MECHATROLINK Analyzer 2.0.0.0 manual

LICENSE AGREEMENT

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Mechatrolink Members Association (hereinafter “MMA") licenses the User to use this Program subject to his/her agreement with this License Agreement (hereinafter the “Agreement").

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1. “Program” refers to the software “MECHATROLINK Analyzer software" provided by MMA as well as the documents and accessories supplied with it.
2. “Third-party Licensor(s)” refers to Yaskawa Electric Corporation, which holds whole or a part of the copyright of the Program, and other Copyright holder(s) of any part of the Program, if any.

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The licensing rights of the Program are vested in MMA. Provision or licensing of the Program shall under no circumstances be construed as transferring intellectual property rights of the Program, including any copyright, patent rights, or trademark associated therewith to the User.

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The User may install the Program in his/her own computer(s) and use it for free to the extent necessary for his/her use of the Program as intended and in accordance with the terms of the Agreement.

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1. The Program is deemed MMA's confidential information. The User shall keep the Program confidential, shall not disclose it to any third party, and shall handle it with the care expected of a good manager.
2. The User shall not conduct any of the acts listed below:

(1) Reverse engineering, decompiling, disassembling, or analyzing the Program
(2) Reproducing the Program (except the act of installing it as per Article 3)
(3) Assigning, lending, or providing the Program to any third party
(4) Installing the Program to any computer device belonging to a third party
(5) Using the Program in any manner other than that as separately set forth by MMA
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(7) Allowing any third party to use the Program either for profit or not
(8) Applying for any industrial property right associated with invention related to the Program without the prior written consent of MMA
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Should the User violate any provision of this Agreement, or be deemed by MMA or Third-party Licensor(s) to have infringed any of rights of MMA or the Third-party Licensor(s), the User shall take actions (1) ~ (5) while following the instructions of MMA or the Third-party Licensor(s).

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(2) Ceasing to use the Program
(3) Uninstalling the Program
(4) Disposing of and eliminating copies of the Program
(5) Remedying any other violations/infringements

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1. MMA AND THIRD-PARTY LICENSOR(S) PROVIDE NO WARRANTY, WHETHER EXPRESSLY STATED OR IMPLIED, REGARDING THE PROGRAM (INCLUDING IMPLICIT

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2. Connection of Target Equipment to a computer with the Program installed shall be done at the sole discretion of the User, and MMA and/or the Third-party Licensor(s) assume no liability of any kind for failure or other accidents in the Target Equipment arising out of such connection.
3. MMA shall perform the correction and update of any errors (bugs) in the Program (hereinafter collectively "Program Updating") as necessary. However, MMA may determine at its sole discretion the necessity, timing, and means of distribution of Program Updating. When MMA conducts Program Updating, any updated components of the Program shall be deemed a part of the Program.

Article 7. Injunction

Should the User violate this Agreement, MMA shall be entitled to claim for remedies that MMA deems necessary in any jurisdiction.

In such cases, MMA shall not be required to post a bond or other security.

Article 8. Indemnification

Should the User cause any damage to MMA or the Third-party Licensor(s) due to their violation of this Agreement or infringement of any right of MMA or the Third-party Licensor(s), the User shall compensate the party/parties for the damages.

Article 9. Termination

1. Should the User violate this Agreement, MMA may terminate the Agreement forthwith by notification and without any peremptory notice.
2. Notwithstanding the preceding paragraph, MMA may terminate this Agreement for any reason by providing the User with a 30-day prior notice or posting information to that effect on MMA's website. In such cases, the User shall be obliged to conduct the actions set forth in (2) through (4) in Article 6 as per the pertinent notice or posted information without delay.

Article 10. Governing Laws

1. This Agreement shall be interpreted and governed by the laws of Japan without regard to its conflict of laws principles.
2. Any dispute, controversy, or disagreement between the parties hereto arising out of or in relation to the Agreement shall be finally settled by arbitration in Tokyo, Japan, in accordance with the commercial arbitration rules of the Japan Commercial Arbitration Association.

Article 11. Other

1. The User shall comply with the export control acts and regulations of Japan and the USA, etc. when exporting the Program.
2. The User may not assign, hand over, or collateralize any of his/her rights or duties hereunder to any third party.
3. Any failure of MMA to ask the User to adhere to his/her liabilities or duties hereunder shall in no way affect MMA's right to demand such performance thereafter.
4. If any of the provisions of this Agreement are held as invalid under applicable laws, such provisions shall be deemed deleted only to the extent they are deemed invalid, and the other provisions shall remain in full force and effect.
5. This Agreement represents the entire and only agreement between the User and MMA and supersedes any previous preliminary negotiation, consultation, or agreement between the parties concerning the subject matter of this Agreement.

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Introduction

This manual describes how to use the MECHATROLINK Analyzer.

MECHATROLINK Analyzer is software that is used in combination with Hilscher's netANALYZER (*1) to acquire (*2) and display data on the MECHATROLINK-III network.

In addition, functions such as filters and triggers make it easy to narrow down the area to be checked.

* 1 Model to have confirmed the operation

NANL-B500BG-RE

* 2 Data is retrieved using netANALYZER API from Hilscher

Preparation

This chapter describes the preparations required before using "MECHATROLINK Analyzer".

Operation requirement

Processor	Processor or SoC more than two (GHz)
Memory	2 GB or more
Display	1280x1024 or more
OS	Windows 7 SP1 64bit
	Windows 7 SP1 32bit
	Windows 10 64bit

Installation of various run time and driver

Install run time and a driver all following to operate MECHATROLINK Analyzer.

Installation of Microsoft .NET Framework4.5.2

Download from following URL and install Microsoft .NET Framework 4.5.2.

Japanese version :https://www.microsoft.com/ja-JP/download/details.aspx?id=42642
English version :https://www.microsoft.com/en-US/download/details.aspx?id=42642

Installation of VC++2010 run time

Download from following URL and install Microsoft Visual C++ 2010 SP1 Redistributable Package (x86).

Japanese version :https://www.microsoft.com/ja-jp/download/details.aspx?id=8328
English version :https://www.microsoft.com/en-US/download/details.aspx?id=8328

netANALYZER driver's installation

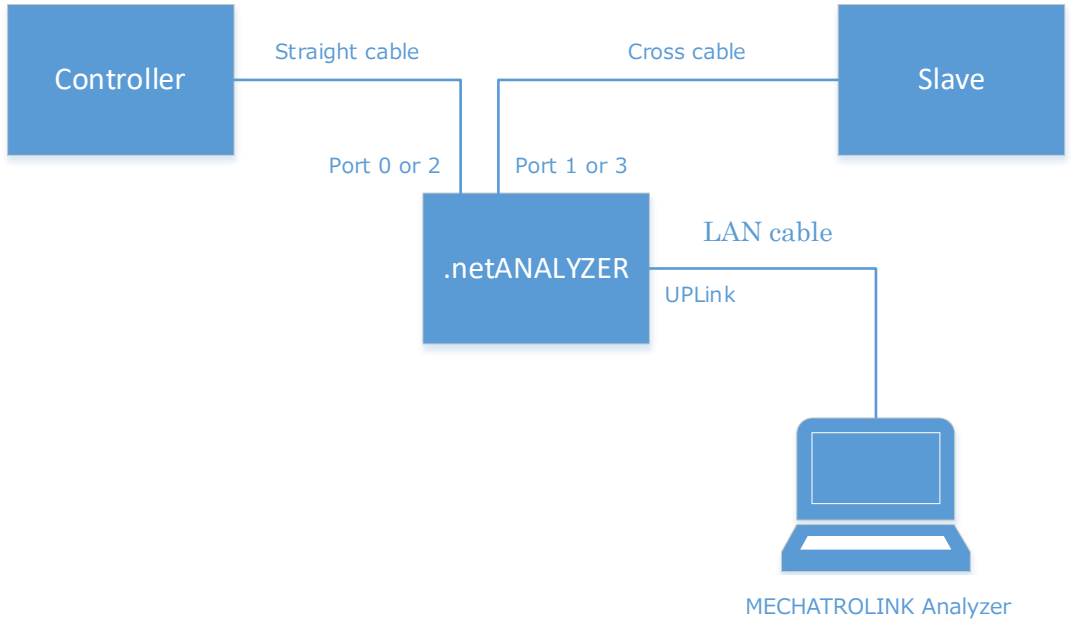
Download and install netANALYZER Scope DVD from the Hilscher Web site.
For installation instructions, please refer to Software installation for netANALYZER devices on the same website.
(Confirmed May 2022).

Cable connection

netANALYZER has 4 ports and can capture up to 2 networks simultaneously.

Network 1 : Port0, Port1
Network 2 : port2, port3

The connection is shown in the figure below.



Pay attention to the cables used to connect netANALYZER to MECHATROLINK-III devices.
netANALYZER requires a cable with an RJ-45 connector.
If your controller or slave has an Industrial Mini I/O (IMI) connector, you must have cables with different connectors at both ends.
Also, these cables must be one straight cable and one cross cable.
If they are the same cable, communication will not be possible.

Startup

This chapter describes the startup procedure and basic screens after startup.

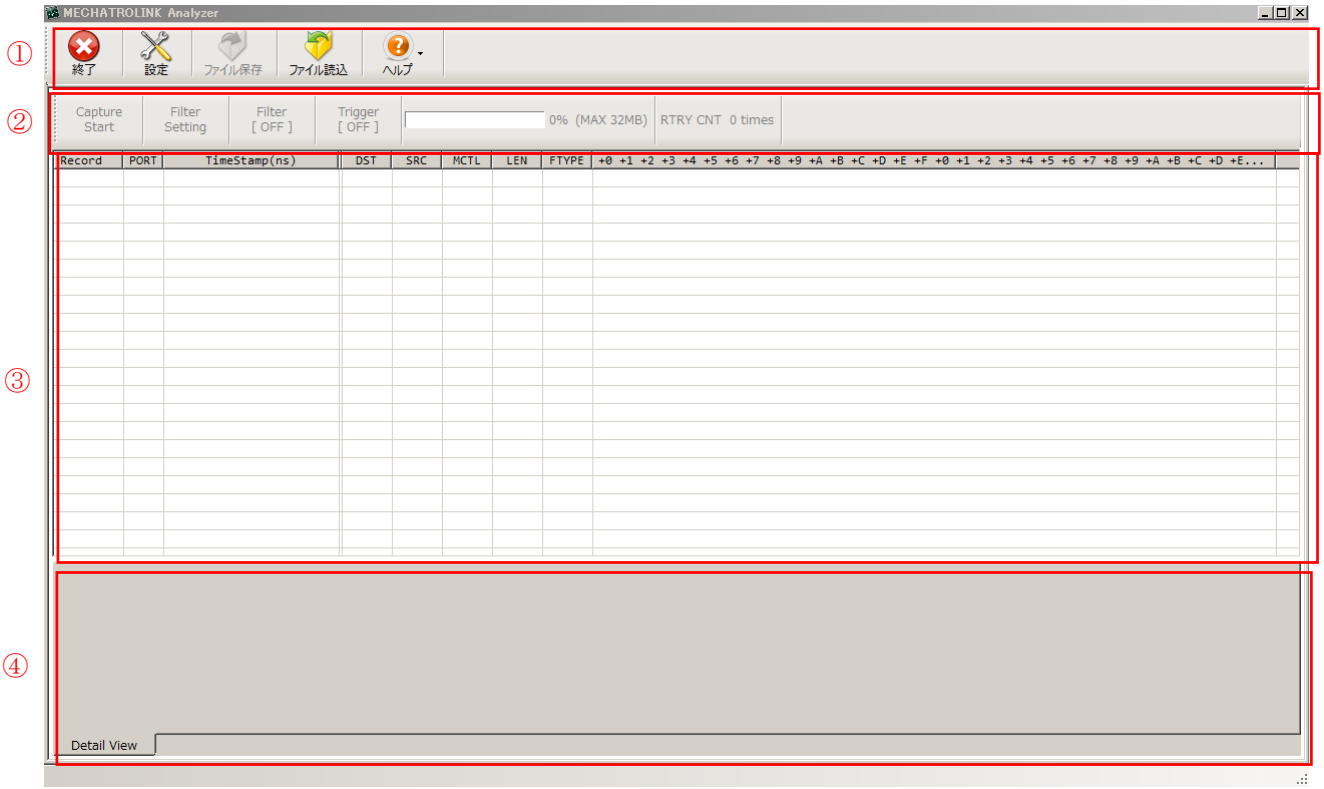
Startup method

Execute “MECHATROLINK Analyzer.exe" in the folder.

Screen

An overview of each screen in the MECHATROLINK Analyzer is provided below.

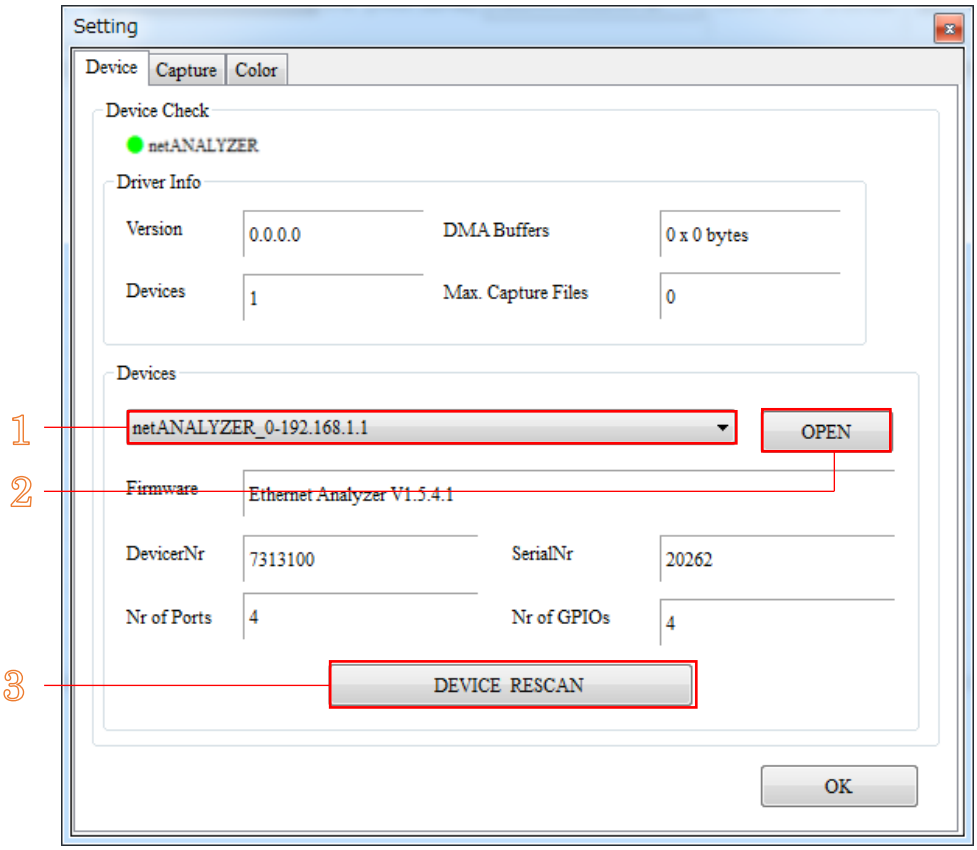
Main screen



1. ”Application exit”, ”Settings", "Save file", and "Open file" are arranged
2. "Capture start/stop", "filter setting", "Filter ON/OFF", "Trigger ON/OFF", "Buffer usage status", "display mode", and "retry count display".
3. Captured data display field. The captured data is displayed.
4. Detailed data display field. The original data of the line selected in "3. Captured data display field" will be displayed.

