Industry Canada NOTICE

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

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

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

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

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

NOTICE: The Load Number assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device, to prevent overloading. The termination on an interface may consist of any combination of devices subject only to the requirement that the total of the Load Numbers of all the devices does not exceed 100.

The Load Number of this unit is 40.

FCC Compliance Statement

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

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

Important Information

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

Notification to Telephone Company

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

FCC Registration Number: 1VDCAN-74582-AL-N
Ringer Equivalence Number: 0.3B

Telephone Connection Requirements

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

Incidence of Harm

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

Changes in Telephone Company Equipment or Facilities

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

General

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

Ringer Equivalence Number (REN)

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

Equipment Maintenance Facility

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

U.S. Point of Contact
Digital Security Controls Ltd.
160 Washburn St.
Lockport, NY 14094
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SG-DRL2A V1.81/1.81SV RELEASE

New Features:

- The new version 1.81 will now provide the Silent Knight FSK1 and FSK2 communication formats.
- No necessary programming needs to be performed to handle the new formats.
- Features two optional computer outputs for the FSK2 format. For more details, please see page 42.
- New option to convert the BFSK computer output into a 3/2 format. See page 23.
- New option to enable/disable the ring simulator input. See page 22.
- Sescoa Super Speed format has been removed.
- DSC SIA Audio (option 61) added. See page 23.
- SIA Video Block
- The DRL2A v1.81 supports the SIA Video block (available on the DSC PC1575 and PC5015). Please see page 41.
- Support FBI two-way audio and contact ID two-way audio.
- ITI Ultra Guard compatible.
- Support for the Radionics D2212 wireless transmission signals.
- Double ring with Caller ID compatible.
- Download A.I.R. compatible.

INTRODUCTION

The MLR2-DG is a Multi-Line, Multi-Format Digital Receiver, (U.L. and U.L.C. listed) for commercial fire and burglary. The basic unit consists of a CPM2 Central Processor Module and a DRL2A Digital Receiver Line Card Module. Additional DRL2A Line Cards may be added to enable the CPM2 to monitor up to 14 telephone lines. The MLR2-DG includes many features, all designed to make the receiver more powerful and easier to use. The MLR2-DG can decode a variety of popular and widely used communication formats. Refer to Appendix D, DRL2A Communication Formats for a list of the available communication protocol.

The MLR2-DG’s real-time clock and calendar “stamps” all information received with the time and date, and all information is displayed on the receiver’s LCD screens and may be printed or forwarded to a computer. To ensure security, adjustment of the clock, calendar and other programming is protected by password codes.

CPM2

The CPM2 Central Processing Module oversees operation of the receiver. Along with its built-in keypad and LCD message screen, the CPM2 features both a printer and computer interface.

The CPM2 features a 128-event nonvolatile memory buffer. The buffer may be examined on the LCD screen or printed. If the printer or computer is off-line, the CPM2 will retain events in the buffer and will automatically send the events to the computer or printer when communications are restored.

DRL2A

Each DRL2A Line Card Module can monitor two telephone lines. The Line Card module is equipped with a 256-event nonvolatile memory to record events and corresponding telephone numbers. Caller Identification (Call Display) capability is built-in and telephone numbers can be displayed, printed out, and stored in memory. Events and information stored in memory may be printed at any time.

Power and Supervision

The MLR2-DG requires 16VAC from a 115V or 230 VAC 50/60 Hz transformer. The receiver is equipped with 12V rechargeable stand-by battery connections and an automatic battery charger.

The stand-by battery voltage and connections are supervised. The Line Cards are also continuously supervised to ensure uninterrupted communication with the CPM2. Any trouble conditions are reported on the LCD screens and may be sent to the printer and the computer.

The DRL2A Line Card Module also verifies communications with the CPM2. In the event of a malfunction, the operator will be advised with an audible indication and the Line Cards will continue to function with their individual LCD displays and controls. Each line card will continue to receive information, and the operator may review the event buffer on each line card.

The printer is supervised for loss of power, off-line, paper out and other trouble conditions. The communication link to the computer through the RS232 port can be monitored by the supervisory “heartbeat” test transmissions.

Compatibility

The DRL2A has one programmable output which in factory default is used to indicate that faulty data has been received. It can also be used for the video, audio and other applications. Central station automation software packages such as:

- ABM
- DICE
- MICRO KEY
- SIMS
- ALARMSOFT
- GENESIS
- SAMM
- SIS
- APROPOS
- MAS
- SMS
- SIMS CSM

and support the Sur-Gard interface. The receiver also provides a basic communication protocol similar to the RADIONICS 6500 interface for other software packages that have yet to be updated to include the Sur-Gard interface.

CPM2 Outputs

The CPM2 features three switched-negative outputs. One output labelled “OPTION” has a corresponding LED on the CPM2 front panel; the factory default programming slowly flashes the OPTION LED when the “OPTION” output is activated. Switched negative outputs are also provided for the Acknowledge and Trouble LEDs.
System Overview

- Caller Identification (Call Display) capability
- Non-Volatile RAM on each DRL2A line card module for programming and event buffer
- 3/1, 4/2 formats with or without parity, 4/1 without parity at 10, 14, 20, or 40 baud
- 4/1, 4/2, 4/3, and 4/3 DTMF formats
- Optional* Formats: 3-2, 4/1/4/2 extended
- ACRON  DTMF format
- Contact ID (DTMF) format
- Super Fast or High Speed DTMF format, with or without parity
- DTMF 4/1 Express format (optional)
- DTMF 4/2 Express format
- FBI Super Fast format with or without parity
- RADIONICS Modem II, Modem IIE and BFSK formats
- SIA format: 110 and 300 baud, tone and data acknowledgement
- SK/FSK1, FSK2
- ITI
- Varitech format (1.81SV only)
- 1400Hz, 2300Hz, Dual Tone, SIA FSK, Modem II and ITI handshakes selected by configuration commands
- Large, easy to read 2-line, 16-characters-per-line, Liquid Crystal Display screens
- Plain language message display capability
- EUROCARD circuit board design for reduced complexity, high reliability and easy servicing
- All modules function individually to help ensure uninterrupted operation during hardware or software upgrades
- Line Cards available for DVACS-compatible multiplex operation and remote receiver connection
- Output on DRL2A for 2-Way audio communication
- Input and output on DRL2A for MLRV-A VIDEO DOWNLOOK VERIFICATION
- Inputs for ring simulation on DRL2A and inputs on CPM2 for UPS supervisory or external Ack. button
- 14 lines maximum per receiver
- 128-event memory buffer on CPM2
- Real-time clock
- CPM2 feature 16-bit micro-controller
- 1 parallel printer port; 2 serial RS232 ports
- Programmable serial ports configuration
- Programmable System Functions: Computer and printer
- Fast transmission of multiple alarms to the computer and printer to ensure operator’s quick response
- Continuous verification of the computer-receiver link with the “heartbeat” function
- Switched-negative outputs on CPM2 (special applications)
- Outputs on CPM2 for Acknowledge and Buzzer
- AC-lost detection and stand-by battery supervision
- Low battery detection and automatic low battery disconnect to prevent deep-discharge damage to battery
- Operator Acknowledge option
- Telephone Line Supervision

* All formats noted as (optional) are selected using configuration commands
**QUICK START**

Refer to the Quick Installation booklet for installation instructions.

**Receiver Setup and Operation Without Programming**

**Unpacking**

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

**Introduction to Operation**

Refer to the following sections of this manual for an overview of the operation of the DRL2A Digital Receiver Line Card and the CPM2 Central Processing Module:

- **DRL2A**
  - General Information
  - Features
  - Installation
  - Controls and Display

- **CPM2**
  - General Information
  - Controls and Display
  - Cold Start-up

If the receiver is to be used with a computer and central station automation software, refer to “MLR2-DG Computer Interface”

**Bench Testing**

Becoming familiar with the connections and setup of the unit on the work bench will make final installation more straightforward.

The following items are required:

- 16VAC transformer
- 2 telephone lines
- One or more dialers or digital dialer control panels

Direct connection testing without the use of telephone lines is possible by using the ring simulator switch input connections on the back of the receiver.

Dialers and control panels using an optocoupler phone line interface will require a connection method providing a DC current for direct connection testing.

**Power Up**

When power is applied, the receiver will beep and will indicate one or more trouble conditions on the LCD message screen.

If the Line Cards do not have telephone lines connected, the DRL2A modules will beep and their “ALARM” lights will FLASH.

Press the flashing [ACK] button to silence the buzzer. If there is no computer or printer connected, a trouble message will be displayed on the CPM2 LCD and the “ACK” light will FLASH. Press the [ACK] button to silence the CPM2 buzzer.

**Operation with Default Program**

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

- The master ID password is “CAFE”.
- Answers incoming calls on the first ring
- Sends 2300 Hz as the first handshake
- Sends 1400 Hz as the second handshake
- Sends dual tone as the third handshake
- Sends SIA FSK tone as the fourth handshake
- Sends ITI/Modem IIE tone as fifth handshake
- Sends Modem II tone as sixth handshake
- Receives all Communication Formats, except for: 3/2, 4/1 express, 4/2 extended

The above formats can be manually selected, but may conflict with more commonly used formats.

- Signals will be displayed on the Line Card LCD as they are received. The signals are then sent to the parallel printer and computer connected to serial port COM1. The default event codes described in the “DRL2A Library Decoding and Event Codes Table” will be used with the Sur-Gard RS-232 Communication Protocol to send signals to the computer, if connected.

- If a computer is not connected, press the [ACK] button on the CPM2 module to silence the buzzer. The time and date of the Acknowledgment will be printed.

**Direct Connect Testing Wiring Diagram Shown with a Control Panel**
INSTALLATION

Mounting the Receiver
- Install the MLR2-DG in a closed 19" rack or cabinet with a locking rear access door. Cover all unused spaces with blank metal plates. The LCD screens on the receiver are designed to be viewed below eye level. If the unit must be mounted where the screens are above eye level, angle the unit downwards to improve visibility. The following items can be supplied for a complete installation:

Stand-up Unit (61.25" tall up to 14 telephone lines)
Part # MLR2-CL

<table>
<thead>
<tr>
<th>Part</th>
<th>FRONT VIEW</th>
<th>REAR VIEW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rack</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Door with lock and ventilation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blank plates 21&quot; (2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blank plate 5.25&quot; (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Screws</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clipnuts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FROST 16V 75VA transformer (SG-16V7SUA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AC Utility Box</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AC Cable Clamps (2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8’ Battery Cables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 gauge 3-conductor AC Cable</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTE: If 14 telephone lines are not used, cover each unused location with a blank plate

Desk-mount Unit (28” tall up to 14 telephone lines)
Part # MLR2-CM

<table>
<thead>
<tr>
<th>Part</th>
<th>FRONT VIEW</th>
<th>REAR VIEW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rack</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Louvred door back plate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blank Plate 1.75&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Back Plate 7“</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blank Plates 5.25 (4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Screws</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clipnuts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16V 75VA Transformer (part SG-16V7SUA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AC Utility Box</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AC Cable Clamp for 3/8” cable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8’ Battery Cable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 gauge 3-conductor AC Cable</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTE: If 14 telephone lines are not used, cover each unused location with a blank plate

NOTE: Use only U.L. listed components with programmable output on the MLR2-DG.

Ex: UL listed Buzzer part # PKB5-3A0
UL listed Relay part # HAS-112-12

Printer Connections
The following printers can be used with MLR2-DG:
- Brother M-1309
- Citizen 180D
- Epson LQ-570+
- Olivetti DDM-100-S
- Panasonic KX-P1124
- Panasonic KX-P1150
- Okidata ML 182 Turbo
- Okidata ML 182 Plus
- Okidata ML 184 Turbo
- Roland Raven 9101
- Star NX-1000
- Star DP8340 Sur-Gard part # DCDP8340 (The SG-1220P power supply should be used)
- The SG-1220P (Sur-Gard part number XP1220) is a 12V 2A power supply housed in a metal case with a tamper switch. It requires one 12VDC sealed rechargeable battery (6 to 25 Ah rating) and one 16VAC 40VA Class 2 wire-in transformer (Frost FTC4016 or equivalent).

Connect the parallel printer to the MLR2-DG printer output port using a parallel printer cable.

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

Computer Connections
- Connect the computer to the MLR2-DG RS-232 port using a serial cable to COM1. IMPORTANT: Do not use a null modem cable.
- DB25 to DB25
- DB25 to DB9

Automation Computer Connection

Telephone Line Connections
- With 6-pin modular cables, connect each line module output to its corresponding telephone line.

Grounding
- For maximum resistant to static and electrical noise, the 19” rack frame should be connected to earth ground through the AC utility box.

Power Supply
- Ensure that all electrical connections are made correctly. After verifying all connections, connect the RED and BLACK leads to a 12VDC sealed rechargeable battery. Be sure to observe polarity when connecting the battery. When the battery is connected, test the system under battery power only.
- If a separate DC input is used to power the LCD backlighting during AC power failures, connect it to the BLGT terminal. It must be a listed Fire-Protective Signalling System power supply rated 12VDC. Connect the positive lead from the DC supply to the BLGT terminal; connect the negative lead from the DC supply to the GND terminal. CAUTION: Connecting a positive (+) terminal to a negative (-) terminal may cause a fire and possibly serious personal harm.
- For 24 hour stand-by, 12V 17.5Ah rechargeable battery should be used for 6 lines configuration, and 12V 38Ah rechargeable battery should be used for 14 lines configuration.
Battery Charging Current
The maximum battery charging current is factory set at 1A.

Removing and Installing System Components
Note that the receiver does not have to be powered down when components are removed or installed.

To Remove the CPM2 Module
The CPM2 charges the battery and provides low battery voltage disconnect; removing the CPM2 module will disconnect the battery and shut down the entire system if AC power is not available. If the CPM2 must be removed during an AC power failure, first connect a temporary battery (protected with a 5A fuse and reasonably charged) to the +BATT and GND terminals of the DML2A before removing the CPM2.

Remove the 4 retaining screws on the front panel of the module. Slowly pull the module out of the metal cabinet.

After the CPM2 is replaced, remove the temporary battery so that the CPM2 can properly maintain the main battery.

To Remove a Line Card Module
Remove the 4 retaining screws from the front panel of the module. Slowly pull the module out of the metal cabinet.

To Install a Line Card Module
Adding a Line Card Module to the MLR2-DG requires the addition of an MLRX Expansion Card Cage. Each MLRX can hold two DRL2A modules. The MLRX is shipped with power and communications bus cables.

Installation Checklist

<table>
<thead>
<tr>
<th>Complete</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MLR2-DG installed in 19” Rack Mount Cabinet</td>
</tr>
<tr>
<td></td>
<td>19” Rack Mount Cabinet connected to earth ground</td>
</tr>
<tr>
<td></td>
<td>SG-1220B Printer Power Supply installed (with transformer and battery) if DP8340 printer is used</td>
</tr>
<tr>
<td></td>
<td>6-pin modular cable(s) connected to MLR2-DG and telephone line</td>
</tr>
<tr>
<td></td>
<td>Parallel Printer Cable connected to MLR2-DG Parallel Printer Port</td>
</tr>
<tr>
<td></td>
<td>Parallel Printer power connected</td>
</tr>
<tr>
<td></td>
<td>Computer connected to MLR2-DG COM1 port using serial cable</td>
</tr>
<tr>
<td></td>
<td>CPM2 Cold Boot completed</td>
</tr>
</tbody>
</table>

MLR2-DG INSTALLATION
Maximum configuration
### DML4 Connections

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AC IN</strong></td>
<td>16VAC power input</td>
</tr>
<tr>
<td><strong>AC OUT</strong></td>
<td>16VAC filtered power output</td>
</tr>
<tr>
<td><strong>BATT</strong></td>
<td>12V battery</td>
</tr>
<tr>
<td><strong>B.LGT</strong></td>
<td>Backlight Power Terminal: connect as secondary 12V power supply to illuminate the LCD screens</td>
</tr>
<tr>
<td><strong>GND</strong></td>
<td>Ground</td>
</tr>
<tr>
<td><strong>BUZZ</strong></td>
<td>Buzzer Output: this 12V output follows the internal buzzer</td>
</tr>
<tr>
<td><strong>TAMP</strong></td>
<td>UPS Low Battery Supervisory or External</td>
</tr>
<tr>
<td><strong>ACK</strong></td>
<td>UPS AC Failure Supervisory</td>
</tr>
<tr>
<td><strong>HNDSET B</strong></td>
<td>Not used</td>
</tr>
</tbody>
</table>

### DML2A Connections

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PLL</strong></td>
<td>Programmable output 1 for Line Card 1 and Line Card 2. Outputs switched to negative. Max short circuit current 70mA at 12Vdc limited by 150 ohm 1W resistor.</td>
</tr>
<tr>
<td><strong>RXRNG</strong></td>
<td>Ring Simulator Terminals. Shunting connection lines shown above (ring switches) will simulate a ring voltage detected from an incoming call on the telephone line. This may allow direct testing with a dialer without using a telephone line. (Option 3B = D1)</td>
</tr>
</tbody>
</table>

**14VAC** May be used as an external AC output.

**BATT** May be used as an external 12V power source. Do not connect a battery to these terminals.

**B. LIGHT** Backlight power input terminal. Connect a secondary 12V power source to illuminate the LCD screens. A secondary power supply is not required if a 12V supply has already been connected to the DML4 B LGT terminal.

**HNDSET1** Handset connections for Line 1 and Line 2. These terminals are used to provide 2-way voice communication when the Audio Mode is activated. Note that the handsets must normally be off-hook.

**RxRNG1** These terminals are used to simulate a ring signal on the telephone lines for test purposes. These terminals are also used for Downlook video communication or to remotely cancel an audio session.

**TxPG1** 12V programmable outputs. These terminals are also used for Downlook video communications; when Downlook is being used, these terminals may not be used as programmable outputs.
MLR2-DG BACKPLANE CONNECTION DIAGRAM

Connections for DML2A Line Card Expansion

DML4 POWER CONNECTIONS
- Battery: 12V DC, 17.2 to 36V
- External 12VDC input (secondary battery or power supply for CPM2 backplanning, connect positive to 5V, light terminal to negative)
- Transformer 110VAC to 120VAC

DML4 CONNECTIONS
- Not used on CPM2
- +12V 450mA MAX
- Switched negative outputs: Maximum short-circuit current 70 mA at 12V, limited by 150Ω 1W resistor

Connections for DML2A Line Card Expansion

TO P7 OR P14 LINE CARD
TO P2 OF NEXT LINE CARD
DRL2A DIGITAL RECEIVER LINE CARD

The DRL2A acts as an interface between the digital alarm transmitter and the CPM2. Different communication formats can be used to transmit the information.

The main functions of the line cards are to continuously monitor the telephone line, receive calls from digital dialers or control panels, and to report alarms to the CPM2. In addition, if a Line Card is unable to communicate with the CPM2, each Line Card is capable of functioning independently with manual interaction with the central station operator. Each Line Card can record 256 different alarm messages and 256 Caller-ID telephone numbers.

General Information

The receiver is capable of processing signals from digital communicators in variety of formats. The type of signal (alarm, trouble, restore, cancel and so on) can be displayed and printed. The following formats are accepted by the DRL2A on power up:

- 3/1, 3/1 extended, 4/2 format with or without parity, 10, 14, 20, or 40 baud
- 4/1, 4/1 extended at 10, 14 or 20 baud
- 3/1 with parity at 40 baud
- 4/1, 4/2, 4/3, and 4/3 DTMF formats
- Ademco Contact ID (DTMF) format
- Ademco Super Fast or High Speed DTMF format with and without parity
- Ademco DTMF 4/2 Express
- FBI Super Fast
- Radionics Modem II, Modem IIE and BFSK
- SK FSK1, FSK2
- ITI
- SIA format: 110 and 300 baud, tonal and data acknowledge
- 1400Hz, 2300Hz, Dual Tone, Modem II, SIA FSK, and other handshakes selected by configuration commands
- The following formats can be selected using configuration commands:
  - 4/2 extended from 10 to 40 baud
  - 3/2
  - Ademco DTMF 4/1 Express

DRL2A Features

- Operator selection of communication formats and handshake priority
- Records up to 256 messages for later display
- Records up to 256 Caller-ID phone numbers. This feature helps locate and identify the source of the device in communication and assists in troubleshooting
- Multiple alarms are forwarded to the computer and printer through the CPM2 with minimum delay
- The DRL2A monitors the telephone line connection every 10 seconds; telephone line faults will result in messages on the LCD screens, and reports to the computer and the printer after 2 consecutive failed tests
- DRL2A automatically goes into stand-alone mode in case of CPM2 failure
- “Watchdog” timer continually monitors receiver operation
- “Cold boot” option allows receiver’s configuration to be reset to factory default programming
- LCD contrast is easily adjusted
- “Examine” mode combines Caller-ID phone number and alarm messages for the account
- Built-in sounder can be programmed in the “MUTE BUZZER” option for different functions to suit different applications
- One programmable output can be used for “message error” indication or other applications
- Filter and pulse-count tone processing to reduce data receiving errors for weak and noisy signals
- Line switching to handset or telephone for listen-in, 2-Way audio and medical systems
- Serial link for video monitoring control
**Installation**

It is recommended that a DRL2A Cold Boot be performed when the unit is updated with a new program version. Refer to Operating Mode Section 3.0 (DRL2A Cold Boot and Changing The Line Card Number) for information.

