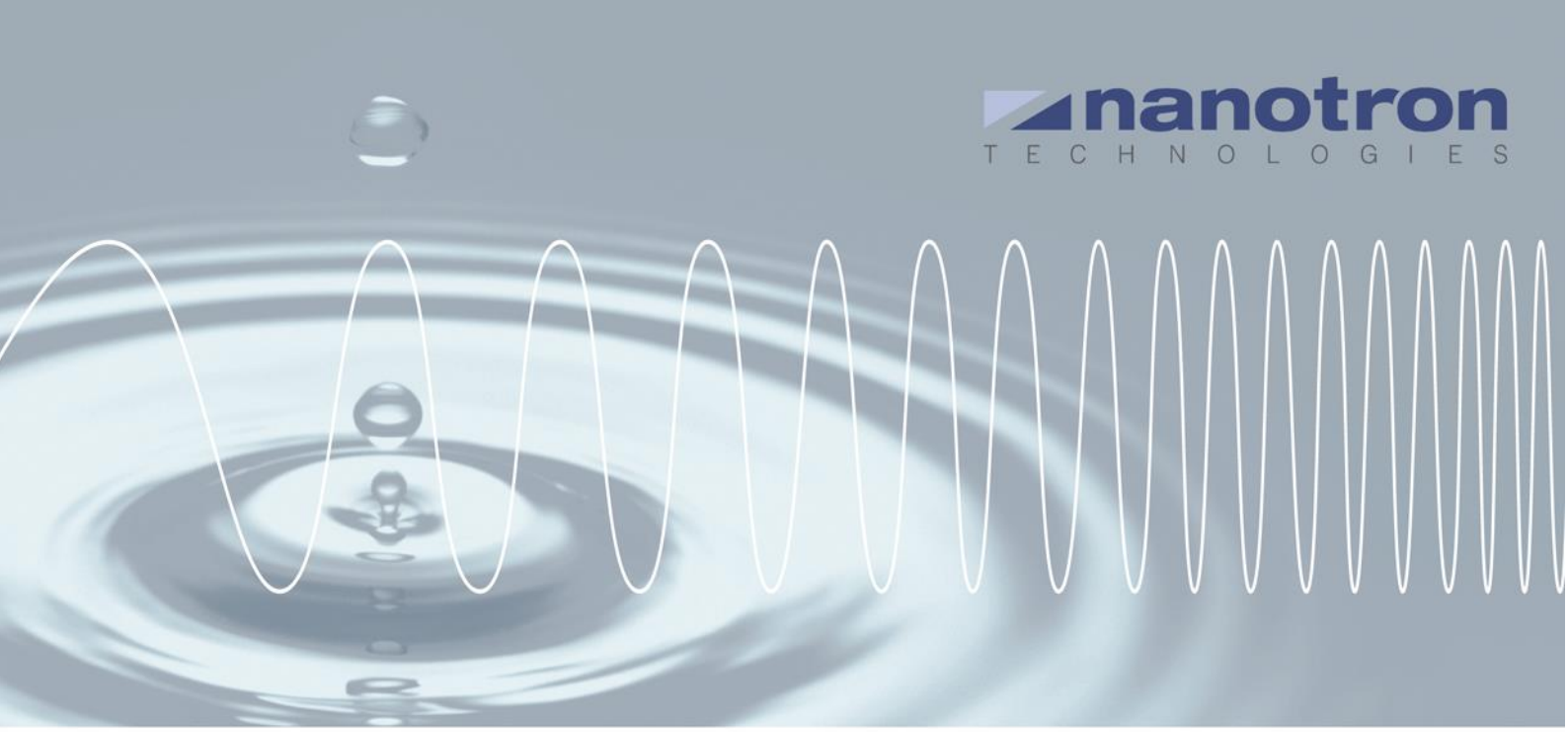


swarm Sniffer GUI User Guide

3.0

NA-15-0356-0001-3.0

Document Information

Document Title:	swarm Sniffer GUI User Guide
Document Version:	3.0
Current Date:	2016-04-18
Print Date:	2016-04-18
Document ID:	NA-15-0356-0001-3.0
Document Author:	nanotron

Contents

Figures

1. Introduction

The *swarm* sniffer is a tool to monitor the communication of a *swarm* composed by nanoTAGs or any *swarm* bee modules as well as nanoANQs depending on the topology. A *swarm* is a group of independent *swarm* nodes, capable of communication and locating (based on ranging). The sniffer is able to monitor any *swarm* traffic depending on the settings transmission mode, syncword, RF channel if applicable and FEC. The number of observed nodes doesn't depend only on the total number of nodes in the *swarm*, but also by the radio conditions given by the particular location.

