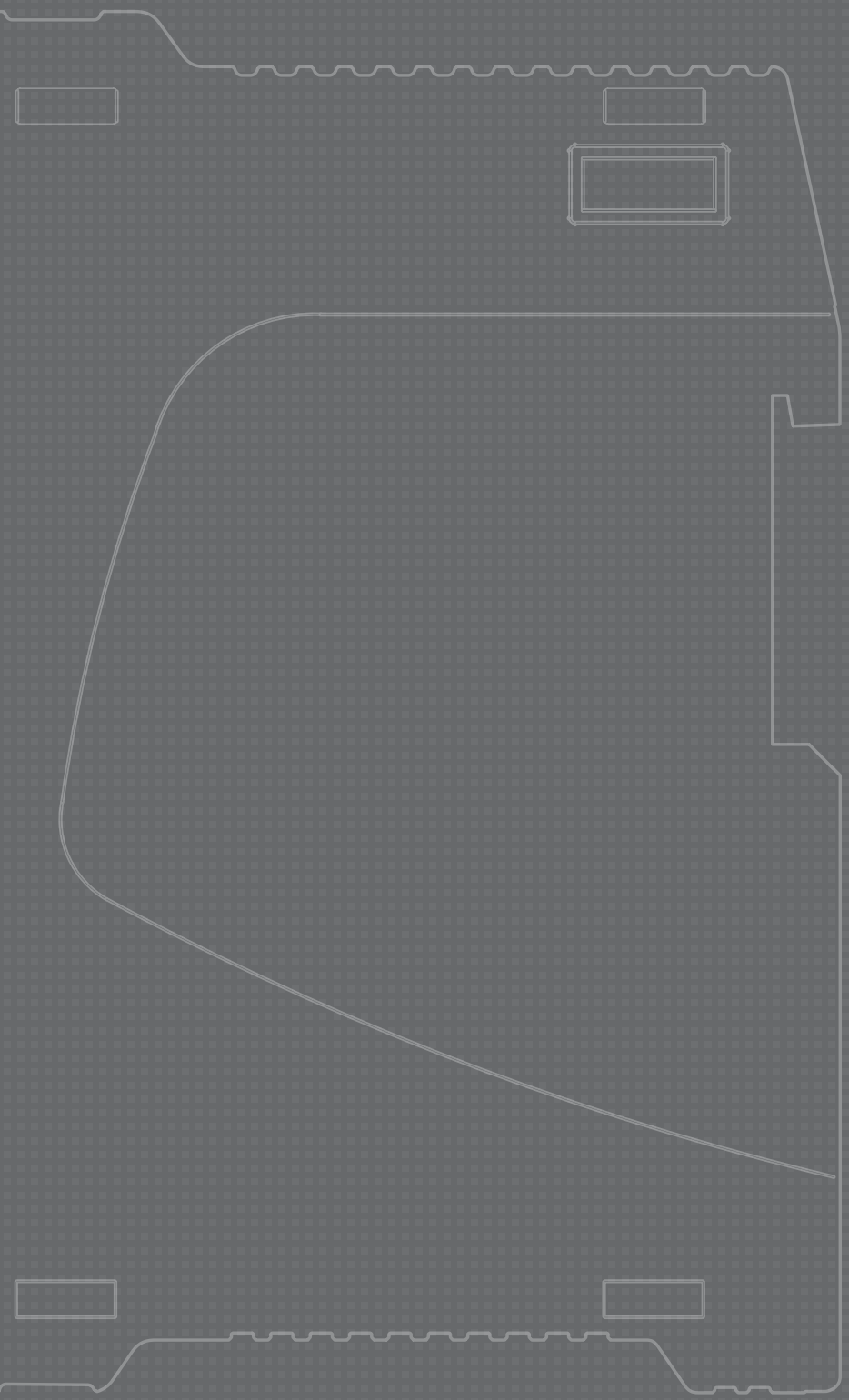
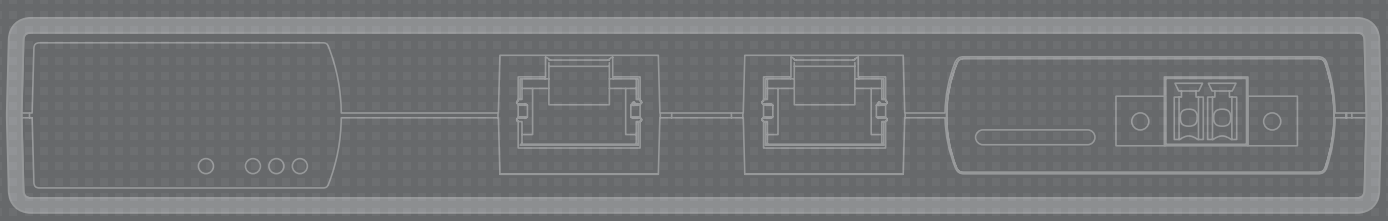
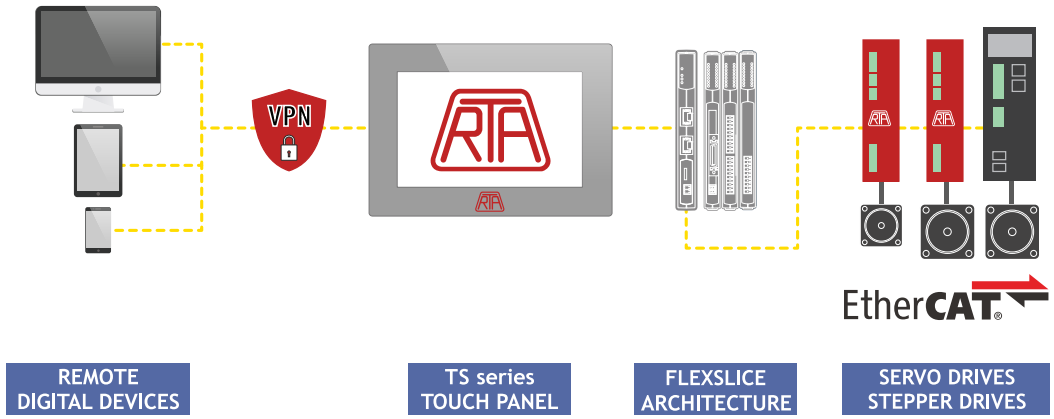
# MOTION CONTROLLERS





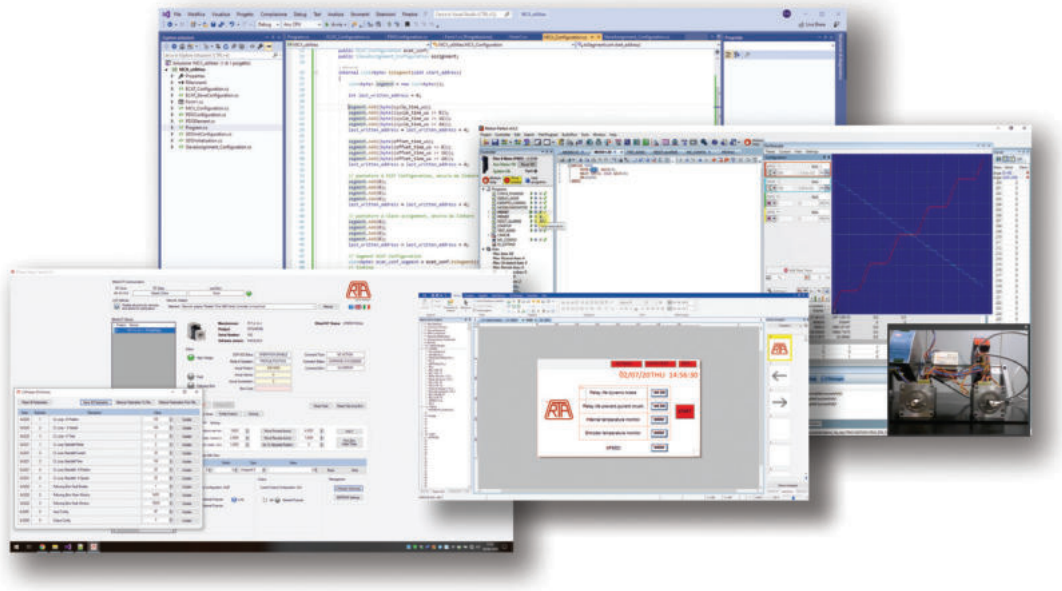
# The architecture

R.T.A. architecture is a flexible solution for a wide range of motion control applications in most industrial fields. It's an articulated system allowing the programming, functioning and monitoring of up to 128 axes of stepper, servo and linear motors (64 real and 64 virtual), based on the most common protocols. Products and technologies are fully compatible and scalable and they can be easily remotely monitored through VPN.




