ESCIENT

ESCIENT®

EXTERNAL CONTROL PROTOCOL

Escient FireBall External Control Protocol Specification

PRODUCTS FOR THE HUMAN INTERFACE.

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External Control Interface Specifications

All FireBall products with external control capabilities can be controlled using either an RS232 or Ethernet connection. If the control system has an Ethernet connection then it is highly recommended to use Ethernet because of the much higher transfer rate of the data. It is also possible to control multiple FireBall units with a single Ethernet port on the control system. The FireBall command and control protocol is identical when used with either RS232 or Ethernet.

RS232 Control Setup

Any of the four RS232 ports on the back of the FireBall can be configured as the external control port but it is standard to use the highest number port. By default, no RS232 port is configured for external control. Use the FireBall TV user interface to select which RS232 port will be used for control. With the FireBall TV interface displayed, press the Setup button on the remote and then navigate to and select External Control, IR and Serial, and then Serial Control COM port. Use the spin control to select which COM port to use and then select save. The FireBall RS232 port selected for external control is set to 9600, N, 8, 1 and these parameters cannot be changed.

A female-to-female DB9 null modem cable is then used between the FireBall RS232 port and the control system.

DB-9 Pin Configuration:

Pin 2 to 3
Pin 3 to 2
Pin 5 to 5

Serial Parameters: 9600, N, 8, 1

Baud Rate: 9600
Parity: None
Databits: 8
Stop Bits: 1
Flow Control: None

Ethernet Control Setup

The Ethernet port on the FireBall is automatically configured for external control using the FireBall's IP address and port 251 (0xFB ;) on the same subnet. The FireBall uses a Dynamic IP address by default. The Dynamic IP address can be found using the **Setup / Utilities/ System Information** menu on the TV UI. However, it is highly recommended to set the FireBall to a Static IP address when using Ethernet for external control because the IP address of the FireBall must be hard coded in the control system program and could change if set to Dynamic.

Use the FireBall TV user interface to set the FireBall Ethernet port to a Static IP address. With the TV user interface displayed, press the Setup button on the remote, navigate to and select

Network and then Ethernet Settings. Select the Static radio button and then enter the Static IP address information. The Static IP address, gateway, subnet mask, and DNS address can all be determined by accessing the router's web interface from a PC. It may then be necessary to ping the static IP address from the PC to be certain that address is not already in use on the network. If the above steps are not familiar then Escient tech support can help or just use an RS232 connection.

External Control Protocol Specification

Commands and Responses Overview

Version 03.11.13.02.00

The external control protocol is standard ASCII based. ESCX is the four-letter preamble that is used for all commands. This preamble must be uppercase. The commands provided in this protocol allow an external control system to navigate the Escient products, get library information to build custom user interfaces, perform transport controls, and receive unsolicited feedback on system status.

All external control commands are made up of the preamble (ESCX), command group (01,02,10,20,50,70), sub command (specific task), specific data (# of data items, and a size of data packet then the actual data packet repeated for the # of data items), and a carriage return end marker.

External Control Command Structure

DESCRIPTION	PREAMBLE	COMMAND GROUP	SUB COMMAND	# DATA ITEMS	DATA ITEM #1 SIZE	DATA #1	DATA ITEM #2 SIZE	DATA #2	END MARKER
Bytes	4	2	2	3	4	5	4	3	1
Example	ESCX	01	08	002	0005	Hello	0003	Bye	Carriage Return

The external control commands are broken down into the following Command Groups:

01 – Command Responses
02 – Unsolicited Events
10 – Remote Button / Keyboard Commands
20 – Database Commands
50 – Status Commands
70 – Control Commands

All commands will cause one of the following response numbers to be issued. Some commands, such as database commands will also send back additional responses that contain more detailed information.

Command Responses

COMMAND GROUP	RESPONSE NUMBER	RESPONSE DESCRIPTION
01	01	OK
01	02	Bad Command Structure
01	03	Empty Library or Bad Range

01	04	Wrong Number of Command Arguments
01	05	Invalid Subcommand
01	06	Invalid Command
01	07	Not Available During Standby (deprecated)
01	08	Requested data not available
01	09	External control command not yet implemented (possible future implementation)
01	10	Not Available at This Time
01	11	Invalid Security Password

Response Format: ESCX01**xx**, where **xx** = Command response

Response 07 has been deprecated due to the new auto-on function. Whenever a valid command is received (with two exceptions), the system will automatically enter the "on" mode, if it is in standby. A client may still handle response 07, but it is no longer sent from the host for any reason.

Response 10 will be sent when a normally valid command is sent to the host, but it cannot be processed due to the system's mode. For example, a database play will not be processed while the system is in setup or options mode, AutoBuilding a changer, etc. Note that a key press command will never return this response, as even audio transport keys (play, stop) have alternate functions in various modes.

Unsolicited status events can be sent to report the state changes of the Escient products. There are two currently defined message levels: 5 - track changes, and 10 - all (including 1-second playing time updates). Clients are registered at level 5 by default. Clients may change their message level using the ESCX7002 command. See the control commands section for instructions on how to resister and unregister for unsolicited status event levels.

