EST3 Synergy Enabled®
3-MODCOM
Self Study Course

P/N 3100340 • Original • 09JULY01

DEVELOPED BY

Edwards Systems Technology
6411 Parkland Drive
Sarasota, FL 34243
(941) 739–4203

CREDITS

This course was developed and written by the EST Technical Institute in conjunction with the Documentation Department, Sarasota.

DOCUMENT HISTORY

Date	Revision	Reason for change
09JULY01	1.0	Initial release

Content

Important information

Limitation of liability

This product has been designed to meet the requirements of NFPA Standard 72, 1993 Edition; Underwriters Laboratories, Inc., Standard 864, 7th Edition; and Underwriters Laboratories of Canada, Inc., Standard ULC S527. Installation in accordance with this manual, applicable codes, and the instructions of the Authority Having Jurisdiction is mandatory. EST shall not under any circumstances be liable for any incidental or consequential damages arising from loss of property or other damages or losses owing to the failure of EST products beyond the cost of repair or replacement of any defective products. EST reserves the right to make product improvements and change product specifications at any time.

While every precaution was taken during the preparation of this manual to ensure the accuracy of its contents, EST assumes no responsibility for errors or omissions. Features described in this manual are subject to change without notice.

FCC warning

This equipment can generate and radiate radio frequency energy. If this equipment is not installed in accordance with this manual, it may cause interference to radio communications. This equipment has been tested and found to comply within the limits for Class A computing devices pursuant to Subpart B of Part 15 of the FCC Rules. These rules are designed to provide reasonable protection against such interference when this equipment is operated in a commercial environment. Operation of this equipment is likely to cause interference, in which case the user at his own expense, will be required to take whatever measures may be required to correct the interference.

EST3 Self-Study Course introduction

Welcome to Edwards Systems Technology's *EST3 Synergy Enabled® 3-MODCOM Self-Study Course.* This course is designed to train you, the technician, in component identification, function, installation and programming practices for the 3-MODCOM and 3-MODCOMP. The materials for this course include:

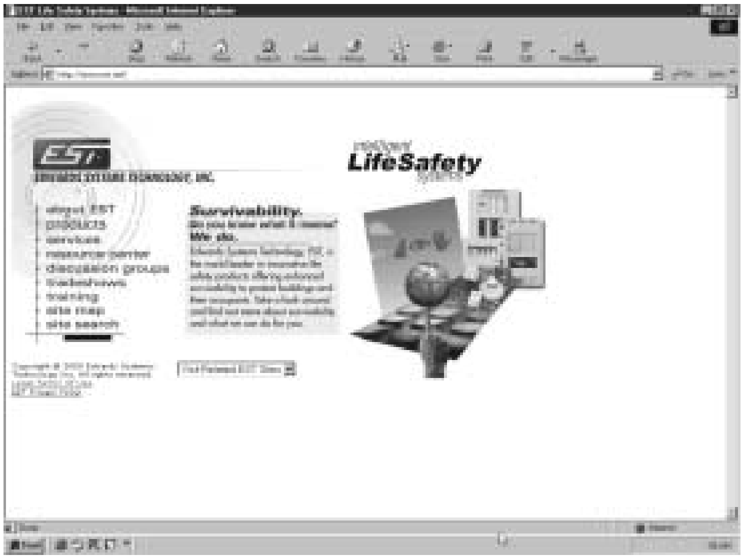
- *EST3 Self-Study Course Manual (p/n3100340)*
- *EST3 Installation and Service Manual,* P/N 270380, Rev 4.0 or later.

This self-study course is also designed to facilitate your use of the EST3 technical reference manuals and the SDU HELP Utility. While taking this course, keep the manuals close by, as you will be referred to them on frequent occasions. You will also need to update your 3-SDU to version 3.0 or greater. You will be required to create a practice project during this lesson.

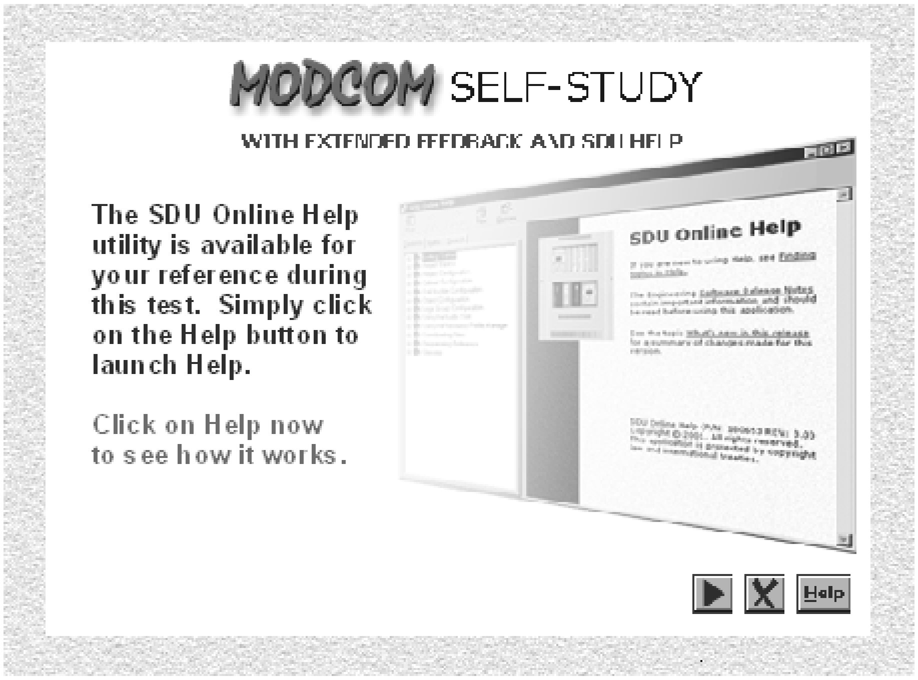
The course consists of four modules covering the 3-MODCOM components and their installation, its configuration, developing message protocols, and programming the MODCOM as a dialer for General Fire Alarm applications. The modules were designed for use in a logical progression. Accordingly, study them in the order in which they are presented.

To answer any questions or concerns encountered while studying these modules, you can contact a course instructor at the EST Training Department.

Upon completion of this entire self-study course take the online module examination at our WEB Site.



Simply go to **www.EST.net**, select **Training**, **sign-in**, select **online training**, select **Self-Study Testing** and select **3-MODCOM Self-Study Test (P/N 3100329).**



MODCOM SELF-STUDY

WITH EXTENDED FEEDBACK AND SDU HELP

The SDU Online Help utility is available for your reference during this test. Simply click on the Help button to launch Help.

Click on Help now to see how it works.

During this test the SDU Online Help is available for your reference while you are taking the test. Simply click on the help button to launch Help at any time.

An average grade of 85 for this online test is required for successful completion. Upon satisfactory completion, you are qualified to purchase the 3-MODCOM and 3-MODCOMP Modem Communicator module and to develop applications using these products.

The scope of this self-study is for Fire Alarm system only applications of these products. Using the MODCOM products in more sophisticated integrated fire, security and access control applications is covered in the factory based EST3 Synergy Enabled® Certification Course. Checkout the quarterly training schedule on our Web Site for the available of this course.

Mail any correspondence to:

Edwards Systems Technology
Training Department
6411 Parkland Drive
Sarasota, FL 34243

Our FAX number is: (941) 755-7387

To talk to an instructor, please call (941) 739-4304.

Caution: Use caution when using this course material as a reference manual after completing the course. Changes and additions to EST3 will continue for the life of the product. These will be added to the EST3 technical reference manuals in periodic revisions. Your course material will **NOT** receive these revisions. **The Installation Sheets received with hardware will contain the most current information.**

Course Prerequisites:

- You must be EST3 certified and have the 3-SDU, version 3.0 or greater installed on your PC.
- You should have a basic understanding Fire Alarm dialer applications.

Module 1

3-MODCOM Product Description

Summary

This self-study module introduces you to the Integrated EST3 System's 3-MODCOM and 3-MODCOMP Modem Communicator modules and provides a general description of their features, requirements, installation and applications.

Content

Introduction to module 1

The 3-MODCOM and 3-MODCOMP Modem Communicators incorporate modem and dialer functions into the integrated EST3 system architecture. These EST3 modules are Local Rail Modules (LRMs) that employ the snap-fit technology used for the other EST3 LRMs. These MODCOM LRMs easily install on the chassis rail slots in the EST3 cabinet enclosures.

The 3-SDU, version 3.0 or greater enables you to develop fully integrated Fire, Security and Access Control system applications. The integrated EST3 system architecture employs the MODCOM LRMs as:

- A modem to download and maintain Access Control and Keypad Display data into the integrated EST3 system.
- A dialer to report Fire, Security and Access Control premises events to a Central Station monitoring service and/or pager.

This self-study module is the 3-MODCOM and 3-MODCOMP product description, which describes the features and capabilities of both MODCOM types. This module also describes MODCOM operation, describes MODCOM installation considerations, and introduces you to the basic MODCOM configuration and programming process required to incorporate the MODCOM into an integrated EST3 system environment.

This self-study course is designed for those who are EST3 certified for fire alarm systems. Successful completion of this MODCOM self-study course results in certification, which enables you to purchase the MODCOM products and incorporate them into your EST3 applications using the 3-SDU version 3.0 or greater.

The 3-MODCOM and 3-MODCOMP products are also taught as part of a factory course on EST3 ***Synergy Enabled***® Access Control and Security products. You can find a description of this factory course on our web site (www.EST.net) *as EST3 Synergy Enabled® Certification Course* (P/N 3100330).. If you intend to use these integrated Access Control and Security products you need to attend this factory course to gain certification.

Associated study

Prior to starting this course you should update your SDU to version 3.0. This will make the SDU's onboard **Help Utility** available to you as a training aid. Prior to starting this course go to the Help Utility, select the Search tab, search on MODCOM and review the related MODCOM help files. Remember that you can print out the file for review if you desire a paper copy.

Use the following technical reference manuals as associated study material for this module:

- *EST3 Installation and Service Manual,* P/N 270380, Rev 4.0 or later)
- *EST3 System Operations Manual,* (P/N 270382, Rev 4.0 or later)
- *Modem Communicator 3-MODCOM/3-MODCOMP Installation Sheet,* (P/N 387476)

Copies of these manuals and the 3-SDU's Help Utility are also available on *the Fire Alarm Support Tools, Online Support System* CD (P/N 270395, Rev 5.0 or later).

This Online Support System CD and its onboard Help Utility are useful tools. The minimum system requirements for your PC or laptop are:

- *IBM compatible Pentium computer*
- *SVGA monitor (800 x 600 pixel at 256 color)*
- *Windows 95 or greater*
- *2X CD-ROM drive*
- *Current version of Acrobat Reader, which is available on this CD.*

This CD also contains all the product installation sheets available as of its date of publication. It would be impossible for EST to maintain these installation sheets at their current revisions on the CD or in the published manuals. The CD and manuals are updated only when major changes to the system are made. The actual installation sheets, shipped with the product components, reflect the current revision levels. It would be good practice to maintain a current set of these installation sheets on site and/or at your office.

It may also be helpful to develop a practice project in the 3-SDU during this self-study course. This will enable you to refine your skills at developing MODCOM applications and become familiar with the SDU tools.

Key items

Key points to look for:

- 3-MODCOM/3-MODCOMP modem function.
- 3-MODCOM/3-MODCOMP dialer function.
- Downloading EST3 application data.
- Premise event reporting to a monitoring service.
- Any Ring, Normal Ring, Long-Long Distinct Ring, Short-Short-Long Distinct Ring, Short-Long-Short Distinct Ring detection and answering modes.
- Required RJ-31X and RJ-38X telephone jacks.
- One/Two loop start line or public switched telephone line compatibility.
- Bell 103 and V.32 compliant 14.4 K-baud modem.
- 1-Line Dialer, 2-Line Dialer, Modem, 1-Line Dialer with Modem and 2-Line Dialer with Modem MODCOM applications are supported.
- Contact ID, SIA DCS, SIA P2 and SIA P3 Central Station Communication Protocols are supported.
- TAP Pager Protocol is supported in 3-MODCOMP.
- General, Zoned and Point ID Central Station event reporting is supported.
- Called Party Disconnect service requirement to prevent jamming from incoming calls.
- Preset default NFPA 72 Certified Fire Alarm and Burglary System compliance operation.

Key terms and components to learn:

- Receivers
- Accounts
- Command List
- Command Qualifiers
- Activation Event
- Activate Command
- Restore Command
- Send Command
- Command Qualifiers
- Substitution Strings
- Hexadecimal Indexing

Objectives

Upon completion of this module you will be able to:

1. Identify the 3-MODCOM and 3-MODCOMP modules.
2. Determine the various MODCOM, telephone line and Central Station requirements for your application.
3. Describe the basic transmission/communication process for the MODCOM dialer.
4. Describe NFPA 72 compliance requirements for MODCOM applications.
5. Describe the purpose of configured MODCOM receivers and accounts.
6. Describe the basic programming function of a command list, send command, command qualifier, numerical indexing, hexadecimal indexing and substitution strings.
7. Physically install the 3-MODCOM and 3-MODCOMP into an EST3 cabinet enclosure.

3-MODCOM/3-MODCOMP Overview

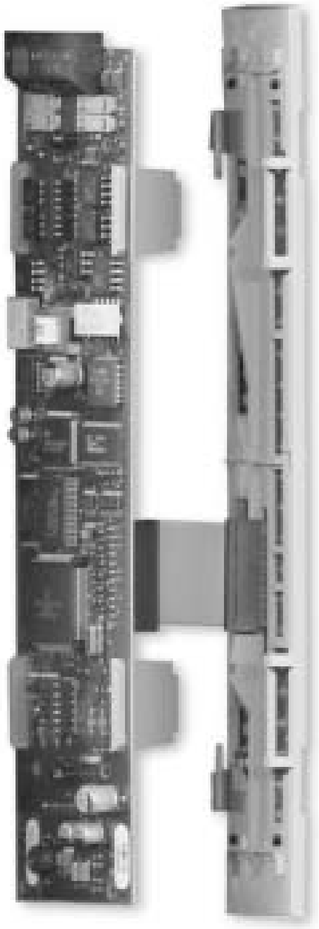


Figure 1-1: A 3-MODCOM Modem Communicator LRM with Control/LED Display module.

The 3-MODCOM and 3-MODCOMP Modem Communicators are Digital Alarm Communicator/Modem modules which incorporate modem and dialer functions into the EST3 system architecture. These modules are optional EST3 Local Rail Modules, which easily install into an expansion slot in an EST3 cabinet enclosure.

The 3-MODCOM Modem Communicator integrates onboard modem and dialer capabilities into the EST3 system environment. As a modem, the 3-MODCOM enables the downloading of information (such as, access control and keypad display applications data) into the EST3 system from a remote site (e.g. from an end-user’s PC).

As a dialer, the 3-MODCOM sends alarm, supervisory and trouble information to a remote site (e.g. Central Station) using one or two phone lines. This information can be reported in a dual or split format.

Note: The 3-MODCOM dialer is used for event reporting to a monitoring station called a Central Monitoring Station (CMS). During this self-study course we will use the term Central Station, CMS or Central Monitoring Station interchangeably. Where Central Monitoring Station is the formal terminology and Central Station is conversationally more popular.

The 3-MODCOMP Modem Communicator provides the same modem/dialer functions as the 3-MODCOM with the addition of also sending information to individually predefined pagers.

Both the 3-MODCOM and 3-MODCOMP are standard type, single-slot LRMs, which support mounting any of the four EST3 Control/LED display modules as shown in Figure 1-1.

These MODCOMs are shipped with two 7 foot, 8-position flat telephone cables with an 8-position modular plug on both ends (P/N 3601377). Line supervision is configurable for both MODCOM phone lines, where line supervision may be enabled or disabled for each phone line.

One end of each cable plugs directly into the two jacks at the top of the MODCOM (shown in Figure 1-2 and Figure 1-3). The other end of each cable plugs directly into a corresponding RJ31X or RJ38X telephone jack, which is obtained locally and wired to a switched telephone network. In Canada use CA31A or CA38A telephone jacks.

CAUTION: Failure to use an RJ31X or RJ38X jack violates FCC and NFPA regulations. A telephone connected directly to an incoming phone line can cause TELCO trouble and can possibly prevent the dialer from connecting to the Central Station during an emergency.

These jacks must be installed within 5 feet of the cabinet that houses the MODCOM. Note that each MODCOM phone line has an LED to annunciate line ringing and data exchange.

Both MODCOM modules are compatible with one/two loop start line on public switched telephone network, with pulse or touch-tone (DTMF) dialing. Both MODCOM modules have an onboard Bell 103 and V.32 bis compliant, 14.4K-baud modem.

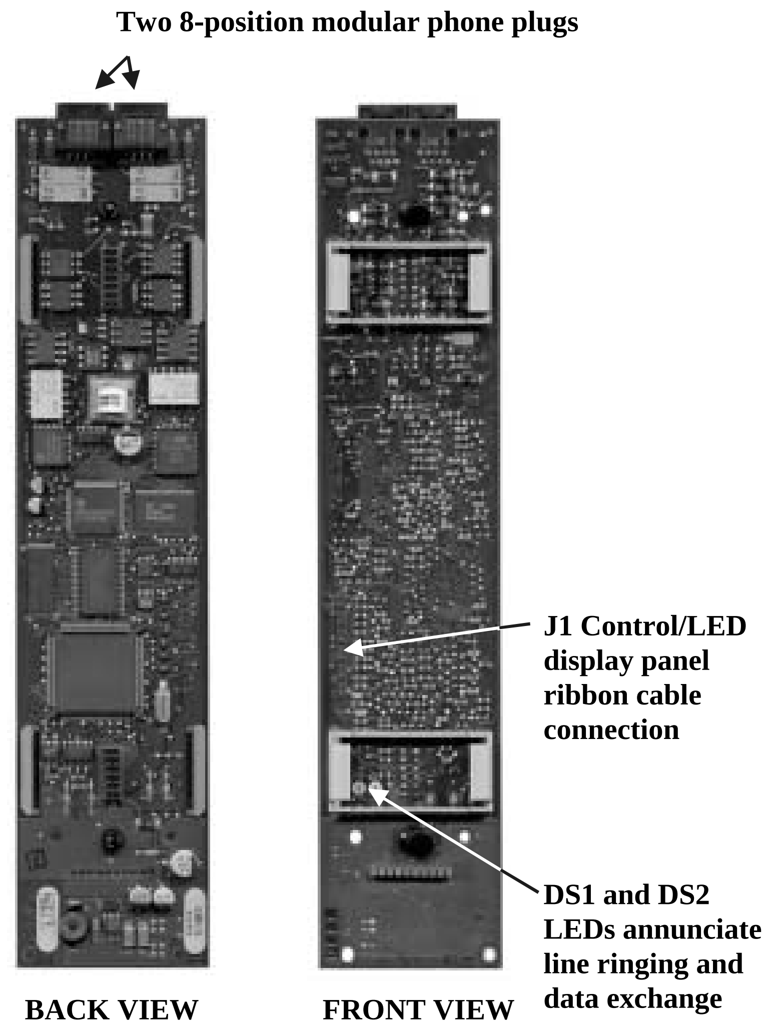
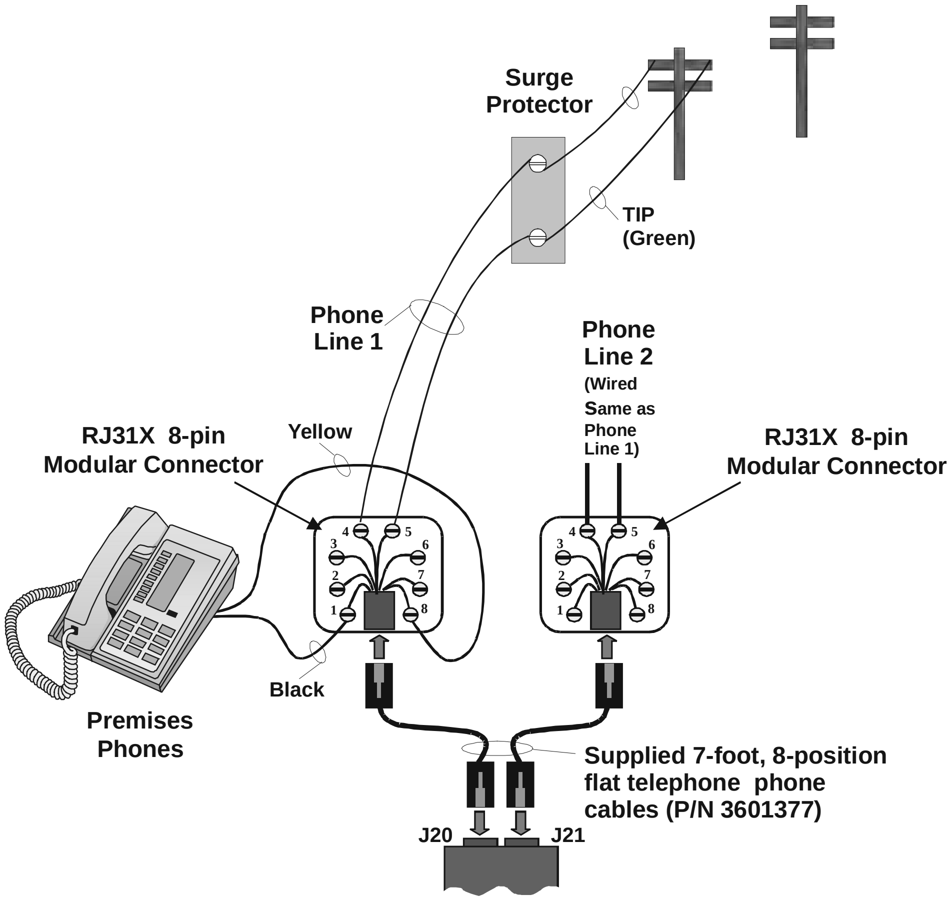

Two 8-position modular phone plugs
J1 Control/LED display panel ribbon cable connection
DS1 and DS2 LEDs annunciate line ringing and data exchange
BACK VIEW
FRONT VIEW

Figure 1-2: A 3-MODCOM Modem Communicator LRM front and back views.

These MODCOM modules can be configured to detect and answer:

- Any Ring.
- Normal Ring.
- Long-Long Distinct Ring.
- Short-Long-Short Distinct Ring.
- Short-Short Long Distinct Ring.

Only MODCOM phone line 1 (J 20) contains a ring detection circuit and can be used to receive incoming calls.


Surge Protector
TIP (Green)
Phone Line 1
Phone Line 2 (Wired Same as Phone Line 1)
RJ31X 8-pin Modular Connector
Yellow
RJ31X 8-pin Modular Connector
Black
Premises Phones
Supplied 7-foot, 8-position flat telephone phone cables (P/N 3601377)
J20
J21

J20 and J21 positions are based on viewing the MODCOM module from the front

Figure 1-3: Typical MODCOM interconnection using RJ31X connectors.

These MODCOM modules are not plug-and-play. They are easily configurable and programmable to meet a variety of modem and dialer applications. You can configure and program either MODCOM for the following applications:

- 1-Line Dialer.
- 2-Line Dialer.
- Modem.
- Modem with 1-Line Dialer.
- Modem with 2-Line Dialer.

Both MODCOM types support the following transmission protocols:

Contact ID, which consists of numeric codes with several optional parameters, such as:

[EventCode][Partition][DeviceNumber][User]

SIA DCS, which consists of ASCII Text codes with several optional parameters, such as:

[Date][Time][UserID][AlarmCode][Device][User][Partition]

SIA P2 (20 pulses/round 3/1), which consists of numeric codes of four digits, containing a 1-digit alarm code:

[AlarmCode]

SIA P3 (4/2 double round), which consists of 2-digit numeric event codes:

[EventCode]

The 3-MODCOMP also supports Telelocator Alphanumeric Protocol (TAP) for pager applications. TAP consists of two fields of up to 59 characters separated by a carriage return (CR):

[UserID] CR [ASCCI Text Message]

where the message is generally the event type and device location within the protected facility.

Note: In all cases, the Account Code would be part of the transmission to the Central Station or Pager Service.

In addition to its role as a dialer performing status transmissions to a Central Station, the dialer provides a modem, which can receive application data from remote PCs. This mode enables you to download keypad display and access control application data into the integrated EST3 system. The MODCOM receives data from the remote source over the phone lines and transfers it to the 3-CPU1. The 3-CPU1 then distributes the appropriate data to the Card Reader Controller and Keypad Display modules via the 3-SAC module and SAC bus of the cabinet you are connected to and over the EST3 Network Data Riser to other nodes with 3-CPU1 and 3-SAC module configurations.

Figure 1-4 shows a 3-MODCOM functional block diagram when installed into an EST3 system. This drawing may aid in your understanding of the MODCOM operating capabilities.

The MODCOM microprocessor handles all handshaking and data transfers over the rail to and from the 3-CPU1. This microprocessor contains static and flash RAM and provides the platform for the MODCOM microcode and database applications software.

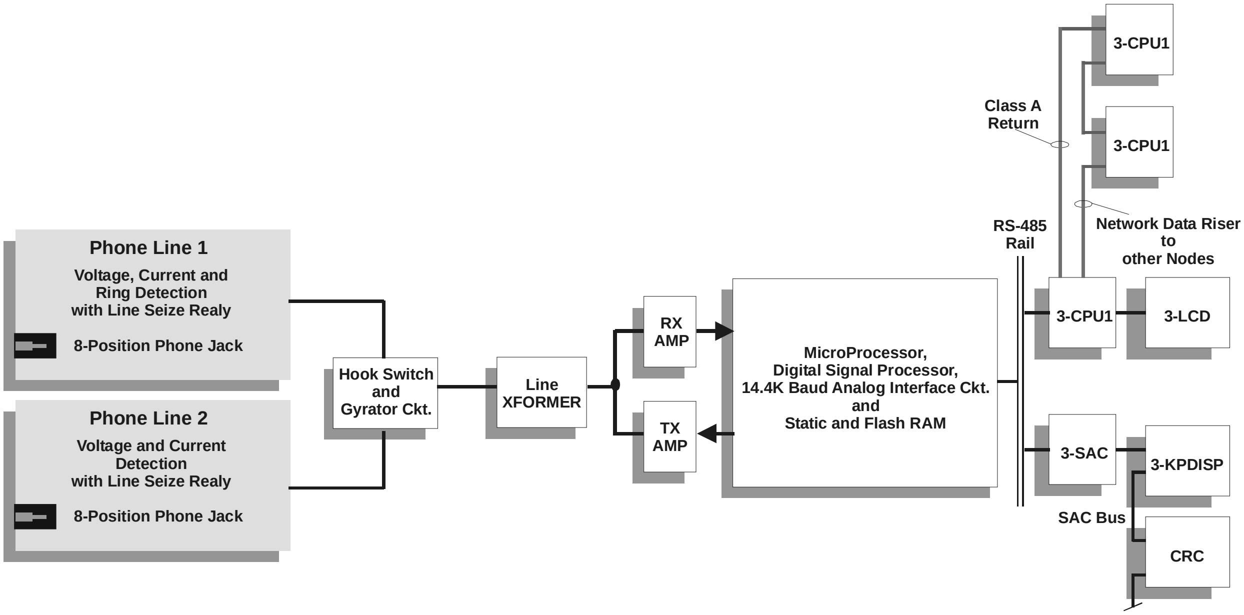

3-CPU1
3-CPU1
Class A Return
Network Data Riser to other Nodes
RS-485 Rail
Phone Line 1
Voltage, Current and Ring Detection with Line Seize Realy
8-Position Phone Jack
Phone Line 2
Voltage and Current Detection with Line Seize Realy
8-Position Phone Jack
Hook Switch and Gyrator Ckt.
Line XFORMER
RX AMP
TX AMP
MicroProcessor, Digital Signal Processor, 14.4K Baud Analog Interface Ckt. and Static and Flash RAM
3-CPU1
3-LCD
3-SAC
3-KPDISP
SAC Bus
CRC

Figure 1-4: 3-MODCOM Functional Block Diagram.

The analog Interface circuit enables transmit and receive operations at 14.4K baud.

The Digital Signal Processor logic handles or manages the MODCOM telecommunication functions. This logic controls the receiver and transmitter amps, switches between the phone lines, detects incoming calls on Phone Line 1 and establishes the protocol and parameters for MODCOM operations.

The 3-MODCOM is programmable and can support up to 255 premise accounts communicating with up to 80 receivers (Central Stations) in any of the four protocols. In addition to these four protocols the 3-MODCOMP can communicate with pagers via the TAP protocol.

Each of the MODCOM phone line circuits contains a line seize relay which cuts off any ongoing call and disconnects the line from any telephone. Each phone line circuit contains a **< 10V** voltage detection circuit to determine loss of the phone line during on-hook periods. Each phone line circuit also contains a **<10 mA** current detection circuit to determine loss of the phone line during off-hook periods.

Note: Only Phone Line 1 (J20) has a ring detection circuit to detect incoming calls, which initiate a connection.

Up to 10 MODCOM modules can be installed within a networked EST3 system. These can be in a single node or distributed throughout the network nodes. Multiple MODCOMs are used to provide redundant communications with the Central Station, as a backup for critical communications links and/or to provide dedicated security transmission hardware.

When using multiple MODCOMs for redundant communications both are configured and programmed to transmit the same messages to different receivers at a Central Station or to different receivers at different Central Station locations.

MODCOM modules can be configured and programmed to backup one another. In this way, Central Station or paging (TAP) communications is guaranteed. Using backup configured MODCOM modules enables you to create a **dynamic failover** operation. This means that when a communication failure or trouble occurs on one of the MODCOMs, the EST3 system switches from accounts on the MODCOM in trouble to matching accounts on its backup MODCOM.

A dedicated Central Station dialer MODCOM can be configured and programmed in multiple tenant integrated system applications where there may be a high volume of Access Control and Keypad Display modem traffic. In this case, the first MODCOM may be used for this modem communications (Access Control and Keypad Display Data) and the second may be used for Central Station dialer communications.

Configuring the MODCOM

You use the 3-SDU System Definition Utility to create the required configuration parameters, properties and data for the specific application where the MODCOM is to be used. After the MODCOM configured database is completed in the 3-SDU, you convert it to a binary file and download it into the appropriate MODCOM.

CAUTION: The 3-MODCOM and 3-MODCOMP modules are configured and programmed using EST3 3-SDU version 3.0 or higher. Do not attempt to use these modules with earlier versions of the SDU or with non-compatible 3-CPU1 microcode.

Once configured, the MODCOM database application is stored in the 3-MODCOM and 3-MODCOMP nonvolatile memory. This database determines the operational parameters for your application's 3-MODCOM or 3-MODCOMP. Such as, phone line properties, receiver attributes, and account parameters. This database includes transmission details, such as telephone numbers and dialing options.

In fully integrated applications supporting fire, security and access control some security and access control data is downloaded to and stored onboard the MODCOM.

As previously stated, the 3-MODCOM and 3-MODCOMP can be configured as a 1-line dialer, 2-line dialer, modem only, modem and 1-line dialer, or modem and 2-line dialer.

WARNING: For UL listed fire and FM approved installations, the MODCOM must be configured as a 2-line dialer, where both lines have line cut detection supervision.

The 3-MODCOM and 3-MODCOMP operate in accordance with the configuration database and rules program downloaded into the networked system's 3-CPU1's. Telephone numbers, dialing details, activation of the dialer test signal, and other MODCOM parameters are configured data which must be downloaded into the MODCOM for proper operation for your specific application.

In order for the MODCOM to electronically dial the Central Station, specific dialer parameters must also be configured in the 3-SDU. These include whether you are using pulse or tone dialing, the Central Station telephone number(s), and periodic test transmission parameters required for fire alarm installations.

After the configuration process is complete, the SDU provides you with a report of all Central Station codes on an account basis that can be transmitted from the MODCOMP. This report should be given to the appropriate Central Station.

MODCOM Dialer Transmission Process

The multiple MODCOM, multiple phone line and multiple telephone features of the 3-MODCOM and 3-MODCOMP provide a high level of transmission integrity. The MODCOM is designed to ensure that the call to the Central Station gets through.

Figure 1-5 shows a flow diagram of the Dialer Transmission Process. The sequence for MODCOM to Central Station communications follows:

1. When an event occurs within the EST3 system that is to be reported to the Central Station, the MODCOM seizes one of the predetermined telephone lines.
2. The MODCOM puts the seized line on-hook for three seconds to cut off any ongoing call and to disconnect the line from any telephone or dialing device that may be connected down-line.

Note: The MODCOM makes two attempts to select an unused line before seizing a line already in use.

3. The MODCOM takes the seized line off-hook and waits for a dial tone. If a dial tone is not detected within a predetermined time established during configuration, the MODCOM puts the line on-hook, increments an attempt counter and continues to alternate lines and preconfigured phone numbers until a dial tone is detected.

For example, if the MODCOM has been configured with two telephone numbers and only one telephone line, it makes four attempts to connect using the first number then four attempts using the second number. This alternation between these two telephone numbers continues until a connection is made or preconfigured maximum number of attempts has been achieved.

Note: The DS1 and DS2 LEDs light steady during the off-hook periods when data is not being transferred.

4. After achieving a connection (dial tone detection), the MODCOM dials the Central Station using the preprogrammed and preconfigured dialing mode and telephone number.
5. The MODCOM then waits 40 seconds for a handshaking message from the Central Station indicating that a connection with the Central Station has been achieved.

6. If handshaking is not received within the 40-second period, the MODCOM puts the line on-hook, waits for a preconfigured period of time and then repeats steps 3 through 5. If handshaking is detected the MODCOM proceeds to step 9.
7. If the MODCOM is still unable to contact the Central Station receiver within a second 40-second period it seizes the other telephone line and makes two attempts to detect handshaking on it.
8. If the MODCOM is still unable to contact a Central Station receiver, it reseizes the first telephone line and repeats the two attempts to reach the Central Station receiver using a preconfigured secondary telephone number. If handshaking is detected the MODCOM proceeds to step 9.

Note: If the MODCOM is still unable to contact the Central Station receivers, it repeats steps 6 through 8, alternating telephone lines and numbers until a preconfigured number of attempts is achieved. On detecting the maximum number of attempts the MODCOM sends a trouble message to the EST3 system's 3-CPU1.

