



RDM PACKET SNIFFER

ENTTEC

www.enttec.com

Entertainment Technology

Conforms to RDM Standard ANSI E1.20 -2006

Software Manual

www.enttec.com/rdm

Version 1.6

17/09/2007

Sniffer Features

- 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
- **Save to disk** option for capturing more than 10K packets
- **Flicker Finder** for DMX packets
- Highlight incorrect packets (as per Standard)
- Real-time capture and Analyze ability
- Perform Timing checks on captured packets as per Standard
- Save captured packets for later processing.

Detailed Description

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 v1.6 application window. At the top, there are menu options (Devices, File, Options, Filter, Statistics) and control buttons for 'Start Capture', 'Enable Real-Time Update', and 'STOP Capture'. A status bar indicates 'Showing From: 0' and 'Next: 1000 >>'. The main area is a table of captured packets.

Start Time (ms)	Duration (ms)	Source ID	Destination ID	Tran Num	Res Type	Command	Parameter	Comments
9405.312	1.636	454E02058246	FFFFFFFFFFFF	190	PORT: 01	Discovery	DISC_UNIQUE_BRAN...	48450000001A48450000001B
9453.201	1.634	454E02058246	FFFFFFFFFFFF	191	PORT: 01	Discovery	DISC_UNIQUE_BRAN...	48450000001A48450000001B
9501.052	1.638	454E02058246	FFFFFFFFFFFF	192	PORT: 01	Discovery	DISC_UNIQUE_BRAN...	484500000018484500000019
9503.188	1.059	N/A	N/A	N/A	N/A	RDM Collision	Bad Packet	Length: 17
9528.975	1.624	454E02058246	FFFFFFFFFFFF	193	PORT: 01	Discovery	DISC_UNIQUE_BRAN...	484500000019484500000019
9531.157	0.868	N/A	N/A	N/A	24 bytes ...	Discovery	Response	good checksum
9557.625	1.305	454E02058246	484500000019	194		Discovery	DISC_MUTE	good checksum
9559.343	1.391	484500000019	454E02058246	194		Discovery Response	DISC_MUTE	good checksum
9571.579	1.829	454E02058246	FFFFFFFFFFFF	195	PORT: 01	Discovery	DISC_UNIQUE_BRAN...	484500000018484500000018
9573.936	0.862	N/A	N/A	N/A	24 bytes ...	Discovery	Response	good checksum
9599.482	1.304	454E02058246	484500000018	196	PORT: 01	Discovery	DISC_MUTE	good checksum
9601.190	1.398	484500000018	454E02058246	196		Discovery Response	DISC_MUTE	good checksum
9613.502	1.831	454E02058246	FFFFFFFFFFFF	197	PORT: 01	Discovery	DISC_UNIQUE_BRAN...	484500000010484500000017
9615.930	0.862	N/A	N/A	N/A	24 bytes ...	Discovery	Response	good checksum
9640.380	1.302	454E02058246	484500000017	198	PORT: 01	Discovery	DISC_MUTE	good checksum
9642.126	1.398	484500000017	454E02058246	198		Discovery Response	DISC_MUTE	good checksum
9648.420	1.833	454E02058246	FFFFFFFFFFFF	199	PORT: 01	Discovery	DISC_UNIQUE_BRAN...	48450000000048450000000F
9695.465	1.637	454E02058246	FFFFFFFFFFFF	200	PORT: 01	Discovery	DISC_UNIQUE_BRAN...	48450000000048450000000F

Below the table, a tree view shows details for a selected packet: 'Third Block: C3 01 00 00 00 10'. It includes fields for Transaction Number (C3), Port ID / Response Type (01), Message Count (00), Sub Device (00 00), and Command Class (10). A 'RDM View' button is visible next to these details.

The bottom section of the window displays a 'Packet Dump' in hexadecimal: CC 01 24 FF FF FF FF FF FF 45 4E 02 05 82 46 C3 01 00 00 00 10 00 01 0C 48 45 00 00 00 18 48 45 00 00 00 18 0A 78.

Total Packets Captured: 251

Connecting RDM USB PRO

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](#).

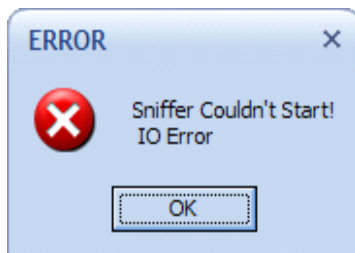
After connecting a RDM USB PRO to the PC using an available USB Port, open the Sniffer Application and click on Devices menu and all the connected PROS shall be listed under this menu. Click on the selected device to allow the Sniffer to connect to the PRO.

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 pop up. This indicates that the Sniffer has successfully to the RDM PRO. Click on OK to use the Sniffer tool, all features would now be available to be used.

