





Taiwan Pulse Motion Inspire New Automation www.tpm-pac.com



Deliver precision motion positioning with affordable, industrial-grade software

KINGSTAR Soft Motion is a complete software solution that creates PC-based machine controllers with premium precision and performance. Using a single industrial PC enhanced by the power of a real-time operating system (RTOS) for Windows, and leveraging the CANopen over EtherCAT standard, you can deliver a software-only motion control and positioning system guickly and cost effectively.



ENHANCE PERFORMANCE Improve performance and control by using the PC NIC, Ethernet cables and EtherCAT infrastructure.

EXTEND EASILY

Add any 3rd party protocols or opensource libraries with no vendor lock-in.

REDUCE COSTS

Replace hardware with software to reduce machine control costs by 25-50%

SPEED TIME-TO-MARKET

Improve productivity with pre-integrated motion libraries and EtherCAT autoconfiguration.

IMPROVE UX

Build a powerful UI with a worldclass Windows Interface (HMI).

SCALE DYNAMICALLY

Auto-configure an EtherCAT network when swapping any servo drives and I/O devices.

KINGSTAR Soft Motion provides the most comprehensive set of software-only components:

CANopen Over EtherCAT Support

Replace proprietary network protocol and I/O hardware with PC NIC and Ethernet cabling.

Auto-Configuration

Utilize a single configuration environment with pre-integrated EtherCAT servos drives and I/O devices for plug-and-play compatibility.

Hard Real-Time Determinism

Use IntervalZero's RTX64 hard real-time SMP aware subsystem for determinism on Windows.

Single Development Environment

Develop Visual Studio custom applications using managed code .NET framework, native Windows, or RTX64 libraries in C or C++.

SDK & Libraries

Leverage robust libraries that deliver functionality for EtherCAT, servo and I/O modules, motion and trajectory, electronic CAM, and PLC IEC-61131-3 standard.

Standalone Controller

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Consolidate, run and synchronize multiple independent systems, across multiple cores, on a Windows and RTX64 processor system.

User Interface

Create powerful UIs with Windows Interface (HMI).

Design, develop, and integrate motion control applications with software-only PC-based controllers for industrial machines.



KINGSTAR Soft Motion Professional & Entry

- · Motion control API for real-time precision, and accessible from Visual Studio
- Built on IntervalZero's latest RTX64 RTOS for real-time determinism
- Transform Windows 10 IoT into an RTOS and use Microsoft's Azure Cloud as a backend for motion control needs
- Scan the EtherCAT fieldbus for list of added or existing slave devices and automatically configure for use, without starting the master
- Use OPC UA for secure, open and reliable data communication
- Integrate with KINGSTAR PLC powered by Axel to simplify app design and development

KINGSTAR FIELDBUS

SOFT MOTION

KINGSTAR

Part of the KINGSTAR Machine Automation Platform

The KINGSTAR Machine Automation Platform is an open and standards-based, integrated platform that enables motion control and machine vision engineers to design, develop and integrate precision motion control and machine vision applications with either KINGSTAR's soft motion library and software PLC or 3rd-party software of their own choosing. It is built on the foundation of EtherCAT and a real-time 64-bit Windows operating system, and is a complete platform for functional integration.

PLC



KINGSTAR Soft Motion Professional

- Enable coordinated motion at 125 microsecond intervals
- Up to 3 cores for dedicated motion control

KINGSTAR Soft Motion Entry

- Support uncoordinated motion at 1 millisecond
- 1 core for dedicated motion control



EtherCAT® Analog Slave

EtherCAT[®] 8-Ch.Al

207-A220F



Features

- 8-Ch. 16-bit Analog input (AI) w. ±10V
 - DIN rail mounting (L-122 x W-65 x H-104 mm)

EtherCAT® Motion Slave

EtherCAT[®] 4-Ch.Encoder Slave

207-C244C/D



207-M2A2-GEN

Features

- Max. 4MHz Encoder input frequency
- DIN rail mounting (L-122 x W-65 x H-104 mm)

EtherCAT® Digital Slave -

EtherCAT[®] 16-Ch.DI/O

207-D411H-NNS/PPS



Features

- Pluggable terminal block with spring plug connectors
- DIN rail mounting (L-122 x W-65 x H-104 mm)

EtherCAT[®] 8-Ch.AO 207-A204F



Features

- 8-Ch. 16-bit Analog output (AO)
- DIN rail mounting (L-122 x W-65 x H-104 mm)

EtherCAT[®] 2-Axis Motion Controller 207-M2A2-GEN

Features

- Max. 6.5MHz pulse output rate
- DIN rail mounting (L-122 x W-65 x H-104 mm)

EtherCAT[®] 32-Ch.DI/O 207-D222-NNS/PPS

Features

- Pluggable terminal block with spring plug connectors
- DIN rail mounting (L-122 x W-65 x H-104 mm)

EtherCAT[®] Micro-Step Drive

Features



Features

EtherCAT[®] Closed-Loop Drive -

1-Axis Closed-Loop Drive

SVR-K111/K112

- K111: Current 2.8A / K112: Current 4.2A
- Dimensions: L-74 x W-140 x H-31 mm

2-Axis Closed-Loop Drive

SVR-K221



Features

- Current 1.8A / axis
- Dimensions: L-75 x W-140 x H-47 mm



- K111: Current 2.8A / K112: Current 4.2A
- Dimensions: L-74 x W-140 x H-31 mm

1-Axis Micro-Step Drive

STP-K111/K112

EtherCAT[®] 64-Ch.DI/O 207-D522-NNS/PPS



Features

- Pluggable terminal block with spring plug connectors
- DIN rail mounting (L-122 x W-105 x H-104 mm)

