

CHAPTER

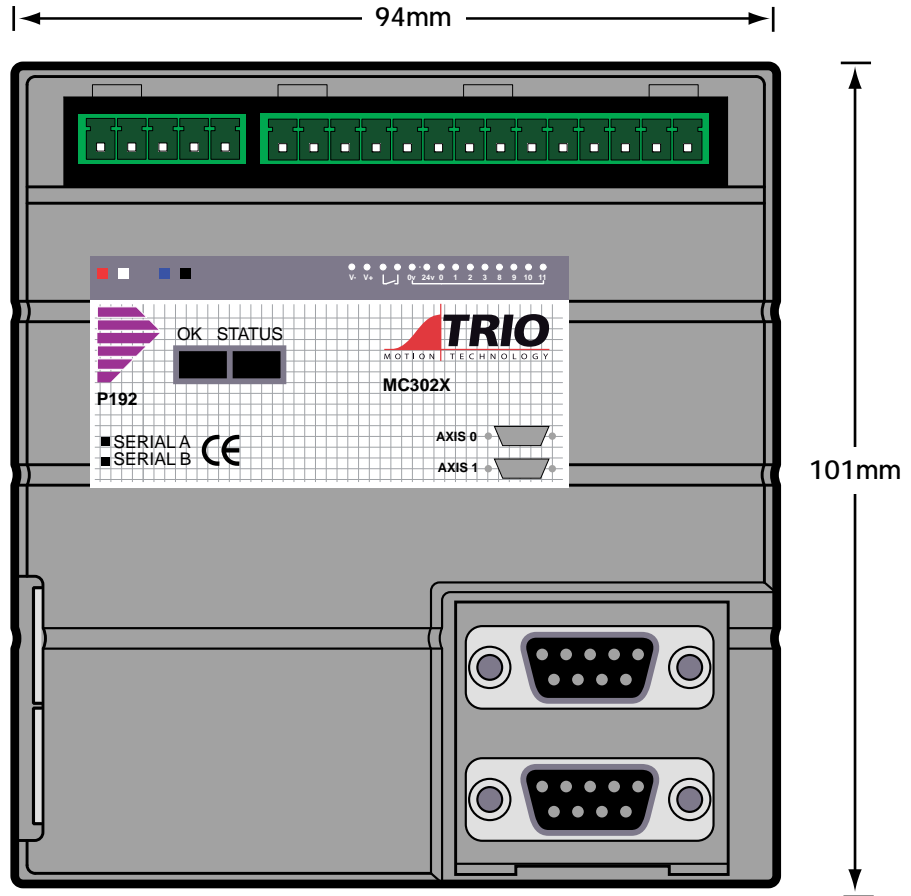
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INSTALLATION

Motion Coordinator MC302X

Packaging

The *Motion Coordinator* MC302X is a DIN rail mounting product. The module is held by a spring clip on its bottom edge on to the DIN rail. The unit should be mounted vertically and should not be subjected to mechanical loading. Care should be taken to ensure that there is a free flow of air vertically around the unit. The dimensions are as shown below.



Including the disconnect terminal, the unit is 48mm deep.
When the serial connector is fitted, around 60mm more width is required.

Connection To Other Trio Products

The MC302X may be connected to other *Motion Coordinator* modules on the CAN bus or using encoder emulation output.