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

---

**DRL2A Controls**

Each DRL2A Module features 2 line cards. The LEDs and push buttons on the left side and the upper LCD are for Line Card 1. The LEDs and push buttons on the right side and the lower LCD are for Line Card 2.

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

**Liquid Crystal Display:** Displays incoming data, programming, and other information. The display is backlit for visibility in low light environments.

**AUDIO:** The “Audio” light comes ON when the receiver is in Audio Mode. When ON, “listen-in” or “2-Way Audio” is in use. The “Audio” light will automatically turn OFF at the end of the timed period or when the [CANCEL] button is pressed.

**LINE FAULT:** The “Line Fault” light will come ON if the telephone line is disconnected. The “Line Fault” light will turn OFF automatically when the telephone line is restored.

**MESSAGE ERROR:** The “Message Error” light will come ON when faulty data is received; for example, if the round pair does not match, or if the checksum is incorrect. Press the [ACK] button to acknowledge the error; the “Message Error” light will be shut OFF.

**[ACK/FUNCTION] button:** Press this button to acknowledge an alarm in emergency manual mode. In the normal mode, press this button to access the Line Card Menu.

**ALARM:** The “Alarm” light is located inside the [ACK/FUNCTION] button. The “Alarm” light will flash if an alarm is received. The “Alarm” light will be shut OFF when the alarm is successfully communicated to the CPM2, or when the operator acknowledges the alarm by pressing the [ACK/FUNCTION] button.

**TROUBLE:** The “Trouble” light will come ON when the Line Card is shut down by an operator’s command or when communication with the CPM2 is interrupted. The “Trouble” light will be shut OFF when the trouble condition is corrected.

**[CANCEL/SELECT] button:** With the Line Card on-line, press [CANCEL/SELECT] to take the Line Card off-line. In Stand-by Mode, pressing [CANCEL/SELECT] has no effect. When in Menu Mode, press [CANCEL/SELECT] to select the menu item currently displayed on the LCD screen. When a menu item is selected, pressing [CANCEL/SELECT] will display the next feature.

**ON LINE:** The “On-Line” light will be ON when the Line Card is on-line. The “On-Line” light will be OFF when the Line Card is in Stand-by Mode.

**WATCHDOG:** The “Watchdog” light will FLASH once every 4 seconds to indicate that Line Card operation is being monitored.
1 DRL2A Stand-By Mode

With the Line Card installed, apply power to the unit. This message will be displayed on the LCD screen for 1 second:

**MAY 23, 97 V 1.01**

The following messages are sent to the printer and computer:

**Printer:** L0x??????0Dx LCardReset
**Computer:** 0000 A  Dx

A hexadecimal digit from 1 to E representing the number of the Line Card will be sent for each “x” shown above.

After these start-up transmissions, the Line Card enters the Stand-By Mode and monitors the telephone line and the CPM2. Depending on the system’s status, the following conditions will be indicated:

- Line fault
- Shutdown of Line Card communication with CPM2
- CPM2 error; display alarm message
- Keep last alarm message
- System in stand-by

1.1 Line Fault

The DRL2A verifies the telephone line voltage every 10 seconds. The “Line Fault” light will come ON after two successive line verifications indicate irregular telephone line voltage. This message will be displayed:

**-L01-Digital Rec <<Line Fault>>**

If the Line Check option is enabled, the following information will be transmitted to the printer and computer:

**Printer:** L01??????30 Line Fault
**Computer:** 0000 A 20

If the Line Check option is disabled, the DRL2A will not send the report to the printer or computer. Refer to “DRL2A Programmable Features” for information on enabling the Line Check option.

When the line condition returns to normal, the “Line Fault” light will be shut OFF.

If the Line Check option is enabled and the telephone line returns to normal, the following information will be transmitted to the printer and computer:

**Printer:** L01??????30 Line Restr
**Computer:** 0000 R 30

1.2 Shutdown of Line Card Communication with CPM2

A Line Card may be temporarily removed from CPM2 polling for testing and maintenance purposes; refer to “CPM2 Utility Modes” for information on shutting down a line card. While in the shutdown mode, the Line Card will retain up to 256 alarm messages in its event buffer. When the Line Card is shut down, the “Trouble” light will come ON and this message will be displayed:

**-L01-Digital Rec LnCard Shutdown!**

1.3 CPM2 Error; Display Alarm Messages

If the DRL2A cannot detect CPM2 polling and there are no alarm events in the event buffer, this message will be displayed:

**-L01-Digital Rec <<CPM Error!>>**

If alarm messages cannot be sent to the CPM2 because of the error, the DRL2A will display the oldest message which has not been manually acknowledged. The “Alarm” light will FLASH and the sounder will beep if the “Mute Buzzer” Option is programmed as [00], [02] or [03].

When a CPM2 Error is present, each alarm must be manually acknowledged. Press the [ACK/FUNCTION] button to acknowledge the alarm and silence the Line Card sounder. If several alarms have been received but cannot be sent to the CPM2, they will have to be individually acknowledged; when all alarms are acknowledged, the Line Card sounder will be silenced.

Up to 256 alarm messages for the printer and computer will be retained in the CPM2 event buffer. When the event buffer is full, the oldest messages will be deleted as new events are recorded.

When the CPM2 Error condition is corrected, the alarm messages in the event buffer will be transmitted to the CPM2.

1.4 Keep Last Alarm Message

The DRL2A may be programmed to leave the last alarm message on the display screen until a new message is received. A typical alarm message is shown below:

**L01-1234-312 Alarm F2**

- “L01” indicates Line Card 01
- “1234” is the account code
- In this example, a 4/3 communication format is used. “3” indicates an alarm, while “12” is the zone number.
- “Alarm” indicates an alarm event.
- “F2” is the event’s location in the event buffer in hexadecimal.

1.5 Stand-by Mode

When the Line Card is operating normally, this message will be displayed:

**L01-Digital Rec *Unit in Standby**

2 Line Card Menu Mode

When the unit is not on line, pressing the [ACK/FUNCTION] button will display the first Function Menu:

**Dsp PRINTER alm ACK:menu SEL:sel**

Press the [ACK] button to scroll through the menu items. Press the [SELECT] button to select the function displayed on the LCD screen. When a function is selected, press [ACK] and [SELECT] together to exit from the Menu Mode. The DRL2A will automatically exit from the Menu Mode if no keys are pressed for 30 seconds. No changes can be performed from this menu.

The following functions are available in the Line Card Menu Mode:

- Display Printer Alarm Buffer
- Display Line Card Configuration
- Display Program Version
- Adjust LCD Contrast
2.1 Display Printer and Caller ID Alarm Buffer

```
Dsp PRINTER alm
ACK:menu SEL:sel
```

With this message displayed, press the [SELECT] button; the most recent alarm message will be displayed. If Option [36] CALLER-ID is selected, the corresponding Caller Identification will also be displayed.

Press the [SELECT] button to scroll backwards through alarm messages; press the [ACK] button to scroll forward through alarm messages. Shown below is a typical alarm message display with the Caller Identification option enabled:

```
0526*1619
15145551212-
```

- “0526” represents the date, in this case, May 26.
- “1619” represents the time, in this case 16:19, or 4:19 pm.
- “15145551212” is the telephone number of the calling dialer reporting the alarm. In this case, the telephone number is 1-514-555-1212.

Press the [ACK] button to display the alarm message:

```
L01-3576-312
Alarm 001
```

- “L01” represents Line Card 01
- “3576” is the Account Code
- In this example, a 4/3 communication format is used. “3” indicates an alarm, while “12” is the zone number.
- “Alarm” indicates an alarm.
- “001” is the event’s location in the Event Buffer.

The Event Buffer can record up to 256 alarm messages and Caller Identifications. To print these messages, a print command may be sent from the CPM2; refer to “System Command Mode” for information.

If no Caller Identification data was received from the dialer reporting the alarm, the following message will be displayed when the [ACK] button is pressed to display the Caller Identification screen:

```
????*????  0000
Unknown Call
```

If the Caller Identification is sent but with no telephone number, these messages will be displayed:

```
????*????  0000
PRIVATE CALL
????*????  0000
NO CALL No.
```

If Option [36] CALLER-ID is disabled, the Caller Identification feature will be bypassed; only the alarm messages will be displayed. Press [ACK] and [SELECT] together to return to the Stand-By Mode. If no keys are pressed, the DRL2A will automatically return to the Stand-By Mode after 30 seconds.

2.2 Display System Configuration Buffer

```
Dsp CONFIG syst.
ACK:menu SEL:sel
```

With this message displayed, press the [SELECT] button; the current Line Card Configuration will be displayed. Press the [ACK] button to scroll forward through the configuration displays, or press the [SELECT] button to scroll backwards. Shown below is a typical configuration display; refer to “DRL2A Programmable Features” for Line Card configuration information.

```
L01 $00 00
4/1 DIGIT#0 -A-
```

Press [ACK] and [SELECT] together to return to the Stand-By Mode.

2.3 Display Program Version

```
Dsp PROGRAM vers
ACK:menu SEL:sel
```

With this message displayed, press the [SELECT] button; the date and the software version number will be displayed as shown below:

```
SG DRL2A Digital
V1.81 May 23,97
```

Press [ACK] and [SELECT] together to return to the Stand-By Mode.

2.4 Adjust LCD Contrast

```
Adjust CONTRAST
ACK:menu SEL:sel
```

With this message displayed, press the [SELECT] button to adjust the LCD screen’s contrast. When the [SELECT] button is pressed, this message will be displayed:

```
Adjust CONTRAST
```

Press the [ACK] button to increase the contrast; press the [SELECT] button to reduce the contrast. The display will indicate the contrast level on the second line.

Press [ACK] and [SELECT] together to return to the Stand-By Mode.

3 DRL2A Cold Boot and Changing the Line Card Number

A “Progr En” switch is located on the side of each Line Card. To perform a Cold Boot or to change the Line Card’s number, this switch must be turned ON. To gain access to the switch, remove the screws from the DRL2A faceplate and slide the unit partially out of the card cage. A “Progr En” switch will be found on either side of the DRL2A module; the switch on the left is for the top Line Card and the switch on the right is for the bottom Line Card.

Insert a small flat screwdriver and turn the switch clockwise to turn it ON. Replace the Line Card in the card cage and apply power; this message will be displayed:

```
SYST COLD BOOT
ACK:yes CAN:no
```

To cancel the Cold Boot and change the Line Card number, press the [CANCEL] button. To perform the Cold Start-up, press the [CANCEL] button. When the [ACK] button is pressed, this message will be displayed for 1 second:

```
COLD BOOT
```
After 1 second, or if the [CANCEL] button was pressed to cancel the Cold Boot, this message will be displayed:

CHANGE LCARD NBR
OF

Press the [ACK] or [CANCEL] buttons to scroll through the list of valid numbers for the line card. The list will scroll through the hexadecimal numbers “01” to “0E” (1 to 14); when the desired number is displayed, press the [ACK] and [CANCEL] buttons together.

When the [ACK] and [CANCEL] buttons are pressed, this message will be displayed:

TURN OFF SWITCH

The Line Card will not operate until the Program Enable switch is shut OFF. Partially remove the Line Card as described above and use a small flat screwdriver to move the Program Enable switch to the OFF position by turning it counter-clockwise. Replace the DRL2A module and secure the faceplate.

4 Communications in Progress

4.1 Data Reception

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

In Communication
1234 56

If valid Caller-Identification information is received, a message similar to this will be displayed:

TEL:15145551212
1234 56

The DRL2A decodes all information received and stores the information in its Event Buffer. When a valid signal is received, the DRL2A sends a kissoff signal and transmits the decoded alarm signal to the computer and then to the printer through the CPM2.

Option [3C] may be enabled to allow the DRL2A to compensate for weak signals or noisy telephone lines; refer to “DRL2A Programmable Features” for information on programming is Option.

The DRL2A 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” and “Fault Call”.

Fault Data Message

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

Printer: L0X????????10     Fault Data *
Computer: 0000 T  10

This output for account code “0000” indicates that data has been received, but is not valid (for example, there are unmatched rounds or the wrong parity). The following is an example of faulty data received by the DRL2A, and the printer output generated:

<table>
<thead>
<tr>
<th>Round</th>
<th>Data Received</th>
<th>Printer Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>123456</td>
<td>[No printout]</td>
</tr>
<tr>
<td>2nd</td>
<td>123446</td>
<td>?1234?56 Fault Data</td>
</tr>
<tr>
<td>3rd</td>
<td>123356</td>
<td>?1233?56 Fault Data</td>
</tr>
<tr>
<td>4th</td>
<td>123456</td>
<td>?1234?56 Fault Data</td>
</tr>
<tr>
<td>5th</td>
<td>123346</td>
<td>?1233?46 Fault Data</td>
</tr>
</tbody>
</table>

Fault Call

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

Printer: L0X????????40     Fault Call *
Computer: 0000 T  40

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 handshake.

Caller ID

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

Fault Data: “??????10 5551212”
Fault Call: “??????40 5551212”

Note that “?” represents the missing data; “5551212” represents the originating telephone number.

4.2 Stopping Data Reception Manually

To cancel communications between the DRL2A Line Card and the calling control panel, press the [CANCEL] button. Pressing the [CANCEL] button will hang up the line. This feature may be used to hang up on a control panel that is repeatedly sending alarms.

4.3 2-Way Audio Mode SG-MLR2-DG Receiver Connections

The DRL2A features two telephone line outputs. The connections are labelled HNDSET1 for the Left Line Card, HNDSET2 for the Right Line Card. These terminals allow a touch-tone telephone to be connected to the DRL2A for voice communication over the same telephone line after digital data has been received. This feature is especially useful for medical signalling installations and vocal alarm verifications.

IMPORTANT NOTE: If a regular touch-tone telephone is used for 2-Way audio communication, the phone must be left in the off-hook position. If the phone is not kept in the off-hook position, the DRL2A will switch to an open line, causing the line to be dropped (hang up).
If used with a PBX system, 2-Way audio communication needs bridging resistors. Measure the handset phone impedance and use a resistor of the same value. A typical value is 220Ω/1 Watt.

If the impedance is incorrect, the handset terminal switchover will behave as if switching to an on-hook phone, and the line will be dropped.

Audio Communication Methods

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

Alarm type code Method

After the digital alarm data has been received and the receiver has transmitted the last kissoff, the control panel will transmit a constant tone of the data transmission frequency for 500 ms. This signal will activate the 2-Way Audio Mode.

The receiver compares the alarm type codes in 3/1, 4/1, 4/2, 4/3, 10-40 BD or DTMF touch-tone formats to the value programmed in Option [4C]. This is done to determine if the 2-Way Audio Mode should be activated. This feature is designed for use with medical signalling systems in areas where privacy regulations apply.

This method of activation is recommended as it can distinguish between different types of alarms from the same panel, and activate the 2-Way Audio Mode only when needed. Note that Options [49] and [4C] must be programmed to use this method.

Reserved Account Code Range Method

The first digit of the Account Code is used to activate 2-Way Audio Mode.

This method is used by some alarm panels and medical signalling systems. The central station manager can group these panels into a range of account codes in order to switch on the 2-Way Audio Mode. The transmission of an Account Code from any of these panels will trigger the DRL2A’s 2-Way Audio Mode. Note that Options [49], [4A] or [4B] must be programmed to use this method.

A combination of the two methods may also be used, please refer to p.25.

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

Audio Mode Operation

When in Audio Mode, the “Audio” light will be ON and this message will be displayed:

```
-01 Digital Rec
TWO WAY AUDIO ON
```

The DRL2A buzzer can be used to indicate Audio Mode operation by programming Option [3E] MUTE BUZZER as “02”. To silence the buzzer, press the [ACK] button.

Select Option [4D] to have a message indicating Audio Mode operation sent to the printer and the computer. For example, use the character “P” (for “phone”) to represent Audio Mode operation. Program Option [4D] as “50” (the ASCII code for “P” is 50). When Audio Mode operation has begun, the following messages will be sent to the printer and computer:

Printer: “L01-0000-P01 AudioLine1”

Computer: “0000 P 01”

- “L01” indicates Line Card 01
- “0000” used as the account code for internal signals
- “P” is the character programmed in Option [4D]; “01” again is the Line Card number

2-Way Audio Mode operation may be manually cancelled by pressing the [CANCEL] button. If not manually cancelled, Audio Mode operation will automatically be cancelled when the time programmed in Option [49] expires.

The Audio Mode may also be cancelled remotely through the Ring Simulation input on the back of the receiver. Future central station audio management equipment will be able to use this input to hang up the line and put the receiver in Stand-By Mode when the operator’s telephone is hung up.

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

An output is also available on the SG-DML2A module (TXPG1 and TXPG2) which may be used to indicate activation of Audio Mode operation or to indicate which telephone line should be picked up for audio operation.

For more details, please refer to the programmable options section.
DRL2A SOFTWARE UPGRADE PROCEDURE

To upgrade the DRL2A, you need to remove and replace the old EPROM Chip located inside the DRL2A. The new EPROM Chip contains the new program version for the line card. All these instructions can be done with the receiver powered up since all the modules are hot swappable.

Note: It is very important to print out the existing line card configuration before doing the version update. To access this command you have to press the “C” key on the keypad of the receiver, then enter the password; default is “CAFE.” The ## is the line card number. For multiple line cards wait until one is done before giving the command to start another print out.

Follow the procedure describe below to perform the Version Upgrade.

1 Remove the DRL2A from the card cage.

With a small screwdriver unscrew the four slot screws in the front faceplate of the DRL2A. These screws do not come all the way off. Therefore when they are about ¼ inch, 1cm, out from the faceplate they should not be holding anymore. Gently removed the DRL2A from the card cage by pulling on the handle located at the bottom of the line card. If it does not easily remove make sure all the screws are loose. (shown in fig.1)

2 Remove the top plate of the DRL2A to get access to the inside of the line.

There are two screws at the front of the unit they are to hold the LCD screen. It is important not to remove these screws. You have to remove the four screws on top of the plate. Some line cards models have two plastic screws at the back of the plate that need to be removed. There is also a ground wire attached to the back of the plate. Loosen the screw that holds the ground wire ¼ turn just to remove the wire from the plate (Screws indicated with arrows in Fig.2).

3 Changing the Software

Inside the line card there are 2 EPROM chips, one on the left side for the top line card, and one on the right side for the bottom line card.

Note: It is very important that before removing the old chip to take note of the position the notch of the old chip. Then put the new chip’s notch facing the same direction as the old one, as instructed on the label inside the DRL2A. Some sockets are bigger then the chip. If this is the case, leave the extra pins at the notch end as shown in the fig 3.

4 Reassemble

Put the top plate back on top of the DRL2A and secure it with all the screws that you previously removed. If you did remove the ground wire from the plate before, remember to re-secure it before you close the top plate of the DRL2A.

5 Cold Boot Activation

Turn the Program Enable (Prog. En.) Switch ON. Use a small screwdriver to turn the switch ON position by turning it clockwise a quarter turn. The Program Enable switch is located on the left side of the DRL2A for the top line card and resembles a recessed screw. (Shown in fig.4). The Program Enable switch for the bottom line card is located on the right side of the DRL2A. Both sides can be done at the same time.

Remove the plate from the line card. The plate is still attached to the line card through a flat ribbon wire and power wires. Do not removed them, they hold the LCD screen data bus and the power for the LCD screen.
6 Cold Boot and Line Numbering

Slide the DRL2A into the card cage, but do not fasten the mounting screws. The DRL2A will power up and this message will be displayed:

\[\text{COLD BOOT} \quad \text{ACK: Yes CAN: No}\]

If the screen does not display the above, remove it from the cage and the switch will need to be turned a little more. Press the [Ack] button for a second located on the top right and left side, then release to perform the COLD BOOT. The following message will be displayed. At this point the factory default values are entered into the programming locations.

\[\text{COLD BOOT} \quad \text{COLD BOOT}\]

After approximately one second, this message will appear:

\[\text{CHANGE LCARD NBR} \quad \text{OF}\]

Press, for approximately one second, and release the [Ack] button. Repeat until the desire line card number is entered. After the line card number has been entered, press and hold the [Ack] and [Cancel/Select] button at the same time, until this message is displayed:

\[\text{TURN OFF SWITCH}\]

7 Turn Off Switch

The DRL2A will remain inoperative until the “Program Enable” switch is turned OFF. To turn the switch OFF, pull the DRL2A out of the card cage. Use again the small screwdriver to turn the “Program Enable” switch OFF by turning it counter-clockwise as shown on fig.4.

