



# RDM PACKET SNIFFER

**ENTTEC**  
www.enttec.com  
**Entertainment Technology**

*Conforms to RDM Standard ANSI E1.20 -2006*

## **Software Manual**

[www.enttec.com/rdm](http://www.enttec.com/rdm)

Version 1.4

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## Sniffer Features

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- Capture all RDM/DMX packets on the line
- Detailed packet view to display each byte captured with time-stamp
- RDM Packet breakup as per RDM Standard for easy debugging
- Analyze captured packets using various options
- Highlight incorrect packets (as per Standard)
- Real-time capture and Analyze ability
- Perform Timing checks on captured packets as per Standard
- Save captured packets as a Log file

## Detailed Description

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This documentation covers all the features and usage instructions for ENTTEC Sniffer Tool. It is recommended that you read the entire manual before using the Sniffer to debug/analyze packets over the RDM/DMX setup.

# Introduction to ENTTEC Sniffer

The screenshot displays the ENTTEC RDM Packet Sniffer v1.3.12 application window. The interface includes a menu bar (Devices, File, Options), a toolbar with 'Start Capture', 'Enable Real-Time Update', and 'STOP Capture' buttons, and a main data table.

Start Time (ms)	Duration (ms)	Source ID	Destination ID	Tran Num	Res Type	Command	Parameter	Comments
6831.696	1.584	454E02052467	FFFFFFFFFFFF	85	PORT: 01	Discovery	DISC_UNIQ...	4845000001C48450000
6888.701	1.582	454E02052467	FFFFFFFFFFFF	86	PORT: 01	Discovery	DISC_UNIQ...	4845000001848450000
6890.779	1.065	N/A	N/A	N/A	N/A	RDM Collision	Bad Packet	Length: 17
7042.600	1.584	454E02052467	FFFFFFFFFFFF	87	PORT: 01	Discovery	DISC_UNIQ...	4845000001A48450000
7131.462	1.583	454E02052467	FFFFFFFFFFFF	88	PORT: 01	Discovery	DISC_UNIQ...	4845000001848450000
7133.529	1.063	N/A	N/A	N/A	N/A	RDM Collision	Bad Packet	Length: 19
7199.417	1.534	454E02052467	FFFFFFFFFFFF	89	PORT: 01	Discovery	DISC_UNIQ...	4845000001948450000
7201.533	0.967	N/A	N/A	N/A	N/A	24 bytes ...	Discovery Response	checksum Verified
7271.453	1.057	454E02052467	484500000019	90	PORT: 01	Discovery	DISC_MUTE	
7273.158	1.139	484500000019	454E02052467	90	ACK	Discovery Resp...	DISC_MUTE	
7288.405	1.585	454E02052467	FFFFFFFFFFFF	91	PORT: 01	Discovery	DISC_UNIQ...	4845000001848450000
7289.519	0.969	N/A	N/A	N/A	N/A	24 bytes ...	Discovery Response	checksum Verified
7361.406	1.051	454E02052467	484500000018	92	PORT: 01	Discovery	DISC_MUTE	
7363.187	1.145	484500000018	454E02052467	92	ACK	Discovery Resp...	DISC_MUTE	
7379.588	1.585	454E02052467	FFFFFFFFFFFF	93	PORT: 01	Discovery	DISC_UNIQ...	4845000001048450000
7381.713	0.962	N/A	N/A	N/A	N/A	24 bytes ...	Discovery Response	checksum Verified

The 'Packet List' section highlights the selected packet (7199.417 ms). Below the table, the 'RDM Packet' details are shown:

- First Block : CC 01 24
- Second Block : FF FF FF FF FF FF 45 4E 02 05 24 67
- Third Block : 59 01 00 00 00 10
- Fourth Block : 00 01 0C 48 45 00 00 00 19 48 45 00 00 00 19 09 D3

The 'Packet Dump' section displays the raw hex data: CC 01 24 FF FF FF FF FF FF 45 4E 02 05 24 67 59 01 00 00 00 10 00 01 0C 48 45 00 00 00 19 48 45 00 00 00 19 09 D3.

At the bottom of the window, the status bar shows: Total Packets Captured: 155 and DMX Packets Captured: 56.