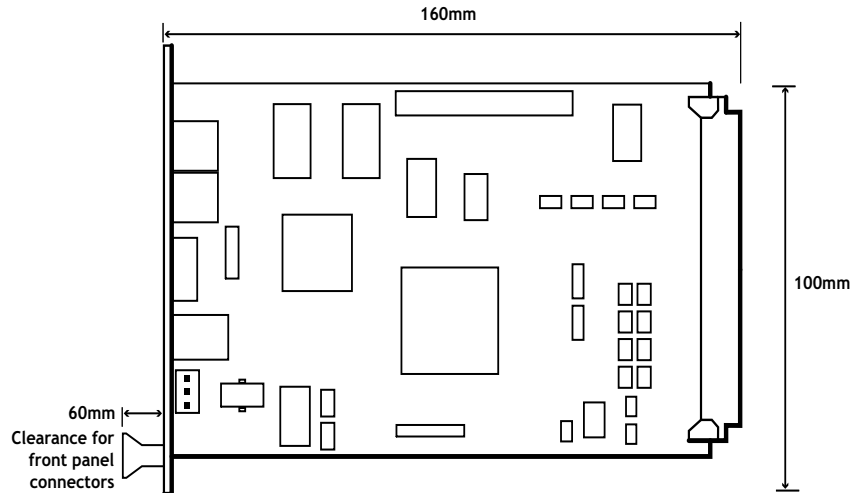
Environmental Considerations

Ensure that the area around the ventilation holes and top of the module are kept clear. Avoid violent shocks to, or vibration of, the system modules whilst in use or storage.

Motion Coordinator Euro 205x

Packaging

The *Motion Coordinator Euro205x* is a 3U Euro rack mounting product. The PCB dimensions are 160mm long x 100mm height. The connectors and front panel overhang these dimensions.



Rack Mounting

The Euro205x should be mounted in a shielded metal rack. The unit should be mounted vertically and should not be subjected to mechanical loading. Care should be taken to ensure that there is a free flow of air around the unit.

Connection To Other TRIO Products

The Euro205x may be connected to other *Motion Coordinators* on the CAN bus, fibre-optic network or using encoder emulation output.

Environmental Considerations

Avoid violent shocks to, or vibration of, the Euro205x whilst in use or storage.

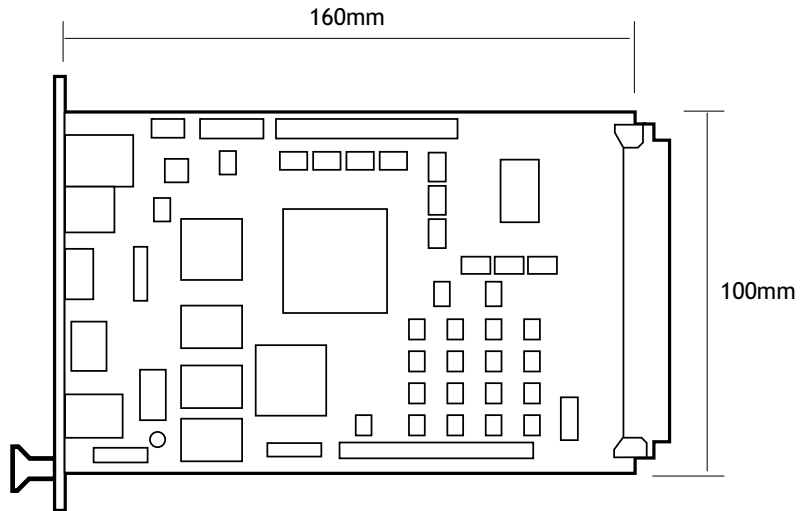
EMC Considerations

The Euro205x requires external power supplies, a card housing and suitable back-plane connections to be supplied and fitted by the machine builder before it can be used. For this reason the Euro205x is not considered by Trio to be a product for which we can offer qualification to known EMC standards. It is therefore only suitable to be taken into service on machines where the whole system fulfils the necessary EMC requirements.

Motion Coordinator Euro 209

Packaging

The *Motion Coordinator Euro209* is a 3U Euro rack mounting product. The PCB dimensions are 160mm long x 100mm height. The connectors and front panel overhang these dimensions.



Rack Mounting

The Euro209 should be mounted in a shielded metal rack. The unit should be mounted vertically and should not be subjected to mechanical loading. Care should be taken to ensure that there is a free flow of air around the unit.

Connection To Other TRIO Products

The Euro209 may be connected to other *Motion Coordinators* on the CAN bus, fibre-optic network or using encoder emulation output.

Environmental Considerations

Avoid violent shocks to, or vibration of, the Euro209 whilst in use or storage.

