

**RS232 Protocol: 128/250BPE and 128/250FBP rev 4+****Table of Contents**

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***General***

This document describes the electrical and protocol specifications for the Ademco RS-232 interface port to any PC to allow home control systems to obtain status information from the Ademco security panel on a real—time basis. In addition, limited control of hardware devices connecting to the Ademco panel will be allowed from home control systems. Any PC connected to the RS232 panel output can be used to communicate with the panel. Connection from the panel's RS232 output to the computer may be via a VA8201, Ademco's 4100SM Interface Module, or other appropriate RS232 H/W interface module available from Ademco. Any software capable of sending ASCII strings through a PC's COM ports may be used.

***Signaling Specifications***

This application uses only GND and the TxD and RxD signals in a half-duplex fashion. The DSR signal is used by the VA8201 if it is installed. TxD and RxD are used in their normal context. The panel ignores all handshake lines when sending data so that connected equipment must be capable of receiving continuous 1200-baud data. The V8201 sets the computer's DSR signal false when communicating with the panel.

Communication settings should be 1200-baud, 8 data bits, no parity, and one stop bit. Logic levels at the computer interface are per standard RS-232.

***Error Checking***

This release does not contain any error detection and re-transmission protocols. It should only be used where the data link is 100% reliable.

***Messages***

With the exception of the message terminator, CR-LF, all characters are printable ASCII.

## **Packet Format**

Data packets both from a PC to the panel and from the panel to a PC use the following format.

**Note:** All hex values are entered in upper case only.

(CR-LF) NNMSD...00 CC (CR-LF)

### **Initiator**

(CR-LF) Message initiator. ASCII characters consisting of hexadecimal 0x0D and 0x0A. This is sent at the start of a message to allow the Home Controller to recover from any noise or spurious signals sent.

### **Packet Length**

NN 2 ASCII characters, length of packet including all characters but CR-LF at the end of the packet. Legal values are hex 00 to FF. Permissible characters are ASCII 0-9 and upper case A-F.

### **Message Type**

M 1 ASCII character, message/packet type ID. These are upper and lower case alpha characters. The commands are case-sensitive, and must be entered with the case shown. Allowed values are a-z and A-Z.

### **Sub-Message Type**

S ASCII character, sub-message/packet type. These are upper and lower case alpha characters. The commands are case-sensitive, and must be entered with the case shown. Allowed values are a-z and A-Z.

### **Data**

D... 0 or more ASCII characters of data associated with the command/packet type. Any printable ASCII character is permitted.

### **Reserved**

00 Two ASCII characters, reserved for future development. The only currently legal character is 0 (numeric zero).

### **Checksum**

CC 2 ASCII characters, 2-digit checksum. This is the hexadecimal two's complement of the modulo-256 sum of the ASCII values of all characters in the message excluding the

checksum itself and the CR-LF terminator at the end of the message. Permissible characters are ASCII 0-9 and upper case A-F.

### **Terminator**

(CR-LF) Message terminator. ASCII characters consisting of hexadecimal 0x0D and 0x0A.

## **Control Messages**

08XN0092 “Communication On”

08XF009A “Communication Off”

During telephone line activity and while in programming mode, the panel will ignore any and all Home Control activity. This means that if the panel software is in the midst of sending a message, and the Central Station contacts it, the panel will stop transmitting to the Home Controller. Prior to this the panel will send the “Communication Off” message to the Home Controller to notify the Home Controller that the panel will not be communicating for an indeterminate period. When communication is again possible, the panel will transmit the “Communication On” message.

The “Communication On” message will also be sent when the panel powers up, or resets.

### **The “Ready for Next” Message**

08OK009E

This message is sent by the panel to indicate that it is ready for another command. It is *not* an indication of the validity of the previous command. It will be sent within 250 mSec. from the end of the last message’s STOP bit.

## **Arm and Disarm Messages**

You can use the PC to arm and disarm the panel and to query the panel’s arming status. For Arm and Disarm messages the data field consists of the two-digit User Number<sup>1</sup> (01-32) followed by the 4-digit User Code (for RS-232 controlled panels *always* use 4-digit arm/disarm codes), followed by 8 ASCII digits indicating to which partitions the command should be applied. The partition numbers may be in any order.

