

intelligence

COMMANDES NUMERIQUES MC464

m o t i o n
la force de la gamme !



transtechnik
servomécanismes



YOUR CHOICE OF FACTORY COMMUNICATIONS

YOUR CHOICE OF DIGITAL DRIVE INTERFACES

REDUCE MACHINE DELIVERY TIMES

FLEXIBLE MOTION CONTROL

FASTER PERFORMANCE

HIGH AXIS COUNT

EASY TO USE



MC464

Accessories:
 P871 MC464 RTEX Interface
 P872 MC464 SERCOS II Interface
 P873 MC464 SLM Interface
 P874 MC464 FlexAxis 8 Interface
 P875 MC464 Anybus-CC Module
 P876 MC464 EtherCAT Interface
 P878 MC464 Blanking Module
 P879 MC464 FlexAxis 4 Interface
 P877 IEC61131 Runtime FEC
 P381 MC464 FlexAxis Splitter Cable
 P877 IEC61131 Runtime FEC
 P680 KW Multiprog IEC 61131-3 Runtime FEC
 P317, P318 and P326 CAN Modules

DIN-RAIL OR PANEL MOUNT

PRODUCT CODE: P860

MC464

The MC464 is Trio's highest performance *Motion Coordinator* and is based on the 64bit 400MHz MIPS processor. The MC464 supports up to 64 axes of motion with 64 bit integer position registers for ultra precise axis resolution. With support for networked digital drives, and programming with TrioBASIC or IEC 61131-3. The MC464 saves interconnection time, increases flexibility and gives you lots more processing power.

Designed from the ground up the attention to detail is evident. The bright easy to read backlit display makes sure that controller status is easily determined, whilst the single piece metal casting provides an integrated earth chassis to improve noise rejection in the industrial environment.

MULTI-TASKING

- 20 simultaneous TrioBASIC tasks
- IEC61131-3 Runtime environment

Every axis can be programmed to move using linear, circular or helical or spherical interpolation, electronic cams and gearboxes. Features include support for merging multiple moves that are typically generated by CAD/CAM software and support is provided for continuously rotating machinery.

PROGRAMMING

- Multi-tasking TrioBASIC programmed using *Motion Perfect 2*
- TrioPC for ActiveX
- IEC61131-3 (option)
- G-Code (option)

The axis expansion modules feature many options for digital drive network interfaces, analog servo, pulse/direction, absolute or incremental feedback and accurate hardware registration.

State of the art servo performance is assured by the MC464's software design. Servo period can be set to 125, 250, 500, 1000 or 2000 microseconds to suit even the highest performance servo positioning systems. Motion that was only dreamed about a decade ago is now an everyday possibility.

ADVANTAGES OF DIGITAL DRIVE INTERFACES

- Plug & play
- Drive parameter configuration in the *Motion Coordinator*
- Monitoring parameters in real time from the *Motion Coordinator*
- Transmit data at high speeds with precise synchronisation
- Communicate with the drive using velocity, position or torque control modes (if the drive is mode supported)
- Noise resistant communications
- Reduced wiring, each connection replaces up to 11 discrete wired connections per drive
- Cuts material costs, cabinet space and build time
- Machine downtime reduced for drive changeovers

DIGITAL DRIVES SYSTEMS SUPPORTED

- EtherCAT 
- SERCOS II 
- Panasonic Real Time Express 
- Control Techniques SLM 
- Further drive types to be supported

The MC464 is fully compatible with the range of CAN I/O modules from Trio as well as some third party I/O modules using the CANopen protocol. In addition the MC464 takes advantage of Trio's new range of remote Input/Output modules, giving the user even more flexibility when defining the digital I/O in a system.

