Change log

KPA Master Development Kit 1.6.55118.0, 2022-07-20

Contents

1. MDK version 1.6.55118.0, 2022-07-20

1.1. Common

1.1.1. Features

1.1.1.1. XML parser improvement

From now on, in addition to the values 1/0, Master can recognize the True/False values of boolean variables when parsing an XML file.

1.1.1.2. Restriction of background frames size

A possibility to limit a maximal size of background (not cyclic) frames has been added. The restriction value is set as the scheduler.busload.bgsizelimit INI parameter.

1.2. RTX64

1.2.1. Fixed bugs

Mailbox operations may not check timeout for disconnected hot connect devices. This leads to infinity wait on mailbox request.

1.3. QNX

1.3.1. Features

1.3.1.1. QNX 7.1 support

From now on Master supports QNX SDP 7.1 - the latest version of QNX.

2. MDK version 1.6.55111.0, released 2022-04-05

2.1. Zynq Xenomai

2.1.1. Features

2.1.1.1. Sample package for ZC702 update

Updated structure of Sample package for ZC702. Added SP.Designing with ZC702.pdf manual.

2.1.1.2. Documentation update

Updated documentation for MDK for Zynq Xenomai. The content of manuals was reviewed.

Also, from now on we do not deliver Readme separately. It was merged into MRT.Zynq.Xenomai.Manual. To get the corresponding information, refer to the sections MDK package and Installation.

3. MDK version 1.6.54937.0, released 2022-06-13

3.1. Fixed bugs

- Minor bugs fix.

4. MDK version 1.6.54931.0, released 2022-05-19

4.1. QNX

4.1.1. Features

4.1.1.1. Documentation merge

From now on we do not deliver Readme and Quick start guide separately. They were merged into MRT.QNX.Manual. To get the corresponding information, refer to the sections MDK package, Installation and Quick start guide.

5. MDK version 1.6.54924.0, released 2022-03-24

5.1. Fixed bugs

- Minor bugs fix.

6. MDK version 1.6.54923.0, released 2022-03-16

6.1. Xenomai

6.1.1. Features

6.1.1.1. Documentation merge

From now on we do not deliver Readme separately. It was merged into MRT.Xenomai.Manual. To get the corresponding information, refer to the sections MDK package and Installation.

7. MDK version 1.6.54916.0, released 2022-02-28

7.1. Fixed bugs

- Incorrect SATA disk initialization.

8. MDK version 1.6.54908.0, 2021-12-17

8.1. RTX64

8.1.1. Features

8.1.1.1. Documentation merge

From now on we do not deliver Readme and Quick start guide separately. They were merged into MRT.RTX64.Manual. To get the corresponding information, refer to the sections MDK package, Installation and Quick start guide.

9. MDK version 1.6.54901.0, 2021-12-02

9.1. Common

9.1.1. Fixed bugs

- ENI load fails when it contains the same object entry mapped for inputs and outputs.

9.2. Linux

9.2.1. Features

9.2.1.1. Ubuntu 16.04 support

From now on MDK binaries are available for Ubuntu 16.04.

9.3. Xenomai

9.3.1. Fixed bugs

- Damaged mailbox frame causes lock of mailbox operation.

9.4. RTX64

9.4.1. Fixed bugs

- Extra delays during communication with Master RPC Server.

9.5. VxWorks

9.5.1. Features

9.5.1.1. VxWorks SDK v 6.9.4.12 support

From now on VxWorks SDK version 6.9.4.12 is supported.

9.5.1.2. 4 hours Demo time

We increased time of Master operating in Demo mode and for Trial versions. From now on an operating time limitation is four hours.

9.5.1.3. Control of system resource allocation

A new error code ECAT_E_SYS has been added to Master error codes. It indicates system resources allocation fail. Master OSAL has been updated accordingly.

9.5.1.4. Function type

Function type has been added into description of Master functions.

9.5.2. Fixed bugs

- Fixed OS selection on the stage of socket configuring.

