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Subject: Guide to checking the MC2xx Programming Port

APPLICATION NOTE

1. Summary

There are some situations when the RS232 programming port of a Motion Coordinator does not connect to Motion Perfect.

This document is a step by step guide to checking the RS232 “command line” connection and establishing communication.

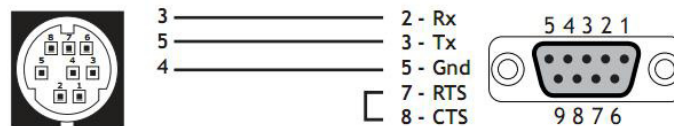
2. RS232 programming cable

The following tests must be done using the P350 RS232 serial cable supplied by Trio Motion Technology.

If a P350 cable is not available, it is possible to make a cable to the same specification using RS232 specification 3 core screened cable. The connectors must be wired as shown in figure 1.

Serial Cables

Trio recommend the use of their pre-made serial cables (product code P350). If cables need to be made to connect to a PC serial port the following connections are required:



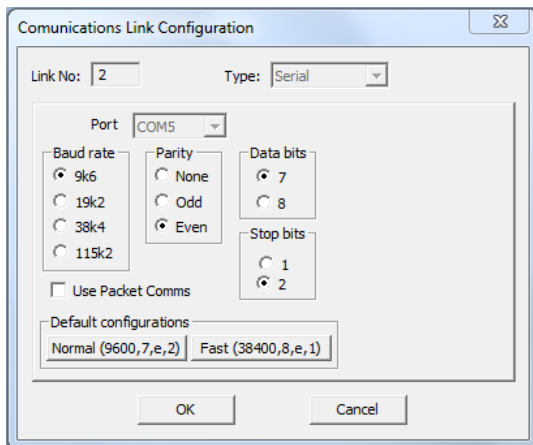
Motion Coordinator to 'AT' style PC with 9pin serial connector

Figure 1. RS232 programming cable.

Test the cable with a known good Motion Coordinator before continuing.

3. Motion Perfect setup

Configure Motion Perfect with the correct serial port setting. Either “normal” or “fast” default setting should be used depending on the baud rate set in the Motion Coordinator. Menu: [Options->Communications](#). Click ADD button and set up the serial port.



MC302X and MC302-k: use Fast default button.

MC2xx, OK and Status LEDs come on steady on power up: Use Normal default button.

MC2xx, OK and Status LEDs flash alternately on power up: Use Fast default button.

Figure 2. MP2 Baud rate setting

Open the Motion Perfect terminal in “Disconnected” mode. Menu: *Tools->Terminal*.