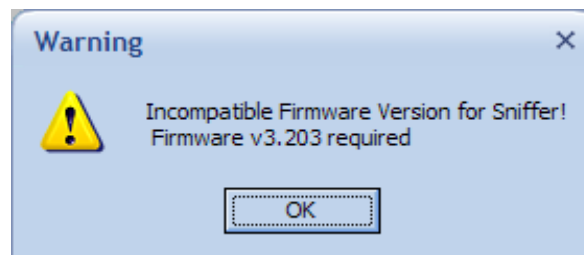


window will connected the



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 you are using has incorrect this could mean that the PRO is not a RDM USB PRO. In this case devices from the Device menu until succeed to connect to the RDM PRO.



the PRO firmware, connected try all other you

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.

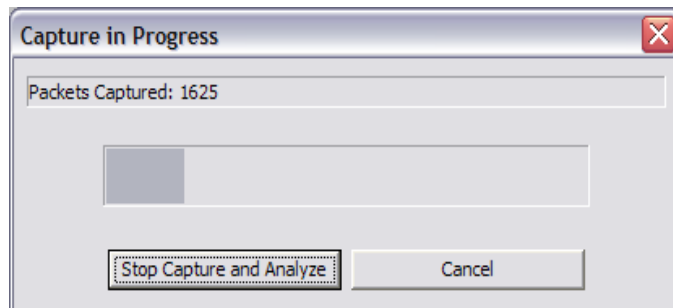
Press **"Start Capture"** button while **Enable Real Time Update** is selected, to perform both the tasks at the same time. The packet list screen will be updated as and when new packets are captured.

Start Time (ms)	Duration (ms)	Source ID	Destination ID	Tran Num	Res Type	Command	Parameter	Comments
9405.312	1.636	454E02058246	FFFFFFFFFFFF	190	PORT: 01	Discovery	DISC_UNIQUE_BRAN...	48450000001A48450000001B
9453.201	1.634	454E02058246	FFFFFFFFFFFF	191	PORT: 01	Discovery	DISC_UNIQUE_BRAN...	48450000001A48450000001B
9501.052	1.638	454E02058246	FFFFFFFFFFFF	192	PORT: 01	Discovery	DISC_UNIQUE_BRAN...	484500000018484500000019
9503.188	1.059	N/A	N/A	N/A	N/A	RDM Collision	Bad Packet	Length: 17
9528.975	1.624	454E02058246	FFFFFFFFFFFF	193	PORT: 01	Discovery	DISC_UNIQUE_BRAN...	484500000019484500000019

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:

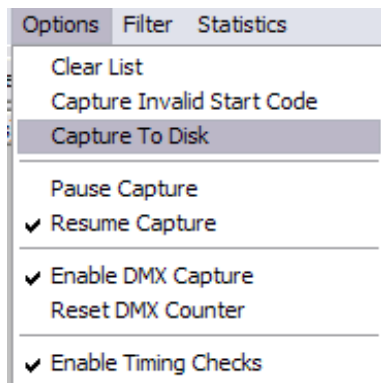
RDM Packet	blue
RDM Discovery Response	cyan
RDM Collision	red
DMX Packet	black
Timing Error in Packet	white

Sniffer Options

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.



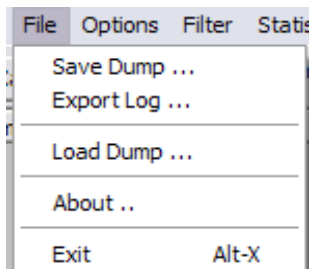
Pause/ Resume Capture: Pauses Live Capture. When paused Capture can be resumed, this is different from starting and stopping capture.

Capture to Disk: Saves the packets to Disk (in binary format in current directory) . On stopping, loads the first 1000 packets into memory. Use the navigation buttons for going through all captured packets while in **Disk Mode**.

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



Export Log as Text: Saves the current Packet List (Packet Dump, with timestamp and Packet Type in a text format)

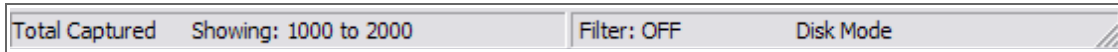
Save Dump: Saves the packets captured in a binary format that can be loaded into Sniffer for later use.

Load Dump : Loads the binary file as the current packet list into Sniffer. (only .bin)

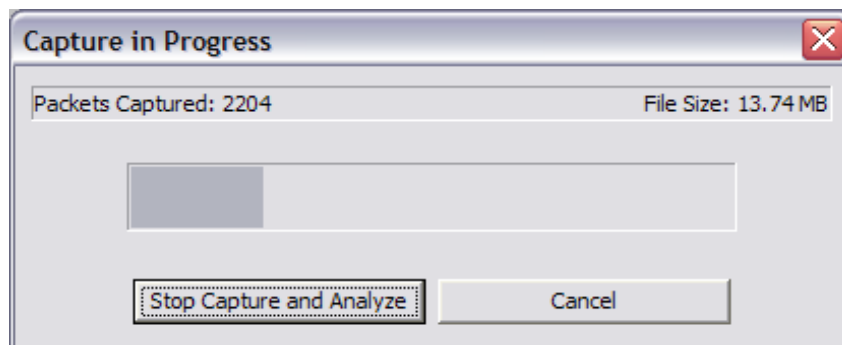
Only the first 1000 packets will be displayed on loading, please use the navigation button to browse for rest.