Note: A sniffer node has monitoring capabilities only and thus is not able to initiate ranging requests and communication operations to other *swarm* nodes, nor it will respond to ranging requests coming from other nodes.

1.1. Purpose

This document describes the GUI and the handling of the *swarm* sniffer.

2. Prerequisites

2.1. Hardware Platform

To enable the *swarm sniffer* to monitor the radio communication between nodes, a standard DK+ board with a dedicated *sniffer* firmware (FW) is required. This FW is provided by nanotron. The connection to a PC is done via an USB cable. (Type A – Type Mini USB)

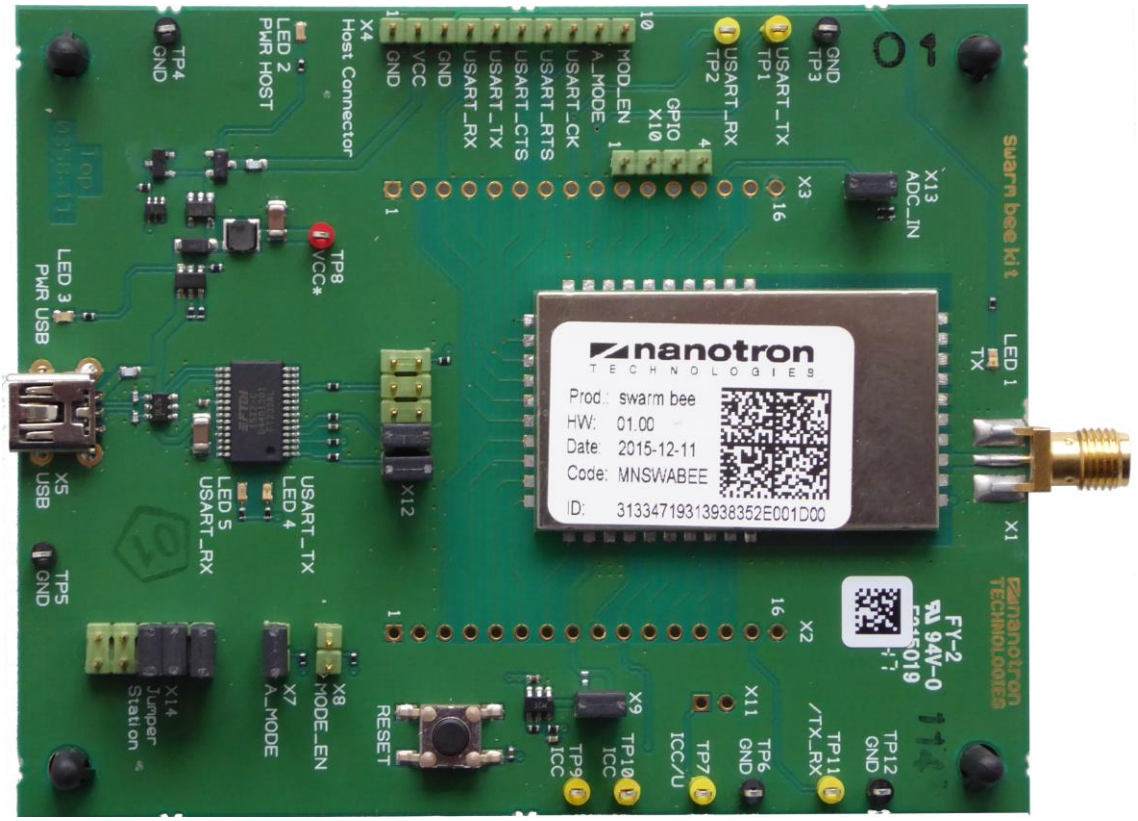


Figure 2-1 DK+ Board

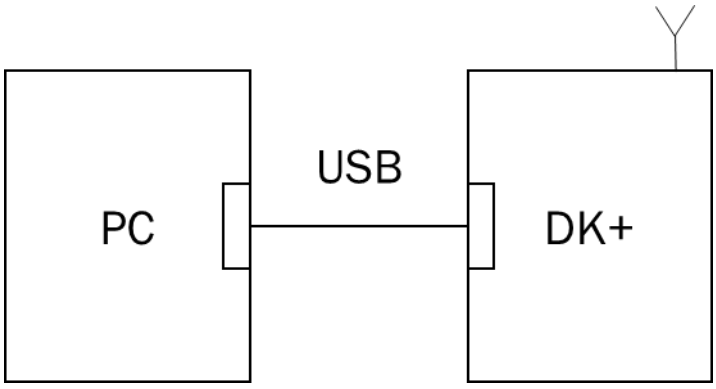


Figure 2-2 Connection PC – DK+

2.2. Firmware

A dedicated *sniffer* FW is required to enable the designated DK+ board to monitor the *swarm.* Please refer to section 3.2 for proper installation if required.

2.3. Software

The application requires Microsoft® Windows® 7 or later with a 2.0 GHz dual-core processor or equivalent and 2 GB memory. Also a PC with an USB port is required.

3. Installation

Note: The sniffer firmware and software must have the same or a higher version as the related firmware of the nodes which has to be monitored.

3.1. Windows Software (GUI)

Download the installation file from our eLibrary. https://www.nanotron.com/elibrary/ or an alternative URL provided by nanotron.
Open the downloaded installation file and follow the instructions.

3.2. FW

How to flash the DK+ board with the sniffer firmware or vice versa is explained in document [2]. Please assure that you are using the correct image file before flashing. Otherwise, you may obtain unpredictable results or behavior.

4. Sniffer GUI and Handling

4.1. Overview

After the sniffer has started, the window as shown in Figure 4-1 appears. Apart from the menu bar, two toolbars are displayed. The “Main Toolbar” serves to open, save, close a capture file session in offline mode or to start, stop an online live capture session. The “Filter Toolbar” is used to filter the captured raw data in order to minimize the information to the desired amount. The status bar displays if the application is connected to a DK+ board. The window has two frames. The “Short View” displays one event per line in a condensed manner while the “Detailed View” displays all the data belonging to the one selected line of the “Short View”

