

Product Release Notice

KINGSTAR 4.2

General Availability Release Date

February 21, 2022

Product Overview

KINGSTAR is an all-software, complete “plug-and-play” PC-based Machine Automation platform for IoT and Industry 4.0. Key pre-tested and pre-integrated industrial machine components include software-based motion control, machine vision, programmable logic controller (PLC) and the industry’s only plug-and-play EtherCAT master that auto-discovers any vendor’s EtherCAT drive, IO or device and auto-configures the EtherCAT environment at startup. Built on the EtherCAT standard and supported by a real-time 64-bit Windows operating-system (RTOS) from IntervalZero, KINGSTAR empowers engineers to design, develop and integrate machine control applications or a system of controllers on a single Industrial PC. The KINGSTAR platform can replace all hardware with software-only motion controllers and machine vision positioning systems quickly and cost-effectively.

KINGSTAR version 4.2 allows developers to select only the functionality they need. KINGSTAR’s flexibility is provided through feature packages that allow you to grow your product at any time by adding functionality to the existing KINGSTAR Runtime.

Available KINGSTAR Runtime feature packages:

- Core packages for: 1, 2, 3 or 7 KINGSTAR cores
- Motion Packages for: Point to Point, Synchronization, Blending, and Kinematics
- Axis Packages for: 8, 16, 32 or unlimited Axis
- High Speed Timer
- Multiple Masters
- Hot Connect
- Cable Redundancy
- Programmable Logic Controller (PLC)

New Features

- Auto Tuning Feature is now available in the Configuration Tool. [KS-576] [KS-3103]
- Adds Servo drive profile over EtherCAT (SoE). [KS-111] [KS-3249]
- Adds Vendor-specific protocol over EtherCAT (VoE). [KS-3185] [KS-3249]
- Adds functionality to support all data in a slave's EEPROM. [KS-1501]
- Configuration Tool, on the Test page, now uses LEDs to represent an axis' motion state. [KS-3102]
- Adds a function to release an axis from the Stopping state, and detach an axis from camming or gearing. [KS-3231] [KS-3232]
- Adds a manual slave homing mode. [KS-3238]
- PLC supports writing a value to a simulated input. [KS-3241]
- Adds backlash compensation. [KS-3322]
- Adds a function to release a group from the GroupStopping state. [KS-3342]
- Adds APIs for customizing data to be updated in TickAction. [KS-3378] [KS-3401] [KS-3402] [KS-3403]
- Adds handles and feedback for slave mailboxes. [KS-3175]
- Adds Mailbox errors for AoE, CoE, and FoE. [KS-3398]
- Adds ESC errors and additional KINGSTAR error codes. [KS-3399] [KS-3401] [KS-3402]
- Adds Log function to .NET Class. [KS-3439]
- Adds the parameters of override factors. [KS-3545]
- Adds additional properties to KsCommandStatus. [KS-3554]
- Adds Hardware and Tools Search Filters to KINGSTAR Help.

Updates

- Analysis Console has been updated to get additional trace messages when specific message types are selected. [KS-3068]
- Adds additional log data types to KsLogDataType: logNone to KsLogVariable and logUnknown. [KS-3179]
- PLC function block adds a default timeout to MC_Reset. [KS-3195]
- In the Control Panel under Runtime Settings > Network Interface Cards, a new button was added to convert a Windows NIC to RTX64. [KS-3250]

- In the Control Panel under Runtime Settings > Network Interface Cards, a new shortcut was added to access the Windows Device Manager. [KS-3252]
- All start failures are now properly sent back to the user application. [KS-3400]
- Supports RTX64 4.2. [KS-3424]
- Changes RG-Factor to 1 in McPidSettings.DefaultTorquePid method. [KS-3441]
- Improves support for Sigmatek I/O: [KS-3639]
 - Improves support in the ESI Import Tool for the devices that use multiple input/output sync managers.
 - Supports revision 1 of the Sigmatek I/O coupler.
 - Fixes an issue in SDO segmented transfer.
- Adds return codes and descriptions to the KINGSTAR Command list.

Resolved Issues

- Resolves an issue where velocity deviation occurred when constant velocity was applied. [KS-2539]
- Resolves an issue of no value being read when mcCommandedValue was selected as the source of GetAxisVelocity. [KS-2541]
- Resolves an issue where MoveLinearAbsolute did not follow group motion profile settings when mcMotionProfileTypeACS was set to profileDelayInSecond. [KS-3048]
- Resolves an issue where InchGroup, JogGroup, HaltGroup, StopGroup, MoveCircularAbsolute, and MoveHelicalAbsolute did not follow group motion profile settings when mcMotionProfileTypeACS was set to profileUnitPerSecond. [KS-3053] [KS-3054] [KS-3055] [KS-3059] [KS-3060]
- Resolves an issue where ReadAxisTouchProbeStatus returned errNoError when EnableTouchProbe was set to FALSE. [KS-3090]
- Resolves an issue where MoveCircularAbsolute, when used in Machine Coordinate System (MCS), caused the velocity in ACS and MCS to be different when it was done. [KS-3091]
- Resolves an issue in MCS where MoveHelicalRelative returned a wrong starting position when it started to move to the commanded position. [KS-3097]
- Resolves an issue where GetGroupAcceleration could not get the expected value when the source was mcSecondEncoderValue. [KS-3107]
- Resolves an issue where no error was reported when ReadBoolVariable was called to read deleted variables. [KS-3109]

