0 or A have the same event code. Since, the changing event code for alarm digit A has no effect.

Option 28: Handshake and Kisosff Duration

Some control panels have difficulty in decoding the receiver's handshake and/or kisosff tones on noisy phone lines. This option provides a possible solution for this problem by providing longer constant tones. Press [SELECT] when the "28:H.S./K.O. Time" is displayed, the following message will be displayed:

```
HS/KO - Duration
1.0s Chg to:X.Xs
```

A duration delay from 0.6 sec to 3.0 seconds can be programmed. The factory default setting for Handshake and Kisosff duration is 1.0 second tone. If a value greater than 3.0 is programmed, it takes the maximum value 3.0 sec. by default. Same thing applies if a smaller value than 0.6 is entered, it takes the minimum value 0.6 sec. by default.

NOTE: Handshake and Kisosff Duration does not affect SIA and ModemII Handshakes/Kisosff.

Option 29: Plain library

When the option [29] is enabled, the receiver will send the message to the printer with **FULL LIBRARY**. Press [SELECT] button when the "29:Plain Library" message is displayed, the following message will be displayed:

```
Library sel :1/0
0 change to:
```

EXAMPLE: When option 29: is enabled, alarm messages will be printed as follows:

```
L01-1234-05 AlarmZn#5 21:24-28/02/94
```

EXAMPLE: When option 29: is disabled, alarm messages will be printed as follows:

```
L01-1234-05          21:24-28/02/94
```

Option 30: 2-Way Audio (Handset) Activation Time

Option [30] determines how long the 2-Way Audio mode will be active once it is initiated. At the end of this time, the SLR will hang up the line.

Program a value from "01" to "99". This value is in units of 30 seconds. Three (3) minutes is the recommended length of time for the 2-Way Audio Activation time. (Option programmed as "06")

To disable the 2-Way Audio feature, program Option [49] as "00".

Option 31: 4-Digit Account Codes to Activate 2-Way Audio

Option [31] determines which Account Codes will be able to activate the 2-Way Audio feature. Program the first digits of the desired Account Codes in Option [31]. For example, to allow all account codes between 1000 and 2FFF to activate the 2-Way Audio function, program Option [31] as "12". To allow all account codes between 3000 and 6FFF to activate the 2-Way Audio function, program Option [31] as "36".

Option [31] may be used with any formats supported by the SLR. To disable it, program Option [31] as "00".

Option 32: 3-Digit Account Codes to Activate 2-Way Audio

Option [32] determines which 3 digits Account Codes will be able to activate the 2-Way Audio feature. Program the first digits of the desired Account Codes in Option [32]. For example, to allow all 3 digits account codes between 200 and 3FF to activate the 2-Way Audio function, program Option [32] as "23". To allow all 3 digits account codes between 300 and 6FF to activate the 2-Way Audio function, program Option [32] as "36".

Option [32] may be used with any 3 digits account code formats supported by the SLR. To disable this 2-Way Audio function, program Option [32] as "00".

Option 33: Alarm Codes to Activate 2-Way Audio

Option [33] determines the range of Alarm Codes which will activate the 2-Way Audio function. Program the first digits of the desired Alarm Codes in Option [33]. For example, if all alarm codes beginning with 6, 7 and 8 are to activate 2-Way Audio, program Option [33] as "68".

Option [33] may be used with 10 to 40 baud formats, DTMF 4/1, 4/2, 4/3 and Contact ID formats. Program Option [33] as "00" to disable this function.

First, to enable the audio feature, the option "[30] AUDIO MIN." must be programmed. The SLR will initiate audio by the account range, option [31] and [32] or by option [33] ALARM CODE or by both.

Example: 4/2 format with account code 1234, alarm code 2 on zone 3. (1234-23)

Option [31] (or [32])	Option [33]	Switch to Audio	Reason
00	1-2	Yes	Alarm code 2 falls within the code range 1-2
1-1	00	Yes	Account code 1234 falls within the range 1-1
2-3	00	No	Account code 1234 is outside the range 2-3
00	3-4	No	Alarm code 2 is outside the range 3-4
1-2	3-4	No	If both are programmed, both must be good and alarm code 2 is outside the range 3-4
3-5	1-3	No	Both must be good and account code 1234 is outside the range 3-5
1-4	1-5	Yes	Alarm code 2 falls within the code range 1-5, account code 1234 falls within the range 1-4

Option 34: Audio Event Code

Option [34] is used to send a message to the computer and the printer to indicate that the SLR has enabled the 2-Way Audio function. Program an ASCII code to be used as the event code for activation of the 2-Way Audio feature.

For example, if an Account activates the 2-Way Audio mode and Option [34] is programmed as "50" (ASCII "P"), the following messages will be sent:

Sent to computer: 0000 P 01

Sent to printer: "2-Way Audio Active"

Ensure that the event code in Option [34] is compatible with the automation software being used. Program Option [34] as "00" to disable this option.

Option 35: SIA Option

Option 35 is used to enable signals received in SIA Level 2 to be sent to the automation software correctly. The SIA Protocol 1 can not handle certain information that could be received in SIA Level 2 or 3. We now provide the optional SIA Protocol 2 as the following (option 35=1):

```

SRR1[#AAAAAAIEMMZ/ZZZ/MMZZZ/MMZZZ][DC4]
S      : Beginning transmission of the new SIA protocol
RR     : Receiver number 00-FE
1      : Line number, fixed as 1.
[      : Beginning data delimiter
#      : Account ID block code
AAAAAA : Account ID, maximum sixteen digits.
I      : Field separator
E      : Function block code
MM     : Event code or modifier
ZZZZ   : Zone code, or user code, or time/date information
/      : Data code packet separator
]      : Ending data delimiter
[DC4]  : Terminator, 14 Hex

```

The length of the signal is varying, and it can support a maximum of 63 bytes data block transmission from the control panel. When this optional protocol is selected, all SIA information will be sent to the host computer using this protocol.

Compatible Alarm-related function code blocks on SLR V1.20.

<i>Block Type</i>	<i>Block Code</i>	<i>Block Type</i>
System	0	End of data
Inf.	E	Environmental
Inf.	N	New Event
Inf.	O	Old Event
Special	@	Configuration
Special	#	Account ID
Special	A	ASCII
Special	X	Extended
Special	L	Listen-in
Special	&	Origin

SG-SLR V1.20 SIA Digital Compatible Levels				
SUPPORTED FEATURE	SIA1	SIA2	SIA3	SG-SLR
Tonal acknowledgment	✓	✓	✓	✓
N block with zone numbers only	✓	✓	✓	✓
Single account block per call	✓	✓	✓	✓
O block	✓	✓	✓	✓
X block	✓	✓	✓	✓
300 baud	✓	✓	✓	✓
Configuration block		✓	✓	✓
Data acknowledgment		✓	✓	✓
Modifier		✓	✓	✓
Multiple account block per call		✓	✓	✓
Extended block		✓	✓	✓
Data code with unit numbers		✓	✓	✓
Receiver call out and access passcode block			✓	
Reverse channel C blocks			✓	
Reverse channel P blocks *			✓	N/A
Reverse channel ASCII blocks			✓	
Dynamic block and group sizes			✓	✓
Listen-in			✓	✓
Video			✓	
ASCII blocks to receiver			✓	✓
V-channel communications *			✓	N/A
Origin block			✓	✓

*Support of feature is optional for receiver.

SG-SLR SYSTEM STATUS

SG-SLR Stand-By Mode

The following messages are sent to the printer and computer when the receiver is powered up:

Printer: SG-SLR AUG-19-96 V1.20

Computer: 0000 A D0

After these start-up transmissions, the unit enters the Stand-by Mode and monitors the system's status. Depending on the system's status, the messages according to the following priority will be indicated on the display:

1. COM1 Diagnostic Active
2. Data reception
3. Retain last alarm message
4. Line fault
5. Printer error
6. COM1 Absent
7. 12V Battery low
8. AC Failure
9. Standby Mode message

1. COM1 Diagnostics

If both options [07] and [15] are enabled, the screen will display the data being communicated through COM1. A typical transmission is shown here:

```
1RRL.....AAAA.X  
..YY      N 06
```

- | | |
|------|---|
| 1 | : protocol number |
| R | : Receiver number |
| L | : line number |
| N | : represents the number of times the unit tries to re-send the message to COM1, this value should be "1" during normal communication. |
| 06 | : represents the acknowledge received from computer from COM1. |
| | : represents the space character. |
| AAAA | : Account code. |
| X | : event code |
| YY | : Alarm code |

2. Data Reception

During data reception, a message similar to this will be displayed:

```
In communication  
1234 56
```

If valid Caller-Identification information is received and Caller ID option is enabled, a message similar to this will be displayed.

```
TEL:5145551212  
1234 56
```

The SG-SLR decodes all information received and stores the information in its event buffer. When a valid signal is received, it sends a kiss-off signal and transmits the decoded alarm signal to the printer and computer.

Option [24] may be enabled to allow the unit to compensate for weak signals or a noisy telephone on programming this option.

The unit will send each received message to the printer for review by the system operator. Two messages may be sent to the printer to indicate reception problems: the "Fault Data" and "Fault Call".

Fault Data Message

When this problem is encountered, the following information is transmitted to the printer and the computer:

Printer: TRBL ????-10 Fault Data

Computer: 0000 T 10

This output for account code "0000" indicates that data has been received, but is not valid (for example, there are unmatched rounds or the wrong parity). The following is an example of fault data received by the unit, and the printer output generated:

Round	Data Received	Printer Output
1st	123456	[No printout]
2nd	123446	?1234?56 Fault Data ?1234?46 Fault Data
3rd	123356	?1233?56 Fault Data
4th	123456	?1234?56 Fault Data
5th	123346	?1233?46 Fault Data ??????10 Fault Data

[No more data]

Fault Call

When this problem is encountered, the following information is transmitted to the printer and the computer:

Printer: TRBL ????-40 Fault Call

Computer: 0000 T 40

This output indicated that a call was received, but no data was detected. The call may have been a wrong number, or the calling control panel was unable to connect with the receiver handshake. If the Caller-Identification option is enabled, check the memory for the originating phone number.

