Sur-Gard System III

Multi-Platform

Digital Telephone Receiver

WARNING: *This manual contains information on limitations regarding product use and function and information on the limitations as to liability of the manufacturer. The entire manual should be carefully read.*

Table of Contents

GENERAL DESCRIPTION of the EQUIPMENT and CLASSIFICATION.

CLASSIFICATION

The SYSTEM III equipment is a CLASS 1, RACK-MOUNTED, (FIXED – STATIONARY) EQUIPMENT, PLUGGABLE TYPE A USING A DETACH-ABLE POWER SUPPLY CORD, designed to be INSTALLED, OPER-ATED and MAINTAINED by SERVICE PERSONNEL ONLY. [persons having appropriate technical training and experience necessary to be aware of hazards to which they are exposed in performing a task and of measures to minimise the danger to themselves or other persons].

The equipment SYSTEM III is designed to be installed in RESTRICTED ACCESS LOCATIONS within an environment that pro-vides the Pollution Degree max 2 and OVERVOLTAGES CATEGORY II - NONHAZARDOUS LOCATIONS, INDOOR ONLY.

The POWER SUPPLY CORD serves as a means of disconnection from the MAINS. The OUTLET used to power the equipment shall be installed near the equipment and shall be easily accessible. The equipment must be connected to a socket-outlet with a protective earthing connection! The INSTALLATION of the SYSTEM III equip-ment must provide a reliable earth connection and it shall respect the local electrical wiring regulations.

IMPORTANT:

IT IS THE RESPONSIBILITY OF THE INSTALLER TO ENSURE THAT THE SYSTEM III EQUIPMENT IS PROPERLY MOUNTED WITHIN A METALLIC FIRE ENCLOSURE WITH A MINIMUM THICKNESS OF 1.5 MM AND THE FINAL ASSEMBLY IS COMPLIANT WITH ALL OF THE APPLICABLE REQUIREMENTS FROM THE POINT OF VIEW OF THE ACCESSIBILITY TO THE ENERGIZED PARTS (HAZARDOUS VOLTAGES, TNV CIRCUITS, ETC.) AS THESE CHARACTERISTICS ARE DEFINED WITHIN THE EN60950:2000 STANDARD.

THE EXTERNAL ENCLOSURE SHALL MEET ALL OF THE APPLICABLE REQUIREMENTS FROM THE POINT OF VIEW OF PHYSICAL REQUIREMENTS, E.G.: STEADY FORCE 250N, IMPACT AND STABIL-ITY. THE EQUIPMENT MUST BE SECURED TO THE BUILDING STRUCTURE BEFORE OPERATION; ALL WIRING AND INSTALLA-TION SHALL BE IN ACCORDANCE WITH ELECTRICAL CODES ACCEPTABLE TO THE AUTHORITIES THAT HAVE JURISDICTION WHERE THE EQUIPMENT IS INSTALLED, SERVICED AND OPER-ATED.

NOT MORE THAN 3 (THREE) ASSEMBLIES [EACH CONSISTING OF 2 (TWO) SYSTEM III EQUIPMENT] MOUNTED WITHIN THE SAME RACK SHALL BE POWERED FROM THE SAME BRANCH CIRCUIT. USE A DIFFERENT BRANCH CIRCUIT FOR ANY GROUP LARGER THAN 3 (THREE) ASSEMBLIES.

Internal wiring shall be routed in a manner that prevents:

• excessive strain on wire and on terminal connections;

• loosening of terminal connections;

• damage of conductor insulation.

The wireways within the enclosure shall be smooth and free from sharp edges. Wires shall be protected and routed so that they do not come in contact with burrs, cooling fan or heatsinks which could cause damage to the insulation of conductors. Holes in metal shall have smooth well-rounded surfaces or shall be protected with bushings.

The EXTERNAL ENCLOSURE shall be connected to the PROTECTIVE EARTH GROUND. The external cabinet (RACK) must be secured to the building structure before operation in a such a way to fully meet the STABILITY REQUIREMENTS as per EN60950: 2000 conditions.

An adequate MARKING [visible before the door (cover)], NEXT TO THE ACCESS DOOR (or cover) of the rack, with instructions for pro-tection once the DOOR (or covers) IS (are) removed, stating that "telephone cord is to be disconnected prior to opening the door" is an example of an acceptable Marking), and it shall be provided by the Installer.

An acceptable power supply cord (detachable), shall be used accordingly to the local outlets and voltages. IT IS THE INSTALLER'S RESPONSIBILITY TO PROVIDE AN APPROPRIATE ACCEPTABLE POWER SUPPLY CORD.

CAUTION:

This product uses Lithium Batteries. Improper handling of lithium batteries may result in HEAT GENERATION, EXPLOSION or FIRE, which may lead to personal injuries.

Please ensure that the above precautions are strictly observed by the related divisions including but not limited to sales, service, cus-tomers and (or) outside contractors.

THE EQUIPMENT SYSTEM III IS EQUIPPED WITH LITHIUM NON REPLACEABLE BATTERY. DO NOT ATTEMPT TO REPLACE THE BAT-TERIES.

CONNECTION TO THE MAINS

1. Connect first the DETACHABLE POWER SUPPLY CORD to the IEC 320 connector located on SYSTEM III equipment.

2. Connect all the telecommunications cord-sets to the appropri-ate connectors.

3. Be sure that the enclosure of the equipment SYSTEM III is fully installed (covers, doors, etc.) in a such a way that HAZARDOUS VOLTAGES and TNV Circuits will not be ACCESSIBLE when the equipment will be connected to the MAINS and/or TELECOM-MUNICATION NETWORK.

ATTENTION: THE INTERNAL POWER SUPPLIES ARE NOT SWAPPA-BLE! DISCONNECT POWER BEFORE ATTEMPTING TO CHANGE A POWER SUPPLY!

In order to change the INTERNAL Power Supply, first DISCONNECT the DETACHABLE POWER SUPPLY CORD from the socket outlet used to provide power, and then, from the IEC320 Connector which is mounted on the SYSTEM III equipment. Wait minimum 5 seconds to allow the Capacitor (C8) within the unit to discharge. IF THE FUSE IS SUSPECTED OF HAVING OPENED, a discharge path for the involved Capacitor (C8) shall be provided.

Do not touch the HEATSINKS within the equipment: these are LIVE PARTS and/or may present a hazard related to high temperatures. In order to swap the boards USE THE PROVIDED PLASTIC HAN-DLES (INSERTERS, EXTRACTORS).

NO REPAIRS IN THE FIELD ARE ALLOWED. THE EQUIPMENT SYSTEM III MUST BE RETURNED TO THE MANUFACTURER FOR REPAIRS.

Section 1 - Introduction

The System III is a multi-platform digital telephone receiver intended for remote monitoring of commercial fire and burglary systems.

The System III can monitor up to 24 telephone lines; receive and process alarm data in up to 64 pre-programmed formats (profiles) per line card.

The System III real time clock and calendar stamps all received alarm data which is then transmitted to a central station computer via TCP/IP or RS-232 port; transmitted directly to a printer using the parallel printer port; and viewed on the 1/4 VGA LCD on the front panel. System configuration and phone line profiles can be programmed using a PC with System III Console Software or locally using the scroll buttons and LCD. Each rack can house up to 12 DRL3 cards. Each telephone line is monitored by a DRL3 line card.

1.1 System Overview
- Patented Caller Identification (Call Display) capability
- Patent pending AHS (Automatic Handshake selection)
- Patented virtual configurations
- Non-volatile RAM on each DRL3 line card for programming and event buffer
- Flash download for software upgrades for the DRL3 line cards and the CPM3
- DSP technology (patent pending)
- Up to 64 different options set (profiles per line card)
- Up to 8 different handshakes per profile
- Large, easy to read LCD (Liquid Crystal Display)
- All modules function individually to help ensure uninterrupted operation during hardware or software upgrades
- All cards are **Hot Swappable**. Printed circuit cards can be removed and replaced without removing power from the system or compromising the system performance
- 24 lines maximum per redundant receiver

- 256-event memory buffer on each individual line card
- Real-time clock
- One parallel printer port, two serial RS-232 ports and 10/100BaseT connection per rack
- Operator Acknowledge
- Programmable serial ports configuration
- Continuous verification of the computer-receiver links with the 'heartbeat' function
- Fast transmission of multiple alarms to the computer and printer to ensure operator's quick response
- Telephone Line supervision
- Rack mount in standard 19 inch rack
  For UL listed installations use MLR2-CL, MLR2-CM, IMRAK 1400 or other equivalent listed enclosure.

1.2 Approvals

1.2.1 Industry Approvals
The System III is listed under the following UL standards:
- UL 864 Control Units for Fire-Protective Signaling Systems
- UL 1610 Central Station Burglar Alarm Units

This equipment should be installed in accordance with the requirements of NFPA72, NFPA70, UL827 and the authority having jurisdiction.

1.2.2 UL Manual Mode
For UL manual mode, each event will activate the internal buzzer to be acknowledged manually. Each event will also be sent automatically to the connected printer.

For Central Station applications, the signaling performance of each DACT (Digital Alarm Communication Transmitter) shall be manually tracked. Failure to receive a signal from a DACT over 24 hour period shall be handled as a trouble signal.

Figure 1-1, System III
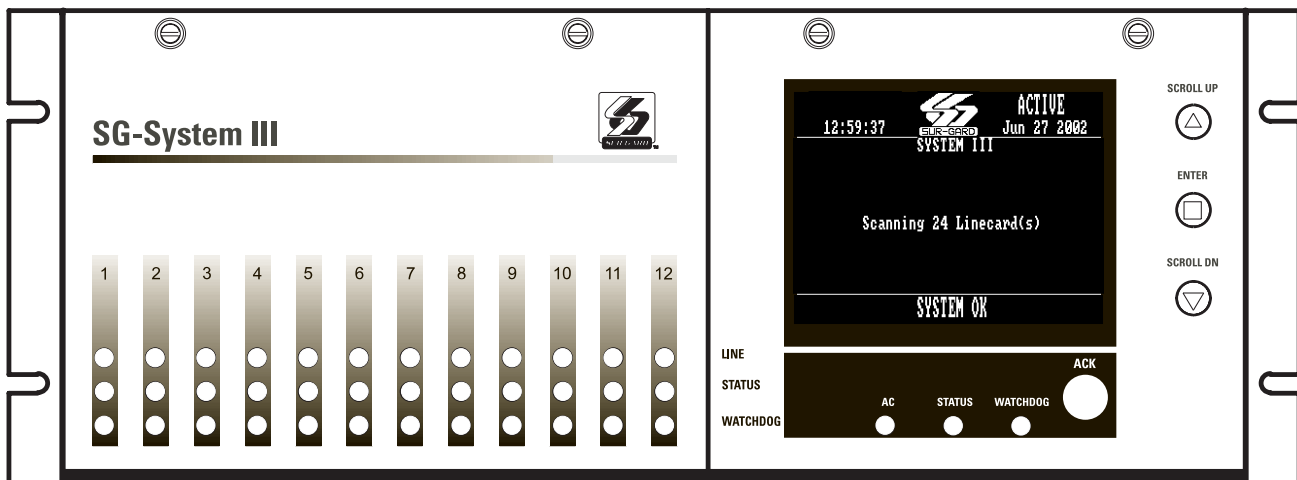
1.3 Description (Hardware)

- **Basic Configuration:** The basic configuration consists of one 19" rack mounted chassis comprising the following:
- **BP3 Backplane** provides interconnection of modules and communications interface
- **CPM3 Module** contains the CPU that controls all communication to and from up to 24 line receiver modules, printers, including 2 serial ports and an Ethernet connection.
- **PSU3 Power Supply Unit** provides power to all modules of the system.
- **DRL3 Line Card:** Each DRL3 line card monitors one telephone line. Stores on the card up to 64 profiles for data management including 8 different handshaking protocols. Each card has a 256-event buffer, for short term retention of signals.
- **DC/DC3** provides 5 VDC power output required for the DRL3 line cards. A slot exists for a second DC/DC3 voltage converter. In the event of a failure, the redundant DC/DC3 can be removed/replaced without powering down the unit.
- **PSC3** (Power Supply Controller) monitors the states of the power and fan for each MLRF3.
- **MLRF3:** The metal rack of the System III that incorporates the LCD and BP3.

1.3.1 BP3 Backplane

The BP3 provides for interconnection of system modules and racks; and provides communication outputs as indicated in figure 1-6.

1.3.2 DC/DC-3 5V Power Converter

Each DC/DC3 converts 15VDC input from the PSU3 module and outputs the 5VDC required for all modules to function. A slot is provided for a second DC/DC3 power supply to provide full redundancy for 5VDC power requirements. Power will remain ON if there are two DC/DC3 in the rack. The DC/DC3 is also **Hot Swappable** if a working redundant DC/DC3 is in the same rack.

Figure 1-2

DRL3 Line Card (12 cards per rack)   CPM3   PSC3   DC/DC3 B   DC/DC3 A

Line Card Debug Output   PSU3   LCD   UIB3
Fan (not shown) located above PSU3
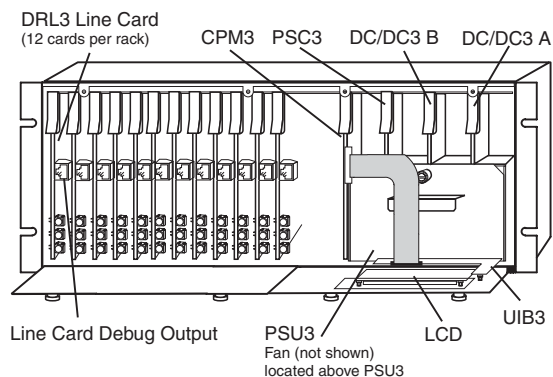
1.3.3 PSU3 Power Supply Unit

The PSU3 is the System III power supply. The System III requires a 120VAC/60Hz input power source. A power cord with a IEC connector is required. The model System III CE requires a 240VAC, 50Hz input power source.

NOTE: *For UL installations use only 120VAC/60Hz to power the SYSTEM III.*
For UL installations use UL listed UPS Power Supply for protective signaling systems and/or listed burglar alarm power supply, as applicable.
The model System III CE is not UL Listed.

Electrical Specifications:

System III

- Input voltage range: 120 VAC
- Frequency: 60 Hz
- Input current: 2.5A max (RMS) @120 VAC

In 2-rack configurations a redundant PSU3 can be inserted in the second shelf. In the event of a PSU3 failure, the redundant PSU3 automatically assumes operation. These modules are **Hot Swappable** (can be removed/replaced while the system is in operation) if a working redundant PSU3 is installed.

1.3.4 PSC3 Power Supply Controller

The PSC3 performs two functions. It provides the high voltage required for backlighting to the LCD display. It also monitors the activity of the PSU3, DC/DC3 power supplies and the power supply fan, and reports their status to the CPM3 module.

1.3.5 CPM3 Central Processing Module

The CPM3 Central Processing Module collects system information and directs line card information to the appropriate outputs. Along with it's built in scroll buttons and large LCD message screen, the CPM3 features TCP/IP, parallel printer and two serial RS-232 ports for computer interface capability. 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 and TCP/IP port can be monitored by the supervisory heartbeat test transmissions.

1.3.6 DRL3 Line Card

The System III supports a maximum of 24 line cards. Each DRL3 line card can monitor one telephone line and act independently of the CPM3 module. Each module is equipped with a 256-event non-volatile memory to record events and corresponding telephone numbers. Calling source (Caller ID, ANI and calling name) capability is built-in and telephone numbers can be printed out, sent to automation and stored in memory. Events and information stored in memory may be printed at any time. Each line card also features flash downloads through Ethernet or serial port for fast software upgrades.

The DRL3 receives ANI (Automatic Number Identification) and/or DNIS (Dialed Number Identification Service) via the Telco connection. This information allows the Sur-Gard expert format identification system to change options on the fly for each received call. This eliminates dedicated line pool hardware. The DNIS information is used in a look-up table, which sets up virtual line pools to identify security formats and extend account numbers. Standard dialed number identification is supported up to 10 digits. Each dialed number would have formerly been a line pool on conventional line cards.

1.3.7 BP3X Interface Module
(optional - one required per rack)

This 19" Rack mounted panel interfaces with the System III Telco connector to provide 24 RJ-11 connectors for direct connection to telephone lines.

NOTE: On the BPX3 the B ports are the channels used for two-way audio or back-up telephone line.

Figure 1-3   Front
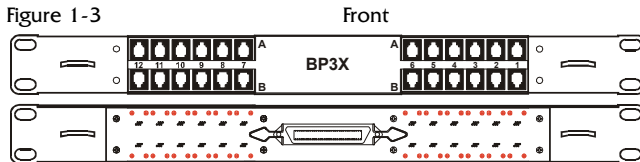
- **Parallel Printer**: A standard parallel printer output is located on the back of the CPM3.

  For UL Listed applications, the following UL listed printers can be used with the System III:
  - Sur-Gard CPU-1150   - DMP SCS-PTR
  - Sur-Gard CPU DMP-206   - Seiko DPU-414

- **Serial Printer**: A standard serial printer output is located on the back of the CPM3.

  For UL Listed applications, the following UL listed printers can be used with the System III: Seiko DPU-414

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

NOTE: Non-printable characters are replaced by a square on the print out. Ensure that the printer is configured for 80 columns (System III only supports 80 columns).

- **Connections for Redundant System III:** Refer to Figure 1-6 System III Redundancy Wiring Diagram.
- **CPM3 Debug Output:** Connect the RJ-45 end of the debug cable to the debug output jack.
  Connect the female DB-9 connector to the serial port of a computer (COM1 port - usually DB-9 male).

Figure 1-4 CPM3 Debug Cable
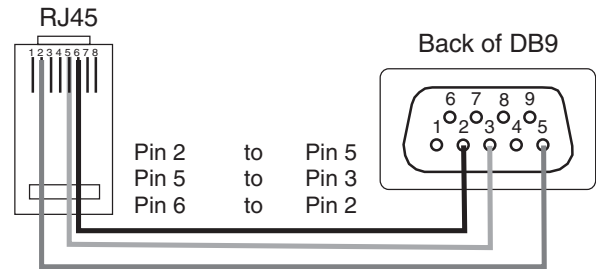
- **DRL3 Debug Output (not shown):** Connect the RJ-45 end of the debug cable to the debug output jack on the front of the line card. Connect the female DB-9 connector to the serial port of a computer (COM1 port - usually DB-9 male).

Figure 1-5 DRL3 Debug Cable
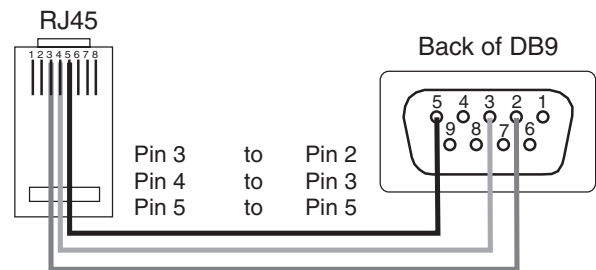
- **IEC Power Connector:** Provides local power line connection (cable is not supplied).

Figure 1-6, System III Wiring Diagram

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WARNING! *To reduce the risk of electric shock the product is provided with a grounding type power supply IEC recepticle. Connect product using an appropriate IEC cable to a grounded receptable.*

- **RS-232 Serial Automation Output:** Provides serial connection to a local computer running automation software. A straight through serial cable must be used.
- **RS-232 Serial Printer Output:** Provides serial connection to a local computer or serial printer.
- **25 Pair Telco Connection:** Connects directly to the local PBX or to BP3X-3 (Refer to Appendix C for pinouts).

- **Ethernet Output 10/100 BaseT:** Traditional automation communication is provided via port 1025 on the Ethernet connection. This primary port is a Sur-Gard standard output and provides Sur-Gard standard automation protocol output. All or a number of virtual receiver types can be mapped to the Sur-Gard output.

Figure 1-8, System III Redundancy Wiring Diagram

All circuits are power limited

Shelf 1

Shelf 2

Use only the cables provided in the System III Interconnect Pack. Failure to do so may result in damage to the unit. Using the provided RJ-45 patch cables connect the Output of the primary System III (shelf address 1) to the Input of the redundant system III (shelf address 2). Connect the Output of the redundant System III to the Input of the primary System III.

Use a small flat screw driver to turn the shelf address switch to 2 on the second redundant System III.

Figure 1-9, System III UPS Supervision Connection Diagram

SG-System III Backplane

For UL installations use UL listed UPS (uninterrupted power supply) power supply for protective-signaling systems and/or listed burglar alarm power supply, as applicable.

