

# **D8-16X Serial Interface Protocol**

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# INTRODUCTION

The D32X ALARM PANELS RS232 serial interface allows communication between various external devices. This document details the input and outputs messages – all of which use an ASCII Protocol.

## The ASCII outputs are

1. Event data.
2. Panel status.

## The ASCII inputs are

- Keypad strings
- User code entry
- Arming

**The serial data is always 9600 baud, 8 data bits, no parity, 1 stop bit.**

NOTE: This document refers to hexadecimal numbers, which are represented by the prefix 0x. Decimal numbers have no prefix.

## 1. Output Event Data

These messages are sent as they occur in the D32x. The format of the message is:

NAME	START	ADDRESS	LENGTH	COMMAND	DATA	TIME STAMP (decimal bytes)						CHECKSUM	FINISH
LENGTH	1 BYTE	1 BYTE	1 BYTE	1 BYTE	3 BYTES	6 BYTES						1 BYTE	2 BYTES
ID	ST	AD	L	CM	E I A D D R	Y	M	D	H	M	SC	CK	CR LF
TYPE	HEX	HEX	HEX	HEX	H D H E E E X C X	DE	DE	DE	DE	DE	DE	HEX	HEX HEX

### 1. START.

The START byte defines the structure of the message being sent.

Output Event Data on the D32X is always an ASCII message with optional Address & Time Stamp. Therefore the START byte for the Output Event Data on the D32X is derived from the following bit definitions.

BIT	Parameter Definition	Program Option
1 (0x01)	ADDRESS included	P199E 1E
2 (0x02)	Basic header - always SET	<i>NONE - Fixed ON</i>
3 (0x04)	TIME STAMP included	P199E 2E
4-6	Not used	<i>NONE - Always OFF</i>
7 (0x80)	ASCII format	<i>NONE - Fixed ON</i>

NOTE: Values starting with 0x (such as 0x80) signify a hexadecimal number.

This table shows the START value for different address/ time stamp selections.

START BYTE (hex)	ADDRESS included	DATE/TIME included	P199E 1E	P199E 2E
87	Y	Y	On	On
86	N	Y	Off	On
83	Y	N	On	Off
82	N	N	Off	Off

## 2. ADDRESS.

The ADDRESS byte identifies the D32X sending the message.

The address is either 0x00 or the last digit of the **Account Number 2** (P73E).

Range is 0x00 to 0x0F (the Account Number can include hex numbers).

EXAMPLE: If Account Number 2 = 1234, ADDRESS = 4.

## 3. TIME STAMP.

These values are in decimal format.

The time stamp includes the DATE and TIME.

It is 6 bytes – YEAR, MONTH, DAY of Week & DAY of Month, HOURS, MINUTES & SECONDS.

1. YEAR - 00 to 99.
2. MONTH - 01 (January) to 12 (December).
3. DAY of MONTH - 1 to 31. The 3 MSB can also be used to represent the Day of the week, with 1 = MONDAY.
4. HOURS – 00 (midnight) to 23 (11pm) (12 is midday). Always 24hr format. The 3 MSB can also be used to represent Daylight Saving.
5. MINUTES – 0 to 59.
6. SECONDS – 0 to 59

## 4. LENGTH & SEQUENCE NUMBER BIT.

The SEQUENCE NUMBER BIT is the MSB of the LENGTH byte. It is either 0 or 1.

For each new message the sequence number bit is toggled.

The length of the Output Event Data is always 3 bytes.

Therefore this byte is either 0x03 or 0x83 – depending on the sequence bit.

## 5. COMMAND.

This byte is fixed at 0x61 to indicate a SYSTEM STATUS message.

## 6. DATA MESSAGE.

The data message is always 3 bytes to identify the EVENT, the ID and the AREA data.

- a. EVENT. The EVENT categories are:

Zone or User EVENTS		Applicable ID		Applicable AREA		
Value	Description	Value	Description	Value	Description	Comment
0x01	Sealed	00	Power up	0x00	No Area	Power up or reset
0x00 0x01	Unsealed Sealed	01 to 32	Zone 1 to 32	0x00	No Area	Current zone state
		01 to 56	User 1 to 56	0xa1 to 0xa3	Door 1 to Door 3	User access door
0x02 0x03	Alarm Alarm Restore	01 to 32	Zone 1 to 32	0x01	Area 1	When Armed Area 1
				0x02	Area 2	When Armed Area 2
				0x03	Home	When Armed Home
				0x04	Day	When Armed Day
		0x80	24 hr	24 hr		
0x81	Fire	24hr converted to Fire				
0x85	Door	Door Open too Long				
		0xf0	Keypad	0x81	Fire	Keypad Fire
				0x82	Panic	Keypad Panic
				0x83	Medical	Keypad Medical
				0x84	Duress	Keypad Duress
		01 to 56	User 1 to 56	0x82	Panic	Radio Panic
		0x00	Main Unit	0x82	Panic	Keyswitch Panic
0x04 0x05	Manual Exclude Manual Include	01 to 32	Zone 1 to 32	0x00	Area 1 Area 2 Home 24 hr	When Armed Area 1 When Armed Area 2 When Armed Home 24 hr