Unsolicited Status Events

COMMAND GROUP	EVENT NUMBER	EVENT DESCRIPTION
02	01	Power status changed. When the system has booted into an off state you will receive a "RDY" status indicating it is ready to be powered on and from then on an "OFF" or an "ON " status.
02		*Event Format*: ESCX02010010003**xxx**, Where **xxx** = a 3 character string "RDY" = when power is first applied and it boots into the off state (standby mode) – ready for power on. "ON " = if power on turned on (GUI appears) "OFF" = if power is off (standby mode) (Video out off)
02	02	Play Mode changed (normal, random, etc)
02		*Event Format*: ESCX02020010002**xx**, Where **xx** = the new play mode 01 = normal 02 = repeat track 03 = repeat title 04 = repeat group

		05 = random title 06 = random group
02	03	Guide View changed
02		*Event Format*: ESCX02030010002**xx** Where **xx** = the new guide view 01 = Guide changed to Artist view CD titles are displayed sorted by artist name 02 = Guide changed to Titles view CD titles are displayed sorted by CD title 03 = Guide changed to Song view Song titles are displayed sorted by song title 04 = Guide changed to Cover view Covers are displayed sorted by artist then by title
02	04	Playing Artist/Title/Song has changed
02		*Event Format*: ESCX02040070002**aa**0003**bbbccccdddeeeefffgggghhhiiiijjj**0002**kk** **aa** = the play state 01 = Play, 02 = Stop, 03 = Pause **Radio only:** 04 = Locating Station, 05 = Buffering data, 06 = Station Not Found **bbb** = current track number (0 if Radio Mode) **cccc** = length of artist name **ddd** = artist name **eeee** = length of title name **fff** = title name (station name if Radio Mode) **gggg** = length of track name **hhh** = track name (aspect ratio if Movie Mode) Aspect Ratio (Movie Mode only): 00 = Unknown 01 = Standard 1.33 02 = Standard 1.78 03 = Standard 1.85 04 = Standard 2.35 05 = Anamorphic 1.33 06 = Anamorphic 1.78 07 = Anamorphic 1.85 08 = Anamorphic 2.35 **iiii** = length of track time **jjj** = current track time (0 if Radio Mode) **kk** = current media type 00 = unknown, 01 = CD, 02 = DATACD, 03 = MP3, 04 = playlist, 05 = DVD, 06 = radio The current track, artist name, title name, track name, current track time, and media type are only returned for the play event. The stop and pause events just signify that the state has changed.
02	05	Guide Mode changed (Playlist edit mode, Record mode, Delete mode, etc) [possible future implementation]
02	06	Screen Mode changed (Guide, Player, Options, Setup, etc) [possible

		future implementation]
02	07	Database has changed. The external control system should re-read the library information.
02	08	GUI to Movie. User switched to the Full screen movie. [possible future implementation]
02	09	Movie to GUI. User switched back to the FireBall GUI from a movie. [possible future implementation]
02	10	Security Password changed. The system is now locked (password protected mode) until the user unlocks it.
02	11	Video mode changed.
02		*Event Format*: ESCX02110010002**xx** Where **xx** = the new video mode 00 = Video is in normal mode (FireBall video) 01 = Video is in passthru mode (DVD changer video)
02	12	Volume changed or muted
02		*Event Format*: ESCX02120020002**xx**0003**yyy** **xx** = new volume command 00 = Volume mute / un-mute 01 = Volume down 02 = Volume up **yyy** = zone to which the volume command applies number 000 to 999

The Remote Button / Keyboard commands are used when the video output of the FireBall system is displayed on a TV or large screen projector and it is desired to directly select the FireBall control functions through an external control system.

The up, down, left, right, and select functions can be used to navigate objects on the screen and select them. The active FireBall control function is highlighted and the selection cursor is moved over it.

Various other commands are used to mimic the operation of the remote control. Note that the command response will be “OK” as long as the key code is a valid one, even though the system may ignore the key if the system is in a mode where the key would not normally be processed.

Remote Button / Keyboard Commands

COMMAND GROUP	SUB COMMAND NUMBER	COMMAND DESCRIPTION
10	01	Left
10	02	Up
10	03	Right
10	04	Down
10	05	Select
10	06	Move To X and Y Coordinates and Select
10		The upper left point on the screen is (0,0) and the resolution of the screen is 720 by 480 pixels.

10		
10	07	Power Toggle
10	08	Power On
10	09	Power Off
10		
10	10	“0”
10	11	“1”
10	12	“2”
10	13	“3”
10	14	“4”
10	15	“5”
10	16	“6”
10	17	“7”
10	18	“8”
10	19	“9”
10	20	“~”
10	21	“.”
10	22	“/”
10	23	“,”
10	24	“?”
10	25	“@”
10	26	“-“
10	27	“_”
10	28	“*”
10	29	“#”
10	30	Ch/Page +
10	31	Ch/Page -
10	32	Mode Increment – Only works in Player
10	33	Mode Play – Normal – Only works in Player
10	34	Mode Play – Repeat Track – Only works in Player
10	35	Mode Play – Repeat Title – Only works in Player
10	36	Mode Play – Repeat Group – Only works in Player
10	37	Mode Play – Random Title – Only works in Player
10	38	Mode Play – Random Group – Only works in Player
10	39	Setup
10	40	Option
10	41	Guide (toggles between Guide and Player) **
10	42	Guide Explicit (always goes to Guide) **
10	43	Player Explicit (always goes to Player) **
10	44	OpenGlobe
10	45	Info
10	46	Menu (DVD Menu and Guide View Increment)
10	47	Guide View – Covers
10	48	Guide View – Artist
10	49	Guide View – Title
10	50	Guide View - Song

10		
10	51	Play a numbered Playlist (argument has Playlist number)
10	52	Repeat
10	53	Macro
10	54	Play
10	55	Stop
10	56	Pause
10	57	Previous Track
10	58	Next Track
10	59	Record
10		
10	60	Movies
10	61	Music
10	62	iRadio
10	63	Title
10	64	Audio
10	65	Previous
10	66	Next
10	67	Add Favorites
10	68	Play Favorites
10	69	Random
10	70	“ “
10	71	BACKSPACE
10	74	“A”
10	75	“B”
10	76	“C”
10	77	“D”
10	78	“E”
10	79	“F”
10	80	“G”
10	81	“H”
10	82	“I”
10	83	“J”
10	84	“K”
10	85	“L”
10	86	“M”
10	87	“N”
10	88	“O”
10	89	“P”
10	90	“Q”
10	91	“R”
10	92	“S”
10	93	“T”
10	94	“U”
10	95	“V”
10	96	“W”

10	97	"X"
10	98	"Y"
10	99	"Z"

** This command does not function if the Options screen, OpenGlobe CE-Commerce screen, or Playlist Edit screens are displayed.