If: Option [04] is programmed as 1 (Caller-Identification enabled and send Caller-Identification to printer)

Then: Under normal conditions, when there are no data or call faults, the printer messages will be similar to the following:

SG43 1234-346 5551212

If a Data Fault or Call Fault occurs, the printer messages will be similar to the following:

Fault Data: TRBL ????-10 5551212

Fault Call: TRBL ????-40 5551212

NOTE: "?" represents the missing data, 5551212 represents the originating telephone number.

If: Option [04] is programmed as 2 (Send Caller-Identification to printer when faulty data is received)

Then: Under normal conditions, where there are no data or call faults, the printer messages will be similar to the following:

SG42 1234-C6 CloseUsr6

If a Data Fault occurs, the printer message will be similar to the following:

Fault Data: TRBL ????-10 5551212

Caller ID

If a Fault Data or Fault Call occurs and Caller ID is enabled, the printer messages will be similar to the following:

Fault Data: ??????10 5551212

Fault Call: ??????40 5551212

NOTE: "?" represents the missing data; "551212" represents the originating telephone number.

2.1 Stopping Data Reception Manually

To cancel communications between the SG-SLR and the calling control panel, press the [C] button when the unit is in communication mode. Pressing the [C] button will transmit a kiss-off signal and hang up the receiver. This feature may be used to hang up on a control panel that is repeatedly sending alarms.

2-Way Audio Mode SG-SLR Receiver Connections

The SLR features two telephone jacks. The connections are labelled "Telephone Line" for the incoming telephone line and HANDSET. The handset connector allows a touch-tone telephone to be connected to the SLR for voice communication over the same telephone line after digital data has been received. This feature is especially useful for medical signalling installations and vocal alarm verifications.

IMPORTANT NOTE: If a regular touch-tone telephone is used for 2-Way audio communication, the phone must be left in the **off-hook** position. If the phone is not kept in the off-hook position, the SLR will switch to an open line, causing the line to be dropped (hung up).

Audio Communication Methods

Two methods are available for using the 2-Way Audio Mode:

Alarm type code Method (Event)

After the digital alarm data has been received and the last kiss-off has been transmitted, the receiver compares the alarm type codes received in 3/1, 4/1, 4/2, 4/3, 10-40 BD or DTMF touch-tone formats to the value programmed in Option [33]. This will determine if the 2-Way Audio Mode should be activated. This feature is designed for use with medical signalling systems in areas where privacy regulations apply.

This method of activation is recommended as it can distinguish between different types of alarms from the same panel, and activate the 2-Way Audio Mode only when required. Note that Options [30] and [33] must be programmed to use this method.

Reserved Account Code Range Method

The first digit of the Account Code determines if the 2-Way Audio Mode is to be activated.

This method is used by some alarm panels and medical signalling systems. The central station manager can group these panels into a range of account codes in order to switch on the 2-Way Audio Mode. The transmission of an Account Code from any of these panels will trigger the SLR's 2-Way Audio Mode. Note that Options [30], [31] and/or [32] must be programmed to use this method.

A combination of the two methods may also be used, please refer to pages 19-20.

EXAMPLE: Reserve a block of account codes, such as 800-9FF (for 3-digit formats) or 7000 - 8FFF (for 4-digit formats) for panels which can communicate in 2-Way Audio.

Audio Mode Operation

When in Audio Mode, the "On-Line" light will be ON and this message will be displayed:

```
<Two Way Audio>
<Press C Cancel>
```

The SLR buzzer can be used to indicate Audio Mode operation by programming Option [14] MUTE BUZZER as "0". To silence the buzzer, press the [ACK] button.

Select Option [34] to have a message indicating Audio Mode operation sent to the printer and the computer.

For example, use the character "P" (for "phone") to represent Audio Mode operation. Program Option [34] as "50" (the ASCII code for "P" is 50). When Audio Mode operation has begun, the following messages will be sent to the printer and computer:

Printer: "Two Way Audio Active"

Computer: "0000 P 01"

- "0000" is the internal signals Account Code
- "P" is the character programmed in Option [34]; "01" is the receiver number

The 2-Way Audio Mode operation may be manually cancelled by pressing the [C] button. If not manually cancelled, Audio Mode operation will automatically be cancelled when the time programmed in Option [30] expires.

To disable the 2-way audio mode feature, program Option [30] as "00".

An output is also available on the back of the SG-SLR case which may be used to indicate activation of Audio Mode operation.

For more details, please refer to the programmable options sections.

3. Retain last alarm message

If the option [14] is selected, the unit leaves the last alarm message on the display screen until a new message is received. A typical alarm message is shown below:

```
SG43 1234-567
Open-Usr67 FF
```

SG43 : Indicates a 4/3 Sur-Gard communication format is used
1234 : is the account code
5 : indicates an opening, while
67 : is the user number
FF : indicates that this is the last event received

4. Line Fault

If the option [11] is selected for line test delay, the SG-SLR verifies the telephone line voltage every number of seconds programmed on the option [11]. If the line fault occurs, the "Line Fault" light turns **ON** and the following message will be displayed:

```
*DEC-30 10:30:30  
<<-Line Fault->>
```

The following information will be transmitted to the printer and/or computer:

Printer: TRBL ????-20 Line Fault

Computer: 0000 A 20

If the Line Check option is disabled, the unit will not send the report to the printer and/or computer. Refer to option [11] to enable the Line Check option.

When the line condition returns to normal, the "Line Fault" light will be shut **OFF**. If the Line Check option is enabled and the telephone line returns to normal, the following information will be transmitted to the printer and computer:

Printer: TRBL ????-30 Line Restr

Computer: 0000 R 30

5. Printer Error

If option [05] is enabled and there is a printer trouble (for example printer off-line, or paper out) the following will be displayed:

```
*Dec-30 07:30:30  
<Printer ERROR!>
```

6. COM1 Absent

If option [07] is enabled and COM1 is absent (for example, disconnected, or fails to send acknowledge signal) the following message will be displayed:

```
*Dec-30 07:30:30  
<Com#1 ABSENT>
```

7. 12V Battery LOW!

If the 12V back-up battery is disconnected or voltage is low, the following message will be displayed:

```
*Dec-30 07:30:30  
12V Battery LOW!
```

8. AC Failure

If AC power is cut, the following message will be displayed:

```
*Dec-30 07:30:30  
<AC Power LOST>
```

9. Stand-by Mode Message

In normal Stand-by operation, the following message will be displayed:

```
*Dec-30 07:30:30  
SLR In Standby
```

SG-SLR COMMUNICATION FORMATS

Common Formats

The following formats are commonly used:

- 3-1, 4-1, 4-2 formats; 10, 14, 20 baud
- 3-1, 4-2 formats with or without checksum; 40 baud
- 3-2 format; 10, 14, 20 baud (option)
- 3-1 extended 10-40 baud

Sur-Gard DTMF Formats

Sur-Gard DTMF 4-3 and 4-3 with Checksum formats provide fast, reliable and easy to understand and decode data transmission. On-line time will be greatly reduced when using 4-3 and 4-3 with Checksum formats. The 4-1 and 4-2 DTMF formats can also be decoded by the SG-SLR.

When using the 4-3 with Checksum format, Option [22] should be programmed as "00" to avoid conflict with the 4-1 Express format. The 4-3 with Checksum format is recommended for use with Sur-Gard security control panels.

Computer Protocols:

Acron Format

The Acron format is a DTMF format. It can transmit 3 or 4 account digits and 8 digits of channel status at a time. Each channel can be programmed for an alarm code from "2" to "8". The restore code is only one code for 8 channels, by convention, code "9". The software has decoded the data in each position to determine which channel is in alarm or restore. Do not use the alarm code "1" for any zone, as this code is used for previously reported zones, and nothing will be printed or sent to computer when this code is received.

Shown below are several examples of Acron transmissions. The following applies to these examples:

- Handshake / Kissoff: 2300Hz
- Code "0" means channel in normal condition, NO REPORT.
- Code "1" means channel previously reported, NO REPORT.
- Code "2" to "8" used for ALARM.
- Code "9" used for RESTORE status.
- Code "A" used for ARMING/CLOSING status.
- Code "B" used for LOW BATTERY status.
- Code "C" used for ALARM status.
- Code "D" used for DISARMING/OPENING status.
- Code "E" used for TROUBLE status.
- Code "F" used for ALARM status.

<i>Transmitted</i>	<i>Event</i>	<i>Printer Message</i>	<i>Computer Message</i>
1234 AAAA AAAA	Master User 0 Closing	AC48-1234-00 CloseUsr#A0	1234 C A0
1234 DDDD DDDD	Master User 0 Opening	AC48-1234-00 Open-Usr#A0	1234 O A0
1234 000A 0000	User 4 Closing	AC48-1234-A4 CloseUsr#04	1234 C A4
1234 0000 0000	24-hour Test	AC48-1234-00 24HrsTest	1234 T 00
1234 BBBB BBBB	Low Battery	AC48-1234-B0 LwBattery	1234 T B0
1234 1111 1111	Force Arming	AC48-1234-C0 Forced Zn#00	1234 T C0
1234 0700 0000	Alarm Zone 2; with Alarm Code 7	AC48-1234-72 AlarmZn#02	1234 A 72

Where AC48 represent the Acron 4 account digit and 8 digit channel status format

Ademco Contact ID Format

This DTMF format requires a dual tone handshake and 1400 Hz kissoff, or 1400Hz handshake and 1400Hz kissoff.