12VDC, 25mA

In2
In1
COM

IEC Power Connector

For UL Installation of model SG-System III: UPS Output 120VAC/60Hz, 2.5A
For model System III CE (not UL Listed): UPS Output 240VAC/50Hz

AC Out

Common

UPS LOW BAT Normally Closed

UPS AC TROUBLE Normally Closed

UPS

EGND

AC In

Note:
UPS connection is to be made using dry contact connections provided by the UPS.

For UL Installation of model SG-System III: UPS Output 120VAC/60Hz, 2.5A
For model System III CE (not UL Listed): UPS Output 240VAC/50Hz

WARNING:

To reduce the risk of electric shock the product is provided with a grounding type power supply IEC receptacle. Connect product using an appropriate IEC cable to a grounded receptacle.

1.4 Receiver Setup and Operation

DSC recommends testing the receiver before actual installation. Becoming familiar with the connections and setup of the unit on the workbench will make final installation more straightforward.

The following items are required:

- IEC power supply cord
- One telephone line
- One or more dialer or digital control panel(s)

1. Unpack the components for the System III.

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

2. Unscrew the front thumb screws and open the front plates.

NOTE: *Before inserting the CPM3 connect the ribbon cable from the UIB3 board. Before inserting the PSC3 connect the LCD backlight.*

3. Insert all the cards in the rack, in their appropriate position (refer to figure 1-2). Connect the ribbon cable of the front panel to the CPM3 before inserting it. Connect the backlight power connection to the PSC3 then insert the PSC3.
4. Insert the PSU3 into the rack and fasten it properly.
5. Connect a telephone line to the proper line.
6. Connect the main power using a standard computer IEC cable (not supplied).
7. The LCD will power up and display internal troubles (printer, computer, telephone line fault). The DRL3 that has the telephone line connected to it will have its red LED off. If the LED is always on make sure the telephone line is connected to the right port.

NOTE: *Internal diagnostics may require more than one minute during the power up sequence.*

8. Send a signal from a control panel to the receiver. The signal will be displayed on the LCD. Press the [ACK] button to silence the buzzer and clear the signal from the LCD.

1.5 Description (Operation)

1.5.1 Operation with Default Programming

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

- Answers incoming calls on the first ring
- Sends the following handshake order

1	2300 Hz
2	1400 Hz
3	Dual-tone
4	SIA FSK
5	ITI, Modem IIE/IIIa2
6	Modem II

- Receives all communication formats, except for 3/2, 3/1 checksum, SKFSK, 4/2 extended, and 4/2 checksum (see Option 95).
- The above formats can be manually selected
- Signals can be displayed on the debug output computer as they are received. The signals are then sent

to the printer and computer connected to serial port COM1 or to the 10/100BaseT connector. The default event codes described in the **DRL3 Library Decoding and Event Codes Table** will be used with the Sur-Gard automation communication protocol to send signals to the computer, if connected.

- If a computer is not connected press the [ACK] button on the CPM3 to silence the buzzer and to clear the alarm(s) from the LCD display.

1.5.2 Virtual Connectivity

Each receiver has one static IP address and a number of associated ports. Internal socket programming uses specific ports for expected tasks. The configuration management, done from the Console Software, is located on port 1024. The System III Console software is provided for Windows 98/ME/NT/2000/XP, which provides a graphical style menu for configuration management. Additional features are available with the Console software including storage of virtual receiver setups and configuration wizards.

NOTE: *For Windows NT, user must be logged in as Administrator or with administrator rights for proper use of the Console Software.*

1.5.3 Status Addressing

Line card status is reported via physical addressing. Shelf and slot number are assigned automatically to each line card. All device status information is in Sur-Gard format. The reporting of status on this port, automation output and printer will relate to physical addressing.

1.5.4 Automation Input/Output (Port 1025)

Traditional automation communication is provided via port 1025 on the Ethernet connection. This primary port is a Sur-Gard standard output and provides Sur-Gard standard automation output.

1.5.5 Compatibility

Central station automation software packages such as:

- MAS • DICE • SIMS II • GENESYS
- S.I.S. • IBS • MicroKey

support the System III Sur-Gard interface. Refer to automation software specifications for compatibility.

NOTE: *Automation connections are considered supplementary per UL864 Listing. Compatibility with the automation software in a system used at a central station is intended to be handled under a separate UL1981 software and/or site certification evaluation.*

1.5.6 Automation Protocols

The System III receiver sends a variety of protocols to report signals to the central station computer via a TCP/IP and/or RS-232 port. A complete list of protocols can be provided upon request.

1.5.7 Data Byte Protocol

The System III receiver uses a default configuration of 9600 Baud rate, 1-start bit, 8-data bits, 0-parity bits and 1-stop bit structure, to transmit and receive signals on the RS-232 port. This protocol can be programmed on the receiver to enable different configurations.

1.5.8 Acknowledgment of the Signal

The System III receiver requires an acknowledgment signal [ACK] (Hex 06) from the computer software within 4 seconds for each message sent. Failure to receive the [ACK] will result in 3 retransmissions of the signal before indicating a communication failure. During a communication failure the System III receiver will cease transmitting except for the heartbeat. The same thing happens if the receiver receives a [NAK] (Hex 15). In case of communication failure with the computer, the System III receiver can store up to 256 events per line card in the line card internal memory. Communication is resumed when the first acknowledgment is received on the heartbeat; all buffered information is then transmitted.

1.5.9 COM Responses

When the CPM3 sends an event to the computer, it checks for 3 responses: ACK, NAK or Unknown/No Response. An ACK tells the CPM3 the computer automation got the event successfully. A NAK tells the CPM3 the computer automation got the message but didn't understand it. The line card will attempt to send the messages 25 times. If after 25 attempts it continually gets a NAK from the computer automation, the DRL3 will generate an internal communication error. After 20 NAKs the CPM3 will send an internal communication error event to the printer. Any other response from the computer automation, including no response will cause the CPM3 to attempt to send the message again, up to 4 times. If after 4 attempts the CPM3 gets no response or an unknown response, it will assume nothing is connected and generate an alarm.

1.5.10 Automation Absent

When the computer is not responding to transmissions, the CPM3 will generate a 'SG-Serialx fail' or 'SG-TCP/IPx Fail' trouble. When a trouble occurs, the CPM3 will continue to attempt to send a heartbeat signal to the computer until it gets a response. The System III receiver will make 4 attempts, then wait for the next heartbeat period before making another 4 attempts. The typical heartbeat interval is 30 seconds.

Supervisory Heartbeat Signal Protocol (1)	
	100000ssssssssssss@ssss[DC4]
00000	Receiver number (Real programmed number. Never virtual).
s	Space Character.
@	Supervisory Signal.
[DC4]	Terminator, 14 Hex

This signal is used to supervise the communication between the receiver and computer automation. It is sent to the computer automation every 30 seconds and is programmable from the receiver. The computer automation should acknowledge this signal with an [ACK]. The CPM3 can be programmed to send a heartbeat signal to the computer automation once every 01-99 seconds to test the connection between the CPM3 and the computer automation (30 seconds is recommended). If a heartbeat fails to get a response from the computer automation, the CPM3 will immediately transmit the heartbeat again, up to 4 attempts. The SG-System III, by default, will output the automation signals via TCP/IP. If TCP/IP fails it will switch to the Serial Automation output.

If the serial output fails, the CPM3 will switch to manual mode, all signals will be displayed on the LCD and will require a manual acknowledgement. To re-establish connection with the TCP/IP a reset SG fallback command must be generated from the Console software. If the line card buffers are full, the line cards will stop answering calls.

1.5.11 System III SIA Internal Status Output

0	0RRLLL[#0000|NYYZZZZ
	Protocol ID
RR	Receiver number of the CPM3
LLL	Line card number, 000 signifies a CPM3 Event.
0000	System III account.
NYYZZ	SIA Event
[DC4]	Terminator, 14 Hex

Refer to "CPM3 Internal Status Messages" on page 33.

Section 2 - CPM3 Operating Modes

2.1 Contrast Adjust

To adjust the contrast press the Up and Enter buttons together to increase the contrast or press Scroll Down and Enter together to decrease the contrast. This operation can be done at any time after the power up sequence.

2.2 Active Mode

In active mode, the primary connection to the computer is via TCP/IP networking on the 10/100 BaseT Ethernet connection for the automation computer. If this fails, then the output will go via serial RS-232. A command can then be sent through the System III Console software to revert back to TCP/IP when the connection is restored.

Figure 2-1, Active Mode
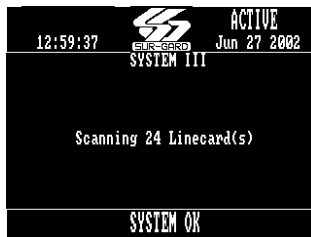
2.3 Manual Mode

For manual mode, each event will activate the internal buzzer to be acknowledged manually. Each event will be sent automatically to the connected printer and displayed on the CPM3 LCD. Once the signal is acknowledged, it will be cleared from the screen.

Figure 2-2, Manual Mode
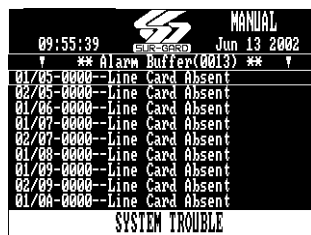
NOTE: *The CPM3 will display a maximum of 5000 events which have not been acknowledged.*

2.4 Standby Mode

When two CPM3s are present, one CPM3 will be in active or manual mode, and the other CPM3 will be in standby. If the active CPM3 fails, the standby unit will automatically take over the control of the system.

Figure 2-3, Standby Mode
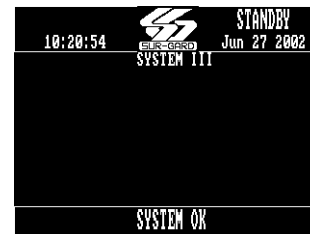
2.5 System Trouble

When a trouble is present on the System III, the message 'SYSTEM TROUBLE' will be displayed at the bottom of the screen.

- To view which trouble is present, press the SCROLL UP and SCROLL DN buttons simultaneously. (All signal must be acknowledged before this is available.)
- To return to the main screen, press the SCROLL UP and SCROLL DN buttons simultaneously, or wait for timeout before this is available.

System Troubles are displayed as shown in Figure 2-4:

Figure 2-4, System Troubles

Section 3 - DRL3 Operating Modes

3.1 DRL3 Standby Mode

After start-up the line card enters the Standby mode and monitors the telephone line and the CPM3. Depending on the system's status, the following conditions will be displayed for each line card:

LED	ON	OFF	FLASH-ING
LINE (Red)	Line Fault	Line Normal	N/A
STATUS (Yellow)	On-line	Off-line	*Error condition
WATCH-DOG (Blue)	Line Card not functional		Line Card functional

*   The number of flashes on the yellow LED indicates the following errors:
1. CPM absent
2. Line card clock not set
3. EBUS command to disable the line card was sent.
4. Printer or computer buffer full.
5. Checksum failed when downloading Flash ROM files.

3.2 Line Fault

The DRL3 verifies the telephone line voltage. The 'Line Fault' LED will come ON when the voltage drops below 12VDC.

Printer:

```
Jul  17  1998-08:08:28-SS/OO-SG-RR-LLL-0000-
PHONE LINE TROUBLE
```

Computer:

```
0RRLLL[#0000¦NLTSSOO][DC4]
```

A hexadecimal number from 01 to 0C representing the slot number of the line card will be sent for each '00' shown above.

A hexadecimal number from 01 to 02 representing the shelf number of the line card will be sent for each 'SS' shown above.

When the line condition returns to normal, the 'Line Fault' LED will be shut OFF. The following information will be transmitted to the printer and computer:

Printer:

```
Jul  17  1998-08:08:35-SS/OO-SG-RR-LLL-0000-
PHONE LINE RESTORE
```

Computer:

```
0RRLLL[#0000¦NLRSSOO][DC4]
```

NOTE: *Additional line fault operation if Backup Line option is enabled. See Backup Line option (Option 0E) for explanation.*

3.3 CPM3 Error

If the DRL3 cannot detect the CPM3 polling, the DRL3 will start buffering incoming calls. Up to 256 alarm messages for the printer and computer will be retained in the DRL3 event buffer. When the event buffer is full, the line card will stop answering the calls and the status LED will begin flashing. When the CPM3 Error condition is corrected, the alarm messages in the event buffer will be transmitted to the CPM3 with the corresponding time/date the alarm has been received.

3.4 Data Reception

During data reception, the yellow STATUS LED will turn on. The DRL3 decodes all information received and stores the information in its Event Buffer. When a valid signal is received, the DRL3 sends a kiss-off signal and transmits the decoded alarm signal to the computer and to the printer through the CPM3. The DRL3 will send each message it receives to the printer for review by the system operator. Two messages may be sent to the printer to indicate reception problems: the 'Fault Data' (Invalid Report) and 'Fault Call' (Communication Fail).

3.4.1 Fault Data Message

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

Printer:

```
Jun  25  1998-11:18:07-SS/OO-SG-12-234-0000-
INVALID REPORT
```

Computer:

```
012234[#0000¦NYNSSOO][DC4]
```

This output for account code '0000' indicates that data has been received, but is not valid (for example, there are unmatched rounds or incorrect parity).

3.4.2 Fault Call Message

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

Printer:

```
Jun  25  1998-11:18:07-SS/OO-SG-12-234-0000-
COMMUNICATION FAIL
```

Computer:

```
012234[#0000¦NYCSSOO] [DC4]
```

This output indicates 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's handshakes.

Computer message NACKed 25 consecutive times.

Printer message: Internal Comm. Error

Computer signal: RRLLL[#0000¦NRTSSOO][DC4]

Section 4 - Programming/Operation

4.1 Introduction

The System III can be programmed manually using the front panel; from a local computer using the Debug Output located on each line card behind the front panel; or remotely using the TCP/IP network and System III Console software. The Debug output is intended as a testing and troubleshooting tool. Manual programming allows the user to program all of the System III options for remote and local operation. Manual programming does not support the grouping of line cards into hunt groups or line pools.

4.2 System III Console Software

The System III Console software is intended to be the primary method of programming the system, refer to the **System III Console User Manual** for details.

4.3 Debug Programming

The debug output is another method of accessing the line card's programmed options and diagnostics features. A debug cable is required to connect by serial communication from the line card to a standard PC running Windows 95 or higher software.

NOTE: *Debug programming only affects options in profile "0".*
ALL PROGRAMMING WITH THE DEBUG SETUP IS LOST WHEN THE SYSTEM IS POWERED DOWN OR WHEN LINE CARDS ARE REBOOTED OR REMOVED FROM THE RACK.

4.3.1 Debug Cable Connectivity

- Connect the RJ-45 end of the debug cable to the debug jack on the front of the line card.
- Connect the female DB-9 connector to the serial port of a computer.

4.3.2 Debug Software Setup

- Using Windows 95 or higher, point and click on the ⊞Start button.
- Then select **Programs ▸ Accessories ▸ Communications ▸ HyperTerminal**. Once in the HyperTerminal window, point and click on the '**Hypertrm.exe**' icon.
- A connection description window should appear. A prompt should appear on the 'Name' category. Type a name. Point and click on the 'OK' button.
- A phone number window should appear. Choose the direct to COM port required for connection and point and click on 'OK'.

Figure 4-1
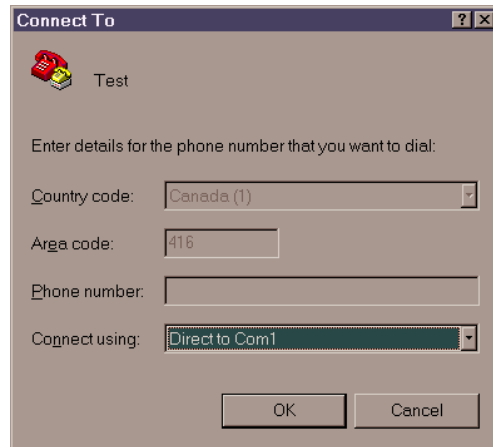
- The COMx properties windows should appear. The configuration should be:

Bits per second:	19200
Data bits:	8
Parity:	None
Stop bits:	1
Flow control:	None

Figure 4-2
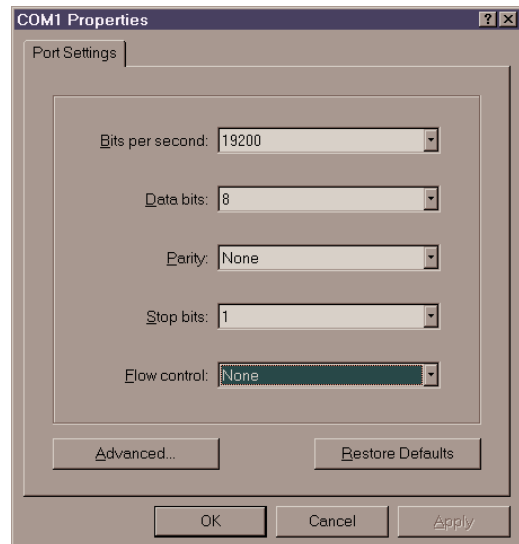
- Click on the 'OK' button after setting the configuration.
- The HyperTerminal window should appear. Press any key. The debug menu will be displayed.

Keyboard Commands

- The $\boxed{^{\text{p}}}$ key will initiate the download of a file to the line card.
- The $\boxed{^{\text{o}}}$ key will enable the user to dump the current programmed options of the line card or set an option to a particular value.

4.3.3 Downloading Steps

1. Press the ⌂ key to initiate downloading of the binary file. The HyperTerminal will display:
   Ready to download.
   CCCC
2. Point and click on 'Transfer' on the HyperTerminal menu and access the 'Send File' category. The 'Send File' window should appear.

Figure 4-3
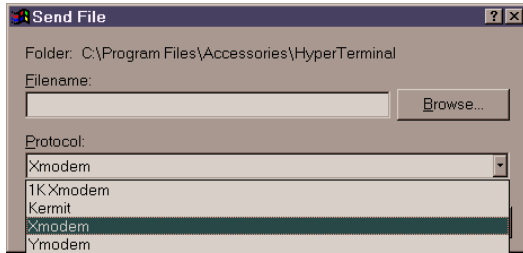
3. Change the protocol to 'X-modem' and place the correct path and file name of the binary file to be downloaded.
4. Point and click on the [Send] button and the downloading status window should appear. The line card will restart automatically after a successful download.

4.4 Manual Programming

The user interface consists of 3 buttons: the Scroll Up button, the Scroll Down button, and the Enter button. These buttons are used to access the programming of the line cards and the CPM3, and to view alarm and trouble messages in manual mode. They are located on the right side of the screen.

Figure 4-4

The Configuration mode allows programming of the various features and options available on the System III. To enter the Configuration mode, press the [Enter] button; the following screen will be displayed.

Enter the Master Access Code using the buttons; the default Master Access Code is "CAFE" to change the default Master Access Code.

When the access code is entered, the screen will display the Configuration Menu.

Figure 4-5, Configuration Menu
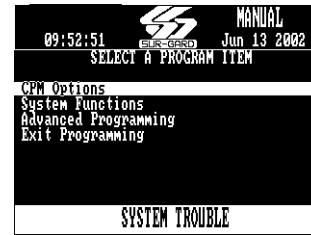
CPM Options allow the user to customize the operation of the system TCP/IP addressing, Passwords, COM settings and other system functions are programmable here. Refer to the description of all CPM options and their default settings.

4.4.1 Advanced Programming

The advanced programming menu allows the user to change the options of a specific profile and line card.
The CPM3 will prompt the user to enter the line card number, the profile number, and the option number.
When all the information is entered (the line card number, the profile number, and the option number), the CPM3 will move to the option value segment and display the current value of the option. The user can change the value by pressing the up or down key. After the changing the value, the CPM3 will display the following:
Line card Menu
0   Go to next Line card number
1   Go to next profile number
2   Go to next option number
3   Save
The user can change multiple profiles and options per line card. After all the modifications to options and profile are made, the user must Save in order for the changes to take effect for each line card.
To exit from the menu, the user must press the Scroll Up and Scroll Down keys simultaneously.

NOTE: *The line card will need to be reset in order for the options to take effect.*

Programming Line Card Options:
• Cold boot Line Card
   Resets the selected line card to the factory defaults. This will also clear all the internal buffers.

Figure 4-6, Advanced Programming Menu
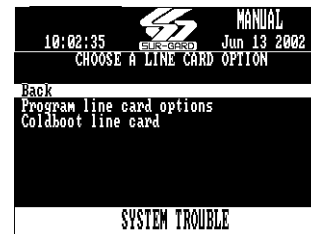
4.4.2 System functions
- Reset the CPM3
  Restarts the CPM3. This is required to make the changes to some options effective. For example, the IP address.
- Date and Time
  To set the date and time of the System III. This can also be done from the Console software.

