acontis technologies GmbH

EC-Lyser

User's Manual

Version 3.8

Edition: 2023-04-18

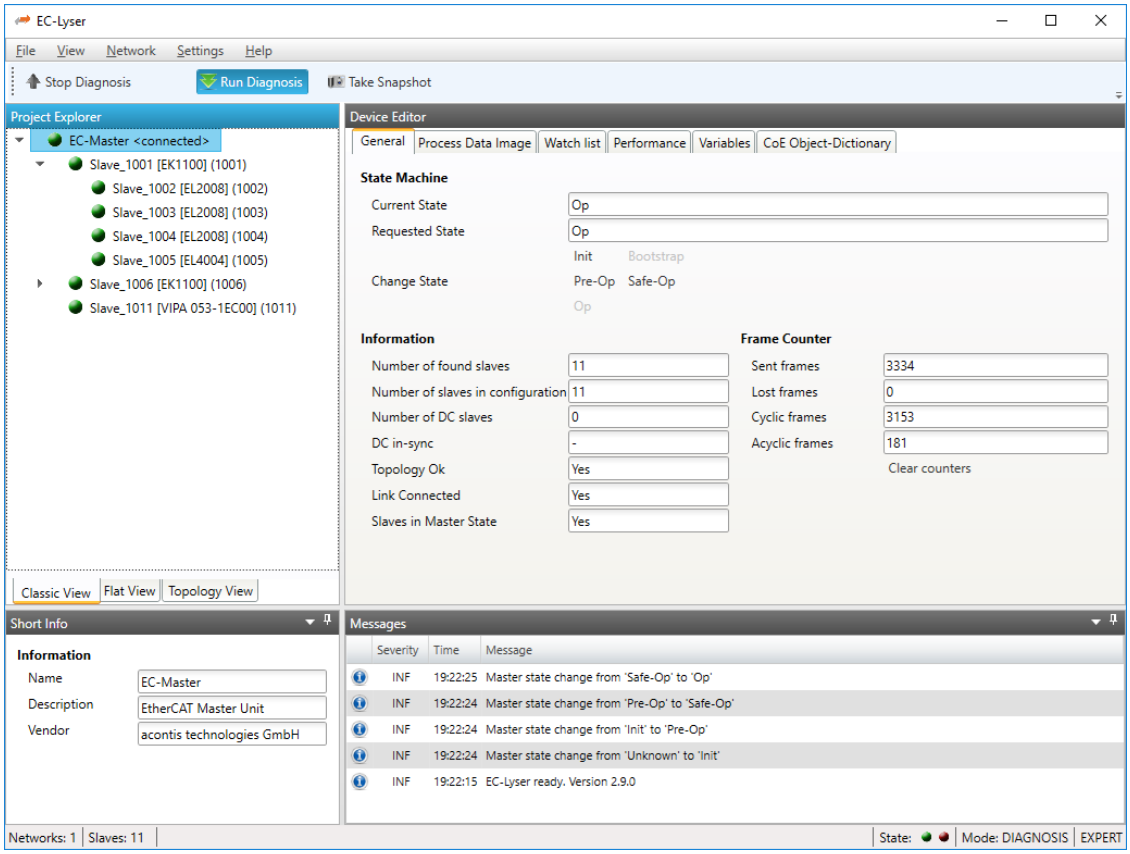
Content

1 Introduction

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.

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, slave devices).

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

- Useful for setting up the system
- System analysis and maintenance
- Error detection
- Documentation

1.2 Features

- Master diagnosis
  - General
    - Changing state of state machine
    - Reading count of slaves or frames, …
    - Compare configured and found slaves (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
- Slave 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

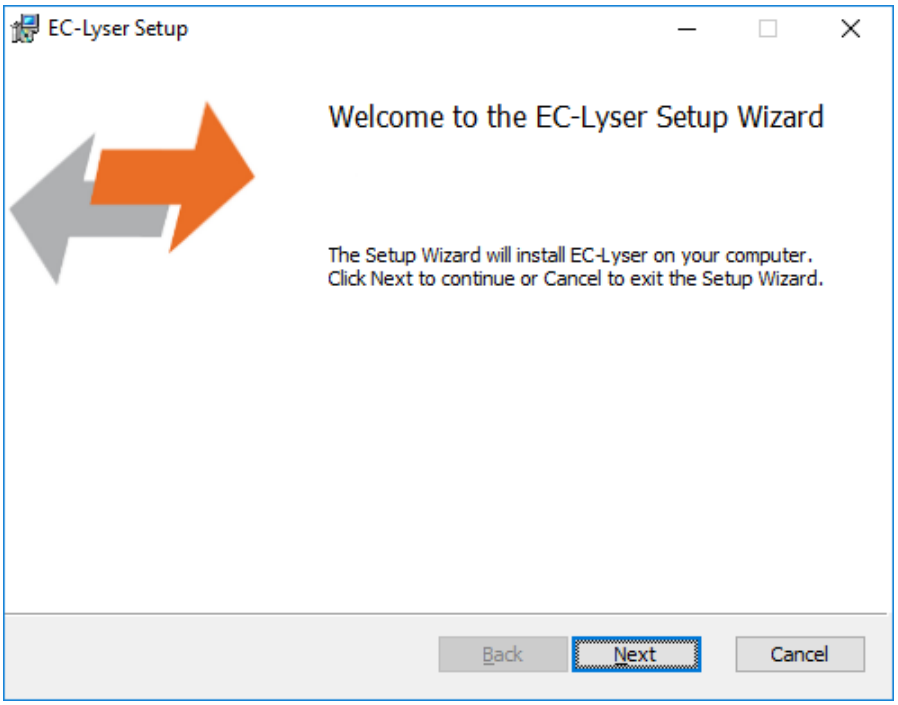
- Microsoft Windows 10 and above
- Microsoft .NET Framework 4 Client Profile
- Screen resolution at least 1024x768 pixel
- Memory as recommended for operating system

2 Installation

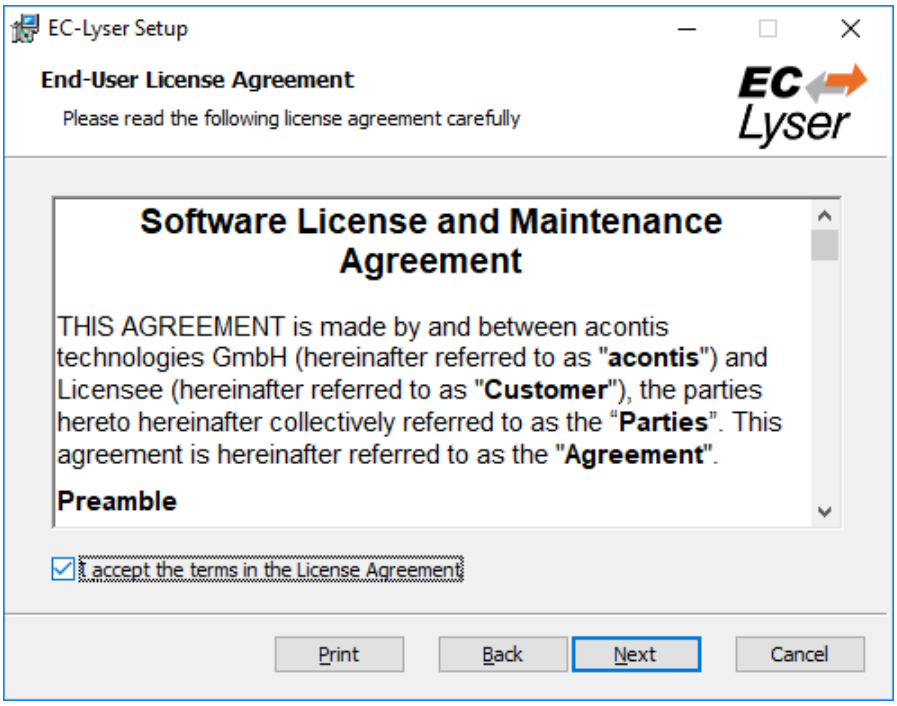
2.1 Setup Process

The product can be installed by executing the “setup.exe” (requires administrator privileges) and follow the screen instructions:

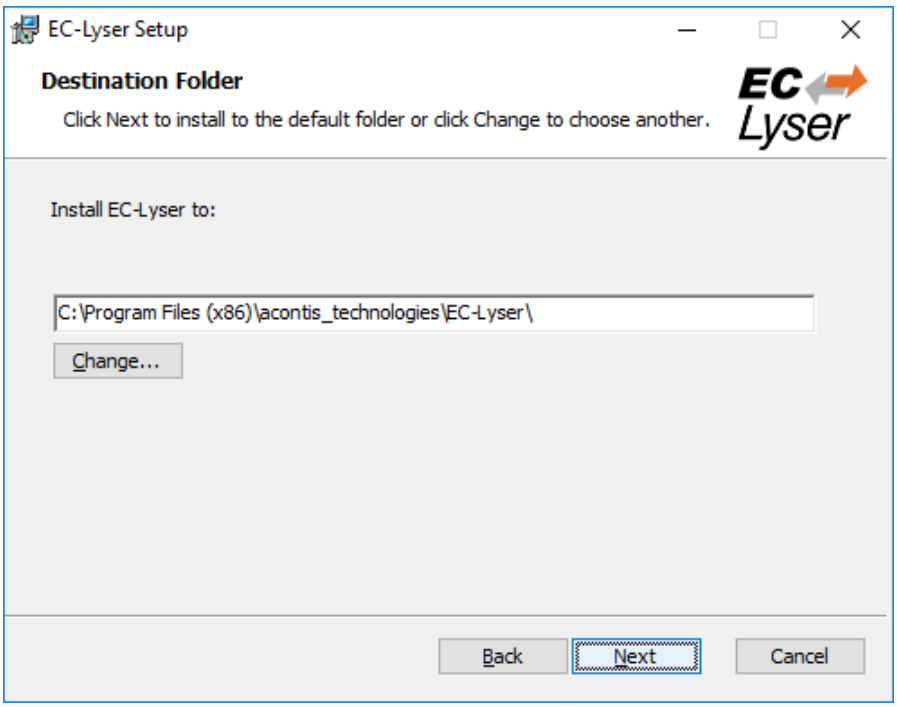
- Welcome page:



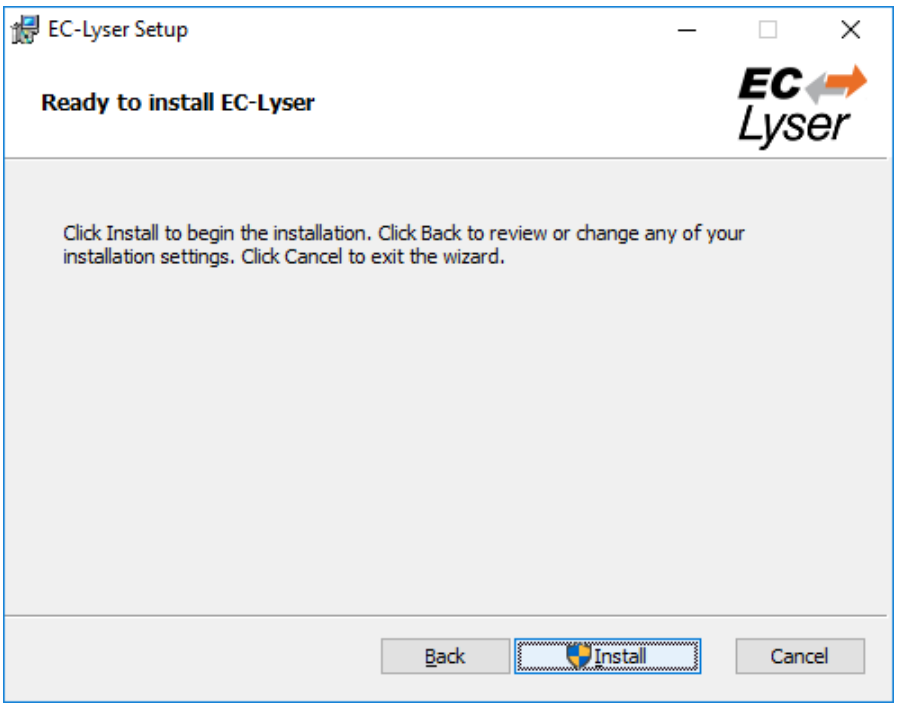
- License Agreement:



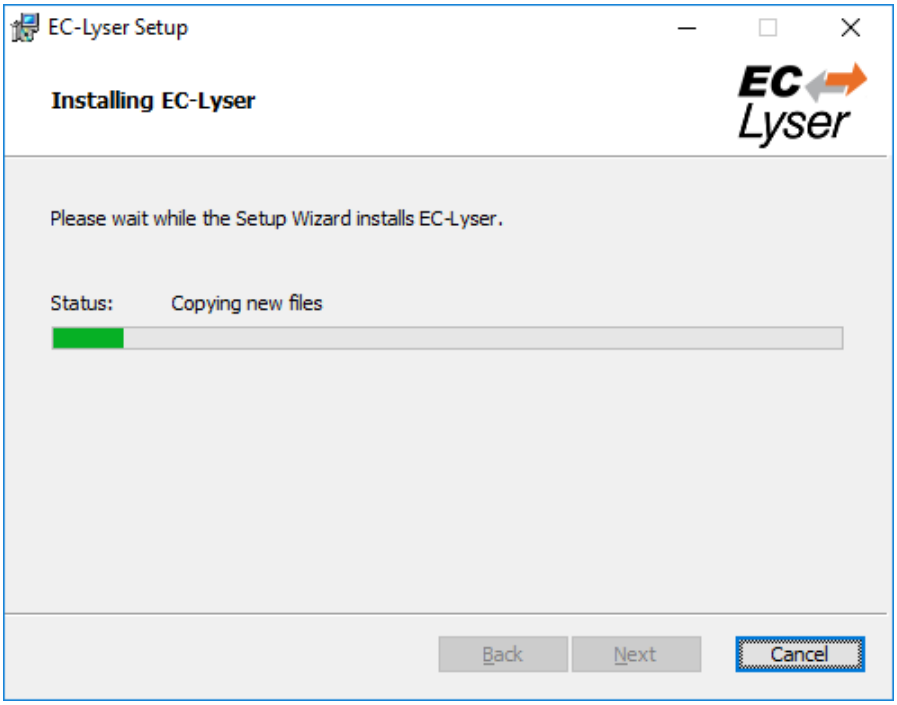
- Select Installation Folder:



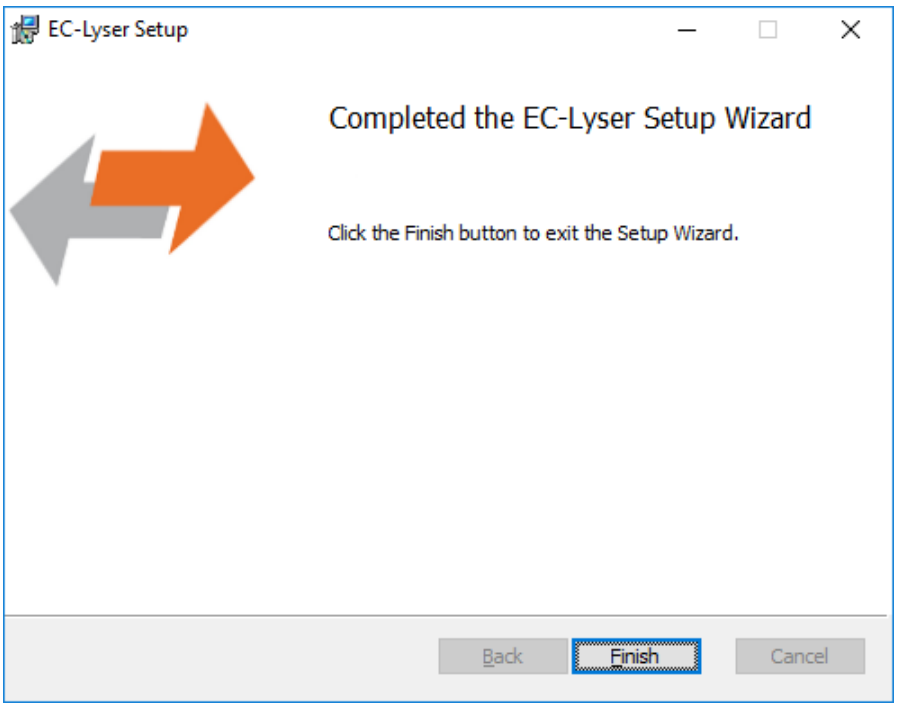
- Confirm Installation:



- Installing EC-Lyser:



- Installation Complete:



2.2 Silent Installation

The product can be also installed in silent mode by using the command line parameters of “msiexec”.

Sample 1: Installs EC-Lyser into default installation folder
msiexec /i c:\temp\ECLyser.msi /quiet /qn /norestart /log c:\temp\install.log

Sample 2: Installs EC-Lyser into “C:\EC-Lyser”
msiexec /i c:\temp\ECLyser.msi /quiet /qn /norestart /log c:\temp\install.log TARGETDIR="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:

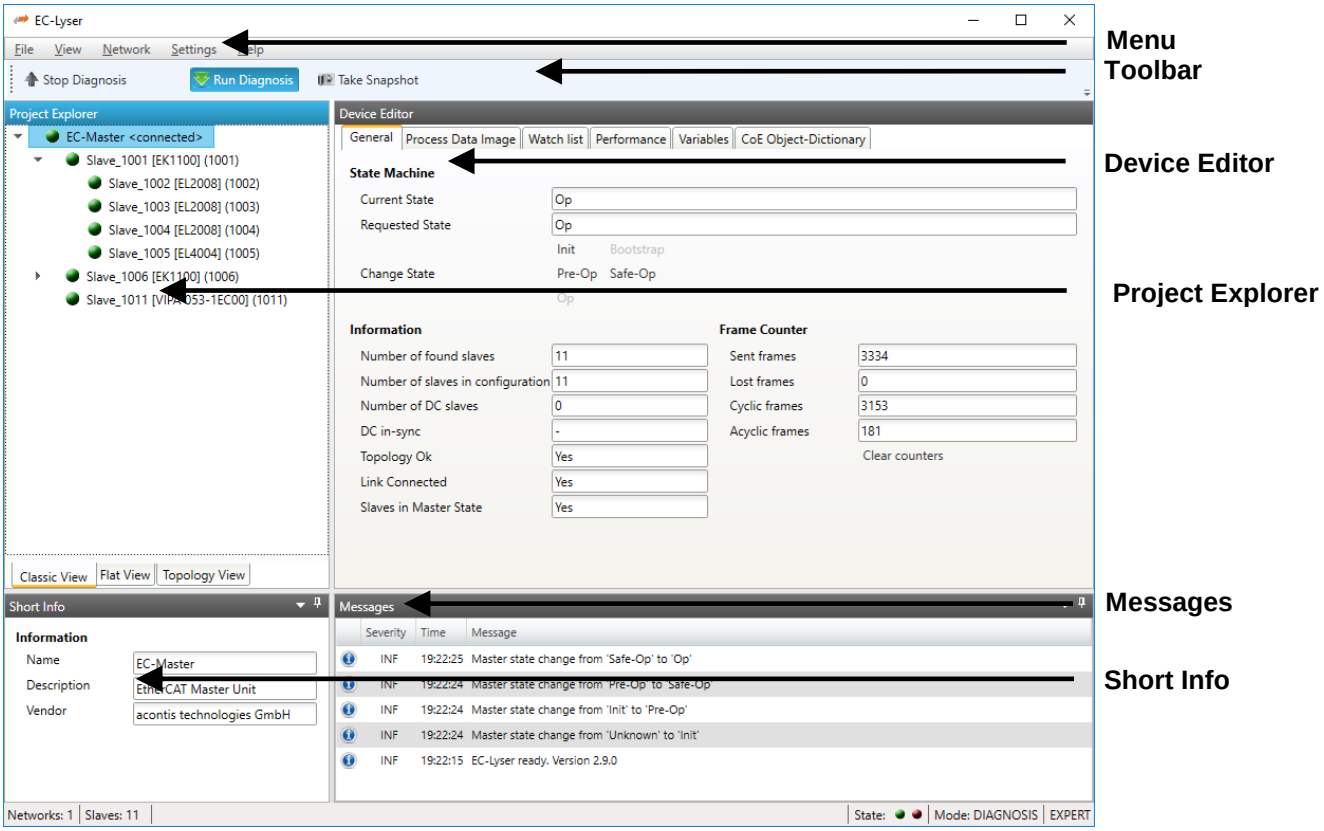
- Installation directory: (Default: “%ProgramFiles%\acontis_technologies\EC-Lyser”)
  - \EEC
    - Files for mapping emergency error codes
  - \Languages
    - Lanugage specific files
  - EC-Lyser.exe
  - EcMaster.dll
  - …
- All users directory: (“%AllUsersAppData%\EC-Lyser”, like "C:\ProgramData\EC-Lyser” or “C:\Documents and Settings\All Users\Application Data\EC-Lyser”)
  - \CAPTURE
    - Capture files which can be analysed in offline diagnosis mode (see section “5.2”)
  - \EtherCAT

        - EtherCAT Slave Information (ESI) Files (Can be modified via ESI-Manager, see section “5.1”)
    - \EMI
        - EtherCAT Master Information files
    - \EtherCAT
        - EtherCAT Slave Information (ESI) Files
    - ESICache.xml
        - ESI-File-Cache for faster access of ESI files
    - EC-Lyser.log
        - Log file
    - User.myusername.xml
        - User specific settings

3 Graphical user interface

3.1 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 and allows the user to change it by adding or removing devices/slaves/modules.
- ***Device Editor***
  Show information about the selected device, like process variables or PDO mappings. It allows the user also change this information.
- ***Short Info***
  Show short information about selected device, like name, description or vendor.
- ***Messages***
  Shows notifications which occur e.g. when the EtherCAT Master has changed its operation state or a slave has been removed from (or added to) the EtherCAT network.

