

HD-R1 Serial Protocol

Revision E

The serial protocol is designed so that it can be exercised using a common terminal program; therefore, all markers are normal, printable 8-bit ASCII characters, and the end of line marker is flexible. Fields are not case-sensitive, unless specifically documented otherwise. Messages follow the same general structure, although some messages do not contain all the fields defined below:

Parameter ID: 1 to 24 characters. Specifies the parameter in question. If there are leading or trailing spaces, the HD-R1 ignores them. The Parameter ID is not case-sensitive and will not contain an equals sign, question mark, or exclamation point.

Command: 1 character, Determines what is to be done with the parameter in question.
Commands include: **=** (set/value), **?** (query)

Value: 1 to 24 characters, Contains the value of the parameter in question. If there are leading or trailing spaces, the HD-R1 ignores them. The value is not case-sensitive unless specifically documented otherwise.

End Marker: 1 or 2 characters. A line feed (**LF**) or a carriage return followed by a line-feed (**CR LF**). The HD-R1 will always accept either type of end marker and can be configured to transmit either.

What follows is an example of a typical message. Here, the Parameter ID and Value fields are not padded with trailing spaces and a single-character end marker is used.

	Parameter ID	Cmd	Value	End Marker
Visible Text	Input Source	=	Analog/Mic	LF
ASCII codes (decimal)	73 110 112 117 116 32 83 61 111 117 114 99 101		65 110 97 108 111 103 47 10 77 105 99	

Conventions

In this document commands sent to the HD-R1 are formatted as follows:

Input Source?

Responses from the HD-R1 are formatted similarly but in italics:

Input Source=Analog/Mic

Incoming Commands

Parameter Query

When the command field of an incoming message is a question mark, the message is a parameter query command. If the parameter is not recognized or does not support queries, the HD-R1 will respond with an error message; otherwise, it will respond with a Parameter Value message containing the current value of that parameter. This is an example of a command that request the current value of a parameter and the response from the HD-R1:

```
Input Source?  
Input Source=Analog/Mic
```

Parameter Set

When the command field of an incoming message is an equals sign, the message is a parameter set command. When the HD-R1 receives a parameter set command, it will set the parameter as requested, if possible. If the parameter is set successfully, the HD-R1 will not respond. If the parameter is not recognized or the value is not recognized, it will respond with an error. Generally, the strings used for parameter IDs and their values match the text seen on the LCD user interface screen. This is an example of a command that sets a parameter:

```
Input Source=Analog/Mic
```

Outgoing Messages

Parameter Value Response

When the command field of an outgoing message is an equals sign, the HD-R1 is reporting the current value of a parameter. Generally, the strings used for parameter IDs and their values match the text seen on the LCD user interface screen. For example:

Input Source?
Input Source=S/PDIF

Error Responses

When the command field of an outgoing message is a question mark, the HD-R1 is reporting an error, usually because it cannot understand the message it just received. If the HD-R1 receives a Parameter Query for an invalid parameter called Blah, then the HD-R1 will respond as follows:

Blah?
Blah???

If the HD-R1 receives a Parameter Set command for an invalid parameter the HD-R1 will respond as follows:

Blah=Foo
Blah???Foo

Set Refused Responses

If the HD-R1 receives a Parameter Set command for a valid parameter, but the value is illegal, the HD-R1 will respond with an exclamation in the command field:

Input Source=Blah
Input Source!Blah

If the HD-R1 receives a Parameter Set command for a valid parameter, but the value is missing the HD-R1 will respond like this:

Input Source=
Input Source!Missing Value

Some parameters can only be set when the transport is stopped. If a request is made to change one of these parameters during a non-stopped transport state a response with an asterix (*) is returned. For example, attempting to change the sample rate while recording would result in the following response from the HD-R1:

WAV Sample Rate=44.1 kHz
WAV Sample Rate*44.1 kHz

Special Incoming Commands

End Marker

The HD-R1 can be set to terminate messages it transmits using just a line feed (**LF**) or a carriage return followed by a line-feed (**CR LF**). The HD-R1 will accept this query or command at any time. After being powered on, the HD-R1 defaults to terminating transmitted messages with CR LF. Examples:

End Marker=LF

End Marker=CR LF

Protocol Width

Because some devices may prefer to receive messages with fixed-width fields, the HD-R1 can be set to transmit messages of fixed width or of variable width. When set to fixed width, the Parameter ID and Value fields are padded with trailing spaces so that they are always 24 characters wide. The HD-R1 will accept this query or command at any time. After being powered on, the HD-R1 defaults to variable width messages. Examples:

Protocol Width=Fixed

Protocol Width=Variable

Logging In

After being powered on, the HD-R1 requires a password before it will respond to serial commands other than **End Marker**, **Protocol Width**, and **Login**. The HD-R1's default password is "HDR1" and is case-sensitive. The password can be changed via the front panel. To login:

Login=HDR1

Login Succeeded

Logging Out

Once logged in, the session can be logged out by sending this command:

Logout

Logged Out

Software Version

This command causes the HD-R1 to respond with the version number of the currently running software:

Version?

Version=1.0

Direct Transport Commands

Sometimes using the front panel commands to control the transport via virtual key presses is undesirable because a key's behavior changes depending on the current transport state. The direct transport commands do not depend on the current transport state. In some situations, these may be preferable to use. For example, sending a direct transport record command will cause the HD-R1 to immediately start recording. What follows is a list of all the direct transport commands.