10. MDK for RTX64 1.6.54518.0, 2021-10-27

10.1. Fixed bugs

- Extra delays during communication with Master RPC Server.

11. MDK for Rt-Preempt 1.6.54505.0, 2021-04-30

11.1. Features

11.1.1. Support of EL6695 as a DC external synchronization device

From now on it is possible to use EL6695 as an external synchronization device for Distributed Clock synchronization.

11.1.2. Performance improvement

Reduced time of Master cycle processing.

11.1.3. Added DriveRotaionCiA402 sample

A new sample 22_DriveRotationCiA402 has been added into MIP. This sample demonstrates how to control a motor by using the CiA402 standard.

11.2. Fixed bugs

- Segmentation fault occurs while using Multimaster.
- Memory limit on attempt to download a firmware to the slave.
- Fail at executing EcatLoadConfigFromString repeatedly.

12. MDK for RTX64 1.6.54113.0, 2021-03-19

12.1. Features

12.1.1. RTX64 4.0 support

From now on Master supports RTX64 4.0.

12.1.2. Virtual COM improvements

From now it is possible to define names of input/output COM channels of the slave which is used for setting Virtual COM communication. To set channel names, the following INI parameters are added: vcom.channels.input and vcom.channels.output for input and output channels respectively.

To get details on the parameters, refer to MRT Manual.pdf (Master configuration file).

Added Virtual COM diagnostic messages. To get their description and remedies, refer to the Troubleshooting section in MRT Manual.pdf.

13. MDK version 1.6.53902.0, 2020-12-21

13.1. Features

13.1.1. 4 hours Demo time

We increased time of Master operating in Demo mode and for Trial versions. From now on an operating time limitation is four hours.

13.2. Fixed bugs

- The system BOOL type is used instead of ECAT_BOOL.
- Minor bugs fix.

14. MDK for Rt-Preempt 1.6.53715.0, 2020-11-04

14.1. Features

14.1.1. 4 hours Demo time

We increased time of Master operating in Demo mode and for Trial versions. From now on an operating time limitation is four hours.

14.2. Fixed bugs

- S2S communication failure.
- The system BOOL type is used instead of ECAT_BOOL.
- Minor bugs fix.

15. MDK for Xenomai 1.6.53703.0, 2020-07-29

15.1. Features

15.1.1. Xenomai 3.1 support

Master supports Xenomai 3.1.

15.2. Fixed bugs

- Impossible to start Master after RPC Server exit (Ctrl+C or “exit”).
- Minor bugs fix.

16. MDK for QNX 1.6.53501.0, 2020-03-30

16.1. Features

16.1.1. 4 hours Demo time

We increased time of Master operating in Demo mode and for Trial versions. From now on an operating time limitation is four hours.

16.2. Fixed bugs

- Master of Basic class does not support Mailbox FoE.
- Cannot write slave's alias to EEPROM.

17. MDK for RTX64 1.6.49070.0, 2020-03-20

17.1. Fixed bugs

- RtxTcpipStack exception when attaching to a bus with unplugged hot connected slave.
- Minor bugs fix.

18. MDK for RTX64 1.6.49048.0, 2019-10-07

18.1. Features

18.1.1. Master Status Monitor

The Master Status Monitor utility has been added to MRT for RTX64. Using this utility provides a convenient and simple way of monitoring Master status and, additionally, allows to start/stop Master.

18.1.2. RTX64 3.7 support

From now on Master supports RTX64 3.7.

19. MDK for RTX64 1.6.49041.0, 2019-04-23

19.1. Features

19.1.1. PCI card support

Master supports the usage of PCI card as a network interface card.

19.2. Fixed bugs

- EoE communication failed at sending a frame from Master to a slave if a frame size bigger than mailbox size on 64-bit operational system.
- Slave-To-Slave Communication is not enabled in Master of Basic class.

20. MDK for Xenomai/Zynq Nucleus 1.6.53302.0, 2019-03-13

20.1. Common

20.2. Features

20.2.1. 4 hours Demo time

We increased time of Master operating in Demo mode and for Trial versions. From now on an operating time limitation is four hours.

