



acontis technologies GmbH

SOFTWARE

EC-Lyser

User Manual

Version 4.1

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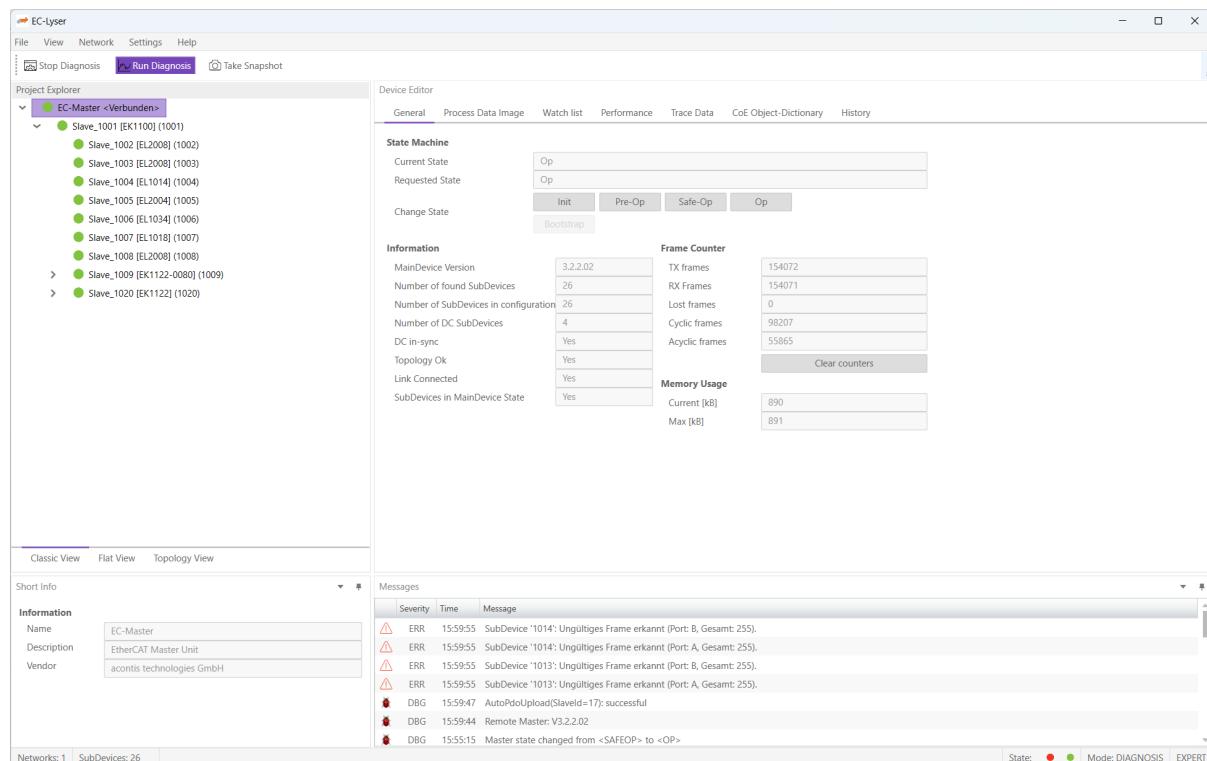
1 Introduction

Since this software is not intended to offend any sensibilities, the term MainDevice (abbreviated MainDevice) replaces “master” and SubordinateDevice (abbreviated SubDevice) replaces “slave”.

1.1 Overview

EC-Lyser is a diagnosis tool for EtherCAT networks that are controlled by the EC-Master.

The following screenshot shows the EC-Lyser:



Automated control systems usually require high availability of the whole system. Due to the rough industrial environment this is often hardly to achieve.

1.2 Features

MainDevice diagnosis

General:

Changing state of state machine

Reading count of SubDevices or frames, ...

Compare configured and found SubDevices (network mismatch analyzer)

Process Data Image:

See value of variables in a list view or chart view

Changing value of a variable

Object-Dictionary:

Reading/Writing values

SubDevice diagnosis

General (Changing state of state machine, reading or clearing current error state, downloading or uploading file over FoE, ...)

Variables:

See value of variables in a list view or chart view

Changing value of a variable

ESC Register:

Reading/Writing values

EEPROM Reading/Writing values

Extended Diagnosis:

Reading error or frame counters

CoE Object-Dictionary:

Reading/Writing values

ADS:

Reading/Writing values over AoE

1.3 Requirements

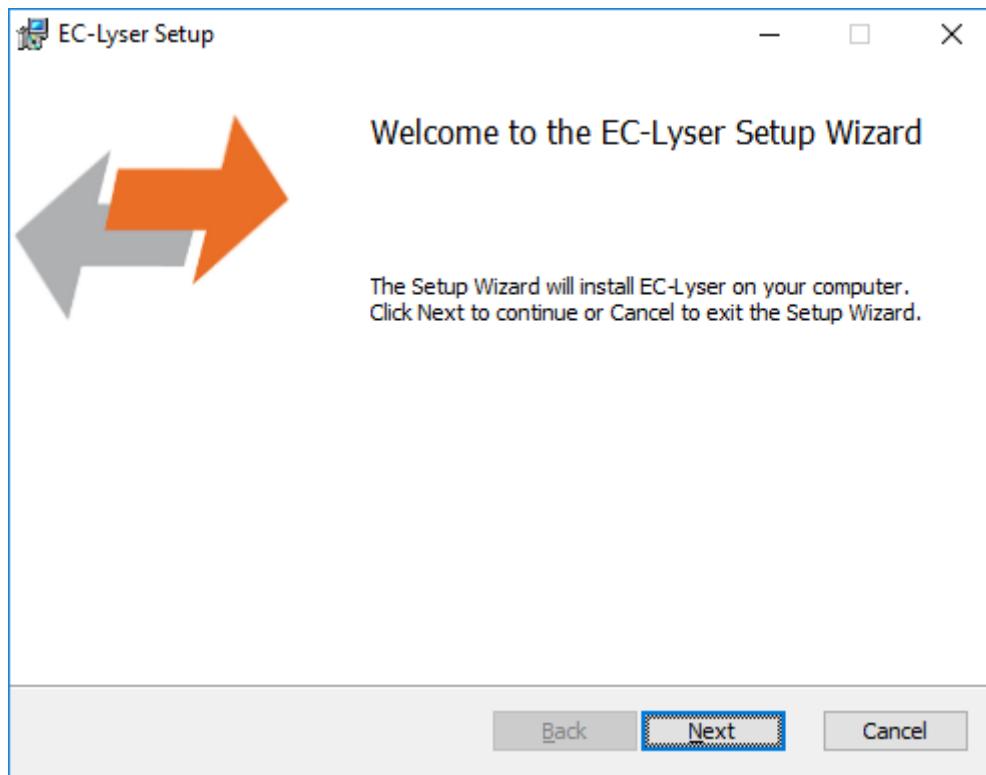
- Microsoft Windows 10 and above
- Microsoft .NET Framework 4 Client Profile
- Screen resolution at least 1024x768 pixel
- Memory as recommended for operating system
- Disk space approximately 80 MB (depend on number of ESI files)

2 Installation

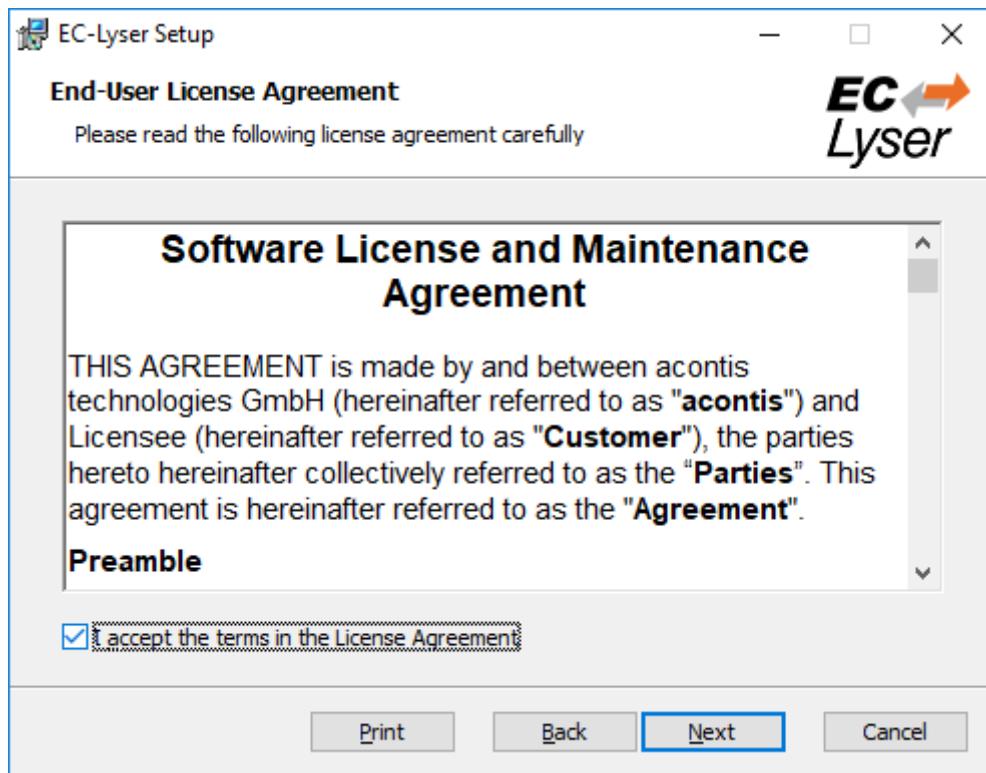
2.1 Setup Process

The EC-Lyser can be installed by executing the `setup.exe` (requires administrator privileges) and follow the screen instructions:

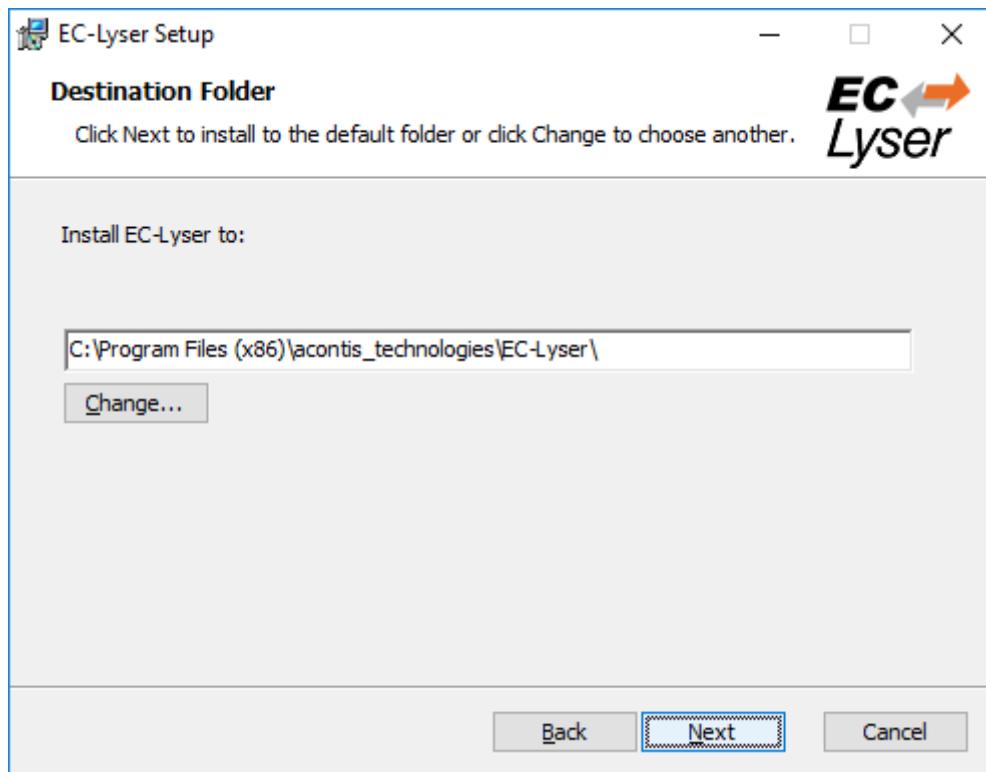
Welcome page:



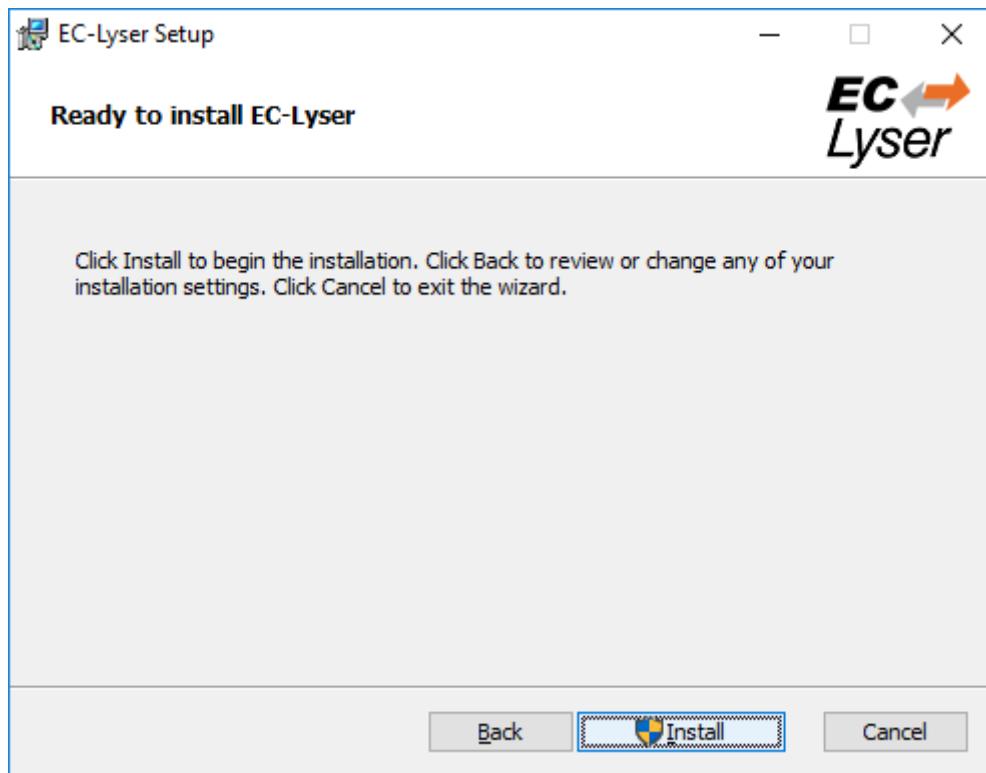
License Agreement:



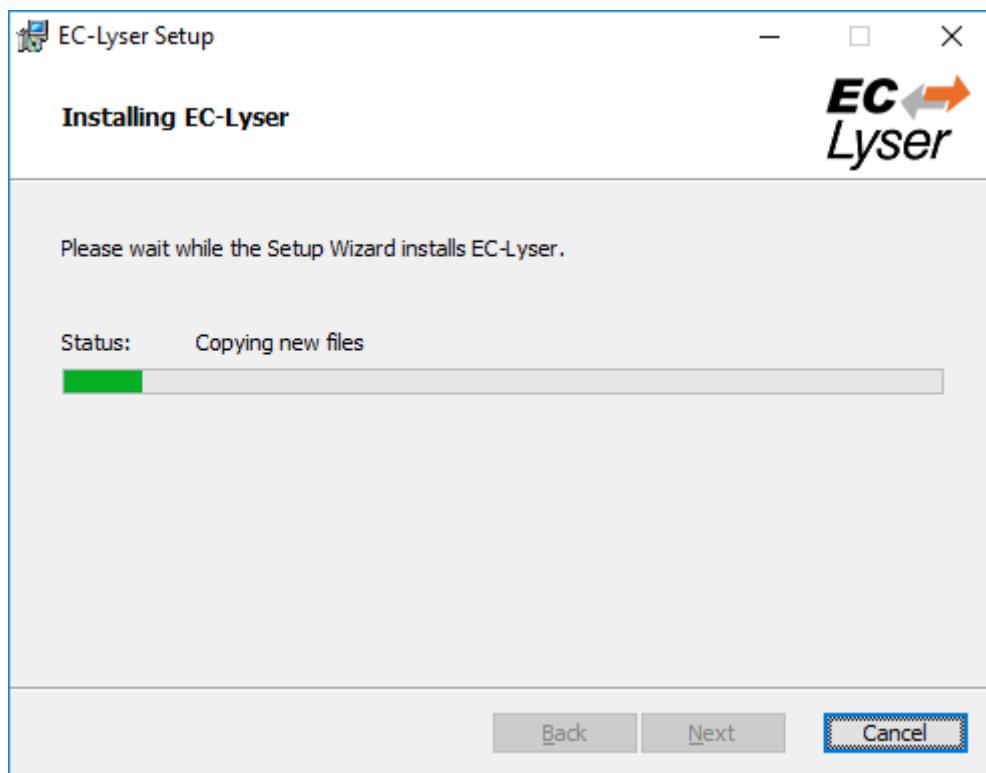
Select Installation Folder:



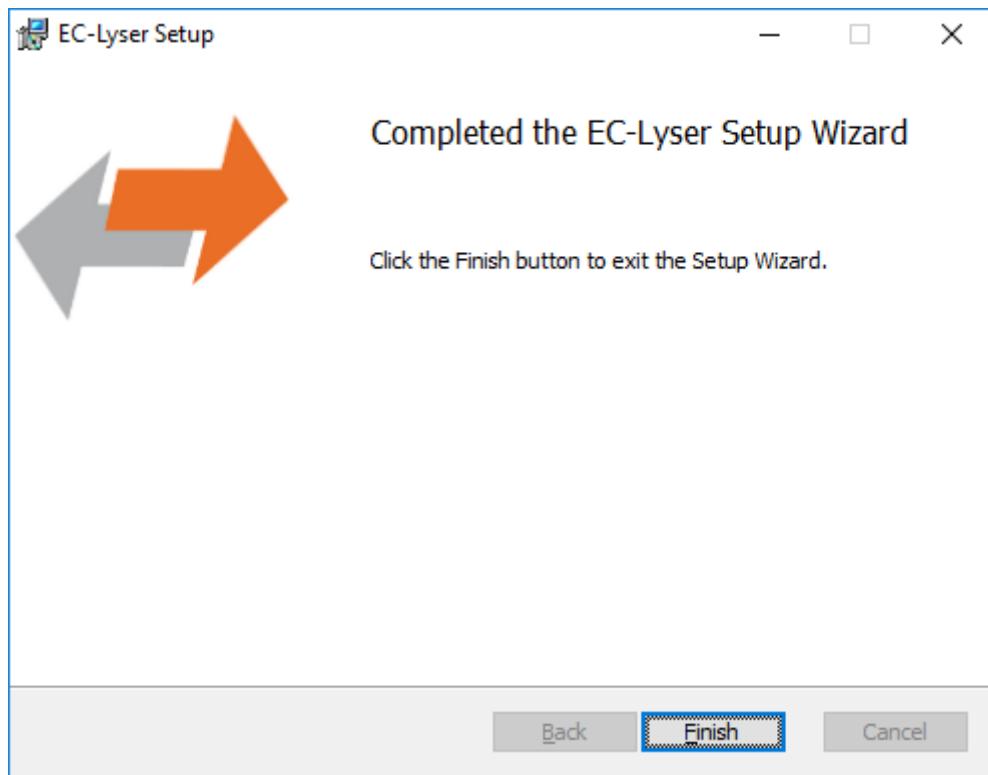
Confirm Installation:



Installing:



Installation Complete:



2.2 Silent Installation (optional)

The EC-Lyser can be also installed in silent mode by using the command line parameters of `msiexec`.

Sample 1: Installs EC-Lyser into default installation folder

```
PS C:
  > msiexec /i c:/temp/ECLyserSetup.msi /quiet /qn /norestart /log
  ↳ c:/temp/install.log
```

Sample 2: Installs EC-Lyser into “C:/EC-Lyser”

```
PS C:
  > msiexec /i c:/temp/ECLyserSetup.msi /quiet /qn /norestart /log
  ↳ c:/temp/install.log INSTALLLOCATION="C:/EC-Lyser"
```

For more information please refer command line parameters of `msiexec`.

Note: The system requirements (see section “1.3”) will be not checked!

2.3 File and Folder Structure

The setup process will copy all necessary files into the following folder:

Installation directory:

```

/Doc
    Release notes and the user manual

/EEC
    Files for mapping emergency error codes

/Languages
    Lanugage specific files

/
    • EC-Lyser.exe
    • EcWrapper.dll
    • ...

```

All users directory: (%ALLUSERSPROFILE%/EC-Lyser, like C:/ProgramData/EC-Lyser)

```

/CAPTURE
    Capture files which can be analysed in offline diagnosis mode (see Capture File)

/EMI
    EtherCAT MainDevice Information files

/EtherCAT
    EtherCAT SubDevice Information (ESI) Files. Can be modified via ESI-Manager

/
    • ESICache.xml (ESI-File-Cache for faster access of ESI files)

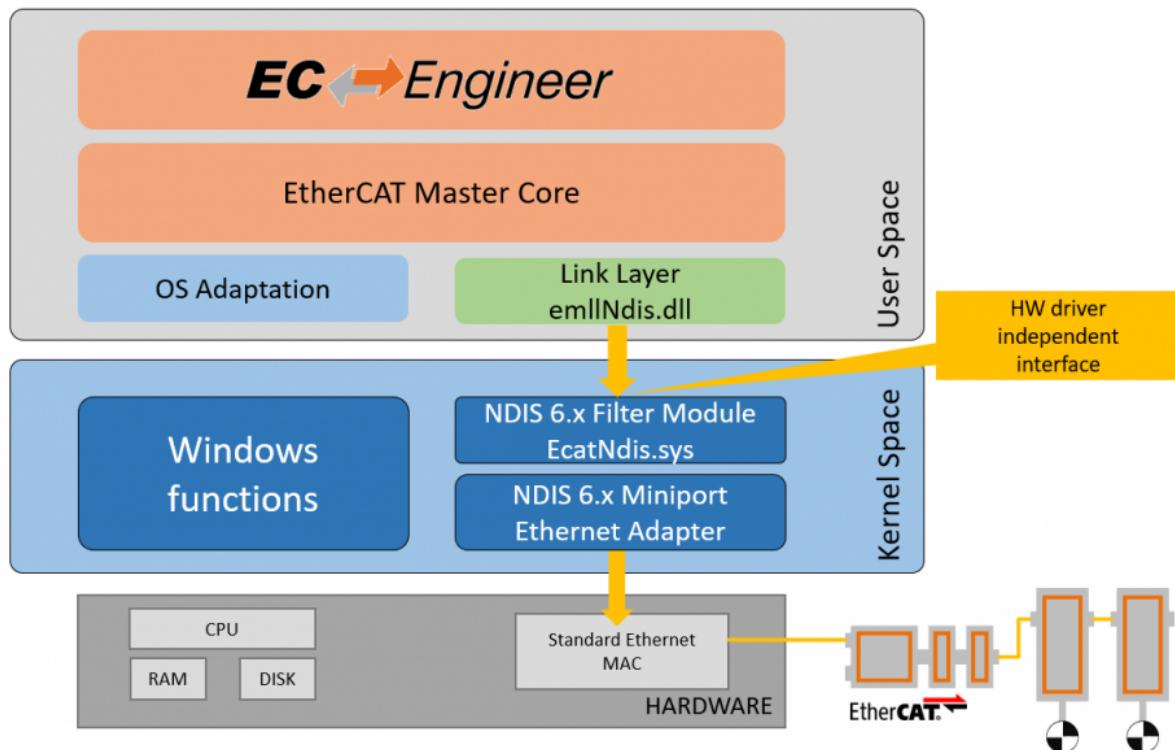
        – EC-Lyser.log (Log File)
        – User.myusername.xml (User specific settings)

```

2.4 NDIS Driver

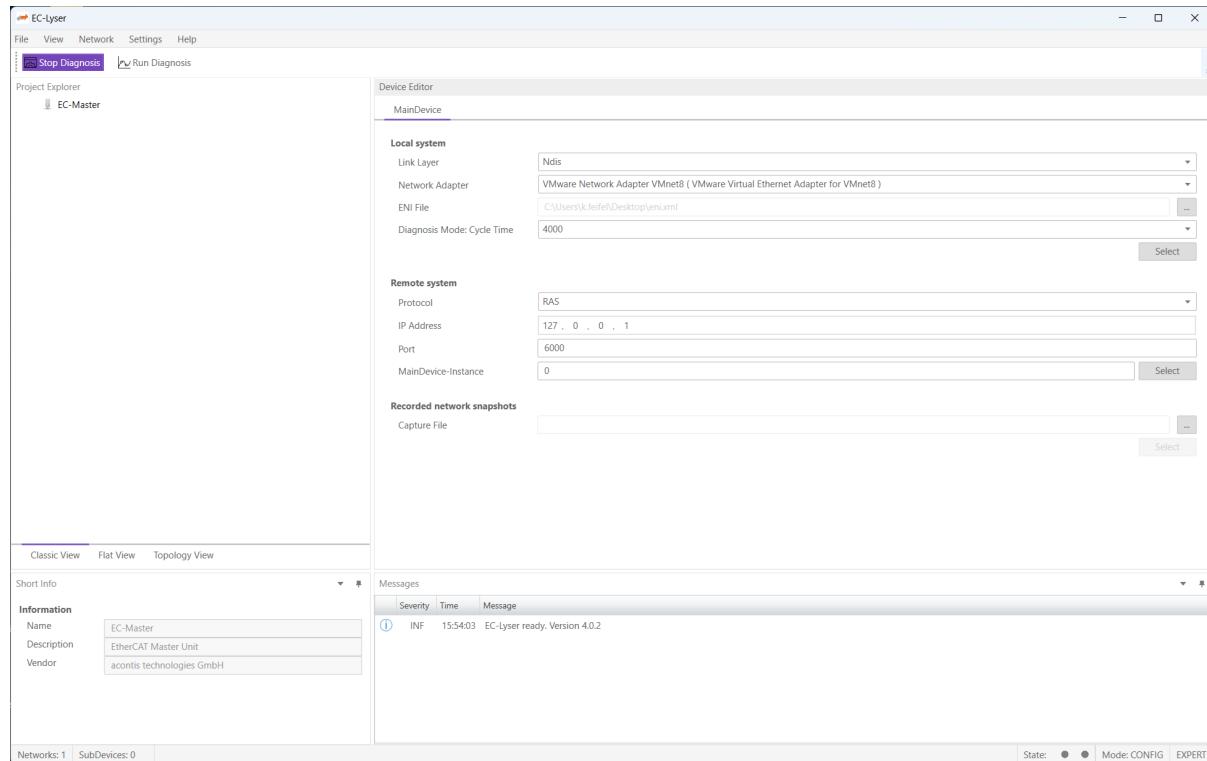
The Network Driver Interface Specification (NDIS) is the specification for a network driver architecture that allows transport protocols like TCP/IP to communicate with an underlying physical network adapter. For sending and receiving EtherCAT frames in Windows, EC-Lyser makes use of the well-known Windows packet capture library, WinPcap. However, WinPcap was based on the NDIS 5.x driver model, and development has ceased. The latest versions of Windows 10 do not support this old NDIS 5.x version anymore, so now EC-Lyser (V3.2 and higher) includes an installation package in the install directory of EC-Lyser to install the acontis NDIS 6.x Filter Module `EcatNdis.sys`. With this new Filter Module and the new NDIS Link Layer `emllNdis.dll`, it is now possible for EC-Lyser to work without WinPcap on all Windows 10 versions.

Note: Please restart EC-Lyser after the NDIS installation.



3 Getting Started

For a better usability, the product comes up with a start page, where the user can adjust the cycle time and decide if he wants to connect to the local or remote control system or to load data from a capture file.



General:

Cycle Time:

Interval in microseconds in which all EtherCAT commands will be sent from the MainDevice. The user can choose between the following values: 125, 250, 500, 1000, 2000 and 4000.

SubDevices connected to local system:

Network Adapter:

Network adapter which is connected to the control system

ENI File:

Path to the EtherCAT Network Information (ENI) file (for more information about the ENI file, please refer the manual of EC-Engineer)

SubDevices connected to remote system:

Protocol: Protocol of the remote system

- RAS (Default port is 6000)
- **Mailbox Gateway (Default port is 34980)**
 - EC-Master V3.0.1.22 and above
 - TwinCAT 3.1.4024 or TwinCAT 3.1.4022.30 and above

IP Address: IP address of the remote system, which is connected to the control system
Port: Port of the remote system, which is connected to the control system
MainDevice-Instance: Used to determine which MainDevice instance should be used in the remote system (MainDevice supports up to 10 instances).

