



DESTINY 6100 RS-232 Interface Specification

Release 3.0

Document Version 3.1

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For use with Destiny 6100 (K1111 board) running 8.05 software.

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1.0 General

This document is intended to describe the electrical and protocol specifications for the Apex RS-232 interface port provided on the Destiny K1111 security panel.

This interface is provided to allow home control systems to obtain status information from the security panel on a real-time basis. In addition, limited control of hardware devices present in the Destiny panel will be allowed from home control systems.

Connection to the port is via a plug-in adapter card is optionally available for the Destiny panel.

2.0 Electrical/Mechanical Specifications

The panel interface board supports a full RS-232 interface in hardware. The pin-outs are jumper selectable DTE or DCE. This application uses only the TXD, RXD, DSR, and DTR signals.

TXD and RXD are used in their normal context.

DTR and DSR are used to indicate the presence of equipment at either end of the interface cable. As the Destiny shares a “software” UART between the on-board modem and the RS-232 port, there are rare occasions when the panel will show the serial port as unavailable. This occurs during an upload or download activity only.

Communication 1200 baud. Character format is 8 data bits, no parity and 1 stop bit. Logic levels at the interface are standard RS-232 voltage levels.

The interface is full duplex.

The interface is provided with a 9-pin female D connector. When jumpered for DTE connections, a standard pin-to-pin male-to-female cable may be used to connect to an IBM PC serial port.

DTE vs. DCE selection

Hold the RS-232 port so the 9 pin connector points to the right and the words “RS232” are upright. Above the 9 pin connector is a jumper labeled “J3”. The left two posts are for DTE and the right two posts are for DCE. Slide the connector on the desired 2 pins to determine the port configuration.

3.0 Packet Format

With the exception of the message terminator, CR-LF, all characters are printable ASCII. Data packets are sent in either direction in the following format:

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

Packet format: NNASV...OCCC

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.
A	1 ASCII character, command/packet type ID. These are upper and lower case alpha characters. Upper case are responses from and panel and lower case is reserved for commands to the panel. Legal values aa-ZZ
S	ASCII character, sub-command/packet type. These are upper and lower case alpha characters. Upper case are responses from and panel and lower case is reserved for commands to the panel. Legal values aa-ZZ.
V...	1 or more ASCII characters of data associated with the command/packet type. Any printable ASCII character is permitted.
OO	2 ASCII characters, sequence number, hex 00 to FF. *Currently not utilized, all messages use 00.
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. A checksum utility and source code are available.
CR,LF	Message terminator. ASCII characters consisting of hexadecimal 0x0D and 0x0A.

4.0 Protocol

This release is a “blind” protocol designed to be used when the data link is considered to be 100% reliable. Future release versions will contain error checking and retransmission.

5.1 Commands To Panel

a Arming

For RS-232 controlled panels only use 4 digit arm/disarm codes. Arming the panel with zones open will initiate “force arming” regardless if force arming is enabled or disabled in the panel. If “access code before arm” is not selected or partitioning is not used, the user number will always be 00 in the NQ message.

a Arm to Away aa 0EaaUUKKKK00CC
0E - 14 character message length (hex)
aa - Arm to Away
UU - User Number 01 - 32 (dec)
KKKK - Arm/Disarm Code
00 - Spacer
CC - Checksum

h Arm to Home ah 0EahUUKKKK00CC
0E - 14 character message length (hex)
ah - Arm to Home
UU - User Number 01 - 32 (dec)
KKKK - Arm/Disarm Code
00 - Spacer
CC - Checksum

d Disarm ad 0EadUUKKKK00CC
0E - 14 character message length (hex)
ad - Disarm
UU - User Number 01 - 32 (dec)
KKKK - Arm/Disarm Code
00 - Spacer
CC - Checksum

s Status Request (returns AS) as 08as0064 - response: see AS
08 - 8 character message length (hex)
as - Arming Status Request
00 - Spacer
64 - Checksum

z Zones

- s Zone status request (returns ZS) zs 08zs004B - response: see ZS
 08 - 8 character message length (hex)
 zs - Zone status request
 00 - Spacer
 4B - Checksum

This command is designed to be used when a connection is made with the panel. The 'zs' command is not intended to be used as a 'polling' command. The panel gives regular messages (NQ) that give real time status changes as they occur.

