

Firmware TSD-4.12.x

Summary: We strongly propose to use this release because of faster reaction to OverCurrent events! New Tama functions use large persistent tables based on filesystem. New dump files for error diagnostics.

CpuFirmware: Build 2.1.18 (4.12.12) (branch 4.12)

Release Date: 2021-06-25 16:40:35 +0200 (Fr., 25 Jun 2021)

SVN Revision: Revision: 38130

Remarks: Use TAM SDK >= 7.16.0 to support Tables and Option modules AN and AO

- FIX: The PulseTrain option must support negative cyclic data
- CHG: The Tama timeout detection was far too slow.
- FIX: Priority of STO warnings against DcBus warnings for the TSD350
- FIX: MotorTemperature fixes for the TS350
- FIX: Redmine #1067 USB-Jitter problems and other fixes
- NEW: masterError is now a 100kHz register
- CHG: EtherCAT: Default sConfiguredModuleIdentList is now two axes
- CHG: EtherCAT: Default resolution is now 1e6 instead of 10000
- CHG: EtherCAT: Some register write messages are now only shown with severity flags 0x04000000
- FIX: Not absolute encoders must setPosition(0)
- NEW: TOA4 parameters and fixed several TOA4 problems
- NEW: Individual dumpFile per axis, including EtherCAT signals
- CHG: Default velocityFilterT1=10ms
- CHG: Common Mode Current compensation is made after writing the Signals ActualCurrent.U,V,W
- FIX: Immediate Disable of PWM
- NEW: Phasing integrator limit error
- NEW: A commutationSource register allows specifying the encoder used for the commutation source
- FIX: Not-serial encoder commit not always successful
- FIX: The encoder velocity filter class used tau/2pi instead of tau.
- FIX: Publishing CPU-Temperature to the bridge monitor was accidentally removed in SVN33608 (4.9.1)
- NEW: Log file is now a circular file log.txt instead of log0.txt and log1.txt
- NEW: Timeout for homing setPosition in cases, where an external command overrides standstill
- NEW: persistent file system 10 tables
- CHG: (Breaking) No USB massstorage, obsolete because of EoT
- NEW: move to home position for absolute encoders, if already homingDone
- NEW: Directory format is now html instead of plain text and add a directory link to index.html
- FIX: Encoder conflict error: Wrong logic on encoderTopology change
- NEW: Homing must show errors in the explorer, prevent overwrite of axis error in case of errors that cause disable
- FIX: Gantry homing with ax1.secondSearch==Skip showed a parameterError (4.10.7, 36940)
- CHG: Excentricity option now also sets the excentricity register and saves it with the persistency
- FIX: EncoderTopology OptionB threw an error, if the 2nd option module was not an encoder mod. (4.12.10, 38126)
- FIX: (4.12.12, Update Encoder option modules)

FpgaFirmware: Build 1.4.9

- FIX: Improve reaction time to DcBusOverCurrent events

MonitorFirmware:

Release Date: 2021-05-21

Firmware TSD-4.10.x

Summary: New gantry features, fixes and improvements

CpuFirmware: Build 1.10.18 (4.10.7)

Release Date: \$Date: 2021-02-24 09:35:38 +0100 (Mi., 24 Feb 2021) \$

SVN Revision: \$Revision: 36960 \$

Remarks: Use TAM SDK >= 7.14.0 to support "Ethernet over Tria-Link"

