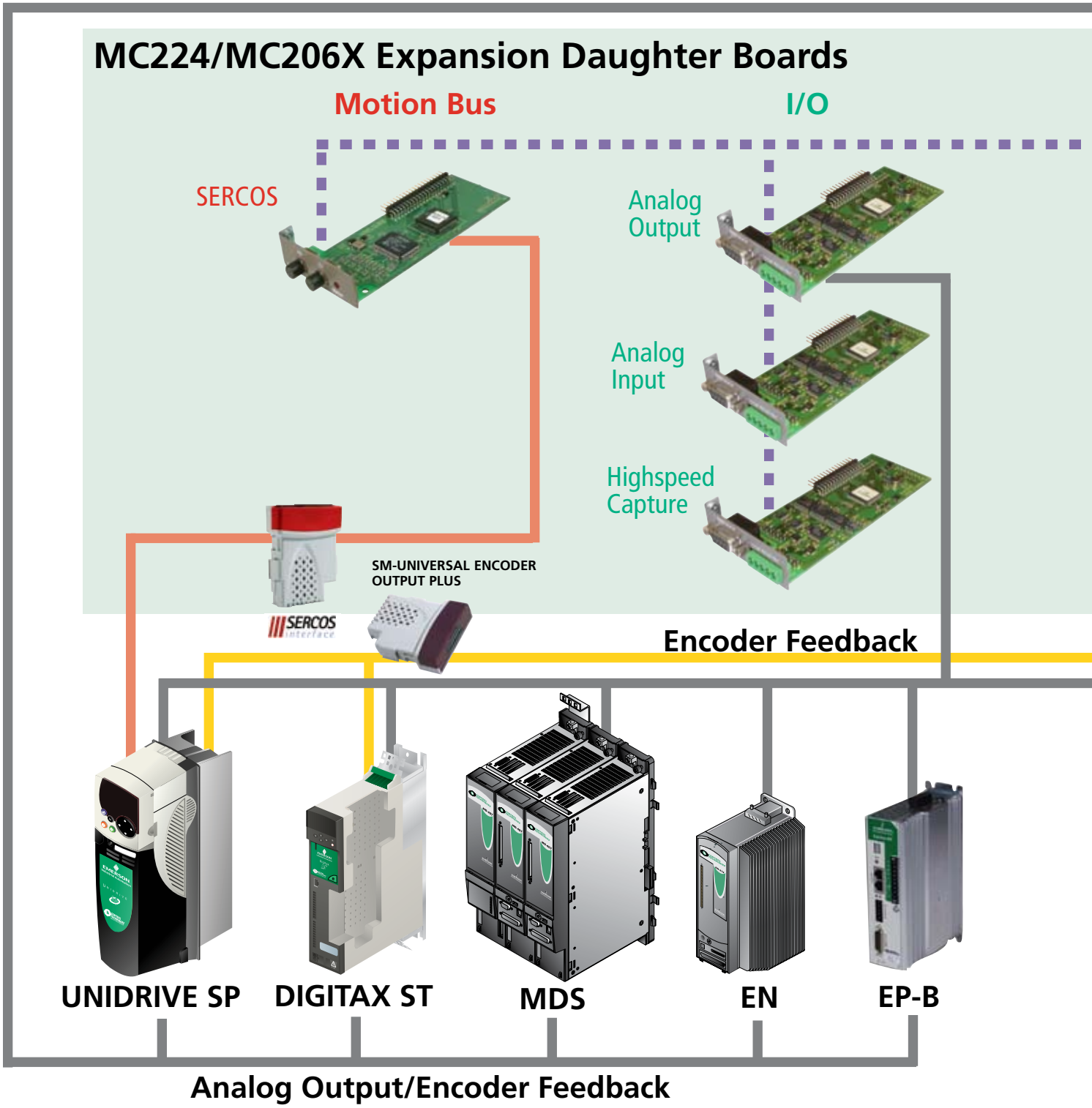
Centralized Multi-Axis Control

Motion Coordinator Series

The Motion Coordinator series of centralized controllers offer scalability, modularity, and flexibility. Scalability is offered through the choice of two different base controllers, four different servo drive series, and over 15 daughter board options.