3.2 Menu/Tool/Status bar

3.2.1 File

- ***ESI-Manager***
  Add, delete or export ESI files
- ***Exit***
  Closes the EC-Lyser

3.2.2 View

- ***Message Window***
  Shows/Hides the message window
- ***Short-Info Window***
  Shows/Hides the short-info window
- ***Expert Settings***
  (De-)Activates expert mode
- ***Refresh***
  Updates the current view

3.2.3 Network

- ***Network Mismatch Analyzer (active only in diagnosis is running)***
  Compares the configured slaves with the connected slaves
- ***Clear Error Counters (active only in diagnosis is running)***
  Clears the error counters of all connected slaves (for more information about the extended diagnosis, see section “4.3.5”)
- ***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.
- ***Take Snapshot (active only for local or remote system)***
  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 section “5.2”)
- ***Automatic Snapshot Mode (active only for local or remote system)***
  Activates the automatic snapshot mode to take snapshots based on the configured rules
- ***Snapshot (active only for offline diagnosis system)***
  Changes the active snapshot
- ***EoE Endpoint Configuration (active only for local or remote system)***
  Activates EoE Endpoint support in diagnosis mode

3.2.4 Settings

- ***Language***
  Changes the current language
- ***Theme***
  Changes the current theme
- ***Message Level***
  Change the current message level

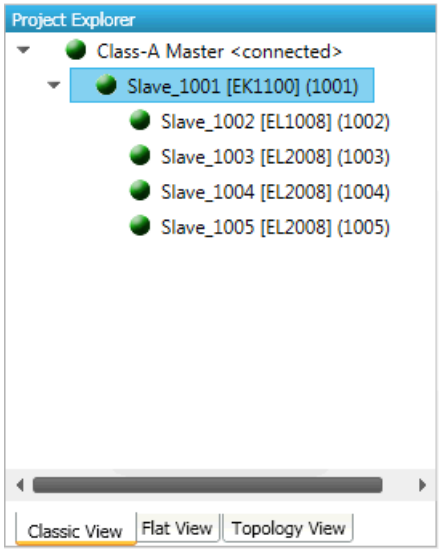
3.2.5 Help

- ***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).
- ***About …***
  Show the about dialog

3.3 Project Explorer

3.3.1 Classic View

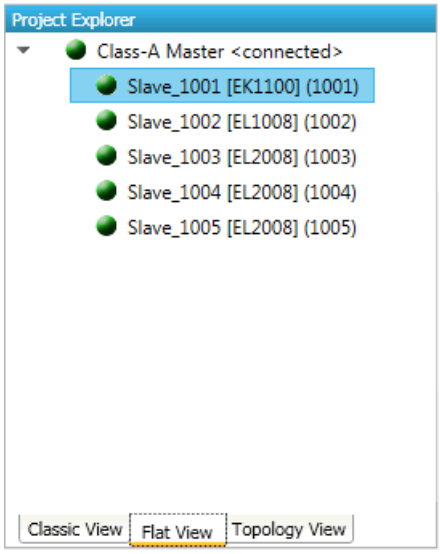


This is a tree view which has two levels. In the first level you can find coupler slaves and in the second level you will see the connected slaves.

Possible device states:

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

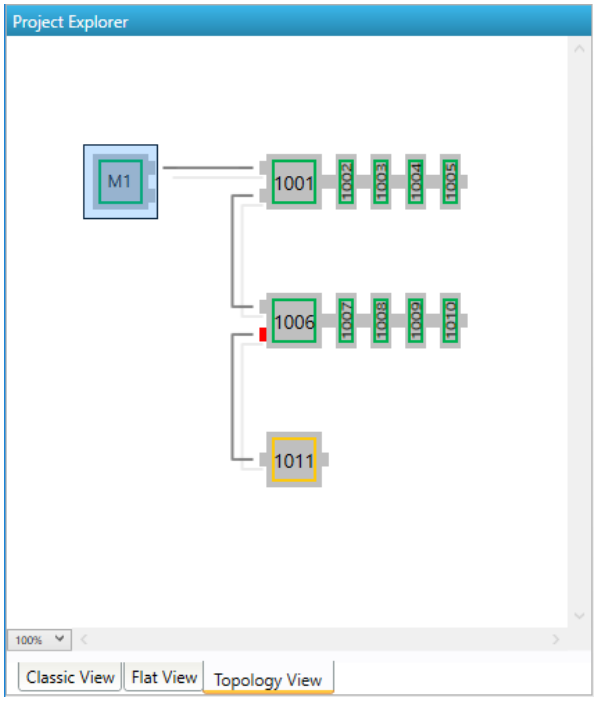
3.3.2 Flat View



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

Possible device states:
- Init / Bootstrap
- Pre-Op
- Safe-Op
- Op

3.3.3 Topology View



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

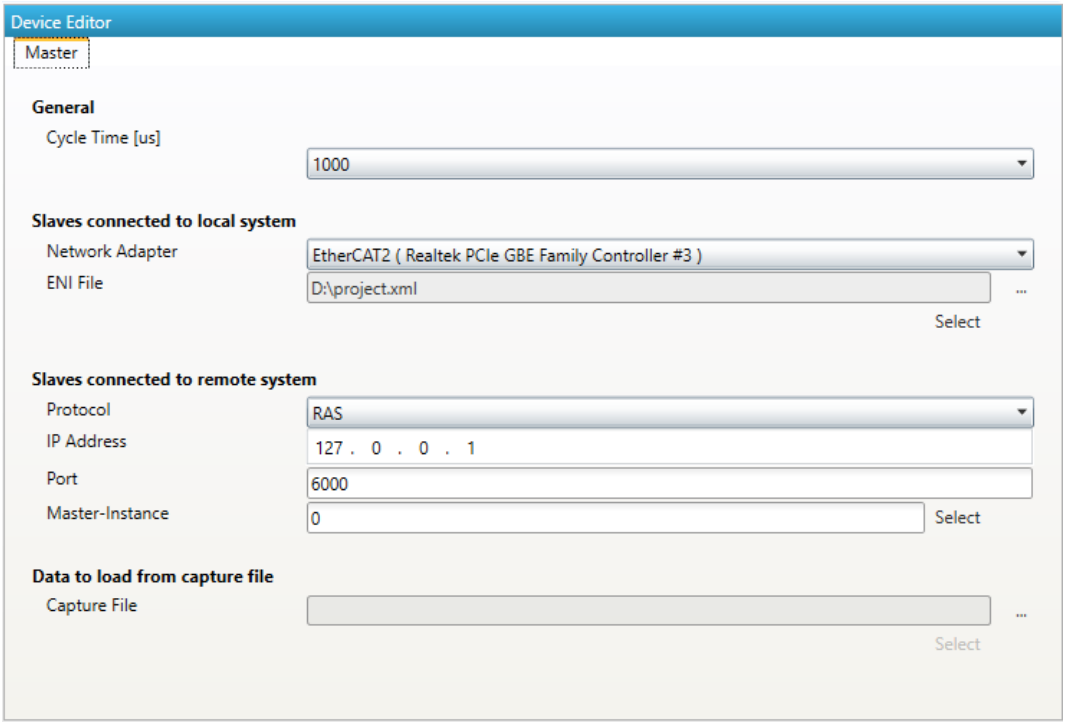
Possible device states:
- Init / Bootstrap
- Pre-Op
- Safe-Op
- Op

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 slave (for more information about the extended diagnosis, see section “4.3.5”).

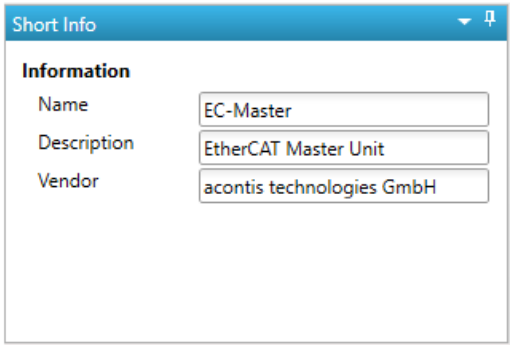
3.4 Device Editor

This Editor gives the user the possibility to read and write information of the selected master or slave.



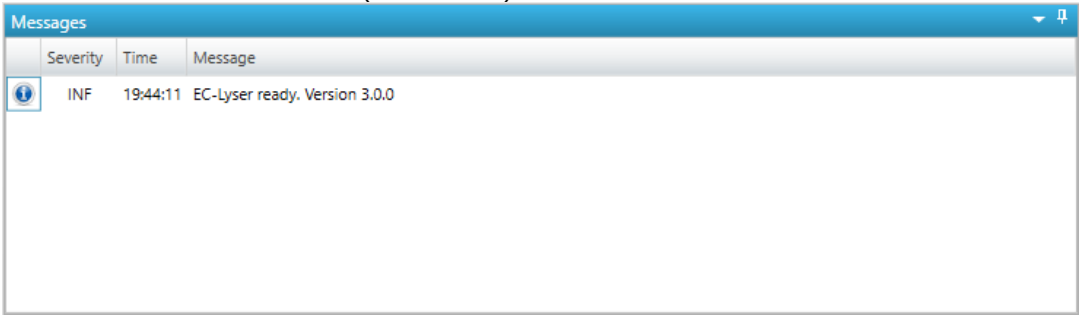
3.5 Short Info

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



3.6 Message Window

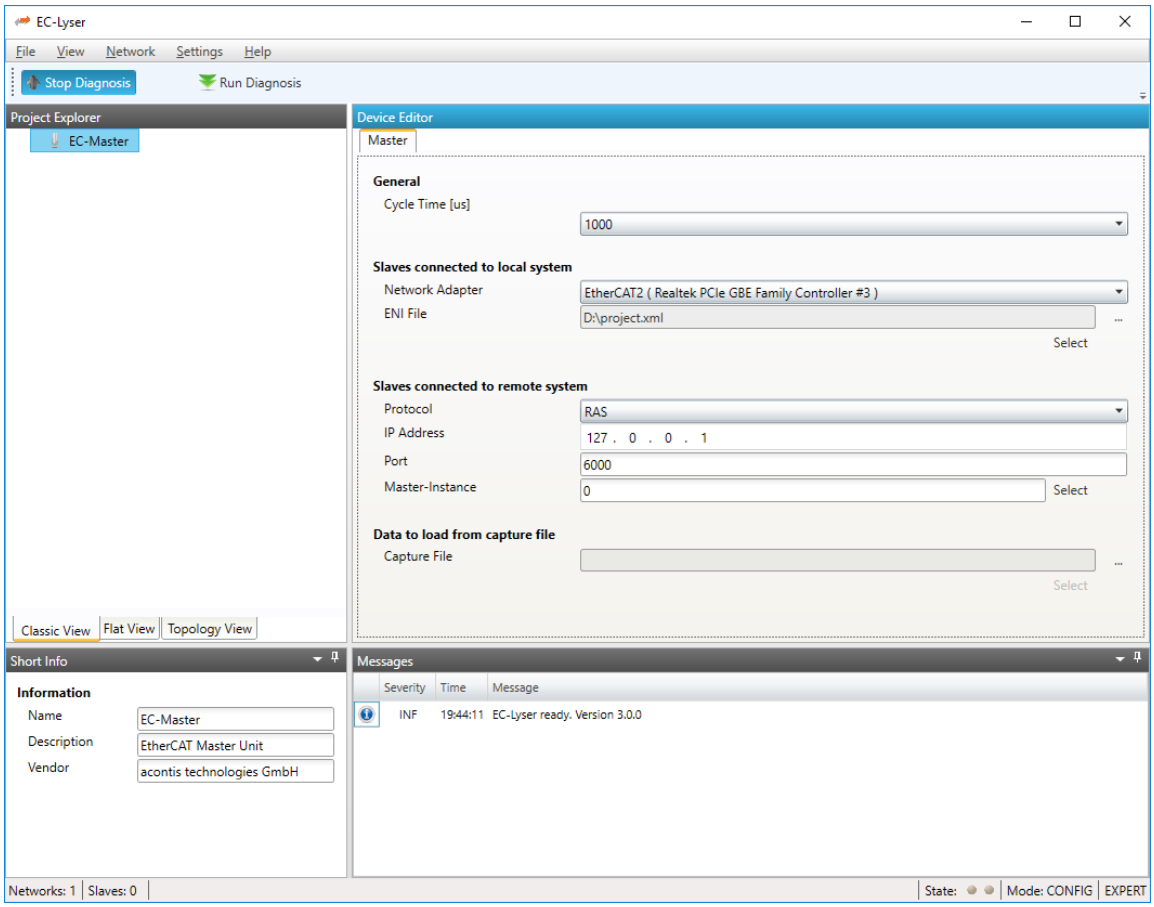
Shows notifications which occur e.g. when the EtherCAT Master has changed its operation state or a slave has been removed from (or added to) the EtherCAT network.



4 Diagnosis

4.1 Overview

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 master. The user can choose between the following values: 125, 250, 500, 1000, 2000 and 4000.
- Slaves 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)
- Slaves 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

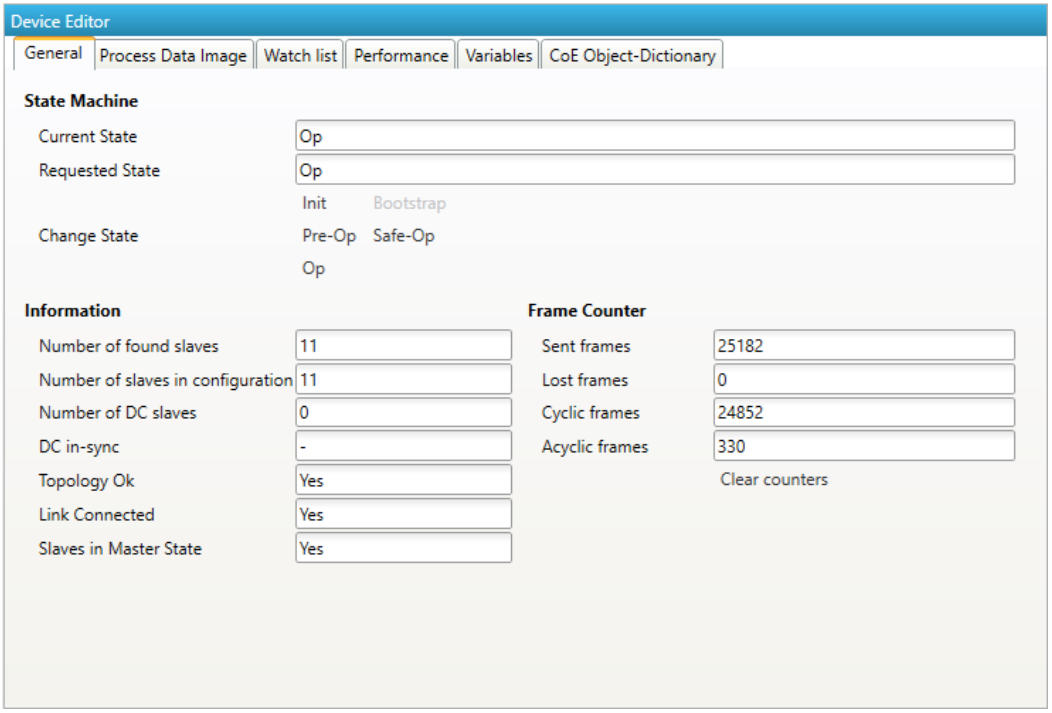
        - TwinCAT 3.1.4024 or TwinCAT 3.1.4022.30 and above
    - IP Address: IP address of the remote system, which is connected to the control system
    - Port: Port of the remote system, which is connected to the control system
    - Master-Instance: Used to determine which master instance should be used in the remote system (Master supports up to 10 instances).
- Data to load from capture file
    - Capture File: Path to the capture file, which contains one ore more snapshots

4.2 Master

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

4.2.1 General

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



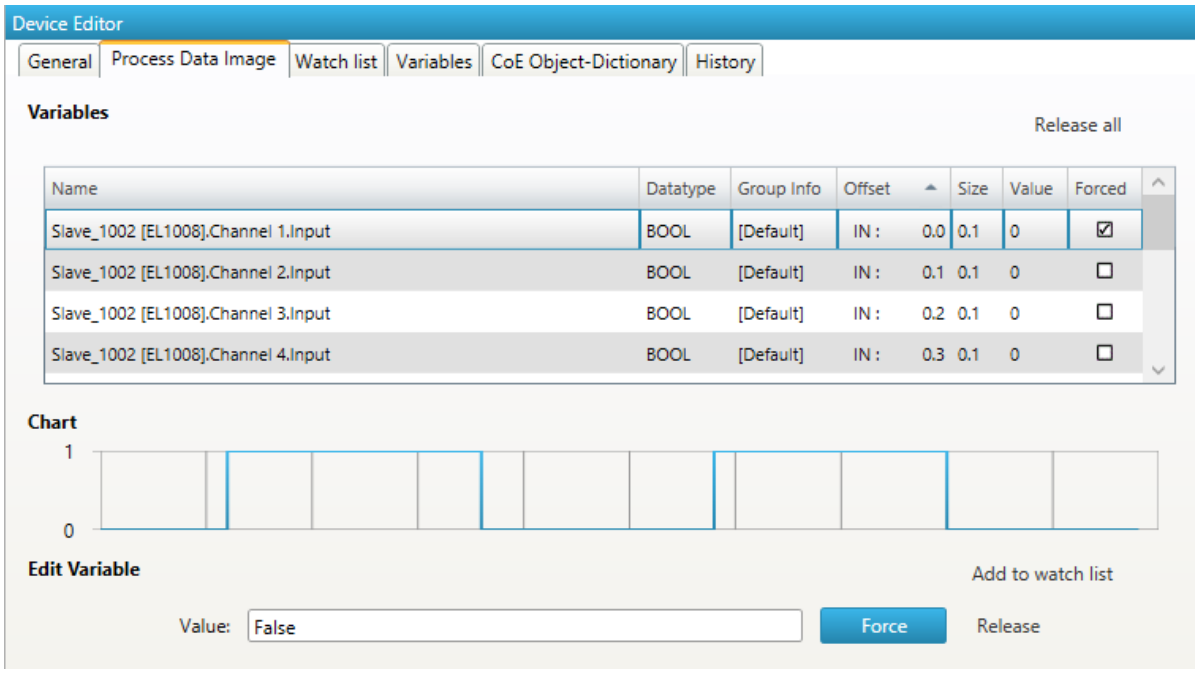
- State Machine
  - Current State: Current state of the master
  - Requested State: Requested state of the master
  - Change State: Master can reach the states INIT, PRE-OP, SAFE-OP and OP.
- Information
  - Number of found slaves: Number of slaves, which were found from master on the network
  - Number of slaves in configuration: Number of slaves, which are configured in the ENI file
  - Number of DC slaves: Number of slaves with DC support, which were found from master on the network
  - DC in-sync: Signals that all slaves with DC support are correctly synchronized or not. If not all slaves 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.
- Slaves in Master State: Signals that all slaves are in master state.