8 Re Install

Reinstall the DRL2A in the card cage by pushing it in all the way in. If the message COLD BOOT re-appears on the screen just slide the unit out again and make sure the “Program Enable” switch is all the way to the off position. Now you can secure the faceplate screws of the DRL2A.

9 Ready

The DRL2A is now ready for operation under the factory default configuration. You should now compare the default settings and your back up setting to see if any location(s) need to be programmed. The easiest way is to print the default configuration on one of these DRL2A and compare them. All the instructions on how to program the line card can be found in the manual. However, if you have any questions or difficulties please feel free to contact the Sur-Gard Technical Support Department.
**DRL2A PROGRAMMING**

**COMMANDS**

There are 5 main Programming Commands available on the DRL2A Line Card Module:

- **F7** Options Programming
- **FA** Buffer Output
- **FB** Shutdown Line Card Communications with CPM2
- **FC** Reactivate Line Card Communication with CPM2
- **FE** Line Card Buffer Maintenance

Some Programming Commands feature options that provide a variety of different functions; each command is fully explained in the following sections of this manual.

**Entering Commands**

Commands are entered on the CPM2 keypad using the following format:

LCard: Comd: Op: Cd: Sc

- **LCard:** “Line Card” is the Line Card number; enter a hexadecimal number from 01 to 0E for Line Cards 1 through 14
- **Comd:** “Command” is the Command; enter a command from the list above
- **Op:** “Option” indicates a function that is part of a command; the following sections of this manual will explain which commands have options. Enter a 2-digit hexadecimal number
- **Cd:** “Code” is the code or value to be programmed for the Option; enter a 2-digit hexadecimal number
- **Sc:** “Second Code” is a code or value that is only used with SCADA commands; if required, enter a 2-digit hex number

**Example:**

The following is how to enter the Programming Password and program an Option in the F7 Options Programming section:

**Entering Data**

- Press and hold the [C] button on the CPM2 until the CPM2 displays the following message:

```
Enter PASS-WORD
****
```

The default password is “CAFE”. Enter the password using the CPM2 keypad.

- When the password is entered, the CPM2 will display this message:

```
LCard:__ Comd:__
Op:__ Cd:__ Sc:__
```

- Enter the Line Card number. In this example, Line Card 01 will be used. When “01” is keyed in, the number will appear on the display as shown below:

```
LCard:01 Comd:__
Op:__ Cd:__ Sc:__
```

- Enter the Command number. In this example, the F7 Options Programming command will be used. When “F7” is keyed in, the command will appear on the display as shown below:

```
LCard:01 Comd:F7
Op:__ Cd:__ Sc:__
```

- Enter the Option number. In this example, Option [36] will be changed. When “36” is keyed in, the Option will appear on the display as shown below:

```
LCard:01 Comd:F7
Op:36 Cd:__ Sc:__
```

- Enter the value to be programmed at Option 36. In this example, 01 will be programmed at Option [36] to enable it. When “01” is keyed in, the value will appear on the display as shown below:

```
LCard:01 Comd:F7
Op:36 Cd:01 Sc:__
```

**Verifying Data**

- To verify the changes just entered, press and hold the [ACK] button on the DRL2A until this message is displayed:

```
Dsp CONFIG syst.
ACK:menu SEL:sel
```

- Press the [SELECT] button to view the system configuration; this message will be displayed:

```
L01 IB0 00
4/1 DIGIT00 -A-
```

Press the [ACK] button to scroll forward through the configuration displays until you reach option 36, or press the [SELECT] button to scroll backwards through the configuration displays. Press [ACK] and [SELECT] together to return to the Stand-By Mode.

**1.0 F7 Line Card Options Programming**

**Line Card-F7-Option-Code**

The F7 Options Programming command is used to change various operating parameters for the Line Card. Reporting Codes, the Line Card number, buzzer operation and other features. Also functions may be changed using the F7 command.

Refer to the example illustrated in “Entering Commands” in the “DRL2A Programming Commands” section of this manual. Refer to the DRL2A Reference Sheets in the back of this manual; be sure to record any programming changes on these sheets.

**NOTE:** Options are programmed with 2 hexadecimal or decimal digits (depending on the option), but are shown on the DRL2A screen with 3 digits. This allows 3-digit decimal display for some options.

Options [00] through [30], and [4D] are programmed with ASCII codes; refer to Appendix F for ASCII code information.

**Options [00] - [0F]:**

- **3/1, 4/1 Format Event Codes and printer library selection**

The DRL2A uses a unique Sur-Gard communication format to transmit data through the CPM2 to the central station computer. Event codes corresponding to alarm codes in 10 to 40 BD 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 DRL2A will use the last digit of data received in 3/1 and 4/1 formats to determine the printer message and computer event code. The event code will then be transmitted to the central station computer. Refer to the DRL2A Decoding Library for the complete set of messages and event codes used by the DRL2A.

In Sections [00] through [0F], program ASCII codes according to the Decoding Library. Values other than 20-7F (ASCII) will not be accepted. Note that the old value programmed in each Option will not be changed until a command with valid data is received.

The Limited English Printer Library is provided and can be selected by programming the event codes to the corresponding ASCII code to the following letters:

**Words available:** Alarm (A; ASCII 41), Bypass (B; ASCII 42), Close (C; ASCII 43), Cancel (\ or D; ASCII 5C OR ASCII 44), Open (O; ASCII 4F), Restr (R; ASCII 52), and Trble (T; ASCII 54).

For example, if the word "Alarm" is wanted when the alarm code 1 is received in 3/1 (or 4/1 formats), the option [01] must be programmed as "41". The print out will be as follows:

L01-1234-312 Alarm 10:32:54-18/09

**Option [30]: Common Event Code and Library Selection**

Some central station software packages are unable to process the alarm using the event codes listed in the DRL2A Decoding Library. Where a central station monitors thousands of accounts belonging to different companies, the same reporting codes may have different meanings between companies. Because of this, the individual event codes in Options [00] through [2F] and the corresponding library cannot accurately represent the alarm condition. To overcome this, Option [30] may be programmed as follows:

<table>
<thead>
<tr>
<th>Program</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Use Individual Event Codes to computer, with Library enabled on the printer</td>
</tr>
<tr>
<td>01</td>
<td>Use Individual Event Codes to computer, without Library on the printer</td>
</tr>
<tr>
<td>20, 30-39 and 41-5A</td>
<td>Use Common Event Codes without Library on the printer</td>
</tr>
</tbody>
</table>

When using Common Event Codes with Library, it is recommended that either hexadecimal code “5A” (ASCII “Z”) or hexadecimal code “41” (ASCII “A”) be used.

When using Common Event Codes without Library, it is recommended that either hexadecimal code “DA” (“Z” with the bit 7 set) or “C1” (“A” with the bit 7 set) be used. Note that the event codes will still choose the word printed if a common event is programmed with library. When viewing the DRL2A configuration, this message will be displayed:

```
L01 #30 30
RS-232 CD: -ZL
```

Where "-ZL" indicates that the Common Event Code is “Z” and that the Library is 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.

Note that Option [30] is ignored when using SIA, ITI, Contact-ID, ACRON, MODEM II, MODEM IIE, FBI Super Fast, BFSK, ADEMC0 Super Fast and SK FSK1, 2 formats.

**Option [31]: SIA Option**

The DRL2A provides SIA Protocol 1 for SIA level 1 RS-232 communication and SIA Protocol 2 for SIA level 1, 2, 3 RS-232 communication. Refer to "MLR2-DG Computer Interface" for more information.

Program '00' for SIA Protocol 1 and "01" for SIA Protocol 2

**[DEFAULT 00]**
Option [32]: Communication Select
If the MLR2-DG Receiver is not to be used with central station automation software and a computer, program Option [32] as "00".
If the MLR2-DG is to be used with central station automation software, program Option [32] with one of the values listed below:

<table>
<thead>
<tr>
<th>Value</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>No communication to computer</td>
</tr>
<tr>
<td>01</td>
<td>Alarms communicated to 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 Codes when sent to the computer</td>
</tr>
<tr>
<td>02</td>
<td>Alarms communicated to 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 Codes</td>
</tr>
<tr>
<td>03</td>
<td>Alarms communicated to 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 1-digit alarm code</td>
</tr>
</tbody>
</table>

Ex: 1011ssssssAAsXssssY[DC4]

**Note:**
- Option [36] must be programmed as "01".
- Option [36] allows the Line Card to receive Caller Identification data that is transmitted after the first ring on the telephone line.
- Program “01” to enable this feature, or program “00” to disable it. The “Call Display” service must be available and requested from the Telephone Company for this feature to be operational.

Program Option [36] with one of the following:

<table>
<thead>
<tr>
<th>Value</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>No reception</td>
</tr>
<tr>
<td>01</td>
<td>Normal reception operation with checksum verify</td>
</tr>
<tr>
<td>02</td>
<td>Reception without checksum verify</td>
</tr>
</tbody>
</table>

The following library messages are used with Option [36]:

- **PrivateCall:** 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
- **UnknownCall:** The originating telephone number has not been received or was not transmitted

**[DEFAULT 00]**

Option [37]: Send Caller-Identification (Telephone number) to Computer

The DRL2A can send the Caller-Identification numbers to the computer. If the telephone number is not received, the Caller-Identification information will not be sent to the computer.

Program Option [37] with one of the following:

<table>
<thead>
<tr>
<th>Value</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Do not send Caller Identification</td>
</tr>
<tr>
<td>01</td>
<td>Send Caller Identification</td>
</tr>
<tr>
<td>02</td>
<td>Send Caller Identification only when fault call or fault data is received</td>
</tr>
<tr>
<td>03</td>
<td>Send Caller Identification for every call without the “1” long distance indicator</td>
</tr>
<tr>
<td>04</td>
<td>Send Caller Identification only when fault call or faulty data is received, and send the information without the “1” long distance indicator</td>
</tr>
</tbody>
</table>

Note that option [36] must be programmed as "01".

**[DEFAULT 00]**

Option [38]: Send Caller Identification to Printer

To use Option [38], Option [36] must be programmed as "01".

Program Option [38] with one of the following:

<table>
<thead>
<tr>
<th>Value</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Do not send Caller Identification to printer</td>
</tr>
<tr>
<td>01</td>
<td>Send alarm code and Caller Identification to printer instead of the english alarm message. The printer library must be removed at option [30]. Note that 10-40 baud and 4/3 formats only will be printed with Caller Identification. Contact ID and SIA formats will be printed with two lines. The first line will be the alarm message and the second line will be the caller-ID.</td>
</tr>
<tr>
<td>02</td>
<td>Send Caller Identification to printer only when fault call or faulty data is received</td>
</tr>
</tbody>
</table>

**[DEFAULT 00]**

Option [39]: Line Check

The Line Card will perform a telephone line test every 10 seconds. When Option [39] is enabled, if the line is faulty, a warning message will be displayed on the Line Card screen and an alarm will be sent to the computer and the printer. When option is disabled, no alarm will be transmitted.
Program Option [39] as “01” to enable the line fault report; program “00” to disable the transmission of the line fault condition to computer and printer.

[DEFAULT 01]

Option [3A]: Programmable Output
The DRL2A provides one programmable output at the terminal TxPG1 of the DML2A backplane board, for the left hand Line Card, and one programmable output at the terminal TxPG2 for the right hand Line Card.

Program Option [3A] with one of the following:

00 Programmable output follows the Error Message LED
01 Programmable output will switch to ground for 100mS in Two-way Audio Condition

NOTE: This option will be over-written by the Video DOWNLOOK option selection.

[DEFAULT 00]

Option [3B]: FBI RS232
To enable the computer FBI superfast protocol, program the option [3B] as ‘01’. Please see page 42 for details.

[DEFAULT 00]

Option [3C]: Filter Option
The Line Card will process incoming signals through a filter circuit if this option is selected. If this option is not selected, the Line Card will process incoming signals through a software filter. Program Option [3C] as “01” to enable this feature, or as “00” to disable it.

[DEFAULT 00]

Option [3D]: Reserved for future use

Option [3E]: Mute Buzzer
Operation of the Line Card’s buzzer may be programmed as follows:

00 Buzzer sounds for Line Fault, CPM2 Error, or if an Alarm occurs during a CPM2 error
01 Buzzer does not sound for any events
02 Buzzer sounds for Audio, Line Fault, CPM2 Error, or if an Alarm occurs during a CPM2 error
03 Buzzer sounds for all status change conditions

[DEFAULT 00]

Option [3F]: Last Message On
When Option [3F] is enabled, the last alarm message will be retained on the Line Card display screen until a new signal is received. Program Option [3F] as “01” to enable this feature, or as “00” to disable it. If Option [3F] is disabled, the stand-by message described in Section 1.4 will be displayed when communication of an event is completed.

[DEFAULT 00]

Option [40]: Hook Flash
The hook flash feature is used for two-way audio in a PBX system. The line card can hook-flash the line for 100ms-900ms programmable to put the line on hold and then back on line for 3 seconds and hang up. Program option [40] to ‘01’ for 100 ms, ‘02’ for 200 ms, etc. “00” will disable the option.

[DEFAULT 00]

Options [41] through [46]: Handshake Selection
The DRL2A is a multi-format receiver capable of sending several handshakes to a dialer. Often it is important which handshake is sent first. Program Options [41] through [46] according to your applications. If all six Options are programmed as “00”, 2300Hz handshake will be sent.

Handshake Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>No handshake</td>
</tr>
<tr>
<td>01</td>
<td>Dual tone handshake</td>
</tr>
<tr>
<td>02</td>
<td>2300Hz handshake</td>
</tr>
<tr>
<td>03</td>
<td>1400Hz handshake</td>
</tr>
<tr>
<td>04</td>
<td>SIA FSK handshake</td>
</tr>
<tr>
<td>08</td>
<td>Modem II handshake</td>
</tr>
<tr>
<td>10</td>
<td>Modem IIE and ITI handshake</td>
</tr>
<tr>
<td>13</td>
<td>Single Dual tone handshake</td>
</tr>
</tbody>
</table>

(Refer to Appendix D for Corresponding Formats)

Option [47]: Handshake and Kissoff Duration
Some control panels have difficulty in understanding the receiver’s handshake and/or kissoff tones on noisy phone lines. Option [47] provides a possible solution for this problem by providing longer constant tones. Program one of the following:

00 1.0 second tone
01 1.5 second tone
02 2.0 second tone
03 800 ms tone

Note that this option affects only handshakes 02 and 03.

[DEFAULT 00]

Option [48]: Interval Delay Between Handshakes
The DRL2A Line Card will usually wait for signals from the control panels for 4 seconds before sending the next handshake, if there is no signals received. In certain applications, control panels can not wait long enough to get their own handshake especially if the handshake is programmed as the third or fourth handshake.

Program Option [48] with one of the following:

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

[DEFAULT 00]

Option [49]: 2-Way Audio (Handset) Activation Time
Option [49] determines how long, in minutes, 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 “99” for 1 to 99 minutes. 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 [49] as “00”.

NOTE: SIA, Contact ID FBI Super Speed and Modem II, will identify to the DRL2A when it should switch into Two-Way Audio. Therefore overwriting option 4A, 4B and 4C, but will still follow the time programmed at option 49.

[DEFAULT 00]

Option [4A]: Account Codes to Activate 2-Way Audio
Option [4A] 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 [4A]. For example, to allow all account codes between 3000 and 6FFF to activate the 2-Way Audio function, program Option [4A] as “12”. To allow all account codes between 3000 and 6FFF to activate the 2-Way Audio function, program Option [4A] as “36”.

[DEFAULT 00]
Option [4A] may be used with any formats supported by the MLR2-DG. To disable the 2-Way Audio function, program Option [4A] as “00”.

**[DEFAULT 00]**

**Option [4B]: 3 Digits Account Codes to Activate 2-Way Audio**

Option [4B] determines which 3 digits Account Codes will be able to activate the 2-Way Audio feature. Program the first digits of the desired Account Codes in Option [4B]. For example, to allow all 3 digits account codes between 200 and 3FF to activate the 2-Way Audio function, program Option [4B] as “23”. To allow all 3 digits account codes between 300 and 6FF to activate the 2-Way Audio function, program Option [4B] as “36”.

Option [4B] may be used with any 3 digits account code formats supported by the MLR2-DG. To disable the 2-Way Audio function, program Option [4B] as “00”.

**[DEFAULT 00]**

**Option [4C]: Alarm Codes to Activate 2-Way Audio**

Option [4C] 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 [4C]. For example, if all alarm codes beginning with 6, 7 and 8 are to activate 2-Way Audio, program Option [4C] as “68”.

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

First, to enable the audio feature, the option *[49] AUDIO MIN.* must be programmed. The DRL2A will initiate audio by the account range, option [4A] and [4B] or by option [4C] ALARM CODE or by both.

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

<table>
<thead>
<tr>
<th>Option 4A (or 4B)</th>
<th>Option 4C</th>
<th>Switch to Audio</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>1-2</td>
<td>Yes</td>
<td>Alarm code 2 falls within the code range 1-2</td>
</tr>
<tr>
<td>1-1</td>
<td>00</td>
<td>Yes</td>
<td>Account code 1234 falls within the range 1-1</td>
</tr>
<tr>
<td>2-3</td>
<td>00</td>
<td>No</td>
<td>Account code 1234 is outside the range 2-3</td>
</tr>
<tr>
<td>00</td>
<td>3-4</td>
<td>No</td>
<td>Alarm code 2 is outside the range 3-4</td>
</tr>
<tr>
<td>1-2</td>
<td>3-4</td>
<td>No</td>
<td>If both are programmed, both must be good and alarm code 2 is outside the range 3-4</td>
</tr>
<tr>
<td>3-5</td>
<td>1-3</td>
<td>No</td>
<td>Both must be good and account code 1234 is outside the range 3-5</td>
</tr>
<tr>
<td>1-4</td>
<td>1-5</td>
<td>Yes</td>
<td>Alarm code 2 falls within the code range 1-5, account code 1234 falls within the range 1-4</td>
</tr>
</tbody>
</table>

**[DEFAULT 00]**

**Option [4D]: Audio Event Code**

Option [4D] is used to send a message to the computer and the printer to indicate that the Line Card has enabled the 2-Way Audio function. Program an ASCII code 0 through 9 and A through Z using the hex code listed in Appendix F, to be used as the event code for activation of the 2-Way Audio feature.

For example, if an Account on Line Card 01 activates the 2-Way Audio mode and Option [4D] is programmed as “50” (ASCII “P”), the following messages will be sent:

- Sent to computer: 0000 P 01
- Sent to printer: L01-0000-P01 AudioLine1

Note that this event code will not be affected by the common event code selected at Option [30]. Ensure that the event code in Option [4D] is compatible with any automation software being used. Program Option [4D] as “00” to disable this option.

**[DEFAULT 00]**

**Option [4E]: Video Downlook**

The DRL2A is capable of receiving video images from the Sur-Gard DC1664LC, P-16LCD, P-1664, DSC8400, DSC PC1575, DSC PC5010, DSC PC5015 and DSC PC3000 Security Control Panels and sending those images to a video receiver. Option [4E] is used to enable it. Program Option [4E] as “00” to disable this option, or program a value of “01” to enable it.

**NOTE:** When this Option [4E] is enabled, the “Message Error” light will not indicate when faulty data is received.

**[DEFAULT 00]**

**Option [4F]: 3-2 Format**

The DRL2A could not distinguish between 4/1, 3/2 or 3/1 with checksum because all of them contain a total of 5 digits. Therefore, this option must be programmed to inform the DRL2A which of the 3 formats may be used.

**Option 4F (3/2 format)**

- 00 select 4/1 format
- 01 select 3/2 format
- 02 select 3/1 with checksum format
- 03 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 and Radionics Fast sent on the 1400Hz.

Note that the printer messages for the 3-2 format are the same as those used for the 4/2 format.

**[DEFAULT 03]**

**Option [50]: 4/1 Extended Format**

Program Option [50] 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 [50] enabled, the security control panel may transmit the following information:

- 1234 3
- 3333 1
- 3333 1

The DRL2A will interpret this information as: 1234 31

This format is not recommended as it occupies the telephone line for long periods of time. Note that all 4/1 and 4/1 extended formats must be at 10,14 or 20 baud rates; the DRL2A will not accept 4/1 or 4/1 extended formats at 40 baud if unless option [4F] is modified. The default setting for Option [50] is “01”; when programmed as “00”, the option is disabled.