Note: The MODCOM retries the full number of attempts if another event occurs or one attempt for the existing event if the preconfigured **Wait Time On-Hook Between Attempts To Same Number** period expires.

9. When a connection is completed, ringing is detected by the Central Stations dialer receiver, which goes off-hook and transmits the required handshaking.
10. If the handshaking received by the MODCOM matches the preconfigured format, the MODCOM transmits all premises event data in the predetermined format (Contact ID, SIA, 4/2 or 3/1).

Note: The DS1 and DS2 LEDs flash rapidly during data transmissions.

11. The MODCOM then waits for acknowledgement and shut down signal handshaking (called a KISSOFF) from the Central Station receiver. On receiving this KISSOFF handshaking the MODCOM puts the telephone line on-hook, ending the call.

Note: The DS1 and DS2 LEDs extinguish.

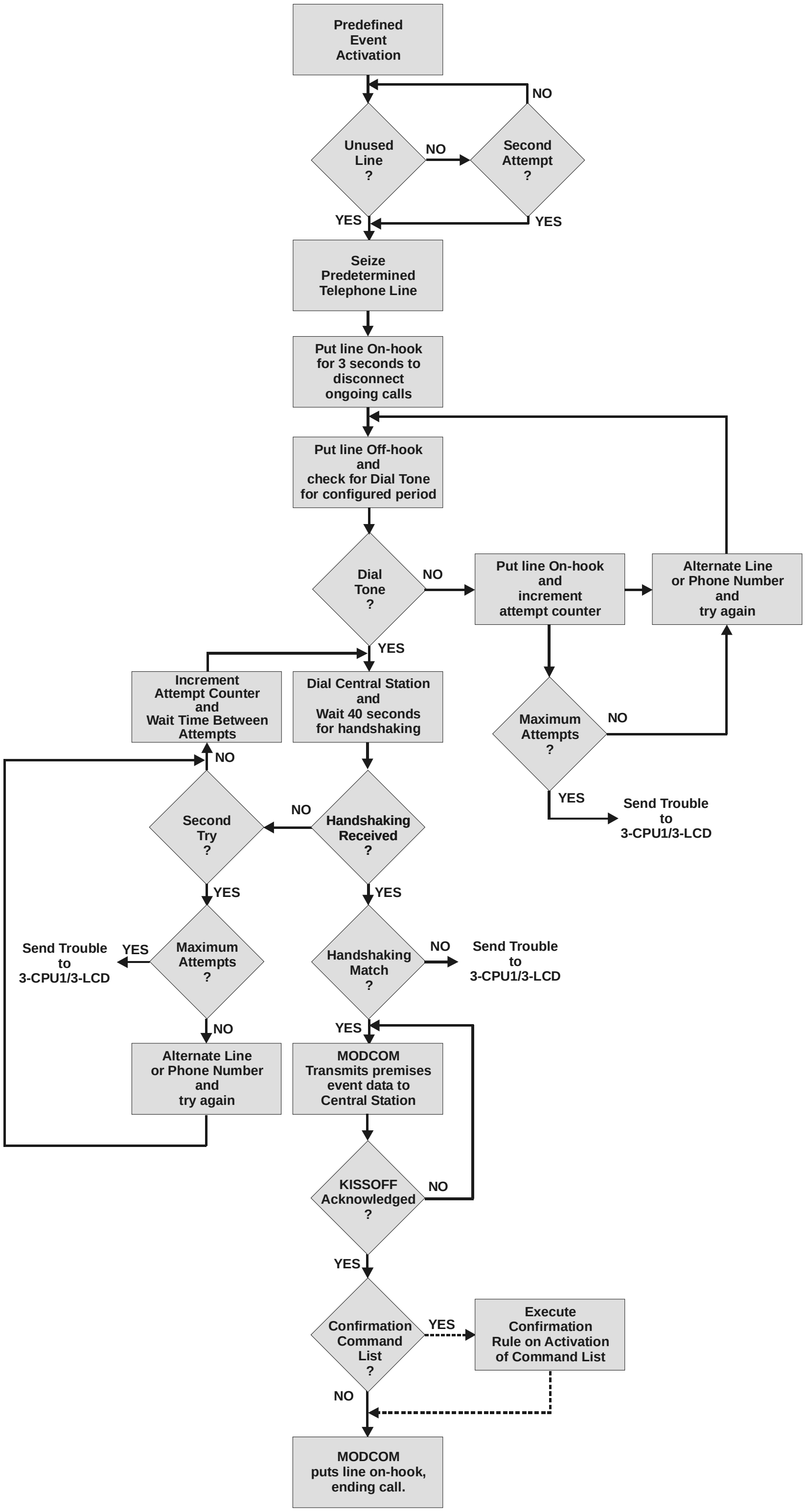

Predefined Event Activation
NO
Unused Line ?
NO
Second Attempt ?
YES
YES
Seize Predetermined Telephone Line
Put line On-hook for 3 seconds to disconnect ongoing calls
Put line Off-hook and check for Dial Tone for configured period
Dial Tone ?
NO
Put line On-hook and increment attempt counter
Alternate Line or Phone Number and try again
YES
Increment Attempt Counter and Wait Time Between Attempts
Dial Central Station and Wait 40 seconds for handshaking
Maximum Attempts ?
NO
YES
Send Trouble to 3-CPU1/3-LCD
NO
NO
Second Try ?
Handshaking Received ?
YES
YES
Send Trouble to 3-CPU1/3-LCD
YES
Maximum Attempts ?
Handshaking Match ?
NO
Send Trouble to 3-CPU1/3-LCD
NO
YES
Alternate Line or Phone Number and try again
MODCOM Transmits premises event data to Central Station
KISSOFF Acknowledged ?
NO
YES
Confirmation Command List ?
YES
Execute Confirmation Rule on Activation of Command List
NO
MODCOM puts line on-hook, ending call.

Figure 1-5: 3-MODCOM Transmission Process Flow Diagram.

12. In the more sophisticated Access Control and Security integrated applications it is sometimes desired to initiate premise notification (security alarm) after the Central Station has confirmed receipt of the event. In this way, the Central Station can respond to the event before possible warning the intruder. In this case, you would have configured a Command List object for this KISSOFF confirmation. You would then write a rule where this Confirmation Command List would activate on receipt of KISSOFF (dotted lines). This Confirmation Command List's activation would then execute the rule for premise notification.

Advanced Access Control and Security applications are beyond the scope of this self-study course and are covered in the EST3 Synergy Enabled® Certification course. For this lesson which is for fire only applications, on receiving this KISSOFF handshaking, the MODCOM puts the telephone line on-hook, ending the call.

Programming the MODCOM

As previously stated, the 3-MODCOM and 3-MODCOMP modules are very flexible dialer/modem modules used to support a wide variety of applications. These modules are not plug-and-play and require some level of preconfiguration and programming to support your specific modem/dialer requirements. Before attempting to configure and program the MODCOM you should communicate with the Central Station to gather the required parameters and protocol requirements before you begin using the 3-SDU.

In the case of dialer applications, you need to identify the level of event reporting for your application. For this self-study course we will discuss three levels of event reporting to a Central Station.

The first is **GENERAL** reporting which is basic and the simplest event reporting method. In this case, event reporting is normally limited to fire-only applications and the following events are reported:

1. General alarm activation and restoration.
2. General supervisory activation and restoration.
3. General trouble activation and restoration.

Note: Phone line troubles, AC power failure troubles, etc. are reported as a general troubles to the Central Station. If more detailed trouble event reporting is desired you will need to use **ZONE** or **POINT** reporting techniques. When the AC Power Delay is configured, an AC Power Failure event will report after the preset delay, but only as a general trouble.

4. Low Battery or Dead Battery Trouble (pseudo point BATT_TRBL_CC_SS) activation and restoration.

   Where CC is the cabinet address and SS is the monitor module slot location.

5. Communication Trouble activation and restoration.

Note: This Communication trouble is not a MODCOM pseudo point listed in the SDU objects. Comm Trouble reporting is built into the MODCOM microcode software and all you need to do is create the coded event message to be sent.

In security applications to report Security Perimeter, Security Interior, and Holdup alarms you will need to use **ZONE** or **POINT** reporting techniques.

In general reporting you simply report the event code to the Central Station and are not required to report **ZONE** or **POINT** events. What is important here is to resolve MODCOM operating parameters and Central Station receiver, account, telephone line/number, and communications protocol issues before the configuration and programming process begins.

The second method is **ZONE** reporting. In this case, the premises reporting to the Central Station is subdivided into zones or areas. You are required to support event reporting similar to that described for general, but this time on a zone-by-zone or area-by-area basis. Now when you report the event code to the Central Station you would send the event code and a zone or area identifier (location) code.

The third method is **POINT** reporting. This method requires that enhanced communication protocols be used. In this case, the MODCOM must report the event status and identity of every device or point within the premises. This method is called point reporting because every point within the system that goes into fire Alarm, security Alarm, trouble or supervisory activation and the restoration of each can be reported to the Central Station. This reporting would be in the order of occurrence and priority. Now when you report the event code to the Central Station you would also send a system point identification code.

Note: The more sophisticated ZONE and POINT event reporting methods are beyond the scope of this self-study course. These methods are presented in *the EST3 Synergy Enabled*® *Certification Course*.

In any of the three methods of event reporting the MODCOM must be configured to support the required operation and rules must be written to report event activation and restoration to the Central Station.

You will also need to specify Central Station receivers, accounts and telephone numbers prior to programming your application.

A Central Station **receiver** is the logical destination at the Central Station to which the MODCOM must connect and subsequently transmit event status messages to. A Central Station may have many receivers in operation, each capable of receiving many calls. The Central Station will determine which receiver and telephone number you use for each account.

During the configuration process you will need to:

- Label each receiver specified.
- Create a description of each receiver's purpose.

Note: For Central Station purposes, the telephone number used to gain access to a specified receiver basically identifies the receiver. It may be critical to your application to enter relevant Central Station information for the receiver being configured in this description field for your reference.

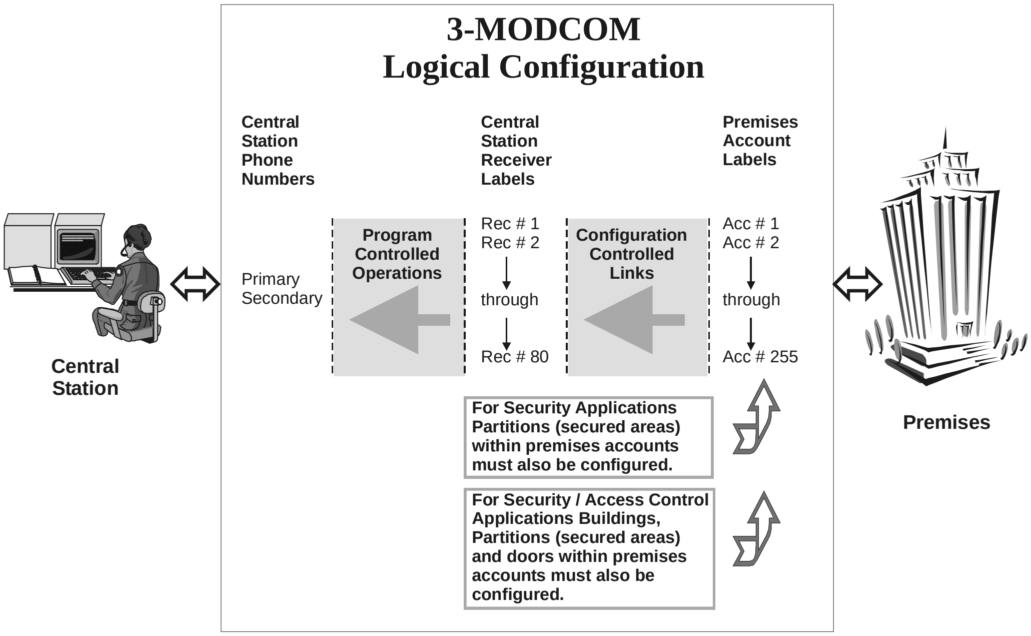
- Configure telephone line properties.
- Enter your dial-in telephone number.
- Enter the auto-answer ring cycle count.
- Enter the wait time to detect dial tone.
- Enter the wait time for calling party disconnect.
- Enter the wait time for line cut monitor sensing.
- Enter the primary and secondary Central Station receiver telephone numbers.
- Identify the protocol used for event reporting.
- Enter the maximum number of dial attempts.
- Enter the on-hook wait time between dial attempts.

An **account** within the MODCOM links the end user to a specific Central Station receiver, identifying the user site sending the event code and the Central Station to which the message is being sent. Each event message sent by the MODCOM includes an account number. During the configuration process you will need to:

- Label each account specified.
- Create a description of each account.
- Specify by label the Central Station where this account is to be used.
- Enter the Central Station account number.
- Enter the dial test interval and/or time of day.

Note: Several accounts may share the same Central Station receiver.

As you can see from Figure 1-6, there are many MODCOM operational and object parameters that must be configured for the Central Station, MODCOM and premise operation. As previously stated it is critical to identify and specify your project parameters prior to the configuration and programming process. Remember that an ounce of planning is worth a pound of rework.



For Security Applications Partitions (secured areas) within premises accounts must also be configured.

For Security / Access Control Applications Buildings, Partitions (secured areas) and doors within premises accounts must also be configured.

Figure 1-6: 3-MODCOM Logical Configuration.

This description is simply an overview of the aspects of configuring and programming the MODCOM. Detailed applications related methods are described in latter modules of this self-study.

As a new MODCOM user it is important that you understand the onboard **HELP Utility** in your 3-SDU, version 3.0 or greater. This is a valuable, labor saving tool when used dynamically during your project development process. This **HELP Utility** not only provides definitions of MODCOM features and functions, it also provides sample rules, which may be copied into the ***rules editor*** for your application, and edited to meet your project requirements. This **HELP Utility** also contains template files of the various Central Station protocol codes used for Central Station event reporting.

Note: We recommend that you take a few minutes to tour the **HELP Utility** to become familiar with this valuable resource. The examples in this self-study will teach you to use SDU’s help during the MODCOM configuration and programming process.

To better understand developing applications which employ the MODCOM and applications which integrate Access Control and Security into the EST3 Life Safety System you need to understand the features and functions that have been added to version 3.0 of the 3-SDU. A description of what's new in the SDU follows.

The Command List

During MODCOM, Access Control and Security applications it may be desired to branch to a sub-routine when an event occurs.

For example, Figure 1-7 shows a flow diagram of a rule sequence on an event's activation. For the sake of this example, let's assume that the event was a security alarm. In our example, we are using a Central Station service and the first output action might be to report this security alarm to this service. The second output action might be to annunciate this security event at the security office on the premises. The third output action may send a message to a pager. The fourth output action may be to report to the Central Station when the security intrusion has been verified on the premises.

In our example, we also want to sound an on-premises security alarm for a period of 3 minutes. We will due this by activating a subroutine from the last output command of our primary rule, which turns on a security bell, delays for 180 seconds and turns the security bell off.

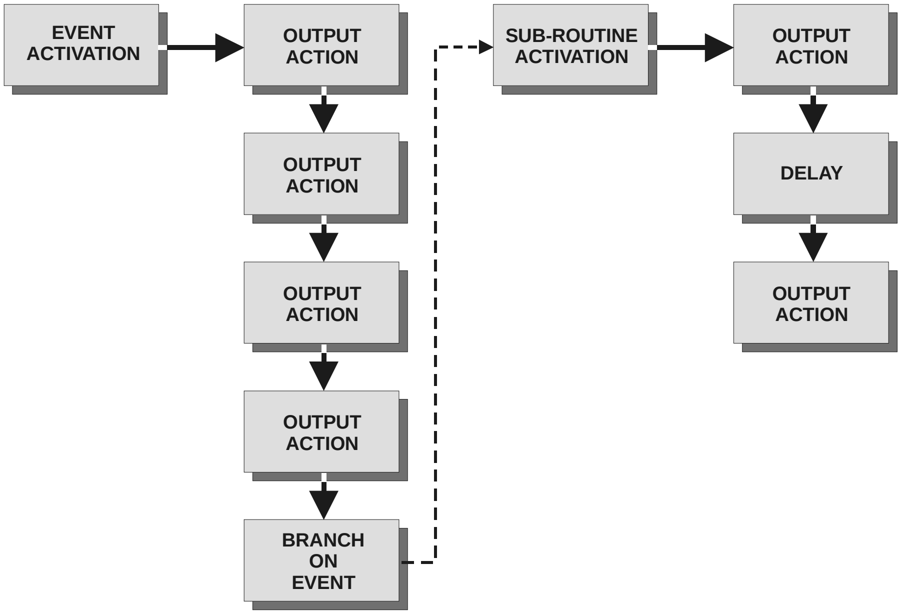
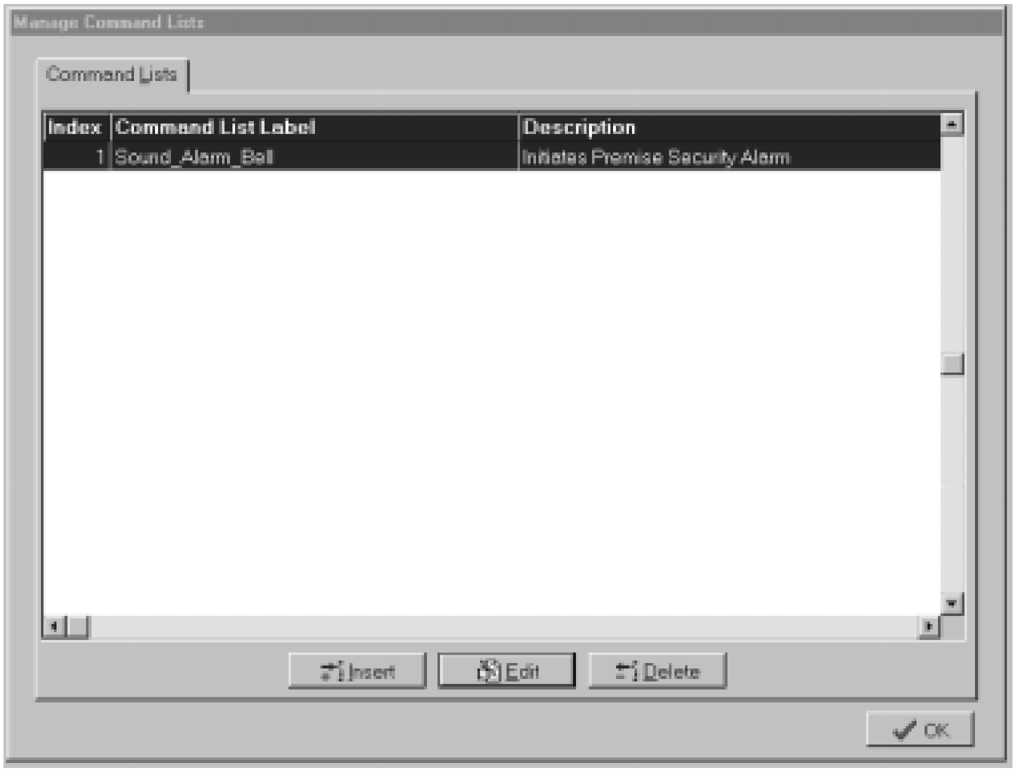


Figure 1-7: Example Security Alarm Sequence.

This rule subroutine is executed on activation of an object in the SDU database called a Command List. A Command List is an EST3 object you create during the configuration process. Each Command List object you create requires a unique label like any other SDU database object.

To configure a Command List object you would simply select **Configure** and **Command List** from the SDU main menu bar. This would display the **Manage Command Lists** dialog box shown in Figure 1-8. You then simply insert a Command List object, label it and create a meaningful description. For our example we will create a **sound security bell** command list object. This command list will then be used to activate the premise alarm bell on a security alarm.



Index	Command List Label	Description
1	Sound_Alarm_Bell	Initiates Premise Security Alarm

Figure 1-8: Manage Command Lists Dialog Box.

It may be simpler to think of Command List objects as events, which activate within the EST3 application but do not fit into other input device types or input event types. Such as, a Security Perimeter Alarm. In this case, the Security Perimeter Alarm is an event that is configured as a Command List device type with a unique label.

In this way, a command list, when activated, executes a subroutine rule, as a normal rule, on activation of the predefined system event. Where the input event type would be **ACTIVATION**, the device type would be **COMMANDLIST** and Command List label is what you've assigned during the configuration process.

Assuming that we are reporting on a general alarm basis to the Central Station and using Contact ID protocol, the rules for our Figure 1-7 example may look like:

[Security Alarm Sequence]

```
SECURITYALARM PARTITION ‘FLOOR1_WEST’:
        SEND ‘XYZAcct1234’ MSG “ActivateEventCode”,
        FAST ‘SecDesk_Flr1_Perimiter_LED’,
        SEND ‘PageCo’ MSG “UserID$(CR)$Message”,
        SEND ‘XYZAcct1234’ MSG “VerifyEventCode”,
        ACTIVATE ‘Sound_Alarm_Bell’;
```

[Sound Alarm Bell Sequence]

```
ACTIVATION ‘Sound_Alarm_Bell’:
        ON ‘Floor*_SecurityBell’,
        Delay 180,
        OFF ‘Floor*_SecurityBell’;
```

As you can see, the integration of MODCOM, Access Control and Security into EST3 applications has created new Input Events and Output Commands.

> **ACTIVATION** – An Input Event that lets you detect a predefined Command List activation.
>
> **ACTIVATE** – An Output Command that lets you activate a command list from a rule and subsequently execute a subroutine rule.
>
> **RESTORE –** An Output Command that lets you restore a command list from a rule.
>
> **SEND –** An output Command that lets you send a message (predefined code) to a Central Station through the MODCOM when an event occurs.

Command Lists are used in advanced Access Control and Security applications. As previously stated, these integrated system applications are beyond the scope of this self-study course and are covered in *the EST3 Synergy Enabled® Certification Course*.

The Command Qualifiers

On the surface the rules of the previous example look like they will do the trick. However on closer examination we see that this is not the case.

From your previous experience with writing rules you should understand the rules activate sequentially (top-down) and restore sequentially (bottom-up). With this knowledge it is easy to see that the primary rule reports to the Central Station on the rule activation and restoration, fast flashes the LED on activation and turns off the LED on restoration. The Command List also executes on the primary rules activation and restores during the primary rules restoration, sounding the security bells for a second 3-minute sequence.

In our example, we want to report the security alarm to the Central Station and Pager Service during the rule’s activation sequence, report the security intrusion verification during rule’s restoration sequence and sound the security alarm bells once only during rule’s activation sequence. To accomplish this new behavior for rules, command qualifiers have been added to the syntax of rules.

A command qualifier is simply a **+** or **–** added to the command of a rules output statement. A **+** causes the command to execute only on a rule’s activation. The **–** causes the command to execute only on a rule’s restoration. As shown below, by adding the appropriate command qualifiers to our example rules we can control when we want the commanded actions to occur.

[Security Alarm Sequence]

```
SECURITYALARM PARTITION ‘FLOOR1_WEST’:
        +SEND ‘XYZAcct1234’ MSG “ActivateEventCode”,
        FAST ‘SecDesk_Flr1_Perimiter_LED’,
        +SEND ‘PageCo’ MSG “UserID$(CR)$Message”,
        -SEND ‘XYZAcct1234’ MSG “VerifyEventCode”,
        +ACTIVATE ‘Sound_Alarm_Bell’;
```

[Sound Alarm Bell Sequence]

```
ACTIVATION ‘Sound_Alarm_Bell’:
        ON ‘Floor*_SecurityBell’,
        Delay 180,
        OFF ‘Floor*_SecurityBell’;
```

These rules now report to the Central Station at the appropriate time and sound the security alarm bell once. These rules could have been written as follows and still sounded the security alarm bells once.

[Security Alarm Sequence]

```
SECURITYALARM PARTITION ‘FLOOR1_WEST’:
        +SEND ‘XYZAcct1234’ MSG “ActivateEventCode”,
        FAST ‘SecDesk_Flr1_Perimiter_LED’,
        +SEND ‘PageCo’ MSG “UserID$(CR)$Message”,
        -SEND ‘XYZAcct1234’ MSG “VerifyEventCode”,
        ACTIVATE ‘Sound_Alarm_Bell’;
```

[Sound Alarm Bell Sequence]

```
ACTIVATION ‘Sound_Alarm_Bell’:
        +ON ‘Floor*_SecurityBell’,
        +Delay 180,
        +OFF ‘Floor*_SecurityBell’;
```

Note: It’s important to note here that the Central Station messages used in this example are created for ease of understanding and are not the actual coded messages sent to the Central Station or Pager. Detailed codes for the various protocols used for MODCOM communications will be described later in this self-study course. Detailed templates for EST3 supported protocols are provided in you onboard **HELP Utility**.

Numerical Indexing or N-Variables

Numerical Indexing (N-Variables), prior to 3-SDU release 3.0, was used to simplify writing rules. A numerical index was always used in the input side of a rule to specify specific numbers, ranges of numbers or combinations of numbers and ranges in the rule’s input object label. For example:

A number - <N:#>

A range - <N:#-#>

A combination - <N:#,#-#,#,#-#>

A Numerical Calculator or Operator could then be used in a rule’s output object label to determine which output objects were to be activated.

For example the rule:

```
[Alarm Notification]
ALARM 'FLOOR<N:1-9>*':
        AMPON 'Floor<N>_AMP' TO 'EVAC',
        AMPON 'Floor<N+1>_AMP' TO 'EVAC',
        AMPON 'Floor<N-1>_AMP' TO 'EVAC',
        AMPON 'Floor*_AMP' TO 'ALERT',
        ON 'Floor<N>_STB',
        ON 'Floor<N+1>_STB',
        ON 'Floor<N-1>_STB';
```

broadcasts default EVAC messages to the floor of incident, floor above and floor below and turns on the strobes to the same floors. A default ALERT message is broadcast to all other floors.

Prior to release 3.0, the numerical index would not recognize a leading 0. For example, if the previous rule was for a 25-story building where the floors were labeled Floor01 through Floor25, you could not use the label **‘Floor<N:01-25>*’** in the input statement. This rule would not include any object for floors 01 through 09. Prior to release 3.0 you would have written two rules, one labeled **‘Floor0<N:1-9>*’** and the other labeled **‘Floor<N:10-25>’**.

CAUTION: You can write the label **‘Floor*<N:1-25>*’** and make it work. However, the ***** prior to the numerical index will include all variable modifiers between **Floor** and the **<N:1-25>**. Which may include undesired input objects in the rule. The bottom line is to take caution when using a wildcard (*****).

3-SDU release 3.0 or greater provides an additional function to the numerical index and numerical calculator or pperator used in the input and output object labels. Now you can specify the minimum number of digits or width to be used in the numerical index within the rule. The syntax would be:

Input Object Label: **<N:#-#:W>**

Output Object Label: **<N:W>**

where W is the minimum number of digits or width of the index. The default is 1.

This accepts the 0 of the 1 through 9 index numbers. Now you can write the rule for the 25-story building in one rule:

```
[Alarm Notification]
ALARM ‘FLOOR<N:1-25:2>*’:
        AMPON ‘Floor<N:2>_AMP’ TO ‘EVAC’,
        AMPON ‘Floor<N+1:2>_AMP’ TO ‘EVAC’,
        AMPON ‘Floor<N-1:2>_AMP’ TO ‘EVAC’,
        AMPON ‘Floor*_AMP’ TO ‘ALERT’,
        ON ‘Floor<N:2>_STB’,
        ON ‘Floor<N+1:2>_STB’,
        ON ‘Floor<N-1:2>_STB’;
```

Substitution Strings

Integrated MODCOM, Access Control and Security applications that require the EST3 System to report to the Central Station have created new requirements for the EST3 applications tools. As previously discussed, the EST3 System can report events to a Central Station and/or pager in one of five protocols: Contact ID, SIA, 4/2, 3/1 and TAP.

The requirements of the Central Station or Pager Service that the EST3 system is communicating with will determine the protocol to be used for these communications**. It is critical that these requirements be determined prior to the configuration and programming process.**

These coded messages may be numerical or alphanumerical ASCII text. In either case, they contain relevant information to support monitoring premises status. After determining the protocol to be used, you need to determine the coded message content required by the monitoring service. The structure of these coded messages varies from one monitoring service to another.

The 3-SDU provides a substitution string function that enables you to tailor communications to match the monitoring service requirements. For example, in all protocols, sending account, user ID and event codes information would be required. However, frequently it may be desired to send the time and the date of the event being reported or other information.

The syntax for a Substitution String is:

$(Alphanumeric ASCII Field)

where the dollar sign **$** indicates that a substitution string follows. The actual substitution message data is enclosed in the parenthesis (**( )**).

Figure 1-9 shows examples of using a Substitution String in a rule. In the SIA DCS protocol example, if any of the smokes on Floors 1 through 7 go into alarm, you send the fire alarm event (**FA<N>**) for the specific floor to the for the specified account to the Central Station's specified receiver. By using the substitution string function, you also send the date and time of the event.

It is important to note here that the available Substitution Strings for the SIA DCS protocol are:

- **$(TIME)** inserts the default 24-hour clock time.
- **$(DATE)** inserts the default MMDDYY date format.
- **$(USER)** inserts the user identification code.

Note: As shown in Figure 1-9, the substitution strings must be entered into the message before the event (**FA<N>** in our example).

- **$(USERID)** inserts the user identification code and a qualifier (i.e. pin number for individual identification). USER ID differs from USER in that it sends a lower case **id** with the pin number.

Note: USER and USER ID numbers are configured in the Access Control Database software used for EST3 Synergy Enabled® Access Control applications. These would be pin numbers of individuals approved for entry into a protected premise. For example, if you wanted to report the individual pin number access was granted for you would use an access granted event type (**DG**) and the User ID substitution string:

"DG$(USERID)"

SIA DCS substitution conventions are described in detail in Module 3 of this self-study.

In the TAP protocol example, if any of the smokes on Floors 1 through 7 go into alarm, you send the pager ID and fire alarm event to the specified pager via the pager service. Again, by using the Substitution String you also send the carriage return **$(CR)** which separates the pager ID and message, the date, time and specific location of the event $(**LOCATION:M-N**).

It is important to note here that the available Substitution strings for the TAP protocol are:

- **$(TIME)** inserts the default 24-hour clock time.
- **$(TIME12)** inserts the 12-hour clock time.
- **$(TIME24)** inserts the 24-hour clock time.
- **$(DATE)** inserts the default MM-DD-YY date format.
- **$(MMDDYY)** inserts the MM-DD-YY date format.
- **$(MMDDYYYY)** inserts the MM-DD-YYYY date format.
- **$(DDMMYYYY)** inserts the DD-MM-YYYY date format.
- **$(USER)** inserts the user identification code.
- **$(CR)** inserts a carriage return used to separate the User ID and the event message.
- **$(")** inserts a quotation mark.
- **$(LOCATION)** inserts the location text from the corresponding objects 42-character message field.

Note: Remember that the maximum number or characters that can be included into a TAP message, including the User ID and other Substitution Strings, is 59.

```
{Example of rule using Substitution String with SIA DCS protocol}
[Send Floor Fire Alarm]
Alarm Smoke 'Floor<N:1-7>*' :
 +SEND 'SIA_Account_1234' MSG "$(DATE)$(TIME)FA<N>";
{Where the available Substitution Strings for the SIA DCS protocol are
$(DATE), $(TIME), $(USER) and $(USERID).}
```

```
{Example of rule using Substitution String with TAP protocol}
[Send Floor Fire Alarm]
Alarm Smoke 'Floor<N:1-7>*' :
 +SEND 'PagerInc' MSG "ID53244$(CR)$(DATE) $(TIME) FireAlarm $(LOCATION:M-N)";
{Where the available Substitution Strings for the TAP protocol are
$(DATE), $(MMDDYY), $(MMDDYYYY), $(DDMMYYYY), $(TIME),
$(TIME12), $(TIME24), $(USER), $("), $(CR), $(LOCATION)
and $(LOCATION:M_N).  M-N specifies which of the characters
in the points 42 character message are to be included.}
```

```
{Example of rule using Substitution String with Contact ID protocol}
[Send Security Alarm]
SecurityAlarm  'Partition<N:1-15:2>*' :
 +SEND 'Account1234' MSG "1130<H>$(USER)";
{Where the only Substitution String for the ContactID protocol is
$(USER) .  This is rarely used.  Remember that only numerical
hexadecimal coded messages may be sent to the Central Station.}
```

Figure 1-9: Example Substitution String Applications.

The **$(LOCATION)** Substitution String inserts the number of characters starting at character 1 from the 42-character object message into the 59-character field which is available in the rule's **MSG**. In that, if after entering User ID, date and time only 30 of the 59 characters are still available, only the first 30 characters of the object message will be inserted. It is important to understand that you will need to predetermine and plan the actual message content to be sent to the pager and the object message text so that no relevant information is excluded.

Note: Also remember to use spaces in the message, as shown in our example, to be sent to the pager to promote ease of reading.

- **$(LOCATION:M-N)** inserts the location text from a specified range of characters from corresponding objects 42-character message field.

  Where: M specifies the 1st character of a range of characters from the 42-character object message field to be that is to be included in the event message and **N** is the last character of the range to be included in the event message.

  Note: M must be greater than 0 and less than **N**.

For the Contact ID protocol example, it is important to understand that a hexadecimal coded message is sent to the Central Station, which may specify the event, partition and device number. Rarely is the substitution string used to send addition information. In this example, each of the floors has been configured into a partition. If any of the security alarm devices within a partition in our example goes into alarm, you send a event qualifier **1** for activation and the security alarm event **130<H>** specifying the partition to the specified Central Station account (receiver). In this case the substitution string is used to also send the user ID.

Note: Remember that in Contact ID hexadecimal coded messages are sent to the Central Station. You need to verify with the Central Station provider the code requirements of your application. Sending information that the Central Station is not equipped to use is meaningless.

In all three example cases, the Central Station account or Pager account destination is specified by its label after the SEND command and is enclosed in **' '**. **MSG** specifies that the message follows, which in enclosed in **" "**.

Hexadecimal Indexing or H-Variables

3-SDU release 3.0 or greater also offers hexadecimal indexing (H-Variables), which operate similar to numerical indexing. This feature enables you to incorporate base$_{16}$ hexadecimal numbers into your labels or coded messages to be sent to the Central Station. This is a critical feature when using the Contact ID protocol to report to a Central Station.