You can use the PC to request the arming status of the system by sending an Arming Status Request. The Panel will respond with an Arming Status Report.

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<sup>1</sup> User Numbers are no longer needed. Any two-digit number (i.e., “00”) may be used to fill that location.

**Arm to Away**

16AANNUUUUppppppppp00CC (CR-LF)

*Example:*

To Arm-Away partitions 1,2,4,5, and 8 with User Code 1234, send:

*16AA0112340124580000F8*

**Arm to Home (Stay)**

16AHNNUUUUppppppppp00CC (CR-LF)

*Example:*

To Arm-Stay partitions 1,2,4,5, and 8 with User Code 1234, send:

*16AH0112340124580000F1*

**Arm to Instant**

16AINNUUUUppppppppp00CC (CR-LF)

*Example:*

To Arm-Instant partitions 1,2,4,5, and 8 with User Code 1234, send:

*16AI0112340124580000F0*

**Arm to Max**

16AMNNUUUUppppppppp00CC (CR-LF)

*Example:*

To Arm-Maximum partitions 1,2,4,5, and 8 with User Code 1234, send:

*16AM0112340124580000EC*

**Disarm**

16ADNNUUUUppppppppp00CC (CR-LF)

*Example:*

To Disarm partitions 1,2,4,5, and 8 with User Code 1234, send:

*16AD0112340124580000F5*

**Force Arm to Away**

16FANNUUUUppppppppp00CC (CR-LF)

*Example:*

To Force-Arm-Away partitions 1,2,4,5, and 8 with User Code 1234, send:  
*16FA0112340124580000F3*

### **Force Arm to Home (Stay)**

*16FHNNUUUUppppppppp00CC (CR-LF)*

*Example:*

To Force-Arm-Stay partitions 1,2,4,5, and 8 with User Code 1234, send:  
*16FH0112340124580000EC*

## **Zone List Messages**

These commands are used to bypass or unbypass a group of zones in a zone list. “ZL” is the zone list number (01, 02, etc.).

### **Auto-Bypass Zone List**

*0AZBZL00CC (CR-LF)*

*Example:*

To Auto-bypass Zone List 01 send:  
*0AZB010032*

### **Auto-Unbypass Zone List**

*0AZUZL00CC (CR-LF)*

*Example:*

To Auto-unbypass Zone List 02 send:  
*0AZU02001E*

## **Status Requests**

### **Arming Status Request**

*08AS00A4 (CR-LF)*

The panel responds to this message with an Arming Status Report.

### **Arming Status Report**

*10ASDDDDDDDD00CC (CR-LF)*

The panel sends this message in response to a Status Request

The 8-character data field represents the arming status of partitions 1-8. Each partition field can contain one of the following values:

- A Armed to Away

- H Armed to Home
- D Disarmed
- N Not Ready
- B Bypassed
- M Maximum
- I Instant

If partitioning is not used or not available, all 8 data fields will contain the same value. Fields for partitions not assigned to a User will display 'D.'

*Example:* With 6 partitions assigned, partitions 1-4 Armed to Home, partitions 5-6 not assigned, and partitions 7-8 Armed to Away, the message is

10ASHHHHDDAA0081 (CR-LF)

## **Zone Status Messages**

You can use your PC to query the panel concerning the status (open, closed, trouble, alarm, bypassed) of all zones, and to request the partition assignment of all zones. The panel will respond with a Zone Status or Zone Partition Status message for all zones, sent in blocks of 64 zones. In addition, the panel can be programmed to send System Notification Messages concerning zone status. (See Notification Messages, below.)

### **Zone Status Request**

08ZS008B (CR-LF)

The panel responds with a Zone Status Report.

*Note:* This message should be sent only when an initial connection is made with the panel. *It is not intended to be used as a 'polling' command.* The panel can be programmed to send System Notification Messages concerning zone status.

### **Zone Status Report**

49ZSMD...00CC (CR-LF)

The panel sends this message in response to a Zone Status Request.

The data portion of this message is 65 characters long, with the first character indicating which block is being sent: 1, 2, 3 or 4. Message block 1 contains information pertaining to zones 1 - 64, message block 2 for zones 65 -128, message block 3 for zones 129 - 192



and message block 4 for zones 193 - 250.<sup>2</sup> The shorter length of the fourth data block will be reflected in the packet length bytes.