## Connecting RDM USB PRO

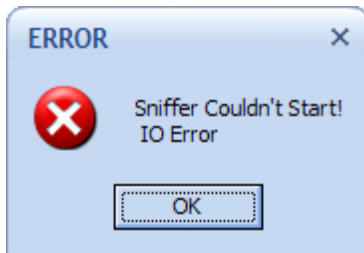
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ENTTEC Sniffer is designed to be used only with a RDM USB PRO. Usage of any other hardware with this tool is strictly not recommended. More info about the RDM USB PRO may be found [here](#).

After connecting a RDM USB PRO to the PC using an available USB Port, open the Sniffer Application and click on Devices menu and all the connected PROS shall be listed under this menu. Click on the selected device to allow the Sniffer to connect to the PRO.

Please note that the Sniffer application requires the latest drivers for the RDM USB Pro, these can be downloaded from the RMD USB Pro drivers page

On successful connection to the PRO a small success window will pop up. This indicates that the Sniffer has successfully connected to the RDM PRO. Click on OK to use the Sniffer tool, all the features would now be available to be used.



If the connection is not made correctly an error window will pop-up which could mean an I/O Error. In that case, try selecting the device again from the Device menu, and if it again shows an error, close the Sniffer tool, reconnect the PRO to the PC, and restart Sniffer and try to connect again.

Another possible instance could be the PRO you are using has incorrect firmware, this could mean that the PRO connected is not a RDM USB PRO. In this case try all other devices from the Device menu until you succeed to connect to the RDM PRO.



## Using Sniffer to capture packets

ENTTEC Sniffer is designed to be used primarily for the capture and analysis of RDM/DMX packets. The entire process is divided into two stages:-

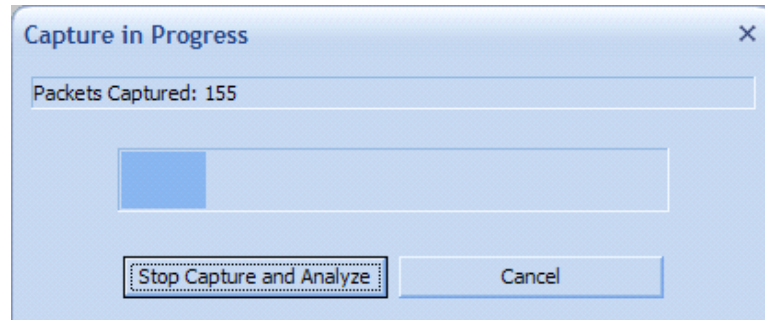
- Capture of Data, and
- Analysis of capture data into meaningful form.

Press “**Start Capture**” button while **Enable Real Time Update** is selected, to perform both the tasks at the same time. The packet list screen will be updated as and when new packets are captured.

Start Time (ms)	Duration (ms)	Source ID	Destination ID	Tran Num	Res Type	Command	Parameter	Comments
4385.767	0.683	N/A	N/A	N/A	N/A	RDM Collisi...	Bad Packet	Length: 15
4460.339	1.579	454E02052467	FFFFFFFFFFFF	185	PORT: 01	Discovery	DISC_UNIQ...	4845001000004845001FF...
4515.280	1.580	454E02052467	FFFFFFFFFFFF	186	PORT: 01	Discovery	DISC_UNIQ...	4845000000004845000FF...
4517.345	1.059	N/A	N/A	N/A	N/A	RDM Collisi...	Bad Packet	Length: 19
4592.237	1.576	454E02052467	FFFFFFFFFFFF	187	PORT: 01	Discovery	DISC_UNIQ...	4845000800004845000FF...
4648.163	1.583	454E02052467	FFFFFFFFFFFF	188	PORT: 01	Discovery	DISC_UNIQ...	48450000000048450007F...
4650.203	1.079	N/A	N/A	N/A	N/A	RDM Collisi...	Bad Packet	Length: 25
4721.160	1.569	454E02052467	FFFFFFFFFFFF	189	PORT: 01	Discovery	DISC_UNIQ...	48450004000048450007F...
4775.091	1.585	454E02052467	FFFFFFFFFFFF	190	PORT: 01	Discovery	DISC_UNIQ...	48450000000048450003F...