Furthermore, all Motion Coordinators are programmed with the free MotionPerfect2 software. Modularity is offered by selecting only the daughter board required for your specific application. Finally, flexibility is offered by the controller's ability to perform interpolated, point to point, camming and electronic gearing.



MC224

MC206X

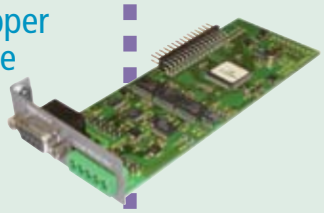
MC Canbus

Stepper

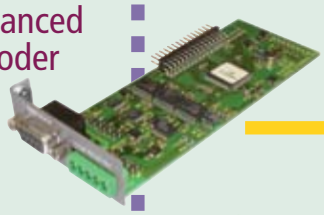
Encoder

Fieldbus

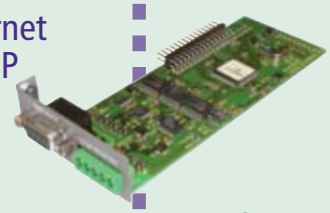
Stepper Pulse



Enhanced Encoder

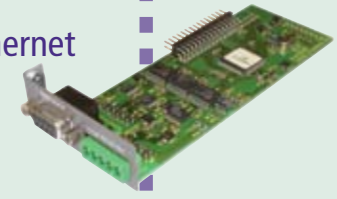


Ethernet TCP/IP

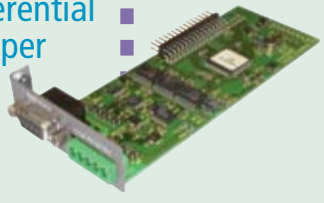


SSI Encoder

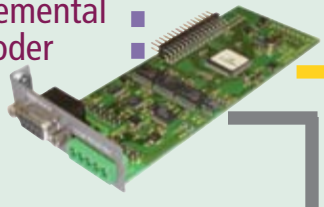
Ethernet IP



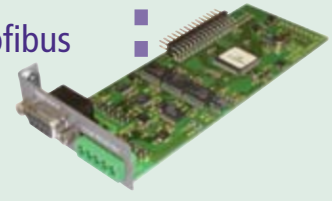
Differential Stepper

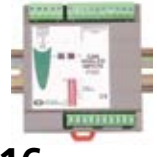


Incremental Encoder

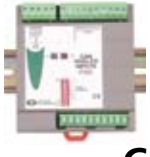


Profibus





CAN-16
24V I/O

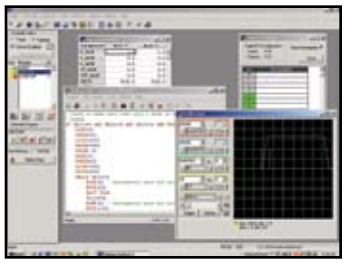


CAN-8
Analog Inputs

MC206X
2-7 Axis Control

The MC206X is a very capable all-in-one motion controller and integrates easily with Control Techniques scalable servo offering. The MC206X can coordinate 2-4 Control Techniques drives via encoder feedback, analog output. The MC206X comes standard with onboard I/O for high speed digital inputs, outputs, analog inputs, and an additional encoder reference signal. The MC206X with a SERCOS Daughter Board can coordinate up to 7 SM-SERCOS equipped Unidrive SP drives. Capable also means, the MC206X is capable of Point to Point motion, Camming, Velocity, Torque, and Circular Interpolated motion all programmed using the simple and free MotionPerfect2 programming software.

