



acontis technologies GmbH

EC-Monitor

EtherCAT® Network Monitoring

Version 3.1

Release Notes

1 EC-Monitor – Features

The EtherCAT specification contains a broad range of different protocols. The EC-Monitor Stack supports the following EtherCAT features:

- Configuration: EtherCAT Network Information Format (ENI XML)
- Cyclic process data update
 - Synchronous and asynchronous modes
 - Master triggered and user triggered data update
 - Memory provider interface for user application synchronization
- Error detection and diagnosis, e.g.
 - Lost cable connection or missing EtherCAT slave response
 - Wrong EtherCAT slave reaction (not all slaves responded)
 - Slave operation monitoring
- Modular software structure, easy portable
 - Ethernet Link Layer (zero-copy and polling option to optimize performance and CPU load)
 - OS-LayerFeature Pack Master Object Dictionary
 - An optional additional license for Master Object Dictionary support is now available.
- Feature Pack ET9000 Remote Access

2 V3.1

2.1 V3.1.4.12

Platform

- Fix support for KSZ9131 (disable EEE in Phylib)
- Add support for 64Bit DMA physical address on INtime6
- Add MAC Protection for Rockchip RK3588 and RK3568
- Fix AM437x SYSBIOS examples stack size
- ICSS: Configure TTS interrupt only if EC_T_LINK_PARAMS_ICSS::TtsParms::pfnStartCycle set
- Fix memory leak in emllAlteraTse

2.2 V3.1.4.11

- Fix reentrancy of emlInitMonitor() after emlInitMonitor() was called with bad parameters

Platform

- Platform, independent of Monitor
- Add PCI device ID 0x8161 to emllRTL8169
- Add QNX SMMUMAN support
- Add OsReleaseLinkLayerRegFunc to Linux
- Add support for SGMII on Marvell 88E1510 for Intel DW3504
- Fix DW3504 Rockchip Clocks and second Instance

2.3 V3.1.4.10

- Add emReadSlaveRegister

Platform

- Fix text translation crash in EC-Wrapper
- Fix crash in EC-Wrapper .NET if variable size exceeds 512 bytes
- Fix bit offset of process variables Inputs.DevicesState and Inputs.BusTime
- Fix RAS protocol corruption in case of concurrent send requests at server
- Refactor EcatDrv inf files to support all network adapters
- Add Device ID for Intel Pro/1000 I82545EM Copper
- Add support for Rockchip DW3504
- Add support for IRQ CPU affinity on Linux
- Add device IDs for Intel Pro/1000 (i8254x) I226
- Add support for Xilinx KR260 SGMII Port
- Fix occasional lock-up at stopping acceptor thread in emRasSrvStop(...)
- Fix EcatDrv to support KeTimer period < 16ms
- Update atemsys V1.4.25
 - Add IOCTL_INT_CPU_AFFINITY

- Add Device Tree Ethernet driver support for RockChip

2.4 V3.1.4.09

- Prolong Eval time limit from 10 to 30 minutes
- Enhance frame direction detection
- Add pcap file name support to EcMonitorDemo
- Add "-maxbusslaves" parameter to examples
- Fix frame processing in case of all RX frames missing
- Fix incomplete wireshark trace recordings
- Fix value distribution for min and max bin in performance measurement histogram
- Remove systematical delay of 250ms within emConfigLoad(), emConfigureMaster(), emConfigExtend(), emDeinitMaster(), emRescueScan(), emSelfTestScan()
- Fix crash in case of multiple cyclic entry ENI

Platform

- Add support for STM32MP135 to DW3504
- Add PartialImage libraries for VxWorks70
- Add support for ecatNotifyApp() from RAS Server application to RAS Client application
- Change connection type from UDP to TCP for emIIProxy
- Fix memory leak in RAS Client if connection lost while EoE-Endpoint active
- Fix EC_COPYBITS out-of-bounds read from pbySrc
- Fix all printf replaced with EcLogMsg in LinkOsLayer for VxWorks