**NOTE: Real-Time update capture** will consume more CPU resources, and is not recommended for slow systems.

Press “**Start Capture**” button without Real-Time Update, to only capture the packets first. To see the actual packets you will need to “**Stop Capture and Analyze**” which would then update the Packet List screen.



### Color Codes for Packets displayed:

<b>RDM Packet</b>
<b>RDM Discovery Response</b>
<b>RDM Collision</b>
<b>DMX Packet</b>
<b>Timing Error in Packet</b>

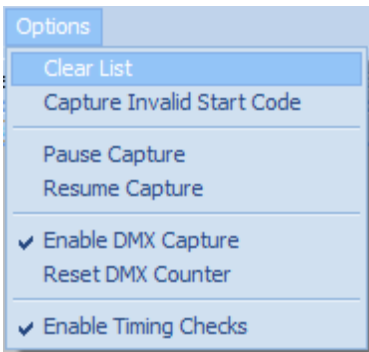
## Sniffer Options

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Using the **Options** menu, the following changes can be made which control the way Sniffer captures/ analyses data captured:

**Clear List:** clears the Packet List window, i.e. all the packets captured will be deleted from the Sniffer

**Capture Invalid Start Code:** when selected, the Sniffer will also capture non-standard RDM or DMX packets.



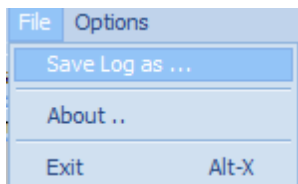
**Pause Capture:** Pauses Live Capture. When paused Capture can be resumed, this is different from starting and stopping capture.

**Resume Capture:** Resumes Live Capture. Unlike starting capture again, this does not clear the list.

**Enable DMX Capture:** When enabled Sniffer will also capture DMX Data. Since it is enabled by default, you may disable it to capture only RDM Packets.

**Reset DMX Counter:** Resets the “DMX Packets captured” counter to 0. Displayed on the right bottom status bar

**Enable Timing Checks:** Imposes Timing checks as outlined in Appendix A. These, are imposed on the packets captured. If any packet does not conform to the timing requirements, it will be shown in different color, and the Comments field will have “**timing error**” string. Enabled by default



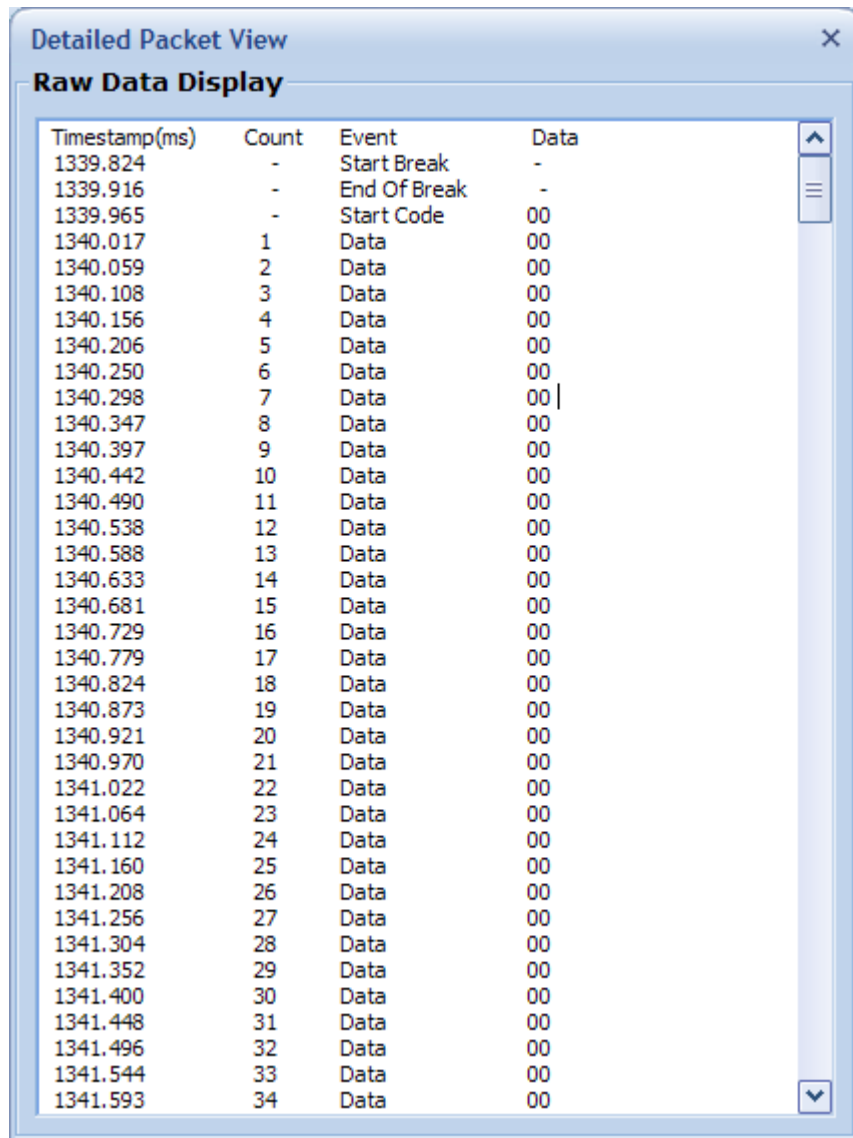
**Save Log as:** Save the current Packet List (Packet Dump, with timestamp and Packet Type in a text format)

