CHAPTER

3

INSTALLATION

Motion Coordinator PCI 208

Packaging

The *Motion Coordinator* PCI 208 is designed to be fitted into any free PCI slot within most modern PC's. If P184 or P185 option modules are to be fitted they should be installed in a static free environment by a static protected operator. Take care to avoid touching any of the P180's electronic components during installation. Ensure that the P180 is fully seated into the PCI slot and the break-out board is connected prior to switching on the PC.

Connection To Other Trio Products

The PCI 208 may be connected to other *Motion Coordinator* modules on the CAN bus only.

Environmental Considerations

Avoid violent shocks to, or vibration of, the 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 EN55022:1995 or BS EN50081-1:1992

(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 EN50082-2:1995.

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 PCI 208 and options

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 PC in which the PCI 208 is installed must meet the required EMC standards and be earthed.

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 drive 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 breakout board should be made with a Trio supplied cable, or equivilent with earthed screen and twisted pair connections for all differential signals. The cable between the PCI 208 and the breakout board must not exceed 2.5 metres.

5) The PCI 208, breakout board and breakout cable should not be handled whilst the PC or 24 volt power is connected.

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