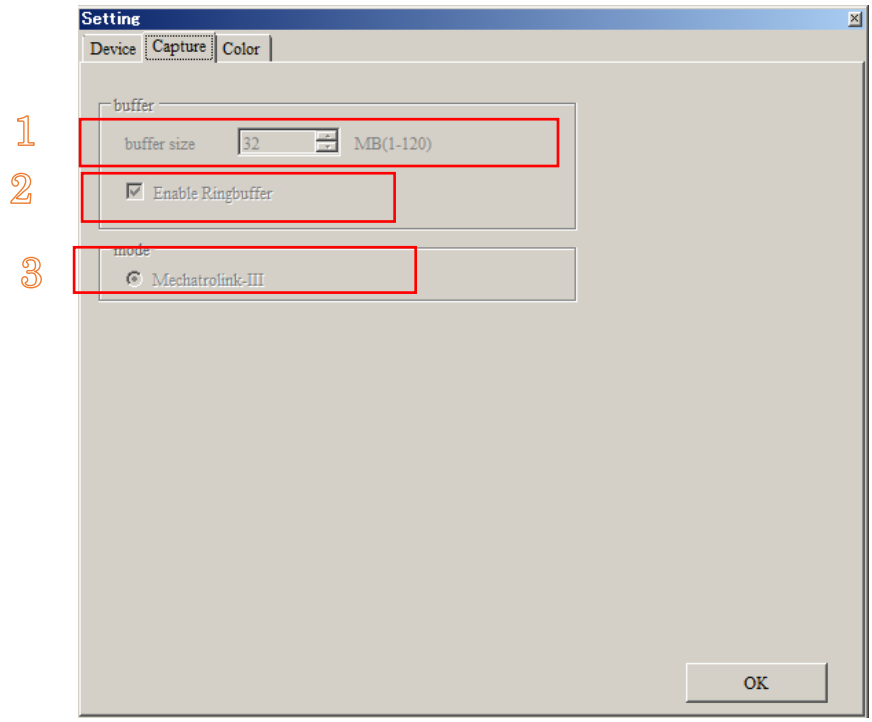
Setting window

Device tab



1. Hardware detected during device detection is displayed.
2. Open and close buttons for the hardware selected in 1.
3.The device rescan button is placed.

Capture tab

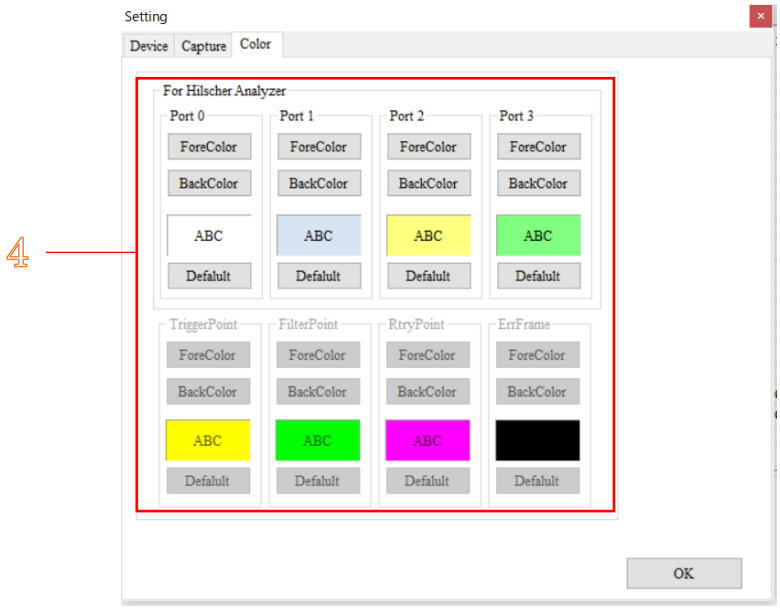


1.The maximum data size of the capture buffer can be set.

2.The ring buffer ON/OFF for the capture buffer can be set.

3.The capture mode is displayed. (Only for MECHATROLINK-III.)

Color tab



4. Various display colors can be selected for the capture data display field on the main screen.

The types of settings available are as follows, from upper left to right.

1. Port0 input data

2. Port1 input data

3. Port2 input data

4. Port3 input data

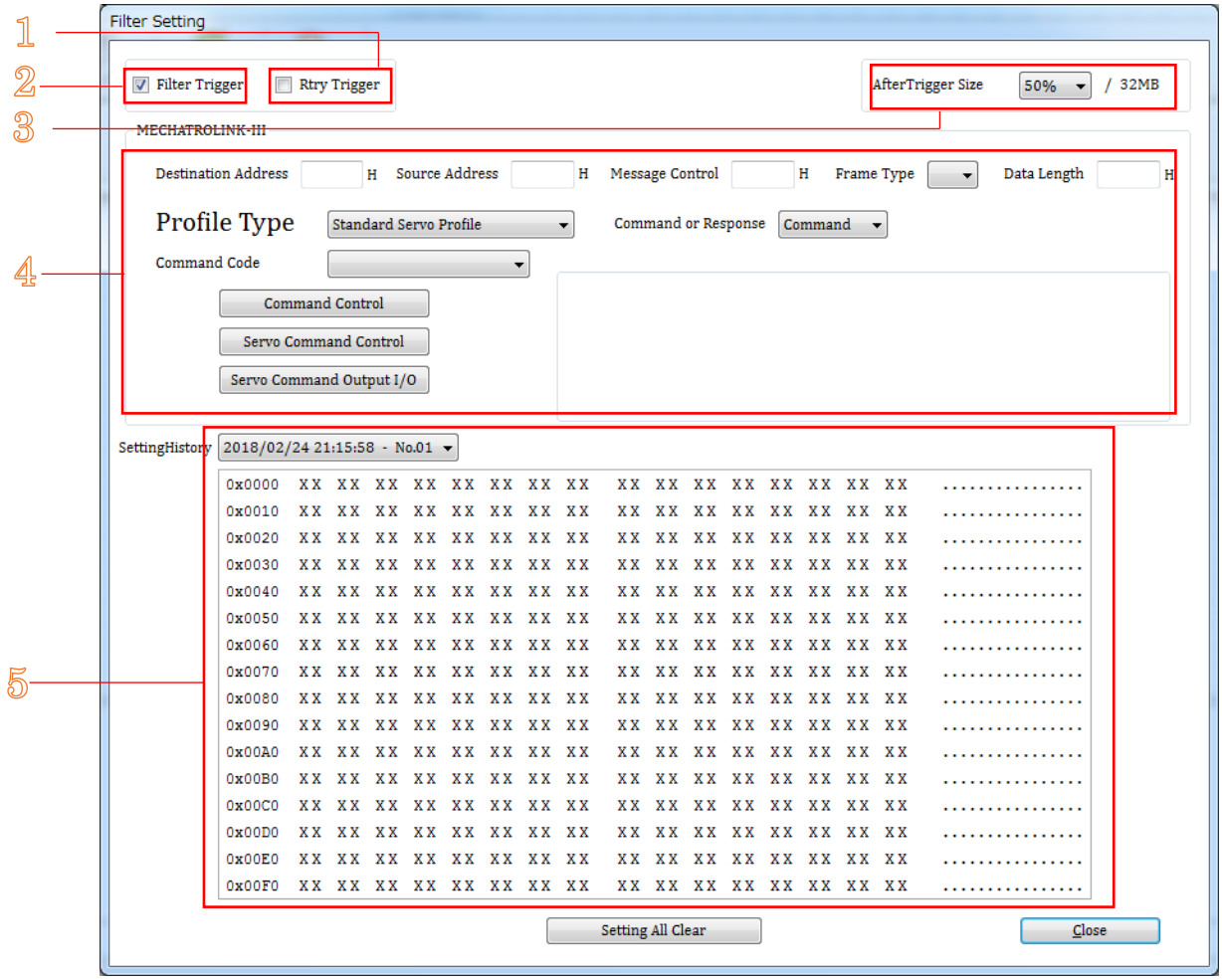
5. Trigger point

6. Filter point

7. Retry point

8. Abnormal/Error frame

Filter/Trigger setting screen

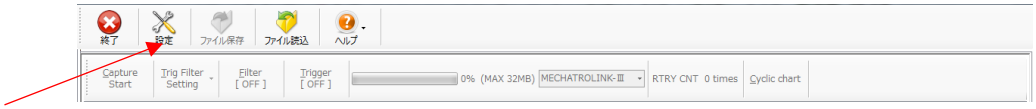


1. Enables/disables the Retry trigger.
2. Enable/Disable the Filter trigger.
3. After-trigger size can be set.
4. Editing of packet filter can be assisted.
5. Edit packet filters.

Connection with device

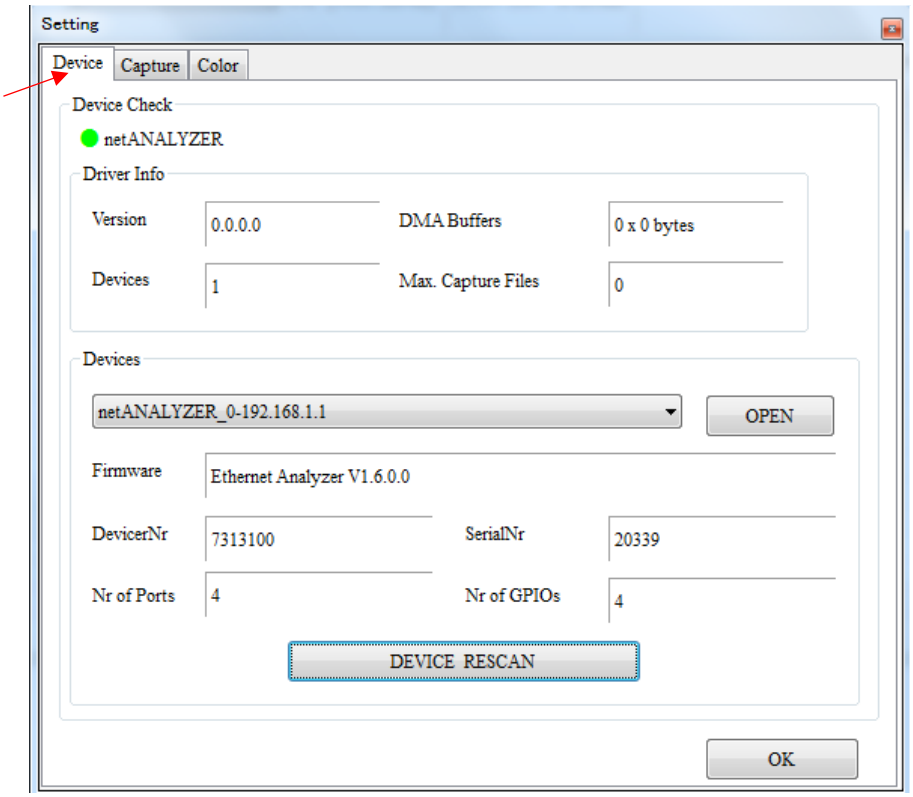
When the application is launched, only the following buttons are enabled and no other functions can be performed.

1. Exit this applicatoin
2. Setting
3. Open a file
4. Help

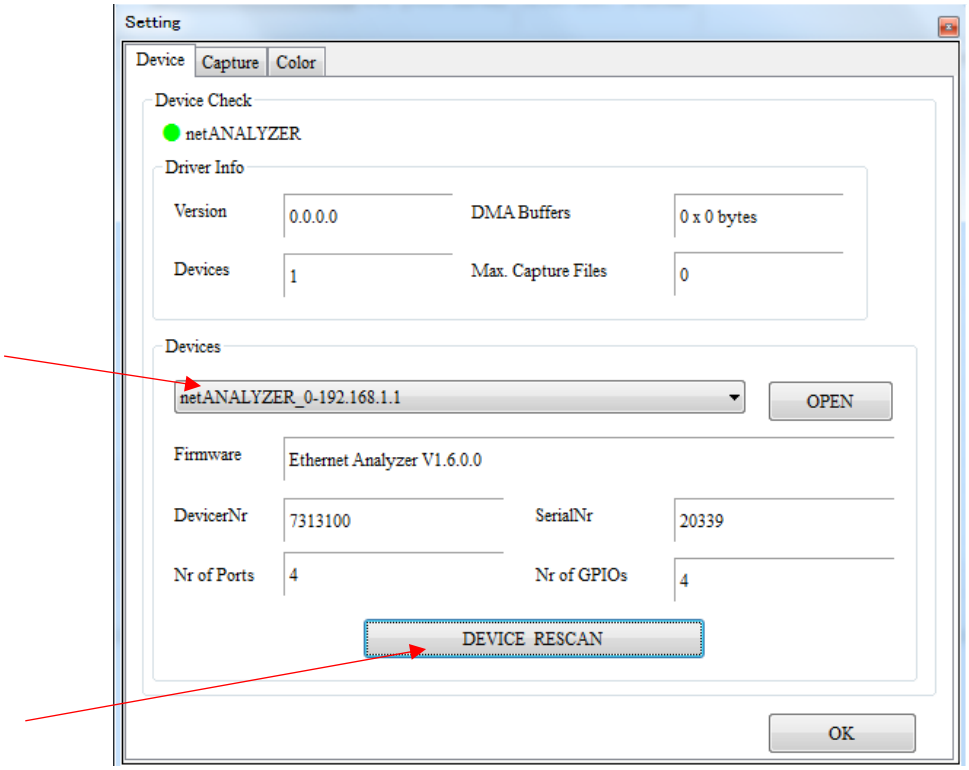


To enable other function buttons, press the "Settings" button to connect to the device.

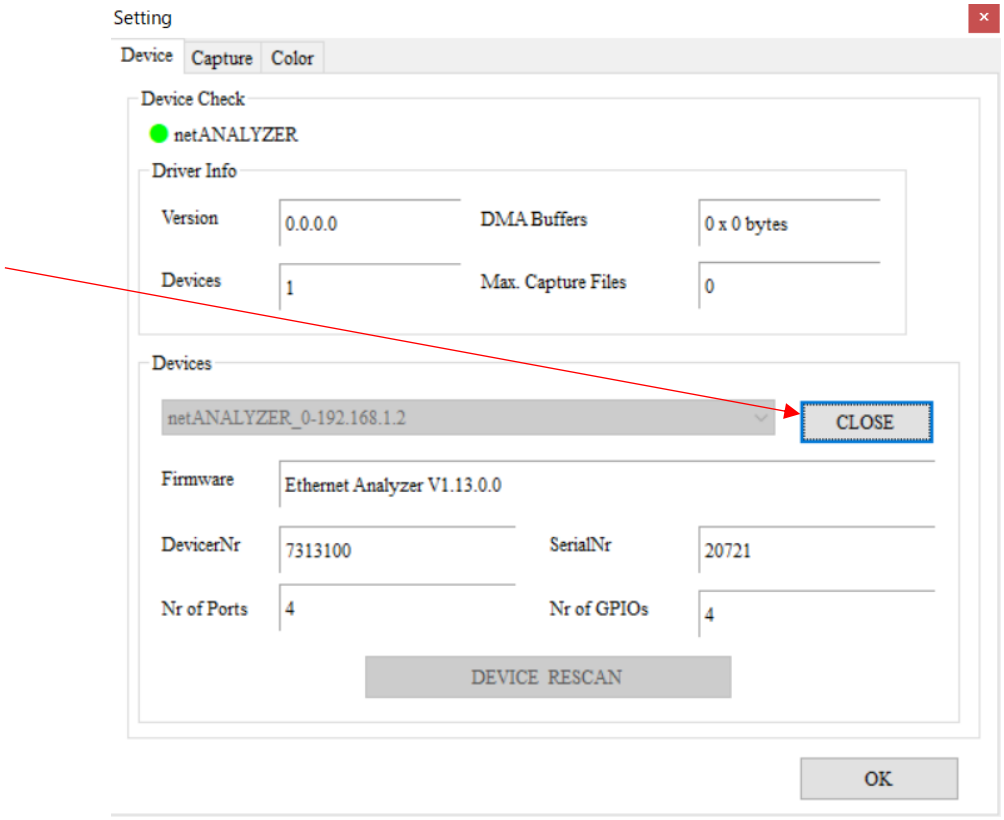
Select the "Device" tab after the setting window opens.