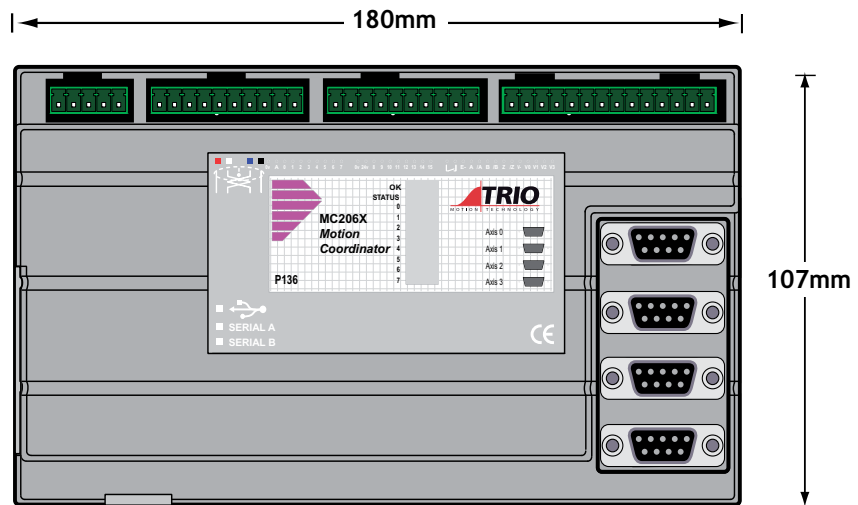
EMC Considerations

The Euro209 requires external power supplies, a card housing and suitable back-plane connections to be supplied and fitted by the machine builder before it can be used. For this reason the Euro209 is not considered by Trio to be a product for which we can offer qualification to known EMC standards. It is therefore only suitable to be taken into service on machines where the whole system fulfils the necessary EMC requirements.

Motion Coordinator MC206X

Packaging

The *Motion Coordinator* MC206X is a DIN rail mounting product. The module is held by spring clips on its bottom edge on to the DIN rail. The unit should be mounted vertically and should not be subjected to mechanical loading. Care should be taken to ensure that there is a free flow of air vertically around the unit. The dimensions are as shown below.



Including the disconnect terminal, the unit is 48mm deep.

When the serial connector is fitted, around 60mm more width is required.

Connection To Other TRIO Products

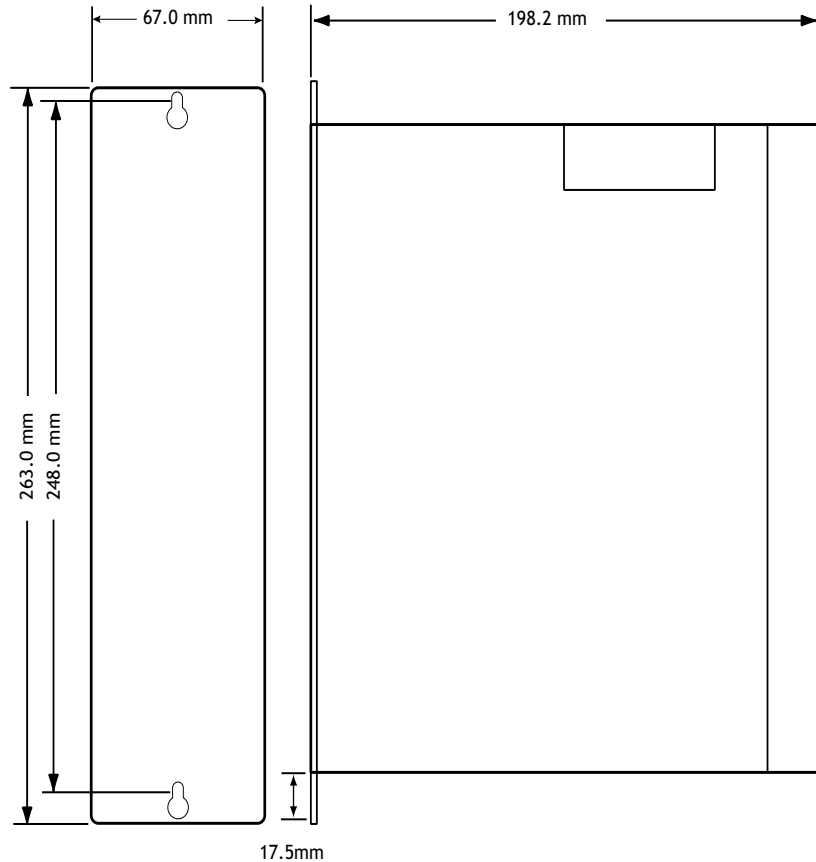
The MC206X may be connected to other *Motion Coordinators* on the CANbus, fibre-optic network or using encoder emulation output.