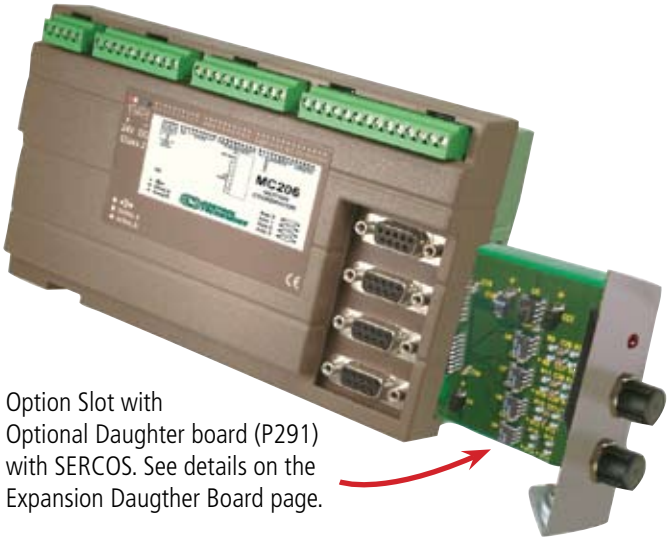
MotionPerfect2 Programming Software



MotionPerfect2 is a powerful and fast multitasking configuration and programming software. MotionPerfect2 provides comprehensive system monitoring and diagnostics tools. See the software and connectivity catalog section for more details.

MC206X Capabilities

- **250 µs, 500 µs, or 1 ms Servo cycle time**
- **Multitasking processor with 7 tasks**
- **Floating point Math**
- **Interpolation; linear, circular, helical**
- **Centralized point to point position controller**
- **Cam Profiles**
- **Electronic Gearing**
- **Accel/Decel S Ramps Controls**
- **4 encoder/analog axis control standard**
- **2 virtual axis standard**
- **1 master encoder standard**
- **High speed latch inputs standard**
- **7 axis control with optional SERCOS Daughter Board**
- **5 axis control with optional encoder/feedback Board**
- **Expandable I/O up to 256**
- **One Daughter Board Expansion Slot**



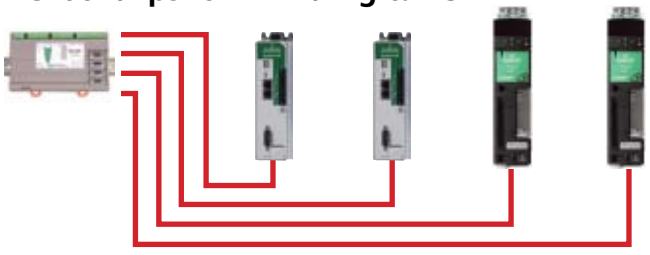
Option Slot with Optional Daughter board (P291) with SERCOS. See details on the Expansion Daugther Board page.

Flexible and Modular Daughter Board Options

The MC206X accepts one of 15 plus daughter board options providing unlimited flexibility. The slot can be used for added axis control such as an additional encoder/analog axis or SERCOS. The slot could also be used to add Ethernet TCP/IP, EtherNet/IP or PROFIBUS.