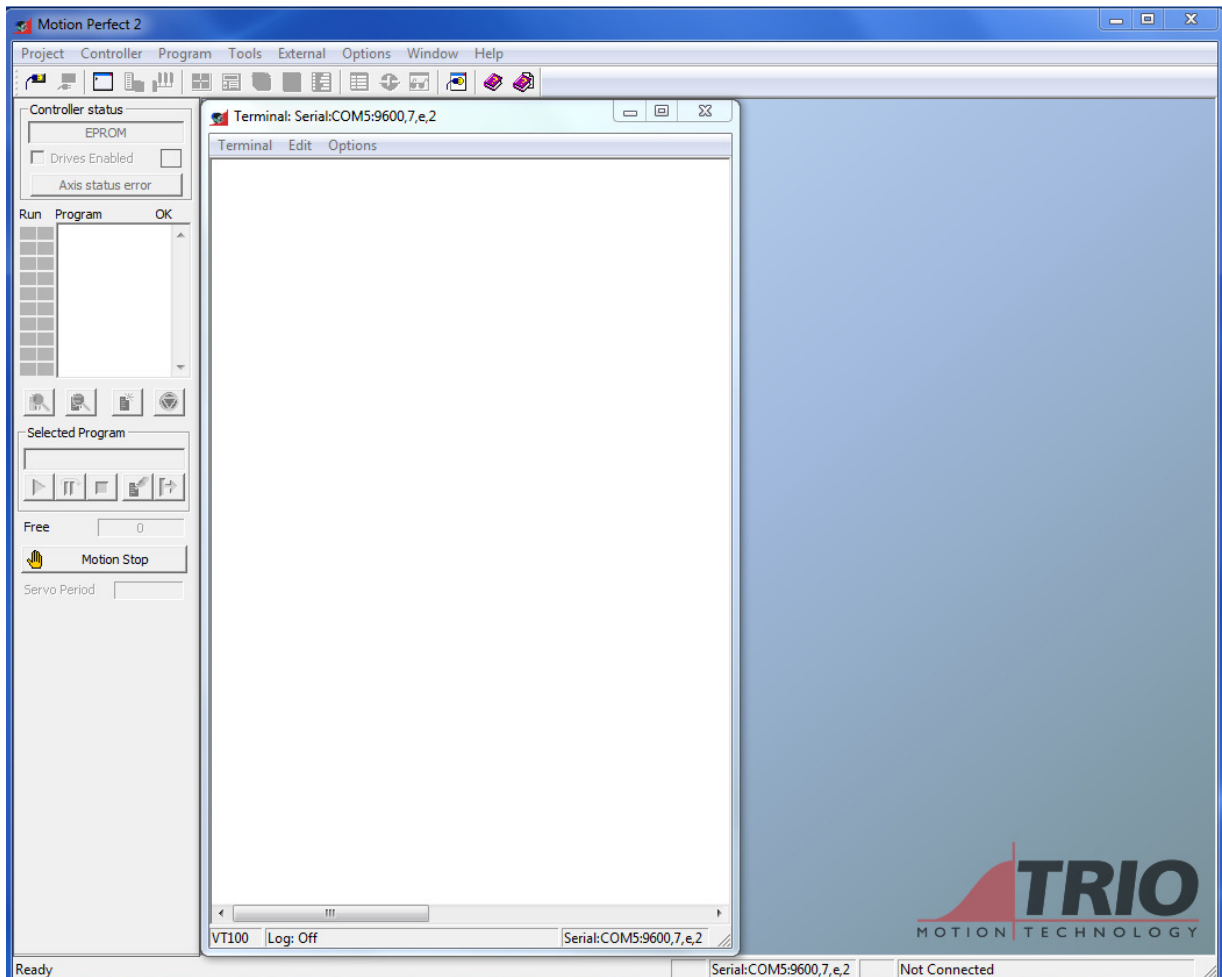
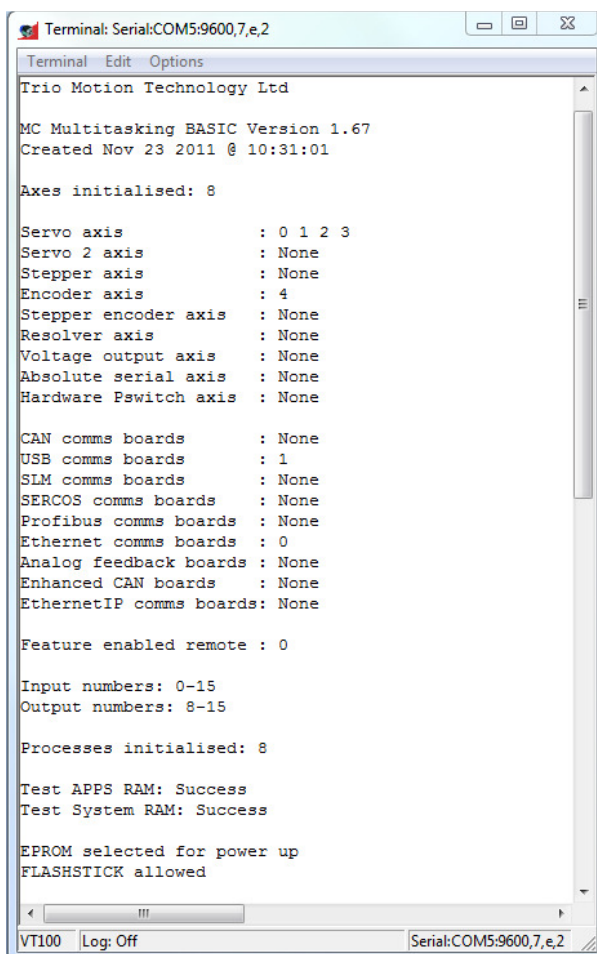


Figure 3. Motion Perfect in Disconnected Mode.