Environmental Considerations

Ensure that the area around the ventilation holes and top of the module are kept clear. Avoid violent shocks to, or vibration of, the system modules whilst in use or storage.

Motion Coordinator MC224

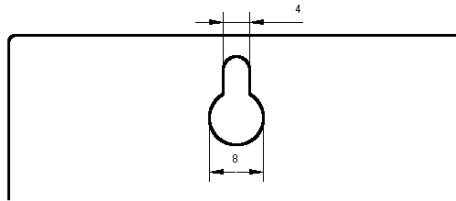
The *Motion Coordinator* MC224 modules are supplied with exterior packaging which has been specifically designed for ease of use and flexibility of mounting. The MC224 dimensions are given below.



Allow 70mm clearance for connectors at the front of the module.

Bulkhead Mounting

The module may be bulkhead mounted by securing in two locations through the rear panel of the unit with M4 screws. The unit should be mounted vertically and should not be subjected to mechanical loading. Care should be taken to ensure that there is a free flow of air vertically through the unit.



Module Interconnection

Modules to be connected should be mounted on 70mm centres at the same height. The MC224 should be at the right hand end. After mounting on the bulkhead the interconnection bus cover may be removed by unscrewing the 2 securing screws. The appropriate length of ribbon cable will be supplied ready assembled and tested by TRIO. With the power off, the ribbon cable can be inserted and the cable locked with the ears on each connector. The power may then be re-applied and all the interconnection bus covers replaced

Note: *Modules must never be connected or disconnected whilst the power supply is on.*

Environmental Considerations

Ensure that the area around the ventilation holes and top of the module are kept clear. Avoid violent shocks to, or vibration of, the system modules whilst in use or storage.

EMC Considerations

Most pieces of electrical equipment will emit noise either by radiated emissions or conducted emissions along the connecting wires. This noise can cause interference with other equipment near by which could lead to that equipment malfunctioning. These sort of problems can usually be avoided by careful wiring and following a few basic rules.

- 1) Mount noise generators such as contactors, solenoid coils and relays as far away as possible from the modules.
- 2) Where possible use solid-state contactors and relays.
- 3) Fit suppressors across coils and contacts.
- 4) Route heavy current power and motor cables away from signal and data cables.
- 5) Ensure all the modules have a secure earth connection.
- 6) Where screened cables are used terminate the screen with a 360 degree termination, if possible, rather than a "pig-tail" and connect both ends of the screen to ground.

The screening should be continuous, even where the cable passes through a cabinet wall or connector.

These are just very general guidelines and for more specific advice on specific controllers, see the installation requirements later in this chapter. The consideration of EMC implications is now more important than ever since the introduction of the EC EMC directive which makes it a legal requirement for the supplier of a product to the end customer to ensure that it does not cause interference with other equipment and that it is not itself susceptible to interference from other equipment.

Background to EMC Directive

Since 1st January 1996 all suppliers of electrical equipment to end users must ensure that their product complies with the 89/336/EEC Electromagnetic Compatibility directive. The essential protection requirements of this directive are:

- 1) Equipment must be constructed to ensure that any electromagnetic disturbance it generates allows radio and telecommunications equipment and other apparatus to function as intended.
- 2) Equipment must be constructed with an inherent level of immunity to externally generated electromagnetic disturbances.