Command Format: ESCX10**xx**

01 – ESCX10**01**
02 – ESCX10**02**
03 – ESCX10**03**
04 – ESCX10**04**
05 – ESCX10**05**
06 – ESCX10**06**0020003**aaa**0003**bbb**
aaa = X coordinate
bbb = Y coordinate

10 – ESCX10**10**

20 – ESCX10**20**
21 – ESCX10**21**
22 – ESCX10**22**
etc…

51 – ESCX10**51**0010001**x**
x = Playlist number (1 – 6)

All the Database commands are available regardless of the power state, except for Command 05, Play which will return an error response if attempted during standby. The groups, styles, and custom genres are grouped into system groups and user groups. The System Music Groups (sorted by Artist) have groupings such as the All group, CDs group, MP3 group, and Playlists groups. The User Music Groups (sorted by Artist) contain the genres for your music and your custom genres that have been created. The System HardDrive Music Groups (sorted by Artist) are a subset of the System Music Groups (sorted by Artist) and filter out media that does not exist on the hard drive. The User HardDrive Music Groups (sorted by Artist) are a subset of the User Music Groups (sorted by Artist) and also filter out media external to the hard drive. The All radio station group and the NetRadio group are contained in the radio system groups while all other radio stations are in the user groups. Likewise, the All movie group is in the movie system group while all other movie genres are in the user groups. Titles are returned listed in alphabetical order by title regardless of the state of the user interface.

Database Commands

COMMAND GROUP	SUB COMMAND	DESCRIPTION
20	01	Get number of groups (genres) in the database
20		ESCX20010010002**xx** **xx** = which list to get groups from, where

		01 = System Music Groups (sorted by Artist) 02 = User Music Groups (sorted by Artist) 03 = System Radio Groups 04 = User Radio Groups 05 = System Movie Groups 06 = User Movie Groups 07 = System HardDrive Music Groups (sorted by Artist) 08 = User HardDrive Music Groups (sorted by Artist) 81 = System Music Groups (sorted by Title) 82 = User Music Groups (sorted by Title) 87 = System HardDrive Music Groups (sorted by Title) 88 = User HardDrive Music Groups (sorted by Title) 91 = System Music Groups (sorted by Song) 92 = User Music Groups (sorted by Song) 97 = System HardDrive Music Groups (sorted by Song) 98 = User HardDrive Music Groups (sorted by Song) *Reply Format*: ESCX20010010004**xxxx**, Where **xxxx** = total number of groups in the specified list Once the total number of groups is known, you can ask information for a range of groups using the **02** subcommand
20	02	Get group information
20		ESCX20020030002**aa**0004**bbbb**0004**cccc** **aa** = which list to get groups from, where 01 = System Music Groups (sorted by Artist) 02 = User Music Groups (sorted by Artist) 03 = System Radio Groups 04 = User Radio Groups 05 = System Movie Groups 06 = User Movie Groups 07 = System HardDrive Music Groups (sorted by Artist) 08 = User HardDrive Music Groups (sorted by Artist) 81 = System Music Groups (sorted by Title) 82 = User Music Groups (sorted by Title) 87 = System HardDrive Music Groups (sorted by Title) 88 = User HardDrive Music Groups (sorted by Title) 91 = System Music Groups (sorted by Song) 92 = User Music Groups (sorted by Song) 97 = System HardDrive Music Groups (sorted by Song) 98 = User HardDrive Music Groups (sorted by Song) **bbbb** = starting group number **cccc** = ending group number
20		*Reply Format*: ESCX2002**xxx**GROUP1GROUP2etc…, Where **xxx** = total number of groups multiplied by 2, Each group is made up two items so
20		GROUP1 above = **XXXXxxxxYYYYyyyyyyyy** where **XXXX** = length of item #1, by default this is 0003 but may be 0004 if there are more than 999 titles in the group

		xxxx = number of titles in the group **YYYY** = length of item #2 (length of group name) **yyyyyyyy** = group name (length depends on **YYYY**)
		GROUP2, etc… have the same format as GROUP1
20	03	Get title (music or movie) or station (radio) information (includes Playlists because they are virtual CD titles). For groups 91-98 the 'title' is actually the song name and 'title number' is the song number.
20		ESCX20030040002**aa**0004**bbbb**0004**cccc**0004**dddd** **aa** = which list to get groups from, where 01 = System Music Groups (sorted by Artist) 02 = User Music Groups (sorted by Artist) 03 = System Radio Groups 04 = User Radio Groups 05 = System Movie Groups 06 = User Movie Groups 07 = System HardDrive Music Groups (sorted by Artist) 08 = User HardDrive Music Groups (sorted by Artist) 81 = System Music Groups (sorted by Title) 82 = User Music Groups (sorted by Title) 87 = System HardDrive Music Groups (sorted by Title) 88 = User HardDrive Music Groups (sorted by Title) 91 = System Music Groups (sorted by Song) 92 = User Music Groups (sorted by Song) 97 = System HardDrive Music Groups (sorted by Song) 98 = User HardDrive Music Groups (sorted by Song) **bbbb** = group number to get titles for **cccc** = starting title number **dddd** = ending title number
		Reply Format: ESCX2003**xxx**TITLE1TITLE2etc…, Where **xxx** = total number of titles multiplied by 2, Each title is made up of two items so
		TITLE1 above = 0003**xxxyyyyzzzzzzzzzz** 0003 = length of item #1 (always 3) **xxx** = number of tracks in the title for Music, running time of title for Movie, bitrate of station for Radio **yyyy** = length of item #2 (length of title) **zzzzzzzzzz** = music artist-title(or title-artist or song-artist)/movie title/radio station (length depends on **yyyy**)
		TITLE2, etc… have the same format as TITLE1
20		ESCX20030050002**aa**0004**bbbb**0004**cccc**0004**dddd**0002**ff** **aa** = which list to get groups from, where 01 = System Music Groups (sorted by Artist) 02 = User Music Groups (sorted by Artist) 03 = System Radio Groups 04 = User Radio Groups 05 = System Movie Groups 06 = User Movie Groups 07 = System HardDrive Music Groups (sorted by Artist) 08 = User HardDrive Music Groups (sorted by Artist)