**[DEFAULT 01]**

**Option [51]: 4/2 Extended Format**

Program Option [51] as “01” or “02” 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 sends: 1234 05
   1234 05
   0505 16
   0505 16
   The DRL2A will interpret this information as 1234 516
02 The panel sends: 1234 03
   1234 03
   3333 01
   3333 01
   The DRL2A 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
   [51] is "00"; when programmed as "00", the option is disabled.
   [DEFAULT 00]

Option [52]: SK FSK RS232
The DRL2A provides two possible outputs to the computer.
Select 00 for protocol #1 or 01 for protocol #2. Please refer
to the section “Communication Protocol with Central Station
Computer” for more details.
   [DEFAULT 00]

Option [53]: 4/1 Express Format
The Ademco 4/1 Express format may cause conflicts with
the Sur-Gard DTMF 4/3 with Checksum format or FBI Superfast
without checksum. Therefore, this option must be programmed
to inform the DRL2A 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
   [DEFAULT 00]

Option [54]: SESCOA Super Speed Format
(Only Available on 1.81SV version)
Program Option [54] as '01' to enable SESCOA Super Speed
format decoding and disable 4/2 with Checksum 40 baud
format decoding. When programmed as '00', the option
is disabled.
   [DEFAULT 00]

Option [55]: Inter Digit time
Certain old dialers may have difficulties in communicating
with the receiver. The DRL2A provides a possible solution
by programming this option. This option should be left as
default and should be changed only on the recommendation
of a Sur-Gard technician.
   00 1.25 seconds
   01 1.50 seconds
   02 1.80 seconds
   [DEFAULT 02]

Option [56]: Group Arming / Disarming with User Code
Option [56] applies to the Sur-Gard DTMF 4/3 format.
When Option [56] is programmed as “01”, group arming/
disarming signals will be combined with the user code into
one signal which will be sent to the computer and the printer.
For 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.
   [DEFAULT 00]

Option [57]: 4/3 Format User Conversion / 3-digit
Alarm Code
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.
Option [57] allows the user codes to be converted from
hexadecimal to decimal to meet the needs of the central
station software. Program Option [57] with one of the following:
   00 Send the last two digits as user codes without
     conversion
   01 Convert the last 2-digit user codes to decimal as
     shown here:
   User Code received 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
   For example, if 1234 4B1 is received, 1234 C 101 will be
   sent to the computer.
   02 Send the last 3 digits as the zone codes with the
     5th digit still used as the event code
   For 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.
   03 Send the last 3 digits as the zone codes and
   convert the user codes only to decimal
   NOTE: When Option [56] Group Arming/Disarming with User
   Code is programmed as "01", the 3-digit user codes will be
   combined with the group number as follows:
   Code received Code sent to computer and printer
   1234B01 No transmission
   1234B1 1234 C 101
   [DEFAULT 00]

Option [58]: Equivalent Line
Option [58] is used when an incoming signal can be received
on another receiver telephone line if the original line is
busy. Information printed and/or sent to computer will indicate
that the information was received on the same telephone
line. The receiver number does not change. Program 00 at
Option [58], or a number from 01 to 0E.
Examples:
   Option [58] = 00; no equivalent line number
   If receiver number is 02, and the line number is 3: the
   printer message will be “L03-1234...”, and the computer
   message will be: 1023ssssss1234
   [DEFAULT 00]
Option [58] = 01; equivalent line number is 1

If receiver number is 02 and the line number is 3: the printer message will be “L21-1234...” and the computer message will be: 1021ssssss1234

If receiver number is 12 and the line number is 3, the printer message will be “121-1234...” and the computer message will be: 1121ssssss1234

[DEFAULT 00]

Option [59]: MODEM II RS-232

The DRL2A is able to decode the Modem II format, with the RADIONICS control panels model: D4112, D6112, D7112, D8112 and Honeywell model D5700, and the Modem IIE format with the RADIONICS D2112, D7212 and D9112. The handshake number 08 needs to be programed as one of the handshakes of the DRL2A for the Modem II and handshake 10 for Modem IIE. Option [59] determines the format of the code sent to the computer. Program Option [59] as "01" for the Sur-Gard format, or with "00" for a Radionics 6500 compatible interface.

If option [59] is programmed as "00", codes will be transmitted as 1RRLssssssAAAAXXYYYY[DC4]

If option [59] is programmed as "01", codes will be transmitted as 6RRLssssssAAAAXXYYYY[DC4]

Note: This option will also affect the BFSK format.

[DEFAULT 00]

Option [5A]: Acron RS-232

When this option is programmed as "00", the DRL2A 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 follows:

9RRLssssssAAAACCCCCCCCC[DC4]

Where:

9 = Protocol number
RR = receiver number
L = Line number
ssss = Spaces
AAAA = Account code
CCCC = Channel 1-4
CCCC = Channel 5-8
[DC4] = Terminator

[DEFAULT 00]

Option [5B]: Ademco High Speed RS-232

When this option is programmed as "00", the DRL2A will convert the High Speed format signal into 4/2 format (Ex: 1RRLssssssAAAAsXssYY[DC4] ). If it is programmed as "01" the Ademco High Speed will be sent to the computer as follows:

8RRLAAAAsCCCCCsCCCCCs[DC4]

Where:

8 = Protocol number
RR = Receiver number
L = Line number
AAAA = Account code
s = Space
CCCC = Channel 1-4
s = Space
CCCC = Channel 5-8
s = Space
C = Channel 9
[DC4] = Terminator

[DEFAULT 00]

Option [5C]: PGM Input

When programming the option [5C] to "01", the “RxRngX” input terminal on the backplane DML2A board will be utilized as a ring input. When shorted to the common, the receiver will be forced to pick up the line. The default is "00".

[DEFAULT 00]

Option [5D]: 3/1 extended format

Program Option [5D] as "01" to combine 2 round pairs of 3/1 extended format into 3/2 output for reporting to the computer and the printer. (For M.A.S. software users, the option should be programmed as "02")

For example, with Option [5D] enabled, the security control panel may transmit the following information:

123 3
123 3
333 1
333 1

The DRL2A will interpret this information as: 123 31

When programmed as "00", the option is disabled.

[DEFAULT 00]

Option [5E]: Inter-burst

Certain old dialers may have difficulties in communicating with the receiver. The DRL2A provides the possible solution by programming this option. This option should be left as default and should be changed only on the recommandation of a Sur-Gard technician.

00 100 ms
01 150 ms
02 200 ms

[DEFAULT 00]

Option [5F]: Radionics 6500 computer output

The DRL2A will emulate the Radionics 6500 RS232 protocol on pulse formats only. (00=disable, 01=enable)

Examples:

1. 3/1 format: Account code “123” with alarm code “1”, (alarm) the computer output will be:

00 1RRLssssss123sAss1[DC4]
01 1RRLssssss123sAss1[DC4]

2. 3/1 format: Account code “123” with alarm code “B”, (opening) the computer output will be:

00 1RRLssssss123sOssB[DC4]
01 1RRLssssss123sOsss[DC4]

3. 4/2 extended (or 3/2 or 3/1 extended): Account code “1234” with alarm code “2” on zone “1”, (alarm) the computer output will be:

00 1RRLssssss1234sAs21[DC4]
01 1RRLssssss1234sAs21[DC4]

4. 3/1 extended (or 4/2 or 3/1 extended): Account code “1234” with alarm code “C” on zone “2”, (closing) the computer output will be:

00 1RRLssssss1234sCsC2[DC4]
01 1RRLssssss1234sCsC2[DC4]

Where RR = Receiver Number
L = Line Number
ss = Space
[DC4] = Terminator

Please note that option [30] must be left as individual event code when enabling this option.
Option [60]: BFSK RS232
When programming option [60] as "01", the BFSK format will convert its radionics 6500 computer output to a standard protocol output. Default is "00".

Option [61]: DSC SIA Audio
Programming option [61] as "01", will enable the Audio Listen-in block with the DSC PC5010 control panel when used with the 5908 audio matrix module when sent in SIA format.

 Option [62]: Downlook Time-out
This will determine how long (in minutes) the receiver will stay on line for image reception. This gives central station control over the amount of time the receiver will stay on line for Downlook. Three minutes is the recommended length of time for the Downlook activation (8 images).

2.0 Buffer Output Command: LC-FA-XX-XX
The “FA” command is used to send part of the Line Card buffer to the printer or the computer. The number of messages to be printed is entered as a hexadecimal number.
The time and date of the buffer output is printed on the same line after the event; a typical event along with the time and date it was printed is shown here:
L01*1234*12 AlarmZn#2 09:30:15-27/01
• 09:30:15 is the time (hours:minutes:seconds)
• 27/01 is the date (day-month)
Note that the time and date of the event itself may be viewed by printing the CPM2 buffer.

2.1: Output Alarm Type Printer Messages to the Printer: LC-FA-01-XX
The LC-FA-01-XX command will send the specified number of printer alarm messages to the printer. “XX” should be a hexadecimal number from 01 to FE to indicate a number of events from 1 to 254.
Shown here are typical alarm messages:
L01*1234*12 AlarmZn#2 21:24:00-27/01
L01*1276*02 PanicZn#2 21:24:01-27/01

2.2: Output Alarm Type Computer Messages to the Printer: LC-FA-02-XX
The LC-FA-02-XX command will send the specified number of computer alarm messages to the printer. “XX” should be a hexadecimal number from 01 to FE to indicate a number of events from 1 to 254.
Shown here are typical alarm messages:
L01 COM 1011 0001 A 01 21:24:00-27/01
L01 COM 1011 1234 R 70 21:24:01-27/01

2.3: Output Line Card Configuration: LC-FA-04-04
The LC-FA-04-04 command will print the Line Card configuration; this record may be used for future reference. Refer to “Line Card Configuration Command LC-F7-OP-CD" for more information.

2.4: Output Caller Identification and Corresponding Alarm Messages to the Printer: LC-FA-05-XX
The LC-FA-05-XX command will send the specified number of Caller Identification and corresponding alarm messages to the printer. “XX” should be a hexadecimal number from 01 to FE to indicate a number of events from 1 to 254.
Shown below is a typical message generated by this command. The first line is the Caller Identification, and the second line is the alarm event:
0816*1619 5551212-21:24:00-27/01
L01*1234*12 Alarm 21:24-01-27/01

2.5: Output Computer Alarm Messages to the Computer: LC-FA-06-XX
The LC-FA-06-XX command will send the specified number of computer alarm messages to the computer. “XX” should be a hexadecimal number from 01 to FE to indicate a number of events from 1 to 254.
This command provides a means of manually transferring events to the computer. If the computer goes off-line, the CPM2 will record any events in its own buffer. When the computer returns on-line, the CPM2 will automatically send the computer any alarm messages that were received while the computer was off-line.

3.0 Shutdown Line Card Communication with CPM2: LC-FB
The LC-FB command will shut down communications between the Line Card specified at “LC” and the CPM2. Note that this command does not require an Option or Code number to be entered; simply enter the number of the Line Card to be shut down, the command FB, and then press the CPM2 [Escape] button.
The CPM2 will record the shut down by sending messages to the printer and the computer:
Printer: L01-Inc.Resp. 11:57:58-15/01
Computer: 1011 0000 A F1
This warning message will also be displayed on the Line Card display:

4.0: Reactivate Line Card Command: LC-FC
The LC-FC command will reactivate a Line Card that was shut down using the LC-FB command. Note that this command does not require an Option or Code number to be entered; simply enter the number of the Line Card to be reactivated, the command FC, and then press the CPM2 [Escape] button.

5.0: Line Card Buffer Command: LC-FE-XX-XX
The FE command is used to access the Line Card buffers. The following functions may be performed:
5.1 Erase Alarm Printer/Computer Messages: LC-FE-00-00
Ensure that a copy of the printer and computer alarms exists before using this command. This command erases all computer and printer alarm messages and Caller Identification messages in the Line Card’s memory.
5.2 Software Reset: LC-FE-02-02
This command will reset the Line Card.
**DRL2A COMMUNICATION FORMATS**

**Common Formats**

The following formats are commonly used:
- 3/1, 4/1, 4/2 formats; 10, 14, 20 baud
- 3/1 extended format; 10, 14, 20, 40 baud.
- 3/1, 4/2 formats with or without Checksum; 40 baud
- 3-2 format; 10, 14, 20 baud (option)
- 4/1 Extended format; 10, 14, 20 baud (option)
- 4/2 Extended format; 10, 14, 20, 40 baud (option)

**Sur-Gard DTMF Formats**

Sur-Gard DTMF 4/3 and 4/3 with Checksum formats provide fast, reliable and easy to understand and decode data transmission. On-line time will be greatly reduced when using 4/3 and 4/3 with Checksum formats. The 4/1 and 4/2 DTMF formats can also be decoded by the DRL2A. The 4/3 with Checksum format is recommended for use with Sur-Gard and DSC security control panels.

**Acron Format**

The Acron format is a DTMF format. It can transmit 3 or 4 account digits and 8 digits of channel status at a time. Shown below are several examples of Acron transmissions. The following applies to these examples:
- Handshake / Kissoff: 2300Hz
- 1234: Account Code

**Ademco Contact ID Format**

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

**Ademco Express Format**

This format consists of 4-digit Account Codes and 1- or 2-digit alarm codes. The DRL2A will decode the signal as regular 4/1 or 4/2 format. Option [53] must be programmed as “01” to decode the 4/1 Express format instead of the Sur-Gard 4/3 with Checksum format.

**Ademco Super Fast or High Speed Format**
## EVENT CODE CLASSIFICATIONS

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

<table>
<thead>
<tr>
<th>Event Type</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Alarms - 100</td>
<td>100</td>
<td>Medical</td>
</tr>
<tr>
<td>101</td>
<td>Pendant transmitter</td>
<td></td>
</tr>
<tr>
<td>102</td>
<td>Fail to report in</td>
<td></td>
</tr>
<tr>
<td>Fire Alarms - 110</td>
<td>110</td>
<td>Fire alarm</td>
</tr>
<tr>
<td>111</td>
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<tr>
<td>115</td>
<td>Pull Station</td>
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<tr>
<td>116</td>
<td>Duct</td>
<td></td>
</tr>
<tr>
<td>117</td>
<td>Flame</td>
<td></td>
</tr>
<tr>
<td>118</td>
<td>Near alarm</td>
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<tr>
<td>Panic Alarms - 120</td>
<td>120</td>
<td>Panic alarm</td>
</tr>
<tr>
<td>121</td>
<td>Duress</td>
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</tr>
<tr>
<td>122</td>
<td>Silent</td>
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<td>123</td>
<td>Audible</td>
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<tr>
<td>Burglar Alarms - 130</td>
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<td>Burglary</td>
</tr>
<tr>
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<tr>
<td>133</td>
<td>24 Hour</td>
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<td>134</td>
<td>Entry/Exit</td>
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<td>135</td>
<td>Day/Night</td>
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<tr>
<td>136</td>
<td>Outdoor</td>
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<tr>
<td>137</td>
<td>Tamper</td>
<td></td>
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<tr>
<td>138</td>
<td>Near alarm</td>
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<tr>
<td>139</td>
<td>Silent Burg</td>
<td></td>
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<tr>
<td>General alarms</td>
<td>140</td>
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<tr>
<td>141</td>
<td>Polling loop open</td>
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<tr>
<td>142</td>
<td>Polling loop short</td>
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<tr>
<td>143</td>
<td>Expansion module failure</td>
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<tr>
<td>144</td>
<td>Sensor tamper</td>
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<tr>
<td>145</td>
<td>Expansion module tamper</td>
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<tr>
<td>146</td>
<td>Silent Alarm</td>
<td></td>
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<tr>
<td>24 Hour Non-Burglary - 150</td>
<td>150</td>
<td>24 Hour non-burg</td>
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<tr>
<td>151</td>
<td>Gas detected</td>
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<td>152</td>
<td>Refrigeration</td>
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<td>153</td>
<td>Loss of heat</td>
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<td>154</td>
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<td>155</td>
<td>Foil break</td>
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<tr>
<td>156</td>
<td>Day trouble</td>
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<td>157</td>
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<tr>
<td>158</td>
<td>High temp</td>
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<td>159</td>
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<td>161</td>
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<td>Fire supervisory - 200</td>
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<td>202</td>
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<tr>
<td>203</td>
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<td>204</td>
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<tr>
<td>205</td>
<td>Pump activated</td>
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<tr>
<td>206</td>
<td>Pump failure</td>
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<tr>
<td>System Troubles - 300</td>
<td>300</td>
<td>System trouble</td>
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<tr>
<td>301</td>
<td>AC loss</td>
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<td>302</td>
<td>Low system battery</td>
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<td>303</td>
<td>RAM checksum bad</td>
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<tr>
<td>304</td>
<td>ROM checksum bad</td>
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<td>305</td>
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<td>308</td>
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<td>310</td>
<td>Ground fault</td>
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<td>Remote Access - 410</td>
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<td>Remote Access</td>
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<td>412</td>
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<td>413</td>
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<td>414</td>
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<td>415</td>
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<td></td>
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<td>Access Control - 420</td>
<td>420</td>
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<td>422</td>
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<td>System O/C - 440 and 450</td>
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<td>System O/C</td>
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<td>450</td>
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<td>451</td>
<td>Early O/C</td>
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<td>Late O/C</td>
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<td>453</td>
<td>Fail to Open</td>
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<td>454</td>
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<td>Auto Arm Fail</td>
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<td>456</td>
<td>O/C Partial Arm</td>
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<td>457</td>
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<td>458</td>
<td>User on Premises</td>
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<td>459</td>
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<tr>
<td>System Disables - 500</td>
<td>500</td>
<td>System Disables</td>
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<tr>
<td>501</td>
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<tr>
<td>502</td>
<td>Sounder/Relay disable</td>
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</tr>
<tr>
<td>503</td>
<td>Alarm relay disable</td>
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<tr>
<td>504</td>
<td>Trouble relay disable</td>
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<tr>
<td>505</td>
<td>Reversing relay disable</td>
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<tr>
<td>Communication Disables - 550</td>
<td>550</td>
<td>Communication Disables</td>
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<tr>
<td>551</td>
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<td>552</td>
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<td>553</td>
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<td>554</td>
<td>Burg. bypass</td>
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<tr>
<td>555</td>
<td>Group bypass</td>
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<tr>
<td>556</td>
<td>Swinger Bypass</td>
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<td>System peripheral Disables - 530</td>
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<td>System peripheral Disables</td>
</tr>
<tr>
<td>531</td>
<td>Communication</td>
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<tr>
<td>532</td>
<td>Telco 1 fault</td>
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<tr>
<td>533</td>
<td>Telco 2 fault</td>
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<td>534</td>
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</tr>
<tr>
<td>535</td>
<td>Fail to communicate</td>
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</tr>
<tr>
<td>536</td>
<td>Loss of radio supervision</td>
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</tr>
<tr>
<td>537</td>
<td>Loss of central polling</td>
<td></td>
</tr>
<tr>
<td>538</td>
<td>Radio Xmtr VSWR</td>
<td></td>
</tr>
<tr>
<td>Communication Troubles - 350</td>
<td>350</td>
<td>Communication Troubles</td>
</tr>
<tr>
<td>351</td>
<td>Protection loop</td>
<td></td>
</tr>
<tr>
<td>352</td>
<td>Protection loop open</td>
<td></td>
</tr>
<tr>
<td>353</td>
<td>Protection loop short</td>
<td></td>
</tr>
<tr>
<td>354</td>
<td>Fire trouble</td>
<td></td>
</tr>
<tr>
<td>355</td>
<td>Exit Alarm</td>
<td></td>
</tr>
<tr>
<td>Sensor Troubles - 380</td>
<td>380</td>
<td>Sensor trouble</td>
</tr>
<tr>
<td>381</td>
<td>Loss of super. - RF</td>
<td></td>
</tr>
<tr>
<td>382</td>
<td>Loss of super. - RPM</td>
<td></td>
</tr>
<tr>
<td>383</td>
<td>Sensor tamper</td>
<td></td>
</tr>
<tr>
<td>384</td>
<td>RF Xmtr. low battery</td>
<td></td>
</tr>
<tr>
<td>385</td>
<td>Smoke Hi-Sens.</td>
<td></td>
</tr>
<tr>
<td>386</td>
<td>Smoke Low Sens.</td>
<td></td>
</tr>
<tr>
<td>387</td>
<td>Intrusion Hi-Sens.</td>
<td></td>
</tr>
<tr>
<td>388</td>
<td>Intrusion Low Sens.</td>
<td></td>
</tr>
<tr>
<td>389</td>
<td>Detector Self Test Fail</td>
<td></td>
</tr>
<tr>
<td>Protection Loop Troubles - 370</td>
<td>370</td>
<td>Protection Loop Troubles</td>
</tr>
<tr>
<td>371</td>
<td>Protection loop</td>
<td></td>
</tr>
<tr>
<td>372</td>
<td>Protection loop short</td>
<td></td>
</tr>
<tr>
<td>373</td>
<td>Fire trouble</td>
<td></td>
</tr>
<tr>
<td>374</td>
<td>Exit Alarm</td>
<td></td>
</tr>
<tr>
<td>Open/close - 400</td>
<td>400</td>
<td>Open/close</td>
</tr>
<tr>
<td>401</td>
<td>O/C by user</td>
<td></td>
</tr>
<tr>
<td>402</td>
<td>Group O/C</td>
<td></td>
</tr>
<tr>
<td>403</td>
<td>Automatic O/C</td>
<td></td>
</tr>
<tr>
<td>404</td>
<td>Late to O/C</td>
<td></td>
</tr>
<tr>
<td>405</td>
<td>Deferred O/C</td>
<td></td>
</tr>
<tr>
<td>406</td>
<td>Cancel</td>
<td></td>
</tr>
<tr>
<td>407</td>
<td>Remote arm/disarm</td>
<td></td>
</tr>
<tr>
<td>408</td>
<td>Quick Arm</td>
<td></td>
</tr>
<tr>
<td>409</td>
<td>Keyswitch O/C</td>
<td></td>
</tr>
<tr>
<td>Test/Misc. - 600</td>
<td>600</td>
<td>Test/Misc.</td>
</tr>
<tr>
<td>601</td>
<td>Manual trigger test</td>
<td></td>
</tr>
<tr>
<td>602</td>
<td>Periodic test report</td>
<td></td>
</tr>
<tr>
<td>603</td>
<td>Periodic RF Xmission</td>
<td></td>
</tr>
<tr>
<td>604</td>
<td>Fire test</td>
<td></td>
</tr>
<tr>
<td>605</td>
<td>Status report to follow</td>
<td></td>
</tr>
<tr>
<td>606</td>
<td>Listen-in to follow</td>
<td></td>
</tr>
<tr>
<td>607</td>
<td>Walk Test Mode</td>
<td></td>
</tr>
<tr>
<td>608</td>
<td>OFF normal condition</td>
<td></td>
</tr>
<tr>
<td>609</td>
<td>Video transmitter active</td>
<td></td>
</tr>
<tr>
<td>611</td>
<td>Fire test: point tested</td>
<td></td>
</tr>
<tr>
<td>612</td>
<td>Fire test: point not tested</td>
<td></td>
</tr>
<tr>
<td>621</td>
<td>Event log reset</td>
<td></td>
</tr>
<tr>
<td>622</td>
<td>Event log 50% full</td>
<td></td>
</tr>
<tr>
<td>623</td>
<td>Event log 90% full</td>
<td></td>
</tr>
<tr>
<td>624</td>
<td>Event log overflow</td>
<td></td>
</tr>
<tr>
<td>625</td>
<td>Time/Date Reset</td>
<td></td>
</tr>
<tr>
<td>626</td>
<td>Time/Date inaccurate</td>
<td></td>
</tr>
<tr>
<td>627</td>
<td>Program mode Entry</td>
<td></td>
</tr>
<tr>
<td>628</td>
<td>Program mode Exit</td>
<td></td>
</tr>
<tr>
<td>631</td>
<td>Exception Schedule change</td>
<td></td>
</tr>
<tr>
<td>632</td>
<td>Access Sched change</td>
<td></td>
</tr>
</tbody>
</table>
The High Speed format consists of 4 account numbers, 8 channel status digits, and 1 auxiliary channel.