- Frame Counter
  - Sent frames: Number of sent frames
  - Lost frames: Number of lost frames
  - Cyclic frames: Number of cyclic frames
  - Acyclic frames: Number of acyclic frames

4.2.2 Process Data Image

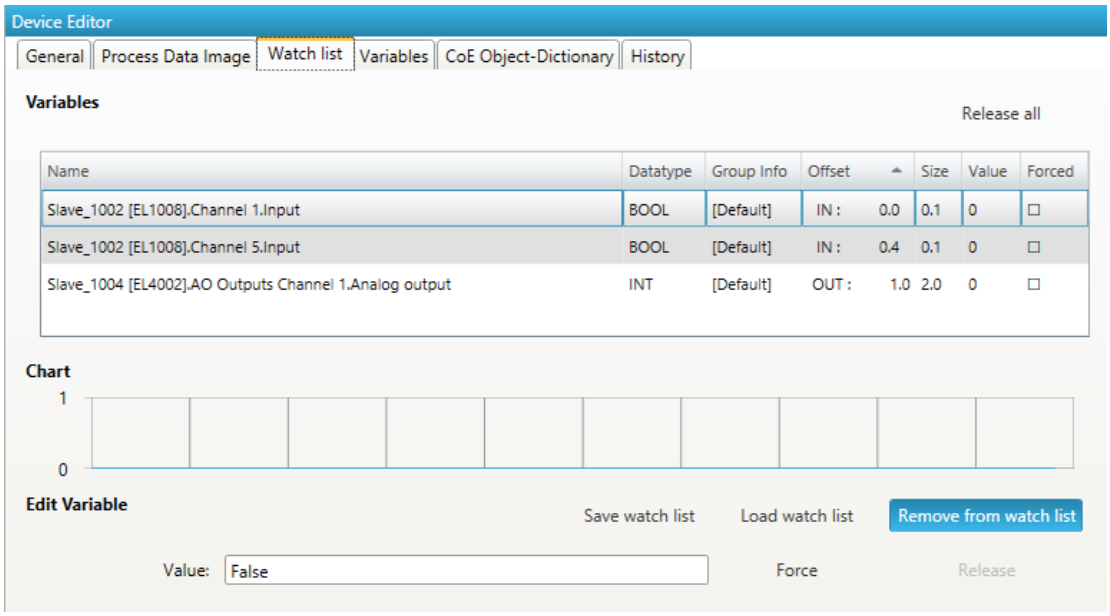
In this tab, the user can see and change the values of the process variables. The variables will be forced to the value the user entered. The user can press release to release the variable. If one or two variables are selected, a chart of the values is shown. Also resize and zoom is possible to see more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



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

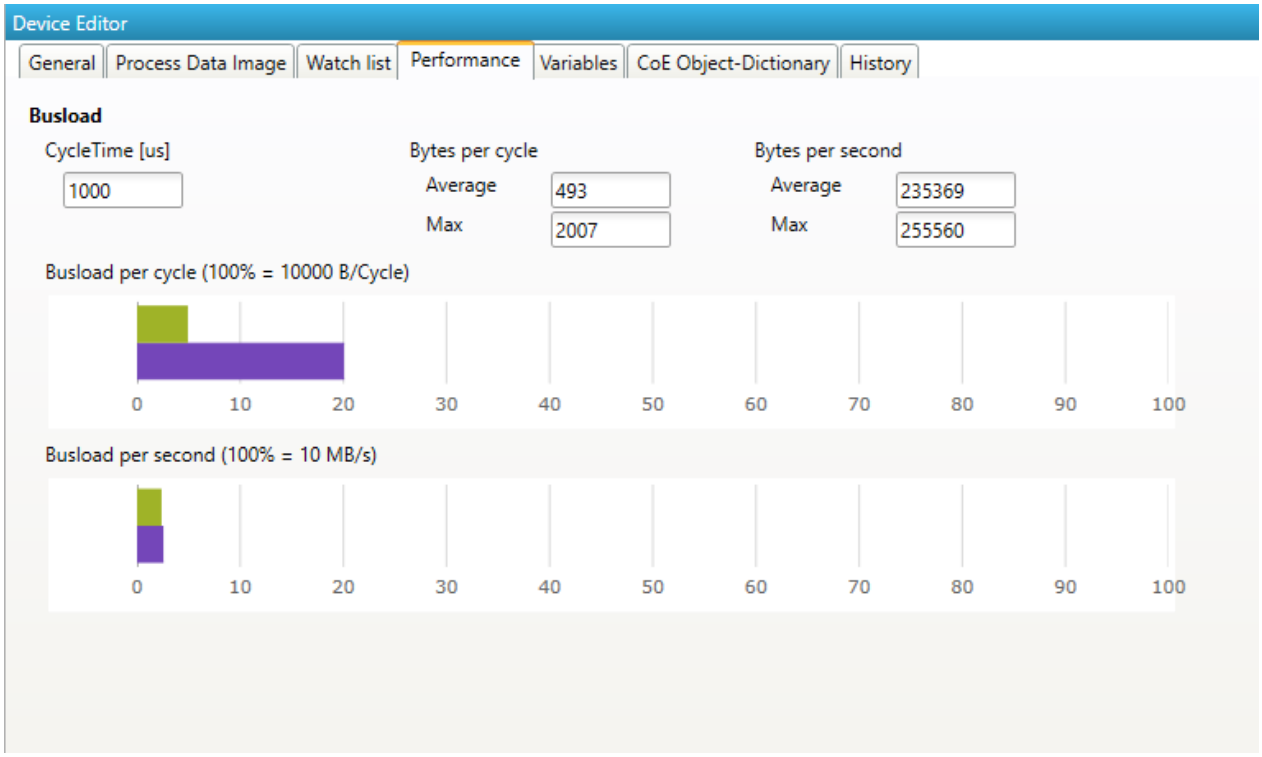
4.2.3 Watch list

In this tab, the user can monitor selected variables. He can go through the slaves 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.

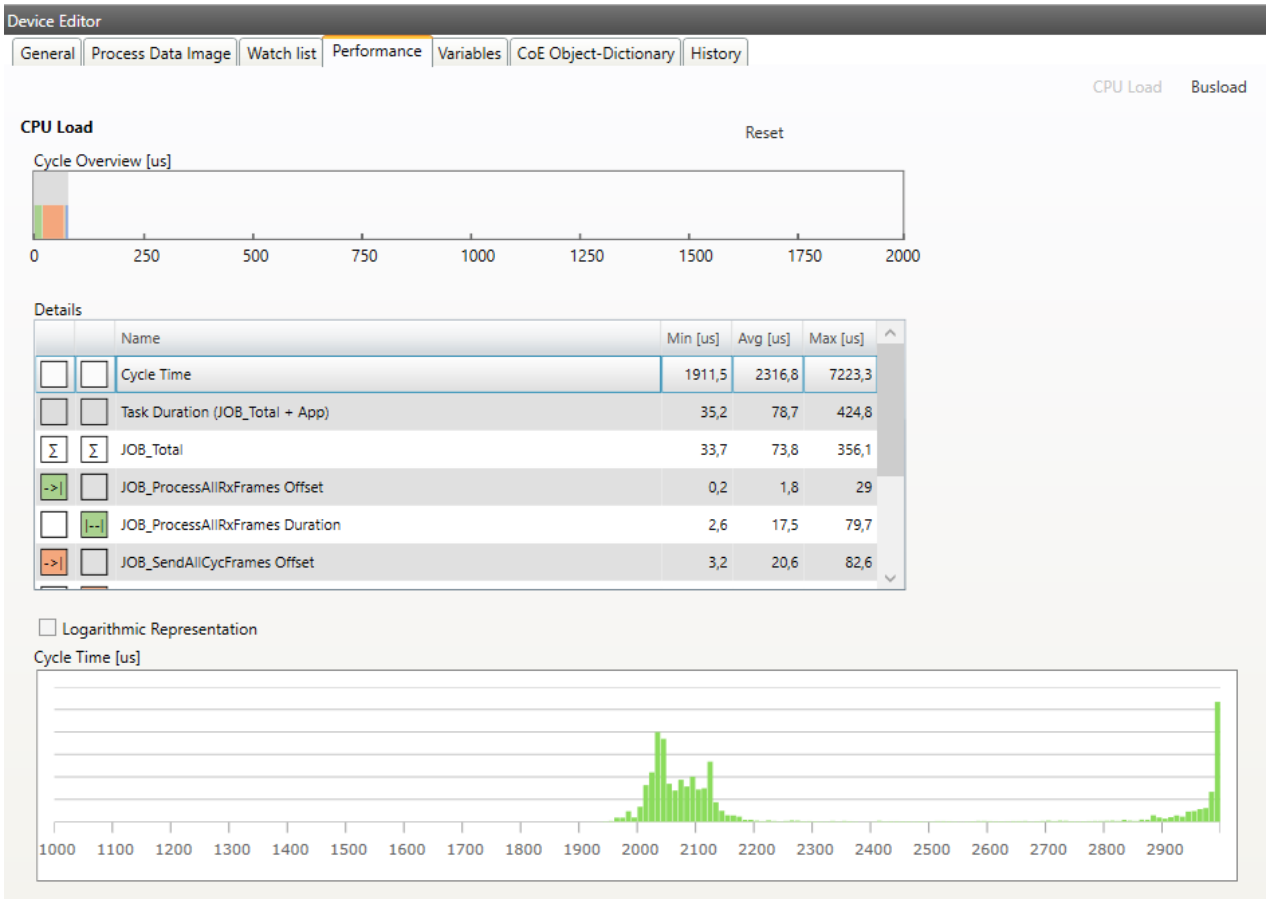


4.2.4 Performance

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

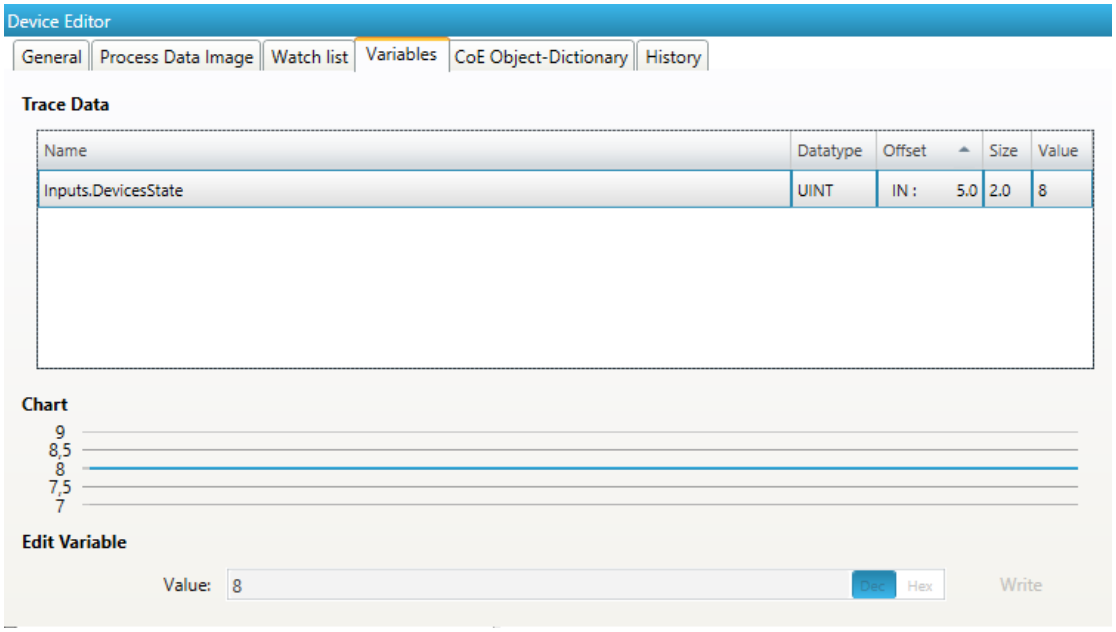


On the other tab the user can the CPU load. In the grid is a list of all running jobs and how long they take. In the diagram above is a summary of all jobs. When a job is selected, the chart shows how many times a job has taken how long to complete.



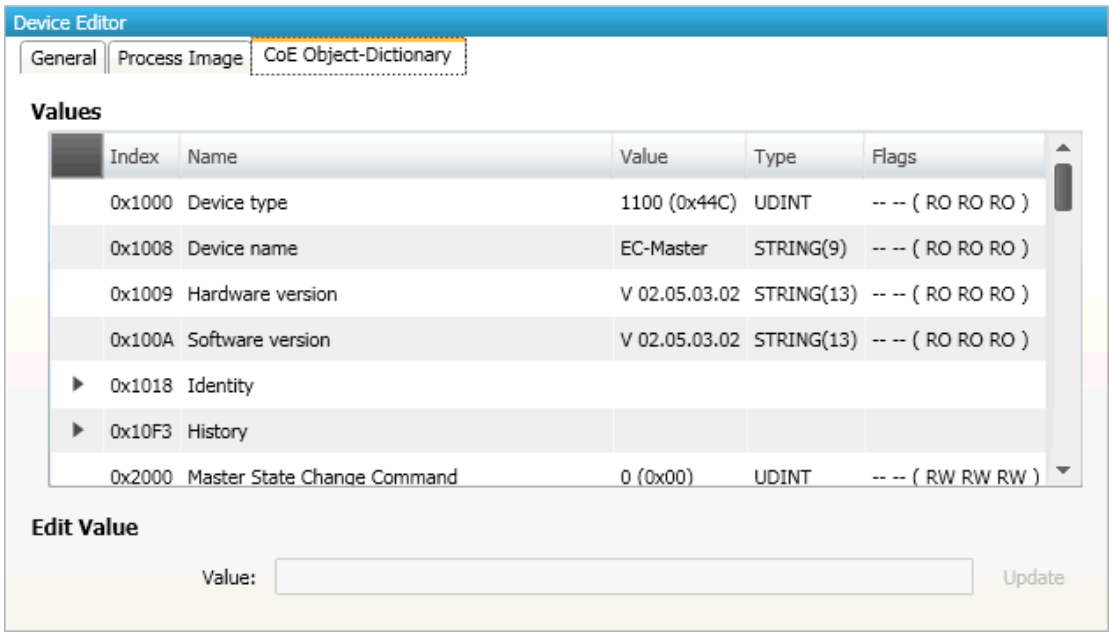
4.2.5 Trace Data (Expert)

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.



4.2.6 CoE Object-Dictionary (Expert)

In this tab, the user can see and change the values of the object dictionary of the master.



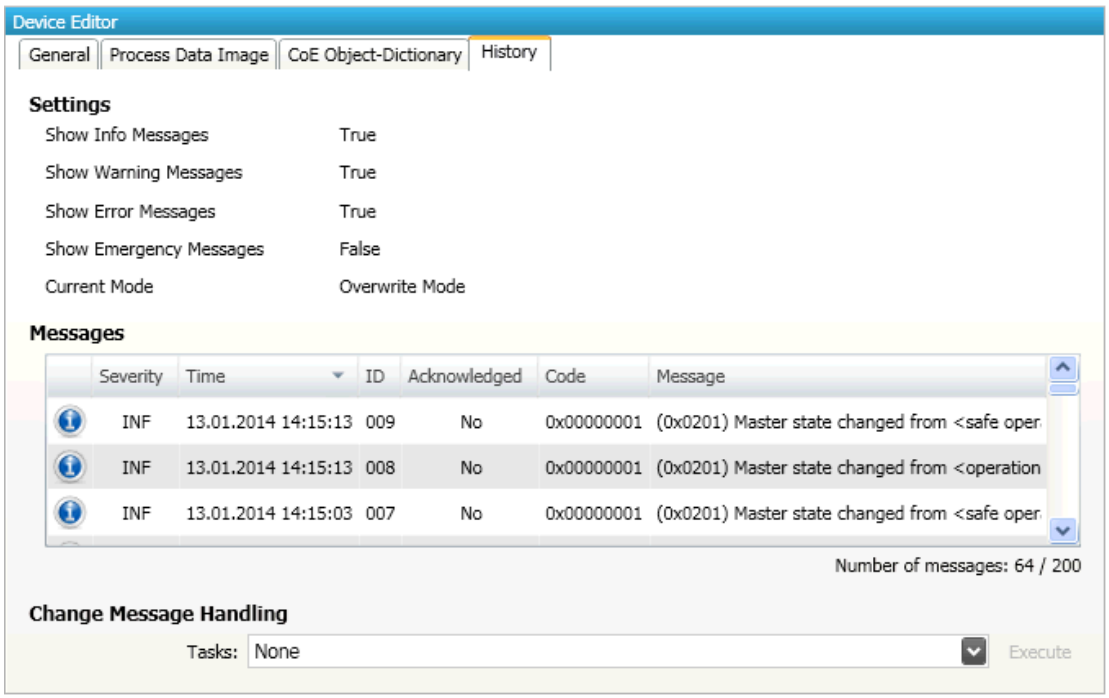
- Lists of CoE Object-Dictionary entries
  - Entries are uploaded from the master
  - The “Flags” column tells the user if this entry is an PDO entry and if it can be edited
    - “AA BB (CC DD EE)”

- 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

4.2.7 History (Expert)

In this tab, the user can see and change the diagnosis history of the master (Supported from EC-Master V2.7 and above).



Settings

- Show Info Messages:
  - Info messages will be collected from master
- Show Warning Messages:
  - Warning messages will be collected from master
- Show Error Messages:
  - Error messages will be collected from master
- Show Emergency Messages:
  - Not supported from master
- Current Mode:
  - Overwrite Mode: Messages will be overwritten if buffer is full
  - Acknowledge Mode: Not supported from master

Messages

- List of history messages

Change Message Handling

- Enable/Disable Info Messages:

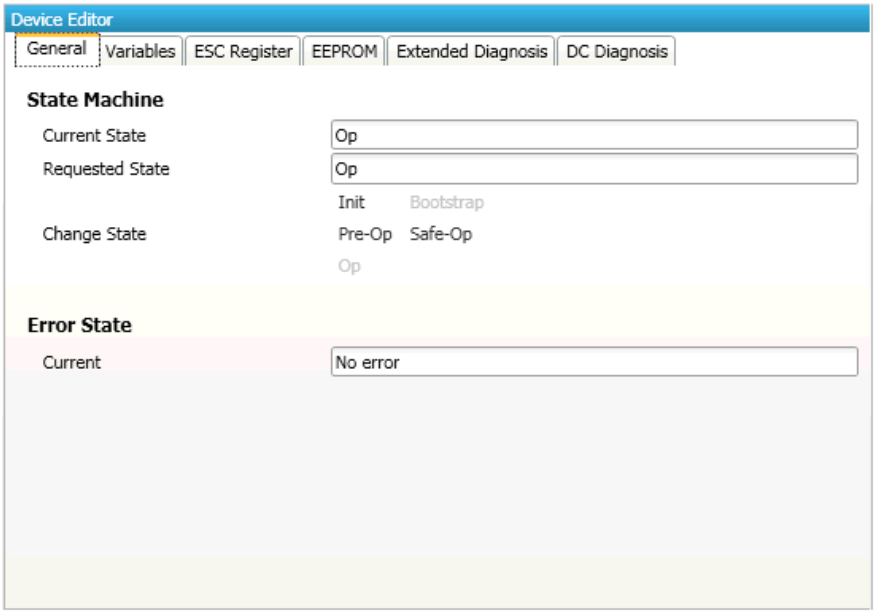
    - Enable or disable info messages
- Enable/Disable Warning Messages:
    - Enable or disable warning messages
- Enable/Disable Info Messages:
    - Enable or disable info messages
- Enable/Disable Error Messages:
    - Enable or disable error messages
- Enable Acknowledge Mode:
    - Enable acknowledge mode
- Clear All Messages:
    - Clear all messages

4.3 Slave

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

4.3.1 General

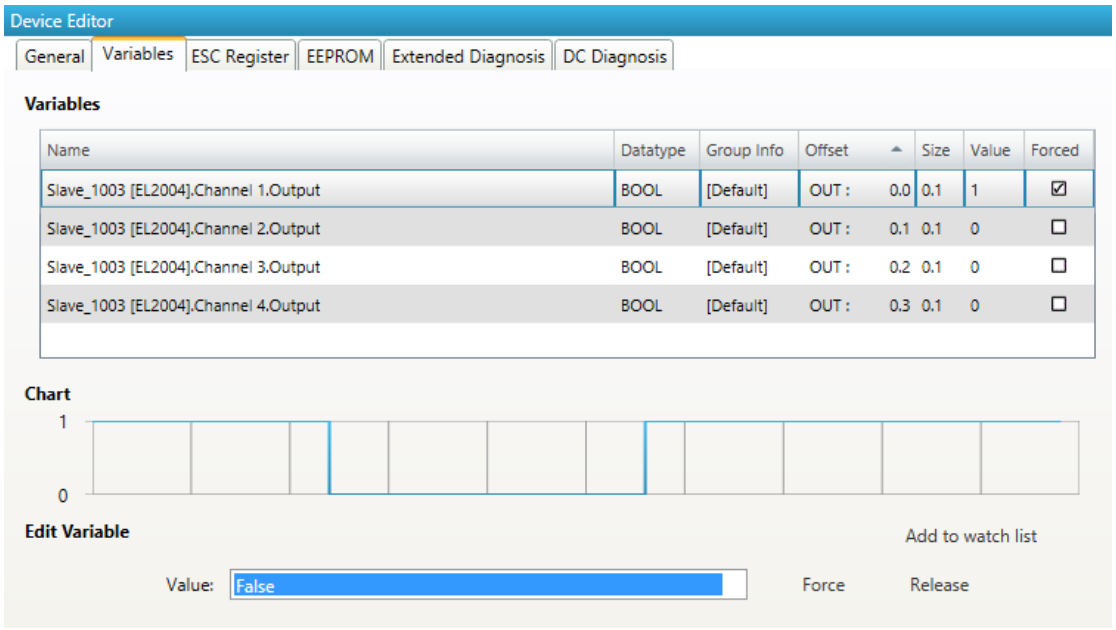
In this tab, the user can see and change the current state of the state machine of the slave. He can see and clear also the current error state of the slave.