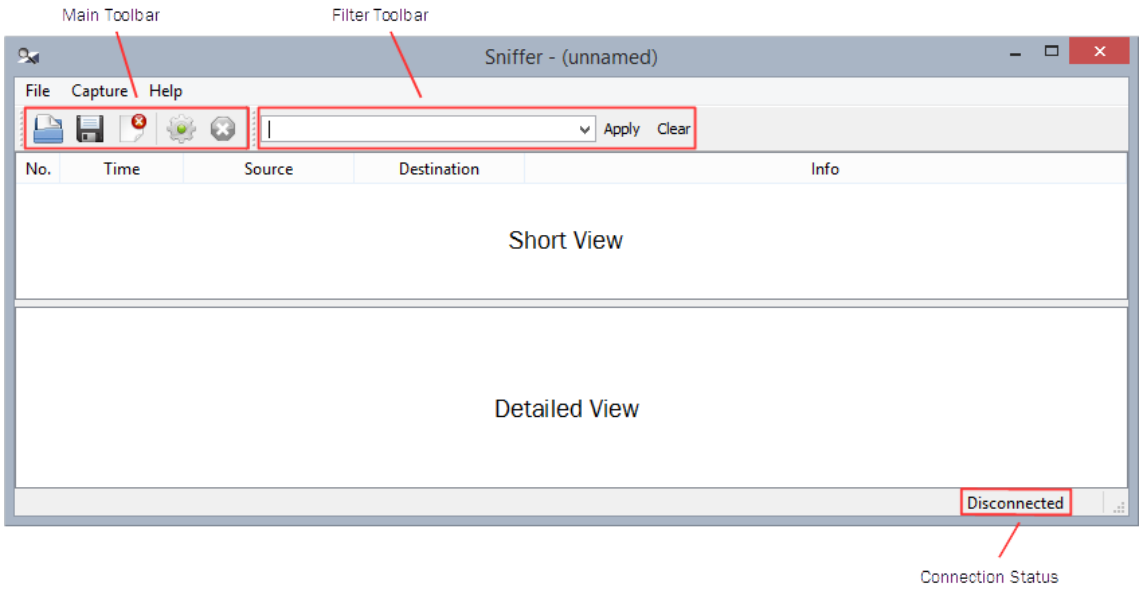


Figure 4-1 Opening window

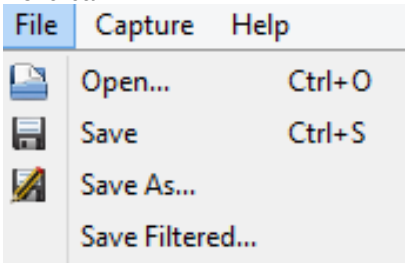
4.2. Offline Mode

The offline mode allows to analyze the captured data from a file which has been saved before or when the live capture has been stopped. The data may be filtered and the capture can be saved filtered or as raw data to a file.

4.2.1. File operation

In the offline mode it is possible to playback a capture from a file which has been saved before or to save the filtered or unfiltered content of the current capture. Following commands are provided.

- Menu bar



Opens a file

Saves file unfiltered

Saves file unfiltered under another name or folder

Like Save as…, but with the current filter setting

- Main Toolbar

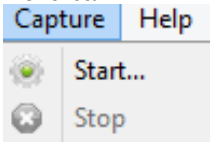
Opens a file

Saves file unfiltered

4.3. Online Mode

The online mode is used to monitor and analyze real-time live data. The live monitoring is started and stopped as follows:

- Menu bar:



Starts online capture

Stops online capture

- Main Toolbar

Start session

Stop session

Close session

4.3.1. Capture Settings

Before starting a capture session, some elementary parameters have to be set.

- Serial interface: COM Port on which the DK+ board is connected to
- Transmission Mode Transmission mode to listen to 80/1, 80/4 or 22/4
- Channel Number Channel Number to listen to
- Synchronization Word Syncword to trace
- Capture Filter Optionally filter settings as explained in section 5
- FEC If FEC is applied or not

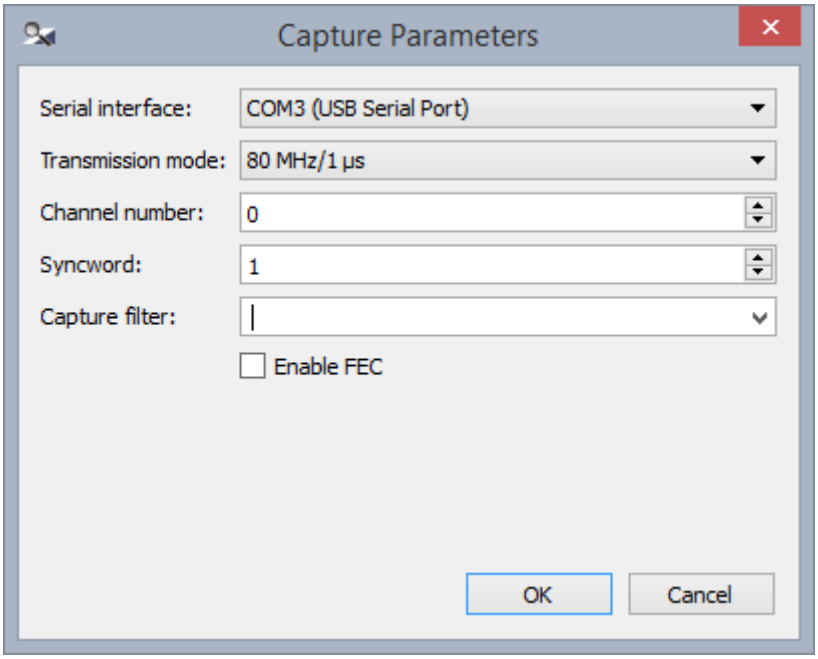


Figure 4-2 Capture parameters

Note: Depending on the FW of the monitored nodes the range of the Syncword may change.
FW: 2.1 range [0-8]
FW: 3.0 range [0-12]