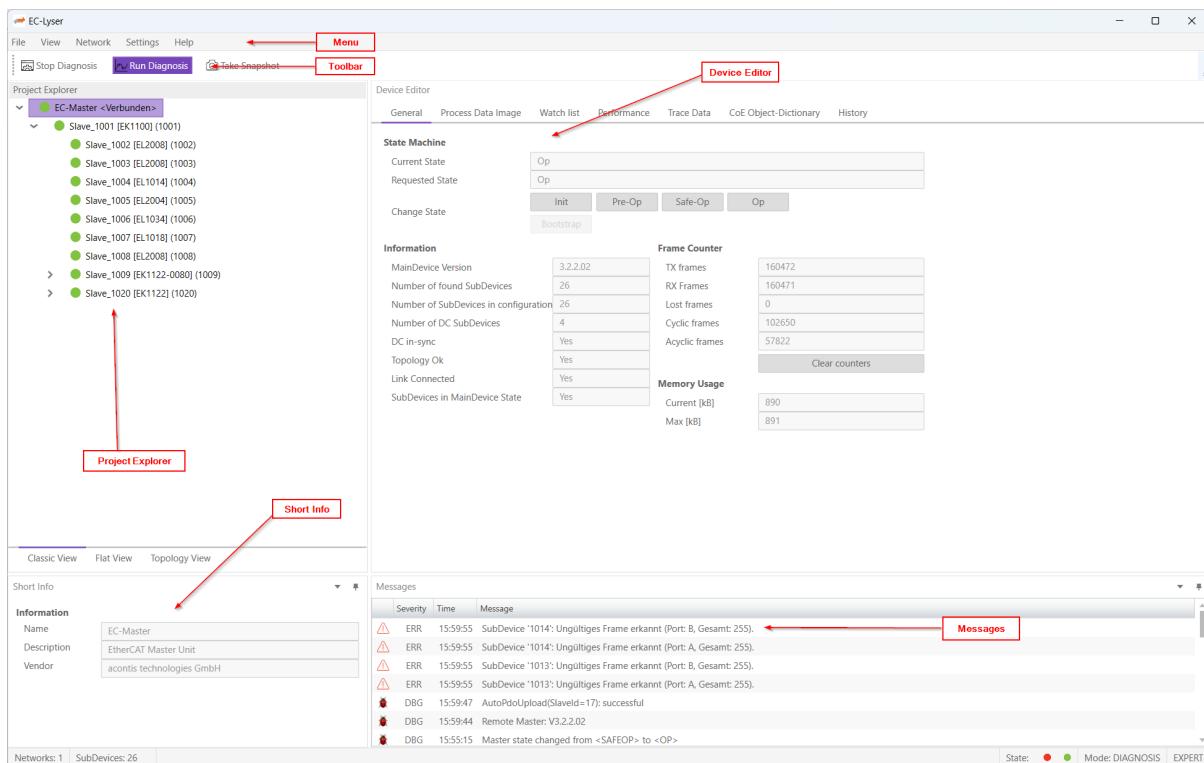
Data to load from capture file:

Capture File: Path to the capture file, which contains one or more snapshots

4 Graphical user interface

4.1 Overview

This section gives an overview about the graphical user interface:



The graphical user interface is divided into five parts:

Menu/Tool/Status bar:

Shows current status or mode of the EC-Lyser and allows the user to change it.

Project Explorer:

Shows different views of the current network configuration

Device Editor:

Show information about the selected device, like process variables.

Short Info:

Show short information about selected device, like name, description or vendor.

Messages:

Shows notifications which occur e.g. when the EtherCAT Device has changed its operation state or a SubDevice has been removed from (or added to) the EtherCAT network.

4.2 Menu/Tool/Status bar

4.2.1 File

ESI-Manager:

Add, delete or export ESI and SCI files (see: [ESI-Manager](#))

Exit:

Closes the EC-Lyser

4.2.2 View

Message Window:

Shows/Hides the message window

Short-Info Window:

Shows/Hides the short-info window

Expert Tabs:

(De-)Activates expert mode

Motion Tabs:

(De-)Activates motion mode

Refresh:

Updates the current view

4.2.3 Network

Network Mismatch Analyzer (active only in diagnosis mode):

Compares the configured SubDevices with the connected SubDevices. See [Network Mismatch Analyzer](#)

Line Crossed Analyzer (active only after scan):

Shows wrong connected SubDevices. See [Line Crossed Analyzer](#)

Inspection Report (active only in diagnosis mode):

Opens a statistic about the state of the network. Collects some useful data like error counters and so on.

Possibility to print a PDF. See [Inspection Report](#)

Hardware Diagnostics:

Enables or disables the additional hardware diagnostics and warnings in project explorer.

Acknowledge all warnings (active only in diagnosis mode):

Clears the yellow warning icon of all SubDevices

Clear Error Counters (active only in diagnosis mode):

Clears the error counters of all connected SubDevices (for more information about the extended diagnosis, see [Extended Diagnosis](#))

Take Snapshot:

Takes a snapshot from the current diagnosis state and saves it into a capture file (for more information about the snapshots and capture files, see [Capture File](#))

Automatic Snapshot Mode:

Activates the automatic snapshot mode to take snapshots based on the configured rules

Snapshot:

Changes the active snapshot

EoE Endpoint Configuration (active only for local or remote system):

Activates EoE Endpoint support in diagnosis mode

4.2.4 Settings

Message Level:

Change the current message level

Settings:

Shows more settings in the dialog *Settings*

4.2.5 Help

Show User Manual:

Shows this user manual

Show Log File:

Shows the log file

Check for updates:

Enable / disable automatic update check (once per month). Also a manual update check is performed on activation.

About ...:

Show the about dialog

4.3 Project Explorer

4.3.1 Drag and Drop

It is possible to drag and drop files here to import/open them

Project file

Opens the configuration stored in the ECC, only one project file can be imported at a time.

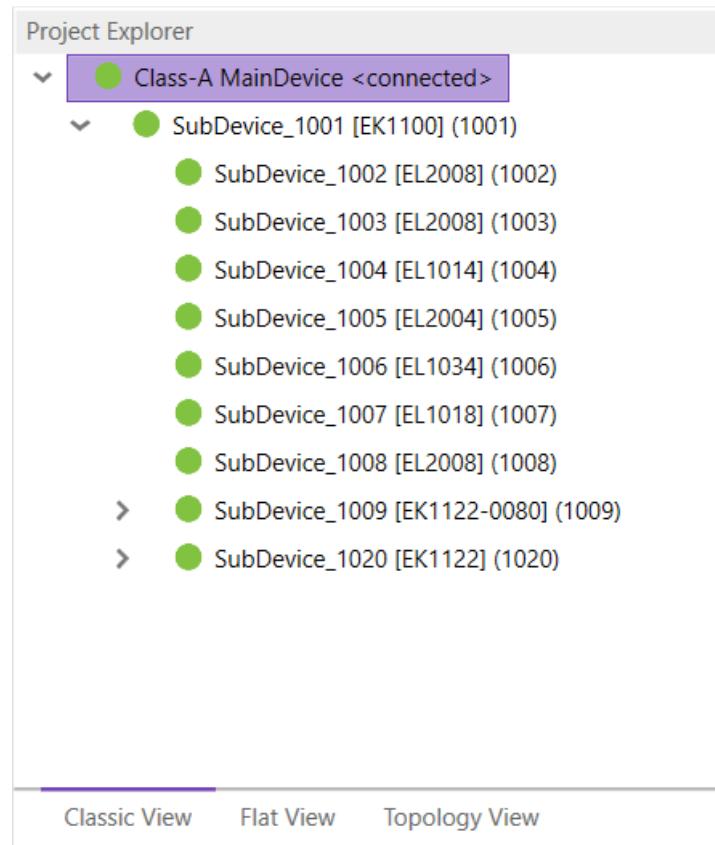
ESI files

Adds the files to the ESI-Manager, it only allows ESI, SCI and ZIP files, multiple files are allowed.

4.3.2 Diagnosis Mode

There are three topology visualisation views:

Classic View

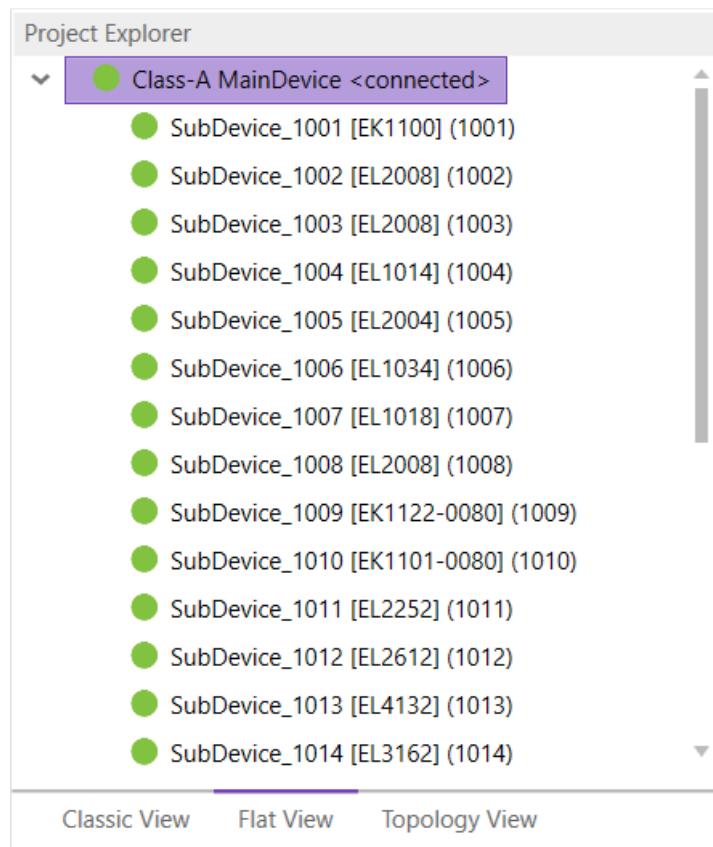


This is a tree view with multiple levels.

Possible device states:

- Init Bootstrap
- Pre-Op
- Safe-Op
- Op

Flat View

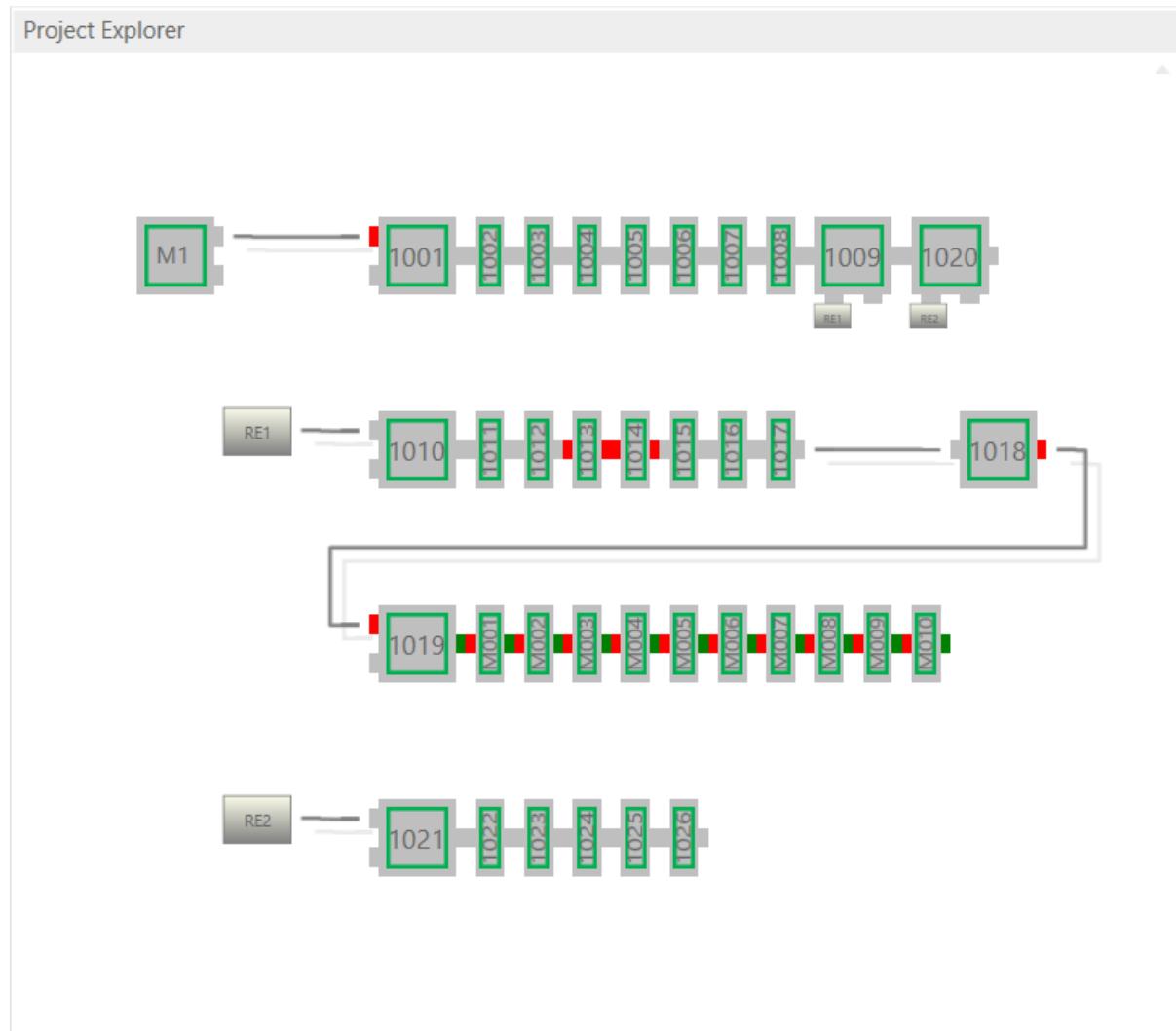


This view shows all SubDevices in a flat list, as they are connected in the EtherCAT network.

Possible device states:

- Init Bootstrap
- Pre-Op
- Safe-Op
- Op

Topology View



This view shows a graphical tree of all SubDevices, as they are connected in the EtherCAT network.

Possible device states:

- Init Bootstrap
- Pre-Op
- Safe-Op
- Op

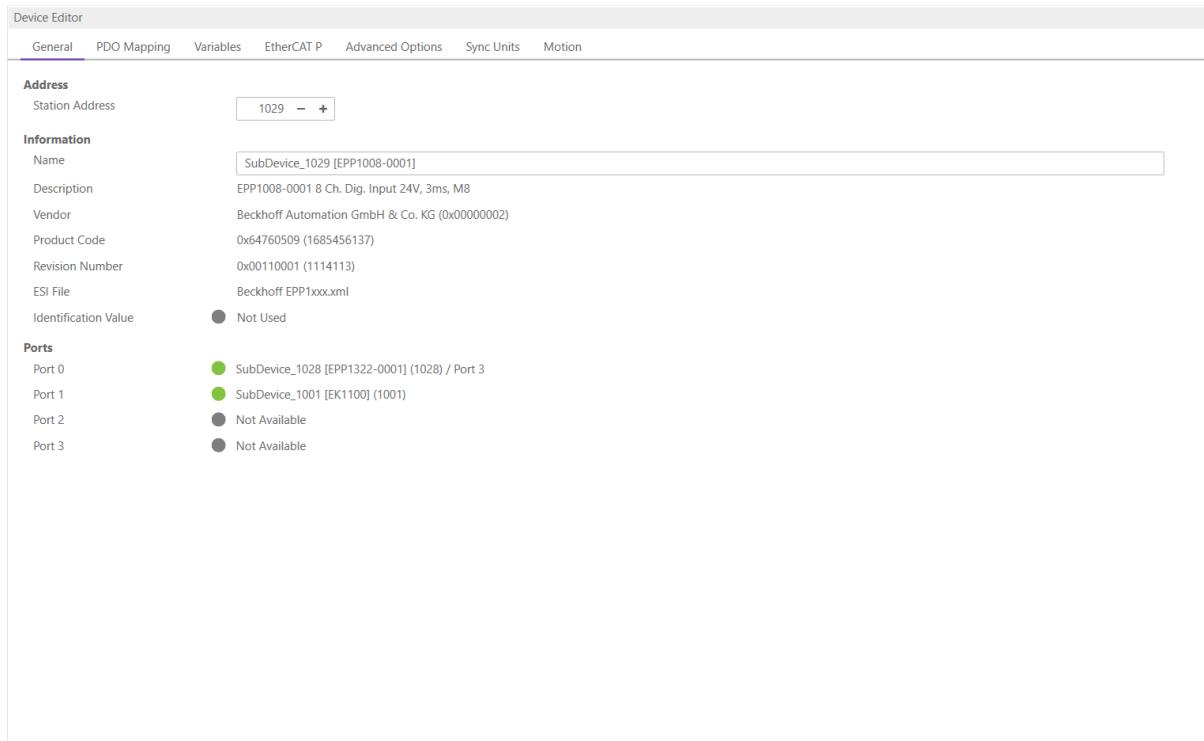
Possible port states:

- Bad Cable Quality
- Constricted Cable Quality
- Good Cable Quality

If cable quality is constricted or bad, please check the error counters of the SubDevice (for more information about the extended diagnosis, see [Extended Diagnosis](#)).

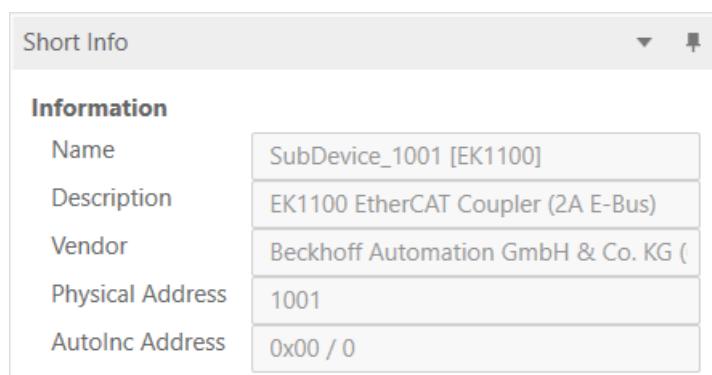
4.4 Device Editor

This Editor gives the user the possibility to read and write information of the selected device or SubDevice:



4.5 Short Info

This window shows short information about selected device, like name, description or vendor:



4.6 Message Window

Shows notifications which occur e.g. when the EtherCAT MainDevice has changed its operation state or a SubDevice has been removed from (or added to) the EtherCAT network:

Messages		
Severity	Time	Message
① INF	14:24:55	MainDevice state change from 'Init' to 'Pre-Op'
① INF	14:24:51	MainDevice state change from 'Unknown' to 'Init'
① INF	14:24:51	MainDevice state change from 'Unknown' to 'Init'
① INF	14:24:49	Network scan successful - 26 SubDevices found
① INF	14:21:03	MainDevice state change from 'Unknown' to 'Init'

5 Diagnosis

5.1 Overview

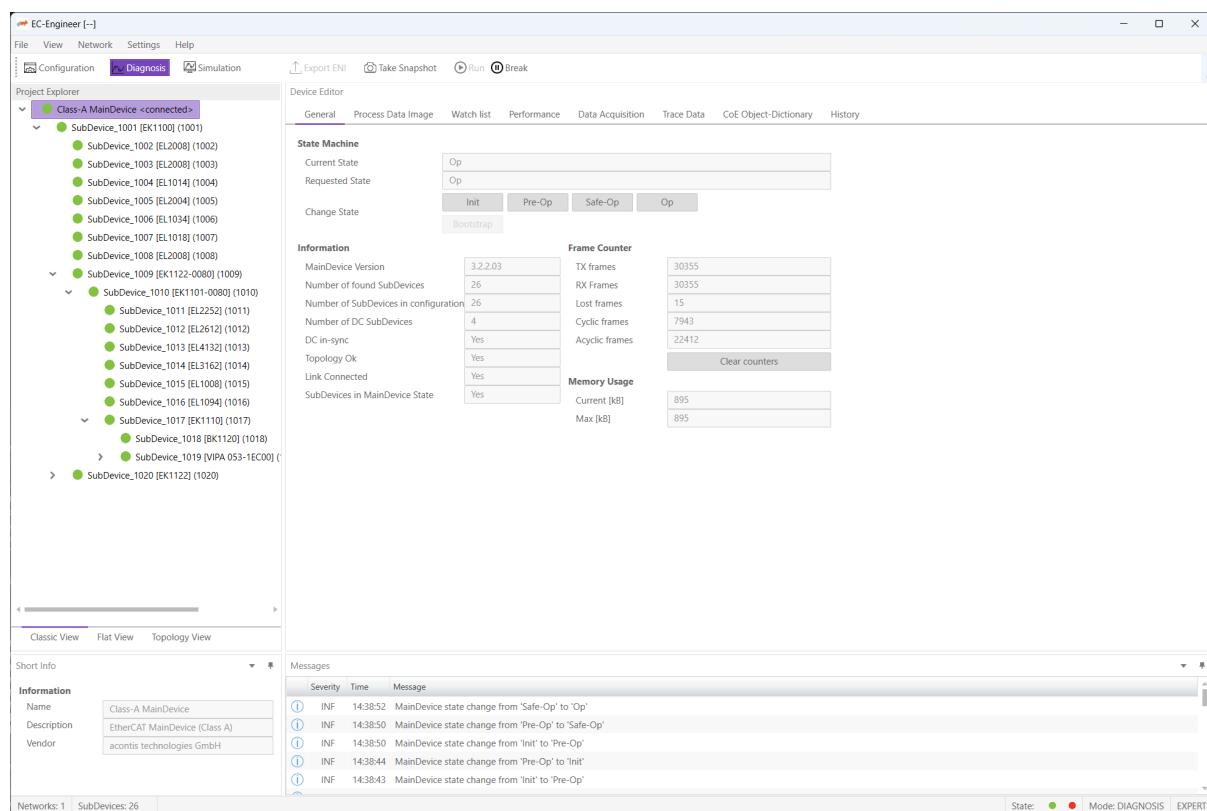
EC-Lyser is a diagnosis application specifically developed to analyze EtherCAT networks that are controlled by an EtherCAT MainDevice. Automated control systems usually require high availability of the whole system. Due to the rough industrial environment this is often hardly to achieve.

If high availability shall be guaranteed for an automated control system it is important to verify and maintain the field bus. Using EC-Lyser it is possible to take a look into the “health” of the EtherCAT system. Detection of signs of system degradation prior to running into a system failure will be of great benefit. In that case it is possible to exchange the problematic components (cables, SubDevice devices).

Many aspects of diagnosis are covered by the EC-Lyser:

- System analysis and maintenance
- Error detection
- Documentation

After switching into diagnosis mode of EC-Lyser, the user will see this page:

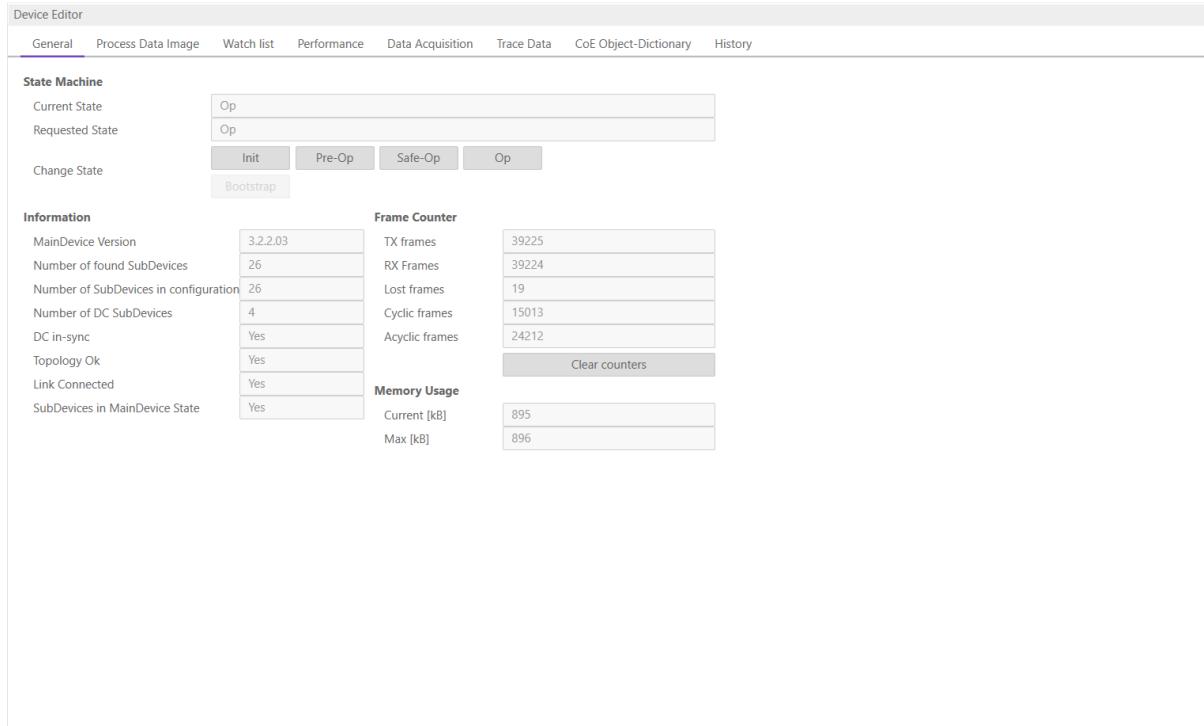


5.2 Device

This section shows the current “health” state of the MainDevice and helps the user to analyze MainDevice related problems.

5.2.1 General

In this tab, the user can see the current state of the state machine of the MainDevice. He has also an overview over the current “health” state of his EtherCAT network:



The screenshot shows the 'Device Editor' interface with the 'General' tab selected. The 'State Machine' section displays the current state as 'Op', requested state as 'Op', and available change states: 'Init', 'Pre-Op', 'Safe-Op', 'Op', and 'Bootstrap'. The 'Information' section provides details about the MainDevice, including its version (3.2.2.03), the number of found SubDevices (26), and the number of SubDevices in configuration (26). It also shows the number of DC SubDevices (4), DC in-sync (Yes), Topology Ok (Yes), Link Connected (Yes), and SubDevices in MainDevice State (Yes). The 'Frame Counter' section tracks TX frames (39225), RX Frames (39224), Lost frames (19), Cyclic frames (15013), and Acyclic frames (24212). A 'Memory Usage' section shows current and maximum memory usage in kB (895 and 896 respectively). A 'Clear counters' button is also present in the frame counter area.

State Machine

Current State:

Current state of the MainDevice

Requested State:

Requested state of the MainDevice

Change State:

MainDevice can reach the states INIT, PRE-OP, SAFE-OP and OP.

Information

Device version:

Version number of the running MainDevice

Number of found SubDevices:

Number of SubDevices, which were found from device on the network

Number of SubDevices in configuration:

Number of SubDevices, which are configured in the ENI file

Number of DC SubDevices:

Number of SubDevices with DC support, which were found from MainDevice on the network

DC in-sync:

Signals that all SubDevices with DC support are correctly synchronized or not. If not all SubDevices are correctly synchronized, please refer the [Message Window](#) for more information.

Topology OK:

Signals that topology is “okay” or not. If topology is not “okay”, you have a mismatch between the configured bus and the currently connected bus. Please open the ‘Network Mismatch Analyzer’ (Menu Network Network Mismatch Analyzer) to solve the problem.

Link Connected:

Signals the link is connected.

SubDevices in MainDevice State:

Signals that all SubDevices are in MainDevice state.

Frame Counter**TX frames:**

Number of sent frames

RX frames:

Number of received frames

Lost frames:

Number of lost frames

Cyclic frames:

Number of cyclic frames

Acyclic frames:

Number of acyclic frames

Memory Usage**Current:**

Current memory usage in bytes

Max:

Maximum memory usage in bytes

5.2.2 Process Data Image

In this tab, the user can see and change the values of the process variables. The variables will be forced to the value the user entered. The user can press release to release the variable. If one or two variables are selected, a chart of the values is shown. Also resize and zoom is possible to see more details. The chart will be updated every 250 milliseconds:

Name	Datatype	Offset	Size	Value	Forced
SubDevice_1018 [BK1120].Status PDO.CouplerState	UINT	IN : 0.0	2.0	128 (0x80)	<input type="checkbox"/>
SubDevice_1018 [BK1120].TxPDO Mapping Terminal 003.Channel 1	BOOL	IN : 2.0	0.1	0	<input type="checkbox"/>
SubDevice_1018 [BK1120].TxPDO Mapping Terminal 003.Channel 2	BOOL	IN : 2.1	0.1	0	<input type="checkbox"/>
SubDevice_1019 [VIPA 053-1EC00].Inputs.Hardware Interrupt Counter	UDINT	IN : 4.0	4.0	0 (0x00)	<input type="checkbox"/>
SubDevice_1019 [VIPA 053-1EC00].Inputs.Diagnostic Interrupt Counter	UDINT	IN : 8.0	4.0	0 (0x00)	<input type="checkbox"/>
SubDevice_1019 [VIPA 053-1EC00].Module 2 (021-1BD00).Inputs.DI 0	BOOL	IN : 12.0	0.1	0	<input type="checkbox"/>
SubDevice_1019 [VIPA 053-1EC00].Module 2 (021-1BD00).Inputs.DI 1	BOOL	IN : 12.1	0.1	0	<input type="checkbox"/>
SubDevice_1019 [VIPA 053-1EC00].Module 2 (021-1BD00).Inputs.DI 2	BOOL	IN : 12.2	0.1	0	<input type="checkbox"/>
SubDevice_1019 [VIPA 053-1EC00].Module 2 (021-1BD00).Inputs.DI 3	BOOL	IN : 12.3	0.1	0	<input type="checkbox"/>
SubDevice_1019 [VIPA 053-1EC00].Module 4 (040-1BA00).Inputs.Status byte	USINT	IN : 13.0	1.0	136 (0x88)	<input type="checkbox"/>
SubDevice_1019 [VIPA 053-1EC00].Module 4 (040-1BA00).Inputs.Input byte 1	USINT	IN : 14.0	1.0	0 (0x00)	<input type="checkbox"/>
SubDevice_1019 [VIPA 053-1EC00].Module 4 (040-1BA00).Inputs.Input byte 2	USINT	IN : 15.0	1.0	0 (0x00)	<input type="checkbox"/>

It is also possible to add the variables to a watch list (next chapter).