I/O CAPABILITY

- 8 24V dc inputs and 8 24V dc bi-directional channels
- 2 x 12 bit 0-10V analogue inputs
- Expandable to 256 I/O channels and 32/16 I/O analogue channels using the P317, P318 and P326 modules
- The P316 and P325 modules are also compatible

BACKLIT STATUS DISPLAY

RS232 + RS485 (MODBUS-RTU, HOSTLINK OR USER PROGRAMMABLE)

ETHERNET PROGRAMMING MODBUS-TCP, PC MOTION ACTIVEX

SYNC PORT

SYNC ENCODER

SD CARD

I/O, CAN, POWER, ANALOGUE

COMMON EARTHING FOR IMPROVED NOISE REJECTION

FIRST EXPANSION MODULE

EASY RELEASE EXPANSION COVER



FACTORY COMMUNICATIONS OPTIONS

- Ethernet IP
- Modbus-TCP/IP
- CANopen Master
- DeviceNet Slave
- CC-Link
- Profibus
- Profinet I/O
- Modbus-RTU

Built in Anybus technology enabling support for current and future communication networks.

BUILT-IN FIELDBUS COMMUNICATION

Ethernet	Ethernet IP and Modbus-TCP, TrioPC ActiveX, Telnet
CAN	TrioCAN I/O, DeviceNet slave, CANopen I/O, or user programmable
RS232	Modbus-RTU slave, Hostlink or user programmable†
RS485	Modbus-RTU slave, Hostlink or user programmable†

OVERALL DIMENSIONS (MC464 AND EXPANSION MODULE)

56 mm 155 mm 201 mm

All dimensions approximate

DIN RAIL OR PANEL MOUNT

PRODUCT CODE: VARIOUS

MC464 EXPANSION MODULES

4

Configure the MC464 for your application by connecting up to 7 half-height expansion modules or 3 full-height expansion modules.

Each module easily attaches to the controller with a new high density bus connection and a uniquely designed screw integrates the earth planes of all modules and *Motion Coordinator* together. Trio's feature enable code system for axis activation allows the whole system to be scaled exactly to your requirements.



PRODUCT CODE: P876

ETHERCAT INTERFACE

For use with and EtherCAT based drive products. EtherCAT is the open real-time Ethernet network originally developed by Beckhoff.

Part Number	P876
Network	EtherCAT
Network Speed	100Mbps
Topology	Star / Hub / Chain
Max Slaves per Interface	64
Max Interfaces per MC464	7
Max Axes on MC464	64
Cable	STP Cat 5-e or better
Bus to MC464	32 Bit
Registration Inputs	8 x 24V Inputs
Optically isolated registration inputs	Y
Map any I/O to any Axis	Y



PRODUCT CODE: P872

SERCOS II INTERFACE

For use with any Sercos II IEC61491 compliant drive. The module allows control of up to 16 axes via SERCOS with cycle times down to 250usec. Multiple SERCOS II interfaces can be used to increase axes count to 64.

Part Number	P872
Network	SERCOS II
Network Speed	4, 8 or 16Mbps
Topology	Ring
Max Slaves per Interface / Ring	16
Max Interfaces per MC464	7
Max Axes on MC464	64
Cable	Fibre Optic
Bus to MC464	32 Bit
Interpolated time based registration	8 x 24V inputs
Remote Registration	Y
Optically isolated registration inputs	Y
Map any registration input to any Axis	Y



Part Number	P871
Network	Panasonic Real Time Express (RTEX)
Network Speed	100Mbps
Topology	Ring
Max Slaves per Interface / Ring	32
Max Interfaces per MC464	7
Max Axes on MC464	64
Cable	STP Cat 5-e or better
Bus to MC464	32 Bit
Interpolated time registration	8 x 24V Inputs
Optically isolated registration inputs	Y
Map any registration input to any Axis	Y



PRODUCT CODE: P871

RTEX INTERFACE

For use with the latest range of Panasonic MINAS A4N amplifiers supporting the Panasonic Real Time Express (RTEX) network. Allows Plug & Play interconnection with Shielded twisted pair (TIA/EIA-568B CAT5e or more) Ethernet cables.