Disk Mode

The **Status Bar** shows what mode the Sniffer is currently in. It also shows whether the Filter is On/Off. Another useful info. Is the current range of packets it's displaying in the list and the total no. of packets captured.

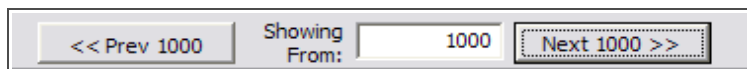


(Options) Capture to Disk: Enables Disk Mode Saves the packets to Disk (in binary format in current directory) . Use the navigation buttons for going through all captured packets while in **Disk Mode**.



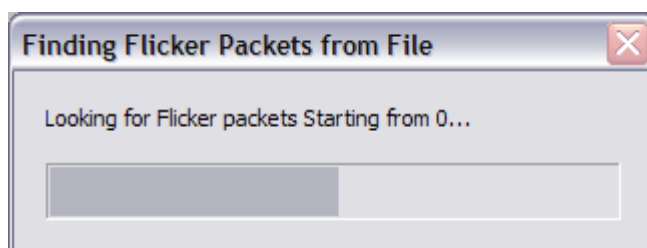
The capture progress window while in disk mode, shows the file size ('disk_dump.bin') which is being saved in the current working directory of the Sniffer.

On Stopping the Capture, only the first 1000 packets are loaded into display from the file. To navigate through the rest of the captured packets (> 1000), the navigation buttons (top right corner) must be used.



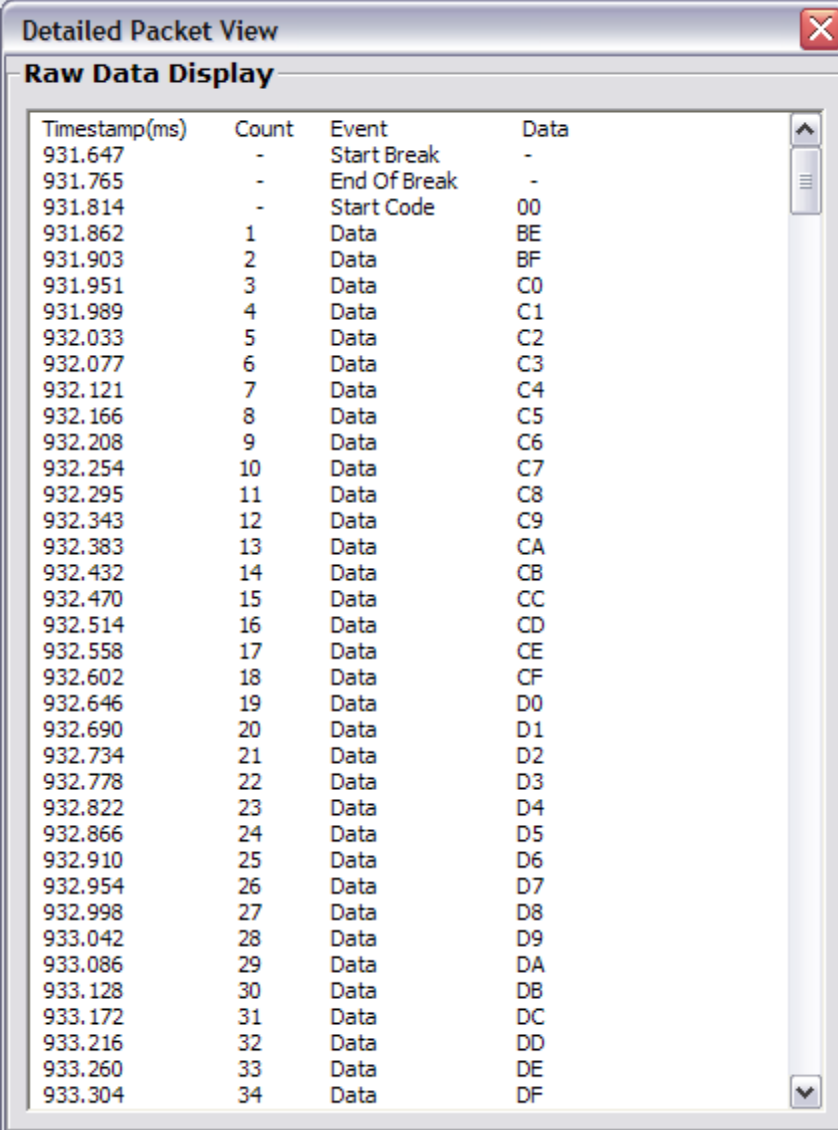
The Navigation pane may also be used to get to Next / Previous 1000 packets starting from a 'user-defined' range.