**NOTE:** When option [5B] is programmed as '00', the DRL2A will interpret the signal into 4/2 format. When option [5B] is programmed as '01', the DRL2A will send the information as it received to the printer and to the computer using High Speed RS-232 communication protocol.

**Channel Status Codes (Digits 5 though 12)**

**Code**

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

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

**Code**

1. Duress report in previous 8 channels (specifically channel 1)  
   Printer: 1234-00 Duress——  
   Computer: 1234 A 00
2. Opening report in the previous 8 channels (with user ID in channel 1)  
   Printer: 1234-21 Open-Usr01  
   Computer: 1234 O 01
3. Zone Bypass/Unbypass status report in the previous 8 channels  
   Printer: 1234-11 BypasZn#01  
   Computer: 1234 B 01
   Printer: 1234-31 UnBypZn#01  
   Computer: 1234 H 01
4. Closing report in the previous 8 channels (with user ID in channel 1 if expanded reporting of user # is selected at the communicator)  
   Printer: 1234-41 CloseUsr01  
   Computer: 1234 C 01
5. Zone trouble active/ trouble restore status report in the previous 8 channels  
   Printer: 1234-B1 TrbleZn#01  
   Computer: 1234 T B1
   Printer: 1234-B2 TrbleRst01  
   Computer: 1234 R B1
6. System trouble active/restore reports in the previous 8 channels

**NOTE:** Zone #07 is not used for code 6.

7. Zone alarm status report, alarms are reported in previous 8 channels
8. New low battery (will not re-report on subsequent calls and will not send restore).
   Printer: 1234-80 LowBt——  
   Computer: 1234 T 80
9. Test report, alarm status is reported in the previous 8 channels  
   Printer: 1234-90 24HrsTest-  
   Computer: 1234 T 90
0. Radio diagnostics, radio testing info is reported in previous 8 channels.
   Printer: 1234-00 Radio——  
   Computer: 1234 T 00
FBI Super Fast Format
This DTMF format consists of 4-digit Account Codes, 2-digit zone codes, 1-digit zone type codes, and 1-digit event codes. The zone codes will be converted into 3-digit decimal codes by the DRL2A.

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

<table>
<thead>
<tr>
<th>FBI Code</th>
<th>Converted Event Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire</td>
<td>1</td>
</tr>
<tr>
<td>Panic</td>
<td>2</td>
</tr>
<tr>
<td>Burglary</td>
<td>3</td>
</tr>
<tr>
<td>Medical</td>
<td>4</td>
</tr>
<tr>
<td>Auxiliary</td>
<td>5</td>
</tr>
<tr>
<td>Bypass</td>
<td>6</td>
</tr>
<tr>
<td>Inactive</td>
<td>7</td>
</tr>
<tr>
<td>Eight</td>
<td>8</td>
</tr>
<tr>
<td>Nine</td>
<td>9</td>
</tr>
<tr>
<td>Zero</td>
<td>0</td>
</tr>
<tr>
<td>Opening</td>
<td>0</td>
</tr>
<tr>
<td>Closing</td>
<td>C</td>
</tr>
<tr>
<td>Abort</td>
<td>D</td>
</tr>
<tr>
<td>Restore</td>
<td>E</td>
</tr>
<tr>
<td>Trouble</td>
<td>F</td>
</tr>
</tbody>
</table>

Note that option [3B] can give a unique FBI RS232 output when enable.

Modem II, Modem IIIE, Modem IIia² and BFSK Formats
The alarm signals sent by the D2112, D4112, D6112, D7112, D7212, D8112, D9112, Discovery 1000, NAPCO 3000 and Honeywell D5700 using Modem II or Modem IIIE formats can be decoded by the DRL2A.

The printer messages will be similar to the following:

Modem II Single Line Example:
L01-1234-CLOSING ID 801 14:04:20-09/13

BFSK Example:
L01-123-CLOSING ID1 15:19:23-10/06

Modem II Double Line Example:
L01-1234-ALARM REPORT 14:05:20-09/13

AREA=1 POINT=008 14:05:21-09/13

• L01 represents Line 01
• 1234 represents the account codes.

The Signals will be sent to the computer according to Option [59]:
If Option [59] = 00: 1011ssssssAAAAXXYYYY[DC4]
If Option [59] = 01: 6011ssssssAAAAXXYYYY[DC4]

Following the example described above, the signal will be sent to the computer as:
1011ssssss1234As300[DC4]
or
6011ssssss1234As300[DC4]

NOTE: The DRL2A will not follow the listen-in time sent by any transmitter even though the time is printed. The DRL2A will follow its own audio duration programmed at location [49].

ITI Format
The ITI format covers ITI panels model: RF Commander, Caretaker Plus, SX-IVB, SX-V, Commander III, Commander 2000, Security Pro 5000 and UltraGard 5000. In order to receive the ITI format, handshake #10 must be programmed. After a coldboot, the fifth handshake (option [45]) is programmed as 10.

<table>
<thead>
<tr>
<th>ITI LIBRARY SENSOR No.</th>
<th>PRINTED OUT AS</th>
<th>SPECIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>00 Buddy Alarm xx</td>
<td>SX-V only</td>
</tr>
<tr>
<td>01-32</td>
<td>XX ALM</td>
<td>Caretaker plus</td>
</tr>
<tr>
<td>00-16</td>
<td>XX ALM</td>
<td>RF Commander / Commander III</td>
</tr>
<tr>
<td>02-07</td>
<td>XX ALM</td>
<td>SX-IVB</td>
</tr>
<tr>
<td>01</td>
<td>BAD SENSOR #</td>
<td>SX-V only</td>
</tr>
<tr>
<td>02-76</td>
<td>XX ALM</td>
<td>Commander 2000</td>
</tr>
<tr>
<td>10-18</td>
<td>XX ALM</td>
<td>UltraGard 5000</td>
</tr>
<tr>
<td>01-76</td>
<td>XX ALM</td>
<td>Caretaker plus, SX-IVB, SX-V UltraGard 5000 only</td>
</tr>
<tr>
<td>77</td>
<td>77 Alaram Tmpr / Supervisory / CANC</td>
<td>Caretaker plus, UltraGard 5000 only</td>
</tr>
<tr>
<td>78</td>
<td>78 TRB</td>
<td>All supported ITI panels</td>
</tr>
<tr>
<td>79</td>
<td>79 No activ alm / CANC</td>
<td>All supported ITI panels</td>
</tr>
<tr>
<td>80</td>
<td>80 Alarm</td>
<td>All supported ITI panels</td>
</tr>
<tr>
<td>81</td>
<td>81 Alarm</td>
<td>All supported ITI panels</td>
</tr>
<tr>
<td>82</td>
<td>82 Alarm</td>
<td>All supported ITI panels</td>
</tr>
<tr>
<td>83</td>
<td>83 Phone Tst</td>
<td>All supported ITI panels</td>
</tr>
<tr>
<td>84</td>
<td>84 OpenUsr xx</td>
<td>All supported ITI panels</td>
</tr>
<tr>
<td>85</td>
<td>85 CloseUsr xx</td>
<td>All supported ITI panels</td>
</tr>
<tr>
<td>86</td>
<td>86 SilentDuress</td>
<td>All supported ITI panels</td>
</tr>
<tr>
<td>87</td>
<td>87 ForceArmed / AutoForceArm</td>
<td>All supported ITI panels</td>
</tr>
<tr>
<td>88</td>
<td>88 TRB</td>
<td>Caretaker plus, UltraGard 5000 only</td>
</tr>
<tr>
<td>89</td>
<td>89 TRB</td>
<td>Caretaker plus, UltraGard 5000 only</td>
</tr>
<tr>
<td>90</td>
<td>90 AC Fail / RESTR</td>
<td>All supported ITI panels</td>
</tr>
<tr>
<td>91</td>
<td>91 Low CPU Bat / RESTR</td>
<td>All supported ITI panels</td>
</tr>
<tr>
<td>92</td>
<td>92 ALmTamprLoop / RESTR</td>
<td>All supported ITI panels</td>
</tr>
<tr>
<td>93</td>
<td>93 AutoPhoneTst</td>
<td>All supported ITI panels</td>
</tr>
<tr>
<td>94</td>
<td>94 TRB</td>
<td>All supported ITI panels</td>
</tr>
<tr>
<td>95</td>
<td>95 CPU Back In / 95 RESET</td>
<td>All supported ITI panels</td>
</tr>
<tr>
<td>96</td>
<td>Failure to communicate</td>
<td>Local alarm only</td>
</tr>
<tr>
<td>97</td>
<td>No phone line</td>
<td>Local alarm only</td>
</tr>
<tr>
<td>98</td>
<td>98 Event Dump Report</td>
<td>Commander 2000</td>
</tr>
</tbody>
</table>
SIA FSK Format

The SIA digital format is a modem format communicating at 110 or 300 baud and using the SIA protocol to transfer information to the computer.

The standard DRL2A is equipped with the Bell 103 modem chip. The CCITT V.21 modem chip may be installed upon request when ordering the MLR2-DG or DRL2A modules. The CCITT V.21 chip is for use with modem frequencies specified by the CCIT V.21 recommendation.

NOTE: The DRL2A can accept SIA formats with and without separators. The DRL2A Version 1.8 Software implements Level 1, Level 2 and Level 3 of the SIA 1993IIb Digital Communication Standard, except that it does not support "Receiver Call out and Access Passcode Block", "Reverse Channel Block", and "V-Channel Communications".

To distinguish from the other formats already decoded by the DRL2A, the data will be displayed on the printer as follows:

L01-xx1234NBA-3423 18:36:00-30/09
• L01 represents Line Card 01
• xx1234 represents Account Code 001234
• N represents New event
• BA represents a Burglary Alarm
• 3423 represents Zone 3423
• 18:36:00 is the time in the 24-hour clock format (hours:minutes:seconds; in this example, the time is 6:36 pm)
• 30-09 represents the date; in this example, the date is September 30

The DRL2A supports an account code with a maximum of 16 digits, (including any displayable ASCII characters except the "|") with option 31 (SIA option for Level 2 & 3 decoding) enabled (01), and an account code with a maximum of 6 digits with option 31 disabled (00). If option 31 (SIA level 2-3) is disabled, the "A"s received in the account code will be converted to "0"s. It also supports an Alarm code within a maximum of 4 digits. Usually, the central station automation software will interpret the Alarm Codes. For manual operation, refer to the SIA Event Block Data Code Definitions for information on interpreting the Alarm Codes.

When an alarm is received, it will be displayed on the DRL2A display. For the alarm message shown above, the following would be displayed:

L01-xx1234
NBA-3423------

Acknowledgements for the SIA format are tonal by default. The transmitter may, however, request data acknowledgement by transmission of the optional configuration block. When the DRL2A receives the configuration block from a transmitter requiring data acknowledgement, it will send the tonal acknowledgement to this block. It will then send the data acknowledgement to the following data blocks if the data received is identical.

Silent Knight FSK1, FSK2

Please see page 39 for details.

Varitech Format (Available on 1.81SV)

The Varitech format data will be decoded by the DRL2A as 4/1 or 4/2 format data. The printer messages and the computer outputs are the same as those used for the regular 4/1 and 4/2 format.
### DRL2A Library Decoding and Event Codes Table

#### 3/1 - 4/1 Alarm Library

<table>
<thead>
<tr>
<th>Alarm Message</th>
<th>Corresponding Code</th>
<th>Event Code (Options 00-AF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm 0</td>
<td>0 (A)</td>
<td>A</td>
</tr>
<tr>
<td>Alarm 1</td>
<td>1</td>
<td>A</td>
</tr>
<tr>
<td>Alarm 2</td>
<td>2</td>
<td>A</td>
</tr>
<tr>
<td>Alarm 3</td>
<td>3</td>
<td>A</td>
</tr>
<tr>
<td>Alarm 4</td>
<td>4</td>
<td>A</td>
</tr>
<tr>
<td>Alarm 5</td>
<td>5</td>
<td>A</td>
</tr>
<tr>
<td>Alarm 6</td>
<td>6</td>
<td>A</td>
</tr>
<tr>
<td>Alarm 7</td>
<td>7</td>
<td>A</td>
</tr>
<tr>
<td>Restore</td>
<td>9</td>
<td>R</td>
</tr>
<tr>
<td>Open</td>
<td>B</td>
<td>O</td>
</tr>
<tr>
<td>Close</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Cancel</td>
<td>D</td>
<td>/</td>
</tr>
<tr>
<td>Restore</td>
<td>E</td>
<td>R</td>
</tr>
<tr>
<td>Trouble</td>
<td>F</td>
<td>T</td>
</tr>
</tbody>
</table>

#### 3/1-4/1 Extended, 3/2 & 4/2 Alarm Library

<table>
<thead>
<tr>
<th>Alarm Message</th>
<th>Corresponding Code</th>
<th>Event Code (Options 10-1F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm 0x</td>
<td>(Ax)</td>
<td>A</td>
</tr>
<tr>
<td>Alarm 1x</td>
<td>A</td>
<td>1</td>
</tr>
<tr>
<td>Alarm 2x</td>
<td>A</td>
<td>2</td>
</tr>
<tr>
<td>Alarm 3x</td>
<td>A</td>
<td>3</td>
</tr>
<tr>
<td>Alarm 4x</td>
<td>A</td>
<td>4</td>
</tr>
<tr>
<td>Alarm 5x</td>
<td>A</td>
<td>5</td>
</tr>
<tr>
<td>Alarm 6x</td>
<td>T</td>
<td>6</td>
</tr>
<tr>
<td>Alarm 7x</td>
<td>A</td>
<td>7</td>
</tr>
<tr>
<td>Alarm 8x</td>
<td>T</td>
<td>8</td>
</tr>
<tr>
<td>Restr 9x</td>
<td>R</td>
<td>9</td>
</tr>
<tr>
<td>CloseGrp Bxx</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>OpenGrp Cxx</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Bypas Dxx</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>UnByp Exx</td>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>Cancl Fxx</td>
<td>/</td>
<td>/</td>
</tr>
</tbody>
</table>

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

#### 4/2 Extended & 4/3 Alarm Library

<table>
<thead>
<tr>
<th>Alarm Message</th>
<th>Corresponding Code</th>
<th>Event Code (Options 20-2F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm 0xx</td>
<td>(Axx)</td>
<td>T</td>
</tr>
<tr>
<td>Alarm 1xx</td>
<td>A</td>
<td>1</td>
</tr>
<tr>
<td>Alarm 2xx</td>
<td>A</td>
<td>2</td>
</tr>
<tr>
<td>Alarm 3xx</td>
<td>A</td>
<td>3</td>
</tr>
<tr>
<td>Close 4xx</td>
<td>C</td>
<td>4</td>
</tr>
<tr>
<td>Open 5xx</td>
<td>O</td>
<td>5</td>
</tr>
<tr>
<td>Alarm 6xx</td>
<td>T</td>
<td>6</td>
</tr>
<tr>
<td>Alarm 7xx</td>
<td>A</td>
<td>7</td>
</tr>
<tr>
<td>Alarm 8xx</td>
<td>A</td>
<td>8</td>
</tr>
<tr>
<td>Restr 9xx</td>
<td>R</td>
<td>9</td>
</tr>
<tr>
<td>CloseGrp Bxx</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>OpenGrp Cxx</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Bypas Dxx</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>UnByp Exx</td>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>Cancl Fxx</td>
<td>/</td>
<td>/</td>
</tr>
</tbody>
</table>

#### Event Codes Summary

<table>
<thead>
<tr>
<th>Code</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Automatic Test</td>
</tr>
<tr>
<td>1</td>
<td>Fire Alarm</td>
</tr>
<tr>
<td>2</td>
<td>Panic Alarm</td>
</tr>
<tr>
<td>3</td>
<td>Burglary Alarm</td>
</tr>
<tr>
<td>4</td>
<td>Closing by User Number</td>
</tr>
<tr>
<td>5</td>
<td>Opening by User Number</td>
</tr>
<tr>
<td>6</td>
<td>Service</td>
</tr>
<tr>
<td>7</td>
<td>Medical Emergency</td>
</tr>
<tr>
<td>8</td>
<td>Message</td>
</tr>
<tr>
<td>9</td>
<td>Restore</td>
</tr>
<tr>
<td>A</td>
<td>Alarm</td>
</tr>
<tr>
<td>B</td>
<td>Bypass</td>
</tr>
<tr>
<td>C</td>
<td>Closing by User Number</td>
</tr>
<tr>
<td>D</td>
<td>Cancel</td>
</tr>
<tr>
<td>H</td>
<td>Unbypass</td>
</tr>
<tr>
<td>O</td>
<td>Opening by User Number</td>
</tr>
<tr>
<td>R</td>
<td>Restore</td>
</tr>
<tr>
<td>T</td>
<td>Trouble</td>
</tr>
<tr>
<td>Z</td>
<td>Common Event Code</td>
</tr>
</tbody>
</table>

20 Hex Common Event code “Space”
SG-CPM2 CENTRAL PROCESSING MODULE

The CPM2 is the central processing module that monitors the DRL2A Line Cards and forwards the information from the Line Cards to the computer and printer. The CPM2 is capable of monitoring a maximum of 14 telephone lines from 7 DRL2A modules.

General Information
The CPM2 16-bit micro-controller and real-time assembly language program running at 16MHz allow the system to quickly and efficiently execute several tasks at the same time. The use of a unique menu display system enhances the system’s ease of use for the operator and makes the system configuration and programming simple and efficient. Several diagnostics modes are available to assist the operator in troubleshooting and maintenance.

Features
• Multi-tasking allows the receiver to perform functions that might otherwise be delayed by a slow computer acknowledgement response
• Fast internal communication results in practically no delay in transfer of information between the Line Card and the CPM2. The CPM2 is capable of polling 14 Line Cards in 1 second
• 128-event printer alarm message buffer
• 128-event computer alarm message buffer
• LCD contrast easily adjusted

CPM2 Controls

Liquid Crystal Display: 2-line, 16 character per line liquid crystal display; backlit for easy reading in low level light

“Option” light: Indicates the state of the “Option” programmable output. Flashing 2 seconds ON, 2 seconds OFF, with the standard program.