Part Number	P872
Network	SLM
Network Speed	SLM Standard
Topology	Star
Max Slaves per Interface / Ring	6
Max Interfaces per MC464	7
Max Axes on MC464	42
Cable	RS485
Bus to MC464	32 Bit
Interpolated time registration	6 x 24V Inputs
Add Registration Capability	Y
Optically isolated registration inputs	Y
Map any registration input to any Axis	Y



PRODUCT CODE: P873

SLM INTERFACE

For use with drives supporting Control Techniques SLM protocol. Each module supports 6 axes which can be individual drives or a single drive using the CT Multiax concept.

Factory Communications Options	Profibus
CompactCom Modules	DeviceNet
	CANOpen
	CC-Link
	EtherNet IP
	USB
	Modbus-TCP
	Modbus-RTU
	RS232
	RS485
	Profinet I/O
	Bluetooth



PRODUCT CODE: P875

ANYBUS-CC MODULE

This module adds support for the Anybus CompactCom device modules.

Anybus-CC is the latest range of cost optimised plug-in modules supporting all major Fieldbus and Ethernet networks.

DIN RAIL OR PANEL MOUNT

PRODUCT CODE: VARIOUS

MC464 EXPANSION MODULES

6

PRODUCT CODE: P879/ P874

FLEXAXIS 4/8 INTERFACE



For use with Stepper, Analogue Servo & Piezo motors with support available for SSI/Endat/Tamagawa Absolute encoders. Standard FlexAxis I/F modules are available in 4 axis (P879) and 8 axis (P874) versions. An 8 axis SSI absolute encoder version (P881) is available as a special order.

Part Number	P874	P879
Max Slaves per Interface / Ring	8	4
Max Interfaces per MC464	3	3
Max Axes on MC464	24	12
Cable	Mixed	Mixed
Bus to MC464	32 Bit	32 Bit
Registration Inputs	Flexible dual registration on all axes	Flexible dual registration on all axes
position based registration	4 x 24V inputs	4 x 24V inputs
Bi-direction registration input position switch output	4 x 24V	4 x 24V
Map any position switch to any axis	Y	Y
Optically isolated registration inputs	Y	Y
Map any registration input to any Axis	Y	Y
Independent axis Configuration	Y	Y
Servo or Stepper Axis	8	4
No of 16 bit DAC Outputs	8	4
Pulse & Direction / Encoder Output	Y	Y
Encoder Input	Y	Y
Support for incremental encoder	Y (8 axes max standard)	Y (4 axes max)
Support for SSI Absolute Encoder	Y (4 axes max standard)	Y (4 axes max)
Support for Endat Absolute Encoder	Y (4 axes max standard)	Y (2 axes max)
Support for Tamagawa absolute enc.	Y (4 axes max standard)	Y (2 axes max)

*Note 1: An 8 axis SSI absolute encoder version (P881) is available as a special order.
Note 2: More registration Input capability is available. Call for details.*

P381 - Breakout cable to split the high density D-Type connectors to standard 9 way D type connectors.



PRODUCT CODE: P878

BLANKING MODULE



Part Number P878
Blanking module to ensure the system is "tied" together mechanically if there are any gaps in the build. There is no communication bus connection, but the P878 is required for the earth connection.

Part Number P877
 Enables the IEC61131-3 run-time code to provide the IEC 61131 standardised programming language, instruction sets and the handling / structuring of projects.

PRODUCT CODE: P877
 IEC61131-3 RUNTIME (FEC)

Part Number P680
 MULTIPROG® IEC 61131-3 programming system. Programs can be written in FBD, LD, IL, ST and SFC, compiled and then downloaded to the MC464. Includes Trio Motion Command Library and links with *Motion Perfect 2*. Online debug tools, task scheduler and project structure management make this one of the leading IEC 61131-3 suites around.