# Software development

- At R.T.A. we have a team of software engineers fully dedicated to software development projects.
- We can offer A-to-Z or partial software design, working closely with the customer's technicians in every phase of the project.
- FREE Windows-based programming interface for setup, diagnostic and configuration activities and a comprehensive motion library.
- Online and on-site fast and qualified technical assistance.



# Products and solutions

## EtherCAT MOTION CONTROLLERS

Drive of up to 128 axes via EtherCAT real-time field bus
TrioBASIC and IEC61131-3 programming languages.
Precise calculation thanks to powerful dual- and quad-core processors.
Multitasking programming language and free Windows-based development environment.
Built-In Ethernet port, allowing programming, connection with HMI, and data transferring with the rest of the world, using the most common protocols.

EtherCAT®

## PULSE TRAIN & ANALOG MOTION CONTROLLERS

Linear, circular, helicoidal and spherical interpolation.
3, 5 or 8 multi-function channels.
TrioBASIC and IEC61131-3 programming languages.
Multitasking programming language and free Windows-based development environment.
Built-In Ethernet port, allowing programming, connection with HMI, and transferring data with the rest of the world, using the most common protocols.

PULSE TRAIN
ANALOG INPUT
ANALOG OUTPUT

## HMI - TS SERIES

Three standard models in two sizes.
Free Windows based developing program.
Free remote control (VPN) enabling the operator to easily connect and monitor the "on the field" HMI through a safely protected VPN connection.

**Easy integration with all R.T.A. products**

## ANALOG & DIGITAL I/Os

A selection of digital and analogue I/O terminals and motion modules designed for precise positioning
of stepper and servo motors, that perfectly fit in a complex system, that can be placed remotely from the master if needed.

Available modules: Power Connect, Thermocouple, RTD, Load Cell,
16 IN/out PnP, 2 Servo Axes, 8 Analog I/O

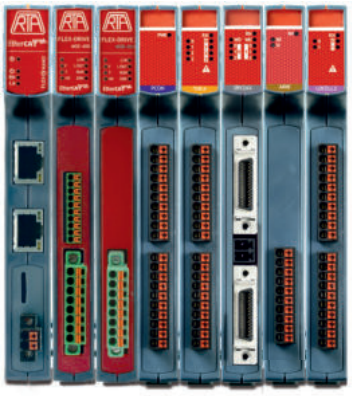
## CAN I/O

Digital and analogue I/O expansion modules provide a simple and scalable I/O system based on CANopen protocol.

- Power Supply: 24 VDC
- Up to 256 distributed input/output channels

CANopen®

## FLEXSLICE ARCHITECTURE MAIN FEATURES:



- Scalable and expandable system
- Easy parameter configuration
- Up to 6 drives in a row
- Up to 128 axes controlled

  (64 real and 64 virtual)
- DIN-rail mounted

# Table of contents

## MOTION CONTROLLERS

MOTION CONTROLLERS

# ETHERCAT MOTION CONTROLLERS & FLEXSLICE ARCHITECTURE

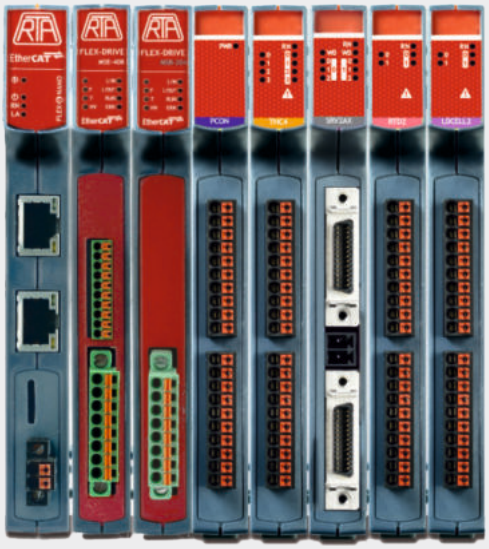
# FLEX-6 NANO Integrated EtherCAT® Controller

## INTRODUCTION

Flex-6 Nano is a powerful, flexible and compact DIN-rail mounted motion coordinator, controlling up to 64 stepper and servo axis.

Flex-6 Nano can be used as a stand-alone controller or it can easily «plug» straight into the EtherCAT Flexslice Architecture, including servo and stepper drives and I/O modules.


## THE FLEXSLICE ARCHITECTURE



*NO NEED FOR EtherCAT COUPLER*

EtherCAT®

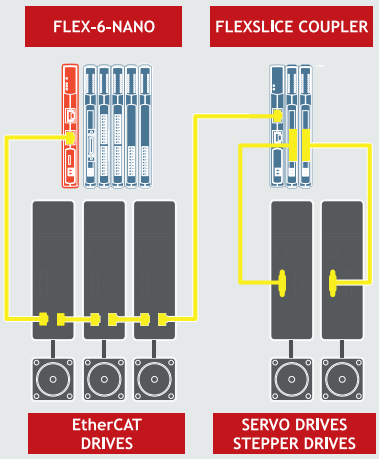
POWERFUL
COMPACT
VERSATILE

## HIGHLIGHTS

- Dual core 1GHZ Arm Processor
- 2 - 64 stepper and servo axis
- Built in EBus Coupler
- Cycle Time as low as 125us
- Ethercat Protocol to Individual modules using the Ebus System.
- Easy parameter configuration
- Remote placement of the modules from the master if needed.
- DIN-rail mounted

## SPECIFICATIONS

- Multitasking Operating System
- Comprehensive Motion Library
- TrioBasic Motion Language
- IEC61131-3 Programming
- HMI Support
- Robotic Functions
- Multi-protocol Communications Support

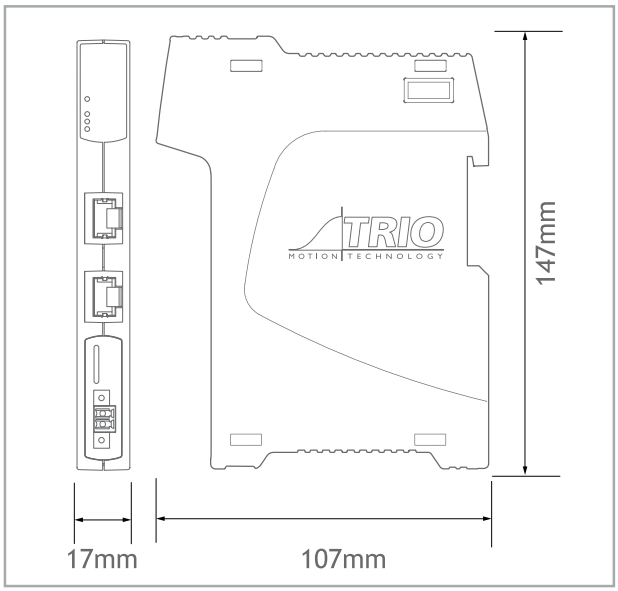


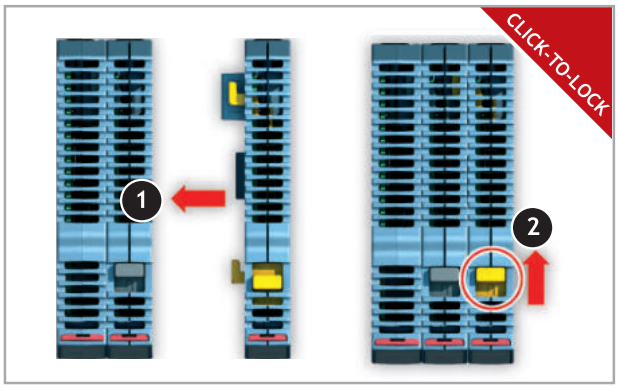

EtherCAT®

## TECHNICAL FEATURES

- Dual core 1 GHZ Arm Processor.
- 1 Gbit DDR3 Memory.
- 1 Gbit Fast Serial Flash Memory to store data.
- Built-in Long Time Retention RTC.
- Built-in Ethercat coupler for direct access to Flexslice modules.
- Completely field programmable with *Motion Perfect*.
- Bus cycle time synchronised with *Motion Coordinator* Servo Period.
- EtherCAT protocol remains intact down to individual modules using the EBUS system.
- I/O functions tightly synchronised to motion using EtherCAT distributed clock.
- Practical Push-In connector options.
- RoHS and UL approved.

