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

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Packet List

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RDM View

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Packet Dump

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Total Packets Captured: 251
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 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 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.

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.
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:

a) Capture of Data, and
b) 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.

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:

<table>
<thead>
<tr>
<th>Packet Type</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>RDM Packet</td>
<td>blue</td>
</tr>
<tr>
<td>RDM Discovery Response</td>
<td>cyan</td>
</tr>
<tr>
<td>RDM Collision</td>
<td>red</td>
</tr>
<tr>
<td>DMX Packet</td>
<td>black</td>
</tr>
<tr>
<td>Timing Error in Packet</td>
<td>white</td>
</tr>
</tbody>
</table>
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.

![Status Bar Example]

**(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**.

![Capture in Progress]

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.

![Navigation Buttons]

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.

![Finding Flicker Packets from File]

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

![DMX Statistics Screen](image)

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Average</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Break Length</strong></td>
<td>85 usec</td>
<td>90 usec</td>
<td>94 usec</td>
</tr>
<tr>
<td><strong>Mark After Break</strong></td>
<td>4 usec</td>
<td>5 usec</td>
<td>10 usec</td>
</tr>
<tr>
<td><strong>Slots In Packet</strong></td>
<td>512 Slots</td>
<td>512 Slots</td>
<td>512 Slots</td>
</tr>
<tr>
<td><strong>Break To Break</strong></td>
<td>24687 usec</td>
<td>24637 usec</td>
<td>24709 usec</td>
</tr>
<tr>
<td><strong>Updates per Sec</strong></td>
<td>41 Packets</td>
<td>40 Packets</td>
<td>41 Packets</td>
</tr>
<tr>
<td><strong>Slot To Slot</strong></td>
<td>0 usec</td>
<td>4 usec</td>
<td>42 usec</td>
</tr>
</tbody>
</table>

**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
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

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

Timing Resolution +/- 1.5uS