PRODUCT CODE: P680
 KW MULTIPROG IEC61131-3 SW

Part Number P317
 Description Vertical DIN rail mounting 16 x 24V Digital Output CAN module with 1 Power LED, 1 Fault LED and 16 Output status LEDs
 Network Speed 500KBit/s
 Protocols Supported TrioCAN I/O
 EMC Compliance ROHS, UL and EMC (BS EN 61000-6-4:2007 for emissions and BS EN 61000-6-2:2005 for immunity testing)



I/O SYSTEMS
 PRODUCT CODE: P317
 CAN 16-OUT DIGITAL

Part Number P318
 Description Vertical DIN rail mounting 16 x 24V Digital Input CAN module with 1 Power LED, 1 Fault LED and 16 Output status LEDs
 Network Speed 500KBit/s
 Protocols Supported TrioCAN I/O
 EMC Compliance ROHS, UL and EMC (BS EN 61000-6-4:2007 for emissions and BS EN 61000-6-2:2005 for immunity testing)



I/O SYSTEMS
 PRODUCT CODE: P318
 CAN 16-IN DIGITAL

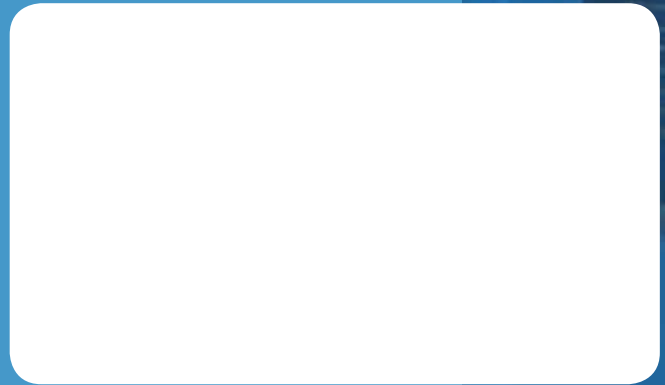
Part Number P326
 Description Vertical DIN rail mounting 8 x 12 bit analogue inputs and 4 x 12 bit analogue outputs. software-Programmable Input and Output Voltage Range, single ended or Differential with 1 Power LED, 1 Fault LED and 16 Output status LEDs
 Network Speed 500KBit/s
 Protocols Supported TrioCAN I/O
 EMC Compliance ROHS, UL and EMC (BS EN 61000-6-4:2007 for emissions and BS EN 61000-6-2:2005 for immunity testing)



I/O SYSTEMS
 PRODUCT CODE: P326
 CAN 8-IN/4-OUT ANALOGUE

WE CAN CUSTOMISE AND EMBED...

Are you planning to upgrade your machine design, or control front end for your drive?
We can offer a customised / embedded solution to suit your exact needs. If you are manufacturing 200 machines per annum then talk to the Trio team and find out how adaptable our technology is.



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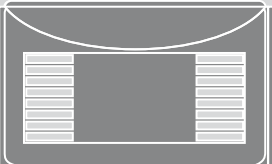




MOTION COORDINATOR MC464

Quick Connection Guide

BACKLIT DISPLAY



ETHERNET PROGRAMMING



SYNC PORT



SD CARD



I/O, CAN, POWER, ANALOGUE



RS232 + RS485



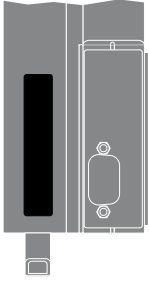
SYNC ENCODER



FIRST EXPANSION MODULE



I/O CONNECTOR



0V AIN		0V CAN/AIN
AIN0		CAN LOW
AIN1		CAN EARTH
WDOG+		CAN HIGH
WDOG-		24V CAN/AIN SUPPLY
I 0		I/O8
I 1		I/O9
I 2		I/O10
I 3		I/O11
I 4		I/O12
I 5		I/O13
I 6		I/O14
I 7		I/O15
0V I/O		24V I/O SUPPLY
0V SUPPLY		24V SUPPLY

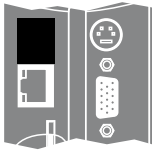
The bottom 2 pins of the 30 way high density input connector are used to provide the 24V dc power to the MC464. A 24V dc, Class 2 transformer or power source must be provided.

The 2 pins above the 24V dc supply are to power the I/O 24 Volts.

The MC464 is grounded via the metal chassis. It MUST be installed on an unpainted metal plate or DIN rail which is connected to earth.