Like the numerical index, a hexadecimal index is used in the input side of a rule to specify specific numbers, ranges of numbers or combinations of numbers and ranges in the rules input object label.

For example:

A number: **<H:#$_{16}$>**

A range: **<H:#$_{16}$-#$_{16}$>**

A combination: **<H:#$_{16}$,#$_{16}$-#$_{16}$,#$_{16}$,#$_{16}$-#$_{16}$>**

A hexadecimal calculator or operator can be used in a rules output object label to determine which output objects are activated. Also like numerical indexing you can specify the minimum number of digits (**W**) within the hexadecimal index:

<H:#$_{16}$-#$_{16}$:W>

Before we continue, let take a few minutes to review hexadecimal conventions. First its important to note that hexadecimal is a base-16 numbering system. Each hexadecimal digit has a decimal equivalent. Figure 1-10 shows the conventional hexadecimal integers or digits and their decimal equivalents.

Conventional Hexadecimal vs Decimal Correlation	
Hexadecimal Digit	**Decimal Equivalent**
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
A	10
B	11
C	12
D	13
E	14
F	15

Figure 1-10: Conventional Hexadecimal Conventions.

The telephone providers use a modified hexadecimal convention for data transmission, which the Central Station must comply to when using the Contact ID protocol. Figure 1-11 shows the Hexadecimal integers or digits and their decimal equivalents used for the modified hexadecimal conventions.

Modified
Hexadecimal vs Decimal
Correlation

Hexadecimal Digit	Decimal Equivalent
0	10
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
B(*)	11
C(#)	12
D	13
E	14
F	15

Figure 1-11: Modified Hexadecimal Conventions for MODCOM applications.

Note: Observe that there is no hexadecimal **A**. You need to observe these variations when using the H-variables. In that, sending a 01 or A1 is received as a 01 at the Central Station. If you were not careful, two input points having hexadecimal ID's of 01 and A1, respectively, would send only 01 to the Central Station. This could create some confusion to the Central Station provider.

You can mix N-Variables and H-Variables within a rule. This feature enables you to automatically convert from decimal to hexadecimal or from hexadecimal to decimal. For example the following rule:

```
[Send Point ID Smoke Alarms]
Alarm Smoke 'L1_SMK<N:1-15:2>':
           +SEND 'Central' MSG "FA<H>";
```

sends a fire alarm event message to the Central Station which includes a hexadecimal code to identify the specific smoke detector on level 1 that went into alarm.

CAUTION: This conversion utilizes Modified Hexadecimal digits. In that a conventional hexadecimal A is converted to a 0. You’ll need to take this into account when labeling objects, creating messages and writing rules. A good labeling plan would be a helpful tool is determining the modified hexadecimal values required for the Central Station.

The following rule is an example of converting from hexadecimal to decimal. In this example, the Central Station transmits a confirmation of the receipt of a closing message from a specific floor identified by a hexadecimal number. These confirmations are events which are configured as **CLOSE_1** through **CLOSE_C** Command Lists. As each confirmation occurs it is to light a corresponding LED steady on the premises, which has a decimal labeling convention.

```
[Confirm Floor Closings]
Activation ‘CLOSE_<H:1-C>’ :
        STEADY ‘FLOOR_CLOSED_LED<N:2>’;
```

Where Floor 1 lights LED 1 to Floor C lights LED 12.

Again, remember that the hexadecimal digits in our example are conventional, not the modified version required by MODCOM applications.

MODCOM Installation Considerations

Telephone Line Requirements

Prior to installing the 3-MODCOM or 3-MODCOMP you need to arrange for suitable TELCO lines and services. These MODCOM dialers can be used in most telephone line applications. The 3-MODCOM and 3-MODCOMP should not be used in applications where:

- The Central Station telephone number(s) cannot be dialed directly and require operator assistance on the call.
- Multiparty or party-line service exists.
- Operator assistance is required to complete a call where a foreign exchange (FX) connection cannot be introduced.
- A connection cannot be established within 38 seconds following the completion of dialing.
- An nonsupervised WATS or ground-start connection is used.

These MODCOM dialers are compatible with any switched direct dialing (local) or direct distance dialing (DDD) telephone network that does not require operator assistance.

The 3-MODCOM and 3-MODCOMP dialers prevent jamming by incoming calls when used with the **Called Party Disconnect** telephone service option. In areas where Called Party Disconnect is not available and jamming is a problem, a separate, confidential, unlisted telephone number should be used for the MODCOM. Two unlisted telephone numbers, one for each MODCOM telephone line, provide maximum dialer integrity.

The 3-MODCOM and 3-MODCOMP must be connected to the incoming telephone line ahead of any other equipment (e.g., telephones, answering machines, FAX machines) connected to the phone line and immediately after the demarcation block. This requirement ensures that the MODCOM dialer circuit can seize the line during an alarm, disconnecting the other equipment on the telephone line.

Other requirements:

1. Do not use a telephone line that is considered essential for conducting the customers business. When possible use a separate, dedicated line for MODCOM use.

2. When the input telephone line is composed of rotary telephones, use the telephone line with the highest telephone number for MODCOM connection to create the least interference with the customers business telephone lines.
3. When the MODCOM connection is made to a TELCO (telephone) line also used for business, advise the customer that telephone service will be disrupted for a few minutes during the MODCOM dialer connection periods.
4. In areas where connection must be made to the telephone provider's own connector blocks, they should be wired per the USOC RJ-31X or RJ-38X configuration specified on the MODCOM installation sheet (P/N 387476).
5. When the MODCOM is configured as a two-line dialer the two incoming telephone lines must be used and connections must be made to each line.

Installing the MODCOM module

Prior to installing the 3-MODCOM or 3-MODCOMP into the EST3 chassis:

- Review your project requirements and source information for MODCOM parameters and the proper location where the MODCOM is to be installed on the EST3 chassis rail.
- Arrange for suitable TELCO lines and services per the line requirements given above.
- Make sure the power is OFF on the cabinet where the MODCOM is to be installed.

To install the MODCOM module:

1. Use an anti-static wrist strap or equivalent to ground yourself while handling the MODCOM during installation.
2. Carefully remove the MODCOM module from the anti-static bag or box that the module is packed in. This module is shipped with a blank door cover installed. Always handle this module by its edges or by this door.

Note: Do not discard the anti-static carrier and shipping materials you received with the module. If a failure or damage occurs, the module must be shipped back to the factory in the anti-static packaging.

3. Place the anti-static bag on a flat surface and place the module, with the modular phone jacks facing the top, on this bag. Inspect the module for visible shipping damage, turn it over and inspect the other side for visible damage.

4. If a Control/LED display operator layer module is to be installed, remove the blank front plate and assemble the Control/LED module membrane to it per installation sheet P/N 270493. Attach the Control/LED display module to the MODCOM via the plastic standoffs and the ribbon cable provided.

5. Carefully plug the MODCOM module into the predetermined rail position within the host cabinet.

CAUTION: Ensure that the module aligns with the plastic guide pins and seats firmly onto the rail connectors. These modules mount fairly easily onto the rail. If you find that you have to force the module into place you are probably doing it wrong. In this case, inspect the rail connectors for bent pins and reinstall the module carefully.

6. After you have ensured that the module is mounted properly, fasten the module in place with its plastic pushpins.

Note: A special removal tool is provided with the cabinet that enables you to unsnap these pushpins when it is desired to remove any module from its host chassis.

7. Restore power to the cabinet.

This completes the physical installation of the MODCOM modules. You are now ready to connect the MODCOM to the facility TELCO telephone lines, download its configuration and programming data, and test transmissions to the monitoring service.

Connecting the MODCOM to the TELCO lines

Plug one end of the supplied 8-position modular telephone cable(s) to the appropriate TELCO line jack(s) on the top of the MODCOM module.

DO NOT plug the other end of the cable(s) into the RJ-31X jack(s) until you have downloaded the MODCOM applications and are ready to test the system. This prevents interference with other normal customer traffic and equipment until you are ready for the final connection and testing phase.

When you are ready for the final connection and testing phase connect the TELCO line jack(s) as follows:

J20 – Line 1 Jack	**J21 – Line 2 Jack**
Single-line dialer	Second line for two-line dialer
(or first line for two-line dialer)	

Incoming Modem Line

Note: NFPA 72 Fire Alarm System compliance requires that the MODCOM be connected to two loop-start telephone lines. When the s uses ground-start telephone lines, two loop-start lines must be installed for the dialer.

To determine the type of TELCO lines that are present on premises:

1. Disconnect the phone line pair.
2. Connect the line pair to a test meter.
3. The meter will read between 48 to 52 Vdc between the lines if it is equipped for loop-start.
4. The meter will read 0 Vdc between the lines, 48 to 52 Vdc between one line and ground and 0 Vdc between the other line and ground if it is equipped for ground-start.

Note: NFPA 72 Certified Fire Alarm System and Burglar Alarm System compliance requires that the TELCO telephone line be ***Called Party Disconnect*** or ***Timed-Released Disconnect***, which permit the MODCOM to seize the line when the TELCO line is in use.

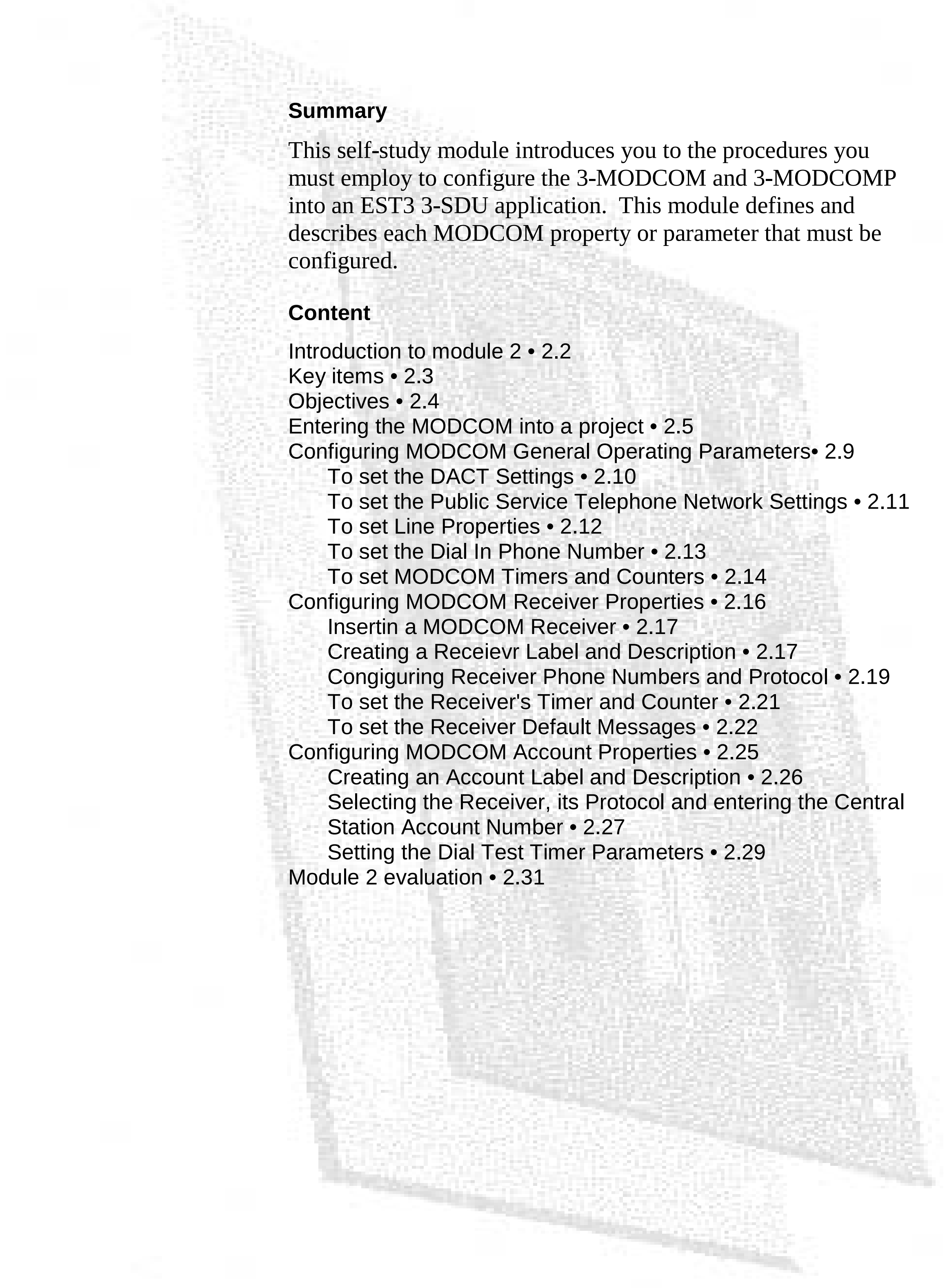
To determine that the line is Called Party Disconnect have someone call the s from outside, hang up the premises telephone but not the outside telephone, wait 40 seconds and then pick up the premises telephone again. If the caller is still connected the system does not have Called Party Disconnect service.

Module 1 evaluation

This concludes Module 1 of the *3-MODCOM Self-Study Course.* Return to the objectives stated at the beginning of this module. Study them carefully to ensure that you are comfortable with each objective. If not, return to that section and review it. When you are satisfied, proceed to Module 2. You will be tested at the end of this self-study course.

Module 2

Configuring the MODCOM



Summary

This self-study module introduces you to the procedures you must employ to configure the 3-MODCOM and 3-MODCOMP into an EST3 3-SDU application. This module defines and describes each MODCOM property or parameter that must be configured.

Content

Introduction to module 2

This module covers the procedures required to configure both the 3-MODCOM and 3-MODCOMP into the 3-SDU database. This self-study module provides detailed instruction on entering the MODCOM into the database, selected its operational properties or parameters and setting the MODCOM timers and counters to meet the needs of your specific application.

Also covered are the procedures for configuring Central Station receiver and premises account properties. Details on transmission protocols for dialer application are covered in Module 3 of this self-study course. Descriptions on programming the many MODCOM applications are covered later in this course.

Configuring the MODCOM is an easy task of simply selecting the desired properties from SDU dialog boxes. The MODCOM has a default setup for NFPA 72 compliance built into the SDU software. These default settings will handle a majority of MODCOM applications.

This self-study will focus on basic fire only applications using the Contact ID protocol, which is the prevalent fire application, the MODCOM is used in. Although discussed in this course, the more sophisticated Security, Access Control and Keypad display MODCOM applications are covered in the factory-based EST3 Synergy Enabled® training Course.

Review the Configure Projects, Cabinets, LRMs, and MODCOM topics in your 3-SDU, Version 3.0 **HELP Utility**. You can get to the **HELP utility** through the 3-SDU or from your Online Support Tools CD, release 4.0 or later.

Prior to starting this module and the remainder of this self-study course, install or upgrade the 3-SDU to version 3.0 or greater. It is recommended that you create a practice project that you can develop during these lessons. As each step of the MODCOM configuration and programming process is covered, you can practice what you have learned in your practice project. Having your project open during this lesson will make the **HELP utility** readily available for you reference.

Associated study

Use the following technical reference manuals as associated study material for this module:

- *EST3 Installation and Service Manual*, P/N 270380, Rev 4.0 or later)
- *Modem Communicator 3-MODCOM/3-MODCOMP Installation Sheet*, (P/N 387476)

Key items

Key points to look for:

- NFPA 72 Central Station, Remote Station compliance Mode
- Fully Programmable Mode
- Configuring MODCOM phone lines and supervision
- Configuring MODCOM Counter and Timer properties
- Available communications protocols
- Configuring Central Station Receiver properties
- Configuring premise Account properties
- Default message types

Key terms and operations to learn:

- Override Answering Machine
- Default Dialing Methods
- Ring Cycle Types
- Calling Party Disconnect
- Ring Cycle Count
- Line Cut Monitoring
- Tone vs. Pulse dialing
- Contact ID protocol
- SIA DCS, 3/1 and 4/2 protocols
- TAP protocol
- CMS Account numbers
- Dial Test Timer settings

Objectives

Upon completion of this module you will be able to:

1. Configure the 3-MODCOM or 3-MODCOMP for the default NFPA 72 compliant or fully programmable operational mode based on the requirements of your project.
2. Describe the relationship of Central Station Receivers and Premises Accounts within the MODCOM configuration process.
3. Create meaningful Receiver and Account labels and descriptions.
4. Configure Central Station Receiver properties.
5. Configure Premise Account properties.
6. Describe the purpose and ranges for the various MODCOM Counters and Timers.

Entering the MODCOM into a project

Review the Configure Projects, Cabinets, LRMs and MODCOM topics in your 3-SDU, Version 3.0 **HELP Utility**. You can get to the **HELP utility** via the 3-SDU or from your Online Support Tools CD, release 4.0 or later.

Prior to starting this module and the remainder of this self-study course, install or upgrade the 3-SDU to version 3.0 or greater. It is recommended that you create a practice project that you can develop during these lessons. As each step of the MODCOM configuration process is covered, you can practice what you have learned in your practice project. Having your project open during this lesson will make the **HELP utility** readily available for you reference.

Entering the 3-MODCOM and 3-MODCOMP into your project database is an easy step-by-step process. After you have created a new project, configured the project parameters and configured each cabinet in your project, you simply enter the MODCOM into the required slot of the cabinet in which it is to reside. A description of these steps follows.

To enter the MODCOM into your project, select **Configure** from the main menu and **Cabinet** from the drop-down menu as shown in Figure 2-1.

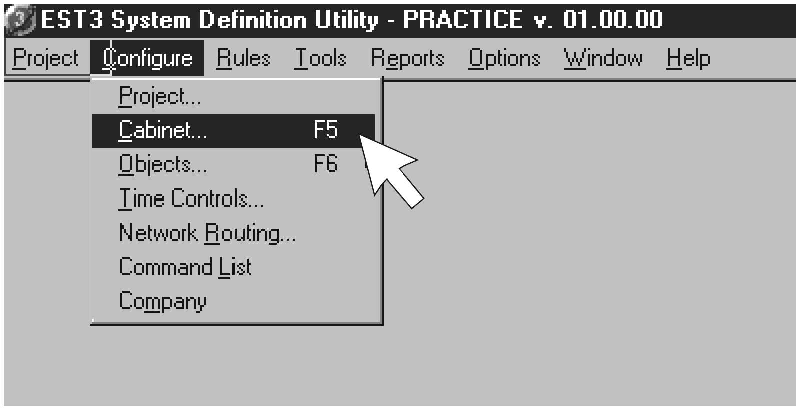
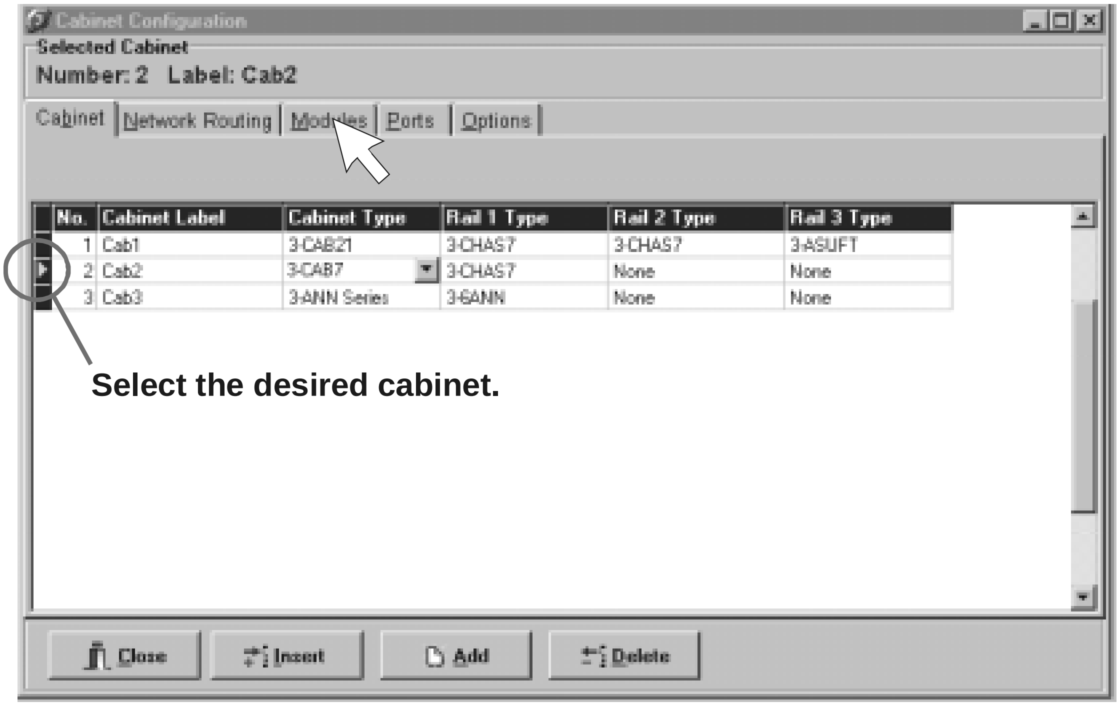


Figure 2-1: Select Configure and Cabinets.

Observe that the Cabinet Configuration window opens with the Cabinet tab selected as shown in Figure 2-2. Now select the **Cabinet** you wish to install the MODCOM into and then select the **Modules** tab. For our example we will select 3-CAB7 cabinet type for CAB2.



Selected Cabinet
Number: 2 Label: Cab2

No.	Cabinet Label	Cabinet Type	Rail 1 Type	Rail 2 Type	Rail 3 Type
1	Cab1	3-CAB21	3-CHAS7	3-CHAS7	3-ASUFT
2	Cab2	3-CAB7	3-CHAS7	None	None
3	Cab3	3-ANN Series	3-6ANN	None	None

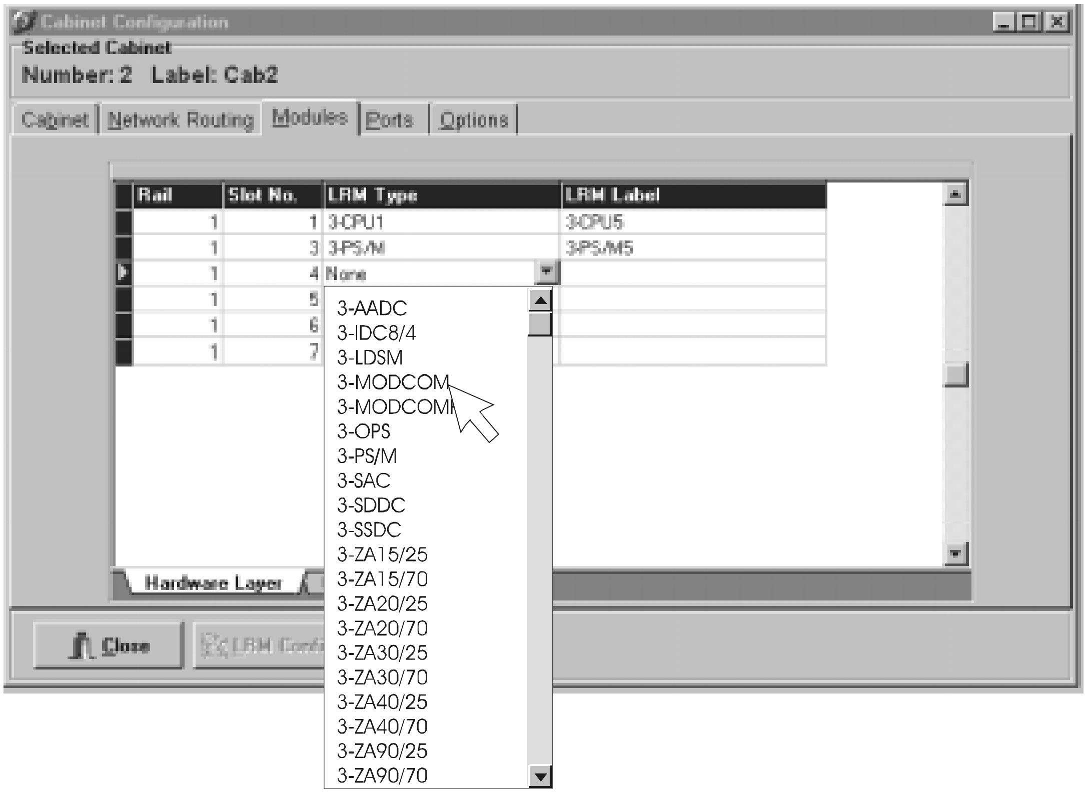
Select the desired cabinet.

Figure 2-2: Select the Cabinet in which the MODCOM is to be installed, then select the Modules tab.

As shown in Figure 2-3, the **Modules Tab** of the configuration window is now displayed. Now click on the LRM Type and down-arrow for the slot you wish to install the MODCOM into.

The down-arrow displays a list of available LRM types you can install. Simply select 3-MODCOM from this list to install it into your project database.

For this example we will install the 3-MODCOM LRM type in slot 4 and the 3-MODCOMP LRM type in slot 5 as shown in Figure 2-4.



Selected Cabinet
Number: 2 Label: Cab2

Rail	Slot No.	LRM Type	LRM Label
1	1	3-CPU1	3-CPU5
1	3	3-PS/M	3-PS/M5
1	4	None	
1	5		
1	6		
1	7		

Figure 2-3: Select the 3-MODCOM LRM type for installation into slot 4.

You should remember from your past experience with the SDU that you have the ability to preset the SDU's behavior. If when you initially setup the SDU behavior in the Options function of the main menu you selected to automatically display the LRM Configuration dialog boxes when you enter each LRM into the database, you would have seen the Configure 3-MODCOM dialog box during your practice. If this is the case, click on the **OK** button for this display for this example. For this lesson we will manually select the Configure 3-MODCOM function by pressing the **LRM Config** button on the Modules Tab.

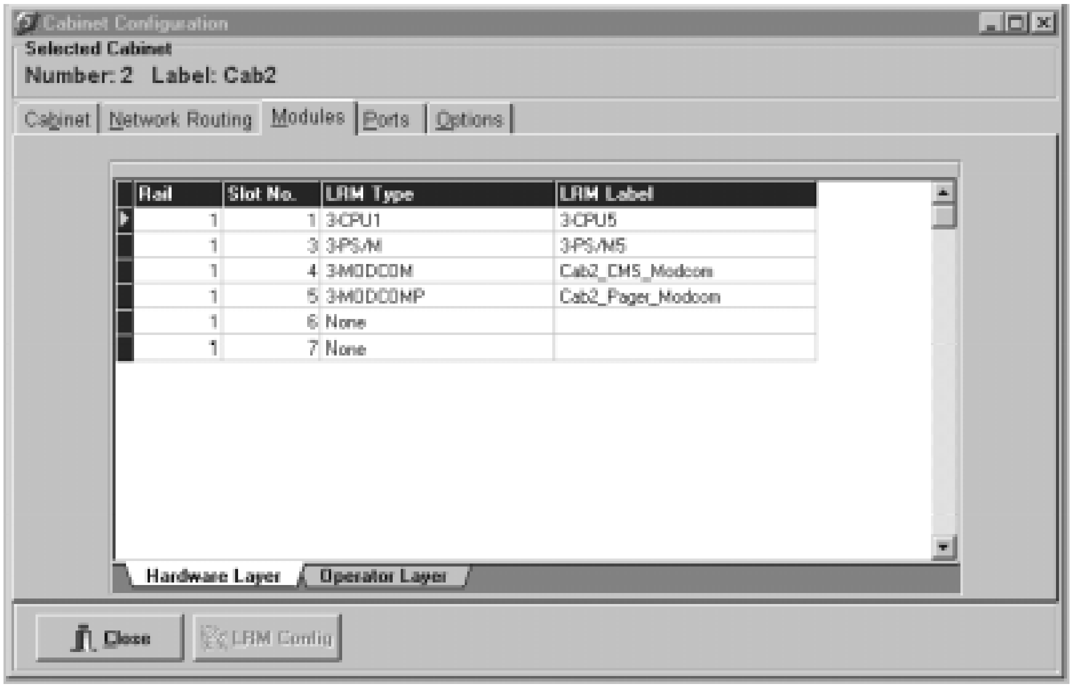
After we have entered the 3-MODCOM and 3-MODCOMP into slots 4 and 5 respectively we need to create a unique label for each.

The content of these labels is important to you as the system developer. You will view these labels in your LRM Limitation Filter during the object configuration process and they also appear on various reports. You should remember from your past EST3 training, that a label should include a combination of Location, Function and Device Type.

In our example of Figure 2-4, Cab2 is the location within our 3-node system. In multi-area, multi-MODCOM facilities, you may want to include building, floor or other label modifiers to be more specific.

The example labeling of Figure 2-4 shows that the second label modifier gives the function of each MODCOM type. This would be especially important to you in multi-MODCOM applications. In our example, the 3-MODCOM is used for Central Monitoring Station reporting (labeled **CMS**), while the 3-MODCOMP is used to send event messages to a pager (labeled **Pager**).

The function label modifier can be important. For example, in MODCOM failover applications, where a backup MODCOM is used, you may want to specify which MODCOM is primary and which is the backup. In applications where excessive Access Control and Keypad Display traffic requires that you dedicate a MODCOM for the Access Control and Keypad Display communications and a separate MODCOM for Central Station reporting, you may want to specify which MODCOM provides modem communications and which provides the dialer communications. The last modifier in our example for both MODCOMs indicates the device type (labeled **Modcom**).



Selected Cabinet

Number: 2 Label: Cab2

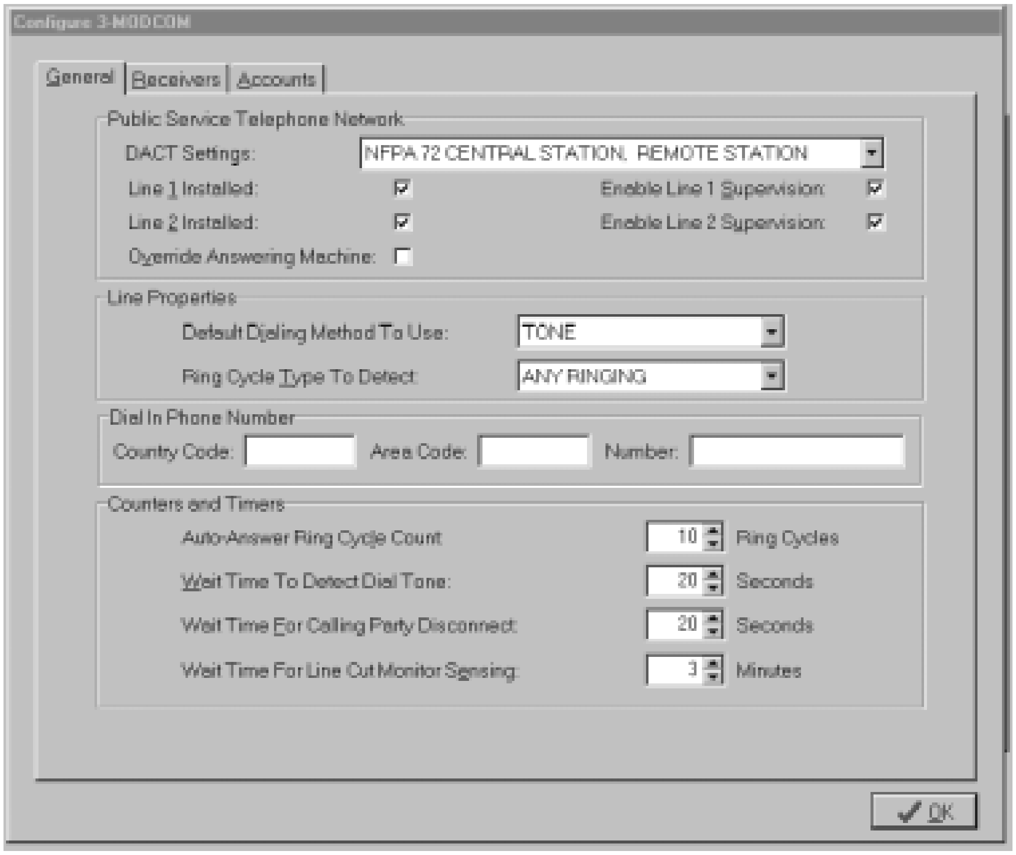
Rail	Slot No.	LRM Type	LRM Label
1	1	3-CPU1	3-CPU5
1	3	3-PS/M	3-PS/M5
1	4	3-MODCOM	Cab2_CMS_Modcom
1	5	3-MODCOMP	Cab2_Pager_Modcom
1	6	None	
1	7	None	

Figure 2-4: 3-MODCOM and 3-MODCOMP with labels.

After you have practiced entering the MODCOM into your project you are now ready to configure the operating parameters, receivers, and accounts for each MODCOM type.

Configuring MODCOM General Operating Parameters

If under options, you have the auto-configure function set, the **Configure 3-MODCOM** dialog box would display on MODCOM entry into the database. If not, you can get to the **Configure 3-MODCOM** dialog box by selecting it from the Cab2, Modules tab and selecting the **LRM Config** button. In either case, the Configure 3-MODCOM dialog box, with the **General** tab selected, shown in Figure 2-5 is displayed.