- Update atemsys V1.4.22
 - Fix Build Warnings
 - Fix kernel config depending irq structures
 - Fix kernel version 4.12 to 4.15 for handle of dma_coherent bit
 - Add IOMMU support, new mapping to userspace active and tested for kernel > 5.4,
use old mapping with ATEMSYS_LEGACY_DMA=1 define or
activate new mapping with ATEMSYS_LEGACY_DMA=0 define for older kernel
- Update atemsys V1.4.23
 - Fix PCI bars
- Update atemsys V1.4.24
 - Add Device Tree Ethernet driver support for STM32mp135

2.5 V3.1.4.08 - V3.1.4.07

No changes

2.6 V3.1.4.06

- Add emStartLivePacketCapture to EcMonitorDemo
- Add support for fragmented CoE SDO Info mailbox transfers
- Fix read multiple *.pcap files
- Fix frame type (cyclic/acyclic) detection if cyclic frame contains NOP commands
- Fix rebuild topology from bus scan failed in packet capture processing mode
- Add emNotify - eMbxTferType_COE_GETODLIST
- Add slave station address to EC_T_COE_ENTRYDESC, EC_T_COE_OBDESC and EC_T_COE_ODLIST
- Add frame response error type eRspErr_CRC
- Remove BlockNode handling from CEmNotification
- Fix slave information prints contain "ERROR: Not found" in examples
- Fix crash in case of invalid ENI containing a hot connect group head slave with physical address equal to zero
- Increase log buffer in examples

Platform

- Force disconnection using PHY loopback for emIII8254x if ResetOnDisconnect not set
- Add support for emITiEnetIcssg on AM64xEVM with FreeRTOS
- Add emIIDW3504 for Xenomai
- Select 'ECAT Protocol Driver' installation on Windows by default if not currently installed
- Fix PCI link layer support for QNX ARM 32 Bit
- Add DCM MasterShift for QNX
- Add support for emIIIGEM on Xilinx Kria KR260
- Fix missing ATEMRAS_NOTIFY_CONNECTION EMRAS_EVT_SERVERSTOPPED on connection termination by server
- Fix TX hang in emIII8254x for I219 after uncontrolled termination
- Fix lock-up in EC-Wrapper RAS connection on termination by server
- Set default stack size to 0x8000 for 64 Bit architectures

2.7 V3.1.4.05

- Add histogram export to examples
- Fix no messages in error log if NOPRINTF defined

Platform

- Add emIIBcmGenet for Raspberry PI 4 (BCM2711)
- Fix reset MAC address at DW3504

- Fix memory leak in `OsCreateEvent()` on Linux, Xenomai, RTEMS and SylixOs in case of semaphore initialization error

2.8 V3.1.4.04

- Add Hilscher netANALYZER Ethernet TAP support
- Enhance Live Packet Capture
- Add `emNotify - eMbxTferType_COE_GETENTRYDESC`

Platform

- Add support for VxWorks70

2.9 V3.1.4.03

- Add packet capture processing command line option `"-play"`
- Add `"-oem"` command line parameter to examples
- Fix FoE monitoring in Bootstrap
- Extend pcap file format support (nanosecond pcap)
- Add FoE monitoring support
- Add interrupt support

Platform

- Increase resolution for `OsSystemTimeGet()` on Windows
- Add `bDisablePromiscuousMode` and `bDisableForceBroadcast` parameters to `emIINdis`
- Add absolute path support alternative to `OsGetLinkLayerRegFunc` for VxWork70
- Fix counter overrun in `OsQueryMsecCount` on VxWorks69 PENTIUM4
- Fix RTOS-32 is not supporting cycle times below 1000us (broken since V3.1.1.06)
- Fix occasional crash in RAS Server on `EC_IOCTL_UNREGISTERCLIENT`
- Fix occasional crash on `emRasCIntRemoveConnection` after `emRasSrvStop`
- Fix Interrupt Mode support for `emIINProxy`
- Fix Multi Tasks Configuration doesn't work with `emIINdis Linklayer`
- Fix memory leak on RAS socket disconnect while API call pending
- Fix to block `emRasCIntRemoveConnection`, `emRasSrvStop` until all worker threads terminated