## MECHANICAL DIMENSIONS



# Flexslice Architecture

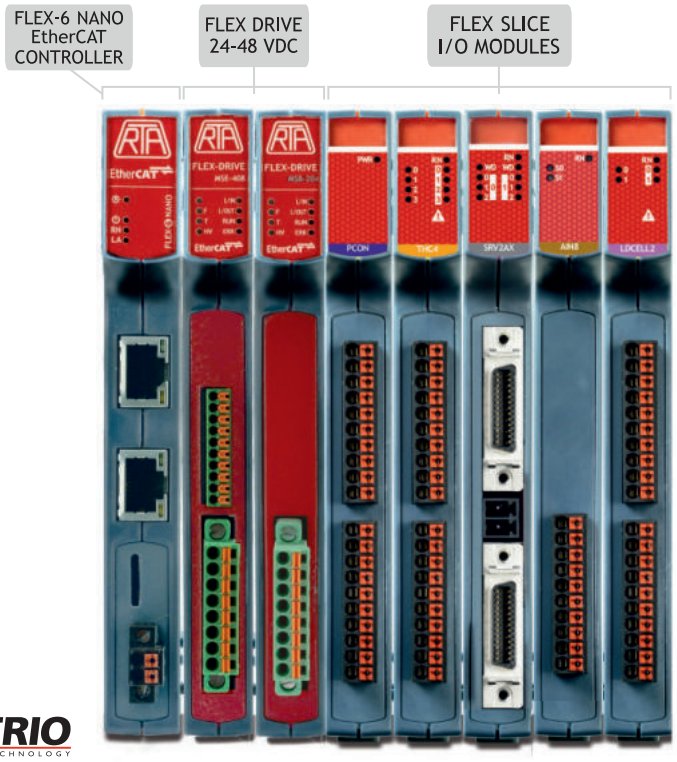
## INTRODUCTION

Flexslice architecture is a flexible solution for a wide range of motion control applications in most industrial fields. It is an articulated system allowing the complete process of programming, functioning and monitoring of up to 128 axes of stepper, servo and linear motors, based on the most common protocols.

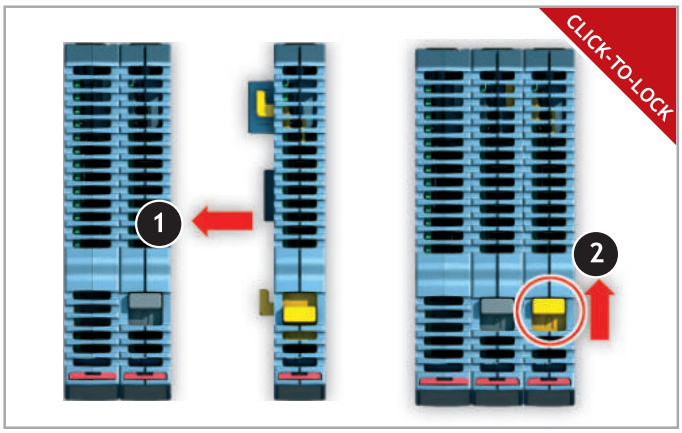
It is an intelligent system originally designed by TRIO Motion Technologies,where R.T.A. EtherCAT drives fit perfectly, developing a powerful and ultra-compact solution.

## HIGHLIGHTS

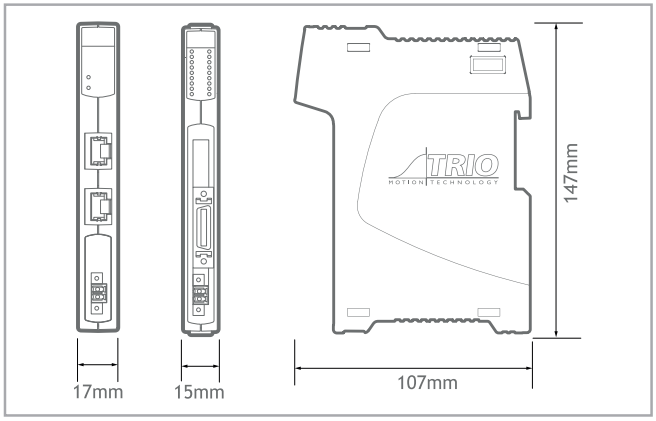
- Scalable and expandable system
- Easy parameter configuration
- Perfect matching with R.T.A. Flex-Drive EtherCAT stepping motor drive.
- Power supply:
  - for controller and Coupler: 24 VDC
  - for Flex-Drive: 24-48 VDC
  - for all Modules: via internal EBus
- Up to 128 axes controlled
- EtherCAT cycle times down to 125 µs
- Wide selection of digital and analog I/O modules designed for precise positioning of stepper and servo motors.
- Secure remote monitoring through VPN
- DIN-rail mounted




## FAST & EASY ASSEMBLY




## MECHANICAL DIMENSIONS



## LOGIC MODULES

### Flex-6 Nano EtherCAT Motion Coordinator

- EBus output current: 2500 mA
- **Power supply requirement: 24 VDC**
- EtherCAT Connection: RJ45
- Protocol: EtherCAT Master
- Cycle Time as Low as 125us
- Modes of Operation: CSP, CSV and CST
- Communication: Modbus/TCP

### P366: EtherCAT Coupler

- EBus output current: 2500 mA
- **Power supply requirement: 24 VDC**
- EtherCAT Connection: RJ45
- Protocol: EtherCAT Slave
- Data rate 100 Mbit/s
- Network Cable: CAT 6

## POWER MODULES

### RTA Flex-Drive EtherCAT MSE 408 Model

- EBus module current consumption: 350 mA max + Encoder (85 mA max)
- **Power supply requirement: 24-48 VDC**
- $I_{NP}$ (Peak value): 4 A
- Sensor Feedback: ENCODER or OPEN LOOP

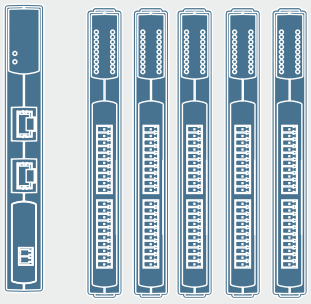
### RTA Flex-Drive EtherCAT MSB 204 Model

- EBus module current consumption: 350 mA max
- **Power supply requirement: 24-48 VDC**
- $I_{NP}$ (Peak value): 2.5 A
- Sensor Feedback: OPEN LOOP

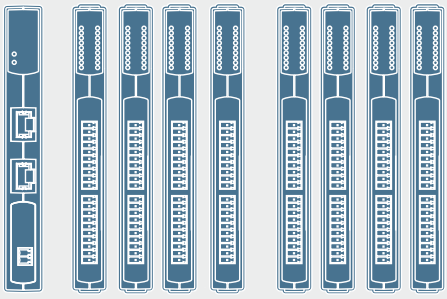
The configuration of a Flex-Drive Architecture can be defined considering that the total sum of the EBus current consumption of every included module should be lower than the Ebus output current of Flex-6-Nano Motion Coordinator or P366 EtherCAT coupler (2500 mA).

