



acontis technologies GmbH

EC-Engineer

Release Notes

Version 4.0

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1 Introduction

1.1 Overview

This document describes the changes between the different versions.

1.2 Layers

The architecture of EC-Engineer is very modular and splittet into the following layers:

- Internal Layers
 - L5: EniEngine Layer 5
 - L4: Core Layer 4
 - L2: View Layer 2
 - L1: Brand Labeling Layer 1
- External Layers:
 - E5: EniBuilder
 - E4: Core Demo
 - E2: EtherCAT Suite
 - E1: EC-Engineer

2 Features of EC-Engineer V4.0

2.1 List of enhancements/bug fixes in version 4.0.4

- Enhancements
 - Integrated master version V3.2.2.04 [L4]
- Fixes:
 - Fixed bug: Missing "C1_Response_Timeout" in GSD file caused invalid InitCmd [L5]
 - Fixed bug: FoE upload crashed sometimes with very small files [L4]
 - Fixed bug: PDO Entry Dialog did sometimes not show CoE OD values for Rx [L2]

2.2 List of enhancements/bug fixes in version 4.0.3

- Enhancements
 - Added possibility to change cycle time SoE init commands [L5]
 - Added possibility to rename variables using an EBI file [L5]
 - Added flag to disable check if remote server is up [L4]
 - Removed play and pause button [L2]
 - Improved FoE bootstrap message [L2]
- Fixes:
 - Fixed bug: S2S-In-Cycle failed, if FMMU of source slave was disabled [L5]
 - Fixed bug: PDO size of task tab was not rounded correctly [L5]
 - Fixed bug: Link layer instance as bus/device/function was not supported [L4]
 - Fixed bug: History Timestamp was running backwards [L4]
 - Fixed bug: PDO assignment was sometimes enabled even when excluded [L2]
 - Fixed bug: The slot color was not resetted correctly if the slot was empty and cutting failed [L2]
 - Fixed bug: Redundancy link layer overwrote link layer [L2]

2.3 List of enhancements/bug fixes in version 4.0.2

- Enhancements
 - Enhanced GSD parser to get default slot module pairs [L5]
 - Added support for ESI schema 1.19 [L5]
 - Added possibility to activate Junction Red through EMI file for scanning [L4]
 - Added possibility to activate Cable Red through EMI file for scanning [L4]
 - Changed default theme [L2]
 - Automatically show export EXI Button if a project contains a Simulator [L2]
- Fixes:
 - Fixed bug: Sort order of floating HC groups was sometimes lost [L5]
 - Fixed bug: Empty mailbox was sometimes configured in ENI [L5]
 - Fixed bug: Process image PDOs were sometimes missing for EL6731 modules [L5]
 - Fixed bug: In some cases the export pldiag.h had wrong alignments [L4]
 - Fixed bug: Switching between config and diag mode caused memory leak [L4]

2.4 List of enhancements/bug fixes in version 4.0.1

- Enhancements
 - Improved append SubDevice "Apply" function, more than one SubDevice can be applied [L2]
 - Improved printing in Inspection Report [L2]
 - Added new welcome splash screen [E1]
- Fixes:
 - Fixed bug: Simulation Button was sometimes visible even without Simulator [L2]
 - Fixed bug: Red border was missing for remote simulator quickstart [L2]

2.5 List of enhancements/bug fixes in version 4.0.0

- Enhancements
 - Added Bootstrap polling to the advance settings [L5]

- Added support for check identification in EBI files [L5]
- Added external slave settings for the EBI generator [L5]
- Added support for multiple devices (IODD) on the EL6224 Gateway [L5]
- Added the possibility to enter a priority for tasks [L5]
- Add init cmds to clear sm pdos not always [L5]
- Added GSD file support to EL6731-0010 [L5]
- Added RX frames to general tab [L4]
- Added possibility to append more slaves without reopen the Append Slave Dialog [L2]
- Improved the self test scan [L2]
- Added a new settings dialog [L2]
- Changed what is displayed on expert mode and disabled its automatic activation [L2]
- Added Dyn. Arrays for the Edit PDO Dialog [L2]
- Added SII tab to EEPROM tab [L2]
- Improved Simulator usability [L2]
- Added new icon set [L2]
- Use inclusive language [L2]
- Added new modern themes [L2]
- Redesign of the welcome page [L2]
- Added DAQ diagnosis tab to EC-Engineer [E1]
- Changed to 64-Bit application [E1]
- Fixes:
 - Fixed bug: I/O size was invalid of some of modules in GSD from Festo [L5]
 - Fixed bug: GSD from Balluff was not supported [L5]
 - Fixed bug: Fixed UpgradeGateway function for Gateway EL6224 [L4]
 - Fixed bug: In some cases there was no disconnect from RAS when editing topology [L2]
 - Fixed bug: Short Info was sometimes not complete resetted [L2]

3 Features of EC-Engineer V3.9

3.1 List of enhancements/bug fixes in version 3.9.10

- Enhancements
 - Added support for ESI schema 1.20 [L5]
 - Integrated master version V3.2.2.04 [L4]
- Fixes:
 - Fixed bug: Missing "C1_Response_Timeout" in GSD file caused invalid InitCmd [L5]
 - Fixed bug: EbiExport generated "Edit Entries" when two variables had the exact PDO Index and SubIndex [L5]
 - Fixed bug: FoE upload crashed sometimes with very small files [L4]
 - Fixed bug: Export pdlayout was wrong for BITARRAY datatype [L4]
 - Fixed bug: Topology view was sometimes not displaying correctly when a SubDevice has three ports [L4]
 - Fixed bug: PDO Entry Dialog did sometimes not show CoE OD values for Rx [L2]
 - Fixed bug: General diagnosis view was not refreshed after hardware diagnostics were activated [L2]

3.2 List of enhancements/bug fixes in version 3.9.9

- Enhancements
 - Added GSD file support to EL6731-0010 [L5]
 - Enhanced GSD parser to get slot definitions [L5]
 - Enhanced GSD parser to get default slot module pairs [L5]
 - Added support for ESI schema 1.19 [L5]
 - Added possibility to rename variables using an EBI file [L5]
 - Added possibility to change cycle time SoE init commands [L5]
 - Added possibility to activate Junction Red through EMI file [L4]
 - Added flag to disable check if remote server is up [L4]
- Fixes:
 - Fixed bug: I/O size was invalid of some of modules in GSD from Festo [L5]

- Fixed bug: GSD from Balluff was not supported [L5]
- Fixed bug: Sort order of floating HC groups was sometimes lost [L5]
- Fixed bug: Empty mailbox was sometimes configured in ENI [L5]
- Fixed bug: PDO size of task tab was not rounded correctly [L5]
- Fixed bug: S2S-In-Cycle failed, if FMMU of source slave was disabled [L5]
- Fixed bug: Process image PDOs were sometimes missing for EL6731 modules [L5]
- Fixed bug: In some cases the export pdlayout.h had wrong alignments [L4]
- Fixed bug: History Timestamp was running backwards [L4]
- Fixed bug: Switching between config and diag mode caused memory leak [L4]
- Fixed bug: Link layer instance as bus/device/function was not supported [L4]
- Fixed bug: Short Info was sometimes not complete resetted [L2]
- Fixed bug: The slot color was not resetted correctly if the slot was empty and cutting failed [L2]

3.3 List of enhancements/bug fixes in version 3.9.8

- Enhancements
 - Improved error and warning handling for duplicate variables [L5]
 - Split to big frames even if command splitting is disabled [L5]
 - Improved S2S copy in cycle error message [L5]
 - Enhanced GSD parser to get PDOs of module [L5]
 - Improved overflow handling of station addresses [L4]
 - Integrated master version V3.2.2.03 [L4]
 - Added multiple language messages for EErrInvalidS2SInCylceFound and EErrInvalidTopology [L2]
 - Added ProcessDeviceIdentifierAsUnsignedInEni to command line arguments [E5]
- Fixes:
 - Fixed bug: Moving init cmds of MDP slaves caused duplicate init cmds [L5]
 - Fixed bug: ENI Tag "EoE/MaxMACs" was invalid with more than 100 EoE slaves [L5]
 - Fixed bug: GSD from Festo was not supported [L5]
 - Fixed bug: GetInstallDir caused exception, if "Assembly.Location" returned an empty string [L5]
 - Fixed bug: Transition of slave InitCmd was invalid for slaves without digital IO interface [L5]
 - Fixed bug: Round bracket at the end was missing in enums of GSD parser [L5]
 - Fixed bug: Bit value without range was not parsed correctly in GSD parser [L5]
 - Fixed bug: In some cases the download slot cfg init command was not removed when deactivated download [L4]
 - Fixed bug: Wrong Data Type used in PdoEntryEditDialog when it was not found in ESI [L2]
 - Fixed bug: Context menu of text boxes disappeared immediately [L2]
 - Fixed bug: In some cases occurred a CanDelete exception for InitCommands [L2]
 - Fixed bug: It was possible to enter zero as Station Address [L2]
 - Fixed bug: Check max slaves on Edit Topology Dialog [L2]
 - Fixed bug: Context Menu was not updated after detach and attach HC Group [L2]
 - Fixed bug: InitCommand Upload with complete access had sometimes the wrong SubIndex [L2]
 - Fixed bug: InitCommand value was changeable for upload without validate [L2]
 - Fixed bug: Sometimes disabled slots got the wrong color [L2]
 - Fixed bug: It was possible to enter to high device IDs for the Identification Value [L2]
 - Fixed bug: Fixed inconsistent behaviour on advanced options tab [L2]
 - Fixed bug: It was possible to change SubDevice with Sub-SubDevices [L2]

3.4 List of enhancements/bug fixes in version 3.9.7

- Enhancements
 - Improved copy slaves with MDP slaves [L4]
 - Reload DC OpModes after overwrite disabling to prevent showing third OpMode [L2]
 - Improved physics handling of ESI file if there was a blank space in it [L2]
- Fixes:

- Fixed bug: Append modules to EL6752-0010 caused sometimes invalid tree [L5]
- Fixed bug: Copied InitCmds caused exception on reset on OD tab [L4]
- Fixed bug: Messages without text ID were not displayed on history tab [L4]
- Fixed bug: If slaves had the same address, duplicated slaves were shown [L4]
- Fixed bug: Changing MSU ID of already used MSU caused "unselected" MSU [L2]
- Fixed bug: Context menu was not updated after removing a group [L2]
- Fixed bug: PDOs were not updated in GUI after Download PDO config was changed [L2]
- Fixed bug: It was possible to create a PDO with an already existing Index [L2]
- Fixed bug: Transitions of the original init command were changed when copying and editing them [L2]

3.5 List of enhancements/bug fixes in version 3.9.6

- Enhancements
 - Improved automatic address logic if address was higher than the max value and with MaxSlaveCount [L4]
 - Integrated master version V3.2.2.01 [L4]
- Fixes:
 - Fixed bug: SyncManager was not correctly enabled in ENI file [L5]
 - Fixed bug: Reload ESI data on DC slave caused exception [L5]
 - Fixed bug: Unique ID of MDP modules was updated after loading project [L4]

3.6 List of enhancements/bug fixes in version 3.9.5

- Enhancements
 - Added support for ESI tag "Device/Info/VendorSpecific" [L5]
 - It was not possible to select a slave address if max slave count was smaller than the address [L4]
 - Improved selection after enabling a slave [L2]
- Fixes:
 - Fixed bug: InitCmd of EL6652-0010 with more data as described in OD was not supported [L5]
 - Fixed bug: SyncManager list was not updated on PDO Edit dialog if PDO direction changed [L2]
 - Fixed bug: Slave with many CoE init cmds might cause "OutOfMemoryException" [L2]
 - Fixed bug: Tab control does not trigger lost focus event on changing tab in .NET core [L2]

3.7 List of enhancements/bug fixes in version 3.9.4

- Enhancements
 - Improved timing of RAS [L4]
 - Integrated master version V3.2.1.05 [L4]
 - Improved input of double and real values [L2]
- Fixes:
 - Fixed bug: Changed delete order for slaves in ENI Variants file [L2]

3.8 List of enhancements/bug fixes in version 3.9.3

- Enhancements
 - Added support for ENI schema 1.6 [L5]
 - Added support for ENI attribute "Slave/Mailbox/EoE/Disabled" [L5]
 - Added support for EL6752 and EL6752-0010 [L5]
 - Added alias variables to process variables export (CSV, PLC, XML) [L4]
 - Disabled context menu in topo view for multiselection because it is not supported [L2]
 - Improved selected vendor on append dialog if vendor count changed [L2]
 - Added mask to numeric up down to prevent to high numbers [L2]
- Fixes:

- Fixed bug: Alias name was not updated, if "EditCompleteVariableName" was enabled [L5]
- Fixed bug: Timestamp of history tab was sometimes wrong displayed in offline diagnosis mode [L4]
- Fixed bug: It was possible to add variables to fixed PDOs [L2]
- Fixed bug: Manual ref clock was resetted if no other ref clock was selected [L2]
- Fixed bug: PDO was collapsed in view when assignement was changed [L2]
- Fixed bug: Edit PDO was not applying the actual index [L2]
- Fixed bug: In some cases the Append Slave Dialog shows an error [L2]
- Fixed bug: If init command value was null it was not editable in value box [L2]
- Fixed bug: Refresh with active filter settings flag did not work [L2]
- Fixed bug: New InitCommand comment was not generated if init command value was empty [L2]
- Fixed bug: Fixed binding warning for Identification Value [E2]
- Fixed bug: EC-Title not found in EtherCAT Suite [E2]

3.9 List of enhancements/bug fixes in version 3.9.2

- Enhancements
 - Upgraded Infragistic controls to v23.2.20232.94 [L2]
- Fixes:
 - Fixed bug: There was a problem with the generated init commands with ESI flag "DownloadModuleIdentList" [L5]