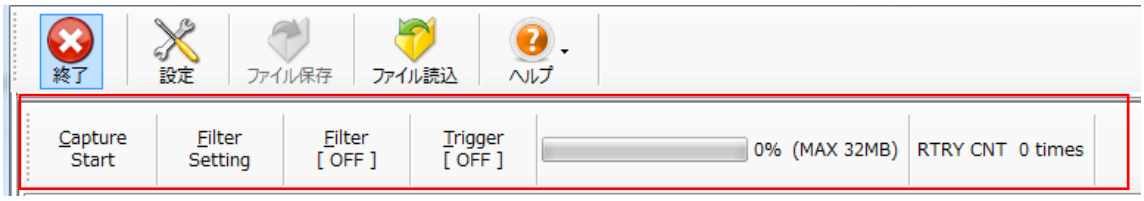
Next, select "netANALYZER" from the device list.
If "netANALYZER" does not appear in the device list, use "DEVICE RESCAN" to re-detect it.
If it still does not appear, recheck the connection with netANALYZER and turn on the power again before re-detecting the device.



Next, open the device pushing the "OPEN" button.
(The "OPEN" display is changed to "CLOSE" when succeeding in opening the device.)



If the device is successfully opened, the connection to the device is established and the capture function is enabled.



Function

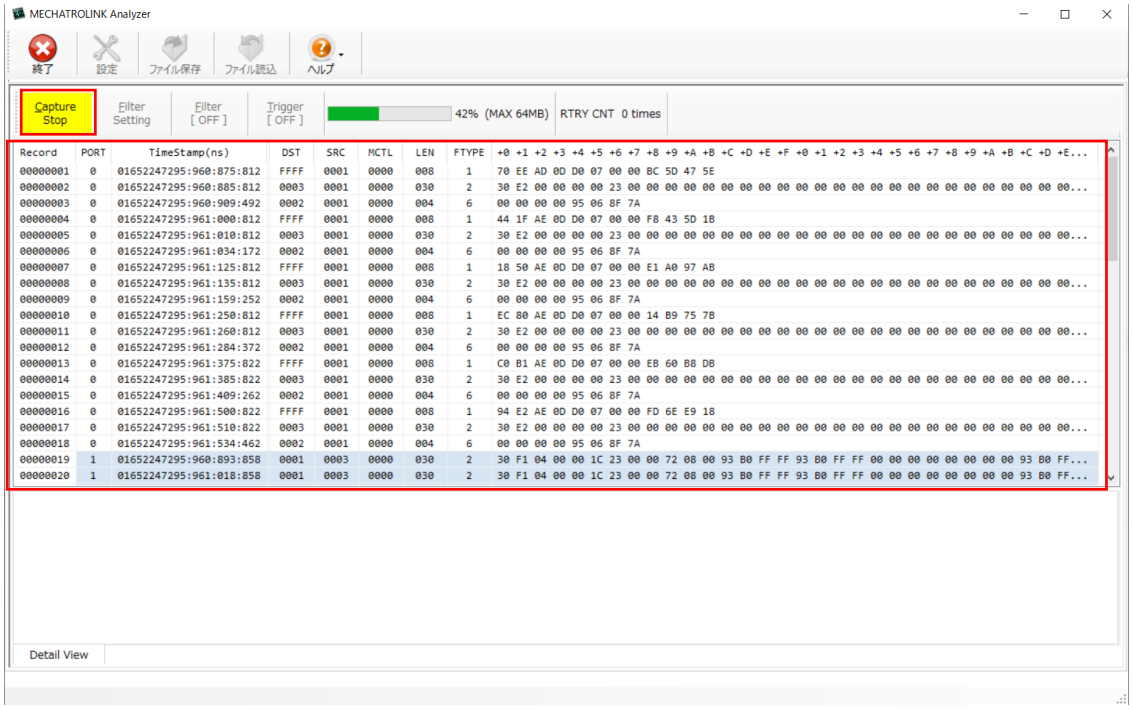
The functions available in the MECHATROLINK Analyzer are listed below.

Data capture

Data capture functionality will be enabled.

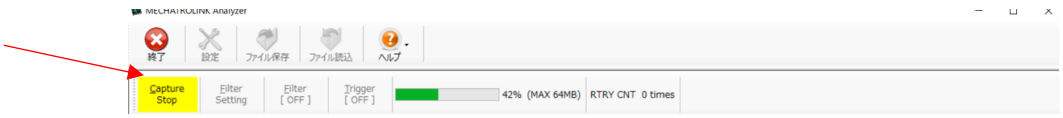
Capture is started by pressing the "Capture Start" button.

During capturing data, the "Capture Start" button lights up yellow and the display text changes to "Capture Stop".

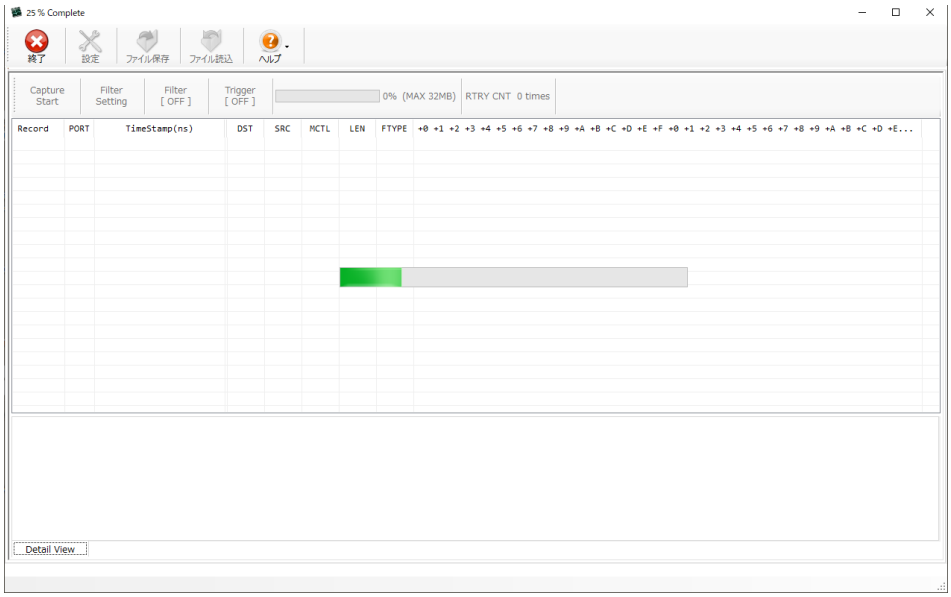


"Settings","Save file," "Open file," "Filter Setting," "Filter" and "Trigger" buttons are grayed out and cannot be selected during capturing data, and cannot be selected.

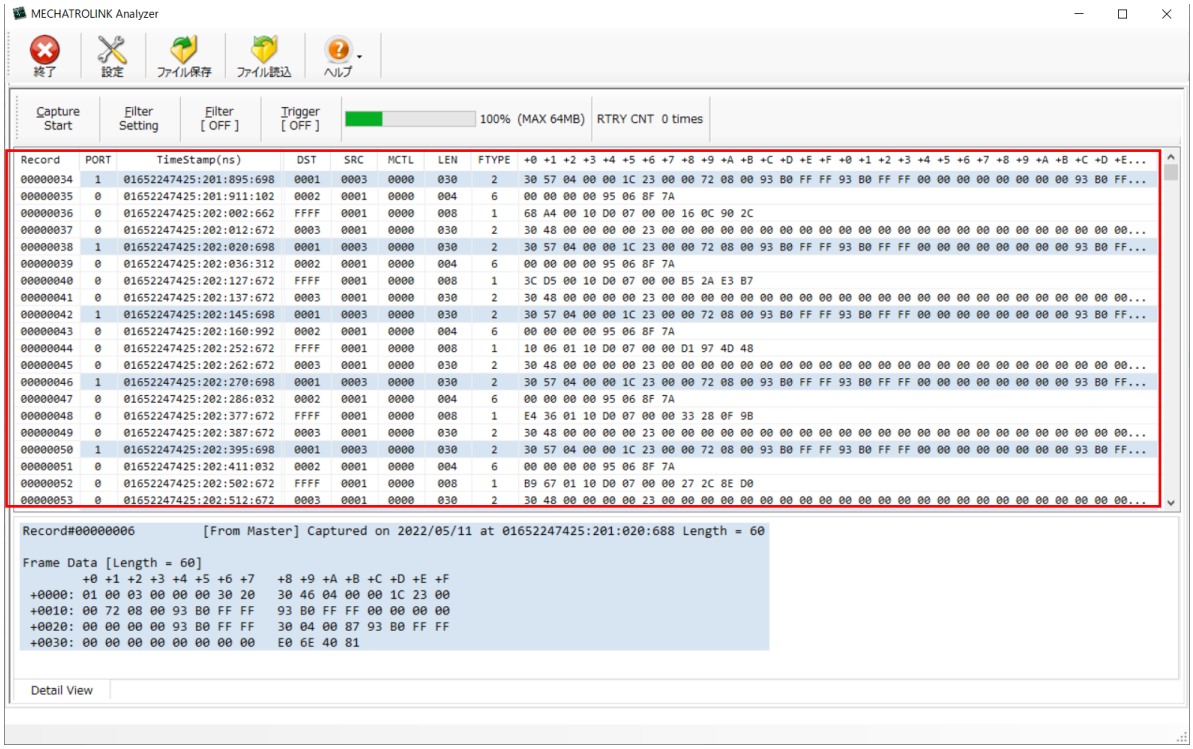
To stop capturing, press the "Capture Stop" button.



Capture stops and all data is displayed after data is analyzed.

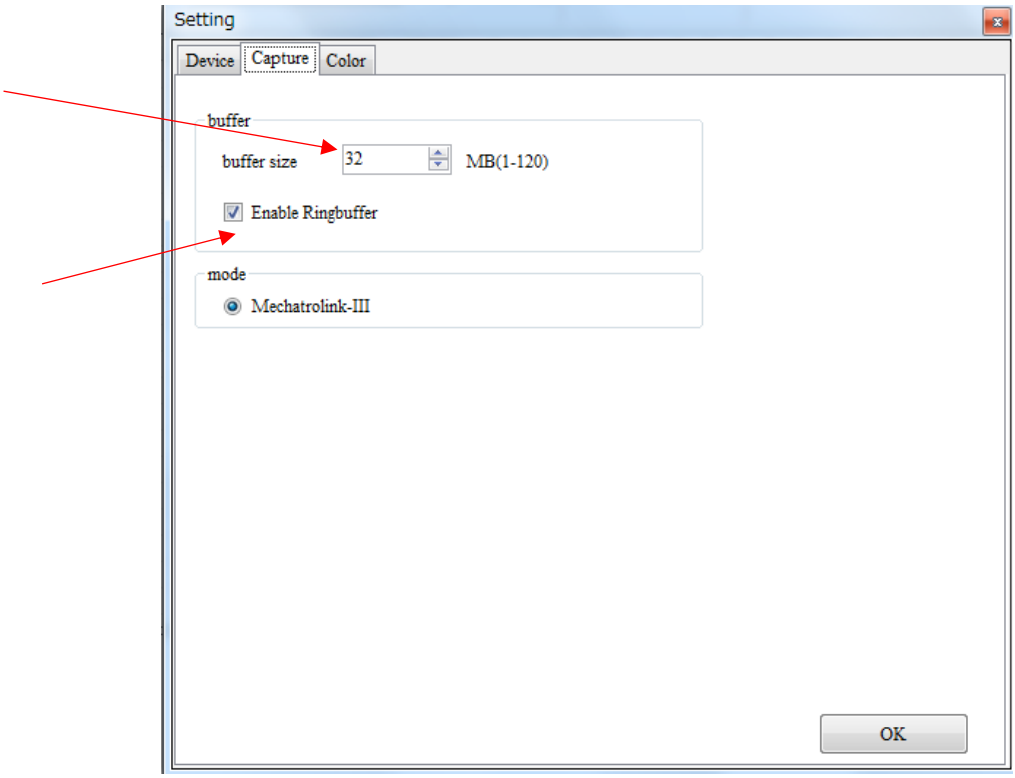


↓



Setting of capture buffer

"Setting" Button → "Capture" tab



A capture maximum size can be changed by changing Buffer size.

The buffer size can be specified between 1 and 120 MB..

Also, by checking the Enable Ringbuffer checkbox, the capture buffer can be used as a ring buffer. If "Enable Ringbuffer" is checked, data will be captured after capture starts until capture stops. If unchecked, data capture will automatically stop when data equivalent to the buffer size has been captured.

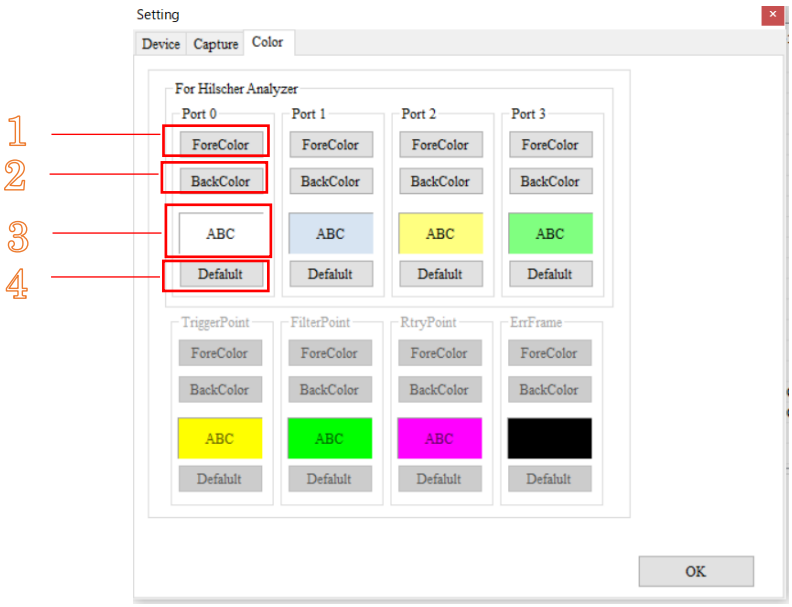
The default settings are as follows.

Buffer size = 32MB

Enable Ringbuffer = on

Display color change

Changing the display color makes it easier to identify the data displayed for each function.



