

## Software History Xvi75V8S

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### 8.04A - 17th of February 2025

#### Fixes

- Small force bump after finishing force drive with already released force in cyclic synchronized position mode minimized
- Display of error 61 (overvoltage motor inverter supply) made more tolerant

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### 8.04 - 27th of January 2025

#### New

- EtherNet/IP CIP Sync support
- Gantry coupled mode support for easier integration of gantry systems into PLCs
- Position reached in cyclic synchronous position mode now indicated with bit 10 in CANopen statusword
- PSR bit 9 function extended and renamed to PSR\_BIT\_SYSTEM\_REFERENCE\_DONE
- New ASCII-Commands
  - CSTSO CIP Sync timestamp offset
  - FBCM Force buffered CSP mode for EtherNet/IP
  - GCME Gantry Coupled Mode Enable
  - SOD P402 Switch on at transition 3 disabled
- New SDO Objects corresponding to ASCII-Commands
  - 0x5003:106 (FBCM)
  - 0x5003:105 (GCME)
  - 0x5003:104 (SOD)
- New value for CANopen direct command object 0x5000
  - Object 0x5000, value 0x5002: RESO command

#### Fixes

- Mutual blocking at simultaneous web and socket server communication fixed
- Spurious freezing of WebMotion after motion recorder start fixed
- Spurious faulty display of warning 46 fixed
- Error in I2T calculation for ELAX fixed
- Processing of invalid application data setting with Ethernet Installer versions older than 1.5.0 prevented
- Sporadic problems during pole alignment with active notch filter fixed

#### Improvements

- In CANopen DS402 state machine, power stage now enabled at "switch on" command (used to be done at "enable operation" command)

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## 8.02B - 22th of November 2024

### Fixes

- Improvements in cyclic synchronized position mode with intensive additional SDO communication and Busmodule MP firmware V5.18

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## 8.02A - 30th of October 2024

### Fixes

- Missing TCP/IP events "@S1"/"@S2" at moves to actual position fixed
- Faulty functions at some buttons on WebMotion® load cell calibration tab fixed

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## 8.02 - 11th of October 2024

### New

- LINAX® Lxs F60S and Lxu F60S support
- Profinet MC\_HOME support
- Force Monitoring Verification support
- Storage of force calibration data into motor can now be disabled which is useful if force calibration is run frequently
- New ASCII-Commands
  - PMHSD Profinet MC\_HOME Support Disable
  - FMV Force Monitoring Verification
  - FCSM Force Calibration Storage Mode
  - IEMAC Industrial Ethernet MAC address
- New SDO Objects corresponding to ASCII-Commands
  - 0x5003:102
  - 0x5003:103
  - 0x5008
  - 0x5009

### Improvements

- Minor optical WebMotion® improvements

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## 8.00B - 09th of September 2024

### Fixes

- Abort during single protocol Busmodule update fixed
- Data range check for Forceteq Pro force sectors in WebMotion® fixed

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## 8.00A - 27th of August 2024

### Improvements

- General WebMotion® improvements
  - Preserve zoom when changing motion diagram display data
  - Logarithmic sliders changed to linear
  - Input fields in the MOVE section of move axis by click now persistent
  - Selected filter in advanced settings section of setup state controller now persistent
  - Filter not set automatically, when selecting desired frequency in FFT diagram
  - Correct display of Gantry Offset setting
  - Various minor optical improvements
- Consistency of PSR bits and internal trajectory generator state improved
- Various improvements in service menu

### Fixes

- Correct handling of ROTAX® Rxhq motors with not yet determined Position I\_Force Drift Compensation
- Incorrect display of error 91 after self starting program in Main/Sub configuration removed

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## 8.00 - 19th of July 2024

### New

- General synchronisation of controller firmware Xvi75V8S, Xvi48V8 and Tvi36V5
- Full functionality support for Busmodule MP
  - Ethernet over EtherCAT (EoE)
  - TCP/IP communication for WebMotion®, ASCII protocol and Ethernet Installer over Busmodule MP
- New ASCII-Commands
  - LARES Linear Axis Resolution
  - LAST Linear Axis Stroke
  - RP Repeat Positions
  - BCSPR Buffered CSP reserve
  - APSD Automatic program start delay
  - APSM Automatic program start number
  - FEIP Fieldbus ethernet IP address
  - FEMAC Fieldbus ethernet MAC address
  - FENM Fieldbus ethernet net mask
  - FEGW Fieldbus ethernet gateway address
  - FTCP Force Busmodule MP to TCP/IP communication
  - TLICA Tell installed licences
- New error numbers
  - Info 28 "IP range overlap"