20.3. Zynq Nucleus

20.4. Features

20.4.1. Running Master via JTAG interface

From now on it is possible to get access to Master on the target via JTAG interface. You need to connect the host PC to the target with JTAG cable, build the boot image for JTAG and build Master application in Nucleus ReadyStart SDK. For more details refer to MDK documentation (MDK.Zynq.Nucleus.DesigningWithLZ200.docx).

20.5. Fixed bugs

- Master Cycle is unstable if the length of data to be sent is more then 820 bytes.
- Communication with Master is lost when the size of Ethernet packet to be sent exceeds maximum transmission unit (MTU).
- Error occurs at trying to log data.
- It is impossible to download firmware via Mailbox FoE.

20.6. Xenomai

20.7. Features

20.7.1. i.MX 6Q support

From now on Master supports i.MX 6Quad processor with custom KPA Driver.

20.8. Fixed bugs

- EoE communication failed at sending a frame from Master to a slave if a frame size bigger than mailbox size on 64-bit operational systems.

21. MDK for RTX64 1.6.49027.0, 2019-02-22

21.1. Features

21.1.1. RTX64 3.6 support

Master supports RTX64 3.6.

21.1.2. 4 hours Demo time

We increased time of Master operating in Demo mode and for Trial versions. From now on an operating time limitation is four hours.

22. MDK for INtime 1.6.50005.0, 2018-12-27

22.1. Fixed bugs

- ECAT_S_PI_SYNC_LATE code is returned while Master transitioning from Safe-Operational to Operational state.

23. MDK for RTX64 1.6.49011.0, 2018-12-12

23.1. Features

23.1.1. RTX64 3.5 support

Master supports RTX64 3.5.

24. MDK for Xenomai/Zynq Xenomai 1.6.49002.0, 2018-11-28

24.1. Common

24.1.1. Features

24.1.1.1. C++ samples

From now on all MIP samples are also available for C++.

24.1.2. Fixed bugs

- Return code of function KPAMkpaInit() is not checked for errors.
- "Premium" is displayed as Master's name in Master about info in case of Full license applying.
- Dynamic load of libecatmsvr.so failed due to master lib dependencies.
- "space" character is removed from a variable name after the variable is got via API KPAMasterPiVariableGetName.
- "line 6: LD_LIBRARY_PATH: command not found" trace is got in the terminal after Master samples starting.
- 0 timeout in 19_MailboxMultipleRequests.

24.2. Zynq Xenomai

24.2.1. Features

24.2.1.1. Control of system resource allocation

A new error code ECAT_E_SYS has been added to Master error codes. It indicates system resource allocation fail. Master OSAL has been updated accordingly.

24.2.1.2. Function type

Function type has been added into description of Master functions.

24.2.2. Fixed bugs

- It is impossible to disable separate IO update for Sync Mode 2.
- Master crashes with "Segmentation fault" when a lot of separate threads are used and all of them request mailbox objects (CoE).

25. MDK for Rt-Preempt 1.6.48203.0, 2018-10-19

25.1. Features

25.1.1. Control of system resource allocation

A new error code ECAT_E_SYS has been added to Master error codes. It indicates system resources allocation fail. Master OSAL has been updated accordingly.

25.1.2. Function’s type

Function’s type has been added into description of Master functions.

25.1.3. C++ samples

From now on all MIP samples are also available for C++.