		81 = System Music Groups (sorted by Title) 82 = User Music Groups (sorted by Title) 87 = System HardDrive Music Groups (sorted by Title) 88 = User HardDrive Music Groups (sorted by Title) 91 = System Music Groups (sorted by Song) 92 = User Music Groups (sorted by Song) 97 = System HardDrive Music Groups (sorted by Song) 98 = User HardDrive Music Groups (sorted by Song) **bbbb** = group number to get titles for **cccc** = starting title number **dddd** = ending title number **ff** = reply format 00 = Reply format same as above 01 = Reply format separates Title/Artist info (or Song/Artist info)
		Reply Format of '01' is as follows *Reply Formats:* ESCX2003**xxx**INFO1 INFO2 etc…, Where **xxx** = total number of info items multiplied by 3, Each info item is made up of three items so
		INFO1 above = 0003**aaabbbbccccccddddeeeeeee** 0003 = length of item #1 (always 3) **aaa** = number of tracks in the title for Music, running time of title for Movie, bitrate of station for Radio **bbbb** = length of item #2 (length of title) **ccccccc** = title/radio station (length depends on **bbbb**) **dddd** = length of item #3 (length of artist name) **eeeeeee** = artist name for Music (length depends on **dddd**)
		TITLE_ARTIST2, etc… have the same format as TITLE_ARTIST1
20	04	Get track information
20		ESCX20040050002**aa**0004**bbbb**0004**cccc**0004**dddd**0004**eeee**
		aa = which list to get groups from, where 01 = System Music Groups (sorted by Artist) 02 = User Music Groups (sorted by Artist) 07 = System HardDrive Music Groups (sorted by Artist) 08 = User HardDrive Music Groups (sorted by Artist) 81 = System Music Groups (sorted by Title) 82 = User Music Groups (sorted by Title) 87 = System HardDrive Music Groups (sorted by Title) 88 = User HardDrive Music Groups (sorted by Title) 91 = System Music Groups (sorted by Song) 92 = User Music Groups (sorted by Song) 97 = System HardDrive Music Groups (sorted by Song) 98 = User HardDrive Music Groups (sorted by Song) **bbbb** = group number to get tracks for **cccc** = title number to get tracks for (ignored if sorted by Song) **dddd** = starting track number **eeee** = ending track number
		Reply Format: ESCX2004**xxx**TRACK1TRACK2etc…, Where **xxx** = total number of tracks, Each TRACK is made of one item so:

		TRACK1 = **yyyyzzzzzzz** **yyyy** = length of track name **zzzzzzz** = track name (length depends on **yyyy**) TRACK2, etc… have the same format as TRACK1
20		ESCX20040060002**aa**0004**bbbb**0004**cccc**0004**dddd**0004**eeee**0002**ff**
		aa = which list to get groups from, where 01 = System Music Groups (sorted by Artist) 02 = User Music Groups (sorted by Artist) 07 = System HardDrive Music Groups (sorted by Artist) 08 = User HardDrive Music Groups (sorted by Artist) 81 = System Music Groups (sorted by Title) 82 = User Music Groups (sorted by Title) 87 = System HardDrive Music Groups (sorted by Title) 88 = User HardDrive Music Groups (sorted by Title) 91 = System Music Groups (sorted by Song) 92 = User Music Groups (sorted by Song) 97 = System HardDrive Music Groups (sorted by Song) 98 = User HardDrive Music Groups (sorted by Song) **bbbb** = group number to get tracks for **cccc** = title number to get tracks for (ignored if sorted by Song) **dddd** = starting track number **eeee** = ending track number **ff** = reply format 00 = Reply format uses track names (same as above) 01 = Reply format uses file urls 02 = Reply format uses detailed track info
		Reply Formats of '00' and '01' are as follows *Reply Format*: ESCX2004**xxx**TRACK1INFOTRACK2INFOetc…, Where **xxx** = total number of tracks, Each TRACK is made of one item so: TRACK1INFO = **yyyyzzzzzzz** **yyyy** = length of track info **zzzzzzz** = track info (length depends on **yyyy**) TRACK2INFO, etc… have the same format as TRACK1INFO *Reply Format of '02' is as follows* *Reply Format*: ESCX2004**xxx**TRACK1INFOTRACK2INFOetc…, Where **xxx** = total number of tracks multiplied by 4 Each TRACK is made of four items so: TRACK1INFO = **xxxxXXXXXXXyyyyYYYYYYYzzzzZZZZaaaaAAAA** **xxxx** = length of track name **XXXXXXX** = track name (length depends on **xxxx**) **yyyy** = length of track url **YYYYYYY** = track url (length depends on **yyyy**) **zzzz** = length of track bitrate **ZZZZ** = track bitrate (length depends on **zzzz**) **aaaa** = length of track length **AAAA** = track length in seconds (length depends on **aaaa**)