3.10 List of enhancements/bug fixes in version 3.9.1

- Enhancements
 - Improved Sync Manager view, virtual SMs were missing [L5]
 - Improved EDS parser to support SubIndex with hex values and PDO flags [L5]
 - Integrated master version V3.2.1.03 [L4]
 - Added limits to the slave DC tab for Shift Time and User defined Cycle Time [L2]
 - Simplified and improved PDO Mapping Tab [L2]
 - Added "Include" function to ENI variants [L2]
- Fixes:
 - Fixed bug: Converting project sometimes failed due to "System.MissingMethodException" [L5]
 - Fixed bug: Error message was sometimes missing, if not complete PDO was added to S2S-In-Cycle [L5]
 - Fixed bug: IdentificationAdo was missing in the EBI schema file [L5]
 - Fixed bug: Disabled slave and manual ref clocked were causing problems [L4]
 - Fixed bug: In some circumstances it was possible to get a higher station address than the max value [L4]
 - Fixed bug: Sync units tab does not show correct MSU assignment for S2S-In-Cycle [L2]
 - Fixed bug: Apply button on S2S tab was not disabled if a slave was selected [L2]
 - Fixed bug: Opacity was not correctly set after pressing apply button on S2S tab [L2]
 - Fixed bug: Disabled slaves were displayed on S2S tab [L2]
 - Fixed bug: Change Mailbox size checkbox was not set back on advanced options tab [L2]
 - Fixed bug: No datatype was selected on PDO Entry dialog when switched to base datatypes [L2]
 - Fixed bug: Group tab was only shown after reselect when creating a group [L2]
 - Fixed bug: It was possible to change the complete PdoEntry for fixed PDOs [L2]
 - Fixed bug: It was sometimes possible to generate an ENI file without slaves [L2]
 - Fixed bug: It was possible to name a MSU "Default" which caused problems [L2]

3.11 List of enhancements/bug fixes in version 3.9.0

- Enhancements
 - Added support for ESI schema 1.18 [L5]

- Updated ESI schema to support new attribute "Dc.PdoOversampling" [L5]
- Added max page width to topology settings [L4]
- Added TAP adapters to the network adapter list [L4]
- Fixes:
 - Fixed bug: Sometimes node in project explorer was not selected before opening context menu [L2]

4 Features of EC-Engineer V3.8

4.1 List of enhancements/bug fixes in version 3.8.6

- Enhancements
 - Added support for ESI attribute "SafetyParaMapping/SRA_Parameter" [L5]
 - Improved x-Axis scale on variables chart [L2]
 - Fixed Code Meter 8.0 problem while installing [E1]
- Fixes:
 - Fixed bug: Variables export worked only with CSV format [L2]

4.2 List of enhancements/bug fixes in version 3.8.5

- Enhancements
 - Added possibility to export process data image in diag mode to CSV with values [L4]
 - Integrated master version V3.2.1.02 [L4]
 - Improved GUI update after CoE write [L2]
 - Upgraded Infragistic controls to V22.2.20222.97 [L2]
- Fixes:
 - Fixed bug: Invalid variable size were sometimes imported from Beckhoff Slave Description [L5]
 - Fixed bug: Variables were created with invalid index and subindex for EL6695 [L5]
 - Fixed bug: DC was not correctly setup for EL6688 [L5]
 - Fixed bug: Upload PDOs from EL6695 caused sometimes variables with invalid size [L4]
 - Fixed bug: Simple Datatype was not supported in Simulator OD [L4]
 - Fixed bug: External Sync did not work correctly [L2]
 - Fixed bug: Unexpected change of ecc file [L2]

4.3 List of enhancements/bug fixes in version 3.8.4

- Enhancements
 - Added support for optimized link layer "IntelGbe" [L4]
- Fixes:
 - Fixed bug: SoE init commands were always generated for all channels [L5]
 - Fixed bug: Configured and not present slaves were sometimes missing [L4]

4.4 List of enhancements/bug fixes in version 3.8.3

- Enhancements
 - Added cmdline parameter "/IGNOREMISSINGOBJECTS" to ignore missing objects in EniBuilder [L5]
 - Removed Slave Address from Edit Topology dialog diff to improve merging [L2]
- Fixes:
 - Fixed bug: It was not possible to add a slave behind the master in Edit Topology dialog [L2]
 - Fixed bug: Empty History Tab caused exception [L2]

4.5 List of enhancements/bug fixes in version 3.8.2

- Enhancements
 - Added possibility to select DCM Mode for local master [L4]
 - Integrated master version V3.2.1.01 [L4]
 - Improved date format on History Tab for AM / PM [L2]

- Rename default slave name automatically on changing slave address [L2]
- Added EXI export to CommandLine interface [L2]
- Fixes:
 - Fixed bug: Some datatypes were sometimes missing in EXI OD [L4]

4.6 List of enhancements/bug fixes in version 3.8.1

- Enhancements
 - Generate default master sync unit with name of task [L5]
 - Added support for IN/OUT modules for EL6631-0010 [L5]
 - Added support to create ESI from online description [L5]
 - Fixed split reserved bits in pdlayout [L4]
 - Added more settings when switching to diagnosis mode with local system [L4]
 - Read Diagnosis History Settings even if there are no messages [L4]
 - Improved sorting of History Tab [L4]
 - Improved timestamp of History Tab [L2]
 - Renamed PortA..D to Port0..3 [L2]
 - Added refactor menu to device to reset slave addresses and names [L2]
 - Display unsigned values on variables tab also in hexadecimal [L2]

4.7 List of enhancements/bug fixes in version 3.8.0

- Enhancements
 - Auto generate acceptance filter for CAN Interface mode in EL6751 [L5]
 - Read master version from "GetMasterInfo()" instead of using master OD [L4]
 - Added possibility to remove Hot Connect function through EMI [L4]
 - Changed default value for EditCompleteVariableName in EMI to true [L4]
 - Added possibility to export process data image to clipboard [L4]
 - Integrated master version V3.2.0.03 [L4]
 - Added possibility to export eeprom file in config mode [L2]
 - Added function for multi axis synchronization [L2]
 - Added possibility to hide clock adjustments from Master DC Tab [L2]
 - Upgraded Infragistic controls to V22.2.20222.30 [L2]
 - Added copy function to variables tab for name [L2]
 - Improved performance of rendering topology [L2]
 - Improved scroll position when tab is changed [L2]
 - Added multi selection support for FoE download [L2]
- Fixes
 - Fixed bug: Hashtag in install directory caused exception [L5]
 - Fixed bug: It was not possible to get all values through RAS without ESI files [L4]
 - Fixed bug: Selected slave were lost after changing topology [L2]

5 Features of EC-Engineer V3.7

5.1 List of enhancements/bug fixes in version 3.7.13

- Fixes
 - Fixed bug: ENI Tag "EoE/MaxMACs" was invalid with more than 100 EoE slaves [L5]
 - Fixed bug: There was a problem with the generated init commands with ESI flag "DownloadModuleIdentList" [L2]

5.2 List of enhancements/bug fixes in version 3.7.12

- Enhancements
 - Integrated master version V3.1.4.10 [L4]
- Fixes
 - Fixed bug: It was not possible to get all values through RAS without ESI files [L4]

5.3 List of enhancements/bug fixes in version 3.7.11

- Enhancements

- Improved .NET core support to EtherCATSuiteForMfc [L2]
- Fixes
 - Fixed bug: FIPS enabled detection sometimes failed [L5]
 - Fixed bug: CoE OD Tab was missing in diagnosis mode if ESI was missing for one slave [L4]

5.4 List of enhancements/bug fixes in version 3.7.10

- Enhancements
 - Auto generate acceptance filter for CAN Interface mode in EL6751 [L5]
 - Integrated master version V3.1.4.09 [L4]

5.5 List of enhancements/bug fixes in version 3.7.9

- Fixes
 - Fixed bug: IO-Link process data had sometimes wrong offsets and sorting [L5]

5.6 List of enhancements/bug fixes in version 3.7.8

- Fixes
 - Fixed bug: Reserved bytes were not added aligned to last bit offset [L4]

5.7 List of enhancements/bug fixes in version 3.7.7

- Enhancements
 - Added support for ESI schema 1.17 [L5]
 - Added EMI feature to disable PDO upload during scan [L5]
 - Report ESI device as duplicate only if they have the same file version [L5]
 - Added support to import complete ENI for Simulator HiL [L4]
 - Renamed tab "Variables" of master node into "Trace Data" [L2]
- Fixes
 - Fixed bug: SubDevices were sometimes not connected to the correct port [L5]
 - Fixed bug: Product code detection caused invalid format exception for "EL9550-0012" [L5]
 - Fixed bug: Sometimes it was not possible to enter OP mode directly after PDO upload [L4]
 - Fixed bug: Writing SubIndex 0 of simulator CoE OD tab failed [L2]

5.8 List of enhancements/bug fixes in version 3.7.6

- Enhancements
 - Added support for overwrite DC modes in EBI files [L5]
 - Integrated master version V3.1.4.06 [L4]
 - Added EMI Feature to activate disable LRW per default for cable red [L4]
 - Added possibility to use FoE for more slaves of the same type at once [L2]
- Fixes
 - Fixed bug: Change slave caused invalid mailbox mode [L5]
 - Fixed bug: Invalid ENI could be generated during scan with missing ESI files [L4]
 - Fixed bug: Edit offline CoE OD entries sometimes failed [L4]
 - Fixed bug: Notifications were sometimes missing via RAS [L4]
 - Fixed bug: Edit Topology scan reconfigured running RAS Master [L2]
 - Fixed bug: It was possible to create empty slave-, module-, pdo- and variable name [L2]

5.9 List of enhancements/bug fixes in version 3.7.5

- Enhancements
 - Added SCI support for ENI-Builder [L5]
 - Added support to import start up checking with ENI import [L5]
 - Ignore invisible slaves on max slaves check [L4]
 - Integrated master version V3.1.4.02 [L4]

- Improved Network Mismatch Analyzer dialog [L2]
- Added support to delete Cia402 Init Commands [L2]
- Fixes
 - Fixed bug: PDO assignment of MDP slaves was sometimes wrong after ENI import [L5]
 - Fixed bug: Slave name from project template was not adjusted [L4]

5.10 List of enhancements/bug fixes in version 3.7.4

- Enhancements
 - Added possibility to select all slaves as a DC reference clock [L5]
 - Added Reset button to Bus Load tab [L4]
 - Integrated master version V3.1.4.03 [L4]
 - Improved Diag History Messages Tab Performance and traffic [L4]
 - Added smart view to Master ObjectDictionary [L2]
 - Increased update interval of DC diagnosis tab [L2]
 - Added Capture File play function to Simulator HiL EMI [E1]
- Fixes
 - Fixed bug: PDOs were sometimes not correctly generated in IO-Link gateways with MDP support [L5]
 - Fixed bug: ESC register values were read with 16 additional bytes [L4]
 - Fixed bug: Modules were not always named correct when Append Module was used [L2]
 - Fixed bug: Release all button was not visible [L2]
 - Fixed bug: After slave state changed, the write button of CoE OD tab was still disabled [L2]

5.11 List of enhancements/bug fixes in version 3.7.3

- Enhancements
 - Added SafetyMapping flags to ESI parser [L5]
 - Removed duplicate cycle time setting from EL6751 and use it directly from master [L5]
 - Added product code as search criteria to append slave dialog [L5]
 - Validate EEPROM data length during ESI parsing [L5]
 - Improved user input validation for gateway slaves [L5]
 - Added Inspection Report with the possibility to print a PDF [L4]
 - Integrated master version V3.1.4.02 [L4]
- Fixes
 - Fixed bug: Port InitCmds were missing in IO-Link gateways with MDP support [L5]
 - Fixed bug: Process image displayed only variables of slaves and not the real process image [L4]
 - Fixed bug: Switching into diag mode crashed sometimes if no network adapter was found [L4]
 - Fixed bug: Mixed Mode fix if only one slave is simulated [L4]
 - Fixed bug: String values greater than 128 bytes were not displayed in CoE OD [L4]
 - Fixed bug: Watchlist chart colors after Infragistics update were wrong [L2]
 - Fixed bug: DC tab showed wrong factor, if cycle time was set to 1024 Hz [L2]

5.12 List of enhancements/bug fixes in version 3.7.2

- Enhancements
 - Added multi language support to ESI parser [L5]
 - Added backup and settings flag to CoE dictionary flags [L5]
 - Added more Notifications to Capture File [L4]
 - Improved motion support to start EcMasterDemoMotion with EC-Engineer [L4]
 - Write IgnoreDownloadError Tag in EXI when slave has CoE [L4]
 - Added SubIndex to Motion Config [L4]
 - Improved diagram and performance of process data with RAS [L4]
 - Integrated master version V3.1.4.01 [L4]
 - Improved "Change Slave" function [L4]

- Improved performance tab and diagram [L2]
- Upgraded Infragistic controls to V21.2.20212.39 [L2]
- Fixes
 - Fixed bug: EL6751 Acceptance End in filter was read only [L5]
 - Fixed bug: First sync manager was sometimes not found [L5]
 - Fixed bug: CoE OD entries were missing, if they were removed from internal cache [L5]
 - Fixed bug: UseLrdLwr information was missing with SCI [L5]
 - Fixed bug: Slave addresses of simulator and master must be the same [L4]
 - Fixed bug: Changing parent slave caused sometimes endless loop [L4]
 - Fixed bug: Load OD on simulator tab crashed sometimes [L2]

5.13 List of enhancements/bug fixes in version 3.7.1

- Enhancements
 - Disabled mailbox if list is empty in ESI file [L5]
 - Improved ESI handling [L5]
 - Added message box when Master evaluation limit reached [L4]
 - Added Self Test Scan function [L4]
 - Added performance measurement tab and functions [L4]
 - Added memory usage and master version to General Tab [L4]
 - Integrated master version V3.1.3.02 [L4]
- Fixes
 - Fixed bug: DC was not enabled for slaves with enabled DC cyclic unit [L5]
 - Fixed bug: Topology view was not correctly created if slaves were wrapped into next line [L4]
 - Fixed bug: MSU column on variables tab was visible in diagnosis mode [L2]