Suppliers of equipment that falls within the scope of this directive must show “due diligence” in ensuring compliance. Trio has achieved this by having products that it considers to be within the scope of the directive tested at an independent test house.

As products comply with the general protection requirements of the directive they can be marked with the CE mark to show compliance with this and any other relevant directives. At the time of writing this manual the only applicable directive is the EMC directive. The low voltage directive (LVD) which took effect from 1st January 1997 does not apply to current Trio products as they are all powered from 24V which is below the voltage range that the LVD applies to.

Just because a system is made up of CE marked products does not necessarily mean that the completed system is compliant. The components in the system must be connected together as specified by the manufacturer and even then it is possible for some interaction between different components to cause problems but obviously it is a step in the right direction if all components are CE marked.

Testing Standards

For the purposes of testing a typical system configuration had to be chosen because of the modular nature of the *Motion Coordinator* products. Full details of this and copies of test certificates can be supplied by Trio if required. For each typical system configuration testing was carried out to the following standards:

Emissions - BS EN61000-6-4 : 2001.

(depending on the particular product.)

Note that both standards specify the same limits for radiated emissions which is the only applicable part of the standards to Trio products. Most products conform to the Class A limits but some products, such as the range of membrane keypads, are within Class B limits.

Immunity - BS EN61000-6-2 : 2001.

This standard sets limits for immunity in an industrial environment and is a far more rigorous test than part 1 of the standard.

Installation Requirements to Ensure Conformance

Motion Coordinator MC302X

When the Trio products are tested they are wired in a typical system configuration. The wiring practices used in this test system must be followed to ensure the Trio products are compliant within the completed system.

A summary of the guidelines follows:

- 1) The MC302X modules must be earthed via its shield connection of the CAN connector.
- 2) If any IO lines are not to be used they should be left unconnected rather than being taken to a terminal block, for example, as lengths of unterminated cable hanging from an IO port can act as an antenna for noise.
- 3) Screened cables should be used for encoder, stepper and registration input feedback signals and for the demand voltage from the controller to the servo amplifier if relevant. The demand voltage wiring must be less than 1m long and preferably as short as possible. The screen should be connected to earth at both ends. Termination of the screen should be made in a 360 degree connection to a metallised connector shell. If the connection is to a screw terminal e.g. demand voltage or registration input the screen can be terminated with a short pig-tail to earth.
- 4) Connection to the serial ports should be made with a Trio supplied cable. When a *Motion Coordinator* is not connected to a PC the serial cable must be removed as it will act as an antenna for electrical noise if it is left unterminated.
- 5) The MC302X should not be handled whilst the 24 volt power is connected.

As well as following these guidelines, any installation instructions for other products in the system must be observed.

Motion Coordinator Euro205x

The Euro205x should be mounted in a screened metal card cage. The power supplies should be generated by regulated filtered supplies.

The following requirements should also be adhered to:

- 1) The Euro205x's front panel should be earthed.
- 2) If any I/O lines are not to be used they should be left unconnected rather than being taken to a terminal block, for example, as lengths of unterminated cable hanging from an I/O port can act as an antenna for noise.

- 3) Screened cables should be used for encoder, stepper and registration input feedback signals and for the demand voltage from the controller to the servo amplifier if relevant. The demand voltage wiring must be less than 1m long and preferably as short as possible. The screen should be connected to earth at both ends. Termination of the screen should be made in a 360 degree connection to a metallised connector shell. If the connection is to a screw terminal e.g. demand voltage or registration input the screen can be terminated with a short pig-tail to earth.
- 4) Connection to the serial ports should be made with a Trio supplied cable. When a *Motion Coordinator* is not connected to a PC the serial cable must be removed as it will act as an antenna for electrical noise if it is left unterminated.

The Euro205 should not be handled whilst the power is connected.

As well as following these guidelines, any installation instructions for other products in the system must be observed.