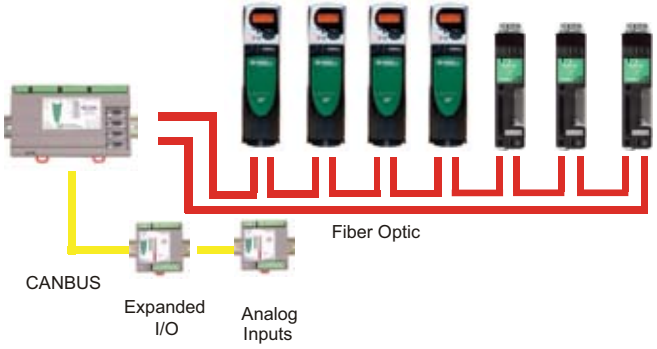
ANALOG

MC206X/Epsilon EP-B/Digitax ST

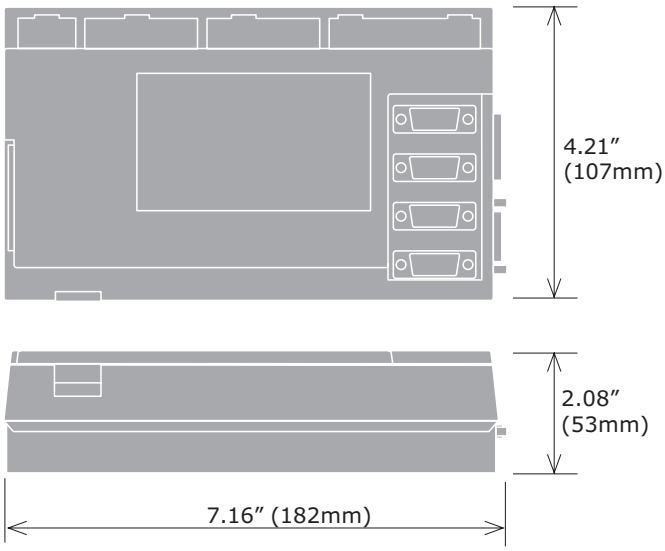


SERCOS

MC206X/Unidrive SP/Digitax ST



MC206X SPECIFICATIONS



• Size	107 mm x 182 mm x 53 mm
• Weight	325 g
• Operating Temp.	0-45° Celsius
• Min Power Consump.	24V @ 300 mA (Nominal)
• Max Power Consump.	24V @ 800 mA
• Axes count	5 analog or 7 with SERCOS
• Encoder Inputs	1 @ 6 MHz (Line Driver)
• Bi-directional Ports	4 @ 6 MHz (Encoder) or 2 MHz (Stepper
• Analog Outputs	4 @ +/-10V 16-bit Resolution
• Servo Cycle Time	1000 µs, 500 µs, or 250 µs
• Inputs	8 x 24V Opto-Isolated
• Outputs	None
• Bi-directional I/O	8 x 24V Opto-Isolated
• Analog Inputs	1 @ 0-10V 10-bit Resolution
• Inputs Functions	Forward Limit / Reverse Limit / Datum / F Hold
• Watchdog Relay	1 Solid State Relay - 24V @ 100 mA
• Serial Ports	RS232 (Programming) / RS232 / RS485 / TTL / USB
• CAN Ports	1 @ 1 MBAUD max
• Daughter board Slots	1 Slot
• User Memory	512 kbytes
• Table Memory	32000 values
• Multi-tasking	2 Fast Tasks + 5 Normal
• EMC Compliance	BS EN61000-6-2 BS EN61000-6-4

General Ordering Information

Base Unit

MC206X	Base Unit, 1 servo axis enabled
P399	MC206X Daughter Board Adapter

Axis control

P201	Enhanced Servo Encoder Daughter Board
P220	Reference Encoder Daughter Board
P291	SERCOS Daughter Board 2 axis enabled Requires SM-SERCOS on either the Unidrive SP or Digitax ST

Fieldbus

P296	EtherNet TCP/IP Daughter Board
P298	EtherNet/IP Daughter Board
P297	Profibus Daughter Board
P316	CAN 16-I/O
P325	CAN 8 Analogue Inputs

Programming Cables

P350	PC to MC RS232 to RS232 programming cable
P361	PC to MC USB programming cable

Enable Codes

P390	Enable Code for Additional Servo Axis
P393	Enable Code for Additional Reference Encoder Input
P70x	Enable additional SERCOS axis 1, 2, 4, 8 or 16

Feedback cables

MC-CEN-xxx	Epsilon, EN, MDS command cable
MC-CEP-xxx	Epsilon EP command cable
MC-EUN-xxx	Unidrive SP command cable requires encoder module on Unidrive SP

Notes:
MC206X has only one option slot.

For "How to Order" information see the last page in this section.

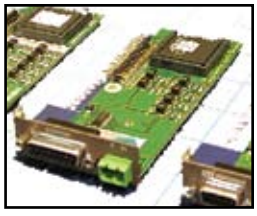
MC224
Up to 24 Axis Control

The MC224 is a high performance controller capable of 24 axis of coordinated motion control when combined with Control Techniques scalable servo drive offering. The MC224 motion capabilities include circular interpolation, point to point, camming, electronic gearing and basic accel/decel s-ramp motion profiles. The MC224 is a flexible and modular system which consists of base modules with option slots for flexible daughter board options. A large 16 axis system would consist of a MC224 base module and three expansion modules connected together each with up to 4 flexible daughter boards to fit your application needs.