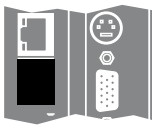
RJ45 CONNECTOR (TOP)



A standard ethernet connector is provided for use as the primary programming interface.

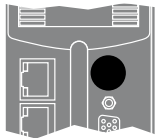
The Trio programming software, *Motion Perfect 2*, must be installed on a Windows based PC that is fitted with an Ethernet connection. The IP address is displayed on the MC464 display for a few seconds after power-up or when an Ethernet cable is plugged in.

RJ45 CONNECTOR (BOTTOM)

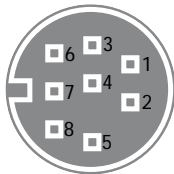


A standard ethernet connector is provided to allow synchronisation between units.

SERIAL CONNECTIONS

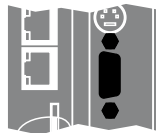


8 Way MiniDIN

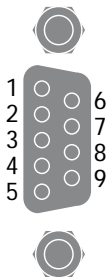


Pin	Function	Note
1	RS485 Data In A Rx+	Serial Port #2
2	RS485 Data In B Rx-	
3	RS232 Transmit	Serial Port #1
4	0V Serial	
5	RS232 Receive	Serial Port #1
6	Internal 5V	
7	RS485 Data Out Z Tx-	Serial Port #2
8	RS485 Data Out Y Tx+	

SYNC ENCODER CONNECTIONS



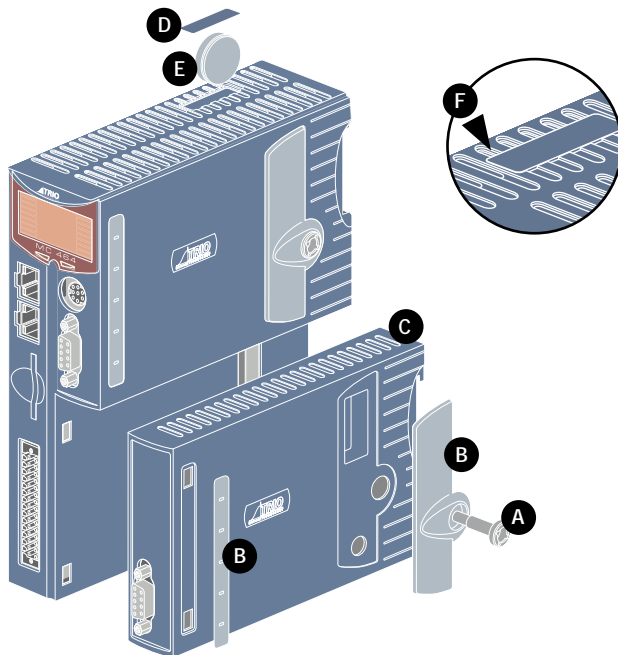
9 Way D-Type



Pin	Encoder	Pulse & Direction
1	Enc. A	Step +
2	Enc. /A	Step -
3	Enc. B	Direction +
4	Enc. /B	Direction -
5	0V Encoder	0V Stepper
6	Enc. Z	Enable +
7	Enc. /Z	Enable -
8	5V*	5V*
9	Registration Input (5V)	Registration Input (5V)

* 5V supply is limited to 150mA.

ADDING EXPANSION MODULES AND BATTERY



Unscrew the lower retaining fixing (A) using the supplied tool or a coin.

Remove the covers from the module (B).

Swing the expansion module (C) out from the rear and unclip from the front end.

Replacing the module is the reverse of the procedure.

To replace the battery, insert screwdriver under the frontmost ventilation slot (F) and prize off the battery cover (D) and pull the battery ribbon to lift the battery (E) from the MC464. Replacing is the reverse of the procedure.

LCD DISPLAY



Display at start-up



Display with WDOG on

The IP address and subnet mask of the MC464 is shown on the LCD display for a few seconds after power-up. The factory default IP address is 192.168.0.250. This can be changed using the ETHERNET command via *Motion Perfect 2*.