NOTE: If the dialer responds to a 2300 Hz handshake by sending the Contact ID Format data, the SG-SLR will accept and decode the format. The SG-SLR will send a 1400Hz kissoff tone regardless of the handshake.

The SG-SLR will display a message similar to this one:

**CONT 1234-
Group Close-- 15**

- CONT represents Contact ID format
- 1234 is the Account Code
- Group Close is the reported event
- 15 is the event number in the SLR's printer buffer

Information is sent to the computer using the following protocol:

5RRLs18AAAAQXYZGGCCC[DC4]

5 : represents the Contact ID format
RR : represents the receiver number
L : represents the Line Card number
s : represents a space (blank character)
18 : will be displayed when this format is used
AAAA : represents the Account Code
Q : represents the Qualifier: E = new event or opening; R = new restore or closing; P = previously reported alarm
X : represents the class codes
YZ : represents the event codes
GG : represents the group number
CCC : represents the zone codes or User ID
[DC4] : is the terminator

Ademco Express Format

This format consists of 4-digit Account Codes and 1- or 2-digit alarm codes. The SG-SLR will decode the signal as regular 4-1 or 4-2 format. Option [22] must be programmed as "1" to decode the 4-1 Express format instead of the Sur-Gard 4-3 with Checksum format.

Ademco Super Fast or 4-8-1 High Speed with or without checksum Format

The High Speed format consists of 4 digit account numbers, 8 channel status digits, and 1 auxiliary channel.

DSFA means DTMF Super Fast Ademco

Channel Status Codes (Digits 5 through 12)

AAAAxxxxxxxxY -> AAAA = account code

Code x

- 1 New event (previously unreported)
Printer: DSFA 1234-11 AlarmZn#01
Computer: 1234 A 01
- 2 New opening (previously unreported)
Printer: DSFA 1234-21 Open-Usr01
Computer: 1234 O 01
- 3 New restore (previously unreported)
Printer: DSFA 1234-31 RestrZn01
Computer: 1234 R 01
- 4 New closing (previously unreported)
Printer: DSFA 1234-41 CloseUsr01
Computer: 1234 C 01
- 5 Normal (no event since previously reported restore)
- 6 Previous reported event still in effect.
- 0 New trouble
Printer: DSFA 1234-D1 TrbleZn#01
Computer: 1234 T 01

For the ninth channel (digit 13), the following channel status codes are used:

Code Y

- 1 Duress report in previous 8 channels (specifically channel 1)
Printer: DSFA 1234-00 Duress—
Computer: 1234 A 00
- 2 Opening report in the previous 8 channels (with user ID in channel 1)
Printer: DSFA 1234-21 Open-Usr01
Computer: 1234 O 01
- 3 Zone Bypass/Unbypass status report in the previous 8 channels
Printer: DSFA 1234-11 BypasZn#01
Computer: 1234 B 01
Printer: DSFA 1234-31 UnByZn#01
Computer: 1234 H 01

-
- 4 Closing report in the previous 8 channels (with user ID in channel 1 if expanded reporting of user # is selected at the communicator)
 - Printer:** DSFA 1234-41 CloseUsr01
 - Computer:** 1234 C 01
 - 5 Zone trouble active/ trouble restore status report in the previous 8 channels
 - Printer:** DSFA 1234-B1 TrbleZn#01
 - Computer:** 1234 T B1
 - Printer:** DSFA 1234-B2 TrbleRst01
 - Computer:** 1234 R B1
 - 6 System trouble active/restore reports in the previous 8 channels

Printer: DSFA 1234-C1 ACIstZn#01	or	DSFA 1234-C1 ACIstRst01
Computer: 1234 T C1	or	1234 R C1
Printer: DSFA 1234-C2 LowBtZn#02	or	DSFA 1234-C2 LowBtRst02
Computer: 1234 T C2	or	1234 R C2
Printer: DSFA 1234-C3 SysFIZn#03	or	DSFA 1234-C3 SysFIRst03
Computer: 1234 T C3	or	1234 R C3
Printer: DSFA 1234-C4 WDTimZn#04	or	DSFA 1234-C4 WDTimRst04
Computer: 1234 T C4	or	1234 R C4
Printer: DSFA 1234-C5 StMsgZn#05	or	1234-C5 StMsgRst05
Computer: 1234 T C5	or	1234 R C5
Printer: DSFA 1234-C6 TelcoZn#06	or	1234-C6 TelcoRst06
Computer: 1234 T C6	or	1234 R C6
Printer: DSFA 1234-C8 SensoZn#08	or	1234-C8 SensoRst08
Computer: 1234 T C8	or	1234 R C8

NOTE: Zone #07 is not used for code 6.
 - 7 Zone alarm status report, alarms are reported in previous 8 channels
 - 8 New low battery (will not re-report on subsequent calls and will not send restore).
 - Printer:** DSFA 1234-80 LowBt——
 - Computer:** 1234 T 80
 - 9 Test report, alarm status is reported in the previous 8 channels
 - Printer:** DSFA 1234-90 24HrsTest-
 - Computer:** 1234 T 90
 - 0 Radio diagnostics, radio testing info is reported in previous 8 channels.
 - Printer:** DSFA 1234-A0 Radio——
 - Computer:** 1234 T A0

FBI Super Fast Format

This DTMF format consists of 4-digit Account Codes, 2-digit zone codes, 1-digit zone type codes, and 1-digit event codes. The zone codes will be converted into 3-digit decimal codes by the SG-SLR.

The following are the zone type codes used by this format:

Event	Code
Fire	1
Panic	2
Burglary	3
Medical	4
Auxiliary	5
Bypass	6
Inactive	7
Alarm	8
Alarm	9
Alarm	0 (A)
Opening	B
Closing	C
Abort	D
Restore	E
Trouble	F

Modem II Format

The alarm signals sent by Radionics control panels models D4112, D6112, D7112, D8112 Honeywell D5700 using Modem II format can be decoded by the SG-SLR.

The printer messages will be similar to the following:

```
MD2-1234-Alarm Report   14:05:20 - 30/06
Area=1 Point=300       14:05:20 - 30/06
```

- MD2 represents Modem II format
- 1234 represents the account codes.

The signals will be sent to the computer in this protocol

```
6RRLssssssAAAAXXYYYY[DC4]
```

Following the example described above, the signal will be sent to the computer as:

```
6011ssssss1234sAs300[DC4]
```

Scantronic Format

This DTMF format uses 4- or 6-digit account codes, 8 or 16 zones, and a 1-digit supervisory zone. The format requires a dual tone handshake to send alarms, and a 1400Hz kissoff to complete the transmission. The following table shows the zone events for this format:

<i>Event code for zones</i>	<i>Event</i>
1	New event
2	Opening
3	Restoral
4	Closure
5	No event (historic restoral or closure)
6	Old event (historic activation or opening)
7	No event on supervisory zone
8	Battery alarm on supervisory zone
9	Test on supervisory zone

In order to receive the Scantronic format, the SG-SLR should be programmed using Option [3] to send the DTMF handshake first. The following are samples of transmissions using this format:

EXAMPLE 1

The panel sends the following in 4-16-1 format: 123455555515111555558

This transmission will be decoded as follows:

<i>Printer</i>	<i>Computer</i>
S416 1234-800 LowBattery 1234 T 00	
S416 1234-107 AlarmZn#07	1234 A 07
S416 1234-109 AlarmZn#09	1234 A 09
S416 1234-110 AlarmZn#10	1234 A 10
S416 1234-111 AlarmZn#11	1234 A 11

Where: S416 represent Scantronics 4 account digit, 16 alarm digit format.

EXAMPLE 2

The panel sends the following in 6-8-1 format: 987654515255537

The SG-SLR decodes:

<i>Printer</i>	<i>Computer</i>
SC68 987654-02 AlarmZn#02	987654 A 02
SC68 987654-04 Open-Usr04	987654 O 04
SC68 987654-08 RestrZn#08	987654 R 08

Where: SC68 represent Scantronics 6 account digit, 8 alarm digit format

SIA Format

The SIA digital format is a modem format using 110 or 300 baud and the SIA protocol to transfer information from the transmitter to the receiver.

The standard SG-SLR is equipped with the Bell 103 modem chip. The CCITT V.21 modem chip may be installed upon request when ordering the SG-SLR or SG-SLR modules. The CCITT V.21 chip is for use with modem frequencies specified by the CCITT V.21 recommendation.

NOTE: The SG-SLR can accept SIA formats with and without separators. The SG-SLR Version 1.00 Software implements all of Level 1 and Part of Level 2 of the November 1991 SIA Digital Communication Standard. (The level 2 & 3 will be implemented during 1994).

To distinguish from the other formats already decoded by the SG-SLR, the data will be displayed on the printer as follows:

SIA1-xx1234 BA-3423—— 18:36:00-30/09

SIA1	:	SIA 110 baud format and SIA3 represents SIA 300 baud format
xx1234	:	Account Code 001234
BA	:	Burglary Alarm
3423	:	Zone 3423
18:36:00	:	The time in the 24-hour clock format (hours:minutes:seconds; in this example, the time is 6:36 pm)
30-09	:	The date; in this example, the date is September 30

The SG-SLR supports a maximum of 6 digits for the Account Code, and a maximum of 4 digits for the Alarm Code. Usually, the central station automation software will interpret the Alarm Codes. For manual operation, refer to the SIA Event Block Data Code Definitions for information on interpreting the Alarm Codes.