25.2. Fixed bugs

- It is impossible to disable separate IO update for Sync Mode 2.
- Master of Basic and Standard class cannot be transferred to a state unequal to actual state if connection with the bus has been previously lost and then recovered.
- Multimaster:
  - Second Master crashes after trying to get slaves count if the first Master is already running.
  - Communication with EtherCAT bus may be established only via the first NIC while local Multimaster usage.
- Master crashes with "Segmentation fault" when a lot of separate threads are used and all of them request mailbox objects (CoE).
- Custom application crashes on direct call of EcatMkpaInit function if Master resource manager was not started previously.
- Return code of function KPAMkpaInit() is not checked for errors.
- "Premium" is displayed as Master’s name in Master about info in case of Full license applying.
- Dynamic load of libecatmsvr.so failed due to master lib dependencies.
- There is no startup of ecatrsmngr in samples startup scripts.
- Master crashes with "Segmentation" fault after trying to load Master configuration in "09_NetworkScan" sample.
- Segmentation fault is got while disconnecting Master in 14_MailboxSoE sample and 15_MailboxVoE sample.
- "space" character is removed from a variable name after the variable is got via API KPAMasterPiVariableGetName.
- "line 6: LD_LIBRARY_PATH: command not found" trace is got in the terminal after Master samples starting.
- 0 timeout in 19_MailboxMultipleRequests.

26. MDK for Xenomai 1.6.33936.0, 2018-09-28

26.1. Features

26.1.1. Control of system resource allocation

A new error code ECAT_E_SYS has been added to Master error codes. It indicates system resource allocation fail. Master OSAL has been updated accordingly.

26.1.2. Function’s type

Function’s type has been added into description of Master functions.

26.2. Fixed bugs

- It is impossible to disable separate IO update for Sync Mode 2.
- Master crashes with "Segmentation fault" when a lot of separate threads are used and all of them request mailbox objects (CoE).

27. MDK for QNX 1.6.47501.0, 2018-07-26

27.1. Features

27.1.1. QNX 7.0 support

From now on Master supports QNX 7.0.

28. MDK for INtime 1.6.46201.0, 2018-06-20

28.1. Features

28.1.1. KPA Virtual COM via Windows

Support of Virtual COM communication via Windows Virtual COM interface has been added. From now on you can use both native INtime COM interface and Windows COM interface to communicate with serial devices.

29. MDK for INtime 1.6.44172.0, 2018-05-25

29.1. Features

29.1.1. KPA Virtual COM

The KPA Virtual COM support has been added to KPA MRT. In conjunction with the Virtual Serial COM plug-in for KPA Studio they allow the user to communicate with the serial device from Windows application via Virtual COM port. It is not required additional configuring with COM settings (baudrate, data bits, parity etc.). The KPA Virtual COM feature should be additionally activated through the MRT license file. More details see in the MRT Manual (MRT.INtime.Manual.pdf).

29.1.2. Microsoft Visual Studio 2015 support

From now on Master supports Microsoft Visual Studio 2015.

30. MDK for RTX64 1.6.44171.0, 2018-05-23

30.1. Features

30.1.1. Function’s type

Function’s type has been added into description of Master functions.

31. MDK for Windows 1.6.44140.0, 2018-04-19

Initial release of KPA EtherCAT Master Run-time 1.6 for Windows based on version 1.5. New features have been added:

1. Multimaster functionality
2. Event Handler
3. Explicit Device Identification
4. Virtual Serial COM

32. MDK for QNX 1.6.44113.0, 2018-03-21

Initial release of KPA EtherCAT Master Run-time 1.6 for QNX based on version 1.5.
It includes new features:

- Multimaster
- Event Handler
- Explicit Device Identification

33. MDK for Zynq Nucleus 1.6.42300.0, 2018-02-23

Initial release of KPA EtherCAT Master Run-time for Zynq Nucleus version 1.6.

34. MDK for INtime 1.6.33927, 2018-01-26

34.1. Features

34.1.1. INtime 6.3 support

From now on Master supports INtime v6.3.

35. MDK for INtime 1.6.33921.0, 2017-11-20

Initial release of KPA EtherCAT Master Run-time 1.6 for INtime based on version 1.5.
It includes new features:

- Multimaster
- Event Handler
- Explicit Device Identification

36. MDK for Zynq Xenomai 1.6.33918.0, 2017-10-27

Initial release of KPA EtherCAT Master Run-time 1.6 for Zynq Xenomai based on version 1.5.
New features have been added:

- Multimaster
- Event Handler
- Explicit Device Identification

37. MDK for Cyclone Rt-Preempt 1.6.33917.0, 2017-10-23

Initial release of KPA EtherCAT Master Run-time 1.6 for Zynq Xenomai based on version 1.5.
New features have been added:

- Multimaster
- Event Handler
- Explicit Device Identification

38. MDK for Xenomai 1.6.33910.0, 2017-10-13

38.1. Features

38.1.1. Xenomai 3.0.5 support

Master supports Xenomai 3.0.5.