Figure 4-7. System Function Menu
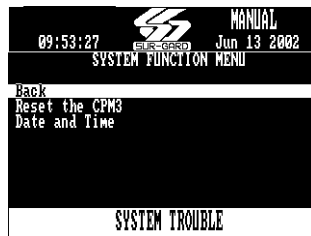
Advanced Programming allows the user to customize line card profiles.

4.5 CPM3 Options

Option [01]: IP Address - Default [10.0.7.100]

Enter the IP Address of the CPM3. Ensure that the IP address programmed is unique to the CPM3.
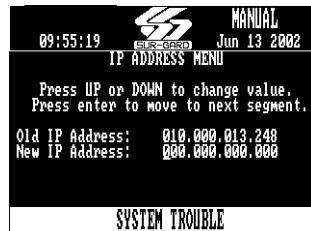
Option [02]: Subnet Mask Address -
Default [255.255.0.0]

Enter the Subnet Mask Address of the CPM3.

Option [03]: Gateway Address - Default [0.0.0.0]

Enter the Gateway Address of the CPM3 if required.

Option [04]: Language - Default [0] (Future Use)

Determines what language the CPM3 interface displays. This does not affect automation or printer outputs.

Option [05]: Contrast Adjust - Default N/A

Allows the contrast of the message display screen to be adjusted. Press the up or down button to adjust. The contrast can also be adjusted from the main screen by holding the up and enter buttons simultaneously to increase the level, or by holding the enter and down buttons simultaneously to decrease the level.

Option [06]: Password Menu - Default [CAFE]

Allows the System III users and passwords to be erased or changed. Sixteen users with 4-digit passwords are available for use on the System III. User 0 is the Master user, and users 1 through F may be
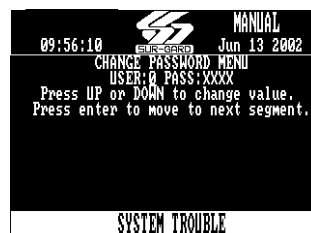
assigned to individual operators. The Master user will provide access to all menus, while the operators will not have access to the CPM3 settings. To erase a user, program the password for that user to 'FFFF'.

NOTE: User "0" cannot be erased.

Option [07]: COM1 Baud Rate - Default [9600]

Determines the baud rate at which the CPM3 will communicate to the automation software via serial port 1.

1200	9600
2400	19200
4800	38400

Option [08]: COM1 Data Bits - Default [8]

Determines the number of data bits used to communicate to the Automation Software connected on the serial port 1. Choose a number from 7 through 9 to indicate 7, 8, or 9 data bits.

Option [09]: Parity - Default [0]

Determines the parity of the serial port 1.
0: no parity (default)
1: odd parity
2: even parity

NOTE: The number of stop bits can not be changed and will always be 2.

Option [0A]: COM2 Format - Default [0]

This option affects how the COM2 Serial Port is supervised and how the data is formatted.
To disable the option set to [0].
To enable the printer messages to be outputted to a serial printer via the COM2 set to [1].
To enable the printer messages to be outputted to a computer via the COM2 port set to [2].
To enable SCADA interface through the COM2 set [3]. This setting is for FUTURE USE.

Option [0B]: COM2 Baud Rate - Default [9600]

Determines the baud rate at which the CPM3 will communicate to the Automation Software connected on the serial port 2

1200	9600
2400	19200
4800	38400

Option [0C]: COM2 Data Bits - Default [8]

Determines the number of data bits used to communicate to the Automation Software connected on the serial port 2. Choose a number from 7 through 9 to indicate 7, 8, or 9 data bits.

Option [0D]: COM2 Parity - Default [0]

Determines the parity of the serial port 2.
0: no parity (default)
1: odd parity
2: even parity

NOTE: The number of stop bits can not be changed and will always be 2.

Option [0E]: TCP GUI - Default N/A (Future Use)

Option [0F]: B32 Headers - Default [00]

Compatible with MAS B32 Automation Software through TCP/IP. To enable, change to [01].

Option [10]: DNIS Digits - Default [5]

Indicates the number of expected digits in the computer message header from the line card. This must be the same as Option [02] of the line cards +2.

Option [11]: RRLLL Digits - Default [5]

Indicates the number of digits the CPM3 will send in the header to the automation output. This should be left as 5 unless the automation software does not support the MLR2000 or System III output protocol.

NOTE: Ensure that option [02] in the DRL3 line cards is programmed to match this entry. For example, if CPM3 option [0F] is programmed with [04], then DRL3 option [02] must be set to, [02].

Option [12]: Heartbeat Timer - Default [30]

Determines at what time interval, in seconds, the heartbeat transmission will be sent to COM1 and TCP/IP port 1025. The heartbeat transmission is used to ensure that communications through COM1 and TCP/IP are functioning normally. 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.

Option [13]: Mute Buzzer - Default [OFF] (Disabled)

A tone will sound when the System III receives an alarm and is unable to forward the alarm message to COM1 or TCP/IP. The tone may be silenced with this option. If enabled, the buzzer will not sound when an alarm is received and cannot be forwarded to COM1.

Option [14]: Receiver Number - Default [01]

The receiver number is used to identify the receiver when communicating to the TCP/IP Automation, COM1 and the printer. To change the receiver number, enter a new receiver number using the hexadecimal numbers "01" to "FE".

Option [15]: Printer Test - Default [Off]

When this option is enabled, a test signal will be sent to the printer at 05:00 and 17:00 hrs. This option is set to "0" (OFF) by default.
Printer message:
26 Nov 2003 16:41:25 - 26 Nov 2003-16:41:25-00/00-SG -01-000-0000--Printer Test Message

Option [16]: Mask PSU 1- Default [Off]

Some installation may not have the full System III configuration, Option 14 through 1E are used to enable or disable the supervision of the selected components. To not report the trouble, turn the appropriate option ON.

NOTE: PSU 1 is the PSU3 installed in shelf 1

Option [17]: Mask PSU 2- Default [On]

NOTE: PSU 2 is the PSU3 installed in shelf 2

Option [18]: Mask DC A - Default [Off]

DC A is the Right DC/DC3 located on the same shelf as the CPM3 being programmed

Option [19]: Mask DC B- Default [On]

DC B is the Left DC/DC3 located on the same shelf as the CPM3 being programmed.

Option [1A]: Mask DC A2 - Default [On]

DC A2 is the Right DC/DC3 located on the other shelf from the CPM3 being programmed.

Option [1B]: Mask DC B2- Default [On]

DC B is the Left DC/DC3 located on other shelf from the CPM3 being programmed.

Option [1C]: Mask Low Battery 1 - Default [On]

DC/DCB Shelf 1 trouble mask. If set, DC/DCB Shelf 1 trouble conditions are not reported

Option [1D]: Mask Low Battery 2 - Default [On]

DC/DCB Shelf 2 trouble mask. If set, DC/DCB Shelf 2 trouble conditions are not reported.

Option [1E]: Mask Fan 1 Fail - Default [Off]

Fan Shelf 1 trouble mask. If set, Fan Shelf 1 trouble conditions are not reported.

Option [1F]: Mask Fan 2 Fail - Default [On]

Fan Shelf 2 trouble mask. If set, Fan Shelf 2 trouble conditions are not reported.

Option [20]: Mask UPS AC 1 - Default [On]

UPS AC Shelf 1 trouble mask. If set, UPS AC Shelf 1 trouble conditions are not reported.

Option [21]: Mask UPS BAT 1 - Default [On]

UPS Battery Shelf 1 trouble mask. If set, UPS Battery Shelf 1 trouble conditions are not reported.

Option [22]: Mask UPS AC 2 - Default [On]

UPS AC Shelf 2 trouble mask. If set, UPS AC Shelf 2 trouble conditions are not reported.

Option [23]: Mask UPS BAT 2 - Default [On]

UPS Battery Shelf 2 trouble mask. If set, UPS Battery Shelf 2 trouble conditions are not reported.

Option [24]: Mask SG TCP 1 – Default [Off]

SG TCP Shelf 1 trouble mask. If set, SG TCP shelf 1 trouble conditions are not reported.

Option [25]: Mask SG Serial 1 – Default [Off]

SG Serial Automation Shelf 1 trouble mask. If set SG Serial automation shelf 1 trouble conditions are not reported.

Option [26]: Mask SG TCP 2 – Default [On]

SG TCP Shelf 2 trouble mask. If set, SG TCP shelf 2 trouble conditions are not reported.

Option [27]: Mask SG Serial 2 – Default [On]

SG Serial Automation Shelf 2 trouble mask. If set, SG Serial automation shelf 2 trouble conditions are not reported.

Option [28]: Mask TCP 1 Printer - Default [Off]

SG TCP Printer Shelf 1 trouble mask. If set, SG TCP Printer shelf 1 trouble conditions are not reported.

Option [29]: Mask Parallel 1 Printer - Default [Off]

SG Parallel Printer shelf 1 trouble mask. If set, SG Parallel Printer shelf 1 trouble conditions are not reported.

Option [2A]:Mask Serial 1 Printer - Default [Off]

SG Serial printer shelf 1 trouble mask. If set, SG Serial Printer Shelf 1 trouble conditions are not reported.

Option [2B]: Mask TCP 2 Printer - Default [On]

SG TCP Printer Shelf 2 trouble mask. If set, SG TCP Printer Shelf 2 trouble conditions are not reported.

Option [2C]: Mask Parallel 2 Printer - Default [On]

SG Parallel Printer shelf 2 trouble mask. If set, SG Parallel Printer Shelf 2 trouble conditions are not reported.

Option [2D]: Mask Serial 2 Printer - Default [Off]

SG Serial Printer Shelf 2 trouble mask. If set, SG Serial Printer Shelf 2 trouble conditions are not reported.

Option [2E]: Number of Line Cards- Default [12]

Option [1F] is used to set the number of line cards polled by the CPM3. Enter a number from 01 to 24 to indicate how many line cards are to be polled by the CPM3.

Option [2F]: Automation Mode - Default [1] (Fall Back)

The TCP/IP connection is the primary output of the System III for automation computer alarms. It is estimated that sockets may appear and disappear regularly as processes are terminated and reconstituted. After 5 seconds of socket loss, a socket loss is declared and automation output is shifted to the next connection level, which is the serial automation output connection.

First configuration: LOOP (0)

If both outputs are present, the CPM3 will send to the TCP/IP until it fails, proceed to the serial until it fails, proceed back to the TCP/IP until it fails ... and so on. See Automation out flow diagram 1.

Second configuration: FALL BACK (1)

If both outputs are present, the CPM3 will send to the TCP/IP until it fails, proceed to the serial until it fails, and will keep trying on the serial continuously, or until the reset fallback command is generated from the console, in which case it would go back to try the TCP/IP connection. See Automation out flow diagram 2.

Third Configuration: ALL (2)

The CPM3 will always send to all connected outputs. If at least one output replies with a ACK, then the alarm is considered as transmitted regardless if the other output acknowledged it or not. This setting is NOT recommended. See Automation out flow diagram 3.

Fourth Configuration: IP Fall Back Mode (3)

The CPM3 A will send through its TCP/IP output until it fails. If it fails the CPM3 B will sent through its TCP/IP output. If it fails the CPM3 A will send the signals through its serial output. If that fails the CPM3 B will output through its serial output. See Automation out flow diagram 4.

Option [30]: Printer Mode- Default [2]

The printer outputs can be configured in a similar approach as the automation outputs except that the FALLBACK (1) option is not available.

Default Configuration: ALL (2)

NOTES: Order of sequence is TCP, Parallel and finally Serial.

DSC does NOT recommend changing the default setting.

Option [31]: ACK Wait - Default [40]

Determines the acknowledge wait time, in tenths of a second, to be used for automation outputs before the CPM3 will try again if no response is received within this interval.

Enter a decimal number from 40 to 99 for 4.0 seconds to 9.9 seconds.

Option [32] Date Format – Default [0]

Selects the format used to represent date for printer output. Format [1] represents US format is MM/DD/YY . Format [0] International format is DD/MM/YY.

Option [33] Protocol ID – Default [0]

When this option is programmed as '0' the CPM3 will output its internal messages in the following format: 0RRLLL[#AAAA|Nxxyy]

When this option is programmed as 'S' the CPM3 will output its internal messages in the following format: SRRLLL[#AAAA|Nxxyy]

S,0 (zero): protocol number

RR: Receiver number

LLL: Line number

AAAA: Account code, always 0000

Nxxyy: SIA event

Option [34] Time Correct – Default [000]

The CPM3 will synchronize its time with the SG-System III console application PC. However in some situations it may be desirable to automatically correct the time of the CPM3. Valid values are -590 to +590; value represents time in tenths of a second (i.e. 243 means 24.3 seconds).

Option [35] Output Config – Default [Local] (Future Use)

Option [36] CIS Enable – Default [0] (Future Use)

Enable the CIS protocol for automation outputs.

Option [37] RBUS HighSpeed – Default [0]

Sets the speed of the communication from the CPM3 to the to the DRL3s.

NOTE: The option in the DRL3 must be set to the same speed in order for communication to work. All units must have the same speed. Once changed the unit must be reset for the option to take affect.

The CPM3 will update its time once an hour.

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Flow Diagram for **Automation LOOP Mode (0)**
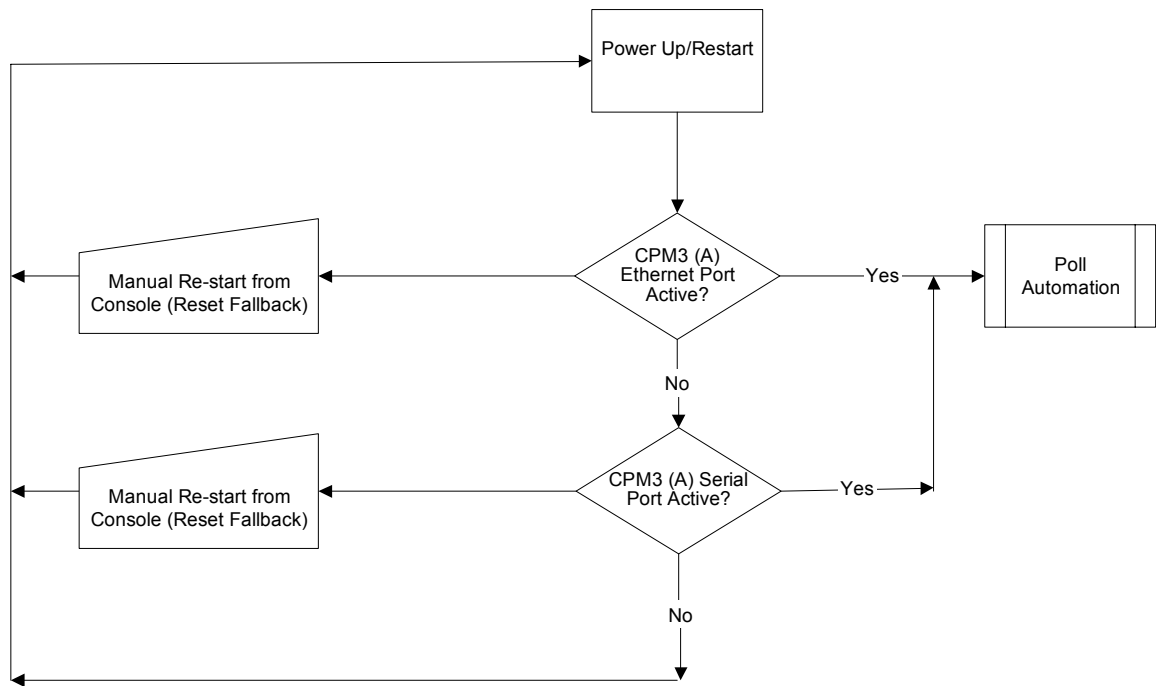
Flow Diagram for **Automation FALL BACK Mode (1)**
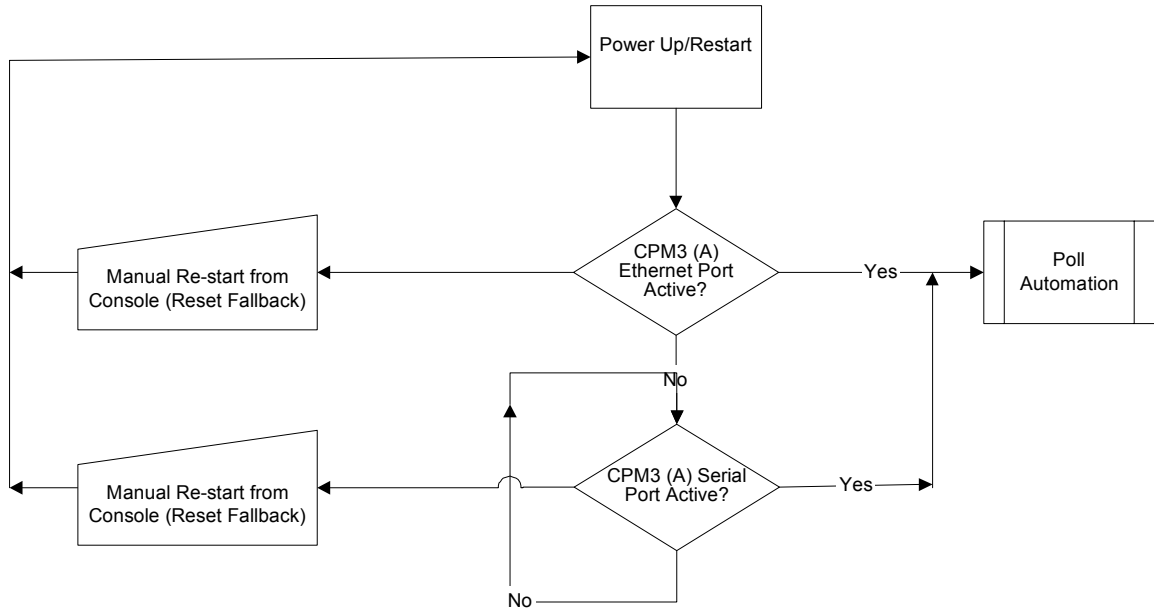
Flow Diagram for **Automation ALL Mode (2)**

```
                    ┌─────────────────┐
          No        │  Power Up/Restart │        No
    ┌───────────────┤                 ├───────────────┐
    │               └────────┬────────┘               │
    │           ┌────────────┴────────────┐           │
    ▼           ▼                         ▼           ▲
  ┌──────────────────┐            ┌──────────────────┐
  │  CPM3 (A) Serial │            │   CPM3 (A)       │
  │   Port Active?   │            │  Ethernet Port   │
  │                  │            │    Active?       │
  └────────┬─────────┘            └────────┬─────────┘
           │                               │
          Yes        ┌─────────────┐      Yes
           └────────▶│    Poll     │◀──────┘
                     │  Automation │
                     └─────────────┘
```
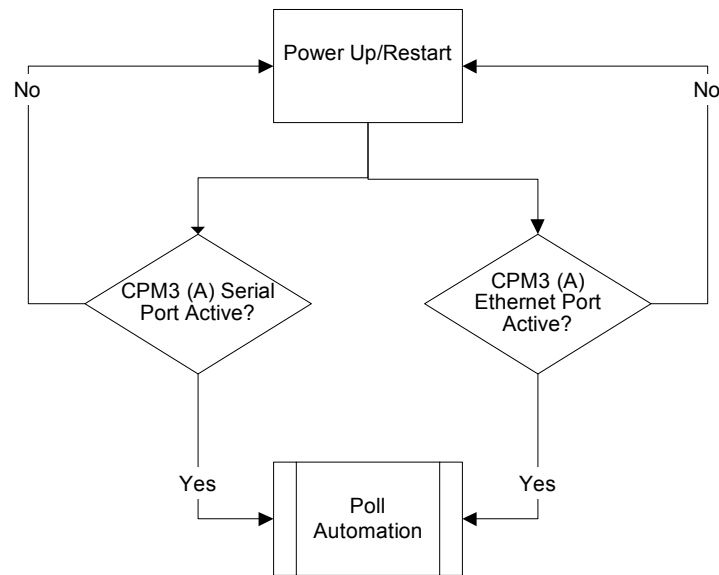
Flow Diagram for **Automation IP FALL BACK Mode (3)**

```
                                    ┌─────────────────┐
                                    │ Power Up/Restart │
        ┌───────────────────────────┤                 │
        │                           └────────┬────────┘
        │                                    │
        │                                    ▼
  ┌──────────────────┐            ┌──────────────────┐         ┌─────────────┐
  │ Manual Re-start  │◀───────────│    CPM3 (A)      │  Yes    │    Poll     │
  │ from Console     │            │  Ethernet Port   ├────────▶│  Automation │
  │ (Reset Fallback) │            │    Active?       │         └─────────────┘
  └──────────────────┘            └────────┬─────────┘
        │                             No   │
        │                                  ▼
  ┌──────────────────┐            ┌──────────────────┐
  │ Manual Re-start  │◀───────────│    CPM3 (B)      │  Yes
  │ from Console     │            │  Ethernet Port   ├────────▶
  │ (Reset Fallback) │            │    Active?       │
  └──────────────────┘            └────────┬─────────┘
        │                             No   │
        │                                  ▼
  ┌──────────────────┐            ┌──────────────────┐
  │ Manual Re-start  │◀───────────│  CPM3 (A) Serial │  Yes
  │ from Console     │            │   Port Active?   ├────────▶
  │ (Reset Fallback) │            └────────┬─────────┘
  └──────────────────┘                 No  │
        │                                  ▼
  ┌──────────────────┐            ┌──────────────────┐
  │ Manual Re-start  │◀───────────│  CPM3 (B) Serial │  Yes
  │ from Console     │            │   Port Active?   ├────────▶
  │ (Reset Fallback) │            └────────┬─────────┘
  └──────────────────┘                 No  │
```
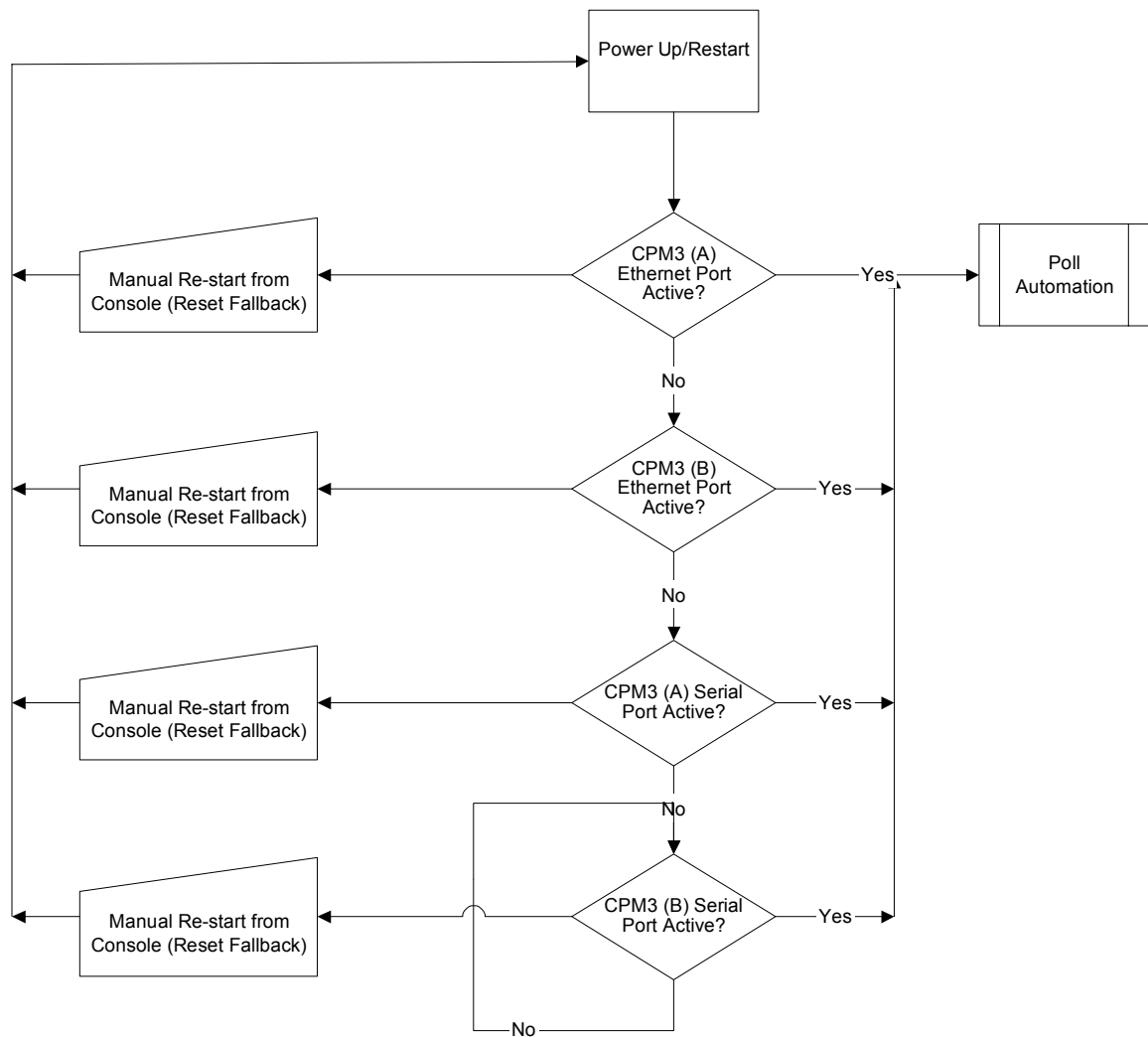
Section 5 - Advanced Programming