		TRACK2INFO, etc… have the same format as TRACK1INFO
20	05	Play music track/radio station/Playlist
20		ESCX20050040002**aa**0004**bbbb**0004**cccc**0004**dddd** **aa** = which database to get groups from, where 01 = System Music Groups (sorted by Artist) 02 = User Music Groups (sorted by Artist) 03 = System Radio Groups 04 = User Radio Groups (allow direct play of movies even though we don't track actual number of chapters) 05 = System Movie Groups 06 = User Movie Groups 07 = System HardDrive Music Groups (sorted by Artist) 08 = User HardDrive Music Groups (sorted by Artist) 81 = System Music Groups (sorted by Title) 82 = User Music Groups (sorted by Title) 87 = System HardDrive Music Groups (sorted by Title) 88 = User HardDrive Music Groups (sorted by Title) 91 = System Music Groups (sorted by Song) 92 = User Music Groups (sorted by Song) 97 = System HardDrive Music Groups (sorted by Song) 98 = User HardDrive Music Groups (sorted by Song) **bbbb** = group number **cccc** = title/station number (song number if sorted by Song) **dddd** = track number (ignored for Radio and Music sorted by Song)
20	06	Get group number for a specific music, radio, or movie genre by name.
20		ESCX20060020002**aaBBBBbbbbbbbb** **aa** = which list to get groups from, where 01 = System Music Groups (sorted by Artist) 02 = User Music Groups (sorted by Artist) 03 = System Radio Groups 04 = User Radio Groups 05 = System Movie Groups 06 = User Movie Groups 07 = System HardDrive Music Groups (sorted by Artist) 08 = User HardDrive Music Groups (sorted by Artist) 81 = System Music Groups (sorted by Title) 82 = User Music Groups (sorted by Title) 87 = System HardDrive Music Groups (sorted by Title) 88 = User HardDrive Music Groups (sorted by Title) 91 = System Music Groups (sorted by Song) 92 = User Music Groups (sorted by Song) 97 = System HardDrive Music Groups (sorted by Song) 98 = User HardDrive Music Groups (sorted by Song) **BBBB** = length of the group name **bbbbbbbb** = which group you want the number for
20		01 – System Music group name examples are: All, Playlists, CDs, MP3s

20		02 –User Music group name examples are: Blues/Folk Classical Country Dance Easy Listening Family HipHop-Rap Jazz Latin New Age Other Pop R&B/Soul Rock Soundtracks
20		03 – System iRadio group name examples are: All, NetRadio
20		04 – User iRadio group name examples are: Alternative Classic Rock Classical Country Eclectic Hip Hop Holiday International Jazz New Age Oldies R&B Religious Soft Rock News/Talk Top 40 Rock Other
20		*Reply Format*: ESCX20060010004**xxxx**, Where **xxxx** = group number for the group specified by aaaa
20		Once group number is known, use the **02** subcommand for info.
20	07	Get title (music or movie) or station (radio) information by name (includes Playlists also, because they are virtual CD titles). Partial strings can be used. Case does not matter. For groups 91-98 the 'title' is actually the song name and 'title number' is the song number.
20		ESCX20070030002**aa**0004**bbbbccccdddd** **aa** = which list to get groups from, where 01 = System Music Groups (sorted by Artist) 02 = User Music Groups (sorted by Artist) 03 = System Radio Groups

		04 = User Radio Groups 05 = System Movie Groups 06 = User Movie Groups 07 = System HardDrive Music Groups (sorted by Artist) 08 = User HardDrive Music Groups (sorted by Artist) 81 = System Music Groups (sorted by Title) 82 = User Music Groups (sorted by Title) 87 = System HardDrive Music Groups (sorted by Title) 88 = User HardDrive Music Groups (sorted by Title) 91 = System Music Groups (sorted by Song) 92 = User Music Groups (sorted by Song) 97 = System HardDrive Music Groups (sorted by Song) 98 = User HardDrive Music Groups (sorted by Song) **bbbb** = group number to get title for **cccc** = length of the title/station/Playlist name **dddd** = name of title/station/Playlist you want the number for
		Reply Format: ESCX2007**xxx**TITLE1TITLE2etc…, Where **xxx** = total number of titles/station/Playlists that match Multiplied by 2, each title is made up of two items so
		TITLE1 above = 0003**xxx**0004**yyyy** 0003 = length of item #1 (always 3) **xxx** = number of tracks in the title for Music, running time of title for Movie, bitrate of station for Radio 0004 = length of item #2 (always 4) **zzzz** = title/station number
		Most likely only one title will be returned for this command, however if you have duplicate titles, TITLE2, etc… have the same format as TITLE1
		Once the title/station/Playlist number and the number of tracks are known you can use the 04 – Get track information command or the 05 – Play music track/radio station/Playlist command.
20	08	Get title (music or movie) or station (radio) cover art (includes Playlists because they are virtual CD titles)
20		ESCX20080040002**aa**0004**bbbb**0004**cccc**0004**dddd** **aa** = which list to get groups from, where 01 = System Music Groups (sorted by Artist) 02 = User Music Groups (sorted by Artist) 03 = System Radio Groups 04 = User Radio Groups 05 = System Movie Groups 06 = User Movie Groups 07 = System HardDrive Music Groups (sorted by Artist) 08 = User HardDrive Music Groups (sorted by Artist) 81 = System Music Groups (sorted by Title) 82 = User Music Groups (sorted by Title) 87 = System HardDrive Music Groups (sorted by Title) 88 = User HardDrive Music Groups (sorted by Title) 91 = System Music Groups (sorted by Song) 92 = User Music Groups (sorted by Song)

