



CX90240 CSM22
CX93011 CSMxx
CX93040 CSPMxx Modems

11/1/2011 Rev 2.2

Implementation of Ademco Contact ID Protocol for Alarm Systems on CSM22 & CSM32/34/92 & CSPM32/34/92

Introduction

This document describes the implementation of Ademco DTMF Contact ID Protocol on CSM22, CSMxx, and CSPMxx modems. The implemented feature includes the transmission side of the protocol. Its intended application is for transmitting client. However, the server side was also included for the sole purpose of facilitating in-house test or evaluation. For complete information on this protocol please refer to Security Industry Association document SIA DC-05-1999.09 or visit http://www.siaonline.org/standards/dc_05.html.

AT Commands

+MS=ALM1 - Selects DTMF Alarm mode operation

This command selects DTMF Alarm mode operation. The modem will do alarm mode only with this setting. This means that it is a fixed mode and no other modulation will be detected.

Result Code

OK	Valid sub parameter string
ERROR	Otherwise

AT-ALM=X - Sends alarm DTMF

This command triggers the modem to transmit DTMF(s) and wait for the Kissoff tone acknowledgement. The server should send the Kissoff tone, 1400Hz, with a duration of 750-1000 ms. This command may only be sent when off-hook AND connected in ALM1 mode.

Kissoff tone – 1400 Hz – 750-1000 ms

It is the host's responsibility to append the 1-byte checksum at the end of the DTMF digit(s). The host must use the "Digit Value", shown in Table 1, to calculate the checksum which is modulus 15.

Result Code

OK If the Kissoff tone is detected within 1.25 seconds and verified for 400 ms
ERROR If the Kissoff tone is NOT detected within 1.25 seconds

Digit	Low Tone (Hz)	High Tone (Hz)	Digit Value
0	941	1336	10
1	697	1209	1
2	697	1336	2
3	697	1477	3
4	770	1209	4
5	770	1336	5
6	770	1477	6
7	852	1209	7
8	852	1336	8
9	852	1477	9
B	941	1209	11
C	941	1477	12
D	697	1633	13
E	770	1633	14
F	852	1633	15
N/A	941	1633	N/A

Table 1. The following are the digits and frequencies that may be sent. Note that there is no DTMF "A"

Dialing Mode

Issuing the ATD command in alarm mode puts the modem in alarm originate mode. Consequently, the modem will dial out and listen for the following tones:

- dial tone
- busy tone
- ring back tone
- alarm answer tone

Alarm answer tone is comprised of two tones verified at 100 ms each with 100 ms silence in between, as shown below.

Answer Tone		
1400 Hz – 100 ms	Silence – 100 ms	2300 Hz – 100 ms

Result Code

CONNECT	Answer tone detected. The modem returns to command mode.
NO CARRIER	Answer tone NOT detected and the S7 timer timed out.
BUSY	Busy tone detected.
NO ANSWER	Ring back tone detected and the S7 timer timed out.
NO DIALTONE	Dial tone NOT detected and the S7 timer timed out.

Connection Mode

Once connected, the host should start sending the DTMF digit(s) using the AT-ALM=X command. The -ALM command should be issued as soon as possible since the server expects the transmission within 250ms to 300ms after sending the answer tone or Kisosff tone.


After answer tone or Kisosff tone detection the modem waits for 250ms before sending the DTMF message. This is to insure the proper timing. Sending the -ALM message sooner will not cause the message to be sent until the 250ms timer expires.

After the DTMF transmission, the modem waits up to 1.25 seconds for the Kisosff tone acknowledgement, which is 1400Hz with 750ms to 1000ms duration.

If the Kisosff tone is not detected then the server didn't get the message successfully with the correct checksum. The message should be retransmitted by sending another -ALM command.

If the Kisosff tone is detected then the modem will respond with "OK". The host should then send the next message using the -ALM command or hang up using the ATH command.

Example: Back-to-back CSM22 to demonstrate the client side application.

Client	Server
AT+MS=ALM1	AT+MS=ALM1
OK	OK
	ATS0=1
	OK
ATDTxxx	
	RING
CONNECT	CONNECT
AT-ALM=1234181131010158 ¹	
	
OK	1234181131010158
AT-ALM=1234183331010156	
ERROR	
AT-ALM=1234183131010156	
OK	1234183131010156
ATH	NO CARRIER
OK	

1. Denotes the 1-byte checksum

The 2nd -ALM command was in error because the checksum was incorrect. No Kissoff was sent. See Figure 1 below for a complete wave file sample of a typical connection.

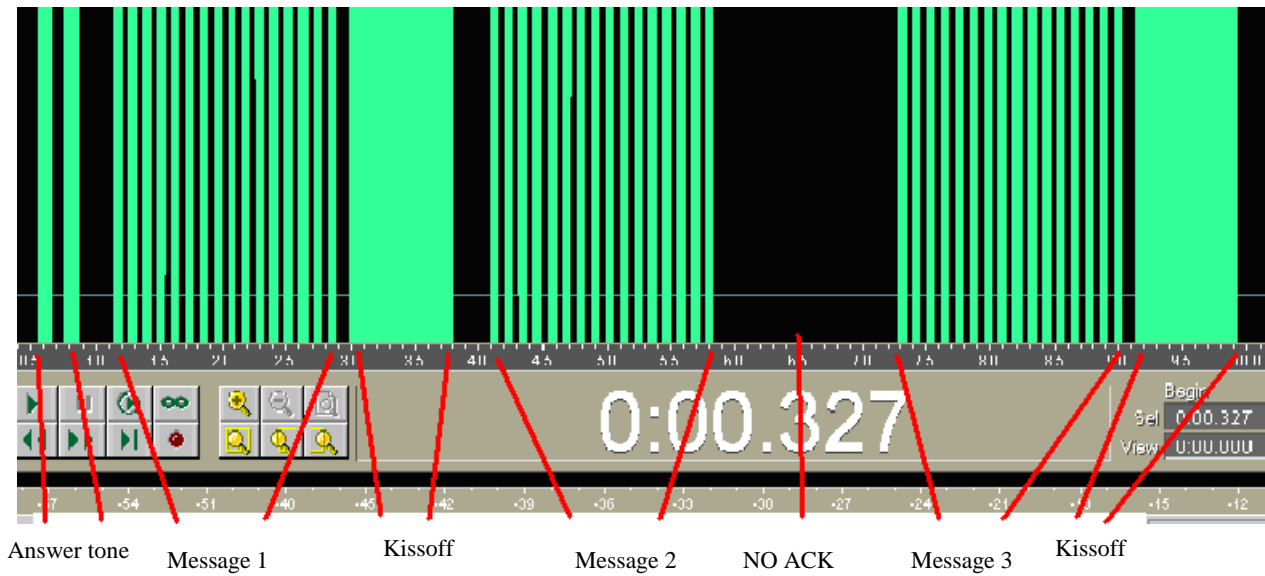


Figure 1. Wave file capture of the originating modem using Adobe Audition.