### Improvements

- General controller improvements
  - Cyclic synchronized position mode with feed forward
  - More accurate I2T calculation
  - General calculation optimization within controller
- General WebMotion® improvements

- Various optical adjustments
- More detailed information in application data file
- Controller and motor serial number available
- Extended error history buffer
- Automatic program start
- WebMotion® access preventable by pin
- Quickstart function improved
- General communication improvements
  - TCP/IP stack update

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## **5.26A - 16th of Mai 2024**

- Enabling power stage with activated SS2 only possible if PSR bit PHASING\_DONE is set (otherwise error 90 is displayed)

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## **5.26 - 14th of Mai 2024**

- Saving SMU application again after SMU error 220 (SMU data inconsistent) and SMU error 0 (SMU unconfigured) now possible
- Spurious faulty calculation of error ramp down fixed (this caused error 50 when axis was referenced in soft limit with Codesys)

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## **5.24 - 19th of March 2024**

- LINAX® Lxs\*\*\*F120 with optical absolute measurement system support
- New ASCII-Command
  - BCSPR Buffered CSP Reserve
- Spurious error 77 at Power ON/OFF with Ethernet/IP buffered CSP mode at low RPI<4ms fixed
- DS402 mode initialisation adjusted (no reinitialization of already active DS402 mode, prevents problems with multiple mode request to same mode as done in Codesys)
- Initialisation issue for position correction table at ROTAX® Rxhq with optical encoder fixed

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## **5.22A - 01th of March 2024**

- General limit switch behaviour in gantry systems improved
- Improved communication stability between the controller and rotative drives

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## **5.22 - 09th of February 2024**

- Support for Rxhq110T4.0
- Ethernet/IP Buffered Cyclic Synchronous Position mode bus cycle time (RPI) is now configurable. Bus cycle time down to 1ms is possible
- Referencing a rotative motor will set the position of the motor to its single turn position
- New SDO Objects corresponding to ASCII-Commands
  - 0x5003:98 (ENAR)
  - 0x5003:99 (CTAB)
- Limit switch warning displayed correctly after enabling power stage

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## **5.20B - 11th of December 2023**

- Additional debug functionality added (no functional changes)

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## **5.20A - 04th of December 2023**

- Unnecessary communication to JSC motor removed at power loss

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## **5.20 - 28th of November 2023**

- Support for Lxs80F120, Lxs200F120 and Lxs2000F120
- Forceteq Pro: Speed limitation at limit force reached improved (especially after finishing a force drive in cyclic synchronised position mode)
- I2C communication improved at Xvi75V8S (reduction of I2C error at long motor cables)

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## **5.18A - 13th of November 2023**

- Improvements in cyclic synchronized position mode with intensive additional SDO communication

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## **5.18 - 26th of September 2023**

- Correction table support for ROTAX® Rxhq motors with optical encoder
- General controller performance improvements for ROTAX® Rxhq motors with optical encoder
- Autogain setting via WebMotion for all ROTAX® Rxhq motors sets a lower gain leading to more stable controller behavior

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## **5.16 - 17th of August 2023**

- Support for high resolution optical Rxhq 110 and Rxhq 50 motors
- Support for absolute gantry reference
- General improvements for gantry reference
- More accurate I2T supervision for Lxs\*\*\*F120 motors

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## 5.14B - 24th of May 2023

- No functional changes

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## 5.14A - 09th of May 2023

- Bug in output function assignment fixed
- Minor text changes in WebMotion

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## 5.14 - 17th of April 2023

