

**NEW  
'23**



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# TRIO MOTION TECHNOLOGY **NEW PRODUCTS**



- THE MOTION SPECIALIST -

# Flex-X Nano

## Integrated EtherCAT Controller Automation Product Line

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- ### AT A GLANCE
- \* EtherCAT cycles down to 125us
  - \* Up to 64 EtherCAT axes
  - \* Plug and play EtherCAT configuration
  - \* Built on Trio's Motion iX advanced motion core
  - \* Programmable in Trio's multi-tasking language or IEC61131-3
  - \* Application programming through *Motion Perfect*
  - \* Supports Trio's Flexslice system
  - \* Real time clock
  - \* 1.2 GHz, 64-bit Dual Core ARM Cortex A55
  - \* 128Mbyte DDR3, 128Mbyte Flash
  - \* RoHS, CE and UL approved
  - \* Clip-Together Design With 'Quick Release' Locks For Mechanical Integrity
  - \* RoHS, CE and UL Approved



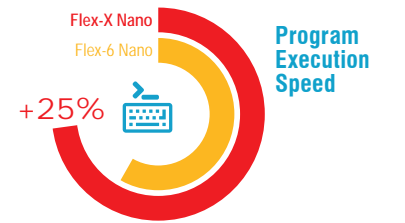
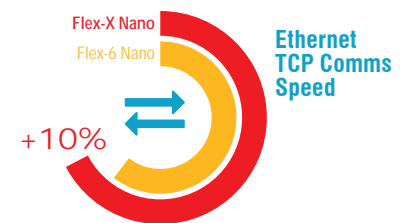
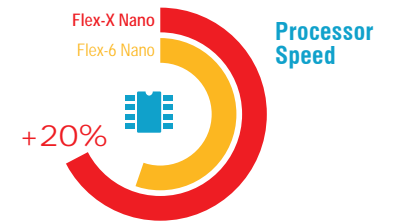
**The Flex-X Nano is Trio's next generation compact integrated EtherCAT solution offering up to 64 axes of motion and expandable through the matching Flexslice system.**

The Ethernet port on the Flex-X Nano supports application programming via Trio's easy to use *Motion Perfect* along with common HMI and PLC protocols for up-stream connections.

In addition to Ethernet communications, the Flex-X Nano is an EtherCAT master, with a connection for EtherCAT devices through an RJ45 port or through the EBUS connector for Trio's Flexslice system consisting of a range of high performance I/O peripherals.

User programs can be written in Trio's established multi-tasking programming language or industry standard IEC61131-3 using the powerful *Motion Perfect* application development software.

Build on Trio's advanced motion core, the complete suite of motion functionality is available through all languages, making complex motion easy.



Preliminary specifications may change without notice

# PC-MCAT-2

Motion + PC Solution  
Software Integration

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PC-MCAT-2 is an innovative 'Motion + PC Solution'. A choice of Intel processors (from Celeron through to i3 - i7) is used to drive both a high performance motion controller and a compact PC that can run user applications under Windows. PC-MCAT-2 is especially suitable where a machine needs the software and hardware features of a PC, paired with a powerful 64 axis *Motion Coordinator*.

## AT A GLANCE

- \* Motion + PC solution for Automation Machinery
- \* Fanless Compact PC with a choice of processors
- \* Up to 64 EtherCAT axes
- \* Plug and play EtherCAT configuration
- \* Built on Trio's Motion iX advanced motion core
- \* Programmable in Trio's multi-tasking language or IEC61131-3
- \* Shared memory API interface to allow PC side applications to interface with Motion-iX
- \* RTX64 Real Time Extensions to Windows
- \* 4 Gbyte DDR4 + 64 Gbyte SSD
- \* Built in Gbit ports for vision cameras