## SOME EXAMPLES OF FLEXSLICE ARCHITECTURES

**1 FLEX-6 NANO or 1 COUPLER**
**+ UP TO 5 FLEX-DRIVE MSE 408**



**1 FLEX-6 NANO or 1 COUPLER**
**+ UP TO 4 FLEX-DRIVE MSE 408**
**+ 4 DIGITAL I/Os or 2 ANALOG I/Os**



*Please refer to R.T.A. Technical support in case of doubts about specific layouts.*

# FLEX-DRIVE Series Drives

EtherCAT®

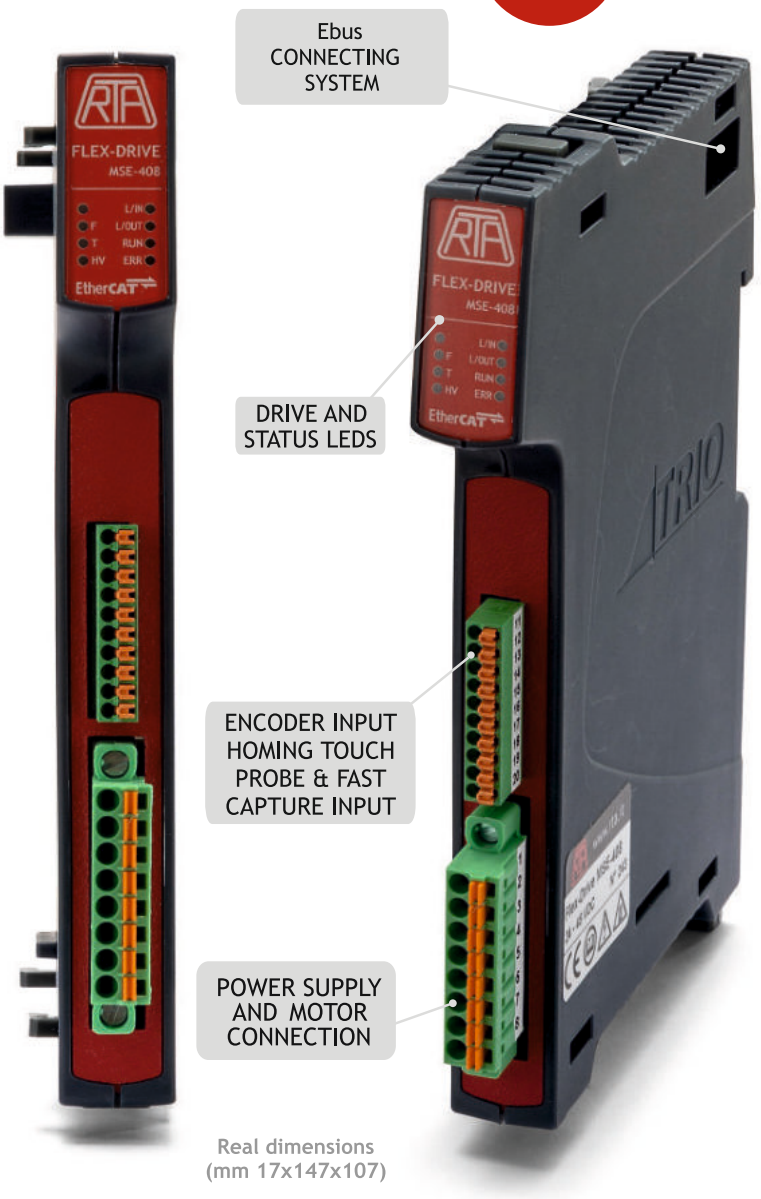
## INTRODUCTION

- FLEX-DRIVE allows connection with any stepper motor up to Nema 24 (60 mm) with or without encoder feedback, supporting PP, CSP, CSV and Homing mode of operation.
- MSE 408 model is equipped with one configurable fast capture input, suitable for Touch Probe, proximity or free use.
- Easy setup: no need of programming software, all settings are made through EtherCAT network.
- Separated power supply for logic circuit and motor power.

## MAIN EtherCAT FEATURES

- Modes of operation: PP, PV, Homing, CSP and CSV.
- Wide range of motor phase current setting and motor current overboost (120%).
- Different variety of HOMING operation modes.
- Encoder feedback and support of different resolution.
- Touch Probe function available.
- Limit switches management.
- Auto-sync function available featuring a closed loop positioning.

3rd FIRMWARE GENERATION




Real dimensions (mm 17x147x107)

AUTO SYNC FUNCTION

**Please refer to download.rta.it for technical specifications**

FLEX-DRIVE

AUTO-SYNC

*SCAN THE QR CODES TO WATCH TWO VIDEOS ON FLEX-DRIVE AND AUTO-SYNC FUNCTION*

# Flexslice Modules

## P362: Power Connect

The P362 Flexslice Power Connect provides a solution for simple and convenient wiring of 3 wire sensor power and return wires.
The pins of the 2 x single-row push-in connectors are joined together to form 2 isolated banks of commoned connections.
With 0V connected to the lower connector and 24V to the upper connector, the LED gives an indication that power is on.

- EBus Module current consumption: 0mA
- Power supply requirement: 24V (+/-20%) DC
- Max connector current: 4A

## P367: Thermocouple

The P367 Flexslice Thermocouple module has 4 thermocouple inputs, each digitised to a resolution of 16 bit. The 4 thermocouple inputs are brought out to a single row push-in connector. A second single row push-in connector has 4 relay outputs for control of a heater or other switched load.

- EBus Module current consumption: 160mA max
- Power supply: via the EBUS
- Number of Inputs: 4
- Thermocouple types: J, K, T, E
- Resolution: 16 bit
- Number of Outputs: 4
- Output type: Normally open (NO)
- Load type: Resistive, inductive and capacitive
- Max. Output Voltage: 24V
- Max Output Current: 100mA

## P368: RTD Module

The P368 Flexslice RTD module has 4 resistance temperature detector (RTD) inputs, each digitised to a resolution of 16 bit. The 4 RTD inputs are brought out to a single row push-in connector.
A second single row push-in connector has 4 relay outputs for control of a heater or other switched load.

- EBus Module current consumption: 160mA max
- Power supply: via the EBUS
- Number of Inputs: 4
- RTD types Resolution: 16 bit
- Number of Outputs: 4
- Output type: Normally open (NO)
- Load type Resistive, inductive and capacitive
- Max. Output Voltage: 24V
- Max Output Current: 100mA

## P369: Load Cell Module

The P369 Flexslice Load Cell module has 2 load cell inputs, each digitised to a resolution of 16 bit. The 2 load cell inputs are brought out to a single row push-in connector. A second single row push-in connector has 4 relay outputs for control of a switched load.

- EBus Module current consumption: 160mA max
- Power supply: via the EBUS
- Number of Inputs: 2
- Load Cell types: 4 wire
- Resolution: 16 bit
- Number of Outputs: 4
- Output type: Normally open (NO)
- Load type Resistive, inductive and capacitive
- Max. Output Voltage: 24V
- Max Output Current: 100mA

## P371: 16-OUT PnP

The P371 digital output Flexslice connects the binary control signals from the *Motion Coordinator* to the machine's output devices at 24V DC. All 16 outputs are current sourcing (PNP) type and have electrical isolation. Outputs and power connection are via 2 x single-row push-in connectors.
The Flexslice module indicates the output signal states via LEDs.

- EBus Module current consumption: 110 mA max
- Power supply: via the EBUS
- Power supply requirement: 24V (+/-20%) DC
- Number of Digital Outputs: 16 (2 banks of 8)
- Load type: Resistive,inductive and capacitive
- "ON" time: 110us (10% to 90%)
- "OFF" time 210us (90% to 10%)
- Max. Output current: 0.5A per channel
- Max. Output current: 4A per bank of 8
- Short-Circuit Protection: 1.4A typ per output
- Over voltage Protection: Yes
- Reverse Voltage Protection: Yes

## P372: 16-IN PnP

The P372 digital input Flexslice connects 24V DC signals from devices on the machine to the binary control registers in the *Motion Coordinator*. All 16 inputs are current sinking (PNP) type and have electrical isolation. Inputs and power connection are via 2 x single-row push-in connectors.
The Flexslice module indicates the input signal states via LEDs.

- EBus Module current consumption: 110 mA max
- Power supply: via the EBUS
- Power supply requirement: 24V (+/-20%) DC
- Number of Digital Inputs: 16 (2 banks of 8)
- Load type: Resistive,inductive and capacitive
- "ON" Voltage Threshold: 11.2V typ
- "OFF" Voltage Threshold: 10.2V typ
- Input current: 3.5mA typ
- Input filter Cut-off (RC network): 18KHz

## P374: Analog 2 Servo Axes

The P374 Flexslice Analogue 2 Servo Axes module allows up to 2 servo motors, connected to a control system. It supports incrementale encoder inputs. If conigured for stepper/pulse output an axis can be pulse+direction or quadrature simulated encoder output. Each MDR connector supports all the signals for full closed loop control of a servo axis.