- Z-Mark detection for reference drive made more robust, especially for Lxs160F60/Lxu160F60 with magnetic measuring system
- Maximum current settings increased to 20A
- New SDO Objects corresponding to ASCII-Commands
  - 0x5003:96 (EGMSO)
  - 0x5003:97 (VMTAE)
  - 0x5010:13 (BWFP)
  - 0x5010:14 (FTPES)

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## 5.12 - 05th of April 2023

- LINAX® Lxs\*\*\*F120 with absolute measurement system support
- Forceteq Pro controller enhancements
  - Adaptive switch between force controller and position controller to minimize dependencies of these two controllers
  - New Forceteq Pro elastic mode for special force applications with elastic structure (standard mode is solid mode)
- Gantry master/slave offset settings improved for easier commissioning of gantry systems
- New ASCII-Commands
  - BWFP Bandwidth Forceteq Pro
  - FTPES Forceteq Pro Elastic Spring constant
  - FTM Forceteq Mode (extended with value 2 = elastic mode)
  - TMO Tell Mode of Operation
- ROTAX® Rxhq measuring system filtering improved
- New Error 52 "The connected Jenny Science Motor is not supported by this servo controller"
- Same output functions can now be assigned to multiple outputs
- Velocity estimation used in ASCII command "TV" (Tell Velocity) and safety function SLS improved
- Power stage control signal generation for small target currents improved

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## 5.10G - 19th of December 2022

- Gantry master/slave offset settings now available at gantry master WebMotion
- New ASCII-Command
  - EGMSO Enable user defined gantry master slave offset
- Maximum allowed servo controller identification string length now 32 characters (ASCII-command "SID")
- Command line echo can be switched off for socket server communication
- Minor adjustments on load cell tab in WebMotion

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## 5.10F - 09th of November 2022

- Increased tolerance for continuous broadcast frames
- Optimized timing when setting the statusword bit which indicates success after reference drive (HORM). Prevents illegal state in a special case

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## 5.10E - 07th of September 2022

- Functionality "Virtual Multiturn Absolut Encoder" added
- New ASCII-Command
  - VMTAE Virtual Multiturn Absolut Encoder
- New Error 53 "Virtual multiturn position deviation exceeded tolerance"
- I2C communication improved for master/slave configuration

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## 5.10D - 08th of August 2022

- Functionality "Position Window Time" added (selectable delay of the PSR-Bit "IN\_POSITION" and Statusword-Bit "Target Position Reached")
- New ASCII-Command
  - PWT Position Window Time
- New SDO Objects corresponding to ASCII-Commands
  - 0x6068
  - 0x5001:42
  - 0x5010:11
  - 0x5010:12
- Update time of PDO objects 0x2005 (I\_Force Actual) and 0x200A (Force Actual Value) reduced to 100us
- Communication more robust against excessive Ethernet broadcast load
- Minimization of measuring system failures on LINAX® motors with optical measuring system after short power interruption

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## 5.10C - 09th of June 2022

- Default value of "Emergency Deceleration" after reset command now depending on encoder resolution
- Spurious error 88 in gantry systems fixed
- Controller problem with rotative motors passing overflow position  $2^{\text{exp}(31)}-1$  to  $-2^{\text{exp}(31)}$  and vice versa solved

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## 5.10B - 14th of February 2022

- Various improvements related to Signateq® and WebMotion
- New ASCII-Commands
  - SQAC Signateq® available calibrations
  - SQCM Switch Signateq® calibration mode
- Error number 58 messages clarified

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## 5.10 - 17th of December 2021

- Support for ROTAX Rxhq110-50T1.5
- ROTAX Rxhq measuring system filtering improved (static position error eliminated and control settling time reduced)
- New ASCII-Commands
  - TVPSM Tell Voltage Power Supply Motor
- Error number 54 extended for ROTAX Rxhq measuring system failure
- Error number 92 (3-phase motor output frequency exceeded 599Hz) only showed when power stage is enabled
- Error number 50 (Position deviation too large) works now as well with deviation position set to 1'000'000

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## 5.08F - 10th of December 2021