4.4. Short View

The “Short View” displays one event per line in a condensed manner. Each column provides the following information:

- No. Current sequence number
- Time Timestamp of the event generated by the DK+ board hh:mm:ss.ms
- Source Source node address
- Destination Destination node address
- Info Brief information of the event

Note: The destination address FF:FF:FF:FF:FF:FF is used by broadcast messages

The colors have following meanings:

- Blue Broadcast messages
- Orange () Ranging (light) -> Step 0, Step 1, 2 (deep)
- Plum Ranging result without error
- Deep-pink Ranging result with error
- Red General Error
- Green ISO blink
- White All others mainly SDAT messages

No.	Time	Source	Destination	Info
51	01:55:59.739	00:00:11:01:4f:12	ff:ff:ff:ff:ff:ff	swarm Node Id Notification
52	01:55:59.741	00:00:59:04:75:c4	00:00:11:01:4f:12	Ranging 3W_A step 0
53	01:55:59.743	00:00:11:01:4f:12	00:00:59:04:75:c4	Ranging 3W_A step 1
54	01:55:59.744	00:00:11:01:4f:12	00:00:59:04:75:c4	Ranging 3W_A step 2
55	01:55:59.748	00:00:59:04:75:c4	ff:ff:ff:ff:ff:ff	Ranging result: 0.00m [00:00:59:04:75:c4->00:00:11:01:4f:12]

Figure 4-3 Short View

4.5. Detailed View

The “Detailed View” gives detailed information of the selected event line in the “Short View”. An example of a ranging result is shown below.