MC224 Capabilities

- **Control up to 16 axis via analog/encoder or up to 24 axis via SERCOS**
- **250 µs, 500 µs, or 1 ms Servo cycle time**
- **Multitasking processor with 14 tasks**
- **Floating point Math Interpolation**
- **Centralized point to point position controller**
- **Cam Profiles**
- **Electronic Gearing**
- **Accel/Decel S Ramps Controls**
- **Scalable axis via option slots and expansion base**
- **Onboard I/O**
- **Expandable I/O**
- **Programmed using the free MotionPerfect2 Software**

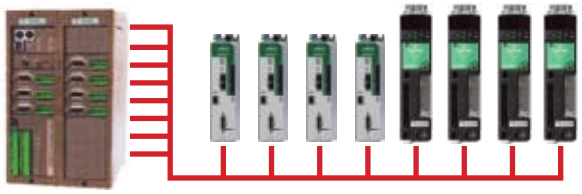
Flexible and Modular Daughter Board Options



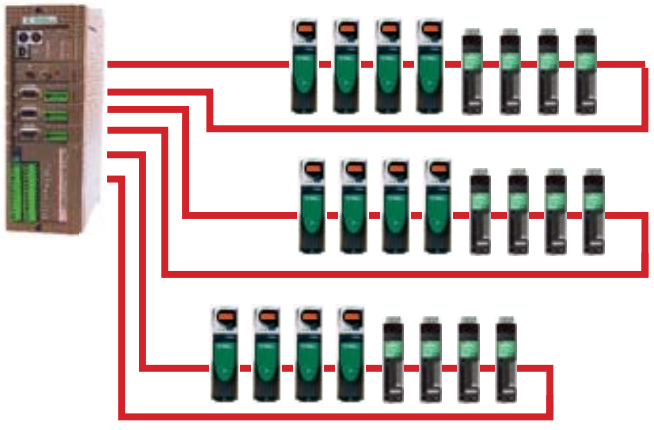
There are four daughter board slots on the MC224 or expansion modules. The slots can be used for added axis control such as an additional encoder/analog axis or a SERCOS daughter board. The slot could also be used to add Ethernet (Modbus TCP/IP, EtherNet/IP) or Profibus.

The MC224 complements the MC206X by offering capability for more than five analog/encoder servo axis or more than seven SERCOS axis. For example, a MC224 with one expansion base and eight encoder daughter boards could control seven analog/encoder Epsilon EP-B servo drives. Additionally, the available slots could be used for SERCOS daughter boards which can control eight axis per board. So a single MC224 with two SERCOS daughter boards could control 16 Unidrive SP axis. A flexible system consisting of a mixture of analog/encoder and SERCOS axes could also be created.