0x06 0x07	Auto Exclude Auto Include	01 to 32	Zone 1 to 32	0x00	Area 1 Area 2 Home 24 hr	When Armed Area 1 When Armed Area 2 When Armed Home 24 hr
0x08 0x09	Tamper Unsealed Tamper Normal	0x00	Main Unit	0x00 0x01	Internal External	Internal Tamper External Tamper
		0xF0	Keypad	0x00	No Area	Keypad Tamper
		01 to 32	Zone 1 to 32	0x91	Radio Detector	Radio Detector Tamper

System EVENTS		Applicable ID		Applicable AREA		
Value	Description	Value	Description	Value	Description	Comment
0x10 0x11	Power Failure Power Normal	0x00	Main Unit	0x00	No Area	AC Mains Fail AC Mains Restored
0x12 0x13	Battery Failure Battery Normal	0x00	Main Unit	0x00	No Area	Main Battery
		01 to 56	User 1 to 56	0x92	Radio Key	Radio Key Battery
		01 to 32	Zone 1 to 32	0x91	Radio Detector	Radio Detector Battery
0x14 0x15	Report Failure Report Normal	0x00	Main Unit	0x00	No Area	Dialler Fail to report
0x32 0x17	Supervision Failure Supervision Normal	01 to 32	Zone 1 to 32	0x00	No Area	Supervised zone failure
0x19	Real Time Clock	0x00	Main Unit	0x00	No Area	RTC Time or Date Changed

Area EVENTS		Applicable ID		Applicable AREA		
Value	Description	Value	Description	Value	Description	Comment
0x20 0x21	Entry Delay Start Entry Delay End	01 to 32	Zone 1 to 32	0x01 0x02 0x03	Area 1 Area 2 Home	When Armed Area 1 When Armed Area 2 When Armed Home
0x22 0x23	Exit Delay Start Exit Delay End	01 to 32	Zone 1 to 32	0x01 0x02 0x03	Area 1 Area 2 Home	When Armed Area 1 When Armed Area 2 When Armed Home
0x24	Armed Away	01 to 56 57 58	User 1 to 56 Keyswitch 57 Short Arm 58	0x01 0x02	Area 1 Area 2	When Armed Area 1 When Armed Area 2
0x25	Armed Home	01 to 56 57 58	User 1 to 56 Keyswitch 57 Short Arm 58	0x03	Home	When Armed Home
0x26	Armed Day			0x04	Day	When Armed Day
0x27	Armed Night	-	-	-	-	
0x28	Armed Vacation	-	-	-	-	
0x2e	Armed Highest	-	-	-	-	
0x2f	Disarmed	01 to 56 57 58	User 1 to 56 Keyswitch 57	0x01 0x02 0x03 0x04	Area 1 Area 2 Home Day	
0x30	Arming delayed	01 to 56	User 1 to 56	0x01 0x02 0x03	Area 1 Area 2 Home	Auto arming delayed

Result EVENTS		Applicable ID		Applicable AREA		
Value	Description	Value	Description	Value	Description	Comment
0x31	Output On	01 to 10	Aux 1 to 10	0x00	-	Outputs on D8x/D32x
0x32	Output Off	090	Siren			
		091	Soft Siren			
		092	Soft Home			
		093	Siren Fire			
		094	Strobe			
		095	Reset			
		096	Sonalert			
		097	Keypad			
			Display			
			Enable			

7. **CHK.** The checksum byte HEX character results in the LSB being zero when all the message bytes are summed. *This is done before the message is converted to ASCII and excludes the FINISH bytes.*
8. **FINISH.** This is always CR, LF (Carriage Return, Line Feed).

## 2. INPUT COMMANDS

There are 2 types of input commands:

1. Keypad strings.
2. Status Requests.

The format of the input message is:

NAME	START	ADDRESS	LENGTH	COMMAND	DATA	CHECKSUM	FINISH
LENGTH	1 BYTE	1 BYTE	1 BYTE	1 BYTE	1 – 30 BYTES	1 BYTE	0-3 BYTES
ID	ST	AD	L	CM		CK	CR LF
TYPE	HEX	HEX	HEX	HEX		HEX	HEX
Example	83	0	05	60	A123E		? CR LF
	38 33	30	30 35	36 30	41 31 32 33 45	31 32	3F 0D 0A

### 1. START.

The START byte defines the structure of the message being sent.

**Input Event Data** on the D32X is an ASCII message.

This table shows the START value

START BYTE (hex)	ADDRESS included	DATE/TIME included		
83	Y	N		

### 2. ADDRESS.

The ADDRESS byte identifies the D32X receiving the message.

The address is either 0x0 or the last digit of the **Account Number 2** (P73E).

Range is 0x00 to 0x0F (the Account Number can include hex numbers).

EXAMPLE: If Account Number 2 = 1234, ADDRESS = 4.