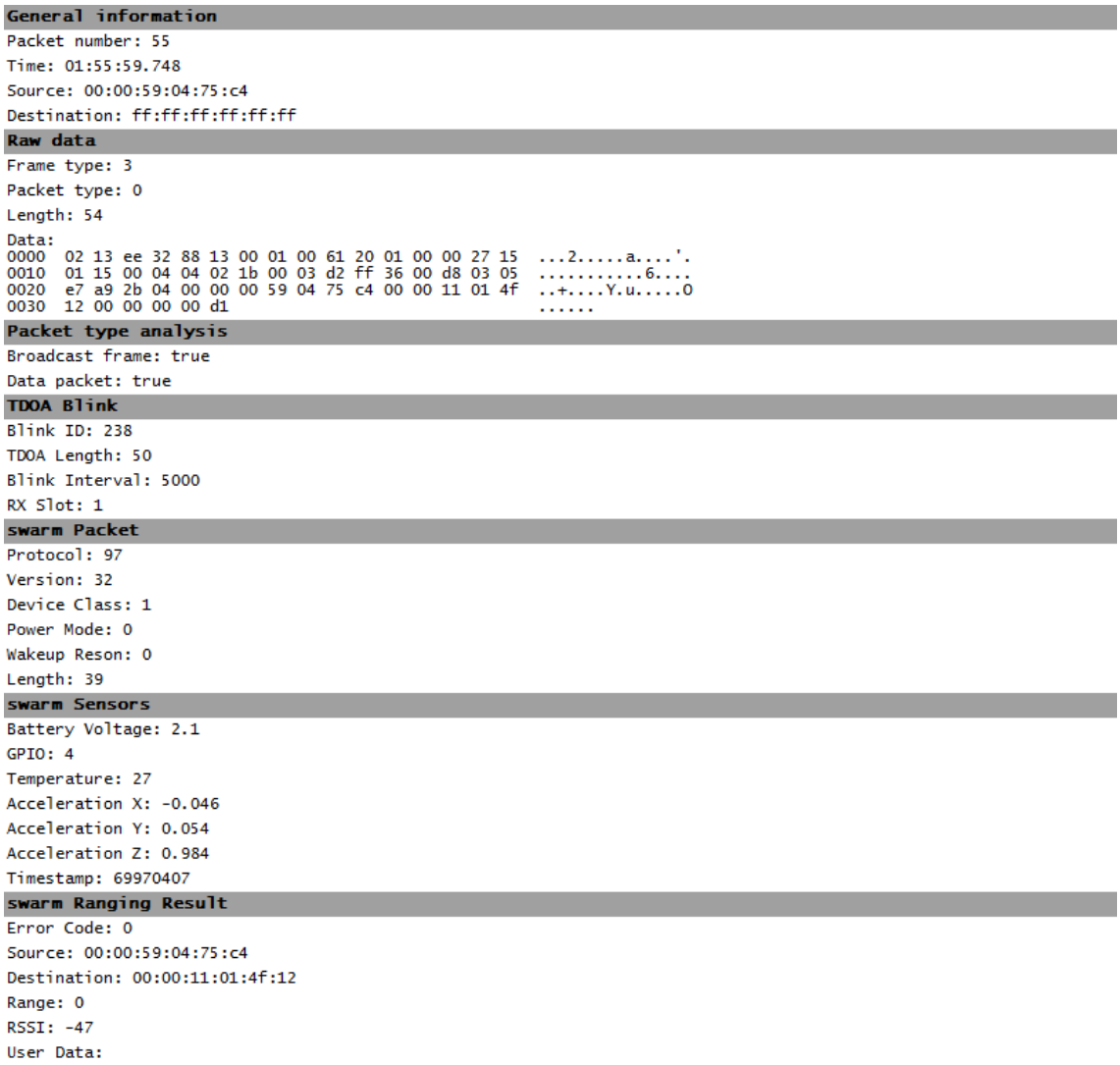


Figure 4-4 Detailed View

5. Filter

Two menus are offered for filtering. ”Apply Filter” and “Prepare Filter”. The “Apply Filter” is used to filter a single condition and to apply the setting. Alternatively it can be used when a suite of conditions have been set by the “Prepare Filter” to add the last condition and apply the whole setting. The “Prepare Filter” is used to concatenate several logical conditions. Moreover, the filter line can be edited to refine or to create more complex settings.

5.1. Apply Filter

To filter a particular item, position the mouse cursor to the row and line of this item in the “Short View” and click the right mouse button. Then:

Apply Filter -> Selected

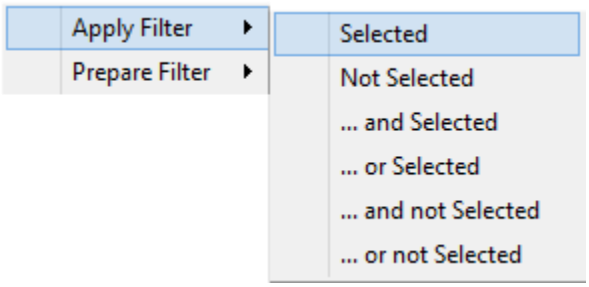


Figure 5-1 Apply Filter

In the case it is the last condition of concatenated conditions, select the appropriate logical operation after “Apply Filter”. This will close and apply the setting immediately.

E.g.: Cond_1 or Cond_2

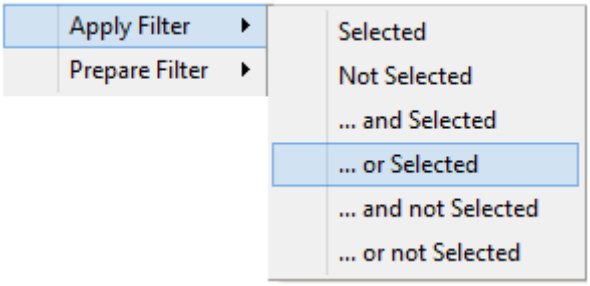


Figure 5-2 Apply Filter with “or” condition

Note: It is also possible to select an item in the “Detailed View” as filter condition.