5.14 List of enhancements/bug fixes in version 3.7.0

- Enhancements
 - Added reserved bytes at the beginning when necessary in pdlayout header [L4]
 - Added possibility to remove simulator functions through EMI and OEM file [L4]
 - Added Self Test Scan function [L4]
 - Removed automatic rescue scan function box [L2]
 - Added EcSampleNoThirdPartyPlugin without Infragistics [L2]
 - Display subindex of CoeOD entry also in hexadecimal [L2]
 - Enhanced plugin interface [L2]
- Fixes
 - Fixed bug: Generated InitCmds "download pdo index" of EL6751 were not added the end in EniBuilder [L5]
 - Fixed bug: Module scan of EL6751 doesn't create all PDOs [L4]
 - Fixed bug: Empty module caused exception during module scan of EL6751 [L4]
 - Fixed bug: Slaves disappeared sometimes when power off with Simulator [L4]
 - Fixed bug: Master log level was not correctly converted [L4]
 - Fixed bug: Export variables in diag mode was sometimes wrong [L2]

6 Features of EC-Engineer V3.6

6.1 List of enhancements/bug fixes in version 3.6.14

- Enhancements
 - Added support for EL6752 and EL6752-0010 [L5]
 - Added support for ENI schema 1.6 [L5]
- Fixes
 - Fixed bug: There was a problem with the generated init commands with ESI flag "DownloadModuleIdentList" [L5]
 - Fixed bug: InitCmd of EL6652-0010 with more data as described in OD was not supported [L5]

6.2 List of enhancements/bug fixes in version 3.6.13

- Enhancements
 - Added support for ESI attribute "SafetyParaMapping/SRA_Parameter" [L5]
 - Added support for ESI schema 1.18 [L5]
 - Updated ESI schema to support new attribute "Dc.PdoOversampling" [L5]
 - Integrated master version V3.1.4.15 [L4]
- Fixes
 - Fixed Code Meter 8.0 problem while installing [E1]

6.3 List of enhancements/bug fixes in version 3.6.12

- Fixes
 - Fixed bug: Variables were created with invalid index and subindex for EL6695 [L5]
 - Fixed bug: DC was not correctly setup for EL6688 [L5]

6.4 List of enhancements/bug fixes in version 3.6.11

- Enhancements
 - Integrated master version V3.1.4.10 [L4]
- Fixes
 - Fixed bug: Hashtag in install directory caused exception [L5]
 - Fixed bug: FIPS enabled detection sometimes failed [L5]
 - Fixed bug: Some invisible slaves like "EL9550-0012" were not supported [L5]
 - Fixed bug: SoE init commands were always generated all channels [L5]
 - Fixed bug: It was not possible to get all values through RAS without ESI files [L4]

6.5 List of enhancements/bug fixes in version 3.6.10

- Fixes
 - Fixed bug: SubDevices were sometimes not connected to the correct port [L5]
 - Fixed bug: Product code detection caused invalid format exception for "EL9550-0012" [L5]

6.6 List of enhancements/bug fixes in version 3.6.9

- Enhancements
 - Added EMI feature to disable PDO upload during scan [L5]
 - Added support for ESI schema 1.17 [L5]
- Fixes
 - Fixed bug: Change slave caused invalid mailbox mode [L5]
 - Fixed bug: Edit offline CoE OD entries sometimes failed [L4]
 - Fixed bug: Notifications were sometimes missing via RAS [L4]
 - Fixed bug: It was possible to create empty slave-, module-, pdo- and variable name [L2]

6.7 List of enhancements/bug fixes in version 3.6.8

- Enhancements
 - Added support to import start up checking with ENI import [L5]
 - Changed order of init commands and clear all output SyncManagers together [L5]
 - Integrated master version V3.1.4.05 [L4]
 - Ignore invisible slaves on max slaves check [L4]
- Fixes
 - Fixed bug: PDO assignment of MDP slaves was sometimes wrong after ENI import [L5]
 - Fixed bug: Port InitCmds were missing in IO-Link gateways with MDP support [L5]
 - Fixed bug: PDOs were sometimes not correctly generated in IO-Link gateways with MDP support [L5]
 - Fixed bug: Invalid ENI could be generated during scan with missing ESI files [L4]
 - Fixed bug: String values greater than 128 bytes were not displayed in CoE OD [L4]

- Fixed bug: ESC register values were read with 16 additional bytes [L4]
- Fixed bug: Modules were not always named correct when Append Module was used [L2]
- Fixed bug: Release all button was not visible [L2]
- Fixed bug: DC tab showed wrong factor, if cycle time was set to 1024 Hz [L2]
- Fixed bug: Edit Topology scan reconfigured running RAS Master [L2]

6.8 List of enhancements/bug fixes in version 3.6.7

- Enhancements
 - Added multi language support to ESI parser [L5]
 - Added SafetyMapping flags to ESI parser [L5]
 - Improved "Change Slave" function [L4]
- Fixes
 - Fixed bug: UseLrdLwr information was missing with SCI [L5]
 - Fixed bug: EL6751 Acceptance End in filter was read only [L5]
 - Fixed bug: First sync manager was sometimes not found [L5]
 - Fixed bug: CoE OD entries were missing, if they were removed from internal cache [L5]
 - Fixed bug: Changing parent slave caused sometimes endless loop [L4]

6.9 List of enhancements/bug fixes in version 3.6.6

- Enhancements
 - Improved ESI handling [L5]
 - Added message box when Master / Monitor evaluation limit reached [L4]
 - Integrated master version V3.1.3.02 [L4]
- Fixes
 - Fixed bug: DC was not enabled for slaves with enabled DC cyclic unit [L5]
 - Fixed bug: Topology view was not correctly created if slaves were wrapped into next line [L4]

6.10 List of enhancements/bug fixes in version 3.6.5

- Enhancements
 - Disabled mailbox if list is empty in ESI file [L5]
 - Added reserved bytes at the beginning when necessary in pdlayout header [L4]
- Fixes
 - Fixed bug: Generated InitCmds "download pdo index" of EL6751 were not added the end in EniBuilder [L5]
 - Fixed bug: Module scan of EL6751 doesn't create all PDOs [L4]
 - Fixed bug: Slaves disappeared sometimes when power off with Simulator [L4]
 - Added possibility to remove simulator functions through EMI and OEM file [L4]
 - Fixed bug: Master log level was not correctly converted [L4]
 - Fixed bug: Export variables in diag mode was sometimes wrong [L2]

6.11 List of enhancements/bug fixes in version 3.6.4

- Enhancements
 - Integrated master version V3.1.3.01 [L4]
- Fixes
 - Fixed bug: PDOs from ESI were not correctly used from gateways [L5]
 - Fixed bug: Removed generated InitCmds "download pdo entries" from EL6751 [L5]
 - Fixed bug: Transition of slave InitCmd was invalid for slaves with device emulation [L5]
 - Fixed bug: Re-selecting empty watch list caused exception [L2]

6.12 List of enhancements/bug fixes in version 3.6.3

- Enhancements
 - Integrated master version V3.1.2.11 [L4]

- Allow ENI Export for Simulator EMI and added S2S Tab [L2]
- Fixes
 - Fixed bug: Sometimes process image size was too small with S2S copy in cycle [L5]
 - Fixed bug: Export CoE and Simulator OD was wrong if Subinxex 0 was ENUM [L5]
 - Fixed bug: Fixed missing reserved entries in PD Layout export header file [L4]
 - Fixed bug: Array data types were not displayed correctly on variables tab [L4]

6.13 List of enhancements/bug fixes in version 3.6.2

- Enhancements
 - Improved Simulator handling [L4]
- Fixes
 - Fixed bug: Rename gateway variables of EL6631-0010 and EL6731-0010 failed in EniBuilder [L5]
 - Fixed bug: Sometimes first frame was too big [L5]
 - Fixed bug: HC group was sometimes not correctly copied after Copy&Paste of slaves [L4]
 - Fixed bug: GUI Updated to slow on some tabs [L2]

6.14 List of enhancements/bug fixes in version 3.6.1

- Enhancements
 - Improved support for EL6731 [L5]
 - Improved handling and naming of SCI files [L5]
 - Added support for setting "Station Name" and "IP Configuration" to EL6631-0010 [L5]
 - Added support for scan K-Bus modules to BK1120 [L4]
 - Integrated master version V3.1.2.09 [L4]
 - Automatically connect HC groups when starting Simulator [L4]
 - Removed unsupported functions from EC-Simulator in GUI [L4]
 - Added Physical Address and AutoInc Address to Short Info [L2]
 - Added possibility to show two graphs in variable view at once with different colors [L2]
- Fixes
 - Fixed bug: DC was not always enabled for slaves with DC Latch [L5]
 - Fixed bug: S2S copy in cycle worked only for slaves with inputs or outputs [L5]

6.15 List of enhancements/bug fixes in version 3.6.0

- Enhancements
 - Added support for ESI schema 1.16 [L5]
 - Added import and export of preconfigured slaves (SCI) [L5]
 - Remove invalid characters from bin file name automatically [L5]
 - Enhanced support for gateway slaves [L5]
 - Improved process data image calculation [L5]
 - Improved topology view in diag mode and mark port A in red, if it is not connected [L4]
 - Automatic disable LRW, if master redundancy is active [L4]
 - Optimized readig process data synchronization [L4]
 - Integrated master version V3.1.2.06 [L4]
 - Added support to show difference if error counter is zero or unread [L4]
 - Added possibility to use base data types instead of OD for PdoEntry [L2]
 - Added zoombar to chart [L2]
 - Upgraded Infragistic controls to V20.2.20202.53 [L2]
 - Added mailbox protocols to Class-B EMI [E1]
 - Added online update check [E1]
- Fixes
 - Fixed bug: MinValue and MaxValue check in CoE OD was wrong for some datatypes [L5]
 - Fixed bug: Sometimes it was not possible to write string values in CoeOD [L5]
 - Fixed bug: Sometimes a slave was disconnected shown in topo view with EC-Simulator [L4]

7 Features of EC-Engineer V3.5

7.1 List of enhancements/bug fixes in version 3.5.3

- Enhancements
 - Added possibility to execute rescue scan through network menu [L4]
 - Integrated master version V3.1.2.04 [L4]
 - Added 16ms cycle time to default EMI [E1]
- Fixes
 - Fixed bug: ESI tag "Device/Eeprom/ConfigData" smaller than 2 bytes caused exception [L5]
 - Fixed bug: Some projects with EL6751 did no load correctly in some versions [L5]
 - Fixed bug: RAS Server port was sometimes not opened from LinkLayer [L4]
 - Fixed bug: Sub tree might changed after Copy&Paste of slaves with junction [L2]

7.2 List of enhancements/bug fixes in version 3.5.2

- Enhancements
 - Added support to configure cycle time by frequency [L5]
 - Generate valid EtherCAT data types for EL6631-0010 and EL6731-0010 [L5]
 - Added support for different DAP module versions to EL6631-0010 [L5]
 - Added possibility to set triggers and pause in diagnosis mode [L4]
 - Improved updating process data for local EC-Master and EC-Monitor [L4]
 - Integrated Master Version 3.1.2.02 [L4]
 - Added filter to ESI manager [L2]
 - Upgraded Infragistic controls to V20.2.20202.38 [L2]
 - Keep selected device on switching modes [L2]
 - Added multi selection support to force/release/update variables [L2]
 - Added more values to chart and possibility to resize and zoom and tooltip [L2]
 - Added possibility to change amount of chart entries in User.xml [L2]
- Fixes
 - Fixed bug: PDO entry was missing for EL6631-0010 after re-import EBI file [L5]
 - Fixed bug: Ethernet size of cyclic tasks was not correctly displayed [L5]
 - Fixed bug: SiL function with Simulator does not work correctly [L4]

7.3 List of enhancements/bug fixes in version 3.5.1

- Enhancements
 - Improved script handling [L4]
 - Added cycle time to script automation mode [L4]
- Fixes
 - Fixed bug: EL6751 SDO Subindex Type was displayed wrong [L2]

7.4 List of enhancements/bug fixes in version 3.5.0

- Enhancements
 - Added calculation of EEPROM checksum to Simulator [L4]
 - Integrated Master Version 3.1.1.06 [L4]
 - Improved EL6731 GSG File handling [L2]
 - Force checkbox was resized wrong [L2]
- Fixes
 - Fixed bug: Connecting PDOs with S2S copy in cycle failed, if PDO uses not the default sync unit [L5]

8 Features of EC-Engineer V3.4

8.1 List of enhancements/bug fixes in version 3.4.1

- Enhancements
 - Support latest OpenVPN TAP Adapter [L4]
 - Integrated Master Version 3.1.1.05 [L4]

- Fixes
 - Fixed bug: Two invisible slaves in series were not supported [L5]

8.2 List of enhancements/bug fixes in version 3.4.0

- Enhancements
 - Added support to change PDO Configuration Flag from ESI [L5]
 - Added support for 29Bit mode of EL6751 as CAN Interface [L5]
 - Add copy info tag also for S2S copy in cycle to improve diag mode [L5]
 - Added trace variables to S2S copy in cycle [L5]
 - Integrated Master Version 3.1.1.02 [L4]
 - Improved LxWin Script handling [L4]
 - Support more CoE values for Simulator [L4]
 - Added possibility to connect to EC-Monitor [L4]
 - Added Simulator diagnosis features [L2]
 - Installer: Removed merge modules from WIBU [E1]
- Fixes
 - Fixed bug: Offset of cyclic command was sometimes invalid with S2S copy in cycle [L5]
 - Fixed bug: Take ESI defaults, if object 0xF050 does not exist during MDP scan [L4]
 - Fixed bug: Init commands were not correctly copied on copy slave multiple times [L4]