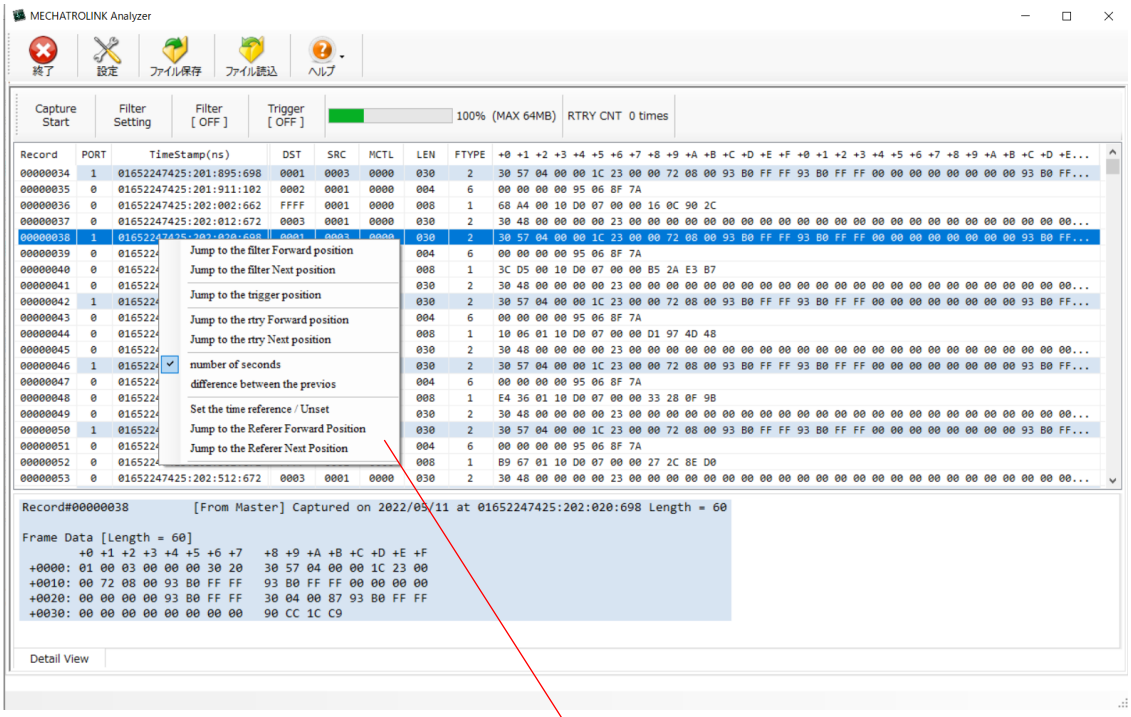
1. Change the character color.
2. Change the background color.
3. Display image.
4. Change to the default display color for both text and background.

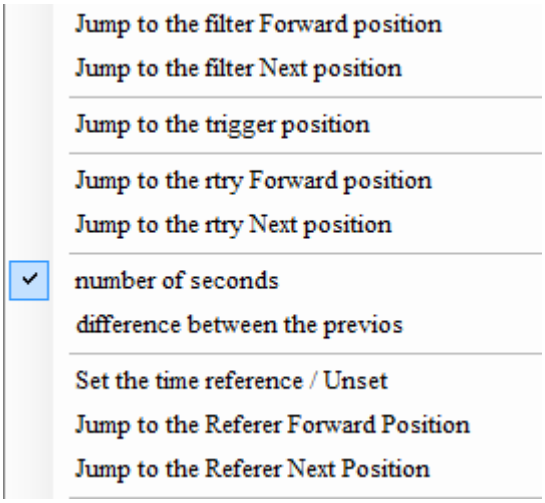
Retry frame detection

When a retry occurs, this software displays the number of occurrences on the retry counter indicator.

Short cut menu

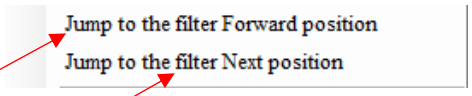
This function can be performed by right-clicking on the display screen after data capture..





Filter position jump

This function jumps to a filter point when one or more filter points have been set.

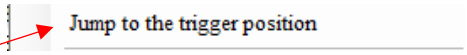


Jumps to the previous filter point.

Jumps to the next filter point.

> If the filtering process has never been performed, there is no change when it is performed.

Trigger position jump

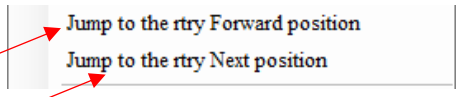


Jumps to the trigger position.

> If the triggering process has never been performed, there is no change when it is executed.

Retry position jump

This function jumps to the retry point when one or more retries are detected.



Jumps to the previous retry position.

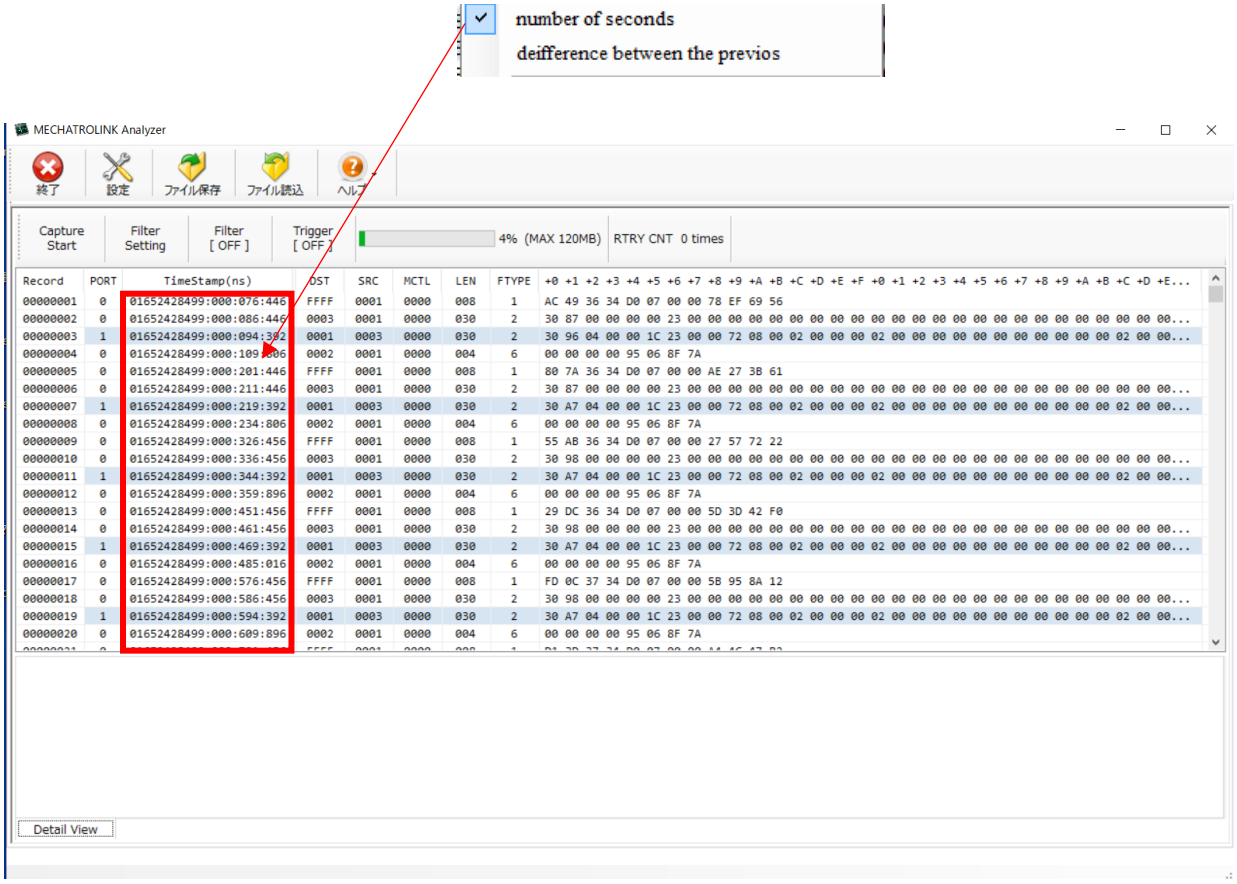
Jumps to the next retry position.

> If the retry has not been detected at least once, executing it will not make any change.

Time series display change

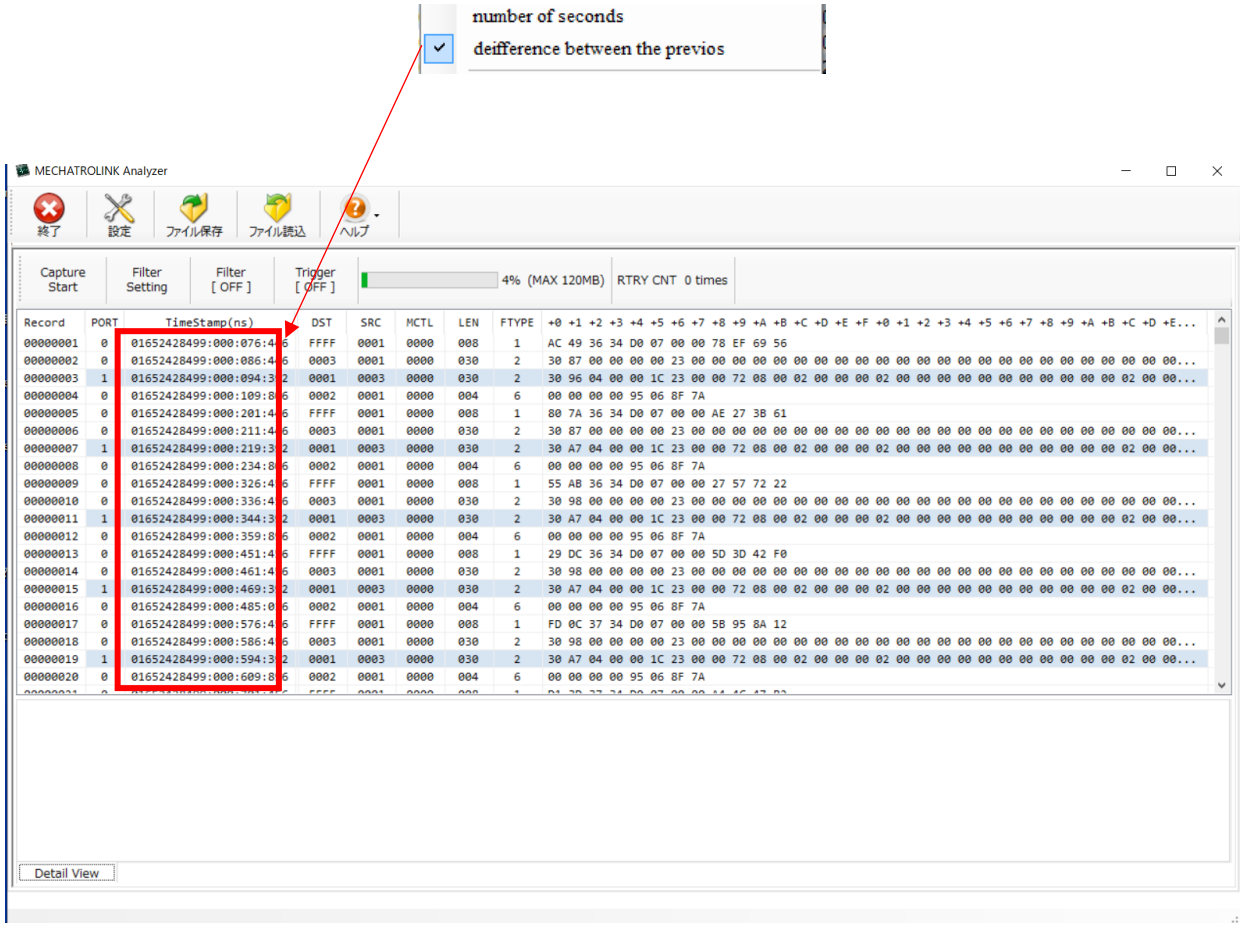
Change the displayed time series.

Acquisition time display: (default)



The acquired time of each frame is displayed in the TimeStamp column. (default)

Difference time display:

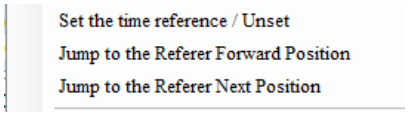


TimeStamp(ns)	
00000000000:000:463:640	Differential time
00000000000:000:010:000	
00000000000:000:011:240	
00000000000:000:013:520	
00000000000:000:465:250	
00000000000:000:010:000	
00000000000:000:012:680	
00000000000:000:013:680	
00000000000:000:463:640	
00000000000:000:010:000	
00000000000:000:011:320	
00000000000:000:013:760	

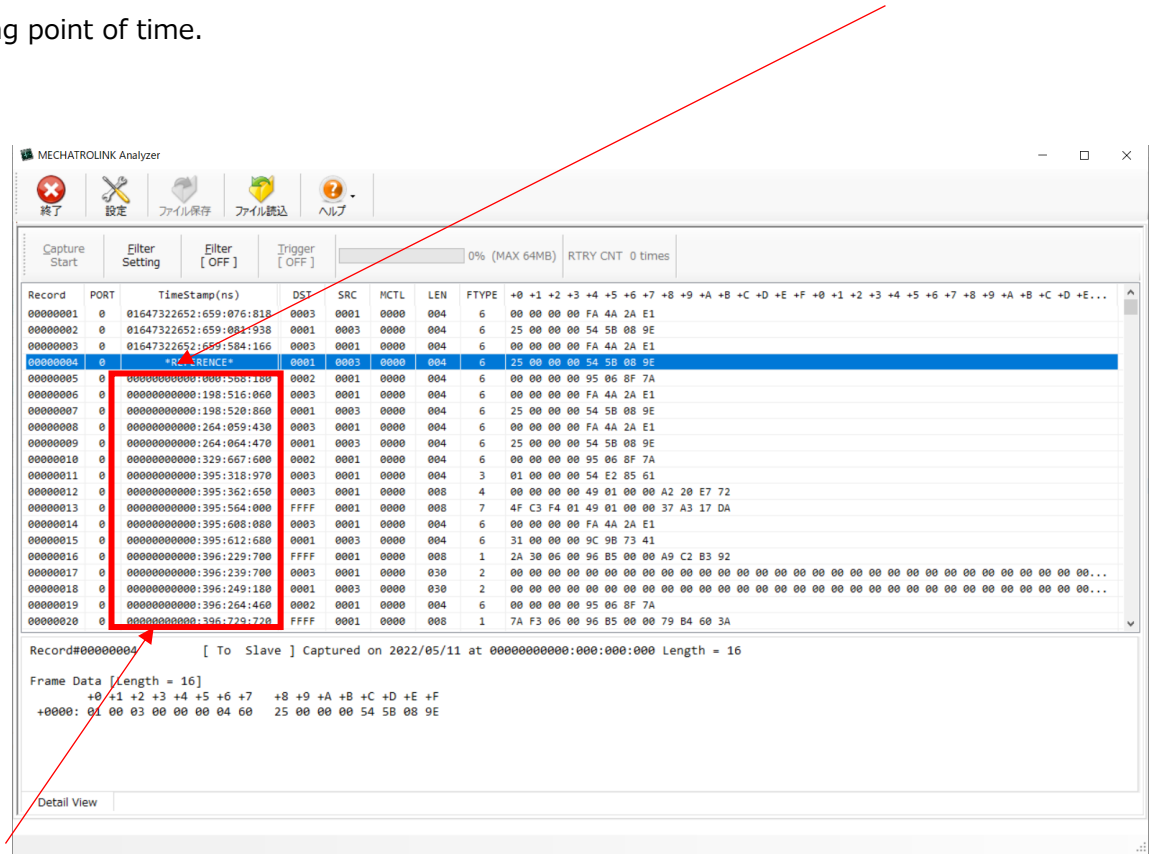
The display format is the difference time from the previous frame time.