- i) An address of 0 is always accepted.
- ii) An address other than 0 must match the last digit of P73E.

### 3. LENGTH.

The length of the Input Event Data is variable with a maximum of 30 bytes.

### 4. COMMAND.

This byte is fixed at 0x60 to indicate a **CMD USER INTERFACE** message.

### 5. DATA.

The DATA is from 1 to 30 bytes.

Ascii	Name	Description
A	Arm Key	ARM key
H	Home Key	HOME or MONITOR key
E	Enter Key	ENTER or E key
X	Exclude Key	EXCLUDE key
F	Fire Key	FIRE key
V	View Key	MEMORY key
P	Panic Key	PANIC key (same as pressing double panic)
D	Medical Key	MEDICAL key
M	Program Key	PROGRAM or P key
*	Panic1 Key	* Key (* on LHS of keypad)
#	Panic2 Key	# Key (* on RHS of keypad)
0-9	0-9 Keys	Number keys
S	Status update	STATUS request (not a key). Followed by a 2 digit ID.

### 6. CHK.

The checksum is calculated after the message is converted to ASCII.

- a. All the ASCII characters up to the checksum position are added together.
- b. The least significant byte (LSB) of the addition is then used to calculate the checksum CHK.
- c.  $LSB + CHK = 100 \text{ hex}$ .
- d. CHK is then converted into 2 ASCII characters and added to the message.

Examples: Status request for unsealed zones.

NAME	START	ADD	LEN	CMD	DATA	CHK	Delay	FINISH
Status 0	83	00	03	60	S 0 0	E9	?	CR LF
	38 33	30	30 33	36 30	53 30 30	45 39	3F	0D 0A

1.  $38+33+30+30+33+36+30+53+30+30 = 217$ . (LSB = 17)

2.  $17+E9 = 100$ . (CHK = E9)

Arm using code 123

NAME	START	ADD	LEN	CMD	DATA	CHK	Delay	FINISH
ARM12 3E	83	00	05	60	A 1 2 3 E	7E	?	CR LF
	38 33	30	30 35	36 30	41 31 32 33 45	37 45	3F	0D 0A

1.  $38+33+30+30+35+36+30+41+31+32+33+45 = 282$ . (LSB = 82)

2.  $82+7E = 100$ . (CHK = 7E)

### 7. FINISH.

It includes:

- a. **?** - Command Separator. If a number of messages are sent together then they should be separated by '?'. This adds a delay between processing successive messages.
- b. **CR** - Carriage Return. Optional - it is ignored by the panel.
- c. **LF** - Line Feed. Optional - it is ignored by the panel

## Status update

This is sent in response to a STATUS request.  
STATUS allows remote viewing of the current arming and alarm states.  
The format of the status message is:

NAME	START	ADDRESS	LENGTH	COMMAND	DATA	CHKSUM	FINISH
LENGTH	1 BYTE	1 BYTE	1 BYTE	1 BYTE	3 BYTES	1 BYTE	2 BYTES
ID	ST	AD	L	CM		CK	CR LF
TYPE	HEX	HEX	HEX	HEX		HEX	HEX
Example	82	07	03	60	00 40 00	13	CR LF
	38 32	30 37	30 33	36 30	30 30 34 30 30 30	31 33	0D 0A

(This message reports a zone 7 unseal on D8x panel with address 7)

### 8. START.

The START byte defines the structure of the message being sent.

**Status report Data** on the D32X is an ASCII message = 82 .

### 9. ADDRESS.

The ADDRESS byte identifies the D32X receiving the message.

The address is either 0x00 or the last digit of the **Account Number 2** (P73E).

Range is 0x00 to 0x0F (the Account Number can include hex numbers).

EXAMPLE: If Account Number 2 = 1234, ADDRESS = 4.

iii) An address of 0 is always accepted.

iv) An address other than 0 must match the last digit of P73E.

### 10. LENGTH.

The length of the Status Data is fixed at 3 bytes.

### 11. COMMAND.

This byte is fixed at 0x60 to indicate a **CMD USER INTERFACE** message.

### 12. DATA.

The DATA is 3 bytes.

The 1<sup>st</sup> byte is the received status request ID.

The 2<sup>nd</sup> & 3<sup>rd</sup> bytes are the data as explained below.

ID No	Description	Size (bytes)	Rules
0	Zone 1-16 Input Unsealed	2	FORM 4. Zones 1-16
1	Zone 1-16 Radio Unsealed	2	FORM 4. Zones 1-16
2	Zone 1-16 CBus Unsealed	2	FORM 4. Zones 1-16
3	Zone 1-16 in Delay	2	FORM 4. Zones 1-16
4	Zone 1-16 in Double Trigger	2	FORM 4. Zones 1-16
5	Zone 1-16 in Alarm	2	FORM 4. Zones 1-16
6	Zone 1-16 Excluded	2	FORM 4. Zones 1-16
7	Zone 1-16 Auto Excluded	2	FORM 4. Zones 1-16
8	Zone 1-16 Supervision Fail Pending	2	FORM 4. Zones 1-16
9	Zone 1-16 Supervision Fail	2	FORM 4. Zones 1-16
10	Zone 1-16 Doors Open	2	FORM 4. Zones 1-16
11	Zone 1-16 Detector Low Battery	2	FORM 4. Zones 1-16
12	Zone 1-16 Detector Tamper	2	FORM 4. Zones 1-16
13	Miscellaneous Alarms	2	FORM 20. Miscellaneous alarms.
14	Arming	2	FORM 21.
15	Outputs	2	FORM 22.
16	View State	2	FORM 23.