Public Service Telephone Network

DACT Settings: NFPA 72 CENTRAL STATION, REMOTE STATION

Line 1 Installed: ☑ Enable Line 1 Supervision: ☑

Line 2 Installed: ☑ Enable Line 2 Supervision: ☑

Override Answering Machine: □

Line Properties

Default Dialing Method To Use: TONE

Ring Cycle Type To Detect: ANY RINGING

Dial In Phone Number

Country Code: Area Code: Number:

Counters and Timers

Auto-Answer Ring Cycle Count 10 Ring Cycles

Wait Time To Detect Dial Tone: 20 Seconds

Wait Time For Calling Party Disconnect: 20 Seconds

Wait Time For Line Cut Monitor Sensing: 3 Minutes

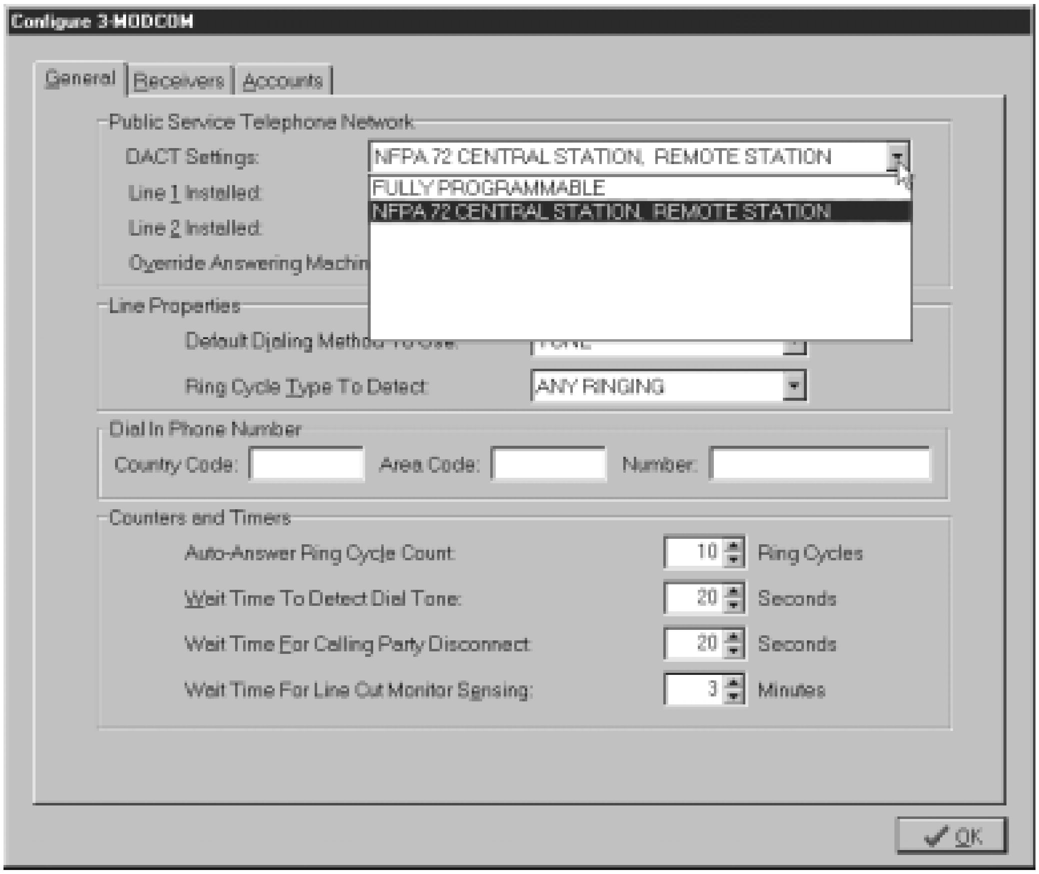
Figure 2-5: Configure 3-MODCOM Dialog Box with default settings.

Observe that the 3-MODCOM general default parameters are preset for **NFPA 72 CENTRAL STATION, REMOTE STATION** operation. In this way the 3-MODCOM is automatically configured as a NFPA code-compliant DACT with two supervised telephone lines.

Before we continue take a few minutes to review the **General** tab default settings. Also remember that you can review the **General** tab selections at any time in the SDU **HELP Utility**.

To set the DACT Mode

As previously stated the general 3-MODCOM parameters default to **NFPA 72 CENTRAL STATION, REMOTE STATION** DACT compliance. To make your 3-MODCOM fully programmable click on the down-arrow and select **FULLY PROGRAMMABLE** as shown in Figure 2-6.



DACT Settings: NFPA 72 CENTRAL STATION, REMOTE STATION

Line 1 Installed:

Line 2 Installed:

Override Answering Machin

Default Dialing Method To Use: TONE

Ring Cycle Type To Detect: ANY RINGING

Country Code: Area Code: Number:

Auto-Answer Ring Cycle Count: 10 Ring Cycles

Wait Time To Detect Dial Tone: 20 Seconds

Wait Time For Calling Party Disconnect: 20 Seconds

Wait Time For Line Cut Monitor Sensing: 3 Minutes

Figure 2-6: Selecting DACT settings.

When the **FULLY PROGRAMMABLE** mode is selected you are allowed to customize the 3-MODCOM operating parameters. This will enable you to configure your MODCOM for Access Control and Keypad Display modem communications or non-compliant Dialer operations. In that, you can now change parameters (line parameters, counters and timers) which were locked to the required default values in the NFPA compliant mode.

CAUTION: Take care when using the fully programmable mode. Check with you local authority before configuring any variance from NFPA requirements for Fire and/or Security applications.

To set the other Public Service Telephone Network Options

As shown in Figure 2-5, the remaining Public Service Telephone Network setting that may be configured are lines installed and lines supervised for the two 3-MODCOM phone lines and the Answering Machine Override.

With the NFPA compliance mode selected the two phone lines are required and both must be supervised. These parameters are locked to the default settings in this mode. Where:

- ✓ Line 1or 2 Installed indicates that the corresponding MODCOM phone jack (J20 Line 1 or J21 Line2) is connected to a switched telephone network.
- ✓ Enable Line 1 or 2 Supervision indicates that the MODCOM supervises the Line1 and/or Line 2 telephone connections for faults.

Note: When enabled the MODCOM supervision function detects <10V during On-hook periods, <10mA during Off-hook periods and line faults.

In the **FULLY PROGRAMMABLE** mode you have the ability to disable or enable line installation and supervision. Use care when changing these parameters. Remember that only MODCOM line 1 has a ring detection circuit and can accept incoming calls.

Caution: When the MODCOM is being used in the **FULLY PROGRAMMABLE** mode as an Access Control and Keypad Display communications modem or as a non-compliant (non-fire) single phone line dialer disable Line 2 supervision.

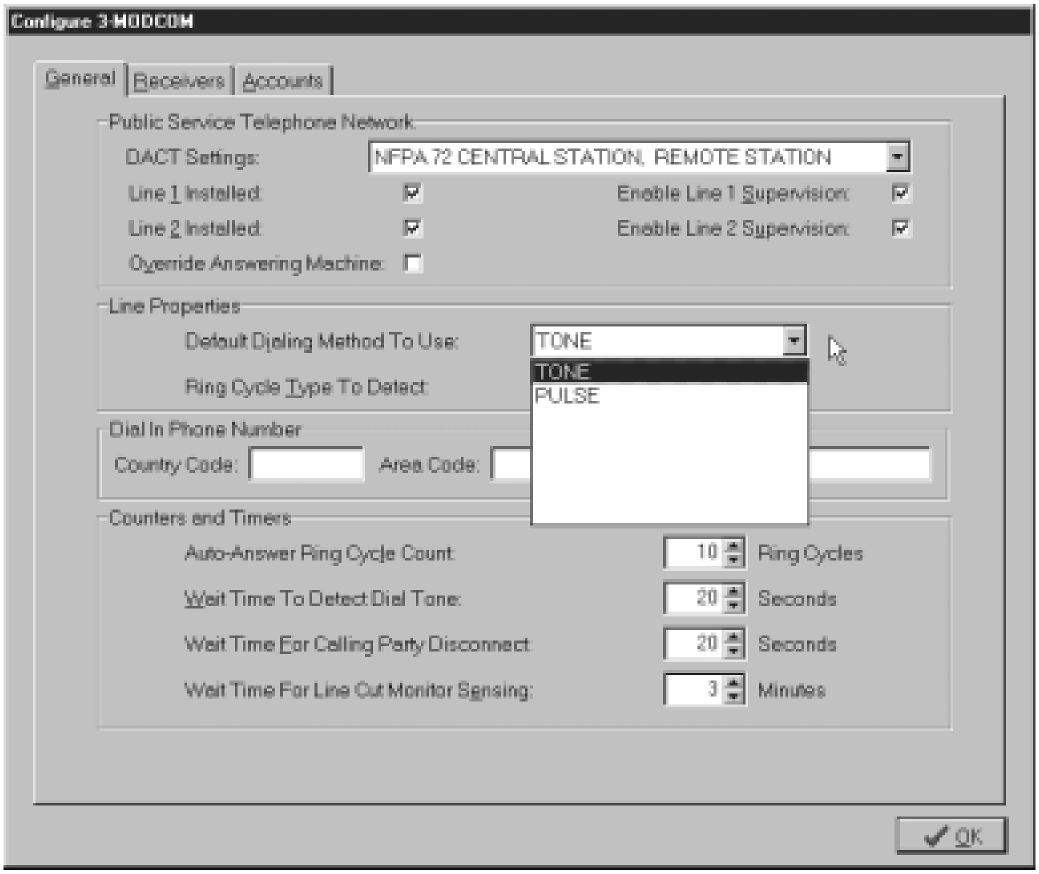
The Override Answering Machine function may be enabled or disabled in either mode. This is an important feature of Access Control and Keypad Display communications over a phone line also connected to an answering machine. This mode enables the calling computer to seize the line on incoming calls, overriding the answering machine for Access Control Database (ACDB) and Keypad Display downloads into the EST3 via the system's 3-MODCOM(s).

To set Line Properties

As shown in Figure 2-5, there are two parameters to select to set line properties:

- Default Dialing Method To Use.
- Ring Cycle Type To Detect.

Figure 2-7 shows the two methods available for the MODCOMs dialing method. The default method is **TONE** (DTMF) used for touch tone phone systems. The **PULSE** method is used for rotary phone systems. The **TONE** method is faster and universally used in the US market. The **PULSE** method may be found in some international markets. Only use the pulse method when the phone line does not support tone.



Public Service Telephone Network

DACT Settings: NFPA 72 CENTRAL STATION, REMOTE STATION

Line 1 Installed: ☑ Enable Line 1 Supervision: ☑

Line 2 Installed: ☑ Enable Line 2 Supervision: ☑

Override Answering Machine: □

Line Properties

Default Dialing Method To Use: TONE

Ring Cycle Type To Detect:

Dial In Phone Number

Country Code: Area Code:

Counters and Timers

Auto-Answer Ring Cycle Count: 10 Ring Cycles

Wait Time To Detect Dial Tone: 20 Seconds

Wait Time For Calling Party Disconnect: 20 Seconds

Wait Time For Line Cut Monitor Sensing: 3 Minutes

Figure 2-7: Default Dialing Method Selections.

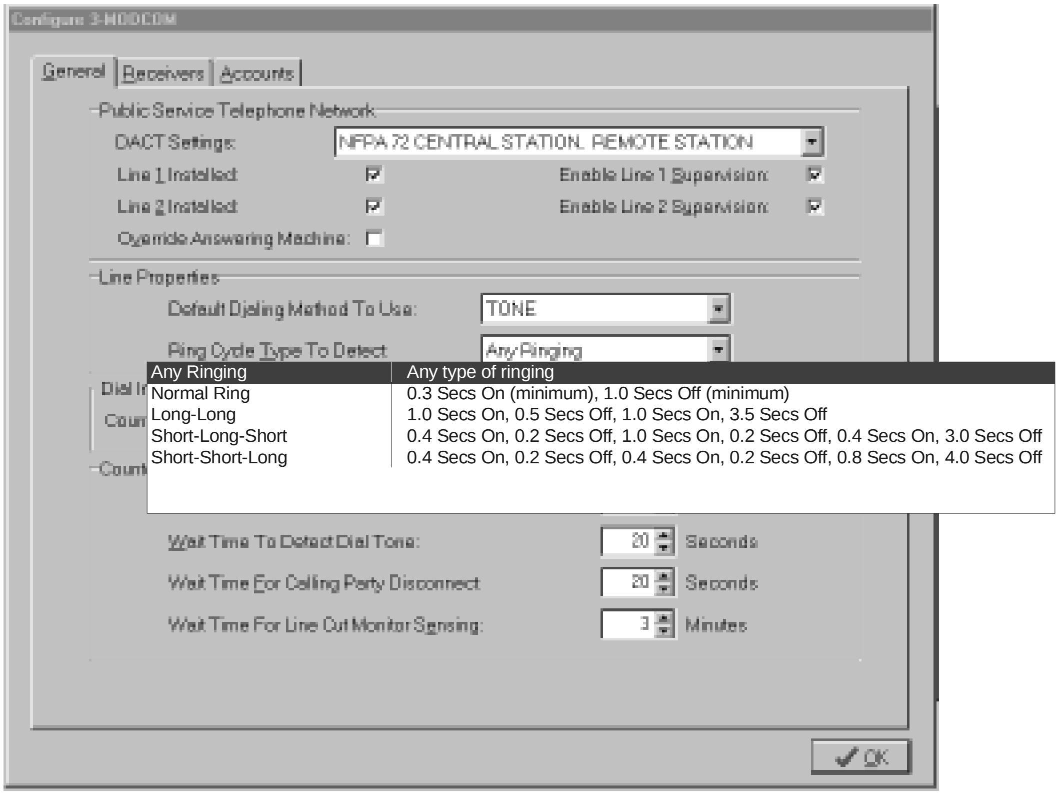
Figure 2-8 shows the five types of Ring Cycle Detection available for MODCOM operation. These are:

- **ANY RINGING**: This is the default ring cycle type, where phone line 1 of the MODCOM answers any call regardless of the ring cycle type.
- **NORMAL RINGING**: This is the Distinct Ring pattern type that is the standard type used. Where MODCOM phone line 1 only answers a ringing pattern of 0.3 seconds **ON** and 1.0 seconds OFF.
- **Long-Long** : This is the Distinct Ring pattern where MODCOM Phone Line 1 only answer a ringing pattern of 1.0 seconds **ON**, 0.5 seconds **OFF**, 1.0 second **ON** and 3.5 seconds **OFF**.
- **Short-Long-Short**: This is the Distinct Ring pattern where MODCOM Phone Line 1 only answers a ringing pattern of 0.4 seconds **ON**, 0.2 seconds OFF, 1.0 seconds ON, 0.2 seconds **OFF**, 0.4 seconds **ON** and 3.0 seconds **OFF**.
- **Short-Short-Long**: This is the Distinct Ring pattern where MODCOM Phone Line 1 only answers a ringing pattern of 0.4 seconds **ON**, 0.2 seconds **OFF**, 0.4 seconds **ON**, 0.2 seconds **OFF**, 0.8 seconds **ON**, 4.0 seconds **OFF**.

A distinct ring type would be used for MODCOM applications using a shared phone line. In this way, the MODCOM and the computer calling in would have a dedicated ringing pattern and the MODCOM would ignore all other calls using other ringing patterns.

To set the Dial In Phone Number

The Dial In Phone Number parameters shown in Figure 2-5 are used in Access Control and Keypad Display modem communications only. This is the phone number of the MODCOM that the ACDB in a remote computer must use to call the MODCOM to establish the Access Control and Keypad Display communications phone link.



DACT Settings: NFPA 72 CENTRAL STATION, REMOTE STATION

Line 1 Installed: ☑ Enable Line 1 Supervision: ☑

Line 2 Installed: ☑ Enable Line 2 Supervision: ☑

Override Answering Machine: ☐

Default Dialing Method To Use: TONE

Ring Cycle Type To Detect: Any Ringing

Any Ringing	Any type of ringing
Normal Ring	0.3 Secs On (minimum), 1.0 Secs Off (minimum)
Long-Long	1.0 Secs On, 0.5 Secs Off, 1.0 Secs On, 3.5 Secs Off
Short-Long-Short	0.4 Secs On, 0.2 Secs Off, 1.0 Secs On, 0.2 Secs Off, 0.4 Secs On, 3.0 Secs Off
Short-Short-Long	0.4 Secs On, 0.2 Secs Off, 0.4 Secs On, 0.2 Secs Off, 0.8 Secs On, 4.0 Secs Off

Wait Time To Detect Dial Tone: 20 Seconds

Wait Time For Calling Party Disconnect: 20 Seconds

Wait Time For Line Cut Monitor Sensing: 3 Minutes

Figure 2-8: Ring Cycle Type Selections.

To set the MODCOM Timers and Counters

The **General** tab of the Configure 3-MODCOM dialog box (shown in Figure 2-5) provides four configurable counter and timer parameters:

- **Auto-Answer Ring Cycle Count**: default value is 10 cycles.
- **Wait Time To Detect Dial Tone**: default value is 20 seconds.
- **Wait Time For Calling Party Disconnect**: default value is 20 seconds.
- **Wait Time For Line Cut Monitor Sensing**: default value is 3 minutes.

The operation aspects of these counter and timer functions are described in Module 1 of this self-study. In most application the default values meet the MODCOM communication requirements.

The **Auto-Answer Ring Cycle Count** parameter has a range from 0 to 255 Ring Cycles. This count is the number of rings that must occur before the MODCOM goes Off-hook to automatically answer an incoming call.

When this counter is set to 0 the MODCOM will not automatically answer calls. In this case calls are manually answered by programming an LED to annunciate an incoming call and a switch to activate a connection to the phone line.

The **Wait Time To Detect Dial Tone** parameter is the maximum time the MODCOM must wait, after going Off-hook, to detect a dial tone. This timer has a range from 20 to 255 seconds. Failure to detect a dial tone within the specified time is one attempt at making a connection. The MODCOM will retry dial tone detection until a preset maximum number of attempts is reached. After the maximum number of attempts is tried a trouble is sent to the EST3 3-CPU1 and displayed on the 3-LCD panel

The **Wait Time For Calling Party Disconnect** parameter is the time the MODCOM must wait before disconnecting an ongoing call and seizing the phone line. This timer has a range of from 5 seconds to 255 seconds. The time to disconnect an ongoing call varies between TELCO providers in different areas. Generally this time is from 18 to 90 seconds. You will need to check with you local TELCO provider to determine the specific timing for Calling Party Disconnect service (if available) in your area.

The **Wait Time For Line Cut Monitor Sensing** parameter is the number of minutes the MODCOM must wait before annunciating a TELCO line cut. This timer may be set for 1, 2 or 3 minutes. UL fire and burglar requirements for this delay vary. You will need to verify the specific timer delay required for you specific application.

Configuring the 3-MODCOM and 3-MODCOMP to this point is the same. In your practice project it may be useful to configure the general parameters for both MODCOM types.

Configuring the MODCOM may look like a complex task. However, remember that it has a default configuration, which meets the requirements for most MODCOM applications.

A few minutes of research and planning prior to configuring and programming your application's MODCOM(s) can eliminate a lot of the time you might spend debugging and reworking your application.

During this configuration process remember that Help is only a mouse click away.

Configuring MODCOM Receiver Parameters

After you have completed configuring the general MODCOM parameters, select the **Receivers** tab to insert receivers and configure their properties. Figure 2-9 shown the initial **Receivers** dialog box without any receivers configured for both the 3-MODCOM and 3-MODCOMP.

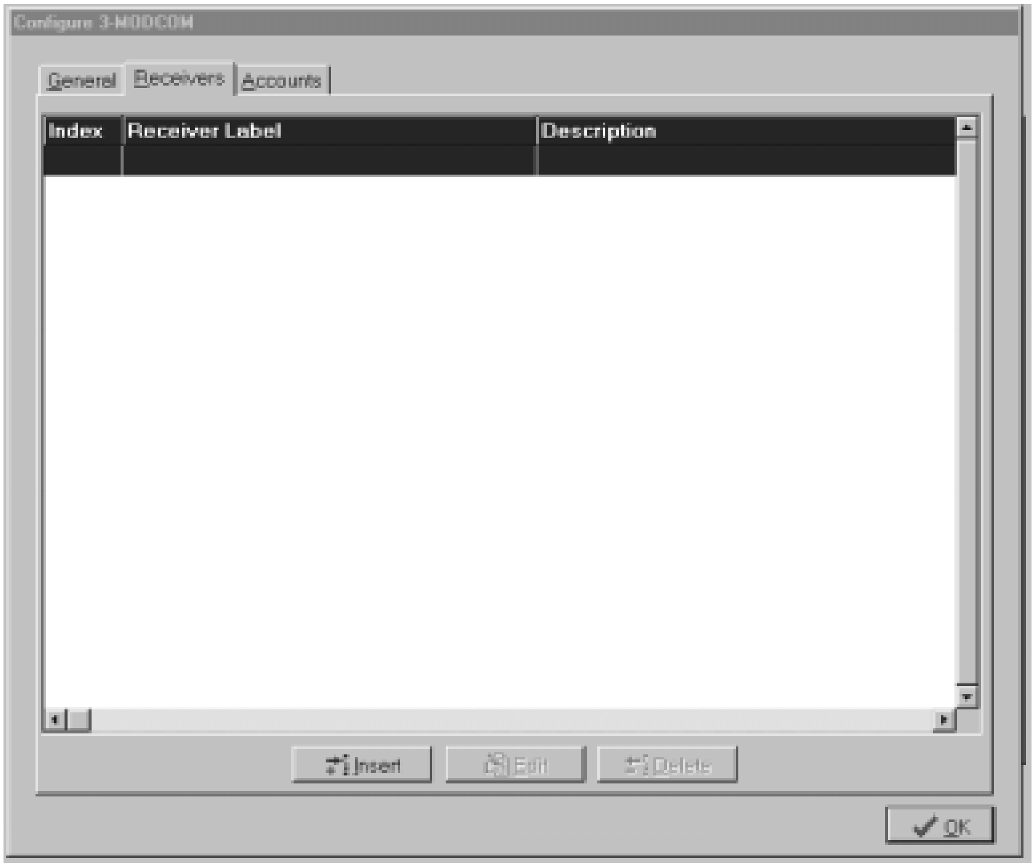


Figure 2-9: MODCOM Receivers Dialog Box.

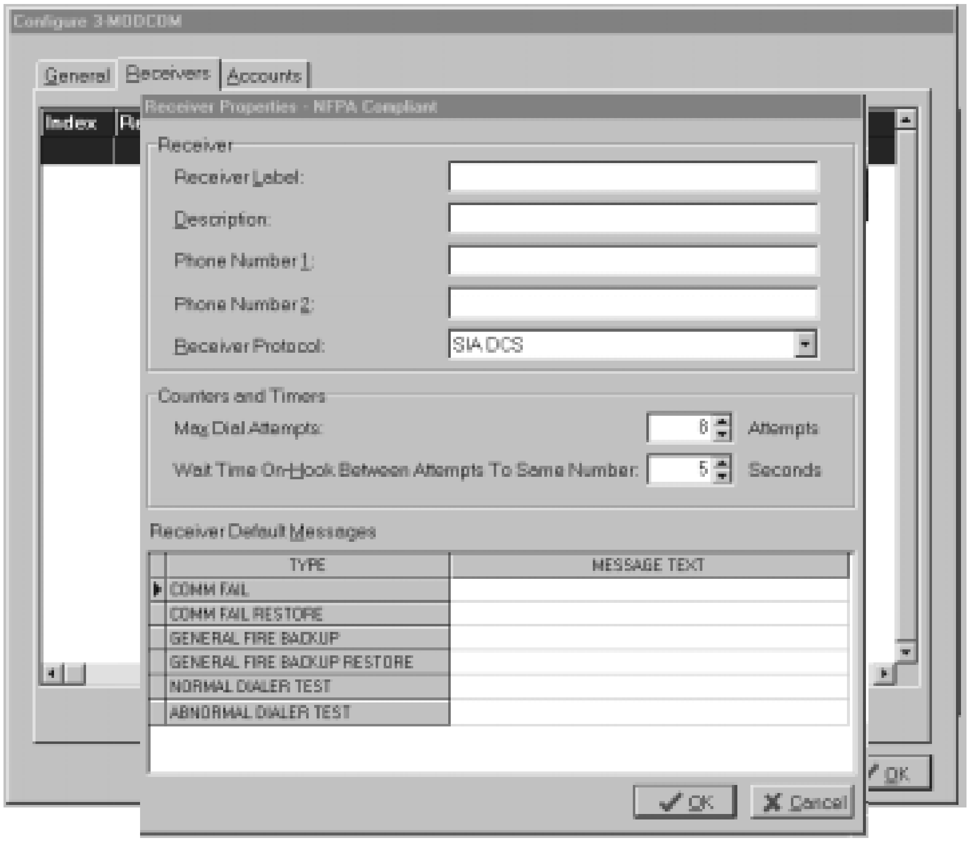
Remember that a Receiver is a logical destination at the Central Station where the MODCOM must connect to send event status messages. This Receiver tab is where you define the Central Station receivers required for your application. You can define up to 80 Central Station receivers for each MODCOM in your project.

As you can see in Figure 2-9, the Receivers tab enables you to insert a receiver, delete a receiver you have previously inserted and edit each receiver’s properties.

Once a receiver is inserted you will need to create a label for it and generate meaningful a text message description.

Inserting a MODCOM Receiver

When you insert a receiver the **Receiver Properties** dialog box is displayed as shown in Figure 2-10. This dialog box is displayed for each receiver you define for the MODCOM being configured.



Receiver Properties - NFPA Compliant

Receiver

Receiver Label:

Description:

Phone Number 1:

Phone Number 2:

Receiver Protocol: SIA DCS

Counters and Timers

Max Dial Attempts: 8 Attempts

Wait Time On-Hook Between Attempts To Same Number: 5 Seconds

Receiver Default Messages

TYPE	MESSAGE TEXT
COMM FAIL	
COMM FAIL RESTORE	
GENERAL FIRE BACKUP	
GENERAL FIRE BACKUP RESTORE	
NORMAL DIALER TEST	
ABNORMAL DIALER TEST	

Figure 2-10: MODCOM Receivers Properties Dialog Box.

For our example we selected the DACT Setting for NFPA compliance. Note that a NFPA Compliant notation appears in this dialog box's title. If the Fully Programmable mode would have been selected the NFPA Compliant notation would not be present.

Creating a Receiver Label and Description

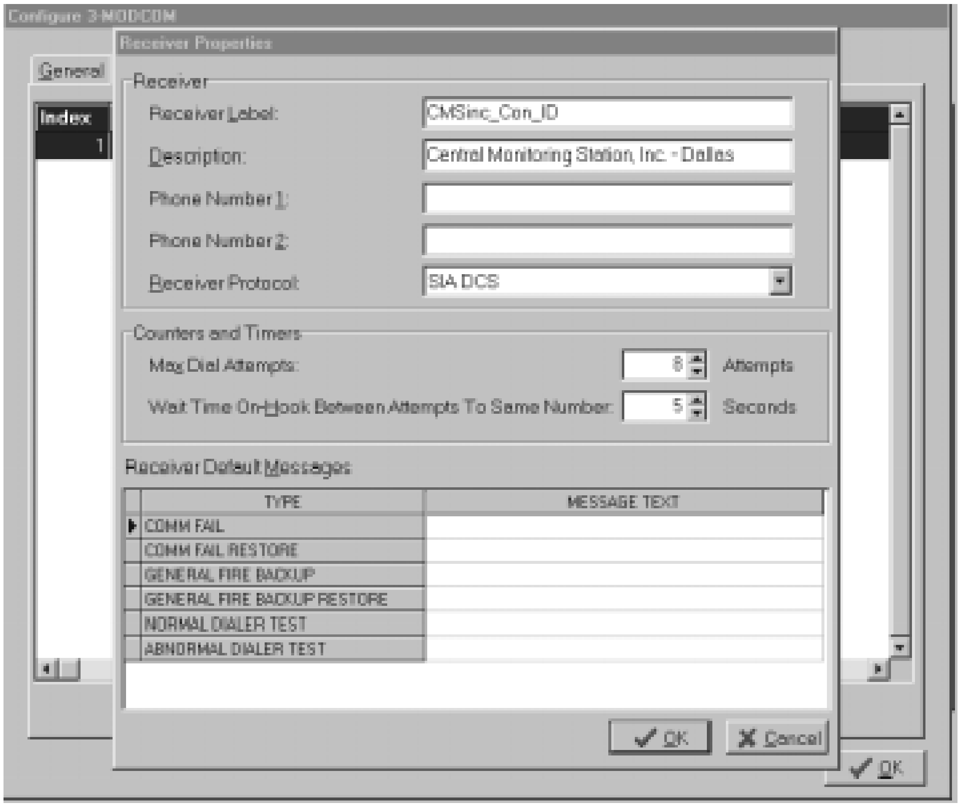
The Receiver Label is simply a naming convention you will refer to when configuring premises accounts and on reports. Each label will be unique based on your specific application. For example it may be a good idea to identify the Central Station provider as a modifier within this label.

In the case where several receivers are used with different protocols, you may opt to include a modifier to specify the specific receiver protocol used.

What's important here is that you create a unique label that helps you to easily identify each receiver's function and Central Station identification. During operation the MODCOM will identify a Central Station receiver by the phone number(s) you enter into this dialog box. The critical information to the Central Station will be the unique premises Account labels you assign to report to each receiver.

The Receiver Description is a text only field that you can use for engineering annotations. Here you may want to spell out abbreviations used in the corresponding label or other information you feel is pertinent to the receiver.

In the example of Figure 2-11 we have labeled the receiver CMSinc**_Con_ID**, specifying the Central Station Provider and the Protocol used. In the description field we entered **Central Monitoring Station, Inc – Dallas**, spelling out the Central Station provider's name and giving its city location.



Receiver

Receiver Label: CMSinc_Con_ID

Description: Central Monitoring Station, Inc - Dallas

Phone Number 1:

Phone Number 2:

Receiver Protocol: SIA DCS

Counters and Timers

Max Dial Attempts: 8 Attempts

Wait Time On-Hook Between Attempts To Same Number: 5 Seconds

Receiver Default Messages:

TYPE	MESSAGE TEXT
COMM FAIL	
COMM FAIL RESTORE	
GENERAL FIRE BACKUP	
GENERAL FIRE BACKUP RESTORE	
NORMAL DIALER TEST	
ABNORMAL DIALER TEST	

Figure 2-11: Example Receiver Label and Description.

Configuring Receiver Phone Numbers and Protocol.

The remaining receiver properties to be configured are the primary and secondary Central Station phone numbers and the protocol to be used for event reporting.

Phone Number 1 is the Central Station's primary phone number dialing string. This is generally the first phone number in the receiver rotary hunt group for the Central Station. To enable the MODCOM to automatically dial the Central Station receiver, this dialing string must contain all the digits required to call out of the protected premises and connect to the Central Station via the TELCO lines being used.

This dialing string must include the number being called and may include:

- **Access Codes** such as 9 and/or 1 to call out of the premises and connect to a TELCO phone line.
- **Country Codes** when they do not require operator intervention for international calls.
- **3-Digit Area Codes** when required for calls to a Central Station out of the premises area.
- *** and #** if required in the dialing sequence.

Commas (**,**) may be included in the dialing string to add a pause of 6 seconds during the dialing sequence. Hyphens (**-**), spaces, and left and right brackets (**[** and **]**) may be used to make the dialing string more visually appealing without affecting the dialing sequence.

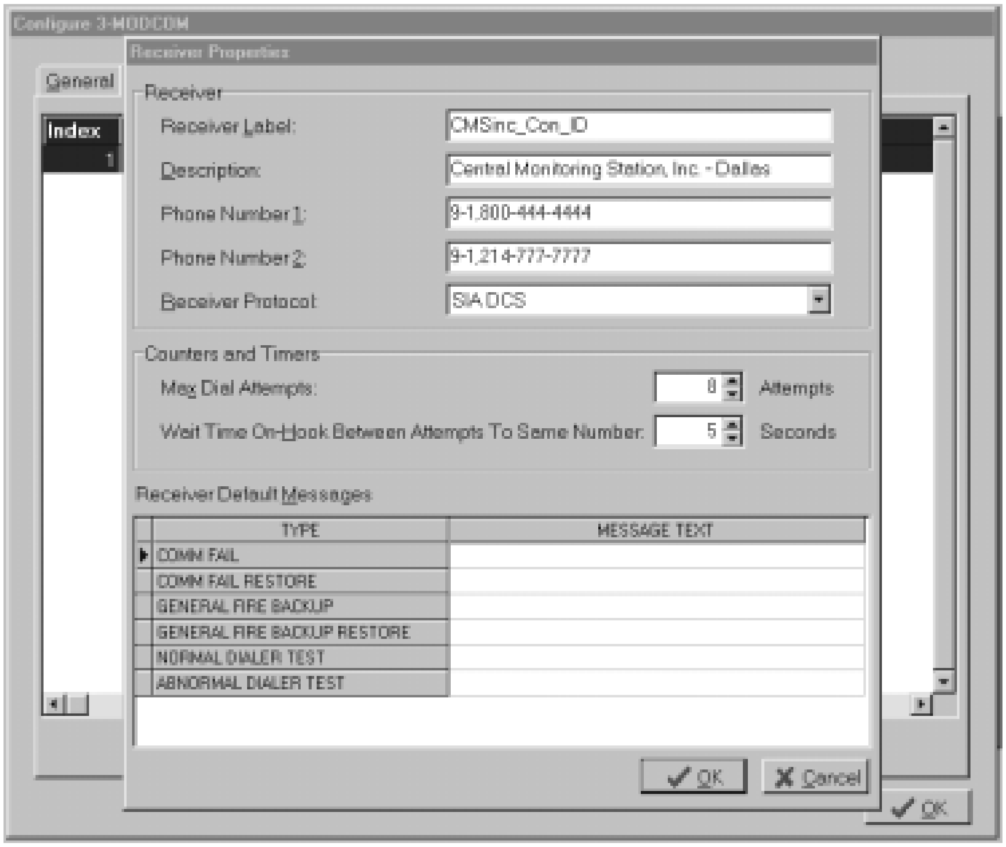
Remember that **TONE** is the default for the dialing mode for MODCOM communications. If you wish to switch to **PULSE** dialing, simply enter a **P** to the dialing string. If you wish to return to TONE later in the dialing sequence, simply add a **T** to the dialing string. You can easily switch between dialing methods by inserting **P** and **T**.

CAUTION: When entering a phone number for a receiver configured to use the TAP protocol, use a number from the carrier's modem pool not the pool of dial-up touch-tone numbers.

Phone Number 2 is the Central Station's secondary phone number dialing string. This is generally the second phone number in the receiver rotary hunt group for the Central Station.

Note: Using a secondary phone number, which is the second number in a rotary group, overcomes the inability of a rotary phone system to function, if the primary telephone fails.

All characteristics described for Phone Number 1 apply to this secondary phone number dialing string. Figure 2-12 illustrates primary and secondary dialing strings entered for a Central Station provider that is out of the premises normal calling area and required Access Codes to connect to the TELCO carrier's phone lines.