- EBus Module current consumption: 180 mA max
- Power Supply: via the EBUS
- Power Supply 24V (+/-20%) DC @ 100mA
- Max Axes: 2 (software configurable)
- Max Enc Rate: 8M Edges/s encoder count
- Max Step Rate: 8MHz pulse count
- Step/Pulse Width: Wave
- Enc/Step Input/Output: RS422
- DAC Voltage Output: 2 x 12bit +/-10V
- Registration inputs: 4 x 24V Isolated PNP
- WDOG Output: 2 x Normally open (NO)
- WDOG Max. Output Voltage: 24V
- WDOG Max Output Current: 100mA
- Field Programmable: Yes

## P378: 8 Analog outputs

The P378 Flexslice 8 Analogue Output module has eight programmable voltage range output terminals, each digitised to a resolution of 12 bit. The 8 single ended outputs have a common 0V potential and are brought out to a single push-in connector.

- EBus Module current consumption: 200mA max
- Power Supply: via the EBUS
- Signal voltage: -10...+10V; 0...+10V
- Signal current: +/-5mA max
- Resolution: 12 bit
- Output impedance: 16 ohm
- Number of Analogue Ouputs: 8

## P379: 8 Analog inputs

The P379 Flexslice 8 Analogue Input module has eight programmable voltage range input terminals, each digitised to a resolution of 12 bit.
The 8 single ended inputs have a common 0V potential and are brought out to a single row push-in connector.

- EBus Module current consumption: 160mA max
- Power Supply: via the EBUS
- Signal voltage: -10...+10V; 0...+10V
- Signal current: 0...20 mA
- Resolution: 12 bit
- Overvoltage protection: ±25V
- Number of Inputs: 8

*Please refer to R.T.A. Technical Support for architectures layouts and Flexslice modules features.*

# MC6N-ECAT EtherCAT® Master

## INTRODUCTION

The MC6N is a high performance Motion Coordinator which perfectly dialogues with the R.T.A. motion control solution (servos and steppers).


## HIGHLIGHTS

- High performance motion coordinator for remote servo and stepper drives via EtherCAT bus.
- EtherCAT drives can be connected and driven in cyclic synchronous position, speed or torque modes.
- 1 GHz dual core processor controlling up to 64 axes (twice as the previous model MC4N).
- Same simple programming as the traditional analog and step/dir axes, with the possibility to set up drives and process alarms over the EtherCAT bus.
- Ideal for high axes count machines or robotic applications.

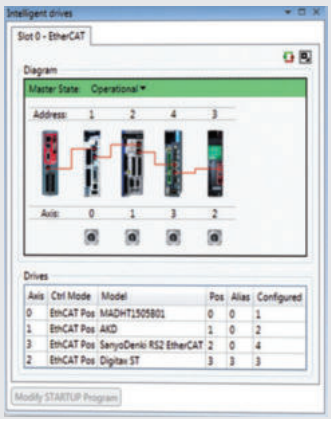
## 1st GENERATION Vs 2nd GENERATION

| MC4N | MC6N |
|---|---|
| 532 Mhz ARM11 | 1GHz dual core ARM Cortex-A7 processor |
| up to 32 axis | up to 64 axis |
| Execution time: 35 lines/ms | Execution time: 102 lines m/s |
| 350 mA power consumption | 180 mA power consumption |
| Maximum retentive variables: 4096 | Maximum retentive variables: 16384 |

## EASY PROGRAMMING SYSTEM

The built-in Ethernet port allows programming and connection of common PLC and HMI protocols.

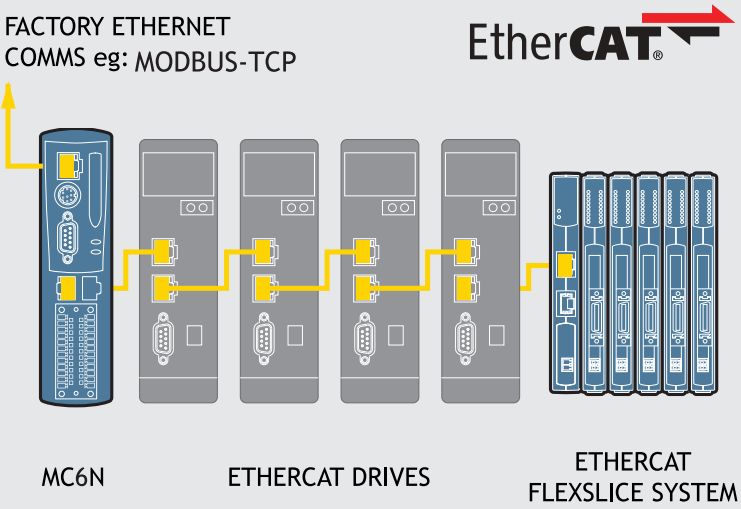
Standard IEC 61131-3 languages available, allowing a fully functional PLC programming system.



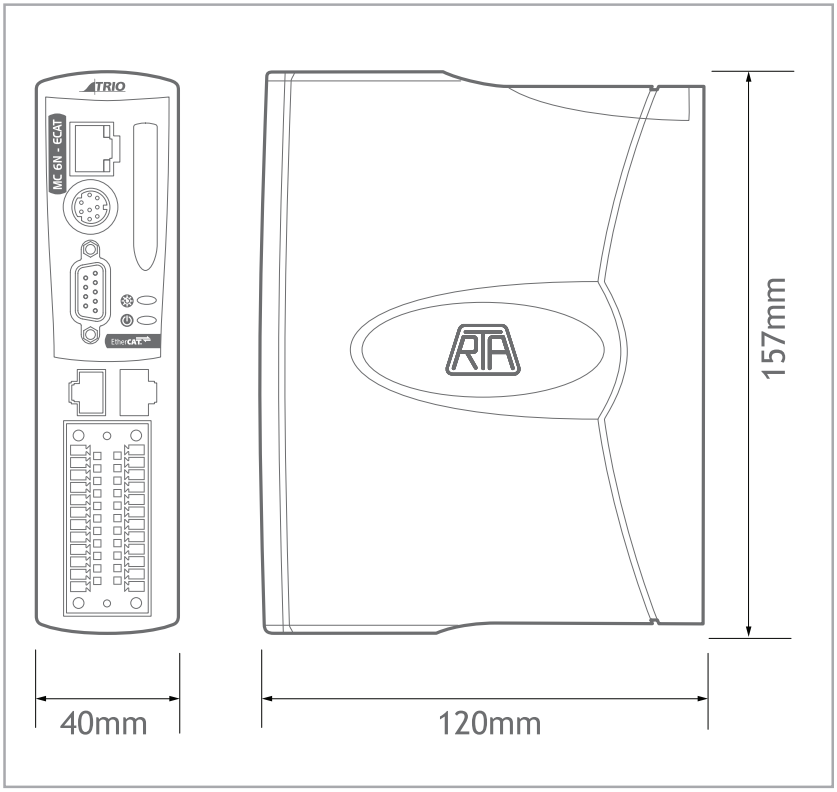
EtherCAT®

## SPECIFICATIONS

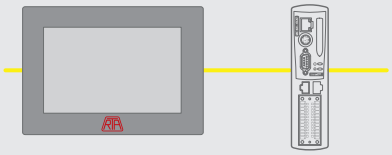
- Up to 64 EtherCAT digital drive virtual axis
- Multitasking operating system
- Up to 1024 EtherCAT I/O
- Ethercat cycle times down to 125 µsec.
- Linear, circular, helical and spherical interpolation
- EnDAT and SSI absolute encoder supported
- Ethernet-IP / Modbus TCP / Trio Activex /HMI Uniplay / UDP / Ethernet interface built-in
- Metal backplate for maximum noiselessness
- Robotic transformations
- High speed registration inputs
- SD memory card slot
- CANopen I/O expansions
- RoHS and UL approved




## MECHANICAL DIMENSIONS




## TS SERIES TOUCH SCREEN COMPATIBILITY




Easy interaction with R.T.A.'s TS series touch screens.