When an alarm is received, it will be displayed in the SG-SLR display. For the alarm message shown above, the following would be displayed:

L01-XX1234
BA-3423----

Acknowledgements

Acknowledgements for the SIA format are tonal by default. The transmitter may, however, request data acknowledgement by transmission of the optional configuration block.

SIA Protocol 1 for RS-232C Output (see page 38)

Refer to the SIA standard for more information concerning the SIA format.

- **Please contact Sur-Gard's technical support for the complete SIA Library chart.**

SG-SLR Library Decoding and Event Codes Table

3-1 / 4-1 Alarm Library

<i>Message</i>	<i>For Alarm Code</i>	<i>Corresponding Event Code (Options 00-AF)</i>
24HrsTest	0 (A)	T
Fire	1	A
Panic	2	A
Burglary	3	A
Alarm	4	A
Alarm	5	A
Service	6	A
Medical	7	A
LowBattery	8	A
Restore	9	R
Opening	B	O
Closing	C	C
Cancel	D	A
Restore	E	R
Trouble	F	T

4-3 Alarm Library

<i>Message</i>	<i>For Alarm Code</i>	<i>Corresponding Event Code (Options 20-2F)</i>	
		<i>Default</i>	<i>Other *</i>
24HrTZn#	0xx (Axx)	T	0
Fire-Zn#	1xx	A	1
PanicZn#	2xx	A	2
BurglZn#	3xx	A	3
CloseUsr	4xx	C	4
Open-Usr	5xx	O	5
ServiZn#	6xx	T	6
MedicZn#	7xx	A	7
MessgZn#	8xx	A	8
RestrZn#	9xx	R	9
CloseGrp	Bxx	C	C
Open-Grp	Cxx	O	O
BypasZn#	Dxx	B	B
CanclUsr	Exx	H	H
AuxilZn#	Fxx	A	F

* These alternative codes are available. Ensure that the central station automation software is able to accept these codes if they are to be used.

3-1 Extended, 3-2, 4-2 Alarm Library

<i>Message</i>	<i>For Alarm Code</i>	<i>Corresponding Event Code (Options 10-1F)</i>
24HrTZn#	0x (Ax)	T
Fire-Zn#	1x	A
PanicZn#	2x	A
BurglZn#	3x	A
AlarmZn#	4x	A
AlarmZn#	5x	A
ServiZn#	6x	A
MedicZn#	7x	A
LwBatZn#	8x	A
RestrZn#	9x	R
OpenUsr	Bx	O
CloseUsr	Cx	C
CanclUsr	Dx	A
RestrZn	Ex	R
TroubleZn	Fx	T

Event Codes Summary

<i>Code</i>	<i>Event</i>
0	Automatic Test
1	Fire Alarm
2	Panic Alarm
3	Burglary Alarm
4	Arming by User Number
5	Disarming by User Number
6	Service
7	Medical Emergency
8	Message
9	Restore
A	Alarm
B	Bypass
C	Arming by User Number
F	Auxiliary
H	Cancel
O	Disarming by User Number
R	Restore
T	Trouble
z	Common Event Code

EVENT CODE CLASSIFICATIONS

The Event codes have been grouped according to the type of event, as described below.

Medical Alarms - 100

- 100 Medical
- 101 Pendant transmitter
- 102 Fail to report in

Fire Alarms - 110

- 110 Fire alarm
- 111 Smoke
- 112 Combustion
- 113 Water Flow
- 114 Heat
- 115 Pull Station
- 116 Duct
- 117 Flame
- 118 Near alarm

Panic Alarms - 120

- 120 Panic alarm
- 121 Duress
- 122 Silent
- 123 Audible

Burglar Alarms - 130

- 130 Burglary
- 131 Perimeter
- 132 Interior
- 133 24 Hour
- 134 Entry/Exit
- 135 Day/Night
- 136 Outdoor
- 137 Tamper
- 138 Near alarm
- 139 Silent Burg

General alarms

- 140 General alarm
- 141 Polling loop open
- 142 Polling loop short
- 143 Expansion module failure
- 144 Sensor tamper
- 145 Expansion module tamper
- 146 Silent Alarm

24 Hour Non-Burglary - 150 and 160

- 150 24 Hour non-burg
- 151 Gas detected
- 152 Refrigeration
- 153 Loss of heat
- 154 Water leakage
- 155 Foil break
- 156 Day trouble
- 157 Low bottled gas level
- 158 High temp
- 159 Low temp
- 161 Loss of air flow

Fire supervisory - 200 and 210

- 200 Fire supervisory
- 201 Low water pressure
- 202 Low CO2
- 203 Gate valve sensor
- 204 Low water level
- 205 Pump activated
- 206 Pump failure

System Troubles - 300 and 310

- 300 System trouble
- 301 AC loss
- 302 Low system battery
- 303 RAM checksum bad

- 304 ROM checksum bad
- 305 System reset
- 306 Panel program changed
- 307 Self-test failure
- 308 System shutdown
- 309 Battery test failure
- 310 Ground fault

Sounder/Relay Troubles - 320

- 320 Sounder/relay
- 321 Bell 1
- 322 Bell 2
- 323 Alarm relay
- 324 Trouble relay
- 325 Reversing

System Peripheral Troubles - 330 and 340

- 330 System Peripheral
- 331 Polling loop open
- 332 Polling loop short
- 333 Exp. module failure
- 334 Repeater failure
- 335 Local printer paper out
- 336 Local printer failure
- 337 Exp Mod DC Loss
- 338 Exp Mod Low Batt
- 339 Exp Mod Reset
- 341 Exp Mod Tamper

Communication Troubles - 350 and 360

- 350 Communication
- 351 Telco 1 fault
- 352 Telco 2 fault
- 353 Long range radio
- 354 Fail to communicate
- 355 Loss of radio supervision
- 356 Loss of central polling
- 357 Radio Xmtr VSWR
- 370 Protection loop
- 371 Protection loop open
- 372 Protection loop short
- 373 Fire trouble
- 374 Exit Alarm

Sensor Troubles- 380

- 380 Sensor trouble
- 381 Loss of super. - RF
- 382 Loss of super. - RPM
- 383 Sensor tamper
- 384 RF xmtr. low battery
- 385 Smoke Hi-Sens.
- 386 Smoke Low Sens.
- 387 Intrusion Hi-Sens.
- 388 Intrusion Low Sens.
- 389 Detector Self Test Fail

Open/close - 400

- 400 Open/Close
- 401 O/C by user
- 402 Group O/C
- 403 Automatic O/C
- 404 Late to O/C
- 405 Deferred O/C
- 406 Cancel
- 407 Remote arm/disarm
- 408 Quick Arm
- 409 Keypress O/C

Remote Access - 410

- 411 Callback request made
- 412 Success - download access
- 413 Unsuccessful access
- 414 System shutdown
- 415 Dialer shutdown

Access Control - 420

- 421 Access denied
- 422 Access report by user

Special O/C - 440-450

- 441 Armed Stay
- 450 O/C by Exception
- 451 Early O/C
- 452 Late O/C
- 453 Fail to O/C

- 455 Auto Arm Fail
- 456 O/C Partial Arm
- 457 Exit Error
- 458 User on Premises
- 459 Recent Close

System Disables - 500 and 510

Sounder/Relay disables - 520

- 520 Sounder/Relay disable
- 521 Bell 1 disable
- 522 Bell 2 disable
- 523 Alarm relay disable
- 524 Trouble relay disable
- 525 Reversing relay disable

System peripheral Disables - 530 and 540

Communication Disables - 550 and 560

- 551 Dialer disabled
- 552 Radio xmmitter disabled

Bypasses - 570

- 570 Zone bypass
- 571 Fire bypass
- 572 24 Hour zone bypass
- 573 Burg. bypass
- 574 Group bypass
- 575 Swinger Bypass

Test/Misc. - 600

- 601 Manual trigger test
- 602 Periodic test report
- 603 Periodic RF Xmission
- 604 Fire test
- 605 Status report to follow
- 606 Listen-in to follow
- 607 Walk Test Mode
- 608 OFF normal condition
- 609 Video transmitter active
- 611 Fire test: point tested
- 612 Fire test: point not tested
- 621 Event log reset
- 622 Event log 50% full
- 623 Event log 90% full
- 624 Event log overflow
- 625 Time/Date Reset
- 626 Time/Date inaccurate
- 627 Program mode Entry
- 628 Program mode Exit
- 629 1&1/3 day no read log
- 630 Sched change
- 631 Exception Schedule change
- 632 Access Sched change

SG-SLR UTILITY MODES

When the SG-SLR is in the Stand-By Mode, the following functions may be accessed by pressing the [9] through [F] keys:

- [9] Ring simulation
- [A] Send Computer Messages to Printer
- [B] Operator Log-On
- [C] Call cancel
- [D] Send Printer Messages to the Printer
- [E] Examine Printer Messages on Display Screen
- [F] Examine Computer Messages on Display Screen

[9] Ring Simulation

This mode is used to switch the system into the communication mode. When the [9] key is pressed, The SLR will seize the line and send the handshakes, while this message is displayed:

In Communication

This feature enables a test communication between the receiver and a digital panel without using a phone line. After sending all the handshakes programmed at option 3, if no data is transmitted to the receiver, it will print out the following message: **“Fault Call”**

(PGM IN could be used for local installation as a Ring Simulation)

[A] Send Computer Message to the Printer

This mode is used to send the computer messages in the buffer to the printer for operator’s verification. When the [A] key is pressed, this message will be displayed:

**Dump COM Msg->PR
Up=Yes, Down=No**

EXAMPLE: If [▲] is entered, then the printer shows:

```
Dump Computer Alarm Buffer
1011 ..... 0000 . R .. 06 12:37:31 - 12/10 106
1011 ..... 1234 . A .. 01 12:38:22 - 12/10 106
```

[B] Operator Log-On

Different operators may “log-on” to the system by entering this mode. When an operator logs on, a message similar to this one will be printed:

Printer: Operator on duty S.G. 11:03-21/12/92

The operator’s initials, (if programmed), and the time and date will be printed. If the Star 8340 printer is being used, this message will be printed in red.