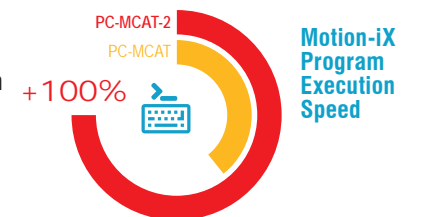
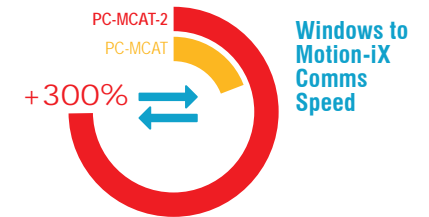
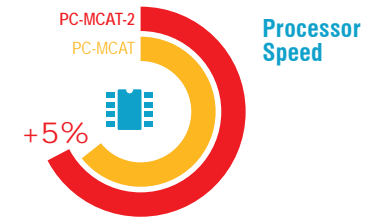


Trio's next generation PC-MCAT-2 combines PC technology with the Motion-iX advanced motion core allowing PC applications to run alongside real-time motion control and deterministic EtherCAT communication.

User programs can be written in Trio's established multi-tasking programming language or industry standard IEC61131-3 using the powerful *Motion Perfect* application development software. Alternatively, applications can be written and executed under Windows and use a shared memory API to communicate with Trio's Motion-iX advanced motion core, allowing maximum flexibility in application development.

PC-MCAT-2 supports a wide range of communication ports including Ethernet (up to 1000Mbit), USB (3.0 and 2.0) COM ports (RS232 and RS485) and HDMI for connectivity to PC peripherals. In addition to the communication ports, PC-MCAT-2 has 16 GPIO points, 8 DIN and 8 DOUT.

Supporting PC peripherals and off-the-shelf Windows applications alongside Trio's Motion-iX advanced motion core gives a high-performance flexible solution for applications where specific external devices are required (e.g. vision applications).





# MC403-X

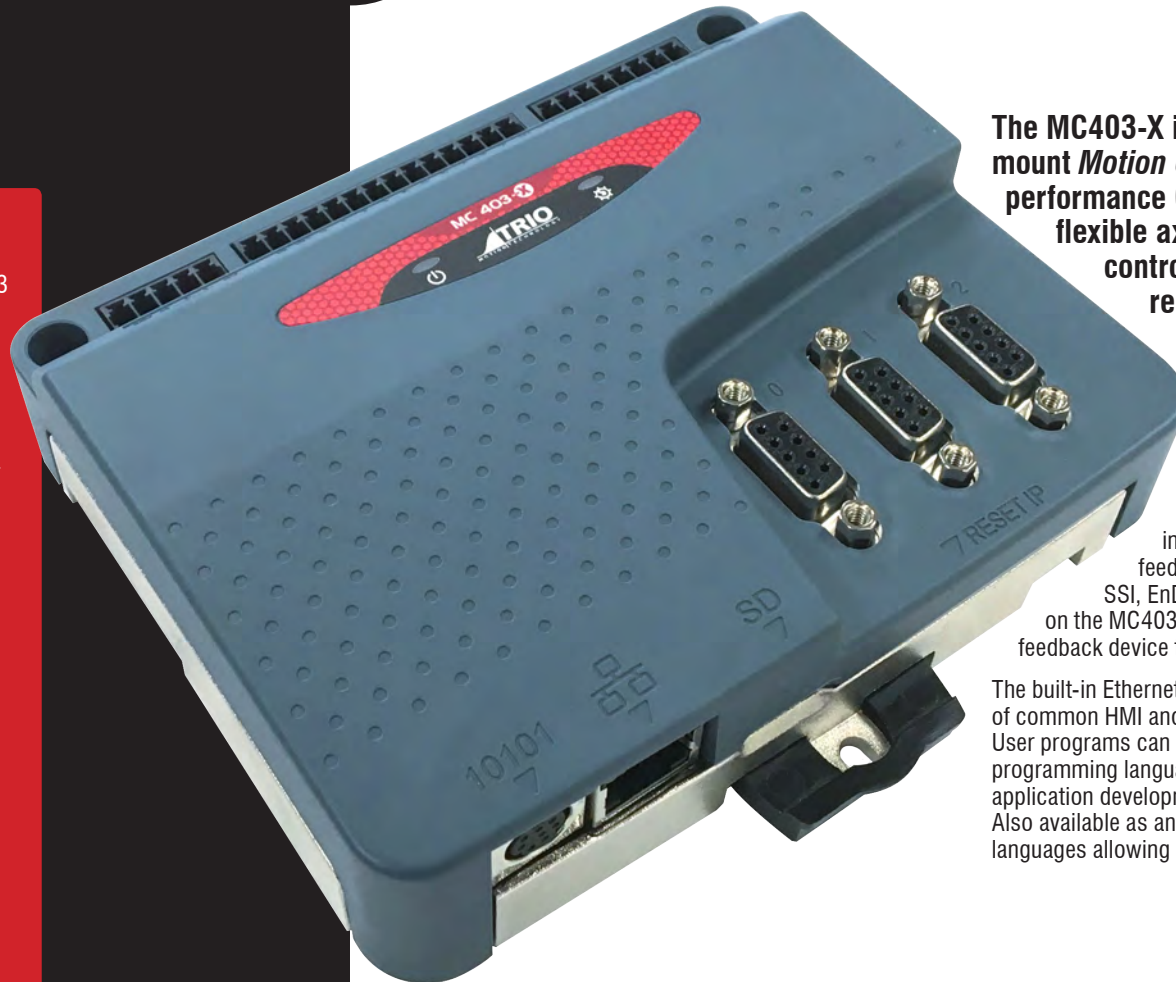
Pulse and Direction Controller  
All-in-one Controller