Receiver Label: CMSinc_Con_ID

Description: Central Monitoring Station, Inc. - Dallas

Phone Number 1: 9-1,800-444-4444

Phone Number 2: 9-1,214-777-7777

Receiver Protocol: SIA DCS

Max Dial Attempts: 8 Attempts

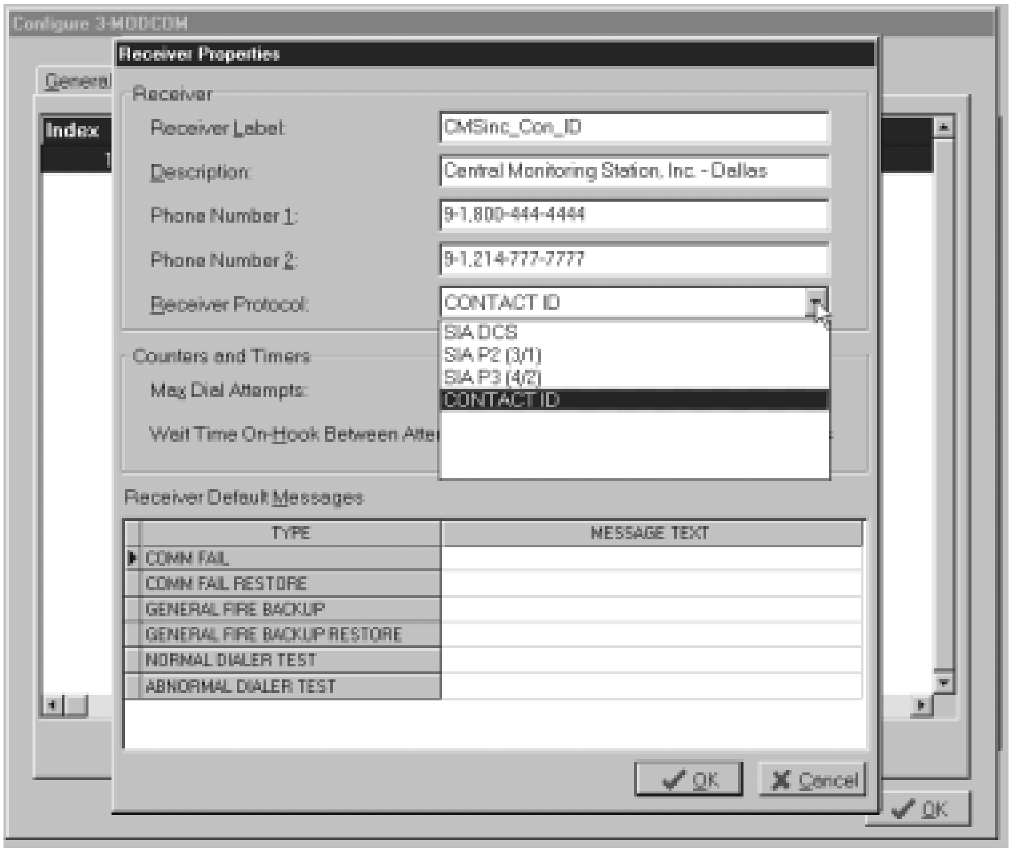
Wait Time On-Hook Between Attempts To Same Number: 5 Seconds

Receiver Default Messages

TYPE	MESSAGE TEXT
COMM FAIL	
COMM FAIL RESTORE	
GENERAL FIRE BACKUP	
GENERAL FIRE BACKUP RESTORE	
NORMAL DIALER TEST	
ABNORMAL DIALER TEST	

Figure 2-12: Entering Primary and Secondary Phone Numbers.

The last receiver property that needs to be configured is **Receiver Protocol**. Selecting the desired protocol for a receiver is a simple a matter of clicking on this field's down-arrow and selecting the appropriate protocol as shown in Figure 2-13. Note that the available protocols for our example are **SIA DCS**, **SIA P2 (3/1)**, **SIA P3 (4/2)** and **CONTACT ID**. This is due to the fact that we are configuring the 3-MODCOM in our example project. When a 3-MODCOMP is being configured the **TAP** protocol is also listed for pager operations. For our example we will select **CONTACT ID**.



Receiver Label: CMSinc_Con_ID

Description: Central Monitoring Station, Inc. - Dallas

Phone Number 1: 9-1,800-444-4444

Phone Number 2: 9-1,214-777-7777

Receiver Protocol: CONTACT ID

Receiver Default Messages

TYPE	MESSAGE TEXT
COMM FAIL	
COMM FAIL RESTORE	
GENERAL FIRE BACKUP	
GENERAL FIRE BACKUP RESTORE	
NORMAL DIALER TEST	
ABNORMAL DIALER TEST	

Figure 2-13: Selecting the Receiver’s Protocol..

To set the Receiver’s Timer and Counter

The Receiver Properties Dialog box provides a configurable **Max Dial Attempts** counter and a **Wait Time On-Hook Between Attempts To Same Number** timer.

The **Max Dial Attempts** counter is set for the maximum number of times the MODCOM will attempt to contact a specific Central Station receiver if no handshaking is received on each attempt. The default is 8 attempts. UL limits the number of attempts allowed to a range from 5 to 10 attempts. Generally, the default setting is sufficient. When the maximum attempts count is reached a trouble pseudo point is sent to the host EST3 system’s 3-CPU11 and 3-LCD.

Note: You will need to check with the Central Station and local authority if a variance is required outside of the recommended UL requirements.

For our example we will use the default count.

The **Wait Time On-Hook Between Attempts To Same Number** timer is set for the time the MODCOM must stay On-hook (Wait) between attempts to the same receiver phone number. The default for this timer is 5 seconds. The acceptable range of wait times is from 5 to 120 seconds. Again, the default time is generally sufficient.

Note: This timer value may change when multiple receivers are configured for the MODCOM due to varying Central Station and/or TELCO carrier requirements.

When a second call is made to the same receiver phone number, this time is compared to the **Calling Party Disconnect** time and the greater of the two is used as the wait time.

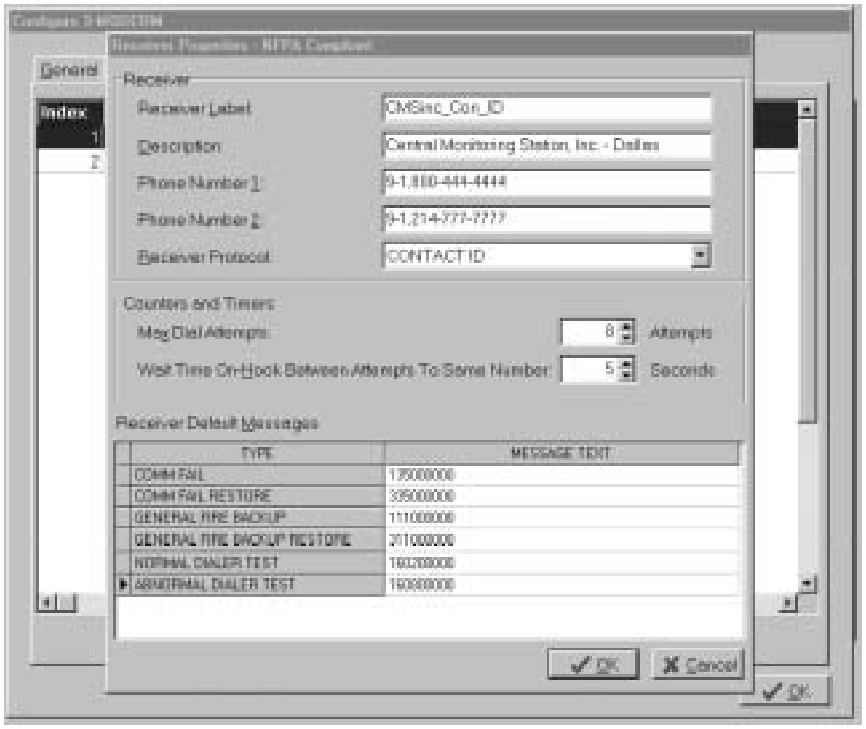
For our example we will use the default time.

To set the Receiver Default Messages.

The last of the receiver properties to be configured are the **Receiver Default Messages**. These messages will vary based on the protocol selected for communication to the Central Station receiver. For our example we will use Contact ID on a General reporting basis. Simply enter the appropriate Contact ID code to be sent to the Central Station for the six types of messages as shown in Figure 2-14.

The Contact ID protocol messages used in our example are explained in detail in Module 3 of this self-study course. The actual coded event messages reported to the Central Station can vary greatly based on specific Central Station protocol requirements and the level of reporting required (general, zoned or point ID). Details for creating the required coded messages for the various protocols and applications are given in Module 3 and in the SDU’s onboard **HELP utility**.

As you can see, the MODCOM products are very versatile, enabling you to support an almost unlimited variety of dialer applications in addition to Access Control and Keypad Display communications. Most MODCOM applications, however, can be configured in a matter of minutes by taking advantage of the built-in defaults and conventions given in the SDU’s **HELP utility**.



Configure 3-MODCOM

Receiver Properties - NFPA Compliant

Receiver

Receiver Label: CMSinc_Con_ID

Description: Central Monitoring Station, Inc. - Dallas

Phone Number 1: 9-1,800-444-4444

Phone Number 2: 9-1,214-777-7777

Receiver Protocol: CONTACT ID

Counters and Timers

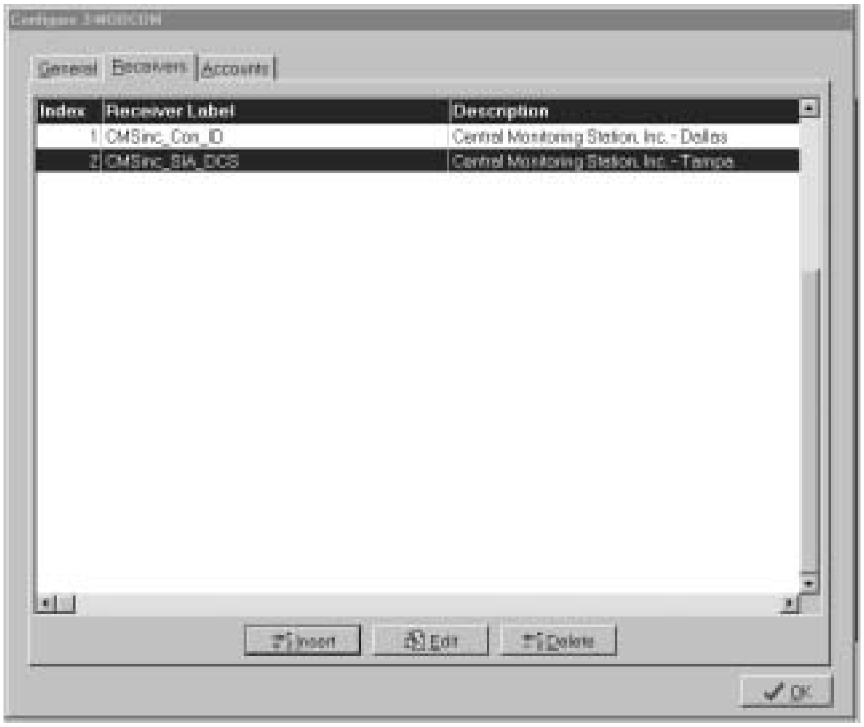
Max Dial Attempts: 8 Attempts

Wait Time On-Hook Between Attempts To Same Number: 5 Seconds

Receiver Default Messages

TYPE	MESSAGE TEXT
COMM FAIL	135000000
COMM FAIL RESTORE	335000000
GENERAL FIRE BACKUP	111000000
GENERAL FIRE BACKUP RESTORE	311000000
NORMAL DIALER TEST	160200000
ABNORMAL DIALER TEST	160800000

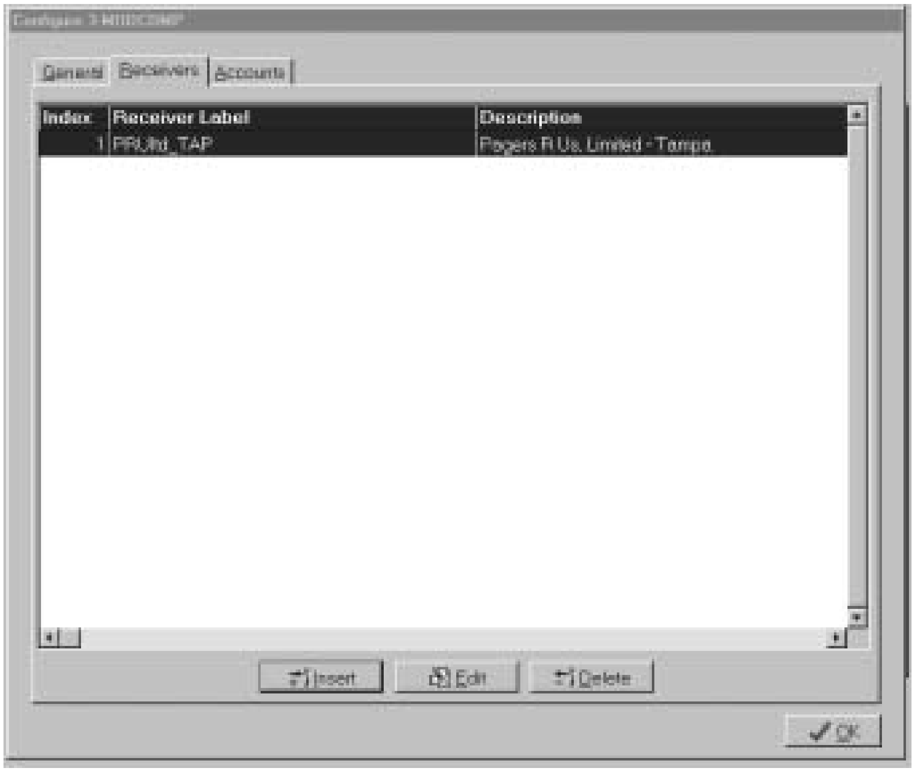
Figure 2-14: Entering Receiver Default Contact ID Messages.



Configure 3-MODCOM

Index	Receiver Label	Description
1	CMSinc_Con_ID	Central Monitoring Station, Inc. - Dallas
2	CMSinc_SIA_DCS	Central Monitoring Station, Inc. - Tampa

Figure 2-15: 3-MODCOM with two Receivers.



Index	Receiver Label	Description
1	PRUltd_TAP	Pagers R Us, Limited - Tampa

Figure 2-16: 3-MODCOMP with one Receiver using TAP Protocol.

For our example project, lets configure two MODCOM receivers for the Central Monitoring Station, Inc. provider, one for Contact ID and the other for SIA DCS protocols as shown in Figure 2-15. Also, lets configure the Pagers R Us MODCOMP for one receiver using the TAP protocol for a pager application as shown in Figure 2-16.

Before you continue with this lesson to configure the premise accounts take this opportunity to practice what you have learned using your practice project in the 3-SDU. This lesson stepped you though the configuration process for the first Central Station receiver of the 3-MODCOM. Practice configuring this MODCOM's second receiver (Figure 2-15) and the TAP protocol receiver of the 3-MODCOMP (Figure 2-16).

Configuring MODCOM Account Properties

After you have completed configuring the receivers for your application you should establish the premises accounts. Remember that each MODCOM can support up to 255 accounts reporting to up to 80 receivers. This is the point in the process where you link each premises account to its corresponding Central Station receiver and incorporate the relevant user ID or account number into the database.

To configure the MODCOM premises accounts select the **Accounts** tab and observe that the **Accounts Tab** appears without any accounts configured as shown in Figure 2-17.

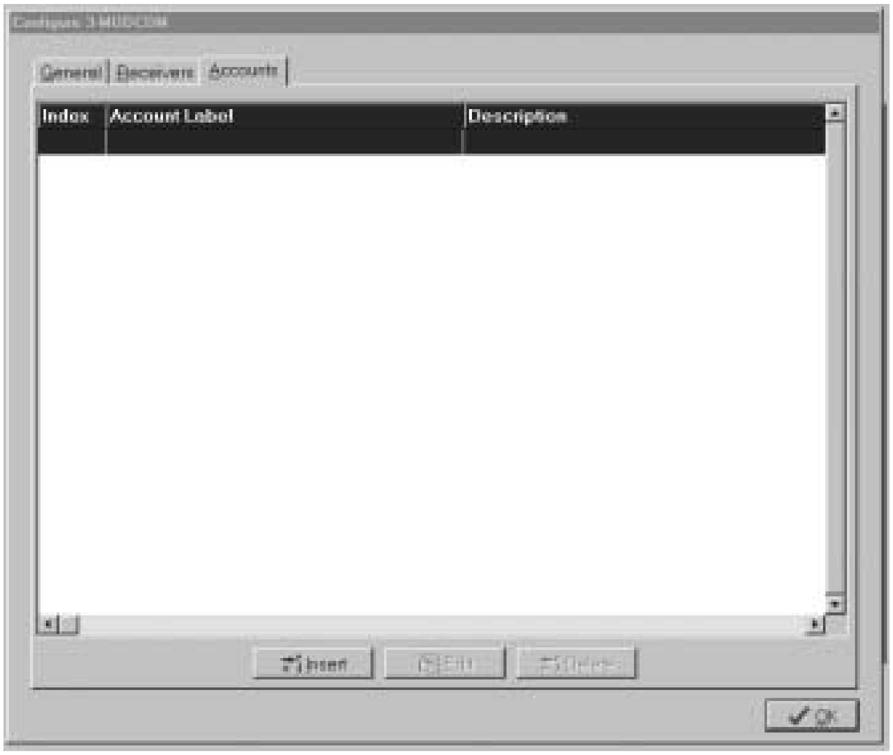
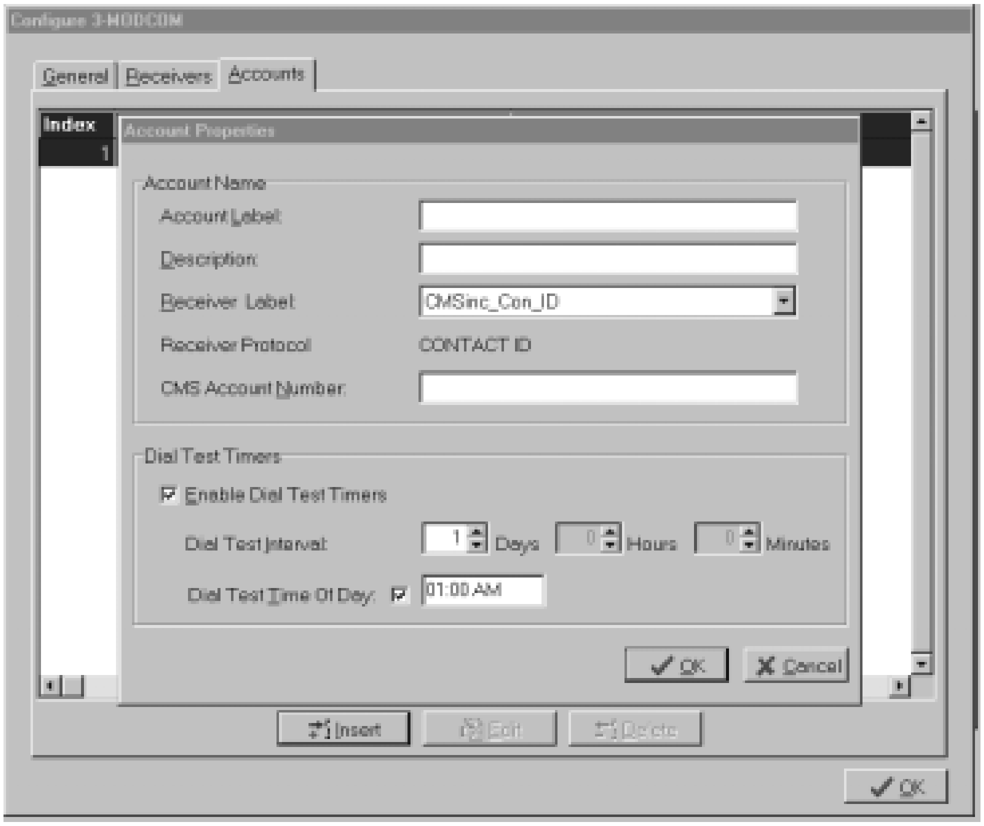


Figure 2-17: MODCOMP Accounts Dialog Box.

As you can see in Figure 2-17, the Accounts tab enables you to insert an account, delete an account you have previously inserted or edit an account’s properties.

Once an account is inserted you will need to create a label for it and generate a meaningful text message description.

When you insert an account, the **Account Properties** dialog box is displayed as shown in Figure 2-18. This dialog box is displayed for each account you define for the MODCOM being configured.



Account Name

Account Label:

Description:

Receiver Label: CMSinc_Con_ID

Receiver Protocol: CONTACT ID

CMS Account Number:

Dial Test Timers

☑ Enable Dial Test Timers

Dial Test Interval: 1 Days 0 Hours 0 Minutes

Dial Test Time Of Day: ☑ 01:00 AM

Index 1

Figure 2-18: MODCOMP Account Properties Dialog Box.

Creating an Account Label and Description.

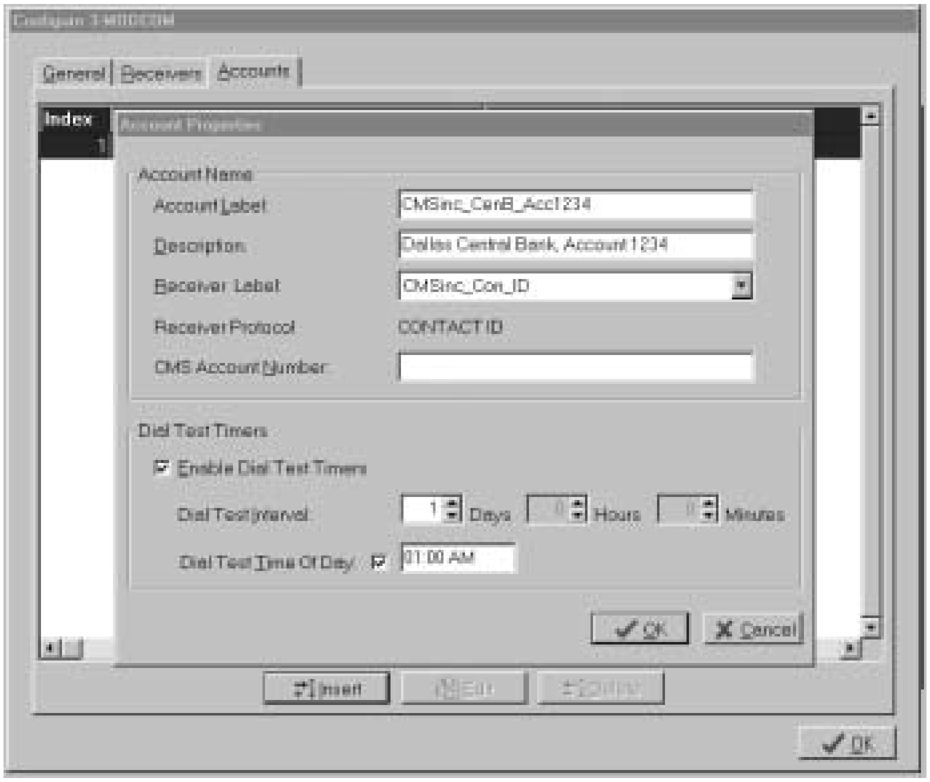
The Account Label is the naming convention you create to identify each individual premises account, which reports event status messages to the Central Station receiver. The content of this label can be critical to effective development of your project.

This label should be unique, based on your application, giving premise location, Central Station and user ID account designation information. Most importantly, this label will be used in the send commands of your rules to initiate event reporting to the Central Station.

What’s important here is that this label helps you and the Central Station to easily identify each account user, and the account number. Also important is that this label is easy to incorporate into your rules program.

The Account Description is a text-only field that you use for engineering annotations. Here you may spell out any abbreviations used in the label. This description will be printed out on the report you send to the Central Station and must contain information relevant to Central Station personnel.

In the example of Figure 2-19 we have labeled the Account **CMSinc_CenB_Acc1234**, specify the Central Station provider, the Customer and the customer account number provided by the Central Station. In the description field we have entered **Dallas Central Bank, Account 1234**, spelling out the protected premises customer name, customer location and relevant account number.



Account Name

Account Label: CMSinc_CenB_Acc1234

Description: Dallas Central Bank, Account 1234

Receiver Label: CMSinc_Con_ID

Receiver Protocol: CONTACT ID

CMS Account Number:

Dial Test Timers

☑ Enable Dial Test Timers

Dial Test Interval: 1 Days 0 Hours 0 Minutes

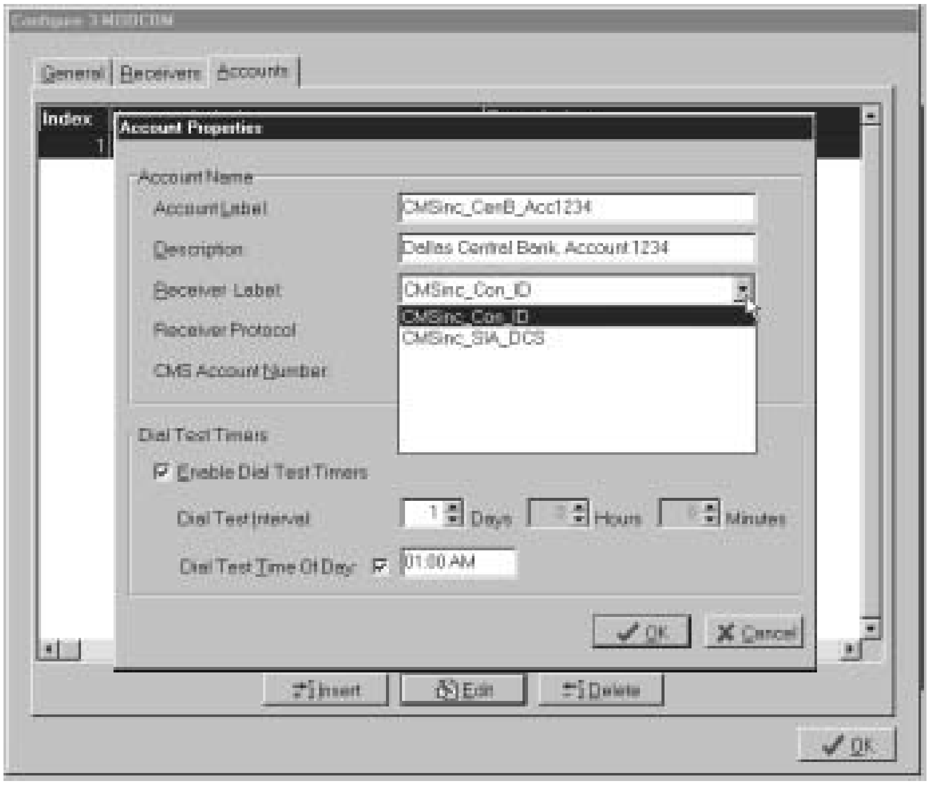
Dial Test Time Of Day: ☑ 01:00 AM

Figure 2-19: Example Account Label and Description.

Selecting the Receiver, its Protocol and entering the Central Station Account Number.

The next step in configuring an account is to link it to the appropriate Central Station Receiver it is to report to. This is simply done by clicking on the receiver label down-arrow and selecting the appropriate receiver from the previously configured MODCOM receivers.

For our example shown in Figure 2-20, lets select the **CMSinc_Con_ID** receiver we configured in the Receiver Properties dialog box. Observe that the previously configured protocol for this receiver is displayed. If we had selected the **CMSinc_SIA_DCS** receiver, the SIA DCS protocol would have been displayed.



Account Label: CMSinc_CenB_Acc1234

Description: Dallas Central Bank, Account 1234

Receiver Label: CMSinc_Con_ID

CMSinc_Con_ID
CMSinc_SIA_DCS

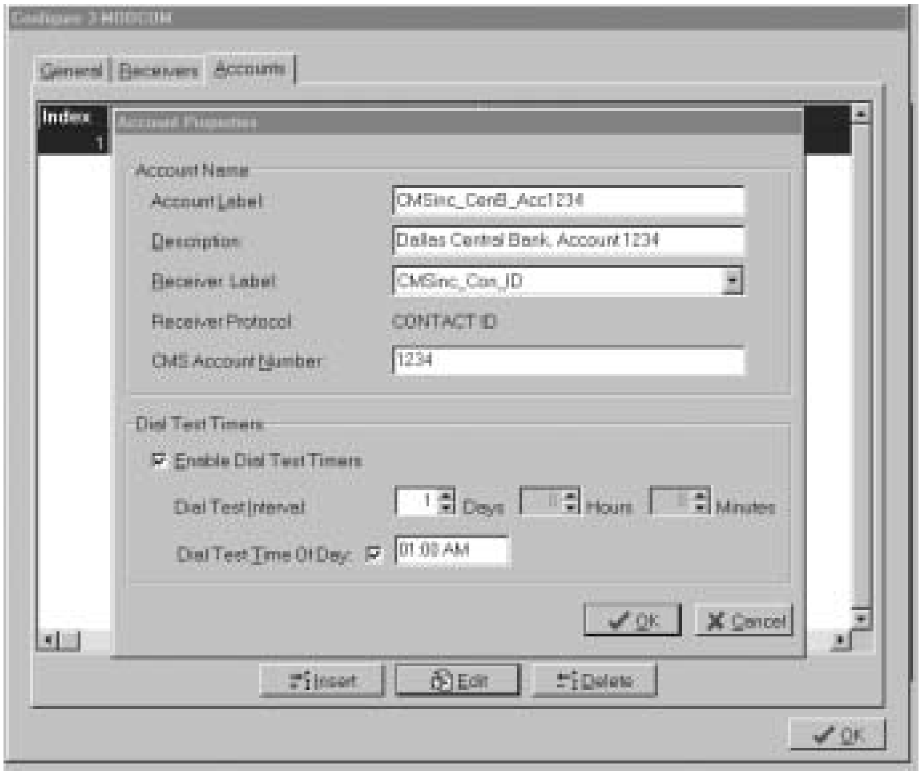
☑ Enable Dial Test Timers

Dial Test Interval: 1 Days, Hours, Minutes

Dial Test Time Of Day ☑ 01:00 AM

Figure 2-20: Selecting the accounts Central Station Receiver.

The CMS Account Number is a 3- or 4-digit customer ID number assigned by and obtained from the Central Station provider. This is the actual coded client account number sent to the Central Station when reporting event status messagesa. As shown in Figure 2-21, we have determined from the Central Station that the premise client account number is **1234**.



Account Name

Account Label: CMSinc_CenB_Acc1234

Description: Dallas Central Bank, Account 1234

Receiver Label: CMSinc_Con_ID

Receiver Protocol: CONTACT ID

CMS Account Number: 1234

Dial Test Timers

☑ Enable Dial Test Timers

Dial Test Interval: 1 Days, Hours, Minutes

Dial Test Time Of Day: ☑ 01:00 AM

Figure 2-21: Entering the Premises Client Account Number.

Setting the Dial Test Timer Properties.

If you selected a DACT setting of **NFPA 72 Compliant** under the General tab, the timer function is defaulted to **Enabled Dial Test Timers** selected (✓), with a **Dial Test interval** of 1 Day. These properties can not be changed in the NFPA 72 compliant mode. However, the **Dial Test Time Of Day** timer is selectable and should be set in conjunction with the Central Station providers requirements.

When **Fully Programmable** is selected on the **General** tab, you can unpick the **Enable Dial Test Timers** check box. The fully programmable mode also enables you to change the **Dial Test Interval** and the **Dial Test Time Of Day** settings.

CAUTION: Take care when using the fully programmable mode. Check with you local authority before configuring any variance from NFPA requirements for Fire and Security applications.

The **Dial Test Time Of Day**, when selected (✓), makes the Dial Test time specific (01:00 AM shown). When not selected, the Dial Test tome is relative, initiating a periodic Dial Test as each interval times out. In that, when not selected, any transmission from this account presets the dialer test interval timer to the value specified by the **Dial Test Interval**.

Any alarms or troubles that occur during the day do not change the specified dialer test time.

In Security and Access Control applications, involving opening and closing signals, the **Dial Test Time Of Day** function should not be selected (relative timing). In this way, the test signal timer is reset by any off-premises transmission, including opening and closing signals. This makes the off-premises transmission act as the test signal, minimizing test traffic to the Central Station.

CAUTION: Do not select the relative timing test option (time of day not selected) for fire-only applications. To do so causes the periodic test signal transmission to occur during the open period, disrupting any alarm, trouble or other signal traffic that may occur during the day.

In practice, you would continue this process configuring the premises accounts and linking then to the relevant Central Station receivers. Take this opportunity to configure additional accounts for the three receivers in your practice project.

Module 2 evaluation

This concludes Module 2 of the *3-MODCOM Self-Study Course.* Return to the objectives stated at the beginning of this module. Study them carefully to ensure that you are comfortable with each objective. If not, return to that section and review it. When you are satisfied, proceed to Module 3. You will be tested at the end of this self-study course.

Module 3

MODCOM Communication Protocols

Summary

This self-study module defines each of the 3-MODCOM and 3-MODCOMP protocols used in dialer applications. This module describes and gives examples of the configuration and programming procedures required to build and subsequently transmit event messages to a Central Station or Paging Service.

Content

Introduction to module 3

This module provides a detailed description of the five protocols used for 3-MODCOM and 3-MODCOMP dialer applications. Also covered are example rules which build and send the required event messages to a Central Station or Paging Service provider.

This self-study will focus on basic fire-only applications using the Contact ID protocol, which is the prevalent fire application that use the MODCOM. Although discussed in this course, the more sophisticated Security, Access Control and Keypad display MODCOM applications are covered in the factory based EST3 Synergy Enabled® Certification Course.

Review the Programming a MODCOM, SIA and Contact ID codes, SIA substitution strings, TAP substitution strings and Programming Examples topics in your 3-SDU, Version 3.0 Online **HELP Utility**. You can get the **HELP utility** through the 3-SDU or on your Online Support Tools CD, release 4.0 or later.