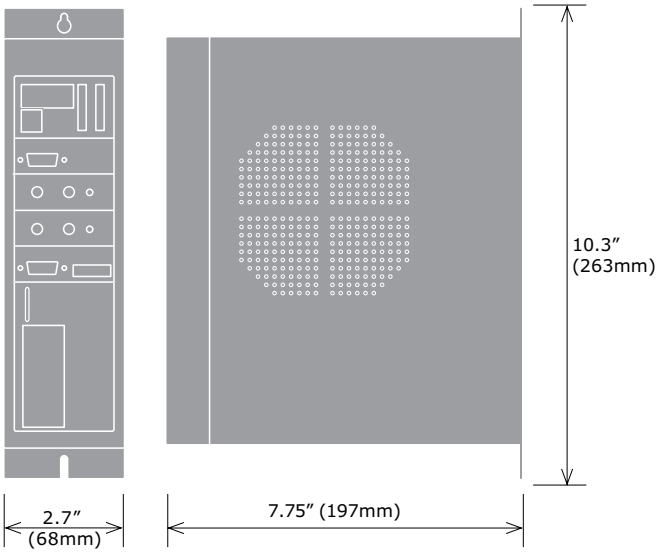
ANALOG
MC224/Epsilon EP-B/Digitax ST



SERCOS
MC224/Unidrive SP/Digitax ST



MC224 SPECIFICATIONS



• Size	263 mm x 68 mm x 197 mm
• Weight	750 g
• Operating Temp.	0-45° Celsius
• Min Power Consump.	24V @ 450 mA (Nominal)
• Max Power Consump.	24V @ 800 mA
• Axes count	16 analog or 24 with SERCOS
• Encoder Inputs	None
• Analog Outputs	None
• Servo Cycle Time	1000 µs, 500 µs, or 250 µs
• Inputs	8 x 24V Opto-Isolated
• Outputs	None
• Bi-directional I/O	8 x 24V Opto-Isolated
• Analog	Inputs 2 @ 0-10V 12-bit Resolution
• Inputs Functions	Forward Limit / Reverse Limit / Datum / F Hold
• Watchdog Relay	2 Solid State Relays - 24V @ 100 mA
• Serial Ports	RS232 / RS485 / TTL / USB
• CAN Ports	1 @ 1 M BAUD max
• Daughter board Slots	4 Slots (expandable)
• User Memory	1 Mbyte max
• Table Memory	250,000 values
• Multi-tasking	2 Fast Tasks + 12 Normal
• EMC Compliance	BS EN61000-6-2 BS EN61000-6-4

General Ordering Information

Base Unit

MC224	Base Unit
P301	MC224 Expander Unit
P355	Expansion cable for adding 1 bay
P360	Expansion cable for adding 2 bays
P365	Expansion cable for adding 3 bays

Axis control

P201	Enhanced Servo Encoder Daughter Board
P220	Reference Encoder Daughter Board
P291	SERCOS Daughter Board 2 axis enabled
P316	CAN 16-I/O
P325	CAN 8 Analog Inputs
P225	Analog input 8 x 16-bit 0-10 VDC
P242	Hardware PSWITCH (4 x 1 µs)

Fieldbus

P296	EtherNet TCP/IP Daughter Board
P298	EtherNet/IP Daughter Board
P297	Profibus Daughter Board

Programming Cables

P350	PC to MC RS232 to RS232 programming cable
P361	PC to MC USB programming cable
P398	MC controller memory stick

Enable Codes

P70x	Enable additional SERCOS axis 1, 2, 4, 8, or 16

Feedback cables

MC-CEN-xxx	Epsilon, EN, MDS command cable
MC-CEP-xxx	Epsilon EP command cable
MC-EUN-xxx	Unidrive SP command cable requires SM-Encoder module on Unidrive SP

For "How To Order" information see the last page of this section.

MC224/MC206X
Expansion Daughter Boards

The MC206X single and MC224 multiple expansion slot accept the modular and flexible range of axis control, I/O, and fieldbus daughter boards listed below. The MC206X has one slot located on the right side of the unit. The MC224 has four slots on the base unit and four slots in each expansion bay.

FIELDBUS OPTION BOARDS

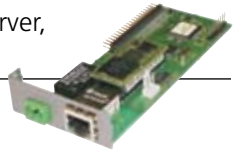
P296 Ethernet TCP/IP Board

Description: Adds 1 channel of Ethernet connectivity with the standard stack

TCP/IP

Network Speed: 10 BaseT

Protocols Supported: Modbus TCP server, native TCP/IP, and ActiveX control

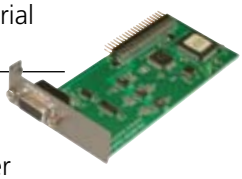


P298 EtherNet/IP Follower Board

Description: Adds 1 channel of Ethernet IP Server or commonly referred to as a follower device and not a scanner.

Network Speed: 10/100 BaseT

Protocols Supported: Common Industrial Protocol (CIP)



P297 Profibus DP Follower Board

Description: Adds Profibus DP follower node for connection to a Profibus Master

Network Speed: Up to 12 Mb auto detection

Data Payload: 16 words input, 16 words output

I/O BOARDS

P225 Analog Input Board

Signal: 8 x 0-10V analog inputs 16-bit

P260 Analog Output Board

Signal: 1 x +/-10V 12-bit resolution analog output

P242 Hardware PSWITCH

Description: 4 1 µs high speed latch inputs and one incremental encoder feedback

Feedback: 5V Line Drive Encoder – 6 MHz qaudrature

For "How To Order" information see following page.