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## AT A GLANCE

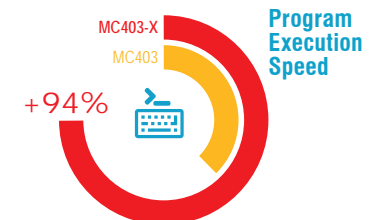
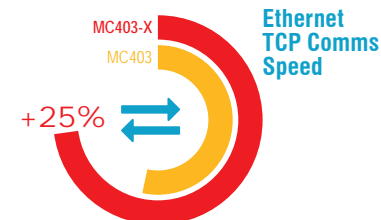
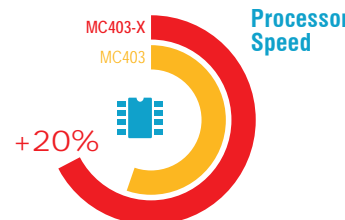
- \* Advanced 2 Axis Closed Loop Servo / 3 Axis Pulse Direction
- \* Linear, Circular, Helical and Spherical Interpolation
- \* Flexible CAM shapes, Linked Motion
- \* Biss, EnDAT and SSI Absolute Encoder Supported
- \* Hardware Linked Outputs for Camera / Laser Control
- \* Ethernet-IP / Modbus TCP / Ethernet Interface Built-In
- \* 125 – 2000  $\mu$ sec Selectable Servo Update
- \* Precise 64 bit Motion Calculations on Cortex M7 Processor with VFP
- \* IEC 61131-3 Programming
- \* Multi-tasking BASIC Programming
- \* Text File Handling
- \* Robotic Transformations
- \* Micro SD Memory Card Slot
- \* CANopen I/O Expansion
- \* RoHS, UL Listed, CE approved



The MC403-X is Trio's next generation panel mount *Motion Coordinator* using a high performance Cortex M7 processor. With three flexible axis ports and I/O for machine control, it is designed as a direct replacement for the successful MC403.

Each of the flexible axis ports can be configured in software as either input or output. As an output it can be used as 'pulse and direction' to control steppers or servo drives, or operate as a simulated encoder output. When configured as an input the axis port supports a variety of feedback devices including incremental encoder, SSI, EnDat or Tamagawa. The two voltage outputs on the MC403-X can be used in conjunction with the feedback device to form a closed loop servo.

The built-in Ethernet port allows programming and connection of common HMI and PLC protocols directly to the MC403-X. User programs can be written in Trio's established multi-tasking programming language using the powerful *Motion Perfect* application development software, making complex motion easy. Also available as an option are the industry standard IEC 61131-3 languages allowing a fully functional PLC programming system.



# RX-SCARA

400mm - 700mm SCARA Robot

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## Why Interface when you can Integrate?

Using a traditional robot controller approach presents challenges of programming the interaction between a machine controller and the robot controller, and two separate systems to maintain.

An integrated solution with robot and machine control as one coordinated system, maximizes performance and simplifies the programming and future maintainability and extensibility of the system.