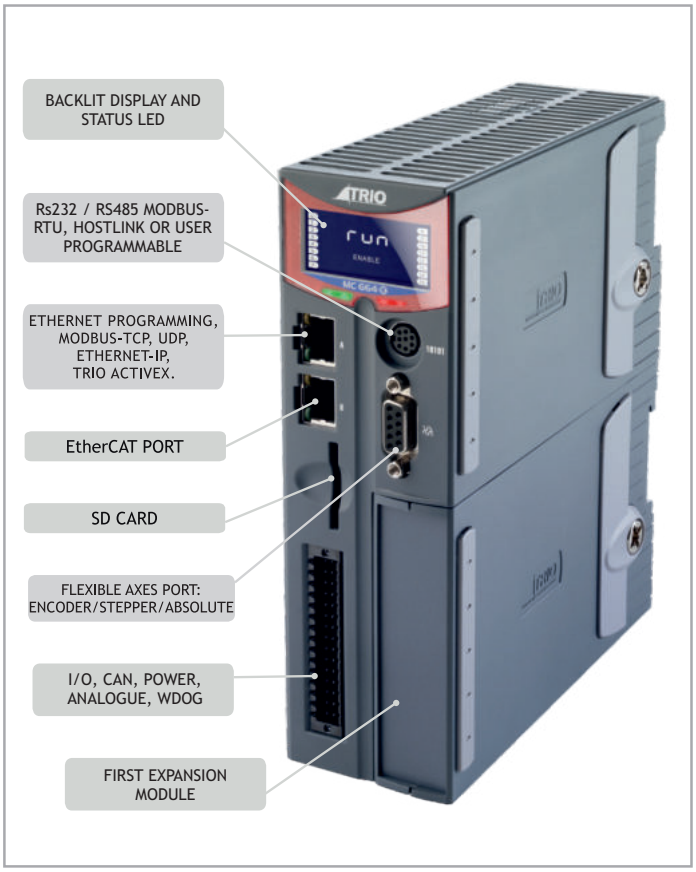
## MAXIMUM VERSATILITY

Built-in support for digital drives and I/Os of most brands on the market.

# MC664X Quad Core 128 Axis EtherCAT® Coordinator

## INTRODUCTION

The MC664X is a very performing flexible EtherCAT Motion Coordinator which perfectly fits the R.T.A. EtherCAT motion control solution (servos and steppers).

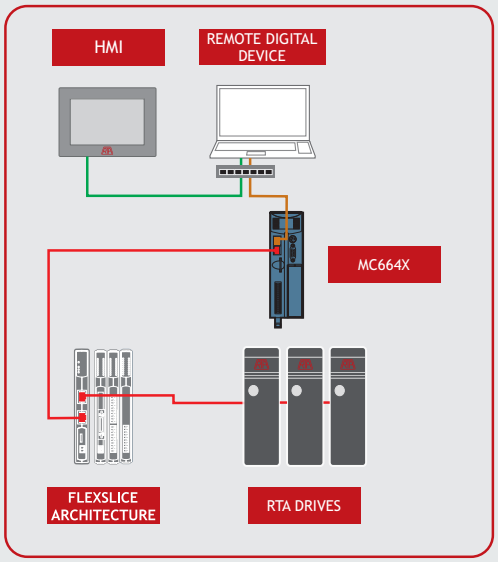



## HIGHLIGHTS

- High performance Motion Coordinator for driving servo and stepper drives via EtherCAT bus.
- Able to manage up to 128 axes (64 stepper/servo and 64 virtual), 1024 digital inputs and outputs and 32 analogue inputs and analog outputs.
- Precise 64 bit Motion Calculations with Quad Core Cortex A9 1GHz Processor for multiple simultaneus robotic transformations.
- Ideal for ultra-precise axes count machines or robotic applications.
- Expansions modules available for managing step & dir analogue signals and encoder feedback.

## SPECIFICATIONS

- Multitasking Operating System
- Comprehensive Motion Library
- TrioBasic Motion Language
- IEC61131-3 Programming
- TS SERIES HMI Support
- Robotic Functions (licensed separately)
- Multi-protocol Communications Support

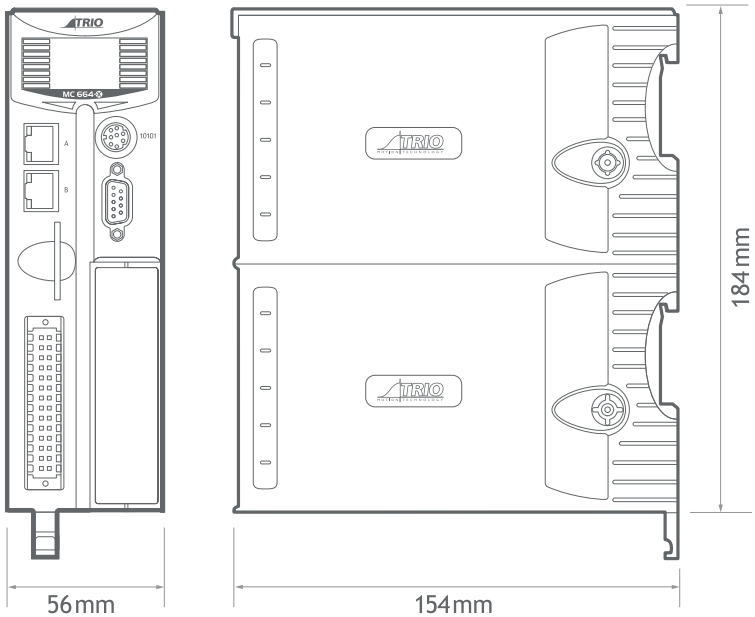


## TECHNICAL FEATURES

- Up to 128 Axes - Stepper / Servo Axes
- Precise 64 bit Motion calculations with Quad Core Cortex A9 1GHz Processor
- Dedicated communications Core
- Built-in EtherCAT port
- Built-in Ethernet interface / Ethernet-IP / Modbus TCP
- Anybus-CC module for flexible factory comms including Profinet/Profibus, Sercos II, SLM and RTEX
- Multi-tasking TRIO BASIC programming
- SD memory card slot
- CANopen I/O expansion
- Backlit LCD display



## MECHANICAL DIMENSIONS



MOTION CONTROLLERS

# PULSE TRAIN & ANALOG INPUT MOTION CONTROLLERS

# MC 403 / MC 405 *Flexible Motion Coordinators*

## INTRODUCTION

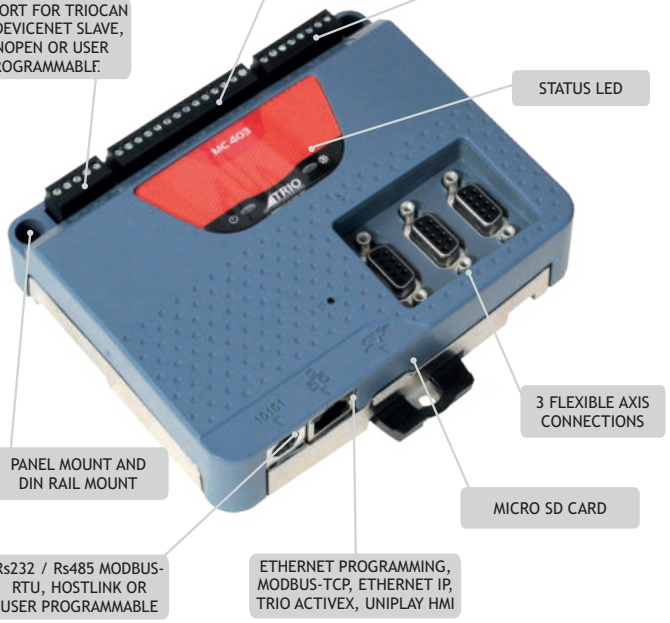
MC 403 and MC 405 are high specification and flexible Motion Coordinators which perfectly fits the traditional R.T.A. motion control solution.

Both models offer maximum flexibility for advanced application in industrial automation, where high performance in interpolated motion is required.