5.2. Prepare Filter

The “Prepare Filter” is used to concatenate several logical conditions. The principle is exactly the same as for the “Apply Filter” except it won’t apply the settings immediately. The filter line is left open and a new condition can be added. To apply the settings press the “Apply” button next to the filter line or alternatively use “Apply Filter” as last step as explained in the previous section.

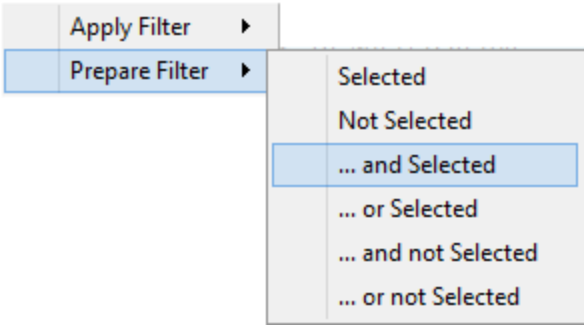


Figure 5-3 Add Filter with “and” condition

5.3. Example

This example shows how to filter the ranging steps 0 to 2.

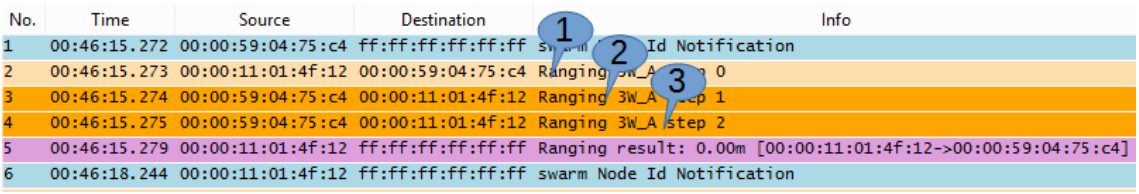


Figure 5-4 Original screen

1. Move mouse pointer to row 2, info field Prepare Filter -> Selected
2. Move mouse pointer to row 3, info field Prepare Filter -> … or Selected
3. Move mouse pointer to row 4, info field Apply Filter -> … or Selected

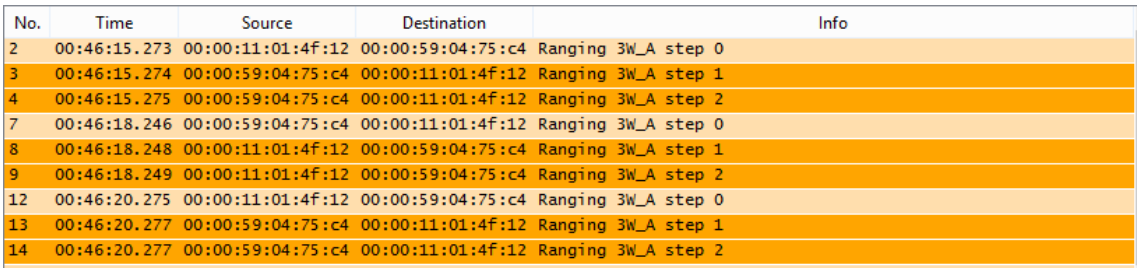


Figure 5-5 Filtered screen

5.4. Edit Filter

To refine or to create complex filter settings, it is possible to edit the setting in the filter line of the “Filter Toolbar”.

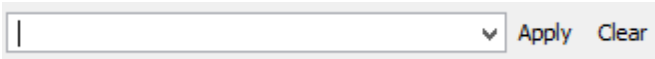


Figure 5-6 Filter Line

One way is to type the filter expression by hand or to use the “Prepare-, Apply Filter” tool to gather the correct parameters and to apply manually the necessary changes like brackets to group conditions or logical operators.

5.4.1. Reset Filter

To reset the current filter press the “Clear” button. This will clear the expression in the filter line. It is then necessary to press the “Apply” button.

5.4.2. Example

This example will change the filter from Ranging Step 0 to 2.