Reference point

By setting a reference point, the display time format can be changed to a differential time display starting from the reference point.



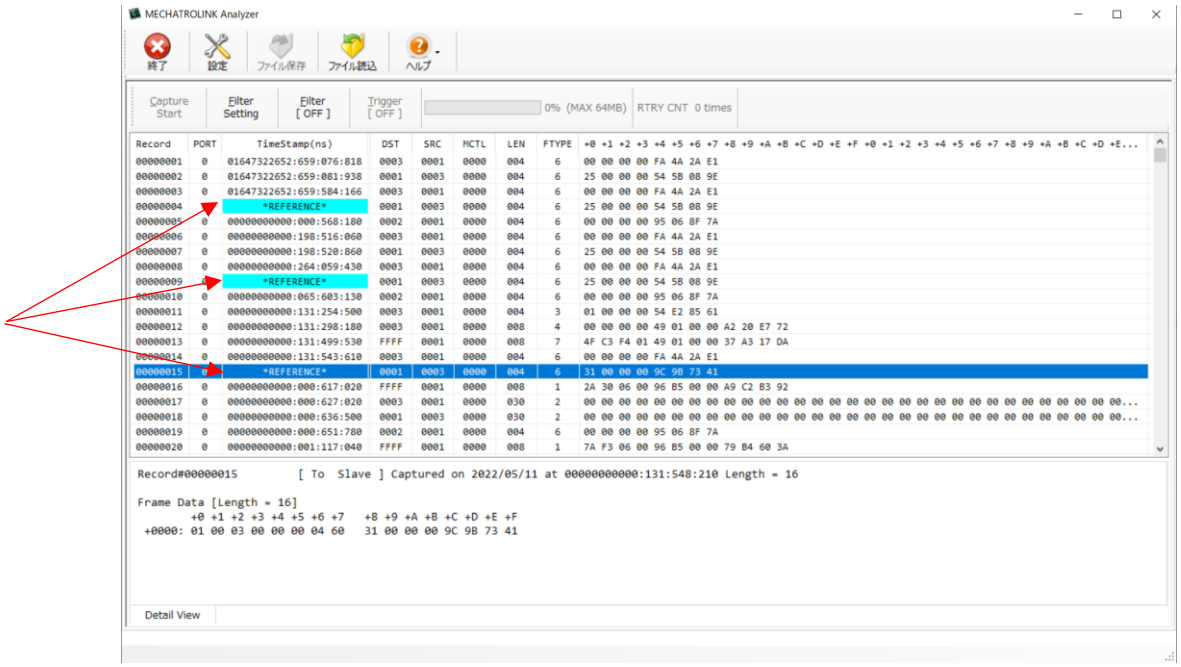
When a reference point is set, the TimeStamp for that line becomes *REFERENCE*, which is the starting point of time.



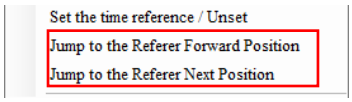
TimeStamp after the reference point displays the difference time from the reference point.

To cancel the reference point, select the line that has been set and click "Set the time reference /Unset" again to remove the reference point.

Multiple reference points can also be set.



If multiple reference points are set, you can jump to the previous or next reference point.

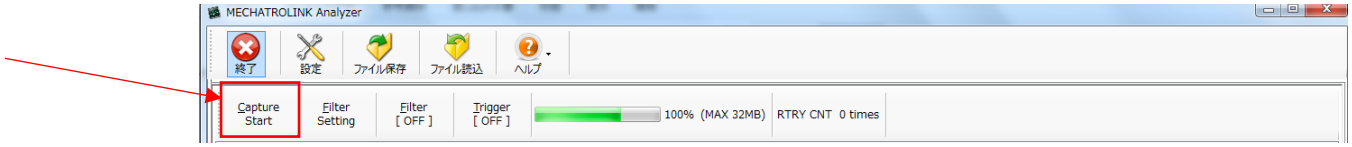


Filter

Filtering of captured data is possible by setting filters in the filter settings screen.

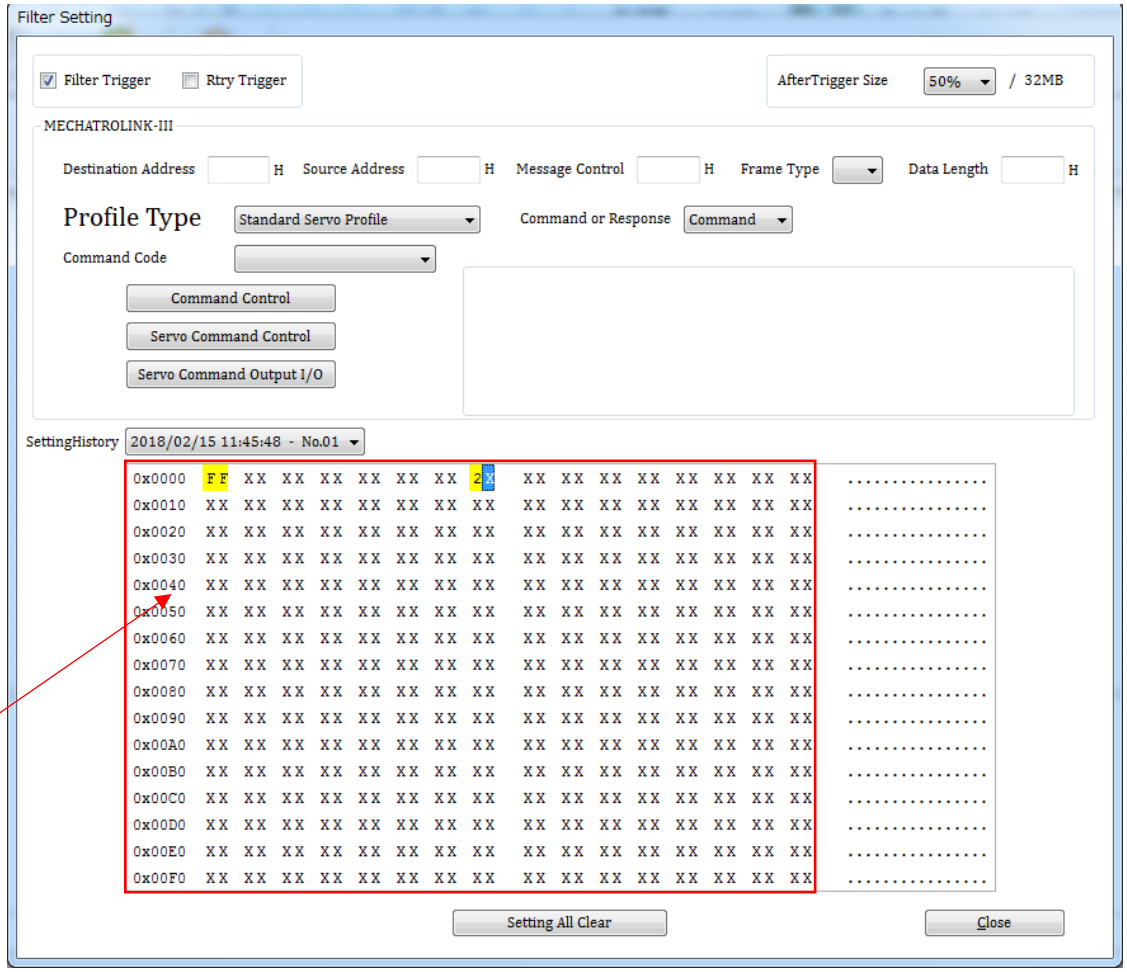
Making a filter data

Pressing the "Filter Setting" button displays the filter setting screen.



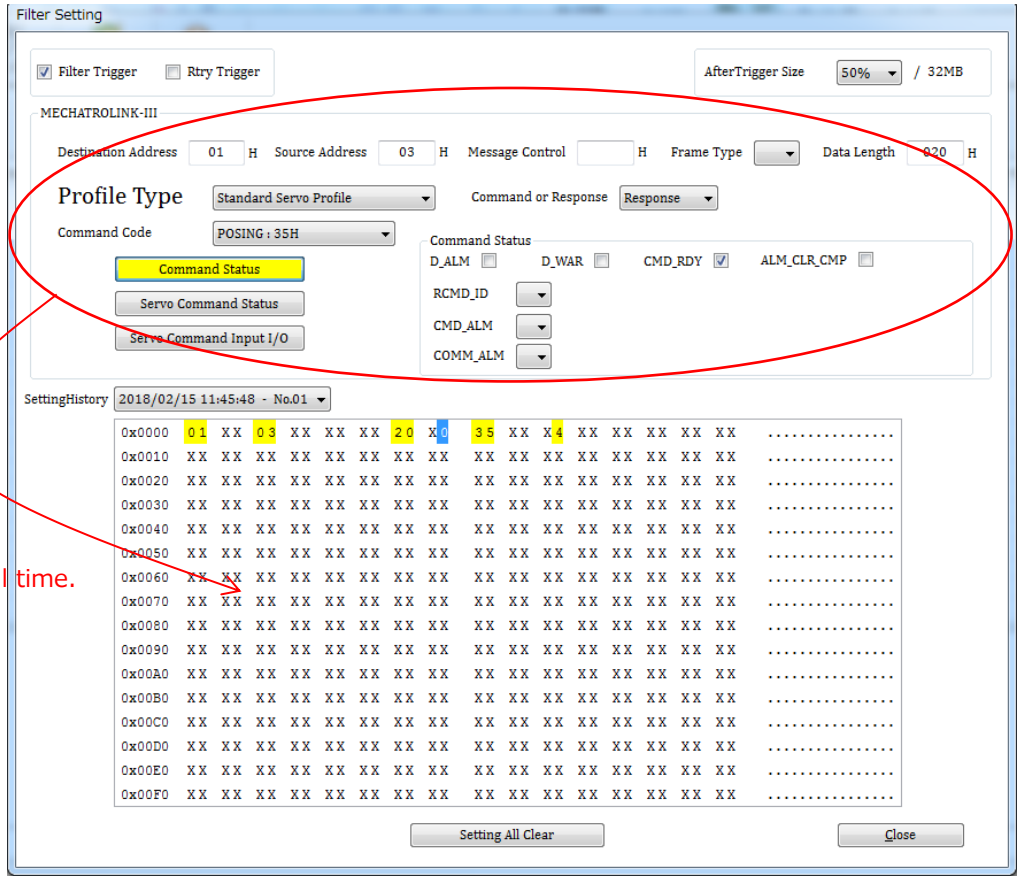
Filter data can be set in 4-bit units for all fields (up to 512 bytes) of a captured frame.

Setting filter data



Create filter data for packets on the above filter setting screen.

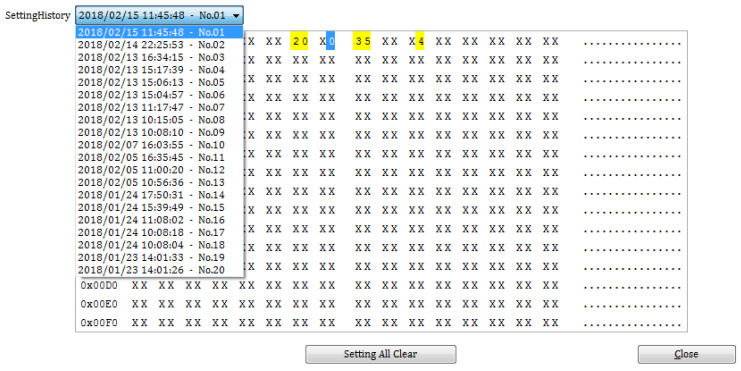
> Filters can be set in 4-bit increments.
>
> The background color is yellow when the filter is active.
>
> Setting the value of the filter to "X" will exclude it from the filter.



The results are reflected in real time.

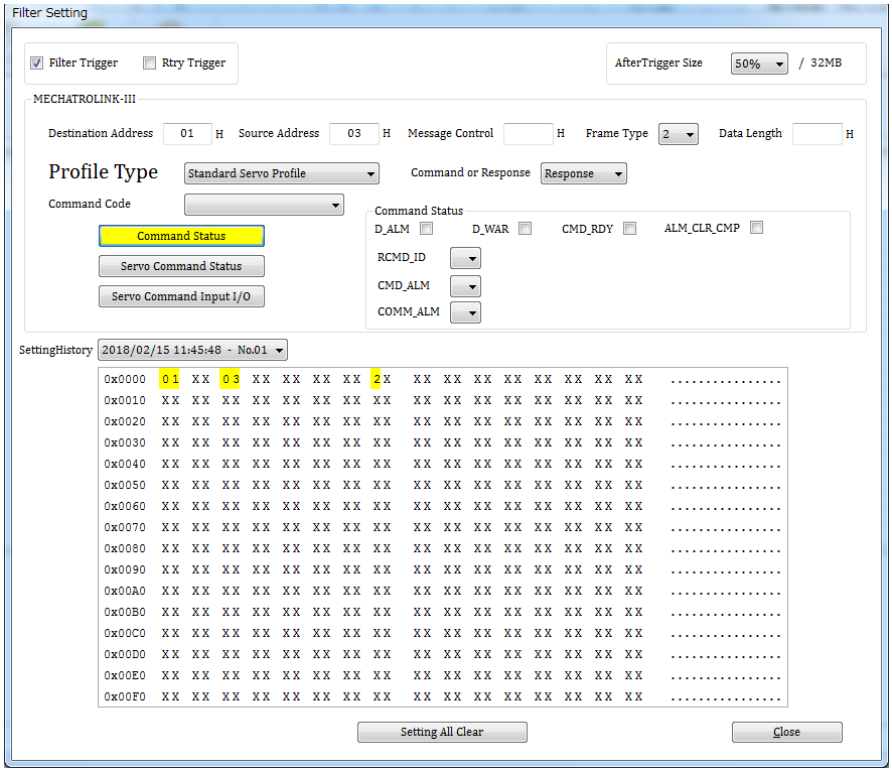
Values set in the input aids are reflected in the filter data in real time.

Set values of the filter data are memorized up to 20.