To log on, press the [B] key, and then enter a 4-digit Password. If a valid password is entered, a log-on message will be printed. If an invalid password is entered, the SG-SLR will sound a tone to indicate that the code was entered incorrectly.

[C] Cancel Call

This command is used to Cancel the call when the receiver is on-line, press [C] to release the line. In stand-by mode pressing the [C] key has no effect.

[D] Send Printer Message to the Printer

With the SG-SLR in the Standby Mode, press the [D] key to send printer messages in the buffer to the printer. When the [D] key is pressed, this message will be displayed:

**Dump PRT Msg PRT
Up=Yes, Down=No**

If an error is made in entering the number, simply enter the desired number from the keypad.

Press the [▼] or [Escape] button to cancel this function and return to the Stand-By Mode. Or, press the [▲] button to print the indicated messages.

[E] Examine Printer Message on LCD Screen

With the SG-SLR in the Standby Mode, press the [E] key to review printer messages on the display screen. When the [E] key is pressed, this message will be displayed:

```
Exam PRINTER msg
Up=Yes, Down=No
```

If an error is made in entering the number, simply enter the desired number from the keypad.

Press the [▼] or [Escape] button to cancel this function and return to the Stand-By Mode. Or, press the [▲] button to view the indicated messages.

When the [▲] button is pressed, the SLR will display the printer messages, starting with the most recent message. When [▲] is pressed, a message similar to this will be displayed:

```
AD42-1234-05
AlarmZn#05    xx
```

Where xx indicates the number of printer messages in the buffer (in Hexadecimal).

Press the [▲] button to scroll through the messages; the messages will be displayed in order from the most recent to the oldest. Press the [▼] button to scroll from the oldest message to the most recent.

When finished viewing the messages, press the [ESCAPE] button.

[F] Examine Computer Message on LCD Screen

With the SG-SLR in the Stand-By Mode, press the [F] key to review computer messages on the display screen. When the [F] key is pressed, this message will be displayed:

```
Examine COM1 msg
Up=Yes, Down=Yes
```

Press the [▼] or [Escape] button to cancel this function and return to the Stand-By Mode. Or, press the [▲] button to view the indicated messages.

When the [▲] button is pressed, the SG-SLR will display the computer messages, starting with the most recent message. When [▲] is pressed, a message similar to this will be displayed:

```
1011..... 1234.a
..56      N AK xx
```

- N : Number of times the receiver resend to COM1 (normally it should be 1 time).
- AK : Character reply (ACK) from COM1. It should be 06 if computer is connected.
- xx : indicates the number of computer messages in the buffer (in Hexadecimal), "FF" if buffer is full.

Press the [▲] button to scroll through the messages; the messages will be displayed in order from the most recent to the oldest. Press the [▼] button to scroll from the oldest message to the most recent.

When finished viewing the messages, press the [ESCAPE] button.

EXAMPLE:N = 1
AK = 06

Where "106" means the message was sent to computer one ("1") time successfully and the computer replied with the <ACK> character ("06").

[SELECT] Silence Beeper

When the [SELECT] button is pressed, the SG-SLR shuts off the Buzzer. In programming mode it's used to select an option.

[ESCAPE] Programming mode

When in normal mode the [ESCAPE] button may be pressed to enter programming mode. When in programming mode the [ESCAPE] button may be used to return to normal mode.

SG-SLR Computer Interface

The SG-SLR is able to send alarm messages to a computer connected to the COM1 serial port. This section describes the communication procedures, and the communications formats available for use.

Overview of Communication

When the SG-SLR receives data from a dialer, it forwards the data to COM1 and awaits an acknowledgment signal from the computer. If a NAK signal is received from the computer, the SG-SLR will make 4 attempts to send the data. If all four attempts fail, the SG-SLR buzzer will sound a communication failure warning. The SG-SLR will retain the alarms in its internal buffer until communication is restored.

The SG-SLR also monitors the connection to the computer by sending a supervisory "heartbeat" signal through COM1 every 30 seconds (This time is programmable at option 09). If the "heartbeat" transmission determines that the computer is off-line or disconnected, a message similar to this will be sent to the printer:

Com#1 Absent!! 09:45-21/09/95

NOTE: The message indicates the time and date that communications through COM1 were determined to be interrupted.

When COM1 communications are re-established, a message similar to this one will be printed:

Com#1 Restored 09:50-21/09/93

NOTE: The message indicates the time and date that communications through COM1 were determined to be re-established.

The "heartbeat" feature may be disabled if it is found that this feature is not compatible with the central station automation software being used on the computer.

SG-SLR COM1 Status Report Messages

The SG-SLR will send the following messages to COM1 to report internal status conditions. SG-SLR will use an Account Code of "0000" to indicate that it is reporting an internal condition.

<i>Sent to COM1</i>	<i>Event</i>
0000 A 01:	Printer Error
0000 R 01:	Printer Restored
0000 A 03:	12V Battery Low
0000 R 03:	12V Battery Restored
0000 A 05:	COM1 Absent
0000 R 05:	COM1 Restored
0000 A 07:	Tamper Alarm on SG-SLR (not used)
0000 R 07:	Tamper Restored on SG-SLR (not used)
0000 A 15:	AC Failure
0000 R 15:	AC Restored
0000 A D0:	System Reset
0000 T 10:	Faulty Data Received
0000 A 20:	Telephone Line Fault
0000 R 30:	Telephone Line Restored
0000 T 40:	Faulty Call; no data received

Communication Protocols with Central Station Computer

The Sur-Gard SLR receiver sends the following protocol to report signals to the central station computer via the RS-232 port.

Data Byte protocol

The Sur-Gard receiver uses 1200 baud rate, 1 start bit, 7 data bits, 1 even parity bit, and 1 stop bit structure, to transmit and receive signals. The above protocol can be programmed on the receiver by the central station operator to enable different configurations (Start and stop bits fixed at 1).

Acknowledgement of the Signal

The Sur-Gard receiver requires an acknowledge signal [ACK] from the computer software within a certain programmable time for each message sent. The waiting period for the [ACK] can be adjusted up to 10 seconds. Failure to receive the [ACK] will result in the re-transmission of the same signal three more times before giving up. In case of communication failure with the computer, the Sur-Gard receiver can store up to 256 messages in its static RAM memory. When communication is resumed, these messages will be automatically sent to the computer.

Basic Signal Protocol

1RRLsSSSSAAAAAAs XGYYY[DC4]

1	: Protocol number
RR	: Receiver number
L	: Line number (fixed at one).
s	: Space Character
AAAAAA	: Account Code, usually 4 digits with 2 leading spaces
X	: Event Code. See Table below
G	: O/C by Area Number (1-F) or Space
YYY	: Zone number or user number
[DC4]	: Terminator, 14 Hex

Event Code Table

0	Automatic Test *
1	Fire Alarm *
2	Panic Alarm *
3	Burglary Alarm *
4	Arming by User # *
5	Disarming by User # *
6	Service
7	Medical Emergency *
8	Message *
9	Restore *
A	Alarm
B	Bypass
C	Arming by User #
F	Auxiliary
H	Unbypass
O	Disarming by User #
R	Restore
T	Trouble
Z	Common Event Code
20(H)	Common Event Code Space Character

* These codes are used in the Sur-Gard digital control panel with the DTMF 4/3 format.

The "space" character (20 Hex) can be used in case the automation software package combines the event code with the zone code, conflicting with the existing account code data base.

When the O/C signals are transmitted by Groups with the user number included, the "G" code, currently from 1-F, will be in effect to show the Group number, including the proceeding Event Code O or C, as well as the User number at the "YYY" position. The computer may then redirect this signal when necessary.

EXAMPLE:The panel 0012 is partially armed on Group #1 and Group #2 by user #128. The Sur-Gard receiver will send following messages to the computer:

1RRLsSSSSs0012sC1128[DC4]

1RRLsSSSSs0012sC2128[DC4]

The computer software could probably redirect these signals to a programmable sub-account, in which an o/c schedule for users can be available.

The user report codes on Sur-Gard receiver can be decimal or hexadecimal digits.

Two-Way Audio

Once the Sur-Gard receiver is in the two-way audio mode, it sends an optional signal to the computer; Option [34]

1RRLssssss0000sPss0L[DC4]

1 : Protocol number
RR : Receiver number
L : Line number (fixed at one)
s : Space character
0000 : Account Code 0000
P : Event Code. P is recommended but it is programmable {SLR option [34]}
L : Receiver number
[DC4] : Terminator 14 Hex

This signal tells the operator which line is in the two-way audio mode.

Supervisory Heartbeat Signal protocol

101ssssssssss@ssss[DC4]

s : Space character
@ : Supervisory signal
[DC4] : Terminator, 14 Hex

This signal is used to supervise the communication between the receiver and the computer. It is sent to the computer about every 30 seconds, programmable on the receiver. The computer should acknowledge this signal with an [ACK]. It is recommended to have this signal running.