### AT A GLANCE

- \* Trio SCARA package based on standard parts for simpler maintenance and offers standard cabinet install (no custom box required)
- \* Applications specific integration, adaptation of the application is possible, including I/O extension with our FlexSlice I/O offer
- \* Motion is simpler to implement in the Trio software environment (which includes IEC61131-3) than many PLCs
- \* The Trio controller can be programmed to control more of the machine solution and integrate machine elements, including additional axes, simplifying the PLC hardware and project
- \* Upstream Ethernet connection to the machine system / PLC (Ethernet/IP, Modbus TCP, Profinet I/O)
- \* DX standard drives can be used for other machine axes, making spares and maintenance even simpler



#### Integration Efficient

Rapid application development of controller and robot configuration with TrioRPS within *Motion Perfect*.



#### Design Efficient

One system to program, simplifying development and any future production changes needed.



#### Performance Efficient

Tightly coupled actions between robot and machine axes improves process quality and performance.



#### Maintenance Efficient

Spares holding of the robot control unit is simplified by using standard servo drives and motors to minimize downtime and reduce spares value.

# DX5

## Multiaxis Servo Drives

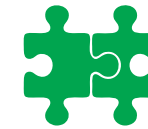


Building on the Trio DX series concept of 'everything you need, nothing more', DX5 is highly optimised for high axis counts and designed to maximise efficiency in all stages of design, installation and operation.

It's optimized hardware is designed to minimize cost in multi-axis motion systems by expanding at the controller and system I/O level.

Cabinet space is minimised by combining dual-axis drives units and DC power supply and reduced cabling and AC power side components.

This result can be a 8-axis system that uses 50% of a cabinet space of a typical AC servo system of similar power.



### Integration Efficiency

Rapid application development of controller and drive configuration within *Motion Perfect*.



### Space Efficient

Highly compact compared to standalone AC powered servo drives solution. AC power cabling and system wiring reduced by up to 80%.



### Design Efficient

One system to program, simplifying development and any future production changes needed.



### Energy Efficient

DC Bus regenerative energy is reused by the system. Energy savings for the life of the system, motor braking is absorbed and reused by all axes.





# DX3

200V - 400V Servo Solutions  
EtherCAT or Conventional



**DX3, the single-axis ac servo drive, is designed to create the most cost-effective optimised entry level solution with excellent performance and practical control functions.**

The Trio DX3 drive is compatible with Trio MX servo motors and Trio *Motion Coordinators* to provide high-speed, high-precision, high performance machine solutions.

With a power range from 50W to 7.5kW and options for EtherCAT or Conventional (Pulse & Direction, Analogue and CANopen) control, DX3 will suit a wide variety of machine types.

DX3 is fully integrated into Trio's application development tool, *Motion Perfect*, our software environment for system planning, configuration, virtualisation and machine programming.



### Integration Efficiency

Rapid application development of controller and drive configuration within *Motion Perfect*.



### Space Efficient

Compact single axis servo drive. Zero stacking to save panel space.



### Design Efficient

One system to program, simplifying development and any future production changes when required.



### Cost Efficient

Developed to be cost optimised, entry level servo drive with either EtherCAT or Pulse/Direction, Analogue and CANopen interfaces.



### Your Choice

Options for EtherCAT or Conventional control to suit your machine types.