- p Partition Request (returns ZP) ap 08zp004E - response: see AP
 08 - 8 character message length (hex)
 zp - Partition status request
 00 - Spacer
 4E - Checksum

- k Send bus command to panel zk 12zkDDSSMMDDAA00CC
 12 - 18 character message length (hex)
 zk - Send bus command to panel
 DD - Destination address
 SS - Source address
 MM - Command
 DD - Data 1
 AA - Data 2
 00 - Spacer
 CC - Checksum

Keypad bus command set:

- Destination address 10 (hex)
 Source address 30 (keypad 1) through 37 (keypad 8) (hex)
 Command 00 - send a keystroke (hex)
 Data 1 01 (Key 1) See chart (hex)
 Data 2 01 (Key 1) Data 1 repeated (hex)

Keypad Button Addresses							
Code	Key	Code	Key	Code	Key	Code	Key
01	1	05	5	09	9	12	Status
02	2	06	6	00	0	13	Monitor
03	3	07	7	0A	A	14	F1
04	4	08	8	0B	H	15	F2

Currently only the command set for the keypad is published. If a feature requires the ability to send the panel commands for a different bus device, contact Apex for further bus information.

c Control Channels

The Control channel commands only send an on or off command. The control channel programming determines which outputs are controlled and when (if ever) the outputs are automatically turned off

- | | | | | |
|----|-----------------------------|--------------------------------|-----------------------------|-----------------------|
| n | Channel On | cn | 0AcnAA00CC | |
| 0A | - | 10 character message length | | (hex) |
| cn | - | Turn on a control channel | | |
| AA | - | Control Channel Number | | (dec: one referenced) |
| 00 | - | Spacer | | |
| CC | - | Checksum | | |
| | | | | |
| f | Channel Off | cf | 0AcfAA00CC | |
| 0A | - | 10 character message length | | (hex) |
| cf | - | Turn off a control channel | | |
| AA | - | Control Channel Number | | (dec: one referenced) |
| 00 | - | Spacer | | |
| CC | - | Checksum | | |
| | | | | |
| s | Channel status (returns CS) | cs | 08cs0062 - response: see CS | |
| 08 | - | 8 character message length | | (hex) |
| cs | - | Request control channel status | | |
| 00 | - | Spacer | | |
| 62 | - | Checksum | | |

s Speak Word

- o Outside and Inside speaker so 0BsoWWW00CC
0B - 12 character message length (hex)
so - Speak word to outside and inside speakers (full volume)
WWW - Word assignment (dec: one referenced)
00 - Spacer
CC - Checksum
- i Inside speaker si 0BsiWWW00CC
0B - 11 character message length (hex)
si - Speak word to inside speakers (adjustable volume)
WWW - Word assignment (dec: one referenced)
00 - Spacer
CC - Checksum
- a Inside: alert vol. sa 0BsaWWW00CC
0B - 11 character message length (hex)
si - Speak word to inside speakers (full volume)
WWW - Word assignment (dec: one referenced)
00 - Spacer
CC - Checksum
- l Local phone sl 0BslWWW00CC
0B - 11 character message length (hex)
sl - Speak word to the local phone
WWW - Word assignment (dec: one referenced)
00 - Spacer
CC - Checksum
- r Remote phone sr 0BsrWWW00CC
0B - 11 character message length (hex)
so - Speak word to the remote phone
WWW - Word assignment (dec: one referenced)
00 - Spacer
CC - Checksum