- State Machine
    - Current State: Current state of the selected slave
    - Requested State: Requested state of the selected slave
    - Change State: Slave can reach the states INIT, BOOTSTRAP, PRE-OP, SAFE-OP and OP. Note: The BOOTSTRAP mode can only be reached from the INIT state.
- Error State
    - Current: Slave error which occurred during state transition

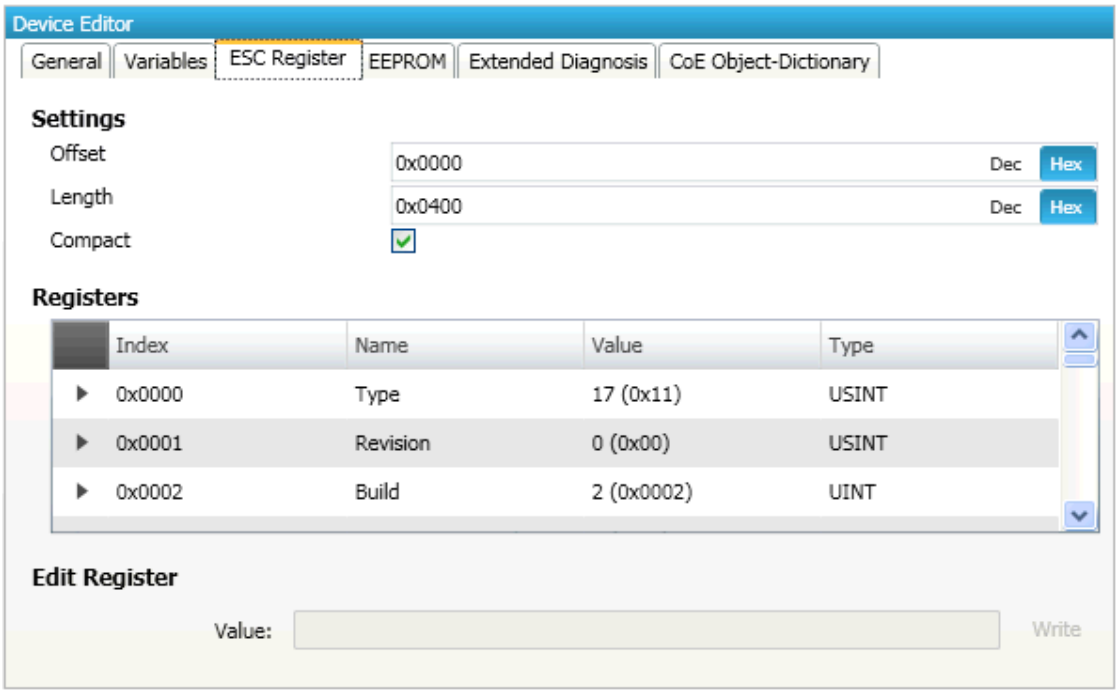
4.3.2 Variables

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.



4.3.3 ESC Register (Expert)

In this tab, the user can see and change 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.

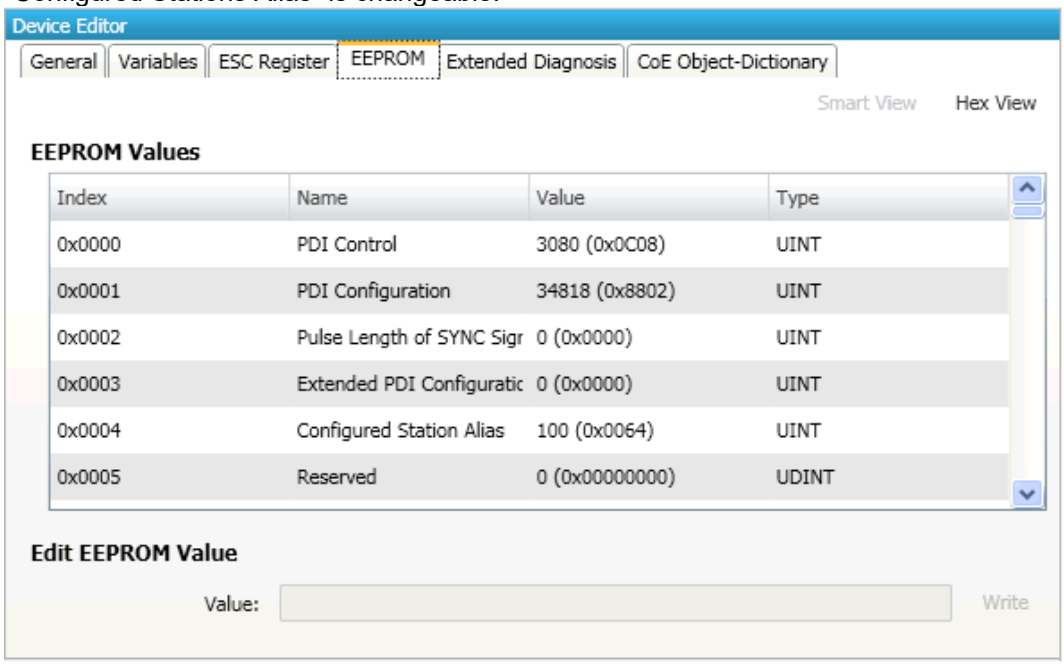


4.3.4 EEProm (Expert)

This tab consists of 2 views:

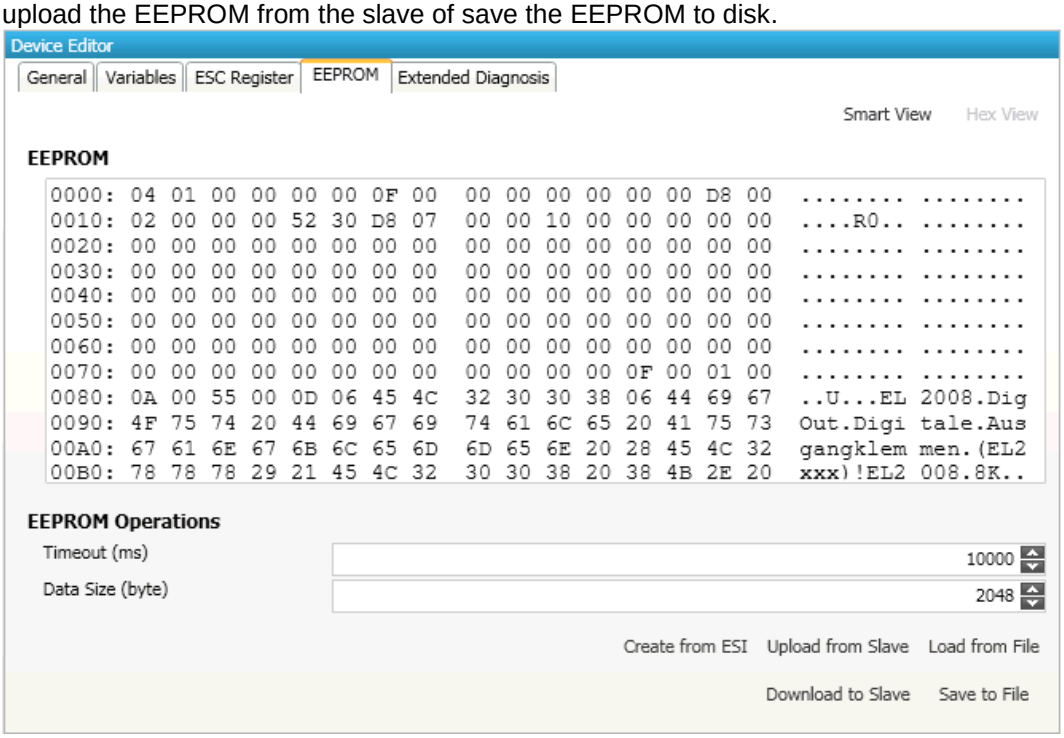
- Smart View

  In this view, the user can see and change the values of the EEProm. At the moment only the “Configured Stations Alias” is changeable.



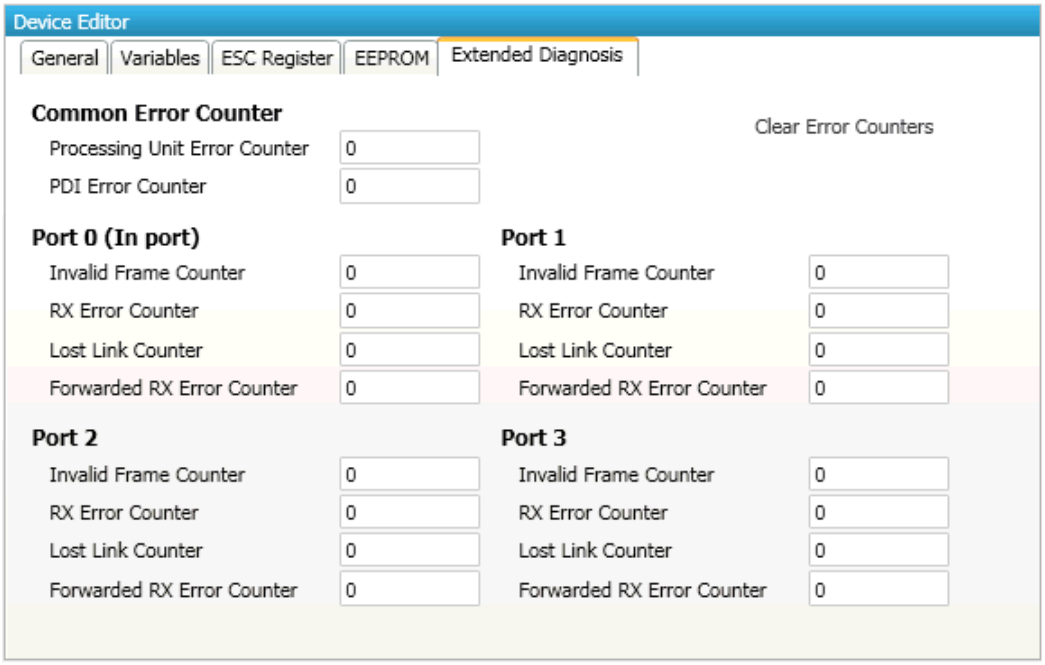
- Hex View

  In this view, the user can load an EEPROM from the disk, download the EEPROM to the slave, upload the EEPROM from the slave of save the EEPROM to disk.



4.3.5 Extended Diagnosis (Expert)

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

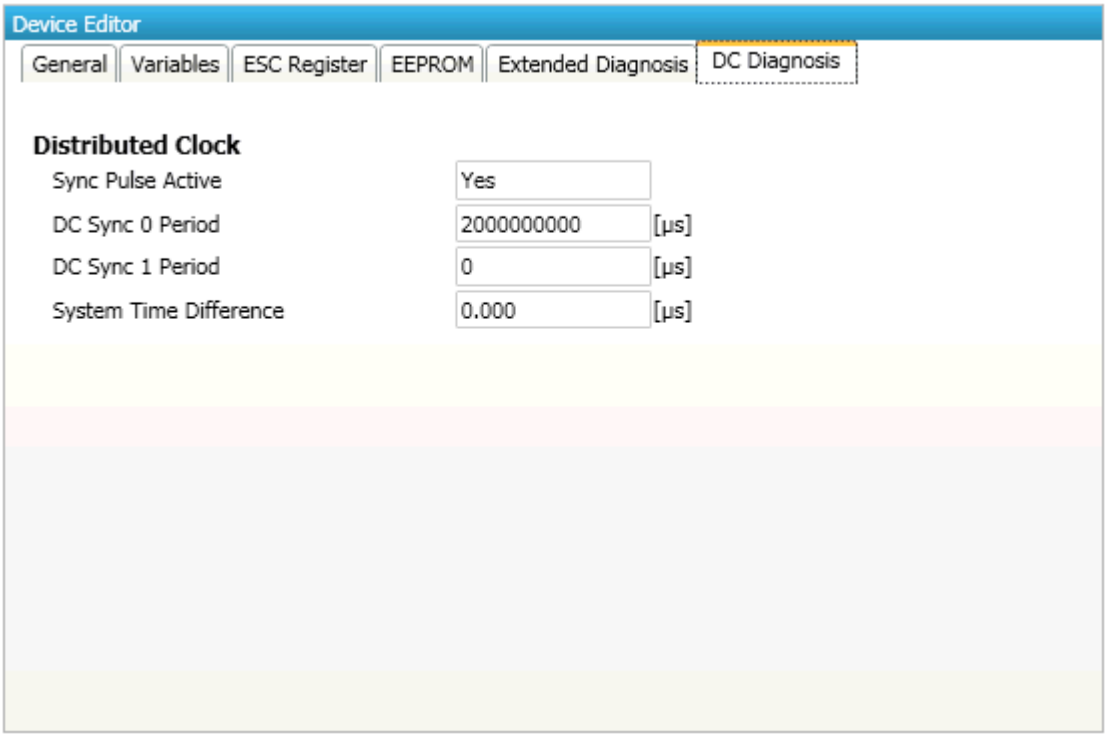


- Common Error Counter
  - Processing Error Counter: Indicates that slave received “not EtherCAT frames”, which are not allowed in the EtherCAT segment (of course acceptable in a test environment)
  - PDI Error Counter: Counts if a PDI access has an interface error (read from register: 0x30D)
- Port 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)

NOTE:
All error counters can be cleared by clicking on “Clear Error Counters” of the context menu of the master.

4.3.6 DC Diagnosis (Expert)

In this tab, the user can see all DC related values of the slave.



- 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 slave clock to reference clock

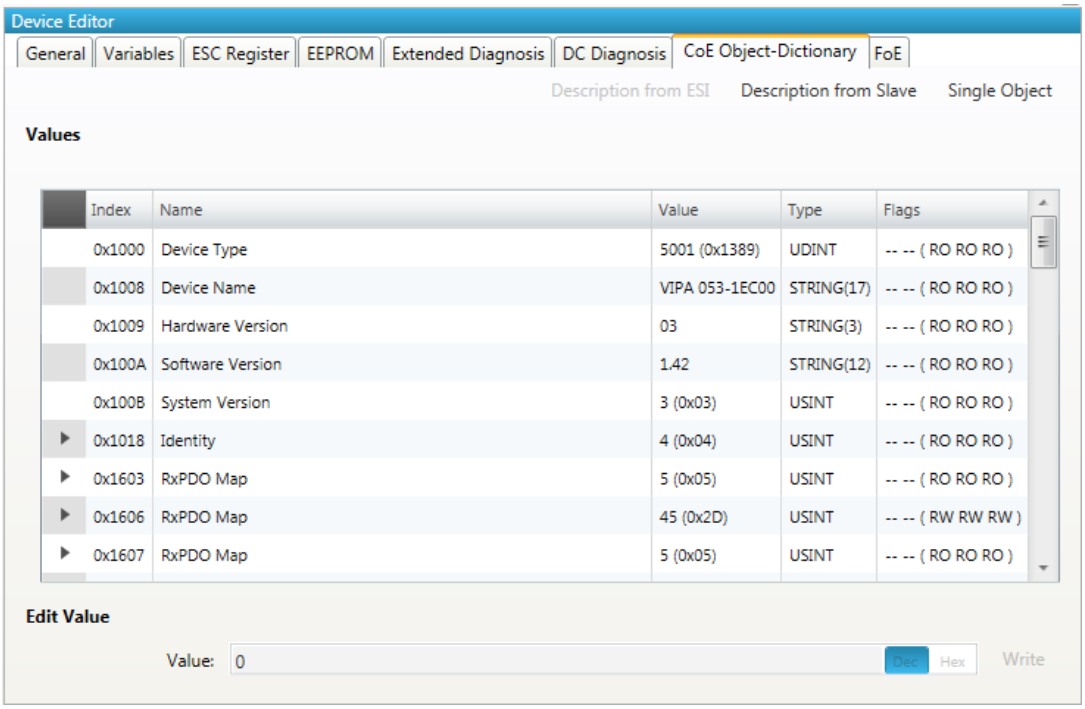
NOTE:
The option “Sync Window Monitoring” must be enabled.

4.3.7 CoE Object-Dictionary

This tab consists of 3 modes (in user mode, only the description from ESI or slave is available):

- Description from ESI

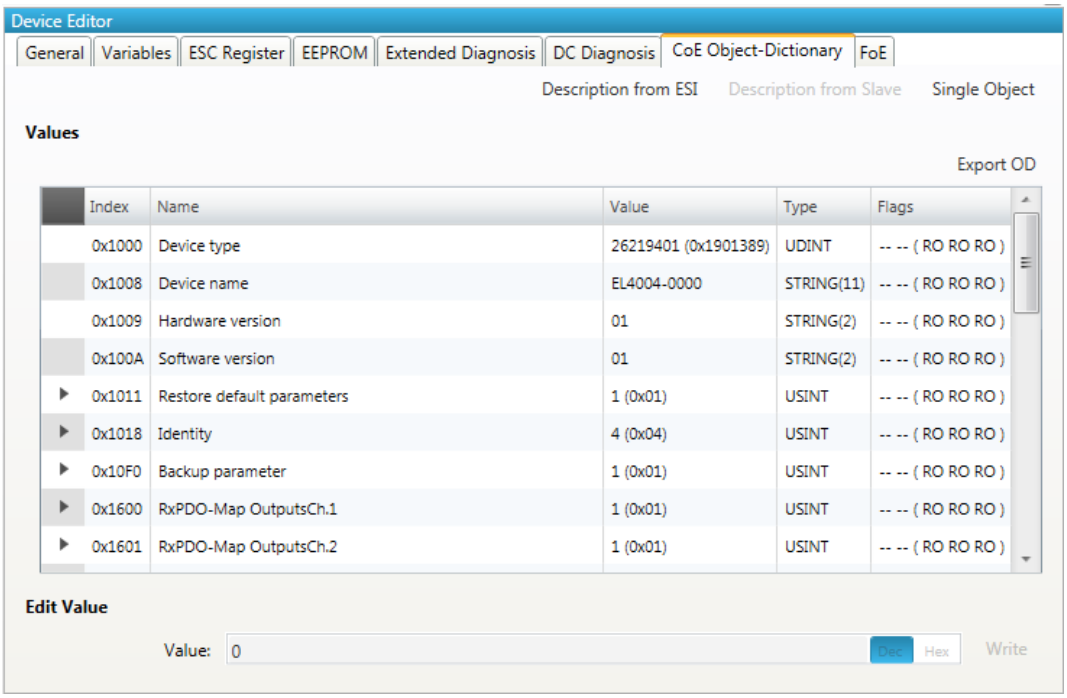
In this tab, the user can see the description of the object dictionary from ESI and the values from the slave. He can also change the values.



- 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 (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
  - Write: Writes the selected entry

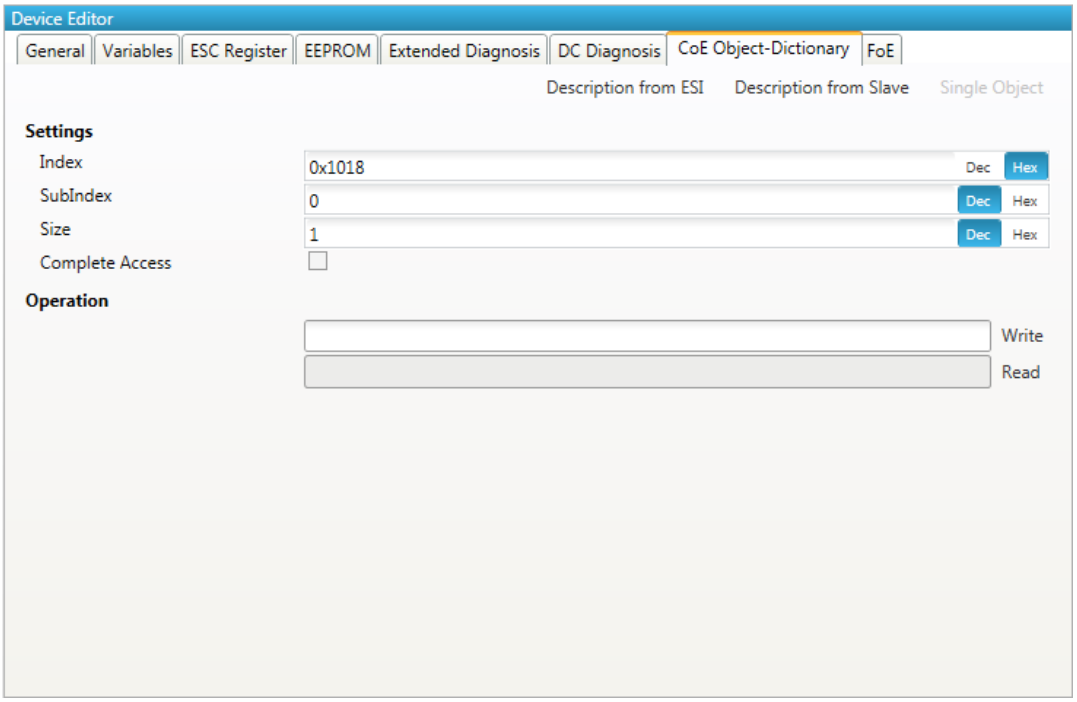
- Description from Slave

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



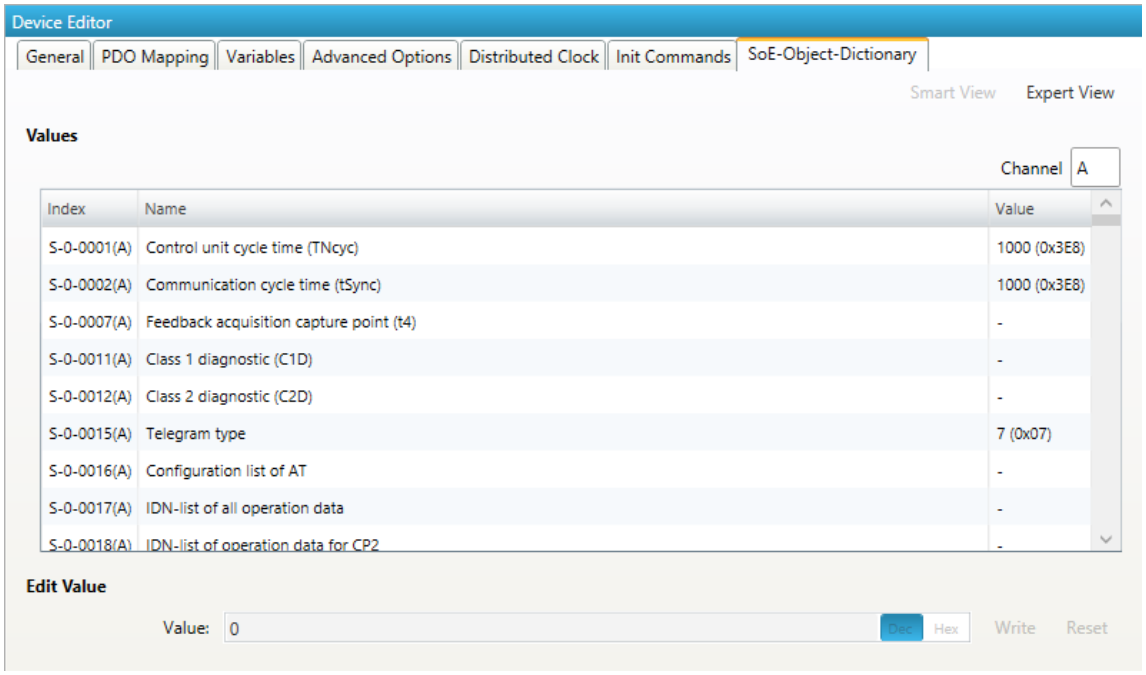
- Lists of CoE Object-Dictionary entries
  - Entries are uploaded from the slave (if “SDO Information Service” is supported)
  - The “Flags” column tells the user if this entry is an PDO entry and if it can be edited
    - “AA BB (CC DD EE)”
    - AA = Mapping as RX PDO or not
    - BB = Mapping as TX 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
  - Write: Writes the selected entry
- Single Object

In this tab, the user can read and write the values of the object dictionary of the slave.