- Resolves an issue where MC_GroupSetPosition showed an error in MCS and PCS modes because the Cartesian transform supported only three axes but PLC used the fixed length of 64. [KS-3111]
- Resolves an issue where SetGroupPositionOffset in MCS did not affect PCS. [KS-3113]
- Resolves an issue where McMotionState didn't have the state mcHalted. [KS-3122]
- Resolves an issue where if Log was used and logAxis was KsLogSource, Log's ValueLength in KsCommandStatus was zero when Done was TRUE. [KS-3180]
- Resolves an error that occurred when you deleted a row containing default values under cam tables in LogicLab and Configuration Tool. [KS-3197] [KS-3210]
- Resolves an issue in access modes where, if an axis was moved in accessVelPos and then in accessPosVelTor, an unintended acceleration was generated. [KS-3201]
- Resolves an issue where axes did not follow commanded settings if the profile type was delay in second. [KS-3211]
- Resolves an issue in the Configuration Tool on the Tune page, under the Constant Speed area, where the test failed and the Start button was unavailable when torque mode was used to run the constant speed test. [KS-3214]
- Resolves an issue where an errWrongParameter error occurred if SetAxisParameter is used and mcTorqueMinimumOutput's value is equal to or greater than two. [KS-3215]
- Resolves an issue where the Reset button in Diagnostic Tool was not resetting slaves. [KS-3239]
- Resolves an issue where the Analysis Console contained a memory leak when standard messages were being logged. [KS-3264]
- Resolves an issue where HaltAxis could not halt the axis while an axis was homing using homingSlave. [KS-3307]
- Resolves an issue where using RequestSlaveState to switch the EtherCAT state to PreOP, caused the states read from 0x0130 (AL Status) and GetSlaveById to be different. [KS-3308]
- Resolves an issue where method IModule.UpdateConfiguration did not update KD in PID setting. [KS-3325]
- Resolves an issue where if deceleration and jerk used in HaltAxis are much smaller than the commanded velocity, the commanded velocity would overshoot. [KS-3331]
- Resolves an issue where InchAxis would never end if it took negative distance and mcNegativeDirection. [KS-3335]
- Resolves an issue where the interpolation jerk HomeAxis used was different from its commanded value. [KS-3336]

- Resolves an issue where GetAxisError could not get an expected axis' error when an alarm was triggered on a drive. [KS-3344]
- Resolves an issue where when cable redundancy was enabled, if the first two cables were broken, the third axis would be offline but the offline axis should have been the first one. (The first cable connects the master and the first axis. The second connects the first and second axes.) [KS-3352]
- Resolves an issue where the method Api.AbortCommand could not release probe after Motion.SetAxisTouchProbe method's Done became TRUE. [KS-3354]
- Resolves an issue where a position lag error occurred when SetAxisPositionOffset was run in Relative mode. [KS-3357]
- Resolves an issue where an RTSS exception would occur when MoveLinearAbsolute contained a blending mode was called after HaltGroup. [KS-3371]
- Resolves an issue where MDP slaves failed to start if they required the list of identification numbers to be downloaded. [KS-3375]
- Resolves an issue where FoE write failed with slow devices. [KS-3385]
- Resolves an issue where a motion command was sent in ACS or MCS, its target position could not be retrieved in PCS. [KS-3423]
- Resolves an issue where MoveHelical functions could not be halted or stopped. [KS-3434]
- Resolves an issue where the ESI Import tool could not import a file in Turkish Windows. [KS-3445]
- Resolves an issue where Log would return errWrongParameter when setting KsLogSource to logInput or logOutput and KsLogVariable was logNone. [KS-3463]
- Resolves an issue where setting KsLogSource to logAxis caused an RTSS exception to occur if the index in a log channel was greater than the total number of axes. [KS-3464]
- Resolves an issue where calling SetVirtualAxis resulted in an exception if it was called after Start and ConfigureAxis. [KS-3465]
- Resolves an issue where calling PowerAxis caused a sudden unintended acceleration on an axis if the axis had an alarm when it was enabled. [KS-3466]
- Resolves an issue where using Log with negative length resulted in access violation. [KS-3489]
- Resolves an issue where some I/O control functions could not be used with I/O alias. They would throw RTSS exceptions if I/O alias were used. [KS-3494]
- Resolves an issue where a value given to IAxis.Alias and IloModule.Alias was not written to the Subsystem. [KS-3496]