I Location Programming

r	Location read (returns LR)	lr	10lrBBLLLL00CC
10	-	16 character message length	(hex)
lr	-	Location read	
BB	-	Number of bytes (legal values: 0 to 20 (hex))	(hex: one referenced)
LLLL	-	Starting location	(hex: zero referenced)
00	-	Spacer	
CC	-	Checksum	

Locations not found in the Installation Manual (Word Descriptions, Zone Types, etc.) are available in a separate document. Contact Apex for further information.

s	Send data	ls	MMlsBBLLLLDD..00CC
MM	-	variable message length	(hex)
ls	-	Location send	
BB	-	Number of bytes (legal values 0 to 20 (hex))	(hex: one referenced)
LLLL	-	Starting location	(hex: zero referenced)
DD	-	Data: 2 characters per byte	(hex: one referenced)
00	-	Spacer	
CC	-	Checksum	

The 'ls' command should be used with extreme CAUTION. Writing invalid data to the system can jeopardize the integrity of the system. Please contact Apex with any programming questions. The system DOES NOT provide error checking for valid programming information. USE THIS FEATURE WITH EXTREME CAUTION AND AT YOUR OWN RISK!

5.2 Responses From the Panel

A Arming Status

S Arm Status AS 10ASPPPPPPPP00CC
10 - 16 character message length (hex)
AS - Arming Status
PPPPPPPP - Partition 1-8.
00 - Spacer
CC - Checksum

The data in the 'P' positions will be one of the letters below. The each 'P' position represents an area 1-8. If partitioning is not being used all 8 'P' positions will contain the same letter.

'P' Partition Status							
Code	Status	Code	Status	Code	Status	Code	Status
A	Away	H	Home	N	Night	D	Disarmed

Z Zone Status

S Zone Status ZS 68ZSV(96)...00CC
68 - 104 character message length (hex)
ZS - Zone Status
V(96)... - Zones 1-96
00 - Spacer
CC - Checksum

The position of each 'V' represents the respective zone; therefore, zone 1 is in the first 'V' position and zone 96 status is shown in 'V' position 96. Data shown in the 'V' positions will be a value from the chart below. If two status messages apply, they are added (Hex).

'V' Zone Status									
Value	Status	Value	Status	Value	Status	Value	Status	Value	Status
000	Closed	001	open	002	trouble	004	alert	008	bypassed

P Zone Partition Assignments ZP 68ZPL(96)...00CC
68 - 104 character message length (hex)
ZP - Partition Status
L(96)... - Zones 1-96
00 - Spacer
CC - Checksum

The position of each 'L' represents the respective zone; therefore, zone 1 is in the first 'L' position and zone 96 status is shown in 'L' position 96. The data in the 'L' positions will be 0-8. '0' = no partition assignment. '1' - '8' = area.

N Notification

K Keystroke Notification NK 0BNKSKK00CC
0B - 11 character message length (hex)
NK - Keystroke Notification
S - Source - From: [K=System keypad L=Local phone R=Remote phone]
KK - Kestroke
00 - Spacer
CC - Checksum

Keypad Button Addresses							
Code	Key	Code	Key	Code	Key	Code	Key
01	1	05	5	09	9	12	Status
02	2	06	6	00	0	13	Monitor
03	3	07	7	0A	A	14	F1
04	4	08	8	0B	H	15	F2

Enter “Remote System Mode” Code = 16 (hex)
Exit “Remote System Mode” Code = 0B (hex).

The above keystrokes used in conjunction with the Speak Word (s) commands offer the ability to use the control panel’s phone and keypad interfaces with other systems. When the system is placed in “Remote System Mode”(See below) a code 16 is sent. Following the “enter notification” are the users keypress. The client system is responsible for sending feedback speech to the user.

Using the Remote System Mode

Remote System Mode can be accessed in a couple of ways. From a remote or local phone the user can enter 7,7,7,7. The system will speak “Enter Remote System Mode.” At this point the client system will receive a code 16 notification and will be responsible for sending a speech prompt. For access from a keypad, any key (or combination) can be programmed to button function 023 (Enter Remote System Mode). Once the panel is in the remote mode a user can hit H to exit, or the system will time out. When the time-out occurs, the client system is sent the H keystroke (0B).