		97 = System HardDrive Music Groups (sorted by Song) 98 = User HardDrive Music Groups (sorted by Song) **bbbb** = group number to get titles for **cccc** = starting title number **dddd** = ending title number
		Reply Format: ESCX2008**xxx**TITLE1TITLE2etc…, Where **xxx** = total number of titles Each title is made up of one item so
		TITLE1 above = **xxxxyyyyyyyyyy** **xxxx** = length of cover art url **yyyyyyyyyy** = cover art url
		TITLE2, etc… have the same format as TITLE1
20	09	Get title (music or movie) or station (radio) detailed information (includes Playlists because they are virtual CD titles)
20		ESCX20090040002**aa**0004**bbbb**0004**cccc**0004**dddd** **aa** = which list to get groups from, where 01 = System Music Groups (sorted by Artist) 02 = User Music Groups (sorted by Artist) 03 = System Radio Groups 04 = User Radio Groups 05 = System Movie Groups 06 = User Movie Groups 07 = System HardDrive Music Groups (sorted by Artist) 08 = User HardDrive Music Groups (sorted by Artist) 81 = System Music Groups (sorted by Title) 82 = User Music Groups (sorted by Title) 87 = System HardDrive Music Groups (sorted by Title) 88 = User HardDrive Music Groups (sorted by Title) 91 = System Music Groups (sorted by Song) 92 = User Music Groups (sorted by Song) 97 = System HardDrive Music Groups (sorted by Song) 98 = User HardDrive Music Groups (sorted by Song) **bbbb** = group number to get titles for **cccc** = starting title number **dddd** = ending title number
		Reply Format: ESCX2009**xxx**TITLE1TITLE2etc…, Where **xxx** = total number of titles multiplied by 2, Each title is made up of two or four items so
		For Music and Radio, TITLE1 above = **xxxxXXXXyyyyYYYY** **xxxx** = length of item #1 (length of year/channels) **XXXX** = year of title for Music, audio channels for Radio (length depends on **xxxx**) **yyyy** = length of item #2 (length of label/location) **YYYY** = record label for Music, station location for Radio (length depends on **yyyy**)
		For Movies, TITLE1 above = **wwwwWWWWxxxxXXXXyyyyYYYYzzzzZZZZ** **wwww** = length of item #1 (length of year)

		WWWW = year of title for Movies (length depends on **wwww)** **xxxx** = length of item #2 (length of rating) **XXXX** = rating of title for Movies (length depends on **xxxx**) **yyyy** = length of item #3 (length of cast) **YYYY** = cast list of title for Movies (length depends on **yyyy**) **zzzz** = length of item #4 (length of description) **ZZZ** = description of title for Movies (length depends on **zzzz**)
		TITLE2, etc… have the same format as TITLE1
20		ESCX20090050002**aa**0004**bbbb**0004**cccc**0004**dddd**0002**ee** **aa** = which list to get groups from, where 01 = System Music Groups (sorted by Artist) 02 = User Music Groups (sorted by Artist) 03 = System Radio Groups 04 = User Radio Groups 05 = System Movie Groups 06 = User Movie Groups 07 = System HardDrive Music Groups (sorted by Artist) 08 = User HardDrive Music Groups (sorted by Artist) 81 = System Music Groups (sorted by Title) 82 = User Music Groups (sorted by Title) 87 = System HardDrive Music Groups (sorted by Title) 88 = User HardDrive Music Groups (sorted by Title) 91 = System Music Groups (sorted by Song) 92 = User Music Groups (sorted by Song) 97 = System HardDrive Music Groups (sorted by Song) 98 = User HardDrive Music Groups (sorted by Song) **bbbb** = group number to get titles for **cccc** = starting title number **dddd** = ending title number **ee** = reply format 00 = same response as above 01 = return year, label, title, artist, number of tracks, total length, genre and coveart url (Music only, Radio and Movies will have same response as above)
		Reply Formats "01' for Music is as follows: *Reply Format*: ESCX2009**xxx**TITLE1TITLE2etc…, Where **xxx** = total number of titles multiplied by 8: **NOTE:** this implies a limit of 124 items since 8*125 > 999 Each title is made up of eight items so
		TITLE1 above = **ssssSSSSttttTTTTuuuuUUUUvvvvVVVVwwwwWWWWxxxxXXXXyyyyYYYYzzzzZZZZ** **ssss** = length of item #1 (length of year) **SSSS** = year of title (length depends on **ssss**) **tttt** = length of item #2 (length of label) **TTTT** = record label (length depends on **tttt**) **uuuu** = length of item #3 (length of title) **UUUU** = record title (length depends on **uuuu**)

		vvvv = length of item #4 (length of artist) **VVVV** = record artist (length depends on **vvvv**) **wwww** = length of item #5 (number of tracks) **WWWW** = total number of tracks (length depends on **wwww**) **xxxx** = length of item #6 (length of total music length in minutes) **XXXX** = total length all tracks in seconds (length depends on **xxxx**) **yyyy** = length of item #7 (length of genre) **YYYY** = record genre (length depends on **yyyy**) **zzzz** = length of item #8 (length of coverart url) **ZZZZ** = record coverart url (length depends on **zzzz**)
		TITLE2, etc… have the same format as TITLE1
20	10	Get group names
20		ESCX20100030002**aa**0004**bbbb**0004**cccc** **aa** = which list to get groups from, where 01 = System Music Groups (sorted by Artist) 02 = User Music Groups (sorted by Artist) 03 = System Radio Groups 04 = User Radio Groups 05 = System Movie Groups 06 = User Movie Groups 07 = System HardDrive Music Groups (sorted by Artist) 08 = User HardDrive Music Groups (sorted by Artist) 81 = System Music Groups (sorted by Title) 82 = User Music Groups (sorted by Title) 87 = System HardDrive Music Groups (sorted by Title) 88 = User HardDrive Music Groups (sorted by Title) 91 = System Music Groups (sorted by Song) 92 = User Music Groups (sorted by Song) 97 = System HardDrive Music Groups (sorted by Song) 98 = User HardDrive Music Groups (sorted by Song) **bbbb** = starting group number **cccc** = ending group number
20		*Reply Format*: ESCX2010**xxx**GROUP1GROUP2etc…, Where **xxx** = total number of groups. If the starting group number and ending group number are both equal to zero, all groups in the list are returned. Each group is made up of one item so
20		GROUP1 above = **xxxxyyyyyyyy** where **xxxx** = length of group name **yyyyyyyy** = group name (length depends on **xxxx**)
20	11	Change music playlist name
20		ESCX20110020004**aaaabbbbcccccccc** **aaaa** = which playlist to rename (number in System Music's Playlists group) **bbbb** = length of new playlist name **cccc** = new name of the playlist
		ESCX20110030004**aaaabbbbcccccccc**0002**dd** **aaaa** = which playlist to rename (number in the indicated groupings Playlists group)