AXIS CONTROL BOARDS

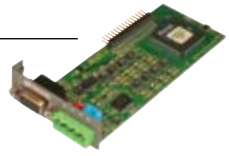
P201 Enhanced Servo Encoder Board

Description: Controls 1 servo axis with analog output and incremental encoder feedback

Encoder Input: 5V Line Drive Encoder – 6 MHz max edge rate

Analog output: +/- 10v 16-bit resolution or 2 Mhz 90° A/B quadrature output

Registration: 2 x 24V inputs @ 1 µs accuracy

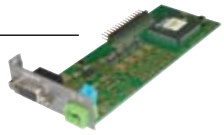


P270 SSI Servo Encoder Board

Description: Controls 1 servo axis with analog output and SSI encoder feedback

Feedback: SSI standard configurable to max 24-bits

Analog: +/- 10v 12-bit resolution

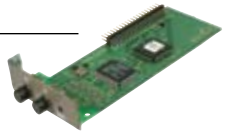


P220 Reference Encoder Board

Description: Input for 1 standard incremental encoder with high speed latch

Feedback: 5V Line Drive Encoder – 6 MHz max edge rate

Registration: 1 x 24V inputs @ 1 µs accuracy



P291 SERCOS Digital Drive Board

Description: SERCOS network master for controlling Unidrive SP with SM-SERCOS module

Number of Axis per Board: 2 standard, 8 Max.

Axis Enable Code: 1, 2, 4, 8,16 axes with order codes P701, P702, P704, P708, P716

Baud Rates: 2, 4, 8, 16 Mb

MC EXPANSION I/O

P316 Input/Output Expansion Module

Description: 16 I/O channels and each channel can be freely configured as 24 VDC input or output.

Communication bus: Proprietary protocol on Can

Bus Speed: 500 kbaud

Max Nodes: Connect up to 16 modules for total of 256 I/O points.

Max Distance: 100 m total distance

P325 Analog Input Expansion Module

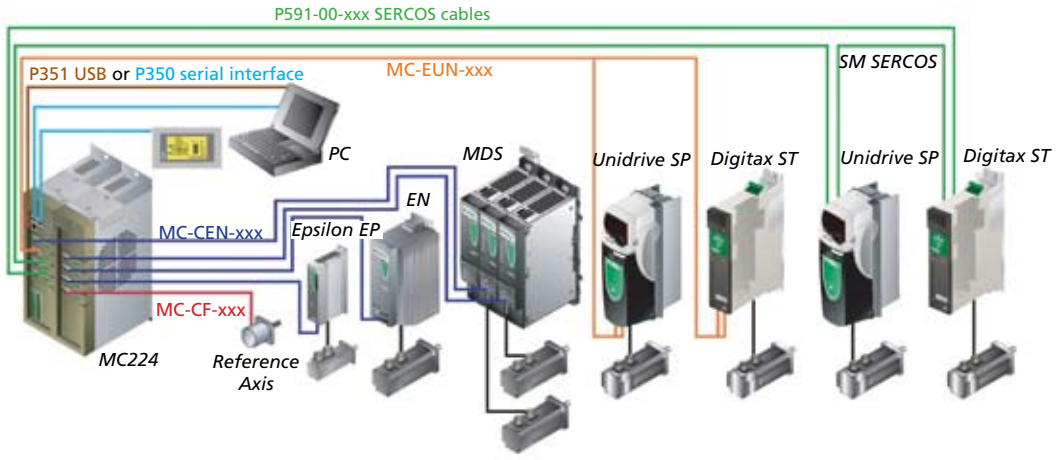
Description: 8 x +/-10V 12-bit resolution analog input channels.

Communication bus: Proprietary protocol on Can

Bus Speed: 500 kbaud

Max Nodes: Connect up to 4 modules for a total of 32 analog input channels.

Max Distance: 100 m total distance



How to Order

1 Select Coordinator

All MC Coordinators are shipped with a CD containing Manuals and Software. Additional information can be found on our web site at www.emersonct.com

Order: MC206X-00-000
1 servo and 1 sync encoder enabled, capable of 4 onboard servo axis Expandable: accepts 1 daughter board.