Looking at Figure 5-4 select pointer 1 and apply. The result is displayed below

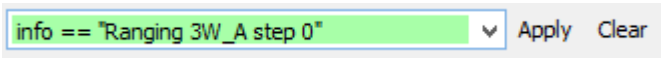


Figure 5-7 First step

Replace 0 by 2 and press “Apply”

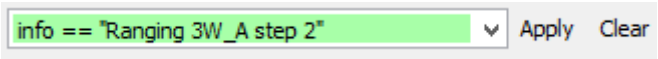


Figure 5-8 Second step

Note: If an expression cannot be parsed, the background color becomes pink and it is not possible to “Apply”

Figure 5-9 Incorrect expression

More details about the syntax and the field properties can be found in document [1].

6. Capture Properties

The properties of the current capture (live or file) can be displayed. This are mainly the settings as explained in section 4.3.1. This can be meaningful when the capture settings are unknown or forgotten.

From the Menu Bar: File -> Properties

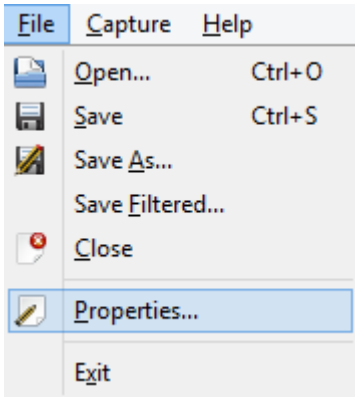


Figure 6-1 Open properties

The following window pops-up.

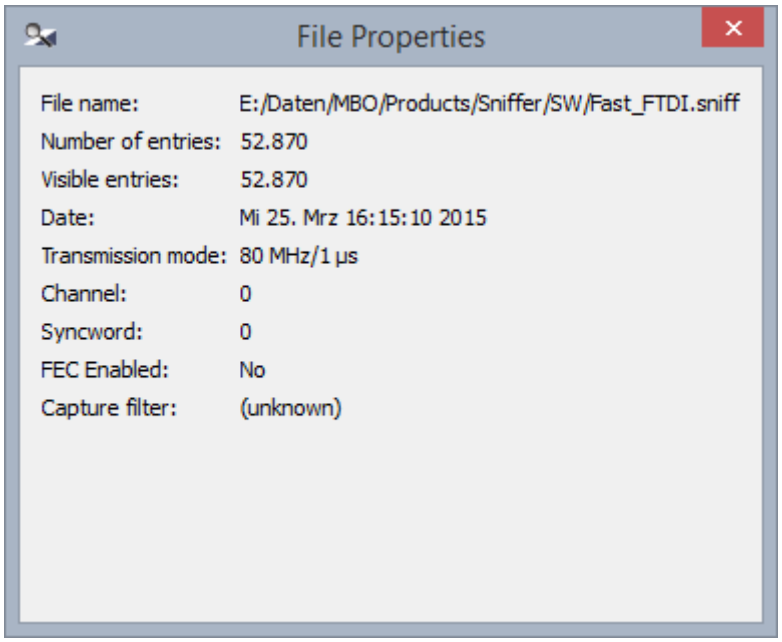


Figure 6-2 Properties result

7. References

[1] Sniffer Filter Expression NA-16-0356-0044
[2] AN0507 *swarm* bee LE Firmware Update NA-14-0267-0017-1.0

Document History

Date	Authors	Version	Description
2015-05-18	nanotron	1.0	Initial version
2016-04-08	nanotron	3.0	Updated version for API 3.0. Two notes added

Life Support Policy

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Nanotron Technologies GmbH customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify nanotron Technologies GmbH for any damages resulting from such improper use or sale.

About Nanotron Technologies GmbH

Today nanotron's *embedded location platform* delivers location-awareness for safety and productivity solutions across industrial and consumer markets. The platform consists of chips, modules and software that enable precise real-time positioning and concurrent wireless communication. The ubiquitous proliferation of interoperable location platforms is creating the location-aware Internet of Things.

Further Information

For more information about products from nanotron Technologies GmbH, contact a sales representative at the following address:

nanotron Technologies GmbH
Alt-Moabit 60
10555 Berlin, Germany
Phone: +49 30 399 954 – 0
Fax: +49 30 399 954 – 188
Email: sales@nanotron.com
Internet: www.nanotron.com