		bbbb = length of new playlist name **cccc** = new name of the playlist **dd** = which group the Playlist is from, where 01 = System Music Groups (sorted by Artist) (same as above) 07 = System HardDrive Music Groups (sorted by Artist) 81 = System Music Groups (sorted by Title) 87 = System HardDrive Music Groups (sorted by Title) 91 = System Music Groups (sorted by Song) 97 = System HardDrive Music Groups (sorted by Song)
20	12	Delete music playlist
		ESCX20120010004**aaaa** **aaaa** = which playlist to delete (number in System Music's Playlists group)
		ESCX20120020004**aaaa**0002**bb** **aaaa** = which playlist to delete (number in the indicated groupings Playlists group) **bb** = which group the Playlist is from, where 01 = System Music Groups (sorted by Artist) (same as above) 07 = System HardDrive Music Groups (sorted by Artist) 81 = System Music Groups (sorted by Title) 87 = System HardDrive Music Groups (sorted by Title) 91 = System Music Groups (sorted by Song) 97 = System HardDrive Music Groups (sorted by Song)
20	13	Add music track to the Favorites playlist
20		ESCX20130040002**aa**0004**bbbb**0004**cccc**0004**dddd** **aa** = which list to get groups from, where 01 = System Music Groups (sorted by Artist) 02 = User Music Groups (sorted by Artist) 07 = System HardDrive Music Groups (sorted by Artist) 08 = User HardDrive Music Groups (sorted by Artist) 81 = System Music Groups (sorted by Title) 82 = User Music Groups (sorted by Title) 87 = System HardDrive Music Groups (sorted by Title) 88 = User HardDrive Music Groups (sorted by Title) 91 = System Music Groups (sorted by Song) 92 = User Music Groups (sorted by Song) 97 = System HardDrive Music Groups (sorted by Song) 98 = User HardDrive Music Groups (sorted by Song) **bbbb** = group number **cccc** = title/station number (song number if sorted by Song) **dddd** = track number (ignored if sorted by Song)
20	14	Add music track to a playlist
20		ESCX20140050004**aaaa**0002**bb**0004**cccc**0004**dddd**0004**eeee** **aaaa** = which playlist to change (number in the Playlists group) **bb** = which list to get groups from, where 01 = System Music Groups (sorted by Artist) 02 = User Music Groups (sorted by Artist) 07 = System HardDrive Music Groups (sorted by Artist)

		08 = User HardDrive Music Groups (sorted by Artist) 81 = System Music Groups (sorted by Title) 82 = User Music Groups (sorted by Title) 87 = System HardDrive Music Groups (sorted by Title) 88 = User HardDrive Music Groups (sorted by Title) 91 = System Music Groups (sorted by Song) 92 = User Music Groups (sorted by Song) 97 = System HardDrive Music Groups (sorted by Song) 98 = User HardDrive Music Groups (sorted by Song) **cccc** = group number **dddd** = title/station number (song number if sorted by Song) **eeee** = track number (ignored if sorted by Song)
20	15	Delete music track from a playlist
20		ESCX20150030004**aaaa**0002**bb**0004**cccc** **aaaa** = which playlist to change (number in the Playlists group, which indicates both the playlist and the track if sorted by Song) **bb** = which list to get Playlist group from, where 01 = System Music Groups (sorted by Artist) 07 = System HardDrive Music Groups (sorted by Artist) 81 = System Music Groups (sorted by Title) 87 = System HardDrive Music Groups (sorted by Title) 91 = System Music Groups (sorted by Song) 97 = System HardDrive Music Groups (sorted by Song) **cccc** = track number (ignored if sorted by Song)
20	16	Create a new empty playlist
20		ESCX2016001**aaaabbbbbbbb** **aaaa** = length of name of the new playlist **bbbb** = name of the new playlist
20	17	Generate a list of random tracks from a group
20		ESCX20170050002**aa**0004**bbbb**0004**cccc**0004**dddd**0004**eeee**
		aa = which list to get groups from, where 91 = System Music Groups (sorted by Song) 92 = User Music Groups (sorted by Song) 97 = System HardDrive Music Groups (sorted by Song) 98 = User HardDrive Music Groups (sorted by Song) **bbbb** = group number to get tracks for **cccc** = starting track number (if 0, assume first track in group) **dddd** = ending track number (if 0, assume last track in group) **eeee** = max number of tracks to be returned
		Reply Format: ESCX2017**xxx**TRACK1INFOTRACK2INFOetc…, Where **xxx** = total number of tracks multiplied by 2, Each TRACK is made of two items so: TRACK1INFO = **wwwwxxxxyyyyzzzzzzz** **wwww** = length of track number