2.10 V3.1.4.02

- Add `emGetSlaveInfo`
- Add performance measurement level to `-perf` command line parameter
- Add `emGetMemoryUsage` over RAS
- Fix topology after reconnect/restart/communication timeout
- Fix `EC_NOTIFY_TAP_LINK_STATUS` in interrupt mode
- Fix CoE response and abort handling
- Fix blocking API handling over RAS

Platform

- Add MAC protection to emlIFsIFec for i.MX8 and i.MX8m
- Fix CPSW transmit channels to work with acontis CPSW Linux driver patch
- Fix command line contains unexpected application name in RTOS-32 config files

2.11 V3.1.4.01

- Add notifications:
 - EC_NOTIFY_PDIWATCHDOG
 - EC_NOTIFY_STATUS_SLAVE_ERROR
 - EC_NOTIFY_SLAVE_ERROR_STATUS_INFO
 - EC_NOTIFY_SLAVE_STATECHANGED
 - EC_NOTIFY_CYCCMD_WKC_ERROR
- Fix bus load average 0 in case of Monitor and Master run with different cycle times
- Fix unfilled MbxData after emCoeGetODList
- Don't call OsMeasCalibrate() if performance measurement is disabled
- Rename PerfMeas distances to offsets

Platform

- Fix i8254x interrupt mode on ARM/AARCH64
- Updated to ECAT NDIS Protocol Driver Setup V3.1.3.4
Hide command window during driver installation
- Updated to atemsys V1.4.20
Fix support for CMA (Contiguous Memory Allocator) for kernel > 4.9.00

2.12 V3.1.3.03

- Add EC_T_MASTER_INFO::dwMasterStateSummary
- EC_T_MASTER_INFO::BusDiagnosisInfo data available even if compiled with EXCLUDE_MASTER_OBD
- Add EC_IOCTL_SET_NOTIFICATION_ENABLED and EC_IOCTL_GET_NOTIFICATION_ENABLED
- Add MasterSyncUnit support
- Fix interrupt mode support
- Add EC_T_PACKETCAPTURE_PARAMS::bReadMultipleFiles for emOpenPacketCapture()
- Cycle time and JOB_Total timer missing in EcSimulator since V3.1.2.10

Platform

- Updated to atemsys V1.4.18
Remove obsolete ARM cycle count register(CCNT)
Fix PCI driver do registration for all Ethernet network adapters
Add modul parameter AllowedPciDevices to adjust PCI driver
- Add CPU affinity support to Link Layers supporting interrupt mode

2.13 V3.1.3.02

- Support ENI file with CU2508 only
- Add support for emCoeGetODList
- Add EC_T_MONITOR_STATUS::bNextCyclicEntryReceived, rename EC_T_MONITOR_STATUS::bFramesInLinkLayerPending to bNextFramesReceived
- Add EC_NOTIFY_SB_STATUS, EC_NOTIFY_SB_MISMATCH
- Fix build topology immediately in packet capture processing mode
- Add process data input mapping for Inputs.BusTime and Inputs.DevicesState

Platform

- Add RTL8168H support to emIIRTL8169
- Fix DMA buffer alignment in emIIRTL8169 (regression since V3.1.3.01)
- Fix DMA allocation, requesting memory below 4GB for AARCH64/ARM64 on QNX
- Updated to ECAT NDIS Protocol Driver V3.1.3.2
Move promiscuous mode setting from NDIS Link-Layer to NDIS protocol driver
Add an entry "DontSetPromiscuousMode" in the Windows registry to avoid setting promiscuous mode in ECAT NDIS Protocol Driver
Rename Setup to "ECAT NDIS Protocol Driver"
- Fix EcatDrvGetDrvVersion on Windows (regression since V3.1.3.01)
- Add RTL8125 support to emIIRTL8169
- Updated to atemsys V1.4.17.
Fix atemsys dma_set_mask_and_coherent() missing in kernels under 3.12.55
- NDIS fix start-up with link disconnected