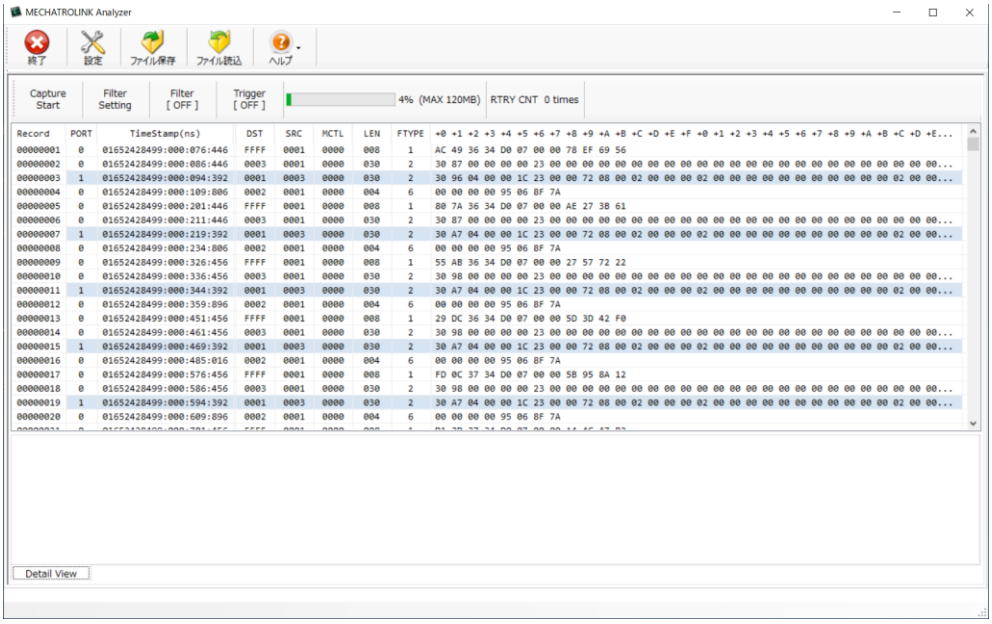


Execution of filter processing

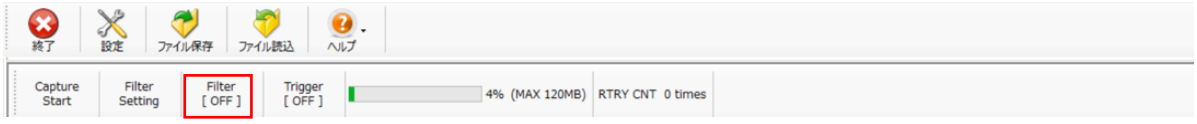
Filtering settings are configured on the filter settings screen in advance.



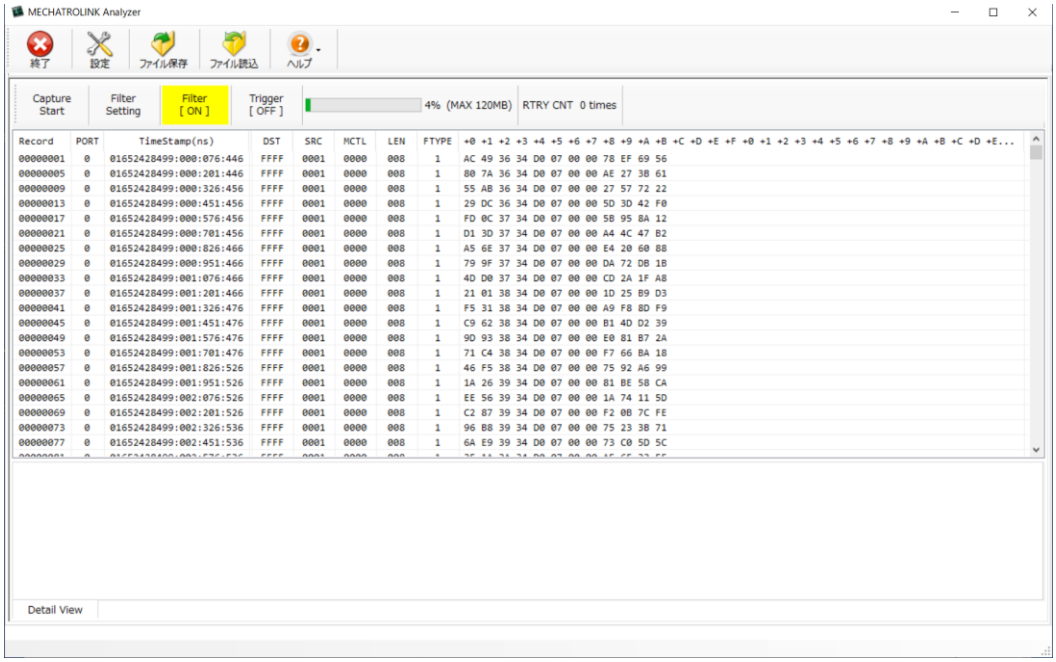
Capture starts.



Press the "Filter" button after capture is complete.



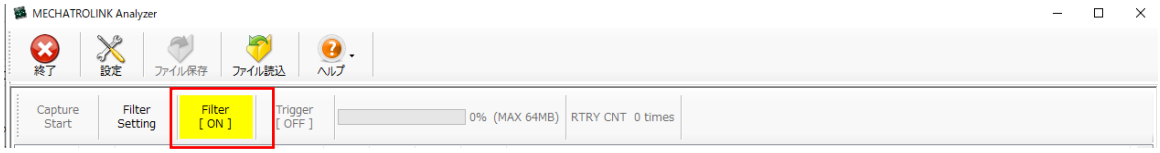
Filter conditions are parsed and only packets that meet the filter conditions are displayed.



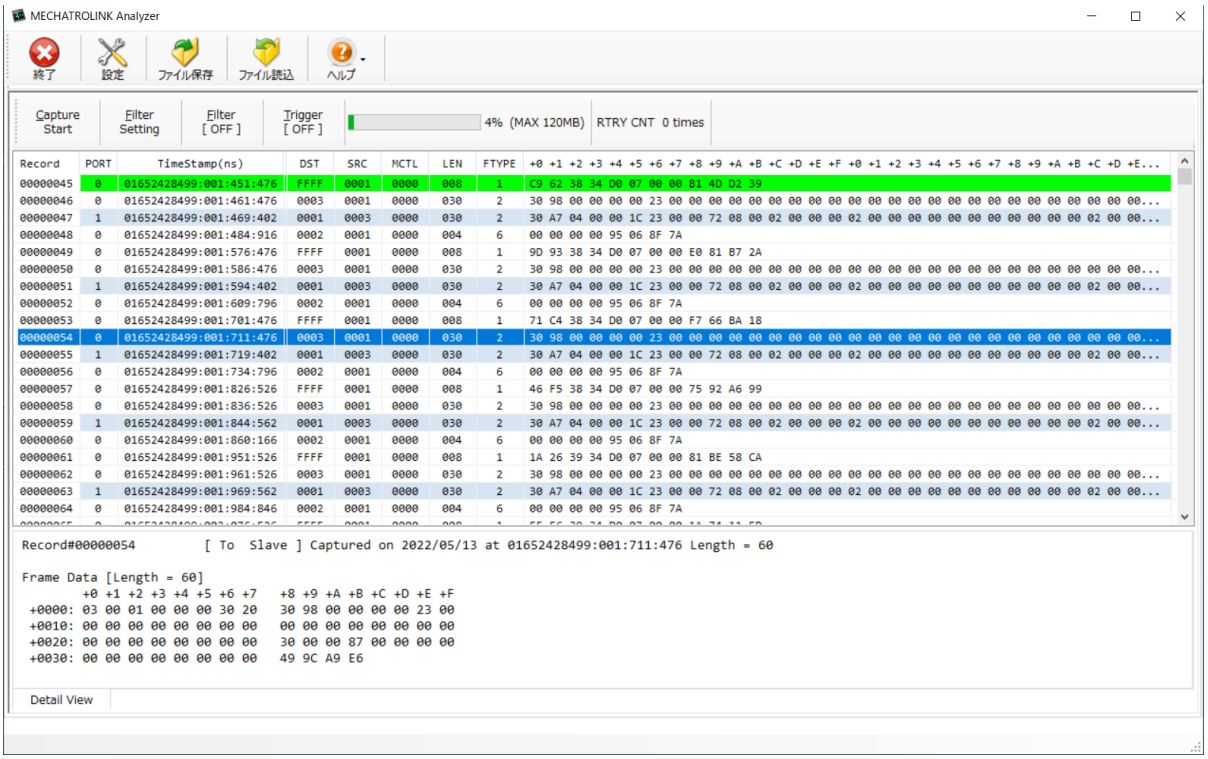
While the filter is active, the "Filter" button turns yellow and [ON] is displayed.

Release of filter processing

With the filter enabled, press the "Filter" button.



The unfiltered data is displayed with the row that was selected at the time of filtering at the top of the list.



The color of the top-most row of the filter selection can be changed by clicking on the "Change Display Color" button.

When the filter is released, the background color of the "Filter" button returns to normal and [OFF] is displayed.

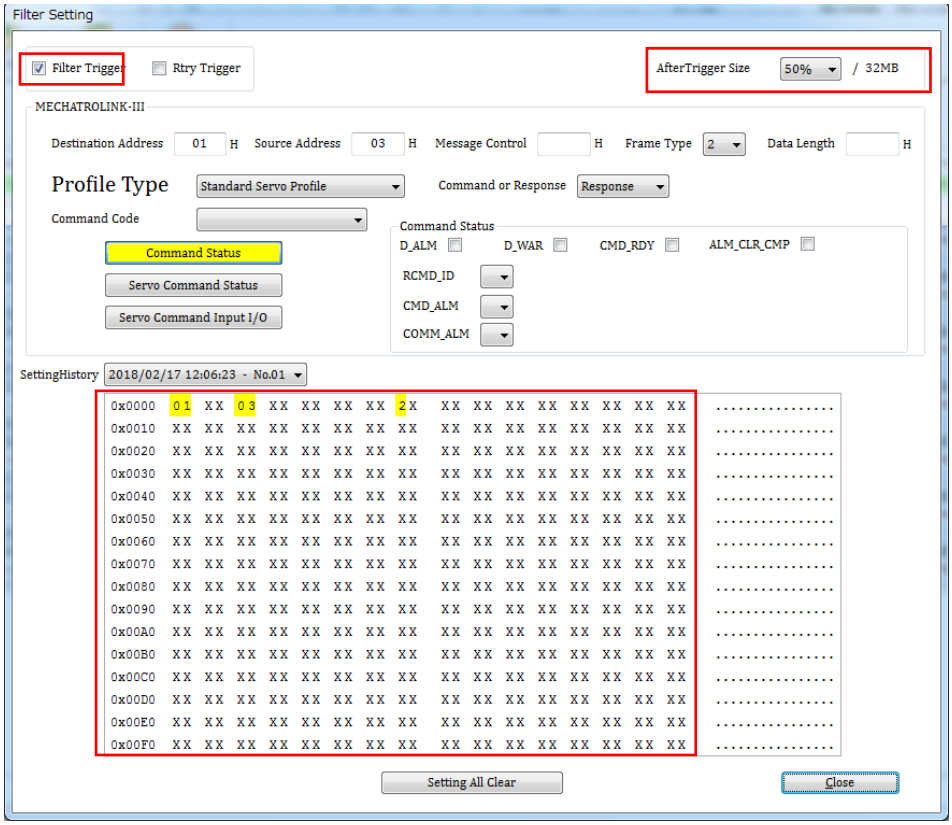
Trigger

This function starts and stops capturing based on the conditions set in the filter settings screen.
Packets before and after receiving a packet that matches the condition can be checked.
Filter triggers or retry triggers can be applied as conditions.

Filter trigger

Filter Trigger triggers packets that match the filter conditions.

Set the filter conditions and check the "Filter Trigger" checkbox.

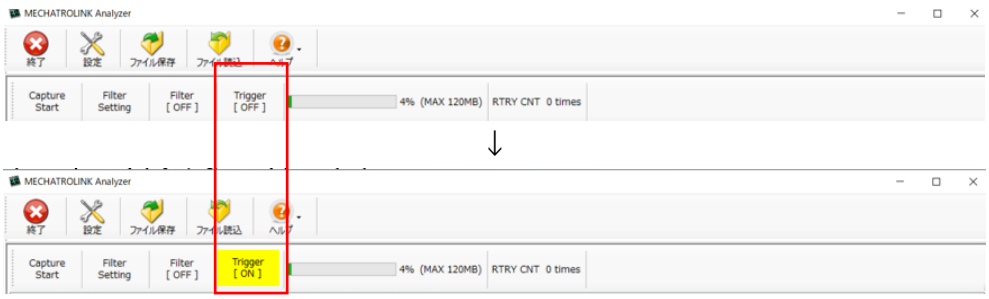


Also, specify the size of the after trigger in "AfterTrigger Size.

> See "Setting Filter Data" for information on how to set filters.

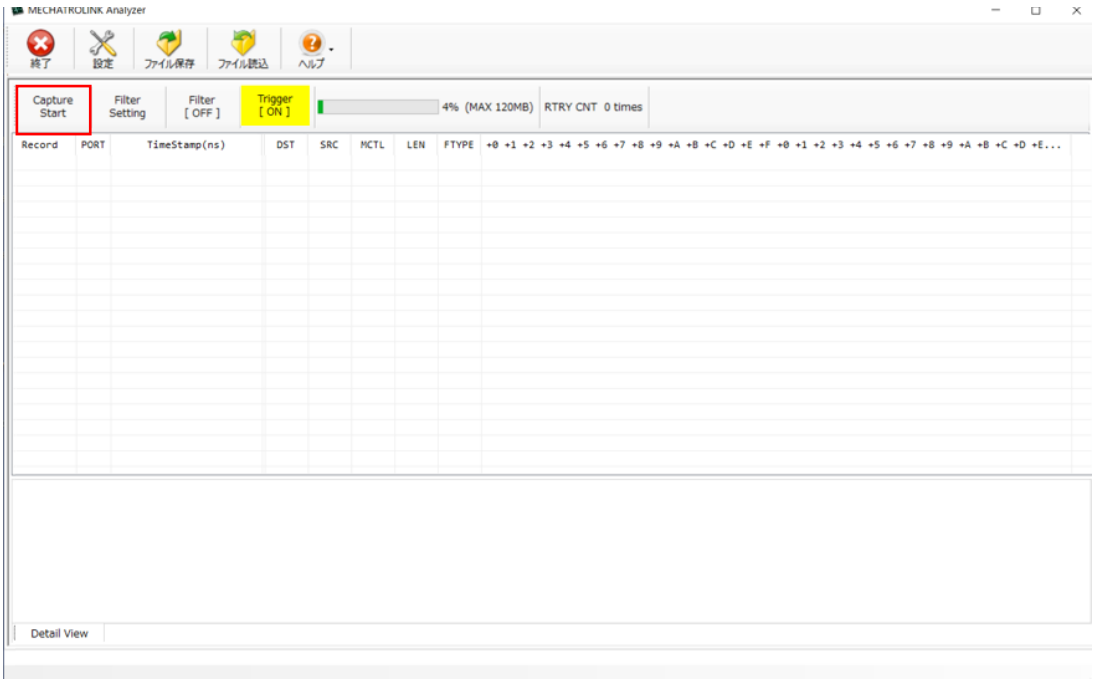
> AfterTrigger Size can be set from 10 to 50%.
> Example: If the capture data size is 32 MB and AfterTrigger Size is set to 50%, the AfterTrigger Size will be 16MB.

Press the "Trigger" button to activate the trigger function.