Associated study

Use the following technical reference manuals as associated study material for this module:

- *EST3 Installation and Service Manual, (*P/N 270380, Rev 4.0 or later)
- *Modem Communicator 3-MODCOM/3-MODCOMP Installation Sheet*, (P/N 387476)

Key items

Key points to look for:

- Supported MODCOM protocols
- Configuring Event Types and Codes
- Building event messages
- Using the SEND Command
- Using Substitution Strings
- Help Utility Templates
- CMS Messaging Reports
- Receiver Default Messages

Key terms to learn:

- Contact ID protocol
- SIA DCS protocol
- SIA P2 (3/1) protocol
- SIA P3 (4/2) protocol
- TAP protocol
- Event Qualifier
- Event Code
- SEND Command
- Substitution Strings
- KISSOFF Tone

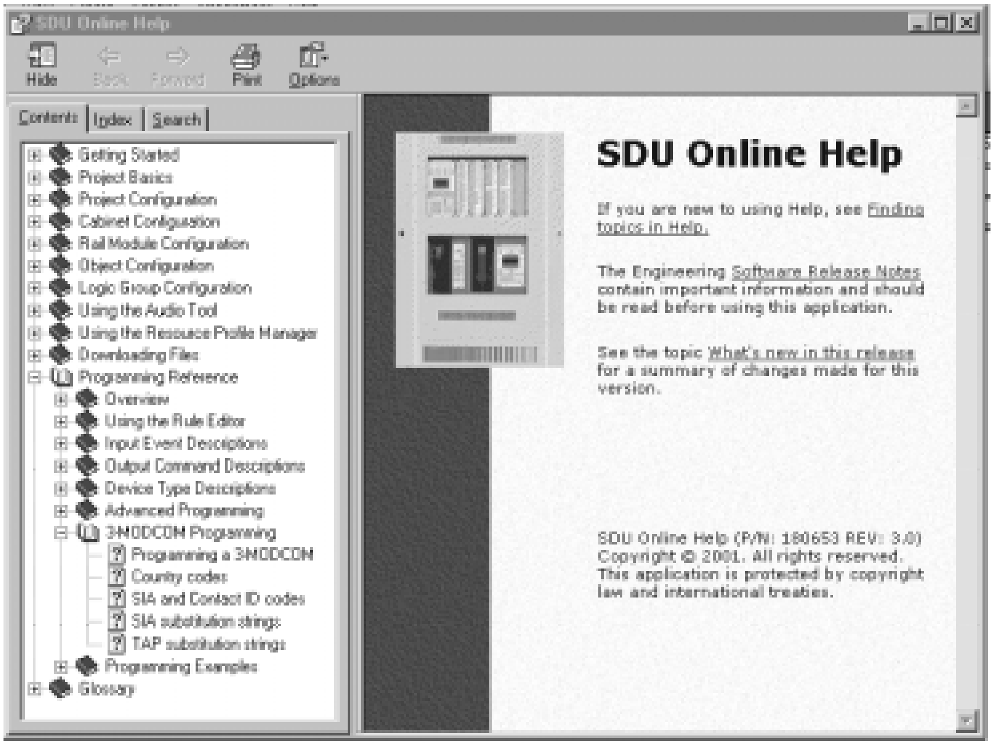
Objectives

Upon completion of this module you will be able to:

1. Describe the parameters, structure and application of the protocols supported by both MODCOM types.
2. Write rule output statements which build and send the event messages to a Central Station and/or a Paging Service.

Supported Message Protocols

Review the Programming a MODCOM, SIA and Contact ID codes, SIA substitution strings, TAP substitution strings and Programming Examples topics in your 3-SDU, Version 3.0 HELP Utility. You can get the HELP utility through the 3-SDU or on your Online Support Tools CD, release 4.0 or later.



SDU Online Help

If you are new to using Help, see Finding topics in Help.

The Engineering Software Release Notes contain important information and should be read before using this application.

See the topic What's new in this release for a summary of changes made for this version.

SDU Online Help (P/N: 180653 REV: 3.0)
Copyright © 2001. All rights reserved.
This application is protected by copyright law and international treaties.

Figure 3-1: Selecting SDU Online HELP.

As previously stated in Module 1 five protocols are available for MODCOM dialer message communications. These are:

- **Contact ID**: 3-MODCOM and 3-MODCOMP.
- **SIA DCS**: 3-MODCOM and 3-MODCOMP.
- **SIA P2 (3/1)**: 3-MODCOM and 3-MODCOMP.
- **SIA P3 (4/2)**: 3-MODCOM and 3-MODCOMP.
- **TAP**: 3-MODCOMP only.

The most commonly used protocol for event reporting for Fire Alarm to a Central Station is Contact ID.

This self-study module will focus on Contact ID and fire only applications. Also, most applications will require general event reporting as defined in Module 1. This lesson also focuses on these basic applications for the MODCOM. The more advanced Security, Access Control and Zone/Point Event Reporting applications are covered in detail in the factory-based EST3 Synergy Enabled® Certification Course.

The protocol established for each Central Station receiver configured for a MODCOM is determined by the specific Central Station provider and customer premises requirements.

Note: The SDU Online **HELP utility** is a very useful tool to use during the process of configuring and programming a MODCOM. Not only does this utility give descriptions of the processes, it also provides a template of the standard EST3 protocol coded messages and example MODCOM rules. Remember that you can copy information from the **HELP utility**, paste it into your SDU rules editor and edit it to fit your application. By using the default MODCOM properties and the **HELP utility** in this way, most MODCOM applications can be configured and programmed in a matter of minutes.

The actual configuration and programming for MODCOM applications can vary greatly depending on the type of premises application (fire only to fully integrated), each specific Central Station's protocol requirements, TELCO services provided and other premises requirements. It would be unrealistic to attempt to cover every variation a MODCOM application may have in this self-study course. This course will focus on basis applications and techniques you would use to develop your specific application.

In this module we will discuss the various message protocols supported by the MODCOM dialer for event message reporting to a Central Station.

Contact ID Coded Messages

Contact ID is the most frequent protocol used by Central Stations for fire applications. The entire message in this protocol is composed of hexadecimal coded messages. Contact ID utilizes the modified hexadecimal conventions required by the TELCO carriers shown in Figure 1-10 of Module 1.

This modified hexadecimal coded message can contain:

- User Account Number
- Event Qualifier
- Event Code
- Partition(for Access Control and Security Applications) or Zone ID Code
- Point, device or object ID Code.
- User ID for Security/Access applications.

To better understand the Contact ID protocol lets breakdown the information sent to the Central Station in this coded message. The 16-digit Contact ID format used for EST3 MODCOM applications is:

ACCTMTQEEEGGPPPS

Where:

- **ACCT** is the hexadecimal 3- or 4-digit user account number. This account code is included in the message sent to the Central Station by including the account label in the SEND command statement used to initiate the communications to the Central Station. This account label is created during the configuration process.

  For example: **SEND 'Account_Label'**
- **MT** is a hexadecimal 2-digit message type code automatically sent by the MODCOM to the Central Station specifying the protocol used. For Contact ID this code is **18**.
- **Q** is a 1-digit event qualifier code that specifies the type of event being reported. Where:
  - ✓ 1 is a new event activation or an opening.
  - ✓ 3 is a new event restoration or a closing.
  - ✓ 6 is a previously reported event condition (Status) which is still present.

- **EEE** is a 3-digit event code that specifies the actual event that is being reported. Such as, a Fire Alarm (110), a supervisory (210), a trouble (310), etc.
- **GG** is a 2-digit group number code that specifies which predefined partition or group the event occurred in. Using **00** indicates that no group is being specified. Up to 255 groups may be identified by this 2-digit hexadecimal code.
- **PPP** is a 3-digit point ID code that specifies the actual point, device or object that is being reported. Using **000** indicates that no specific point is being reported. Up to 3,375 points may be identified by this 3-digit hexadecimal code.
- **S** is a 1-digit checksum code automatically sent by the MODCOM to the Central Station to verify communications.

A single substitution string may be used in Contact ID to incorporate the User ID into this message. In this case, the message field in the output command would be **"QEEEGG$(USER)"**. Where the USER ID code is sent in the 3-digit point ID field (**PPP**).

Note: In some Security and Access Control applications this may be a 20-digit format where the user ID may be included.

In either case, the User ID is created in the Access Control Database and is the pin number for individuals initiating events, such as gaining access to the protected premises.

CAUTION: All activation event coded messages must have a restoral message. In fire applications all new event activation messages sent must also send a restoral message before the protected premise is considered to be in a normal state.

Figure 3-2 shows an example of creating the coded Contact ID message for a fire alarm. In this example we have previously configured the system for event reporting on a point basis. We have configured an account label (**Account_Label**) and entered a CMS account number of **1234**.

In our example device 15 of zone 1 went into alarm. Device 15 could be a smoke detector, a heat detector, a manual pull station or a waterflow switch. We have already configured the account number to be sent to the Central Station. The message type (MT) is automatically sent by the MODCOM, which is an **18** for our Contact ID example.

Since this is an initial activation, the event qualifier is **1**. Then from the template in the **HELP Utility** we have determined that the event code for a fire alarm is **110**. Since we have configured our system into logical groups the group code for the alarm point is **01**. Point 15 in this group went active making the device code for this alarm point **015**. The checksum for this message is calculated (**1**) and automatically sent by the MODCOM.

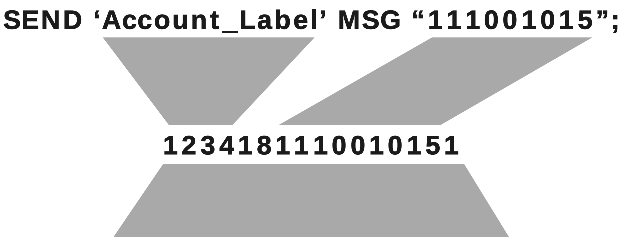
Account 1234 is reporting a Fire Alarm for device 15 of zone 1

Where 1234, 15 and 1 are hexidecimal integers.

Contact ID format breakdown for this example

Account Number	Message Type	Event Qualifier	Event Code	Group Code	Device Code	Checksum
ACCT	MT	Q	EEE	GG	PPP	S
1234	18	1	110	01	015	1

You would write the following output command in your rule to initiate this event’s communications to the Central Station .



```
SEND ‘Account_Label’ MSG “111001015”;
```

```
12341811100101 51
```

Actual Code sent to Central Station

Where the **MT** and **S** codes are automatically generated by the MODCOM.

Figure 3-2: Contact ID Coded Message Example.

You must write a rule to report this event to the Central Station. This example shows the Output Statement that must be included in the rule to send the appropriate hexadecimal coded message. The **SEND** command is used to initiate this communication to the Central Station.

You include the Account label within single quotation marks (**‘Acount_Label’**) in this output statement. This automatically sends the 3- or 4-digit CMS account number (**1234**) as the first 4 digits of the coded message. The MODCOM automatically sends the message type (**18**) based on the protocol type you configured for the Central Station receiver.

The remainder of the coded message you are responsible for must be included in this output statement as the message. To do this you would enter **MSG** into your output statement followed for the remainder of the message enclosed in double quotation marks (**"QEEEGGPPP"**), which sends the next part of the coded message (**111001015**). The last integer sent is the checksum (**1**), which is automatically sent by the MODCOM.

Note: A Numerical or Hexadecimal Operator (**<N>** or **<H>**) could be used in the message field to calculate the **GGPPP** value to be sent.

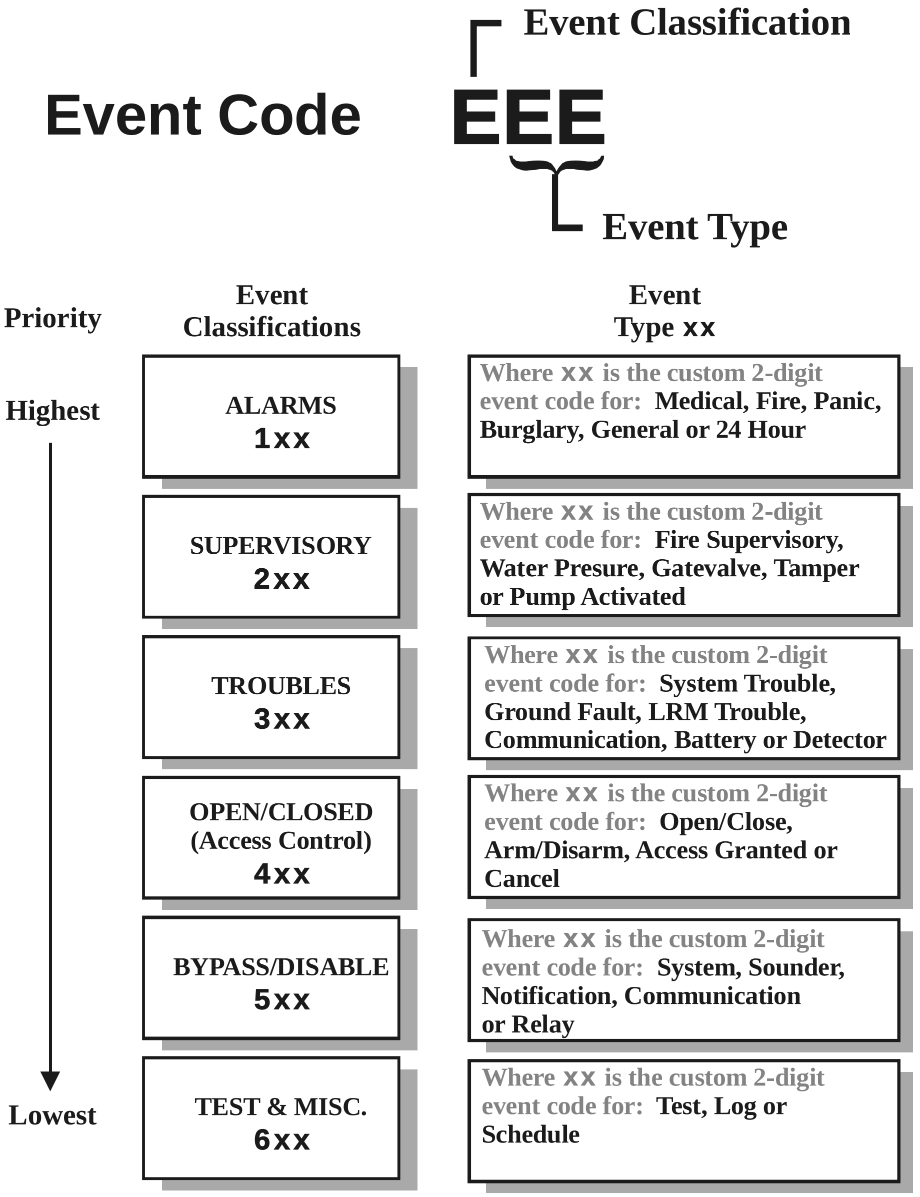
The event code of this message contains valuable information for the Central Station. In MODCOM dialer applications a broad variety of events of different types may be reported to the Central Station.

Figure 3-3 defines the structure of the 3-digit event code part of the message sent to the Central Station. The first integer of the event code is the event classification shown in the order of reporting priority. Where 1 is alarm, 2 is supervisory, 3 is trouble, and so on.

The 2-digit event type gives the type of event being reported. For example, the event type would be **10** for fire and **30** for burglary. It should be easy to see that the 3-digit event code for a fire alarm would be **110** and the event code for a burglar alarm would be **130**.

If the event being reported is an initial activation, the 3-digit event codes are proceeded by a **1** (**1110** for fire and **1130** for burglary, respectively). A restoration event must be sent for each activation previously reported. In this case, the event code is proceeded by a **3** (**3110** and **3130**, respectively).

The last digit of the event code enables you to specify more specific event information to the Central Station. For example, a perimeter burglar alarm is **31**, an interior burglar alarm is **32**, an outdoor Burglar Alarm is **36**, and so on.



Priority	Event Classifications	Event Type xx
Highest	ALARMS 1xx	Where xx is the custom 2-digit event code for: Medical, Fire, Panic, Burglary, General or 24 Hour
	SUPERVISORY 2xx	Where xx is the custom 2-digit event code for: Fire Supervisory, Water Presure, Gatevalve, Tamper or Pump Activated
	TROUBLES 3xx	Where xx is the custom 2-digit event code for: System Trouble, Ground Fault, LRM Trouble, Communication, Battery or Detector
	OPEN/CLOSED (Access Control) 4xx	Where xx is the custom 2-digit event code for: Open/Close, Arm/Disarm, Access Granted or Cancel
	BYPASS/DISABLE 5xx	Where xx is the custom 2-digit event code for: System, Sounder, Notification, Communication or Relay
Lowest	TEST & MISC. 6xx	Where xx is the custom 2-digit event code for: Test, Log or Schedule

Figure 3-3: Event Code Definitions.

Figure 3-4 shows a small sample of the event codes used for EST3 applications for fire and burglar alarms. As you can see, if you wished to report a general fire alarm you would use an event code of **110**. To report the more specific smoke fire alarm event you would use **111**, and so on.

Specific 11x
Fire Alarm Event Codes

Fire (general)	110
Smoke	111
Combustion	112
Waterflow	113
Heat	114
Pull Station	115
Duct	116
Flame	117
Near Alarm	118

Specific 13x
Burglar Alarm Event Codes

Burglary (general)	130
Perimeter	131
Interior	132
24 Hour (Safe)	133
Entry/Exit	134
Day/Night	135
Outdoor	136
Tamper	137
Near Alarm	138
Intrusion Verifier	139

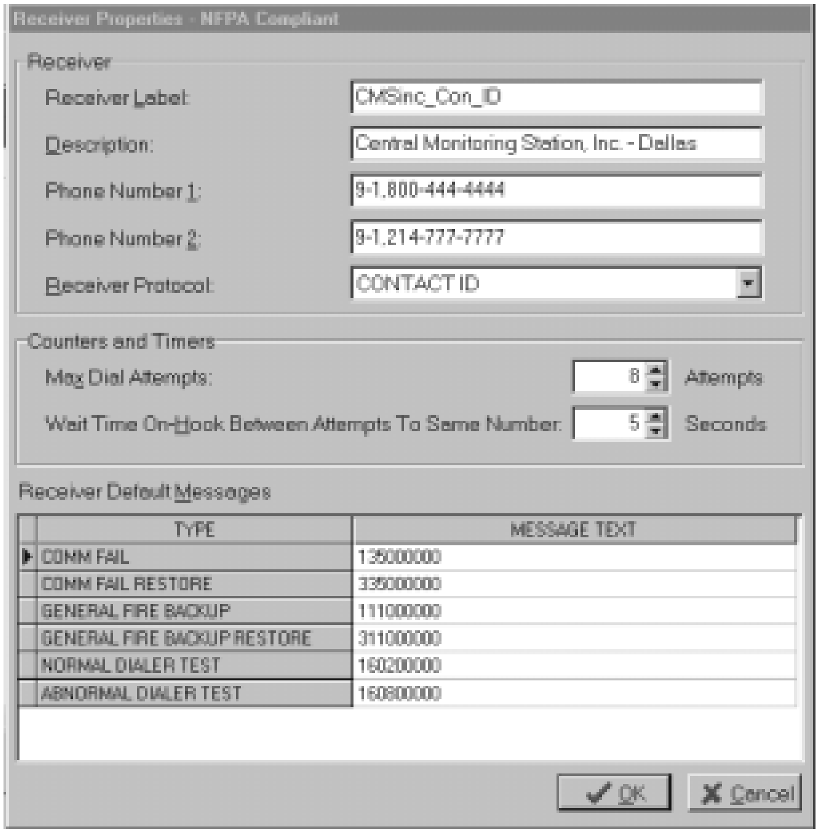
Figure 3-4: Sample Fire and Burglary Event Types.

The number of event code variations is extensive and the event codes you include in your applications will be based on the reporting requirements of the protected premises and the Central Station provider. The list of event codes is too extensive to list in this self-study course. A detailed template of the EST Contact ID Codes conventions and example applications are given in the SDU **HELP Utility**.

Note: In the rare case where the event code template provided in help is in conflict with the event code requirements for the Central Station and premises of your application, simply obtain a listing of the required codes and construct your coded messages accordingly to these requirements.

The values entered as the Group Code (**GG**) and Device Code (**PPP**) should be **00000** for General Reporting when the Central Station requires no group or point information. Enter **00000** also if at any time these fields contain useless information to the Central Station.

A good example where the **GGPPP** fields are **00000** is the practice example in Module 2 where we configured the six Receiver Default Messages shown in Figure 3-5. As you can see these are general default coded messages where group and device information is not desired. In all six cases the last five digits are 0s.



Receiver

Receiver Label: CMSinc_Con_ID

Description: Central Monitoring Station, Inc. - Dallas

Phone Number 1: 9-1.800-444-4444

Phone Number 2: 9-1.214-777-7777

Receiver Protocol: CONTACT ID

Counters and Timers

Max Dial Attempts: 8 Attempts

Wait Time On-Hook Between Attempts To Same Number: 5 Seconds

Receiver Default Messages

TYPE	MESSAGE TEXT
COMM FAIL	135000000
COMM FAIL RESTORE	335000000
GENERAL FIRE BACKUP	111000000
GENERAL FIRE BACKUP RESTORE	311000000
NORMAL DIALER TEST	160200000
ABNORMAL DIALER TEST	160800000

Figure 3-5: Default Contact ID coded messages with 0s in GGPPP fields.

The SDU provides a report utility that is accessible from its Main Menu bar. This report utility gives you the ability to print a **CMS Messaging Report** on an account-by-account basis. After you have completed the configuration process for the MODCOM and have established its receiver protocol messages, you should print these reports and send them to the Central Station for verification.

To print these reports, select **Reports** from the Main Menu and **CMS Messaging Reports** from the pull-down menu as shown in Figure 3-6.

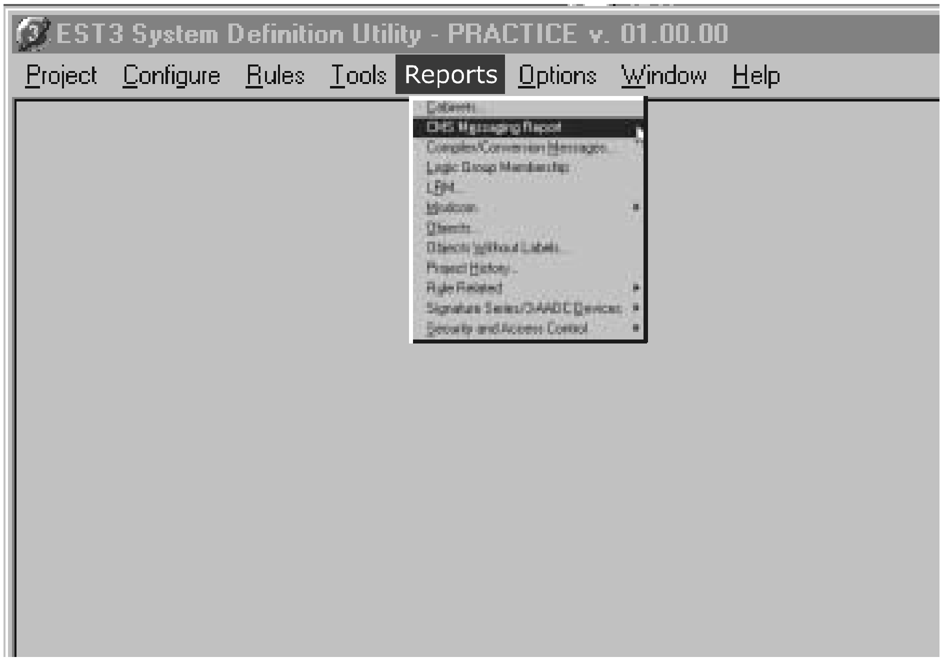
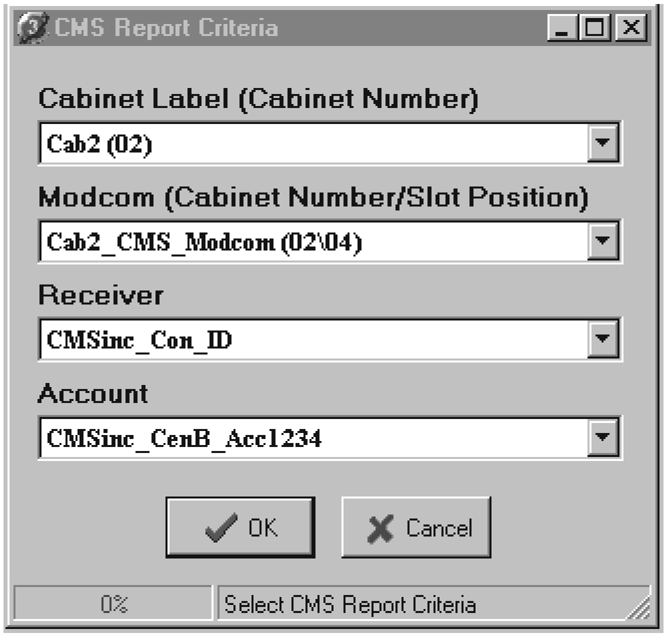

EST3 System Definition Utility - PRACTICE v. 01.00.00
Project
Configure
Rules
Tools
Reports
Options
Window
Help
Cabinets...
CMS Messaging Report
Complex/Conversion Messages...
Logic Group Membership
LRM...
Modcom
Objects...
Objects Without Labels...
Project History...
Rule Related
Signature Series/DAADC Devices
Security and Access Control

Figure 3-6: Selecting the CMS Messaging Report.

Observe that the CMS Report Criteria dialog box appears as shown in Figure 3-7. This dialog box enables you to select the desired report by specifying the cabinet, the MODCOM, the receiver and the specific account. Once your selections are made, simply click OK to view and print the desired report.



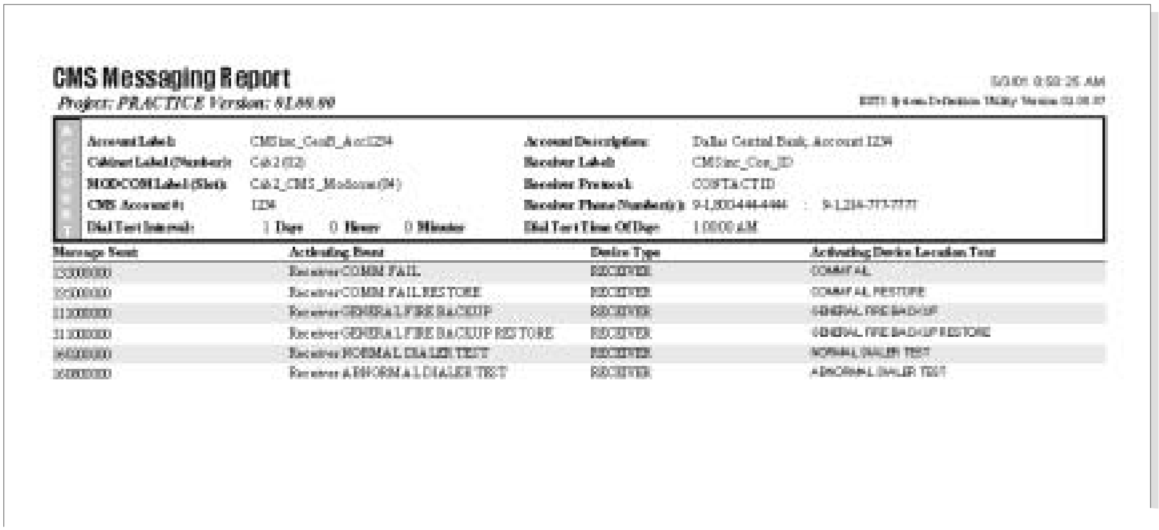
Cabinet Label (Cabinet Number)
Cab2 (02)

Modcom (Cabinet Number/Slot Position)
Cab2_CMS_Modcom (02\04)

Receiver
CMSinc_Con_ID

Account
CMSinc_CenB_Acc1234

Figure 3-7: Selecting CMS Report Criteria.



CMS Messaging Report

Project: PRACTICE Version: 81.00.00

5/3/01 0:50:25 AM

EST3 System Definition Utility Version 02.00.07

ACCOUNT

Account Label:	CMSinc_Gen3_Acc1234	**Account Description:**	Dallas Central Bank, Account 1234
Cabinet Label (Number):	Cab2 (02)	**Receiver Label:**	CMSinc_Con_ID
MODCOM Label (Slot):	Cab2_CMS_Modcom (04)	**Receiver Protocol:**	CONTACTID
CMS Account #:	1234	**Receiver Phone Number(s):**	9-1,800-444-4444 : 9-1,214-373-7777
Dial Test Interval:	1 Days 0 Hours 0 Minutes	**Dial Test Time Of Day:**	1:00:00 AM

Message Sent	Activating Event	Device Type	Activating Device Location Text
135000000	Receiver COMM FAIL	RECEIVER	COMM FAIL
335000000	Receiver COMM FAIL RESTORE	RECEIVER	COMM FAIL RESTORE
113000000	Receiver GENERAL FIRE BACKUP	RECEIVER	GENERAL FIRE BACKUP
313000000	Receiver GENERAL FIRE BACKUP RESTORE	RECEIVER	GENERAL FIRE BACKUP RESTORE
160200000	Receiver NORMAL DIALER TEST	RECEIVER	NORMAL DIALER TEST
160800000	Receiver ABNORMAL DIALER TEST	RECEIVER	ABNORMAL DIALER TEST

Figure 3-8: Sample CMS Messaging Report.

Figure 3-8 shows a sample CMS Messaging Report for the Dallas Central Bank, Account 1234 of our example project. This reports provides useful information on receiver properties and coded message structure to the Central Station.

Lets look at some examples of configuring receiver Contact ID protocols you may be required to generate.

MODCOM Loses Communications (Comm)

When the MODCOM loses communications with its 3-CPU1 it may be required to sends a **Comm Fail** message to the Central Station's receiver. This message in intended to report to the Central Station that the MODCOM has lost communications with the 3-CPU1 and may be out of service.

This message is transmitted for each Account configured for this MODCOM's configured Central Station Receivers. Because this is a new or an initial event an event qualifier (**Q**) of **1** is sent to the Central Station, followed by an event code (**EEE**) of **350** for a comm. trouble.

Since no other information would be useful or required by the Central Station, the **GGPPP** fields are set to **00000**. In this way, the completed general **Comm Fail** coded message sent to the Central Station would be **135000000**. See the default messages of Figure 3-5.

When MODCOM communications is restored with its 3-CPU1, it sends a **Comm Fail** restore message to the Central Stations receiver. This restoral message notifies the Central Station that the MODCOM has re-established communications with the CPU. Because this is a restoral event an event qualifier of **3** is sent to the Central Station followed by the same event code of **350**. Again the **GGPPP** field is all **0**s and the completed **Comm Fail** restored message sent to the Central Station is **335000000**. See the default message of Figure 3-5.

MODCOM Loses Communications in the Standalone Mode.

The standalone mode is an emergency backup operation for the EST3 system when the 3-CPU1 or its communications fails. If the MODCOM loses communications with its 3-CPU1 when the common alarm standalone mode is active, it sends a **General Fire Backup** alarm message to the Central Station's receiver.

Because this is a new or an initial event, an event qualifier of **1** is sent to the Central Station, followed by an event code of **110** for a fire alarm. In the Standalone mode a general fire alarm is activated and no group or point ID information is available. Due to this the **GGPPP** field is all **0**s and the completed **General Fire Backup** alarm message sent to the Central Station is **111000000**, as shown in the default message of Figure 3-5.

When the general fire alarm standalone event is restored a General Fire Backup alarm restoral message is sent to the receiver. Using what you have learned, it should be obvious that the completed message sent to the Central Station is **311000000**, as shown in the default message of Figure 3-5.

Daily Dialer Test

When configured, the daily dialer test event, when the system is in a normal state, sends an event code of **602**, proceeded by an event qualifier of **1**. Again, the **GGPPP** field is all **0**s and the complete message sent to the Central Station is **160200000**, as shown in the default message of Figure 3-5.

The daily dialer test event, when the system is in an abnormal state, sends an event code of **608**, proceeded by an event qualifier of **1**, making the complete message sent **160800000**, as shown in the default message of Figure 3-5.

Coded Contact ID Message Considerations

When creating information regarding events which occur on a customer's premises that are sent to a Central Station provider you need to consider:

- The information should be in a form and contain content that is easily interpreted by the Central Station operators.
- Use the same or standardized event messages for all projects, which have a common Central Station provider.
- Put Group or Point ID numbers in an order that is meaningful and easily interpreted by the Central Station operator.
- As much as practically possible, minimize event message transaction time to limit the amount of time the line is seized and not available to the customer.
- When programming the MODCOM event reporting parameters do not send unnecessary repeat event messages or multiple messages. For example, if you reported an event on a point ID basis to the Central Station, you should not also send a general event message for the same event.

The KISSOFF Tone

The Central Station Receiver sends a KISSOFF tone to the MODCOM indicating that the coded event message has been successfully received. If the MODCOM does not detect a KISSOFF tone it redials and resends the message until a KISSOFF tone is received or the preset maximum number of attempts is reached.

SIA DCS Coded Messages

The SIA DCS protocol is composed of alphanumeric ASCII text characters. This protocol offers greater flexibility in the coded message structure than Contact ID and is frequently used in applications incorporating Security and Access Control monitoring. SIA DCS coded messages can simply be 2-integer alphanumeric event coded messages or messages with this event code and detailed location information.

The 3-SDU also provides a message building tool called a Substitution String for constructing SIA DCS coded event messages to be sent to the Central Station. This programming feature enables you to incorporate time, date and user information into the coded event message.

CAUTION: Due to the flexibility of SIA DCS message structures it's is critical that you become familiar with the messaging requirements that the Central Station provides for the protected premises application you are developing.

The SIA DCS coded message can contain:

- User account number
- Event code
- Date
- Time
- User ID
- Partition
- Area, zone and and/or device ID

To better understand the SIA DCS protocol let's break down the coded message sent to the Central Station. First we need to realize that in SIA DCS, these messages are sent to the Central Station in Data Code Packets and Modifier Code Packets that make up a Data Block.

As in the case of Contact ID the Data Block must include a user account number (**ACCT**). This account code is included in the message sent to the Central Station by including the account label, created during the configuration process, in the SEND Command statement used to initiate the communications to the Central Station (e.g. **SEND 'Acount_Label'**).

The format for the SIA DCS Data Code Pack is:

TTAAAA*

Where:

- **TT** is the 2-digit, capital ASCII character letters that represent the event code (Data Code Type). For example, **FA** is the event code or type for a fire alarm and **BA** is the event code or type for a burglar alarm.

  Note: a complete listing of the 2-interger SIA DCS event codes is provided in the SDU **HELP Utility**.

- **AAAA** is the 4-digit address number. This is an optional field. To send a general fire alarm you would simply send **FA**. However, for group or point reporting you would enter the group or point code here. This field must contain an ASCII representation of a hexadecimal number. However, you can enter decimal or hexadecimal addresses. If your project conventions are in decimal you can report up to 9999 separate point events. By using hexadecimal conventions or converting decimal to hexadecimal, you can report up to FFFF events (equivalent to 65,516 decimal).