5.2.3 Watch list

In this tab, the user can monitor selected variables. He can go through the SubDevices and add variables to the watch list to monitor them. The user can also export or import the watch list, so changes can be saved:

Device Editor

General Process Data Image Watch list Performance Data Acquisition Trace Data CoE Object-Dictionary History

Variables

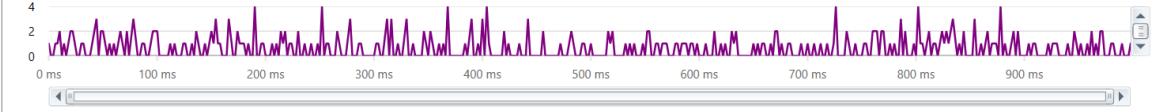
Name Datatype Offset Size Value Forced

SubDevice_1014 [EL3162].Channel 1.Value	INT	IN:	158.0	2.0	1	<input type="checkbox"/>
SubDevice_1011 [EL2252].Channel 1.TriState	BOOL	OUT:	166.1	0.1	0	<input type="checkbox"/>

Release all Export

Save watch list Load watch list Remove from watch list

Chart



Value: 1 Force Release

5.2.4 Performance

This tab is split into two sub tabs. On one the user can see the busload per cycle and per second:

Device Editor

General Process Data Image Watch list Performance Data Acquisition Trace Data CoE Object-Dictionary History

CPU Load Busload

Busload

CycleTime [us] Bytes per cycle Bytes per second

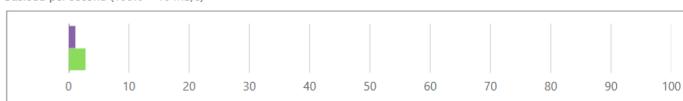
2000	Average 313	Average 113205
	Max 2025	Max 284228

Reset

Busload per cycle (100% = 20000 B/Cycle)

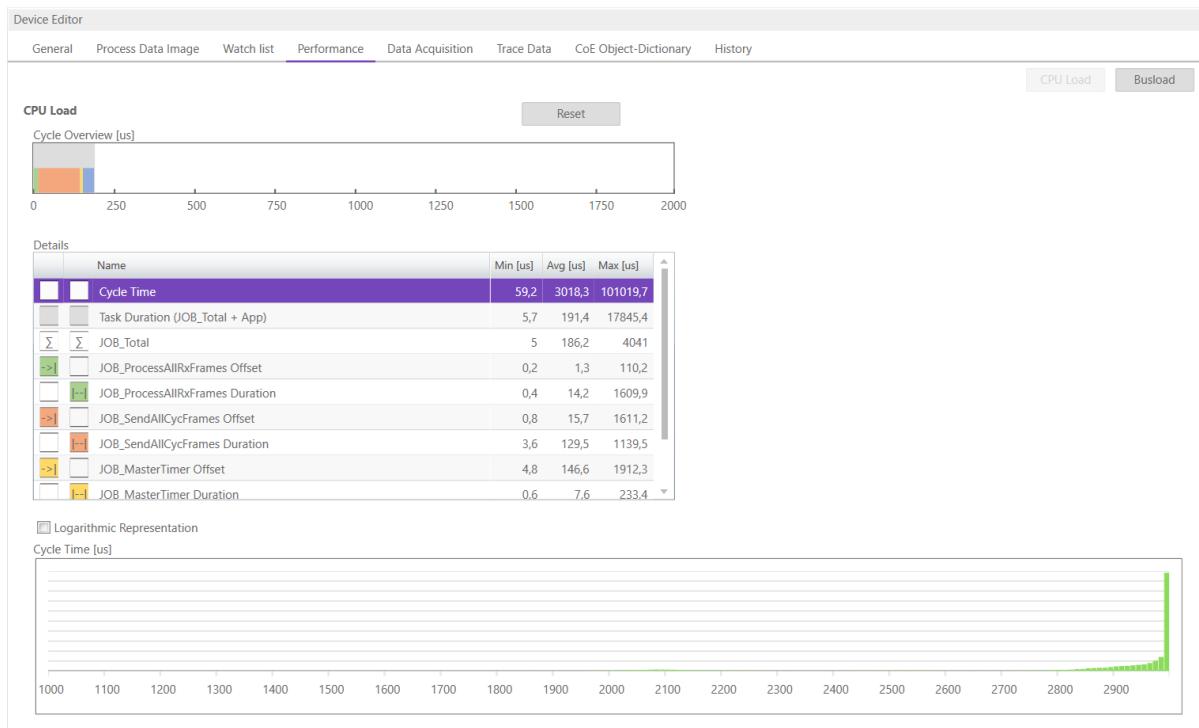


Busload per second (100% = 10 MB/s)



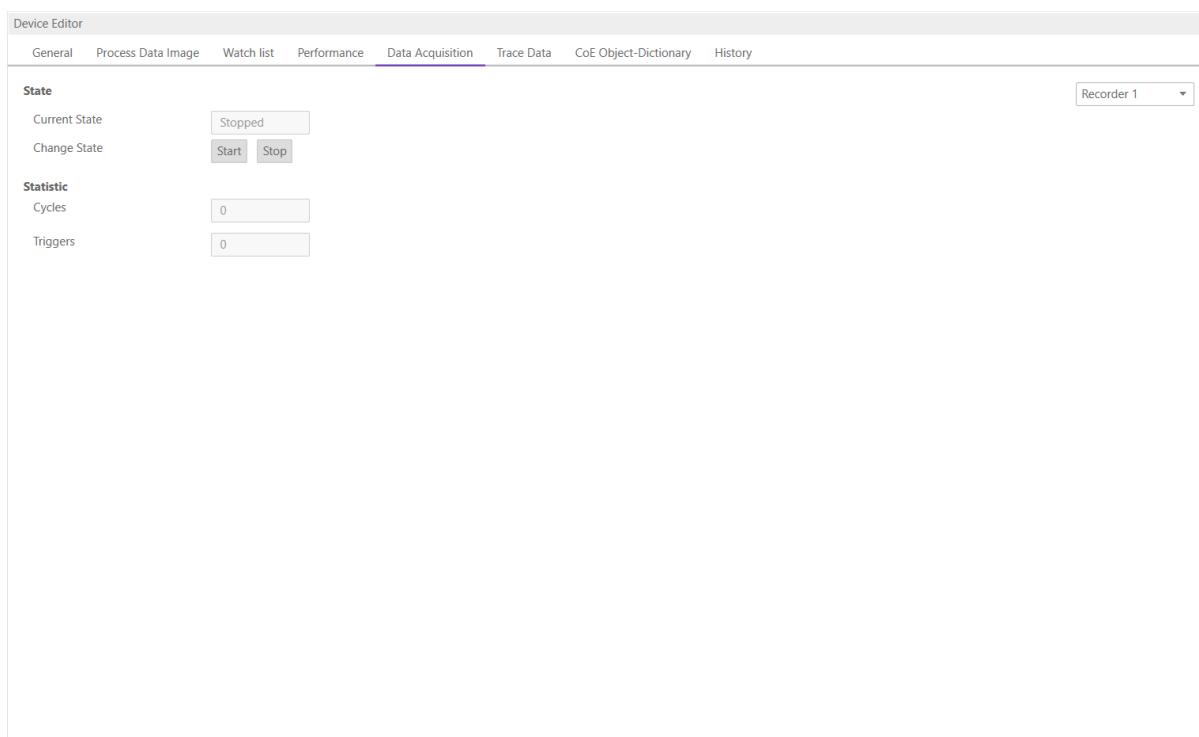
On the other tab the user can see the CPU load. In the grid is a list of all running jobs and how long they take. In the diagram above is a summary of all jobs. When a job is selected, the chart shows how many

times a job has taken how long to complete.



5.2.5 Data Acquisition Diagnosis

In this tab, the user can start and stop the DAQ recorders. Also he can see some statistics of running recorders.



5.2.6 Trace Data (Expert)

In this tab, the user can see and change the values of the trace variables. If he selects a variable he will see a chart of the values. The chart will be updated every 250 milliseconds:

Device Editor

General Process Data Image Watch list Performance Data Acquisition Trace Data CoE Object-Dictionary History

Variables

Name	Datatype	Offset	Size	Value
Inputs.DevicesState	UINT	IN:	173.0	2.0 12
Inputs.BusTime	UDINT	IN:	179.0	4.0 1306941666

Chart

15
10
5
0

Edit Variable

Value: 12

5.2.7 CoE Object-Dictionary (Device)

In this tab, the user can see and change the values of the object dictionary of the MainDevice:

Device Editor

General Process Data Image Watch list Performance Data Acquisition Trace Data CoE Object-Dictionary History

Description from MainDevice

Values

Index	Name	Value	Type	Flags
0x1000	Device type	1100 (0x44C)	UDINT	---- (RO RO RO)
0x1008	Device name	EC-Master	STRING(9)	---- (RO RO RO)
0x1009	Hardware version	V3.2.2.03	STRING(9)	---- (RO RO RO)
0x100A	Software version	V3.2.2.03	STRING(9)	---- (RO RO RO)
0x1018	Identity	4 (0x4)	USINT	---- (RO RO RO)
0x10F3	History	47 (0x2F)	USINT	---- (RO RO RO)
0x2000	Master State Change Command	0 (0x0)	UDINT	---- (RW RW RW)
0x2001	Master State Summary	79745 (0x13781)	UDINT	---- (RO RO RO)
0x2002	Bus Diagnosis Object	14 (0x1E)	USINT	---- (RO RO RO)
0x2003	Redundancy Diagnosis Object	4 (0x4)	USINT	---- (RO RO RO)
0x2004	Notification Counter Object	17 (0x11)	USINT	---- (RO RO RO)
0x2005	MAC Address Object	4 (0x4)	USINT	---- (RO RO RO)
0x2006	Mailbox Statistics Object	65 (0x41)	USINT	---- (RO RO RO)
0x2007	Add History Diagnosis Message Command	5 (0x5)	USINT	---- (WO WO WO)
0x2010	Debug Register	0 (0x0)	ULINT	---- (RW RW RW)
0x2020	Master Initialization Parameters	16 (0x10)	USINT	---- (RO RO RO)
0x2100	DC Deviation Limit	2147483647 (0x7FFFFFFF)	UDINT	---- (RO RO RO)
0x2101	DC Current Deviation	-76 (0xFFFFFB4)	DINT	---- (RO RO RO)

Edit Value

Value: 1100

Lists of CoE Object-Dictionary entries

- Entries are uploaded by the MainDevice from the SubDevice
- The “Flags” column tells the user if this entry is an PDO entry and if it can be edited**
 - “AA BB (CC DD EE)”
 - AA = Mapping as RX PDO or not
 - BB = Mapping as TX PDO or not
 - CC = Access rights for PreOp (RO, WO, RW)
 - DD = Access rights for SafeOp (RO, WO, RW)
 - EE = Access rights for Op (RO, WO, RW)

Buttons

Update:

Changes the selected entry

5.2.8 History (Device)

In this tab, the user can see and change the diagnosis history of the MainDevice (Supported from EC-Master V2.7 and above). It is also possible to export the data:

Device Editor

General Process Data Image Watch list Performance Data Acquisition Trace Data CoE Object-Dictionary **History**

Settings

Show Info Messages	True
Show Warning Messages	True
Show Error Messages	True
Show Emergency Messages	False
Current Mode	Overwrite Mode

Messages

Severity	Time	ID	Acknowledged	Code	Message
ERR	21.11.2024 13:54:46.636	081	No	0x0001000A (0x0219)	Unexpected response on cyclic Ethernet frame
ERR	21.11.2024 13:54:46.636	080	No	0x0001000A (0x0219)	No response on cyclic Ethernet frame
ERR	21.11.2024 13:54:46.599	079	No	0x0001000A (0x0219)	Unexpected response on cyclic Ethernet frame
ERR	21.11.2024 13:54:46.599	078	No	0x0001000A (0x0219)	No response on cyclic Ethernet frame
ERR	21.11.2024 13:54:46.599	077	No	0x0001000A (0x0219)	Unexpected response on cyclic Ethernet frame
ERR	21.11.2024 13:54:46.599	076	No	0x0001000A (0x0219)	No response on cyclic Ethernet frame
ERR	21.11.2024 13:54:45.825	075	No	0x0001000A (0x0219)	Unexpected response on cyclic Ethernet frame
ERR	21.11.2024 13:54:45.825	074	No	0x0001000A (0x0219)	No response on cyclic Ethernet frame
ERR	21.11.2024 13:54:45.802	073	No	0x00010001 (0x020D)	Cyclic command WKC error on LRW - Address: 0x10000000 - WKC act/set=6/12
WRN	21.11.2024 13:54:45.800	072	No	0x00010013 (0x0229)	ERROR: At least one slave in error status
ERR	21.11.2024 13:54:45.800	071	No	0x00010014 (0x022A)	Slave error "SubDevice_1026 [EL7201]" - EtherCAT address=1026 - State <SAFEOP ERROR>(0x14), control status <Sync manage
ERR	21.11.2024 13:54:45.800	070	No	0x00010014 (0x022A)	Slave error "SubDevice_1025 [EL7031]" - EtherCAT address=1025 - State <SAFEOP ERROR>(0x14), control status <Sync manage
ERR	21.11.2024 13:54:45.800	069	No	0x00010014 (0x022A)	Slave error "SubDevice_1018 [BK1120]" - EtherCAT address=1018 - State <SAFEOP ERROR>(0x14), control status <Sync manage

Number of messages: 76 / 200

Change Message Handling

Tasks:

Settings

Show Info Messages:

Info messages will be collected from MainDevice

Show Warning Messages:

Warning messages will be collected from MainDevice

Show Error Messages:

Error messages will be collected from MainDevice

Show Emergency Messages:

Not supported from MainDevice

Current Mode:

Overwrite Mode: Messages will be overwritten if buffer is full Acknowledge Mode: Not supported from MainDevice

Messages

List of history messages

Change Message Handling**Enable/Disable Info Messages:**

Enable or disable info messages

Enable/Disable Warning Messages:

Enable or disable warning messages

Enable/Disable Info Messages:

Enable or disable info messages

Enable/Disable Error Messages:

Enable or disable error messages

Enable Acknowledge Mode:

Enable acknowledge mode

Clear All Messages:

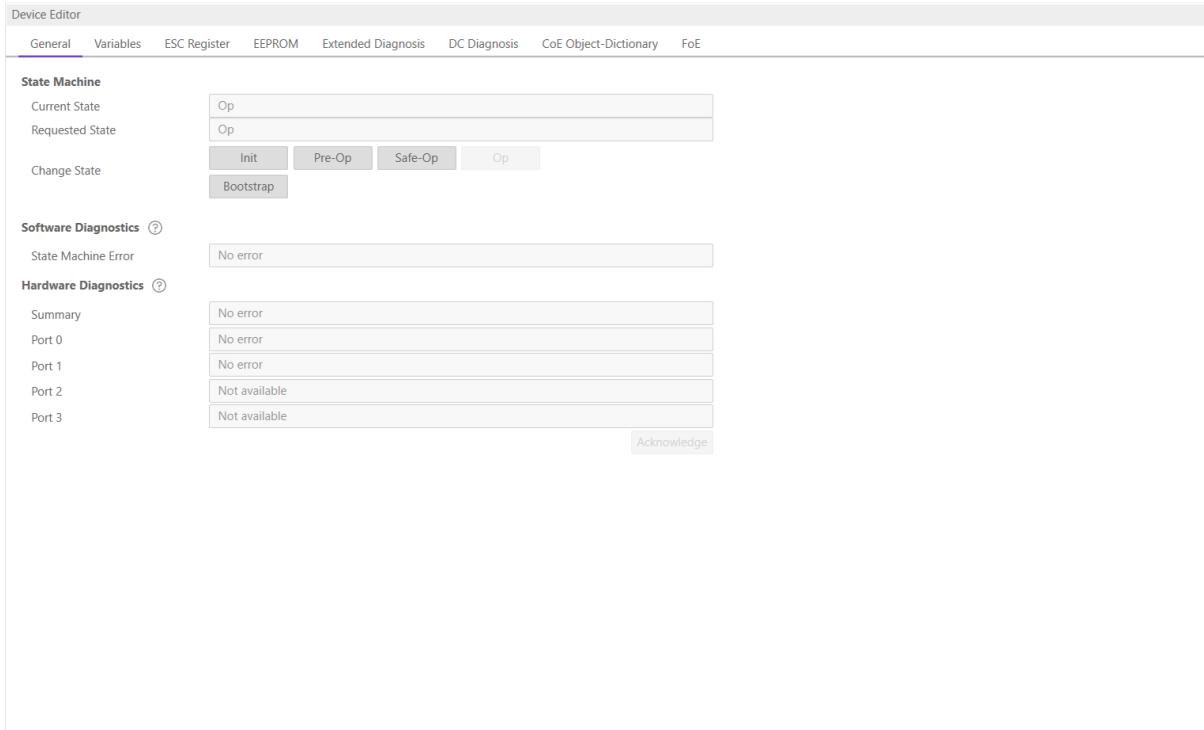
Clear all messages

5.3 SubDevice

This section shows the current “health” state of the selected SubDevice and helps the user to analyze SubDevice related problems.

5.3.1 General (SubDevice)

In this tab, the user can see the current state of the state machine of the SubDevice:



State Machine

Current State:

Current state of the selected SubDevice

Requested State:

Requested state of the selected SubDevice

Change State:

SubDevice can reach the states INIT, BOOTSTRAP, PRE-OP, SAFE-OP and OP.

Software Diagnostics

State Machine Error:

SubDevice error which occurred during state transition

Hardware Diagnostics

Summary:

Summary of hardware diagnostics

Port A:

Port specific error

Port D:

Port specific error

Port B:

Port specific error

Port C:

Port specific error

Buttons**Acknowledge:**

Acknowledge the current error state and notify the user again if error state was changed again.

Possible warning and errors:**Disturbed Connection:**

There may be problems in the connection between two SubDevices. The message will tell either that there is a problem between two SubDevices or two ports. The warning appears if error counters are increased (Invalid Frame: 0x300-0x306, RX Errors: 0x301-0x307, Lost Link: 0x308-0x30B). The value from which a warning is issued can be set in the User.xml files in C:/ProgramData/EC-Engineer. More information below.

Bad Connection:

The same as “Disturbed Connection” but the error counters are higher. The value from which an error is issued can be set in the User.xml files in C:/ProgramData/EC-Engineer. More information below.

Line break:

A line break is detected before a SubDevice. This error is detected by looking at the topology.

Link missing:

A link is missing on input port of the SubDevice. This error is detected by looking at the topology.

Multiple warnings:

There are multiple warning for this port.

Multiple errors:

There are multiple errors for this port.

Multiple warnings and errors:

There are multiple warning and errors for this port.

State Machine:

See ETG1020 “Description of AL Status Codes” or ETG.1000.6. This error is detected by looking at the AL Status (0x130).

How to solve errors?

- Lost Link errors are often caused by the power supply system
- Helpful might be the usage of an extra power supply
- It is recommended to clear all error counters after startup

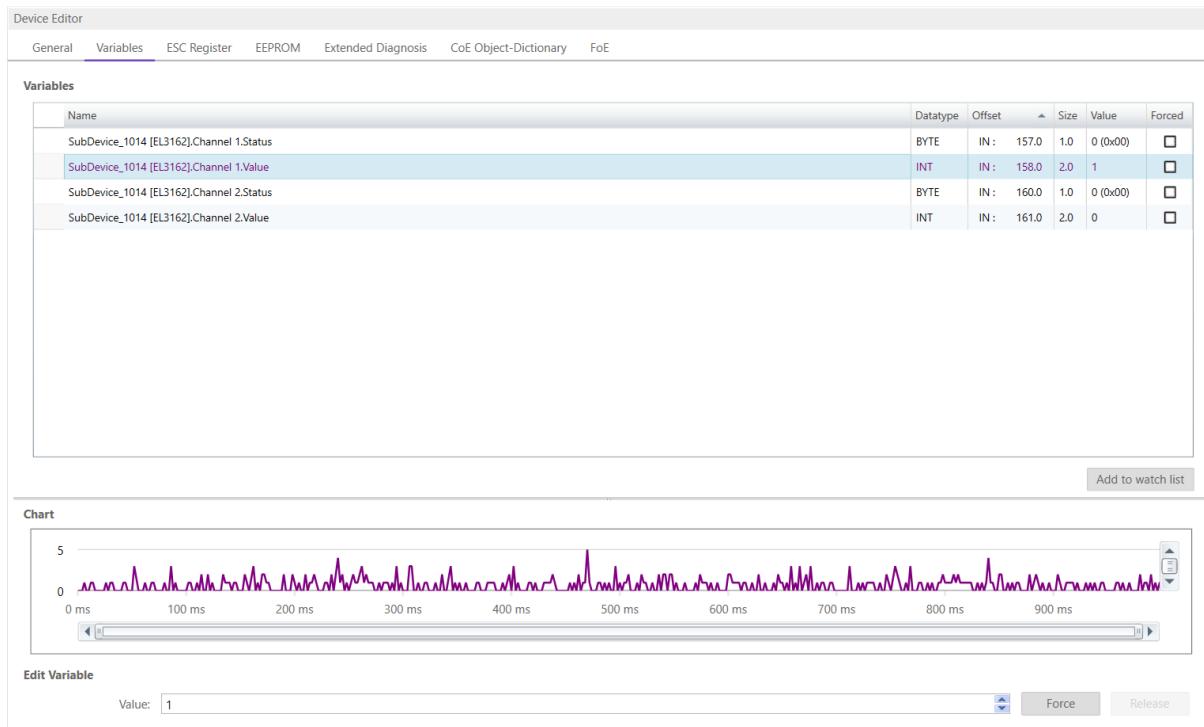
How to change amount of errors leading to a warning or error:

- Open C:/ProgramData/EC-Lyser
- Search for DiagGeneral
- **Change the values which should be adjusted**
 - LostLink: The value entered is used
 - All others are calculated depending on the amount of cyclic frames: (Value / CyclicFrames) x 10⁶

Note: Please refer also the “ETG.1600 EtherCAT Installation Guideline”: <http://www.ethercat.org/ETG1600>.

5.3.2 Variables

In this tab, the user can see and change the values of the process variables. The variables will be forced to the value the user entered. The user can press release to release the variable. If one or two variables are selected, a chart of the values is shown. Also resize and zoom is possible to see more details. The chart will be updated every 250 milliseconds:



5.3.3 ESC Register

In this tab, the user can see the values of the registers. In the settings section he can set the offset and the length. If he activates the compact view, he will only see the registers which have a description:

Device Editor

General Variables ESC Register EEPROM Extended Diagnosis DC Diagnosis

Settings

Offset	0x0000	Dec	Hex
Length	0x0400	Dec	Hex
Compact	<input checked="" type="checkbox"/>		

Registers

Index	Name	Value	Type
0x0000	Type	18 (0x12)	USINT
0x0001	Revision	0 (0x00)	USINT
0x0002	Build	3 (0x0003)	UINT
0x0004	FMMUs supported	3 (0x03)	USINT
0x0005	SyncManagers supported	4 (0x04)	USINT
0x0006	RAM Size	1 (0x01)	USINT
0x0007	Port Descriptor	74 (0x4A)	USINT
0x0008	ESC Features supported	252 (0x00FC)	UINT
0x0010	Configured Station Address	1011 (0x03F3)	UINT
0x0012	Configured Station Alias	0 (0x0000)	UINT
0x0020	Write Register Enable	0 (0x00)	USINT
0x0021	Write Register Protection	0 (0x00)	USINT
0x0030	ESC Write Enable	0 (0x00)	USINT
0x0031	ESC Write Protection	0 (0x00)	USINT
0x0040	ESC Reset ECAT	0 (0x00)	USINT
0x0041	ESC Reset PDI	0 (0x00)	USINT
0x0100	ESC DL Control	509185 (0x0007C501)	UDINT

Edit Register

Value: Dec Hex Write

5.3.4 EEPROM

This tab consists of three views:

Smart View

In this view, the user can see and change the values of the EEPROM.

Device Editor

General Variables ESC Register EEPROM Extended Diagnosis DC Diagnosis CoE Object-Dictionary FoE

Smart View Hex View Sii View

EEPROM Values

Index	Name	Value	Type
0x0000	PDI Control	3080 (0x0C08)	UINT
0x0001	PDI Configuration	34818 (0x8802)	UINT
0x0002	Pulse Length of SYNC Signals	0 (0x0000)	UINT
0x0003	Extended PDI Configuration	0 (0x0000)	UINT
0x0004	Configured Station Alias	500 (0x01F4)	UINT
0x0005	Reserved	0 (0x00000000)	UDINT
0x0007	Checksum	249 (0x00F9)	UINT
0x0008	Vendor ID	45054 (0x0000AFFE)	UDINT
0x000A	Product Code	87157760 (0x0531EC00)	UDINT
0x000C	Revision Number	18 (0x00000012)	UDINT
0x000E	Serial Number	1226 (0x000004CA)	UDINT
0x0010	Execution Delay	0 (0x0000)	UINT
0x0011	Port0 Delay	0 (0x0000)	UINT
0x0012	Port1 Delay	0 (0x0000)	UINT
0x0013	Reserved	0 (0x0000)	UINT
0x0014	Bootstrap Receive Mailbox Offset	4608 (0x1200)	UINT
0x0015	Bootstrap Receive Mailbox Size	532 (0x0214)	UINT
0x0016	Bootstrap Send Mailbox Offset	5376 (0x1500)	UINT
0x0017	Bootstrap Send Mailbox Size	532 (0x0214)	UINT
0x0018	Standard Receive Mailbox Offset	7168 (0x1C00)	UINT

Edit EEPROM Value

Value: Dec Hex Write

Hex View

In this view, the user can create an EEPROM from an ESI file, upload the EEPROM from the SubDevice, load an EEPROM from the disk, download the EEPROM to the SubDevice or save the EEPROM to disk.

Device Editor

General Variables ESC Register EEPROM Extended Diagnosis CoE Object-Dictionary History FoE

EEPROM

Smart View Hex View SII View

EEPROM

```

0000: 05 04 03 00 00 00 00 00 00 00 00 00 00 00 00 00 F1 00 ..... .
0010: 02 00 00 00 52 30 50 18 00 00 15 00 00 00 00 00 ..... ROP .
0020: 00 00 00 00 00 00 00 00 00 10 F4 00 F4 10 F4 00 ..... .
0030: 00 10 00 01 11 00 01 00 00 00 00 00 00 00 00 00 ..... .
0040: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 ..... .
0050: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 ..... .
0060: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 ..... .
0070: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 0F 01 00 ..... .
0080: 0A 00 B6 00 16 00 45 4C 36 32 32 34 0D 43 6F 6D ..... EL 6224 .Com
0090: 6D 75 6E 69 63 63 74 69 6F 6E 20 43 6F 6D 6D 75 ..... munication .Commu
00A0: 65 69 63 63 74 69 6F 6E 20 54 65 72 6D 69 6E 61 ..... nication .Terminal
00B0: 65 69 63 63 74 69 6F 6E 20 54 65 72 6D 69 6E 61 ..... (ELxx xx).EL62
00C0: 32 34 20 08 49 4F 20 4C 70 59 6E 20 4D 63 71 04 ..... 24. (ELxx xx).Master
00D0: 65 72 29 07 46 52 65 65 52 75 6B 02 44 63 19 44 ..... .FreeRun.DC.D
00E0: 65 76 69 63 65 53 74 61 74 65 20 49 6B 70 75 74 ..... deviceState .Input
00F0: 73 20 44 65 76 69 63 65 0B 44 65 76 69 63 65 20 ..... s.Device .Device
0100: 44 69 61 67 0C 44 65 76 69 63 65 20 53 74 61 74 ..... Diag.Dev .Ice .Stat
0110: 65 12 44 65 76 69 63 65 53 74 61 74 65 20 49 6E ..... e.Device .State .In
0120: 70 75 74 73 09 53 74 61 74 65 20 43 68 31 09 53 ..... puts .State .Ch1 .S
0130: 74 61 74 65 20 43 68 32 09 53 74 61 74 65 20 43 ..... state .Ch2 .State .d
0140: 68 33 09 53 74 61 74 65 20 43 68 34 13 49 4F 20 ..... h3 .State .Ch4 .IO .
0150: 49 68 70 75 74 73 20 43 68 61 6E 6E 65 66 20 31 ..... Inputs .C .hannel .1
0160: 13 49 4F 20 49 68 70 75 74 73 20 43 68 61 6E 68 ..... .IO .Inpu .ts .Chann
0170: 65 68 20 32 13 49 4F 20 49 6E 70 75 74 73 20 43 ..... el1 .2 .IO .Inputs .C
0180: 68 63 6E 68 65 68 20 33 13 49 4F 20 49 6E 70 75 ..... hannel .1 .3 .IO .Inpu
0190: 74 73 20 43 68 61 6E 6E 65 6C 20 34 14 49 4F 20 ..... ts .Chann .el1 .4 .IO .
01A0: 4F 75 74 70 75 74 73 20 43 68 61 6E 65 6C 20 ..... Outputs .Channel .
01B0: 31 14 49 4F 20 4F 75 74 70 75 74 73 20 43 68 61 ..... 1 .IO .Out .puts .Ch
01C0: 6E 68 65 68 20 38 14 49 4F 20 4F 75 74 70 75 74 ..... nnel .2 .1 .O .Output
01D0: 73 20 43 68 61 6E 6E 65 68 20 33 14 49 4F 20 4F ..... s .Channe .1 .3 .IO .O
01E0: 75 74 70 75 74 73 20 43 68 61 6E 65 66 20 34 ..... utputs .C .hannel .4
01F0: 1E 00 10 00 02 00 01 00 00 00 00 00 00 00 00 00 ..... ..... / . . .
0200: 78 00 03 00 03 00 00 00 00 00 00 00 00 00 00 00 ..... x . . . 3 . . . .
0210: 78 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 ..... x . . . 7 . . . .

```

EEPROM Operations

Timeout (ms): 60000 - +
Data Size (byte): 2048 - +

Upload from SubDevice Load from File Create from ESI
Download to SubDevice Save to File

SII View

In this view, the user can create a SubDevice Information Interface (SII), by uploading the EEPROM data from the SubDevice.

Device Editor

General Variables ESC Register EEPROM Extended Diagnosis DC Diagnosis

Smart View Hex View SII View

EEPROM SII

Strings

Name	Value
Index 0	EL2252
Index 1	DigOut
Index 2	Digitale Ausgangsklemmen (EL2xx)
Index 3	EL2252 2K. Dig. Ausgang 24V, 0.5A, DC Time Stamp
Index 4	DcTimeStamp
Index 5	SysTime
Index 6	Feedback
Index 7	DC Sync Activate
Index 8	Activate
Index 9	DC Sync Start
Index 10	StartTime
Index 11	Channel 1
Index 12	Output
Index 13	TriState
Index 14	Channel 2
Index 15	Reserved

EEPROM Operations

Timeout (ms): 60000 - +

Upload from SubDevice

5.3.5 Extended Diagnosis

In this tab, the user can see the extended diagnosis information:

Common Error Counter	
Processing Unit Error (0x030C)	<input type="text" value="0"/>
PDI Error (0x030D)	<input type="text" value="0"/>

Port 0 counters (In port)	
Invalid Frame, CRC error (0x0300)	<input type="text" value="0"/>
RX Error (0x0301)	<input type="text" value="0"/>
Lost Link (0x0310)	<input type="text" value="0"/>
Forwarded RX Error (0x0308)	<input type="text" value="255"/>

Port 1 counters	
Invalid Frame, CRC error (0x0302)	<input type="text" value="0"/>
RX Error (0x0303)	<input type="text" value="0"/>
Lost Link (0x0311)	<input type="text" value="0"/>
Forwarded RX Error (0x0309)	<input type="text" value="255"/>

Port 2 counters	
Invalid Frame, CRC error (0x0304)	<input type="text" value="0"/>
RX Error (0x0305)	<input type="text" value="0"/>
Lost Link (0x0312)	<input type="text" value="0"/>
Forwarded RX Error (0x030A)	<input type="text" value="0"/>

Port 3 counters	
Invalid Frame, CRC error (0x0306)	<input type="text" value="0"/>
RX Error (0x0307)	<input type="text" value="0"/>
Lost Link (0x0313)	<input type="text" value="0"/>
Forwarded RX Error (0x030B)	<input type="text" value="0"/>

There will be a red ! to signalize that a counter is higher than 0. Except for the forwarded errors.