9 Features of EC-Engineer V3.3

9.1 List of enhancements/bug fixes in version 3.3.2

- Enhancements
 - Added attribute "DataType" to tag "AliasVariables/Add" in EBI format [L5]
 - Datatype of alias variables was empty [L5]
 - Integrated Master Version 3.1.0.19 [L4]
 - Added amount of EtherCAT frames to Task and SyncUnit Tab [L2]
 - Improved "Export EXI" usability [L2]
 - Added support to paste slaves more than once [L2]
 - Show actual revision on change slave dialog [L2]
 - Installer: Updated merge modules of WIBU [E1]
- Fixes
 - Fixed bug: Variables with same offset were not added to watchlist (e.g. alias variables) [L2]
 - Fixed bug: Remote capture cause exception when no update rate was set [L4]

9.2 List of enhancements/bug fixes in version 3.3.1

- Enhancements
 - Added support for S2S copy in cycle [L5]
 - Added support to handle device identifier as unsigned in ENI [L5]
 - Added data acquisition support [L4]
 - Added support to import EBI files [L4]
 - Added Simulator Eval to EC-Engineer installation [L4]
 - Integrated Master Version 3.1.0.18 [L4]
 - Improved error handling [L2]
 - Improved performance of group dialog [L2]
 - Added support to use /REMOTE for more than one master unit [L2]
- Fixes
 - Fixed bug: Import Beckhoff Slave Description did not work with UTF-16 [L5]
 - Fixed bug: The config was sometimes corrupt with invisible slaves [L4]
 - Fixed bug: Some settings were lost after change master unit [L4]
 - Fixed bug: RED connection to junction caused exception in topology view [L4]

9.3 List of enhancements/bug fixes in version 3.3.0

- Enhancements

- Added support for S2S copy in cycle [L5]
- Added support to handle device identifier as unsigned in ENI [L5]
- Added data acquisition support [L4]
- Added support to import EBI files [L4]
- Added Simulator Eval to EC-Engineer installation [L4]
- Improved error handling [L2]
- Improved performance of group dialog [L2]
- Added support to use /REMOTE for more than one master unit [L2]
- Fixes
 - Fixed bug: Import Beckhoff Slave Description did not work with UTF-16 [L5]
 - Fixed bug: The config was sometimes corrupt with invisible slaves [L4]
 - Fixed bug: Some settings were lost after change master unit [L4]
 - Fixed bug: RED connection to junction caused exception in topology view [L4]

10 Features of EC-Engineer V3.2

10.1 List of enhancements/bug fixes in version 3.2.4

- Enhancements
 - Added support for Alias Variables in EniBuilder [L5]
 - Integrated Master Version 3.1.0.16 [L4]
 - Improved EC-Simulator functions and EXI format [L4]
 - Improved Script handling and added LxWin EMI [L4]
- Fixes
 - Fixed bug: Unknown FMMU/SM type caused FMMU is out of bounds error [L5]
 - Fixed bug: Double values caused problems in UserConfig [E1]

10.2 List of enhancements/bug fixes in version 3.2.3

- Enhancements
 - Enhanced ESI2C support (removed compiler warnings) [L5]
 - Added new EXI Schema for Simulator [L4]
 - Changed save routine in /FORCECFG mode [L2]
 - Improved script handling [L2]
 - Improved internet time check [E1]
- Fixes
 - Fixed bug: PDO Entry SwapType was not automatically applied [L5]

10.3 List of enhancements/bug fixes in version 3.2.2

- Enhancements
 - Improved bin filename [L5]
 - Enable Load PDO Info button no matter what is in the ESI [L2]
 - Fixed eval check failed [E1]
- Fixes
 - Fixed bug: Array data type had invalid member count after PDO upload [L5]
 - Fixed bug: Alignment PDO entry of gateway slaves caused error [L5]
 - Fixed bug: Device was sometimes changed after reload ESI data [L5]
 - Fixed bug: Timeout on reading EEPROM caused saving snapshot failed [L4]

10.4 List of enhancements/bug fixes in version 3.2.1

- Enhancements
 - Added support to call scripts [L4]
 - Integrated master version 3.1.0.14 [L4]
 - Added LxWin EMI to simplify start with LxWin [L2]
 - Added possibility to restore connection after connection was lost [L2]
- Fixes
 - Fixed bug: Creating offline CoE OD entry failed with bigger ENUM values [L5]

- Fixed bug: Variables with more than 30 bytes were imported from ENI with wrong size [L5]
- Fixed bug: Reload ESI data was sometimes wrong when ESI was missing before [L4]
- Fixed bug: Changing operation mode on DC tab caused exception [L2]

10.5 List of enhancements/bug fixes in version 3.2.0

- Enhancements
 - Added support for EP(P)6228 IO-Link Gateway [L5]
 - Enhanced S2S copy link support for slaves with multiple sync units [L5]
 - Added support for Motion [L5]
 - Improved performance of ESI serializer [L5]
 - Added support for ENI tag "CoE/Profile/ChannellInfo" [L5]
 - Added support for ENI Deployment [L4]
 - Improved Identification process [L4]
 - Improved support for EC-Simulator [L4]
 - Integrated master version 3.1.0.13 [L4]
 - Added Ndis Driver to setup [L4]
 - Added dependent CoE OD to MDP Modules [L2]
 - Improved merge handling of Edit Topology Dialog [L2]
 - Upgraded Infragistic controls to V19.2.20192.186 [L2]
- Fixes
 - Fixed bug: Virtual PDOs were missing in DC oversampling devices [L5]
 - Fixed bug: Array variables of unsupported data types caused problems [L5]
 - Fixed bug: Append and delete did not work correctly in Topo View on Master Node [L2]

11 Features of EC-Engineer V3.1

11.1 List of enhancements/bug fixes in version 3.1.2

- Enhancements
 - Added EMI flag to allow E-Bus slaves as Hot Connect Group head [L5]
 - Added support for multiple CoE InitCmds with same index/subindex [L5]
 - Added support for SDO Access for single objects [L5]
 - Added support for newest TAP-Adapter [L4]
 - Added multi selection support for deleting init commands [L2]
 - Added support to add and edit comments with EniBuilder [E5]
 - Added the possibility to select the optimized LinkLayer through the CommandLine Interface with FORCECFG [E1]
- Fixes
 - Fixed bug: Watch list was cleared after topology was changed [L4]

11.2 List of enhancements/bug fixes in version 3.1.1

- Enhancements
 - EL6731 PDO align improvement [L5]
 - Added attributes "Type" and "Signed" to ENI tag "InitCmd/Validate" [L5]
- Fixes
 - Fixed bug: Loading project with 1000 slaves took more than 6 minutes [L4]
 - Fixed bug: Project settings were not correctly converted to V3.1 [L4]

11.3 List of enhancements/bug fixes in version 3.1.0

- Enhancements
 - Improved Performance from ESIs with bin files [L5]
 - Added support for EP6224-x022 [L5]
 - Added EMI features: AoE, EoE, VoE [L5]
 - Improved K-Bus support for EL6731 [L5]
 - Added support for Control flag for EL6751 [L5]

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- Import invisible slaves from ENI file [L5]
 - Added station address to LineCrossedAnalyzer [L4]
 - Added warning when object 0xF050 is missing for MDP scan [L4]
 - Integrated master version 3.1.0.10 [L4]
 - Added support to export the history tab grid to csv [L2]
 - Added support for sub groups in select slave dialog [L2]
 - Allow changing PDO entry index/subindex in edit mode, if possible [L2]
 - Upgraded Infragistic controls to V19.1.20191.244 [L2]
 - Added File Dialog to choose gsd files for EL6731 without manually typing the path [L2]
 - Added /ALLMASTERUNITS to create eni and variable export for all master units for command line [E1]
 - Fixes
 - Fixed bug: Slaves were sometimes imported from ENI with wrong address [L5]
 - Fixed bug: SubDevices were sometimes missing in topology view [L4]
 - Fixed bug: Removing MDP module caused invalid S2S copy link [L2]
 - Fixed bug: Deleting ESIs caused problem on click on project file [E1]

12 Features of EC-Engineer V3.0

12.1 List of enhancements/bug fixes in version 3.0.22

- Enhancements
 - Added support for ESI schema 1.18 [L5]
 - Updated ESI schema to support new attribute "Dc.PdoOversampling" [L5]

12.2 List of enhancements/bug fixes in version 3.0.21

- Fixes
 - Fixed bug: Variables were created with invalid index and subindex for EL6695 [L5]
 - Fixed bug: SoE init commands were always generated all channels [L5]
 - Fixed bug: It was not possible to get all values through RAS without ESI files [L4]

12.3 List of enhancements/bug fixes in version 3.0.20

- Enhancements
 - Integrated master version 3.1.0.110 [L4]
- Fixes
 - Fixed bug: Hashtag in install directory caused exception [L5]
 - Fixed bug: Removed references to "System.Private.CoreLib" in .NET Core SDKs [L5]
 - Fixed bug: FIPS enabled detection sometimes failed [L5]

12.4 List of enhancements/bug fixes in version 3.0.19

- Fixes
 - Fixed bug: SubDevices were sometimes not connected to the correct port [L5]
 - Fixed bug: Product code detection caused invalid format exception for "EL9550-0012" [L5]
 - Fixed bug: Updated dependencies of plugins was sometimes missing [L2]
 - Fixed bug: Changing slave of different type was not possible [L2]

12.5 List of enhancements/bug fixes in version 3.0.18

- Enhancements
 - Added EMI feature to disable PDO upload during scan [L5]
 - Added support for ESI schema 1.17 [L5]
- Fixes
 - Fixed bug: Change slave caused invalid mailbox mode [L5]
 - Fixed bug: It was possible to create empty slave-, module-, pdo- and variable name [L2]
 -

12.6 List of enhancements/bug fixes in version 3.0.17

- Enhancements
 - Ignore invisible slaves on max slaves check [L4]
- Fixes
 - Fixed bug: PDO assignment of MDP slaves was sometimes wrong after ENI import [L5]
 - Fixed bug: Invalid ENI could be generated during scan with missing ESI files [L4]

12.7 List of enhancements/bug fixes in version 3.0.16

- Enhancements
 - Added support to import start up checking with ENI import [L5]
 - Support latest OpenVPN TAP Adapter [L4]
- Fixes
 - Fixed bug: Changing parent slave caused sometimes endless loop [L4]

12.8 List of enhancements/bug fixes in version 3.0.15

- Fixes
 - Fixed bug: Transition of slave InitCmd was invalid for slaves with device emulation [L5]
 - Fixed bug: CoE OD entries were missing, if they were removed from internal cache [L5]

12.9 List of enhancements/bug fixes in version 3.0.14

- Enhancements
 - Added support for ESI schema 1.16 [L5]
- Fixes
 - Fixed bug: MinValue and MaxValue check in CoE OD was wrong for some datatypes [L5]

12.10 List of enhancements/bug fixes in version 3.0.13

- Fixes
 - Fixed bug: ESI tag "Device/Eeprom/ConfigData" smaller than 2 bytes caused exception [L5]

12.11 List of enhancements/bug fixes in version 3.0.12

- Enhancements
 - Added support to configure cycle time by frequency [L5]

12.12 List of enhancements/bug fixes in version 3.0.11

- Enhancements
 - Added support for ENI tag "CoE/Profile/ChannelInfo" [L5]
 - Added support to handle device identifier as unsigned in ENI [L5]
- Fixes
 - Fixed bug: Virtual PDOs were missing in DC oversampling devices [L5]
 - Fixed bug: MD5 algorithm caused crash on FIPS enabled systems [L5]
 - Fixed bug: Old projects with empty groups did sometimes not load correctly [L4]
 - Fixed bug: Exported process data layout was sometimes invalid [L4]

12.13 List of enhancements/bug fixes in version 3.0.10

- Enhancements
 - Enable Load PDO Info button no matter what is in the ESI [L2]
- Fixes
 - Fixed bug: Array data type had invalid member count after PDO upload [L5]
 - Fixed bug: Alignment PDO entry of gateway slaves caused error [L5]
 - Fixed bug: Timeout on reading EEPROM caused saving snapshot failed [L4]

12.14 List of enhancements/bug fixes in version 3.0.9

- Enhancements
 - Added attributes "Type" and "Signed" to ENI tag "InitCmd/Validate" [L5]
 - Added enhanced UTF-8 support [L5]
 - Added support for newest TAP-Adapter [L4]
- Fixes
 - Fixed bug: Device was sometimes changed after reload ESI data [L5]
 - Fixed bug: Attaching HC group caused sometimes exception [L4]
 - Fixed bug: Reload ESI data was sometimes wrong when ESI was missing before [L4]
 - Fixed bug: Append and delete did not work correctly in Topo View on Master Node [L2]

12.15 List of enhancements/bug fixes in version 3.0.8

- Enhancements
 - Added EMI features: AoE, EoE, VoE [L5]
 - Integrated master version 3.1.0.10 [L4]
- Fixes
 - Fixed bug: SubDevices were sometimes missing in topology view [L4]
 - Fixed bug: MasterDebugMessageLevel was not forwarded to RAS client [L4]
 - Fixed bug: Loading project with 1000 slaves took more than 6 minutes [L4]

12.16 List of enhancements/bug fixes in version 3.0.7

- Enhancements
 - Added support for new AL Status Codes and Base Data Types [L5]
 - Added support for ESI schema 1.15 [L5]
 - Added support for ESI attribute "Groups/Group/ParentGroup" [L5]
 - Added support to show DC values on tab even when there is no overwrite mode [L2]
 - Added EoE endpoint support [E1: ECLYSER]
- Fixes
 - Fixed bug: Data types list was empty for slaves without CoE OD support [L5]
 - Fixed bug: Slave contained sometimes old ESI data after update ESI file [L5]
 - Fixed bug: Export OD sometimes failed [L5]
 - Fixed bug: EL6731 PDOs where sometimes not correct [L5]
 - Fixed bug: Generated SyncUnits were not visible for "EL2252" [L5]
 - Fixed bug: ENI import of multiple HC groups caused invalid MSU ID [L4]
 - Fixed bug: Disabled slave was sometimes not correctly removed from tree [L4]
 - Fixed bug: Timestamp of History Tab was sometimes wrong [L4]
 - Fixed bug: Wrong tooltip in english language on DC tab [L2]
 - Fixed bug: change slave problem if there is no ESI file [L2]
 - Fixed bug: ESI cache was not updated if valid and invalid ESI files were imported [L2]
 - Fixed bug: PDO tab sometimes doesn't work correctly after changing InitCmds [L2]