Transport=Stop
Transport=Play
Transport=Record
Transport=Ready
Transport=Monitor
Transport=First Track
Transport=Next Track
Transport=Prev Track
Transport=Last Track
Transport=Next Track/Marker
Transport=Prev Track/Marker

(the following are only valid when the Transport is Stopped)

Transport=First Folder/Playlist
Transport=Next Folder/Playlist
Transport=Prev Folder/Playlist
Transport=Last Folder/Playlist

The transport state can be queried:

Transport?
Transport=Record

The transport location may also be queried in several different ways:

Current Track Number?
Total Time Elapsed?
Total Time Remaining?
Event Elapsed?
Event Remaining?

Settings

Most of the HD-R1's settings can be configured remotely. Their parameter IDs and acceptable values are defined in the following tables. All parameters may both be set with a command and queried except where marked otherwise. Note that spaces within a parameter ID or value must be exactly as shown, although capitalization is ignored.

The following settings can be queried and set at any time:

Parameter ID	Possible Values
Num Of Folders	<i>number of folders (query only)</i>
Num Of Playlists	<i>number of playlists (query only)</i>
Repeat	Off On
Auto Ready	Off On
Auto Cue	Off -72 dBFS -66 dBFS -60 dBFS -54 dBFS -48 dBFS -42 dBFS -36 dBFS -30 dBFS -24 dBFS
Channels	Mono Left Mono Right Mono Summed Stereo
WAV Sample Width	16 Bits 24 Bits
Mono MP3 Bit Rate	32 kbps 40 kbps 64 kbps 80 kbps 96 kbps 112 kbps 128 kbps 160 kbps

Stereo MP3 Bit Rate	64 kbps 80 kbps 128 kbps 160 kbps 192 kbps 224 kbps 256 kbps 320 kbps
Mark Audio Overs	Off On
Mark Time Interval	Off 1 minute 2 minutes 3 minutes 4 minutes 5 minutes 10 minutes 30 minutes 60 minutes
Auto Track	512 MB 1 GB 1.5 GB 1.8 GB 2 GB 5 Min 10 Min 15 Min 30 Min 1 Hour
Sync Record	Off -72 dBFS -66 dBFS -60 dBFS -54 dBFS -48 dBFS -42 dBFS -36 dBFS -30 dBFS -24 dBFS

Audio File Base Name	<i>base name (20 characters max of alphanumerics, '-', '_' and '')</i>
Mark Base Name	<i>base name (20 characters max of alphanumerics, '-', '_' and '')</i>
Shuttle Mode	Track/Mark Only Hours Minutes Seconds Tenths
Time Display	Total Elapsed Total Remaining Event Elapsed Event Remaining
Keyboard Type	English Japanese
Overload Threshold	-0.2 dBFS 0 dBFS
Overload Hold	Flash 3 Sec 6 Sec 10 Sec Infinite
Peak Decay Rate	Hold Fast Decay Medium Decay Slow Decay Off
Meter Decay Rate	Fast Decay Medium Decay Slow Decay
Parallel Mode	Off Direct Play Binary Play Program Play
Input Polarity	Active Low Active High

Busy1 Signal	Playback Recording Finished Ducking CF Door Media Full
Busy1 Polarity	Normally Open Normally Closed
Busy2 Signal	Playback Recording Finished Ducking CF Door Media Full
Busy2 Polarity	Normally Open Normally Closed
System Time	<i>hh:mm:ss</i>
System Date	<i>dd/mm/yyyy</i>

The following settings can be queried at any time but can only be changed when the transport is stopped. Attempting to change them while the transport is not stopped will result in an error command being sent back with a “*”.

Parameter ID	Possible Values
Folder Name	<i>name of folder (name is case insensitive)</i>
Playlist Name	<i>name of playlist (name is case insensitive)</i>
Folder Number	<i>number of folder</i>
Playlist Number	<i>number of playlist</i>
Playback Mode	All Single Folder Playlist
Folder Sorting	Time Name
Random	On Off

Input Source	Analog/Mic S/PDIF
WAV Sample Rate	44.1 kHz 48 kHz 82.2 kHz 96 kHz
MP3 Sample Rate	44.1 kHz 48 kHz
File Format	WAV MP3
Pre-Record	Off On
Ref Level	-20 dBFS = +4 dBu -18 dBFS = +4 dBu -16 dBFS = +4 dBu -14 dBFS = +4 dBu -9 dBFS = +6 dBu
Ducking Mode	Off Attenuate Input Attenuate Playback
Ducking Threshold	-6 dBFS -12 dBFS -18 dBFS -24 dBFS -30 dBFS
Ducking Attenuation	-3 dB -6 dB -9 dB -12 dB -18 dB -24 dB -Infinity

Ducking Hold Time	0.1 Sec
	0.5 Sec
	1.0 Sec
	1.5 Sec
	2.0 Sec
	2.5 Sec
	3.0 Sec
	3.5 Sec
	4.0 Sec
	4.5 Sec
	5.0 Sec

Playlist and Folder Discovery

Here is how to discover what playlists and folders are currently available. This will be shown by example. First, we will find out how many playlists are on the currently installed CF card.

Num Of Playlists?

Num Of Playlists=3

With this information, we may obtain the names of the playlists. Note that the list of playlists is always in alphabetical order.

Playlist Name?1

Playlist Name=Jazz

Playlist Name?2

Playlist Name=Rock

Playlists may be loaded by name like this:

Playlist Name=Rock

Playlists may also be loaded by number like this:

Playlist Number=2

The same applies for folders. First, we will find out how many folders are on the currently installed CF card.

Num Of Folders?

Num Of Folders=3

With this information, we may obtain the names of the folders. Note that the list of folders is always in alphabetical order.

Folder Name?1

Folder Name=Monday

Folder Name?2

Folder Name=Tuesday

The active folder may be specified by name like this:

Folder Name=Tuesday

The active folder may also be specified by number like this:

Folder Number=2