Telephone Number Protocol

4RRLAAAAALLLTTTTTT[DC4]

4 : Protocol number
RR : Receiver number
L : Line number
AAAAA : Account code. If account code is less than 6 digits, leading spaces will be added.
LLL : Long distance area code. If no area code is received, sends '000'
TTTTTT : Local phone number
[DC4] : Terminator, 14 Hex

Contact ID Protocol

5RRLs18AAAAQXYZGGCCC[DC4]

5 : Protocol number
RR : Receiver number
L : Line number
s : Space
18 : Contact-ID format identifier
AAAA : Four digit account codes
Q : Qualifier,
E = New event or opening, r=New restore or closing
P = Previous event
XYZ : Class code and event code
GG : Group number
CCC : Zone codes or user ID
[DC4] : Terminator, 14 Hex

Example: Account 1234 sends in a duress alarm with group number 01, and zone code 001, the receiver number 01 and line number 1 will send this signal as follows:

5011s181234E12101001[DC4]

Modem II and BFSK Protocols

When used with the Sur-Gard interface, this protocol is compatible to the Radionics D6500 Mode except that the protocol number is '6'.

6RRLssssAAAAXYYYY[DC4]

6 : Protocol number
RR : Receiver number
L : Line number 9 fixed at one)
s : Space character
AAAA : Account Code (can be 3 BFSK or 4 digits (Modem II) leading spaces).
XX : One or two digit event code (dependant upon format, leading spaces).
YYYY : One to four digit reporting code (sent with leading spaces).
[DC4] : Terminator 14 Hex

SIA Protocol 1

3RRLssssAAAAAXYYYY[DC4]

3 : Protocol number
RR : Receiver number
L : Line number (fixed at one)
ssss : Spaces
AAAAAA : Six digit account codes. Leading spaces will be sent if account codes are less than six digits
XX : Event code, follows the SIA "Event Block Data Code Definitions"
YYYY : Zone code. Leading spaces will be sent if zone codes are less than four digits. If no zone codes are received from the control panel, "ss00" will be sent
[DC4] : Terminator, 14 Hex

SIA Protocol 2

The SIA Protocol 1 can not handle certain information in the SIA level 2 and 3. We now provide the optional SIA Protocol 2 as the following: option [35] enabled

SRRL[#AAAAAAIEMMZ/ZZ/ZZ/ZZ][DC4]

S : Beginning transmission of SIA protocol 2
RR : Receiver number 00-FE
L : Line number (fixed at one)
: Account ID block code
AAAAAA : Account ID, maximum sixteen digits
I : Field separator
e : Function block code
MM : Event code or modifier
ZZZZ : Zone code, or user code, or time/date information
/ : Data code packet separator
] : Ending data delimiter
[DC4] : Terminator, 14 Hex

The length of the signal varies, and it can support the maximum 63 bytes data block transmission from the control panel. When this optional protocol is selected, all SIA information will be sent to the host computer using this protocol.

Examples from a SIA Control Panel
Standard Transmission

```

                SRRL[#1234INri1BA01][DC4]   or   SRRL[#1234INri1/BA01][DC4]
S                : Protocol identifier for SIA protocol 2
RR               : Receiver number 01-FE
L               : Line number (fixed at one)
[               : Beginning data delimiter
#               : Account ID block code
1234            : Account ID
|               : Field separator
N               : New event function block
ri1             : Area/Partition number 1
BA01            : Burglary Alarm zone 01
]               : Ending data delimiter
[DC4]          : Terminator, 14 Hex

```

Listen-in Transmission

```

                SRRL[#1234|Lri1BA01][DC4]   or   SRRL[#1234INriBA01/L90][DC4]
S                : Protocol identifier for SIA protocol 2
RR               : Receiver number 01-FE
L               : Line number (fixed at one)
[               : Beginning data delimiter
#               : Account ID block code
1234            : Account ID
|               : Field separator
L               : Listen-in block
ri1             : Area/Partition number 1
/               : Data code packet separator
BA01            : Burglary Alarm zone 01
L90             : Listen in, panel will stay on line 90 s
]               : Ending data delimiter
[DC4]          : Terminator, 14 Hex

```

The receiver will switch to listen-in only if option 30 is programmed with a value other than 00.

Clock Signal Protocol

```

1RRLssssAAAAAsXGYYYYHH:MM:SS-dd/mm[DC4]
3RRLssssAAAAAXXGYYYYHH:MM:SS-dd/mm[DC4]
4RRLAAAAALLTTTTTTTHH:MM:SS-dd/mm[DC4]
5RRLs18AAAAQXYZGGCCCHH:MM:SS-dd/mm[DC4]
6RRLssssssAAAAXYYYYYHH:MM:SS-dd/mm[DC4]
8RRLAAAsCCCsCCCsCHH:MM:SS-dd/mm[DC4]
9RRLssssAAAACCCCCCCHH:MM:SS-dd/mm[DC4]

```

Where:

```

HH   : Hour
MM   : Minute
SS   : Second
dd   : Day
mm   : Month

```

And the other codes are of the same definition as in the previous signal protocols. The supervisory heartbeat signal can also be used along with this protocol, but the structure remains unchanged.

Ask Sur-Gard technical support for an information sheet when using the SG-SLR with one of the following software packages:

- ABM
- Alarm Soft
- Apropos STA
- Microkey Central-1
- SIMS II
- SIMS CSM
- SIS

APPENDIX A ABBREVIATIONS OF COMMUNICATION FORMAT

Abbreviation	description
AD31	Ademco 3-1 format
AD32	Ademco 3-2 format
AD41	Ademco 4-1 format
AD42	Ademco 4-2 format
A42C	Ademco 4-2 format with Checksum
A31E	Ademco 3-1 Extended format
FR31	Franklin 3-1 format
FR32	Franklin 3-2 format
FR41	Franklin 4-1 format
FR42	Franklin 4-2 format
F42C	Franklin 4-2 format with Checksum
F31E	Franklin 3-1 Extended format
RD31	Radionics 3-1 format
R31C	Radionics 3-1 with Checksum format
RD32	Radionics3-2 format
RD42	Radionics 4-2 format
RD43	Radionics 4-3 format
R42C	Radionics 4-2 format with Checksum
R31E	Radionics 3-1 Extended format
SG41	Sur-Gard 4-1 format
SG42	Sur-Gard 4-2 format
SG43	Sur-Gard 4-3 format
S43C	Sur-Gard 4-3 format with Checksum
D41E	DTMF 4-1 Express format
D42E	DTMF 4-2 Express format
AC38	Acron 3-8 format
AC48	Acron 4-8 format
SC68	Scantronic 6-8-1 format
S416	Scantronic 4-16-1 format
SIA1	SIA 110 baud format
SIA3	SIA 300 baud format
DFBI	DTMF FBI Format
CONT	Contact ID Format
DSFA	DTMF Super Fast Ademco Format
SFAC	Super Fast Ademco with Checksum
MD2	ModemII format
BFSK	BFSK format

APPENDIX B SG-SLR QUICK REFERENCE GUIDE

SG-SLR Utility Modes

Press [SELECT] when "Ack" light flashes to Acknowledge event

- [9] Ring Simulation
- [A] Send Computer Messages to Printer
- [B] Operator Log-On
- [C] Cancel call
- [D] Send Printer Messages to the Printer
- [E] Examine Printer Messages on Display Screen
- [F] Examine Computer Messages on Display Screen
- [ESCAPE] Programming Mode

SG-SLR Configuration Mode

Press the [Escape] button when the system is in Stand-By Mode and enter the Master Password.

Press the [▲] button to display the next menu item; press the [▼] button to display the previous menu item. Press the [SELECT] button to select the menu item presented shown on the display screen.

Menu Item	Function	Default
01	Set Date and Time	00:00:00 NUL-00-00
02	System Passwords	FD#0 - CAFE operator S.G. 1-F Blank operator S.G.
03	System Handshake	1 2 3 4 5 6 7 0
04	Caller Identification	0
05	Printer Select	Backup=0; Enable=1
06	COM1 Configuration	Baud: 1200, Parity: 02, Data: 7 bits
07	COM1 Format	1
08	ACK Wait Delay	4 seconds
09	Heartbeat Select	30 seconds
10	Contrast Adjust	Full Contrast
11	Line Check	10 sec.
12	Erase Memory	
13	Mute Buzzer	0
14	Keep Last Message	0
15	COM1 Diagnostics	0
16	Display Program Version	SLR Ver 1.20
17	Monitor Battery	
18	Select Year/Seconds	0
19	Force Reset	
20	Change Receiver Number	01
21	3-2 Format	0
22	4-1 Express Format	0
23	Off Hook Duration	00 Min.
24	Boost Signal	0
25	3-1, 4-1 Event Codes	TAAAAAAAARTOCAAT
26	4-2 Event Code	TAAAAAAAARTOCAAT
27	4-3 Event Code	TAAACOTAARTCOBHA
28	Handshake/Kissoff Duration	1.0 sec.
29	Plain Library	1
30	Audio Time	0
31	Audio Account 4	0
32	Audio Account 3	0
33	Audio Code	0
34	Audio Event	0
35	SIA Option	0

APPENDIX C TROUBLE SHOOTING

Problem: No communication with the central station computer on COM1

Solution: Ensure that the cable connected to COM1 is an RS232 cable; it should not be a null-modem type.

Check the baud rate for COM1 (SG-SLR Configuration Option 06)

Check the COM1 communication format (SG-SLR Configuration Option 07)

Check the computer software set-up

Enable COM1 Diagnostics with SG-SLR Configuration Option 15 and examine the communications on the display screen. View the Tx/Rx light for Data transmit/Data receive.

Problem: Bad communication with central station computer.

Solution: The central station software is too slow to provide the acknowledgement signal for the SG-SLR. Contact the software manufacturer for a software upgrade.

Increase the acknowledge wait time with SG-SLR Configuration Option 08.