[ACK] button: Used to manually acknowledge an alarm event when a computer is not connected to the receiver or when the UL Receiver Option is enabled. Press the [ACK] button to turn the “ACK” light OFF and silence the buzzer. The [ACK] button is also used in the Configuration Mode to select menu items.

“ACK” light: Flashes when a message is received from the Line Card and COM1 is disabled or disconnected

[Enter] button: Executes a command or scrolls the display to the next message.
“TX” light: Monitors the COM1 transmission signal
[Backspace] button: Used to erase errors or move the cursor back one character; also used to scroll the display back to the previous message.
“RX” light: Monitors the signal received from the computer connected to COM1.
[Escape] button: Used to save changes and exit a mode; also used for other functions when indicated on the display screen.
“TROUBLE” light: Illuminates when a trouble condition is present (not used).
“AC” light: Indicates that AC power is present.
**CPM2 OPERATING MODE**

Computer Reply:
The CPM2 will consider any other character than “06H” or “15H” as the computer being absent.

**NOTE:** The new options available on the CPM2 V2.3 can not be programmed from the MLR2 Programming software. If the Programming Software is utilized for the CPM2 programming, these new options MUST be programmed manually. The programming software can still be used to program the line cards. A new version of the programming software will be available on our Web Site at www.surgard.com during the fall of 1997.

**CPM2 Cold Start-up**
The “cold boot” should be performed to install the default system software.

Follow the procedure described here to perform a “cold boot” of the CPM2.

- Remove the CPM2 from the card cage
- Turn the “PROG EN” (Program Enable) switch ON. The Program Enable switch is located on the left side of the CPM2 unit; use a small screwdriver to turn the switch ON by turning it clockwise.
- Re-install the CPM2 in the card cage, but do not fasten the mounting screws. The CPM2 should power up and this message will be displayed:

  **SYST COLD BOOT?**  
  **Enter Yes Bsp=No**

- Press the [Enter] button to perform the “cold boot”. This message will be displayed:

  **SYST COLD BOOT Executing!**

After approximately 1 second, this message will be displayed:

**Please Turn Off Program Switch!**

The CPM2 will remain in an inoperative mode until the Program Enable switch is turned OFF.

- Pull the CPM2 part way out of the card cage
- Use a small screwdriver to turn the Program Enable switch OFF by turning it counter-clockwise.
- Re-install the CPM2 in the card cage and secure the faceplate screws

The CPM2 is now ready for operation. Set the clock and calendar and configure the CPM2.

**CPM2 in Stand-By Mode**

When the CPM2 is in Stand-By mode, a message similar to this will be displayed:

**#FEB-23 07:30:45**  
**Scanning 0E (14)**

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

**CPM2 Configuration Mode**

The Configuration Mode allows programming of the various features and options available on the CPM2. To enter the Configuration Mode, press the [Escape] button; this message will be displayed:

**Enter MASTER-ID****

Enter the Master Access Code using the keypad; the default Master Access Code is “CAFE”. When the access code is entered, the screen will display the first option in the Options Menu:

**01: Sys Date/Time**  
**Ent+ Bsp- Ack:S**

Press the [Enter] button to display the next menu item, or press the [Backspace] button to display the previous menu item; press the [ACK] button to select the menu item presently displayed on the screen.

**Configuration Options**

The CPM2 features 28 configuration options:

- 01 System Date and Time
- 02 System Passwords
- 03 Number of Line Cards
- 04 Printer Select
- 05 COM1 Configuration
- 06 COM1 Format
- 07 Acknowledge Wait Delay
- 08 Heartbeat Select
- 09 COM2 Configuration
- 10 COM2 Format
- 11 Contrast Adjust
- 12 UL Receiver Option
- 13 Erase Memory
- 14 Mute Buzzer
- 15 Keep Last Message
- 16 Debug ComPort
- 17 Test 9v/12v Batt
- 18 Debug Line Card
- 19 Program Version
- 20 Monitor Battery
- 21 Year / Second
- 22 Force Reset
- 23 Change Receiver Number
- 24 COM1/2 Control
- 25 Printer Control
- 26 Printer Test
- 27 Printer Width
- 28 Tamper Input

**Option 01: Setting the Clock**

Option [01] allows the CPM2 date and time to be set. Press the [ACK] button when the “01: Sys Date/Time” message is displayed; this message will be displayed:

**<D/M/Y> 23/02/93**  
**<H:M:S> 07:30:45**

Enter the date and time using the numbers 0 through 9 only. Press the [Enter] button to move the cursor one character to the right; press the [Backspace] button to move the cursor one space to the left.
When the date and time are entered, press the [Escape] button; when the [Escape] button is pressed, the next Configuration Option will be displayed on the screen. Note that if “0” or a number greater than “12” is programmed for the month, the screen will display the word “Nul” in place of the month while in the Stand-By mode. “Nul” will also be displayed for the time if the time has not been programmed properly.

**Option 02: Changing System Passwords**

Option [02] allows the CPM2 passwords to be changed or erased. Press the [ACK] button when the “02: Sys Passwords” message is displayed; this message will be displayed:

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

Sixteen 4-digit passwords are available for use on the CPM2. Password 0 is the Master Password, and Passwords 1 through F may be assigned to individual operators. Two letters, representing the initials of the operator, may be assigned to each Password to help in identifying the operator.

When this option is entered, a cursor will appear beneath the first character in the 4-digit Password. Enter a new Password using the 0 through 9 and the A through F keys. To enter the operator’s initials, use the [0] and [1] keys to scroll forward or backward through the alphabet. When the desired letter is displayed, press the [Enter] button; the cursor will move to the next character. To move the cursor to the previous character, press the [Backspace] button.

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

**Option 03: Change the Number of Line Cards**

Option [03] is used to set the number of Line Cards polled by the CPM2. Press the [ACK] button when the “03: Num of Lcard” message is displayed; this message will be displayed:

```
$LnCard Attached
E Change to: x
```

Enter a number from 1 to E to indicate how many Line Cards, from 1 to 14, are to be polled by the CPM2. When the new number is entered, press the [Enter], [Backspace], or [Escape] button; the screen will then display the next Configuration Option.

**Option 04: Select Printer Function**

Option [04] determines how the printer connected to the CPM2 will operate. Press the [ACK] button when the “04: PrinterSelect” message is displayed; this message will be displayed:

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

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

<table>
<thead>
<tr>
<th>Bkup</th>
<th>Enable</th>
<th>Printer Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>Bypass printer</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>Enable printer (default setting)</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>Enable printer only if COM1 is in failure</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>Enable printer only if COM1 is in failure (same as above)</td>
</tr>
</tbody>
</table>

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

When using the Star 8340 printer, the CPM2 is able to print in both red and black. If an IBM-compatible printer is selected, the CPM2 will print in black only.

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

**Option 05: COM1 Configuration**

Option [05] determines the baud rate, data bits and parity to be used on COM1. Press the [ACK] button when the “05: Com#1 Config.” message is displayed; this message will be displayed:

```
Com#1 Config As:
Br:12 Da:7 Pa:2
```

Enter a number from 7 through 9 to indicate 7, 8, or 9 data bits.

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

**Note:** The start and stop bit is fixed at 1.

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

**Option 06: COM1 Communication Format**

Option [06] determines the communication format to be used on COM1. Press the [ACK] button when the “06: Com#1 Format” message is displayed; this message will be displayed:

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

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

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>COM1 disabled</td>
</tr>
<tr>
<td>1</td>
<td>Sur-Gard format (default setting)</td>
</tr>
<tr>
<td>2</td>
<td>Sur-Gard format with common event code “A”</td>
</tr>
<tr>
<td>3</td>
<td>Sur-Gard format with header 01 Hex.</td>
</tr>
<tr>
<td>4</td>
<td>Sur-Gard Clock Signal format</td>
</tr>
</tbody>
</table>

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

**Option 07: Wait Time for Acknowledge on COM1**

Option [07] determines the acknowledge wait time, in seconds, to be used for COM1. Press the [ACK] button when the “07: ACK Wait Time” message is displayed; this message will be displayed:

```
Com#1 Config As:
Br:12 Da:7 Pa:2
```

Enter a number from 1 through 9 to indicate seconds.
Enter a decimal number from 4.0 to 9.9. Use the [Enter] and [Backspace] buttons to move the cursor forward or backward when editing the acknowledge time.

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

When the <ACK> wait system option 07 is programmed as "0.0", the CPM2 will not require a "06H" (ACK) from the computer.

**NOTE:** It is strongly recommended not to change the default setting (4.0 sec.) unless it is recommended by a Sur-Gard representative technician.

**Option 08: Heartbeat Time for COM1**

Option [08] determines at what time interval, in seconds, the supervisory "heartbeat" transmission will be sent to COM1. The "heartbeat" transmission is used to ensure that communications through COM1 are functioning normally.

Press the [ACK] button when the "08: Heartbeat Sel" message is displayed; this message will be displayed:

![Heartbeat Select](image)

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

Use the [Enter] and [Backspace] buttons to move the cursor forward or backward when editing the heartbeat time.

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

**Option 09: COM2 Configuration**

Option [09] determines the baud rate, data bits and parity to be used on COM2. Press the [ACK] button when the "05: Com#1 Config." message is displayed; this message will be displayed:

![Com#2 Config As:](image)

**Bd: Baud Rate**

Enter a number from 300 through 1200 for baud rate:

- 110
- 150
- 300
- 1200

**Da: Data Bits**

Enter a number from 7 through 9 to indicate 7, 8, or 9 data bits:

**Pa: Parity**

Entry for parity:

- 0: no parity
- 1: odd parity
- 2: even parity

Note that the stop bit is fixed at 1.

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

**Option 10: COM2 Communication Format**

Option [10] determines the application to be used on COM2. Press the [ACK] button when the "10: Com#2 Format" message is displayed; this message will be displayed:

![Com#2 Format is:](image)

Enter a number from 0 to 2 to select one of the following:

- 0: PC Computer Programming Software capability (default setting).
- 1: SCADA connection through Com#2 enable
- 2: SCADA connection through Com#2 with Redundancy Backup enable

**Option 11: Adjust LCD Contrast**

Option [11] allows the contrast of the message display screen to be adjusted. Press the [ACK] button when the "11: Contrast Adj" message is displayed; this message will be displayed:

![Contrast Level](image)

Press the [Enter] button to increase the contrast; press the [Backspace] button to reduce the contrast.

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

**Option 12: UL Receiver Option**

To have the MLR2-DG operate in compliance with UL-Listed Central Station requirements, press the [ACK] button when the "12: UL Receiver" message is displayed. This message will be displayed:

![UL Requirement](image)

When Option [12] is programmed as "1", the CPM2 will operate according to the following UL864 requirements:

1. All signals are sent to the computer and/or the printer if connected.
2. The CPM2 retains alarm messages received from the Line Cards and the CPM2 supervisory signal on the LCD display, and activates the buzzer to alert the operator. The display will also indicate if additional signals are waiting to be displayed and acknowledged.
3. The operator must press the [ACK] button to acknowledge the signal manually. The CPM2 will scroll to the next message if there are more messages to display.
4. The CPM2 returns to the Stand-by Mode when all signals have been manually acknowledged.

When Option [12] is programmed as "00", functions described above will be bypassed. The default setting for Option 12 is "00".

**Option 13: Erase Alarm Message Buffer**

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

Option [13] is used to erase the CPM2 alarm message buffer. Press the [ACK] button when the "13: Erase Memory" message is displayed; this message will be displayed:

![Erase all MEMORY](image)

Press the [Backspace] or [Escape] buttons to cancel this option without erasing the CPM2 buffer. To erase the buffer, press the [Enter] button. When the [Enter] button is pressed, this message will be displayed:
Again, press the [Backspace] or [Escape] buttons to cancel this option without erasing the CPM2 buffer. To erase the buffer, press the [Enter] button. When the [Enter] button is pressed, all printer and computer messages will be erased. Ensure that a printed record of the alarm messages is made before erasing the buffer.

Option 14: Mute Buzzer

A tone will sound when the CPM2 receives an alarm and is unable to forward the alarm message to COM1. The tone may be silenced by programming Option [14] as “1”. Press the [ACK] button when the “14: Mute Buzzer” message is displayed; this message will be displayed:

Mute Buzzer: 1/0
0 Change to: X

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

NOTE: Option 14 will have no effect on the buzzer if the UL Receiver Option is enabled.

Option 15: Display Last Message

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

The most recent alarm message may be retained on the screen until the next alarm message is received. To retain the most recent alarm message, program Option [15] as “1”. Press the [ACK] button when the “15: Keep Lst Msg” message is displayed; this message will be displayed:

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

To have the Stand-By Mode message displayed after an alarm is received and sent to the computer or printer, program Option [15] as “0”. The default setting is “0”. When “0” or “1” has been entered, press the [Enter] key.

Option 16: ComPort Diagnostics

The CPM2 features a diagnostics mode that allows the operator to view all data being communicated through COM1 (or COM2) on the display screen. To use this feature, press the [ACK] button when the “16: Debug ComPort” message is displayed; this message will be displayed:

Debug ComPort: 1, 2
0 Change to: X

Enter “1” and press the [Enter] button to enable the diagnostics feature on Com1 (or “2” for Com2). All data being sent through COM1 will now be displayed on the screen. A typical transmission is shown here:

1RRL AAAAA
YY N 06

- N represents the number of times the CPM2 tries to re-send the message to COM1; this value should be “1” during normal communication
- 06 represents the acknowledge received from COM1

To disable the diagnostics feature, program Option 16 as “0”. The diagnostics mode should only be enabled to test and review the information being sent to COM1; the diagnostics feature should be disabled during normal receiver operation.

Option 17: Test 9V/12V Battery

Some earlier CPM2 units provide 9V battery for memory storage while present CPM2 units use different technology for this purpose.

If the unit uses 9V battery, the battery voltage should be supervised by enabling this option. Press [ACK] button when the ‘17: Test 9V Batt.’ message is displayed; then the following message will be displayed:

9V/12V Batt: 0-3
2 Change to: X

0: Do not supervise the 9V and 12V batteries
1: Supervise 9V only
2: Supervise 12V only
3: Supervise both batteries

Option 18: Line Card Diagnostics

The CPM2 features a diagnostics mode that allows the operator for view all data being communicated between the CPM2 and the Line Cards. To enable this feature, press the [ACK] button when the “18: Debug LnCard#” message is displayed.

Enter a hexadecimal number from “1” through “E” to monitor Line Card 01 through 14, or enter “F” to monitor all Line Cards connected to the CPM2.

Stand-By communications between the Line Card and the CPM2 will be displayed with messages similar to this:

01 FE

- 01 represents the Line Card number
- FE represents the response from line number 1 to the normal CPM2

Alarm messages transmitted by the Line Cards will be displayed with messages similar to this:

L01-1234-C01

OpenGrp

NOTE: When diagnostic modes are enabled, messages will be displayed according to the following priority:

- UL message - Acknowledge required
- COM1 Diagnostic messages
- Line Card Diagnostic messages
- “Retain last message” displays
- Internal Troubles messages
- Stand-By Mode message

Refer to “Message Priorities” for more information.

Option 19: Display Software Version

To display the software version presently installed in the CPM2, press the [ACK] button when the “19: Program Vers#” message is displayed; a message similar to this will be displayed:

SG-CPM2 RECEIVER

*May-23-97 U2.3D
Option 20: Battery Monitor
To view the present voltage of the 12V general back-up batteries, press the [ACK] button when the "20: Monitor Batt." message is displayed. A message similar to this will be displayed:

**Battery Monitor:**
12V: 13.9 Volt

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

**NOTE:** If option 17 is at 03, a message similar to this will be displayed:

**Battery Monitor:**
9V: 88.8 12V: 13.9

Option 21: Alarm Messages Print Year or Seconds
Alarm messages may be programmed to include either the year in their dates, or the seconds in their times. To program Option [21], press the [ACK] button when the "21: Year/Second" message is displayed; this message will be displayed:

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

Program Option [21] as "1" to include the year in the alarm message date; alarm messages will be printed as follows:

L01-1234-05 Alarm 21:24:24/11/94

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

Program Option [21] as "0" to include the seconds in the alarm message time; alarm messages will be printed as follows:

L01-1234-05 Alarm 21:24:30-24/11

Note that the time (21:24:30) now includes hours, minutes and seconds; the date (24/11) only indicates the day and the month.

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

The system option 21 now provides the following choices for the printer time and date format:

0: hh:mm:ss-DD/MM/MM
2: hh:mm:ss-MM/MM/YYYY
1: hh:mm-DD/MM/YY
3: hh:mm-MM/DD/DD/YYYY

Option 22: System Reset
To reset the CPM2 program, press the [ACK] button when the "22: Force Reset" message is displayed; this message will be displayed:

**Force Sys Reset**
Ent=Yes Bsp=No

Press the [Backspace] button to cancel the option without resetting the CPM2. To reset the CPM2, press the [Enter] button.

The reset will take approximately 8 seconds to complete. Press the [Backspace] or [Escape] buttons to move to the next Configuration Option.

Option 23: Change Receiver Number
The receiver number is used to identify the receiver when communicating to COM1 and printer to report internal troubles. To change the receiver number, press the [ACK] button when the "23: Cng Receiver#" message is displayed. This message will be displayed:

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

Note that when Option [23] is programmed, the display will return to Option [01].

Option 24: Scada
The acronym «SCADA» stands for Supervisory Control And Data Acquisition. This product consists of a package of SCADA receiver and a CPM2 module. Its function is to transport the alarm data from a local (satellite) central station to the master central station reliably by using linked Modems (like the SG-M1) over leased phone lines. This system is specifically intended for use with a point to point 300 baud Schedule 3A data line (CANADA), but can be used with any data lines.

The CPM2 software version 2.3 supports the data transactions for up to 14 Digital and/or DYACS Compatible lines, but we strongly suggest a maximum of 8 lines on the remote location when used within a SCADA configuration. For the alarms output choices (SYSTEM OPTION [24]) a number corresponding to each of the line cards, one to fourteen, is indicated on the LCD at 14 positions from left to right as follows:

**24: Com1/2 Control**
Ent=+ Bsp=- Ack=S

123456789ABCDE :123456789ABCDE :123456789ABCDE :123456789ABCDE :123456789ABCDE :

Press Enter or Backspace to move the cursor over the digit corresponding to the line card you wish to change. Enter the new digit; the CPM2 will display the change on the LCD, and the cursor will move to the next digit. Change another digit, as above, if desired, or exit and save the changes by pressing <Escape>.

The numbers that can be programmed are:

0: no route at all - no printer output, no computer output. (Not recommended)
1: send computer alarm messages only to the Com#1 (local computer) only.
2: send computer alarm messages only to Master central through Com#2 for transmission to the SCADA of the Master Receiver only.
3: send computer alarm messages to Com#1 (local computer) and next to Com#2 for the SCADA line card.
4: send computer alarm messages to Com#1 and Com#2, and send printer alarm messages to Com#2.

Option 25: Printer Control
The Remote Receiver (SCADA) CPM2 sends data to the local printer in the normal way, which can be enable/disable for each line at option [25] as follows:

**25: Prter Control**
Ent=+ Bsp=- Ack=S
Programming "1" will enable the local printer report for this specific line. "0" will disable the local printer for this specific line.

NOTE: When it routes the data to the serial port Com#2, it needs to insert the checksum calculation and support the protocol described in more detail in the MLR2-SCADA manual.

**Option 26: Printer Test**

When enabled to "1", the CPM2 will send a test message to the local printer every day at 05:00 A.M. and at 17:00 P.M. The following message will be printed:

LR0 Printer Test    hh:mm:ss-DD/MM
Where R represents receiver number.

**Option 27: Printer Width**

This new option has been implemented to support the new CIS format. This new format will be available with future line card revisions. Program as "0" if using a 40 columns printer, or program as "1" if using a 80 columns printer.

Please note that the SCADA protocol does not support the 80-column mode.

**Option 28: Tamper Input**

0 = Tamper Terminal on the SG-DML4 is used to monitor for Low Battery condition on the UPS.
1 = Tamper Terminal on the SG-DML4 is used as another <ACK> button.

Connect a push button switch between the TAMP terminal to the GND terminal. When shorting the Tamper terminal with the ground, the receiver will react the same way as if the front <ACK> push button would have been pressed. This could be used to install a remote acknowledge button when using the receiver in manual mode.

**Message Priorities**

When in Stand-By Mode, the CPM2 will display warning and other operational messages according to the following priority:

1. UL Requirement Message
2. COM1/COM2 Diagnostics
3. Line Card Diagnostics
4. "Retain last message" displays
5. Printer Error
6. COM1 Absent
7. 12V Battery Low
8. 9V Battery Low
9. AC Failure
10. Stand-By Mode message

**UL Requirement Message**

When Option [12] is programmed as "01", the "ACK" button must be pressed to acknowledge each incoming alarm manually and to silence the internal buzzer.

**COM1 Diagnostics**

If both Option [16] and Option [06] are enabled, the screen will display the data being communicated through COM1. Refer to Option [16] for information.