The rest of the data consists of one character for each zone in order. They will have values from 0-8, with 0 meaning no partition assignment.

Each character is the *sum* of all applicable status values, expressed in hexadecimal using ASCII characters 0-9 and A-F.

	Values
0	Closed
1	Open
2	Trouble
4	Alarm
8	Bypassed

*Example:* a Zone Status Report for a system in which Zone 1 is Open, Zone 2 is Open, in Trouble, and Bypassed, and the rest Closed, would begin 49ZS1B00...

### Zone Partition Request

08ZP008E (CR-LF)

Panel responds with a Zone Partition Report

*Note:* This message should be sent only when an initial connection is made with the panel. *It is not intended to be used as a 'polling' command.*

### Zone Partition Report

49ZPMD . . . 00CC (CR-LF)

The panel sends this message in response to a Zone Partition Request.

The data portion of this message is 65 characters long, with the first character indicating which block is being sent: 1, 2, 3 or 4. Message block 1 contains information pertaining to zones 1 - 64, message block 2 for zones 65 - 128, message block 3 for zones 129 - 192 and message block 4 for zones 193 - 250.<sup>3</sup> The shorter length of the fourth data block will be reflected in the packet length bytes.

The rest of the data consists of one character for each zone in order. They will have values from 0-8, with 0 meaning no partition assignment.

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<sup>2</sup> Message blocks 3 & 4 are used only for the Vista-250 type panels. Vista-128 type panels will only send the first two message blocks.

<sup>3</sup> Message blocks 3 & 4 are used only for the Vista-250 type panels. Vista-128 type panels will only send the first two message blocks.

*Example:* a Zone Partition Report for a system in which Zone 1 is assigned to Partition 2. Zone 2 is assigned to no partition, and Zone 3 is assigned to Partition 8, would begin 49ZP1208...

### Zone Descriptor Request

08ZD009A(CR-LF)

Panel responds with a Zone Descriptor Report

*Note:* This message should be sent only when an initial connection is made with the panel. *It is not intended to be used as a 'polling' command.*

### Zone Descriptor Report

##zdzzz"[String]"00CC(CR-LF)

The panel sends this message in response to a Zone Descriptor Request.

The data portion of this message consists of the Zone Number (zzz), followed by a quote (ASCII 0x22), followed by the characters in the Zone Descriptor, followed by another quote (ASCII 0x22). Because the length of the Zone Descriptors is indeterminate, the bytes-to-follow (here "##") are also indeterminate. There will be one descriptor sent per message packet, with multiple packets sent until all descriptors have been transmitted. No message will be sent for zones that are not described. After the last zone descriptor is sent an "end of descriptors" message will be sent:

0Dzd000""007A(CR-LF)

### Event Log Dump Request

08LD00A8(CR-LF)

Panel responds with an Event Log Dump Report

*Note:* This message should be sent only when an initial connection is made with the panel. *It is not intended to be used as a 'polling' command.*

### Event Log Dump Report (Not Currently Supported)

1Bldddd...00CC(CR-LF)

The panel sends this message in response to an Event Log Dump Request. The data (ddd) will follow the format given for the System Event Notification Messages:

*Ec Zne Usr P mm hh dd MM yy*

Where:

- Ec = Event Code
- Zne = Zone number

- Usr = User Number
- P = Partition number
- mm = Minute
- hh = Hour
- dd = Date
- MM = Month
- yy = Year

After the last log entry is sent a “log complete” message will be sent:

081c0069(CR-LF)

### **Control Channel Status Request**

08CS00A2(CR-LF)

The panel will respond with a Control Channel Status Report for all 96 control channels.

### **Control Channel Status Report**

68CSD...00CC(CR-LF)

The panel sends this message in response to a Control Channel Status Request.

The data portion of this message is 96 characters long, one character for each control channel in order. The value will be U (Unprogrammed), 0 (Off), or 1 (On).

*Example:* With control channel 1 Off, channel 2 On, channel 3 Unprogrammed, and channel 4 Off, the message would begin 68CS01U0....

## ***Access Point Messages***

Access point messages have the following limits:

The range of access point values is 01- 31 – two digits, with a leading zero if needed.