		xxxx = track number within the indicated group **yyyy** = length of track info **zzzzzzz** = track info (length depends on **yyyy**) TRACK2INFO, etc… have the same format as TRACK1INFO
20		ESCX20170060002**aa**0004**bbbb**0004**cccc**0004**dddd**0004**eeee**0002**ff**
		aa = which list to get groups from, where 91 = System Music Groups (sorted by Song) 92 = User Music Groups (sorted by Song) 97 = System HardDrive Music Groups (sorted by Song) 98 = User HardDrive Music Groups (sorted by Song) **bbbb** = group number to get tracks for **cccc** = starting track number (if 0, assume first track in group) **dddd** = ending track number (if 0, assume last track in group) **eeee** = max number of tracks to be returned **ff** = reply format 00 = Reply format uses track names (same as above) 01 = Reply format uses file urls 02 = Reply format uses detailed track info
		Reply Formats of '00' and '01' are as follows *Reply Format*: ESCX2017**xxx**TRACK1INFOTRACK2INFOetc…, Where **xxx** = total number of tracks multiplied by 2, Each TRACK is made of two items so: TRACK1INFO = **wwwwxxxxyyyyzzzzzzz** **wwww** = length of track number **xxxx** = track number within the indicated group **yyyy** = length of track info **zzzzzzz** = track info (length depends on **yyyy**) TRACK2INFO, etc… have the same format as TRACK1INFO *Reply Format of '02' is as follows* *Reply Format*: ESCX2017**xxx**TRACK1INFOTRACK2INFOetc…, Where **xxx** = total number of tracks multiplied by 5 Each TRACK is made of five items so: TRACK1INFO = **wwwwWWWWxxxxXXXXXXXyyyyYYYYYYYzzzzZZZZaaaaAAAA** **wwww** = length of track number **WWWW** = track number within the indicated group **xxxx** = length of track name **XXXXXXX** = track name (length depends on **xxxx**) **yyyy** = length of track url **YYYYYYY** = track url (length depends on **yyyy**) **zzzz** = length of track bitrate **ZZZZ** = track bitrate (length depends on **zzzz**) **aaaa** = length of track length **AAAA** = track length in seconds (length depends on **aaaa**) TRACK2INFO, etc… have the same format as TRACK1INFO

		Upon receiving the response, the track number within the group can be used in an ESCX2009 query to retrieve details about the track, including the year, label, title, artist, number of tracks, total length, genre and coveart url.

Status Commands

COMMAND GROUP	SUB COMMAND	DESCRIPTION
50	01	Get power state
50		*Reply Format*: ESCX50010010003**xxx**, Where **xxx** = a 3 character string "ON " if power on "OFF" if power is off (standby mode)
50	02	Get music play mode
50		*Reply Format*: ESCX50020010002**xx**, Where **xx** = music play mode, where 01 = normal 02 = repeat track 03 = repeat title 04 = repeat group 05 = random title 06 = random group
50	03	Get sort order [possible future implementation]
50		*Reply Format*: ESCX50030010002**xx**, Where **xx** = guide sort order, where 01 = by artist 02 = by title 03 = by song
50	04	Get current playing title (music or movie) or station (radio) information
50		*Reply Format*: ESCX5004007**aaaabb**0004**cccc**0003**ddd**0002**ee**0002**ff**0004**gggg**0004**hhhh** **aaaa** = length of the title/station that is playing **bb** = title/station name (length depends on **aaaa**) **cccc** = number of the playing title/station in the All group **ddd** = number of the playing track (000 for movie and radio) **ee** = current media type 00 = unknown, 01 = CD, 02 = DATACD, 03 = MP3, 04 = playlist, 05 = DVD, 06 = radio **ff** = current group type (which list to get groups from) 01 = System Music Groups (sorted by Artist) 02 = User Music Groups (sorted by Artist) **gggg** = current group number **hhhh** = current title number
50	05	Get current screen that is displayed in the GUI [possible future implementation]

50		*Reply Format*: ESCX50050010002**xx**, Where **xx** = current GUI screen, where 01 = guide 02 = player 03 = options 04 = configuration

Control Commands

COMMAND GROUP	SUB COMMAND	DESCRIPTION
70	01	Select guide source
70		ESCX70010010002**xx** **xx** = guide source, where 01 = Music 02 = iRadio 03 = Movies
70	02	Register for unsolicited events (by default you are registered to receive the unsolicited events for level 5)
70		ESCX70**02** ESCX70**02**0010002**xx** **xx =** event level, where 05 = All events except 1-second updates while playing 10 = All level 5 events, plus one-second track playing time updates during music play If the short version of the command is used, event level 5 will be used as the default level.
70	03	Unregister for unsolicited events (prevent unsolicited events)
70		ESCX70**03**
70	04	Set Music Play Mode
70		ESCX70040010002**xx** **xx** = music play mode, where 01 = normal 02 = repeat track 03 = repeat title 04 = repeat group 05 = random title 06 = random group
70	05	Change guide view
70		ESCX70**05**0010002**xx** **xx** = guide view, where 01 = Artist View (music) or Title View (movies) 02 = Title View (music only) 03 = Song View (music only) 04 = Cover View (music and movies)
70	06	Lock this control interface (enter password protected mode)
70		ESCX70**06**

70	07	Unlock this control interface (leave password protected mode)
70		ESCX70**07**001**aaaabbbb** **aaaa** = length of security password **bbbb** = security password

Note that when the host is in power standby mode, any command will cause the unit to enter the power on mode before executing the command. There are two exceptions to this: a client may register and unregister for unsolicited events without turning the host on, and the Status Command “Get Power State” (ESCX5001) will return the current state of the unit without turning it on.