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Subject: Recovery from a failed system software load

APPLICATION NOTE

1. Applicability

Some Motion Coordinators have a built-in boot loader which can be used to aid recovery in the event of a failed system software load. This application note applies to using the boot loader in the MC302X, MC403, MC405 and MC464.

Other controllers such as the MC206X and MC224 do not have a separate boot loader. However these older generation Motion Coordinators have a very short period when powering off would cause a firmware load failure and so have no real need of a separate boot loader function.

2. Description

If the power is removed while loading firmware into a Motion Coordinator, there is a chance that the main system software in the Flash memory will be corrupted. All Motion Coordinators, except the MC302 range, load the new firmware copy into RAM before they then program the Flash. If power is removed during the RAM download, then the system can recover and use the old firmware. If power is removed while the Flash is being programmed, then the system software will stop working.

In the MC302 range, the firmware is loaded directly to Flash memory. This is because there is a limited amount of RAM. If the power is removed at any time during the firmware download, the MC302 will lose its system software and will not re-start normally.

If the MC302X or MC302-k loses the system software, it will restart using the Boot Loader. The Boot Loader can then be used to re-install the full system software.

If the MC403 or MC405 loses the system software, it will restart using the Boot Loader. The Boot Loader can then be used to re-install the full system software. The Boot Loader connects to serial port 1.

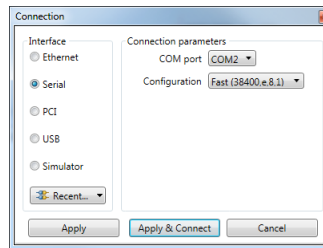
If the MC464 loses the system software, it will restart using the Boot Loader. The Boot Loader can then be used to re-install the full system software. The Boot Loader connects to the Ethernet Port using the last programmed IP address.

3. Connecting to the Boot Loader for the MC403 and MC405

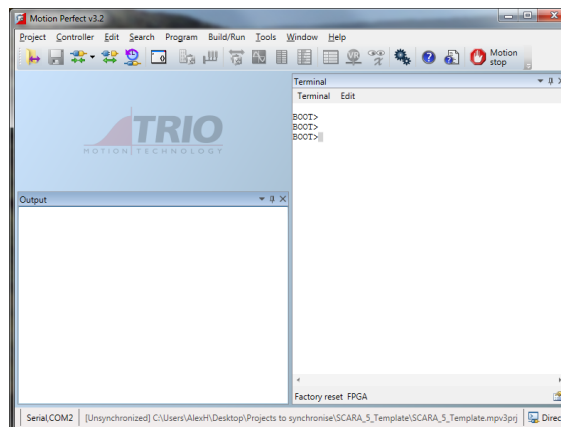
If a MC403 or MC405 appears to have failed after a system software load, follow this procedure.

1. Connect the terminal of either Motion Perfect 2 or Motion Perfect v3 to the RS232 serial port of

the MC403/MC405. Use the same serial cable as you would use to connect a MC2xx or MC302.



2. If using MPv3, then select the serial port connection method and start in Direct Mode.
3. Power up the MC403/MC405.
4. On the MC405 display you will see “bt”. This means it is in the boot loader.



5. Check that this message appears in the terminal;

```
Trio Motion Technology Ltd

MC405 ARM11 Bootloader Version 0.06
Created Jul 5 2012 @ 17:24:01

BOOT>
```

4. Running firmware for the MC403 and MC405

Sometimes the firmware just needs running on the MC405 or MC403. Once it is running then it will run automatically every power up. If not then you will need to reload the firmware.

1. Follow section 3 to connect to the Boot Loader.
2. In the terminal enter the RUN_SYSTEM command to start the firmware running.

```
BOOT>RUN_SYSTEM
```

3. Check if the IP address is shown on the LCD (MC405) and check that the command line is available on Ethernet as normal. If this is correct then power cycle the controller.
4. If the controller returns to the Boot Loader then please follow section 5

5. Loading firmware for the MC403 and MC405

1. Follow section 3 to connect to the Boot Loader.
2. Select “Controller” then “Load System Software” in the Motion Perfect 2 menu. or Select “Controller” then “Load Firmware” in the Motion Perfect v3 menu.

3. Proceed to load the system software in the normal way. Do not remove the power from the MC403/MC405 while the loading process continues.
4. Once the system software has re-loaded, you will be able to connect Motion Perfect 2 or Motion Perfect v3 over Ethernet in the normal way.

6. Recovery method for MC302

If a MC302X or MC302-k appears to have failed after a system software load, follow this procedure.

5. Connect the terminal of Motion Perfect 2, to the main serial port on the MC302. Use the same serial cable as you normally would use to connect Motion Perfect.
6. Power up the MC302.
7. Check that this message appears in the terminal;

```
Trio Motion Technology MC302X BOOTLOADER version 1.07  
Built on Feb 14 2007 at 11:29:38  
Use HELP for list of available commands
```

```
BOOT>
```

8. Select “Controller” then “Load System Software” in the Motion Perfect 2 menu.
9. Proceed to load the system software in the normal way. Do not remove the power from the MC302 while the loading process continues.
10. Once the system software has re-loaded, you will be able to connect Motion Perfect 2 in the normal way.

7. Recovery Method for the MC464

TBA