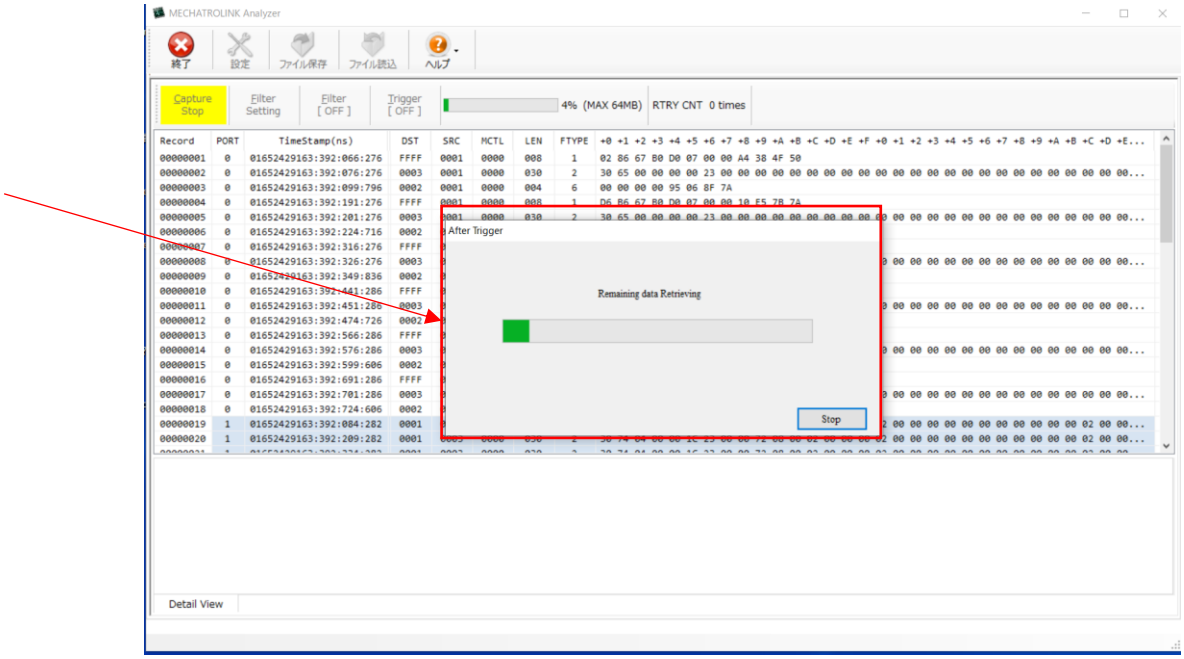


When the trigger function is enabled, the "Trigger" button lights up yellow and the display shows [ON].

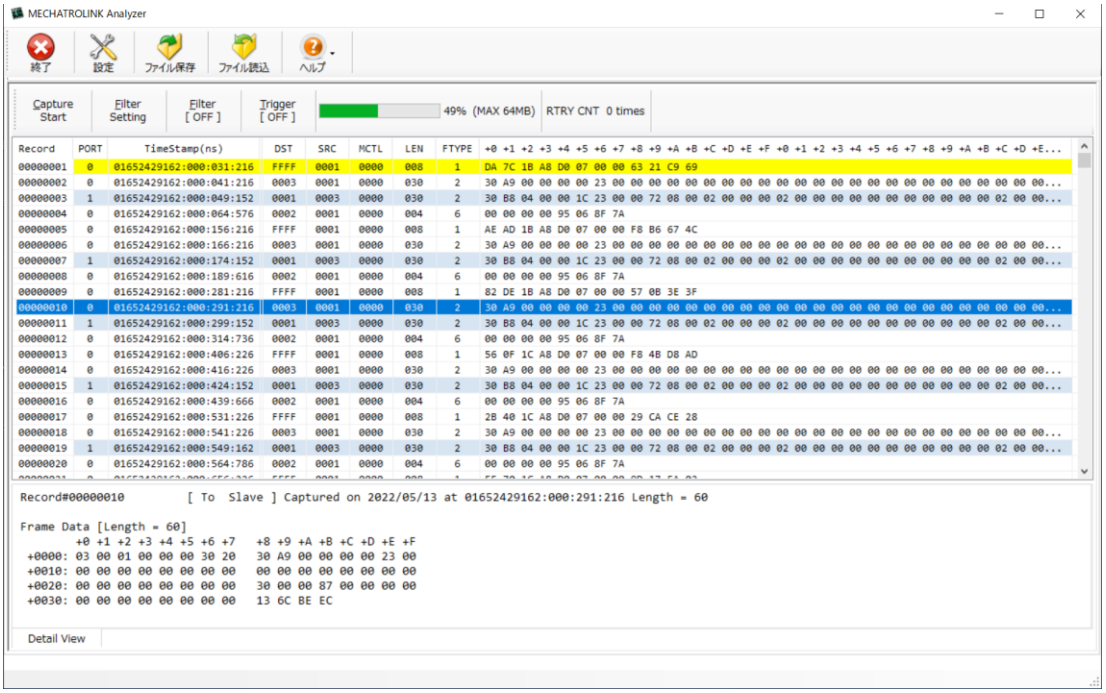
Press the "Capture Start" button to start capturing.



When a packet that matches the filter condition is received, it will be triggered and the after-trigger screen will be displayed.



When the progress bar on the after-trigger screen reaches the right end, trigger processing is complete and the acquired data is displayed.



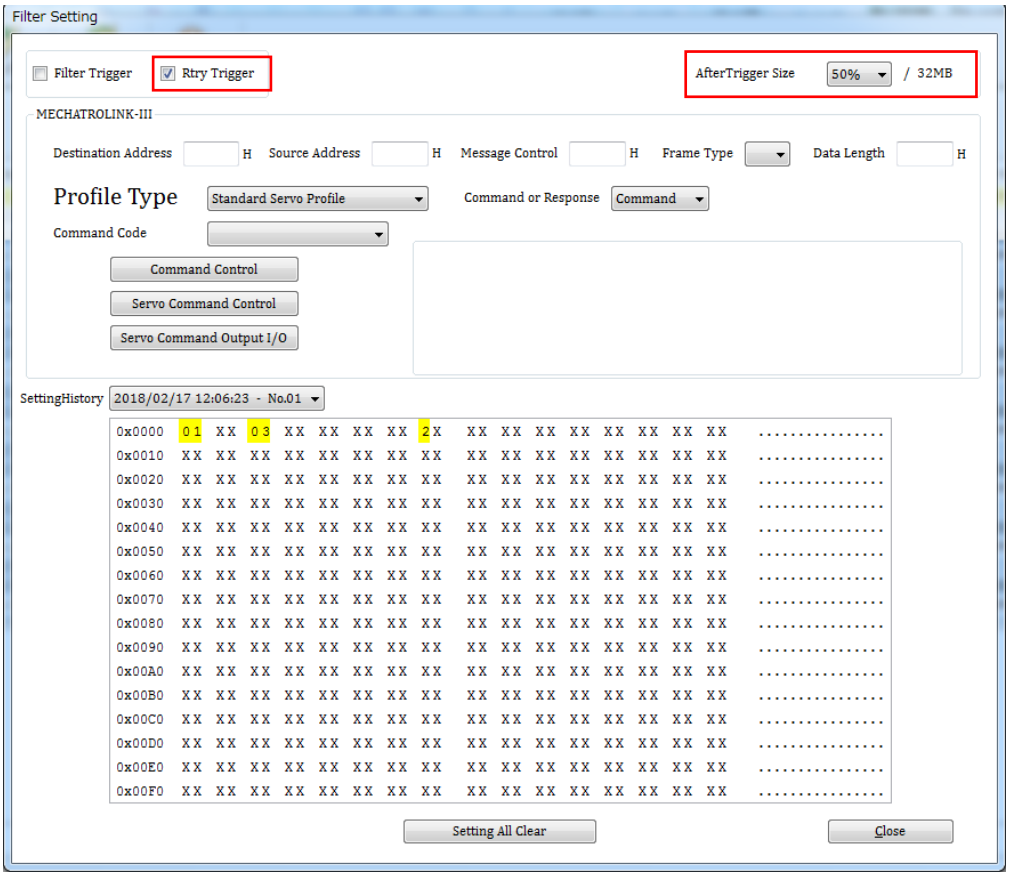
Data is displayed with the trigger position as the top row.

Trigger packets are displayed in the color set by the display color change.

Retry trigger

The retry trigger is triggered by the occurrence of a retry.

Check the "Rtry Trigger" checkbox.

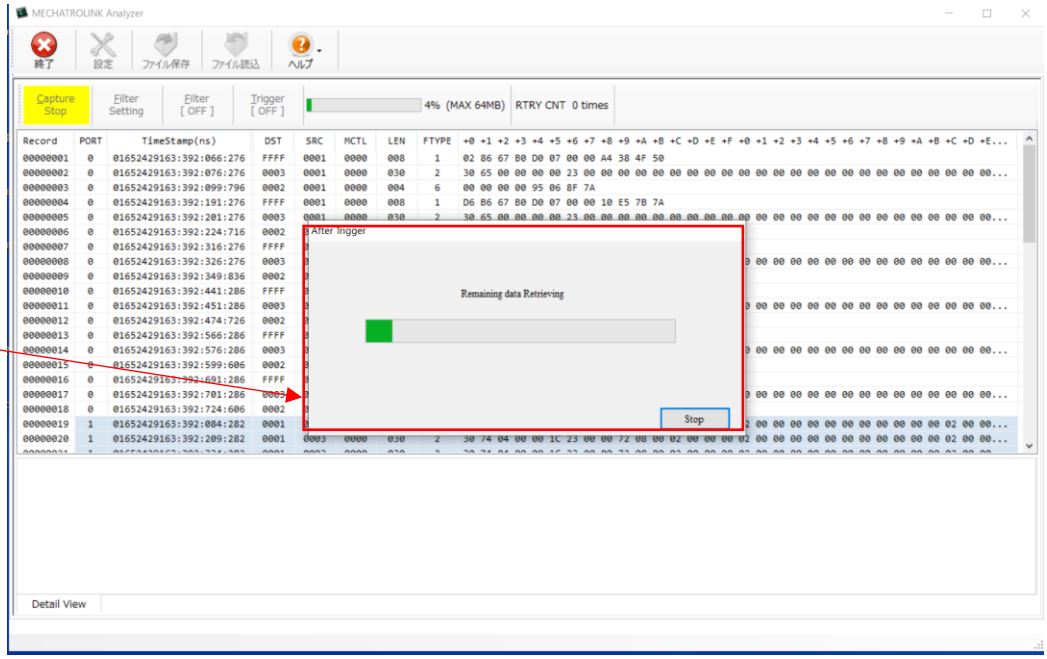


Also, specify the size of the after trigger in "AfterTrigger Size.

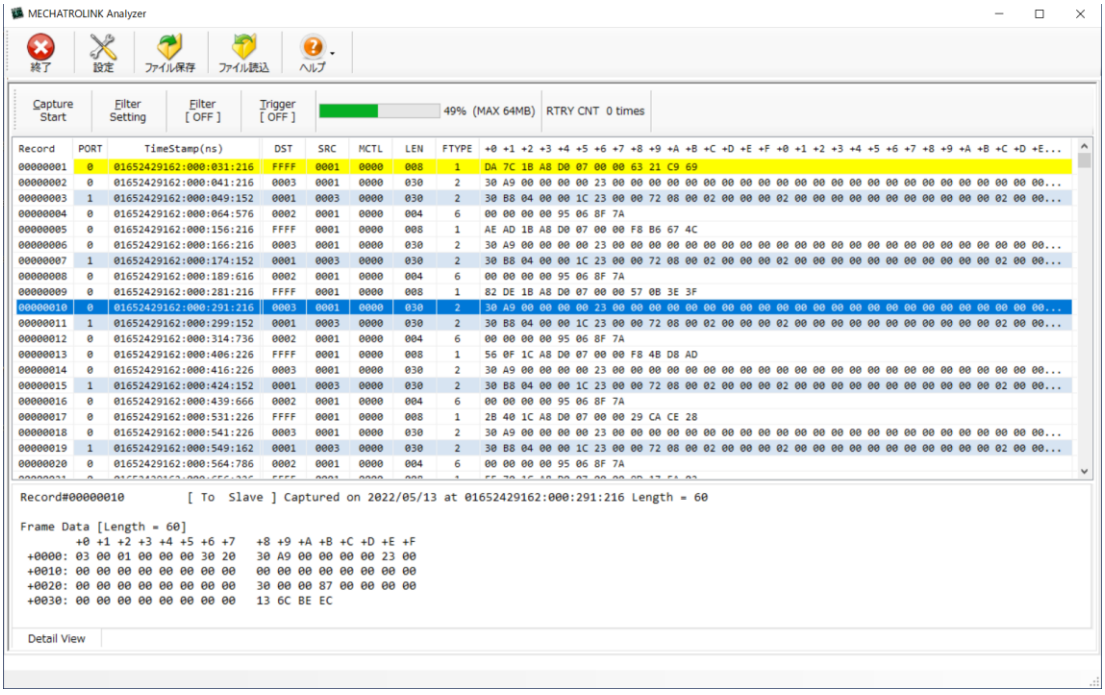
> Filter settings are ignored during a retry trigger.
> However, if Filter Trigger is also checked, the trigger will be a mixed trigger with OR conditions.

> AfterTrigger Size can be set from 10 to 50%.
> Example: If the capture data size is 32 MB and AfterTrigger Size is set to 50%, the AfterTrigger Size will be 16MB.

After activating the trigger function by pressing the "Trigger" button, start capturing and press the "Trigger" button. When a retry occurs, the trigger is applied and the after-trigger screen is displayed.



When the progress bar on the after-trigger screen reaches the right end, trigger processing is complete and the acquired data is displayed.



Data is displayed with the trigger position as the top row.

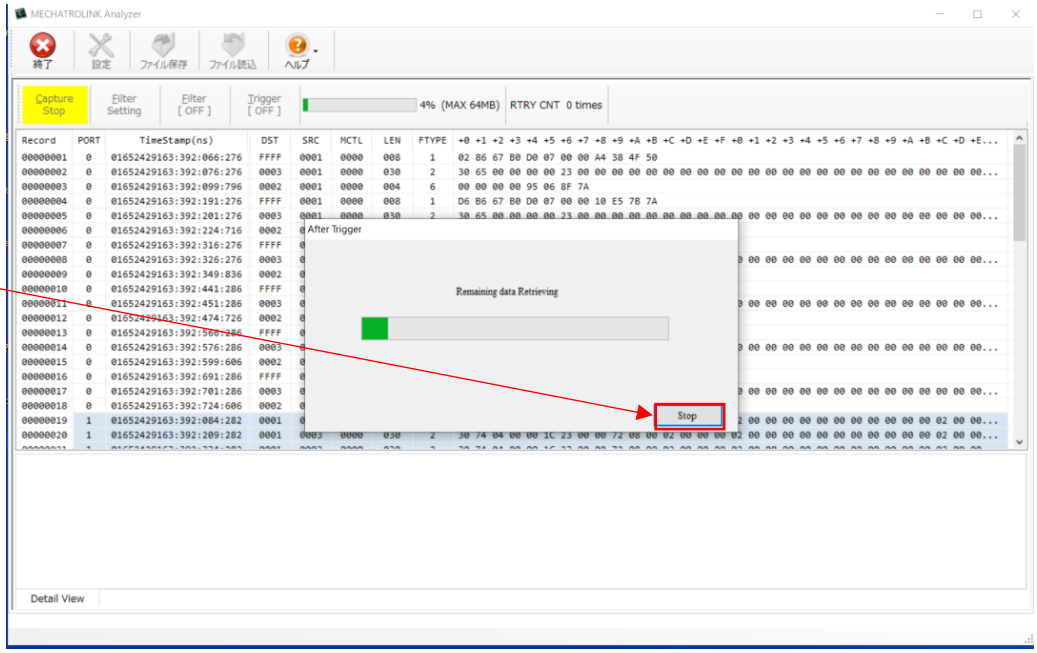
Trigger packets are displayed in the color set by the display color change.

[Note]
When using the litho trigger, use only one of the four analyzer ports (two systems).
If two systems are used at the same time, the litho trigger will not be able to detect the signals properly.