If an error counter is '-' it was not read. If it is '0' it is really zero. So there is a difference between '0' and '-'.

Common Error Counter

Processing Error Counter:

Indicates that SubDevice received “not EtherCAT frames”, which are not allowed in the EtherCAT segment (of course acceptable in a test environment)

PDI Error Counter:

Counts if a PDI access has an interface error (read from register: 0x30D)

Port 0..3

- Invalid Frame Counter of Port y (read from register: 0x0300+y*2)
- RX Error Counter of Port y (read from register: 0x0300+y*2+8Bit)
- Lost Link Counter of Port y (read from register: 0x0310+y)
- Forwarded RX Error Counter of Port y (read from register: 0x0308+y)

Acknowledge warning

If one of the error counters increase there will be a warning in the tree, signalized with an icon. With this button it is possible to acknowledge this warning. So the SubDevice can be monitored again and the icon will come back with the next error.

To see this information the error counters must be read by the EtherCAT MainDevice. Only if this is activated the EC-Lyser is able to read this. Here is a quick overview on how to activate this function on different MainDevices:

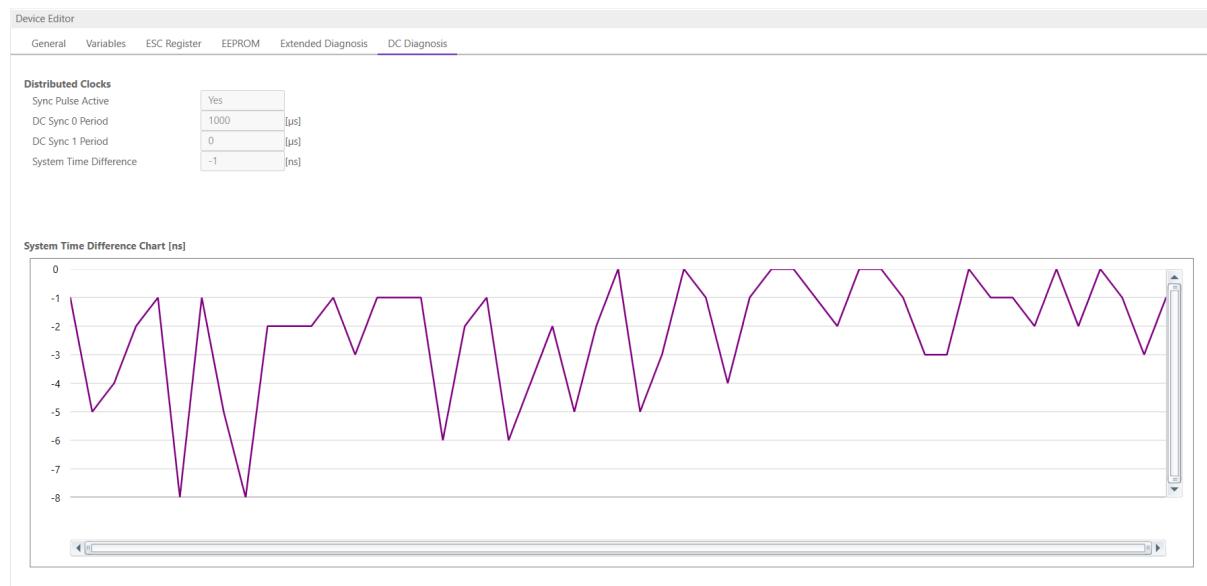
acontis EC-Master:

To activate the error collection of the acontis EC-Master, the following API has to be called:

```
/* SubDevice statistics polling for error diagnostic */
EC_T_DWORD dwPeriodMs = 1000;
dwRes = ecatIoCtl(EC_IOCTL_SET_SLVSTAT_PERIOD, (EC_T_BYTE*)&dwPeriodMs,
sizeof(EC_T_DWORD), EC_NULL, 0, EC_NULL);
if (dwRes != EC_E_NOERROR)
{
    EcLogMsg(EC_LOG_LEVEL_ERROR, (pEcLogContext, EC_LOG_LEVEL_ERROR,
"ecatIoControl(EC_IOCTL_SET_SLVSTAT_PERIOD) returns with error=0x%x\n", dwRes));
    goto Exit;
}
```

5.3.6 DC Diagnosis

In this tab, the user can see all DC related values of the SubDevice:



Distributed Clock

Sync Pulse Active:

Sync pulse was received or not

DC Sync 0 Period:

Configured period for sync unit 0

DC Sync 1 Period:

Configured period for sync unit 1

System Time Difference:

Time difference of SubDevice clock to reference clock

System Time Difference Chart

Chart displaying the System Time Difference over time (The amount of entries and visibility can be change in *Expert*)

Note: The option “Sync Window Monitoring” must be enabled.

5.3.7 CoE Object-Dictionary

This tab consists of different modes:

Description from ESI

In this tab, the user can see the description of the object dictionary from ESI and the values from the SubDevice.

Index	Name	Value	Type	Flags
0x1000	Device Type	5001 (0x1389)	UDINT	-----(RO RO RO)
0x1008	Device Name	VIPA 053-1EC00	STRING(17)	-----(RO RO RO)
0x1009	Hardware Version	03	STRING(3)	-----(RO RO RO)
0x100A	Software Version	1.30	STRING(12)	-----(RO RO RO)
0x100B	System Version	3 (0x03)	USINT	-----(RO RO RO)
0x1018	Identity	4 (0x04)	USINT	-----(RO RO RO)
0x1600	RxPDO Map	5 (0x05)	USINT	-----(RO RO RO)
0x1602	RxPDO Map	5 (0x05)	USINT	-----(RO RO RO)
0x1603	RxPDO Map	60 (0x3C)	USINT	-----(RW RW RW)
0x1604	RxPDO Map	2 (0x02)	USINT	-----(RO RO RO)
0x1606	RxPDO Map	45 (0x2D)	USINT	-----(RW RW RW)
0x1607	RxPDO Map	5 (0x05)	USINT	-----(RO RO RO)
0x1A01	TxPDO Map	5 (0x05)	USINT	-----(RO RO RO)
0x1A03	TxPDO Map	60 (0x3C)	USINT	-----(RW RW RW)
0x1A05	TxPDO Map	5 (0x05)	USINT	-----(RO RO RO)
0x1A06	TxPDO Map	4 (0x04)	USINT	-----(RO RO RO)
0x1A08	TxPDO Map	5 (0x05)	USINT	-----(RO RO RO)
0x1A09	TxPDO Map	45 (0x2D)	USINT	-----(RW RW RW)

Edit Value

Value: Dec Hex Write

Lists of CoE Object-Dictionary entries

- Entries comes from ESI
- The “Flags” column tells the user if this entry is an PDO entry and if it can be edited
 - “AA BB C D (EE FF GG)”
 - AA = Mapping as RX PDO or not
 - BB = Mapping as TX PDO or not
 - C = Backup Flag
 - D = Settings Flag
 - EE = Access rights for PreOp (RO, WO, RW)
 - FF = Access rights for SafeOp (RO, WO, RW)
 - GG = Access rights for Op (RO, WO, RW)

Buttons

Write:

Writes the selected entry

Description from SubDevice

In this tab, the user can see the description of the object dictionary and the values from SubDevice. He can also change the values and has the possiblility to export the object dictionary.

Device Editor

General Variables ESC Register EEPROM Extended Diagnosis DC Diagnosis CoE Object-Dictionary FoE

Description from ESI Description from SubDevice Single Object

Values

Index Name Value Type Flags

Index	Name	Value	Type	Flags
0x1000	Device Type	5001 (0x1389)	UDINT	--- (RO RO RO)
0x1008	Device Name	VIPA 053-1EC00	STRING(30)	--- (RO RO RO)
0x1009	Hardware Version	03	STRING(8)	--- (RO RO RO)
0x100A	Software Version	1.30	STRING(8)	--- (RO RO RO)
0x100B	System Version	3 (0x03)	USINT	--- (RO RO RO)
0x1018	Identity	4 (0x04)	USINT	--- (RO RO RO)
0x1600	RxPDO Map	5 (0x05)	USINT	--- (RO RO RO)
0x1602	RxPDO Map	5 (0x05)	USINT	--- (RO RO RO)
0x1603	RxPDO Map	60 (0x3C)	USINT	--- (RW RO RO)
0x1604	RxPDO Map	2 (0x02)	USINT	--- (RO RO RO)
0x1606	RxPDO Map	45 (0x2D)	USINT	--- (RW RO RO)
0x1607	RxPDO Map	5 (0x05)	USINT	--- (RO RO RO)
0x1A01	TxPDO Map	5 (0x05)	USINT	--- (RO RO RO)
0x1A03	TxPDO Map	60 (0x3C)	USINT	--- (RW RO RO)
0x1A05	TxPDO Map	5 (0x05)	USINT	--- (RO RO RO)
0x1A06	TxPDO Map	4 (0x04)	USINT	--- (RO RO RO)
0x1A08	TxPDO Map	5 (0x05)	USINT	--- (RO RO RO)
0x1A09	TxPDO Map	45 (0x2D)	USINT	--- (RW RO RO)
0x1AEE	Other PDO	2 (0x02)	USINT	--- (RO RO RO)

Edit Value

Value: 0

Dec Hex Write

Lists of CoE Object-Dictionary entries

- Entries are uploaded from the SubDevice (if “SDO Information Service” is supported)
- The “Flags” column tells the user if this entry is an PDO entry and if it can be edited**
“AA BB C D (EE FF GG)” - AA = Mapping as RX PDO or not - BB = Mapping as TX PDO or not - C = Backup Flag - D = Settings Flag - EE = Access rights for PreOp (RO, WO, RW) - FF = Access rights for SafeOp (RO, WO, RW) - GG = Access rights for Op (RO, WO, RW)

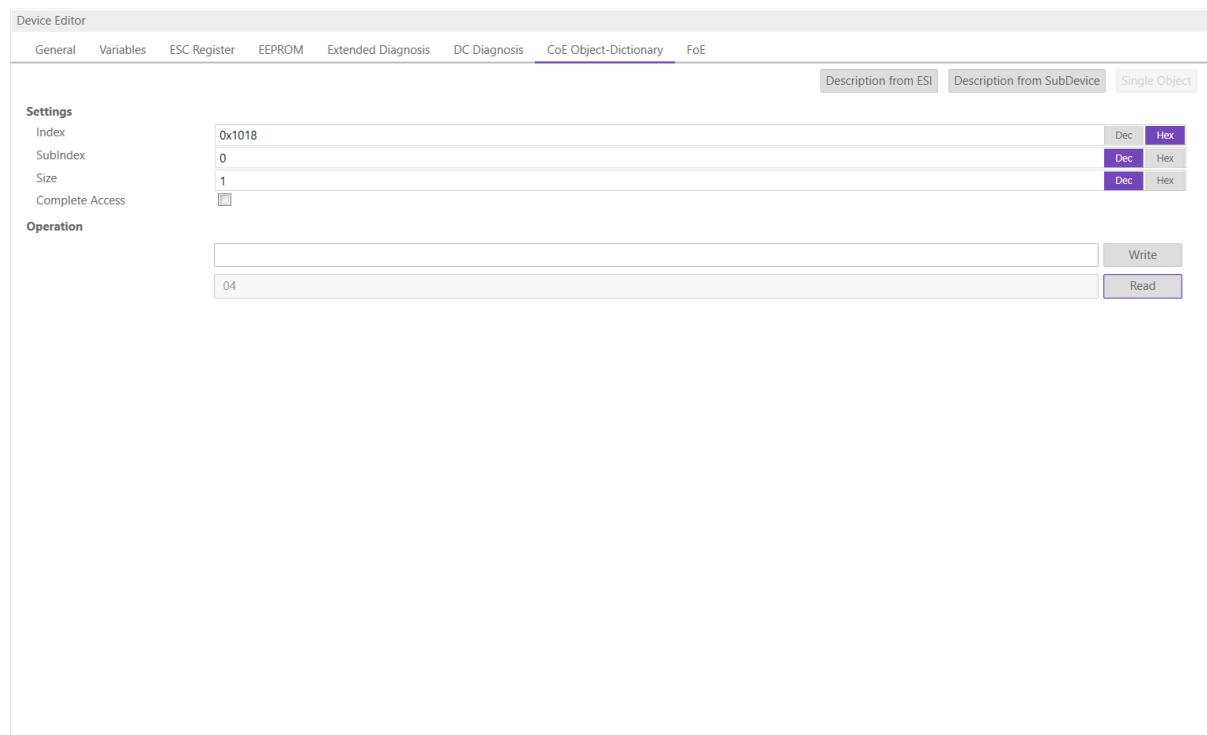
Buttons

Write:

Writes the selected entry

Single Object

In this tab, the user can read and write (not EC-Inspector) the values of the object dictionary of the SubDevice.



Settings

Index:

Index of the CoE value

SubIndex:

SubIndex of the CoE value

Size:

Size of the CoE value (only used for reading)

Complete Access:

Activate, if complete access mode should be used for reading or writing the CoE value (can be used only if it is supported from SubDevice)

Operation

Write:

Writes the value to the SubDevice (Hex format, like: "00 11 22 33 ...")

Read:

Reads the value from SubDevice (Hex format, like: "00 11 22 33 ...")

5.3.8 SoE Object-Dictionary

Index	Name	Value
S-0-0001	Control unit cycle time (TNcyc)	1000 (0x3E8)
S-0-0002	Communication cycle time (tSync)	1000 (0x3E8)
S-0-0007	Feedback acquisition capture point (t4)	-
S-0-0011	Class 1 diagnostic (C1D)	-
S-0-0012	Class 2 diagnostic (C2D)	-
S-0-0013	Class 3 diagnostic (C3D)	-
S-0-0015	Telegram type	7 (0x07)
S-0-0016	Configuration list of AT	(list)
S-0-0017	IDN-list of all operation data	(list)
S-0-0018	IDN-list of operation data for CP2	(list)
S-0-0019	IDN-list of operation data for CP3	(list)
S-0-0020	IDN-list of operation data for CP4	(list)
S-0-0021	IDN-list of invalid operation data for CP2	(list)
S-0-0022	IDN-list of invalid operation data for CP3	(list)
S-0-0024	Configuration list of MDT	(list)

Edit Value

Value:

Lists of SoE Object-Dictionary entries

- Values are uploaded by the MainDevice from the SubDevice
- Entries comes from the ESI

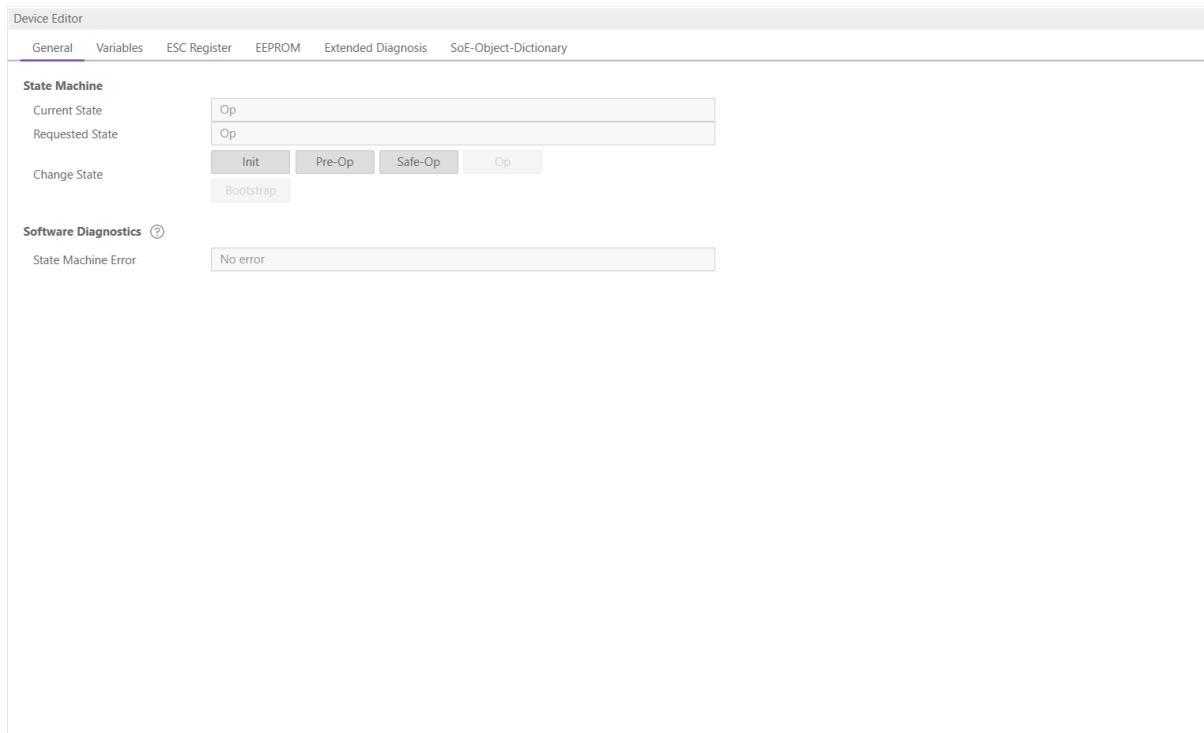
Buttons

Write:

Writes the selected entry

Expert View

In this tab, the user can read and write the values of the object dictionary of the SubDevice:



Settings

Channel:

Channel of the SoE value

IDN:

Index of the CoE value

Size:

Size of the CoE value (only used for reading)

Operation

Write:

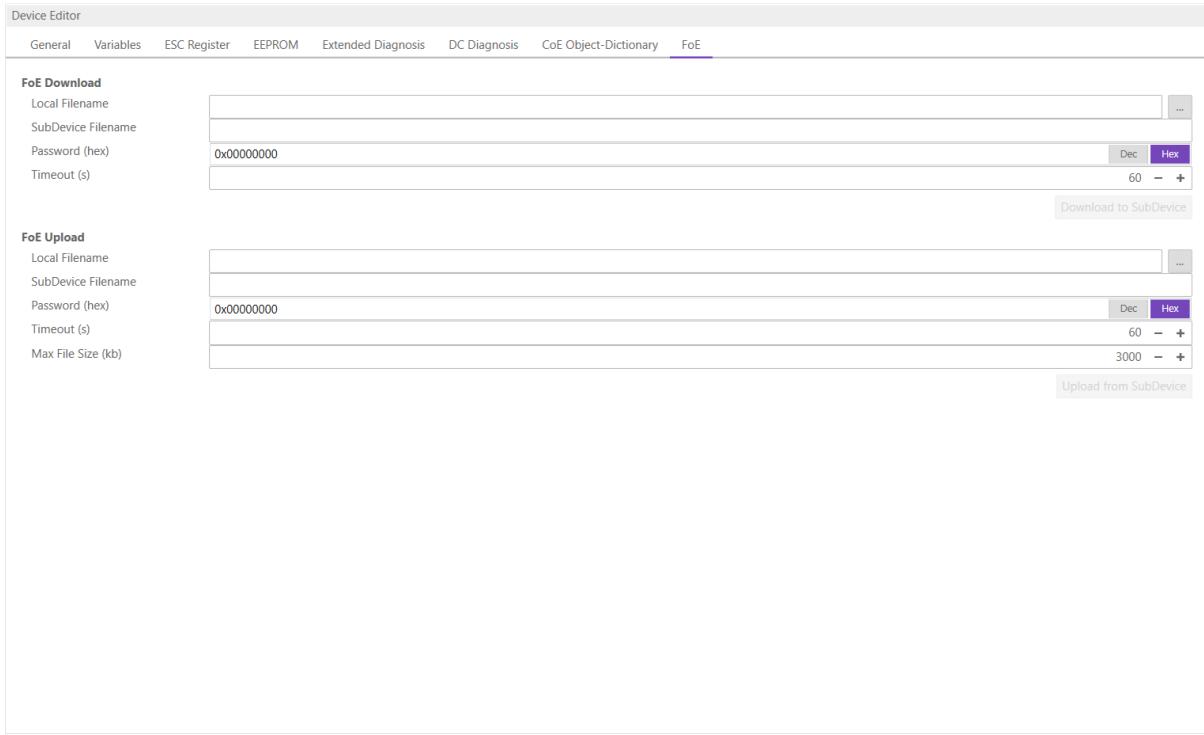
Writes the value to the SubDevice (Hex format, like: "00 11 22 33 ...")

Read:

Reads the value from SubDevice (Hex format, like: "00 11 22 33 ...")

5.3.9 File over Ethernet (FoE)

In this tab, the user has the possibility to download or upload a file to the SubDevice:



Device Editor

General Variables ESC Register EEPROM Extended Diagnosis DC Diagnosis CoE Object-Dictionary **FoE**

FoE Download

Local Filename:

SubDevice Filename:

Password (hex): 0x00000000 Dec Hex

Timeout (s): 60 - +

FoE Upload

Local Filename:

SubDevice Filename:

Password (hex): 0x00000000 Dec Hex

Timeout (s): 60 - +

Max File Size (kb): 3000 - +

Download to SubDevice

Upload from SubDevice

FoE Operations

Local Filename:

Name of the file on the harddrive

SubDevice Filename:

Name of the file on the SubDevice

Password:

Password on the SubDevice as a hex-number

Timeout:

Timeout for downloading or uploading the file in milliseconds

Max File Size:

Maximal file size which should be uploaded from the SubDevice in kilo bytes

5.3.10 ADS

In this tab, the user can see and change the ADS values of the SubDevice.

Device Editor

General Variables ESC Register EEPROM Extended Diagnosis DC Diagnosis CoE Object-Dictionary **ADS** FoE

Information

Target NetId 1.1.1.13.250

Settings

Target Port	100	Dec	Hex
Index Group	0x0000F302	Dec	Hex
Index Offset	0x00000000	Dec	Hex
Size	2	Dec	Hex

Operation

Write

Read

5.3.11 History (SubDevice)

In this tab, the user can see and change the diagnosis history of the SubDevice. It is also possible to export the data:

Device Editor

General Variables ESC Register EEPROM Extended Diagnosis DC Diagnosis CoE Object-Dictionary **History** FoE

Settings

Show Info Messages	True
Show Warning Messages	True
Show Error Messages	True
Show Emergency Messages	False
Current Mode	Overwrite Mode

Messages

Export

Severity	Time	ID	Acknowledged	Code	Message
INFO	21.11.2024 13:50:14.818	030	No	0x1B77E000 (0x1135)	Cycle time o.k.: 2934
INFO	21.11.2024 13:50:14.677	029	No	0x1B77E000 (0x1100)	Detection of operation mode completed: 0x100, 0
INFO	21.11.2024 13:45:30.546	028	No	0x1B77E000 (0x1135)	Cycle time o.k.: 3001
INFO	21.11.2024 13:45:30.404	027	No	0x1B77E000 (0x1100)	Detection of operation mode completed: 0x100, 0
INFO	21.11.2024 13:41:01.102	026	No	0x1B77E000 (0x1135)	Cycle time o.k.: 2911
INFO	21.11.2024 13:41:00.966	025	No	0x1B77E000 (0x1100)	Detection of operation mode completed: 0x100, 0
INFO	12.11.2024 10:59:07.034	024	No	0x1B77E000 (0x1135)	Cycle time o.k.: 2972
INFO	12.11.2024 10:59:06.896	023	No	0x1B77E000 (0x1100)	Detection of operation mode completed: 0x100, 0
INFO	12.11.2024 10:58:53.389	022	No	0x1B77E000 (0x1135)	Cycle time o.k.: 2831
INFO	12.11.2024 10:58:53.255	021	No	0x1B77E000 (0x1100)	Detection of operation mode completed: 0x100, 0
INFO	12.11.2024 10:58:37.409	020	No	0x1B77E000 (0x1135)	Cycle time o.k.: 2906
INFO	12.11.2024 10:58:37.272	019	No	0x1B77E000 (0x1100)	Detection of operation mode completed: 0x100, 0
INFO	12.11.2024 10:58:23.712	018	No	0x1B77E000 (0x1135)	Cycle time o.k.: 2999
INFO	12.11.2024 10:58:23.655	017	No	0x1B77E000 (0x1100)	Detection of operation mode completed: 0x100, 0

Number of messages: 50 / 50

Change Message Handling

Tasks: None

Execute

Settings

Show Info Messages:

Info messages will be collected from SubDevice

Show Warning Messages:

Warning messages will be collected from SubDevice

Show Error Messages:

Error messages will be collected from SubDevice

Show Emergency Messages:

Emergency messages will be collected from SubDevice

Current Mode:

Overwrite Mode: Messages will be overwritten if buffer is full Acknowledge Mode: Messages will be discarded if buffer is full

Messages

List of history messages

Change Message Handling**Enable/Disable Info Messages:**

Enable or disable info messages

Enable/Disable Warning Messages:

Enable or disable warning messages

Enable/Disable Info Messages:

Enable or disable info messages

Enable/Disable Error Messages:

Enable or disable error messages

Enable/Disable Emergency Messages:

Enable or disable emergency messages

Enable Acknowledge Mode:

Enable acknowledge mode

Enable Overwrite Mode:

Enable overwrite mode

Clear All Messages:

Clear all messages (only available if "Overwrite Mode" is active)

Clear All Acknowledged Messages:

Clear all acknowledged messages (only available if "Acknowledge Mode" is active)

Acknowledge All Messages:

Acknowledge all messages, that they can be overwritten from new messages (only available if "Acknowledge Mode" is active)

5.3.12 Motion (Motion Tabs only)

In this tab, the user can see and change the motion settings of the SubDevice. He can read important variables and change velocity and direction of the axis. Also gearing and camming are possible to use:

Device Editor

General Variables ESC Register EEPROM Extended Diagnosis DC Diagnosis Motion

Administrative

Station Address Axis: 001 - + Axis Index: 0 - +

Increment: 000 - + [mm]

Power-On Power-Off Reset

Status Word: - Control Word: -

Drive State: - Result: Read axis state failed!

Motion State: -

Actual Position: - [INC] - [mm]

Target Position: - [INC] - [mm]

Trajectory Parameters

Acceleration: 0,00 - + [mm/s^2] Deceleration: 0,00 - + [mm/s^2]

Velocity: 0,00 - + [mm/s] Jerk: 0,00 - + [mm/s^3]

Move distance: 0,00 - + [mm]

Move to position: 0,00 - + [mm]

Move Velocity (-) Move Velocity (+) Move Relative Move Absolute Stop Halt

Parameters for Synchronized Motion

Station Address MainDevice: 001 - + Axis Index: 0 - +

Gearing

Gear In Ratio Numerator: 3 - + Camming

Gear In Ratio Denominator: 4 - + Camming Periodic:

Gear In Gear Out Camming Start Mode: 0 - +

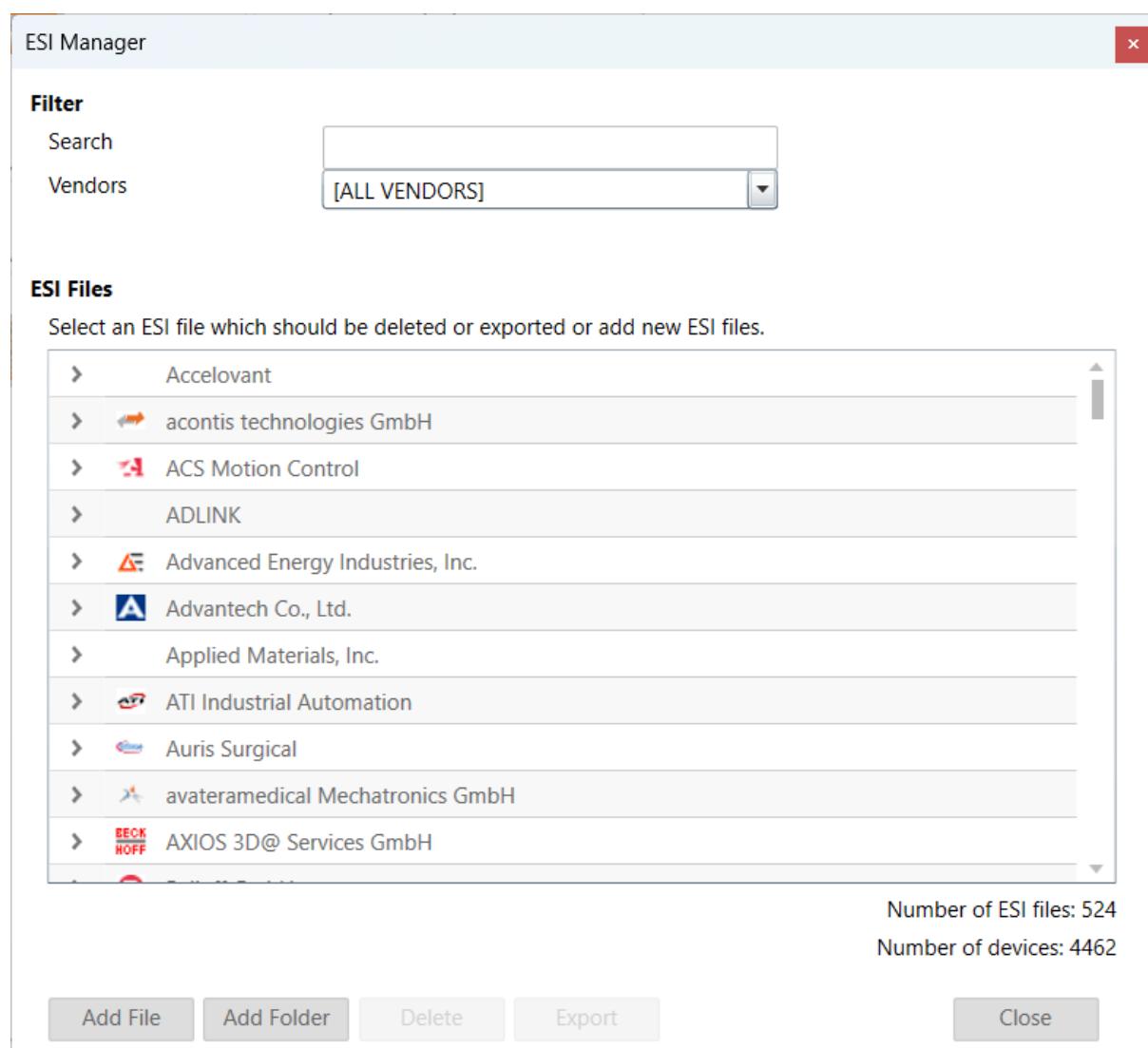
Cam Table Select Cam In Cam Out

6 Additional Tools

6.1 ESI-Manager

ESI-Manager can be found through the main menu File -> ESI-Manager.

