TRIO
MOTION TECHNOLOGY

PICKUP AND LEARN SERIES


# FIRMWARE RECOVERY SYSTEM

# Trio Motion Technology

## Pick-up And Learn Series

Trio Programming Guides are designed to aid learning of the TrioBASIC language through description and examples. Each one will cover a particular topic and discuss which commands and parameters in the TrioBASIC are required to complete the task.

A general understanding of TrioBASIC is required and it is recommended to attend an introduction to TrioBASIC training course. The programming guides are not a replacement for the TrioBASIC help files which can be found in *Motion* Perfect as well as the manual which cover each command and parameter in more detail and should be referenced when required.

Any examples given in the programming guide will work and have been tested on an isolated controller. If you choose to use these examples on a machine please take care that it will not cause damage or injury and that they are correctly included in the project changing parameters and values where required.



**UK | USA | CHINA | INDIA**
www.triomotion.com

## SAFETY WARNING

During the installation or use of a control system, users of Trio products must ensure there is no possibility of injury to any person, or damage to machinery.
Control systems, especially during installation, can malfunction or behave unexpectedly. Bearing this in mind, users must ensure that even in the event of a malfunction or unexpected behaviour the safety of an operator or programmer is never compromised.

This doucment uses the following icons for your reference:

Information that relates to safety issues and critical software information

Information to highlight key features or methods.

Useful tips and techinques.

Example programs

# Contents

# Firmware Recovery System

## INTRODUCTION

In the unlikely event that the *Motion Coordinator* firmware becomes corrupted and the processor will not start the Ethernet port and allow communication, the MC664 and MC508 have a firmware recovery mode activated by a hidden switch. Operating the switch forces the processor to run a protected boot area of the memory. It is dedicated to restoring the full operating system from a SD card.

How might the firmware become corrupted?

- Loading a new firmware using *Motion* Perfect, the *Motion Coordinator* is powered down while the Flash memory is being updated.
- While doing FPGA update, the *Motion Coordinator* is powered down during the FPGA re-programming phase.
- The controls and checks that prevent the loading of incorrect firmware are bypassed by the user.

When should you use this? If the *Motion Coordinator* shows SYS on the display and does not respond to an Ethernet connection, then follow the procedure shown in this guide.

*The programs and data stored in the Motion Coordinator will be erased when the Firmware is re-loaded. Check that the firmware recovery is necessary, and that the issue is not a more simple one that can be resolved by normal means. For example, by setting the IP_ADDRESS or SUBNET.*

## EQUIPMENT

The following equipment is needed to complete the Firmware Recovery;

- SD card (MC664) or micro SD card (MC508) formatted to FAT32. Max size 16GB.
- Small flat screwdriver to remove top flap on MC664.
- Small X-head screwdriver to remove the case on the MC508.
- A PC with SD card and/or micro SD card socket. Or a SD card USB adapter.

If the SD card is not already formatted to FAT32, then insert in a PC and use the PC's formatting function to re-format the SD card to FAT32.

# Preparing the recovery file

## DOWNLOAD

Go to the Trio website www.triomotion.com, log in and go to the Software->All Firmware page.

Select the firmware for the controller (MC508 or MC664) and download the firmware on to the PC.

Rename the firmware file to;

- r_664.out for the MC664

- r_508.out for the MC508

As more *Motion Coordinator*s are released, they will also adopt this firmware recovery method and the filename will reflect the controller model number.
In any case, the file name is displayed on the *Motion Coordinator*'s **LCD** display when in recovery mode.