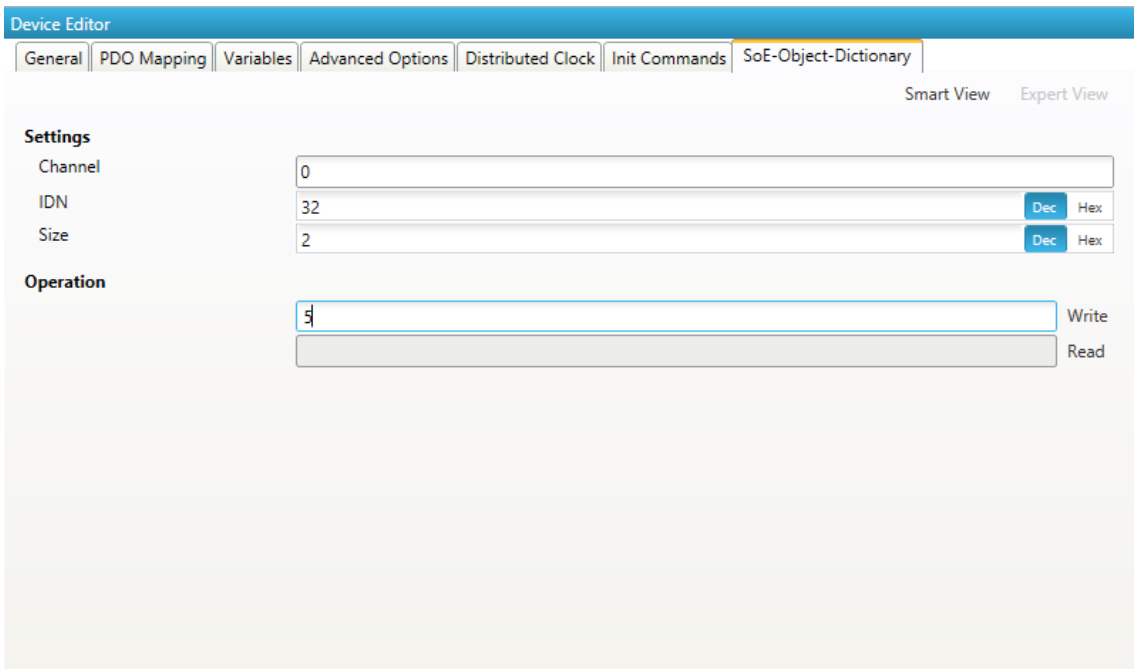
- Settings
  - Index: Index of the CoE value
  - SubIndex: SubIndex of the CoE value
  - Size: Size of the CoE value (only used for reading)
  - Complete Access: Activate, if complete access mode should be used for reading or writing the CoE value (can be used only if it is supported from slave)
- Operation
  - Write: Writes the value to the slave (Hex format, like: “00 11 22 33 …”)
  - Read: Reads the value from slave (Hex format, like: “00 11 22 33 …”)

4.3.8 SoE Object-Dictionary



- Lists of SoE Object-Dictionary entries
  - Values are uploaded by the master from the slave
  - Entries comes from the ESI
- Buttons
  - Write: Writes the selected entry
- Expert View

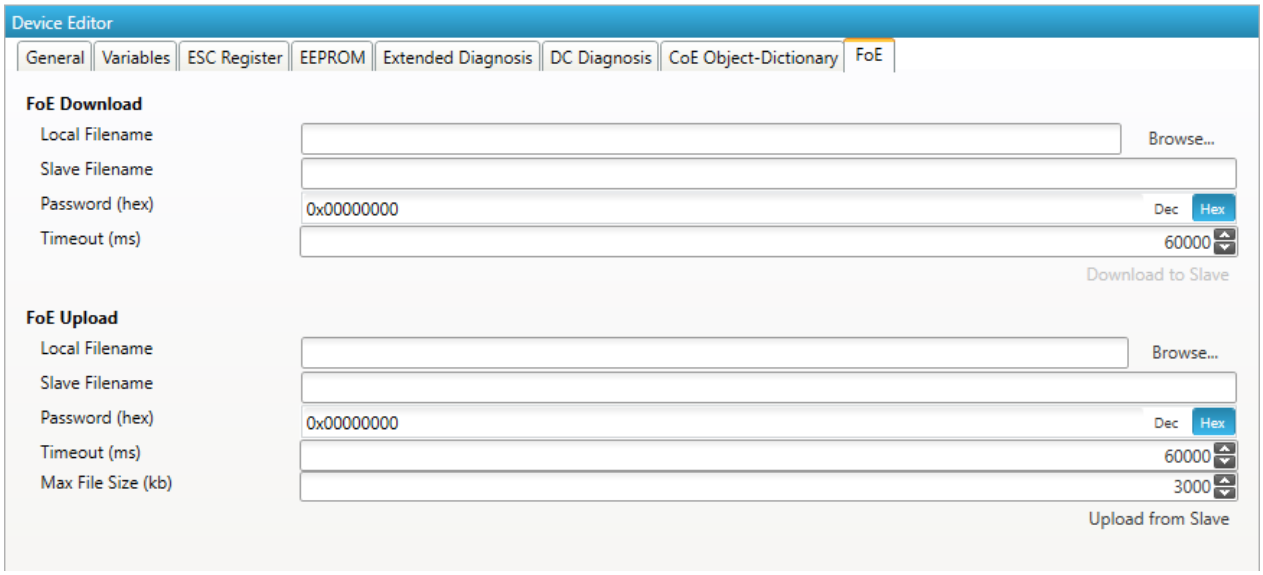
In this tab, the user can read and write the values of the object dictionary of the slave.



- 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 slave (Hex format, like: “00 11 22 33 …”)
  - Read: Reads the value from slave (Hex format, like: “00 11 22 33 …”)

4.3.9 File over Ethernet (FoE)

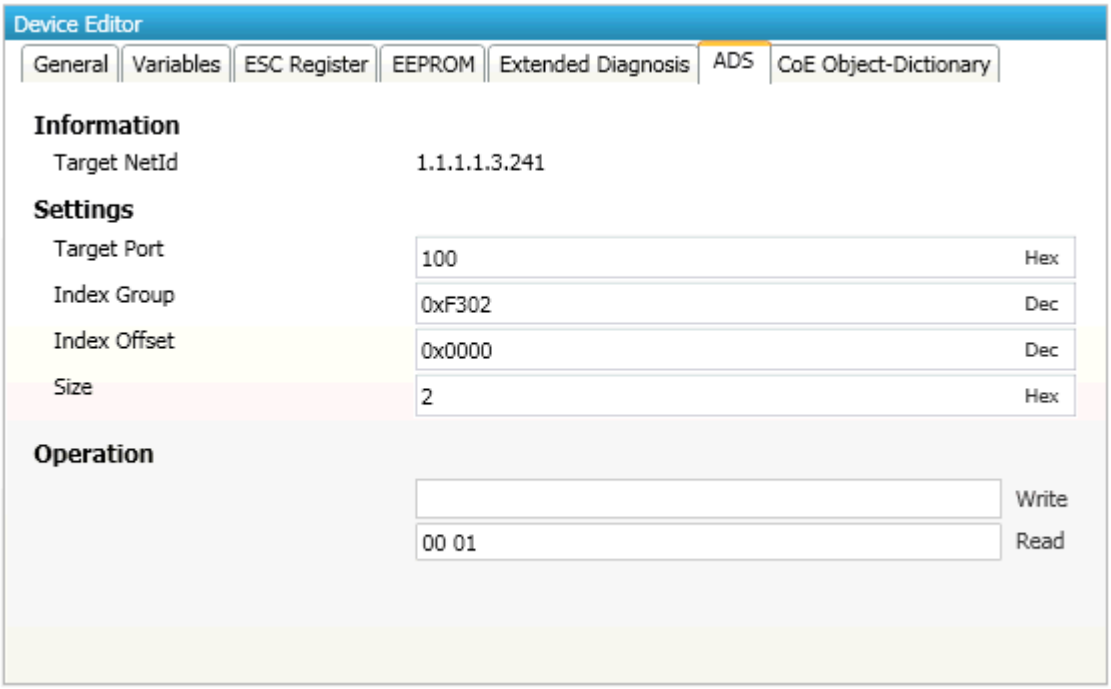
In this tab, the user has the possibility to download or upload a file to the slave.



- FoE Operations
  - Local Filename: Name of the file on the harddrive
  - Slave Filename: Name of the file on the slave
  - Password: Password on the slave 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 slave in kilo bytes

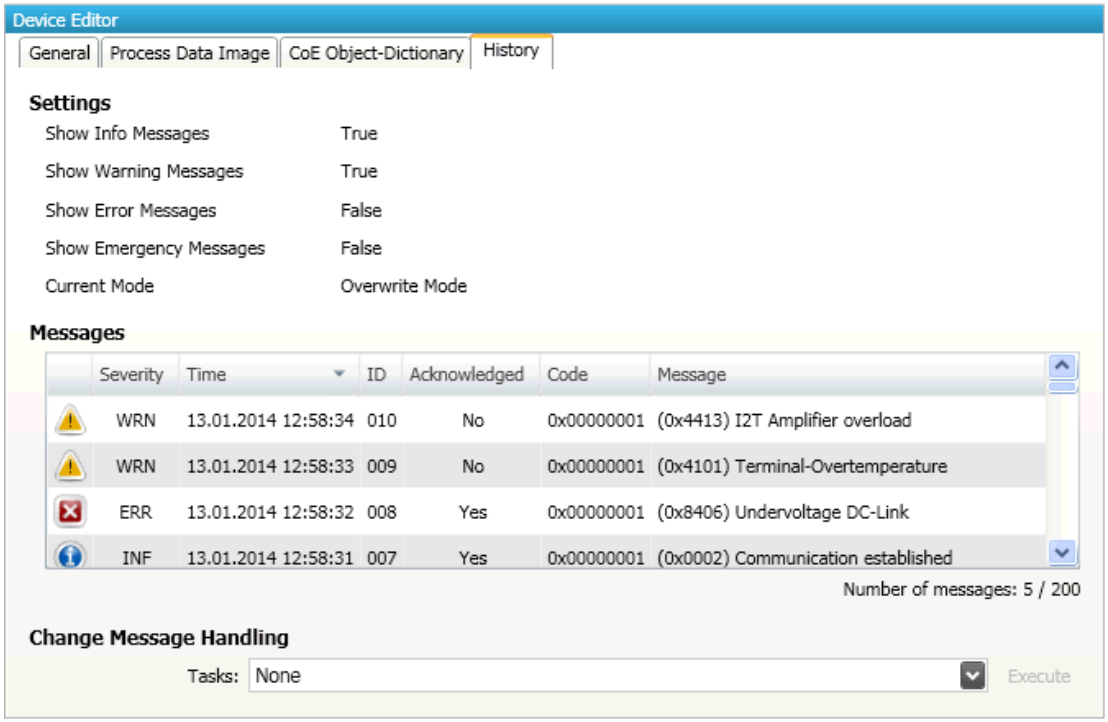
4.3.10 ADS

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



4.3.11 History (Expert)

In this tab, the user can see and change the diagnosis history of the slave.



Settings

- Show Info Messages:
  - Info messages will be collected from slave

- Show Warning Messages:
  - Warning messages will be collected from slave
- Show Error Messages:
  - Error messages will be collected from slave
- Show Emergency Messages:
  - Emergency messages will be collected from slave
- Current Mode:
  - Overwrite Mode: Messages will be overwritten if buffer is full
  - Acknowledge Mode: Messages will be discarded if buffer is full

Messages

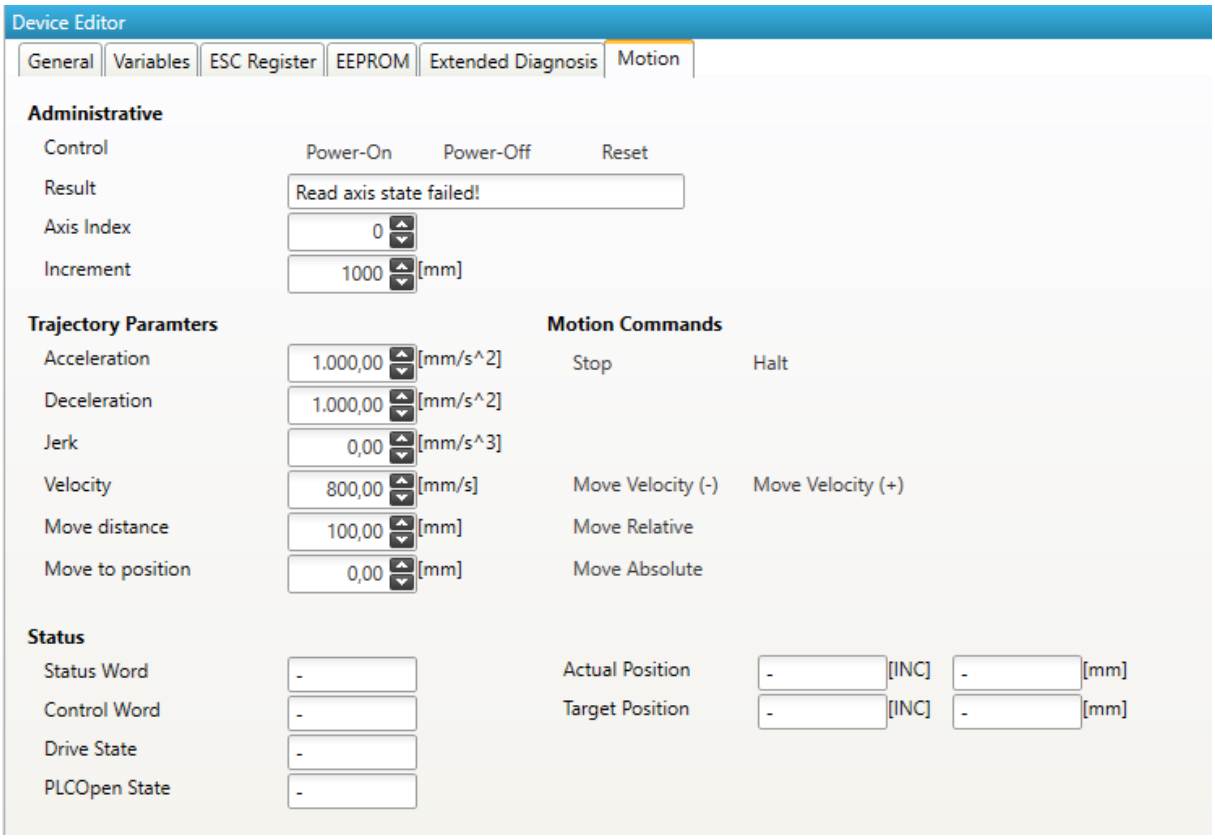
- List of history messages

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)

4.3.12 Motion (Motion Mode only)

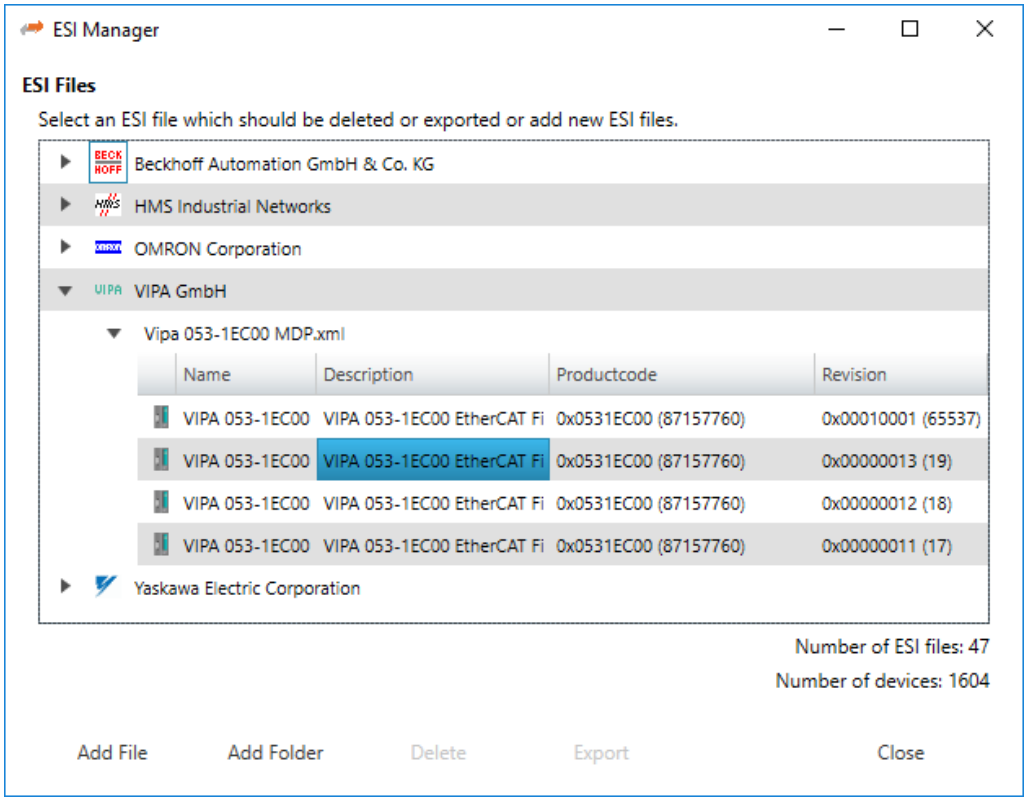
In this tab, the user can see and change the motion settings of the slave. He can read important variables and change velocity and direction of the axis.



5 Additional Tools

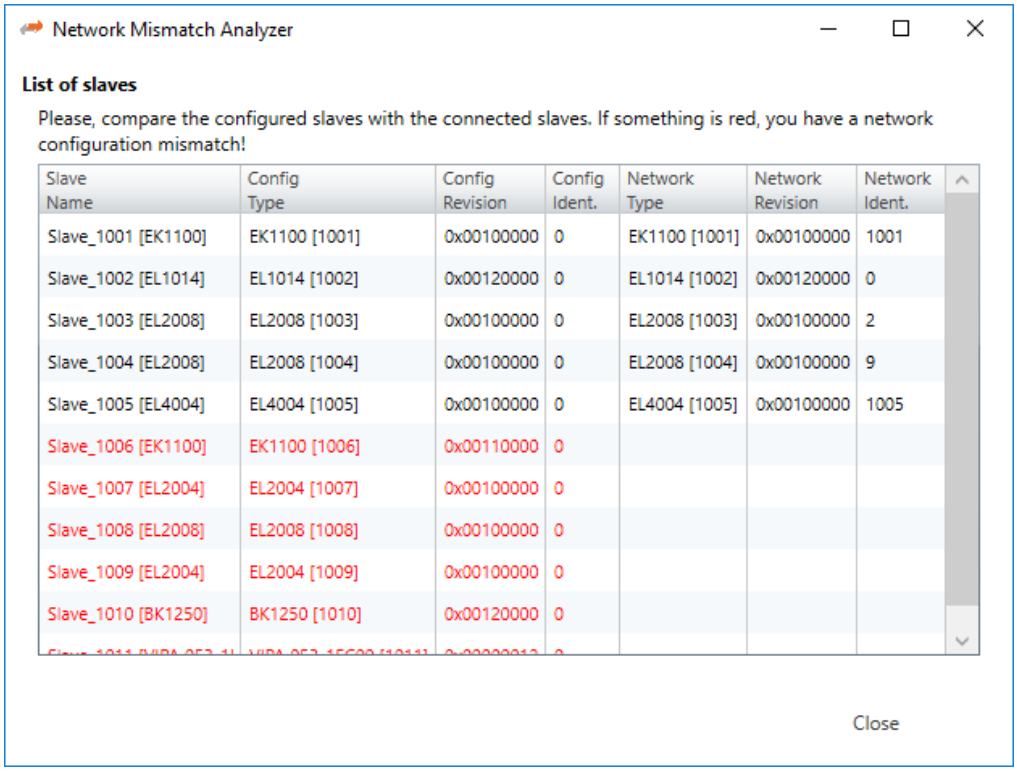
5.1 ESI Manager

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



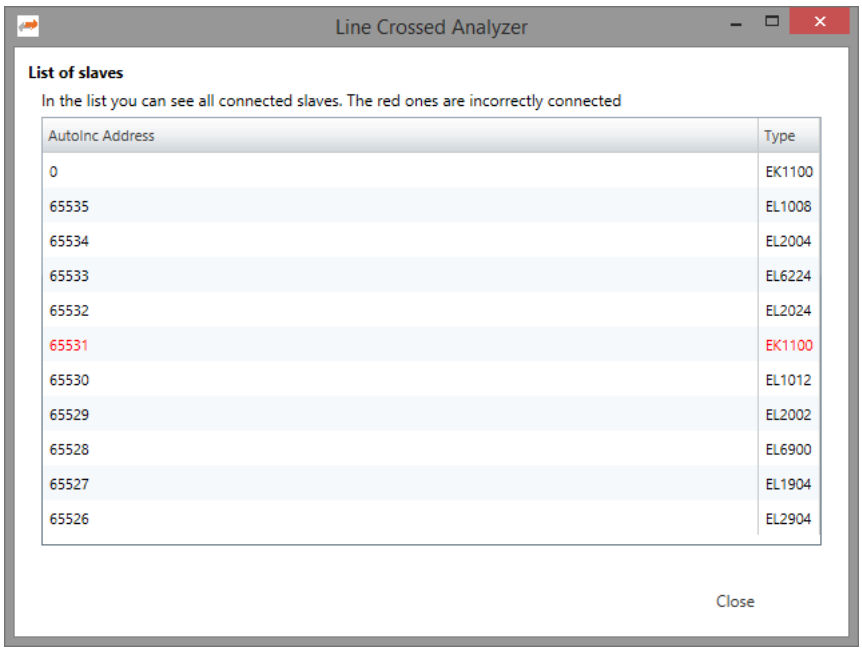
5.2 Network Mismatch Analyzer

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.