**Line Card Diagnostics**

If Option [18] is enabled, the screen will display that data exchanged between the CPM2 and the selected Line Card. Refer to Option [18] for more information.

**“Retain Last Message” Displays**

If Option [15] is enabled, the latest printer message will be retained on the display screen. Refer to Option [15] for more information.

**Printer Error**

If Option [04] is enabled and there is a printer trouble (for example, printer off-line, paper out, and so on), a message similar to this will be displayed:

*Feb-23 07:30:45* printer ERROR!

**12V Battery Low**

If the 12V back-up battery is disconnected or its voltage is low, a message similar to this will be displayed:

*Feb-23 07:30:45* 12V Battery LOW!

**AC Failure**

If AC power is removed from the CPM2, this message will be displayed:

*Feb-23 07:30:45* AC Power LOST!

**Stand-By Mode Message**

During normal stand-by operation, this message will be displayed:

*Feb-23 07:30:45* Scanning 0E (14)
CPM2 UTILITY MODES

When the CPM2 is in the Stand-By Mode, the following functions may be accessed by pressing the [A] through [F] keys:

- [A] Send Computer Messages to Printer
- [B] Operator Log-On
- [C] System Command Mode
- [D] Send Printer Messages to the Printer
- [E] Examine Printer Messages on Display Screen
- [F] Examine Computer Messages on Display Screen

[A] Send Computer Messages to Printer
This mode is used to send the computer messages from the buffer to the printer. When the [A] key is pressed, this message will be displayed:

```
Dump COM Msg->PRT
LCard#:F Ent:EXE
```

Enter a hexadecimal number to print the following:

- **Enter... to Print**
  - "0"  CPM2 internal supervisory signals (if any)
  - "F"  Computer messages for all Line Cards and CPM2 internal supervisory signals
  - "1-E"  Computer messages for specified Line Card

Example: If "0" is entered, the following will be printed:

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

- "106" indicates the message was successfully sent to the computer and the computer has responded correctly with an [06] acknowledge.

[B] Operator Log-On
Different operators may “log-on” to the system by entering this mode. When an operator logs on, a message similar to this one will be printed: “Operator on duty S.G. 11:03-21/12/92”

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

To log on, press the [B] key, and then enter a 4-digit Password. If a valid password is entered, a log-on message will be printed. If an invalid password is entered, the CPM2 will sound a tone to indicate that the code was entered incorrectly.

Refer to CPM2 Option [02] for information on programming operator Passwords and initials.

[C] System Command Mode
The System Command Mode is used to send commands to the Line Cards through the CPM2. To enter this mode, press [C] and then enter an Operator Password. When the Password is entered, this message will be displayed:

```
LCard:__ Comd:__ Op:__ Cd:__ Sc:__
```

- LCard: Enter a 2-digit hexadecimal number from 01 to 0E to indicate which Line Card is to be affected.
- Comd: Enter one of the Line Card Commands described in the DRL2A Line Card Menu Mode section of this manual
- Op: and Cd: “Op” and “Cd” are used to indicate parameters that may be required within certain commands. For example, when using the F7 Line Card programming command “Op” and “Cd” are used to indicate the Option number and the new code programmed for that option.
- Sc: “Sc” is used with SCADA applications.

Enter digits using the keypad; when a digit is entered, the cursor will move one character to the right. Press the [Backspace] button to delete the character presently indicated by the cursor and move the cursor 1 character to the left. When a command has been entered, press the [Escape] button to send the command to the Line Card.

If more than one command is to be sent, press the [ACK] button to send the command presently displayed on the screen. Another command may now be entered.

[D] Send Printer Messages to the Printer
With the CPM2 in the Stand-By Mode, press the [D] key to send printer messages in the buffer to the printer. When the [D] key is pressed, this message will be displayed:

```
Dump PRT Msg->PRT
LCard#:F ent:EXE
```

Enter a hexadecimal number to print the following:

- **Enter... to print**
  - "0"  CPM2 internal trouble messages (if any)
  - "1" to "E" Print messages for specified Line Card
  - "F"  Print messages for all Line Cards

If an error is made in entering the number, simply re-enter the desired number again on the keypad.

Press the [Backspace] or [Escape] button to cancel this function and return to the Stand-By Mode. Or, press the [Enter] button to print the indicated messages. When the [Enter] button is pressed, the CPM2 will print the printer messages, starting with the oldest message first. The messages will be printed in red if the Star DP8340 printer is being used.

If the CPM2 receives new alarms from the Line Card while buffer is being printed, the new alarms will be sent to the printer when the buffer printout is completed.

[E] Examine Printer Messages on Display Screen
With the CPM2 in the Stand-By Mode, press the [E] key to review printer messages on the display screen. When the [E] key is pressed, this message will be displayed:

```
Exam PRINTER msg
LCard#:F ent:EXE
```

Enter a hexadecimal number to view the following:

- **Enter... to view**
  - "0"  CPM2 internal trouble messages (if any)
  - "1" to "E" Messages for specified Line Card
  - "F" Messages for all Line Cards

If an error is made in entering the number, simply re-enter the desired number again on the keypad.

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

When the [Enter] button is pressed, the CPM2 will display the printer messages, starting with the most recent message. When [Enter] is pressed, a message similar to this will be displayed:

```
L01-1234-05
Alarm xx
```
Examine Computer Messages on Display Screen
With the CPM2 in the Stand-By Mode, press the [F] key to review computer messages on the display screen. When the [F] key is pressed, this message will be displayed:

[F] Enter... to view

“0” CPM2 internal trouble messages (if any)
“1” to “E” Computer messages for specified Line Card
“F” Computer messages for all Line Cards

If an error is made in entering the number, simply re-enter the desired number again on the keypad.

Press the [Backspace] or [Escape] button to cancel this function and return to the Stand-By Mode. Or, press the [Enter] button to view the indicated messages. When the [Enter] button is pressed, the CPM2 will display the computer messages, starting with the most recent message. When [Enter] is pressed, a message similar to this will be displayed:

Enter a hexadecimal number to view the following:

<table>
<thead>
<tr>
<th>Hex</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000 A</td>
<td>00: Reserved to indicate Operator activity for C or ESC mode (Not Implemented in this program version).</td>
</tr>
<tr>
<td>0000 A</td>
<td>01: Printer Error</td>
</tr>
<tr>
<td>0000 R</td>
<td>02: Printer Restored</td>
</tr>
<tr>
<td>0000 A</td>
<td>03: 12V Battery Low</td>
</tr>
<tr>
<td>0000 R</td>
<td>04: 12V Battery Restored</td>
</tr>
<tr>
<td>0000 A</td>
<td>05: COM#1 Absent</td>
</tr>
<tr>
<td>0000 R</td>
<td>06: COM#1 Restored</td>
</tr>
<tr>
<td>0000 A</td>
<td>07: UPS Low Battery</td>
</tr>
<tr>
<td>0000 R</td>
<td>08: UPS Low Batt Restr</td>
</tr>
<tr>
<td>0000 A</td>
<td>11: 9V Batt. Low</td>
</tr>
<tr>
<td>0000 R</td>
<td>12: 9V Batt. Restr</td>
</tr>
<tr>
<td>0000 A</td>
<td>13: COM#2 Absent</td>
</tr>
<tr>
<td>0000 R</td>
<td>14: COM#2 Restored</td>
</tr>
<tr>
<td>0000 A</td>
<td>15: AC Failure</td>
</tr>
<tr>
<td>0000 R</td>
<td>16: AC Restored</td>
</tr>
<tr>
<td>0000 A</td>
<td>17: UPS AC Fail</td>
</tr>
<tr>
<td>0000 R</td>
<td>18: UPS AC Restored</td>
</tr>
<tr>
<td>0000 T</td>
<td>19: CPM2 Master Fail</td>
</tr>
<tr>
<td>0000 A</td>
<td>C1 to CE: Internal communication error</td>
</tr>
<tr>
<td>0000 T</td>
<td>10: Faulty Data Received on Line Card</td>
</tr>
<tr>
<td>0000 A</td>
<td>20: Telephone Line Fault on Line Card</td>
</tr>
<tr>
<td>0000 R</td>
<td>30: Telephone Line Restored on Line Card</td>
</tr>
<tr>
<td>0000 T</td>
<td>40: Faulty Call; no data received on Line Card</td>
</tr>
<tr>
<td>0000 P</td>
<td>0X: Audio on line X</td>
</tr>
<tr>
<td>0000 A</td>
<td>D1 to DE: Line Card 01 to 0E Reset</td>
</tr>
</tbody>
</table>

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

Com#1 Restored 09:50-21/09/92

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

The “heartbeat” feature may be disabled if this feature is not compatible with the central station automation software being used on the computer.

Overview of Communication
When the CPM2 receives data from a Line Card, it forwards the data to COM1 and awaits an acknowledgment signal from the computer. If a NAK signal is received from the computer, the CPM2 will make 4 attempts to send the data. If all four attempts fail, CPM2 buzzer will sound and the CPM2 will retain the alarms in its internal buffer until communications are restored. This routing provides reliable and supervised communication between the CPM2 and the Line Cards.

The CPM2 also monitors the connection to the computer by sending a supervisory “heartbeat” signal through COM1 every 30 seconds. If the “heartbeat” transmission determines that the computer is off-line or disconnected, a message similar to this will be sent to the printer:

Com#1 Absent!! 09:45-21/09/92

Note that the message indicates the time and date that communications through COM1 were determined to be interrupted.
COMMUNICATION PROTOCOL WITH CENTRAL STATION COMPUTER

The Sur-Gard MLR2-DG receiver sends the following protocol to report signals to the central station computer via the RS-232 port.

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

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

Basic Signal Protocol:

1RRLssssAAAAAAsXGYYY[DC4]

Where, 1 : Protocol number.
RR : Receiver number.
L : Line number.
s : Space Character.
AAAAAA : Account Code, usually 4 digits with 2 leading spaces.
X : Event Code. See Table below.
G : O/C by Area Number (1-F), or Space.
YYY : Zone Number or User Number.

EVENT CODE TABLE

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Automatic Test</td>
<td>*</td>
</tr>
<tr>
<td>1</td>
<td>Fire Alarm</td>
<td>*</td>
</tr>
<tr>
<td>2</td>
<td>Panic Alarm</td>
<td>*</td>
</tr>
<tr>
<td>3</td>
<td>Burglary Alarm</td>
<td>*</td>
</tr>
<tr>
<td>4</td>
<td>Arming by User #</td>
<td>*</td>
</tr>
<tr>
<td>5</td>
<td>Disarming by User #</td>
<td>*</td>
</tr>
<tr>
<td>6</td>
<td>Service</td>
<td>*</td>
</tr>
<tr>
<td>7</td>
<td>Medical Emergency</td>
<td>*</td>
</tr>
<tr>
<td>8</td>
<td>Message</td>
<td>*</td>
</tr>
<tr>
<td>9</td>
<td>Restore</td>
<td>*</td>
</tr>
<tr>
<td>A</td>
<td>Alarm</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Bypass</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Arming by User #</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Auxiliary</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Unbypass</td>
<td></td>
</tr>
<tr>
<td>O</td>
<td>Disarming by User #</td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>Restore</td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>Trouble</td>
<td></td>
</tr>
<tr>
<td>Z</td>
<td>Common Event Code</td>
<td></td>
</tr>
<tr>
<td>20(H)</td>
<td>Common Event Code Space Character</td>
<td></td>
</tr>
</tbody>
</table>

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

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

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

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

1RRLssssss0012sC1128[DC4]
1RRLssssss0012sC2128[DC4]

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

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

Two-Way Audio:

Once the Sur-Gard receiver is in the two-way audio mode, it sends an optional signal to the computer: (Option [4D])

1RRLssssss0000sPss0L[DC4]

Where, 1 : Protocol number.
RR : Receiver number.
L : Line number.
s : Space Character.
0000 : Account Code 0000.
P : Event Code. P is recommended, but it is programmable (DRL2A option [4D]).
L : Line number.

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

Supervisory Heartbeat Signal Protocol:

1011sssssssssss@ssss[DC4]

Where, s : Space Character.
@ : Supervisory Signal.

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

SIA Protocol 1:

3RRLssssAAAAAAAXXYYYY[DC4]

Where, 3 : Protocol number.
RR : Receiver number.
L : Line number.
ssss : Spaces.
AAAAAA : Six digit account codes. Leading spaces will be sent if account codes are less than six digits.
XX : Event code, follows the SIA "Event Block Data Code Definitions".
YYYY : Zone codes. Leading spaces will be sent if zone codes are less than four digits. If no zone codes are received from the control panel, "ss00" will be sent.
SIA Protocol 2:
The SIA Protocol 1 cannot handle certain information in the SIA level 2 and 3. We now provide the optional SIA Protocol 2 as the following: (option [31] enable)

```
SRRL[#AAAAAA|EMMZZZZ/MMZZZZ/MMZZZZ][DC4]
```

Where,
- **S**: Beginning transmission of the new SIA protocol
- **RR**: Receiver number 00-FE
- **L**: Line number 0-E
- **[**: Beginning data delimiter
- **#**: Account ID block code
- **AAAAAA**: Account ID, maximum sixteen digits.
- **I**: Field separator
- **E**: Function block code
- **MM**: Event block code or modifier
- **ZZZZ**: Zone code, or user code, or time/date information
- **/**: Data code packet separator
- **]**: Ending data delimiter
- **[DC4]**: Terminator, 14 Hex

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

Examples from a SIA Control Panel:
**Standard Transmission:**
```
SRRL[#1234|Nri1BA01][DC4]
```

Where,
- **S**: Protocol identifier for SIA protocol 2
- **RR**: Receiver number 01-FE
- **L**: Line number 1-E
- **[**: Beginning data delimiter
- **#**: Account ID block code
- **1234**: Account ID
- **I**: Field separator
- **N**: New event function block
- **r1**: Area/Partition number 1
- **BA01**: Burglary Alarm zone 01
- **]**: Ending data delimiter
- **[DC4]**: Terminator, 14 Hex

**Listen-in Transmission:**
```
SRRL[#1234|Nri1BA01|L90][DC4] or SRRL[#1234|Nri1BA01][DC4]
```

Where,
- **S**: Protocol identifier for SIA protocol 2
- **RR**: Receiver number 01-FE
- **L**: Line number 1-E
- **[**: Beginning data delimiter
- **#**: Account ID block code
- **1234**: Account ID
- **I**: Field separator
- **L**: Listen-in block
- **r1**: Area/Partition number 1
- **/**: Data code packet separator
- **BA01**: Burglary Alarm zone 01
- **L90**: Listen in, panel will stay on line 90 s
- **]**: Ending data delimiter
- **[DC4]**: Terminator, 14 Hex

The receiver will switch on listen-in only if option 49 is programmed.

---

Compatible Alarms-related Function Code Blocks on DRL2A v1.8

<table>
<thead>
<tr>
<th>Block Type</th>
<th>Block Code</th>
<th>Block Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>System</td>
<td>0</td>
<td>End of data</td>
</tr>
<tr>
<td>Inf.</td>
<td>E</td>
<td>Environmental</td>
</tr>
<tr>
<td>Inf.</td>
<td>N</td>
<td>Event (new)</td>
</tr>
<tr>
<td>Inf.</td>
<td>O</td>
<td>Event (old)</td>
</tr>
<tr>
<td>Special</td>
<td>@</td>
<td>Configuration</td>
</tr>
<tr>
<td>Special</td>
<td>#</td>
<td>Account ID</td>
</tr>
<tr>
<td>Special</td>
<td>A</td>
<td>ASCII</td>
</tr>
<tr>
<td>Special</td>
<td>I</td>
<td>Downlook</td>
</tr>
<tr>
<td>Special</td>
<td>X</td>
<td>Extended</td>
</tr>
<tr>
<td>Special</td>
<td>L</td>
<td>Listen-in</td>
</tr>
<tr>
<td>Special</td>
<td>&amp;</td>
<td>Origin</td>
</tr>
</tbody>
</table>

DRL2A v1.8 SIA Digital Compatible Levels

<table>
<thead>
<tr>
<th>Supported Feature</th>
<th>SIA1</th>
<th>SIA2</th>
<th>SIA3</th>
<th>DRL2A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tonal acknowledgment</td>
<td>✓✓✓✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N block with zone numbers only</td>
<td>✓✓✓✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single account block per call</td>
<td>✓✓✓✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O block</td>
<td>✓✓✓✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X block</td>
<td>✓✓✓✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>300 baud</td>
<td>✓✓✓✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Configuration block</td>
<td>✓✓✓✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data acknowledgment</td>
<td>✓✓✓✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modifiers, name</td>
<td>✓✓✓✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple account block per call</td>
<td>✓✓✓✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental block</td>
<td>✓✓✓✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data code with unit numbers</td>
<td>✓✓✓✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receiver call out and access passcode block</td>
<td>✓✓✓✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reverse channel C blocks</td>
<td>✓✓✓✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reverse channel P blocks*</td>
<td>✓✓N/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reverse channel ASCII blocks</td>
<td>✓✓✓✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dynamic block and group sizes</td>
<td>✓✓✓✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Listen-in</td>
<td>✓✓✓✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Video</td>
<td>✓✓✓✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASCII blocks to receiver</td>
<td>✓✓✓✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-channel communications*</td>
<td>✓✓N/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Origin block</td>
<td>✓✓✓✓</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Support of feature is optional for receiver.
Telephone Number Protocol:

4RRLAAAAALLTTTTTTTT[DC4]
Where, 4 : Protocol number.
RR : Receiver number.
L : Line number.
AAAAAA : Account code. If Account code is less than 6 digits, leading spaces will be added.
LLL : Long distance area code. If no area code is received, sends ‘000’.
If only one digit area code is received, sends ‘001’.
TTTTTTT : Local phone number.

Contact-ID Protocol:

5RRLs18AAAAQXYZGGCCC[DC4]
Where, 5 : Protocol number.
RR : Receiver number.
L : Line number.
s : Space.
18 : Contact-ID format identifier.
AAAA : Four digit account codes.
Q : Qualifier, E=New event or opening, R=New restore or closing. P=Previous event
XYZ : Class code and event code.
GG : Group number.
CCC : Zone codes or user ID.

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

5011s181234E12101001[DC4]

MODEM II / IIE / Illa² and BFSK Protocols:

6RRLssssssAAAAXXXYYYY[DC4]
When used with the SUR-GARD interface. This protocol is compatible to the RADIONICS D6500 Mode except that the protocol number is ‘6’.
Or 1RRLssssssAAAAXXXYYYY[DC4]

Ademco High Speed Protocol:

8RRLAAAasCCCCsCCCCsC[DC4]
Where, 8 : Protocol number.
RR : Receiver number.
L : Line number.
AAAA : Account code.
s : Space.
CCCC : Channel 1-4.
s : Space.
CCCC : Channel 5-8.
s : Space.
C : Channel 9.

Acom Super Fast Protocol:

9RRLssssAAAACCCCCCCCC[DC4]
Where, 9 : Protocol number.
RR : Receiver number.
L : Line number.

Video Downlook Protocol:

DRRLssssssAAAAGCsVPa[DC4]
Where, D : Protocol number.
RR : Receiver number.
L : Line number.
ssss : Spaces.
AAAA : Account code.
G : Line Test Grade 1-9, 0=Bypassed
A-Z=Text to follow, up to 6 characters.
C : Control code 1-F, which is the first digit of alarm code from 4/3 format or 4/2 format.
s : Space.
V : Camera number 1-F, 0=No, X=Unknown.
p : Picture number 1-8, 0=No.
a : Audio Indicator, 1=Audio, 0=No Audio.

SIA Video Downlook Protocol:

DRL2A v1.8 supports the SIA Video block (available on the DSC PC1575, DSC PC5010 and DSC PC5015. In order to enable proper decoding, option 31 (SIA option) and option 4E (Downlook option) must be enabled. The video signal will be sent to the computer as follows:

SRRL[#AAAAIipt010/cn00x/im00x][DC4]
Where, S : SIA header.
RR : Receiver number.
L : Line number.
AAAA : Account code.
I : Field separator.
pt : Manufacturer identifier (010 for DSC/Sur-Gard).
/ : Data code packet separator.
im : Number of images (3 digits).
cn : Camera number.

SIA AIR Downlook Protocol:

SRRL[#AAAAIipt010/ad004/cn00x][DC4]
Where, S : SIA header.
RR : Receiver number.
L : Line number.
AAAA : Account code.
I : Field separator.
I : Video block function code.
/ : Data code packet separator.
ad : Additional images (fixed to 004).
cn : Camera number.

SIA AIR Downlook Protocol:

SRRL[#AAAAIipt010/ad004/cn00x][DC4]
Where, S : SIA header.
RR : Receiver number.
L : Line number.
AAAA : Account code.
I : Field separator.
I : Video block function code.
/ : Data code packet separator.
ad : Additional images (fixed to 004).
cn : Camera number.
SIA Video Block:
The DRL2A Version 1.81 supports the A.I.R. (available on
the DSC PC5015). In order to enable proper decoding, the
option 31 (SIA option) and option 4E (Downlook option)
must be enabled.