12.17 List of enhancements/bug fixes in version 3.0.6

- Enhancements
 - Added Export XML for ProcessImage with Enable Column [L5]
- Fixes
 - Fixed bug: EL6731 files were sometimes read wrong [L5]
 - Fixed bug: Timestamp of History Tab was sometimes wrong [L4]

12.18 List of enhancements/bug fixes in version 3.0.5

- Enhancements
 - Merge alignment PDO entries of array data types to one single variable [L5]
 - Improved module usage of EL6731 [L5]
 - Integrated master version 3.1.0.5 [L4]
 - Added more parameters for /CFG [L2]
- Fixes
 - Fixed bug: MDP modules were added twice if ESI contains two info references [L5]
 - Fixed bug: Slave contained invalid physics after scan without ESI [L4]
 - Fixed bug: Changing slave without ESI was not possible [L2]

12.19 List of enhancements/bug fixes in version 3.0.4

- Fixes
 - Fixed bug: Invalid assembly version of .NET Wrapper caused corrupt installation [L4]

12.20 List of enhancements/bug fixes in version 3.0.3

- Enhancements
 - Validate min/max value of CoE OD [L5]

- Added support for optimized link layers [L4]
- Added real-time clock support [L4]
- Added scan function for EL6751 [L4]
- Added Master Version 3.1.0.03 [L4]
- Added support for Ebus Current Consumption [L2]
- Enabled edit variables on process image tab [L2]
- Added new EcOemSetup example [L1]
- Added cmdline parameter /PROJECTTEMPLATEPATH [E1]
- Fixes
 - Fixed bug: Invisible slaves caused invalid member count of HC groups [L5]
 - Fixed bug: Import ENI failed, because revision number were not written as signed number [L5]
 - Fixed bug: Module name was sometimes invalid in diagnosis mode [L4]

12.21 List of enhancements/bug fixes in version 3.0.2

- Enhancements
 - Generate complete access data from OD entry on InitCmd tab [L5]
 - Added support for new ESI flag "SdoUploadWithMaxLength" [L5]
 - Integrated master version 3.0.1.42 [L4]
 - Enhanced S2S copy link tab to build links to already connected variables [L2]
 - Upgraded Infragistic controls to V18.2.20182.281 [L2]
- Fixes
 - Fixed bug: Deleting or exporting ESI from ESI Manager failed [L5]

12.22 List of enhancements/bug fixes in version 3.0.1

- Enhancements
 - Removed absolute path from ESI cache [L5]
 - Added support for ESI attributes "Device/Crc32" and "Module/Crc32" [L5]
 - Improved error handling of tree operations [L4]
 - Added cable redundancy support to topology view [L4]
 - Integrated master version 3.0.1.30 [L4]
 - Added productcode to ESI Manager [L2]
 - Added FMMU/SM information tab [L2]
 - Enhanced PDO tab with context menu entries "expand/collapse/select/unselect all" [L2]
 - Changed control to select ports on Append Slave Dialog [L2]
 - Improved extended diagnosis tab [L2]
 - Enhanced master DC tab with link layer is reference clock [L2]
 - Added cmdline param /GENERATESLAVEINFOHEADER [E1]
- Fixes
 - Fixed bug: CopyLinks EBI export did not work correctly [L5]
 - Fixed bug: EL6751 CAN Interface mode crashed if there were slaves in config [L5]

12.23 List of features in version 3.0.0

- Added advanced option "Process Data Sync Manager Mode" [L5]
- Import advanced option "Identification Checking" from ENI file [L5]
- Added support for importing "Beckhoff Slave Description" file [L5]
- Resolve error "HC group fixed to master" automatically [L5]
- Added .NET Core Support [L5]
- Improved internal ESI data handling to reduce memory footprint [L5]
- Removed deprecated functions from API [L5]
- Added support for removing slaves and groups in one step [L4]
- Added support for hex values to EMI Manager [L4]
- Improved config format [L4]
- Added Mailbox Gateway Support [L4]
- Enhanced topology view with customizable layout [L2]

- Upgraded Infragistic controls to V18.2.20182.186 [L2]

13 Features of EC-Engineer V2.9

13.1 List of enhancements/bug fixes in version 2.9.17

- Fixes
 - Fixed bug: ESI tag "Device/Eeprom/ConfigData" smaller than 2 bytes caused exception [L5]
 - Fixed bug: Transition of slave InitCmd was invalid for slaves with device emulation [L5]

13.2 List of enhancements/bug fixes in version 2.9.16

- Enhancements
 - Added support to configure cycle time by frequency [L5]
- Fixes
 - Fixed bug: Device was sometimes changed after reload ESI data [L5]
 - Fixed bug: MD5 algorithm caused crash on FIPS enabled systems [L5]

13.3 List of enhancements/bug fixes in version 2.9.15

- Enhancements
 - Added support for ESI schema 1.15 [L5]
- Fixes
 - Fixed bug: Slave disappeared sometimes from project tree after enable slave [L4]
 - Fixed bug: Attaching HC group caused sometimes exception [L4]

13.4 List of enhancements/bug fixes in version 2.9.14

- Enhancements
 - Added EMI features: AoE, EoE, VoE [L5]
 - Added attributes "Type" and "Signed" to ENI tag "InitCmd/Validate" [L5]
 - Added enhanced UTF-8 support [L5]
 - Integrated master version 3.0.1.51 [L4]
 - Added support for newest TAP-Adapter [L4]
- Fixes
 - Fixed bug: MasterDebugMessageLevel was not forwarded to RAS client [L4]

13.5 List of enhancements/bug fixes in version 2.9.13

- Fixes
 - Fixed bug: Import ENI failed, because revision number were not written as signed number [L5]
 - Fixed bug: Data types list was empty for slaves without CoE OD support [L5]
 - Fixed bug: ENI import of multiple HC groups caused invalid MSU ID [L4]
 - Fixed bug: Parent port of first slave was invalid after ENI import and bus scan [L4]
 - Fixed bug: PDO tab sometimes doesn't work correctly after changing InitCmds [L2]

13.6 List of enhancements/bug fixes in version 2.9.12

- Enhancements
 - Added support for new ESI flag "SdoUploadWithMaxLength" [L5]
 - Added new cmdline param /ALLOWDUPLICATENAMES [E5]
- Fixes
 - Fixed bug: Slaves with multiple sync units caused invalid bit offset of copy links [L5]
 - Fixed bug: Upgrade of deprecated HC groups failed, if slaves were in wrong order [L5]
 - Fixed bug: ENI creation with mono caused "Conversion buffer overflow" [L5]
 - Fixed bug: Detached HC group connected to master caused topology error [E5]

13.7 List of enhancements/bug fixes in version 2.9.11

- Enhancements
 - Integrated master version 3.0.1.22 [L4]
- Fixes
 - Fixed bug: "Beckhoff AX5xxx" was not correctly supported [L5]
 - Fixed bug: Copy links were not imported during import slaves from ENI file [L5]
 - Fixed bug: Complex data types of CoE OD were sometimes not correctly parsed [L5]
 - Fixed bug: Used sync manager was sometimes not correctly enabled [L5]
 - Fixed bug: Sync manager was sometimes not activated for virtual PDOs [L5]
 - Fixed bug: Rebuild tree from process image caused invalid HC connection [L4]
 - Fixed bug: "ModuleIdent=0xFFFFFFFF" was not supported [E5]
 - Fixed bug: Connecting normal slave to HC group caused invalid topology [E5]

13.8 List of enhancements/bug fixes in version 2.9.10

- Enhancements
 - Added EMI feature to not include DC NOP Command [L5]
 - Added support for module type DWORD and FLOAT32 for EL6631-0010 [L5]
 - Integrated master version 3.0.1.16 [L4]
- Fixes
 - Fixed bug: ESI references were sometimes not found on parsing ESI file directly [L5]
 - Fixed bug: InitCmd "Interpolation time period (0x60C2)" was not calculated for all axes [L5]
 - Fixed bug: Rebuild tree from process image failed sometimes [L4]
 - Fixed bug: Enter negative values for "REAL" variables was not possible [L2]
 - Fixed bug: Generating tree for classic view caused sometimes endless loop [L2]
 - Fixed bug: Deprecated tag "HotConnect/IdentificationAdo" was ignored [E5]

13.9 List of enhancements/bug fixes in version 2.9.9

- Fixes
 - Fixed bug: InitCmd "download slot cfg" was always created with "CompleteAccess" [L5]
 - Fixed bug: Adding empty InitCmd from type string caused invalid character [L5]
 - Fixed bug: EL6731-0010 doesn't work without outputs [L5]
 - Fixed bug: PDO entries with more than 30 bytes were not created as one single variable [L5]
 - Fixed bug: Moving subsequent MDP modules caused sometimes invalid PDO entry index [L5]
 - Fixed bug: Next station address was generated without disabled slaves [L4]
 - Fixed bug: Running more than 3 hours caused OutOfMemoryException [L4]
 - Fixed bug: Auto rename duplicate variable names on assign MDP module [L4]
 - Fixed bug: Shortcut "Ins/Del" doesn't work on device node [L2]
 - Fixed bug: Watchdog settings were not refreshed sometimes [L2]

13.10 List of enhancements/bug fixes in version 2.9.8

- Enhancements
 - Integrated master version 3.0.1.10 [L4]
 - Enhanced ESI2C support (added flag "bEepromAssignToPdi") [L5]
- Fixes
 - Fixed bug: Error message was missing if slaves uses the same physical address [L5]
 - Fixed bug: Project contained sometimes invalid CoE init commands after project conversion [L5]
 - Fixed bug: Unconnected slaves were not displayed with empty tree [L4]
 - Fixed bug: Not indenting XML files caused project conversion failed [L4]
 - Fixed bug: Missing ESI file caused sometimes invalid slaves after project conversion [L4]
 - Fixed bug: MDP modules were sometimes lost after changing slave [L4]

- Fixed bug: Alias variables of XML slaves were sometimes missing [L4]
- Fixed bug: EMI feature "FoE" was ignored [L2]
- Fixed bug: Unit of System Time Difference was wrong [L2]
- Fixed bug: ENI generation does not fail if errors were detected [E5]

13.11 List of enhancements/bug fixes in version 2.9.7

- Enhancements
 - Enhanced ESI2C support (added flag "UseLrdLwr", removed STL references) [L5]
 - Improved PDO upload for slaves without "CompleteAccess" support [L4]
 - Added possibility to reset ESI data of MDP coupler on change slave [L4]
 - Select last used network adapter on creating a new device [L2]
- Fixes
 - Fixed bug: Copy slave within a group caused invalid MSU ID [L4]
 - Fixed bug: Invalid sync unit pairs caused project conversion failed [L4]
 - Fixed bug: Creating alignment PDO entry caused problems [L2]
 - Fixed bug: Cmdline param /LOGLEVEL was set after creating the ESI cache [E5]

13.12 List of enhancements/bug fixes in version 2.9.6

- Enhancements
 - Integrated master version 3.0.1.3 [L4]
 - Added support for SoE Init Commands in EniBuilder [E5]
- Fixes
 - Fixed bug: Invisible slaves caused invalid previous port [L5]
 - Fixed bug: Writing EEPROM to slave failed [L4]
 - Fixed bug: Adding pdo entry to MDP slaves sometimes fails with EniBuilder [E5]

13.13 List of enhancements/bug fixes in version 2.9.5

- Enhancements
 - Enhanced EBI format to set more advanced options like watchdog, timeouts, ... [L5]
 - After EEPROM update the configured station alias will still be there [L4]
 - Integrated master version 3.0.1.2 [L4]
 - Disabled slave were not shown in active DC list anymore [L2]
 - Added new cmdline param /LOGLEVEL [E5]
- Fixes
 - Fixed bug: Alias variables were lost after assigning new modules to XML slaves [L5]
 - Fixed bug: Input modules were generated as output variables for EL6631-0010 and vice versa [L5]
 - Fixed bug: Empty cyclic command was sometimes generated, if PDO was empty [L5]
 - Fixed bug: Missing sync unit caused invalid offsets [L5]
 - Fixed bug: Line crossed caused internal error message [L4]
 - Fixed bug: Module assignments were sometimes missing after reloading ESI data [L4]
 - Fixed bug: Watchdog default values were not displayed [L2]
 - Fixed bug: Type edit control displayed sometimes invalid value [L2]

13.14 List of enhancements/bug fixes in version 2.9.4

- Fixes
 - Fixed bug: Array OD entries had sometimes wrong name [L5]
 - Fixed bug: Variable names were lost after assigning new modules to XML slaves [L5]
 - Fixed bug: EoE InitCmd without comment caused exception [L5]
 - Fixed bug: Log files bigger than 2 GB caused OutOfMemoryException [L5]
 - Fixed bug: Converting projects with MDP slaves sometimes failed [L4]
 - Fixed bug: Variables tab showed invalid output offsets for pinned groups with separate offsets [L4]
 - Fixed bug: Deleting PDO of MDP slot/module pair failed [L2]