While in the disk mode, The **Flicker finder** Filter, scans the entire file for any possible flickers (not just the displayed packets), which might take a while depending on the file size.



Note: Loading a binary file into sniffer, also enables disk mode.

Detailed Packet View



Timestamp(ms)	Count	Event	Data
931.647	-	Start Break	-
931.765	-	End Of Break	-
931.814	-	Start Code	00
931.862	1	Data	BE
931.903	2	Data	BF
931.951	3	Data	C0
931.989	4	Data	C1
932.033	5	Data	C2
932.077	6	Data	C3
932.121	7	Data	C4
932.166	8	Data	C5
932.208	9	Data	C6
932.254	10	Data	C7
932.295	11	Data	C8
932.343	12	Data	C9
932.383	13	Data	CA
932.432	14	Data	CB
932.470	15	Data	CC
932.514	16	Data	CD
932.558	17	Data	CE
932.602	18	Data	CF
932.646	19	Data	D0
932.690	20	Data	D1
932.734	21	Data	D2
932.778	22	Data	D3
932.822	23	Data	D4
932.866	24	Data	D5
932.910	25	Data	D6
932.954	26	Data	D7
932.998	27	Data	D8
933.042	28	Data	D9
933.086	29	Data	DA
933.128	30	Data	DB
933.172	31	Data	DC
933.216	32	Data	DD
933.260	33	Data	DE
933.304	34	Data	DF

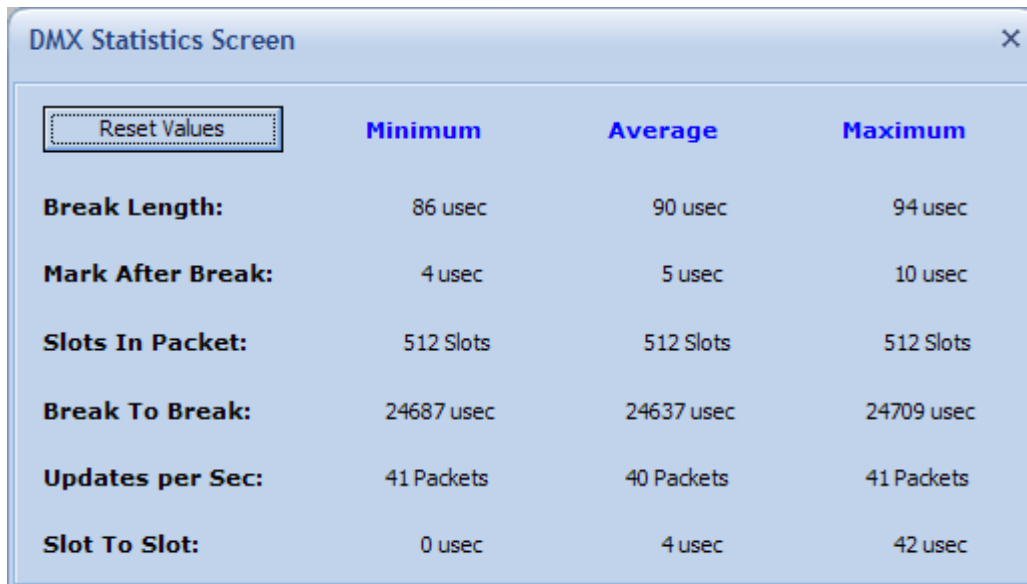
Double Clicking any packet in the packet list will show the **Detailed Packet View** window. It shows the time stamp for each byte of the packet and Break Time as well.

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.

Statistics

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



	Minimum	Average	Maximum
Break Length:	86 usec	90 usec	94 usec
Mark After Break:	4 usec	5 usec	10 usec
Slots In Packet:	512 Slots	512 Slots	512 Slots
Break To Break:	24687 usec	24637 usec	24709 usec
Updates per Sec:	41 Packets	40 Packets	41 Packets
Slot To Slot:	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
Total Statistics		
Total Packets:	100.00 %	354 Packets
DMX Packets:	55.37 %	196 Packets
RDM Packets:	31.07 %	110 Packets
Collisions:	12.99 %	46 Packets
RDM Statistics		
Discovery(s):	89.09 %	98 Packets
Disc Response:	4.55 %	5 Packets
GET Request(s):	0.00 %	0 Packets
SET Request(s):	0.00 %	0 Packets
On Line ..		
Responders	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

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

Timing Resolution +/- 1.5uS