The Video signal for additional picture request will be sent
to the computer as follows:

\[42\]

Where, S : SIA header
# : Account block function code
AAAA : Account code (from 1 to 6 digits)
l : Field separator
I : Video block function code
pt : Picture test (fixed to 010)
\ : Data code packet separator
ad : Number of images (3 digits)
cn : Camera number

ITI Protocol:
The Sur-Gard SG-MLR2-DG ITI protocol is based on the ITI
Generic format, with the protection levels added on.
The version 1.81 now supports the ITI Ultra-guard Pro-5000
control panel.

\[42\]

Where, l : Protocol number (ITI)
RR : Receiver number (00-FF)
L : Line number (0-E)
s : spaces
AAAAAA : Account number (if the account is
4 or 5 digits, the leading “A”s will
be replaced by spaces)
XX : alarm code
Possible alarm codes are as follows:
00 : Alarm Panic
01-08 : Alarm 01-08
09 : Hold-up
10-19 : Alarm 10-19
30 : Test code
31 : Trouble line 1
32 : Trouble line 2
33 : Expand trouble
34 : Forced access
35 : Restore line 1
36 : Restore line 2
37 : Expand restore
38 : Cancel code
39 : Data lost
[DC4] : Represents the terminator

Alarm Condition Code
A = Alarm
R = Cancel
E = Exit fault
S = Supervisory
L = Low battery
B = Bypass
T = Tamper alarm
O = Opening (non-ITI only)
C = Closing (non-ITI only)
W = Restoral
P = Auto phone test
V = Instant meth.
N = New log
J = Trouble
I = Improper ID code
G = One ring meth.
D = Dial out meth.
The group number and the user number are calculated as
follows:

Reported Number Group/User Byte
0-9 ‘0’-‘9’
10-35 ‘A’-‘Z’
36-61 ‘a’-‘z’
62 and greater ‘?’

* Please take note that the DRL2A will not respond to any
interactive commands from the ITI panels, and that the
audio feature is supported for ITI accounts.

Silent Knight FSK1 Protocol:

\[42\]

Where: E : FSK protocol identifier
RR : receiver number
L : line number
s : spaces
AAAAAA : account number (if the account is
4 or 5 digits, the leading “A”s will
be replaced by spaces)
XX : alarm code

Silent Knight FSK2 Protocol:

The DRL2A will provide two possible outputs to the computer,
according to the value set under option 52. When the option
is programmed as “00” (factory default), the computer output
will be as follows:

Where: F = FBI protocol identifier
RR = receiver number
L = line number
s = spaces
AAAAAA = account code.
T = Zone type
ZZ = Zone number, in hex.
E = Event code
if E=0 and T=0 : listen in.

FBI RS232 Protocol:

Where: F = FBI protocol identifier
RR = receiver number
L = 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.
Possible events are as follows:

- YT00 : Battery Trouble
- YR00 : Battery Restore
- AT00 : System Trouble AC
- DOZZ : Access left open ID ZZ
- DFZZ : Access forced ID ZZ
- DSZZ : Access Station ID ZZ
- AJ00 : System Restore AC
- LT0Z : Trouble phone line #0Z
- ETZZ : Expand trouble station ID ZZ
- ERZZ : Expand restore station ID ZZ
- RP00 : Automatic test
- RXZZ : Manual test zone ZZ
- CA : Automatic closing
- OA : Automatic opening
- CLZZ : Normal closing ID ZZ
- OPZZ : Normal opening ID ZZ
- CFZZ : Forced closing ID ZZ
- ORZZ : Forced opening ID ZZ
- OTZZ : Supervised opening ZZ
- CG0a : Closing area 0a
- OG0a : Opening area 0a
- DRZZ : Access granted ID ZZ
- FC00 : Duress
- FE00 : Data lost
- F3zz : Supervised closing ID ZZ
- F7zz : Supervised opening ID ZZ
- FD0a : Closing area 0a
- FF0a : Opening area 0a
- F8zz : Access
- F9zz : Access left open ID ZZ
- FAzz : Access forced ID ZZ
- FBzz : Access station ID ZZ
- \[DC4\] : Representative terminator

**Clock Signal Protocol:**

1. `1RRLssssAAAAAAsXGYYYYHH:MM:SS-dd/mm[DC4]`
2. `3RRLssssAAAAAAXYYYYYHH:MM:SS-dd/mm[DC4]`
3. `4RRLAAAAAAAALLLLTTTTTTTHH:MM:SS-dd/mm[DC4]`
4. `5RRLs18AAAAQXYZGCCCCCHH:MM:SS-dd/mm[DC4]`
5. `6RRLssssssCCCCAAAAXYYYHH:MM:SS-dd/mm[DC4]`
6. `7RRLssssssXXXXsIAACsHH:MM:SS-dd/mm[DC4]`
7. `8RRLaaaaCSSCCCsCCCCsCHH:MM:SS-dd/mm[DC4]`
8. `9RRLssssAAAACCCCCCCHCHH:MM:SS-dd/mm[DC4]`
9. `ARRLssssLLTTTTTTTTHH:MM:SS-dd/mm[DC4]`
10. `DRRLssssssAAAAGCsVPaHH:MM:SS-dd/mm[DC4]`

Where:
- \[HH\] : Hour.
- \[MM\] : Minute.
- \[SS\] : Second.
- \[dd\] : Day.
- \[mm\] : Month.

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

**New Computer Format:**

The SIA CIS format has been implemented. This format will be enabled when the COM#1 Format is programmed as “5”. This will be used only with future line card revisions. To support this new format, the CPM2 buffer size have been reduced to 128 events instead of 256.

When programmed as “5”, the information to the computer will be sent as the following:

```
<identifier><LF><CRC><HT><seq><rec><line><[data]><cr>
```

**Automation Software**

Ask Sur-Gard Technical Support or visit our website at www.sur-gard.com for an information sheet when using the MLR2-DG with one of the following software packages:

- SIMS II
- SIMS CSM
- SIS
- Microkey Central-1
- ABM
- Alarm Soft
- Apropos STA
## CPM2 EPROM PROGRAMMING

Most of the CPM2 options can be changed in the RAM accessed by the system’s configuration. However, some less important features are installed in the EPROM. The following features are located in the CPM2 standard EPROM and programmed to the following default settings:

<table>
<thead>
<tr>
<th>ROM Address</th>
<th>Default</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>6500H</td>
<td>05H</td>
<td>Printer strobe pulse width  Default = 5µs (microseconds)</td>
</tr>
<tr>
<td>6501-6502</td>
<td>3E80</td>
<td>Delay time × 0.25ms to resend message to COM1 if heartbeat is not selected.  Default = 16000 x 1ms = 16 s delay</td>
</tr>
<tr>
<td>6505-6506</td>
<td>0100H</td>
<td>Test Line Card 01 at 01:00</td>
</tr>
<tr>
<td>6507-6508</td>
<td>0115H</td>
<td>Test Line Card 02 at 01:15</td>
</tr>
<tr>
<td>6509-650A</td>
<td>0130H</td>
<td>Test Line Card 03 at 01:30</td>
</tr>
<tr>
<td>650B-650C</td>
<td>0145H</td>
<td>Test Line Card 04 at 01:45</td>
</tr>
<tr>
<td>650D-650E</td>
<td>0200H</td>
<td>Test Line Card 05 at 02:00</td>
</tr>
<tr>
<td>650F-6510</td>
<td>0215H</td>
<td>Test Line Card 06 at 02:15</td>
</tr>
<tr>
<td>6511-6512</td>
<td>0230H</td>
<td>Test Line Card 07 at 02:30</td>
</tr>
<tr>
<td>6513-6514</td>
<td>0245H</td>
<td>Test Line Card 08 at 02:45</td>
</tr>
<tr>
<td>6515-6516</td>
<td>0300H</td>
<td>Test Line Card 09 at 03:00</td>
</tr>
<tr>
<td>6517-6518</td>
<td>0315H</td>
<td>Test Line Card 0A at 03:15</td>
</tr>
<tr>
<td>6519-651A</td>
<td>0330H</td>
<td>Test Line Card 0B at 03:30</td>
</tr>
<tr>
<td>651B-651C</td>
<td>0345H</td>
<td>Test Line Card 0C at 03:45</td>
</tr>
<tr>
<td>651D-651E</td>
<td>0400H</td>
<td>Test Line Card 0D at 04:00</td>
</tr>
<tr>
<td>651F-6520</td>
<td>0415H</td>
<td>Test Line Card 0E at 04:15</td>
</tr>
</tbody>
</table>

Changes are rarely required, but these features may be changed to suit particular needs. To make changes to the EPROM programming, first insert a standard CPM2 EPROM into an EPROM programming unit. Follow the instructions provided with the EPROM programmer to select addresses and modify data. Ensure that the correct addresses are being programmed, and verify the existing data in the address before making changes.
SPECIAL APPLICATIONS – NON-UL

SUR-GARD NETWORK (SCADA)

A complete package to allow one or more receivers in distant cities to communicate their alarm information to a master receiver and to be remotely controlled by the master receiver.

The acronym "SCADA" stands for Supervisory Control And Data Acquisition. It is used to transport the alarm data from a local (satellite) central station to the master central station reliably by using linked Modem over leased phone lines. This system is specifically intended to be used with a point to point 300 baud Schedule 3A data line.
**MLRV-A Automated Video Receiver Module**

The Automated MLRV-A Video Receiver Module provides for the receiving of video images over the regular telephone lines following the Event information.

One MLRV-A module connects to and works with one Digital Receiver line (DRL2A). The MLRV-A can only connect to and work with the Sur-Gard MLR2 Multi Line Receiver.

The MLR2 Receiver is a two line receiver expandable to 14 lines, each receiver line, if required can have the MLRV-A module, if expanded to a maximum number additional power must be taken into consideration.

The MLRV-A can be housed in one of two expansion cages available, the MLRXV or MLR2XV, both are 19" rack mount and should be located in the same cabinet as the MLR2 receiver. A four wire connection must be made between the MLRXV or MLR2XV backplane board and the back plane board of the DRL2A.

The Automated MLRV-A provides for two outputs, a Coaxial video output off a BNC post and PC output by a 25 pin video bus and 9 pin data bus. The MLRV-A can be set for video out, PC out or both.

Video images transmitted to the video monitor and PC also include the Account code, time and date and the camera number with amount of images to be sent.

Two set’s of dip switches in the MLRV-A provide for several options when viewing the video on a Video monitor, they allow for large or small account code, flashing information and how long it will stay on the screen. The options are only applicable to the video monitor, on the PC the Downlook software will display all images with extended account information.

**MLRV-A Receiver Module**

**MLRXV Card Cage**

**MLR2XV Card Cage**

**DLGB Downlook Grabber Board**

To input the Downlook Video into a PC it will be necessary to have a DLGB card, one DLGB works with one MLRV-A receiver module.

A standard 486 or Pentium PC will be required, up to 4 DLGB cards can be placed into one PC.

Each DLGB occupies an ISA slot.

Two cables are connected from the Downlook Interface card to the DML5A backplane.

A 25-pin cable for the pictures and a 9-pin cable for the serial communication.

Both cables can have a maximum length of 30 meters (100 feet).

These cables are not supplied with the Downlook Interface.
PSA v 1.00 Software
Downlook PSA software allows for video images to be displayed, saved, retrieved, printed and managed on a standard PC. A 486 or Pentium with at least 8 Meg of ram must be used, it is advised other than DOS, Windows 3.11 or Windows 95 no other program should run with the Downlook PSA as a conflict of software could exist.
All functions on the software can be accessed by the use of a mouse or by a touch screen monitor. The complete software and all individual icons and commands can be password protected.
Up to 8 images can be viewed at a time on one screen and each image can be expanded to full size, Picture receive and hold windows provide flexibility.
A stay on line feature allows for automatic request of additional images, this is an on-off feature to allow for continuing viewing of a location. This feature is only available with the Power832 and 5108 module.
The PSA software is provided with the DLGB, the Downlook Grabber Board.
## APPENDIX A  DRL2A QUICK REFERENCE GUIDE

### Version 1.8

### Line Card Configuration Command:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Default</th>
<th>Change</th>
<th>ASCII (HEX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>COM SELECT:</td>
<td>001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>PRT SELECT:</td>
<td>001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>RCVER NUMB:</td>
<td>001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>LCARD NUMB:</td>
<td>00F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>CALLER-ID:</td>
<td>000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>TEL#-RS-232</td>
<td>000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>TEL#-PRINTR</td>
<td>000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>LINE CHECK:</td>
<td>001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3A</td>
<td>PGM OUTPUT:</td>
<td>000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3B</td>
<td>FBI RS232:</td>
<td>000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Output (Dump) Commands:

- LC-FA-01-XX Dump xx printer alarm messages to printer.
- LC-FA-02-XX Dump xx computer alarm messages to printer.
- LC-FA-04-04 Dump current or active line card configuration.
- LC-FA-05-XX Dump xx Caller-ID and printer alarms to printer.
- LC-FA-06-XX Dump xx computer alarms to computer.

### Shutdown / Activate Line Card Command:

- LC-FB-XX-XX Shut down line card, xx=not required
- LC-FC-XX-XX Reactivate line card, xx=not required

### Line Card Buffer Commands:

- LC-FE-00-00 Erase Caller-ID, printer alarm and computer alarm buffers.
- LC-FE-02-02 Stop watchdog timer to force line card reset.
APPENDIX B  CPM2 QUICK REFERENCE GUIDE
Version 2.3

CPM2 Utility Modes
Press [ACK] when “Ack” light flashes to Acknowledge event
•  [A] Send Computer Messages to Printer
•  [B] Operator Log-On
•  [C] System Command Mode
•  [D] Send Printer Messages to the Printer
•  [E] Examine Printer Messages on Display Screen
•  [F] Examine Computer Messages on Display Screen

CPM2 Configuration Mode
Press the [Escape] button when the system is in Stand-By Mode and enter the Master Password.
Press the [Enter] button to display the next menu item; press the [Backspace] button to display the previous menu item.
Press the [ACK] button to select the menu item presented shown on the display screen.

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Function</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Set Date and Time</td>
<td>00:00:00 00-00-00 (random)</td>
</tr>
<tr>
<td>02</td>
<td>System Passwords</td>
<td>CAFE</td>
</tr>
<tr>
<td>03</td>
<td>Number of Line Cards</td>
<td>E</td>
</tr>
<tr>
<td>04</td>
<td>Printer Select</td>
<td>Backup=0; Enable=1</td>
</tr>
<tr>
<td>05</td>
<td>COM1 Configuration</td>
<td>Baud: 1200, Data: 7 bits, Parity: 2</td>
</tr>
<tr>
<td>06</td>
<td>COM1 Format</td>
<td>1</td>
</tr>
<tr>
<td>07</td>
<td>ACK Wait Delay</td>
<td>4.0 seconds</td>
</tr>
<tr>
<td>08</td>
<td>Heartbeat Select</td>
<td>30 seconds</td>
</tr>
<tr>
<td>09</td>
<td>COM2 Configuration</td>
<td>Baud: 300, Data: 8 bits, Parity: 2</td>
</tr>
<tr>
<td>10</td>
<td>COM2 Format</td>
<td>0</td>
</tr>
<tr>
<td>11</td>
<td>Contrast Adjust</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>UL Receiver Option</td>
<td>0</td>
</tr>
<tr>
<td>13</td>
<td>Erase Memory</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Mute Buzzer</td>
<td>0</td>
</tr>
<tr>
<td>15</td>
<td>Keep Last Message</td>
<td>0</td>
</tr>
<tr>
<td>16</td>
<td>Debug COMPort</td>
<td>0</td>
</tr>
<tr>
<td>17</td>
<td>Test 9V/12V Battery</td>
<td>3</td>
</tr>
<tr>
<td>18</td>
<td>Line Card Diagnostics</td>
<td>0</td>
</tr>
<tr>
<td>19</td>
<td>Display Program Version</td>
<td>Version 2.3</td>
</tr>
<tr>
<td>20</td>
<td>Monitor Battery</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Select Year/Seconds</td>
<td>0</td>
</tr>
<tr>
<td>22</td>
<td>Force Reset</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Change Receiver Number</td>
<td>01</td>
</tr>
<tr>
<td>24</td>
<td>COM1/2 Control</td>
<td>4444444444444444</td>
</tr>
<tr>
<td>25</td>
<td>Printer Control</td>
<td>1111111111111111</td>
</tr>
<tr>
<td>26</td>
<td>Printer Test</td>
<td>0</td>
</tr>
<tr>
<td>27</td>
<td>Printer Width</td>
<td>0</td>
</tr>
<tr>
<td>28</td>
<td>Tamper Input</td>
<td>0</td>
</tr>
</tbody>
</table>

Line Card Command Descriptions
•  [F7] Line Card Configuration
•  [FA] Print Line Card Buffer
•  [FB] Shutdown Line Card Communication with CPM2
•  [FC] Reactivate Line Card Communication with CPM2
•  [FE] Line Card Buffer Functions
APPENDIX C TROUBLE SHOOTING

Problem: No communication with the central station computer on COM1
Solution: Ensure that the cable connected to COM1 is an RS232 cable; it should not be a null-modem type.
   Check the baud rate for COM1 (CPM2 Configuration Option 05)
   Check the COM1 communication format (CPM2 Configuration Option 06)
   Check the computer software set-up
   Enable COM1 Diagnostics with CPM2 Configuration Option 16 and examine the communications on the display screen.

Problem: Bad communication with central station computer.
Solution: The central station software is too slow to provide the acknowledgement signal for the CPM2. Contact the software manufacturer for a software upgrade.
   Increase the acknowledge wait time with CPM2 Configuration Option 07.
   Check COM1 baud rate and communication format using CPM2 Configuration Options 05 and 06
   Ensure that the COM1 connection is secure

Problem: Fault in received data
Solution: Check the telephone line to determine if noise is a problem; if so, enable DRL2A Option 3C.

Problem: Line Fault
Solution: Check the voltage on the telephone line; it should measure as at least 4V when the receiver is on-line, and approximately 50V when the receiver is off-line.
   Check if the appropriate telephone cable is connected to the DML2A.

Problem: CPM2 displays the COM1 debugging mode and the Master Code is not valid
Solution: The CPM2 needs to be re-booted. Refer to the Cold Boot section of this manual

Problem: Faulty call
Solution: Ensure that the handshake needed by the panel is programmed in the DRL2A handshakes.
   Ensure that the handshake is being sent at the proper positions (4th, 5th or 6th position)
   Ensure that the security control panel does not hand up before it receives the handshake
   Check the DRL2A handshake order or interval between handshakes and make any required changes

Problem: The Line Card displays “<<CPM ERROR>>” and/or alarms are not transmitted to the computer and printer
Solution: Ensure that the Line Card number is not out of the range of the CPM2 scanning
   Ensure that the flat cables connected between the DML4 and the Line Cards are connected correctly; ensure that the contact between the connectors is secure.

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

Calling Technical Support
If you have questions of problems when using Sur-Gard products, you can call technical support. If you are within the United States, Puerto Rico, the U.S. Virgin Islands or Canada, you can get support by dialling 1-800-503-5869. If you are outside these areas, please call (416) 665-4494 or E-mail us at support@sur-gard.com.

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

Products
The MLR2-DG central station receiver was designed to suit your needs. If you ever have a suggestion about the MLR2-DG or about any one of our products, please contact us. We genuinely appreciate your comments. Write to: Sur-Gard Security Systems Ltd.
Receiver Product Manager
401 Magnetic Drive, Units #24
Downsvview, Ontario, Canada
M3J 3H9
<table>
<thead>
<tr>
<th>NAME</th>
<th>HANDSHAKE</th>
<th>DATA</th>
<th>BAUD</th>
<th>FORMAT</th>
<th>EXTENDED</th>
<th>KISS OFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ademco Slow</td>
<td>1400Hz</td>
<td>1900Hz</td>
<td>10bps</td>
<td>3/1,4/1(or 3/2), 4/2</td>
<td>NO</td>
<td>1400Hz</td>
</tr>
<tr>
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## APPENDIX E DECIMAL - HEX - BINARY CONVERSION CHART

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## APPENDIX F  ASCII CHARACTER CHART

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LIMITED WARRANTY

Sur-Gard Ltd. warrants that for a period of 5 years from the date of purchase, the product shall be free of defects in materials and workmanship under normal use and that in fulfillment of any breach of such warranty, Sur-Gard Ltd. shall, at its option, repair or replace the defective equipment upon return of the equipment to its repair depot. This warranty applies only to defects in parts and workmanship and not to damage incurred in shipping or handling, or damage due to causes beyond the control of Sur-Gard Ltd., such as lightning, excessive voltage, mechanical shock, water damage, or damage arising out of abuse, alteration or improper application of the equipment.

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

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

WARNING

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