- CHG: (BREAKING) remove obsolete axes[0].parameters.currentController.currentErrorLimit register
- NEW: Activate motor simulation (option 0x9A) and angleSearch directly writes the phasing angle now
- FIX: Allow homing with limit switches
- NEW: Use Axes[].Parameters.PositionController.ExcentricityCompensation (optional)
- NEW: Use Axes[].Parameters.CurrentController.FeedForwardLimit
- NEW: Support Gantry parallel angleSearch phasing and Gantry.Parameters.AlignAfterHoming (optional)
- FIX: bug from 35096 restart phasing must be possible for all encs
- FIX: Finish Phasing and reset pathplanner after phasing for standard enabling sequence, not only encoder-save
- CHG: Start phasing ramp at 20mA instead of 100mA
- FIX: Homing Invalidate did not reset the command
- CHG: (Breaking) New naming convention
- FIX: SaveParametersPermanently
- NEW: PositionLatch and homing feature positionErrorThreshold
- FIX: USB BooleanGaps issue introduced with Vitis migration
- NEW: Homing cmd SetPosition
- FIX: Relocate move of a modulo axis must not use continuous motion
- TEMP: Temporary release for 50mOhm shunt test (36232, 1.10.11 4.10.3-alpha)
- FIX: No abos for TOU1 and TOA1 since 34399/34430
- FIX: USB ASY bug due to BSP interrupts in XusbPsu_EpBufferRecv
- FIX: Sensorless bandpass filter should be zero for electrical velocities smaller than 1Hz
- FIX: Encoder conflict error: Wrong logic on encoderTopology change (from 36627)
- FIX: Too short filename in fw upload validation (4.10.7, from 36717)
- FIX: Modulo DirectCoupled (#1003) (4.10.7, 36959)
- FIX: BrakeTime (4.10.7, 36940)

FpgaFirmware: Build 1.4.5

- No changes

MonitorFirmware:

Release Date: 2020-10-12

- CHG: lowered motor temperature lower limits to -10°C/-5°C

Firmware TSD-4.9.x

Summary:

This firmware update is recommended for all TSD drive types and solves an occasional SafeTorqueOffStartup error caused by an unwanted watchdog reset of the safety monitor during STO pulse tests

CpuFirmware: Build 1.9.47 (4.9.7)

Release Date: Date: 2020-10-15 09:06:34 +0200 (Do., 15 Okt 2020)

SVN Revision: Revision: 35096

Remarks: Use TAM SDK >= 7.14.0 to support "Ethernet over Tria-Link"

- NEW: RestoreFactory function
- NEW: device commands for persistency save (blocks 180ms), disable and (re)load (blocks 80ms)
- FIX: TCP_MSS 1440
- NEW: desiredCurrentQ/D for the current controller
- NEW: Position controller active command
- NEW: Encoder Injected position, with linear interpolation
- NEW: Support Files system over USB and Tria-Link
- CHG: (Breaking) move masterPosition from command to signal, MasterPosition source must not be "Ignore"
- CHG: (Breaking) StartCurrentSineStaticVector and StartRotatingVectorConstantCurrent
now generate a D-current, not a Q-current
- NEW: Support Nikon 8MHz ("16-24-F8MHz", downsampling 2)
- CHG (!) Gantry2 rotative coordinate is now pos0-pos1 instead of (pos0-pos1)/2 (34335, 4.9.0-alpha)
- NEW: Support Gantry3 (34335, 4.9.0-alpha)
- FIX: Pathplanner endposition not precise redmine #913 / #915 (34430, 4.9.0-alpha)
- FIX: Support TOA4 modules (34430, 4.9.0-alpha)
- FIX: Redmine #916 (34430, 4.9.0-alpha)
- NEW: Support product TSP710 (34430, 4.9.0-alpha)
- CHG: (Breaking)Remove parameter modulationMethod (34430, 4.9.0-alpha)
- FIX: Ethernet connection loss during FW update: #919 LWIP (34570, 4.9.1-alpha)
- FIX: Persistence of DigitalEncoders (34794, 4.9.2)
- NEW: Improvements of the Sensorless mode: Notch (34822, 4.9.3-alpha)
- FIX: FPGA-OpenTrialink behavior (34857, 4.9.3-beta)
- FIX: USB issues (34895, 4.9.3)
- NEW: Register currentController.sensorlessBandpassDamping (34910, 4.9.5-beta)
- CHG: Extend amplitudes of 3-phase and 2-phase motors (34910, 4.9.5-beta)
- FIX: BridgeMode no abo/events for slaves (34967, 4.9.6-beta)
- FIX: SetPositionRelative after homing with Xnew at -1.0000000002 (4.9.7)

FpgaFirmware: Build 1.4.5

- add Trialink watchdog timer
- double size trialink fifo
- add lsb timestamp to extio:
- Support TSP710
- Current U,V,W with 18 bit resolution
- Serial Encoder (except Endat) with communication error and valid flag(OPT MODULES)
- Add Boot_Control and A7_Health_Monitor to slave_top.vhd
- add a pulldown resistor to the encoder ext_io
- saturation for enc_int.x and enc_int.y

MonitorFirmware:

Release Date: 2020-09-14

No changes since last Release

Firmware TSD-4.8.x

CpuFirmware: Build 1.9.8 (4.8.6+7)
Release Date: \$Date: 2020-04-14 11:42:04 +0100 \$
SVN Revision: \$Revision: 33538 \$
Remarks: Use TAM SDK >= 7.10.1 to support Biss-C

Changes since last Build:

- NEW: Nikon Encoder. Implement a string -F2.5MHz and -F4MHz to specify the frequency
- FIX: AnalogEndat and Tamagawa Zero function
- FIX: Backlash filter was limited to 20ms: Now sampled at 10 kHz, max 0.2s
- CHG: Ecat: Wait for booting finished at ISO and ASY
- FIX: TOE1 pulldown of EncIn and reboot
- NEW: Support axes[].commands.general.event = ChangeUnits
- CHG: Prio STO > LinkNotReady
- NEW: errorNumber registers supported and General.Signals.DigitalInputBits and internals.linkAddress
- FIX: if position is close to modulo, coupling can throw a false alarm 26.05
- FIX: MotorTempMon VoltageOutOfRange bug
- CHG: Correct limits for currentController.desiredVoltageD
- FIX: USB ISO might be collected with delay by a slow PC hardware
- FIX: BridgeOverCurrent was delayed unnecessarily
- FIX: FeedForward coulomb friction was not correctly merged from 4.4 branch in SVN30354

CpuFirmware: Build 1.8.0 (4.8.2)
Release Date: \$Date: 2019-12-17 10:11:31 +0100 (Di., 17 Dez 2019) \$
SVN Revision: \$Revision: 32561 \$
Remarks: Use TAM SDK >= 7.10.1 to support Biss-C

Changes since last Build:

- FIX: Not absolute encoders during init: Do not set offset=0 but position=0
- FIX: USB abo gaps introduced in 4.8.0
- CHG: Ecat Touchprobe: use option positions for touchProbe1 if source & 0x1000 (use 0x100E for Fast Axis0DigIn1)

CpuFirmware: Build 1.7.13 (4.8.0)
Release Date: Date: 2019-12-09 16:23:33 +0100 (Mo., 09 Dez 2019)
SVN Revision: Revision: 32478
Remarks: Use TAM SDK >= 7.10.1 to support Biss-C

Changes since last Build:

- NEW: Product TSD81
- NEW: SafetyFOutputs
- NEW: Commutation Angle Parameter
- NEW: Log-File with LogSeverity switches
- FIX: Error recovery of Position controller caused frozen "Enabling" until disable
- FIX: Ecat LinkNotReady did not show up after first boot.
- FIX: TOE1: Build 1.3.6: IncrementalEncoderSaturation
- FIX: Setting Encodertype to Analog for a TOA1 device caused a not recoverable situation
- FIX: Encoderzero for AnalogBiss, PositionLatch of AnalogBiss and AnalogEndat did not consider analogOffset.
- CHG: Use option 0x800 to replace the Ecat state *27 normally used in standstill and coupled mode by 0x23 and show 0x27 only when coupled. Do not use with CNC-ISG (Post-Homing-Problem).
- CHG: Ecat: Option 0xe7 for legacy enable with Command bit 3.
- CHG: Faster Commit

FpgaFirmware: Build 1.3.5
Release Date: 2019-09-20
 - no changes since 4.7.5

MonitorFirmware:
Release Date: 2020-09-14

Changes since last Release:

- FIX: Occasional SafeTorqueOff error (4.8.7), see dedicated Monitor releaseNotes for details

Firmware TSD-4.7.x

CpuFirmware: **Build 1.6.17 (4.7.5)**
Release Date: **Date: 2019-10-23 16:17:36 +0200 (Mi., 23 Okt 2019)**
SVN Revision: **Revision: 32053**
Remarks: **Use TAM SDK >= 7.10.1 to support Biss-C**

- FIX: Absolute Encoders: Set persistence of hom and comm only on saving
- FIX: Absolute Encoders: Biss-B stored the wrong commutation offset
- FIX: STO inconsistent required two clearFaults instead of one
- FIX: Delay BridgeVoltageOutOfRange after bridgeMonitor ready to allow ADC settling
- FIX: Ecat register read/write Triamec-URIs was accidentally removed in 4.7.0
- BREAKING: Ecat state *27 instead of *23 in not coupled operation (CNC-Homing-Problem), use option 0x2000 for legacy behavior