5.1 Profiles Introduction

The DRL3 'virtual receiver' will load unique 'profiles' in order to effectively communicate with control panels. A profile is a set of pre-programmed line card options unique for a particular DNIS number. The 'DNIS' will point to a particular profile, which will then be loaded into the line card before the first handshake is sent. It is essential that the correct option be programmed for a profile in order to correctly communicate with the control panel. Each 'virtual receiver' can have a maximum of 64 profiles. To change the options for a particular profile, the System III Console software is provided. This software will allow the user/operator to edit the profiles.

NOTE: *DNIS (Dialled Number Identification Service). This number represents the dialled number, or the number being called. ANI: (Automatic Number Identification). This number represents the source of a call and allows the system to determine the handshake protocol. Caller ID: This number identifies the source of a call. For the purpose of this document, Caller ID and ANI will be referred to as Caller ID, but both can not be used at the same time. Contact your provider to determine which service is available.*

DNIS or Caller ID can be used for profile selection.

Line Cards Identification Number Handling:

Figure 5-1, Call Processing Flowchart
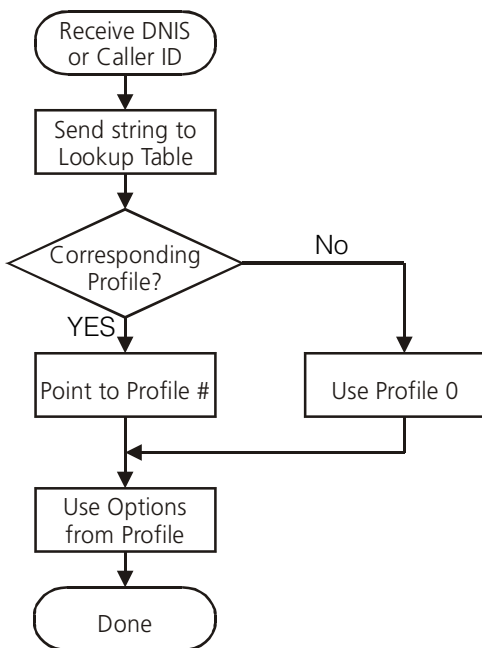
Each profile is made up of Static Options and Dynamic Options. The static options are the same for all profiles, but the dynamic options can be programmed specifically per hunt groups, panel type, etc.

By receiving the DNIS or Caller ID, the appropriate profile can be selected through a look-up table "stored" on the line card.
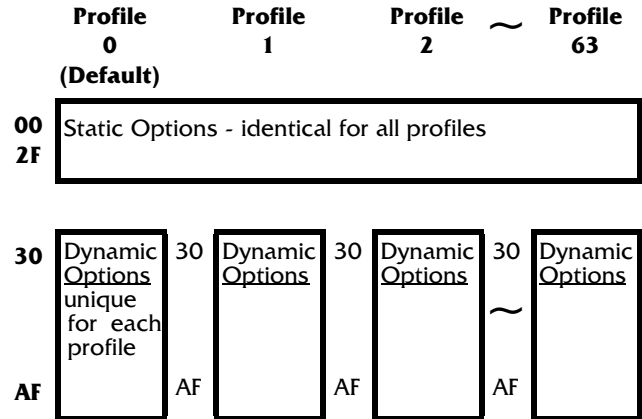
Profile 0 is the default. When no Caller ID or unknown DNIS is received, or when the received number does not point to a profile, the default will be used.

Profiles are used to reduce on-line time, and for specific customers or panel/format types, one can have a profile with certain handshakes sent first. Also, some formats require certain options, and this can be pre-defined as well.

Profiles allow for a more customized system. Rather than having a line card (or a receiver itself) devoted to certain customers, the System III can "handle" any format at any time through the use of profiles. Each line card holds its own look-up table that can be shared through line pools, or shared within the entire receiver.

Two types of tables are available, but only one type can be chosen. The first type, which consists of 10 000 entries, is used strictly with DNIS of up to 5-digits.

Table type 1:

DNIS received Profile # to be used

DNIS Received	Profile# to be used
00001	01
00002	03
00003	24
...	...
99999	45

The second type is used if ANI-Caller ID and/or DNIS are received, and can consist of up to 5,000 entries, with Caller ID or DNIS of up to 10 digits.

Table type 2:

Caller ID Number	Convert Data	Profile
05 603000	Not Used	0
05 603001	Not Used	1
05 603002	Not Used	2
05 603003	Not Used	3

DNIS Number	Convert Data	Profile
12345	54321	0
12346	54322	1
1234	54333	2

Each portion may contain 0-10000 entries with the total of all the entries not exceeding 10000.

The receiver will first check through the Caller ID section if a Caller ID number is received. If only a DNIS number is received, or Caller ID is received but the Caller ID was not found, it will check in the DNIS section.

On a standard receiver, the Automation output would look similar to the following:

```
1RRLLLssssssAAAAsYsZZ[DC4]
```

On the System III, it will replace the RRLLL, which is normally the receiver number and the line card number, by the DNIS received or the convert data found in the table.

This makes possible the duplication of accounts, as long as they are dialling different numbers.

The output will become:

```
1DDDDDssssssAAAAsYsZZ[DC4]
```

Where DDDDD is the DNIS number. See Option 20 for more information on how to enable the combined table.

5.2   Static Options: [00] - [2F]

Option [00]: Reserved

Option [01]: Line Card Number - Default [01]

The line card Number provides a virtual identification code for each DRL3 module. Hexadecimal numbers '01' to 'FE' can be programmed in Option [01] to identify line cards.

Option [02]: Line Card Number Length - Default [0A]

This option is used to determine how many digits from the line card number will be sent to the output. You also have the option of displaying the number in hex or decimal. Program Option 02 with one of the following:
01   Send only one hex digit to the printer or computer output (if you have a 2-digit line card number only the last digit will be sent to the output)
02   Send 2 hex digit line card number to the output
03   Send 3 hex digit line card number to the output (leading Zeros will be inserted prior to the line card number)
0A   Send 3-digit line card number as entered (no conversion).
0D   Send 3-digit line card number in decimal (conversion from decimal to hex decimal

NOTE: *When using the DRL3, the line card Number Length option should always correspond to the number of DNIS digits being received. For example, if 5-*

digits are being received then the line card Number Length Option should be programmed to 3, so that the 5 digits of DNIS will become 1ddddd and overwrite 1RRLLL.

Option [03]: Internal messages RS-232 - Default [01]

When this option is programmed as '00', the DRL3 will output its internal messages in the following format:
SRRLLL[#AAAA|Nxxyy]
If it is programmed as '01' internal messages will be output as
0RRLLL[#AAAA|Nxxyy]
Where S, 0 (zero) = Protocol number
RR = Receiver number
LLL = Line number
AAAA = Account code, always 0000
Nxxyy = SIA event

Option [04]: 2-Way Audio Activation Time - Default [00]

Option [04] determines how long, in 10-second increments, the 2-way audio function will be active once it is initiated. At the end of this time, the line card will hang up the line. Program a value from "01" to "FF" for 10 seconds to 2550 seconds. Three (3) minutes is the recommended length of time for the 2-way audio activation time. To disable the 2-way audio feature, program Option [04] as "00".

NOTES: *Enabling 2-way audio will affect NFPA 72 system loading requirements. Refer to Par. 4-5.3.2.2.2 of NFPA 72 for details.*
If the alarm panel sends a listen-in code activation request and audio is enabled for this format (Option [7F]), the receiver will remain in two-way voice for a period of 60 seconds even if the activation time is not programmed.

Option [05]: Pre-H.S. Duration - Default [0A]

When the line card seizes the line, it will wait the time programmed at Option [05]; then send the first handshake. The value programmed (hex) at this location will be multiplied by 100 ms. [e.g., 100 ms., 200 ms.] The default is 0A, for 1000ms (100ms x default value).
The minimum time is 1 second. If the option is programmed with any value lower than 0A, the line card will use a 1 second delay.

Options [06] to [08]: Reserved

Option [09]: First Ring Length - Default [05]

In order for the line card to detect an incoming ring, the ring signal must be ON for a minimum amount of time.
This option allows the user to change the minimum amount of time the ring signal must be ON before we will pass it as a valid ring length. The default value is 00 = 1 second. The minimum ring duration allowed is 200 mS which corresponds to a value of 02 (200 mS).
Values programmed here will be multiplied by 100 mS. Values of 00 and 01 give the default of 1 second.

Options [0A] to [0C]: Reserved

Option [0D]: Ring Select - Default [00]

Enables or disables the double ring detection. If programmed as 00, the line card will detect single ring. If programmed as 01, the line card will detect the double ring.

Option [0E]: Backup Line Enable/Disable - Default [00]

Enables or disables the Backup line of the DRL3. If programmed as 00, the option is disabled. If programmed as 01, the option is enabled, and if a line fault occurs on the primary channel, the line card will switch to the auxiliary line and allow normal operation. If programmed to anything else, the option disables the Backup line.

NOTE: *if this option is turned on, then 2-way audio will not be available through the auxiliary channel. If 2-way audio is required, the hook-flash operation of the DRL3 must be used.*

With this option enabled, the line fault LED operation will change. The table below shows how the line fault LED will operate with this option enabled.

Primary Channel	Auxiliary Channel	Line Fault LED	Active Line
Not In LF	Not In LF	OFF	Primary
Not In LF	In LF	OFF	Primary
In LF	Not In LF	OFF	Auxiliary
In LF	In LF	ON	None

If the primary line goes into line fault, the line card will then switch to the Backup line and continue normal operation. If at any time the primary line is restored, the line card will finish it's on-line operation (if it is currently communicating with a panel), and upon completion will switch back to the primary line.

Line Fault and Line Restoral Messages:

The line fault and line restoral messages for the primary line are the same as before (computer and printer messages). The line fault and line restoral messages for the auxiliary line are as indicated below:

The computer message for a line fault and line restoral on the auxiliary line are the same as the primary line.

The printer messages for the line fault and line restoral on the auxiliary line are different in that they have line number '2' in them.

```
Jul 17 1998 - 08: 08: 35-SS/OO-SG-RR-LLL-0000-PHONE LINE 2 RESTORE
Jul 17 1998 - 08: 08: 35-SS/OO-SG-RR-LLL-0000-PHONE LINE 2 TROUBLE
```

Option [0F-10]: Reserved

Option [11]: Hook-flash Enable/Disable - Default [00]

Enables or disables ability to hookflash the phone line and determines its duration in increments of 10 ms.

If programmed as 00, the option is disabled. If set to anything else, you multiply the decimal equivalent of the hex value by 10 ms and that is the duration. For example, if hookflash time of 500 ms is wanted, program Option 2A to 32 hex.

```
500 ms / 10    = 50
50 Dec         = 32 hex
```

Option [12]: Caller Source ID Option - Default [00]

Option [12] allows the line card to receive Caller Identification data or DNIS that is transmitted after the first ring on the telephone line. The appropriate service must be available and requested from the Telephone Company for this feature to be operational.

00 Disabled
01 Standard Bellcore Caller-ID
02 Reserved for future use
03 Reserved for future use

0X Receive X (4 to 10) digits DTMF DNIS
2X Receive DNIS and ANI in <DNIS>C<ANI>C
4X Receive ANI and DNIS in <ANI>C<DNIS>C

General messages other than Caller ID or DNIS:
•**Private Call:** An anonymous indication is received instead of the originating telephone number.
•**No Call No.:** An out-of-area or unavailable indication is received instead of the originating telephone number.
•**Unknown Call:** The originating telephone number has not been received or was not transmitted.

Option [13]: Caller Source to SG Computer - Default [00]

Option [13] allows the transmission of the Caller Identification or ANI, to the computer output. Program Option [13] as one of the following:

	Protocol	
00		Do not send to the computer
01	4RRLL	Send to the computer (North American Caller ID)
02	URRLLL	Send to the computer (International Caller ID)
04	4RRLLL	Send ANI information to the computer

NOTE: *Option [12] must be programmed as "01" to use Caller ID or "4x" to use ANI. Where "x" represents the number of DNIS digits (including the terminator digit).*

Option [14]: Caller Source to printer - Default [00]

Option [14] allows the transmission of the Caller Identification or ANI, to the printer output. Program Option [14] as one of the following

00 Do not send to the printer
01 Send to the printer; each alarm will print an extra line, showing the Caller ID
04 Send to the printer; each alarm will print an extra line, showing the ANI number.

NOTE: *Option [12] must be programmed as "01" for Caller ID or "4x" ANI, where "x" represents the number of DNIS digits (including the terminator digit).*

Options [15] - [16]: Reserved

Option [17]: DMP User Length - Default [00]

Option 17 is for the variable length zone and user numbers. The first digit in the option represents the user number and the second digit represents the zone number. For example, if Option 17 is set for 24 than the receiver will output a 2-digit user number and a 4-digit zone number. The default value is 00 for 2-digit zone and 2-digit user number.

NOTE: *: Option [17] Only affects DMP Serial 1 format not DMP Serial 3.*

Option [18]: Sur-Gard DTMF 4/3 Format Output - Default [00]

Each nibbles of this option controls how the 4/3 format computer output string is formatted. The first nibble allows for the user and group codes for openings and closings to be combined. When programmed as "1x", group arming/disarming signals will be combined with the user code into one signal which will be sent to the computer.

Example, the following information may be sent to the computer: (The printer output does not change)

Printer:
1234-B01 CloseGrp
1234-416 Close
1234-C02 OpenGrp
1234-532 Open
Computer:
1234 C1 16 (instead of 1234 C 01 and 1234 C 16)
1234 O2 32 (instead of 1234 O 02 and 1234 O 32)
If a user code is not received after the group opening/ closing, the message "1234 C1 FF" will be sent; "FF" indicates that a user code was not received.

The second nibble of this option controls the user/zone number conversion. The Sur-Gard 4/3 DTMF format is made up of a 4-digit account code, a 1-digit event code, and a 2-digit hexadecimal zone code or user number. However, some central station software packages use a common event code and require decimal user codes. This option allows the user codes to be converted from hexadecimal to decimal to meet the needs of the central station software. Program with one of the following:

X0   Send the last two digits as user codes without conversion

X1   Convert the last 2-digit user codes to decimal as shown here:

User Code Receive	User Code after Conversion
00 to 99	00 to 99
B0 to B9	100 to 109
C0 to C9	110 to 119
D0 to D9	120 to 129
E0 to E9	130 to 139
F0 to F9	140 to 149

Example, if 1234 4B1 is received, 1234 C 101 will be sent to the computer.

X2   Send the last 3 digits as the zone codes with the 5th digit still used as the event code

Example, if 1234 161 is received, 1234 A 161 will be sent to the computer.

When individual event codes are used, if 1234 401 is received, 1234 C 01 will be transmitted to the computer. When common event codes are used, if 1234 401 is received, 1234 Z 401 will be transmitted to the computer, where Z is the common event code.

X3   Send the last 3 digits as the zone codes and convert the user codes only to decimal

NOTE: *When the first nibble of the option is set to 1 the 3-digit user codes will be combined with the group number as follows:*

Code received	Code sent to computer
1234B01	No transmission
12344B1	1234 C1 101

Option [19]: Fault Call Counter - Default [00]

Option 19 is used for limiting the number of Fault Call messages that are sent to the printer and computer. The default setting will send a Fault Call alarm for every 10 Fault Calls. To have every Fault Call sent to the computer and printer set Option 19 to 01.

Option [1A]: DNIS Input Sensitivity - Default [00]

NOTE: *Do not change this option unless instructed to do so by DSC Technical Support.*

Option [1B]: Reserved

Option [1C]: Busy Out - Default [00]

This option allows the line card to seize the phone line in case of checksum error after download or when its internal buffer is full after loss of communication with the CPM. Program Option [1C] with one of the following:

00   The line is seized if any of the conditions mentioned above occurs.

01   The line is NOT seized if any of the conditions

04   mentioned above occurs.
The line will be seized immediately

05   if the automation computer is absent.
The line will be seized if there is a loss of automation software or no communication to the CPM3 ONLY if the internal computer buffer is full. If there is a loss of printer(s), any new alarms will not be buffered in the internal printer buffer. (note: the line card has two independent printer and computer buffers).