# MXL Motors

Low Inertia High Speed Servo Motors  
Matched to DX Drives

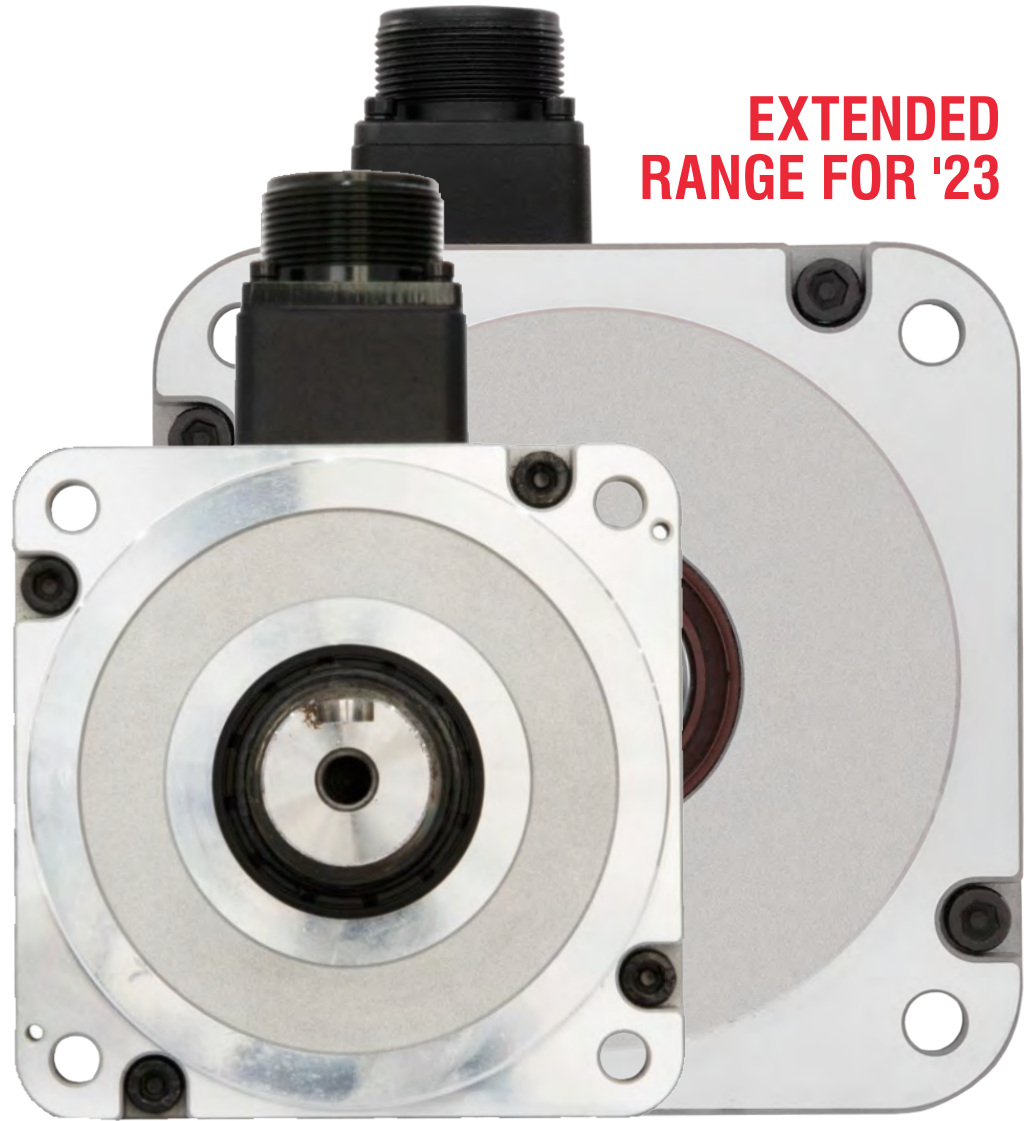


The MXL family of servo motors include solutions with 17-bit or 23-bit encoders, are suitable for application speeds up to 6000 rpm, include variants with an integrated brake.

Low inertia allows very fast response times and these motors develop a very high torque despite their small size. In combination with our servo drives, they are ideal for applications with high dynamic responses and fast and precise positioning.

Our servo drive systems can be used in a wide range of applications thanks to their high performance, available power range and compact dimensions.

**EXTENDED  
RANGE FOR '23**



- AT A GLANCE**
- \* Power range:  
50W to 3kW (200V)  
1kW to 5kW (400V)
  - \* Rated speed 3000 RPM  
(Max speed 6000 RPM)
  - \* 23-bit absolute encoder or  
17-bit absolute encoder
  - \* Low inertia
  - \* IP65 rated
  - \* Oil seal as standard
  - \* Optional brake
  - \* Compatible with  
Trio DX drives



**40mm**  
50W – 100W

**60mm**  
200W – 400W

**80mm**  
750W – 1kW

**100mm**  
1.5kW – 2kW

**130mm**  
3kW – 5kW



# UNIPLAY 15-A

15" HMI



Trio's unique UNIPLAY HMI system is a revolutionary way to make operator interfaces better, easier and more secure!