- Support for Signateq firmware V2.0 with calibration type "test report", "customer calibration" and "factory calibration"
- New ASCII-Commands
  - SQSNF Signateq Sensor Nominal Force
  - SQMRP Signateq Measurement Range Positive
  - SQSS Signateq Sensor Sensitivity
  - QSFT Signateq Sensor Force Type
  - SQOM Signateq Operation Mode
  - QSMT Signateq Sensor Model Type
  - SQSSN Signateq Sensor Serial Number
  - CLFO0 Clear Force Offset Reset
- New value for CANopen direct command object 0x5000
  - Object 0x5000, value 0x0x6011: CLFO0 command
- New SDO Objects corresponding to new ASCII-Commands
  - 0x5010:03 – 0x5010:8
  - 0x5011
  - 0x5012
- New Profinet Parameters corresponding to new ASCII-Commands
  - p6001...p6010
  - p6100
  - p6200
- Error number 58 extended for more detailed Signateq error information
- Command CLFO now available as program function



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## 5.08E - 12th of November 2021

- Forceteq pro controller initialisation corrected (controller parameters now match to the connected motor again)
- SMU parameter could not be loaded or saved in WebMotion (bug was introduced in version 5.08D)

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## 5.08D - 03th of November 2021

- No functional changes

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## 5.08C - 04th of October 2021

- New ASCII-Commands
  - SQFD Signateq Force Direction
  - LFRMS Limit Force Reached Maximum Speed
  - SQVER Signateq Firmware Version
- New value for CANopen direct command object 0x5000
  - Object 0x5000, value 0x1050: AREF1 command
- New SDO Objects corresponding to new ASCII-Commands
  - 0x5010:09 – 0x5010:10
- New functionality "automatic force direction detection" and "speed limitation at limit force reached" implemented
- New Info 34 "Automatic detection of force direction not possible in standstill"
- Error 76 (Gantry Master Slave Offset deviation greater than 0.5mm) changed to Info 35
- Communication to Signateq improved (solves sporadic error 94 at powerup with connected Signateq)
- Return value of ASCII-Commands SPC and SPMAC changed from "-1" to "?", when no SMU is mounted
- Power stage now always disabled before saving safety parameters (fixes incorrect output of error 50 or error 70 after saving safety parameters)
- Sporadic offline problem with WebMotion solved
- Incorrect display of low active inputs during ramp down fixed
- Missing input events at low active inputs fixed
- Bug in object access for Objects 0x5005:12 – 0x5005:13 fixed

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## 5.08B - 01th of July 2021

- New ASCII-Commands
  - SPC Safety Parameter CRC
  - SPMAC Safety Parameter and MAC Address CRC
- New value for CANopen direct command object 0x5000
  - Object 0x5000, value 0x1040: DMES command
- New SDO Objects corresponding to new ASCII-Commands
  - 0x5003:95
  - 0x5005:12 – 0x5005:13
  - 0x5010:01 – 0x5010:02
- Improved trajectory generation in cyclic synchronized mode, when only position is transmitted by PDO communication (noise reduction)
- Data consistency problem of Busmodule object 0x607A (target position) at changing from cyclic synchronized mode to any other mode fixed
- Spurious toggling of Force Calibration Valid "FCV" during active force calibration fixed
- WebMotion Update 6.06A: display SMU Checksum

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## 5.08A - 11th of June 2021

- New ASCII-Command
  - DMES drive mechanical end stop
- Cyclic synchronized mode for reverse direction gantry systems improved

- WebMotion motion recorder speed filter added

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## **5.08 - 28th of May 2021**

- Quickstart problems with mounted SMU solved

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## **5.06G - 06th of May 2021**

- THORLABS DDR25/M angle identification bugfix

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## **5.06F - 09th of April 2021**

- Add support Rxhq110-50T1.4
- Add support THORLABS DDR25/M
- New ASCII-Command
  - AREF automatic reference drive when entering DS402 mode 6
- New error number 58 for communication interrupt with Signateq
- Cyclic CAN Frame communication improved for Signateq
- WebMotion access time improved to reduce conflicts with parallel WebMotion and socket communication
- Improve field adjustment with active brake for brakes with <12um backlash
- Improve Anti-windup for better force regulation with Signateq

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## **5.06E - 05th of January 2021**