NOTE: *If the option is programmed to 01, the line card will NOT buffer any new alarms once the internal buffer is full. Setting Option [1C] to 01 is NOT RECOMMENDED.*

Option [1D]: Input Sensitivity - Default [0F]

Option [1E]: Output Levels - Default [60]

Option [1F]: Debug Output - Default [00]

Set to 01 to enable. The debug mode should only be used when required and disabled after use.

Option [20]: C.L.A.S.S. Field Data - Default [04]

00   Send "0"s in C.L.A.S.S. field of E.-bus.

01   Send receiver line card number from options in C.L.A.S.S. field of E.-bus.

02   Send DNIS in C.L.A.S.S. field of E.-bus.

03   Send Caller ID in C.L.A.S.S. field of E.-bus.

04   Send whatever Option [12] Caller Source is set to in the C.L.A.S.S. field of E.-bus

05   When the receiver is programmed to receive DNIS, send the Convert Data from the DNIS / Caller-ID Conversion table in the C.L.A.S.S. field of EBUS for alarms. If the convert data is 0, the received DNIS will be inserted. If the linecard is not programmed to receive DNIS (for example, Caller-ID), then the table lookup functionalities remain the same. If the entry is found use the Profile from the table to perform the profile switching.

NOTE: *When the CLASS Field option is set to 00-04 then the receiver assumes a DNIS table has been uploaded to the linecard. When the option is set to 05 the receiver assumes a Combined Table has been uploaded to the linecard. All other conditions (NOT RECOMMENDED) will cause failure in the Table Lookup and/or Profile Selection steps of the linecard and the linecard will default to profile 0.*

Option [21] RBUS Speed - Default [00]

This controls the speed at which the DRL3 communicates to the CPM3. Default setting of [00] results in a communication speed of 19.2kb. Program option value as [56] for 57.6kb.

NOTE: *All line cards and CPM3 must have the same BUS speed in order to function properly. All previous version can only communicate at 19.2kb. The option will only take affect after the unit is reset.*

Options [22] - [26]: Internal Use Only

Option [27]: Caller Source Process - Default [05]

This option determines how many digits of Caller ID or DNIS the receiver will process.
0x - x is number of digits of DNIS or Caller ID to be processed (range from 1 to A hex)

Options [28] - [29]: Reserved

Option [2A]: Hook-flash Delay - Default [00]

Time delay before hang-up option. Option value x 100ms to a maximum of 9.5 seconds.
When programmed with values starting with A the second digit will be multiplied by 10 seconds. The second digit must be converted to decimal first.
Example a value of [AF] would result is 150 seconds delay.

Options [2B] - [2C]: Reserved

Option [2D]: A.H.S. - Default [00]

A.H.S., Automatic Handshake Selection is the process of the line card to send a handshake to be used with the ANI. Also included in A.H.S. is the ability for the CPM3 to "remember" which handshakes are used for which ANI.
The A.H.S. have the ability to be used in conjunction with the DNIS to select a predefined profile based on the DNIS table that is stored in the line card. The handshake is retrieved from the A.H.S. table, and the remainder of the options to be taken from the DNIS profile.
Also, if the panel does not respond to the handshake given by the line card, it will proceed with it's handshake sequence from this profile as opposed to the default profile.
00 A.H.S. Disable
01 A.H.S. enable, 10 digits
02 A.H.S. enable international
Call Blocking When A.H.S. is active
At any time the operator may want to use a call blocking type feature for particular customers (i.e. inactive accounts). The operator will be able to manually update the A.H.S. database with the System III Console software. If the operator wishes to call block a particular customer (Caller ID), they would do this by entering for that entry the handshake value of 99. When this is sent to the line card, the line card will release the line as soon as it sees the Caller ID.
Computer Message:
0RRLLL[#0000|ACPM 2000 BLOCKED CALL]
Printer Message:
RRLLL–0000--CPM2000 BLOCKED CALL

Options [2E] - [2F]: Reserved

5.3 Dynamic Options: [30] - [FF]

Options [30] - [3F]: 3/1 - 4/1 Digit 0-F

The DRL3 uses a unique Sur-Gard communication format to transmit data through the CPM3 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.
The DRL3 will use the last digit of data received in 3/1 and 4/1 formats to determine the computer event code. The event code will then be transmitted to the central station computer. Refer to the DRL3 Decoding Library for the complete set of event codes used by the DRL3. In Sections [30] through [3F], program ASCII codes according to the Decoding Library.
Do **NOT** use values other than 20-7F (ASCII).
Defaults:

Option	Value	Code
30	41	A
31	41	A
32	41	A
33	41	A
34	41	A
35	41	A
36	41	A
37	41	A
38	41	A
39	52	R
3A	41	A
3B	4F	O
3C	43	C
3D	5C	/
3E	52	R
3F	54	T

Options [40] - [4F]: 3/2 - 4/2 Digit 0-F

The DRL3 will use the first digit following the account code in 4/2, 3/1 extended or 3/2 formats to determine the computer event code. The event code will then be transmitted to the central station computer. Refer to the DRL3 Decoding Library for the complete set of event codes used by the DRL3.
In Sections [40] through [4F], program ASCII codes according to the Decoding Library. Do **NOT** use values other than 20-7F (ASCII).
Defaults:

Option	Value	Code
40	41	A
41	41	A
42	41	A
43	41	A
44	41	A
45	41	A
46	41	A
47	41	A
48	41	A
49	52	R
4A	41	A
4B	4F	O
4C	43	C
4D	5C	/
4E	52	R
4F	54	T

Options [50] - [5F]: 4/3 Digit 0-F

The DRL3 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. Refer to the DRL3 Decoding Library for the complete set of messages and event codes used by the DRL3. In Sections [50] through [5F], program ASCII codes according to the **Decoding Library.** Do **NOT** use values other than 20-7F (ASCII).

NOTE: The old value programmed in each Option will not be changed until a command with valid data is received.

Defaults:

Option	Value	Code
50	41	A
51	41	A
52	41	A
55	41	A
54	41	A
55	41	A
56	41	A
57	41	A
58	41	A
59	52	R
5A	41	A
5B	43	C
5C	4F	O
5D	42	B
5E	54	T
5F	5C	/

Options [60] - [6F]: Printer Words.

The English Printer Library is provided and can be selected by programming the event codes to the corresponding word.

For example, if the words 'exit alarm' are required when the alarm code 1 is received in 3/1 (or 4/1 formats), Option [61] must be programmed as '90'.

Refer to Appendix A for a list of available words.

Defaults:

Option	Value	Word
60	F2	PERIODIC TEST REPORT
61	OA	FIRE ALARM
62	14	PANIC ALARM
66	1E	BURGLARY
64	63	CLOSING
65	62	OPENING
66	E5	SERVICE
67	00	MEDICAL*
68	E4	MESSAGE
69	61	RESTORE
6A	F2	PERIODIC TEST REPORT
6B	C6	GROUP CLOSING
6C	C7	GROUP OPENING
6D	E6	ZONE BYPASS
6E	50	SYSTEM TROUBLE
6F	A6	CANCEL

*Use only with Model System III CE.
System III CE is not UL Listed.

Option [70]: Automation Common Event Code - Default [00]

Some central station software packages are unable to process an alarm using the event codes listed in the DRL3 Decoding Library. Where a central station monitors thousands of accounts belonging to different companies, the same reporting codes may have different meanings for different companies. Because of this, the individual event codes in Options [30] through [5F] cannot accurately represent the alarm condition. To overcome this, Option [70] may be programmed as indicated below:

Program Operation:

00 - Use individual event codes to computer.

20, 30-39 & 41-5A - Use common event codes (space, 0-9, A-Z). When using common event codes, DSC recommends that either hexadecimal code '5A' (ASCII 'Z') or hexadecimal code '41' (ASCII 'A') be used. The 'Space' character (Hex 20) can be used as the common event code with certain automation software packages to avoid account code database changes when switching over from other brand receivers to the Sur-Gard receiver.

Option [71]: Library Select - Default [04]

Determines how to use Printer Words Options.
00 No printer words.
01 Printer words options used for 1-digit reporting code formats only; other will use pre-defined library.
02 Printer words options used for 2-digit reporting code formats only; other will use pre-defined library.
03 Printer words options used for 3-digit reporting code formats only; other will use pre-defined library.
04 Printer words options used for 1-digit and 2-digit reporting code formats only; other will use pre-defined library.
05 Printer words options used for 1-digit, 2-digit and 3-digit reporting code formats.

NOTE: Option [71] is ignored when using SIA, ITI, Contact-ID, ACRON, MODEM II, MODEM IIE, MODEM IIIa², FBI SuperFast, BFSK, ADEMCO Super Fast and SK FSK1, 2 formats.

Option [72]: SIA Option - Default [00]

When this option is set to 00 alarms sent without zone numbers will not be modified by the receiver.
Example:
[#1234|Nri1BA]
Output: [#1234|Nri1BA]
When this option is set to 01 the receiver will decode SIA alarms sent without zone numbers and add 00 as the zone number to the automation output.
Example 1:
[#1234|Nri1BA]
Output: [#1234|Nri1BA00]
Example 2:
[#1234|Nri1BA01/RP]
Output: [#1234|Nri1BA01/RP00]
Example 3:
[#1234|Nri1BA/RP]
Output: [#1234|Nri1BA00/RP00]
When set to 02 any account digits received as 'A' get converted to '0'.
Example 1:
Received: [A123|NriBA01]
Output: [0123|NriBA01]
When set to 03 any account digit received as 'A' get converted to '0' and alarms without zone numbers will have 00 added as the zone number.
Example 2:
Received: [A123|NriBA]
Output: [0123|NriBA00]
Please note that this option is not compatible with hex digits used in the zone number, and is not compatible with formats being converted to SIA such as Modem II.

Option[72] SIA Option - Default = 00
This option is a bit selectable Option meaning some or all of these choices may be enabled. For example, to enable "Force SIA Zone Number", and "Convert Pulse formats to SIA", set Option[72]=05. To enable only "Convert Pulse to SIA" and "Convert BFSK to SIA" set Option[72]=0C.

Bit0 - Force SIA Zone Number.
The receiver will decode SIA Alarms sent without Zone numbers and add '00' as the zone number to the automation output:
Example: [#1234|NriBA] becomes [#1234|NriBA00]

Bit1 - Convert SIA Account A's.
Any Account Digits received as 'A' will be converted to '0'.
Example: [#A123|NriBA01] becomes [#0123|NriBA01]

Bit2 - Convert Pulse formats to SIA.
All Pulse Format Printer and Computer outputs will be converted to a SIA format, in a two step conversion process.
The automation Output will use the Protocol ID of 'R'.
First the type of alarm is determined by Options[30]-[5F], [70]
Secondly the type of alarm is mapped to a SIA output as per Table1.
The formatID remains the same (PULSE) therefore it should NOT be converted on the CPM2000.
Example: 12341 becomes '1234 A 1' becomes [#1234|NBA1]

Table1

Value	Code	SIA
41	A	BA
42	B	BA
43	C	CL
46	F	FA
48	H	HA
4F	O	OP
4D	M	MA
50	P	PA
52	R	BR
54	T	TA
5C	\	OC
62	b	BR
66	f	FH
68	h	HH
6D	m	MH
70	p	PH
74	t	TH
7C	|	UB

Values programmed in Options[30]-[5F],[70] other than in this table will default to UAxx for Undecoded Alarm.

Bit3 - Convert BFSK format to SIA.
The BFSK outputs will be converted to a SIA format. The automation Output will use the Protocol ID of 'R'.
When this option is enabled it has precidence over the BFSK RS232 Option[A4]. The Accounts 3/x to 4/x Option[76] may be used to insert a leading 0 to the account code.
The formatID remains the same (BFSK) therefore it should NOT be converted on the CPM2000.
Example:[#123|NFA1]

Option [73]: Reserved

Option [74]: Equivalent Line Number - Default [00]

The equivalent line number is used with the receiver number for sending signals to the central station software. This option may be used if there is no DNIS number being received by the line card.

Option [75]: Receiver Number - Default [01]

The receiver number is used for sending signals to the central station software. Refer to the manuals for any central station automation software being used to determine if there are any special requirements for this number. Also, check the numbers used for any other receivers in the station to ensure that numbers are not duplicated.

Option [76]: Accounts 3/x to 4/x - Default [00]

When programmed as 00, if the alarm is reported in 3/1, 3/1 extended, BFSK, 3/2 or 3/8 ACRON formats, a leading space will be communicated in front of the 3-digit account codes.

> Ex: 101001sssssssAAAsXsssY[DC4]

01 - If the alarm is reported in 3/1, 3/1 extended, 3/2 or 3/8 ACRON formats, a leading '0' (zero) will be communicated in front of the 3-digit account codes.

> Ex: 1011sssssss0AAAsXsssY[DC4]

02 - Alarms communicated to the computer. If the alarm is reported in 3/1, 3/1 extended, 3/2 or 3/8 ACRON formats, a leading '0' (zero) will be communicated in front of the 3-digit Account. And a '0' (zero) will be communicated in front of the 1-digit alarm code for the above formats as well as 4/1 formats.

> Ex: 1011sssssss0AAAsXss0Y[DC4]

04 - If the panel is reported in SIA a leading '0' (zero) will be communicated in front of the 3-digit account.
EX: S1011[#0AAA|Nri0/FH00]

05 - If the alarm is reported in 3/1, 3/1 etended, 3/2 BFSK, SIA, 3.8 ACRON formats then a leading '0' (zero) will be communicated in front of the 3-dgit account.

06 - If the alarm is reported in 3/1, 3/1 extended, 3/2 BFSK, SIA, 3.8 ACRON formats then a leading '0' (zero) will be communicated in front of the 3-dgit account and a '0' (zero) will be communicated in front of the 1-digit alarm code.

Option [77]: Digit Replace - Default [00]

Option 77 works in conjunction with Option A2. Option 77 is programmed with an ASCII value that will replace an account code digit or insert a value into an account code. Option A2 is used to replace a digit or insert a digit. To replace a digit use 0x where x is the digit to be replaced. To shift a digit use Option A2 and set to 8x where x is the location in the account code.

Example 1:
Option 77 is set for 41 and Option A2 is set for 01:
Standard 4/2-format output:

> 1RRLLLsssssssa1a2a3a4sXssYZ
> Account code is 9876
> 1RRLLLsssssss9876sXssYZ

The receiver will do the following. First it will replace the first digit (Option A2=01) of the account code (in this example "1") and replace it with the ASCII value of 41, which is an "A".

New Output:

> 1RRLLLsssssssA876sXssYZ

Example 2:
To insert a digit use 8x were x is the spot were the digit is to be inserted.
Option 77 is set to 2D and Option A2 is set for 82:

> Account code is 9876
> 1RRLLLsssssss9876sXssYZ

The receiver will do the following, it will insert the ASCII value of Option 77, in this case the ASCII value of 2D (2D is a " - ") into position two (Option A2=82), and the account code will shift to the left. So it will convert account code 9876 as indicated below:

> 1RRLLLsssssss9-876sXssYZ

* This will not affect SIA.

Option [78]: Max Inter-digit - Default [00]

Certain old dialers may have difficulties in communicating with the DRL3 line cards. The DRL3 provides a possible solution by programming this option. This option should be left as a default and should be changed only on the recommendation of a DSC technician. When programmed as 00, the inter-digit time is determined by the Baud rate of the format being used; all other values are in 100 ms. intervals. 0 determined by Baud rate (default).

00	auto
01	100 ms
02	200 ms
.....	.....
0A	1000 ms

Option [79]: Max Inter-burst - Default [00]

Certain old dialers may have difficulties in communicating with the DRL3 line cards. The DRL3 provides the possible solution by programming this option. This option should be left as default and should be changed only on the recommendation of a DSC technician. When programmed as 00, the inter-burst has a time of 100 ms, all other values are in 10 ms increments.

00	100 ms (default)
01	10 ms
02	20 ms... and so on

Option [7A]: 4 and 5 Digit Account Codes to Activate 2-Way Audio - Default [00]

Option [7A] 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 [7A].

For example:
To allow all account codes between 1000 and 2FFF to activate the 2-way audio function, program Option [7A] as '12'.

To allow all account codes between 3000 and 6FFF to activate the 2-way audio function, program Option [7A] as '36'.

To disable the 2-way audio function, program Option [7A] as '00'.

***NOTE:** Option [7A] may be used with any formats supported by the System III.*

Option [7B]: 3 Digit Account Codes to Activate 2-Way Audio - Default [00]

Option [7B] determines which 3-digit account codes will be able to activate the 2-way audio feature. Program the first digits of the desired account codes in Option [7B].

For example:

To allow all 3-digits account codes between 200 and 3FF to activate the 2-way audio function, program Option [7B] as '23'.

To allow all 3-digit account codes between 300 and 6FF to activate the 2-way audio function, program Option [7B] as '36'.

Program Option [04] as '00' to disable this function.

NOTE: *Option [7B] may be used with any 3-digit account code formats supported by the System III.*

Option [7C]: Alarm Codes to Activate 2-Way Audio - Default [00]

Option [7C] 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 [7C].

For example:

The DRL3 will initiate audio by the account range, Options [7A] and [7B] or by Option [7C] ALARM CODE or by both.

If all alarm codes beginning with 6, 7 and 8 are to activate 2-way audio, program Option [7C] as '68'. Option [7C] may be used with 10 to 40 Baud formats, DTMF 4/1, 4/2, and 4/3 formats.

Program Option [7C] as '00' to disable this function.

Example:

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

Option - [7A] [7C] Switch Reason (or [7B]) to Audio

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 [7D]: Audio Zone Code - Default [00]

Audio zone code is the range of zone codes that will activate audio. The first digit is the lowest code. The second digit indicates the highest zone that will activate audio. Option [7D] may be used with 10 to 40 Baud formats, DTMF 4/1, 4/2, and 4/3 formats.

NOTE: *Option [7D] Only works for DMP Serial 1 not for DMP Serial 3.*

Option [7E] Audio RS-232 - Default [00]

This is the code sent to the automation software that indicates that two-way audio has been initiated. If this option is set to '00' there will be no audio-initiated message sent to the automation output. If set to 01, the automation message for audio will be generated with protocol ID 'S'. If set to 02, the automation message will be generated with protocol ID '0'.

00	No Automation Output
01	Send SRRLLL[#AAAA|NLFssoo][DC4]
02	Send 0RRLLL[#AAAA|NLFssoo][DC4]

Option [7F]: Audio Format Enable - Default [00]

This option gives you the ability to enable and disable audio for selected formats. A '1' in the formats bit position will enable the format for audio. A '0' in the formats bit position will disable audio for the format.

Bit 0	3 Digit pulse format
Bit 1	4 and 5 Digit pulse format
Bit 2	DTMF format
Bit 3	Contact ID
Bit 4	SIA format
Bit 5	Modem II format
Bit 6	ITI Format
Bit 7	Westec format

For example: if the user wants audio to work only for 3-digit pulse and SIA formats, Option 7F would have to be programmed as 11 hex which enables bit 0 and bit 4.

Option 80: Kiss-Off to Hang-up Time - Default [1F]

This option determines the delay between Kiss-off and the release of the line. The hex value programmed at this location will be converted to decimal and then multiplied by 100 milliseconds to generate the delay.

For example:

Option 80 = 0A hex = 10 decimal * 100 ms = 1000 ms = 1 second delay
Option 80 = 28 hex = 40 decimal * 100 ms = 4000 ms = 4 second delay

Options [81] through [88]: Handshake Selection - Default:

[81]	23	[85]	0E
[82]	14	[86]	0B
[83]	2D	[87]	00
[84]	0C	[88]	00

The DRL3 is a multi-format receiver capable of sending several handshakes to a dialer. Often it is important which handshake is sent first. Program Options [81] through [88] according to your applications. Handshake Options

00	No handshake
2D	Double dual-tone handshake
0C	SIA FSK handshake
0B	Modem II handshake
0E	Modem IIE and ITI handshake
1D	Single dual-tone handshake
0F	DMP handshake
0D	Westec handshake*
EC	SURTEC

All other frequencies can be programmed using the first two digits to represent the 3rd and 4th decimal places.

Example:

23	2300 Hz
18	1800 Hz
14	1400 Hz
10	1000 Hz

NOTE: *Westec handshake duration must be programmed as 600 ms.*

Remove

24

Option [89] to [90]: Handshake and Kiss-off Duration - Default [00]

Some control panels may require a different handshake duration. Each unit has increments of 100 ms, from 100 ms to a maximum of 8.1 seconds. Program Options 88 to 90 for the desired duration.

00	1 second
01	100 ms
02	200 ms
03	300 ms
04	400 ms
0A	1 second.
0C	1.2 second.... and so on

DSC does not recommend programmed durations longer than 1.5 seconds, as it may not be tolerated by the alarm panel. For special applications, it may be necessary, but any durations higher than 8.1 seconds will not be accurate and may not match the duration programmed.