SOFTWARE

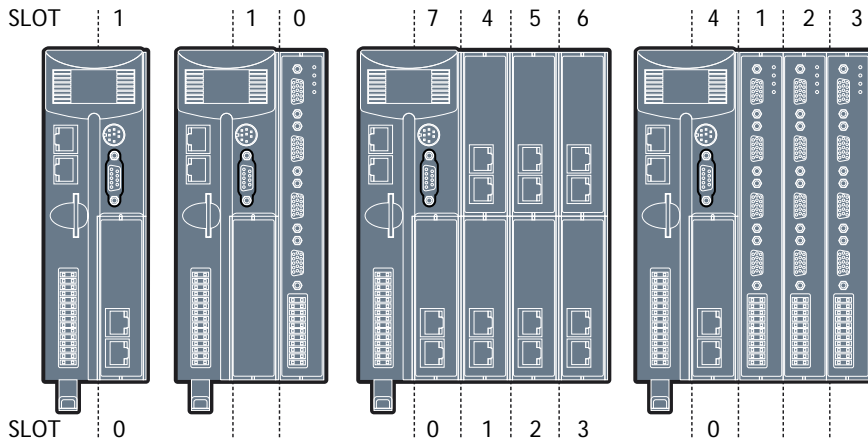
Trio recommend that you use the latest version of *Motion Perfect* when using the MC464 (Minimum recommended version V2.4.0.16). Software can be downloaded from www.triomotion.com.

MODULE ASSEMBLY

A maximum of 7 half height modules or 3 full height modules may be fitted to the MC464. A system may be made using any combination of half and full height modules providing that the full height modules are the last to be attached.

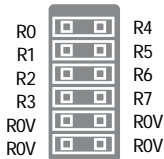
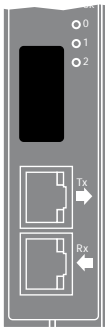
MODULE SLOT NUMBERS

SLOT Numbers are allocated by the system software in order, left to right, starting with the lower bus. Lower modules are allocated slots 0 to m, then the upper modules become slots m+1 to n. Finally, the Sync Encoder Port is allocated slot n+1. The Sync Encoder Port has SLOT number -1 in addition to the one allocated (1) in this sequence.



EXPANSION MODULE P871 - MC464 PANASONIC INTERFACE

REGISTRATION CONNECTOR

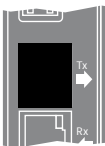


R0 - R7: registration inputs (24V).
R0V: registration common 0V return.

Registration inputs can be allocated to any axis by software.

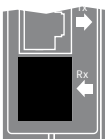
Note: This pin out applies to module serial numbers P871-00011 and higher.

RJ45 CONNECTOR (TX)



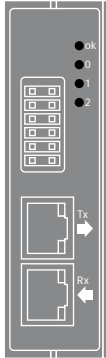
100Mbps Panasonic "Realtime Express" transmit - connect to receive of first drive.

RJ45 CONNECTOR (RX)



100Mbps Panasonic "Realtime Express" receive - connect to transmit of last drive.

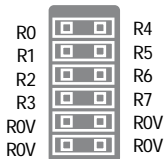
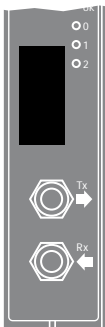
LED FUNCTIONS



LED	LED Colour	LED Function
ok	Green	ON=Module Initialised Okay
0	Red	ON=Module Error
1	Yellow	Status 1
2	Yellow	Status 2

EXPANSION MODULE P872 - MC464 SERCOS INTERFACE

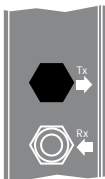
REGISTRATION CONNECTOR



R0 - R7: registration inputs (24V).
0V: registration common 0V return.

Registration inputs can be allocated to any axis by software.

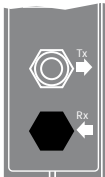
CONNECTOR (TX)



9mm FSMA

SERCOS fibre-optic transmit.