Check COM1 baud rate and communication format using SG-SLR Configuration Options 06 and 07

Ensure that the COM1 connection is secure

Problem: Control panel sends repetitive alarms

Solution: Panel may not be waiting long enough for kissoff tone. The panel should be programmed to wait for 3 seconds before resending an alarm. If required, contact the control panel manufacturer for a software upgrade.

The panel has sent data with the wrong handshake. Check the SG-SLR configuration and make any required changes.

If the telephone line is noisy, the control panel dialer may have difficulty receiving the kissoff tone; try using a longer or different kissoff tone.

Problem: Fault in received digital/DTMF data

Solution: Enable SG-SLR Option 24 to boost the signal strength.

Check the telephone line to determine if noise is a problem.

Problem: Printer Error

Solution: Ensure that the printer is on, has paper inserted properly, and is on-line. Ensure that the printer is a compatible parallel printer, such as the Star 8340.

Problem: Line Fault

Solution: Check the voltage on the telephone line; it should measure as at least 4V when the receiver is on-line, and approximately 50V when the receiver is off-line.

Check if the appropriate telephone cable is connected to the DML4.

Problem: Security Control Panel reporting in unexpected communication format

Solution: Check the control panel's programming and communication formats. Note that some panels will respond to the first handshake and send the message corresponding to that handshake or send the message regardless of the handshake.

Check the SG-SLR handshake tone selection and make any required changes.

Problem: Faulty call

Solution: Ensure that the handshake required by the panel is programmed in the SG-SLR handshakes.

Ensure that the handshake is being sent at the proper position

Ensure that the security control panel does not hang up before it receives its handshake

Check the SG-SLR handshakes order and make any required changes

APPENDIX C TROUBLE SHOOTING

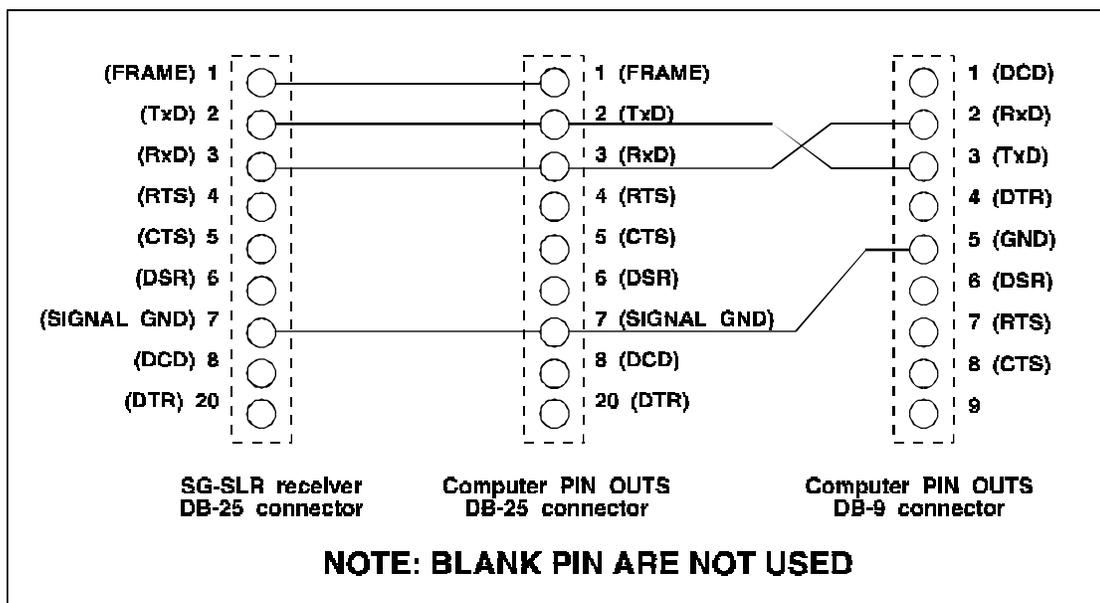
Problem: The SG-SLR does not send the kissoff in Contact ID format

Solution: Check to see if the security control panel has been programmed with "A" where "0" (zero) is required in the reporting codes. If so, the checksum will not match and the SG-SLR will not send the kissoff tone. Check the control panel programming and make any required changes.

Problem: The computer receives an invalid alarm every 30 seconds

Solution: Ensure that the Sur-Gard interface is available in the computer software being used. If not, change the software set-up to use the Sur-Gard interface. Also, the heartbeat transmission may be temporarily disabled by programming the heartbeat interval time to "00" in SG-SLR Option [09].

APPENDIX D CONNECTION BETWEEN SG-SLR AND COMPUTER



HOW TO CONTACT US

Sales

For information about additional products, please call our sales number: 1-800-418-7618 or e-mail us at sales@sur-gard.com.

Calling Technical Support

If you have questions of problems when using Sur-Gard products, you can call technical support. If you are within the United States, Puerto Rico, the US Virgin Islands or Canada, you can get support by dialling 1-800-503-5869. If you are outside these areas, please call (416) 665-4494.

Internet

Sur-Gard will soon have a WWW home page. Here, you will be able to search the Sur-Gard technical information database and read information about new products. You will also be able to send us your questions. Our World Wide Web address is <http://www.sur-gard.com>.

Products

The SG-SLR central station receiver was designed to suit your needs. If you ever have a suggestion about the SLR or about any one of our products, please contact us. We genuinely appreciate your comments. Write to:

Sur-Gard Security Systems Ltd.
Receiver Product Manager
401 Magnetic Drive, Unit 24
Downsview, Ontario, Canada
M3J 3H9

APPENDIX E SG-SLR COMMUNICATION FORMATS

	Name	Handshake	Data	Baud	Format	Kiss Off
01	Ademco Slow	1400Hz	1900Hz	10	3-1, 3-1 extended, 3-2 or 4-1, 4-2	1400Hz 1400Hz
02	Silent Knight Fast	1400Hz	1900Hz	14	3-1, 3-1 extended, 3-2 or 4-1, 4-2	1400Hz 1400Hz
03	Franklin, SESCOA	2300Hz	1800Hz	20	3-1, 3-1 extended, 3-2 or 4-1, 4-2	2300Hz 2300Hz
04	Radionics	2300Hz	1800Hz	40	3-1, 3-1 extended, 4-2	2300Hz
05	Radionics	2300Hz	1800Hz	40	3-1 + checksum 3-1 + checksum extended 4-2 + checksum	2300Hz 2300Hz 2300Hz
06	SIA Level 1, 2	FSK MARK	FSK MARK/ SPACE	110/300		tonal/ Data ack
07	Contact ID	Dual Tone 1400Hz	DTMF	DTMF	4-2-1-3-2-3	1400Hz
08	Sur-Gard	2300Hz	DTMF	DTMF	4-3	2300Hz
09	Sur-Gard	Dual Tone 1400Hz	DTMF	DTMF	4-3	1400Hz
10	Sur-Gard	2300Hz	DTMF	DTMF	4-3 + checksum	2300Hz
11	Sur-Gard	Dual Tone 1400Hz	DTMF	DTMF	4-3 + checksum	1400Hz
12	Super Fast Ademco	Dual Tone	DTMF	DTMF	4-8-1	1400Hz
13	Scantronics	Dual Tone	DTMF	DTMF	4-8-1, & 4-16-1, 6-8-1, & 6-16-1	1400Hz 1400Hz
14	Acron Super Fast	1400Hz	DTMF	DTMF	3-8 & 4-8	1400Hz
15	Ademco Express	Dual Tone	DTMF	DTMF	4-1 (Option), 4-2	1400Hz
16	FBI Super Fast	Dual Tone	DTMF	DTMF	4-3-1	1400Hz
17	Modem II	FSK	FSK	110	FSK	
18	BFSK	1400Hz	FSK	42	FSK	1400Hz
19	BFSK	2300Hz	FSK	42	FSK	2300Hz