## MAIN FEATURES

- Linear, circolar, helical and spherical interpolation.
- Virtual axes flexible cam shapes, and linked motion.
- Precise 64 bit Motion Calculator ARM11 processor with VFP.
- Multi-tasking TRIO BASIC programming.
- Text file handing.
- Robotic transformations.
- Micro SD Memory Card slot.
- CANopen I/O expansions available.
- RoHS and UL approved.

## MC 403



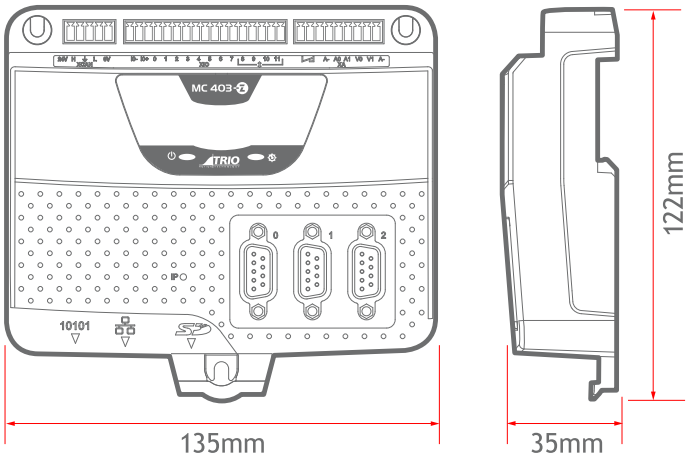

## MC 405

## TECNICHAL FEATURES

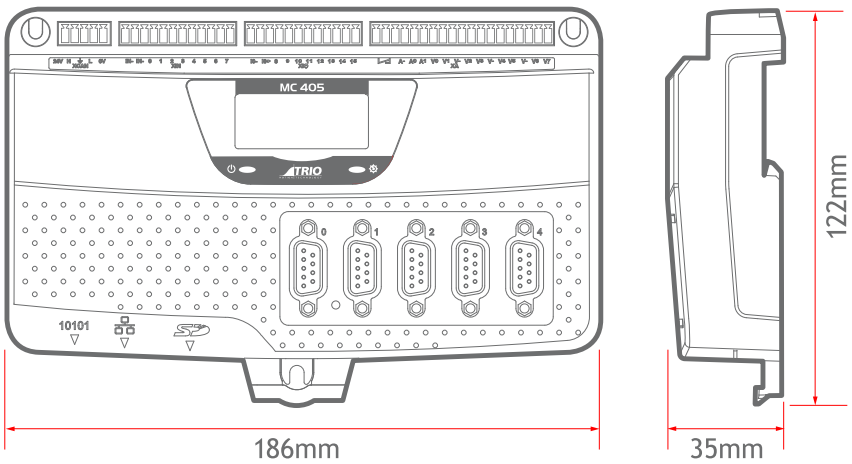
| SPECIFICATIONS | MC 403 | MC 405 |
|---|---|---|
| PULSE TRAIN/AXIS | 3 | 5 |
| SERVO AXIS | 2 | 4 |
| DRIVE COMMUNICATION LOOP | 125 - 2000 µs | |
| BUILT-IN INTERFACES | Ethernet Interface / Ethernet-IP / Modbus TCP | |
| SUPPORTED ENCODER | EnDat Line Driver ABZ SSI Absolute | |
| PROGRAMMING LANGUAGE | TRIO BASIC and IEC 61131-3 | |

## MECHANICAL DIMENSIONS

MC 403




MC 405



MOTION CONTROLLERS

# CAN I/O MODULES

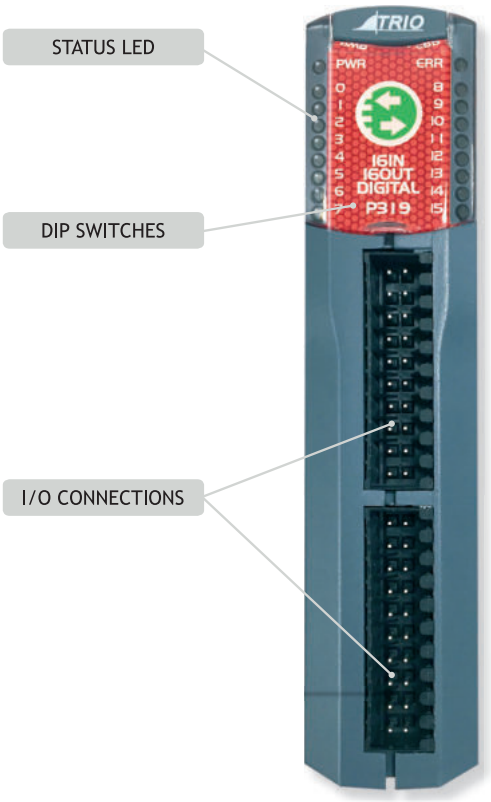
# CAN 16-IN / OUT digital

## INTRODUCTION

The Trio CAN16 Input/Output module offers a compact DIN rail mounted I/O expansion capability for motion coordinators.

It can provide up to 256 distribuited bi-directional I/O channels at 24 VDC level.

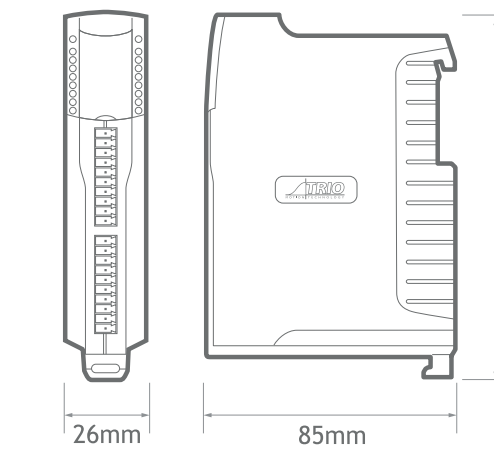
This module can be mixed on the same bus, with other types in the CAN I/O range, reducing considerably the machine wiring.




## MAIN FEATURES

| | |
|---|---|
| **Inputs** | 16 x 24V input channels with 2500V isolation |
| **Outputs** | 16 x 24V sourcing (PNP) output channels |
| **Configuration** | 2 x 8 bi-directional input/output channels |
| **Protection** | Outputs are overcurrent and over temperature rated |
| **Indicators** | Individual status LEDS |
| **Address settings** | Via DIP switches |
| **Power supply** | 24 V / 1,5 W |
| **Mounting** | DIN rail mount |
| **Size** | 26 mm wide x 85 mm deep x 130 mm high |
| **Weight** | 168 g |
| **CAN** | 500 kHz, up to 256 expansion output channels |
| **EMC** | EN61000-6-2 (2005) Industrial Noise Immunity<br>EN61000-6-4 (2007) Industrial Noise Emissions |
| **CAN protocol** | TrioCAN I/O / CANopen Ds401 |
| **Compliancies** | UL and RoHS |

## MECHANICAL DIMENSIONS



MOTION CONTROLLERS

# HMI - TS SERIES

# TS series TOUCH SCREEN - HMI

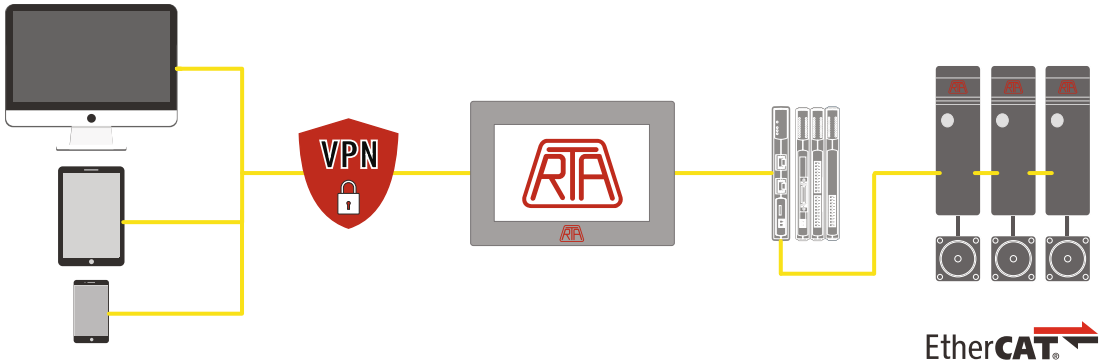
## MAIN SPECIFICATIONS

- Three models in two sizes
- Free developer tools
- Free remote control (VPN)
- Easy integration with R.T.A. products
- R.T.A. support team