CpuFirmware **Build 1.6.12 (4.7.3)**
Release Date **Date: 2019-09-17 14:09:07 +0200 (Di., 17 Sep 2019)**
SVN Revision **Revision: 31847**

- NEW: Support revision4 FPGA option modules with Monitor activation, FIX TOU1 issue
- CHG: If domainName parameter is empty, choose "TSD-NNN" with NNN=serialNumber
- CHG: EtherCAT Upgrade SSC11 from V5.11 to V5.12 (Tool 1.4.2)
- FIX: "ERR63.71 HttpGet FileNotFound" caused TCP errors
- FIX: Sensorless pathplanner tracking and phasing bug
- NEW: Position unit "turns"
- NEW: Reboot function
- NEW: Leave Operational notEnabled with (STO, linkNotReady and BridgeVoltageOutOfRange).
- FIX: Motor temperature settings after STO, and persistency bug with STO
- CHG: SignalProcessor is turned off if mode is turned off even without setting start
- NEW: Encoder short errors

Absolute Encoders

- NEW: Commutation Commands (see AN108)
 - StartPhasingAndSaveEncoder and enabling method AbsoluteEncoderOffsetEncoder
 - StartPhasingAndZeroEncoder
 - InvalidateEncoder requires disabled axis, changed enum from 6 to 10
- NEW: Support Biss-C and fix Biss-B nameplate read and analog bug
- CHG: AnalogEndat and AnalogBiss SubresolutionCheck enabled using dataFormat "M1"
- CHG: Digital encoder without nameplate should not init to zero, but to real absolute position
- FIX: AnalogEndat Legacy commutation Nameplate not handled and analogCount bug
- NEW: Nikon: Status info at Diagnostics.state 0x0F00000, read only during encoder start
- BREAKING: use 16 bit Nikon nameplate
- NEW: AbsoluteEncoder commutation based on mode zero

FpgaFirmware: Build 1.3.5 (4.7.5)

Release Date: **2019-09-20**
 - FIX: endat position with sign extension

FpgaFirmware: Build 1.3.4 (4.7.3)

Release Date: **2019-08-28**
 - FIX: software controlled switch on of the TAD SPI DRIVERS (Option modules).
 - FIX: Global latch digital input inverted

MonitorFirmware:

Release Date: **2019-09-04**

Changes since last Release:

- see dedicated Monitor releaseNotes for details

Firmware TSD-4.6.x

CpuFirmware: Build 1.5.9 (4.6.6)

Release Date: \$Date: 2019-09-04 10:22:58 +0200 (Mi., 04 Sep 2019) \$

SVN Revision: \$Revision: 31717 \$

Remarks: Use TAM SDK >= 7.10.0 to support TOF1, bridge mode and static IP registers

Changes since last Build:

TSD 4.6.3:

- NEW: CSV-Mode based on integrated B-spline, PV-Mode and CSP with velocity based modulo estimation
use 0x1604/0x1a04 or 0x1600/0x1a00 for cyclic telegrams with velocity
0x6502 contains info of CSV and PV modes
- FIX: Triamec.xml: TwinCAT cannot handle type double in startup list (0x23EE=ReferencePosition)
- NEW: restart AnalogEndat after encoderError
- NEW: Ecat: Register for axes[0].parameters.pathPlanner.streamInterpolatorMode
- NEW: New nameplate for DigitalEndat
- FIX: StreamReceiver: Support stop from coupled
- NEW: AxisCommandError "Pathplanner couple" if streamX is not within positionErrorLimit
- FIX: fixed Bug#689 'wrong acceleration when modulo-limit is set during move'
- CHG: improved calculation of deceleration move ratios
- FIX: Option encoders did not show amplitude errors (bug introduced in 4.4)
- NEW: homing persistent offset used on encoder finish, use legacy if OptionEncoderDrivePersistency.
- NEW: errorMessage strings
- NEW: general.signals.etherCAT.cyclic.pdo1c12 and pdo1c13
- NEW: (Re-)StartPhasing tested from Disabled/Operational
- CHG: In the standalone case, EtherCAT must not disable axes
- FIX: Tamagawa and Nikon require a wakeup time of 10ms. 5ms -> 50ms
- FIX: init of tama VMs (1.4.8)