2.14 V3.1.3.01

- Add the InitMonitor parameter dwMbxRecordBufferSize to specify a buffer size for Mailbox recordings
- Fix crash on Xenomai when recording a Coe Object dictionary

2.15 V3.1.2.11

- Fix unset eMbxTferType in COE SDO upload notification when using emCoeSdoUploadReq
- Add EC_NOTIFY_COMMUNICATION_TIMEOUT and EC_NOTIFY_TAP_LINK_STATUS
- Add EC_T_MONITOR_INIT_PARMS::bApiLockByApp
- Add WKC State Support

2.16 V3.1.2.10

- Extend EC_T_FRAME_RSPERR_DESC with wCycFrameNum and dwTaskId
- Fix emGetBusSlaveInfo returns EC_E_NOTFOUND if called with autoinc addressing for some hot-connect configurations

2.17 V3.1.2.09

- Fix CoE Emergency notification
- Fix high CPU load in eUsrJob_MasterTimer
- Fix emGetSlaveState in case of slave is not present

2.18 V3.1.2.08

- Enhance Hot-Connect support to detect groups on master start-up
- Add EC_NOTIFY_MBOXRCV notification for emCoeSdoUploadReq
- Add API emHCGetSlaveldsOfGroup and emHCGetNumGroupMembers
- Store eMbxTferType_COE_SDO_DOWNLOAD and eMbxTferType_COE_SDO_UPLOAD in object dictionary accessible through emCoeSdoUpload

2.19 V3.1.2.07

- Add EC_NOTIFY_MBOXRCV for eMbxTferType_COE_SDO_DOWNLOAD and eMbxTferType_COE_SDO_UPLOAD
- Enable jumbo frame support for i8254x by default
- Enhance Hot-Connect support to detect connection and disconnection of Hot-Connect groups
- Enhance cycle/frame loss detection in states INIT, PREOP and during transitions

2.20 V3.1.2.06

- Fix cycle/frame loss detection for cyclic tasks with more than one frame
- emGetSlaveState returns the current and requested state accordingly to AL-Control, AL-Status respectively

2.21 V3.1.2.05

- Add PCAP file format support for "Nokia tcpdump" and "Modified tcpdump"
- Fix Object 0x2001 "Master State Summary", Bit 10: Bus Scan Match and Bit 16: Link Up
- Add PCAPNG file format support
- Add position independent ethernet tap support
- Fix link status after emInitMonitor

2.22 V3.1.2.04

- Fix emGetMonitorParms

2.23 V3.1.2.03

- Add EC_IOCTL_GET_CYCLIC_CONFIG_INFO, EC_IOCTL_IS_SLAVETOSLAVE_COMM_CONFIGURED, EC_IOCTL_CLR_SLVSTATISTICS

- Fix emGetSlaveInpVarInfoEx, emGetSlaveOutpVarInfoEx
- Add QNX7 support
- Add basic hot connect topologies support

2.24 V3.1.2.02

- Add emIsSlavePresent, EC_IOCTL_ISLINK_CONNECTED, EC_IOCTL_GET_LINKLAYER_MODE
- Fix performance measurement in EcMonitorDemo
- Fix invisible slave handling
- Add Xenomai3 support
- Add emGetMonitorStatus
- Add emBacktracePacketCapture

2.25 V3.1.2.01

- Change emOpenPacketCapture parameter set
- Add emStartLivePacketCapture, emStopLivePacketCapture
- EcMonitorDemo exclude EcDaq dependency
- Add Object 0x2200 "Bus Load" support
- Fix Object 0x2002:03 "Bus Diagnosis"

2.26 V3.1.1.07

- Add Object 0x2001 "Master State Summary", Bit 8: Slaves in requested State

2.27 V3.1.1.06

- Initial release of EC-Monitor

3 Supported CPU architectures

The following CPU architectures are supported:

- x86
- x86_64

4 Supported compilers

The EtherCAT master stack was built and tested with the following compilers:

- Microsoft Visual C++
- GNU Compile Collection (GCC)

5 Notes and known Limitations