## Detailed Packet View

Double Clicking any packet in the packet list will show the **Detailed Packet View** window. It shows the time stamp for each byte of the packet and Break Time as well.

This gives a detailed look into the packet captured by the Sniffer.

The time-stamp as displayed is in milliseconds and represents the time of the start of the event. For example, in case of a data byte it represents the time at which the start bit occurred.

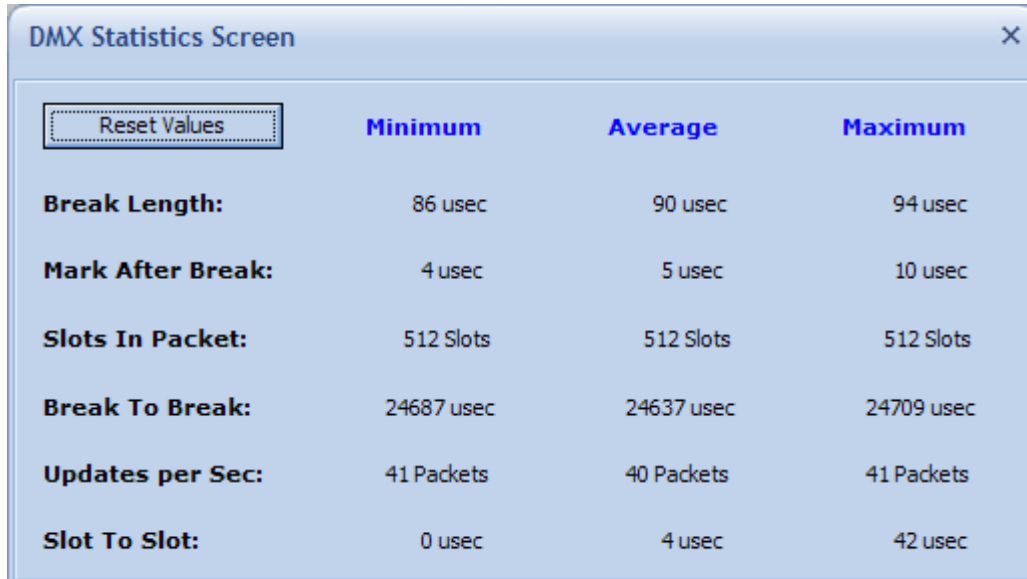


The screenshot shows a window titled "Detailed Packet View" with a sub-header "Raw Data Display". The window contains a table with the following data:

Timestamp(ms)	Count	Event	Data
1339.824	-	Start Break	-
1339.916	-	End Of Break	-
1339.965	-	Start Code	00
1340.017	1	Data	00
1340.059	2	Data	00
1340.108	3	Data	00
1340.156	4	Data	00
1340.206	5	Data	00
1340.250	6	Data	00
1340.298	7	Data	00
1340.347	8	Data	00
1340.397	9	Data	00
1340.442	10	Data	00
1340.490	11	Data	00
1340.538	12	Data	00
1340.588	13	Data	00
1340.633	14	Data	00
1340.681	15	Data	00
1340.729	16	Data	00
1340.779	17	Data	00
1340.824	18	Data	00
1340.873	19	Data	00
1340.921	20	Data	00
1340.970	21	Data	00
1341.022	22	Data	00
1341.064	23	Data	00
1341.112	24	Data	00
1341.160	25	Data	00
1341.208	26	Data	00
1341.256	27	Data	00
1341.304	28	Data	00
1341.352	29	Data	00
1341.400	30	Data	00
1341.448	31	Data	00
1341.496	32	Data	00
1341.544	33	Data	00
1341.593	34	Data	00

## Statistics

The **Statistics** menu provides a summarized DMX/RDM Statistics report on two separate screens.



The screenshot shows a window titled "DMX Statistics Screen" with a close button (X) in the top right corner. Inside the window, there is a table with four columns: "Reset Values" (containing a button), "Minimum", "Average", and "Maximum". The table lists six DMX parameters with their corresponding values in microseconds (uSec) or packets.

	Minimum	Average	Maximum
<b>Break Length:</b>	86 uSec	90 uSec	94 uSec
<b>Mark After Break:</b>	4 uSec	5 uSec	10 uSec
<b>Slots In Packet:</b>	512 Slots	512 Slots	512 Slots
<b>Break To Break:</b>	24687 uSec	24637 uSec	24709 uSec
<b>Updates per Sec:</b>	41 Packets	40 Packets	41 Packets
<b>Slot To Slot:</b>	0 uSec	4 uSec	42 uSec

### DMX Statistics

Displays and calculates the various DMX Packet Timings. The Average time is calculated by dividing individual packet timings by the number of packets captured. The Maximum and minimum timings are then classified based on individual packet timings.

*Break Length:* Calculated time from the Start of Break and the End of Break for each packet.

*Mark After Break:* Time between the End of Break and the Start Code for each DMX packet.

*Slots In Packet:* No. of slots in each packet as captured by the Sniffer.

*Break To Break:* Time between two consecutive Start of Break(s).

*Updates per Sec:* No. of Packets captured every second. It's only calculated every 1 sec (capture time) and in case of DMX @ 700 fps it might take a while to update due to the system delay .

*Slot To Slot:* Time difference between each slot of the Packet.



RDM Statistics Screen		
<input type="button" value="Reset Values"/>		
	Percent %	Value
<b>Total Statistics</b>		
<b>Total Packets:</b>	100.00 %	354 Packets
<b>DMX Packets:</b>	55.37 %	196 Packets
<b>RDM Packets:</b>	31.07 %	110 Packets
<b>Collisions:</b>	12.99 %	46 Packets
<b>RDM Statistics</b>		
<b>Discovery(s):</b>	89.09 %	98 Packets
<b>Disc Response:</b>	4.55 %	5 Packets
<b>GET Request(s):</b>	0.00 %	0 Packets
<b>SET Request(s):</b>	0.00 %	0 Packets
<b>On Line ..</b>		
<b>Responders</b>	4 Devices	

### RDM Statistics

Displays the total and percentage of RDM, DMX & Collision packets captured by the Sniffer. The RDM packets are also broken down into Discovery, Discovery Responses and Get and Set RDM Requests.

It also calculates the number of Responders currently on the line (by decoding the Discovery responses and counting the unique Responders).

Thank you for using the ENTTEC Sniffer Application

## Appendix A: Timing Checks Table

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<b>PACKET TYPE</b>	<b>MIN TIME</b>	<b>MAX TIME</b>	
<b>DMX 512/1990 - Break</b>	<b>88 usec</b>		-
<b>DMX 512/1990 - InterPacket</b>	-	<b>1 sec</b>	
<b>RDM Any - Break</b>	<b>176 usec</b>	<b>352 usec</b>	
<b>RDM Discovery Response</b>	<b>176 usec</b>	<b>2.8 msec</b>	
<b>RDM Controller Request</b>	<b>3 msec</b>	<b>1 sec</b>	
<b>RDM Controller Discovery</b>	<b>5.8 msec</b>	<b>1 sec</b>	
<b>RDM Responder Response</b>	<b>176 usec</b>	<b>2 msec</b>	

Timing Resolution +/- 1.5uS