The UNIPLAY series boasts a 15.6" colour display with a resolution of 1920 x 1080 pixels and a powerful 1GHz ARM Cortex-A8 processor.

## AT A GLANCE

- \* Integrated HMI programming as part of machine solution
- \* Centralised program / HMI screen storage in a single project
- \* Tightly integrated to *Motion Coordinator* application
- \* Bind HMI fields to *Motion Coordinator* properties
- \* Link HMI buttons to functions in *Motion Coordinator* program
- \* Simulator built into *Motion Perfect* to test designs before deployment
- \* Connect up to 2 HMI devices to a single *Motion Coordinator*
- \* Ethernet connection to controller for reduced wiring
- \* 512 Mbyte DDR3, 256 Mbyte Flash



# Motion-iX

Motion Optimal Engineering Technologies



<h3>Trio Machine Automation Technology</h3> <p>Trio has developed powerful rich set of software tools for use with Trio systems. These tools provide all the features necessary for setup and programming to ensure minimum development time.</p>	Development Tools		Motion-iX Technology			Network / Technologies	
	Project Management	3D Visualisation	Programming	Advanced Motion Core		EtherCAT	RTEX
	Security Project Encryption	6D Motion Scope	Multi-tasking Programming Language	64bit Precision	Up to 128 axis Coordination Control		
	Simulation	CAMGen	IEC61131-3 + PLCopen	Scalable Motion Technologies	Complex Motion	ETHERNET-IP	PROFINET
	Drive Configuration	CAD2Motion	G-Code and HPGL	Path Planning Look Ahead	Kinematic SCARA Delta Cartesian	MODBUS	DEVICENET
	HMI Design	Program Libraries	PC Application Development C#/C++ etc	API resources Windows DLL Linux Libs	Advanced Interpolation	CANOPEN	FUNCTIONAL SAFETY (STO)
		ROBOTICS Programming	GEARING/CAM MOVELINK FLEXLINK	Registration Laser Power Modulation Laser Triggering			

*Not all technologies are used with all Trio product.*

Combining an advanced motion core with Trio's ease-of-use, Motion-iX offers performance and dependability of packaged solutions, from the "Motion Specialist", where motion is the core and not just a bolt-on capability.

- New trajectory generation for motion profiles improving dynamic flexibility and on-the-fly changes in motion parameters.
- Fully integrated PROFINET I/O slave implementation based updated and faster TCP/IP stack allowing all EtherCAT controllers to support PROFINET I/O communications.
- Added Kinematic transforms for OEM machines allowing bespoke motion solutions for bespoke mechanics.
- Added IEC function blocks to allow complete controller configuration from IEC languages.
- Extended Trio PC Linux interface to allow firmware update from a Linux PC.
- Numerous incremental improvements for applications.