### COPY TO SD

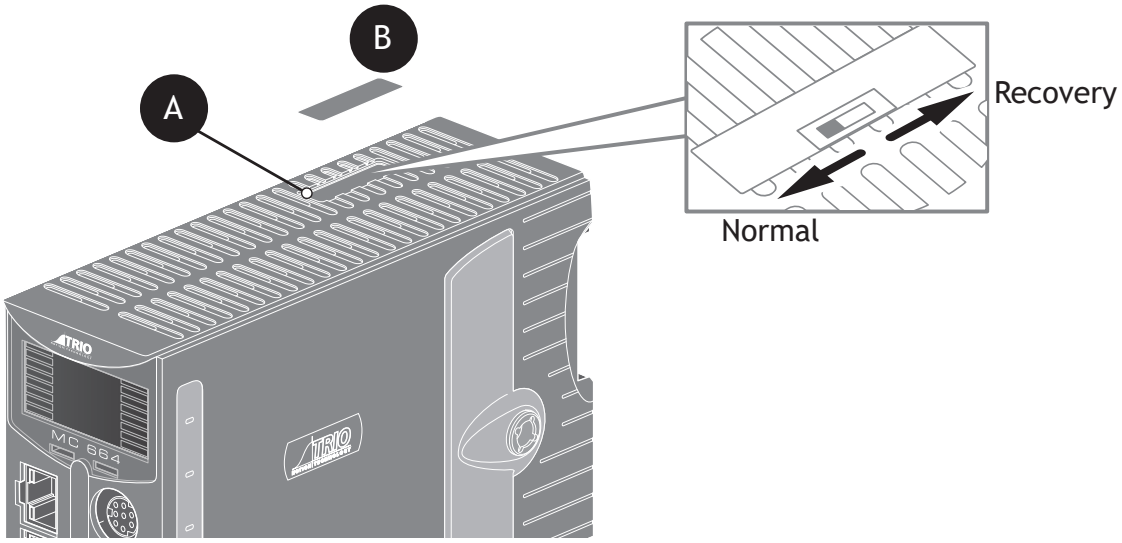
Copy the file to the SD or Micro SD card as appropriate.  Keep the same file name.

# Preparing the Motion Coordinator

The position of the recovery mode switch depends on the *Motion Coordinator* model.

### MC664

The recovery switch is located under the small cover on the top surface of the MC664. To remove the cover, insert screwdriver under the frontmost ventilation slot (A) and prize off the switch cover (B).

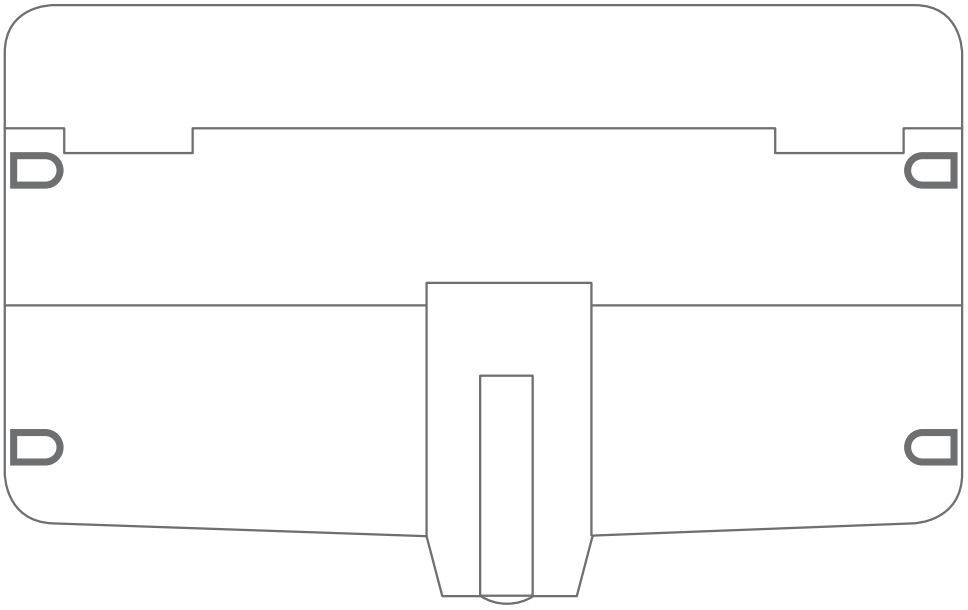



Move the switch towards the rear of the MC664.

## MC508

Remove all power and IO connectors, all Flexible axis connectors and all serial & Ethernet cables. Remove the micro SD card if one is fitted.