NOTE: *These options will only affect steady tones handshakes.*

Option [89]: Handshake #1 duration
Option [8A]: Handshake #2 duration
Option [8B]: Handshake #3 duration
Option [8C]: Handshake #4 duration
Option [8D]: Handshake #5 duration
Option [8E]: Handshake #6 duration
Option [8F]: Handshake #7 duration
Option [90]: Handshake #8 duration

Option [91]: Inter-Handshake Duration - Default [00]

The DRL3 line card will usually wait for signals from the control panels for 4 seconds before sending the next handshake, if there are no signals received. In certain applications, control panels cannot wait long enough to get its own handshake especially if the handshake is programmed as the fifth or later handshake. Program Option [91] with one of the following:

00	4-second interval
01	1-second interval
02	2-second interval
03	3-second interval

Option [92]: Reserved

Option [93]: Min Audio Tone - Default [00]

This option is used for Two-way audio tone detection from specific audio panels. This option should be left as default unless otherwise instructed by DSC Technical Support.

Option [94]: Account Digit Stripping - Default [00]

When Option 94 is set to 01, the leading digit of a four-digit account code will be stripped if it is an F.
Example:
Standard 4/2 format Output:
1RRLLLssssssAAAAsXssYZ
Example 1:
Option 94 set to 00
Panel account code is F245
104091ssssssF245sXssYZ
IF Option 94 is set to 01 the 'F' will be replaced by a space.

This setting will also enable the receiver to decode special pulse extended-extended formats.
104091sssssss245sXssYZ
If Option 94 is set to 02 than the leading digit of a four-digit panel account code will be stripped if it is a zero. This option will work with the following formats:
Standard Pulse and DTMF(3/x, 4/x & Extended)
FBI
Ademco Super Fast (4/8/1, 4/8)
Contact ID
ITI
SIA
Modem II
SKFSK
Example 1:
Option 94 set to 02
Panel account code is 0345
104091sssssss0345sXssYZ
New Output:
104091sssssss345sXssYZ

Option [95]: 5-Digit Pulse - Default [00]

The DRL3 cannot distinguish between 4/1, 3/2 and 3/1 with checksum because all of them contain a total of 5 digits. Therefore, this option must be programmed to inform the DRL3 which of the 3 formats may be used. The DRL3 cannot distinguish between 4/2 and 5/1 they both contain a total of 6 digits, therefore the DRL3 must be programmed to indicate what format.

Value	5 Digit Setting	6 Digit Setting
00	select 4/1 format	select 4/2 format
01	select 3/2 format*	select 4/2 format
02	select 3/1 checksum format	select 4/2 format
03	select 3/1 checksum format special**	select 4/2 format
10	select 4/1 format	select 5/1 format***
11	select 3/2 format*	select 5/1 format***
12	select 3/1 checksum format	select 5/1 format***
13	select 3/1 checksum format special**	select 5/1 format***

NOTE 1: *The printer messages for the 3/2 format are the same as those used for the 4/2 format.*

NOTE 2: *Select 3/1 with checksum only for Radionics Fast (40 baud rate) sent on the 2300Hz handshake, and 4/1 on all other baud rate regardless of the handshake.*

NOTE 3: *The printer messages for the 5/1 format are the same as those used for the 4/1 format.*

Option [96]: 4/1 Extended - Default [00]

Program Option [96] as '01' to combine 2 round pairs of 4/1 extended format into 4/2 output for reporting to the computer and the printer. For example, with Option [96] enabled, the security control panel may transmit the following information:

The DRL3 will interpret this information as: 123 31; the default setting for Option [98] is '01'; when programmed as '00', the option is disabled.

Option [97]: 4/2 Extended - Default [00]

Program Option [97] as '01' to combine 2 round pairs of 4/2 extended format into 4/3 output for reporting to

the computer and the printer. Program one of the following: 00 4/2: Extended format data is not combined.

01: The panel will send:

1234	05
1234	05
0505	16
0505	16

The DRL3 will interpret this information as 1234 516, or the panel will send:

1234	03
1234	03
3333	01
3333	01

The DRL3 will interpret this information as 1234 301. Note that a longer on-line time is required for this format than for a standard 4/2 format. The default setting for Option [97] is '00'; when programmed as '00', the option is disabled.

Option [98]: 3/1 Extend - Default [01]

Program Option [98] as '01' to combine 2 round pairs of 3/1 extended or 3/1 partial extended format into 3/2 output for reporting to the computer and the printer. For example, with Option [98] enabled, the security control panel may transmit the following information:

123	3
123	3
333	1
333	1

The DRL3 will interpret this information as: 123 31; the default setting for Option [98] is '01'; when programmed as '00', the option is disabled.

Option [99]: Ademco Express - Default [01]

The Ademco 4/1 Express format may cause conflicts with the Sur-Gard DTMF 4/3 with checksum format or FBI Super fast without checksum. Therefore, this option must be programmed to inform the DRL3 which of the 3 formats may be used.
00   Sur-Gard DTMF 4/3 with checksum
01   Ademco 4/1 Express
02   FBI without checksum

Option [9A]: ~~Error Counter~~ Reserved

Option [9B]: Echo Canceller - Default [00]

00   Disabled
01   Enabled: Disable echo canceller

Option [9C]: Acron RS-232 - Default [01]

When this option is programmed as '00', the DRL3 will convert the Acron Super Fast format signal into 3/2 or 4/2 format (Ex: AAAAsXssYY[DC4]). If it is programmed as '01' the Acron Super Fast will be sent to the computer as indicated below:

9RRLLLssssAAAACCCCCCCC[DC4]

Where 9 = protocol number
RR = receiver number
LLL = line number
ssss = spaces
AAAA = account code
CCCC = channel 1-4
CCCC = channel 5-8
[DC4] = terminator

Option [9D]: MODEM II RS-232 - Default [01]

The DRL3 is able to decode the Modem II formats. The handshake 0B needs to be programmed as one of the handshakes of the DRL3 for the Modem II and handshake 0E for Modem IIE or Modem IIIa 2. Option [9D] determines the protocol sent to the computer. Note that this option will also affect the BFSK format only if programmed as 00 or 01.

00   SG protocol: 1RRLLLsssssAAAAXXYYYY[DC4]
01   SG protocol: 6RRLLLsssssAAAAXXYYYY[DC4]
02   ModemII to SIA protocol
03   ModemII to SIA protocol, and text is decoded and sent to printer and computer.

NOTE: *Ensure that the automation software supports settings 02 and 03 if the SIA protocol is desired.*

Option [9E]: Scantronics Select - Default [00]

When this option is programmed as '00', 14 Digit DTMF will be decoded as Scantronics 4-8-1 with Checksum. When this option is programmed as '01', 14 Digit DTMF will be decoded as Scantronics 5-8-1.

Option [9F]: Ademco High Speed RS-232 - Default [01]

When this option is programmed as '00', the DRL3 will convert the High Speed format signal into 4/2 format (E.g. 1RRLLLsssssAAAAsXssYY[DC4]). If it is programmed as '01' the Ademco High Speed will be sent to the computer as indicated below:

8RRLLLAAAAsCCCCsCCCCsC[DC4]

Where 8 = protocol number
RR = receiver number
LLL = line number
AAAA = account code
CCCC = channel 1-4
s = space
CCCC = channel 5-8
s = space
C = Channel 9
[DC4] terminator

Option [A0]: 11 / 12-Digit DTMF (Acron or Scantronics) - Default [00]

When this option is programmed as '00', if 11 or 12-digit DTMF is received, it will be decoded as ACRON Format.
When this option is programmed as '01', if 11 or 12-digit DTMF is received, it will be decoded as SCANTRONICS Format.

	Incoming Format	**Decoded Format**
00	11-digit DTMF	Acron 3-8
00	12-digit DTMF	Acron 4-8
01	11-digit DTMF	Scantronics 2-8-1
01	12-digit DTMF	Scantronics 3-8-1

Option [A1]: FBI RS-232 - Default [01]

To enable the computer for FBI Super Fast protocol, program Option [A1] as '01'. When enabled, the computer output will be as indicated below:

JRRLLLsssssssAAAATZZEss[DC4]

Where:
J = FBI protocol identifier
RR = receiver number
LLL = line number
s = spaces
AAAA = account code

T = zone type
ZZ = zone number, in hex.
E = event code
if E = 0 and T = 0 : listen in.

Option [A2]: Digit Replace - Default [00]

Option 77 works in conjunction with Option A2. Option 77 is programmed with an ASCII value that will replace an account code digit or insert a value into an account code. Option A2 is used to replace a digit or insert a digit. To replace a digit use 0x where x is the digit to be replaced. To shift a digit use Option A2 and set to 8x where x is the location in the account code.

Option [A3]: D6500 RS-232 - Default [00]

This option is used to strip hex digits on the automation output. The DRL3 will emulate the Radionics 6500 RS-232 protocol on pulse formats, Ademco Express and Varitech only. When Option A3 is set to 01 the hex digit will be stripped for 1-digit reporting codes including Varitech 4/1.
Example 1: Code 1
Computer output: **104091ssssssss022sAsss1**
Example 2: Code B
Computer output: **104091ssssssss022sOssss**
If Option A3 set to 02: the hex digit will be stripped for 2-digit reporting codes including Varitech 4/2.
Example 1: Code 21
Computer output: **104091ssssssss022sAss21**
Example 2: Code B1
Computer output: **104091ssssssss022sOsss1**
If Option A3 set to 03: the hex digit will be stripped for 1 and 2-digit reporting codes including Varitech.
If Option A3 set to 04: the hex digit will be stripped for BFSK.

***NOTE**: This option will only work if Option A4 is set to 01.*

Example 1: Code 21
Computer output: **604091ssssssss022sAss21**
Example 2: Code B1
Computer output: **604091ssssssss022sOsss1**
If Option A3 is set to 05: the hex digit will be stripped for 1-digit reporting and BFSK.
If Option A3 Is set to 06: the hex digit will be stripped for 2-digit reporting and BFSK.
If Option A3 set to 07: the hex digit will be stripped for 1-digit, 2-digit and BFSK.

***NOTE**: Option [70] must be left as an individual event code when enabling this option.*

Option [A4]: BFSK RS-232 - Default [00]

When programming Option [A4] as '00', the BFSK format will be reported as Radionics 6500 BFSK mode to the computer; the protocol identifier will be a 6.
Example 1: Code 21
Computer Output: 604091   022sAsss1
Example 2: Code B1
Computer Output: 604091   022sOsss1
When Option A4 set to 01, the BFSK will be reported as a standard 3/1 extended format, the protocol identifier will also be changed from 6 to 1.
Example 1: Code 21
Computer Output: 104091   022sAss21
Example 2: Code B1
Computer Output: 104091   022sOssB1

Option [A5]: Sescoa Super Speed - Default [01]

If set to 00 Sescoa Super Speed will be disabled and 4/2 with checksum will be enabled.
If set to 01, Sescoa Super Speed will be enabled and 4/2 with checksum will be disabled.

Option [A6]: ITI Adjust - Default [00]

When set to 01, the ITI account codes will be converted to four digits by stripping the last digit off. For example, a panel account of 23459 will become account 2345. If the leading digit of the panel account is a 0 than it will be stripped and replaced with a space. For example, if 02349 is sent then the receiver will output 234 for the panel account.

Option [A7]: Silent Knight FSK2 RS-232 - Default [00]

The DRL3 provides two possible outputs to the computer for Silent Knight FSK2 format. The operation of this option is explained below:

[A7] = 00   SKFSK disabled

[A7] = 01   SKFSK enabled for:
SKFSK1
ERRLsssssssAAAAYYssss[DC4]
SKFSK2 Protocol #2
CRRLssssAAAAAAAYYZZss[DC4]

[A7] = 02   SKFSK enabled for:
SKFSK1
ERRLsssssssAAAAYYssss[DC4]
SKFSK2 Protocol #2
FRRLssssAAAAAAAYYZZss[DC4]

Options [A8] - [AF]: Dial-out Number For 2-way Audio Transfer - Default [00]

These 8 options are used to provide the dial-out number if the user wishes to transfer the call to another extension. Up to 16 digits may be programmed including any 'Feature Command' digits. The values in these options will be sent as DTMF tones on the phone line after the following sequence takes place:

1   The DRL3 has recognized the current call as a 2-way audio account and alarm code.
2   The calling control panel has finished sending its alarms and switched into 2-way audio mode.
3   The DRL3 will perform a Hook-flash with the time value as programmed in Option 11 and then start to dial the digits programmed in Options A8-AF.

Options A8-AF must be programmed in the following manner: Digits 1-9 are programmed as the numbers 1-9. The digit 'A' must be programmed if a zero is needed anywhere in the dial string as the digit zero is used to indicate to the line card that there are no more digits to dial. If a '*' is needed, (e.g., *70, the transfer command in some PBX/PABX switches) program a 'B'. Similarly, if a '#' is needed, program a 'C'.
To get the line card to wait for 3 seconds in a dial string, program a 'D'. For example: to have the line card transfer a 2-way audio call to Ext. 51386, with a 3 second pause between the transfer command and dialing, Options A8-AF would be programmed as the following:

A8 = B7		AC = 60	
A9 = AD		AD = 00	
AA = 51		AE = 00	
AB = 38		AF = 00	

Glossary

Account The portion of a signal which contains the information identifying the location or the owner of the alarm panel. Also referred to as account number, account code or account digits.

Acknowl-edgement (ACK) A signal sent from the receiver to the panel indicating that data has been received. A positive acknowledgement (ACK) means data was received without any detected errors. (see kiss-off). A negative acknowledgement (NAK) means data was received, but there were detected errors. An acknowledgement may be sent per packet or per alarm.

AHS **Automatic Handshake Selection**. Refers to the receiver feature which enables the line card to request the handshake to be used with a particular panel from the CPM. The CPM maintains a database of most recently used handshakes for all accounts connected to the receiver. Handshakes are stored along with the phone number of the associated alarm panel.

Alarm A message transmitted from the panel to the receiver containing account, event, zone, user or other information. There may be one or more per call. An alarm may be repeated in the same call (if not successfully delivered in a previous attempt). An alarm will contain one or more packets. Packets can contain rounds or different information. Alarm transmission is initiated with a handshake and, if received correctly, acknowledged with a kiss-off.

ANI **Automatic Number Identification**.

ASCII **America Standard Code for Informational Interchange.** A seven-bit alphanumeric code used extensively in data communications. Parity is often added to the seven-bit code for error detection.
AutomationThe combination of software package and PC which connects to the receiver to receive alarm events. The automation can be connected either by direct serial connection or TCP.

Automation Message The alarm information delivered by a receiver in a specified protocol to a central station computer or network. Also referred to as a computer message

Backplane See BP3.

Block A group of data that specifically makes up one of the elements of an alarm. For example: account block, event block, or alarm block. One packet could contain multiple blocks.

BP3 A motherboard-style PCB which acts as the backbone for a single shelf of a System III receiver. The BP3 contains sockets to which up to 12 DRL3s, 1 CPM3, 1 PSC3 and 2 DC/DC3s can be connected. Furthermore, 2 BP3s can be connected together to form a 2-shelf configuration for the System III receiver. The BP3 also contains connections for a parallel printer and 2 serial automation COM ports, as well as an Ethernet connection. Also referred to as a backplane.

Busy Out A state of a line card. Under predefined criteria the line card will go off-hook so as to not process any new alarms.

Call The process of a receiver going off-hook, receiving one or more alarms and returning on-hook.

Caller ID An FSK format received by the line card. This format can be received prior to sending the handshakes. The Caller ID data can be used by the receiver to provide additional information to all alarms received during a call.

Capture The ability of a receiver to store commands sent to the panel from the automation computer after all of the alarms have been sent from the panel to the receiver.

Centronics A parallel printer interface standard. Also known as standard IEEE1284. A centronics interface is implemented on the CPM3 (through the backplane) to interface to the local parallel printer.

Checksum Additional data added to an alarm indicating whether the contents have been received correctly. This is generally done by summing all the digits in the message (mod 256) and reporting this as the checksum. Different methods of calculating a checksum may be specified in particular formats or protocols.

C.L.A.S.S **Custom Local Area Signaling Services.** This term is used in the telephone industry to represent all features of a telephone line, such as Caller -ID, Call Forwarding, 3-Way Calling etc.

Client One side of a two-sided TCP socket connection. The client is the one responsible for initiating the socket connection with the remote host (the server). The console represents the client side of the socket connection with the CPM3.

Computer Message See Automation Message.

Console A PC application program which can connect to the receiver and provide diagnostic/programming abilities to the user. For the System III, the console connects to the CPM3 via TCP/IP.

CPM3 Central Processing Module 3. The CPM3 controls the overall operation of the System III receiver, which includes multiplexing alarm signals from the line cards and sending them to the appropriate outputs

DC/DC3 The DC power supply of the System III receiver.

Dialer Another name for a control panel.

DNIS **Dialed Number Identification Service.**

DRL3 Digital Receiver Line Card 3.

DTMF	**Dual Tone Multiple Frequency.** A method of dialing which utilizes 2 sets of 4 tones (frequencies) each. Selecting one tone from each set will produce 16 distinct pairs. These pairs are used to dial digits when dialing a telephone number.
Ethernet	A network protocol which encompasses the lowest logical layer of the network stack, immediately above the physical layer. This protocol is governed by the IEEE and is outlined in the IEEE802.3 specification. Ethernet consists of several variations, including 10Base2, 10Base5, 10BaseT, 100BaseT, and others. 10BaseT and 100BaseT are the most prevalent.
Equivalent Line Number	An option in the receiver. By default printer and computer messages will contain the line card number. Sometimes it is necessary to output the printer and computer messages with a different line card number; in this case this option can be used to overwrite the line card number in the printer and computer outputs of the receiver.
Event	The specific type of alarm being reported by the panel.
Event Code	A term used to describe a character or group of characters in an automation output. This character(s) is used to represent the event that was reported by the panel. Example 1: SG automation reports an alarm event using an event code of 'A', Restore as 'R', or Trouble as 'T'. Example 2: Sur-Gard automation reports using a SIA output for a burglary alarm an event code of 'BA'.
FES	**Format Expert Systems**. The name given to a receiver task which performs the basic functions of: 1. sending handshakes; 2. detecting the format from the panel; 3. processing the alarm from the panel; 4. sending a kiss-off to the panel.
Format	The pre-established order of events and meanings of the various characters in an alarm transmitted from a panel to a receiver.
FSK	**Frequency Shift Keying**. A modulation technique used with low-speed modems (300 to 1800 bps). The carrier frequency is shifted between two discrete frequencies in accordance with the binary serial data.
Handshake	A signal sent by the receiver to a panel indicating that a connection has been established. These are either tones or modem data.
Heartbeat	A periodic signal sent from the automation outputter tasks to the automation software to verify the presence of that output. The period of this heartbeat is controlled via an option in the CPM3. Alternatively, the heartbeat refers to the signal sent between CPM3s to verify the presence/absence of each other.
Hook Flash	The process of the receiver going temporarily off-hook, usually in an attempt to transfer the phone call.
Hot-Swappable	Refers to the ability to add or remove particular cards to or from the system without removing power. In the System III, the CPM3, DRL3, DC/DC3 and PSC3 are all fully hot-swappable.
HTTP	**Hypertext Transfer Protocol**. A higher level protocol within the TCP/IP suite of protocols which is responsible for implementing web browsers. This is the protocol implemented by the CPM3 to enable the web interface to function.
IEEE 1284	See Centronics.
IEEE 802.3	See Ethernet.
Inter-burst Time	A term for the reception of pulse formats. The time between two bursts.
Inter-digit Time	A term used for reception of pulse or DTMF formats. The time between two digits.
Internal Trouble	A trouble condition which is generated inside a receiver, as opposed to being sent as an alarm from the panel. Internal troubles are also sent to the printer and automation outputs.
Kiss-off	A term used in the security industry for a positive acknowledgement.
Line	An individual channel on a line card. Equivalent to 1 telephone line.
Line Card	A removable, hot-swappable card which contains a POTS line interface which controls 1 or more POTS lines. For System III, each line card (DRL3) will interface to 1 line.
Line Conditioning	Electrical compensation for attenuation and phase delay distortion exhibited by the PSTN. Conditioning is performed through the use of an equalizer.
MAC Address	**Media Access Control.** A globally unique device 6-byte address which identifies a device attached to an Ethernet network. Assignment of MAC addresses is governed by the IEEE; any OEM company which manufactures Ethernet devices must apply for and purchase an OUI (**Organizationally Unique Identifier**), which consists of a block of 16,777,216 MAC addresses, all of which have the same first 3 bytes. Subsequent allocation of addresses within that block is at the discretion of the purchaser. Each Ethernet device produced must be programmed with a different MAC address in order to guarantee that each device will function correctly on the network. For the System III, the MAC address is stored in serial EEPROM on the CPM3 board. It is only programmable during manufacturing.