38.2. Fixed bugs

- Master of Basic and Standard class cannot be transferred to a state unequal to actual state if connection with the bus has been previously lost and then recovered.
- Master statistics values, displayed in "Ethernet link information taken directly from NIC" block, are not reset.
- Multimaster:
  - Second Master crashes after trying to get slaves count if the first Master is already running.
  - Communication with EtherCAT bus may be established only via the first NIC while local Multimaster usage.
- Master and all slaves are not transferred to Operational state after loading configuration file (corresponding to configuration on the bus) via "lc" or "loadnewconfig" command in Master RPC Server application.
- Master crashes with segmentation fault after trying to reset statistics values of Master via "rs" or "resetstat" command in Master RPC Server application.
- EtherCAT stack crashes after trying to get slaves count in Master RPC Server application.
- Master resource manager depends on (links to) Xenomai libraries.
- The error "Failed to start resource manager: already exists: Bad file descriptor" occurs while starting Master resource manager.
- Custom application crashes on direct call of EcatMkpaInit function if Master resource manager was not started previously.
- Return code of function KPAMkpaInit() is not checked for errors.
- There is no startup of ecatrsmngr in samples startup scripts.
- Master crashes with "Segmentation" fault after trying to load Master configuration in "09_NetworkScan" sample.
- Segmentation fault is got while disconnecting Master in 14_MailboxSoE sample and 15_MailboxVoE sample.

39. MDK for RTX64 1.6.26118.0, 2017-09-21

39.1. Features

39.1.1. KPA Virtual COM

The KPA Virtual COM support has been added to KPA MRT. Also, the KPA Virtual COM driver is provided. In conjunction with the Virtual Serial COM plug-in for KPA Studio they allow the user to communicate with the serial device from Windows application via Virtual COM port. It is not required additional configuring with COM settings (baudrate, data bits, parity etc.). The KPA Virtual COM driver is installed independently of MRT installation. It is provided as a Feature Pack that should be additionally activated through the MRT license file. More details see in the MRT Manual (MRT.RTX64.Manual.pdf).

39.1.2. Added MailboxMultipleRequest sample

A new sample **19_MailboxMultipleRequest** has been added into MIP. This sample demonstrates how to work with Mailbox Multiple Request.

39.1.3. Added Multimaster sample

A new sample **21_Multimaster** has been added into MIP. This sample demonstrate how to work with several Master instances in the same process.

39.1.4. Added DriveRotaionCiA402 sample

A new sample **22_DriveRotationCiA402** has been added into MIP. This sample demonstrates how to control a motor by using the CiA402 standard.

39.1.5. RTX64 3.2 support

Master supports RTX64 3.2.

40. MDK for Xenomai/Rt-Preempt 1.6.29101.0, 2017-06-08

Initial release of KPA EtherCAT Master Run-time 1.6 for Xenomai/Rt-Preempt based on version 1.5.

New features have been added:

1. Multimaster functionality
2. Event Handler
3. Excplicit Device Identification.

41. MDK for RTX64 1.6.26105.0, 2017-04-29

Initial release of KPA EtherCAT Master Run-time 1.6 for RTX64 based on version 1.5.

New features have been added:

1. Multimaster functionality
2. Event Handler
3. Excplicit Device Identification.

42. MDK for VxWork 1.6.20111.0, 2015-08-13

42.1. Features

42.1.1. Mandatory LicenseFile parameter

The LicenseFile parameter of Master configuration file (INI file) is mandatory. To start KPA EtherCAT Master in “Demo” mode set “demo:///” as a value of “LicenseFile” parameter:

```
LicenseFile = demo:///
```

More details see in MRT Manual (MRT.VxWorks.Manual.pdf).