13.15 List of enhancements/bug fixes in version 2.9.3

- Enhancements
 - Improved import slaves from ENI file [L5]
 - Added support for ESI schema 1.14 [L5]
 - Improved performance of XML slaves [L5]
 - Added validation for min and max Sync Manager size [L5]
 - Allow deleting of disabled slaves [L4]
 - Added percentage value to progress bar [L2]
 - Upgraded Infragistic controls to V17.2.20172.2029 [L2]
 - Added multi selection support to "reload ESI data" [L2]
 - Added "Filter Settings Flag" button to edit CoE init commands dialog [L2]
 - Added new param "/EBIEXPORT" to "/FORCECFG" mode [E1]
- Fixes
 - Fixed bug: "fixed" CoE init commands were missing after ENI import [L5]
 - Fixed bug: Selecting local address failed for slaves with device identification [L5]
 - Fixed bug: Name of ESI slave caused large ESI cache [L5]
 - Fixed bug: "Su" tag of MDP and oversampling PDOs were not written to ENI file [L5]
 - Fixed bug: Reload ESI data of slave with empty ESI data caused an exception [L5]
 - Fixed bug: Module name was lost on moving module to another slot [L5]
 - Fixed bug: Disabling multiple slaves caused sometimes KeyNotFoundException [L4]
 - Fixed bug: Network Mismatch Analyzer showed empty list, if no slave was configured [L4]
 - Fixed bug: Cut&Paste of multiple slaves failed sometimes [L4]
 - Fixed bug: Changing value with "Filter Settings Flag" on CoE OD tab showed all settings [L2]
 - Fixed bug: Overwriting mailbox size for all slaves was not possible [L2]
 - Fixed bug: EcTypeEditor resets sometimes values to min/max value [L2]
 - Fixed bug: Enable "Complete Access" caused problems with selected CoE OD entry [L2]
 - Fixed bug: Language of context menu entries in project explorer was not reloaded [L2]
 - Fixed bug: Deprecated tag "HotConnect" was ignored [E5]

13.16 List of enhancements/bug fixes in version 2.9.2

- Enhancements
 - Save dockmanager layout and current tree style into user.xml [L2]
 - Added support for configuring revision checking [E5]
 - Added new param "/AUTOSAVE" to "/FORCECFG" mode [E1]
 - Activated "expert mode" by default [E1]
- Fixes
 - Fixed bug: After changing snapshot the bus topology was sometimes not correctly updated [L4]
 - Fixed bug: Re-configure master caused RAS timeouts [L4]
 - Fixed bug: After adding new slave variables tab showed wrong slave name [L4]
 - Fixed bug: EniBuilder crashed if EBI file contained invalid topology [E5]

13.17 List of enhancements/bug fixes in version 2.9.1

- Enhancements
 - Improved EtherCAT P settings and calculation [L5]
 - Changed logic of PDO selection when there is more than one sync manager [L2]
 - Changed FoE Timeout in GUI to s [L2]
 - Added 'Load' button to load EEPROM when AssignToPdi is active [L2]
 - Added support for rescue scan [L4]
 - Added support for reading "DiagMessages" from external file [L5]
 - Integrated master version 3.0.0.13 [L4]
- Fixes
 - Fixed bug: Access rights of ESC registers were not checked [L4]

- Fixed bug: Group name was empty, if a group was created with more than one slave [L2]
- Fixed bug: Changing of two entries of the same ESC register sometimes failed [L2]
- Fixed bug: Mailbox Start Address was sometimes wrong when user changed it [L5]
- Fixed bug: It was possible to activate External Sync without selecting a reference clock [L2]
- Fixed bug: Removing slaves caused sometimes exception [L4]

13.18 List of enhancements/bug fixes in version 2.9.0

- Enhancements
 - Added support for loading external schema files [L5]
 - Added support for EtherCAT P [L5]
 - Enhanced progress bar support for FoE upload and download [L4]
 - Added support for offline diagnosis mode [L4]
 - Changed group handling [L2]
 - Implemented a new setup [E1]
- Fixes
 - Fixed bug: Maximum slave count was not checked on import slaves from ENI file [L4]
 - Fixed bug: Max possible value was not correctly displayed in hex controls [L2]
 - Fixed bug: Sometimes no entry was selected in ComboBox of EscReg tab [L2]
 - Fixed bug: Apply Identification Value to all slaves failed with hex values [L2]

14 Features of EC-Engineer V2.8

14.1 List of enhancements/bug fixes in version 2.8.9

- Enhancements
 - Improved support for OMRON slaves [L5]
- Fixes
 - Fixed bug: Reload ESI data of slave with empty ESI data caused an exception [L2]

14.2 List of enhancements/bug fixes in version 2.8.8

- Fixes
 - Fixed bug: "Su" tag of MDP and oversampling PDOs were not written to ENI file [L5]

14.3 List of enhancements/bug fixes in version 2.8.7

- Enhancements
 - Added percentage value to progress bar [L2]
- Fixes
 - Fixed bug: Selecting local address failed for slaves with device identification [L5]
 - Fixed bug: Re-configure master caused RAS timeouts [L4]
 - Fixed bug: After adding new slave variables tab showed wrong slave name [L4]

14.4 List of enhancements/bug fixes in version 2.8.6

- Enhancements
 - Changed logic of PDO selection when there is more than one sync manager [L2]
 - Changed FoE Timeout in GUI to s [L2]
 - Integrated master version 3.0.0.13 [L4]
- Fixes
 - Fixed bug: Mailbox Start Address was sometimes wrong when user changed it [L5]
 - Fixed bug: Removing slaves caused sometimes exception [L4]

14.5 List of enhancements/bug fixes in version 2.8.5

- Enhancements
 - Integrated master version 3.0.0.12 [L4]

- Fixes
 - Fixed bug: Command splitting went wrong if PDO was too big [L5]
 - Fixed bug: Deleting slaves went sometimes wrong [L5]
 - Fixed bug: Network Mismatch Analyzer did not work correctly with empty MDP Slots [L4]

14.6 List of enhancements/bug fixes in version 2.8.4

- Enhancements
 - Improved performance of building process image [L4]
 - Integrated master version 3.0.0.11 [L4]
- Fixes
 - Fixed bug: Reloading ESI data with MDP modules failed [L5]
 - Fixed bug: SubDevices were sometimes not correctly connected to MainSubDevice [L5]
 - Fixed bug: Project conversion failed, because PDOs had sometimes wrong sort order [L4]
 - Fixed bug: Project conversion failed, because DC calculation used not the correct cycle time [L4]
 - Fixed bug: BusScan notification was displayed multiple times [L4]
 - Fixed bug: Deleting multiple PDOs failed [L2]
 - Fixed bug: Sometimes no entry was selected in ComboBox of EscReg tab [L2]
 - Fixed bug: Cut&paste to same position caused unconnected slaves [L2]

14.7 List of enhancements/bug fixes in version 2.8.3

- Enhancements
 - Added EMI feature: "ShowContinuousPropagationCompensation" [L4]
 - Added support for inactive master [L4]
 - Integrated master version 3.0.0.10 [L4]
- Fixes
 - Fixed bug: "ShiftTimeSync1" was not correctly saved [L5]
 - Fixed bug: Project conversion failed, because DC calculation used not the correct cycle time [L4]

14.8 List of enhancements/bug fixes in version 2.8.2

- Enhancements
 - Auto rename duplicate variable names on ENI import [L5]
 - Preselect last selected vendor in "SlaveSelectDialog" [L2]
- Fixes
 - Fixed wrong offset for some master sync units [L5]
 - Fixed bug: Index of alignment PDO entries was not calculated based on MDP slot [L5]
 - Fixed bug: Copy slave caused invalid notifications that variables of slave uses same name [L4]
 - Fixed bug: Cut&paste to same slave caused invalid entry in "Select Output Port" dialog [L4]
 - Fixed bug: Project conversion failed, because Msuld was missing [L4]
 - Fixed bug: Do not display "copy failed" message, if maximum number of slaves was reached [L2]

14.9 List of enhancements/bug fixes in version 2.8.1

- Enhancements
 - Improved support for NI slot slaves [L5]
 - Enhanced EMI feature "ProcessImageWithHeaders" with new flag to move AL Status command to the end [L5]
 - Added support for TIME_OF_DAY and TIME_DIFFERENCE datatypes [L5]
 - Improved splitting commands [L5]
 - Throttle master notifications to 1 second to avoid flooding [L4]

- Integrated master version 3.0.0.8 [L4]
- Improved Change Slave function [L2]
- Improved handling of TopologyView [L2]
- Added LineCrossed to TopologyView [L2]
- Fixes
 - Fixed bug: MSU was not correctly assigned to fixed cyclic commands (FPRD, FPWR, FPRW) [L5]
 - Fixed bug: Upgrade config failed, if slaves of group were in different task [L4]
 - Fixed bug: Variables tab showed wrong offsets if sync units of slaves were in different MSUs [L4]
 - Fixed bug: EtherCAT Suite hangs after switching from diag to config mode [E2]
 - Fixed bug: Deleting "update.zip" during installation sometimes failed [E1]

14.10 List of enhancements/bug fixes in version 2.8.0

- Enhancements
 - Added support for changing ADO for identification checking [L5]
 - Improved schema validation error handling [L5]
 - Added support for EL6731 [L5]
 - Added support for UDP EtherCAT communication [L5]
 - Added support for master sync units [L5]
 - Added support for ESI schema 1.13 [L5]
 - Improved tree operations [L4]
 - All tree operations (like cut/copy/paste slaves, enable/disable/remove slaves, add/remove groups) are based on multiselection
 - This means, if user wants to remove e.g. an EK1100 he must also select the connected Ebus children, to be able to delete this slave
 - For more information, please refer the user manual
 - Integrated master version 3.0.0.6 [L4]
 - Integrated new combobox into all dialogs [L2]
 - Added list to DC Tab of master of all slaves with active DC [L2]
 - Upgraded Infragistic controls to V17.1.20171.1000 [L2]
- Fixes
 - Fixed bug: Verify that used station alias addresses are unique [L5]
 - Fixed bug: Timeout of user defined CoE init commands was always 0 [L5]
 - Fixed bug: Refresh missing after changing network adapters [L4]
 - Fixed bug: Invalid notifications were displayed during scan [L4]
 - Fixed bug: Warning was sometimes missing, if MDP scan failed [L4]
 - Fixed bug: Not all slaves were added to topology tree with cable redundancy [L4]
 - Fixed bug: Clock adjustment was enabled without active DC slave [L2]

15 Features of EC-Engineer V2.7

15.1 List of enhancements/bug fixes in version 2.7.10

- Enhancements
 - Auto rename duplicate variable names on ENI import [L5]
- Fixes
 - Fixed bug: Copy slave caused invalid notifications that variables of slave uses same name [L4]
 - Fixed bug: Context menu was not refreshed after copying multiple slaves to clipboard [L2]
 - Fixed bug: Maximum slave count was not checked on pasting new slaves [L2]

15.2 List of enhancements/bug fixes in version 2.7.9

- Fixes
 - Fixed bug: Invalid notifications were displayed during scan [L4]
 - Fixed bug: Warning was sometimes missing, if MDP scan failed [L4]

- Fixed bug: Rebuilding process image caused sometimes an exception [L4]
- Fixed bug: Update tree caused InvalidOperationException in diagnosis mode [L2]

15.3 List of enhancements/bug fixes in version 2.7.8

- Fixes
 - Fixed bug: Reading group information of variables caused exception in diagnosis mode [L4]

15.4 List of enhancements/bug fixes in version 2.7.7

- Fixes
 - Fixed bug: "DScale" attribute was sometimes missing after project conversion [L5]
 - Fixed bug: Editing "ModuleAlignPDO" of MDP slaves was not supported [L5]
 - Fixed bug: Input mailbox start address was sometimes wrong calculated [L5]
 - Fixed bug: OD Flags from EDS files was sometimes wrong [L5]
 - Fixed bug: Group information on variables tab was invalid [L4]
 - Fixed bug: Disabling pinned slaves failed [L2]

15.5 List of enhancements/bug fixes in version 2.7.6

- Enhancements
 - Integrated master version 2.9.1.11 [L4]
- Fixes
 - Fixed bug: Reading OD from EDS files failed [L5]
 - Fixed bug: InitCmds of MDP slaves had sometimes wrong value after project conversion [L5]
 - Fixed bug: Verify that used station alias addresses are unique [L5]
 - Fixed bug: Upgrading config failed, because HC groups had wrong order [L5]
 - Fixed bug: List separator was not correctly replaced on CSV export [L4]
 - Fixed bug: EoE InitCmd was added multiple times [L4]
 - Fixed bug: Reload MDP Modules failed sometimes [L4]
 - Fixed bug: It was possible to delete group members [L2]

15.6 List of enhancements/bug fixes in version 2.7.5

- Enhancements
 - Added support for 1.12.P [L5]
 - Added support for EL6751-0010 [L5]
 - Enhanced MDP support of bus mismatch analyzer [L4]
 - Enhanced filtering of vendors in append slave dialog [L2]
- Fixes
 - Fixed bug: Negative enum values in ESI files caused errors [L5]
 - Fixed bug: OD entries of PDO objects had wrong index [L5]
 - Fixed bug: Adding slave from scanned configuration failed [L4]
 - Fixed bug: Fixed bug: Creating multiple variables doesn't work [L4]
 - Fixed bug: Topology view was empty after saving project [L2]
 - Fixed bug: Errors solved notification was sometimes missing [L2]
 - Fixed bug: Export ENI was sometimes disabled in topology view [L2]
 - Fixed bug: Sort network adapter list by name [L2]

15.7 List of enhancements/bug fixes in version 2.7.4

- Enhancements
 - Integrated master version 2.9.1.7 [L4]
- Fixes
 - Fixed bug: CANOpen PDOs were sometimes calculated wrong [L5]
 - Fixed bug: Inserting of MDP modules doesn't work [L4]
 - Fixed bug: Line Crossed Debug Assertion [L4]
 - Fixed bug: Converting large projects caused OutOfMemoryException [L4]
 - Fixed bug: Variables tab showed wrong offsets in diagnosis mode [L2]

- Fixed bug: Floating license support [E1]