The range of group values is 01 – 08, with a leading zero required.

The range of partition values is 01 – 08, with a leading zero required.

## **Adding and Deleting Cards and Users**

### **Add a Card**

18CAfffrccccccuuuu00CC(CR-LF)

Where:

fff is the Facility Code

rr is the RCM number

cccccc is the Card Code

uuuu is the User Code

All numbers are sent MSB-first.

### **Delete a Card**

18CDfffrccccccuuuu00CC(CR-LF)

Where:

fff is the Facility Code

rr is the RCM number

cccccc is the Card Code

uuuu is the User Code

All numbers are sent MSB-first.

### **Add a User**

17UAiiiccccaaaaaaa00CC(CR-LF)

Where:

iii is the User Index

cccc is the User Code

aaaaaaa is the User's Authority Level by partition Ptn 1 first)

All numbers are sent MSB-first.

### **Delete a User**

09URiii00CC(CR-LF)

Where:

iii is the User Index

All numbers are sent MSB-first.

## **Commands for Individual Access Points**

### **Bypass An Access Point**

0ADBpt00CC(CR-LF)

*Example:*

To bypass Access point 01 send:  
*0ADB010048*

### **Exit An Access Point**

0ADEpt00CC(CR-LF)

*Example:*

To Exit Access point 02 send:  
*0ADE020044*

### **Lock An Access Point**

0ADLpt00CC(CR-LF)

*Example:*

To Lock Access point 01 send:  
*0ADL01003E*

### **Grant an Access Point with Override**

0ADOpt00CC(CR-LF)

*Example:*

To Grant-with-Override Access point 03 send:  
*0ADO030039*

### **Access Point Trigger On**

0ADNpt00CC(CR-LF)

*Example:*

To turn on the trigger for Access point 03 send:  
*0ADN03003A*

### **Access Point Trigger Off**

0ADFpt00CC(CR-LF)

*Example:*

To turn off the trigger for Access point 03 send:

*0ADF030042*

**Grant An Access Point**

*0ADGpt00CC(CR-LF)*

*Example:*

To Grant Access point 01 send:

*0ADG010043*

**Protect An Access Point**

*0ADPpt00CC(CR-LF)*

*Example:*

To Protect Access point 01 send:

*0ADP01003A*

**Commands for Group Access Points**

**Bypass Access Point by Group**

*0AGBgg00CC(CR-LF)*

**Exit Access Point by Group**

*0AGEgg00CC(CR-LF)*

**Lock Access Point by Group**

*0AGLgg00CC(CR-LF)*

**Override Access Point by Group**

*0AGOgg00CC(CR-LF)*

**Grant Access Point by Group**

*0AGGgg00CC(CR-LF)*

**Protect Access Point by Group**

*0AGPgg00CC(CR-LF)*

**Enable Access Point by Group**

*0AGNgg00CC(CR-LF)*

**Disable Access Point by Group**

0AGFgg00CC(CR-LF)

**Commands for Access Points by Partition**

**Bypass Access Point by Partition**

0APBpp00CC(CR-LF)

**Exit Access Point by Partition**

0APEpp00CC(CR-LF)

**Lock Access Point by Partition**

0APLpp00CC(CR-LF)

**Grant Access Point by Partition with Override**

0APOpp00CC(CR-LF)

**Grant Access Point by Partition**

0APGpp00CC(CR-LF)

**Protect Access Point by Partition**

0APPpp00CC(CR-LF)

**Control Channel (Relay, X-10, FSA) Messages**

You can use your PC to send an on or off command to a control channel. The control channel programming determines which outputs are controlled and what action occurs. The data portion of the channel on and off commands is a 2-digit, 1-referenced decimal number corresponding to the number of the desired control channel or group number. Duration of the pulse commands is set when the panel is programmed.

You can also query the panel concerning control channel status with a Control Channel Status Request. The panel will respond with a Control Channel Status Report.