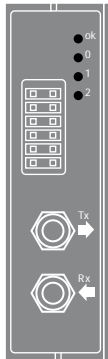
CONNECTOR (RX)



9mm FSMA

SERCOS fibre-optic receive.

LED FUNCTIONS

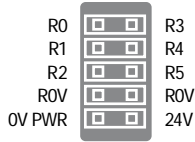


LED	LED Colour	LED Function
ok	Green	ON=Module Initialised Okay
0	Red	ON=Ring Open / Distorted
1	Yellow	SERCOS Phase
2	Yellow	SERCOS Phase

SERCOS PHASE	LED 1	LED 2
0	OFF	FLASH
1	OFF	ON
2	FLASH	OFF
3	ON	OFF
4	ON	ON

EXPANSION MODULE P873 - MC464 SLM INTERFACE

REGISTRATION CONNECTOR



R0 - R5: registration inputs (24V).

0VR: common 0V return.

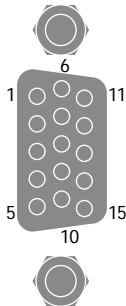
0V PWR: } Power input for SLM system.

24V: }

SLM CONNECTOR

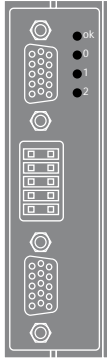


15 Way D-Type



Pin	Upper D-Type	Lower D-Type
1	Com Axis 0	Com Axis 3
2	/Com Axis 0.	/Com Axis 3
3	Hardware Enable	Hardware Enable
4	0V Output	0V Output
5	24V Output	24V Output
6	Com Axis 1	Com Axis 4
7	/Com Axis 1	/Com Axis 4
8	No Connection	No Connection
9	No Connection	No Connection
10	No Connection	No Connection
11	24V Output	24V Output
12	0V Output	0V Output
13	Com Axis 2	Com Axis 5
14	/Com Axis 2	/Com Axis 5
15	Earth / Shield	Earth / Shield

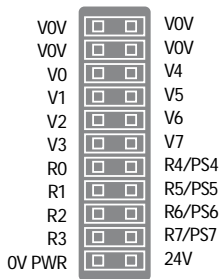
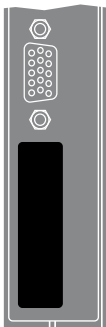
LED FUNCTIONS



LED	LED Colour	LED Function
ok	Green	ON=Module Initialised Okay
0	Red	ON=Module Error
1	Yellow	Status 1
2	Yellow	Status 2

EXPANSION MODULE P874 / P879 - MC464 FLEXIBLE AXIS INTERFACE

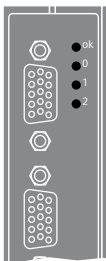
REGISTRATION CONNECTOR



V0 - V7: Voltage outputs
 R4/PS4 - R7/PS7: Bidirectional registration
 R0 - R3: Registration In
 Inputs / 24V: PSwitch outputs
 0V PWR: Power Input
 24V: Power Input
 V0V: DAC common 0V return

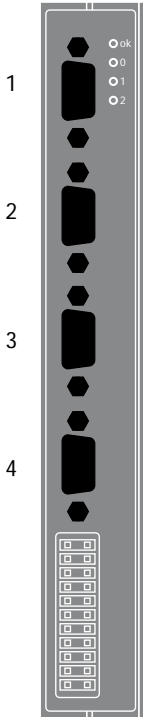
NOTE: 4 axis version uses voltage outputs
 0 - 3 only.