MLRF3	The metal rack which is used to enclose all other modules within a single shelf of the System III receiver.
MPC860	The Power PC microprocessor used as the main processor on the CPM3 board.
Multidrop	A communication link in which a single channel is shared by several stations or nodes (DVACS is a Multidrop network). Only one station may transmit at a time. Multidrop is also referred to as multipoint.
Negative Acknowl-edgement (NAK)	See acknowledgement.
Off-Hook	The process of connecting to the telephone line to answer an incoming call or dial a remote device (answering).
On-Hook	The process of releasing the telephone line after completion of a call (hanging up).
Options	A set of user-configurable parameters which controls the operation of a device. In the System III, both the DRL3 and the CPM3 contain sets of options. **Static** options are affect all Profiles on a card. **Dynamic** options are unique to each profile.
Packet	A group of digits or characters of information in an alarm.
Panel	A device (the alarm system) at the protected premises used to transmit alarms to the receiver.
Ping	A standard network command which can be used to verify the presence of a device on a network, using the device IP address. Ping is implemented as part of the ICMP protocol and consists of the Echo Request and Echo Reply commands (poll and response respectively).
POTS	**Plain Old Telephone System**. An acronym used to describe a standard analog telephone network, or alternatively a standard analog telephone line.
Printer Mes-sage	The alarm information delivered by a receiver to a central station printer. This information is generally encapsulated in a descriptive English text message.
Profile	Generally refers to a group of options. The receiver can select a "profile" based on certain conditions.
Protocol	The pre-established order of events and meanings of the various characters in the information transmitted from a receiver to a monitoring computer.
PSC3	Power Supply Controller 3.
PSTN	**Public Switched Telephone Network**. Analogous to POTS.
PSU3	Power Supply Unit 3.
Receiver	The equipment used to receive alarms sent from panels. Sur-Gard's receivers are the SLR and the MLR. 'Receiver' is sometimes used interchangeably with 'line card' as it is the line card which actually receives the alarm in the MLR.
Ring	One of the wires used on a phone line. By convention this is red.
Rounds	Two or more packets of alarm information used for error checking. If two packets (rounds) are identical the packet contains valid data.
RRLLL	The part of the automation message which stores the receiver number and line card number. The length of this field is variable and is controlled via an option in both the line card and the CPM3.
Server	One side of a two-sided TCP socket connection. The server is the one responsible for receiving the socket connection with the remote host (the client). In general, a host which acts as a server can receive multiple client socket connection requests simultaneously. The CPM3 acts as a server to both the console and the web interface.
SG	Sur-Gard, a brand name of DSC. Also used to describe a particular type of automation output.
SIA	**Security Industry Association**. Sometimes referred to as the SIA format which is an example of FSK modulation.
RS-232	An asynchronous, point-to-point serial communications protocol. Used to communicate between the DRL3 and a PC for the DRL3's debug output. Also used to communicate between the CPM3 and the automation computer, and the CPM3 and a PC for the CPM3's debug output.
System III	Name given to a single entire receiver configuration, including rack, CPM3(s), line card(s), power supply, etc.
TCP/IP	**Transmission Control Protocol/Internet Protocol.** A standard network communications protocol. On the System III, TCP/IP is used to communicate between the console and the CPM3. It is also used to connect the CPM3 to a TCP printer (resident on the console) and TCP automation software (runs independent of the console).
Tip	One of the wires used on a phone line. By convention this is green.
UIB3	User Interface Board 3. An L-shaped board which connects to the CPM3 and contains output LEDs and 4 push buttons used for the user interface. This board also connects directly to the LCD screen.
Zone	The portion of an alarm which contains the information identifying the specific zone of the panel that has been violated.

Appendix A - Printer Words: Options [60-6F]

Hex #	Printer Words
00	MEDICAL*
01	PENDANT TRANSMITTER
02	FAIL TO REPORT IN
03	RESERVED
04	RESERVED
05	RESERVED
06	RESERVED
07	RESERVED
08	RESERVED
09	RESERVED
0A	FIRE ALARM
0B	SMOKE
0C	COMBUSTION
0D	WATER FLOW
0E	HEAT
0F	PULL STATION
10	DUCT
11	FLAME
12	NEAR FIRE ALARM
13	RESERVED
14	PANIC ALARM
15	DURESS ALARM
16	SILENT ALARM
17	AUDIBLE ALARM
18	DURESS
19	DURESS
1A	RESERVED
1B	RESERVED
1C	RESERVED
1D	RESERVED
1E	BURGLARY
1F	PERIMETER
20	INTERIOR
21	24 HOUR
22	ENTRY/EXIT
23	DAY/NIGHT
24	OUTDOOR
25	TAMPER
26	NEAR BURGLARY ALARM
27	INTRUSION VERIFIER
28	GENERAL ALARM
29	POLLING LOOP OPEN
2A	POLLING LOOP SHORT
2B	EXPANSION MODULE FAILURE
2C	SENSOR TAMPER
2D	EXPANSION MODULE TAMPER
2E	SILENT BURG
2F	SENSOR SUPERVISION FAILURE
30	RESERVED
31	RESERVED
32	24 HOUR NON-BURGLARY
33	GAS DETECTED*
34	REFRIGERATION*
35	LOSS OF HEAT*
36	WATER LEAKAGE*
37	FOIL BREAK*
38	DAY TROUBLE
39	LOW BOTTLED GAS LEVEL *
3A	HIGH TEMPERATURE*
3B	LOW TEMPERATURE*
3C	RESERVED
3D	LOSS OF AIR FLOW*

Hex #	Printer Words
3E	CARBON MONOXIDE*
3F	TANK LEVEL*
40	RESERVED
41	RESERVED
42	RESERVED
43	RESERVED
44	RESERVED
45	RESERVED
46	FIRE SUPERVISORY
47	LOW WATER PRESSURE*
48	LOW CO2*
49	GATE VALVE SENSOR*
4A	LOW WATER LEVEL*
4B	PUMP ACTIVATED*
4C	PUMP FAILURE*
4D	RESERVED
4E	RESERVED
4F	RESERVED
50	SYSTEM TROUBLE
51	AC LOSS
52	LOW SYSTEM BATTERY
53	RAM CHECKSUM BAD
54	ROM CHECKSUM BAD
55	SYSTEM RESET
56	PANEL PROGRAM CHANGED
57	SELF-TEST FAILURE
58	SYSTEM SHUTDOWN
59	BATTERY TEST FAILURE
5A	GROUND FAULT
5B	BATTERY MISSING/DEAD
5C	POWER SUPPLY OVERCURRENT
5D	ENGINEER RESET
5E	RESERVED
5F	RESERVED
60	RESERVED
61	RESTORE ALARM
62	OPENING ALARM
63	CLOSING ALARM
64	SOUNDER/RELAY
65	BELL 1
66	BELL 2
67	ALARM RELAY
68	TROUBLE RELAY
69	REVERSING
6A	NOTIFICATION APPLIANCE 3 CHECK
6B	NOTIFICATION APPLIANCE 4 CHECK
6C	RESERVED
6D	RESERVED
6E	SYSTEM PERIPHERAL
6F	POLLING LOOP OPEN
70	POLLING LOOP SHORT
71	EXPANSION MODULE FAILURE
72	REPEATER FAILURE
73	LOCAL PRINTER PAPER OUT
74	LOCAL PRINTER FAILURE
75	EXPANSION MODULE DC LOSS
76	EXPANSION MODULE LOW BATTERY
77	EXPANSION MODULE RESET
78	RESERVED
79	EXP. MODULE TAMPER
7A	EXP. MODULE AC LOSS
7B	EXP. MODULE SELF-TEST FAIL

* *Use only with Model System III CE.*

System III CE is not UL Listed.

Hex #	Printer Words
7C	LOSS SUPERVISORY RF
7D	RESERVED
7E	RESERVED
7F	RESERVED
80	RESERVED
81	RESERVED
82	COMMUNICATION
83	TELCO 1 FAULT
84	TELCO 2 FAULT
85	LONG RANGE RADIO
86	FAIL TO COMMUNICATE
87	LOSS OF RADIO SUPERVISION
88	LOSS OF CENTRAL POLLING
89	VSWR
8A	RESERVED
8B	RESERVED
8C	PROTECTION LOOP
8D	PROTECTION LOOP OPEN
8E	PROTECTION LOOP SHORT
8F	FIRE TROUBLE
90	EXIT ALARM
91	PANIC ZONE TROUBLE
92	HOLDUP ZN TROUBLE
93	SWINGER TROUBLE
94	CROSS ZONE TROUBLE
95	RESERVED
96	SENSOR TROUBLE
97	LOSS OF SUPERVISORY - RF
98	LOSS OF SUPERVISORY - RPM
99	SENSOR TAMPER
9A	RF TRANSMITTER. LOW BATTERY
9B	SMOKE HI-SENSOR
9C	SMOKE LOW-SENSOR
9D	INTRUSION HI-SENSOR
9E	INTRUSION LOW-SENSOR
9F	SELF TEST FAIL
A0	OPEN/CLOSE
A1	O/C BY USER
A2	GROUP O/C
A3	AUTOMATIC O/C
A4	LATE O/C
A5	DEFERRED O/C
A6	CANCEL
A7	REMOTE ARM/DISARM
A8	QUICK ARM
A9	KEYSWITCH O/C
AA	RESERVED
AB	CALLBACK REQUEST MADE
AC	SUCCESSFUL DOWNLOAD ACCESS
AD	UNSUCCESSFUL ACCESS
AE	SYSTEM SHUTDOWN
AF	DIALER SHUTDOWN
B0	SUCCESS FULL UPLOAD
B1	RESERVED
B2	RESERVED
B3	RESERVED
B4	RESERVED
B5	ACCESS DENIED
B6	ACCESS REPORT BY USER
B7	FORCED ACCESS
B8	EGRESS DENIED
B9	EGRESS GRANTED
BA	ACCESS
BB	ACCESS
BC	ACCESS
BD	ACCESS

Hex #	Printer Words
BE	RESERVED
BF	ARMED STAY
C0	KEYSWITCH ARMED STAY
C1	RESERVED
C2	RESERVED
C3	RESERVED
C4	RESERVED
C5	RESERVED
C6	GROUP CLOSING
C7	GROUP OPENING
C8	EXCEPTION O/C
C9	EARLY O/C
CA	LATE O/C
CB	FAIL TO O/C
CC	FAIL TO O/C
CD	AUTO ARM FAIL
CE	O/C PARTIAL ARMED
CF	EXIT ERROR
D0	USER PRESENT
D1	RECENT CLOSE
D2	SOUNDER/RELAY DISABLED
D3	BELL 1 DISABLE
D4	BELL 2 DISABLE
D5	ALARM RELAY DISABLE
D6	TROUBLE RELAY DISABLE
D7	REVERSING RELAY DISABLE
D8	NOTIFICATION APPLIANCE 3 DISABLED
D9	NOTIFICATION APPLIANCE 4 DISABLED
DA	RESERVED
DB	RESERVED
DC	RESERVED
DD	DIALER DISABLED
DE	RADIO TRANSMITTER DISABLED
DF	REMOTE UPLOAD/DOWNLOAD DISABLED
E0	RESERVED
E1	RESERVED
E2	RESERVED
E3	RESERVED
E4	MESSAGE
E5	SERVICE
E6	ZONE BYPASS
E7	FIRE BYPASS
E8	24 HOUR ZONE BYPASS
E9	BURGLARY BYPASS
EA	GROUP BYPASS
EB	SWINGER BYPASS
EC	ACCESS ZN SHUNT
ED	ACCESS POINT BYPASS
EE	RESERVED
EF	UNBYPASS
F0	RESERVED
F1	MANUAL TRIGGER TEST
F2	PERIODIC TEST REPORT
F3	PERIODIC RF TRANSMISSION
F4	FIRE TEST
F5	STATUS REPORT TO FOLLOW
F6	LISTEN-IN TO FOLLOW
F7	WALK TEST MODE
F8	OFF NORMAL CONDITION
F9	VIDEO TRANSMITTER ACTIVE
FA	RESERVED
FB	FIRE POINT TEST
FC	FIRE POINT NOT TESTED
FD	INTRUSION ZONE WALK TESTED
FE	FIRE ZONE WALK TESTED
FF	PANIC ZONE WALK TESTED

Appendix B - CPM3 Internal Status Messages

Description	Printer Message	Automation Message (YYZZZZ)	LCD Message
Shelf 1 PSU3 Failure	PSU 1 Failed	AT0000	PSU 1 FAIL
Shelf 1 PSU3 Restoral	PSU 1 Restored	AR0000	N/A
Shelf 2 PSU3 Failure	PSU 2 Failed	AT0001	PSU 2 FAIL
Shelf 2 PSU3 Restoral	PSU 2 Restored	AR0001	N/A
DC/DC3 A Shelf 1 Failure	DCA 1 Failed	YP0100	DCA 1 FAIL
DC/DC3 A Shelf 1 Restoral	DCA 1 Restored	YR0100	N/A
DC/DC3 B Shelf 1 Failure	DCB 1 Failed	YP0101	DCB 1 FAIL
DC/DC3 B Shelf 1 Restoral	DCB 1 Restored	YR0101	N/A
DC/DC3 A Shelf 2 Failure	DCA 2 Failed	YP0200	DCA 2 FAIL
DC/DC3 A Shelf 2 Restoral	DCA 2 Restored	YR0200	N/A
DC/DC3 B Shelf 2 Failure	DCB 2 Failed	YP0201	DCB 2 FAIL
DC/DC3 B Shelf 2 Restoral	DCB 2 Restored	YR0201	N/A
Battery Low Shelf 1	12V Battery 1 Low	YT0100	BATTERY 1 LOW
Battery Low Restoral 1	12V Battery 1 Restored	YR0100	N/A
Battery Low Shelf 2	12V Battery 2 Low	YT0200	BATTERY 2 LOW
Battery Low Restoral 2	12V Battery 2 Restored	YR0200	N/A
Fan Circuit Shelf 1 Failure	Fan Circuit 1 Failed	YX0100	FAN 1 FAIL
Fan Circuit Shelf 1 Restoral	Fan Circuit 1 Restored	YZ0100	N/A
Fan Circuit Shelf 2 Failure	Fan Circuit 2 Failed	YX0200	FAN 2 FAIL
Fan Circuit Shelf 2 Restoral	Fan Circuit 2 Restored	YZ0200	N/A
TCP/IP Shelf 1 Printer Failure	TCP/IP 1 Printer Failed	VZ0100	TCP 1 PRINTER FAIL
TCP/IP Shelf 1 Printer Restoral	TCP/IP 1 Printer Restored	VY0100	N/A
TCP/IP Shelf 2 Printer Failure	TCP/IP 2 Printer Failed	VZ0200	TCP 2 PRINTER FAIL
TCP/IP Shelf 2 Printer Restoral	TCP/IP 2 Printer Restored	VY0200	N/A
Parallel Shelf 1 Printer Failure	Parallel 1 Printer Failed	VZ0101	PAR 1 PRINTER FAIL
Parallel Shelf 1 Printer Restoral	Parallel 1 Printer Restored	VY0101	N/A
Parallel Shelf 2 Printer Failure	Parallel 2 Printer Failed	VZ0201	PAR 2 PRINTER FAIL
Parallel Shelf 2 Printer Restoral	Parallel 2 Printer Restored	VY0201	N/A
SG-TCP/IP Shelf 1 Failure	SG-TCP/IP 1 Failed	NT0100	SG-TCP/IP 1 FAIL
SG-TCP/IP Shelf 1 Restoral	SG-TCP/IP 1 Restored	NR0100	N/A
SG-TCP/IP Shelf 2 Failure	SG-TCP/IP 2 Failed	NT0200	SG-TCP/IP 2 FAIL
SG-TCP/IP Shelf 2 Restoral	SG-TCP/IP 2 Restored	NR0200	N/A
SG-Serial Shelf 1 Failure	SG-SERIAL 1 Failed	YC0101	SG-SERIAL 1 FAIL
SG-Serial Shelf 1 Restoral	SG-SERIAL 1 Restored	YK0101	N/A
SG-Serial Shelf 2 Failure	SG-SERIAL 2 Failed	YC0201	SG-SERIAL 2 FAIL
SG-Serial Shelf 2 Restoral	SG-SERIAL 2 Restored	YK0201	N/A
Switch Into Active Mode	Taking Over Polling	N/A	N/A
Switch To Manual Mode	Switching To Manual Mode	N/A	MANUAL
Switch To Normal Mode	Switching To Normal Mode	N/A	ACTIVE
Switch To Standby Mode	Switching To Standby Mode	N/A	STANDBY
Line Card Absent	Line Card Absent	YDssOO	N/A
Line Card Restored	Line Card Restored	YEssOO	N/A
Internal Communication Error (Computer)	Computer: Inter-Comm. Error	YOssOO	N/A
Internal Communication Error (Printer)	Printer: Inter-Comm. Error	YOssOO	N/A
Internal Communication Error (Console)	Console: Inter-Comm. Error	YOssOO	N/A
Operator Activity Mode	User:## Entered Programming	LB00##	N/A
Primary CPM3 Power Up	Primary CPM3 Power Up	RR0001	N/A
Secondary CPM3 Power Up	Secondary CPM3 Power Up	RR0002	N/A
Primary CPM3 Failure	Primary CPM3 Failure	YX0001	N/A
Primary CPM3 Restoral	Primary CPM3 Restored	RR0001	N/A
Secondary CPM3 Failure	Secondary CPM3 Failure	YX0002	N/A
Secondary CPM3 Restoral	Secondary CPM3 Restored	RR0002	N/A
AHS Database Full	CPM3 AHS Database Full	N/A	N/A
Shelf 1 UPS AC Fail (PGM In)	UPS AC 1 Failed	AT0102	UPS AC 1 FAIL
Shelf 1 UPS AC Restored	UPS AC 1 Restored	AR0102	N/A
Shelf 1 UPS Low Battery Restore	UPS Battery 1 Restored	YR0102	N/A
Shelf 1 UPS Low Battery	UPS Battery 1 Low	YT0102	UPS BATT 1 LOW
Shelf 2 UPS AC Fail (PGM In)	UPS AC 2 Failed	AT0202	UPS AC 2 FAIL
Shelf 2 UPS AC Restored	UPS AC 2 Restored	AR0202	N/A
Shelf 2 UPS Low Battery Restore	UPS Battery 2 Restored	YR0202	N/A
Shelf 2 UPS Low Battery (PGM in)	UPS Battery 2 Low	YT0202	UPS BATT 2 LOW
Console Session Denied on Primary CPM3	Primary Console Session Denied	RD0001	N/A
Console Session Denied on Secondary CPM3	Secondary Console Session Denied	RD0002	N/A
Line Card Busy	LC Programming	YBss00	N/A
Computer Buffer Full	Computer Buffer Full	YBss00	N/A
Printer Buffer Full	Printer Buffer Full	YBss00	N/A
Checksum Fail	Checksum Failed	YFss00	N/A

Appendix C - TELCO Connector Pin-outs

NOTE: All **B** channels are used for two-way audio or backup telephone line. Pins 25,50 Not used

Pin		Port		Pin		Port		Pin		Port
1	26	A Tip/Ring Channel 1		9	34	A Tip/Ring Channel 5		17	42	A Tip/Ring Channel 9
2	27	B Tip/Ring Channel 1		10	35	B Tip/Ring Channel 5		18	43	B Tip/Ring Channel 9
3	28	A Tip/Ring Channel 2		11	36	A Tip/Ring Channel 6		19	44	A Tip/Ring Channel 10
4	29	B Tip/Ring Channel 2		12	37	B Tip/Ring Channel 6		20	45	B Tip/Ring Channel 10
5	30	A Tip/Ring Channel 3		13	38	A Tip/Ring Channel 7		21	46	A Tip/Ring Channel 11
6	31	B Tip/Ring Channel 3		14	39	B Tip/Ring Channel 7		22	47	B Tip/Ring Channel 11
7	32	A Tip/Ring Channel 4		15	40	A Tip/Ring Channel 8		23	48	A Tip/Ring Channel 12
8	33	B Tip/Ring Channel 4		16	41	B Tip/Ring Channel 8		24	49	B Tip/Ring Channel 12

NOTE: On the BPX3 the B ports are the channels used for two-way audio or back-up telephone line; Refer to DRL-3 options for further information.