  Note: This field does not require leading **0**s.

The 2-digit Event Code (Data Code Type) is the only coded message required for SIA DCS event reporting, other than the account number. The other fields are added as the event reporting requirements get more detailed.

Other information may be included in the Data Block sent to the Central Station by adding optional Modifier Code Packets. The SDU enables you to insert modifier code packets by using the Substitution String described in Module 1. There are three types of modifier packets used for MODCOM SIA DCS applications:

- The **DATE** may be reported with the event by sending the **daMM-DD-YY** modifier code packet, where **da** is the type code. This is accomplished in the SDU rule by incorporating the substitution string **$(DATE)** in the message field of the SEND command output statement that sends the Data Block to the Central Station.

- The **TIME** may be reported with the event by sending the **tiHH:MM:SS** modifier code packet. Where **ti** is the type code. This is accomplished in the SDU rule by incorporating the substitution string **$(TIME)** in the message field of the SEND command output statement that sends the Data Block to the Central Station.
- The subscriber (user) ID may be reported with the event by sending the **idSSSS** modifier code packet. Where **id** is the type code. This is accomplished in the SDU rule by incorporating the substitution string **$(USER)** or **$(USERID)** in the message field of the SEND command output statement that sends the Data Block to the Central Station**.** **$(USER)** simply sends a 4-digit user code while **$(USERID)** sends the user code with the **id** prefix. This could be a critical field in Security and Access Control application where individual pin numbers may be required (e.g. after hours entry into protected premise).

Note: As in the case of Contact ID, all activation SIA DCS event coded messages should have a restoral message. In fire applications all new event activation messages sent must also send a restoral message before the protected premises is considered to be in a normal state.

The order that the Data Code and Modifier Code packets are sent in the Data Block is not important, other than the Modifier Code packets must proceed the Data Code packet. It may be necessary to check with the Central Station provider for the desired structure of these messages.

Figure 3-9 shows an example of creating the SIA DCS coded message for an Access Granted event, which sends the Date, Time, the Door entered and the individual who gained access. We have previously created the Account Label and entered the CMS Account Number of **1234**.

From the template in our **HELP Utility** we have determined that the SIA DCS event code for Access Granted is **DG** (all upper case). In this example we want to include the door being accessed as a decimal number in the address field. In our rule we will use a numerical operator of **<N>** to calculate the a value of **0015** from the rule’s input statement.

Account 1234 is reporting Access Granted on May 17, 2001 at 8:30 AM at Premise Door 15 to the individual whose pin number is 0337.

Data Code Packet Format Breakdown for this example

Account Number	Event Code	Address <N> or <H>
ACCT	TT	AAAA
1234	DG	0015

DG is the Event Code or data type code for an Access Granted event.

The code type for Data Code packets are always upper-case.

The code type for Modifier Code packets are always lower-case.

Modifier Code Packet Format Breakdown for this example

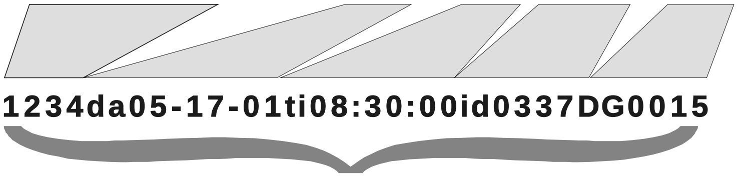
	DATE	
Substitution String	Type Code	Date Format
$(DATE)	da	MM-DD-YY
	da	05-17-01

	TIME	
Substitution String	Type Code	Date Format
$(TIME)	ti	HH:MM:SS
	ti	08:30:00

	USER	
Substitution String	Type Code	Date Format
$(USERID)	id	SSSS
	id	0337

You would write the following output command in your rule to initiate this event's communications to the Central Station .

SEND 'Account_Label' MSG "$(DATE)$(TIME)$(USER)DG<N>";



1234da05-17-01ti08:30:00id0337DG0015

Actual Data BlockCode sent to Central Station

Figure 3-9: SIA DCS Coded Message Example for Access Granted Event.

In some applications the user codes are used in place of the Event Codes address field. For example, in Access Control applications an extended closing time (**CE**) would incorporate the user code in the **AAAA** field. In this case the output commands message may be written:

"$(DATE)$(TIME)CE$(USER)"

Now the user code follows the Event Code without the lower case **id**.

When this door is accessed we also want to report the date, time and pin number of the individual entering the protected premises. Adding substitution strings to the message field in our rule's output statement accomplishes this. In our example **DATE** creates a value of a lower case **da** and **05-17-01**, **TIME** creates a value of a lower case **ti** and **08:30:00**, and **USERID** creates a value of **id** and **0337**. Also the Central Station wants the report message structure as Date, Time, User ID, Event Code, and Door Number.

As shown in Figure 3-9 you must write a rule to report this event to the Central Station. As was the case of Contact ID the **SEND** command is used to initiate this SIA DCS Data Block communication to the Central Station. The account label (**'Account_Label'**) is included in the rule's output statement within single quotation marks. This automatically sends the CMS account number (**1234**) as the first four digits of the coded message.

The remainder of the coded message you are responsible for must be included in this output statement as the message. To do this you would enter **MSG** into your output statement followed for the remainder of the message, which contains the Data Code and Modifier Code packets, enclosed in double quotation marks (**"$(DATE)$(TIME)$(USER)DG<N>"**). This message field in the output statement sends remainder of the message (**da05-17-01ti08:30:00id0337DG0015**) in the desired order. Note that the modifier code packet code types are automatically included.

Figure 3-10 show a second example of creating a SIA DCS coded Data Block event message. This time the event being reported is a fire alarm. For this example we are required to report the point that went into alarm and the date and time of the incident. This example uses the same CMS account number as the previous example, **1234**.

This time we would select the SIA DCS event code of **FA** from the HELP utility templates. We would then include the **<N>** numerical operator to calculate the point that went into alarm (**0099**) from the rules input statement.

In this example the Central Station wants us to send the message in the order of Date, Time Event Code, and the Address of the device in alarm. Thus, we would use the substitution strings **$(DATE)** and **$(TIME)** to send the date (**da07-17-01**) and time (**ti15:00:00**)

Account 1234 is reporting a fire alarm for device 99 on May 17, 2001 at 3:00 PM.

Data Code Packet Format Breakdown for this example

Account Number	Event Code	Address <N> or <H>
ACCT	TT	AAAA
1234	FA	0099

FA is the Event Code or data type code for an Fire Alarm event.

The code type for Data Code packets are always upper-case.

The code type for Modifier Code packets are always lower-case.

Modifier Code Packet Format Breakdown for this example

DATE

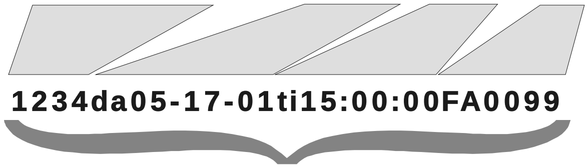
Substitution String	Type Code	Date Format
$(DATE)	da	MM-DD-YY
	da	05-17-01

TIME

Substitution String	Type Code	Date Format
$(TIME)	ti	HH:MM:SS
	ti	15:00:00

You would write the following output command in your rule to Send this event's message to the Central Station .

SEND 'Account_Label' MSG "$(DATE)$(TIME)FA<N>";



Actual Data BlockCode sent to Central Station

Figure 3-10: SIA DCS Coded Message Example for Fire Alarm Event.

This time you would write the rule using the **SEND** command followed by **'Account_Label'** to send the CMS account number **1234**. You would then enter **MSG** followed by **"$(DATE)$(TIME)"FA<N>"** to send the remainder of the SIA DCS Data Block coded event message. In this way the actual message sent is:

1234da05-17-01ti15:00:00FA0099.

In this example the fire alarm activation message should be followed by a restoral message once the incident being reported is resolved. The event code for a fire alarm restoral is **FH**.

As you can see the 2-digit, upper case ASCII text event code contains critical information for the Central Station provider. For EST3 applications the first character for fire is **F**. **FA** then represents fire alarm activation and **FH** represents the fire alarm restoral. In the case of a burglar alarm the first character would be **B**, followed by a second character of **A** for alarm. In this case the burglar alarm restoral is **BH**.

The list of event codes is too extensive to list in this self-study course. A detailed template of the EST SIA DCS event code conventions and example applications are given in the SDU Online **HELP Utility**. Figure 3-11 gives some example event code conventions used for fire and burglar applications.

SIA DCS
Fire Event Codes

Fire Alarm	FA
Fire Alarm Restore	FH
Fire Alarm Cross Point	FM
Fire Bypass	FB
Fire Test	FX
Fire Cancel	FC
Fire Supervisory	FS

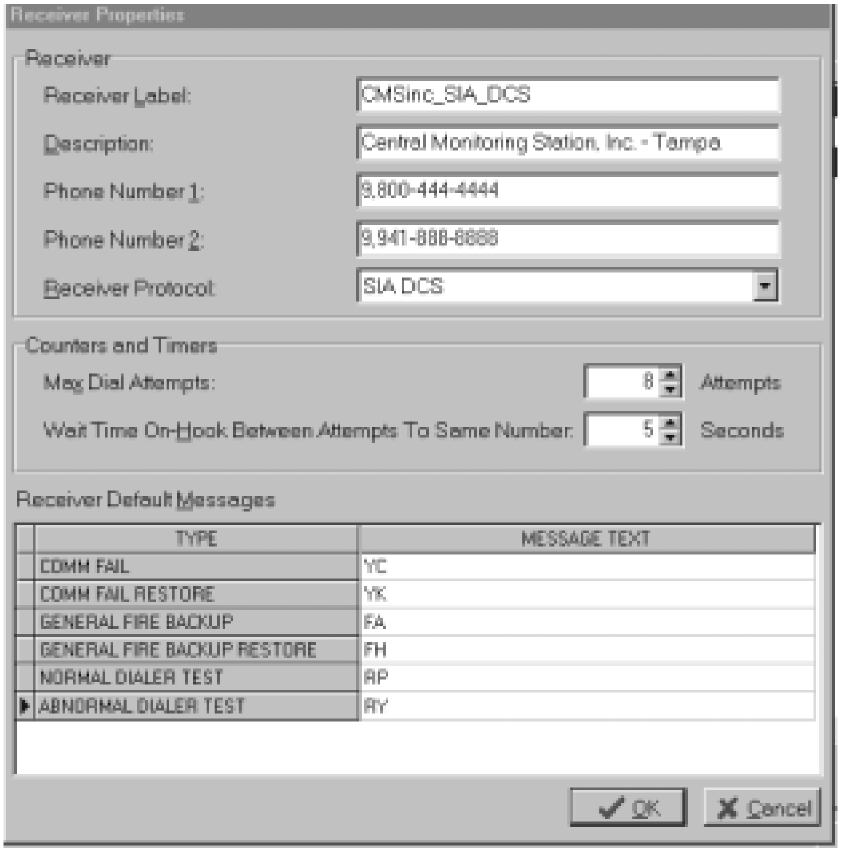
SIA DCS
Burglar Event Codes

Burglary Alarm	BA
Burglar Alarm Restore	131
Burglar Alarm Cross Point	BM
Burglar Bypass	BB
Burglar Test	BX
Burglar Cancel	BC
Burglar Supervisory	BS

Figure 3-11: Sample Fire and Burglary SIA DCS Event Code Types.

The SIA DCS protocol configured MODCOM has six default messages, which may be configured as shown in Figure 3-12. You may want to take this opportunity to configure the SIA DCS receiver in your practice project in this way.

Remember that you also have the capability of printing a CMS Messaging Report, which you can send to the Central Station. Figure 3-13 shows a sample CMS Messaging Report for SIA DCS protocol.



Receiver Properties

Receiver

Receiver Label:	CMSinc_SIA_DCS
Description:	Central Monitoring Station, Inc. - Tampa
Phone Number 1:	9,800-444-4444
Phone Number 2:	9,941-888-8888
Receiver Protocol:	SIA DCS

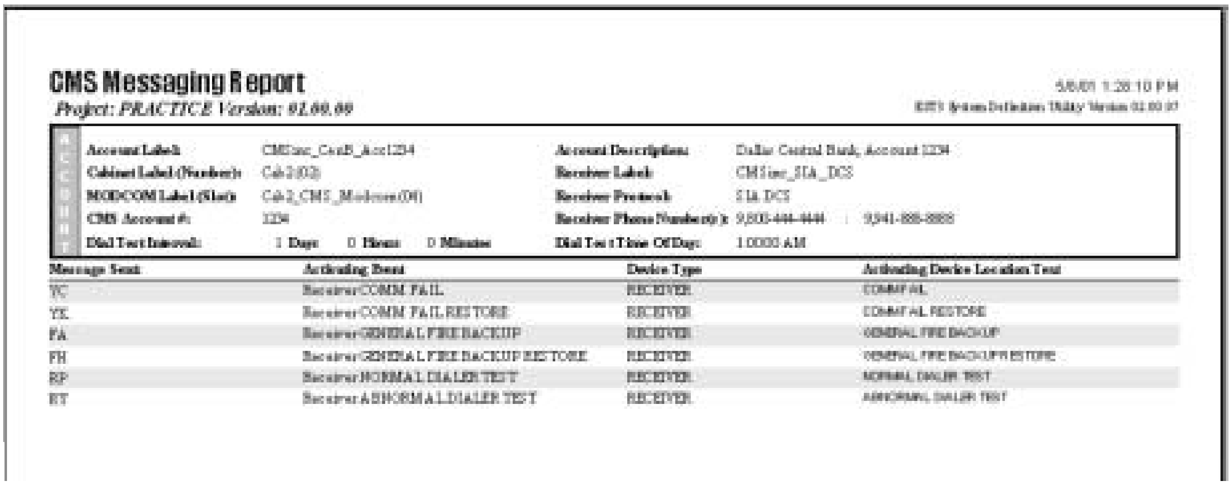
Counters and Timers

Max Dial Attempts:	8	Attempts
Wait Time On-Hook Between Attempts To Same Number:	5	Seconds

Receiver Default Messages

TYPE	MESSAGE TEXT
COMM FAIL	YC
COMM FAIL RESTORE	YK
GENERAL FIRE BACKUP	FA
GENERAL FIRE BACKUP RESTORE	FH
NORMAL DIALER TEST	RP
ABNORMAL DIALER TEST	RY

Figure 3-12: Example SIA DCS Default Messages.



CMS Messaging Report

Project: PRACTICE Version: 01.00.00

5/8/01 1:28:10 PM

EST3 System Definition Utility Version 01.00.07

ACCOUNT

Account Label:	CMSinc_CenB_Acc1234	Account Description:	Dallas Central Bank, Account 1234
Cabinet Label (Number):	Cab2(02)	Receiver Label:	CMSinc_SIA_DCS
MODCOM Label (Slot):	Cab2_CMS_Modcom(04)	Receiver Protocol:	SIA DCS
CMS Account #:	1234	Receiver Phone Number(s):	9,800-444-4444 ; 9,941-888-8888
Dial Test Interval:	1 Days 0 Hours 0 Minutes	Dial Test Time Of Day:	1:00:00 AM

Message Sent	Activating Event	Device Type	Activating Device Location Text
YC	Receiver COMM FAIL	RECEIVER	COMM FAIL
YK	Receiver COMM FAIL RESTORE	RECEIVER	COMM FAIL RESTORE
FA	Receiver GENERAL FIRE BACKUP	RECEIVER	GENERAL FIRE BACKUP
FH	Receiver GENERAL FIRE BACKUP RESTORE	RECEIVER	GENERAL FIRE BACKUP RESTORE
RP	Receiver NORMAL DIALER TEST	RECEIVER	NORMAL DIALER TEST
RY	Receiver ABNORMAL DIALER TEST	RECEIVER	ABNORMAL DIALER TEST

Figure 3-13: Sample SIA DCS CMS Messaging Report.

SIA P2 (3/1) and SIA P3 (4/2) Coded Messages

SIA P2 (3/1) and SIA P3 (4/2) protocols offer the simplest methods of event reporting to the Central Station. Where:

> **SIA P2 (3/1)** consists of a short, predefined hexadecimal message, which contains a 3-digit account number and a 1-digit event code.
>
> **SIA P3 (4/2)** consists of a short, predefined hexadecimal message, which contains a 4-digit account number and a 2-digit event code. SIA P2 also can use the **$(USER)** substitution string to send a used ID number. In this case the first digit of the event code is **0** and the output statement message would be:
>
> **“0$(USER)”**

In both cases, you would simply configure the MODCOM for the desired protocol, create an account label and enter the CMS account number. Next, you would establish the event code conventions for your project. You may want to consult the Central Station provider to establish these conventions. However, in most cases, you would simply define each required event type and print a CMS Messaging Report of your custom event messages to be sent to the Central Station provider.

The SIA P2 (3/1) protocol provides the capability to define from 1 to F (15) events, while the SIA P3 (4/2) provides the capability to define from 01 to FF (225 decimal) events.

The actual event code is up to you. For example, using SIA P2 (3/1), 1 may be a fire alarm, 2 may be a fire alarm restoration, 3 may be a burglar alarm, and so on. In this example, the output statements to send a fire alarm and it’s restoral for account 123 might be:

> **SEND ‘Account_Label’ MSG “1”** which sends **1231** to the Central Station for the initial fire alarm.
>
> **SEND ‘Account_Label’ MSG “2”** which sends **1232** to the Central Station for the restoration of the initial fire alarm event.

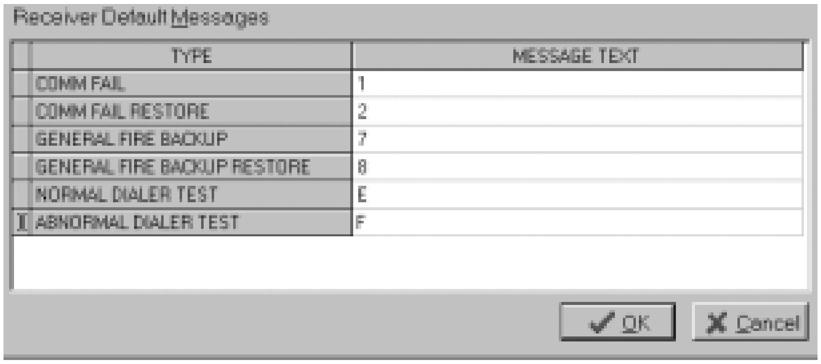
If we were using the 2-digit SIA P3 (4/2) protocol, 10 may be the fire alarm, 11 may be the fire alarm restoral, 12 might be the fire pump failure, and so on. In this case, burglary might be the 2x range of codes. In that, 20 is the burglar alarm, 21 is the burglar alarm restoral, and so on. In this example, the output statements to send a fire alarm event and it’s restoral for account 1234 might be:

SEND 'Account_Label' MSG "10" which sends **123410** to the Central Station for the initial fire alarm.

SEND 'Account_Label' MSG "11" which sends **123411** to the Central Station for the restoration of the initial fire alarm event.

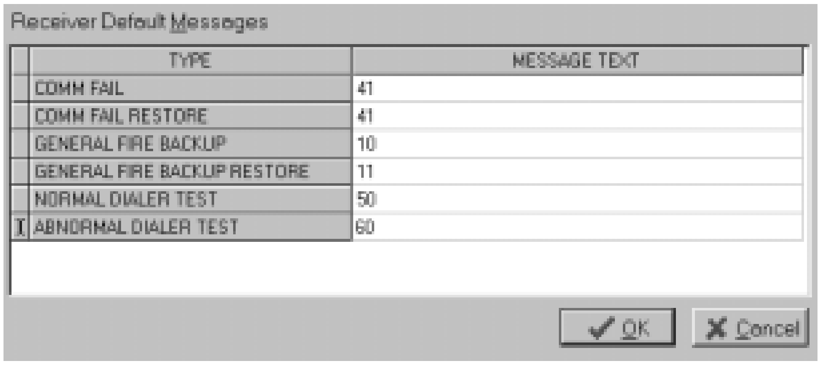
In both of these cases, remember that you need to configure the receivers default message.

SIA P2 (3/1) Example



TYPE	MESSAGE TEXT
COMM FAIL	1
COMM FAIL RESTORE	2
GENERAL FIRE BACKUP	7
GENERAL FIRE BACKUP RESTORE	8
NORMAL DIALER TEST	E
ABNORMAL DIALER TEST	F

SIA P3 (4/2) Example



TYPE	MESSAGE TEXT
COMM FAIL	41
COMM FAIL RESTORE	41
GENERAL FIRE BACKUP	10
GENERAL FIRE BACKUP RESTORE	11
NORMAL DIALER TEST	50
ABNORMAL DIALER TEST	60

Figure 3-14: Example SIA P2 and P3 Default Messages.

TAP Protocol Coded Messages (Pager Applications)

The TAP protocol is used with the 3-MODCOMP for pager applications. The TAP protocol consists of predefined ASCII text messages of up to 59 characters (including spaces) for display on a pager. The TAP message format generally consists of a 4- or 7-digit pager ID number and a custom configurable message, separated by a carriage return (**$(CR)**). Some applications may use up to 10 digits or more. Remember that the more characters you use for the Pager ID, the less are available for the message.

The SDU provides a great deal of flexibility in developing the TAP messages. Substitution Strings are also used in the TAP protocol to develop the ASCII text message to be sent to the pager service. The TAP message can contain:

- **Pager ID:** Generally 4 to 7 digits or characters.
- **ASCII Message:** Generally defines the event (e.g. Fire, Burglary, Emergency, etc.)
- **Date:** Inserts an 8- to 10-character date (including dashes) into the 59-character message by using one of the four DATE substitution strings with the following syntax:

  $(DATE) enters MMDDYY

  $(MMDDYYYY)

  $(DDMMYY)

  $(DDMMYYYY)

- **Time:** Inserts an 8- or 10-character time (including colons and A or P) into the 59-character message by using one of the two TIME substitution strings with the following syntax:

  $(TIME): enters HH:MM:SS in 24-hour clock format

  $(TIME12): enters HH:MM:SS A or P in 12 hour clock format

- **User:** Inserts a 4-character user identification code (e.g. individual pin number) into the 59-character message by using the $(USER) substitution string.

- **Location:** Inserts up to 42 characters from a EST3 point's message field into the 59 character message, based on available unused character positions. This substitution string also lets you specify a range of character positions from this EST3 message field to be included into the pager message. The syntax would be:

  $(LOCATION): enters the entire 42-character EST3 point message.

  $(LOCATION:M-N): enters the specific EST3 point message characters specified by the character range **M-N**.

Another consideration you must make when constructing these pager messages is the use of spaces for readability. Remember that a space is a character position within this pager message.

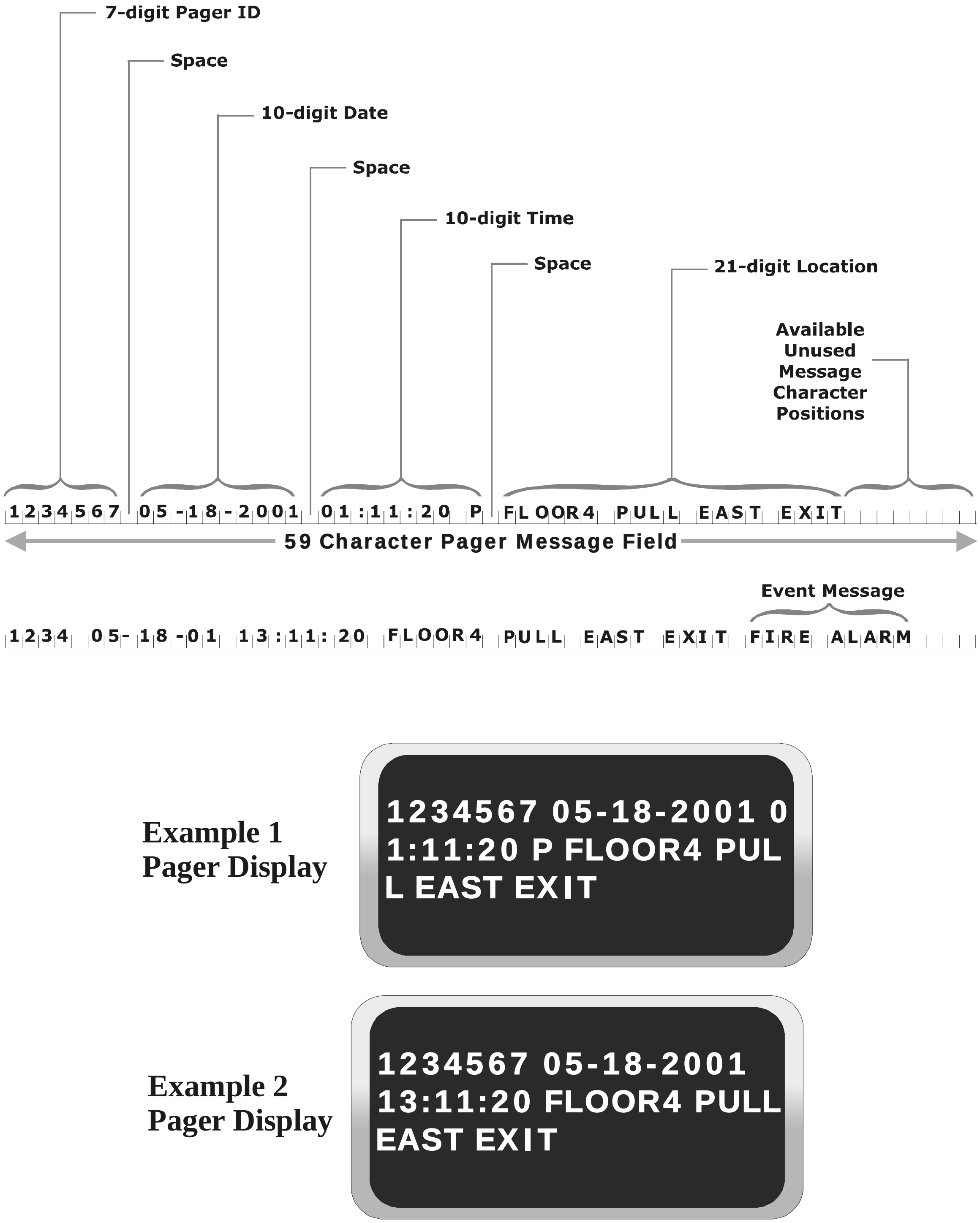
Since you have a maximum of 59 characters available for pager messages, its should be obvious to you that preplanning message content may be critical.

In the example of Figure 3-15 we have configured our pager message for a 7-digit pager ID code, a 10-digit date (**$(MMDDYYYY)**) a 10-digit time (**$(TIME12)**), a 21-digit ASCII location text field (**$(LOCATION:1-21)**), plus appropriate spaces for readability. As you can see we have 8 unused digits available for additional information.

Let's say we wanted to add an ASCII text event message field of **FIRE ALARM** to this pager message. This 10-digit field does not fit. One solution might be to use **FIRE** or **FA**. Another solution might be that during planning we changed the Pager ID to a 4-digit field, changed the date to a 8-digit field (**$(MMDDYY)**), and changed the time to the 24-hour clock (**$(TIME)**). Now we have 15 unused digits and the **FIRE ALARM** event message easily fits.

Another consideration during the planning phase might be the actual display format of the pagers used in your application. In Pager Display Example 1 of Figure 3-15 the message displayed is that which was configured for our earlier example without an event message. The pager we are using has 20-character lines for display. As you can see the message line breaks within fields affecting the readability of the message.

If during the configuration process, we added a second space after the date and changed to the 24-hour clock format, the message line breaks at appropriate places and the display is easily read, as shown in Pager Display Example 2.


7-digit Pager ID
Space
10-digit Date
Space
10-digit Time
Space
21-digit Location
Available Unused Message Character Positions
1234567 05-18-2001 01:11:20 P FLOOR4 PULL EAST EXIT
59 Character Pager Message Field
Event Message
1234 05-18-01 13:11:20 FLOOR4 PULL EAST EXIT FIRE ALARM
Example 1 Pager Display
Example 2 Pager Display

```
1234567 05-18-2001 0
1:11:20 P FLOOR4 PUL
L EAST EXIT
```

```
1234567 05-18-2001
13:11:20 FLOOR4 PULL
EAST EXIT
```

Figure 3-15: TAP Protocol Pager Message Considerations.

The location substitution string provides a great deal of flexibility when building pager messages. For example, the object that is initiating an event has a SDU object message of:

Elevator Lobby SMK Level 2 Parking Area

Using **$(LOCATION)** in your output statement would send all 39 characters of the object message as part of the TAP protocol message for display on the pager.

If you only wished to send **Level 2 Parking** as part of the pager message you would use **$(LOCATION:19-34)**.

Figure 3-16 shows an example of creating a TAP protocol pager message for a fire alarm event. In this example we are required to report a fire alarm event to the PageSmart pager service provider indicating the ID number, the device, its location, and the time and date of the incident.

We have preconfigured each alarm device's object message so that the required device and location information is in character positions 9 through 21. We will use a 7-digit Pager ID number, the **MMDDYY** date format and the 24-hour clock time format.

As in the case of the other protocols we need to write a rule using the **SEND** command, followed by the account label to send the event message to the pager service provider. This time the account label (**PageSmart**) simply dials up the pager service phone number and an account number **is not sent** as part of the message. You would then enter **MSG** followed by:

"1234567(CR)(DATE) $(TIME) Fire Alarm $(LOCATIOM:9_21)"

This is the pager event message to be displayed. The first 7 digits direct this message to the appropriate pager. The carriage return (**$(CR)**) substitution string indicates that the event message follows. The message field within the output statement then sends the actual message for display:

```
1234567 05-17-01 20:30:00

Fire Alarm Room 202 Smoke
```

The use of wildcards and N or H indexing (variables) is permitted in creating TAP protocol messages. These programming features enable you calculate message numerical variables from the input statement, making writing rules a productive effort.

The PageSmart account is reporting a Smoke Alarm on May 17, 2001 at 8:30 PM, which was activated by the Room 202 Smoke Detector.

Each alarm device's object message field (location) has been configured so that character positions 9 through 21 contain the required location information for the pager message.

The object message for this smoke detector is "Floor 2 Room202 Smoke".

Pager ID Number	
1234567	PagerID$(CR)

Where the Pager ID number is always followed by a carriage return to separate it from the actual pager message.

DATE	
Substitution String	Date Format
$(DATE)	MM-DD-YY
	05-17-01

TIME	
Substitution String	Time Format
$(TIME)	HH:MM:SS
	20:30:00

LOCATION	
Substitution String	Location Text
$(LOCATION:9-21)	Room 202 Smoke

You would write the following output command in your rule to initiate this event's communications to the pager service .

```
SEND 'PageSmart' MSG "1234567$(CR)$(DATE) $(TIME) Fire Alarm $(LOCATION:9-21)";
```

Actual pager message sent to the pager service for display.

```
1234567 05-17-01 20:30:00 Fire Alarm Room 202 Smoke
```

Figure 3-16: TAP Protocol Pager Message Example for a fire alarm.

Remember that if a restoration message is required a separate restoral output command must be written. In this example of Figure 3-16 this might look like:

```
1234567 05-17-01 22:15:00

Restored Room 202 Smoke
```

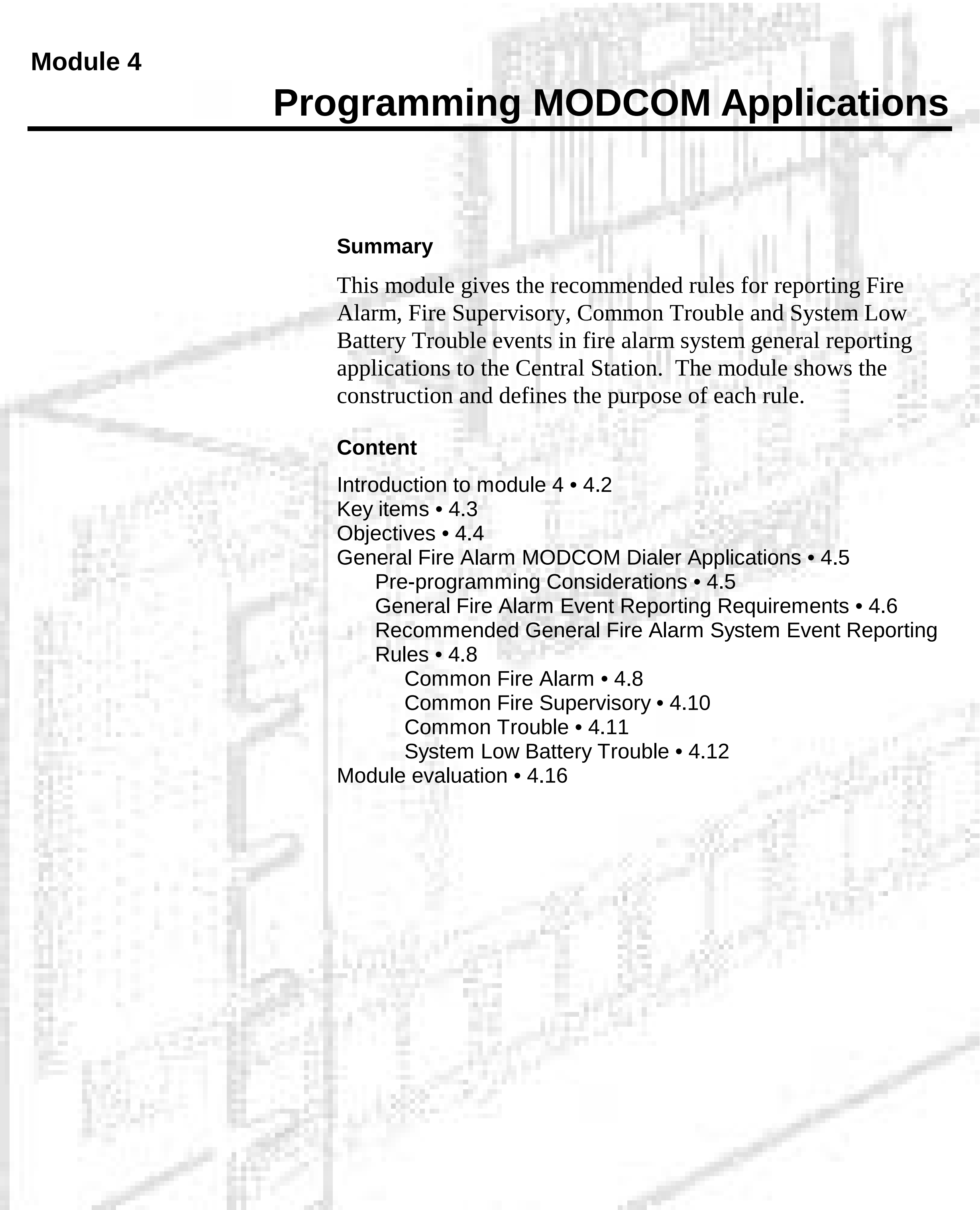
Note: Remember that it is critical that you check with the paging service provider to insure that they accept TAP protocol and for any message length limitations.