TSD 4.6.4

- BREAKING: Ecat product revision is now 2 for Revision4 drives (1 for revision3 drives)
Use Triamec1.6.xml or option 0x100 to force old behavior
- NEW: File upload /put.html and directory /dir
- NEW: Axes[].Parameters.PathPlanner.InterpolatorDelay delays interpolator signals in microseconds. Use -24.0 for legacy behavior.
- NEW: Bridge Mode Ethernet to TriaLink
- NEW: Ethernet parameters for static IP
- NEW: Support new option modules TOA2, TOF1 (FFT)
- FIX: Persistent boot: MotorTemperatureSensor parameters must be copied on success only
- FIX: 1.5.6 Sensorless damping worked only, if a standard encoder was used before (4.6.2-beta, 31292)
- FIX: 1.5.7: Sensorless must disable pathplanner tracking (normally done in disabled) (4.6.3-beta, 31306)
- FIX: 1.5.8 There was a peak of desiredCurrentQ at the beginning of the phasing ramp (4.6.4)
- FIX: 1.5.8 TOF1-Modul interface (merge with 1.5.8, 4.6.4, SVN31361)

TSD 4.6.6 (4.9.2019)

- FIX: 1.5.9 Large encoderCountsperMotorRevolution caused bad commutation wrapping

FpgaFirmware: Build 1.3.2

Release Date: 2019-07-01

Changes since last Release:

NEW: Node addresses can be changed by local bus

NEW: Dedicated node addresses for bridge mode by USB or Ethernet over a drive.

NEW: drive can overtake the trialink master role (rings without trialink controller card)

MonitorFirmware:

Release Date: 2019-05-17

Changes since last Release:

- see dedicated Monitor releaseNotes for details

Firmware TSD-4.4.12 (19.3.2019)

If option modules are present, TSD-4.2.0 must have been installed before this!

CpuFirmware: Build 1.2.12 (4.4.12)

Release Date: Date: 2019-03-13 14:11:04 +0100 (Mi, 13 Mrz 2019)

SVN Revision: Revision: 30312

Remarks: Use TAM SDK >= 7.9.0 to support coulomb friction registers and stream filter

Changes since last Build:

- NEW: Ecat Stream Mode turned on with option 0x200000
- NEW: FeedForward coulomb friction
- NEW: Position Stream Filter
- FIX: TSD80: motorTemperature Configuration lost during STO
- NEW: Prototype of logfile <http://triamec-NNN/1:/log.txt> (option = 0x1000)
- CHG: Min EtherCAT cycle time is now 100us instead of 200us
- FIX: Clearing a hidden STO safe fault was blocked in some cases
- NEW: Encoder: Tamagawa, Analog-Biss-B and Biss-B error reaction
no absoluteCommutation so far
- FIX: DigitalEndat: modulo wrap
- !BREAKING! DigitalEndat: new scale (1.0 per turn)(ROT) or (1.0 per count)(LIN)
- NEW: EtherCAT: Support Explicit Device Id with Trialink1.4.xml
add error UnspecifiedPositionUnit on booting with unspecified scaling factor

FpgaFirmware: Build 1.2.11

Release Date: 2019-02-06

Changes since last Release:

- FIX: option modules transmit data with a downsampling of 79
due to a bug inside the new Zynq SERDES calibration unit.
- NEW: first TSP710 support with 2-Level Pwm
- NEW: Nikon encoder support
- NEW: Tamagawa encoder support
- NEW: Extended encoder error messages (not yet completed)
- CHG: Serial encoder rework
- NEW: Serial encoder without bit filter
- FIX: Pll error counters was not clearable

MonitorFirmware:

Release Date: 2019-02-19

Changes since last Release:

- see dedicated Monitor releaseNotes for details

Firmware TSD-4.3.4 (18.1.2019)

If option modules are present, TSD-4.2.0 must have been installed before this!