Example:

Action	Data
User presses 7,7,7,7 on a local phone	0BNKL1600E2
Send User “Enter One For Energy Management.”	0Bsl06400B5 (enter)
	0Bsl00100BE (one)
	0Bsl00400BB (four[for])
	0Bsl28700AE (energy)
	0Bsl28800AD (management)
User presses 1 on the local phone	0BNKL0100E8
..... system continues with menus	
User exits Remote System Mode	0BNKL0B00D7

Q	System Event	NQ	14NQTTZZMMHHDDXX00CC
14	-	20 character message length	(hex)
NQ	-	System Event Notification	
TT	-	Event Type	
ZZ	-	Zone or User Code. All zones and user codes are 0 referenced (1=00)	
MM	-	Minutes	(dec)
HH	-	Hours	(24hr format)
DD	-	Day	(dec)
XX	-	Month	(dec)
00	-	Spacer	
CC	-	Checksum	

The data in the ‘TT’ positions will be one of the reports below. The NQ statements are all reported in real time. Reports 00 through 0D are all activations that cause the system to generate an alarm. If the zone is an input that has an open and close state (keypad activations do not), the activation will be preceded by a 2B report. A bypassed zone will still send a 2B and 2C (open/close) statement even in a bypassed state. The routine watching the NQ statements must look for 21 and 22 (bypass/unbypass) messages to determine when a zone is being bypassed. Polling the system (zs) will show all zones that are currently bypassed.

Note: Events MUST be programmed to be recorded in the Event Memory Log (EML) for the event to be posted to the RS-232 port. See the “Communicator Report Code” section of the Installation Manual for Event Options.

‘TT’ Zone Types					
Code	Type	Code	Type	Code	Type
00	Exterior Instant	0F	Transmitter low bat	1E	User Communicator test
01	Exterior Delay 1	10	Trans. low bat rest.	1F	Auto Communicator test
02	Exterior Delay 2	11	Zone trouble	20	Cancel alert
03	Interior Instant	12	Zone trouble rest.	21	Zone bypass
04	Interior Delay 1	13	Fuse trouble	22	Zone unbypass
05	Interior Delay 2	14	Fuse trouble restore	23	Day zone trouble
06	Fire	15	Phone line restore	24	Day zone trouble restore
07	Panic	16	Disarm	25	Up/Download attempt
08	Silent	17	Disarm after activate	26	Program mode entered
09	Emergency	18	Arm	27	Fail to disarm
0A	Follower	19	Arm with zones open	28	Fail to arm
0B	Aux type 1 or 2	1A	Ctrl low battery	29	HWB-416 Expander trouble
0C	Duress	1B	Ctrl battery restore	2A	HWB-416 trouble restore
0D	Duress not Armed	1C	AC Fail	2B	Zone open
0E	Zone restore after activation	1D	AC restore	2C	Zone restore (close)

C Control Channels

S	Control Channel Status	CS	40CSF(56)...00CC
40	-	64 character message length	(hex)
CS	-	Arming Status	
F(56)...	-	Control Channel Status	
00	-	Spacer	
CC	-	Checksum	

The position of each 'F' represents the respective channel; therefore, channel 1 is in the first 'F' position and channel 56 status is shown in 'F' position 56. The data in the 'F' positions will be 1=On 0=Off U=Not programmed.

L Location

R	Location read	LR	MMLRBBLLLLDD00CC
MM	-	variable message length	(hex)
LR	-	Location read	
BB	-	Number of bytes (legal values 0 to 20 (hex))	(hex: one referenced)
LLLL	-	Starting location	(hex: zero referenced)
DD	-	Data: 2 characters per byte	(hex: one referenced)
00	-	Spacer	
CC	-	Checksum.	