This dialog helps the user to administrate his ESI and SCI files. Here, he can add/delete/export ESI and SCI files.



ESI Manager

Filter

Search

Vendors [ALL VENDORS]

ESI Files

Select an ESI file which should be deleted or export or add new ESI files.

- › Accelovant
- › acontis technologies GmbH
- › ACS Motion Control
- › ADLINK
- › Advanced Energy Industries, Inc.
- › Advantech Co., Ltd.
- › Applied Materials, Inc.
- › ATI Industrial Automation
- › Auris Surgical
- › avateramedical Mechatronics GmbH
- › AXIOS 3D@ Services GmbH

Number of ESI files: 524

Number of devices: 4462

Add File Add Folder Delete Export Close

6.2 Network Mismatch Analyzer

If you have a network mismatch in your EtherCAT network it is not so easy to find the problem. For this you have the Network Mismatch Analyzer. You find it in the network main menu. If you see here some “red” entries, means that this is the start point of your network mismatch:

Network Mismatch Analyzer

List of SubDevices

Please, compare the configured SubDevices with the connected SubDevices. If something is red, you have a network configuration mismatch!

SubDevice Name	Config Type	Config Revision	Config Ident.	Network Type	Network Revision	Network Ident.
SubDevice_1001 [EK]	EK1100 [1001]	0x00110000	0	EK1100 [1001]	0x00110000	1017
SubDevice_1002 [EL]	EL2008 [1002]	0x00100000	0	EL2008 [1002]	0x00100000	0
SubDevice_1003 [EL]	EL2008 [1003]	0x00100000	0	EL2008 [1003]	0x00100000	1003
SubDevice_1004 [EL]	EL1014 [1004]	0x00100000	0	EL1014 [1004]	0x00100000	1004
SubDevice_1005 [EL]	EL2004 [1005]	0x00110000	0	EL2004 [1005]	0x00110000	0
SubDevice_1006 [EL]	EL1034 [1006]	0x00100000	0	EL1034 [1006]	0x00100000	0
SubDevice_1027 [EL]	EL1014 [1027]	0x00130000	0	EL1018 [1007]	0x00100000	0
SubDevice_1007 [EL]	EL1018 [1007]	0x00100000	0	EL2008 [1008]	0x00100000	0
SubDevice_1008 [EL]	EL2008 [1008]	0x00100000	0	EK1122-0080 [1009]	0x00120050	0
SubDevice_1009 [EK]	EK1122-0080 [1009]	0x00120050	0	EK1101-0080 [1010]	0x00120050	0
SubDevice_1010 [EK]	EK1101-0080 [1010]	0x00120050	0	EL2252 [1011]	0x00130000	0

Close

6.3 Line Crossed Analyzer

If you have connected a line to a wrong port, you can see in the Line Crossed Analyzer which SubDevice is incorrectly connected. The wrong entries will be red:

Line Crossed Analyzer

List of SubDevices

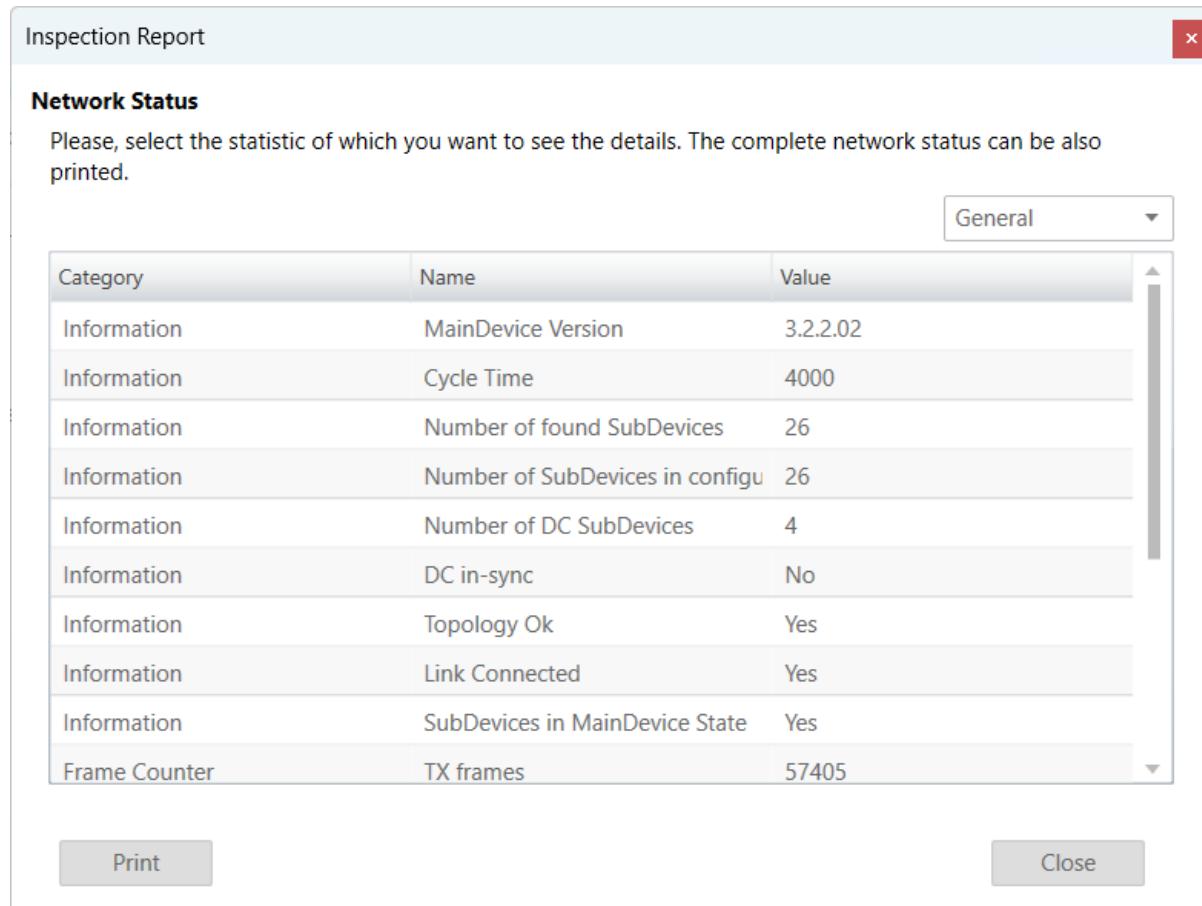
In the list you can see all connected SubDevices. The red ones are incorrectly connected

AutoInc Address	Station Address	Type
65523	1014	EL3162
65522	1015	EL1008
65521	1016	EL1094
65520	1017	EK1110
65519	1018	BK1120
65518	1019	VIPA 053-1EC00
65517	1020	EK1122
65516	1021	EK1100
65515	1022	EL2202-0100
65514	1023	EL2202-0100
65513	1024	EL1114
65512	1025	FI 7031

Close

6.4 Inspection Report

If you want to print or show a report about the actual session, it is possible with the inspection report. It shows a lot of different data about the network communication. It is also possible to print a PDF.

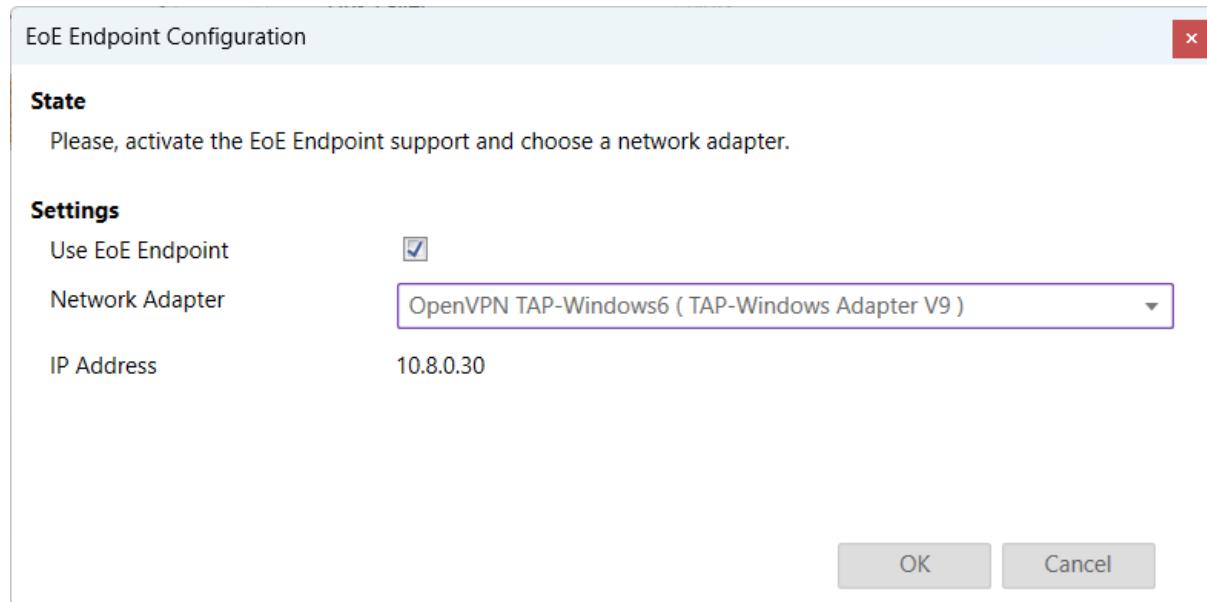


6.5 EoE Endpoint Configuration

If you want to use EoE SubDevices with your local MainDevice, you can activate the EoE Endpoint.

Note: This feature is only available if the package "Tap-Windows" from OpenVPN is installed: <http://openvpn.net/index.php/download/community-downloads.html>

If this package is installed, you will see the following dialog:



Settings

Use EoE Endpoint:

Activate EoE Endpoint support for the selected device

Network Adapter:

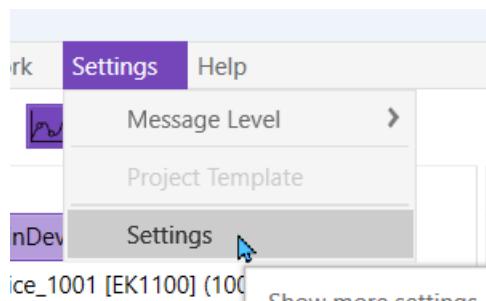
List of installed network adapters (TAP)

IP Address:

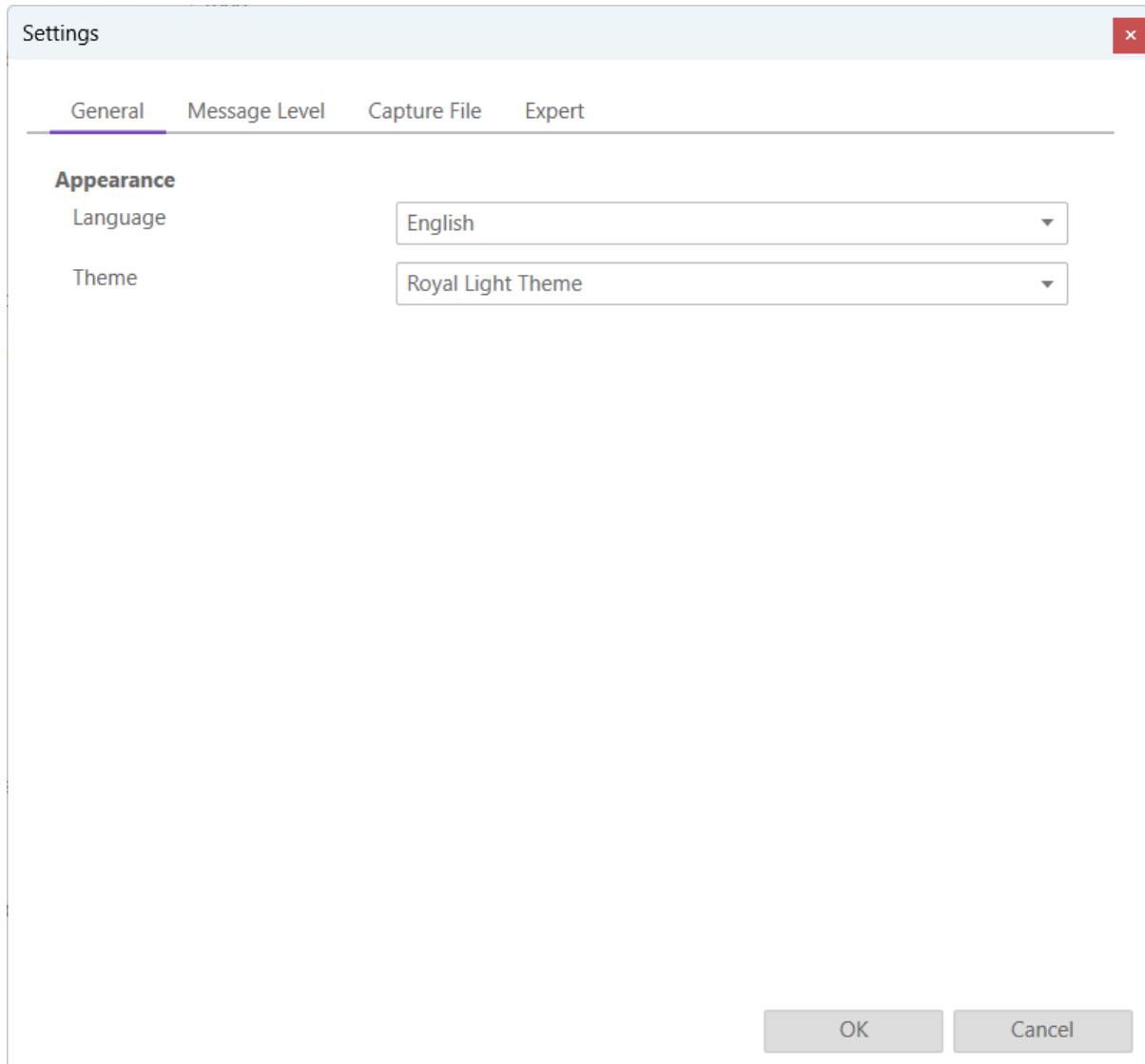
IP Address of the selected network adapter

6.6 Settings

Can be found inside the settings menu bar.



6.6.1 General



Appearance

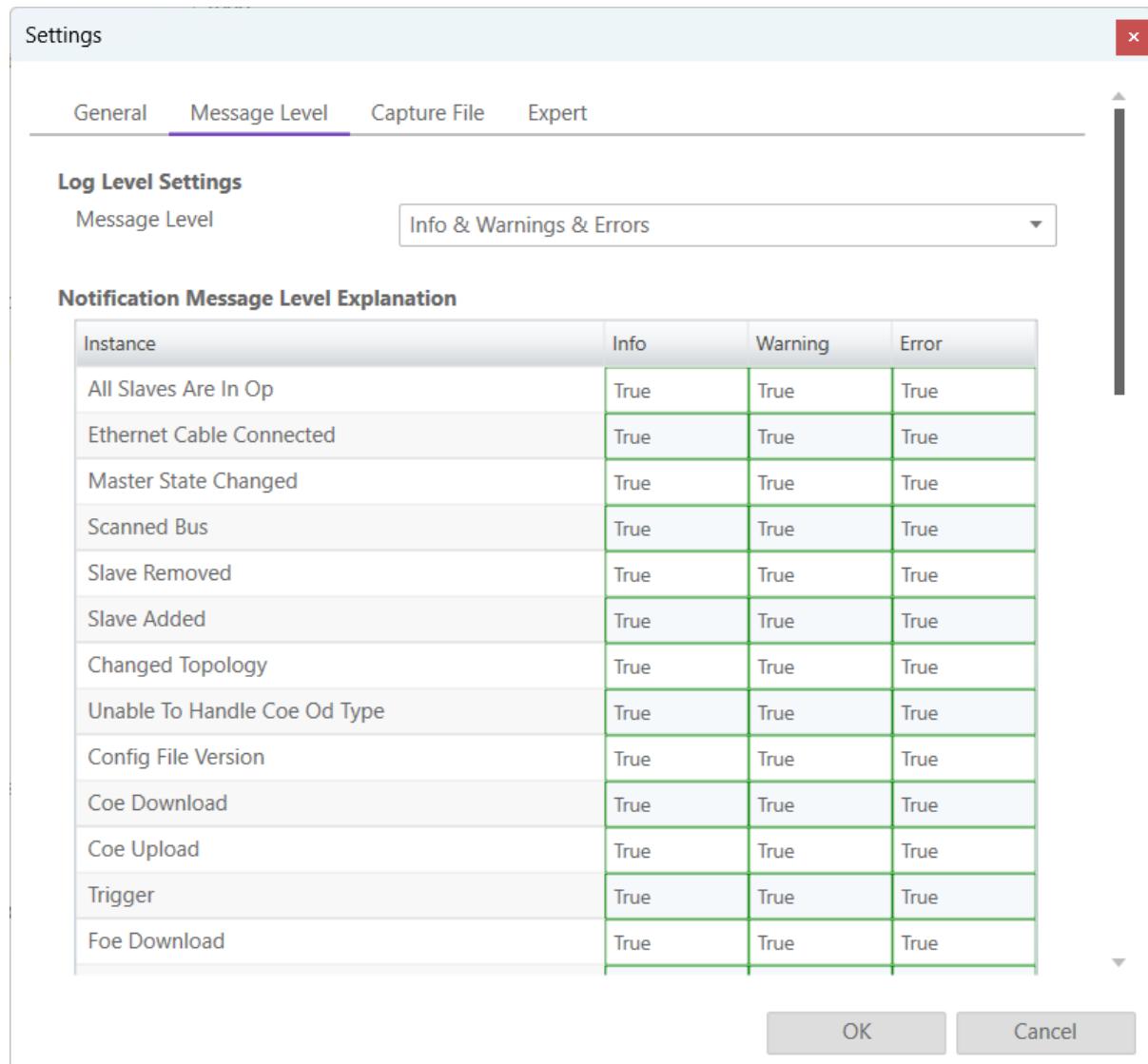
Language:

Changes the current language

Theme:

Changes the current theme

6.6.2 Message Level



In this tab the log level of the message panel can be changed.

Log Level Settings

Message Level:

Changes what messages are displayed on the message panel

Explanation

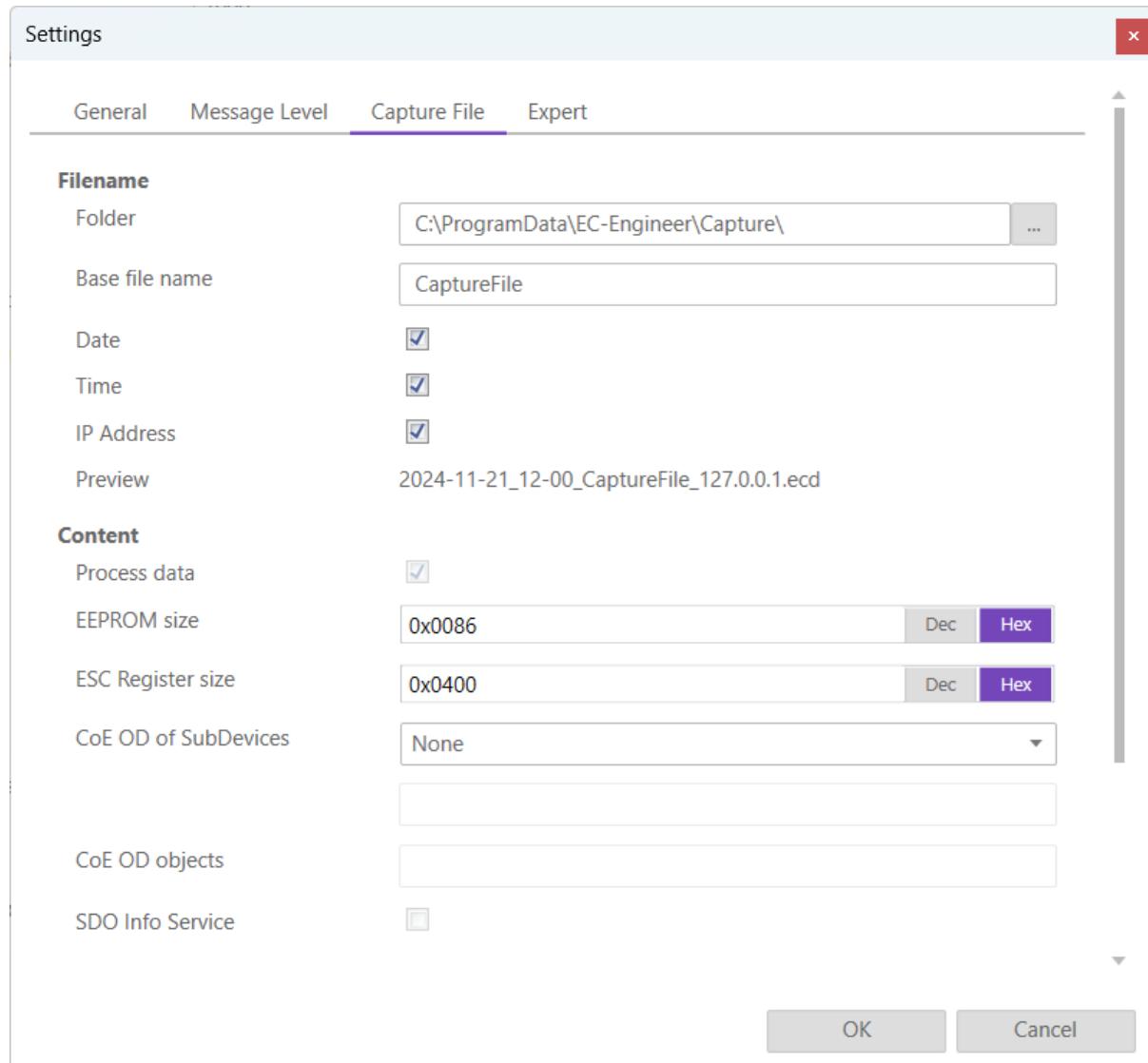
We can see what messages are displayed depending on the selected message level (true it is displayed, false it is not displayed)

6.6.3 Capture File

A capture file could be helpful, if a very large system is given or the system is not always available. In that case the user can connect to their system, save one or more snapshots into a capture file and analyse the created capture file later.

Another use case is, that their system from time to time some problems. In that case the user can activate the automatic mode and create the snapshots at specific intervals or based on specific MainDevice notifications.

At the moment there are the following options:



Filename

Folder:

Path, where the capture files should be saved

Base file name:

Base file name of the generated capture file name

Date:

Activate, to add the date to the generated capture file name

Time:

Activate, to add the time to the generated capture file name

IP Address:

Activate, to add the IP address to the generated capture file name

Preview:

Shows a preview of the generated capture file name

Content**Process data:**

Activate to add process data to the capture file (read-only)

EEPROM size:

Enter size of the EEPROM (0x86 = default, 0 = no EEPROM)

ESC Register size:

Enter size of the ESC Registers (0x400 = default, 0 = no ESC register)

CoE OD of SubDevices:

Select the SubDevices of which the CoE OD information will be captured

None:

CoE OD will be not captured

All:

CoE OD will be captured of all SubDevices

User defined:

CoE OD will be captured of the defined SubDevices by physical address (e.g. 1001-1003; 1005)

CoE OD objects:

Enter index of specific objects or all objects will be collected (e.g. 0x1018; 0x7000-0x7FFF)

SDO Info Service:

Activate to use the SDO Info Service for loading the CoE Object Dictionary instead of readying the information from the ESI file.

Automatic Mode**Interval (min):**

Time to wait until next snapshot will be taken

Maximum Snapshots:

Enter count of maximum snapshots

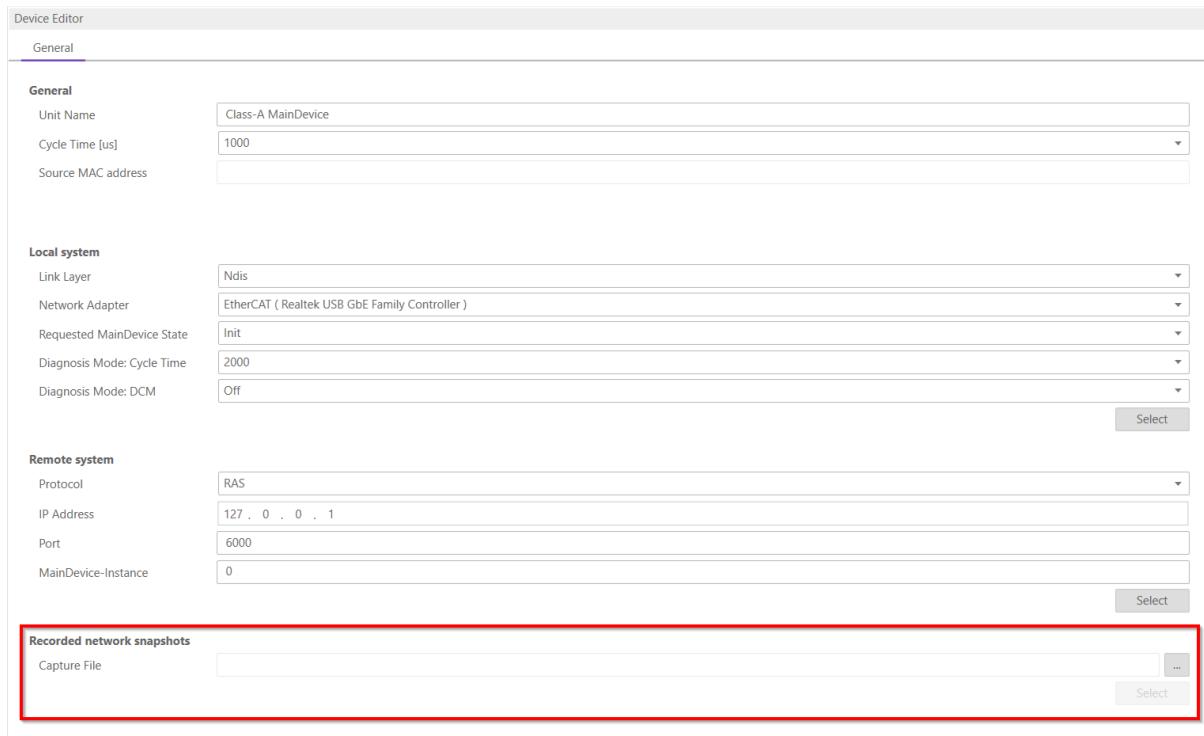
Notifications:

Select the notifications, which will trigger a snapshot. The following notifications are available (for more information about notifications please refer the manual of EC-Master):

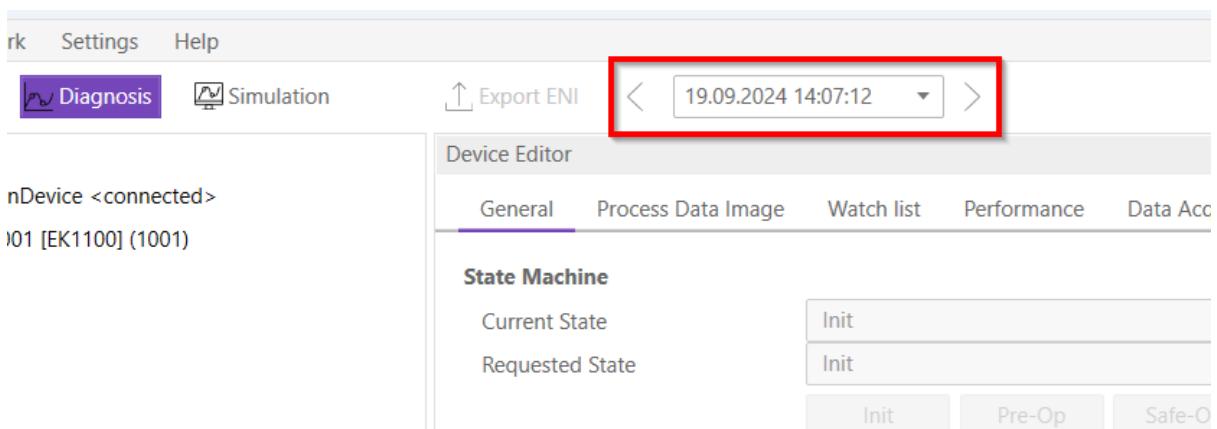
- STATECHANGED
- ETH_LINK_CONNECTED
- ETH_LINK_NOT_CONNECTED
- SLAVE_STATECHANGED
- SLAVE_PRESENCE
- SLAVE_INITCMD_RESPONSE_ERROR