| MODEL | | TS-07-IP-0 | TS-07-IE-R | TS-10-XE-R |
|---|---|---|---|---|
| SOFTWARE FEATURES | EMAIL | | ■ | ■ |
| | VNC VIEWER - VNC SERVER | | ■ | ■ |
| | PLC TAG EMBEDDED IN PROJECT | ■ | ■ | ■ |
| | CIRCULAR TREND DISPLAY | | ■ | ■ |
| | COMBO BUTTON | | ■ | ■ |
| | MEDIA PLAYER | | | ■ |
| | MQTT(PUBLISHER / SUBSCRIBER) | | ■ | ■ |
| | OPERATION LOG | | ■ | ■ |
| | OPC UA CLIENT | | ■ | ■ |
| | PICTURE VIEWER | | ■ | ■ |
| | RECIPE DATABASE | | ■ | ■ |
| REMOTE CONTROL | EASY ACCESS 2.0 | No | Built-in | Built-in |
| I/O PORT | ETHERNET | 10/100 Base-T x 1 | 10/100/1000 Base-T x 2 | 10/100/1000 Base-T x 2 |

## HOW DOES REMOTE CONTROL WORK

EasyAccess 2.0 enables the operator to easily connect and monitor the remote HMI from anywhere in the world, through a protected remote VPN connection.




REMOTE DIGITAL DEVICES

TPR series TOUCH PANEL

FLEXSLICE ARCHITECTURE

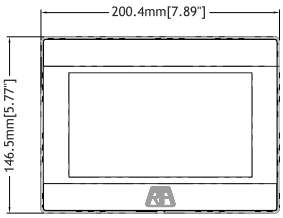
SERVO DRIVES STEPPER DRIVES

## ADVANCED SPECIFICATIONS

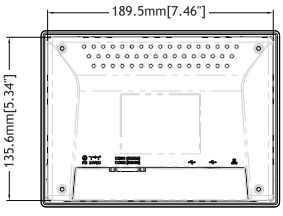
| MODEL | | TS-07-IP-0 | TS-07-IE-R | TS-10-XE-R |
|---|---|---|---|---|
| DISPLAY | DISPLAY | 7" TFT | 7" TFT | 9.7" TFT |
| | RESOLUTION | 800x480 | 800x480 | 1024x768 |
| | BACKLIGHT LIFE TIME | >30,000 hrs. | >30,000 hrs. | >30,000 hrs. |
| MEMORY | FLASH | 128 Mb | 128 Mb | 512 Mb |
| | RAM | 128 Mb | 128 Mb | 256 Mb |
| PROCESSOR | | 32 bits RISC Cortex-A8 600 MHz | 32 bits RISC Cortex-A8 600 MHz | 32 bits RISC Cortex-A8 1 GHz |
| I/O PORT | USB HOST | USB 2.0 x 1 | USB 2.0 x 1 | USB 2.0 x 1 |
| | COM PORT | COM1: RS-232, COM2: RS-485 2W/4W | COM1: RS-232, COM2: RS-485 2W/4W | Con.A: COM2 RS-485 2W/4W, COM3 RS-485 2W |
| | | / | COM3: RS-232/RS-485 2W | Con.B: COM1 RS-232, COM3 RS-232 |
| RTC | | Built-in | Built-in | Built-in |
| CERTIFICATE | | CE | CE/UL/ATEX | CE/UL/ATEX |
| DIMENSIONS | DIMENSIONS WxHxD | 200.4 x 146.5 x 34 mm | 200.3 x 146.3 x 34 mm | 260.6 x 203.1 x 36.5 mm |
| | PANEL CUTOUT | 192 x 138 mm | 192 x 138 mm | 248.5 x 191 mm |
| ENVIROMENT | PROTECTION STRUCTURE | NEMA4 / IP65 Compliant Front Panel | UL Type 4X (indoor use only)/ NEMA4/ IP65 Compliant Front Panel | NEMA4/IP65 Compliant Front Panel |
| POWER | INPUT POWER | 24 ± 20% VDC | 24 ± 20% VDC | 24 ± 20% VDC |
| | POWER CONSUMPTION | 500 mA at 24VDC | 600 mA at 24VDC | 650 mA at 24 VDC |
| | POWER ISOLATION | Built-in | Built-in | Built-in |

## DIMENSIONS (UNIT: mm)

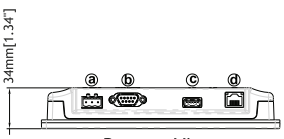
### Model TS-07-IP-0



Front View

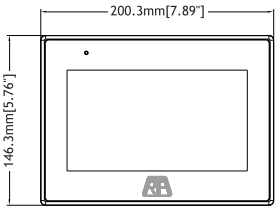


Rear View

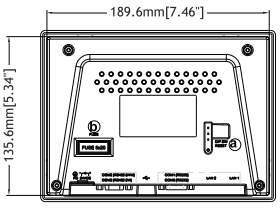


Bottom View

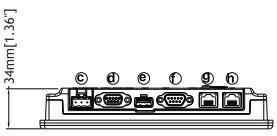
### Model TS-07-IE-R



Front View

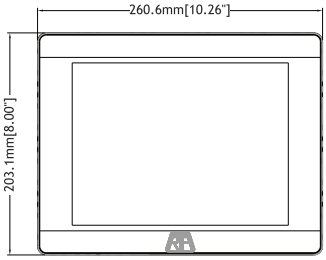


Rear View

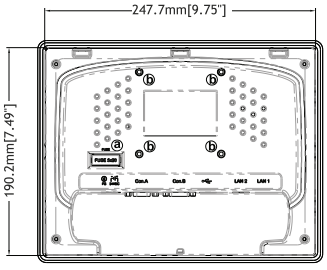


Bottom View

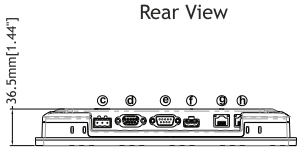
### Model TS-10-XE-R



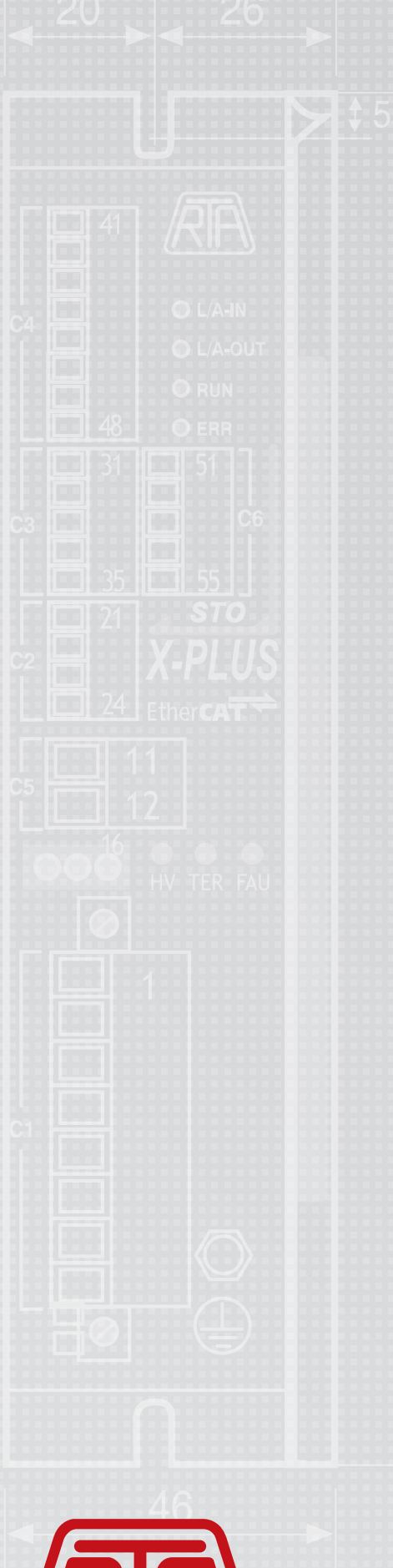
Front View



Rear View



Bottom View





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