Product Release Notice

KINGSTAR 4.4

General Availability Release Date

June 9, 2023

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 4.4 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.

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 Runtime Features & Updates

General

- Incorporates RTX64 4.3 into KINGSTAR 4.4. [KS-4607]
- Supports the latest Windows 10 22H2 and Windows 11 22H2 Feature updates.
- Adds support for the latest 12th and 13th generation Intel® Core™ processors.
- Adds support for an OPC UA Server to remotely access KINGSTAR user variables. [KS-4625][KS-4320]
- Provides Configuration Tools that can communicate with the KINGSTAR Runtime remotely. These tools are provided in a KINGSTAR Remote Tools installer separate from the KINGSTAR Runtime. [KS-4321][KS-4694][KS-4393]
- Adds support for stopping the OPC UA server connection when using the Stop-RealtimeSubsystem [-force] command. [KS-4720][KS-4357]

Configuration Tool

- Supports an OPC UA connection, allowing a remote KINGSTAR Runtime connection. [KS-4640][KS-4483]
- Provides functionality for connecting to or disconnecting from a remote KINGSTAR Runtime system. [KS-4640]
- Adds an EtherCAT status button for displaying the EtherCAT connection status. [KS-4640]
- Supports configuration of additional functions on the Device Configuration page:
  - Motion mode to configure EtherCAT related functions and the built-in KINGSTAR motion control functions
  - Manual mode to configure EtherCAT related functions (IO and SDO). [KS-4743]
- Supports offline function (disconnected from the KINGSTAR Runtime) for editing an ESI database. [KS-4640]
- Adds support to the remote Configuration tool (without KINGSTAR Runtime installed) for auto-apply language (English, Traditional Chinese, Simplified Chinese only) based on the Windows Display Language. [KS-4640]

Scope

- Supports OPC UA connection, allowing remote KINGSTAR Runtime connection. [KS-4640][KS-4395]
- Adds support for the remote Scope tool (without KINGSTAR Runtime installed) for auto-apply language (English, Traditional Chinese, Simplified Chinese only) based on the Windows Display Language. [KS-4640]
- Supports offline function (disconnecting to the KINGSTAR Runtime) for viewing previous recorded data. [KS-4640]
- The Scope now supports automatic inclusion of all user variables on the Add Channel setup page. [KS-4719][KS-4430]

Control Panel

- Adds the OPC UA connection status icon in the Real-Time Subsystem field. Users can hover to the connection status icon to see the number of connections or click the Disconnect button to disconnect the OPC UA clients that are using the Real-Time Subsystem. [KS-4594][KS-4356]
- The Startup page now supports the ability to turn on the OPC UA Server in KINGSTAR PLC at Windows startup. [KS-4593][KS-4556]
- Adds an OPC UA Server setup page to configure user roles and firewall rules for OPC UA server to allow connections from remote computers. [KS-4585][KS-4361] [KS-4518]

ESI Import Tool

- In the Sync Manager field, the enable status of the process data is now set automatically by the import tool or Runtime. [KS-4800][KS-4833]
- SDO commands can be added to modules automatically after importing the ESI files. [KS-4614]

New SDK Features & Updates

General

- Adds development and debugger support for Microsoft Visual Studio 2022 LTSC versions. The SDK includes a VSIX package, that includes IntervalZero Real-Time Debugger and templates for creating RTSS applications and RTDLLs for Visual Studio 2022.
- Instead of single axis and axis group, the Log function now supports axis, input, output, and user variables. [KS-4762]

RT/Win32 APIs

- Adds a KINGSTAR Evaluation function for accessing the EtherCAT performance statistics variables. [KS-4347][KS-4572]
- Adds SourceHandle to the KsLogChannel structure to allow passing a handle instead of an index. [KS-4466]
- Adds two new motion errors, errUnstableTuning and errStaleTuning, to KsError. [KS-4742]
- Adds mcMotionStatusFilterDepth value to McAxisParameter. [KS-4886]
- Adds logDirectory type variables (AddVariableEx, GetVariableEx, GetVariablesEx) to the variable table to allow a tree structure for user applications. [KS-4939][KS-4319]

.NET API and .NET Class interfaces

- Adds .NET API and .NET Class interfaces that can be used from a remote computer. Created a new set of dll/Namespaces. [KS-4741][KS-4288]
    - IntervalZero.KINGSTAR.Base.dll.
        - IntervalZero.KINGSTAR.Base Namespace [KS-4753]
        - IntervalZero.KINGSTAR.Base.Api Namespace [KS-4754]
        - IntervalZero.KINGSTAR.Base.Class Namespace [KS-4755]
    - IntervalZero.KINGSTAR.Local.dll. [KS-4756]
        - IntervalZero.KINGSTAR.Local.Api Namespace
        - IntervalZero.KINGSTAR.Local.Class Namespace
    - IntervalZero.KINGSTAR.OpcUA.Client.dll. [KS-4653][KS-4288][KS-4389][KS-4355]
        - IntervalZero.KINGSTAR.OpcUa Namespace
        - IntervalZero.KINGSTAR.OpcUa.Api Namespace
        - IntervalZero.KINGSTAR.OpcUa.Class Namespace

.NET Base

- Adds the property SourceHandle to the KsLogChannel class. [KS-4466][KS-4631]
- Adds OPC UA error codes to KsError enumeration. [KS-4623][KS-4928]
- Adds new two motion errors, errUnstableTuning and errStaleTuning, to KsError. [KS-4742]
- Adds the value mcMotionStatusFilterDepth to McAxisParameter. [KS-4886]
- TriggerSource.SourceHandle has been changed to an object instead of an IKsCommand to support both KsCommands and UserVariables. [KS-4467][KS-4630]

PLC

- Adds two new motion errors, mcUnstableTuning and mcStaleTuning, to MC_Error. [KS-4742]
- Adds the value mcMotionStatusFilterDepth to MC_AxisParameter. [KS-4886][KS-4714]
- Adds Axel PID library to KINGSTAR LogicLab. [KS-4326]

New 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.

Network Adapters

- Intel® Ethernet Controller I225-LM [KS-4608]

Stepper drives

- Oriental Motor: AZD-CED [KS-4548]

I/O modules

- DECOWELL: EX-1100, EX-310H, EX-210H, EX-5454, EX-4454 [KS-4525]
- KEYENCE: CB-NEC20E [KS-4602]
- PLANET: IECS-1116-DI, IECS-1116-DO [KS-4902]
- XINJE: XINJE-LC3-AP [KS-4620]
- YOUTOOL: EC-MX16Y16LT-MA, EC-MX32LT-MA, EC-MY32RT-T-JSP [KS-4443]

Resolved Issues

For a list of all resolved issues addressed in this KINGSTAR 4.4 release, please refer to the Product Release Notes.

Availability

KINGSTAR 4.4 is available beginning June 9, 2023 through Partners and by contacting Sales: sales@intervalzero.com.

We look forward to any comments and feedback. If you have any recommendations, or wish to suggest any product enhancements, please contact Product Management at: productmanagement@intervalzero.com.