17	VERSION - SW	2	mmxy mm – model D16X - 00h D16X 3G - 04h D16X 4G - 05h D32X - 06h xy - sw version x 0-f (4 bits msb) y 0-f (4 bits lsb) See VERSION examples BELOW
18	AUXILIARY OUTPUTS	2	<b>FORM 24.</b>
19	Zone 1-16 Excluded + Auto Excluded	2	<b>FORM 4. Zones 1-16</b>
20	Zone 17-32 Input Unsealed	2	<b>FORM 5. Zones 17-32</b>
21	Zone 17-32 Radio Unsealed	2	<b>FORM 5. Zones 17-32</b>
22	Zone 17-32 CBus Unsealed	2	<b>FORM 5. Zones 17-32</b>
23	Zone 17-32 in Delay	2	<b>FORM 5. Zones 17-32</b>
24	Zone 17-32 in Double Trigger	2	<b>FORM 5. Zones 17-32</b>
25	Zone 17-32 in Alarm	2	<b>FORM 5. Zones 17-32</b>
26	Zone 17-32 Excluded	2	<b>FORM 5. Zones 17-32</b>
27	Zone 17-32 Auto Excluded	2	<b>FORM 5. Zones 17-32</b>
28	Zone 17-32 Supervision Fail Pending	2	<b>FORM 5. Zones 17-32</b>
29	Zone 17-32 Supervision Fail	2	<b>FORM 5. Zones 17-32</b>
30	Zone 17-32 Doors Open	2	<b>FORM 5. Zones 17-32</b>
31	Zone 17-32 Detector Low Battery	2	<b>FORM 5. Zones 17-32</b>
32	Zone 17-32 Detector Tamper	2	<b>FORM 5. Zones 17-32</b>
33	Zone 17-32 Excluded + Auto Excluded	2	<b>FORM 5. Zones 17-32</b>



**FORM 4. Used to select Zones 1-16.**

Name	DATA	EXAMPLE	COMMENT
Zone 1	0100	82 07 03 60 05 01 00 0e CR LF	05 = Alarm, 0100 = zone 1 (panel address = 07)
Zone 2	0200		
Zone 3	0400		
Zone 4	0800		
Zone 5	1000		
Zone 6	2000		
Zone 7	4000	82 07 03 60 00 40 00 13 CR LF	00 = unseal, 4000 = zone 7 (panel address = 07)
Zone 8	8000	82 07 03 60 00 c0 00 54 CR LF	00 = unseal, c000 = zone 7 & zone 8 (panel address = 07)
Zone 9	0001		
Zone 10	0002		
Zone 11	0004		
Zone 12	0008		
Zone 13	0010		
Zone 14	0020		
Zone 15	0040		
Zone 32	0080	82 07 03 60 00 00 80 94	00 = unseal, 0080 = zone 16 (panel address = 07)

**FORM 5. Used to select Zones 17-32.**

Name	DATA	EXAMPLE	COMMENT
Zone 17	0100	82 07 03 60 25 01 00 0e CR LF	05 = Alarm, 0100 = zone 17 (panel address = 07)
Zone 18	0200		
Zone 19	0400		
Zone 20	0800		
Zone 21	1000		
Zone 22	2000		
Zone 23	4000	82 07 03 60 20 40 00 13 CR LF	00 = unseal, 4000 = zone 23 (panel address = 07)
Zone 24	8000	82 07 03 60 20 c0 00 54 CR LF	00 = unseal, c000 = zone 23 & zone 24 (panel address = 07)
Zone 25	0001		
Zone 26	0002		
Zone 27	0004		
Zone 28	0008		
Zone 29	0010		
Zone 30	0020		
Zone 31	0040		
Zone 32	0080	82 07 03 60 20 00 80 94	00 = unseal, 0080 = zone 32 (panel address = 07)

**FORM 20. Show Miscellaneous alarms.**

Name	DATA		
Duress	0001		
Panic	0002		
Medical	0004		
Fire	0008		
Instal End	0010		
Ext Tamper	0020		
Panel Tamper	0040		
Keypad Tamper	0080		
Pendant Panic	0100		
Panel Battery Low	0200		
Panel Battery Low	0400		
Mains Fail	0800		
CBus Fail	1000		
	2000		
	4000		
	8000		