**Control Channel On**

0ACNDD00CC(CR-LF)

**Control Channel Off**

0ACFDD00CC(CR-LF)

**Control Channel On for 2 Seconds**

0ACP0100CC(CR-LF)

**Control Channel On for XX Minutes**

0ACXDD00CC(CR-LF)

**Control Channel On for YY Seconds**

0ACYDD00CC(CR-LF)

**Control Channel Group On**

0ABNDD00CC(CR-LF)

**Control Channel Group Off**

0ABFDD00CC(CR-LF)

**Control Channel Group Pulse**

0ABPDD00CC(CR-LF)

**Control Channel Group Pulse for XX Minutes**

0ABXDD00CC(CR-LF)



**Control Channel Group Pulse for XX Minutes**

0ABYDD00CC(CR-LF)

***Display Messages***

You can request the panel concerning the message currently being displayed for a partition using the Display Request. The panel will respond with a Display Report.

**Keypad Display Request**

09KDP00CC ( CR-LF )

Where P is the partition number wanted. Note that there must be at least one keypad programmed for that partition.

**Keypad Display Response**

29kddd...00CC ( CR-LF )

The data portion consists of the 32 bytes currently being displayed in the requested partition, and one byte indicating the LED state. The result of requesting the display contents for an unassigned partition is undefined. The seventh bit (MSB) of the first byte will be set to indicate the display's backlight should be turned on. This should be removed to give the proper ASCII value.

The LED state byte is the *sum* of all current LED states, expressed in hexadecimal using ASCII characters 0-9 and A-F.

Values	<i>Meaning</i>
1	Ready
2	Trouble
4	Armed

**Notes****Home Control**

Home control CANNOT be active while programming from the keypad. Keypads are updated once every 7 seconds, so trying to poll them any faster is a waste of bandwidth, and could slow the system deleteriously.

**How to tell when the “\*\*\* ALL SECURE \*\*” message is displayed:**

The System Event Notification message is sent when the system is armed; however, when there is an exit delay, there will be a period when a “You May Exit Now” message is displayed, before the “\*\*\* ALL SECURE \*\*” message is seen. This Exit Delay is programmed by the installer, and is in 15-second increments, with a maximum of 225 (15\*15) seconds. To find when the “\*\*\* ALL SECURE \*\*” message is displayed, poll the keypad every 15 seconds for up to 225 seconds.

When the homeowner’s command coincides with a system event notification, it is ignored (no ‘OK’ message received).

**Key Stroke Message**

You can send a series of up to 5 keystrokes to the panel using the Key Stroke Command. Commands greater than 5 keystrokes can be sent one key at a time, *provided no more than 5 seconds elapses between reception of each keystroke.*

**Key Stroke Command**

##KSPd...00CC (CR-LF)

Where P is the partition number wanted, followed by keystrokes. Allowable characters are ASCII 0-9, ‘A’ for asterisk, ‘B’ for pound (‘#’). To send panic-key combinations, send ‘C’ for ‘1’ + ‘\*’; ‘D’ for ‘\*’ + ‘#’; and ‘E’ for ‘3’ + ‘#’. These key combinations are shared with the ABCD keys: Key A send a ‘C’, Key B send a ‘D’, Key C send an ‘E’, and Key D send an ‘F’

You need to have a keypad assigned to a partition to get keypad text from that partition

**Notification Messages**

The panel can be programmed to send notification messages through the RS-232 port when events occur.

**System Event Notifications**

*1B nq Ec Zne Usr P mm hh dd MM yy 00 CS (CR-LF)\**

Where:

- 1B = Byte count in hex.
- nq = Response header
- Ec = Event Code
- Zne = Zone number
- Usr = User Number

- P = Partition number\*\*
- mm = Minute†
- hh = Hour†
- dd = Date
- MM = Month
- yy = Year
- 00 = End-of-Data Marker
- CS = Checksum

#### Notes

\*Panel will send a “P” after the (CR-LF). This Character can be ignored as it is not a part of the Notification Event.

\*\* System events, such as System Low Battery or Test, display partition ‘0’.

† System Notification Messages are reported in real time, with the Hour and Minute reflecting the time of transmission.