4. Test 1

- Connect only a power supply (24V dc) to the Motion Coordinator and remove all other connections to IO and motor drives.
- Begin the test with the 24V power OFF.
- Connect the serial cable between the Motion Coordinator port “Serial A” and the PC running Motion Perfect.
- Start Motion Perfect 2 as detailed in section 3.
- Switch on the 24V power to the Motion Coordinator.
- View the response in the Motion Perfect terminal.



```

Terminal: Serial:COM5:9600,7,e,2
Terminal Edit Options
Trio Motion Technology Ltd
MC Multitasking BASIC Version 1.67
Created Nov 23 2011 @ 10:31:01

Axes initialised: 8

Servo axis      : 0 1 2 3
Servo 2 axis    : None
Stepper axis    : None
Encoder axis    : 4
Stepper encoder axis : None
Resolver axis  : None
Voltage output axis : None
Absolute serial axis : None
Hardware Pswitch axis : None

CAN comms boards : None
USB comms boards : 1
SLM comms boards : None
SERCOS comms boards : None
Profibus comms boards : None
Ethernet comms boards : 0
Analog feedback boards : None
Enhanced CAN boards : None
EthernetIP comms boards : None

Feature enabled remote : 0

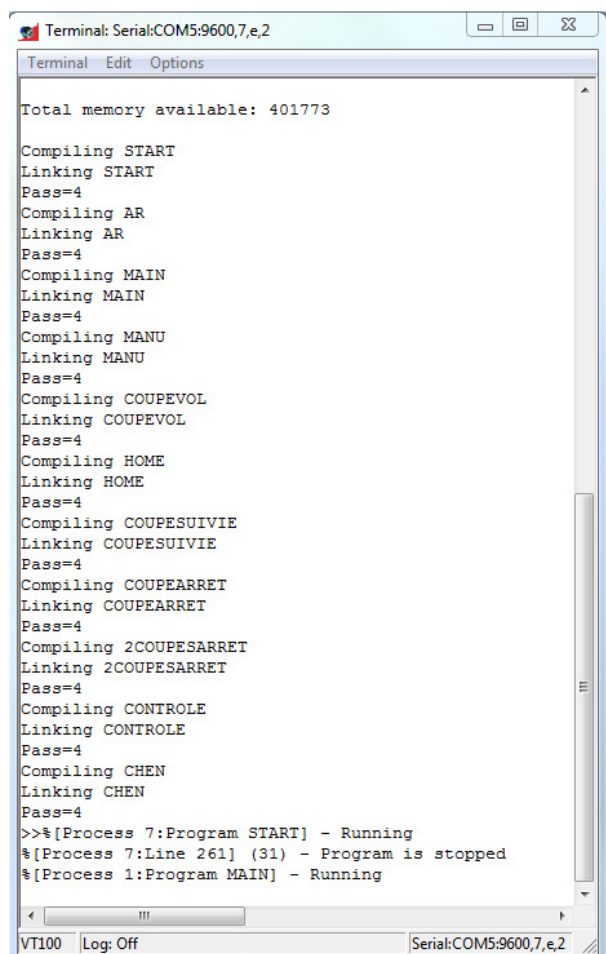
Input numbers: 0-15
Output numbers: 8-15

Processes initialised: 8

Test APPS RAM: Success
Test System RAM: Success

EPROM selected for power up
FLASHSTICK allowed
  
```

Figure 4. MC206X startup with no programs.



```

Terminal: Serial:COM5:9600,7,e,2
Terminal Edit Options
Total memory available: 401773

Compiling START
Linking START
Pass=4
Compiling AR
Linking AR
Pass=4
Compiling MAIN
Linking MAIN
Pass=4
Compiling MANU
Linking MANU
Pass=4
Compiling COUPEVOL
Linking COUPEVOL
Pass=4
Compiling HOME
Linking HOME
Pass=4
Compiling COUPESUIVIE
Linking COUPESUIVIE
Pass=4
Compiling COUPEARRET
Linking COUPEARRET
Pass=4
Compiling 2COUPESARRET
Linking 2COUPESARRET
Pass=4
Compiling CONTROLE
Linking CONTROLE
Pass=4
Compiling CHEN
Linking CHEN
Pass=4
>>[%[Process 7:Program START] - Running
%[Process 7:Line 261] (31) - Program is stopped
%[Process 1:Program MAIN] - Running
  
```

Figure 5. Startup showing programs auto-running

5. Diagnosis

5.1. Is there Text in the Terminal?

If there is no text at all in the terminal, re-check the serial lead and Motion Perfect 2 operation with a known good Motion Coordinator.

If there is no text in the terminal and the cable is known to be OK, then the Motion Coordinator is

faulty and must be returned to Trio for repair.

If the text shown in Figure 4 appears, then the Motion Coordinator is working.

5.2. Does the Return Key give a response?

If no programs are shown, then press the return key on the PC and check that the >> prompt is returned to the terminal.