42.1.2. Binding license to SD device

From now on it is possible to bind license to SD device.

42.1.3. Configuring of Net driver is available via Master INI file

An opportunity to configure Net driver (tEcatDRV task) via Master INI file has been implemented. The following parameters was added into Master INI file:

- Threads.DRV.RX.Priority
- Threads.DRV.RX.Stack
- Threads.DRV.RX.Affinity

42.1.4. Multimaster support

Multimaster functionality is implemented (available as a Feature Pack). From now it is possible to use independent resources of Master for controlling different buses from the same PC. The following parameter was added into INI file:

Masters – comma separated list of names of Master configurations (described in INI file) to be used as instances of Multimaster.

And the following functions for getting a list of Master instances were added:

- **EcatMasterGetConfigurationsCount()** – to get number of Master instances.
- **EcatMasterGetConfigurationName()** – to get names of configured Master instances specified in Masters parameter.

More details see in MRT Manual (MRT.VxWorks.Manual.pdf).

42.1.5. Event Handler

Event Handler functionality has been implemented (available as a Feature Pack). New API functions for handling events were added:

EcatSyncQueueCreate

EcatSyncQueueWait

EcatSyncQueueDestroy

EcatMasterEventHandlerCreate

EcatMasterEventHandlerSetCapacity

EcatMasterEventHandlerAddFilter

EcatMasterEventHandlerAttach

EcatMasterEventHandlerDetach

EcatMasterEventHandlerDestroy

EcatMasterEventProviderCreate

EcatMasterEventProviderGenerateEvent

EcatMasterEventProviderDestroy

42.1.6. Thread priorities determination

It is possible to define Master's threads priorities within INI file through:

- **direct definition**:
  - Threads.RT.Priority=X
  - Threads.Normal.Priority=Y
  - Threads.Low/Priority=Z
- **Normalizer**:
  - Threads.BasePriority=X
  - Threads.RT.Normalizer=Y
  - Threads.Normal.Normalizer=Z
  - Threads.Low.Normalizer=W
- **BaseTaskPriority**:
  - MLTP=MBTP+4
  - MNTP=MBTP+8
  - MRTP=MBTP+12

42.1.7. Configuring MNTP/MLTP threads execution

The parameter "scheduller.busload.reservation" was added to Master INI file. It sets time in nanoseconds to the next cyclic data update during which Master does not initiate executing tasks of MNTP/MLTP threads. For more details refer to MRT Manual (MRT.VxWorks.Manual.pdf).

42.1.8. Support of Explicit device identification

From now on Master supports Explicit device identification.

42.1.9. Distributed Clock Initialization

From now on Master initializes Distributed Clock functionality in Pre-Operational state instead of Init.

42.1.10. Mailbox protocols in Bootstrap mode

In Bootstrap mode all Mailbox protocols except FoE (File access over EtherCAT®) are disabled. Error ECAT_E_INVALID_SLAVE_STATE is returned when attempting to use these Mailbox protocols.

42.1.11. Getting Slave name from ENI via API

An opportunity to get slave's name from ENI via Master API has been implemented with help of EcatMasterGetSlaveName function.

42.1.12. Getting CRC from ENI via API

An opportunity to get CRC from ENI via Master API has been implemented with help of EcatMasterGetCRC function.

42.1.13. Getting initial Master configuration

An opportunity to get initial Master configuration via Master API has been implemented with help of EcatMasterGetInitString function.

42.1.14. New API functions for work with PI Variables

New API functions for work with PI Variables have been added:

EcatMasterPiVariableFind

EcatMasterPiVariableGet

EcatMasterPiVariableGetInfo

EcatMasterPiVariableGetName

EcatMasterPiVariableGetOwner

EcatMasterPiVariableGetEntryInfo

EcatMasterPIVariableList

EcatMasterPIVariableListFilterSlave

EcatMasterPIVariableListFilterEntry

42.1.15. Work with INI file via API

An opportunity to work with custom INI file via Master API has been implemented with help of the following functions:

EcatIniParserExCreate

EcatIniParserExDestroy

EcatIniParserExAttachLookUpVariable

EcatIniParserExParse

42.1.16. ETG "Complete Frame" option

Parameter master.pi.layout was added into Master INI file. From now on it is possible to manage Process Image offset of Process Data according to ENI Standard:

master.pi.layout = auto - Master itself sets frame format depending on which application is used.

master.pi.layout = compact - KPA specific (used by KPA EtherCAT Studio).

master.pi.layout = complete - Complete frame in PI according to ETG format.