[16] messages are duplicates

### Contact ID Messages and Event Types

Code	Contact ID Name	CID Code	Event Type
1	Fire Alarm	110	Alarm
2	Fire Alarm Restore	110	Alarm
3	Trouble	380	Trouble
4	Trouble Restore	380	Trouble
5	Bypass	570	Bypass
6	Bypass Restore	570	Bypass
7	Close (Arm)	401	Open/Close
8	Open (Disarm)	401	Open/Close
0D	Man.Trigger Test Report	601	System
0E	Send A Power-up Report	305	System
0F	Exit Error By User	457	Alarm
11	Duress	121	Alarm
12	Duress Restore	121	Alarm
13	Telco Line 1 Trouble (Fire)	351	Trouble
14	Telco Line 1 Trb Rest(Fire)	351	Trouble
15	Bell 1 Disable (Bypass)(Fire)	521	Bypass

Code	Contact ID Name	CID Code	Event Type
16	Bell 1 Bypass Rest (Fire)	521	Bypass
17	Remote Close (Arm)	407	Open/Close
18	Remote Open (Disarm)	407	Open/Close
19	Pager Failed	336	System
1A	Pager Restore	336	System
1B	A.C. Loss	301	System
1C	A.C. Restore	301	System
1D	Periodic Test Report	602	System
1E	Except Skd Chg	631	System
1F	Exit Error By Zone	374	Alarm
21	Silent	122	Alarm
22	Silent Restore	122	Alarm
23	Telco Line 2 Trouble (Fire)	352	Trouble
24	Telco Line 2 Trb Rest(Fire)	352	Trouble
25	Bell 2 Disable (Bypass)(Fire)	522	Bypass
26	Bell 2 Bypass Rest (Fire)	522	Bypass
27	Quick Arm (Close)	408	Open/Close
29	Low Batt	302	Sytem
2A	Low Batt Restore	302	Sytem
2B	Access Denial(General)	421	Open/Close
2C	A.C. loss at A.C.S. module	342	Trouble
2D	Walk test	607	Sytem
2E	Access Skd Chg	632	Sytem
31	Audible	123	Alarm
32	Audible Restore	123	Alarm
33	Earth Ground Trouble (Fire)	310	Trouble
34	Earth Ground Trb Rest (Fire)	310	Trouble
35	Aux Rly Disable (Bypass) (Fire)	524	Bypass
36	Aux Rly Bypass Rest (Fire)	524	Bypass
37	Keyswitch Close (Arm)	409	Open/Close
38	Keyswitch Open (Disarm)	409	Open/Close
3B	Door Prop Open	426	Trouble
3C	Low Battery At A.C.S. Module	338	Trouble
3D	Walk Test Exit	607	System

Code	Contact ID Name	CID Code	Event Type
3E	Send A Power-up Report	305	System
3F	Fire Walk Test Exit (Fire)	604	Test
41	Perimeter	131	Alarm
42	Perimeter	131	Alarm
43	Zone/Sensor Supv Al (Fire)	200	Trouble
44	Zone/Sensor Supv Al Rest (Fire)	200	Trouble
45	Dialer Disable (Bypass) (Fire)	551	Bypass
46	Dialer Bypass Rest (Fire)	551	Bypass
47	Partial Arm (Close)	456	Open/Close
48	Callback Requ.	411	System
4B	Door Prop Open Restore	426	Trouble
4C	Access Point Bypass	577	Bypass
4D	Event Log 50% Full	622	All
4E	Program Changed	306	All
51	Interior	132	Alarm
52	Interior	132	Alarm
53	Exp. Module Tamper	341	Trouble
54	Exp. Module Tamper Restore	341	Trouble
55	Vent Zone (Bypass)	579	Bypass
56	Vent Zone Bypass Rest	579	Bypass
59	Battery Test Fail	309	System
5A	Battery Test Restore (Fire)	309	System
5B	Access Granted	422	Open/Close
5C	Reset At Module	339	All
5D	Event Log 90% Full	623	All
5E	Auto-arm Fail	455	Open/Close
5F	Send A Cancel Trigger	406	Alarm
61	24 Hour Zone	133	Alarm
62	Hour	133	Alarm
63	R.F. Sensor Super	381	Trouble
64	R.F. Sensor Super Restore	381	Trouble
65	A.C.S. Test Entry	607	System
66	A.C.S. Test Exit	607	Open/Close
67	Auto Close (Arm)	403	Open/Close