- STATUS_SLAVE_ERROR
- SLAVE_UNEXPECTED_STATE
- DC_SLV_SYNC
- DCM_SYNC

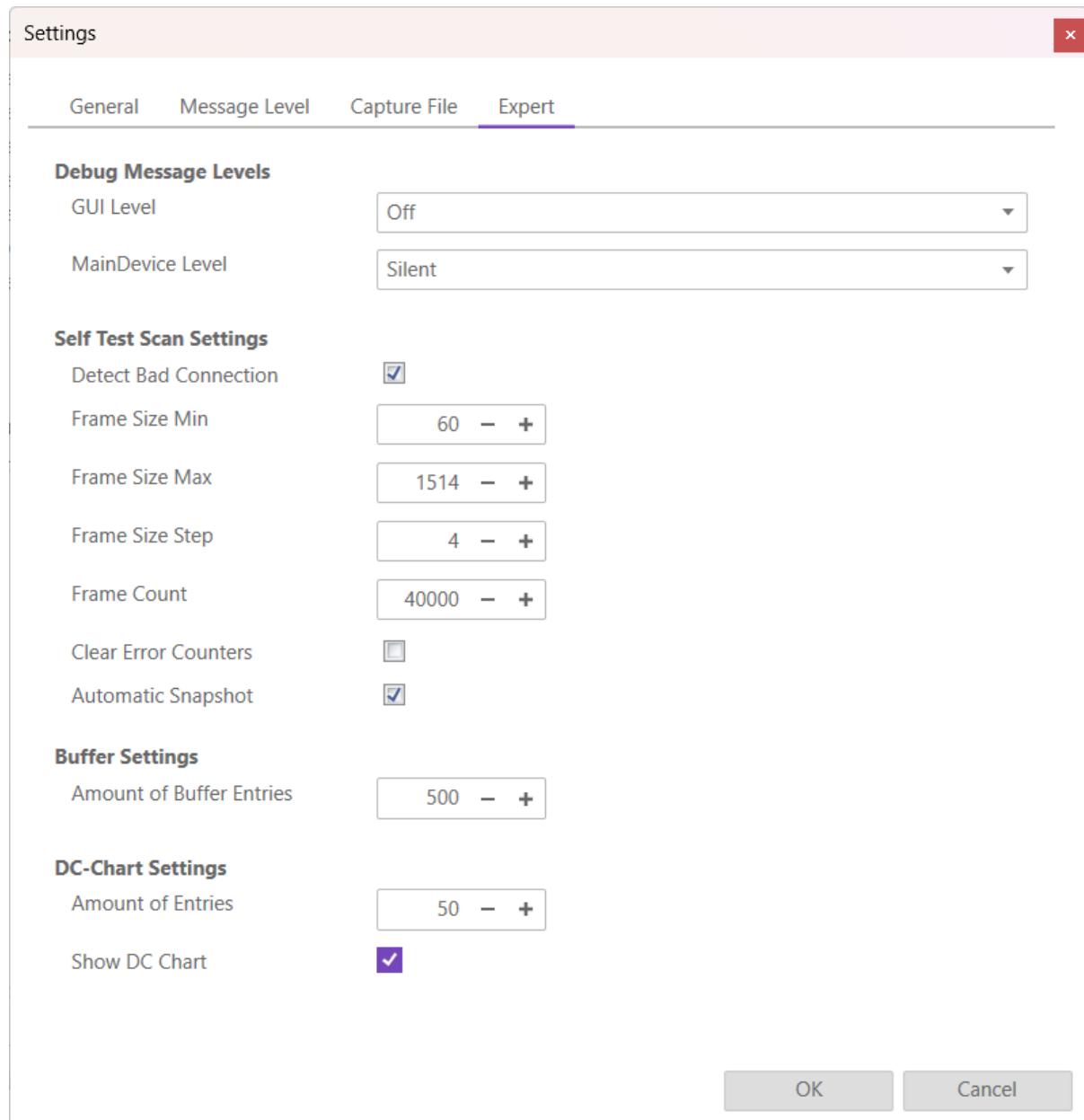
After the snapshot(s) is / are made in diagnosis mode they can be selected in the overview in config mode:



After the selection switching to diagnosis mode is possible. In the toolbar will be an additional combobox to select the snapshot and switch between them:



6.6.4 Expert



Debug Message Levels

GUI Level

Changes the GUI debug message level

MainDevice Debug Message Level

Changes the MainDevice debug message level

Self Test Scan Settings

Detect Bad Connection

(De-)Activates bad connection detection

Frame Size Min

Changes the min frame size

Frame Size Max

Changes the max frame size

Frame Size Step

Changes the frame step size

Frame Count

Changes the frame count

Clear Error Counters

Resets the error counters on the MainDevice

Automatic Snapshots

Enables the creation of a snapshot after running a successful Self Test Scan

Buffer Settings**Amount of Buffer Entries**

Changes the amount of entries in the Buffer/Charts (eg. Variables)

DC-Chart Settings**Amount of Entries**

Changes only the amount of entries in the chart in the DC Diagnosis Tab

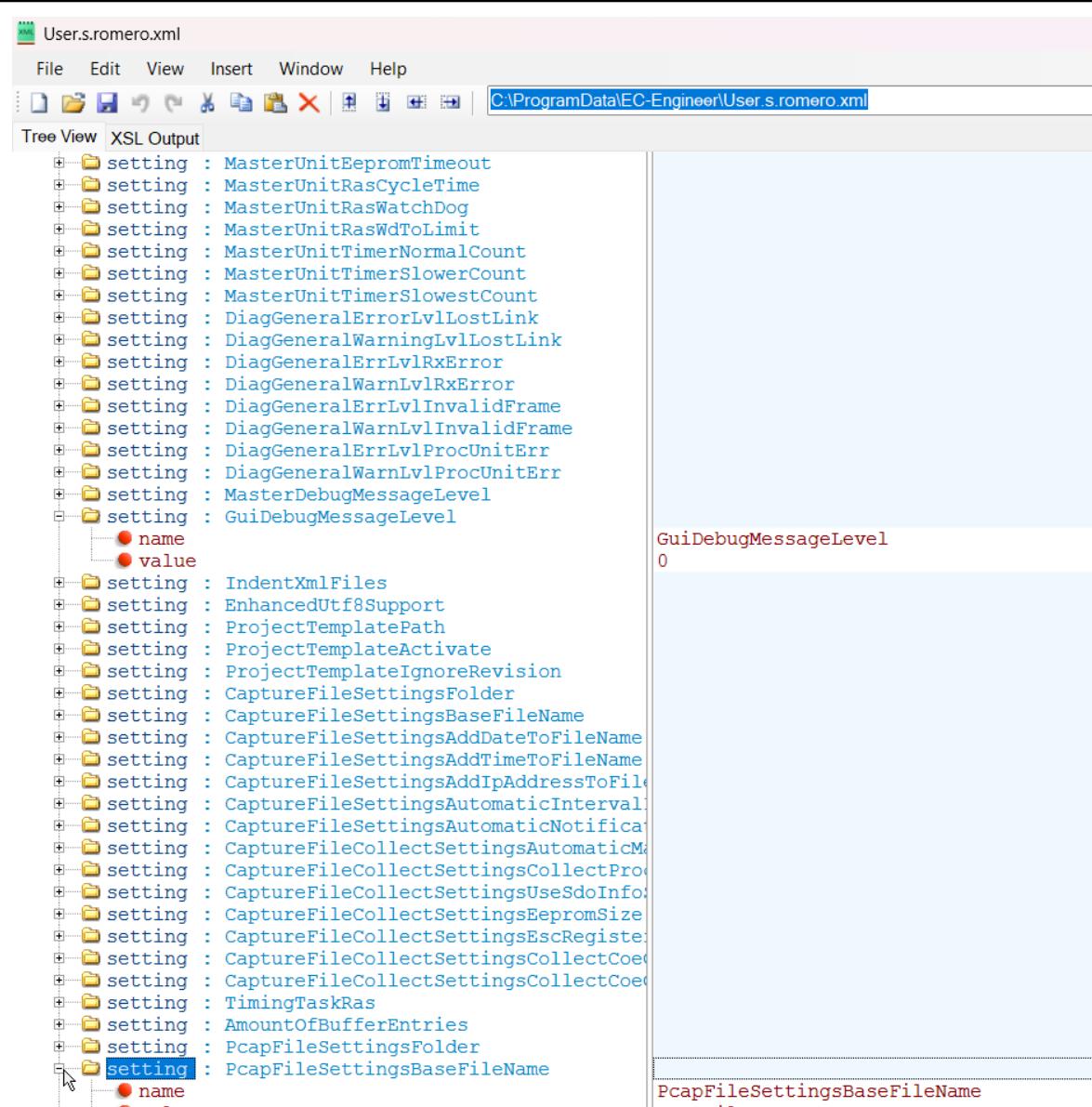
Show DC Chart

Check to display the chart in the DC Diagnosis Tab

6.6.5 Settings File

Inside this file the user can modify all settings, including some that are not present in the settings dialog.

Warning: Only modify this file if you know what you are doing.



The file can be located either at “C:/ProgramData/EC-Engineer/User.<username>.xml” or inside the install directory.

6.7 Real-time Support

Normally on Windows you do not have real-time support, but to get DCM in sync you can install the “ECAT driver” in the following modes:

Network driver

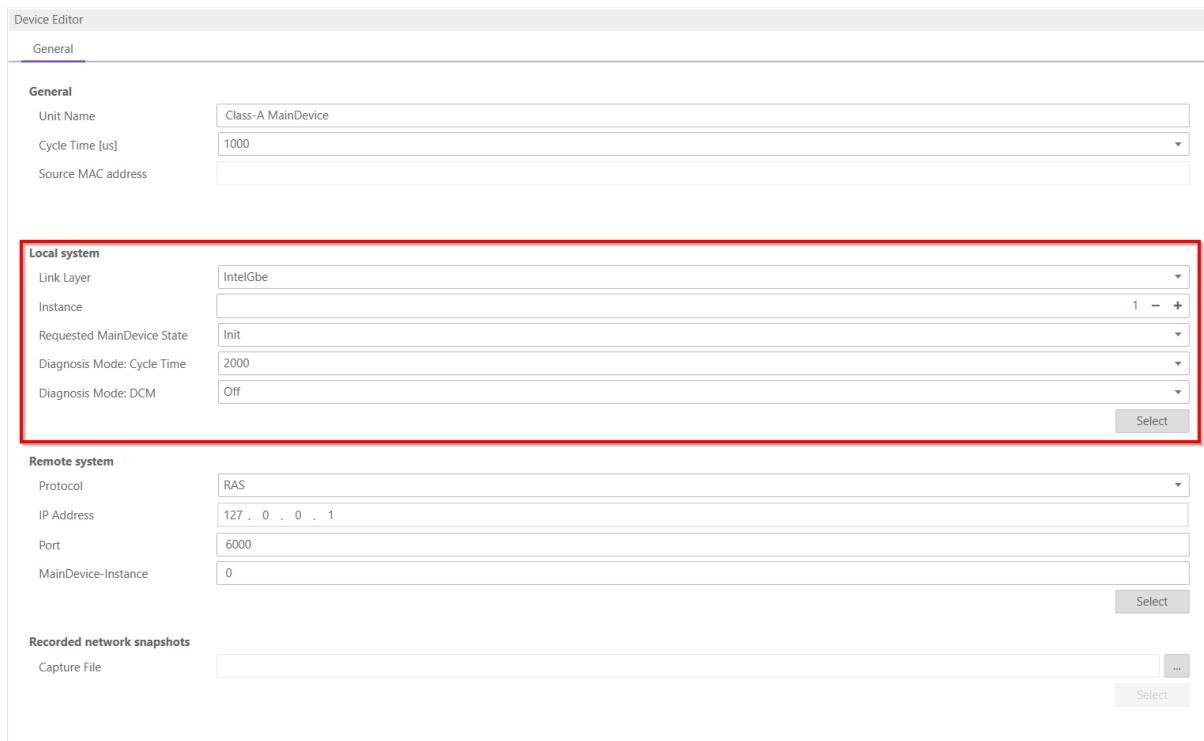
The network driver can be used from the optimized link layers

The real-time support is normally hidden in EC-Lyser. It can be activate by copying the specific link layer libraries into the installation directory of EC-Lyser.

For the local system, EC-Lyser will turn on DCM and use the real-time clock for generating the job task cycles. For more information about how to install the “ECAT driver” please refer the manual of [EC-Master Class A](#) DCM on Windows

6.7.1 Optimized Link Layers

After activating the real-time support the optimized link layer can be selected in the option “Link Layer”:



Depending on the link layer type the user can chose the network adapter or the instance.

The following optimized link layers are currently supported:

`em11I8254x.dll` (Intel PRO/1000 Network Adapters)

`em11I8255x.dll` (Intel PRO/100 Network Adapters)

`em11IRTL8139.dll` (Realtek 8139 Fast Ethernet Adapters)

`em11IRTL8169.dll` (Realtek Gigabit Ethernet Adapters)

`em11ICCAT.dll` (BECKHOFF CCAT)

For more information about optimized link layers and how to install the ECAT driver please refer the manual of [EC-Master Class B EcatDrv for Optimized Link Layers](#)

7 Command Line Interface

For helping users in some special situations and to do not confuse other users the EC-Lyser supports a small command line interface:

/HELP, /?

Shows the help dialog

/REMOTE="127.0.0.1:6000:0:0":

Runs diagnosis with a remote system, **where** IP address is "127.0.0.1", **port** is 6000, **MainDevice** instance is set to 0 and protocol is set to RAS. It is also supported to use the DNS name instead of the IP address

/LOCAL="127.0.0.1":

Runs diagnosis with the local system and the network adapter with IP address "127.0.0.1" will be chosen

/CAPTURE="C:/myfile.ecd:0":

Runs diagnosis with the offline diagnosis system, **where** the path to the capture file is :file:`c:/myfile.ecd` and the selected snapshot is "0"

/ENI="eni.xml":

Sets the path to the ENI file which should be used

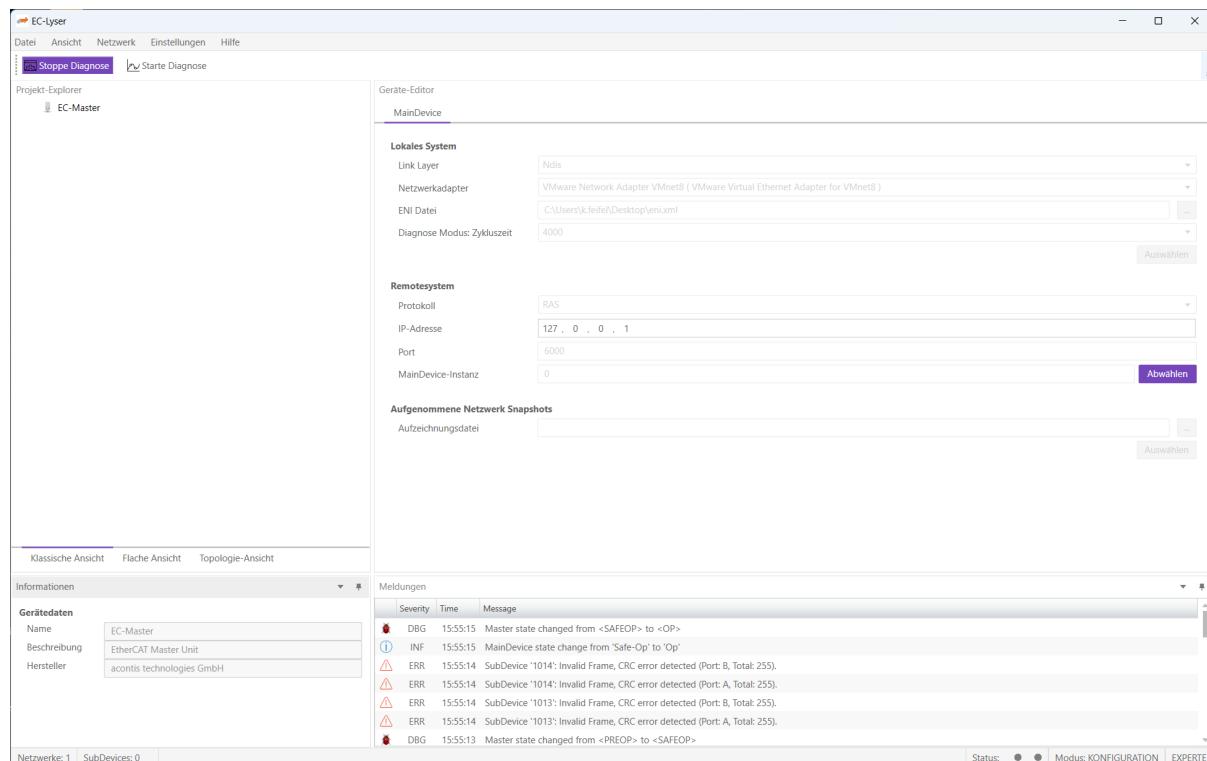
8 Customization

8.1 Multi-Language-Support

EC-Lyser supports multiple languages, which can be changed at runtime. Adding support for further languages is quite easy because it is just a simple XML file which must be added to the kit.

All language files are stored in: `"%ProgramFiles%/acontis_technologies/EC-Lyser/Languages/...`

EC-Lyser has also full UNICODE support, which means that it is also possible to support Asian languages:

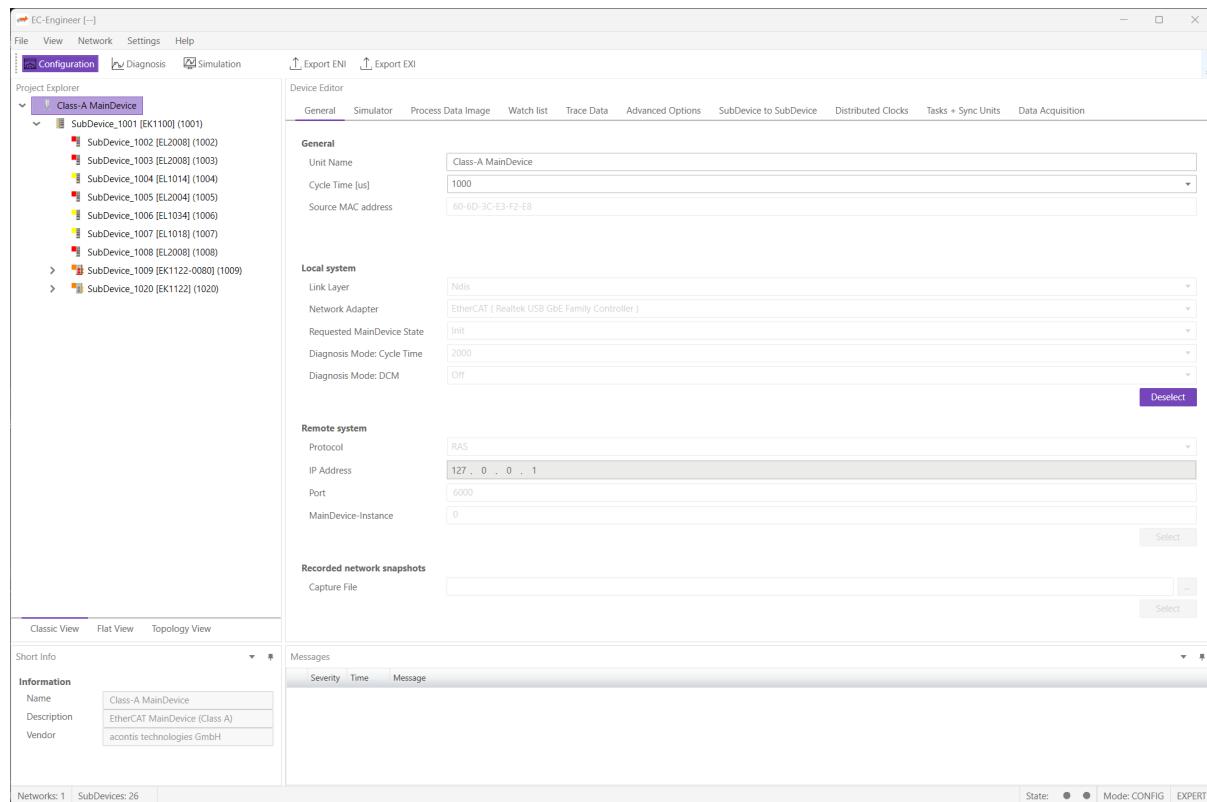


8.2 Themes

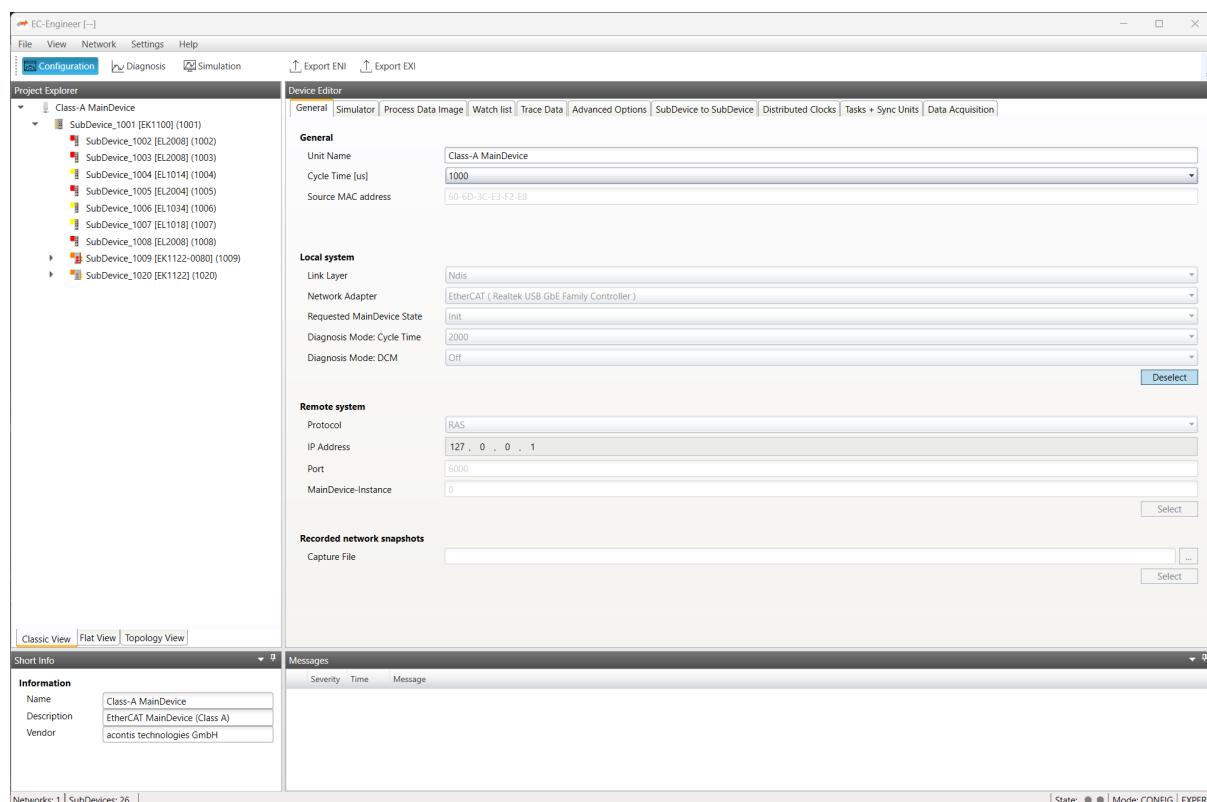
EC-Lyser supports multiple themes, which can be changed during compile time. Adding support for further themes is quite easy because a theme consists of a couple of XAML files which must be added to the kit.

Five themes are already included into EC-Lyser:

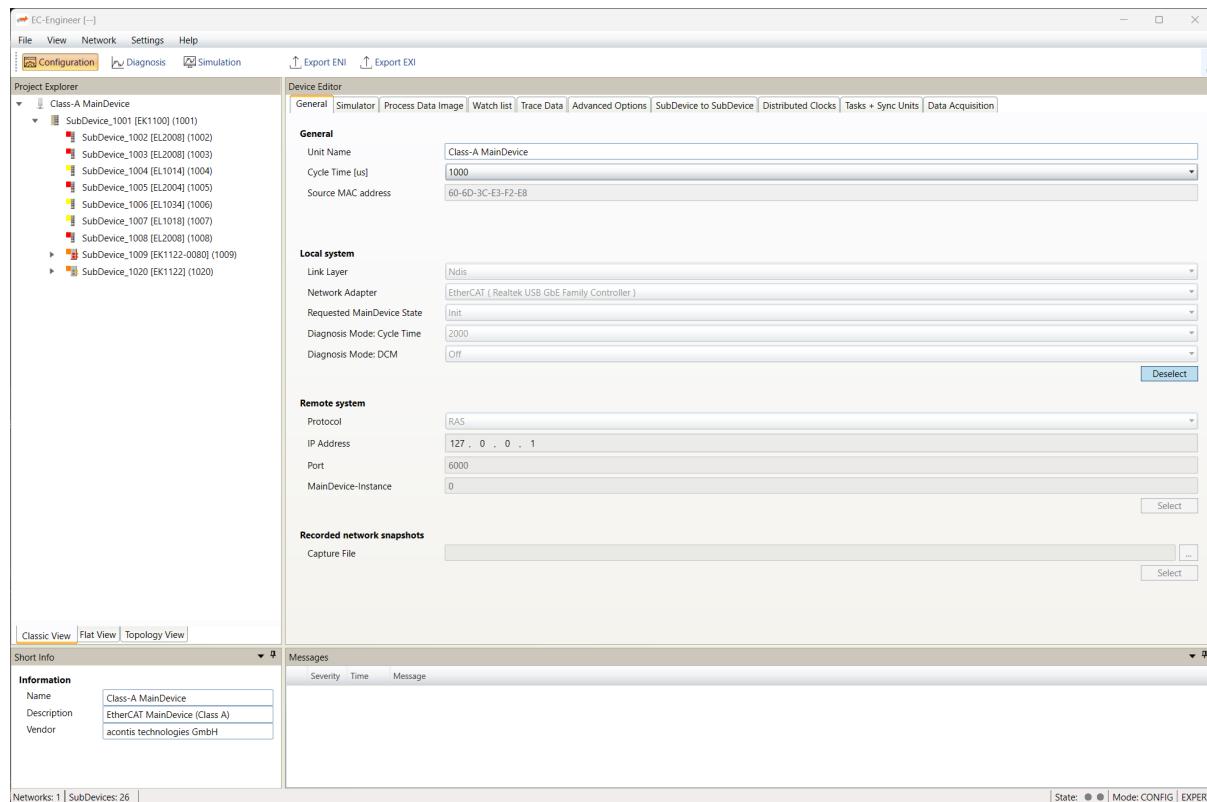
Royal Light Theme



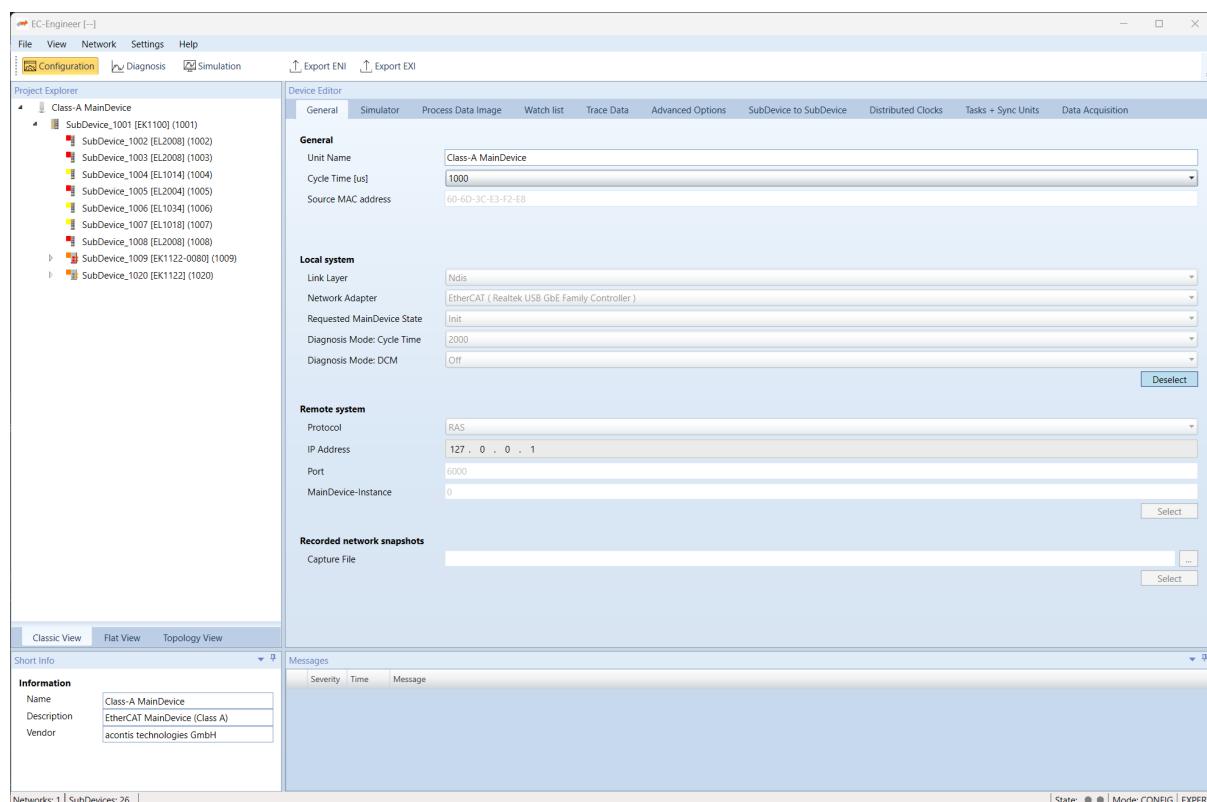
IG Theme



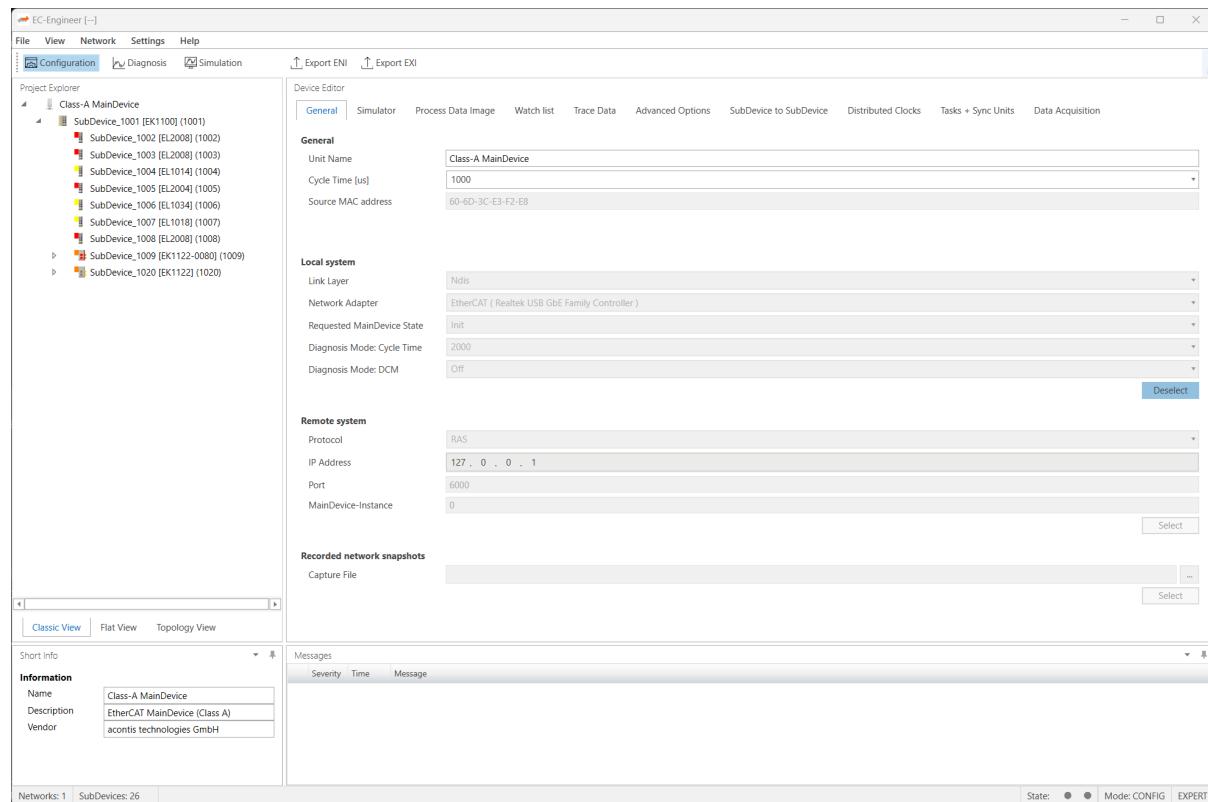
Luna Theme



Office 2010 Blue Theme



Office 2013 Theme



9 Licensing

9.1 Third party Software

EC-Lyser is using the following third party software:

- Infragistics

9.2 EC-Lyser License

For EC-Lyser we have two license models:

- Node Locked License
- Floating License

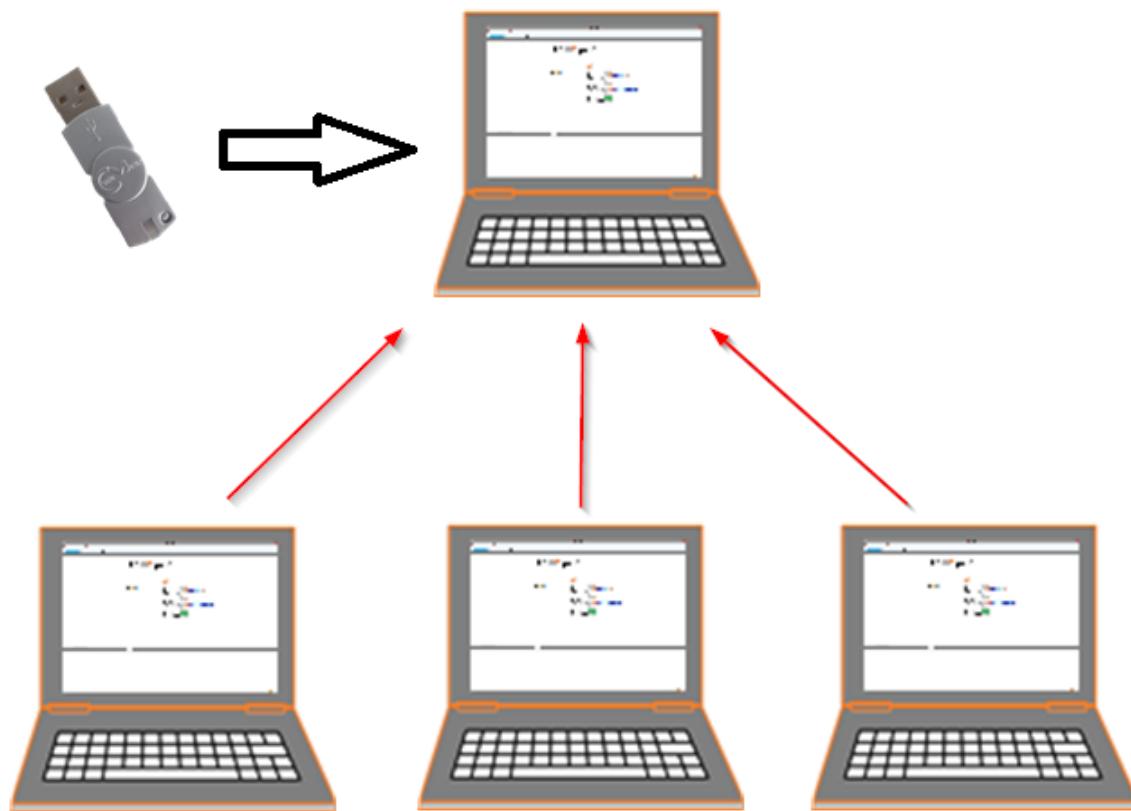
9.3 Node Locked License

If you choose this license model, you need an USB dongle for every single computer. This dongle must be plugged into the computer where you want to use EC-Lyser.



9.4 Floating License

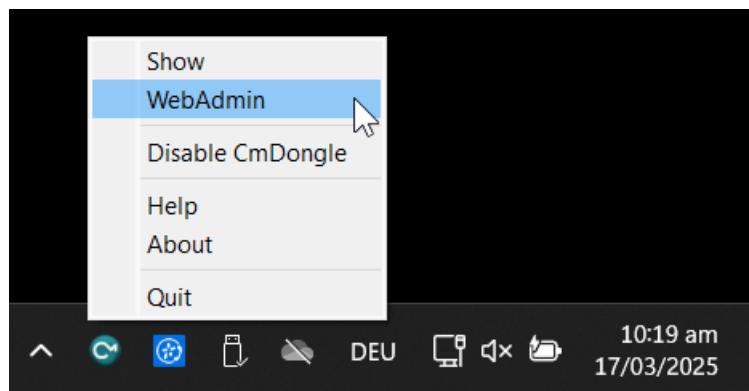
If you choose this license model, you need only one USB dongle with multiple floating licenses. This dongle must be plugged into your license server and all client computers will connect to this license server.



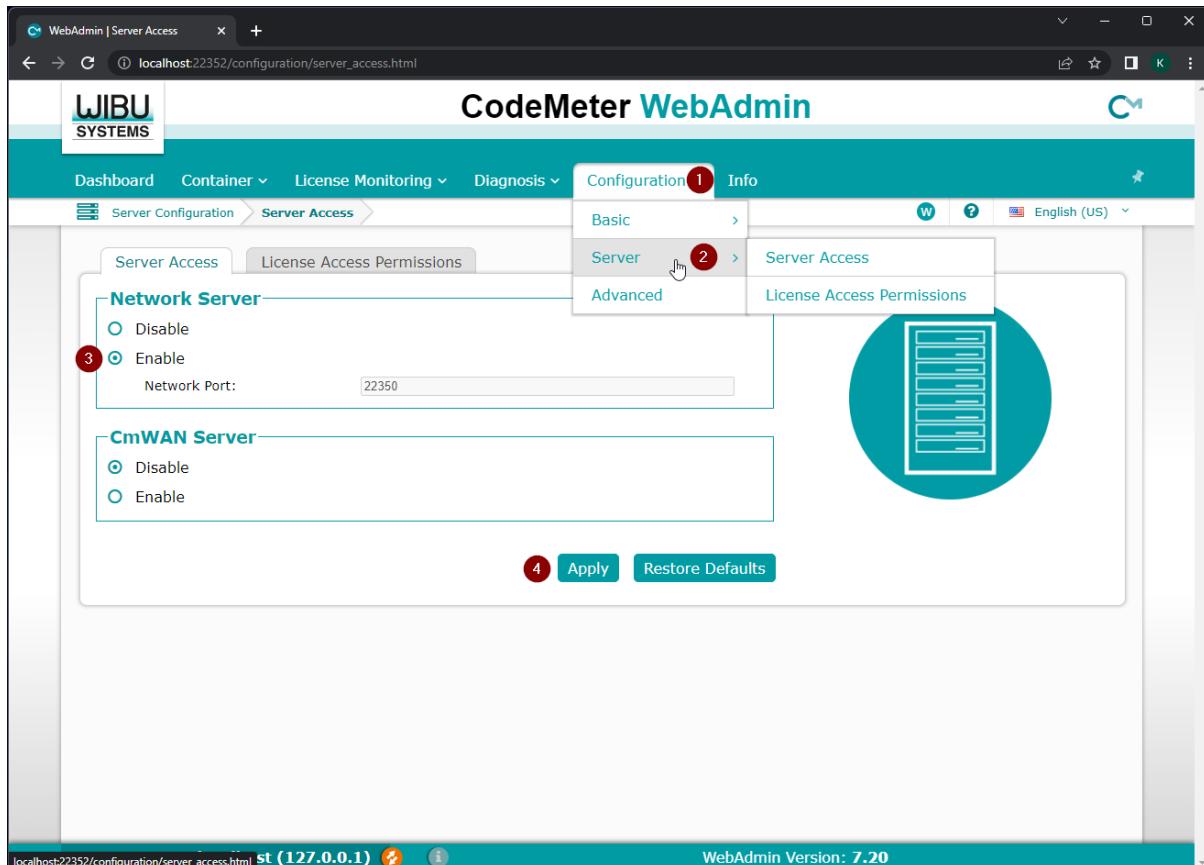
Note: This requires that the “WebAdmin” of the “Code Meter” is installed on the system. Please download and install the “Code Meter Runtime” from WIBU: <https://www.wibu.com/>

9.4.1 Configure License Server

Install the “Dongle-Version” of EC-Lyser on your license server, plug-in your USB dongle and open the “WebAdmin”:

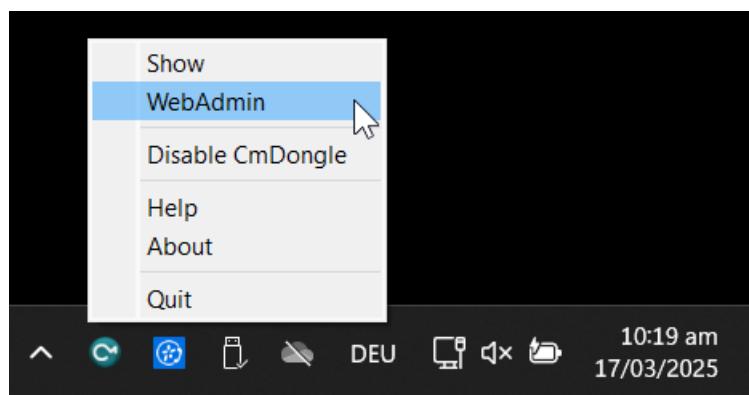


In the “WebAdmin” navigate to “Configuration Server”, select the option “Run Network Server” and press **Apply**:

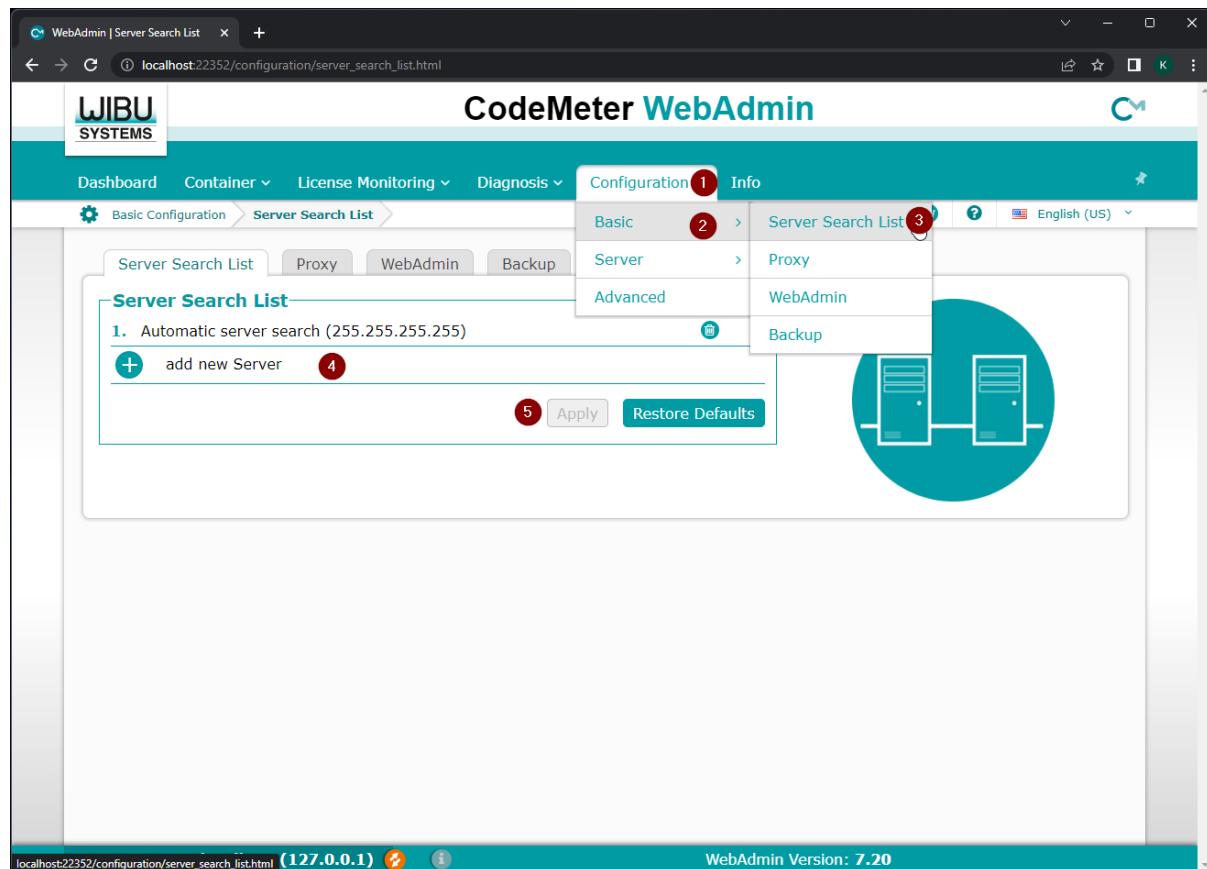


9.4.2 Configure Client Computer

Install the “Dongle-Version” of EC-Lyser and open the “WebAdmin”:

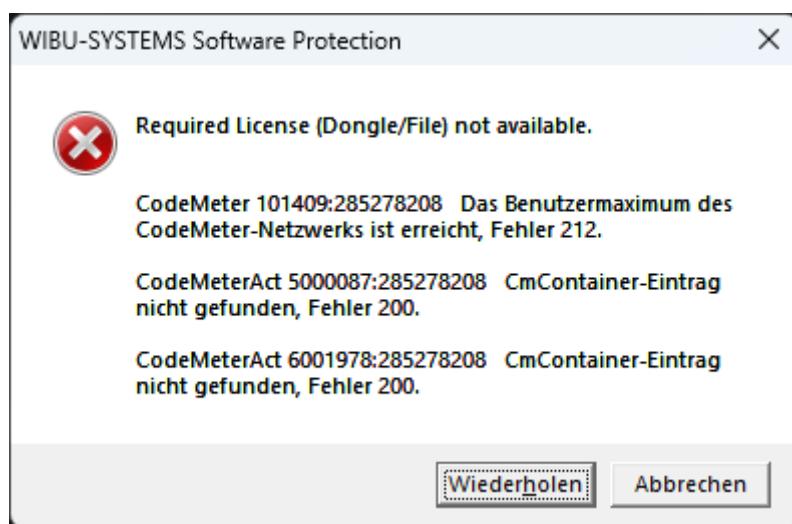


In the “WebAdmin” navigate to “Configuration Network”, press *add*, enter your IP address of your license server and press *Apply*:



Now, you should be able to start EC-Lyser.

Note: If too many clients are connected you will, you will receive the following error message:

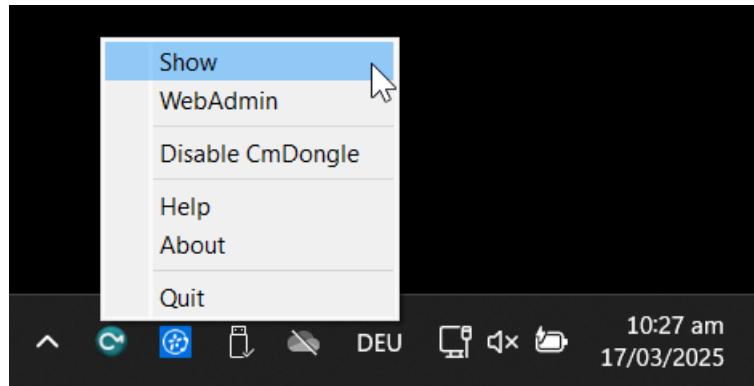


In that case, you should try to close unused EC-Lyser instances or buy more floating licenses.

9.5 License Update

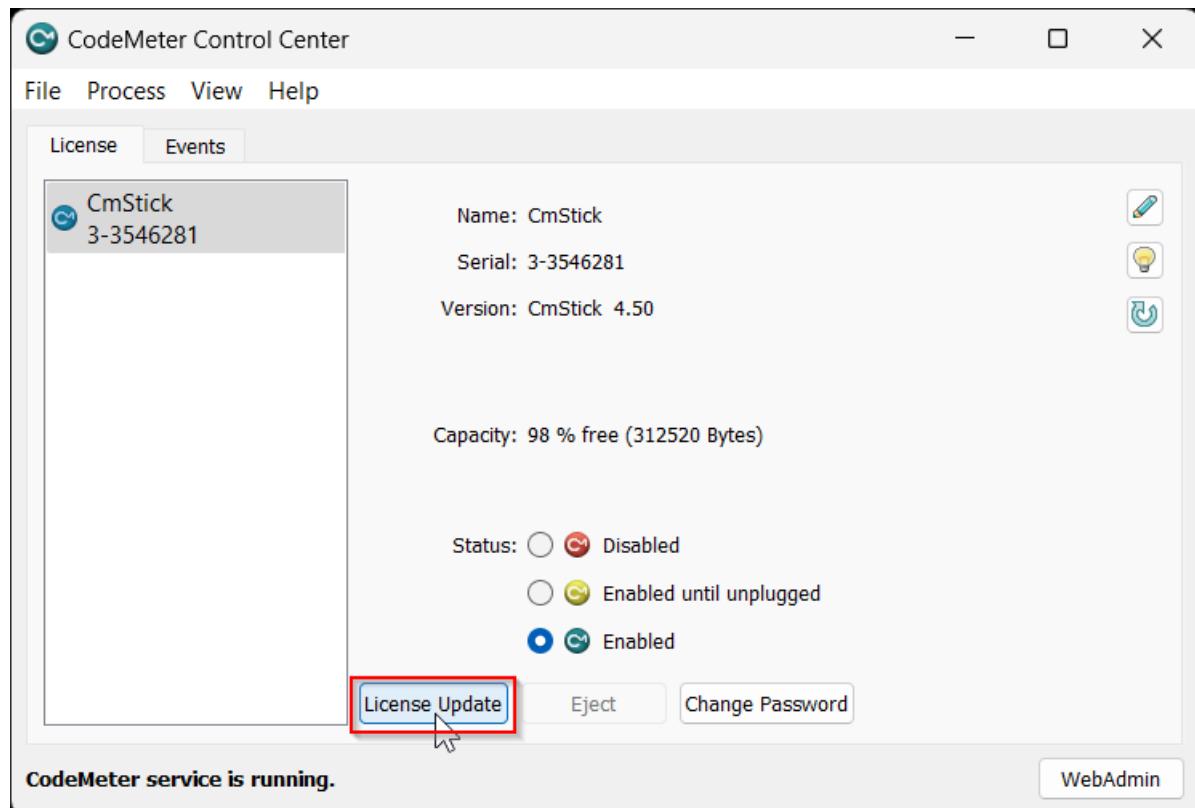
9.5.1 Request License Update

Step 1: Install the “Dongle-Version” of EC-Lyser and open the “CodeMeter Control Center”:

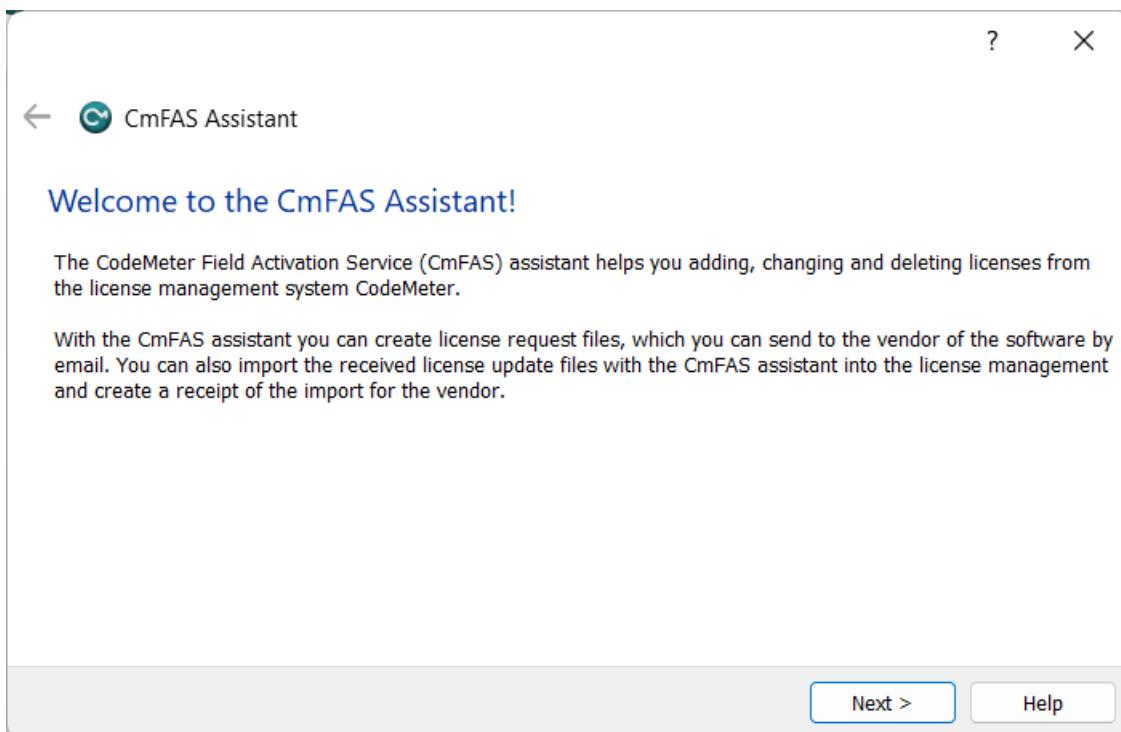
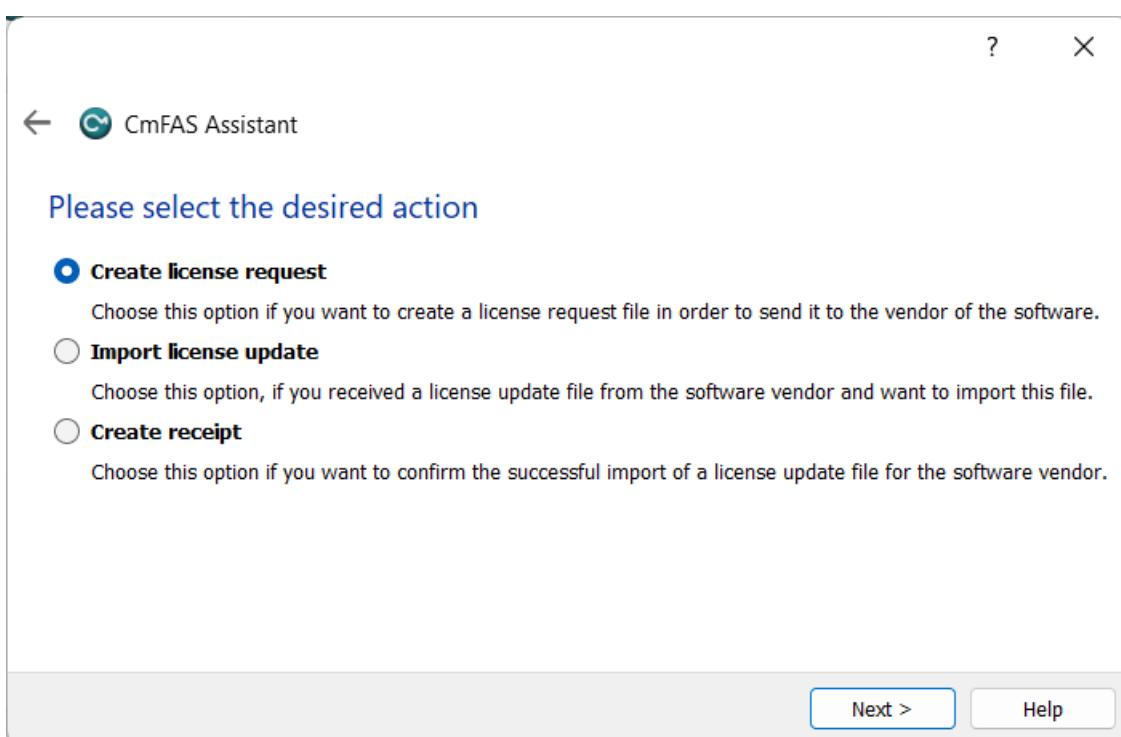


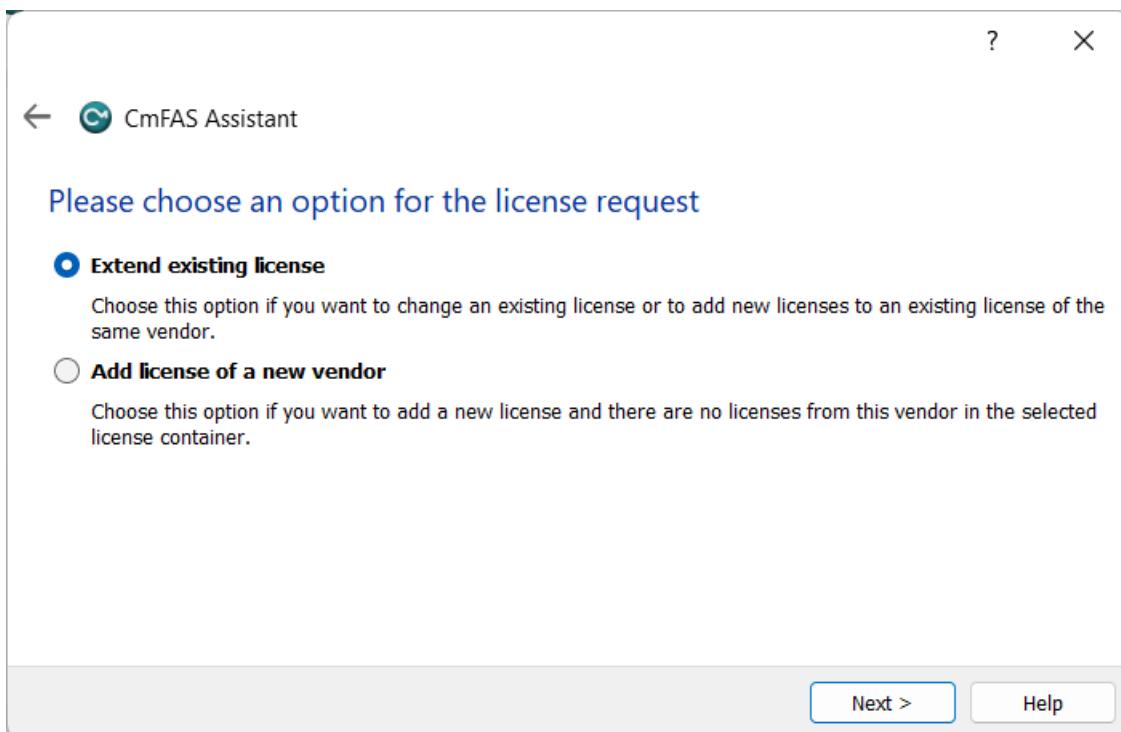
If the selected license is a virtual dongle, simply drag and drop the WibuCmLIF file onto the CodeMeter Control Center. Otherwise, the dongle should already be visible.