Module 3 evaluation

This concludes Module 3 of the *3-MODCOM Self-Study Course*. Return to the objectives stated at the beginning of this module. Study them carefully to ensure you are comfortable with each objective. If not, return to that section and review it. When you are satisfied, please continue on to Module 4. You will be tested at the end of this self-study course.

Module 4

Programming MODCOM Applications



Summary

This module gives the recommended rules for reporting Fire Alarm, Fire Supervisory, Common Trouble and System Low Battery Trouble events in fire alarm system general reporting applications to the Central Station. The module shows the construction and defines the purpose of each rule.

Content

Introduction to module 4

This module describes writing rules to support general reporting to a Central Station of Fire Alarm events using Contact ID protocol. This module lists pre-programming considerations, states requirements and gives recommended MODCOM SEND command rules for general fire alarm event reporting.

This self-study will focus on basic fire only applications using the Contact ID protocol, which is the prevalent fire application in which the MODCOM used. Although discussed in this course, the more sophisticated Security, Access Control and Keypad display MODCOM applications are covered in the factory-based EST3 Synergy Enabled® Certification Course.

Review the Programming a MODCOM, Contact ID codes and Programming Examples topics in your 3-SDU, Version 3.0 **HELP Utility**. You can get to the **HELP utility** through the SDU or from your Online Support Tools CD, release 4.0 or later.

Key items

Key points to look for:

- Pre-programming considerations for MODCOM dialer applications.
- NFPA 72 Central Station, Remote Station requirements.
- Recommended General Fire Alarm Event Messaging.
- Using the **SEND** Command with command qualifiers.
- Using System Events (FirstAlarm, First Supervisory and First Trouble) in general event reporting rules.

Key terms to learn:

- SEND Command
- System Event
- Command Qualifier
- Common Alarm
- Common Supervisory
- Common CMS Trouble
- System Event

Objectives

Upon completion of this module you will be able to:

1. Write rules to support General Fire Alarm event reporting via the 3-MODCOM.
2. Describe the purpose and use of the SEND Command.
3. Describe the purpose and use of command qualifiers.
4. Create Contact ID coded event messages for General Fire Alarm applications.

General Fire Alarm MODCOM Dialer Application

Review the Programming a MODCOM, Contact ID codes and Programming Examples topics in your 3-SDU, Version 3.0 **HELP Utility**. You can get the **HELP utility** through the SDU or from your Online Support Tools CD, release 4.0 or later.

Review the *Programming the MODCOM* section in Module 1 of this self-study before you continue with this module's lesson.

During this lesson it may be helpful to use the practice project you started in Module 2 to practices programming aspects for this general fire alarm reporting MODCOM dialer application.

This module will focus on basic general fire alarm MODCOM dialer event reporting applications only and the Contact ID protocol. The more sophisticated security, access control and keypad display MODCOM dialer and modem applications are covered in the factory-based EST3 Synergy Enabled® Certification Course.

Pre-Programming Considerations

It is important to remember that the MODCOM has predefined default parameters set for **NFPA 72 Central Station, Remote Station** fire applications. When developing a general fire alarm event reporting dialer application these defaults preconfigure most of the MODCOM properties required for this application.

Also remember that the **HELP Utility** provides protocol templates and example rules which are a resource during the configuration and programming tasks. It is a simple matter to copy a rule from Help, paste it into your rules editor and then edit the rule's object labels to fit your specific project.

What you will need to configure for general fire alarm event reporting dialer application is:

1. Insert the required Central Station receivers.
2. Label each Central Station receiver.
3. Create a description for each Central Station Receiver.
4. Enter the primary and secondary Central Station phone number for each receiver being configured.
5. Select Contact ID protocol.
6. Create the Contact ID coded default hexadecimal messages.
7. Insert the required premises accounts.
8. Label each premise account.

9. Create a description for each premises account.

Note: This description is printed on the CMS Messaging Report you send to the Central Station. It's content should be meaningful to and address the requirements of the Central Station provider.

10. Enter the CMS Account Number to be sent to the Central Station, which identifies the premises account reporting an event.
11. Select which of the configured Central Station receivers this account is to report to.

Detailed instructions for the MODCOM configuration process are given in Module 2 of this self-study and in the SDU **HELP Utility**.

General Fire Alarm Event Reporting Requirements

For fire alarm event reporting to a Central Station using Contact ID, any alarm point (e.g. Smoke Detector, Pull Station, Waterflow, etc.) that goes into alarm sends a hexadecimal coded general fire alarm event message to the Central Station. When the incident causing the fire alarm is resolved and all alarm points are restored, a hexadecimal coded restore message is sent to the Central Station.

In a general fire alarm system any point which has a tamper (e.g. a sprinkler system gatevalve) is a supervisory point. If a supervisory event effect the Life-Safety Fire Alarm System the Central Station considers it to be a fire supervisory event. In our general fire alarm event reporting application any fire supervisory point that goes active sends a hexadecimal coded general fire supervisory event message to the Central Station. When the incident causing the fire supervisory event is resolved and all supervisory points are restored, a hexadecimal coded restore message is sent to the Central Station.

When any point in the fire alarm system goes into trouble a hexadecimal coded general trouble event message is sent to the Central Station. Again, when the incident causing the trouble event is resolved and all trouble points are restored, a hexadecimal coded restore message is sent to the Central Station.

As required by NFPA 72, the Central Station should receive a **Dial Test** report every 24 hours from the protected premises. This report enables the Central Station to periodically (24-hour default) determine that the monitored system is working during normal non-event periods.

This 24-hour default **Dial Test** is preconfigured when you select the default **NFPA 72 Central Station, Remote Station** application and does not require a custom rule.

In general fire alarm event reporting applications an AC Power Failure is sent to the Central Station as a general trouble message on a 6 to 12 hour delayed basis. During this loss of AC power period, its backup batteries power the system. In this way, if an alarm event occurs during this AC power loss period a general fire alarm event message is still sent to the Central Station.

The Central Station needs to monitor the integrity of these batteries during an AC power loss period. When these batteries start to weaken, loosing their ability to support the fire alarm system, a unique trouble event message should be sent to the Central Station. This message should be sent to the Central Station before the battery backup completely fails, reporting that the premises may become unprotected.

Within the EST3 3-CPU1 microcode a **BATT_TRBL_CC_SS** local trouble type pseudo point is automatically generated when battery capacity drops below acceptable levels. Where **CC** is the battery's host cabinet address and **SS** is the slot location of the cabinet's 3-PSMON LRM that monitors battery status.

For example, if the backup batteries in cabinet **03** start to die, the **BATT_TRBL_03_03** pseudo point goes active. We can use this local trouble type, low battery pseudo point label within a rule's input statement to send a unique low battery trouble event to the Central Station. In single cabinet standalone applications this input statement would be:

LOCALTROUBLE 'BATT_TRBL_*' :

Where the wildcard (*) includes all batteries in the cabinet.

Note: If the periodic test message was not received at the predefined time it would be safe to assume that the system batteries are dead.

Multinode network applications use an AND group to report battery trouble events and are described later in this lesson. Based on these general fire alarm event reporting application requirements, we need to write rules to send eight general and Contact ID event messages to the Central Station. In all eight cases, the event messages are general in nature and do not require additional group or point information. Due to this fact we will enter **00000** into the **GGPPP** Contact ID fields.

Figure 4-1 shows a table of the hexadecimal coded Contact ID event messages recommended for the general fire alarm event reporting dialer applications.

Recommended General Fire Alarm System Contact ID Event Messaging					
Event Type	Coded Event Message	Event Message Definition			
		Event Qualifier Q	Event Code EEE	Group Code GG	Point Code PPP
Fire Alarm	111000000	1	110	00	000
Fire Alarm Restore	311000000	3	110	00	000
Fire Supervisory	120000000	1	200	00	000
Fire Supervisory Restore	320000000	3	200	00	000
Trouble	130000000	1	300	00	000
Trouble Restore	330000000	3	300	00	000
System Low Battery	130200000	1	302	00	000
System Low Battery Restore	330200000	3	302	00	000

Where:

1. **The General Trouble event includes the 6 to 12 hour delayed AC Power Failure Trouble event.**
2. **The General Trouble event includes the Alarm Silence function as a trouble event.**

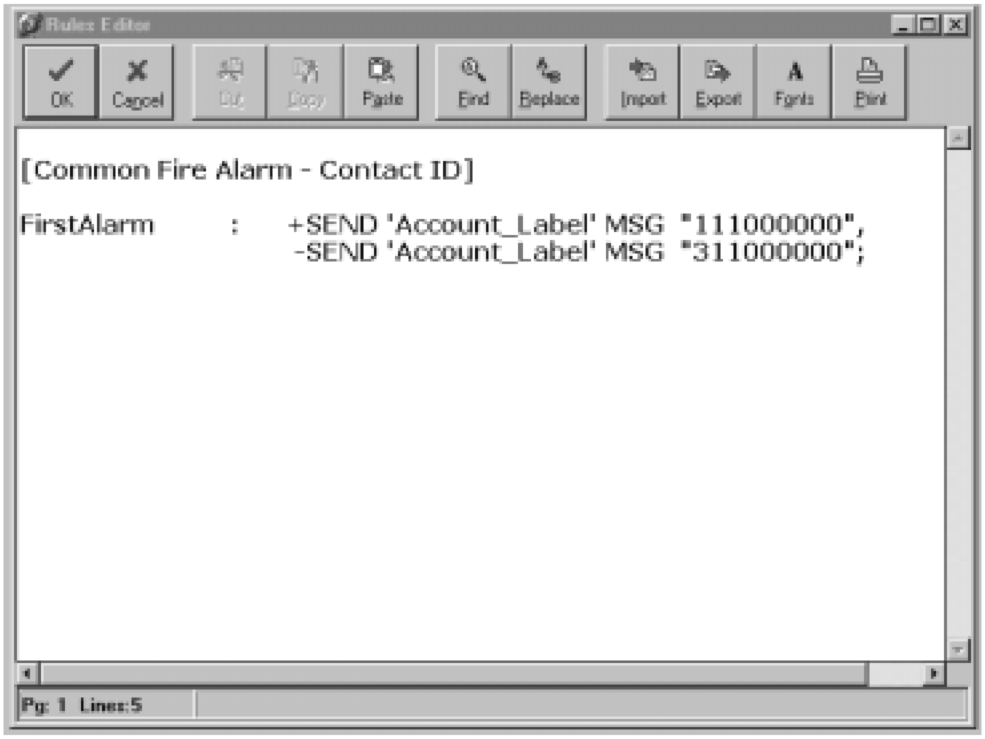
Figure 4-1: Recommended General Fire Alarm Event Messaging.

Note: Each general fire alarm application may vary based on local requirements where additional unique events may need to be reported. In this case, it is a simple matter to create these custom event messages from the templates in the SDU **HELP Utility** or from the Central Station provider requirements.

Recommended General Fire Alarm System Event Reporting Rules

Common Fire Alarm

Figure 4-2 shows the rule you need to write to report a general or common fire alarm event to the Central Station. As you can see, we recommend using the **FirstAlarm** input event type to report this fire alarm event to the Central Station. The **FirstAlarm** event is a system event that activates when any alarm point on any panel within the same network routing group goes into alarm. Subsequent alarm point activations will not reactivate this system event type until it is restored. The result is that only one fire alarm event message is sent to the Central Station.



```
[Common Fire Alarm - Contact ID]

FirstAlarm      :     +SEND 'Account_Label' MSG  "111000000",
                       -SEND 'Account_Label' MSG  "311000000";
```

Figure 4-2: Common Fire Alarm Rule with Contact ID.

This **FirstAlarm** system event does not restore until all alarm points within the network routing group are restored.

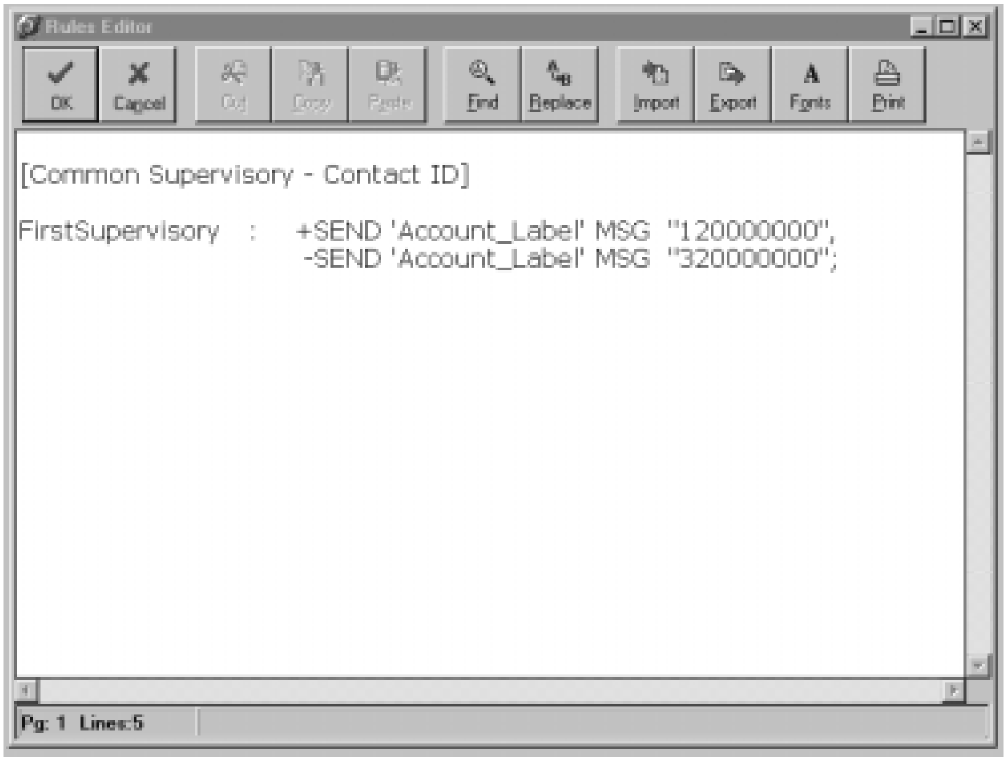
Observe that that we are using the **+** command qualifier for the **SEND** command which reports the initial Fire Alarm event (**111000000**) to the Central Station during the execution or activation sequence for this rule. We then use the **–** command qualifier on the second **SEND** command that reports that the system is restored (**311000000**) to the Central Station during the rule’s restoration sequence.

Remember that all fire events that are reported to the Central Station must be followed by a restore event. In the case of our common alarm rule, if we did not send the restoration of the first event, the next fire alarm event would reinitiate the FirstAlarm event rule. In this case, the Central Station personnel may conclude that is the same event they already responded to.

The rule shown in Figure 4-2 is given in Help. All you need to do for your general fire alarm event reporting application is copy this rule from Help to your rules editor and change the **Account_Label** to the label you have established for your specific premises account and you’re good to go.

Common Fire Supervisory

Figure 4-3 shows the rule you need to write to report a general or common fire supervisory event to the Central Station. This time we will use the **FirstSupervisory** input event type to report this supervisory event to the Central Station. The **FirstSupervisory** event is a system event that activates when any supervisory point on any panel within the same network routing group goes into alarm. Subsequent supervisory point activations will not reactivate this system event type until it is restored. As a result, only one fire supervisory event message is sent to the Central Station. This rules execution and restoration sequences are the same as explained for **FirstAlarm**.



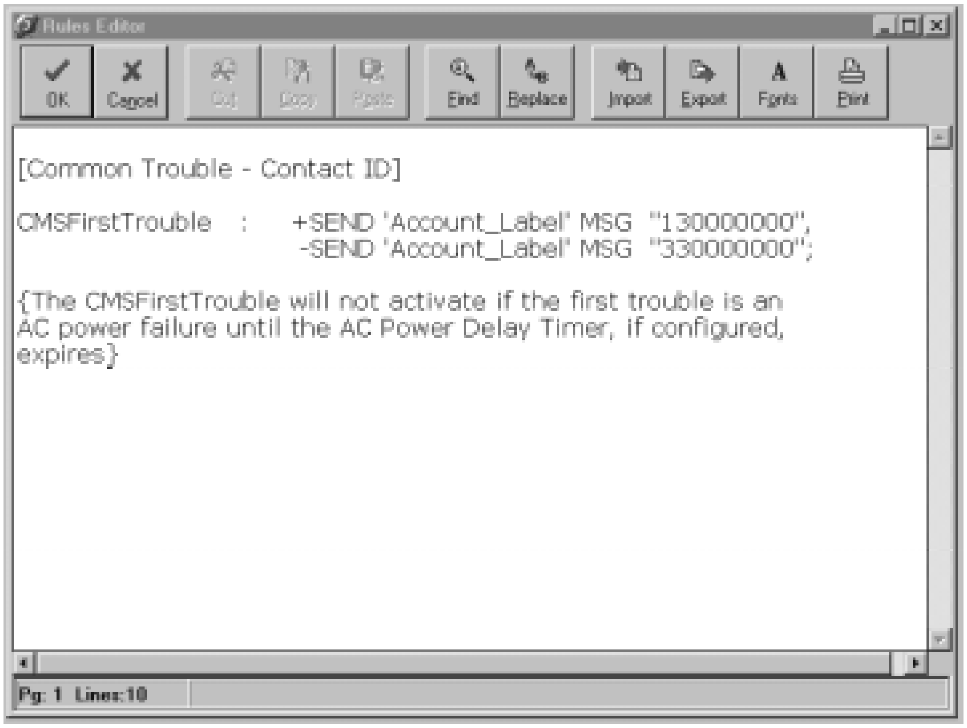
```
[Common Supervisory - Contact ID]

FirstSupervisory   :    +SEND 'Account_Label' MSG  "120000000",
                         -SEND 'Account_Label' MSG  "320000000";
```

Figure 4-3: Common Supervisory Rule with Contact ID.

The rule shown in Figure 4-3 is given in Help. All you need to do for your general fire alarm event reporting application is copy this rule from Help to your rules editor and change the **Account_Label** to the label you have established for your specific premises account and you're good to go.

Common Trouble

Figure 4-4 shows the rule you need to write to report a general or common trouble event to the Central Station. This time we will use the **CMSFirstTrouble** input event type to report this trouble event to the Central Station. The **CMSFirstTrouble** event is a system event that activates when any trouble point on any panel within the same network routing group goes active. Subsequent trouble point activations will not reactivate this system event type until it is restored. As a result, only one trouble event message is sent to the Central Station. This rules execution and restoration sequences are the same as explained for **FirstAlarm**.



```
[Common Trouble - Contact ID]

CMSFirstTrouble   :     +SEND 'Account_Label' MSG  "130000000",
                         -SEND 'Account_Label' MSG  "330000000";

{The CMSFirstTrouble will not activate if the first trouble is an
AC power failure until the AC Power Delay Timer, if configured,
expires}
```

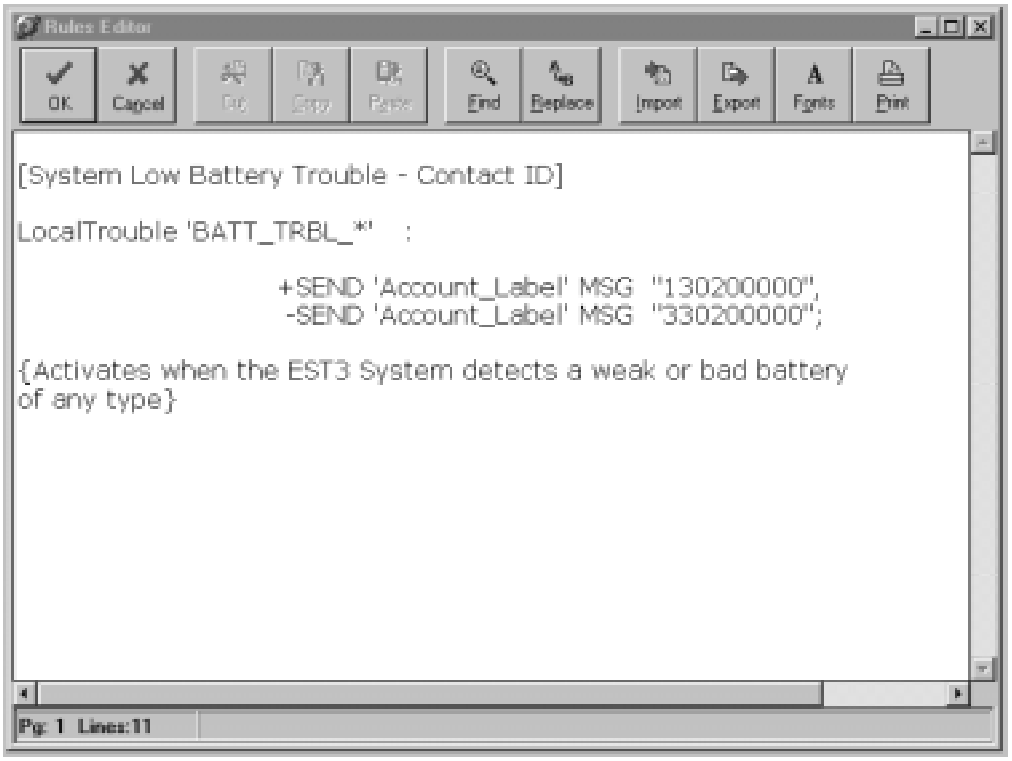
Figure 4-4: Common Trouble Rule with Contact ID.

The rule shown in Figure 4-4 is given in Help. All you need to do for your general fire alarm event reporting application is copy this rule from HELP to your rules editor and change the **Account_Label** to the label you have established for your specific premises account and you're good to go.

Note the programming annotations incorporated into the rules editor within the braces (**{ }**). It is good practice to incorporate meaningful engineering annotation text into your rules for future reference.

System Low Battery Trouble

Figure 4-5 shows the rule you need to write to report a low system battery, local trouble event to the Central Station for a \standalone system (single cabinet). We will use the **LocalTrouble** input event type to report this low system battery event and its subsequent restoration to the Central Station. This rule's execution and restoration sequences are the same as explained for **FirstAlarm**.



```
[System Low Battery Trouble - Contact ID]

LocalTrouble 'BATT_TRBL_*'    :

                    +SEND 'Account_Label' MSG  "130200000",
                     -SEND 'Account_Label' MSG  "330200000";

{Activates when the EST3 System detects a weak or bad battery
of any type}
```

Figure 4-5: System Low Battery Trouble Rule with Contact ID.

The rule shown in Figure 4-5 is given in Help. All you need to do for your general fire alarm event reporting application is copy this rule from Help to your rules editor and change the **Account_Label** to the label you have established for your specific premises account and you're good to go.

Observe that the **LocalTrouble** event type is not a system event and requires the label of the specific pseudo point you wish to use to activate this rules execution (in this case **BATT_TRBL_***).

In multinode EST3 applications and when BPS supplies are used, this rule can send multiple system battery low trouble messages to the Central Station without restoration messages. To eliminate multiple battery trouble message reporting, all BATT_TRBL_CC_SS pseudo point must be configured into an AND group (such as, **Low_Battery_Group**) with an activation of 1. This AND group's activation is used to execute the rule which reports to the Central Station. In this case the input statement would be:

LocalTrouble 'Low_Battery_Group' :

In more advanced fire alarm event reporting applications you may choose to initiate general event reporting from the rules that also initiate complex NAC responses and/or audio egress messages. In this case you can simply add the output statements from our general rule examples to these NAC response rules and achieve the desired event reporting. However, in this case always remember that each alarm activation event message requires a restoration message.

The more advanced zone, point ID, security and access control event reporting applications are beyond the scope of this self-study course. Advanced dialer applications are covered in the factory-based EST3 Synergy Enabled® Certification Course.

This concludes the 3-MODCOM Self-Study course.

Before you proceed to the online test as indicated in the Module 4 Evaluation, it may be a good idea to review this course.

A **review crossword puzzle** has been provided on the next page as a fun way to review the MODCOM.

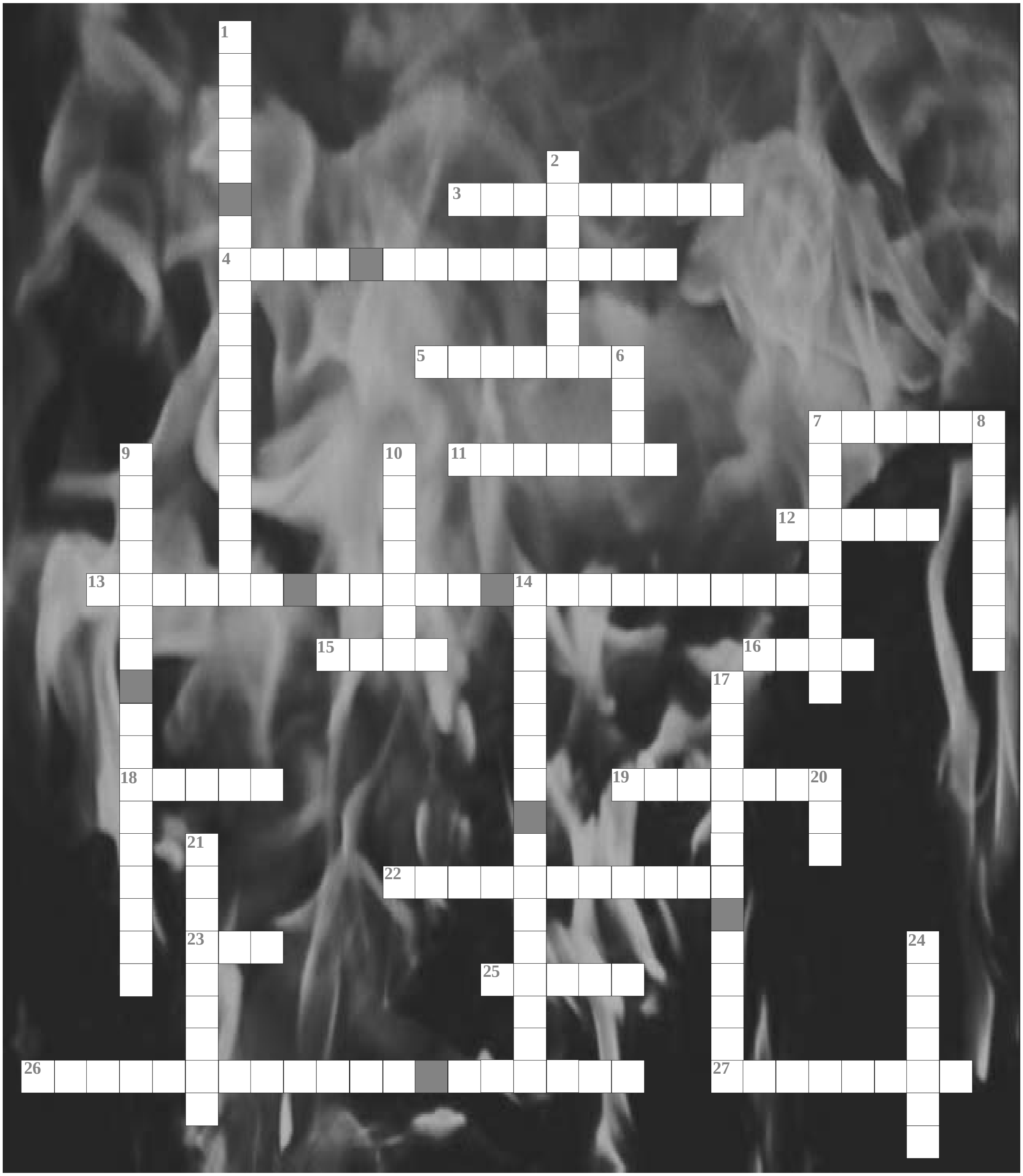
Review Crossword Puzzle

DOWN

1. DACT setting which makes the MODCOM non-NFPA 72 custom configurable. (two words)
2. A ________ detection circuit is used to determine phone line loss during ON-Hook periods.
6. Default Dialing Method.
7. The MODCOM determines that it has achieved connection with the Central Station by detecting the ______ ______. (two words)
8. The logical destination at the Central Station (CMS) where the MODCOM must connect to and subsequently send event status to.
9. Enables you to execute an output command only on a rule's activation or restoration sequence. (two words)
10. Simplest method of event reporting to a CMS.
14. MODCOMs may be configured as backups to one another to support __________ __________ operation. (two words)
17. Naming convention for premise accounts used to identify the account within the rule.
20. Up to ____ MODCOM's may be installed within a networked EST3 system.
21. Hexadecimal coded event reporting communications protocol which is most common to Fire Alarm system applications.
24. Sent by the Central Station to indicate that the message has been successfully received.

ACROSS

3. Modem Communicator module which supports TAP protocol.
4. The unique circuit in MODCOM phone line 1 to answer incoming calls (two words)
5. A ________ detection circuit is used to determine phone line loss during OFF-Hook periods.
7. The MODCOM function which enables it to provide CMS monitoring communications via the phone lines.
11. To enter the 3-MODCOM or 3-MODCOMP into your application database you must select Configure, Cabinets and the _______ tab.
12. Event classification which uses 1xx event codes in the hexadecimal Contact ID messages.
13. Preferred telephone service option that prevents incoming calls from jamming MODCOM dialer operations. (three words)
15. A valuable tool to use during the MODCOM configuration and programming process.
16. Output command that is used to send the event message to the Central Station.
18. The TAP protocol messages are composed of _______ text characters.
19. Identifies the user site sending an event to the Central Station.
22. An input object you configure so that when activated from a rule, it executes a predefined sequence of output commands. (two words)
23. Telelocator Alphanumeric Protocol.
25. The MODCOM function which enables it to download Access Control and Keypad Display data into the integrated EST3 system via the phone lines.
26. Programming feature that enables you to customize SIA DCS and TAP protocol event message fields. (two words)
27. The Substitution String which enables you to incorporate part or all of the object message into the TAP protocol message.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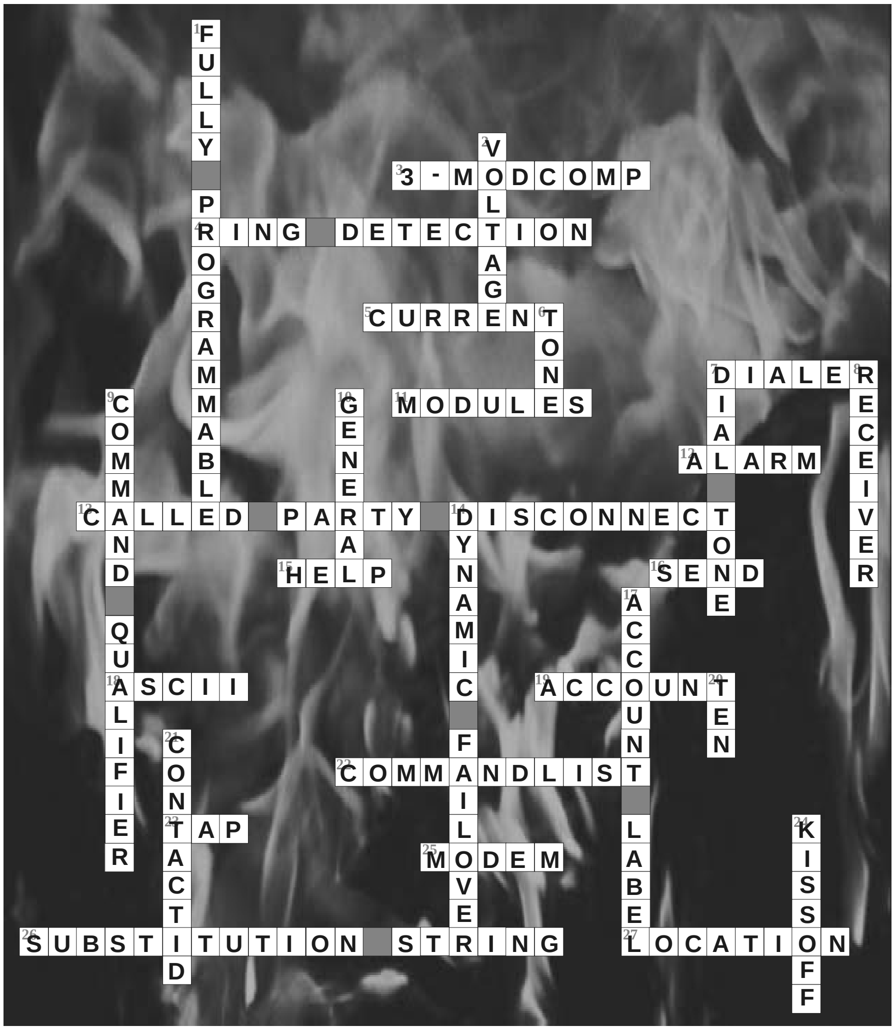
Module evaluation

This concludes Module 4 of the *3-MODCOM Self-Study Course.* Return to the objectives stated at the beginning of this module. Study them carefully to ensure you are comfortable with each objective. If not, return to that section and review it. When you are satisfied, take the web based 3-MODCOM self-study Exam.

Review Crossword Puzzle Answers


1 FULLY PROGRAMMABLE
2 VOLTAGE
3 3-MODCOMP
4 RING DETECTION
5 CURRENT
6 TONES
7 DIALER
7 DIAL TONE
8 RECEIVER
9 COMMAND QUALIFIER
10 GENERAL
11 MODULES
12 ALARM
13 CALLED PARTY DISCONNECT
14 DYNAMIC FAILOVER
15 HELP
16 SEND
17 ACCOUNT LABEL
18 ASCII
19 ACCOUNT
20 TEN
21 CONTACT ID
22 COMMANDLIST
23 TAP
24 KISSOFF
25 MODEM
26 SUBSTITUTION STRING
27 LOCATION