- Resolves an issue where using SetAxisParameter to set mcVelocityMinimumOutput, caused GetAxisParameter to get an incorrect value from mcVelocityMinimumOutput. [KS-3508]
- Resolves an issue where using SetAxisParameter to set mcInterpolationTime to second caused GetAxisParameter to get an incorrect value and unit from mcInterpolationTime. [KS-3509]
- Resolves an issue where some parameters in McAxisParameter could be used after an axis is enabled, but their counterparts in functions could not perform the same task after the axis was enabled. [KS-3510]
- Resolves an issue where the error code of GetStatus is different in RT/Win32 and .NET API. [KS-3517]
- Resolves an issue where if the last two devices were disconnected when cable redundancy was used, incorrect data would be retrieved from SubsystemDiagnostics. [KS-3521]
- Resolves an issue where Sync Manager (SM) and FMMU reordering prevented connection to the devices that contained multiple input and output SM. [KS-3526]
- Resolves an issue where the ESI import tool could display only one input and one output Sync Manager. KINGSTAR now prevents the ESI Import tool from overwriting Sync Manager or FMMU settings when they were not fully displayed. [KS-3527]
- Resolves an issue where in IAxis.Override property, VelocityFactor, AccelerationFactor, and JerkFactor showed the incorrect settings. [KS-3545]
- Resolves an issue where the ISubsystem.Alias property did not reflect the settings written by the Api.EnableAliases method. [KS-3548]
- Resolves an issue where Log could not trigger logging properly if the trigger type was logBelowAbs.. [KS-3562]
- Resolves an issue where KINGSTAR was unable to read the SDO objects from EL6751 when using the ReadIOSdoObject function. [KS-3578]
- Resolves an issue where if MoveAxisAbsolute is used with AOI machine, the axis was sometimes already stopped but the state stayed in Discrete Motion and could not be switched to StandStill. [KS-3625]
- Resolves an issue where PowerAxis could not turn on an axis, the Error flag did not become TRUE and Active and Busy did not become FALSE. [KS-3634]
- Resolves an error that occurred while MoveLinearAbsolute was used with blendingHigh while the group was moving. Resetting the axes and using MoveLinearAbsolute again resulted in an RTSS exception. [KS-3638]

- Resolves an issue where a software lag error and NAN in interpolation were caused by using MoveLinearAdditive with blending, halting the group after a 2-second delay, using MoveLinearAdditive to move the group to the same target positions again, and using SetGroupPositionOffset. [KS-3647]
- Resolves an issue where a software lag error and target positions were not updated correctly when using MoveLinearAdditive with blending. An error would occur while the group was moving. [KS-3649]
- Resolves an issue where an RTSS exception was caused by using MoveLinearAbsolute with blending, delaying 2 seconds and then an error would occur. [KS-3654]
- Resolves an issue where when MoveLinearAdditive was used with blending, the message "Calculate Circle: Start and End are not equidistant from Center" was displayed on the Analysis Console, and an RTSS exception occurred afterwards. [KS-3657]
- Resolves an issue where when modeDirectVel was used with simulated axes, actual position and actual velocity were not updated correctly. [KS-3667]
- Resolves an issue where when EL7201 was connected to KINGSTAR using the Configuration Tool, you would see the message "XXX control mode is not supported" in the Test page and could not control the axis. [KS-3686]
- Resolves an issue where the Configuration Tool reported a COE error of the object 0x2383:35 for the Copley Accelnet BEL. [KS-3687]
- Resolves an issue where the Configuration Tool allowed the HIWIN D2 to be enabled but its feedback was not correct. [KS-3690]
- Resolves an issue where an incorrect message returned from the KINGSTAR Runtime caused LogicLab to always show a warning window. [KS-3725]
- National Instruments hardware fails to start. [KS-3820]

Hardware Support

KINGSTAR has added out-of-the-box support for the following new hardware. See the *KINGSTAR Supported Hardware* document for a complete list of supported hardware.

Servo drives

- Beckhoff EL7211-0010 [KS-3443]
- Beckhoff EL7221-9014 [KS-3442]
- Delta ASDA-A3 [KS-3207]
- Ingenia Capitan XCR-E [KS-3444]

- Panasonic Minus A6BM [KS-3636]

Stepper drives

- Beckhoff EL7037 [KS-3202]

I/O modules

- Beckhoff EL2595, EL3443 [KS-3202]
- Hofo Kingservo: KSTE-P-DO32N, KSTE-P-DI32N, KSTE-P-DR12 [KS-3346]

Availability

KINGSTAR 4.2 is available beginning February 21, 2022, from the [IntervalZero Customer Center](#) or by contacting Sales: sales@intervalzero.com or (781) 996-4481.

We welcome your comments and feedback. If you have any recommendations or wish to suggest product enhancements, please contact [Product Management](#).