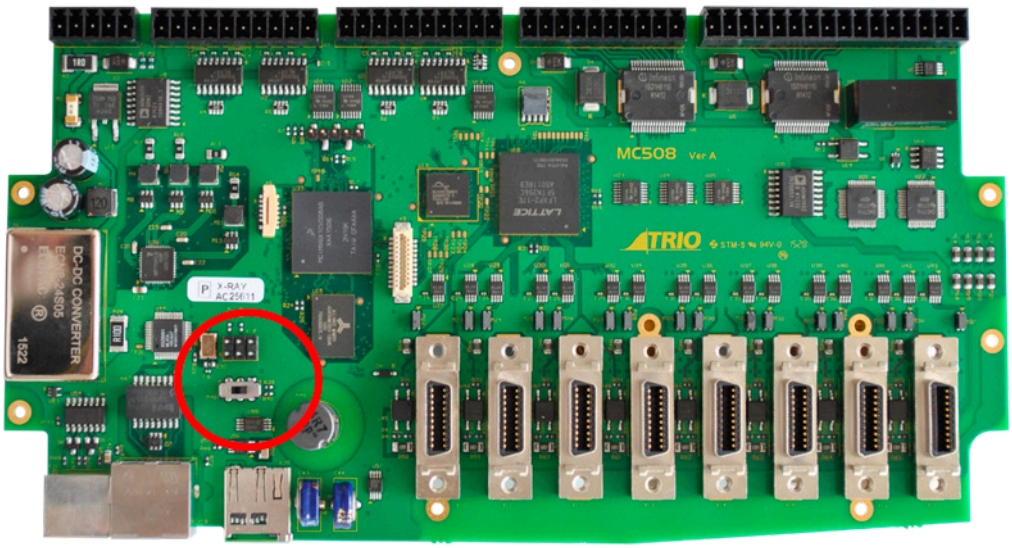
With a suitable X-Head screwdriver, remove the 4 screws from the rear of the heatsink/chassis. Put them safely to one side.



Carefully withdraw the front plastic molding from the chassis.

**Be careful not to stretch or otherwise disturb the ribbon cable between main PCB and LCD display.**

Locate the recovery switch and move it to the recovery position. To the left. PCB marked RECOVERY.

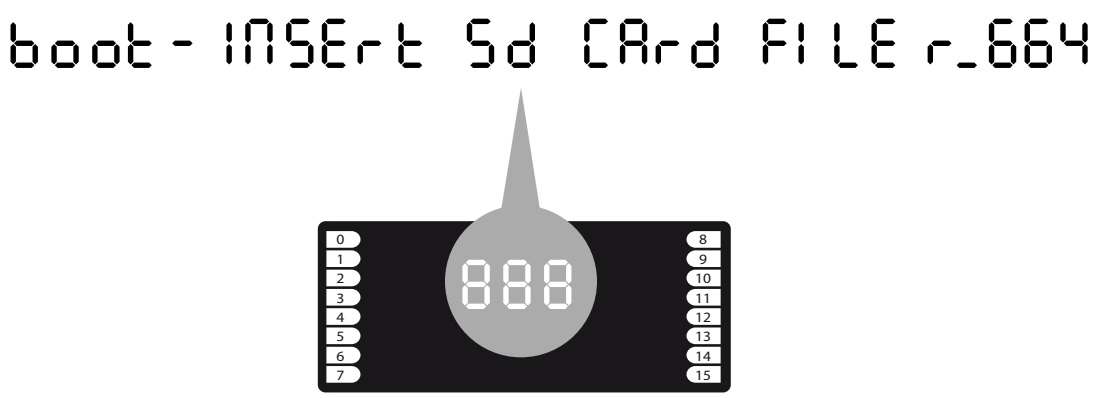



Temporarily replace the front of the MC508 back on to the chassis. Do not replace the screws.

# Recovery process

Power up the *Motion Coordinator*.

The display will scroll “boot – “, followed by the required filename.




Insert the SD card into the MC664, or the micro SD card into the MC508. The recovery sequence will start automatically.

During the recovery sequence, the display will count up in seconds with a prefix letter.

Lxx – Loading the new firmware.

Exx – Erasing the system memory.

Pxx – Programming the system memory.

In addition, if the FPGA was corrupted, there will be a 4th step showing;

Fxx – re-programming the FPGA.

Wait for the sequence to end, then remove the SD / micro SD card from the *Motion Coordinator* and return the recovery switch to the Normal position.

Cycle the power on the *Motion Coordinator*.

Check that the power up is normal and that you can connect to the *Motion Coordinator* using Motion Perfect.

## PUTTING THE *MOTION COORDINATOR* BACK IN SERVICE

With the recovery switch back in its normal position, it remains to replace the covers.

### MC664

Replace the switch cover by pressing it back into position until it clicks in place.

### MC508

Carefully place the front plastic cover on to the metal chassis. Replace the 4 screws using the X-Head screwdriver. Do the screws up fully but do not over-tighten.