Cancel after trigger

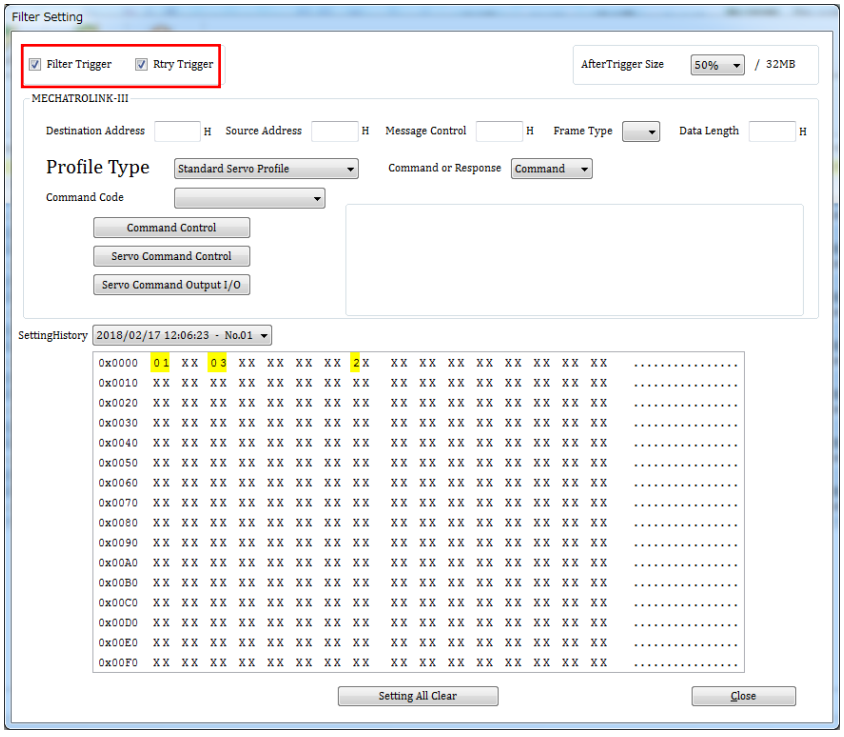
After-trigger acquisition can be interrupted by pressing the "Stop" button during after-trigger acquisition.

When interrupted, data up to the point of interruption will be displayed.



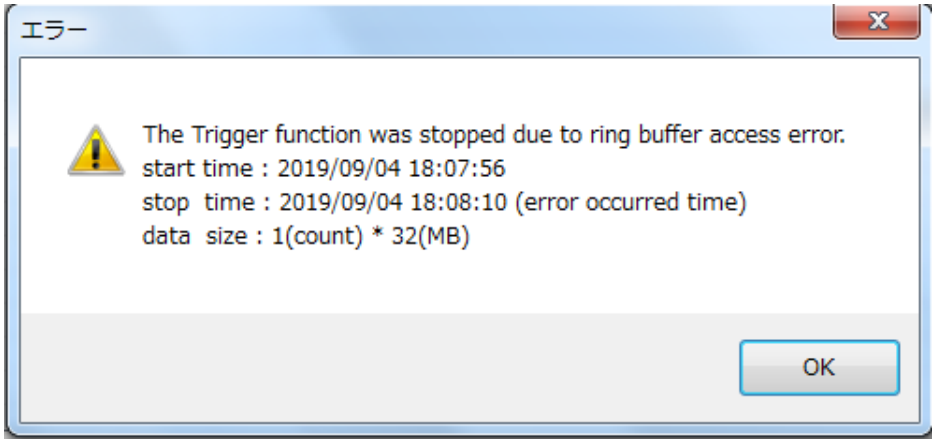
Simultaneous use of filter triggers and litho triggers

Triggering with both filter trigger and litho trigger checks ON will trigger when either one occurs.



Attention about filter trigger

If the following error is displayed during execution of a filter trigger, the filter trigger is aborted.



If this message appears, the following measures may improve the problem.

- Set the buffer size to the maximum (120MB).
- Quit other applications.
- Use MECHATROLINK Analyzer on a PC with high performance.

Capture data writing

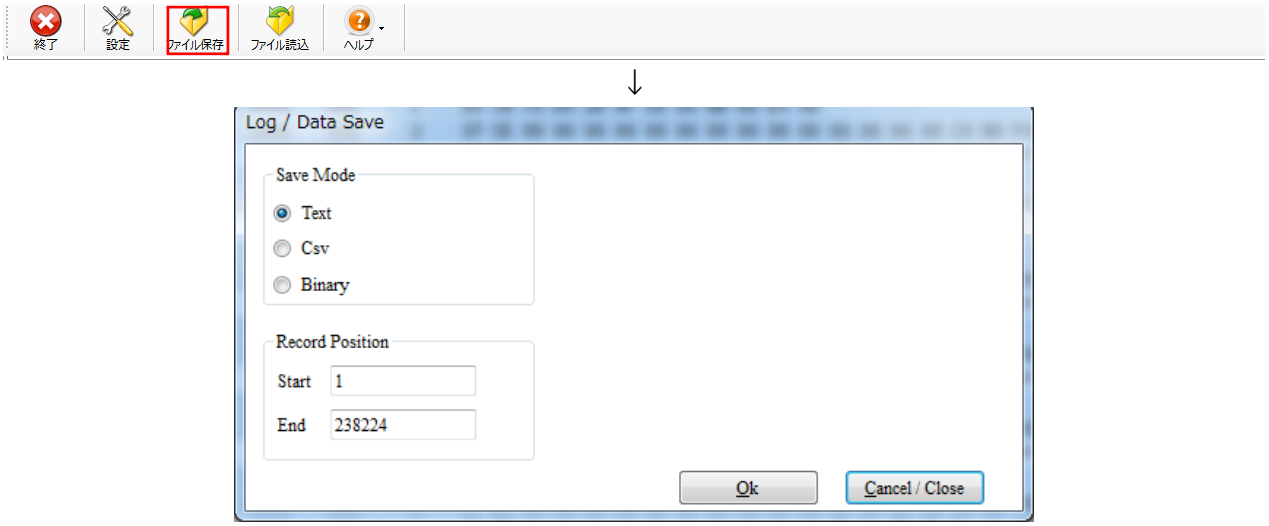
Captured data is stored in a various files can be output externally.

.txt

.csv

.bin

The export screen is displayed by clicking the "Save File" button.

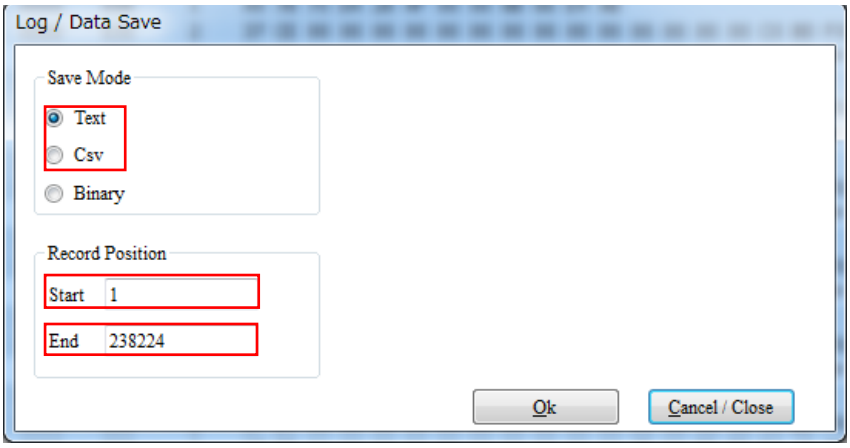


The "Save File" button is enabled only when there is capture data.

Enter the necessary information (Text or Csv or Binary and output start and end lines) on the "Log / Data Save" window and press the Ok button. The output can be sent to an external file..

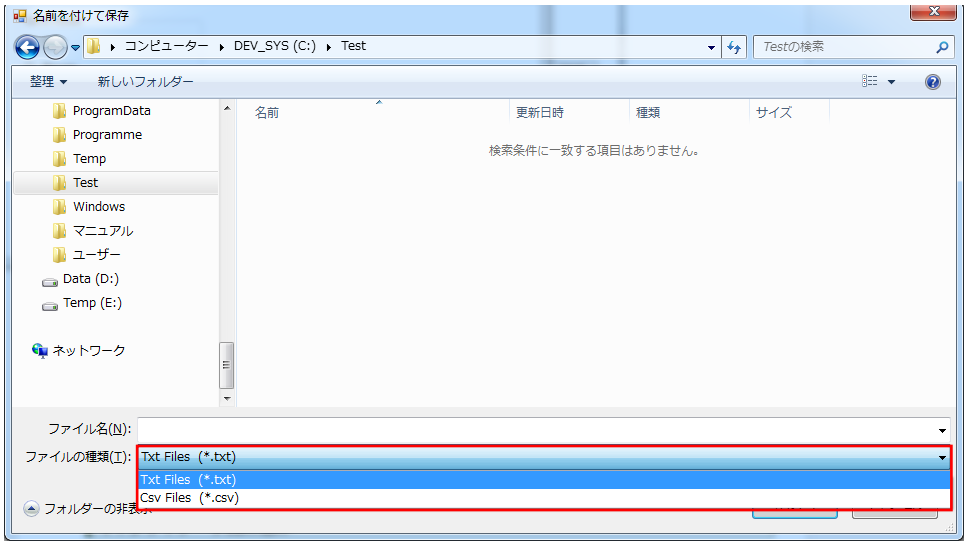
.txt .csv

Text saving is saved in a format that can be viewed in a text editor, EXCEL, etc.



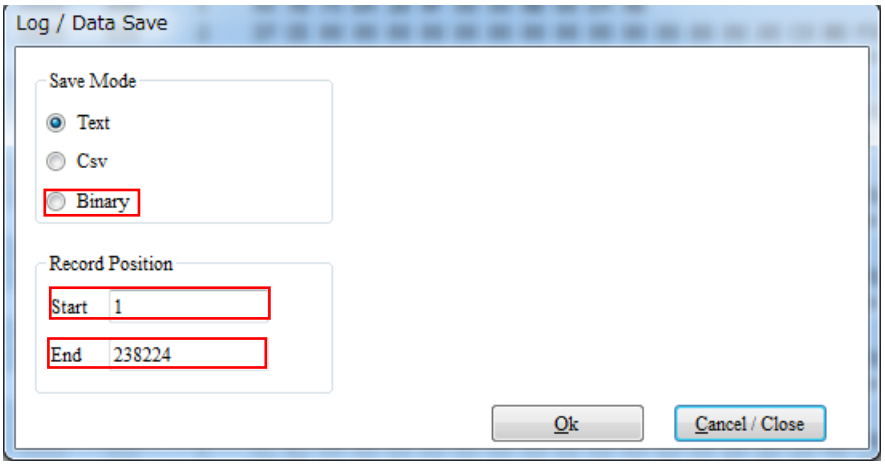
Set "Save Mode" to Text or Csv.
Next, set the Start and End lines of "Record Position" to
Set the start and end lines for output to an external file at Start and End of "Record Position" and press the Ok button.

A file save dialog will appear. Select the type of file you wish to save and set the desired folder and file name.



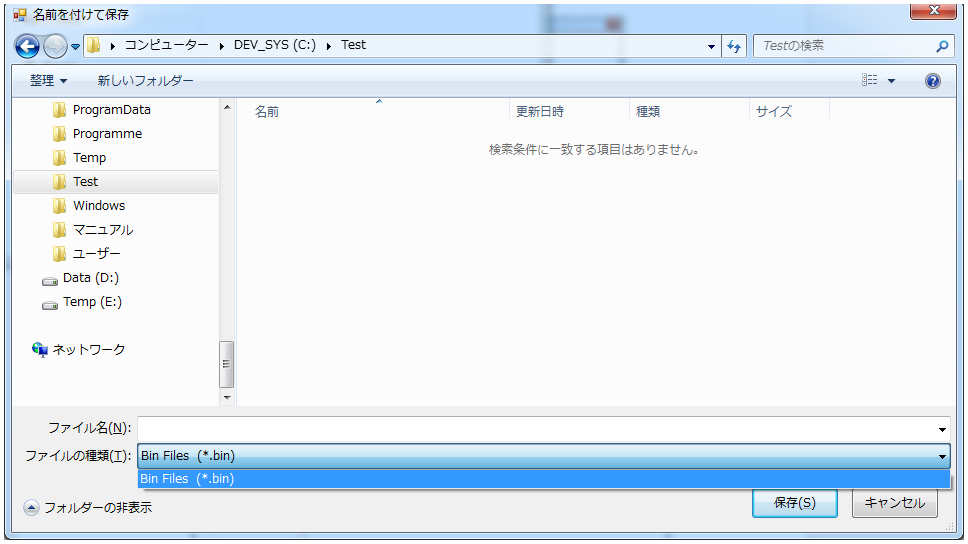
.Bin

Binary saving saves the image as it is displayed on the screen as a binary file.



Set "Save Mode" to Binary.
Next, set the Start and End fields of "Record Position" to the values you want to output to an external file, and press the Ok button.
Set the start and end lines for output to an external file at Start and End of "Record Position" and press the Ok button.

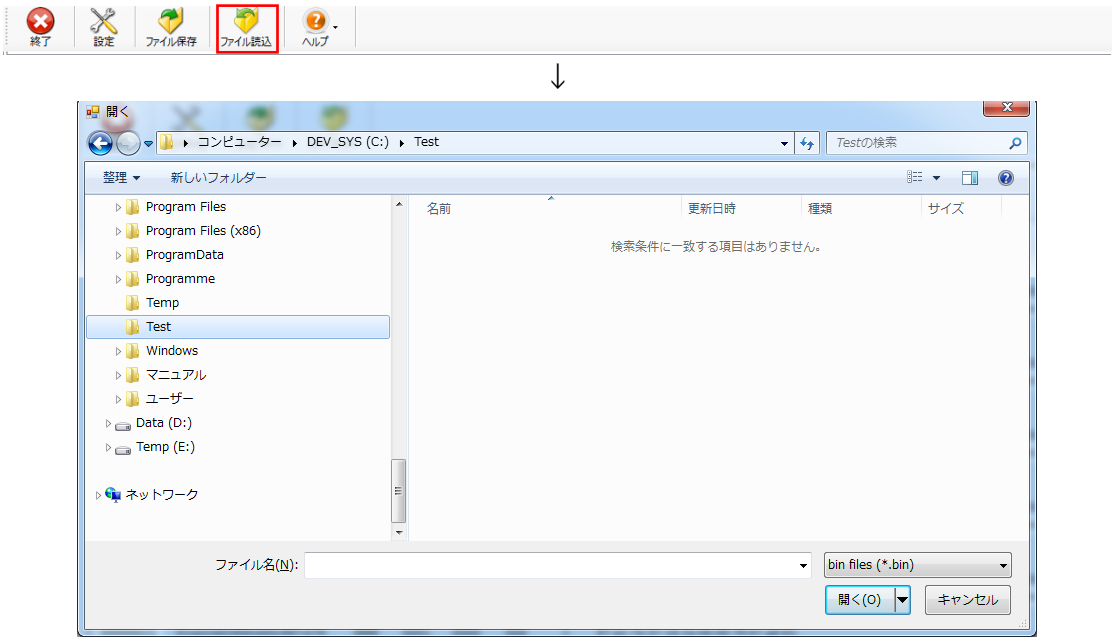
A file save dialog will appear. Set an arbitrary folder and file name, and save the file.



Open a Capture data

The saved .bin file is loaded and displayed on the screen.

Clicking the "Load File" button displays the "Load File" dialog box.



Specify any saved .bin file and press the "Open" button.

> The "Open file" button can be executed without "Connect to Device".

> After opening a file, filters and other functions equivalent to those normally available after the end of capture can be used.