Appendix D - DEC-HEX-BIN Conversion Chart

Dec	Hex	Binary	Dec	Hex	Binary
000	00	0000 0000	027	1B	0001 1011
001	01	0000 0001	028	1C	0001 1100
002	02	0000 0010	029	1D	0001 1101
003	03	0000 0011	030	1E	0001 1110
004	04	0000 0100	031	1F	0001 1111
005	05	0000 0101	032	20	0010 0000
006	06	0000 0110	033	21	0010 0001
007	07	0000 0111	034	22	0010 0010
008	08	0000 1000	035	23	0010 0011
009	09	0000 1001	036	24	0010 0100
010	0A	0000 1010	037	25	0010 0101
011	0B	0000 1011	038	26	0010 0110
012	0C	0000 1100	039	27	0010 0111
013	0D	0000 1101	040	28	0010 1000
014	0E	0000 1110	041	29	0010 1001
015	0F	0000 1111	042	2A	0001 1010
016	10	0001 0000	043	2B	0010 1011
017	11	0001 0001	044	2C	0010 1100
018	12	0001 0010	045	2D	0010 1101
019	13	0001 0011	046	2E	0010 1110
020	14	0001 0100	047	2F	0010 1111
021	15	0001 0101	048	30	0011 0000
022	16	0001 0110	049	31	0011 0001
023	17	0001 0111	050	32	0011 0010
024	18	0001 1000	051	33	0011 0011
025	19	0001 1001	052	34	0011 0100
026	1A	0001 1010	053	35	0011 0101

Appendix E - ASCII Character Chart

Corresponding ASCII on printer (Option 70) Hex Character

Code	Character	Code	Character
20	Space	49	I
30	0	4A	J
31	1	4B	K
32	2	4C	L
33	3	4D	M
34	4	4E	N
35	5	4F	O
36	6	50	P
37	7	51	Q
38	8	52	R
39	9	53	S
41	A	54	T
42	B	55	U
43	C	56	V
44	D	57	W
45	E	58	X
46	F	59	Y
47	G	5A	Z
48	H	5C	\

Appendix F - DRL3 Communication Formats

NAME	HANDSHAKE	DATA	BAUD	FORMAT	EXTENDED	KISS OFF
Ademco Express	Dual Tone	DTMF	DTMF	4/1(option), 4/2	NO	1400Hz
Ademco Slow	1400Hz	1900Hz	10bps	3/1,4/1(or 3/2),4/2	NO	1400Hz
Ademco Slow	1400Hz	1900Hz	10bps	4/2,4/1,3/1	YES	1400Hz
Contact ID	Dual Tone	DTMF	DTMF	4/2/1/3/2/3	NO	1400Hz
Contact ID 10 Digit	Dual Tone	DTMF	DTMF	10/2/1/3/2	NO	1400Hz
FBI Super Fast	2300Hz	DTMF	DTMF	4/3/1	NO	2300Hz
Franklin	2300Hz	1800Hz	20bps	3/1,4/1(or 3/2), 4/2	NO	2300Hz
Franklin	2300Hz	1800Hz	20bps	4/2,4/1,3/1	YES	2300Hz
ITI	ITI	FSK	110/300 Baud	-	NO	ITI
Modem II	Modem II	FSK	110 Baud	FSK	NO	Modem II
Modem IIE	Modem II	FSK	300 Baud	-	NO	Modem IIE
Modem IIIa^2	Modem II	FSK	300 Baud	-	NO	Modem IIIa^2
Radionics	2300Hz	1800Hz	40bps	3/1,4/2	NO	2300Hz
Radionics	2300Hz	1800Hz	40bps	4/2,3/1	YES	2300Hz
Radionics	2300Hz	1800Hz	40bps	3/1+parity	NO 4/2+parity	2300Hz
Radionics	2300Hz	1800Hz	40bps	3/1+parity 4/2+parity	YES	2300Hz
RadionicsBFSK	1400Hz	FSK	42 Baud	3/2	NO	1400Hz
RadionicsBFSK	2300Hz	FSK	42 Baud	3/2	NO	2300Hz
S.F. Ademco	Dual Tone	DTMF	DTMF	4/8/1	NO	1400Hz
S.F. Ademco	Dual Tone	DTMF	DTMF	4/8/1 + Checksum	NO	1400Hz
Sescoa S. Speed	2300Hz	1800Hz	40bps	4/3+Checksum	NO	2300Hz
Sescoa S. Speed	2300Hz	1800Hz	40bps	4/3+Checksum	ID O/C	2300Hz
SIA FSK Level 1, 2, and 3.	SIA	FSK	110bps/ 300bps	-	-	tonal, data ACK
Silent Knight Fast	1400Hz	1900Hz	14bps	3/1,4/1 (or 3/2), 4/2	NO	1400Hz
Silent Knight Fast	1400Hz	1900Hz	14bps	4/2,4/1,3/1	YES	1400Hz
Silent Knight FSK1	2300Hz	FSK	110 Baud	4/2, 5/2, 6/2	NO	2300Hz
Silent Knight FSK1	1400/2300Hz	FSK	100 Baud	4/2	NO	1400/2300Hz
Silent Knight FSK2	2300Hz	FSK	110 Baud	SIA equiv.	NO	2300Hz
Silent Knight FSK2	1400/2300Hz	FSK	100 Baud	4/2	NO	1400/2300Hz
Sur-Gard	2300Hz	DTMF	DTMF	4/1,4/2,4/3	NO	2300Hz
Sur-Gard	Dual Tone	DTMF	DTMF	4/1,4/2,4/3	NO	1400Hz
Sur-Gard	2300Hz	DTMF	DTMF	4/3+Checksum	NO	2300Hz
Sur-Gard	Dual Tone	DTMF	DTMF	4/3+Checksum	NO	1400Hz
Silent Knight FSK 0	1400/2300Hz	FSK	110 Baud	4/1	NO	1400/2300Hz
DMP Serial 1	DMP	FSK	110 Baud	DMP	NO	DMP
DMP Serial 3	DMP	FSK	110 Baud	DMP	NO	DMP
Varitech	2300Hz	FSK	110 Baud	4/1,4/2	NO	2300Hz
Scantronics	1400Hz, Dual Tone	DTMF	DTMF	4/8/1,4/16/1,2/8/1,3/8/1 6/8/1,6/16/1,2/16/1,3/16/1	NO	1400Hz
Adcor	2300Hz	Pulse	Pulse	3/1,3/2	NO	2300Hz
Westec 1,2,3,5,6	Westec	DTMF	DTMF	Westec	NO	Westec
Surtec *	Surtec	DTMF	DTMF	Surtec	NO	Surtec

*** NOTE:** *Format Not UL Listed.*

WARNING Please Read Carefully

Note to Installers

This warning contains vital information. As the only individual in contact with system users, it is your responsibility to bring each item in this warning to the attention of the users of this system.

System Failures

This system has been carefully designed to be as effective as possible. There are circumstances, however, involving fire, burglary, or other types of emergencies where it may not provide protection. Any alarm system of any type may be compromised deliberately or may fail to operate as expected for a variety of reasons. Some but not all of these reasons may be:

■ Inadequate Installation

A security system must be installed properly in order to provide adequate protection. Every installation should be evaluated by a security professional to ensure that all access points and areas are covered. Locks and latches on windows and doors must be secure and operate as intended. Windows, doors, walls, ceilings and other building materials must be of sufficient strength and construction to provide the level of protection expected. A reevaluation must be done during and after any construction activity. An evaluation by the fire and/or police department is highly recommended if this service is available.

■ Criminal Knowledge

This system contains security features which were known to be effective at the time of manufacture. It is possible for persons with criminal intent to develop techniques which reduce the effectiveness of these features. It is important that a security system be reviewed periodically to ensure that its features remain effective and that it be updated or replaced if it is found that it does not provide the protection expected.

■ Access by Intruders

Intruders may enter through an unprotected access point, circumvent a sensing device, evade detection by moving through an area of insufficient coverage, disconnect a warning device, or interfere with or prevent the proper operation of the system.

■ Power Failure

Control units, intrusion detectors, smoke detectors and many other security devices require an adequate power supply for proper operation. If a device operates from batteries, it is possible for the batteries to fail. Even if the batteries have not failed, they must be charged, in good condition and installed correctly. If a device operates only by AC power, any interruption, however brief, will render that device inoperative while it does not have power. Power interruptions of any length are often accompanied by voltage fluctuations which may damage electronic equipment such as a security system. After a power interruption has occurred, immediately conduct a complete system test to ensure that the system operates as intended.

■ Failure of Replaceable Batteries

This system's wireless transmitters have been designed to provide several years of battery life under normal conditions. The expected battery life is a function of the device environment, usage and type. Ambient conditions such as high humidity, high or low temperatures, or large temperature fluctuations may reduce the expected battery life. While each transmitting device has a low battery monitor which identifies when the batteries need to be replaced, this monitor may fail to operate as expected. Regular testing and maintenance will keep the system in good operating condition.

■ Compromise of Radio Frequency (Wireless) Devices

Signals may not reach the receiver under all circumstances which could include metal objects placed on or near the radio path or deliberate jamming or other inadvertent radio signal interference.

■ System Users

A user may not be able to operate a panic or emergency switch possibly due to permanent or temporary physical disability, inability to reach the device in time, or unfamiliarity with the correct operation. It is important that all system users be trained in the correct operation of the alarm system and that they know how to respond when the system indicates an alarm.

■ Smoke Detectors

Smoke detectors that are a part of this system may not properly alert occupants of a fire for a number of reasons, some of which follow. The smoke detectors may have been improperly installed or positioned. Smoke may not be able to reach the smoke detectors, such as when the fire is in a chimney, walls or roofs, or on the other side of closed doors. Smoke detectors may not detect smoke from fires on another level of the residence or building.

Every fire is different in the amount of smoke produced and the rate of burning. Smoke detectors cannot sense all types of fires equally well. Smoke detectors may not provide timely warning of fires caused by carelessness or safety hazards such as smoking in bed, violent explosions, escaping gas, improper storage of flammable materials, overloaded electrical circuits, children playing with matches or arson.

Even if the smoke detector operates as intended, there may be circumstances when there is insufficient warning to allow all occupants to escape in time to avoid injury or death.

■ Motion Detectors

Motion detectors can only detect motion within the designated areas as shown in their respective installation instructions. They cannot discriminate between intruders and intended occupants. Motion detectors do not provide volumetric area protection. They have multiple beams of detection and motion can only be detected in unobstructed areas covered by these beams. They cannot detect motion which occurs behind walls, ceilings, floor, closed doors, glass partitions, glass doors or windows. Any type of tampering whether intentional or unintentional such as masking, painting, or spraying of any material on the lenses, mirrors, windows or any other part of the detection system will impair its proper operation.

Passive infrared motion detectors operate by sensing changes in temperature. However their effectiveness can be reduced when the ambient temperature rises near or above body temperature or if there are intentional or unintentional sources of heat in or near the detection area. Some of these heat sources could be heaters, radiators, stoves, barbeques, fireplaces, sunlight, steam vents, lighting and so on.

■ Warning Devices

Warning devices such as sirens, bells, horns, or strobes may not warn people or waken someone sleeping if there is an intervening wall or door. If warning devices are located on a different level of the residence or premise, then it is less likely that the occupants will be alerted or awakened. Audible warning devices may be interfered with by other noise sources such as stereos, radios, televisions, air conditioners or other appliances, or passing traffic. Audible warning devices, however loud, may not be heard by a hearing-impaired person.

■ Telephone Lines

If telephone lines are used to transmit alarms, they may be out of service or busy for certain periods of time. Also an intruder may cut the telephone line or defeat its operation by more sophisticated means which may be difficult to detect.

■ Insufficient Time

There may be circumstances when the system will operate as intended, yet the occupants will not be protected from the emergency due to their inability to respond to the warnings in a timely manner. If the system is monitored, the response may not occur in time to protect the occupants or their belongings.

■ Component Failure

Although every effort has been made to make this system as reliable as possible, the system may fail to function as intended due to the failure of a component.

■ Inadequate Testing

Most problems that would prevent an alarm system from operating as intended can be found by regular testing and maintenance. The complete system should be tested weekly and immediately after a break-in, an attempted break-in, a fire, a storm, an earthquake, an accident, or any kind of construction activity inside or outside the premises. The testing should include all sensing devices, keypads, consoles, alarm indicating devices and any other operational devices that are part of the system.

■ Security and Insurance

Regardless of its capabilities, an alarm system is not a substitute for property or life insurance. An alarm system also is not a substitute for property owners, renters, or other occupants to act prudently to prevent or minimize the harmful effects of an emergency situation.

Limited Warranty

Digital Security Controls Ltd. warrants the original purchaser that for a period of twelve months from the date of purchase, the product shall be free of defects in materials and workmanship under normal use. During the warranty period, Digital Security Controls Ltd. shall, at its option, repair or replace any defective product upon return of the product to its factory, at no charge for labour and materials. Any replacement and/or repaired parts are warranted for the remainder of the original warranty or ninety (90) days, whichever is longer. The original purchaser must promptly notify Digital Security Controls Ltd. in writing that there is defect in material or workmanship, such written notice to be received in all events prior to expiration of the warranty period. There is absolutely no warranty on software and all software products are sold as a user license under the terms of the software license agreement included with the product. The Customer assumes all responsibility for the proper selection, installation, operation and maintenance of any products purchased from DSC. Custom products are only warranted to the extent that they do not function upon delivery. In such cases, DSC can replace or credit at its option.

International Warranty

The warranty for international customers is the same as for any customer within Canada and the United States, with the exception that Digital Security Controls Ltd. shall not be responsible for any customs fees, taxes, or VAT that may be due.

Warranty Procedure

To obtain service under this warranty, please return the item(s) in question to the point of purchase. All authorized distributors and dealers have a warranty program. Anyone returning goods to Digital Security Controls Ltd. must first obtain an authorization number. Digital Security Controls Ltd. will not accept any shipment whatsoever for which prior authorization has not been obtained.

Conditions to Void Warranty

This warranty applies only to defects in parts and workmanship relating to normal use. It does not cover:

• damage incurred in shipping or handling;

• damage caused by disaster such as fire, flood, wind, earthquake or lightning;

• damage due to causes beyond the control of Digital Security Controls Ltd. such as excessive voltage, mechanical shock or water damage;

• damage caused by unauthorized attachment, alterations, modifications or foreign objects;

• damage caused by peripherals (unless such peripherals were supplied by Digital Security Controls Ltd.);

• defects caused by failure to provide a suitable installation environment for the products;

• damage caused by use of the products for purposes other than those for which it was designed;

• damage from improper maintenance;

• damage arising out of any other abuse, mishandling or improper application of the products.

Items Not Covered by Warranty

In addition to the items which void the Warranty, the following items shall not be covered by Warranty: (i) freight cost to the repair centre; (ii) products which are not identified with DSC's product label and lot number or serial number; (iii) products disassembled or repaired in such a manner as to adversely affect performance or prevent adequate inspection or testing to verify any warranty claim. Access cards or tags returned for replacement under warranty will be credited or replaced at DSC's option. Products not covered by this warranty, or otherwise out of warranty due to age, misuse, or damage shall be evaluated, and a repair estimate shall be provided. No repair work will be performed until a valid purchase order is received from the Customer and a Return Merchandise Authorisation number (RMA) is issued by DSC's Customer Service.

Digital Security Controls Ltd.'s liability for failure to repair the product under this warranty after a reasonable number of attempts will be limited to a replacement of the product, as the exclusive remedy for breach of warranty. Under no circumstances shall Digital Security Controls Ltd. be liable for any special, incidental, or consequential damages based upon breach of warranty, breach of contract, negligence, strict liability, or any other legal theory. Such damages include, but are not limited to, loss of profits, loss of the product or any associated equipment, cost of capital, cost of substitute or replacement equipment, facilities or services, down time, purchaser's time, the claims of third parties, including customers, and injury to property. The laws of some jurisdictions limit or do not allow the disclaimer of consequential damages. If the laws of such a jurisdiction apply to any claim by or against DSC, the limitations and disclaimers contained here shall be to the greatest extent permitted by law. Some states do not allow the exclusion or limitation of incidental or consequential damages, so that the above may not apply to you.

Disclaimer of Warranties

This warranty contains the entire warranty and shall be in lieu of any and all other warranties, whether expressed or implied (including all implied warranties of merchantability or fitness for a particular purpose) And of all other obligations or liabilities on the part of Digital Security Controls Ltd. Digital Security Controls Ltd. neither assumes responsibility for, 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.

This disclaimer of warranties and limited warranty are governed by the laws of the province of Ontario, Canada.

WARNING: Digital Security Controls 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.

Installer's Lockout

Any products returned to DSC which have the Installer's Lockout option enabled and exhibit no other problems will be subject to a service charge.

Out of Warranty Repairs

Digital Security Controls Ltd. will at its option repair or replace out-of-warranty products which are returned to its factory according to the following conditions. Anyone returning goods to Digital Security Controls Ltd. must first obtain an authorization number. Digital Security Controls Ltd. will not accept any shipment whatsoever for which prior authorization has not been obtained.

Products which Digital Security Controls Ltd. determines to be repairable will be repaired and returned. A set fee which Digital Security Controls Ltd. has predetermined and which may be revised from time to time, will be charged for each unit repaired.

Products which Digital Security Controls Ltd. determines not to be repairable will be replaced by the nearest equivalent product available at that time. The current market price of the replacement product will be charged for each replacement unit.

FCC Compliance Statement

CAUTION: Changes or modifications not expressly approved by Digital Security Controls Ltd. could void your authority to use this equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Re-orient the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/television technician for help.

The user may find the following booklet prepared by the FCC useful: "How to Identify and Resolve Radio/Television Interference Problems". This booklet is available from the U.S. Government Printing Office, Washington D.C. 20402, Stock # 004-000-00345-4.

Important Information

This equipment complies with Part 68 of the FCC Rules and the requirements adopted by the ACTA. On the side of this equipment is a label that contains, among other information, a product identifier in the format US:AAAEQ##TXXXX. If requested, this number must be provided to the Telephone Company.

Product identifier: US:1VDAL03BSYSTEMIII
USOC Jack: RJ-21X

Telephone Connection Requirements

A plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA. A compliant telephone cord and modular plug is provided with this product. It is designed to be connected to a compatible modular jack that is also compliant. See installation instructions for details.

Ringer Equivalence Number (REN) The REN is used to determine the number of devices that may be connected to a telephone line. Excessive RENs on a telephone line may result in the devices not ringing in response to an incoming call. In most but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local Telephone Company. For products approved after July 23, 2001, the REN for this product is part of the product identifier that has the format.

US: AAAEQ##TXXXX. The digits represented by ## are the REN without a decimal point (e.g., 03 is a REN of 0.3). For earlier products, the REN is separately shown on the label.

Incidence of Harm If this equipment Sur-Gard SYSTEM III causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice is not practical, the Telephone Company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

Changes in Telephone Company Equipment or Facilities The Telephone Company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens the Telephone Company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.
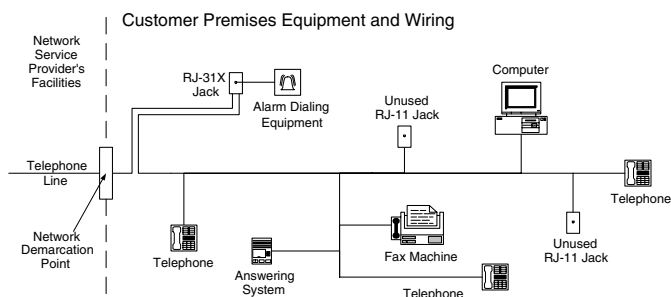
Equipment Maintenance Facility If trouble is experienced with this equipment Sur-Gard SYSTEM III, for repair or warranty information, please contact the facility indicated below. If the equipment is causing harm to the telephone network, the Telephone Company may request that you disconnect the equipment until the problem is solved. This equipment is of a type that is not intended to be repaired by the end user.

Simplex Time Recorder Co.

100 Simplex Drive, Westminster MA 01441-0001 USA, Tel: (978) 731-2500

Additional Information Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information.

Alarm dialing equipment must be able to seize the telephone line and place a call in an emergency situation. It must be able to do this even if other equipment (telephone, answering system, computer modem, etc.) already has the telephone line in use. To do so, alarm dialing equipment must be connected to a properly installed RJ31X jack that is electrically in series with and ahead of all other equipment attached to the same telephone line. Proper installation is depicted in the figure below. If you have any questions concerning these instructions, you should consult your telephone company or a qualified installer about installing the RJ31X jack and alarm dialing equipment for you.

Customer Premises Equipment and Wiring

Industry Canada Statement

IC: 160A-SYSTEM3

NOTICE: This equipment meets the applicable Industry Canada Terminal Equipment Technical Specifications. This is confirmed by the registration number. The abbreviation, IC, before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

NOTICE: The Ringer Equivalence Number (REN) for this terminal is 01. The REN assigned to each terminal equipment 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 Numbers of all the devices does not exceed five.