**FORM 21. Show ARMING STATUS.**

Name	DATA	
AREA 1 ARMED	0100	
AREA 2 ARMED	0200	
AREA 1 FULLY ARMED	0400	
AREA 2 FULLY ARMED	0800	
HOME ARMED	1000	
Day Mode Armed	2000	
Entry Delay 1 ON	4000	
Entry Delay 2 ON	8000	
Manual Exclude mode	0001	

Memory mode	<b>0002</b>	
Day Zone Select	<b>0004</b>	
	<b>0008</b>	
	<b>0010</b>	
	<b>0020</b>	
	<b>0040</b>	
	<b>0080</b>	

**FORM 22. Show output states.**

Name	DATA	
Siren Loud	0100	
Siren Soft	0200	
Siren Soft Home	0400	
Siren Fire	0800	
Strobe	1000	
Reset	2000	
Sonalert	4000	
Keypad Display Enable	8000	
Aux1	0001	
Aux2	0002	
Aux3	0004	
Aux4	0008	
Home Out	0010	
Power Fail	0020	
Panel Batt Fail	0040	
Tamper Xpand	0080	

**FORM 23. Show View states.**

Name	DATA	
NORMAL	F000	
BRIEF DAY (CHIME)	E000	
HOME	D000	
MEMORY	C000	
BRIEF DAY ZONE SELECT	B000	
EXCLUDE SELECT	A000	
USER PROGRAM	9000	
INSTALLER PROGRAM	8000	

**FORM 24. Show Auxiliary output states.**

Name	DATA	
Aux1	0001	
Aux2	0002	
Aux3	0004	
Aux4	0008	
Aux5	0010	
Aux6	0020	
Aux7	0040	
Aux8	0080	

13. **CHK.** The checksum byte HEX character results in the LSB being zero when all the message bytes are summed. *This is done before the message is converted to ASCII and excludes the FINISH bytes.*

14. **FINISH.** It includes:

- a. **CR** - Carriage Return. Optional - it is ignored by the panel.
- b. **LF** - Line Feed. Optional - it is ignored by the panel

## **Program Options**

### **P199E**

### **ASCII Bus Options**

- 1E. Include address in message. The address is the lower byte of P73E.
- 2E. Include time stamp in output message.
- 3E. Include Alarms in output message.
- 4E. Include Warnings in output message.
- 5E. Include Access Events in output message.
- 6E. Zone Seal State (D8x/D32x V6 and later).
- 7E. Send a periodic VERSION -SW message if P199E 7E is ON. Intended as an OK ID signal.

## EXAMPLES

The following tables list the messages sent with an example showing the string data and below it the actual ASCII byte output (ie 80 is sent as the ascii bytes 38 30).