EtherCAT[®] 96-Ch.DI/O 207-D533-NNS/PPS



Features

- Pluggable terminal block with spring plug connectors
- DIN rail mounting (L-122 x W-127 x H-104 mm)

2-Axis Micro-Step Drive





Features

- Current 1.8A / axis
- Dimensions: L-75 x W-140 x H-47 mm

TurboPAC TPC-7200-BEK



KINGSTAR EtherCAT Soft Motion Controller

Features

- Robust and Flexible Fanless Embedded System
- Support Intel[®] Core[®] i7 Desktop Processor
- Support DDR4-2133 SO-DIMM, Max. 32GB
- Support storage with SSD/HDD
- Support RAID 0/1

Expansion					
Mini PCle	1 x Mini PCIe				
PCI / PCIe	1 PCIe x8 and 1 PCIe x1				
Mechanical					
Dimension	275 x 117 x 140 mm (W x H x D)				
Weight	2.7Kg				
Construction	Aluminum & Steel				
Mounting	Desktop or wall mounting (wall mount kit included) Side mounting (Option) DIN-rail mounting (Option)				

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	Ordering information
	• TPC-7200-i7-BEK
	i7-7700T w. KINGSTAR EtherCAT SoftMotion
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Software Supporting

KINGSTAR SoftMotion

Specification

System				
Operating system	Windows 10 IoT 64			
CPU	7th Gen Intel [®] Core™ i7 Desktop Processor			
Chipset	Intel [®] Q170			
BIOS	AMI BIOS			
Memory	DDR4-2133 SO-DIMM, Max. 32GB			
Power mode	1 x power button; 2-pin terminal block for external power			
Input voltage	24VDC input (3-pin terminal block)			
I/O Inte	rface			
Display	DVI-I and DisplayPort			
USB	4 x USB 3.0; 2 x USB 2.0			
Serial port	1 x RS-232(DB9); 1 x RS-232/422/485(DB9); 2 x RS-232(DB15)			
LAN	1 Intel [®] I219-LM			
EtherCAT	1 Intel [®] I211-AT			
Storage	2 x 2.5" SSD/HDD			
Audio jack	1 x Line-Out			

	Environme
Operating temperature	0°C to 0°C to
Storage temperature	5 ~ 90
Humidity	90% (

PCIe Card PCE-V144PS





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- to 60°C (14°F~140°F)*With Air flow to 50°C (14°F to 122°F) without Air flow
- 90% at 45 °C (non-condensing)
- 60°C) (non-condensing @ 60°C)

Features

- PCI Express x4 compliant
- Intel Server-grade I350 Ethernet Controller
- 4 independent Gigabit Ethernet Ports
- IEEE 802.3at Power over Ethernet standard
- Dimesions: L-150 x W-111.2 mm

Challenges With Traditional EtherCAT Configuration Processes

EtherCAT is a very flexible protocol. It allows connection of I/O modules, motor, drives, communication devices, couplers and even controllers. For each hardware type, there are different data exchange methods. A motor drive can use CANopen over EtherCAT (CoE) or SERCOS over EtherCAT (SoE) and multiple control modes like position, velocity and torque. EtherCAT also ensures that hundreds of devices can be used together and be precisely synchronized.

The KINGSTAR Auto-discover And Configuration Process

Instead of downloading and installing separate ESI files (based on XML) for each I/O or motor, KINGSTAR includes the most commonly used device information by default. Objects get built for each device in the whole EtherCAT network by recording vendor and product IDs. When an engineer runs KINGSTAR, the software immediately surveys the network for new, replaced, or edited I/Os, servo motors and drives, then instantly configures the network. This allows the engineer to access, understand, and communicate with all available I/O, motors and drives from the moment their program begins to run. The KINGSTAR API provides all of the variable information that you need to know, in order to write your applications.

What Makes KINGSTAR Different

Auto-configuration saves time, prevents hassle, and improves productivity. Engineers no longer need to spend countless hours downloading, installing, and configuring independent drives. Instead, the network is always up to date. KINGSTAR's list of supported motors continues to grow to keep pace with the market. Even if KINGSTAR does not include a drive that you need to use, you can import it into KINGSTAR when you install your new drive, and it will be instantly registered and configured. This ensures that KINGSTAR remains the most open and flexible soft motion platform on the market.

Axes: 1 I/O: 0 Access Mode: Position *						
Connected Hardware:	TPM SVR_K221 9		Alarm Reset	Disable		
Axes	Resolution 1000	0 velocity	324.00			
TPM EZE_M2A2 1		position	: 21,351.64	Reset		
TPM STP_K221 2	Jog Move SD	0	(Prostations of			
TPM STP_K221 3	Direction:	Forward •	Revolutions •			
TPM STP_K111 5	Acceleration:	3600	degrees per second :	iquare		
TPM SVR_K112 6	Deceleration: Velocity:	3600	degrees per second : degrees per second	quare		
TPM SVR_K111 7	Jerk	360000	degrees per second	ubed		
TPM SVR_K221 8						
TPM EZE-D222-NN 10 TPM EZE-A220F 11						

Benefits of KINGSTAR Auto-Configuration

- Instant configuration of all major I/O motors and drives
- Automatic updates for new, replaced, or edited servos
- No need to run and manage separate ENI files
- Easily configured by on-site resources
- Open to all devices, with the ability to add new devices quickly and easily
- The most complete device list available on the market