15.8 List of enhancements/bug fixes in version 2.7.3

- Fixes
 - Fixed bug: Copy slaves directory to master caused invalid config files [L4]
 - Fixed bug: Invalid devices were not removed, if converting project failed [L4]
 - Fixed bug: Remote bus scan caused sometimes endless loop [L4]
 - Fixed bug: Exported process variables had wrong sort order [L4]
 - Fixed bug: Enable slave back to master caused exception [L4]
 - Fixed bug: SubDevices were not correctly supported [L4]
 - Fixed bug: It was possible to enter duplicate station addresses [L4]
 - Fixed bug: Station address was updated without including disabled slaves [L4]
 - Fixed bug: Append module from clipboard of another device failed [L4]
 - Fixed bug: Refresh of process image was sometimes missing [L4]
 - Fixed bug: Moving variables doesn't work [L4]
 - Fixed bug: Reload ESI data tried to reload MDP modules on non MDP slaves [L2]
 - Fixed bug: Variables of printed process image were not sorted by offset [L2]
 - Fixed bug: Disable a "cut" slave caused crash [L2]
 - Fixed bug: It was possible to make changes on already copied slave to clipboard [L2]
 - Fixed bug: Uninstall failed, if install directory was removed [E1]

15.9 List of enhancements/bug fixes in version 2.7.2

- Enhancements
 - Improved performance of copy slaves from clipboard [L4]
 - Improved language [L2]
- Fixes
 - Fixed bug: ENI import caused exception [L4]
 - Fixed bug: CoE OD was loaded directly and not on request [L4]
 - Fixed bug: Refresh was missing after changing comment of variables [L4]
 - Fixed bug: Trace variables had wrong offset [L4]
 - Fixed bug: Wrong offsets were shown on tab multiple tasks of slave [L4]
 - Fixed bug: sometimes not all slaves were appended [L4]
 - Fixed bug: ESI cache of config file was not updated after reload ESI data [L4]
 - Fixed bug: Cycle Time of Multiple Tasks was sometimes wrong in GUI [L2]
 - Fixed bug: It was possible to append a slave to a HC group [L2]
 - Fixed bug: TopologyView showed disabled slaves [L2]
 - Fixed bug: Edit Topology showed wrong tooltip [L2]
 - Fixed bug: Updated dependencies of plugins was not triggered on rebuild process image [L2]
 - Fixed bug: S2S copy link tab displayed wrong connections [L2]
 - Fixed bug: Restore config if copy slaves fails [L2]
 - Fixed bug: Loading invalid or unsupported configuration caused exception [L2]

15.10 List of enhancements/bug fixes in version 2.7.1

- Fixes
 - Fixed bug: Removed internal debug errors [L5]
 - Fixed bug: Connected slave of RootSlave was not set [L4]
 - Fixed bug: Refresh missing after changing pinned group [L4]
 - Fixed bug: Refresh missing after changing slave address [L4]
 - Fixed bug: Variables had wrong name [L4]
 - Fixed bug: Refresh missing after changing the ref clock [L2]
 - Fixed bug: Edit topology was not working well [L2]

15.11 List of enhancements/bug fixes in version 2.7.0

- Enhancements
 - Improved ESI cache format [L5]

- Improved config format [L4]
- Added support for missing check revision types [L5]
- Hide warning, that old EMI file is used [L2]
- Enhanced general tab of slave and display previous port [L2]
- Improved usability of FoE Tab [L2]
- Fixes
 - Fixed bug: Ignore duplicate physical addresses of invisible slaves [L5]
 - Fixed bug: Changing topology caused sometimes endless loop [L5]
 - Fixed bug: GetSlvStatistics returned sometimes invalid state during bus scan [L4]
 - Fixed bug: Slave was sometimes appended to wrong port of CU1128 [L4]
 - Fixed bug: Deleting used cyclic task caused invalid ENI [L2]

16 Features of EC-Engineer V2.6

16.1 List of enhancements/bug fixes in version 2.6.6

- Enhancements
 - Integrated master version 2.9.1.7
 - Enhanced MDP support of bus mismatch analyzer
- Fixes
 - Fixed bug: EL6751 PDOs were sometimes wrong
 - Fixed bug: Negative enum values in ESI files caused errors
 - Fixed bug: OD entries of PDO objects had wrong index
 - Fixed bug: SubDevices were not correctly supported
 - Fixed bug: Port status of floating hc group was not correctly displayed
 - Fixed bug: Adding master unit caused multiple selected entries
 - Fixed bug: Invalid ESI images were displayed with wrong size
 - Fixed bug: Loading invalid or unsupported configuration caused exception
 - Fixed bug: It was possible to "change" a disabled slave
 - Fixed bug: Topology view was empty after saving project

16.2 List of enhancements/bug fixes in version 2.6.5

- Enhancements
 - Improved check revision number
 - Improved splitting of cyclic commands
- Fixes
 - Fixed bug: WKC was sometimes wrong
 - Fixed bug: Variables had sometimes wrong size after PdoUpload
 - Fixed bug: Alias variables were sometimes added multiple times

16.3 List of enhancements/bug fixes in version 2.6.4

- Enhancements
 - Added EMI feature: "ShowExternalMode"
 - Integrated master version 2.9.1.6
- Fixes
 - Fixed bug: Maximum frame size was wrong calculated
 - Fixed bug: Duplicate OD entry in ESI caused exception
 - Fixed bug: Start address of output mailbox was sometimes wrong
 - Fixed bug: ESI Cache from ECC file contained not all slaves
 - Fixed bug: Edit Topology should only be possible if there are no pending errors
 - Fixed bug: SubnetMask on EoE Tab was sometimes overwritten after reload a project

16.4 List of enhancements/bug fixes in version 2.6.3

- Fixes
 - Fixed bug: Warnings were shown during config cleanup

16.5 List of enhancements/bug fixes in version 2.6.2

- Fixes
 - Fixed bug: Maximum frame size was wrong calculated
 - Fixed bug: Config cleanup failed, because ESI cache contained invalid slaves

16.6 List of enhancements/bug fixes in version 2.6.1

- Fixes
 - Fixed bug: Invalid version of DotNetWrapper was included

16.7 List of enhancements/bug fixes in version 2.6.0

- Enhancements
 - Added support for ESI schema 1.12
 - Integrated master version 2.9.1.4
 - Improved identification for register 134
 - Improved config format
 - Added copy function for CANopen modules
 - Upgraded Infragistic controls to V16.2.20162.1006
- Fixes
 - Fixed bug: Maximum frame size was not checked
 - Fixed bug: Hash from ESI folder was built without language tag
 - Fixed bug: Mailbox max and min size were not checked in advanced options tab
 - Fixed bug: Loading backup config could cause endless loop
 - Fixed bug: Reading a write-only (WO) value of CoE OD abort reading further values
 - Fixed bug: Changed unit of system time difference on diagnosis DC tab to "ns"
 - Fixed bug: Adding ESI archives failed
 - Fixed bug: Negative "ShiftTime" values were not allowed

17 Features of EC-Engineer V2.5

17.1 List of enhancements/bug fixes in version 2.5.6

- Enhancements
 - Reduced error messages if ESI was not found
 - Enhanced user specific settings (RasCycleTime, RasWatchDog, RasWdToLimit)
 - Added automatic Subnetmask suggestion for EoE
 - Added function to split variables
- Fixes
 - Fixed bug: Default modules of MDP slave "MKS Process Control Valve" were not correctly assigned
 - Fixed bug: Clear MDP assignment of slaves without CoE support caused exception
 - Fixed bug: Moving variables of XML slaves doesn't work correctly
 - Fixed bug: EK1200 caused sometimes wrong generation of the next station address
 - Fixed bug: Size of config file increased in some cases
 - Fixed bug: "InsertBefore" from clipboard failed for inserting Ebus slaves
 - Fixed bug: Enabled slave, had wrong positions, if it was connected directly to master
 - Fixed bug: Init Commands did not disappear when CANopen modules were deleted and new index was sometimes wrong
 - Fixed bug: MdpScan and AutoPdoUpload were skipped, when project template was activated
 - Fixed bug: Context menu was not always refreshed on clipboard changes
 - Fixed bug: It was possible to edit CANopen variables in variables tab

17.2 List of enhancements/bug fixes in version 2.5.5

- Enhancements
 - Added support for S2S communication between PDOs and variables
- Fixes

- Fixed bug: ESI attribute "EEPROM/AssignToPdi" was not correctly supported
- Fixed bug: Renaming of oversampling PDO's doesn't work
- Fixed bug: Creating EEPROM from ESI failed, if ESI from EK1100 was missing
- Fixed bug: Copy a slave from clipboard caused duplicate init commands

17.3 List of enhancements/bug fixes in version 2.5.4

- Fixes
 - Fixed bug: Upgrade from config format V4 increased project size
 - Fixed bug: Copy a slave from clipboard caused duplicate init commands
 - Fixed bug: Empty ENI was created, if generating ENI file failed
 - Fixed bug: Copy to clipboard, caused sometimes "InvalidOperationException"

17.4 List of enhancements/bug fixes in version 2.5.3

- Enhancements
 - Added support for "TimeLoopControlOnly"
 - Added support for scanning without revision check
 - Integrated master version 2.8.1.15
 - Added support to force variables with 'Return'
 - Added check for IO-Link if selected file is IO-Link
- Fixes
 - Fixed bug: Cut&paste caused sometimes an endless loop

17.5 List of enhancements/bug fixes in version 2.5.2

- Enhancements
 - Added support for ESI attribute: "EEPROM/AssignToPdi"
 - Added device/vendor specific category on creating EEPROM image from ESI
 - Enhanced ESI Manager to give user more feedback, if ESI is invalid
 - Integrated master version 2.8.1.14
- Fixes
 - Fixed bug: IO-Link init command was sometimes wrong
 - Fixed bug: Missing ESI file caused exception during scan
 - Fixed bug: Generated ENI contained sometimes invalid tags
 - Fixed bug: Copy infos were not correctly imported
 - Fixed bug: Copy slave from another project increased project size
 - Fixed bug: DcmConfigure() caused exception with full logging enabled
 - Fixed bug: Connected Ebus Slaves of EK1914 were not visible in diagnosis mode
 - Fixed bug: Scanning "Beckhoff CX5000" doesn't work
 - Fixed bug: Clipboard data were lost, if loading project took very long

17.6 List of enhancements/bug fixes in version 2.5.1

- Enhancements
 - Added edit topology to context menu of device
 - Added support to delete IO-Link devices
- Fixes
 - Fixed possible crash on switching back to config mode
 - Fixed bug: Variables-Tab refresh was missing by oversampling changes in DC-Tab
 - Fixed bug: it was possible in edit topology dialog to lose some slaves
 - Fixed bug: A new output PDO, was added with wrong syncmanager
 - Fixed bug: Selecting a disposed tree item caused an exception
 - Fixed bug: IO-Link PDO offset was sometimes wrong
 - Fixed bug: After registration was dropped, wait a little bit before re-register client

17.7 List of enhancements/bug fixes in version 2.5.0

- Enhancements
 - Added support to rename variables by pressing 'F2'
 - Added 'Disabled' flag support for import SoE init commands

- Added support for External Synchronization
- Removed EMI: "EtherCATMaster_BeckhoffCX5000"
- Enhanced classic view in project explorer
- Enhanced append slave dialog with port label
- Added port select dialog instead of using the first one
- Added new context menu entries: "expand all", "collapse all"
- Added schema check for EBI files
- Added support for EL6751 CANopen Master
- Integrated master version 2.8.1.13
- Fixes
 - Fixed bug: Parsing ESI files with info references failed with Mono
 - Fixed bug: TopologyView was sometimes wrong
 - Fixed bug: Slaves from clipboard, were inserted in wrong order
 - Fixed bug: Mdp scan went sometimes wrong
 - Fixed bug: Variables tab did not support 64 bit values
 - Fixed bug: Inserting slaves with subslaves doesn't work
 - Fixed bug: Some slave settings were not copied correctly

18 Features of EC-Engineer V2.4

18.1 List of enhancements/bug fixes in version 2.4.4

- Enhancements
 - Improved German Language support
 - Added support for single groups in Edit Topology Dialog
 - Show progress bar on loading project template and on loading clipboard configs
 - Improved change slave
 - Optimized config format
- Fixes
 - Fixed bug: Auto renaming of variables doesn't work after PDO upload
 - Fixed bug: Refresh was missing on EoE tab
 - Fixed bug: Accessing clipboard sometimes failed
 - Fixed bug: No message was shown on saving project, if file was write protected
 - Fixed bug: Changing language caused an exception

18.2 List of enhancements/bug fixes in version 2.4.3

- Enhancements
 - Added support for EK1200
 - Added support for invisible slaves
 - Added write to EEPROM support for identification value
 - Added Line-Crossed-Manager
 - Improved usability of 'Advanced Options' tab
 - Added check if slave can be changed or not
 - Integrated master version 2.8.1.8
- Fixes
 - Fixed bug: Fixed refresh bug after scanning with project templates
 - Fixed bug: Sorting order of variables from EL6731-0010 was not correctly converted from V1.9
 - Fixed bug: Sometimes master was selected after activating "overwrite mode" on DC tab
 - Fixed bug: Slave with MDP and DC caused always a warning that it is not supported
 - Fixed bug: MDP scan reports a warning for empty slots

18.3 List of enhancements/bug fixes in version 2.4.2

- Enhancements
 - Improved visibility of selected item in Topology View
 - Improved interaction between Classic View and Topology View

- Improved usability of History Tab
- Added import ENI support for EK1200
- Added line crossed support
- Improved usability of variables tab
- Improved OEM version support
- Added K-bus support (e.g. BK1120, BK1250, ...)
- Changed names of EMI files
- Fixes
 - Fixed bug: Changing variable name sometimes went wrong

18.4 List of enhancements/bug fixes in version 2.4.1

- Enhancements
 - Enhanced CoE OD tab with "Description from ESI" mode
 - Optimized performance for loading config
- Fixes
 - Fixed bug: "SwapData" doesn't work on PDO tab
 - Fixed bug: "Change slave" doesn't work if ESI file name was changed
 - Fixed bug: Configuration was loaded to often on using clipboard functions
 - Fixed bug: Context menu of config device crashed in integration mode