### ALARM

	Start	Address	Length	Command	Message			Date			TIME			Ck	Cr-LF	
EVENT DESCRIPTION					Event E/R	ID	Area	Yr	Mth	Day	Hr	Min	Sec			
<b>Duress</b>	87		03	61	2	User	0x84	yy	mm	dd	hh	mm	00			
ie D32 2 User1 07:43 1:2:2006	87	02	03	61	02	01	84	06	12	01	07	43	00	8D	0d	0a
30 byte message (ASCII)	38 37	30 32	30 31	36 31	30 32	30 31	38 34	3036	3132	3031	3037	3433	3030	38 44	0d 0a	
<b>Fire</b>	87		03	61	02	Zone	0x81	yy	mm	dd	hh	mm	00			
ie Zone 1 09:43 1:2:2006	87	02	03	61	02	04	81	06	02	01	09	43	00	9B	0d	0a
24 byte message (ASCII)	38 37	30 32	30 31	36 31	30 32	30 31	38 31	30 36	30 32	30 31	30 39	34 33	30 30	39 42	0d 0a	
<b>Medical</b>	87		03	61	2	01	0x83	yy	mm	dd	hh	mm	00			
Ex: User 1 13:15 2:3:2006	87	02	03	61	02	01	83	06	02	01	13	15	00	C0	0d	0a
24 byte message (ASCII)	38 37	30 32	30 31	36 31	30 32	30 31	38 33	30 36	30 32	30 31	31 33	31 35	30 30	43 30	0d 0a	
<b>Panic Radio Key</b>	87		03	61	2	User	0x82	yy	mm	dd	hh	mm	00			
Ex: User 50 13:15 2:3:2006	87	02	03	61	02	32=50d	82	06	02	01	13	15	00	90	0d	0a
24 byte message (ASCII)	38 37	30 32	30 31	36 31	30 32	33 32	38 32	30 36	30 32	30 31	31 33	31 35	30 30	39 30	0d 0a	
<b>Panic Keypad</b>	87		03	61	2	57	0x82	yy	mm	dd	hh	mm	00			
Ex: 13:15 2:3:2006	87	02	03	61	02	39=57d	82	06	02	01	13	15	00	89	0d	0a
24 byte message (ASCII)	38 37	30 32	30 31	36 31	30 32	33 39	38 32	30 36	30 32	30 31	31 33	31 35	30 30	38 39	0d 0a	
<b>Panic Keyswitch</b>	87		03	61	2	58	0x82	yy	mm	dd	hh	mm	00			
Ex: 13:15 2:3:2006	87	02	03	61	02	3A=58d	82	06	02	01	13	15	00	88	0d	0a
24 byte message (ASCII)	38 37	30 32	30 31	36 31	30 32	33 41	38 32	30 36	30 32	30 31	31 33	31 35	30 30	38 38	0d 0a	
<b>Tamper Internal Panel</b>	87		03	61	8	0	0x00	yy	mm	dd	hh	mm	00			
Ex: 23:45 10:5:2008	87	02	03	61	08	00	00	08	05	10	23	45	00	EA	0d	0a
24 byte message (ASCII)	38 37	30 32	30 31	36 31	30 38	30 30	30 30	30 38	30 35	30 31	32 33	34 35	30 30	45 41	0d 0a	
<b>Tamper Radio Detector</b>	87		03	61	8	User	Area	yy	mm	dd	hh	mm	00			
Ex: Zone 15 Area 1 23:45 10:5:2008	87	02	03	61	08	0F= 15d	91	08	05	10	23	45	00	DA	0d	0a
24 byte message (ASCII)	38 37	30 32	30 31	36 31	30 38	30 46	30 31	30 38	30 35	30 31	32 33	34 35	30 30	44 41	0d 0a	
<b>Tamper External</b>	87		03	61	8	57	0x00	yy	mm	dd	hh	mm	00			
Ex: 23:45 10:5:2008	87	02	03	61	08	39=57d	00	08	05	10	23	45	00	B1	0d	0a
24 byte message (ASCII)	38 37	30 32	30 31	36 31	30 38	30 39	30 30	30 38	30 35	30 31	32 33	34 35	30 30		0d 0a	
<b>Tamper Keypad</b>	87		03	61	8	0xf0	Area	yy	mm	dd	hh	mm	00			
Ex: 23:45 10:5:2008	87	02	03	61	08	F0	00	08	05	10	23	45	00	FA	0d	0a
24 byte message (ASCII)	38 37	30 32	30 31	36 31	30 38	46 30	30 30	30 38	30 35	30 31	32 33	34 35	30 30		0d 0a	
<b>Zone</b>	87		03	61	2	1-32	Area	yy	mm	dd	hh	mm	00			
Ex: Zone 12 Area 1 23:45 10:5:2008	87	02	03	61	02	0c=12	01	08	05	10	23	45	00		0d	0a
24 byte message (ASCII)	38 37	30 32	30 31	36 31	30 38	30 43	30 31	30 38	30 35	30 31	32 33	34 35	30 30		0d 0a	
<b>ARM Open/Close</b>	87		03	61	0	1-32	Area	yy	mm	dd	hh	mm	00			
Ex: Open User 24 Area 2 23:45 10:5:2008	87	02	03	61	00	18=24	02	08	05	10	23	45	00		0d	0a
24 byte message (ASCII)	38 37	30 32	30 31	36 31	30 38	30 43	30 31	30 38	30 35	30 31	32 33	34 35	30 30		0d 0a	

NESS ID	Main unit 0 USER or ZONE identifier 0x01 to 0xfe
User	USER ID 1-58
Zone	ZONE ID 1-32
NESS Area	Area unknown 0, area identifier 0x01 to 0x7f
AI	AREA 1 = 1, AREA 2 = 2, HOME = 3, DAY = 4
E	EVENT (always even number)
R	RESTORE = EVENT+1 (always odd number)
DOOR	DOOR ID 1-3
T	TIME mm – MINUTE 00-59 , hh – HOUR 00 to 23 (24hr)
D	DATE dd - DAY OF MONTH 01-31, mm – MONTH 1-12, yy – YEAR 00-99

# ACCESS CONTROL

	Start	Add	Message			TIME		DATE			Check sum	Cr-LF	
EVENT DESCRIPTION			Event E/R	NESS ID	NESS Area	Hours	Mins	Day	Month	Year			
Number Base	Hex	Hex	Hex	Hex	Hex	Dec	Dec	Dec	Dec	Dec	Hex		
<b>Door Access</b>	<b>87</b>		<b>0x30</b>	<b>User</b>	<b>Door</b>	<b>hh</b>	<b>mm</b>	<b>dd</b>	<b>mm</b>	<b>yy</b>			
Ex: User 40 Door 3 06:10 12:1:2006	87	02	30	28=40	03	06	10	12	01	06	ED	0d	0a
24 byte message (ASCII)	38 37	30 32	33 30	32 38	30 33	30 36	31 30	31 32	30 31	30 36	45 44	0d 0a	
<b>Door Open Too Long</b>	<b>87</b>		<b>0x02</b>	<b>Door</b>	<b>0x85</b>	<b>mm</b>	<b>hh</b>	<b>dd</b>	<b>mm</b>	<b>yy</b>			
Ex: Door 1 06:10 12:1:2006	87	02	02	01	85	06	10	12	01	06	C0	0d	0a
24 byte message (ASCII)	38 37	30 32	30 32	30 31	38 35	30 36	31 30	31 32	30 31	30 36	43 30	0d 0a	