- The correct inductance value is entered in the motor table for Lxe 550F40, 100nm / Ra50R30 and Ra 60R30. This means that the controlling option "current feed forward" is also possible with these motors
- Watchdog timer command over socket connection worked only the first time the command was sent and after that not anymore. This is now fixed
- Signateq, force measurement value acquisition every 100µs and value sampling also every 100µs leads to undesired fluctuations with value losses. A sampling value every 50µs solved this issue

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## **5.06D - 04th of December 2020**

- Parameter input check for configuration over Xenax Ethernet Installer improved
- Error 82 in conjunction with excessive temperature requests over Busmodule fixed
- Minor WebMotion modifications

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## 5.06C - 27th of November 2020

- New ASCII-Commands for Forceteq pro
  - CLFO Clear Force Offset
  - FPK Force Peak
  - SFF Sector Force Curve Failed
  - SFS Sector Force Start
  - SFE Sector Force End
  - NDF Number of Drive Force to change parameter
  - ADF Acceleration of selected Drive Force
  - SDF Speed of selected Drive Force
  - DDF Direction of selected Drive Force
- New value for CANopen direct command object 0x5000
  - Object 0x5000, value 0x6010: CLFO command
- Info number for "I\_Force Drift Compensation Drive failed" changed from 31 to 32
- Process Status Register inconsistency for Ethernet/IP fixed
- Error 98 after driving into soft limits in Ethernet/IP buffered cyclic synchronised mode fixed
- Blocked switch from WebMotion to UpdateGUI fixed

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## 5.06B - 22th of September 2020

- Motion now blocked when SMU is unconfigured
- New ASCII-Commands
  - DMBUS Deactivate Motion Blocking by Unconfigured SMU
- New value for CANopen direct command object 0x5000
  - Object 0x5000, value 0x5030: DMBUS command
- Current Feed Forward algorithm improved
- Force limitation controller improved and new default bandwidth for Signateq set to 100Hz
- Internal trajectory generator for cyclic synchronous position mode improved

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## 5.06A - 21th of July 2020

- Signateq controller stability improvement
- WebMotion Force-MotionRecorder and I/O Function Indexes management improved

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## 5.06 - 10th of July 2020

- Signateq support
  - LF Limit Force
  - TF Tell Force
  - DF Drive Force
  - CLF Change Limit Force
  - FDF Force of selected Drive Force
  - FH Force High
  - FL Force Low
  - FTM Forceteq Mode
  - STBW Signateq Bandwidth
  - TTPS Tell Temperature Power Stage
  - MM Motor Manufacturer
- New SDO Objects corresponding to new ASCII-Commands
  - 0x2009:00 – 0x200A:00
  - 0x5001:41
  - 0x5002:16
  - 0x5003:88 – 0x5003:94
  - 0x603F:00

- 0x606C:00
- 0x60FF:00
- Bitfield for warning 46 implemented to find out, which DS402 object caused the warning 46
- Ramp down behaviour in error case in buffered cyclic synchronized mode for Ethernet/IP improved
- Spurious warning 40 after enabling power stage in cyclic synchronised position mode without reference fixed

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## **5.04B - 01th of July 2020**

- Problem in port number request over UDP fixed

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## **5.04A - 25th of June 2020**

- Transfer of current TCP/IP setting to bootloader improved

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## **5.04 - 15th of June 2020**

- Buffered cyclic synchronized mode for Ethernet/IP implemented

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## **5.02A - 12th of June 2020**

- Static Error in the evaluation of the actual position signal for Rotax Rxhq fixed

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## **5.02 - 29th of May 2020**

- New output functions for SMU feedback
- Signal conditioning for Rotax Rxhq encoder improved
- Spurious Error 74 after reference of some Lxs/Lxu motors fixed

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## **5.00 - 08th of May 2020**

- Initial version with XENAX® Xvi75V8S support
- Switch to DS402 mode 8 without reference now possible (starting a drive in mode 8 without reference is still not possible and leads to error 75)
- Synchronous program start support (mode 20)
- Cogging compensation test mode with enabled current feed forward improved
- Default value for avoid vibration damping (AVD) changed to 1
- Spurious Error 77 after switch to mode 8 fixed
- Error in input functions EE/EE1 change over ASCII-Commands or SDO Objects fixed