APPENDIX F

DECIMAL - HEX - BINARY CONVERSION CHART

DEC	HEX	BINARY									
000	00	00000000	064	40	01000000	128	80	10000000	192	C0	11000000
001	01	00000001	065	41	01000001	129	81	10000001	193	C1	11000001
002	02	00000010	066	42	01000010	130	82	10000010	194	C2	11000010
003	03	00000011	067	43	01000011	131	83	10000011	195	C3	11000011
004	04	00000100	068	44	01000100	132	84	10000100	196	C4	11000100
005	05	00000101	069	45	01000101	133	85	10000101	197	C5	11000101
006	06	00000110	070	46	01000110	134	86	10000110	198	C6	11000110
007	07	00000111	071	47	01000111	135	87	10000111	199	C7	11000111
008	08	00001000	072	48	01001000	136	88	10001000	200	C8	11001000
009	09	00001001	073	49	01001001	137	89	10001001	201	C9	11001001
010	0A	00001010	074	4A	01001010	138	8A	10001010	202	CA	11001010
011	0B	00001011	075	4B	01001011	139	8B	10001011	203	CB	11001011
012	0C	00001100	076	4C	01001100	140	8C	10001100	204	CC	11001100
013	0D	00001101	077	4D	01001101	141	8D	10001101	205	CD	11001101
014	0E	00001110	078	4E	01001110	142	8E	10001110	206	CE	11001110
015	0F	00001111	079	4F	01001111	143	8F	10001111	207	CF	11001111
016	10	00010000	080	50	01000000	144	90	10010000	208	D0	11010000
017	11	00010001	081	51	01010001	145	91	10010001	209	D1	11010001
018	12	00010010	082	52	01010010	146	92	10010010	210	D2	11010010
019	13	00010011	083	53	01010011	147	93	10010011	211	D3	11010011
020	14	00010100	084	54	01010100	148	94	10010100	212	D4	11010100
021	15	00010101	085	55	01010101	149	95	10010101	213	D5	11010101
022	16	00010110	086	56	01010110	150	96	10010110	214	D6	11010110
023	17	00010111	087	57	01010111	151	97	10010111	215	D7	11010111
024	18	00011000	088	58	01011000	152	98	10011000	216	D8	11011000
025	19	00011001	089	59	01011001	153	99	10011001	217	D9	11011001
026	1A	00011010	090	5A	01011010	154	9A	10011010	218	DA	11011010
027	1B	00011011	091	5B	01011011	155	9B	10011011	219	DB	11011011
028	1C	00011100	092	5C	01011100	156	9C	10011100	220	DC	11011100
029	1D	00011101	093	5D	01011101	157	9D	10011101	221	DD	11011101
030	1E	00011110	094	5E	01011110	158	9E	10011110	222	DE	11011110
031	1F	00011111	095	5F	01011111	159	9F	10011111	223	DF	11011111
032	20	00100000	096	60	01100000	160	A0	10100000	224	E0	11100000
033	21	00100001	097	61	01100001	161	A1	10100001	225	E1	11100001
034	22	00100010	098	62	01100010	162	A2	10100010	226	E2	11100010
035	23	00100011	099	63	01100011	163	A3	10100011	227	E3	11100011
036	24	00100100	100	64	01100100	164	A4	10100100	228	E4	11100100
037	25	00100101	101	65	01100101	165	A5	10100101	229	E5	11100101
038	26	00100110	102	66	01100110	166	A6	10100110	230	E6	11100110
039	27	00100111	103	67	01100111	167	A7	10100111	231	E7	11100111
040	28	00101000	104	68	01101000	168	A8	10101000	232	E8	11101000
041	29	00101001	105	69	01101001	169	A9	10101001	233	E9	11101001
042	2A	00101010	106	6A	01101010	170	AA	10101010	234	EA	11101010
043	2B	00101011	107	6B	01101011	171	AB	10101011	235	EB	11101011
044	2C	00101100	108	6C	01101100	172	AC	10101100	236	EC	11101100
045	2D	00101101	109	6D	01101101	173	AD	10101101	237	ED	11101101
046	2E	00101110	110	6E	01101110	174	AE	10101110	238	EE	11101110
047	2F	00101111	111	6F	01101111	175	AF	10101111	239	EF	11101111
048	30	00110000	112	70	01110000	176	B0	10110000	240	F0	11110000
049	31	00110001	113	71	01110001	177	B1	10110001	241	F1	11110001
050	32	00110010	114	72	01110010	178	B2	10110010	242	F2	11110010
051	33	00110011	115	73	01110011	179	B3	10110011	243	F3	11110011
052	34	00110100	116	74	01110100	180	B4	10110100	244	F4	11110100
053	35	00110101	117	75	01110101	181	B5	10110101	245	F5	11110101
054	36	00110110	118	76	01110110	182	B6	10110110	246	F6	11110110
055	37	00110111	119	77	01110111	183	B7	10110111	247	F7	11110111
056	38	00111000	120	78	01111000	184	B8	10111000	248	F8	11111000
057	39	00111001	121	79	01111001	185	B9	10111001	249	F9	11111001
058	3A	00111010	122	7A	01111010	186	BA	10111010	250	FA	11111010
059	3B	00111011	123	7B	01111011	187	BB	10111011	251	FB	11111011
060	3C	00111100	124	7C	01111100	188	BC	10111100	252	FC	11111100
061	3D	00111101	125	7D	01111101	189	BD	10111101	253	FD	11111101
062	3E	00111110	126	7E	01111110	190	BE	10111110	254	FE	11111110
063	3F	00111111	127	7F	01111111	191	BF	10111111	255	FF	11111111

NOTICE: The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. Industry Canada does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

User should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

CAUTION: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

NOTICE: The Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Number of all the devices does not exceed 100.

The REN of this unit is 0.1.

AVIS: L'étiquette de l'Industrie Canada identifie le matériel homologué. Cette étiquette certifie que le matériel est conforme à certaines normes de protection, d'exploitation et de sécurité des réseaux de télécommunications. Industrie Canada n'assure toutefois pas que le matériel fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer ce matériel, l'utilisateur doit s'assurer qu'il est permis de le raccorder aux installations de l'entreprise locale de télécommunication. Le matériel doit également être installé en suivant une méthode acceptée de raccordement. L'abonné ne doit pas oublier qu'il est possible que la conformité aux conditions énoncées ci-dessus n'empêchent pas la dégradation du service dans certaines situations.

Les réparations de matériel homologué doivent être effectuées par un centre d'entretien canadien autorisé désigné par le fournisseur. La compagnie de télécommunications peut demander à l'utilisateur de débrancher un appareil à la suite de réparations ou de modifications effectuées par l'utilisateur ou à cause de mauvais fonctionnement.

Pour sa propre protection, l'utilisateur doit s'assurer que tous les fils de mise à la terre de la source d'énergie électrique, les lignes téléphoniques et les canalisations d'eau métalliques, s'il y en a, sont raccordés ensemble. Cette précaution est particulièrement importante dans les régions rurales.

AVERTISSEMENT: L'utilisateur ne doit pas tenter de faire ces raccordements lui-même; il doit avoir recours à un service d'inspection des installations électriques, ou à un électricien, selon le cas.

AVIS: L'indice d'équivalence de la sonnerie (IES) assigné à chaque dispositif terminal indique le nombre maximal de terminaux qui peuvent être raccordés à une interface. La terminaison d'une interface téléphonique peut consister en une combinaison de quelques dispositifs, à la seule condition que la somme d'indices d'équivalence de la sonnerie de tous les dispositifs n'excède pas 100.

L'indice d'équivalence de la sonnerie (IES) de ce produit est 0.1.

LIMITED WARRANTY

Sur-Gard Ltd. warrants that for a period of sixty months from the date of purchase, the product shall be free of defects in materials and workmanship under normal use and that in fulfilment of any breach of such warranty, Sur-Gard Ltd. shall, at its option, repair or replace the defective equipment upon return of the equipment to its repair depot. This warranty applies only to defects in parts and workmanship and not to damage incurred in shipping or handling, or damage due to causes beyond the control of Sur-Gard Ltd., such as lightning, excessive voltage, mechanical shock, water damage, or damage arising out of abuse, alteration or improper application of the equipment.

The foregoing warranty shall apply only to the original buyer, and is and shall be in lieu of any and all other warranties, whether expressed or implied and of all other obligations or liabilities on the part of Sur-Gard Ltd. This warranty contains the entire warranty. Sur-Gard neither assumes, nor authorizes any other person purporting to act on its behalf to modify or to change this warranty, nor to assume for it any other warranty or liability concerning this product.

In no event shall Sur-Gard Ltd. be liable for any direct, indirect or consequential damages, loss of anticipated profits, loss of time or any other losses incurred by the buyer in connection with the purchase, installation or operation or failure of this product.

WARNING

Sur-Gard Ltd. recommends that the entire system be completely tested on a regular basis. However, despite frequent testing, and due to, but not limited to, criminal tampering or electrical disruption, it is possible for this product to fail to perform as expected.

Software Version 1.20
See page 4 for New Features

INSTALLATION MANUAL



SG-SLR

Software Version 1.20

FCC COMPLIANCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communication. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CAUTION: Changes or modification not expressly approved by Sur-Gard Security Systems Ltd. could void the user's authority to operate the equipment.

Important Information

This equipment complies with Part 68 of the FCC Rules. On the back of this equipment is a label that contains among other information, the FCC registration number of this equipment.

Notification to Telephone Company

Upon request, the customer shall notify the telephone company of the particular line to which the connection will be made, and provide the FCC registration number and the ringer equivalence of the protective circuit.

FCC Registration Number: 1VDCAN-20831-AL-N

Ringer Equivalence Number: 0.1B

Telephone Connection Requirements

Except for the telephone company provided ringers, all connections to the telephone network shall be made through standard plugs and telephone company provided jacks, or equivalent, in such a manner as to allow for easy, immediate disconnection of the terminal equipment. Standard jacks shall be so arranged that, if the plug connected thereto is withdrawn, no interference to the operation of the equipment at the customer's premises which remains connected to the telephone network shall occur by reason of such withdrawal.

Incidence of Harm

Should terminal equipment or protective circuitry cause harm to the telephone network, the telephone company shall, where practicable, notify the customer that temporary disconnection of service may be required; however, where prior notice is not practicable, the telephone company may temporarily discontinue service if such action is deemed reasonable in the circumstances. In the case of such temporary discontinuance, the telephone company shall promptly notify the customer and will be given the opportunity to correct the situation.

Changes in Telephone Company Equipment or Facilities

The telephone company may make changes in its communications facilities, equipment, operations or procedures, where such actions are reasonably required and proper in its business. Should any such changes render the customer's terminal equipment incompatible with the telephone company facilities, the customer shall be given adequate notice to effect the modifications to maintain uninterrupted service.

General

This equipment should not be used on coin telephone lines. Connection to party line service is subject to state tariffs.

Ringer Equivalence Number (REN)

The REN is useful to determine the quantity of devices that you may connect to your telephone line and still have all of those devices ring when your telephone number is called. In most, but not all areas, the sum of the REN's of all devices connected to one line should not exceed five (5). To be certain of the number of devices that you may connect to your line, you may want to contact your local telephone company.

Equipment Maintenance Facility

If you experience trouble with this telephone equipment, please contact the facility indicated below for information on obtaining service or repairs. The telephone company may ask you disconnect this equipment from the network until the problem has been corrected or until you are sure that the equipment is not malfunctioning.

U.S. Point of Contact

Digital Security Controls Ltd.
160 Washburn St.
Lockport, NY 14094

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