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**Subject:** Notes for Boot loader 0.19

## TECHNICAL BULLETIN

### 1. Applicability

Primary: MC464 Serial number P860-02055 onwards; the advice in this technical bulletin should be followed to ensure reliable start-up of the product.

Secondary: All MC464s; this advice has no adverse effects on the operation of all MC464 Motion Coordinators and may offer additional reliability.

### 2. Background

A problem has been seen during manufacture of two recent batches of MC464's. Some MC464s were not powering up correctly. This was investigated and the cause identified. Components in the DDR ram memory circuit have a wider tolerance band than the original MC464 design allows for.

The MC464s failing production test are assembled 100% correctly and the startup issue is with the DDR ram controller settings. This can be solved with a software modification. None of the failed production MC464s have been shipped to customers, but it is possible that MC464's without the software modification could fail to power up correctly at other times. Though we expect this to be very rare because once running, the ram will be stable and the issue is not greatly affected by temperature.

- In this Technical Bulletin "not powering correctly" means that when power is applied, the controller does not start at all, the display is blank and there is no communication to the Ethernet Port.

### 3. Solution

Trio Motion Technology have altered the DDR ram settings and have now issued a new Boot Loader which fixes the above mentioned power-up issue. The fix is in Boot Loader version 0.19 and has been released as part of Firmware release 2.0210 on February 7<sup>th</sup> 2013.

**⚠ All production MC464s now have V2.0210 installed at the factory. If a MC464 already has firmware version 2.0210 or later, with Boot Loader V0.19 then that boot loader MUST be kept intact if the firmware is changed. See sections 4 and 5 below.**

It is recommended that when updating the firmware of MC464s in the serial number range from P860-02055 and later, the Boot Loader V0.19 should be used.

It is also recommended that if any MC464 does not power up correctly 100% of the time, it should have Boot Loader V0.19 installed.

## 4. Upgrading firmware

In systems where a complete upgrade of the firmware is acceptable, you should install V2.0210 or later in the normal way using Motion Perfect 2 or Motion Perfect v3.

After the upgrade the MC464 will have firmware version 2.0210 and the boot loader V0.19.

*Remember that upgrading the firmware will erase the application programs.*

After installing the new firmware, you can check that it has the correct boot loader by inspecting the text shown on the Motion Perfect terminal in Direct mode. See figure 1.

```
MC Multitasking BASIC Version 2.02
Bootloader Version 0.19
Trio Motion - T5 Runtime V0.02 [T5DK v8.2.110418]
PRP Flash Boot Version 0.0.22
PRP Flash App Version 0.1.17
Created Feb 7 2013 @ 16:26:13
```

Figure 1. Startup text shown in Motion Perfect's terminal

*Note that the Ethernet processor may also be updated as part of the firmware update. You must allow extra time for the Ethernet processor to be programmed. The MC464 will re-boot twice while this happens. Do not turn off the power until Motion Perfect has re-established communication to the MC464.*

## 5. Updating boot loader only

In some cases it will be necessary to keep the original version of firmware. For example; a machine has been validated with a certain firmware version in place.

It is possible to run an older version of firmware with the new boot loader.

The sequence is:

1. Save the application programs, or if the controller is locked or uses encrypted programs, contact the owner of the application software.
2. Obtain a copy of the original firmware. For example if the MC464 has V2.0196, then you need a copy of the file MC464\_20196\_\_BOOT\_018.out.
3. Using Motion Perfect 2 or Motion Perfect v3, load firmware version 2.0210. The file name is MC464\_20210\_\_BOOT\_019.out. Note that the application programs will be erased as part of this process.
4. Re-connect Motion Perfect in Direct Mode. (MP2 disconnected mode)
5. Using Motion Perfect 2 or Motion Perfect v3, load the original firmware version. For example using file name MC464\_20196\_\_BOOT\_018.out.
6. Re-connect Motion Perfect and load the application programs.

*Note that the Ethernet processor may also be updated as part of the firmware update. You must allow extra time for the Ethernet processor to be programmed. The MC464 will re-boot twice while this happens. Do not turn off the power until Motion Perfect has re-established communication to the MC464*

After step 5 the MC464 will have the original firmware but also will retain the new boot loader V0.19. It does this for one downgrade only. If you want to change the firmware again, *you must first put V2.0210 in the controller before going back to an older version*. This MUST be done every time.

```
MC Multitasking BASIC Version 2.01
Bootloader Version 0.19
Trio Motion - T5 Runtime V0.02 [T5DK v8.2.110418]
PRP Flash Boot Version 0.0.22
PRP Flash App Version 0.1.13
Created Jul 31 2012 @ 17:37:29
```

Figure 2. Startup text after firmware down-grade