18.5 List of enhancements/bug fixes in version 2.4.0

- Enhancements
 - Improved Identification Value support
 - Moved Identification Value settings from General to Advanced Options
 - Improved ESI cache rebuild procedure
 - Integrated master version 2.8.1.1
 - Added multi selection support for deleting slaves
 - Added support for using project templates
 - Added OEM version support
- Fixes
 - Fixed bug: Switching into diagnosis mode caused sometimes a NullReference exception
 - Fixed bug: SoE-Tab was shown to often if expert mode was off
 - Fixed bug: Settings of gateway slaves were not copied correctly
 - Fixed bug: Size of alignment PDO of MDP slaves was not calculated correctly
 - Fixed bug: German text was too long for 'Release all' button
 - Fixed refresh bug on using clipboard functions between two program instances
 - Fixed bug: Some EoE settings were not correctly saved
 - Fixed bug: FMMU setup was sometimes wrong for some slaves
 - Fixed bug: Copy slaves with clipboard functions was very slow

19 Features of EC-Engineer V2.3

19.1 List of enhancements/bug fixes in version 2.3.1

- Enhancements
 - Added support for moving gateway variables
 - Integrated topology plugin into main code
 - Enhanced EMI feature: "ProcessImageWithHeaders"
 - Improved topology view
- Fixes
 - Fixed bug: Changing mail box mode to "cyclic" doesn't work correctly
 - Fixed bug: Main window moved sometimes to background
 - Fixed bug: Moving variables of MDP slaves doesn't work
 - Fixed bug: Sometimes IO-Link did not work correctly

19.2 List of enhancements/bug fixes in version 2.3.0

- Enhancements
 - Improved support for renaming MDP modules
 - Added support for SoE ObjectDictionary (online/offline)
 - Added support to merge the scanned bus with the existing configuration
 - Added support to import SoE init commands from ENI
 - Added multi selection support for deleting PDOs and PDO entries
 - Added multi selection support for deleting variables
 - Reset variables chart on F5
 - Integrated master version 2.7.3.7
 - Overworked welcome page
- Fixes
 - Fixed bug: Extending upgraded configurations from V1.9 doesn't work
 - Fixed bug: After disable/enable slave, variables tab was not refreshed
 - Fixed bug: Fixed memory leaks
 - Fixed bug: Integration plugin doesn't work correctly
 - Fixed bug: Sometimes bus scan failed, because master bus scan was not finished

20 Features of EC-Engineer V2.2

20.1 List of enhancements/bug fixes in version 2.2.3

- Enhancements
 - Improved Short Info View
 - Added support to filter existing messages
 - Added support to add/remove/edit SoE init commands
 - Integrated master version 2.7.3.6
- Fixes
 - Fixed bug: SlaveSelectDialog title was sometimes wrong
 - Fixed bug: Exception was sometimes thrown by module assignment
 - Fixed bug: ENI builder byte offset was sometimes wrong

20.2 List of enhancements/bug fixes in version 2.2.2

- Fixes
 - Fixed bug: ENI builder byte alignment was sometimes wrong

20.3 List of enhancements/bug fixes in version 2.2.1

- Enhancements
 - Added support for forcing variables
 - Added support for new ENI-Feature HotConnect group name
 - Added support for new ENI-Feature Timeout
 - Added support for new ENI-Feature IdentificationValue
 - Added new dialog to edit the topology
 - Added port labels from ESI
 - Improved error message on import invalid ENI file
 - Improved support for "Multiple Cyclic Tasks" in diagnosis mode
 - Improved resizing support for dialogs
- Fixes
 - Fixed bug: ESI Cache from ECC file was sometimes corrupted
 - Fixed bug: SyncManager settings were invalid for "EL2252"
 - Fixed bug: Message window was not correctly reloaded on changing language
 - Fixed translation bugs
 - Fixed bug: It was possible to delete slaves in diagnosis mode
 - Fixed bug: DC support was turned off for scanned slaves
 - Fixed bug: Moving variables greater than 30 bytes doesn't work
 - Fixed bug: Creating variables greater than 60 bytes doesn't work

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20.4 List of enhancements/bug fixes in version 2.2.0

- Enhancements
 - Added support for forcing variables
 - Added watch list to monitor variables
 - Added function to save and load watch list
 - Added support for export object dictionary
 - Removed master state checks for remote scan
 - Improved "Slave to Slave" tab
 - Changed default mailbox poll time to 10ms
 - Improved support of safety slaves (and removed EMI feature: "SafetySlavesSupported")
 - Added EoE endpoint support for remote connections
 - Improved support of creating EEPROM image from ESI
 - Added support for IO-Link terminal EL6224
 - Added support of more than 12 submodules to EL6631-0010
 - Integrated master version 2.7.3.2
 - Removed leading zeros for bit values on EscReg tab
- Fixes
 - Fixed bug: Changed max value of station address 0xFFFF
 - Fixed bug: InitCmd tab was not updated after PDO changes
 - Fixed bug: Reduce EEPROM image size if it is too large
 - Fixed problems with hot connect groups
 - Fixed bug: Refresh problem with "user defined" DC modes
 - Fixed bug: Default assignment from ESI was not used, if MDP scan failed
 - Fixed bug: Names of MDP variables were sometimes not correctly generated
 - Fixed bug: EMI feature "OutputPortPhysics" was not correctly supported
 - Fixed bug: "UseLrdLwr" from ESI doesn't work correctly
 - Fixed bug: Refresh was missing after deleting output variables
 - Fixed bug: Copying gateway slaves doesn't work correctly
 - Fixed bug: EMI feature "OutputPortVendorId" was not correctly supported
 - Fixed bug: Delete MDP assignments before creating them
 - Fixed bug: Disconnect if EcMaster.RegisterClient() returns error

21 Features of EC-Engineer V2.1

21.1 List of enhancements/bug fixes in version 2.1.4

- Enhancements
 - Added support for more OD Datatypes
 - Enhanced MDP scan
- Fixes
 - Fixed bug: DC OpModes with same names were not supported
 - Fixed bug: After changing slave type selection moved to root node
 - Fixed bug: Duplicate variables from ESI were sometimes grouped
 - Fixed bug: Config files from V1.0.2 could be not loaded
 - Fixed bug: Special MDP configurations could not be saved

21.2 List of enhancements/bug fixes in version 2.1.3

- Enhancements
 - Added support for multi selection in project explorer
- Fixes
 - Fixed bug: It was not possible to import ENI-Files with Fast Hot Connect
 - Fixed bug: "Old EMI Warning" was displayed to often
 - Fixed bug: Clipboard operations caused very big config files
 - Fixed bug: After refresh the focus was lost

- Fixed bug: "Disable LRW" was sometimes disabled

21.3 List of enhancements/bug fixes in version 2.1.2

- Enhancements
 - Enhanced sample code and documentation for c# (SDK Layer 2)
 - Added hint if WinPcap is missing
 - Updated ESI schema to support new flag "TimeLoopControlOnly"
 - Changed PDO entry dialog: Hide disabled controls
 - Renamed "Use LRD/LWR instead of LRW" into "Disable LRW"
 - Show progress bar on expanding OD entries
 - Added "EcText.xml" with all master messages
 - Removed creation date and version of EniEngine from generated ENI file
 - Improved visibility of Task-Tab
- Fixes
 - Fixed bug: Multiple Task: Input and output PDO Size was zero if the size was smaller than 8 bits
 - Fixed bug: Station alias address was sometimes wrong
 - Fixed bug: Variables were sometimes merged to a alignment variable
 - Fixed bug: Disconnected hot connect slaves were sometimes visible
 - Fixed bug: Saving hot connect configuration sometimes failed
 - Fixed bug: Refresh problems when "Insert Slave After" was executed
 - Fixed bug: Diagnosis mode with Fast Hot Connect failed

21.4 List of enhancements/bug fixes in version 2.1.1

- Enhancements
 - Added Fast Hot Connect support
 - Optimized refresh handling for PDO tab
 - Added support for ESI tag "Device/Info/Port"
 - Enhanced EMI feature: "ProcessImageWithHeaders"
 - Check if slave or master name is utf-8 or iso 8859-1 encoded
 - Improved support for "Multiple Tasks"
 - Limit name of master and slots to 80 chars
 - Integrated master version 2.7.2.12
 - Added warning if EMI file inside config files is not up-to-date
 - Report some master errors in error level
 - Improved EoE endpoint support for Windows 8.1
 - Added support for DC-Operation-Mode dependent PDO inclusion (prev. DC-Oversampling). Test: EL3773 / EL2262
 - Upgraded Infragistic controls to V15.1.20151.2055
- Fixes
 - Fixed bug: Home or end key in variable tab had to be pressed two times
 - Fixed bug: ENI import failed if ENI was created with activated master properties
 - Fixed bug: Scrollbar doesn't work correctly on PDO tab
 - Fixed bug: InitCmd tab and PDO tab was not correctly refreshed on changing XML slaves
 - Fixed bug: It was possible to remove sub devices
 - Fixed bug: Outputs were sometimes wrong on SlaveToSlave tab
 - Fixed bug: Generated PDOs of variables tab were bigger than 240 bits
 - Fixed bug: Information window did not refresh after delete master unit
 - Fixed bug: Changing the language failed if the project explorer was not empty
 - Fixed bug: Disable and enable slave: Slave disappeared if earlier parent slave was disabled too
 - Fixed bug: Enable slave was not possible if first try didn't match
 - Fixed bug: Cyclic frames had sometimes wrong offset (not for default task)
 - Fixed bug: About dialog
 - Fixed bug: Changing master unit was not possible without configured slaves
 - Fixed bug: Read supported mailbox protocols of slave also on BusMismatch
 - Fixed bug: Subsequent variables after pad variable not shown in GUI. Test: EL3773

- Fixed bug: Refresh problems with bool values
- Fixed bug: Device icon from ESI was sometimes used from modules
- Fixed bug: CopyLinks were sometimes not shown correctly in GUI
- Fixed bug: Disconnected hot connect slaves were sometimes visible

21.5 List of enhancements/bug fixes in version 2.1.0

- Enhancements
 - Improved support for EL6731-0010 and EL6631-0010
 - Optimized refresh handling for PDO tab
 - Added hotkey "Ctrl+MouseWheel" for changing zoom in topology
 - Added support for "Multiple Tasks"
 - Moved "FoE" part to separate tab
 - Added notification if ESI files has been changed of active project
 - Improved tab "General" of slaves
 - Added new context menu entry "Change Slave" for changing the revision
 - Upgraded Infragistic controls to V15.1.20151.2008
- Fixes
 - Fixed bug: Variables tab of slots showed all variables
 - Fixed bug: Message "DC is not support from master" was sometimes missing
 - Fixed bug: Removed deprecated function "ECMaster.GetSlaveInfo()"
 - Fixed bug: Clear ESI cache of active project if slaves is no longer in use
 - Fixed bug: Name of complex OD entries was sometimes wrong
 - Fixed bug: For slaves without output PDOs, it was not possible to add output PDOs

22 Features of EC-Engineer V2.0

22.1 List of enhancements/bug fixes in version 2.0.3

- Enhancements
 - Optimized memory usage
 - Optimized performance for loading config file
 - Optimized performance for clipboard operations
 - Added "Home/End" support to project explorer
 - Improved "Disable Slave" support (try to move it to his previous position)
 - Added slave count to ESI manager
- Fixes
 - Fixed bug: Some DC settings caused wrong calculation
 - Fixed bug: CU1128 was not displayed correctly in diagnosis mode
 - Fixed bug: InitCmd tab sometimes crashed on cleanup
 - Fixed bug: "Append Slave (from Clipboard)" caused sometimes an exception
 - Fixed bug: Adding new slaves to a hot connect group doesn't work
 - Fixed bug: Ebus slaves were not marked with gray color for "Cut Slave"
 - Fixed bug: Connected slaves were not correctly displayed with bus mismatch
 - Fixed bug: "Insert slave before" lost EBus slaves
 - Fixed bug: "Copy&Paste" duplicated slaves
 - Fixed bug: Master API calles were sometimes called with MasterID

22.2 List of enhancements/bug fixes in version 2.0.2

- Enhancements
 - Added support for EC-Master V2.7.2.4
 - Added new EMI feature: "SafetySlavesSupported"
 - Show info message instead of warning in case of duplicate device was found in ESI file
 - Added new tab: "trace variables"
 - Added advanced option for changing mailbox size
 - Added "Page Up/Down" support to project explorer
 - Block installing ESI files with invalid reference files
 - Added station alias address to network mismatch analyzer

- Added check for station alias address
- Improved EscReg tab
- Limit name of slave to 80 chars
- Fixes
 - Fixed bug: If limit of max slaves was reached it was not possible to append more MDP modules
 - Fixed bug: It was possible to "unselect" a toolbar button
 - Fixed bug: Disable a slave inside group doesn't work correctly
 - Fixed bug: CoE OD tab crashed sometimes in diagnosis mode
 - Fixed bug: Log file was locked for the second instance
 - Fixed bug: Show connection lost, if watchdog is expired
 - Fixed bug: Keep name and address of slave after copy from clipboard

22.3 List of enhancements/bug fixes in version 2.0.1

- Enhancements
 - Added support for EC-Master V2.7.1.8
 - Improved usability of "HexEditTextBox"
 - Enhanced "ESI2C" support
 - Reduced size of configuration file
 - Added DC category for creating EEPROM from ESI
- Fixes
 - Fixed bug: Compact view of EscReg tab doesn't work correctly
 - Fixed bug: Registers were sometimes written to wrong offset
 - Fixed bug: Block pinning for groups without IOs
 - Fixed bugs with "Beckhoff CX5000"
 - Fixed refresh bug with S2S-Copy
 - Fixed "DisableSlave" bugs
 - Fixed DC bugs

22.4 List of features in version 2.0.0

- Added support for EC-Master V2.7.1.6
- Added new advanced option "Check Serial Number"
- Added "Source MAC address" to master settings
- Enhanced EMI feature: "Process Image Layout"
- Added new EMI feature: "Cyclic Frame Layout"
- Added possibility to disable slaves
- Improved internal handling between EniEngine & Core & ViewModel
- Build stable API for internal layers
- Improved config file format