NESS ID	0 is main unit 0x01 to 0xfe is the USER or ZONE identifier
User	USER ID 1-58
Zone	ZONE ID 1-32
NESS Area	0 is unknown area 0x01 to 0x7f is the area identifier
AI	AREA ID AREA 1 = 1, AREA 2 = 2, HOME = 3, DAY = 4
E	EVENT (always even number)
R	RESTORE = EVENT+1 (always odd number)
DOOR	DOOR ID 1-3
T	TIME mm - MINUTE , hh - HOUR(24hr)
D	DATE dd - DAY OF MONTH, mm - MONTH, yy - YEAR

# WARNING

	Start	Add	Message			TIME		DATE			Check sum	Cr-LF	
EVENT DESCRIPTION			Event ID	NESS ID	NESS Area	Hours	Mins	Day	Month	Year			
Number Base	Hex	Hex	Hex	Hex	Hex	Dec	Dec	Dec	Dec	Dec	Hex		
Installer Program Mode Restore	87		0x01	0x00	0x00	mm	hh	dd	mm	yy			
Ex: 06:10 12:1:2006	87	02	01	00	00	06	10	12	01	06		0d	0a
24 byte message (ASCII)	38 37	30 32	30 31	30 30	30 30	30 36	31 30	31 32	30 31	30 36		0d 0a	
Power UP Restore	87		0x11	0x00	0x00	mm	hh	dd	mm	yy			
Ex: 06:10 12:1:2006	87	02	11	00	00	06	10	12	01	06		0d	0a
24 byte message (ASCII)	38 37	30 32	31 31	30 30	30 30	30 36	31 30	31 32	30 31	30 36		0d 0a	
Power Panel Battery	87		0x12	0x00	0x00	mm	hh	dd	mm	yy			
EX: 06:10 12:1:2006	87	02	12	00	00	06	10	12	01	06		0d	0a
24 byte message (ASCII)	38 37	30 32	31 32	30 30	30 30	30 36	31 30	31 32	30 31	30 36		0d 0a	
Power Mains	87		0x10	0x00	0x00	mm	hh	dd	mm	yy			
EX: 06:10 12:1:2006	87	02	10	00	00	06	10	12	01	06		0d	0a
24 byte message (ASCII)	38 37	30 32	31 30	30 30	30 30	30 36	31 30	31 32	30 31	30 36		0d 0a	
Radio Key Battery	87		0x12	User	Area	mm	hh	dd	mm	yy			
EX: User 2 06:10 12:1:2006	87	02	12	02	92	06	10	12	01	06		0d	0a
24 byte message (ASCII)	38 37	30 32	31 32	30 32	30 30	30 36	31 30	31 32	30 31	30 36		0d 0a	
Radio Detector Battery	87		0x12	Zone	Area	mm	hh	dd	mm	yy			
EX: Zone 9 06:10 12:1:2006	87	02	12	09	91	06	10	12	01	06		0d	0a
24 byte message (ASCII)	38 37	30 32	31 32	30 39	30 30	30 36	31 30	31 32	30 31	30 36		0d 0a	
Zone Supervisor	87		0x16	Zone	Area	mm	hh	dd	mm	yy			
EX: Zone 9 06:10 12:1:2006	87	02	32	09	00	06	10	12	01	06		0d	0a
24 byte message (ASCII)	38 37	30 32	31 36	30 39	30 30	30 36	31 30	31 32	30 31	30 36		0d 0a	
RTC Adjust	87		0x18	0x00	0x00	mm	hh	dd	mm	yy			
EX: Zone 9 06:10 12:1:2006	87	02	18	00	00	06	10	12	01	06		0d	0a
24 byte message (ASCII)	38 37	30 32	31 38	30 30	30 30	30 36	31 30	31 32	30 31	30 36		0d 0a	
Exclude Zone Manual	87		0x04	Zone	Area	mm	hh	dd	mm	yy			
EX: Zone 9 06:10 12:1:2006	87	02	04	09	00	06	10	12	01	06		0d	0a
24 byte message (ASCII)	38 37	30 32	30 34	30 39	30 30	30 36	31 30	31 32	30 31	30 36		0d 0a	
Exclude Zone Auto	87		0x06	Zone	Area	mm	hh	dd	mm	yy			
EX: Zone 9 06:10 12:1:2006	87	02	06	09	00	06	10	12	01	06		0d	0a
24 byte message (ASCII)	38 37	30 32	30 36	30 39	30 30	30 36	31 30	31 32	30 31	30 36		0d 0a	
Entry Delay	87		0x20	Zone	Area	mm	hh	dd	mm	yy			
EX: Zone 1 Area 1 06:10 12:1:2006	87	02	02	01	01	06	10	12	01	06		0d	0a
24 byte message (ASCII)	38 37	30 32	30 32	30 31	30 31	30 36	31 30	31 32	30 31	30 36		0d 0a	
Zone SEAL	83		0x00	Zone	Area								

