

# CX93011/CX93021 CSM<sub>xx</sub> & CX93040 CSPM<sub>xx</sub> Modems



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*SIA FSK Format for Alarm Systems*

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## Abstract

Security alarm panels are used around the world as a cost-effective means of protecting people and property. The Security Industry Association (SIA) ([www.siaonline.org](http://www.siaonline.org)), a trade organization that represents security market companies, has developed protocols that describe the communications link used by these panels. DTMF tones, pulsed tones, and frequency-shift keying (FSK) are common signaling methods used throughout these SIA protocols.

This document describes how “SIA Format” for Alarm Systems is implemented on CSM32/34/92 and CSPM32/34/92 modems. For information on this Protocol please refer to Security Industry Association document SIA DC-03-1990.01. Modem firmware has been developed to act like **transmitting client**.

## AT Commands

**+MS=ALM2** Select Half-Duplex FSK Alarm Mode operation.

This command selects half-duplex FSK alarm mode operation. Once this command is selected the modem will do Alarm mode only operation. This is a fixed mode and no other modulation will be detected or tried.

**AT&D1** – Enable DTR to enter command mode

This command allows the host once connected to escape to AT command mode. When DTR is dropped the modem will respond with `<cr><lf>OK<cr><lf>`. DTR should then be returned to ON and then the host can send AT command.

**ATS25** – Time to detect DTR drop.

The host should set **ATS25=0** to ensure DTR is detected as soon as possible to ensure timely a response to escape to command mode.

**ATDT<number>** - Dial number and connect in Bell103 HDX in transmit mode.

The modem will go off-hook and dial a number. Upon detect and succession of the FSK alarm answer tone (2225Hz) the modem will delay 200ms and then transmit the speed synchronization signal. The speed synchronization signal is comprised of Mark (1270Hz)

and Space (1070Hz) at 300 BPS. 110 BPS is not supported by this device. The speed synchronization signal will be sent for 300ms. After the speed synchronization signal is sent the modem will print the CONNECT message and be ready to receive data from the host. If the alarm answer tone is not detected then the modem will hang-up with result code NO CARRIER after the time specified by the sregister 7 (S7 default 50sec).

After the CONNECT message any data that the host sends will be transmitted to the alarm server using asynchronous 802 B103 FSK. If nothing is received from the host the host will transmit Mark. It is the host responsibility to ensure the data block protocol is transmitted correctly including the header, function code, data and column parity.

Once the data has been sent from the host to the modem and the host wishes to escape to command mode to look for tonal acknowledgements or reverse signaling the host should drop the DTR signal. Once the host drops the DTR signal the modem will respond with OK.

**AT-ALMACK** - Wait for Tonal Acknowledgement

This command will wait until all remaining data has been sent to the remote then stop any transmission and look for a Tonal Acknowledgement from the remote. This command will wait up to 2.5 seconds looking for either an ACK (2025Hz) or NACK (2225Hz).

OK result code signals ACK received

ERROR result code signals NACK received or timeout occurred

**ATD** - Return to Bell103 HDX as transmitter

This command will wait until all remote signals have ended and then similarly like ATDT connect in Bell103 HDX in transmit mode but without the speed synchronization signal. Once carrier is established the modem will send the CONNECT result code to the host.

After the CONNECT message any data that the host sends will be transmitted to the alarm server using asynchronous 802 B103 FSK. If nothing is received from the host the host will transmit Mark. It is the host responsibility to ensure the data block protocol is transmitted correctly including the header, function code, data and column parity.

**ATA** - Return to Bell103 HDX as receiver

This command will wait until all remote signals have ended and then connect in Bell103 HDX in receiver mode. The modem will wait up to 2.5 seconds for a carrier signal (2225Hz) from the remote. If a carrier is detected the modem will return a CONNECT result code. If it times out without detecting carrier the modem will hang-up with NO CARRIER result code.

After the CONNECT result code any data the remote sends will be transmitted to the host.

ATA should only be used for receiving Data Acknowledgements. ATA command can not be used to make the modem act like a FSK Alarm server.

**ATH** - Terminate connection and go on-hook

**AT-SPD** – Set Parameter Delay

This command is a user-defined additional delay (0-255 ms) between sync and modulation.

This command is available only as a patch for CX93011-1x, CX93011-2x, C93011-2x, CX93021-2x and CX93040-1x.

### **Example 1**

#### **Send Account block and New Event block**

Host (DTE)	Modem (DCE)
RTS=ON	
DTR=ON	
AT+MS=ALM2	
	OK
AT&D1	
	OK
ATS25=0	
	OK
ATDTXXXX	
	CONNECT
“Send Account block, all values are ASCII except the column parity which is displayed in HEX below”	
F#101122,0x9B	
DTR=OFF	
	OK
DTR=ON	
AT-ALMACK	
	OK
ATD	
	CONNECT
“Send New Event, all values are ASCII except the column parity which is displayed in HEX below”	
DNPA12,0xE7	
DTR=OFF	
	OK
DTR=ON	
AT-ALMACK	
	OK
ATH	

OK

**Example 2**

**Send Configuration Block and Receive data ACK**

Host (DTE)	Modem (DCE)
RTS=ON	
DTR=ON	
AT+MS=ALM2	
	OK
AT&D1	
	OK
ATS25=0	
	OK
ATDTXXXX	
	CONNECT
“Send Configuration block, all values are ASCII except the column parity which is displayed in HEX below”	
A@A,0xBF	
DTR=OFF	
	OK
DTR=ON	
AT-ALMACK	
	OK
ATD	
	CONNECT
“Send Account block with reverse channel enable, all values are ASCII except the header and column parity which is displayed in HEX below”	
0xC6,#101122,0x1B	
DTR=OFF	
	OK
DTR=ON	
ATA	
	CONNECT
“Message from Server Something like below”	
	@8,0x87
DTR=OFF	
	OK
DTR=ON	
ATH	
	OK