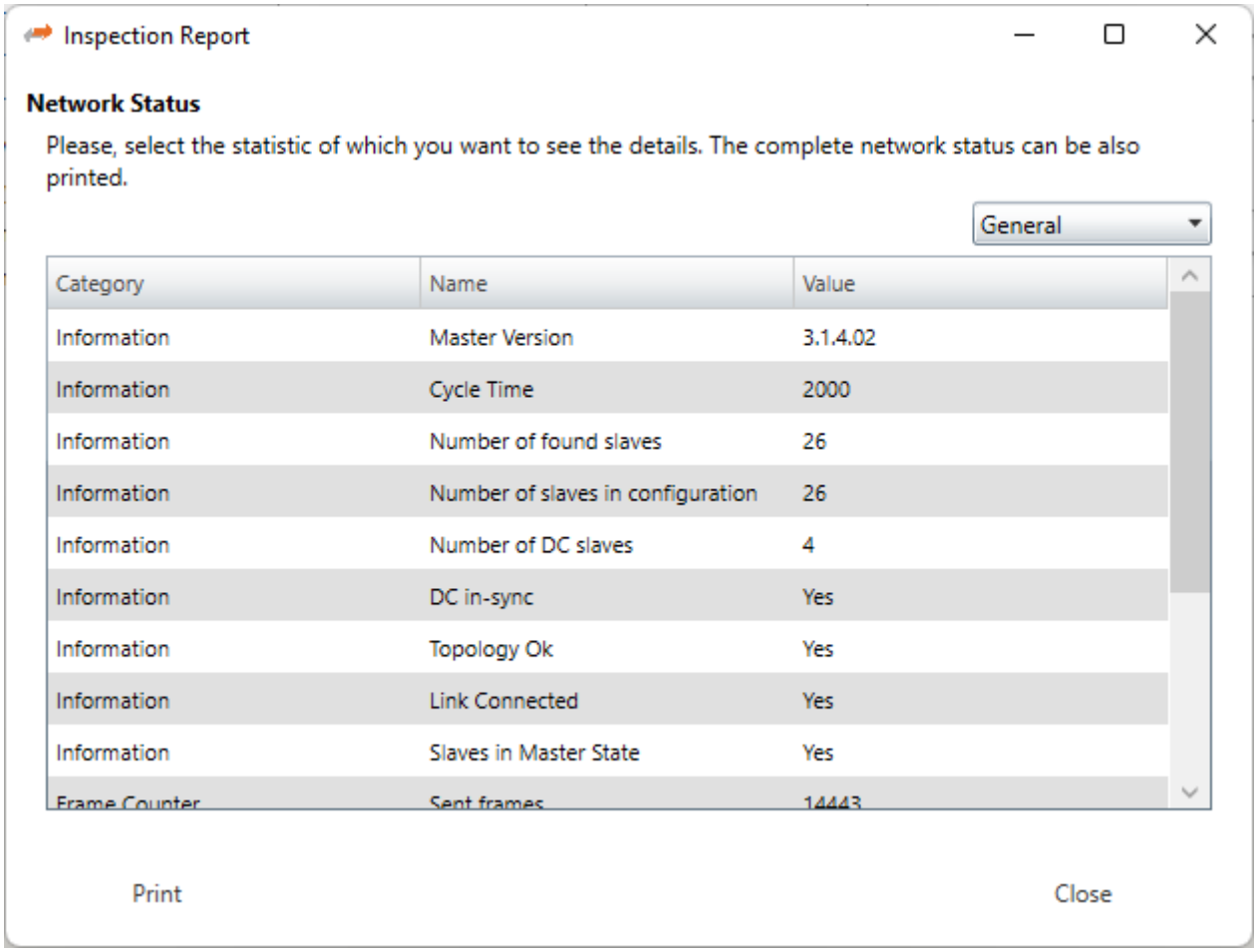
5.3 Line Crossed Analyzer

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



5.4 Inspection Report

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

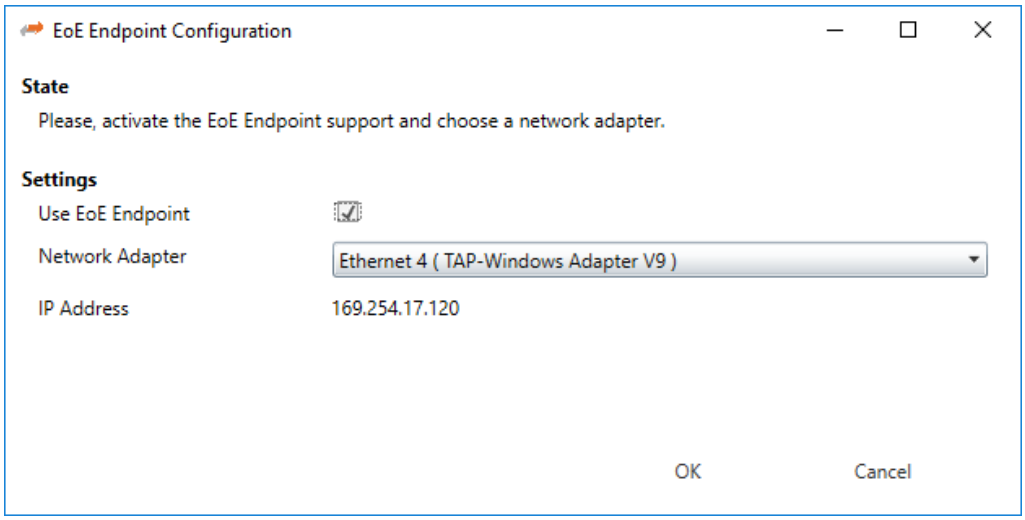


5.5 EoE Endpoint Configuration

If you want to use EoE slaves with your local master, 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:



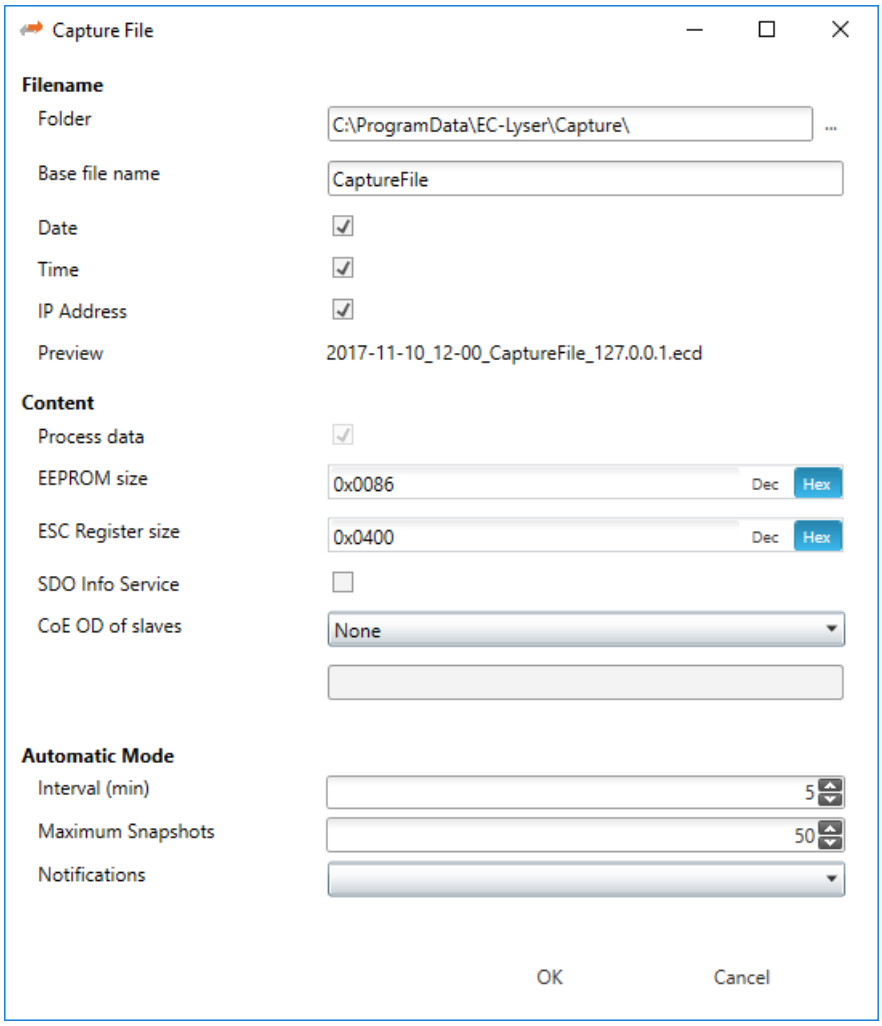
- Settings
  - Use EoE Endpoint: Activate EoE Endpoint support for the selected device
  - Network Adapter: List of installed network adapters (TAP)
  - IP Address: IP Address of the selected network adapter

5.6 Capture File

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

Another use case is, that your system from time to time some problems. In that case you can activate the automatic mode and create the snapshots every specific interval or based on specific master 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
  - ESC Register size: Enter size of the ESC Registers

    - 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.
    - CoE OD of slaves: Select the slaves of which the CoE OD information will be captured
        - None: CoE OD will be not captured
        - All: CoE OD will be captured of all slaves
        - User defined: CoE OD will be captured of the defined slaves by physical address (e.g. 1001-1003; 1005)
- 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 availabe (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

5.7 Real-time Support

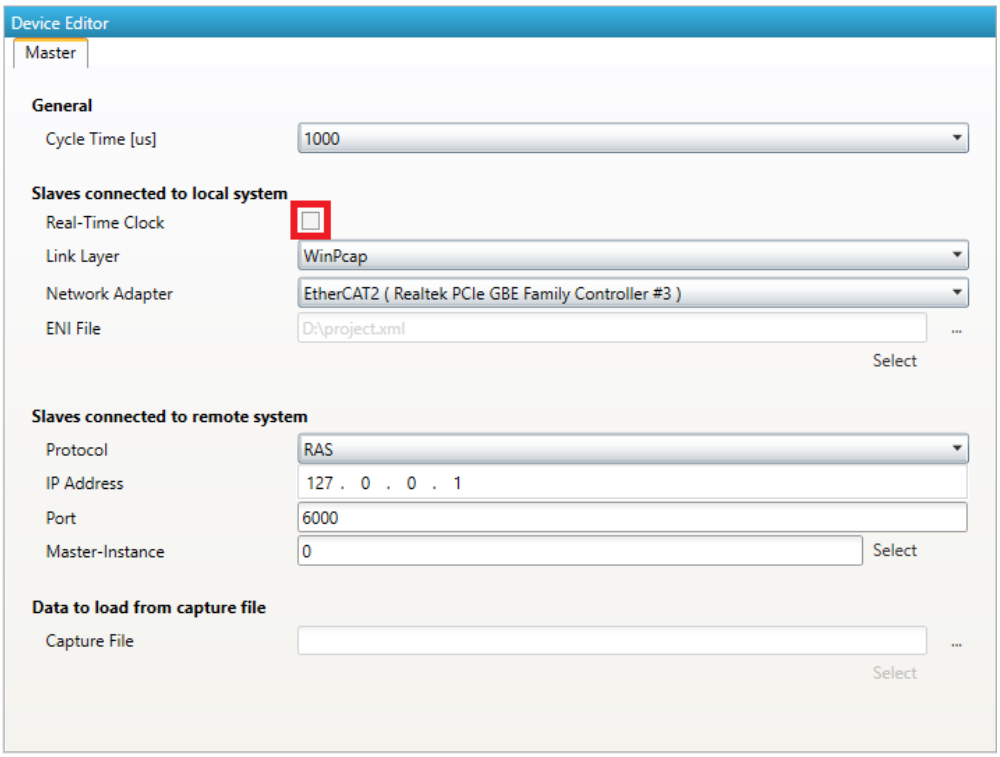
Normally on Windows you do not have real-time support, but to get DCM in sync you can install the “ECAT driver” in the following modes:

- Auxillary Clock
  - This auxillary clock is accurate enough to get DCM in sync (ECAT driver does not guarantee response to the cycle’s deadline)
- 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.

5.7.1 Real-time Clock

After activating the real-time support the real-time clock support can be activated by selecting the option “Real-Time Clock”:

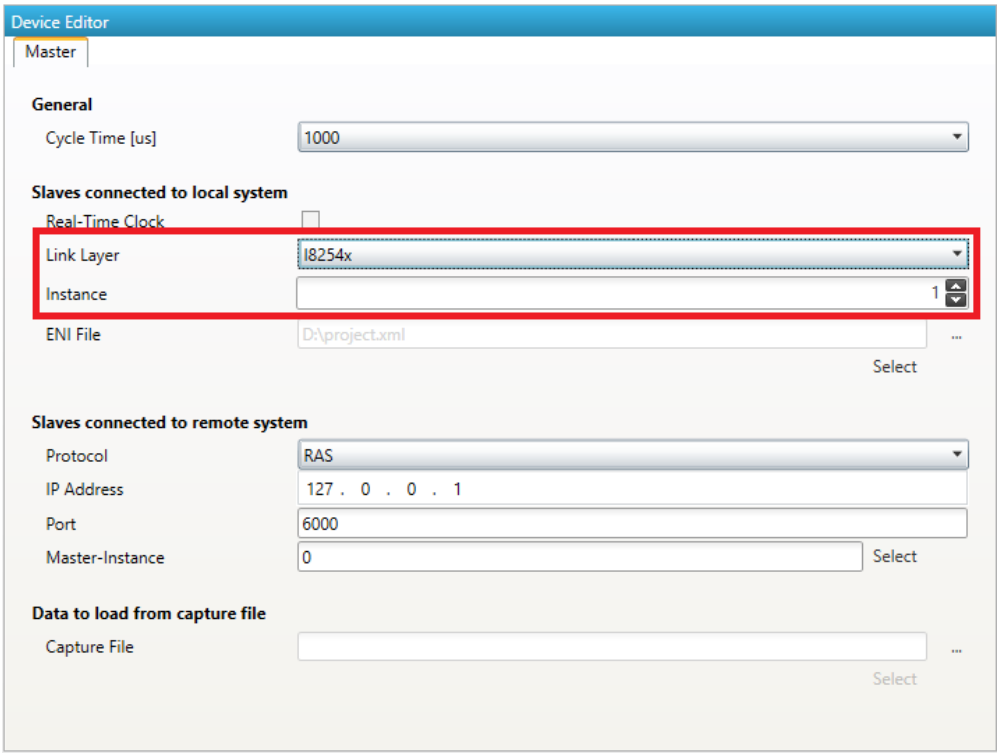


For the local system, EC- Lyser will turn on ECM and use the real-time clock for generating the job task cylces.

For more information about how to install the “ECAT driver” please refer the manual of EC-Master Class A, chapter “2.1.19 DCM on Windows”

5.7.2 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 currenty supported:

- emllI8254x.dll (Intel PRO/1000 Network Adapters)
- emllI8255x.dll (Intel PRO/100 Network Adapters)
- emllIRTL8139.dll (Realtek 8139 Fast Ethernet Adapters)
- emllIRTL8169.dll (Realtek Gigabit Ethernet Adapters)
- emllICCAT.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, chapter “2.3.6.2 EcatDrv for Optimized Link Layers””.

6 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 or /? : 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, master 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 “127.0.01” will be chosen
- /CAPTURE=”C:\myfile.ecd:0” : Runs diagnosis with the offline diagnosis system, where the path to the capture file is “c:\myfile.ecd” and the selected snapshot is “0”
- /ENI=”eni.xml” : Sets the path to the ENI file which should be used

7 Licensing

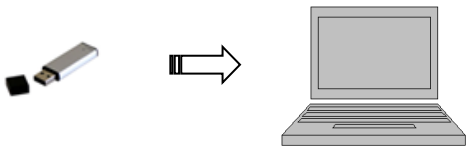
7.1 Overview

For EC-Lyser we have two license models:

- Node Locked License
- Floating License

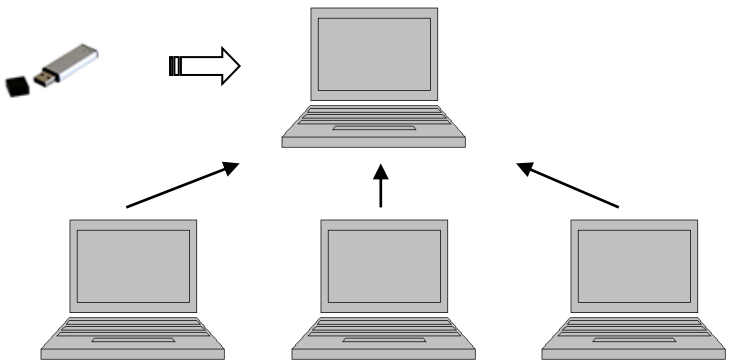
7.2 Node Locked License

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.



7.3 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.