EX Zone 32 06:10 12:1:2006	83	02	00	10=32d	00							0d	0a
14 byte message (ASCII)	38 33	30 32	30 30	31 30	30 30							0d 0a	

NESS ID	0 is main unit 0x01 to 0xfe is the USER or ZONE identifier
User	USER ID 1-58
Zone	ZONE ID 1-32
NESS Area	0 is unknown area 0x01 to 0x7f is the area identifier
AI	AREA ID AREA 1 = 1, AREA 2 = 2, HOME = 3, DAY = 4
E	EVENT (always even number)
R	RESTORE = EVENT+1 (always odd number)
DOOR	DOOR ID 1-3
T	TIME mm - MINUTE , hh - HOUR(24hr)
D	DATE dd - DAY OF MONTH, mm - MONTH, yy - YEAR

**KEYPAD INPUT Example: Control of AUX 1 TO Aux 4.**

The keypad commands 11\*, 22\*, 33\*, 44\* will turn ON AUX 1 to AUX 4 respectively.  
The keypad commands 11#, 22#, 33#, 44# will turn OFF AUX 1 to AUX 4 respectively.  
Note that the corresponding Program option P141E 4E to P144E 4E must be enabled.

**VERSION examples.**

1. 8200036017000004  
0000 Prior to V7.8

2. 820003601700788c  
0078  
00 = D8x  
78 = Version 7.8

3. 8200036017008084  
0080  
00 = D8x  
80 = Version 8.0

4. 820003601714a848 .  
14a8  
14 = D16xcel 3G (04 = D8xCel 3G)  
a8 =Version 10.8 (a = 10)

5. 820003601700877d  
00 = D8x (D16x is 10)  
87 = Version 8.7 ie current product.

6. 820003601715b048 .  
15b0  
15 = D16xcel 4G (05 = D8xCel 4G)  
b0 =Version 11.0 (b = 11)



## APPENDIX A.

The format described above for the D32X ASCII Serial Interface is based on the NESSBus specification document.

Changes made to this document that do not conform to the NESSBus specification should be noted. See below for current list.

The table below is copied from the NESSBus specification document.

It lists the CMD\_SYSTEM\_STATUS (0x61) command bytes.

The D32X does not connect to the NESSBus, however it does conform to the NESSBus specification except as noted in Appendix B.

Event	Identity	Area
<b>Zone/User States</b>	0x00 main unit	0x00 unknown area
0x00 unsealed	0x01-0xef addition identities	0x01 - 0x7f area the event is part of.
0x01 sealed	such as zone/user number	-----
0x02 alarm	-----	0x80 24 hrs
0x03 alarm restore	0xf0-0xfe keypads.	0x81 Fire
0x04 manual exclude	-----	0x82 Panic
0x05 manual include	0xff is reserved.	0x83 Medical
0x06 auto exclude		0x84 Duress
0x07 auto include		0x85 Door/Doorbell
0x08 tamper unsealed		0x90 Radio Device
0x09 tamper normal		0x91 Radio Detector
		0x92 Radio Pendant
<b>System States</b>		0xa1 Access (Door 1)
0x10 power failure		0xa2 Access (Door 2)
0x11 power normal		0xa3 Access (Door 3)
0x12 battery failure		0xa4 Access (Door 4)
0x13 battery normal		0xa5 Access (Door 5)
0x14 report failure		0xa6 Access (Door 6)
0x15 report normal		
0x16 supervision failure		0xb0 Program area
0x17 supervision normal		0x85-0x8f ??? future
0x19 real time clock		0x93-0x9f ??? future
		0x96-0xfe ??? future
<b>Area States</b>		-----
0x20 entry delay started		0xff is reserved.
0x21 entry delay ended		
0x22 exit delay started		
0x23 exit delay ended		
0x24 armed away		
0x25 armed home		
0x26 armed day		
0x27 armed night		
0x28 armed vacation		
0x2e armed highest		
0x2f disarmed		
0x30 arming delayed		
0x31 status state		
<b>Result States</b>		
0x32 Output On		
0x31 Output Off		
0xff is reserved		

## **Appendix B**

The following do not conform to the NESSBus specification:

### **1. Output Event Data and the need for *CMD\_REQUEST\_EVENT*.**

*On the NESSBUS:*

*This command is in response to the *CMD\_REQUEST\_EVENT*.*

*The message is reported so that the entire system is aware of the states of the various devices. Any device can listen to other device's system status if they wish. The *CMD\_SYSTEM\_STATUS* is followed by 3 bytes. These 3 bytes represent a specific event as described in the table.*

*On the D32X:*

*The *CMD\_REQUEST\_EVENT* is generated internally.*

### **2. Output Event Data Address.**

*On the NESSBUS:*

*0x00                      Address of master.*

*0x01–0xff              Address of slave.*

*On the D32X:*

*0x00–0xff                                      The D32X identity.*