MC206X Expansion Options	# of Axis / Expansion Slots
Software Enabled code, Order P390-00-000 for each servo axis, or P395-00-000 for each stepper axis.	Up to 3 Additional axis may be added
Daughter Board slot, Using a daughter board on a MC206X requires a P399-00-000 Daughter Board Adapter.	1 Slot

Order: MC224-00-000
Up to 24 Axes*, Accepts 4 Daughter Boards
*Requires Axis Expander(s)

MC224 Expansion Options	Daughter Board Slots available
Expansion Bay 1, Order (qty 1) 300-00-000 Expander and P355-00-000 2 way ribbon cable	4 Slots
Expansion Bay 2, Order (qty 2) 300-00-000 Expander and P360-00-000 3 way ribbon cable	4 Slots
Expansion Bay 3, Order (qty 3) 300-00-000 Expander and P365-00-000 4 way ribbon cable	4 Slots

** MC224 Notes: When using a CAN Bus (P290), USB (P295), EtherNet (P296), SERCOS (P291), or Profibus (P297) Daughter boards, they must be placed in the Base Unit. Expansion Bays do not accept these daughter boards

2 Select Daughter Board(s)

Order: P201-00-000
Servo Encoder w/Registration Input

Order: P220-00-000
Reference Encoder 2 MHz Max Input

Order: P242-00-000
Hardware PSWITCH, Programmable Limit Switch

Order: P260-00-000
Analog Output, 12-bit +/- 10 VDC

Order: P290-00-000**
CAN Bus 4 Axis

Order: P295-00-000**
USB1.1 12 Mbit Rate

Order: P296-00-000**
Ethernet 10 MHz

Order: P297-00-000**
Profibus 12 MHz

Order: P291-00-000
SERCOS INTERFACE
8 Axis per P291
2 Axis Included

Order: P298-00-000
Ethernet IP Follower

3 Select Expansion Option(s)

Order: P390-00-000 (MC206X only) 1 Additional Servo Axis – Software Code Enabled

Order: P399-00-000 (MC206X only) MC206X Daughter Board Adapter

Order: P398-00-000
Memory Stick

Order: P301-00-000 (MC224 only) Expander Bay - Up to 3 Expanders, Accepts 4 Additional Daughter Boards each

Order: P355-00-000 (MC224 only) 2 Way System Ribbon Cable Required for 1 Expander Bay is used

Order: P360-00-000 (MC224 only) 3 Way System Ribbon Cable Required for 2 Expander Bays are used

Order: P365-00-000 (MC224 only) 4 Way System Ribbon Cable Required for 3 Expander Bays are used

Order: P316-00-000
CAN 16-I/O, +24 VDC I/O

Order: P325-00-000
CAN 8 Analog Inputs, +/-10 VDC, 12-bit

Order: P702-00-000
2 additional SERCOS Axes, Software code Enabled

Order: P704-00-000
4 additional SERCOS Axes, Software code Enabled

Order: P708-00-000
8 additional SERCOS Axes, Software code Enabled

Order: P716-00-000
16 additional SERCOS Axes, Software code Enabled

4 Select Cable(s)

Order: MC-CEP-XXX Command & Encoder Feedback Cable for use with Epsilon EP, (1 per Axis) (-002=2 ft, -004=4 ft)

Order: MC-CEN-XXX for MC206X or MC224 Command & Encoder Feedback Cable for use with Epsilon, EN and MDS (1 per Axis) (-002=2 ft, -004=4 ft)

Order: MC-EUN-XXX for MC206X or MC224 Encoder Feedback Cable for Unidrive to controller (-002=2 ft, -004=4 ft)

Order: MC-CF-XXX Bulk Cable for Command or Feedback between Drive and MC Coordinator (xxx = ft)

Order: P350-00-000
10ft RS232 Serial Cable PC to MC Controller

Order: P361-00-000
6 ft USB Cable PC to MC Controller

Order: P59X-00-000
SERCOS Cable (minimum 1 TX, 1 RX)
P591-00-000=1 meter
P592-00-000=2 meter
P595-00-000=5 meter