Motion Coordinator Euro209

The Euro209 should be mounted in a screened metal card cage. The power supplies should be generated by regulated filtered supplies.

The following requirements should also be adhered to:

- 1) The Euro209's front panel should be earthed.
- 2) If any I/O lines are not to be used they should be left unconnected rather than being taken to a terminal block, for example, as lengths of unterminated cable hanging from an I/O port can act as an antenna for noise.
- 3) Screened cables should be used for encoder, stepper and registration input feedback signals and for the demand voltage from the controller to the servo amplifier if relevant. The demand voltage wiring must be less than 1m long and preferably as short as possible. The screen should be connected to earth at both ends. Termination of the screen should be made in a 360 degree connection to a metallised connector shell. If the connection is to a screw terminal e.g. demand voltage or registration input the screen can be terminated with a short pig-tail to earth.
- 4) Connection to the serial ports should be made with a Trio supplied cable. When a *Motion Coordinator* is not connected to a PC the serial cable must be removed as it will act as an antenna for electrical noise if it is left unterminated.

The Euro209 should not be handled whilst the power is connected.

As well as following these guidelines, any installation instructions for other products in the system must be observed.

Motion Coordinator MC206X

When the Trio products are tested they are wired in a typical system configuration. The wiring practices used in this test system must be followed to ensure the Trio products are compliant within the completed system.

A summary of the guidelines follows:

- 1) The MC206X modules must be earthed via its SHIELD connection of the CAN connector.
- 2) If any I/O lines are not to be used they should be left unconnected rather than being taken to a terminal block, for example, as lengths of unterminated cable hanging from an I/O port can act as an antenna for noise.
- 3) Screened cables should be used for encoder, stepper and registration input feedback signals and for the demand voltage from the controller to the servo amplifier if relevant. The demand voltage wiring must be less than 1m long and preferably as short as possible. The screen should be connected to earth at both ends. Termination of the screen should be made in a 360 degree connection to a metallised connector shell. If the connection is to a screw terminal e.g. demand voltage or registration input the screen can be terminated with a short pig-tail to earth.
- 4) Connection to the serial ports should be made with a Trio supplied cable. When a *Motion Coordinator* is not connected to a PC the serial cable must be removed as it will act as an antenna for electrical noise if it is left unterminated.
- 5) The MC206X should not be handled whilst the 24 volt power is connected.

As well as following these guidelines, any installation instructions for other products in the system must be observed.

Motion Coordinator MC224

- 1) When the Trio products are tested they are wired in a typical system configuration. The wiring practices used in this test system must be followed to ensure the Trio products are compliant within the completed system. A summary of the guidelines follows:

The case of the modules must be earthed via their back panel. If the mount-

- ing panel is painted an area of paint should be removed to ensure a good electrical connection between the module and the cabinet.
- 2) If any I/O lines are not to be used they should be left unconnected rather than being taken to a terminal block, for example, as lengths of unterminated cable hanging from an I/O port can act as an antenna for noise.
 - 3) Screened cables should be used for encoder, resolver and registration input feedback signals and for the demand voltage from the controller to the servo amplifier if relevant. The demand voltage wiring must be less than 1m long and preferably as short as possible. The screen should be connected to earth at both ends. Termination of the screen should be made in a 360 degree connection to a metallised connector shell. If the connection is to a screw terminal e.g. demand voltage or registration input the screen can be terminated with a short pig-tail to one of the screw locks of the D-type shell of the encoder connector.
 - 4) Connection to the serial ports should be made with a Trio supplied cable. When a *Motion Coordinator* is not connected to a PC the serial cable must be removed as it will act as an antenna for electrical noise if it is left unterminated.
 - 5) Where the P230 Stepper Daughter Board is fitted in a P301 Axis Expander, the stepper connections must be made with screened cable. The screen must be terminated at both ends to earth (The case of the p301. A ferrite should be fitted near to the daughter board with at least 1.5 turns of the cable through the ferrite. E.g. TDK ZCAT 3036-1330.

As well as following these guidelines, any installation instructions for other products in the system must be observed.