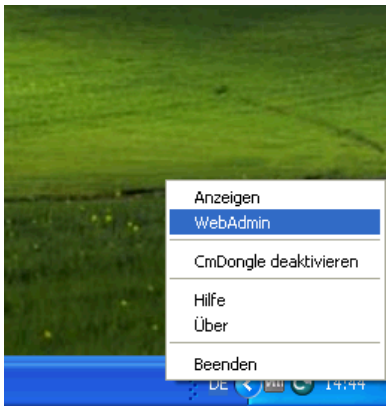


NOTE:
This requires that the “WebAdmin” of the “Code Meter” is installed on the system. On 32 bit systems the “WebAdmin” is included into the MergeModule of WIBU, but on 64 bit systems the “WebAdmin” must be installed by downloading and installing the “Code Meter Runtime” from WIBU:

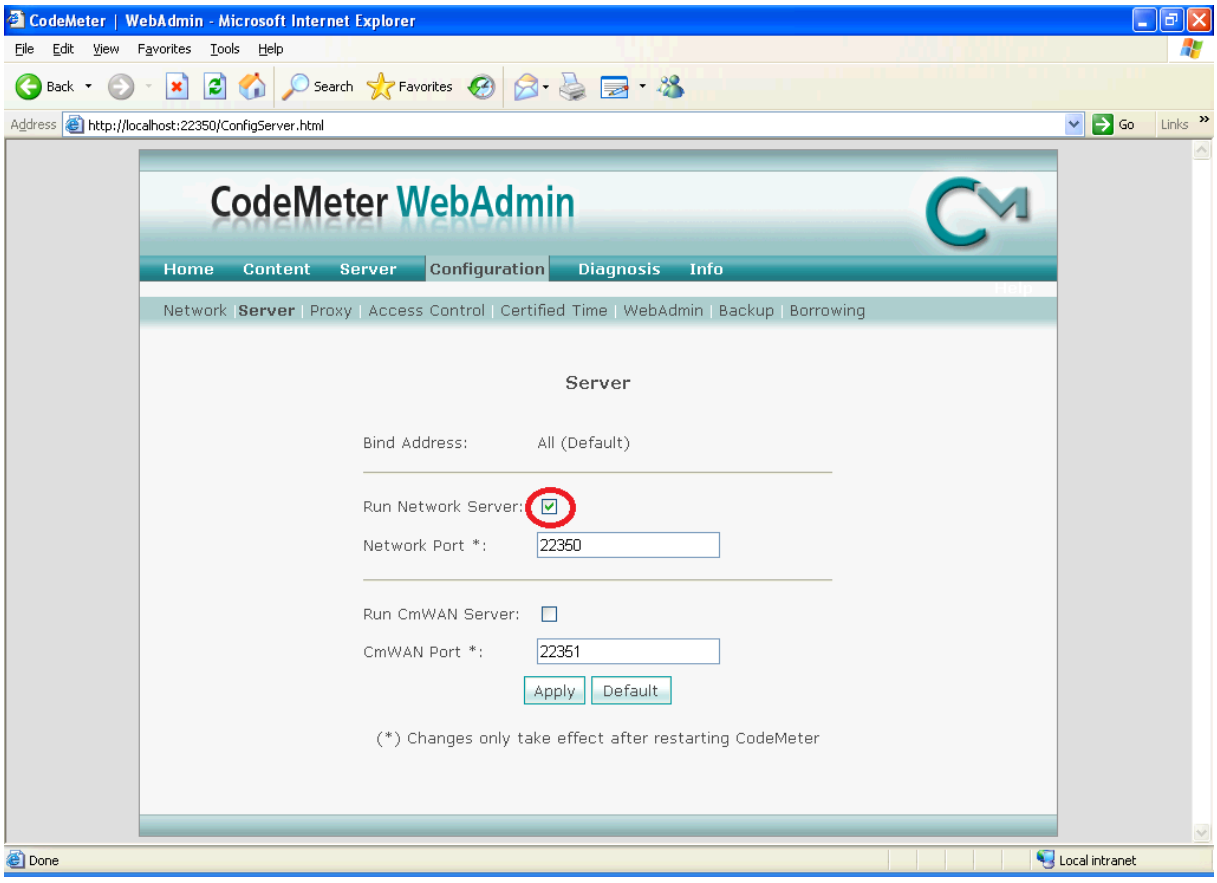
https://www.wibu.com/

7.3.1 Configure License Server

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

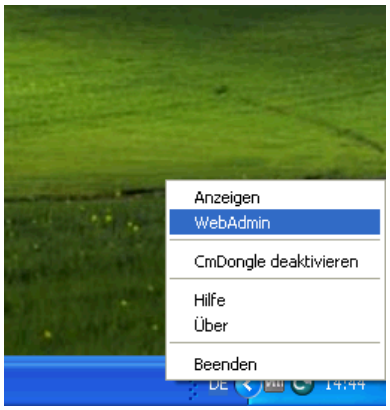


In the “WebAdmin” navigate to “Configuration → Server”, select the option “Run Network Server” and press “Apply”:

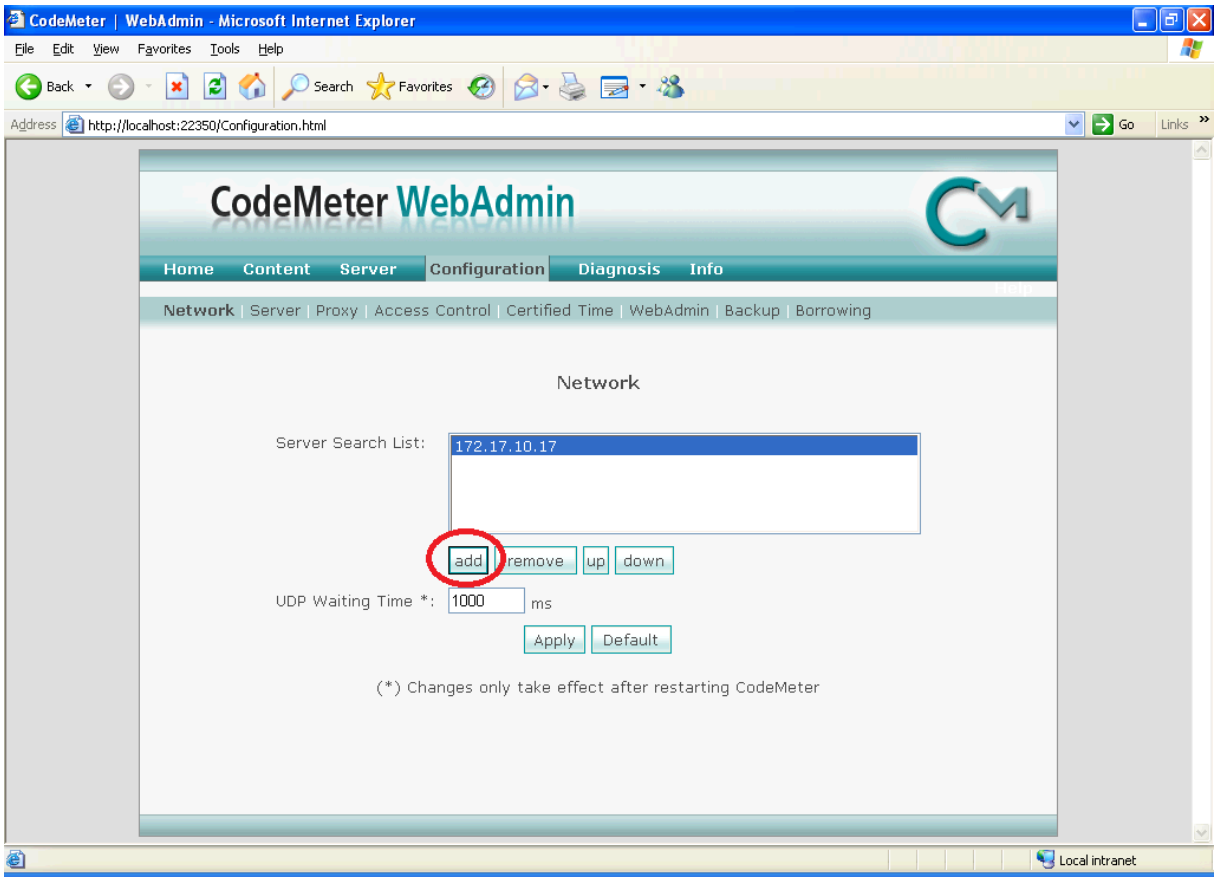


7.3.2 Configure Client Computer

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.

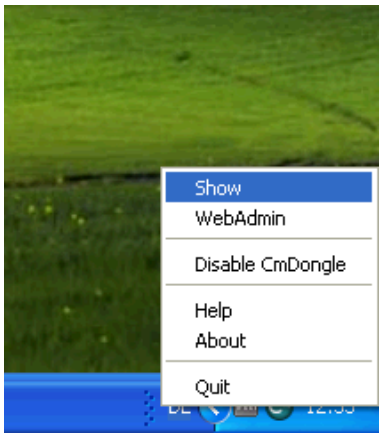
NOTE:
If too many clients are connected you will, you will receive the following error message:

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

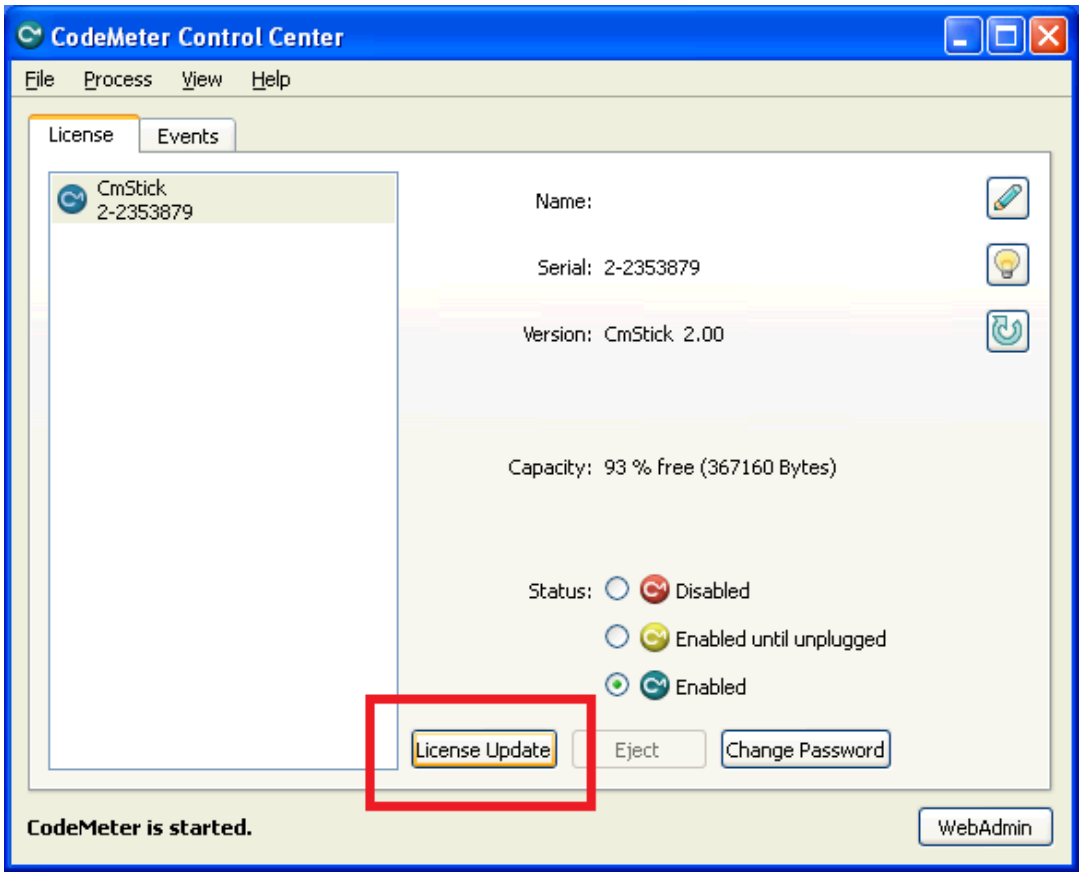
7.4 License Update

7.4.1 Request License Update

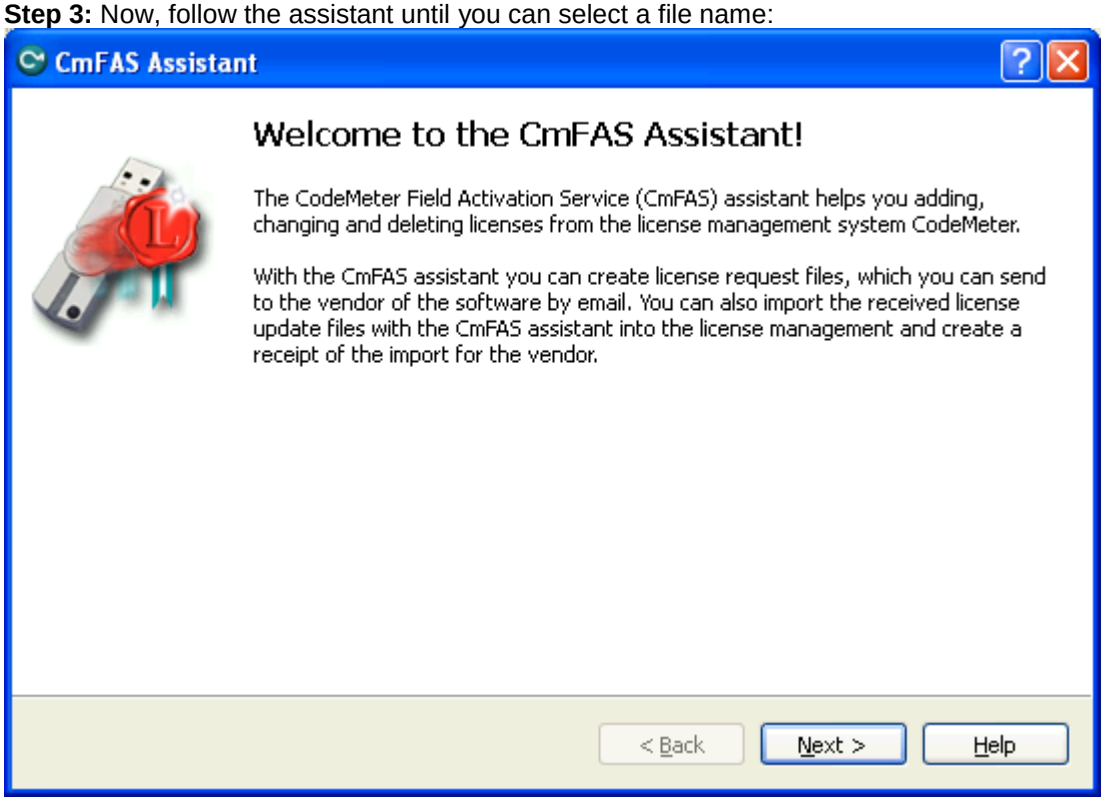
Step 1: Install the “Dongle-Version” of EC-Lyser and open the “CodeMeter Control Center”:



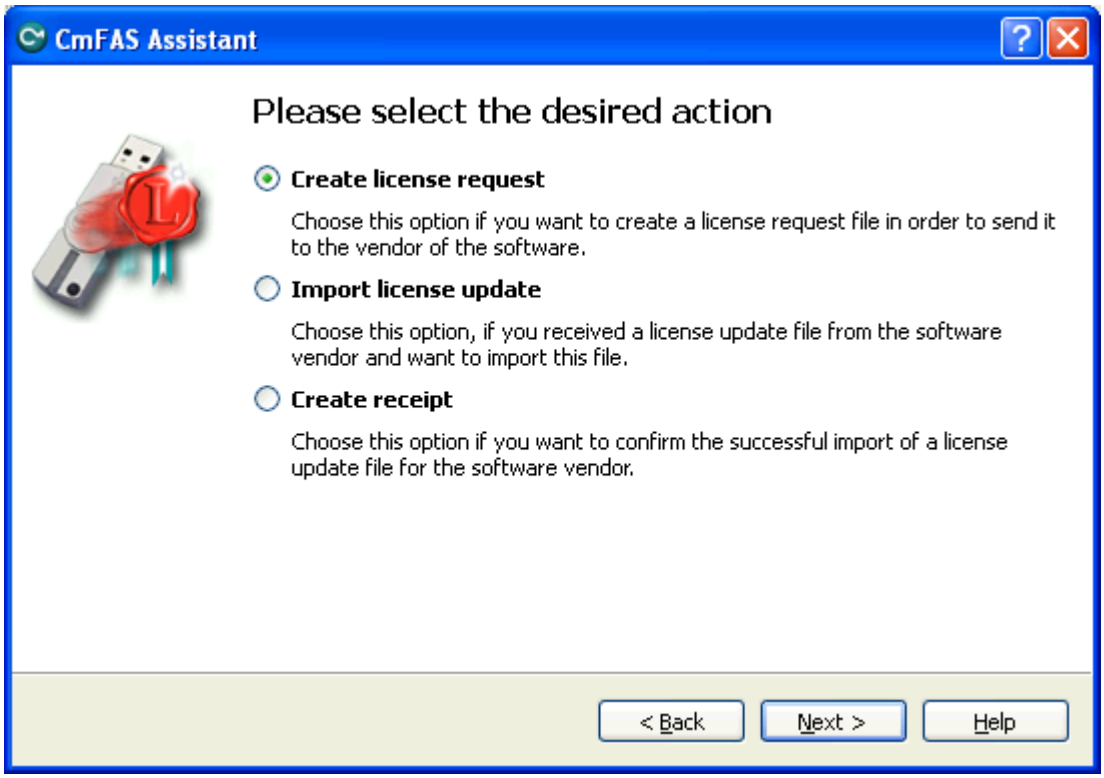
Step 2: In the “CodeMeter Control Center” open the “CmFAS Assistent” by clicking on “License Update”:



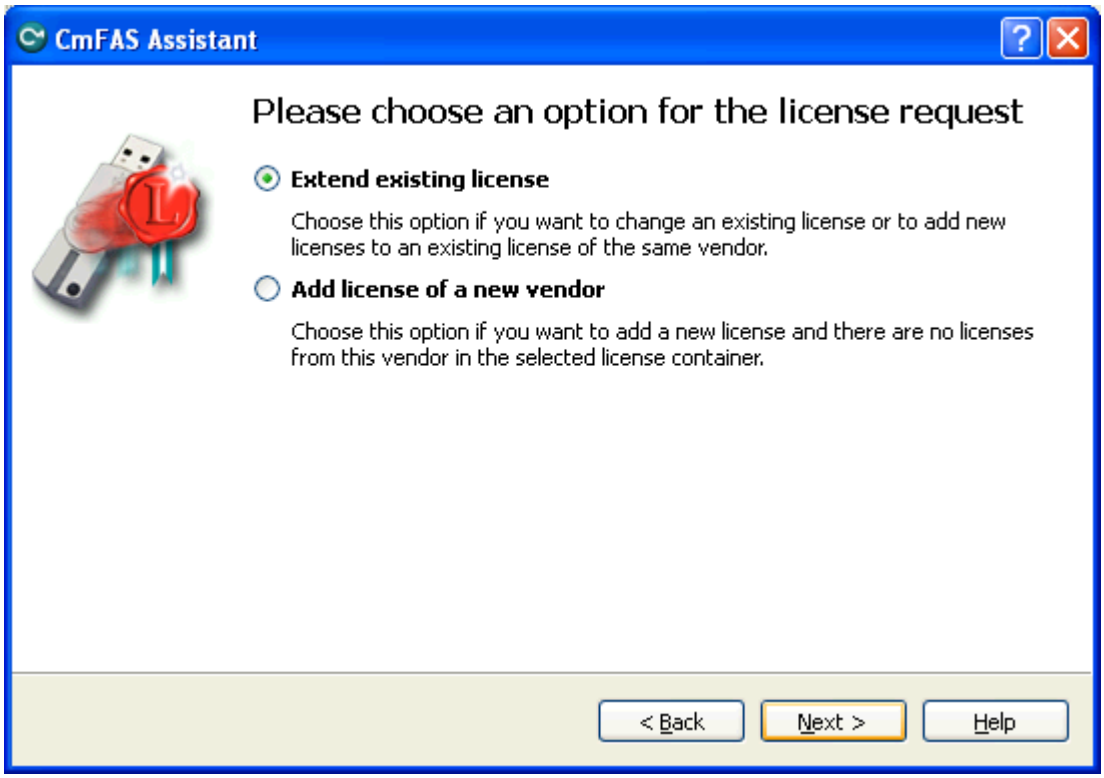
Step 3: Now, follow the assistant until you can select a file name:



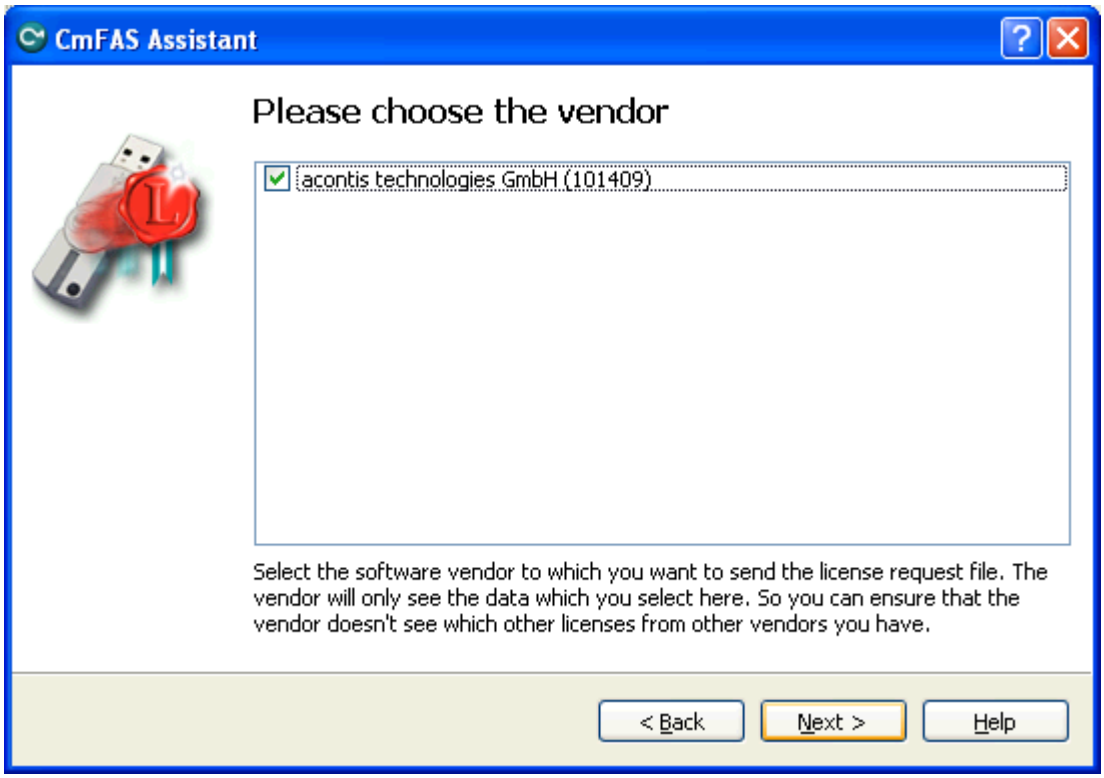
Step 4: Select “Create license request”:



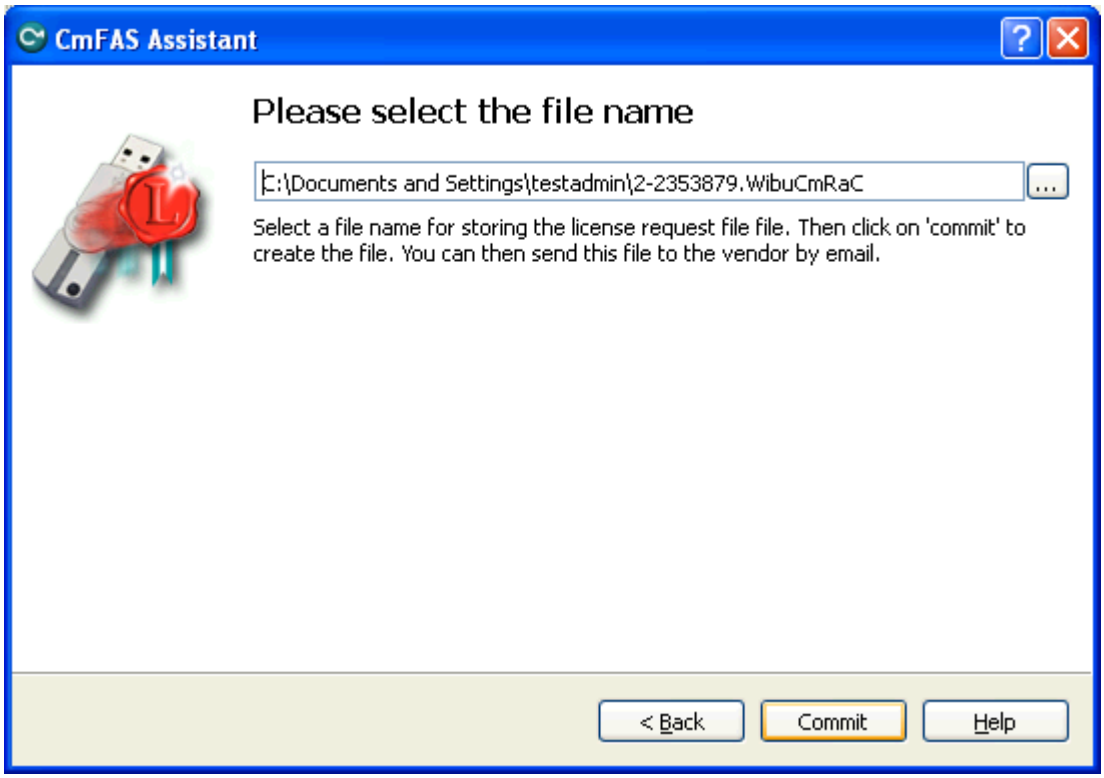
Step 5: Select “Extend existing license”:



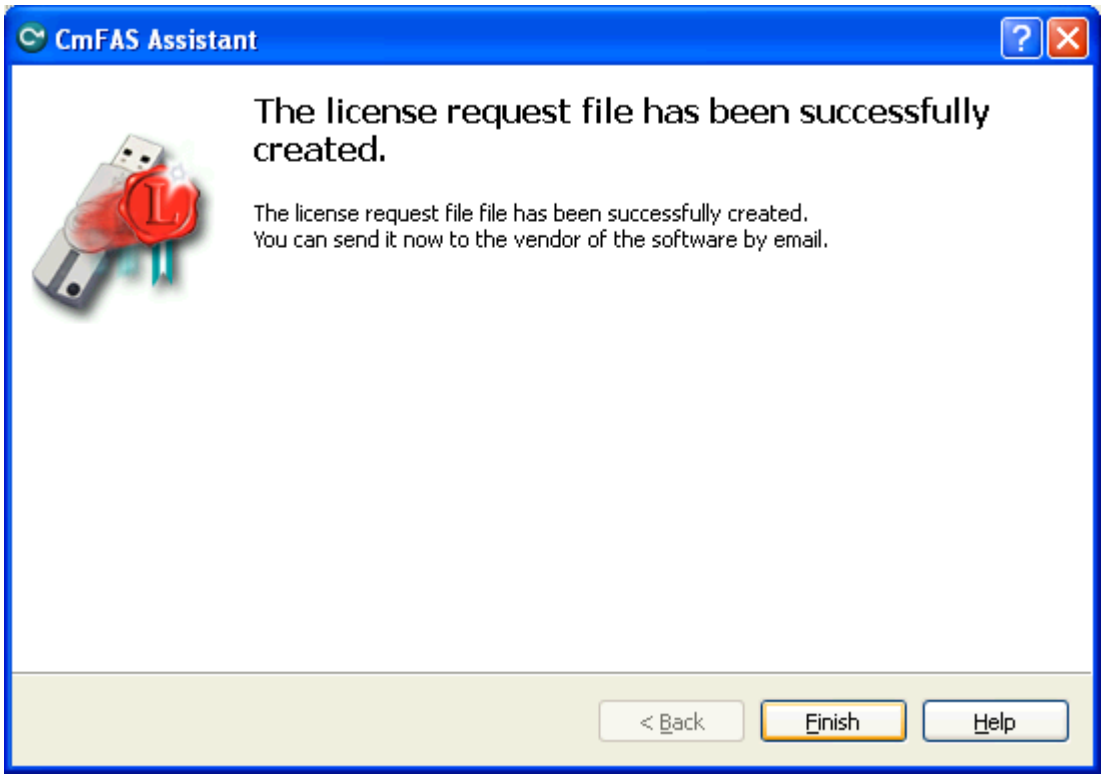
Step 6: Keep the selected the vendor:



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.

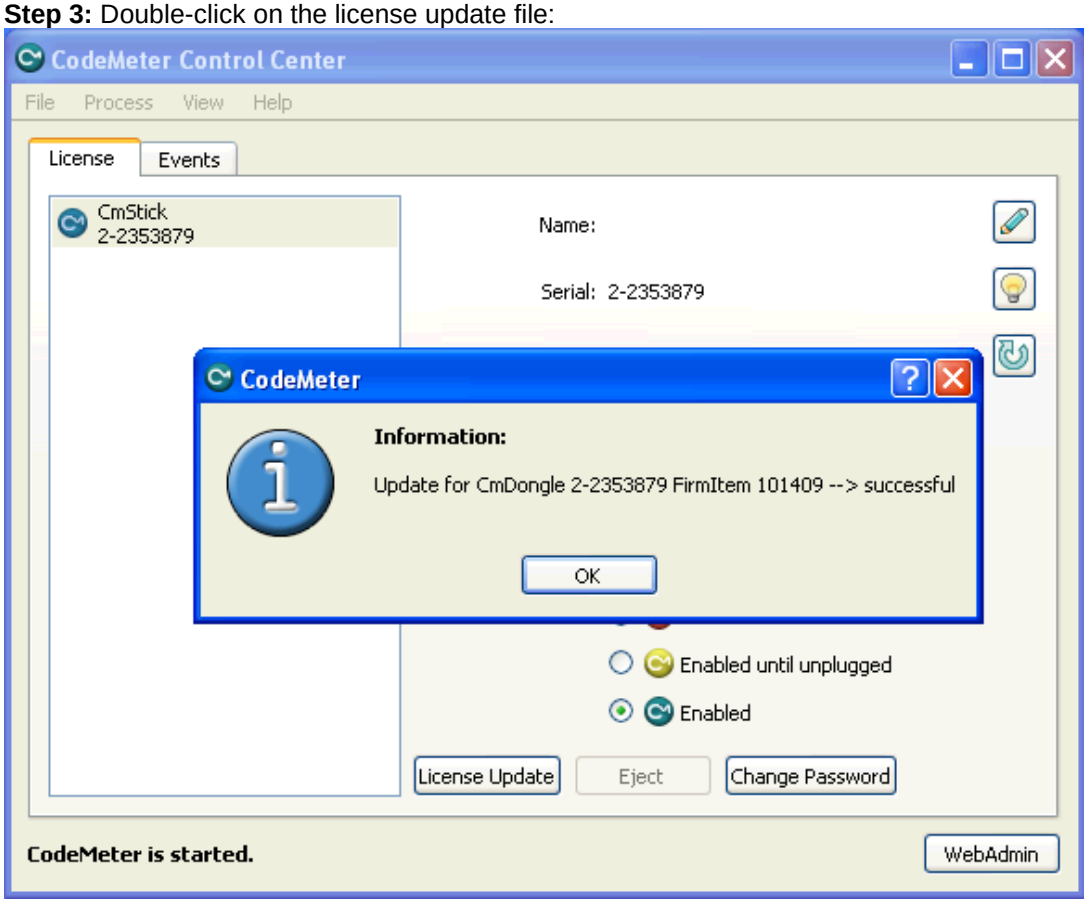
7.4.2 Install License Update

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

Step 1: Connect your dongle.

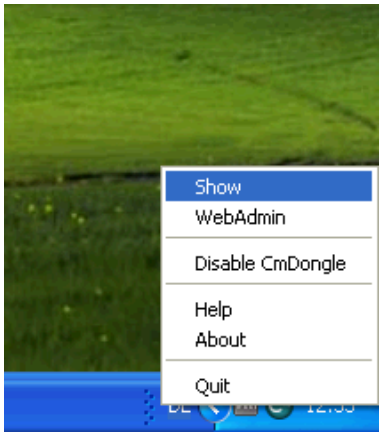
Step 2: Copy the license update file to your desktop.

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

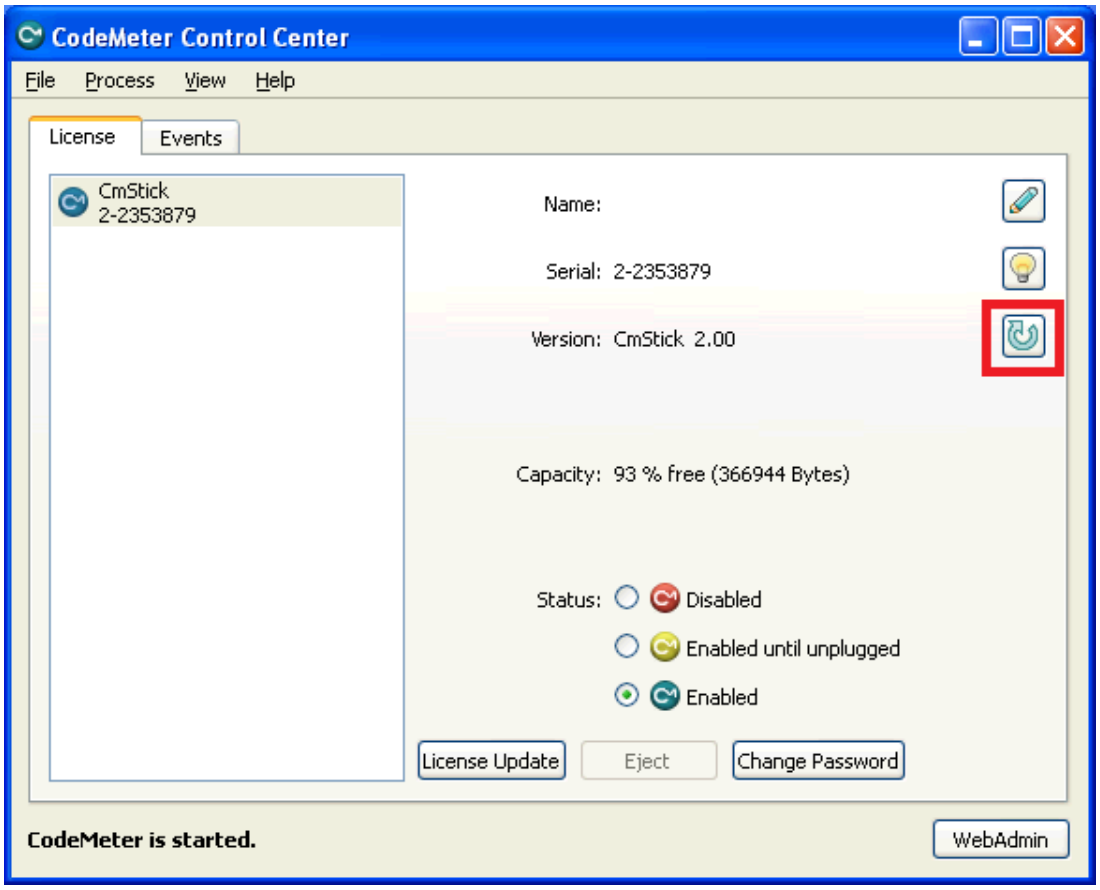


7.5 Dongle Firmware Update

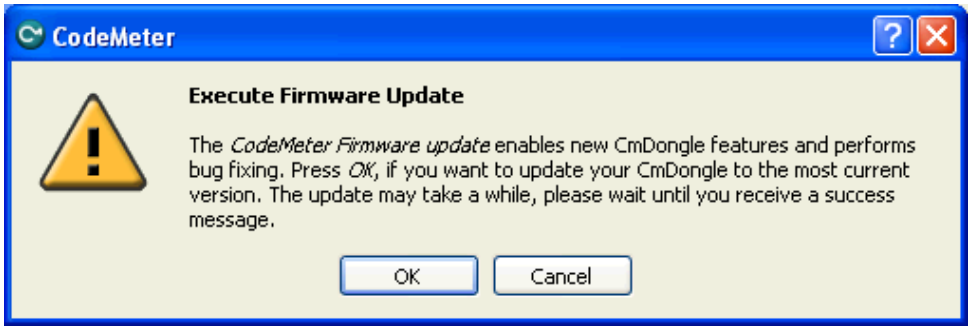
Step 1: Install the “Dongle-Version” of EC-Lyser and open the “CodeMeter Control Center”:



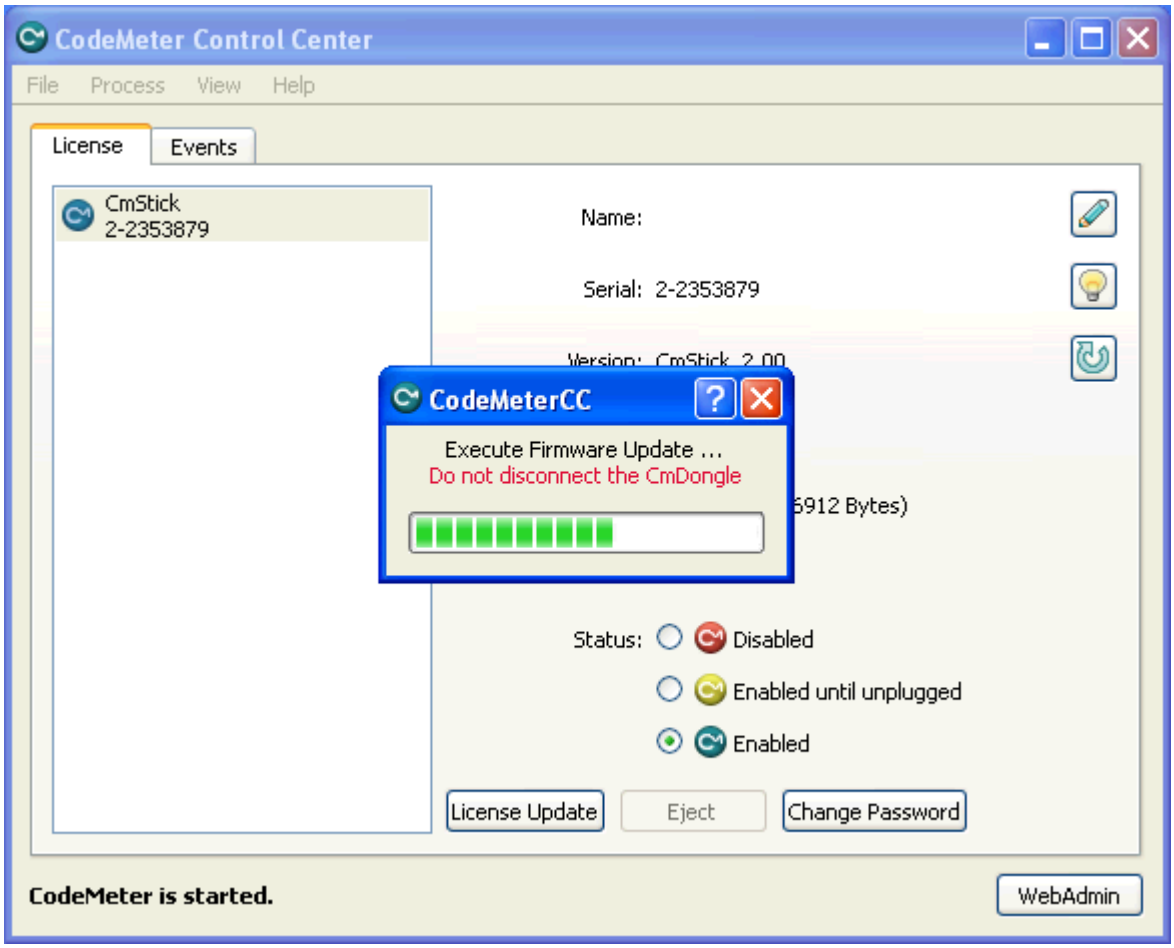
Step 2: In the “CodeMeter Control Center” click on “Update Firmware of selected Cm Dongle”:



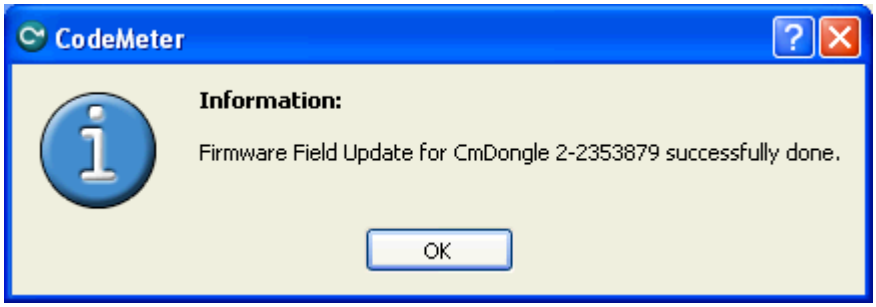
Step 3: Execute firmware update by pressing “OK”:



Step 4: Wait until firmware update was executed:



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



7.6 Expiration Date Dongle

If you chosed 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:

8 FAQ, Tips

8.1 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
    - EC-Lyser Version (Menu → Help → About)
    - Log file (Menu → Help → Show Log File)
    - Short description how the reproduce it

8.2 Internal User Specific Settings

EC-Lyser saves all user specific settings in a subfolder of the all users directoy ("%AllUsersAppData%\EC-Lyser", like "C:\ProgramData\EC-Lyser" or "C:\Documents and Settings\All Users\Application Data\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 master in seconds
- MasterUnitLocalWorkerSleepTimeMs = 100
    - Cycle time of the local master thread in milliseconds
- MasterUnitRemoteWorkerSleepTimeMs = 300
    - Cycle time of the remote master thread in milliseconds
- MasterUnitTimerNormalCount = 4
    - Time shift to cycle time of the normal refresh cycle
    - E.g. local master = 100 ms, normal refresh cycle is every 400 ms
    - Used e.g. for updating master information, error counters of slave, …
- MasterUnitTimerSlowerCount = 20
    - Time shift to cycle time of the slower refresh cycle
    - E.g. local master = 100 ms, slower refresh cycle is every 2 seconds
    - Used e.g. for updating the slave information, EEPROM data, register data, …
- MasterUnitTimerSlowestCount = 120
    - Time shift to cycle time of the slowest refresh cycle
    - E.g. local master = 100 ms, slower refresh cycle is every 12 seconds
    - Used e.g. for updating the CoE Object Dictionary, …
- MasterUnitScanBusTimeout = 5000
    - Timeot 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

8.3 FAQ

Here you can find solutions of possible problems:

- **“The integrated EC-Master does not react as estimated”**
  - Increase the message level (Menu → Settings → All Messages) and try it again.
- **“EC-Lyser reports a message with ErrCode: 0x…”**
  - Error Codes comes directly from the EC-Master. If you want to know what to know how to solve this problem, please refer the manual of EC-Master.
- **“EC-Lyser reports the following message: Not all EtherCAT slave devices are in operational state”**
  - Check if all slaves have a green icon. If the color is not green, open tab “Diagnosis → Slave → General”. Here you can see the error state of the slave. 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 (ErrCode: 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: Slave '…' has unexpected state (Current state: '…', Expected state: '…')”**
  - Select the slave and open the tab “General”. Here you can see the error state of the slave. If it has no error, try to change the state again.
- **“Slave reports the error state: “Sync manager watchdog” (Diagnosis → Slave → General)**
  - You need a realtime operating system. If you still want to use your slave on Windows, you can turn off this watchdog (Slave->Advanced Settings: Set PDI Watchdog = 0).
- **“How can I update the firmware of my slave via FoE?”**

    - For updating the firmware of your slave via FoE, please follow these steps:
        - Run diagnosis
        - Set master state to INIT
        - Select your slave, and set his state machine to BOOTSTRAP
        - Enter path of file on slave (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 WinPcap installed? It must be WinPcap 4.1 or higher must be installed.
    - Is at least one network adapter installed?
- **“EC- Lyser reports the following message: Failed to query EtherCAT Slaves. No slaves found.”**
    - Verify that NDIS or Npcap driver is installed. WinPcap may not work anymore.
    - Try to restart you operating system, because this is sometimes necessary if you e.g. using a USB network adapter
    - Increase the message level (Menu → Settings → All Messages)
    - Turn on debug message of the master
        - Stop “EC-Lyser”
        - Set “MasterDebugMessageLevel” to “7” (verbose) in “%ProgramData%\EC-Lyser \user.myusername.xml”
        - Start “EC-Lyser” again
- **“WebAdmin in Dongle-Version shows page not found, what can I do?”**
    - On 64 bit systems the “WebAdmin” is not included into the MergeModule of WIBU, it must be installed by downloading and installing 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 chapter “8.2 Internal User Specific Settings”