Step 2: In the “CodeMeter Control Center” open the “CmFAS Assistent” by clicking on *License Update*:



Step 3: Now, follow the assistant until you can select a file name:

**Step 4: Select “Create license request”:****Step 5: Select “Extend existing license”:**



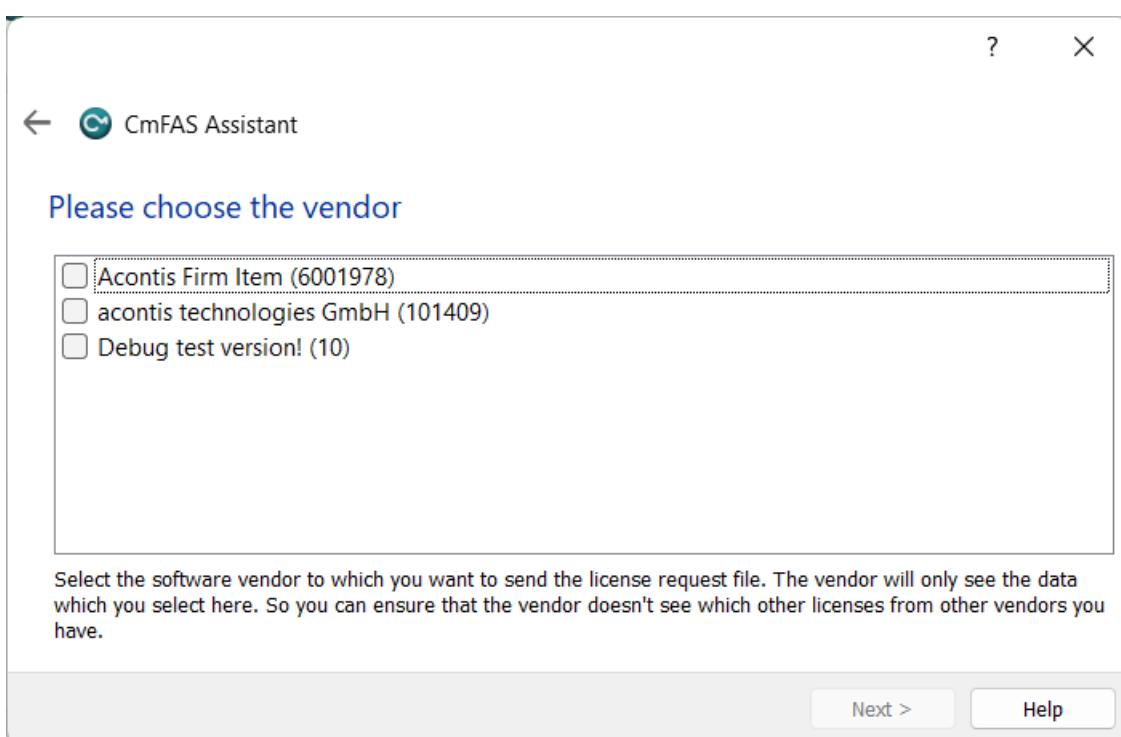
←  CmFAS Assistant

Please choose an option for the license request

Extend existing license
Choose this option if you want to change an existing license or to add new licenses to an existing license of the same vendor.

Add license of a new vendor
Choose this option if you want to add a new license and there are no licenses from this vendor in the selected license container.

[Next >](#) [Help](#)

Step 6: Keep the selected the vendor:

←  CmFAS Assistant

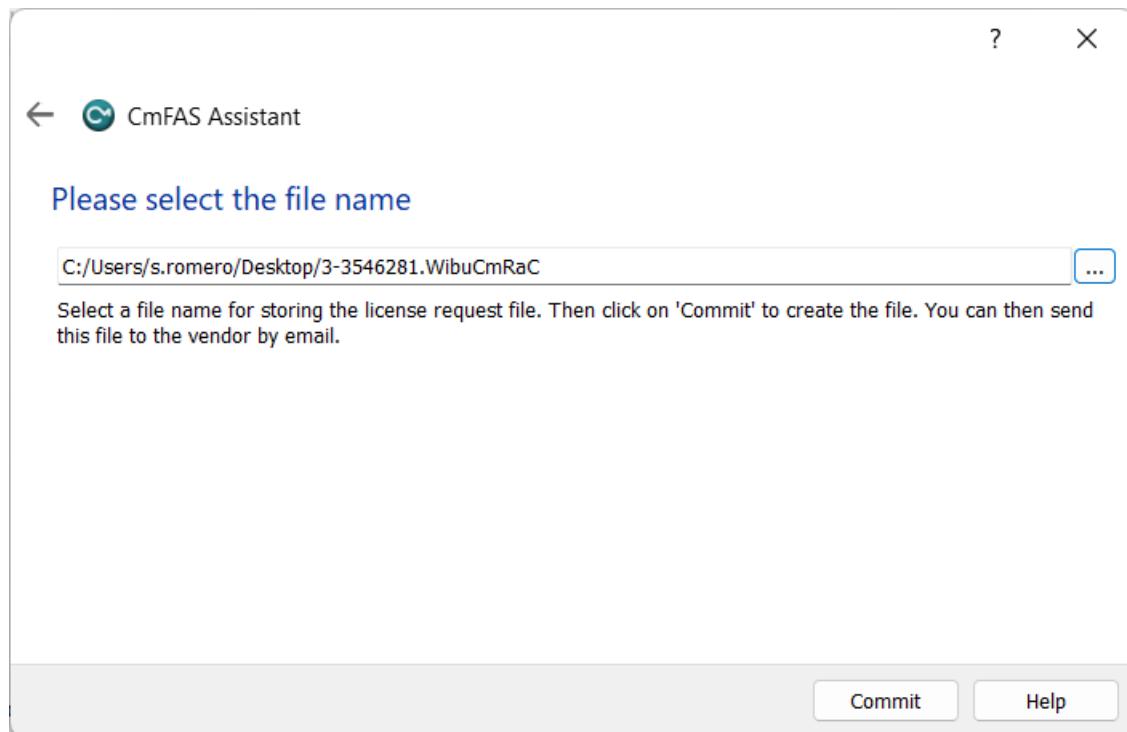
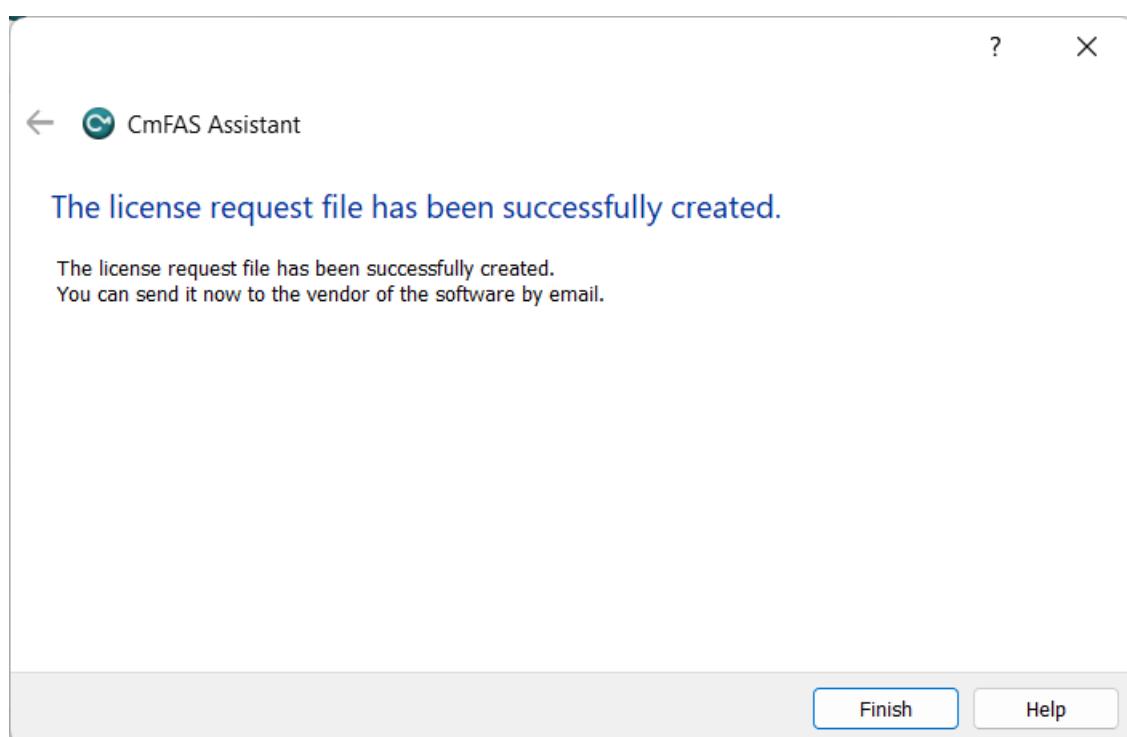
Please choose the vendor

Acontis Firm Item (6001978)
 acontis technologies GmbH (101409)
 Debug test version! (10)

Select the software vendor to which you want to send the license request file. The vendor will only see the data which you select here. So you can ensure that the vendor doesn't see which other licenses from other vendors you have.

[Next >](#) [Help](#)

Step 7: Select the file name:

**Step 8: Finish the assistant:**

Step 9: Your license request file * .WibuCmRaC has been successfully created. Please send it to sales@acontis.com

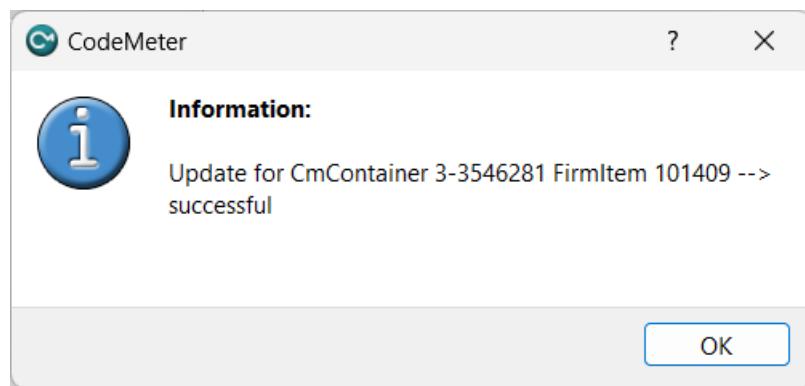
9.5.2 Install License Update

After you have been sent your license request file you will receive the license update file *.WibuCmRaU.

Step 1: Connect your dongle.

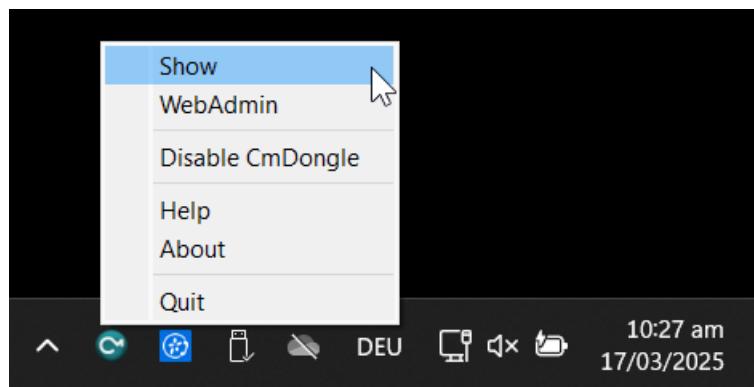
Step 2: Copy the license update file to your desktop.

Step 3: Double-click on the license update file:

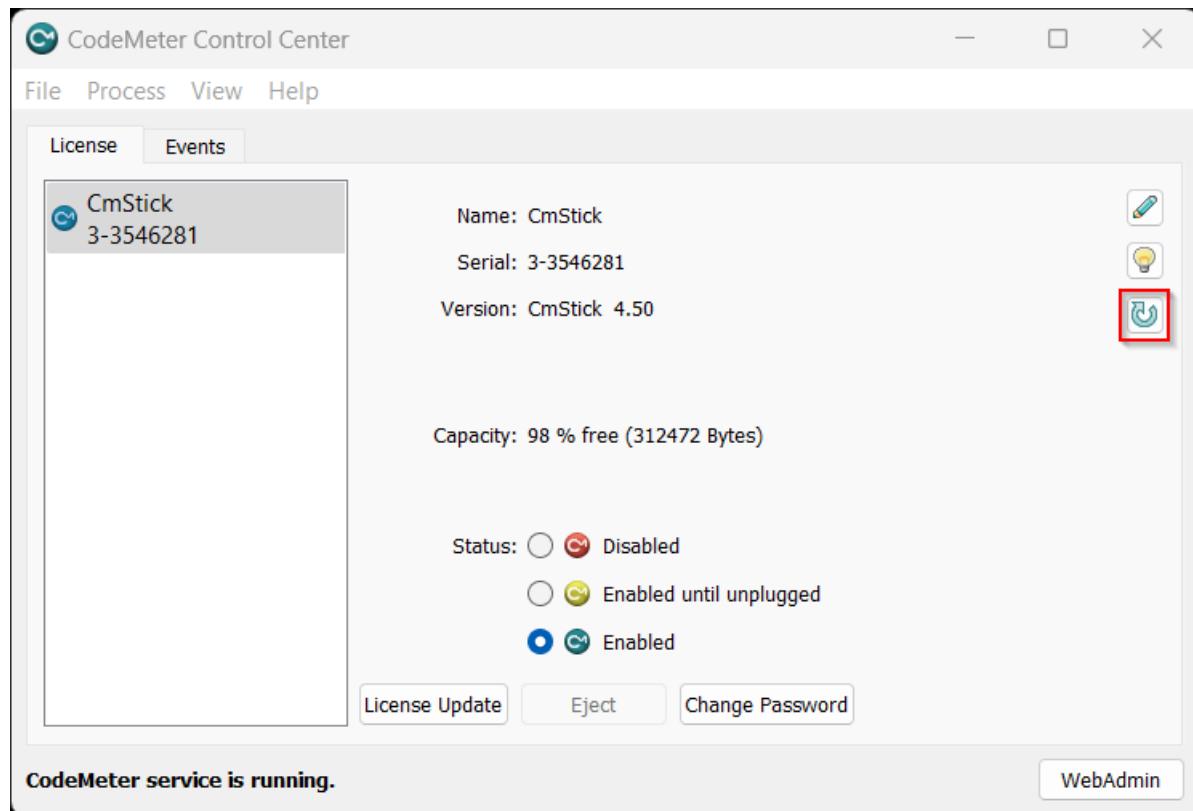


9.6 Dongle Firmware Update

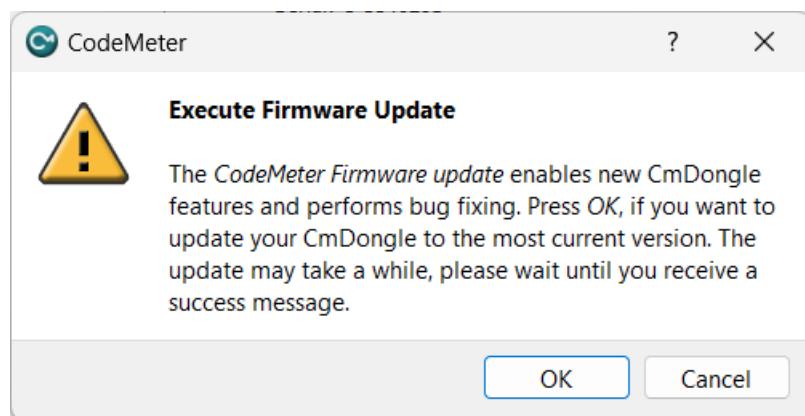
Step 1: Install the “Dongle-Version” of EC-Lyser and open the “CodeMeter Control Center”:



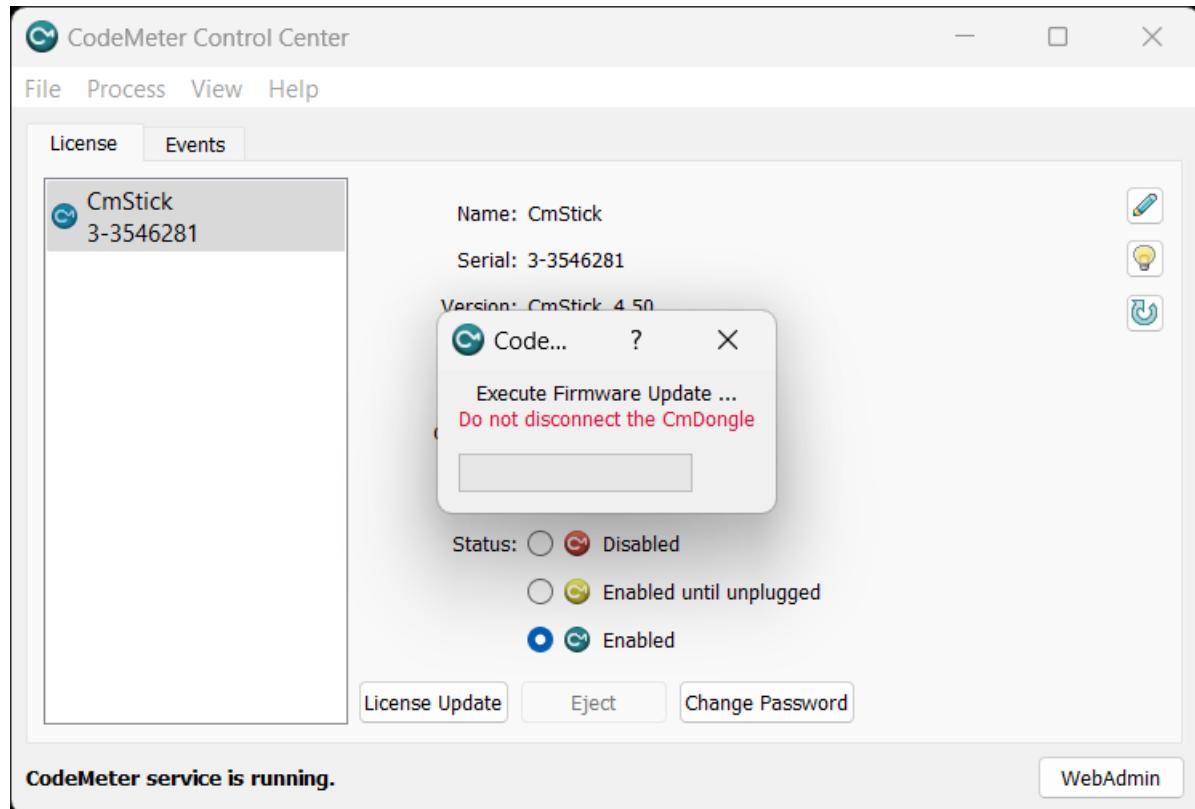
Step 2: In the “CodeMeter Control Center” click on *Update Firmware of selected Cm Dongle*:



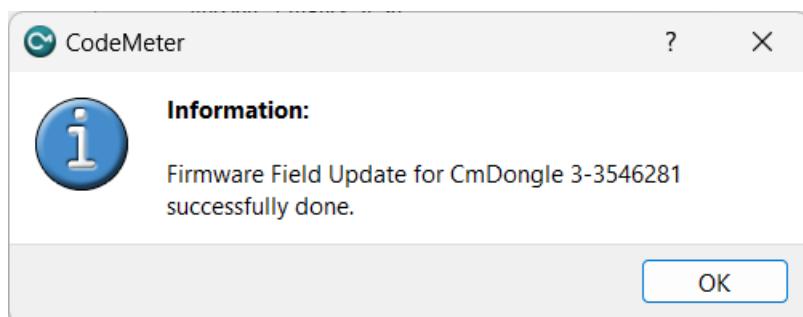
Step 3: Execute firmware update by pressing *OK*:



Step 4: Wait until firmware update was executed:

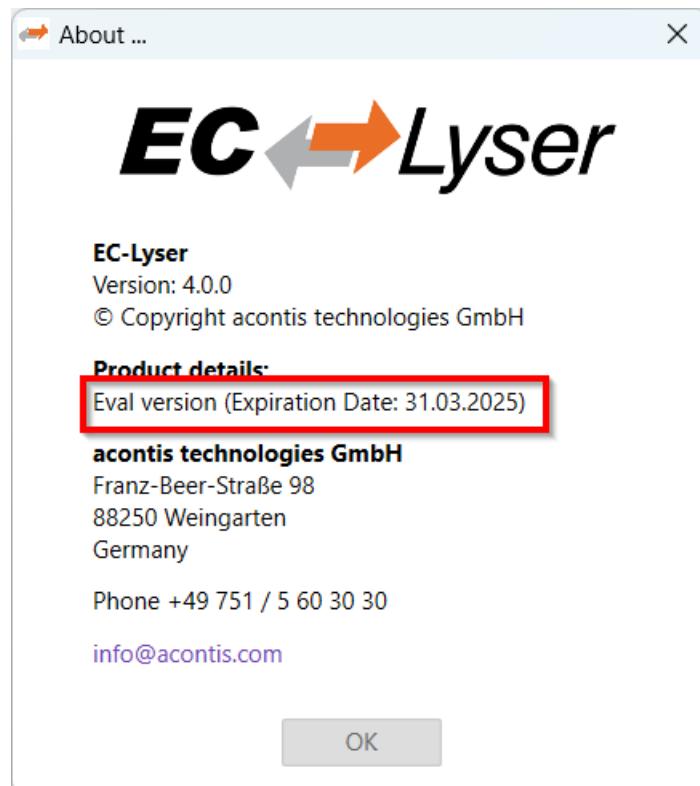


Step 5: Firmware update was done and dongle can be removed:



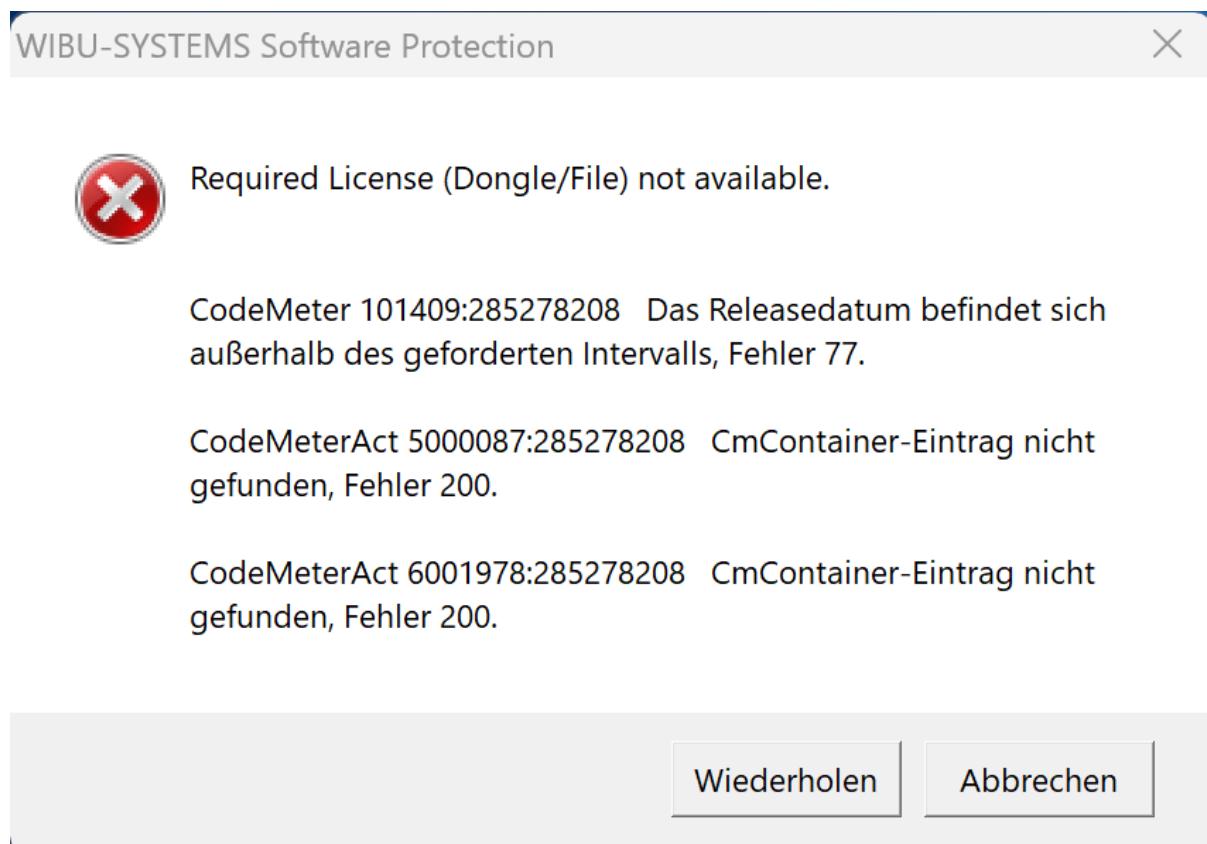
9.7 Expiration Date Dongle

If you chose a expiration dongle you can find your expiration date in the 'About Dialog'. If you have an unlimited dongle you will not see a date in the dialog.



If you see this date you can not use an Engineer which was released after the expiration date, but all older ones are possible.

If you try to start an Engineer which is newer than the expiration date, you will get the following error:



10 FAQ, Tips

10.1 Help in case of a problem

If you have a problem with EC-Lyser or something does not run as expected, please try first the following things:

- Read messages in message window
- Increase message level *Menu* ▶ *Settings* ▶ *All Messages*
- Read log file for more information *Menu* ▶ *Help* ▶ *Show* ▶ *Log* ▶ *File*
- Restart EC-Lyser and try to do it again
- **Contact support by sending a mail to ecsupport@acontis.com and attach the following information**
 - Project file .ecc or .eci if available
 - EC-Lyser Version *Menu* ▶ *Help* ▶ *About*
 - Log file *Menu* ▶ *Help* ▶ *Show Log File*
 - Short description how the reproduce it

10.2 Internal User Specific Settings

EC-Lyser saves all user specific settings in a subfolder of the all users directoy %ALLUSERSPROFILE%/EC-Lyser like C:/ProgramData/EC-Lyser.

In this directoy there is a XML file called `User.myusername.xml`. In this file, the user can find additional settings, which can be helpful for solving some problems:

MasterUnitLocalCycleTime = 1

Bus cycle time of the internal MainDevice in milliseconds

MasterUnitLocalWorkerSleepTimeMs = 100

Cycle time of the local MainDevice thread in milliseconds

MasterUnitRemoteWorkerSleepTimeMs = 300

Cycle time of the remote MainDevice thread in milliseconds

MasterUnitTimerNormalCount = 4

- Time shift to cycle time of the normal refresh cycle
- E.g. local MainDevice = 100 ms, normal refresh cycle is every 400 ms
- Used e.g. for updating MainDevice information, error counters of SubDevice, ...

MasterUnitTimerSlowerCount = 20

- Time shift to cycle time of the slower refresh cycle
- E.g. local MainDevice = 100 ms, slower refresh cycle is every 2 seconds
- Used e.g. for updating the SubDevice information, EEPROM data, register data, ...

MasterUnitTimerSlowestCount = 120

- Time shift to cycle time of the slowest refresh cycle

- E.g. local MainDevice = 100 ms, slower refresh cycle is every 12 seconds
- Used e.g. for updating the CoE Object Dictionary, ...

MasterUnitScanBusTimeout = 5000

Timeout for bus scan in milliseconds

MasterUnitMailboxTimeout = 5000

Timeout for mailbox access in milliseconds

MasterUnitStateChangeTimeout = 5000

Timeout for changing state machines in milliseconds

MasterUnitRegisterTimeout = 3000

Timeout for register access in milliseconds

MasterUnitProcessDataTimeout = 1000

Timeout for process data access in milliseconds

MasterUnitEepromTimeout = 3000

Timeout for EEPROM access in milliseconds

MasterUnitRasCycleTime = 0

Internal RAS cycle time for polling

MasterUnitRasWatchDog = 0

Internal RAS watchdog interval

MasterUnitRasWdToLimit = 0

Internal RAS watchdog limit

DiagGeneralErrorLvlLostLink = 10

Theshold value for the “Lost Link Errors”, which leads to an error

DiagGeneralWarningLvlLostLink = 1

Theshold value of the “Lost Link Errors”, which leads to a warning

DiagGeneralErrLvlRxError = 10

Theshold value for the “RX Errors”, which leads to an error

DiagGeneralWarnLvlRxError = 0.001

Theshold value of the “RX Errors”, which leads to a warning

DiagGeneralErrLvlInvalidFrame = 10

Theshold value for the “Invalid Frames”, which leads to an error

DiagGeneralWarnLvlInvalidFrame = 0.001

Theshold value of the “Invalid Frames”, which leads to a warning

DiagGeneralErrLvlProcUnitErr = 1000

Theshold value for the “Processing Unit Errors”, which leads to an error

DiagGeneralWarnLvlProcUnitErr = 100

Theshold value of the “Processing Unit Errors”, which leads to a warning

MasterDebugMessageLevel = 0

Activates extended debug messages of the EC-Master (0 = Silent, 1 = Any, 2 = Critical, 3 = Error, 4 = Warning, 5 = Info, 6 = InfoApi, 7 = Verbose, 8 = VerboseCyc)

GuiDebugMessageLevel = 0

Activates extended debug messages of the GUI (0 = Off, 1 = Errors, 2 = All)

IndentXmlFiles = False

Activates indenting of XML files (makes exported XML files readable, but increases size)

EnhancedUtf8Support = False

Activates the enhanced UTF-8 support, which might be necessary if characters will be not displayed correctly

10.3 FAQ

Solutions for possible problems:

- **The integrated Device does not react as estimated**
Increase the message level (Menu Settings All Messages) and try it again.
- **EC-Lyser reports a message with ErrorCode: 0x...**
Error Codes comes directly from the Device. If you want to know what to know how to solve this problem, please refer the manual of EC-Master / EC-Monitor.
- **EC-Lyser reports the following message: Not all EtherCAT SubDevice devices are in operational state**
Check if all SubDevices have a green icon. If the color is not green, open tab “Diagnosis SubDevice General”. Here you can see the error state of the SubDevice. If it has no error, try to change the state to OP again.
- **EC-Lyser reports the following message: Changing topology failed: Bus configuration mismatch (ErrorCode: 0x9811001E)**
The configured bus and the currently connected bus does not match. Please open the ‘Network Mismatch Analyzer’ (Menu Network Network Mismatch Analyzer) to solve the problem.
- **EC-Lyser reports the following message: SubDevice ‘...’ has unexpected state (Current state: ‘...’, Expected state: ‘...’)**
Select the SubDevice and open the tab “General”. Here you can see the error state of the SubDevice. If it has no error, try to change the state again.
- **SubDevice reports the error state: “Sync manager watchdog” (Diagnosis SubDevice General)**
You need a realtime operating system. If you still want to use your SubDevice on Windows, you can turn off this watchdog (SubDevice->Advanced Settings: Set SM Watchdog = 0).
- **How can I update the firmware of my SubDevice via FoE?**

For updating the firmware of your SubDevice via FoE, please follow these steps:

- Enable diagnosis mode
- Set MainDevice state to INIT
- Select your SubDevice, and set his state machine to BOOTSTRAP
- Enter path of file on SubDevice (optional)
- Enter password (optional)
- Press button “Download” (it will open the FileOpen-Dialog, where you can choose the file which contains the new firmware and uploads this file)
- **Connect to local system is not possible**
Is Npcap / NDIS installed?
Is at least one network adapter installed?
- **WebAdmin in Dongle-Version shows page not found, what can I do?**
You have to download and install the Code Meter Runtime from WIBU <https://www.wibu.com/>
- **UTF8 characters e.g. in variables or PDOs will be not displayed correctly**
This requires the enhanced UTF-8 support and can be enabled by setting “EnhancedUtf8Support = True”, (see *Internal User Specific Settings*)