More details see in MRT Manual (MRT.VxWorks.Manual.pdf).

42.1.17. Support of Slave-to-Slave in ETG Standard ENI

Master supports static Slave-to-Slave communications defined in ENI file in ETG Standard (parsing of CopyInfos/ CopyInfo tags in ETG ENI

42.1.18. FoE protocol improvement

Master supports FoE Busy service for FoE Write sequence. The FoE Busy service is used to indicate the client, that the Server is busy to store the written data. The client will try to store the data until the server is ready (not busy).

42.1.19. EEPROM access

It is possible to manage number of Master's attempts to get access to slave's EEPROM for EEPROM reading/writing. The following parameters were added into Master INI file:

ss.eeprom.read_retries Number of Master's attempts to get access to slave's EEPROM during read EEPROM operation, default value: 30;

ss.eeprom.write_retries Number of Master's attempts to get access to slave's EEPROM during write EEPROM operation, default value: 30.

42.1.20. Cycle time restrictions

Master parses cycle time of Cyclic tag in ENI. If this value is available, master compares it with dwCycleTimeoutMicrosec parameter of EcatStartCyclicOperation function (non sync mode 2):

if cycle time does not match, Master returns ECAT_E_TIME;

if cycle time specified as MASTER_CYCLE_TIME_AUTO=0xFFFF, Master calculates cycle time automatically.

The same restrictions are applied to SetExternalCycleTime() call. By default external cycle time is set to MASTER_CYCLE_TIME_AUTO.

42.1.21. Improvement of Master initialization procedure

Master initialization is being postponed till the first call to create master via Master API (EcatMkpaInit). More details and examples see in Master Initialization section of the Programmer's Guide (KPA.EtherCAT.Master.ProgrammersGuide.pdf).

42.1.22. Master classes implementation

The following Master classes have been implemented: Basic, Standard and Premium.

42.1.23. New Master diagnostic flag

Additional diagnostic flags were added to EcatMasterDiagnosticState:

- for monitoring Process Image Outputs ("Wrong Outputs") EcatMasterDiagnosticStateOutputsUpdate.
- for checking status of Distributed Clocks synchronization:
  - EcatMasterDiagnosticDCInternalSyncEstablished

- EcatMasterDiagnosticDCExternalSyncEstablished
- EcatMasterDiagnosticDCPropagationDelayInitialized

42.1.24. MDK package update

EULA.txt was added into MDK package.

42.2. Fixed bugs

- Parameter "Mailbox telegram Counter" may take the value "0".
- EcatMasterPiVariableGetEntryInfo function returns 0x8002 error while getting info from "Alignment" variable.
- Master sends the command for outputs update two times in Synchronization mode 2 if "Separate I/O update" is enabled.
- Master returns ECAT_E_OUTOFMEMORY when provided size of "SoE read" buffer is less than required (from slave).
- Usage of ECAT_S_SYNC_CALL may lead Master crash while using SoE “Notify” service.
- Distributed Clocks Synchronization is lost while using 32bit DC slaves.
- Comment cannot be parsed by Master when it is placed after description of parameter in the same string within Master Configuration file.
- Master crashes while trying to read non-existent objects of CoE OD through CompleteAccess request.
- Priority inheritance is not used for critical sections.
- EcatGetDCMasterShiftTime function returns freezed pMasterShiftTime value when reference slave runs in link fail status.
- Undefined symbol message appears while using Master with Custom OSAL.
- HwGen can not get a list of ATA devices because of incompatible definitions of internal structures.

43. Imprint and disclaimer

43.1. Trademarks

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