CpuFirmware: Build 1.0.8

Release Date: \$Date: 2019-01-18 13:54:17 +0100 (Fr, 18 Jan 2019) \$

SVN Revision: \$Revision: 29556 \$

Remarks: Use TAM SDK >= 7.8.0 to support new product naming and new homing method

Changes since last Build:

- **!BREAKING!** SerialEncoder Persistency (Position-Offset) requires parameters.homing.method = AbsoluteEncoderN!
- CHG: Products: Changed strings, support orthogonal scheme and remove obsolete products (SCN 006)
- FIX: USB: Delayed BIOS boot of attached PCs, Support USB3 plugs (Windows USB Stack 3)
- CHG: Adjust continuous current i2t time from 2s to 20s and temperature limits
- CHG: Encoder: change analogEndat mode readposition mode for endat 2.2 encs
- NEW: Ethernet: AUTO-IP hard-coded to 0x169.254.222.222 (AN123)
- FIX: Ethernet: improve plug disconnect behavior during publish
- NEW: resetDiagnosticCounters
- NEW: DigitalBissB encoder
- NEW: Latching of (slow) digital inputs with 100us resolution
- NEW: Support analog sensor input of encoder
- NEW: Axes[]/Signals/PathPlanner/StreamGapCount counts missing stream packets
use TwinCAT CAxis2::simulateStreamError to force a missing packet
- FIX: TSD350: wrong units of Axis[1] motorTemperature
- FIX: Option module axis1 wrong amplitudeState

FpgaFirmware: Build 1.1.11

Release Date: 2019-1-18

Changes since last Release:

- **FIX:** option modules unintended downsampling of 79 due to a bug
- CHG: encoder amplitude error and warning passed through a bit filter
- NEW: encoder error handling
- NEW: biss b, biss c and ssi encoder
- CHG: endat local bus rework
- NEW: encoder error signals on cyclic interface
- CHG: pll not locked behaviour (debouncing of the errors)
- see dedicated FPGA releaseNotes for details

MonitorFirmware:

Release Date: 2019-01-11

Changes since last Release:

- see dedicated Monitor releaseNotes for details

Firmware TSD-4.2.0 (14.11.2018)**CpuFirmware: Build 2329 (TSD-4.2.0-proto)****Release Date: \$Date: 2018-11-13 10:53:30 +0100 (Di, 13 Nov 2018) \$****SVN Revision: \$Revision: 28759 \$****Remarks: Use TAM SDK >= 7.6.0 to support Ethernet connections**

Changes since last Build:

- **MANDATORY FIX:** MotorPeakCurrent > DrivePeakCurrent can cause hardware damage
- **FIX:** FW update of an Option module in backup-mode
- **CHG:** etherCAT object 0x6092 (feed) is not writable in OP, recalculate on unit change
- **NEW:** units mm and degree
- **NEW:** add objects 0x1623 and 0x1a23
- **NEW:** digital endat: Set position zero if no persistency data
- **CHG:** Ecat Homing does not stop anymore if cmd 0x10 disappears, use Option 0x200 for legacy behavior

FpgaFirmware: Build 1.1.4**Release Date: 2018-11-12**

Changes since last Release:

- **MANDATORY FIX:** TriaLink PLL-not-locked issues
- see dedicated FPGA releaseNotes for details

MonitorFirmware:**Release Date: 2018-11-08**

Changes since last Release:

- see dedicated Monitor releaseNotes for details

THIS RELEASE DOES NOT CONTAIN FPGA OPTION MODULE FIRMWARE
USE NEXT RELEASE FOR OPTION MODULE UPDATE

Firmware TSD-4.1.2 (08.11.2018)**CpuFirmware: Build 2327****Release Date: Date: 2018-11-06 08:05:47 +0100 (Di., 06 Nov 2018)****SVN Revision: Revision: 28696****Remarks: Use TAM SDK >= 7.6.0 to support Ethernet connections**

Changes since last Release:

- FIX: Ethernet Ungraceful Disconnection handled
 - FIX: Ethercat eeprom station alias not persistent
 - FIX: Option Module FW download solve retries
 - NEW: Show Factory FW Release number and TSD130 string
- KNOWN ISSUE: FW Download of an Option Module that is running in backup-mode

- see dedicated FPGA releaseNotes for details

FpgaFirmware: Build 2211**Release Date: 2017-12-18**

Changes since last Release:

- see dedicated FPGA releaseNotes for details

MonitorFirmware:**Release Date: 2018-11-08**

Changes since last Release:

- see dedicated Monitor releaseNotes for details