# Motion Perfect

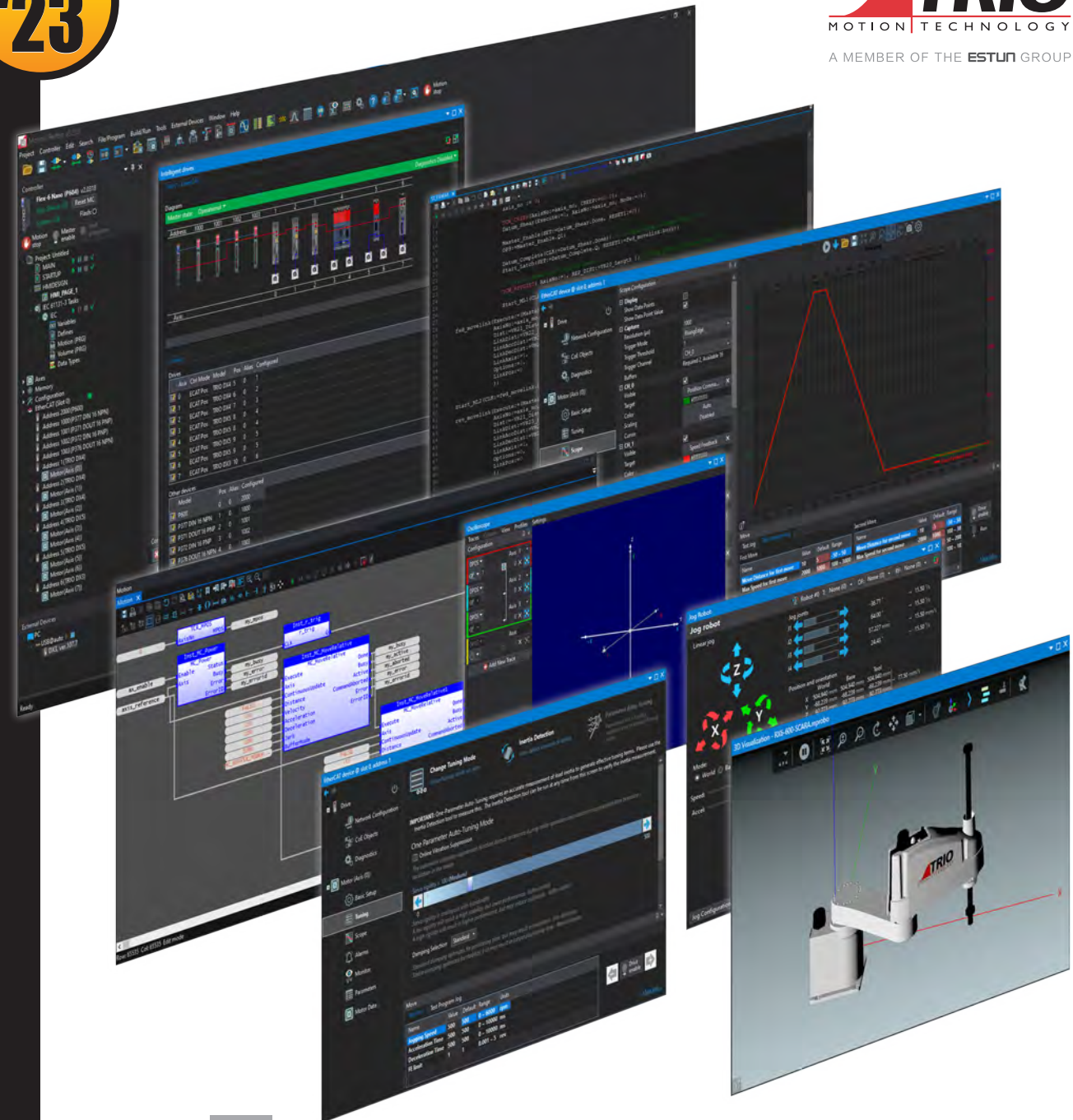
Design, Develop, Test, Deploy and Secure



Motion Perfect provides the user with an easy to understand interface for rapid application development, including configuration and setup of drives, controllers and HMI.

A fully featured IDE for program development and debugging in all Motion-iX languages, multi-page HMI screen development and diagnostic tools for machine commission. Motion Perfect allows complete machine setup from a single software package.

- Added new robot types for Trio RX-SCARA with default ROBOT\_DEFINITION data to minimise setup time.
- Added 3D models for visualisation of all Trio RX-SCARA models and improved integration of visualisation and robot configuration.
- Improved EtherCAT diagnostics with details of error counters and new network topology view.
- Improved IEC user interface with optimised menus and task configuration.
- Allow direct connection to Trio drives for commissioning without Trio controller over EtherCAT and USB.
- Enhanced Uniplay toolbox items with a range of graphical buttons and indicators along with support for recipe editor and alarm pages.







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# TRIO MOTION TECHNOLOGY **NEW PRODUCTS**



Trio Motion Technology specialises in advanced motion control as a core, providing a range of *Motion Coordinators*, drives and motors, expansion interfaces, I/O modules and HMI's built on Motion-iX technologies and designed to enable the control of industrial machines with the minimum of external components.

In support of the Trio concept, we aim to offer the best technical support by telephone, email, our comprehensive website and training courses held throughout the year. Please look at our web site for details.

[www.triomotion.com](http://www.triomotion.com)

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