Code	Contact ID Name	CID Code	Event Type
68	Auto Open (Disarm)	403	Trouble
69	Expander Module Fail	344	Trouble
6A	Expander Module Fail	344	Open/Close
6B	Egress Denied(General)	424	Trouble
6C	Access Point Relay Supervision Fail	432	All
6D	Event Log Overwrite	624	System
6E	Off Normal Report (Fire)	602	System
6F	Begin Drill (Fire)		Test
71	Day/Night Alarm	135	Alarm
72	Day/Night Alarm Restore	135	Alarm
73	Rpm Sensor Super	382	Trouble
74	Rpm Sensor Super Restore	313	Trouble
76	Engineer Reset	415	All
77	Log Dialer Shutdown Rest	415	System
78	Log Dialer Shutdown	308	System
79	System Shutdown	308	All
7A	System Shutdown Restore	308	All
7B	Door Forced Open	423	Alarm
7C	Self Test Fail At Module	343	Trouble
7D	Event Log Reset	621	All
7E	Point Tested Ok	611	System (Burg)
7E	Point Tested Ok	611	Test (Fire)
7F	End Drill		Test
81	Entry/Exit Alarm	134	Alarm
82	Entry/Exit Alarm Restore	134	Alarm
83	E.C.P. Relay Trouble	320	Trouble
84	E.C.P. Relay Trouble Restore	320	Trouble
87	Log System Shutdown Rest	414	System
88	Log System Shutdown	414	System
89	R.F. Low Battery	384	Trouble
8A	R.F. Low Bat Restore	384	Trouble
8B	Door Forced Open Restore	423	Alarm
8C	Access Point D.S.M. Shunt	434	Bypass
8D	Time Clock Reset	625	All
8E	Point Not Tested (Burg)	612	System

Code	Contact ID Name	CID Code	Event Type
8E	Point Not Tested (Fire)	612	Fire
91	Poll Loop Short	142	Alarm
92	Poll Loop Short Restore	142	Alarm
93	Polling Loop Short	332	Trouble
94	Polling Loop Short Restore	332	Trouble
95	A.C.S. Relay/Trigger Disable	520	Bypass
96	A.C.S. Relay/Trigger Enable	520	Bypass
97	A.C.S. Reader Disable	501	Bypass
98	A.C.S. Reader Enable	501	Bypass
99	A.C.S. Zone Alarm	140	Alarm
9A	A.C.S. Zone Alarm Restore	140	Alarm
9B	Egress Granted	425	Open/Close
9C	Access Point D.S.M. Unshunt	343	Bypass
9D	Time Clock Wrong	626	All
9E	Recent Close By User	459	Alarm
A1	Expander Module Fail	143	Alarm
A2	Expander Module Fail Restore	143	Alarm
A3	Expander Module Fail	333	Trouble
A4	Expander Module Fail Restore	333	Trouble
A5	A.C.S. Zone Shunt	576	Bypass
A6	A.C.S. Zone Unshunt	576	Bypass
A7	Access Point R.T.E. Trouble	428	Trouble
A8	Access Point R.T.E. Trouble Restore	428	Trouble
A9	Access Point D.S.M. Trouble	427	Trouble
AA	Access Point D.S.M. Trouble Restore	427	Trouble
AB	Access Point R.T.E. Shunt	433	Bypass
AC	Access Point R.T.E. Unshunt	433	Bypass
AD	Log Pgm Mode Entry	627	Sysem
AE	Listen-in To Follow	606	Alarm
B1	Non-burg Alarm	150	Alarm
B2	Non-burg Alarm Restore	150	Alarm
B3	Sensor Tamper	383	Trouble
B4	Sensor Tamper Restore	383	Trouble
B5	Cross-zoning Trouble	378	Trouble