LED FUNCTIONS

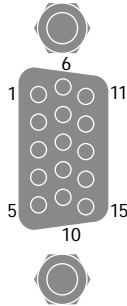


LED	LED Colour	LED Function
ok	Green	ON=Module Initialised Okay
0	Red	ON=Module Error
1	Yellow	Status 1
2	Yellow	Status 2

ENCODER CONNECTOR



15 Way D-Type



Pin	Incremental Encoder	Absolute Encoder	Pulse & Direction
1	Enc. A n	Clock n	Step.+ n
2	Enc. /A n	/Clock n	Step.- n
3	Enc. B n	-----	Direction+ n
4	Enc. /B n	-----	Direction- n
5	0V Enc.	0V Enc.	0V Step.
6	Enc. Z n	Data n	Enable+ n
7	Enc. /Z n	/Data n	Enable- n
8	5V*	5V*	5V*
9	Enc. A n+4	Clock n+4	Step.+ n+4
10	Enc. /A n+4	/Clock n+4	Step.- n+4
11	Enc. B n+4	-----	Direction+ n+4
12	Enc. /B n+4	-----	Direction- n+4
13	Enc. Z n+4	Data n+4	Enable+ n+4
14	Enc. /Z n+4	/Data n+4	Enable- n+4
15	0V Enc.	0V Enc.	0V Enc.

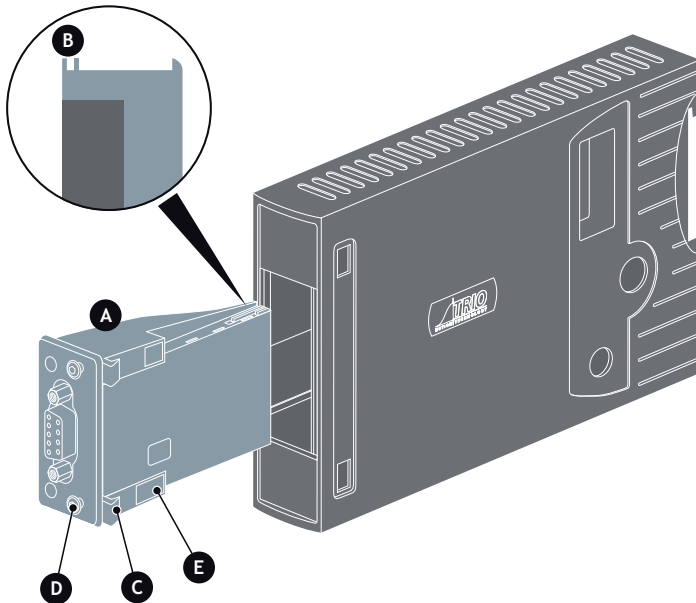
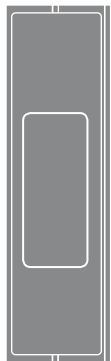
Connector	8 Axes (P874)	4 Axes (P879)
1	0 and 4	0
2	1 and 5	1
3	2 and 6	2
4	3 and 7	3

*5V supply is limited to 150mA per axis.

Absolute Encoder is only available on axes 4 - 7 on P874 and 2 - 3 on P879.

EXPANSION MODULE P875 - MC464 ANYBUS® INTERFACE

ANYBUS® FITTING



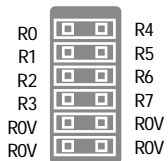
Push the Anybus® module (A) into the Trio Expansion Interface taking care to keep its base in contact with the PCB and align guide slots (B) with the connector rails inside. Ensure that the moulded hooks (C) on the lower front edge of the Anybus® module locate under the P875 PCB at the front.

When the module is flush with the face of the Trio Expansion Interface, tighten the two "Torx" head screws (D) to locate the two lugs (E) and secure the Anybus® module.

To remove the module, reverse this procedure.

EXPANSION MODULE P876 - MC464 ETHERCAT INTERFACE

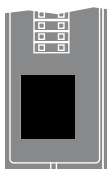
REGISTRATION CONNECTOR



R0 - R7: registration inputs (24V).
0V: registration common 0V return.

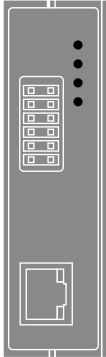
Registration inputs can be allocated to any axis by software.

RJ45 CONNECTOR



100 base-T Ethernet master. Connect to IN of first drive.

LED FUNCTIONS



LED	LED Colour	LED Function
ok	Green	ON=Module Initialised Okay
0	Red	ON=Module Error
1	Yellow	Status 1
2	Yellow	Status 2

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