Code	Contact ID Name	CID Code	Event Type
<b>B6</b>	Cross-zoning Trouble Restore	378	Trouble
<b>B7</b>	Arm Stay (Close)	441	Open/Close
<b>BB</b>	A.C.S. Program Entry	429	All
<b>BC</b>	A.C. Loss Restored At A.C.S. Module	342	Trouble
<b>BD</b>	Pgm Mode Exited	628	System
<b>BE</b>	Point Tested Failed	389	Trouble
<b>C1</b>	Smoke Alarm	111	Alarm
<b>C2</b>	Smoke Alarm Rest (Fire)	111	Alarm
<b>C3</b>	Fire Trouble	373	Trouble
<b>C4</b>	Fire Trouble Restore	373	Trouble
<b>C5</b>	CO Alarm	162	Alarm
<b>C6</b>	CO Alarm Restore	454	Alarm
<b>C7</b>	Fail To Close (Arm)	453	Open/Clos
<b>C8</b>	Fail To Open (Disarm)	453	Open/Clos
<b>C9</b>	Smoke Detector Hi Sensitivity	385	Trouble
<b>CA</b>	Smoke Detector Hi Sensitivity	385	Trouble
<b>CB</b>	A.C.S. Program Exit	430	All
<b>CC</b>	Low Battery Restored At A.C.S. Module	338	Trouble
<b>CD</b>	User Code Added	999	System
<b>D1</b>	Water Flow Alarm (Fire)	113	Alarm
<b>D2</b>	Water Flow Alarm Restore (Fire)	113	Alarm
<b>D3</b>	Fail To Communicate	354	All
<b>D4</b>	Comm. Restore	354	All
<b>D7</b>	Late Close (Arm)	452	Open/Close
<b>D8</b>	Late Open	452	Open/Close
<b>D9</b>	Smoke Detector Lo Sensitivity	386	Trouble
<b>DA</b>	Smoke Detector Lo Sensitivity Restore	386	Trouble
<b>DB</b>	A.C.S. Threat Change	431	All
<b>DC</b>	Access Point Unbypass	577	Bypass
<b>DD</b>	User Code Deleted		System
<b>E1</b>	Zone/Sensor Supv Al (Fire)	200	Alarm
<b>E2</b>	Zone/Sensor Supv Al Rest (Fire)	200	Alarm
<b>E3</b>	Bell 1 Trouble (Fire)	321	Trouble



Code	Contact ID Name	CID Code	Event Type
<b>E4</b>	Bell 1 Trouble Restore (Fire)	321	All
<b>E7</b>	Early Close (Arm)	451	Open/Close
<b>E8</b>	Early Open	451	Open/Close
<b>E9</b>	Intrusion Det. Hi Sensitivity	387	Trouble
<b>EA</b>	Intrusion Det. Hi Sensitivity	387	Trouble
<b>EB</b>	Duress Access Grant	124	Alarm
<b>EC</b>	Access Point Relay Suprv Restored	432	
<b>ED</b>	User Code Changed		System
<b>F3</b>	Bell 2 Trouble (Fire)	322	Trouble
<b>F4</b>	Bell 2 Trb Rest (Fire)	322	All
<b>F5</b>	Faults		All
<b>F6</b>	Fault Restores		All
<b>F9</b>	P.I.R. Detector Lo Sensitivity	388	Trouble
<b>FA</b>	Intrusion Det. Low Sensitivity	388	Trouble
<b>FB</b>	Duress Egress Grant	125	Alarm
<b>FC</b>	Self test Restored At A.C.S. Module	343	Trouble
<b>FD</b>	Fail To Print	336	All
<b>FE</b>	Fail To Print Restore	336	All

**Appendix A: C Source for Command String Generator**

```
#include <stdio.h>
#include <math.h>
#include <stdlib.h>
#include <string.h>

void main( )
{
    char inString[255],outString[261], buffer[3] ;
    unsigned char checksum;
    int i;

    printf("Enter a command string: \n");
    gets(inString);
    //blank input quits program
    while (strlen(inString) )
    {
        checksum = 0;
        //get length of input string
        sprintf(outString,"%02X",strlen(inString)+ 6);
        //insert length at beginning of dstring
        strcat(outString, inString);
        //put '00' spacers at end of string
        strcat(outString, "00");
        i = 0;
        //sum ascii values of characters in expanded string
        while (outString[i])
        {
            checksum += outString[i++];
        }

        //two's complement
        checksum = ~(checksum) + 1;
        sprintf(buffer,"%02X",checksum);
        //append to string
        strcat(outString,buffer);
        printf("%s\n", outString);
        printf("Enter a command string: \n");
        gets(inString);
    }
    exit(0);
}
```

As an example of using this code, to get the checksum for the Arm -Away command, user 01, user code 1234, you would enter the string “aa011234” followed by the ENTER key. The program should return “0Eaa011234003E.” To quit the program, just press ENTER at the prompt.