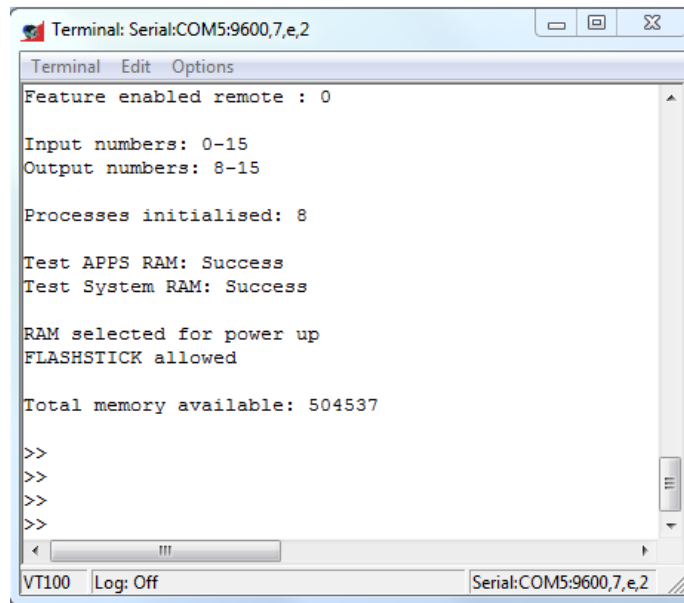


Figure 6. Response to pressing Return Key.

If there is no >> prompt, then either the input side of the RS232 connection is faulty or a program running on power up has changed the RS232 port setting.

5.3. Are programs running?

If programs are shown compiling, linking and running, they may have changed the serial port setting.

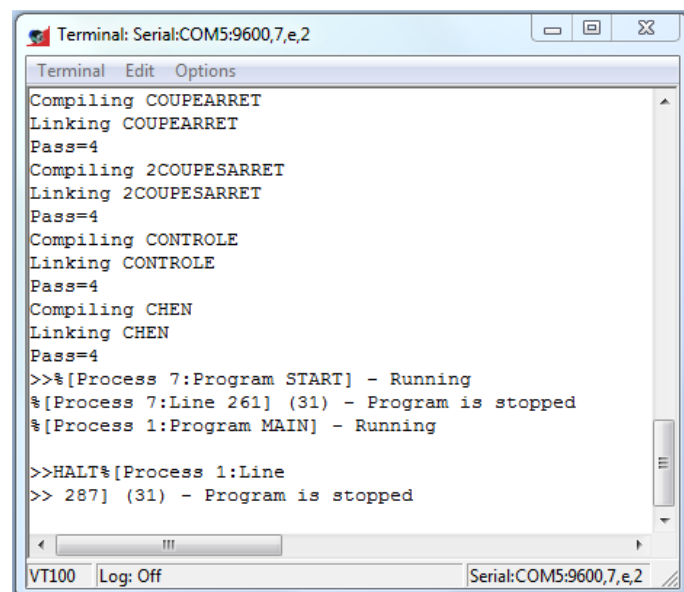


Figure 7. Halting programs

If the >> prompt is available, type HALT <return>. See figure 7.

There are 2 possible reasons why you may not be able to type HALT.

1. A program has changed the RS232 port setting.
2. A running program is sending text to the terminal continuously.

In both cases first power down the Motion Coordinator, then power it up again and keep pressing the <return> key while the boot text arrives at the terminal. This will prevent the programs from starting. You will now be able to get the >> prompt.

6. Restoring the Motion Coordinator

If it is possible to get the >> prompt with Motion Perfect in “disconnected” mode, it should be possible to connect and synchronise the project.

Menu: *Controller->Connect*

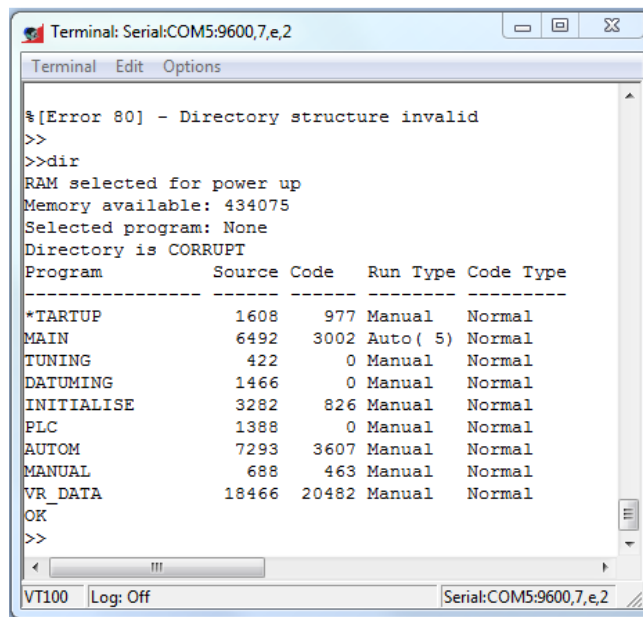
Follow the process shown in the Motion Coordinator Technical Reference Manual to synchronise the project on the Motion Coordinator with your PC.

6.1. Reasons for not connecting.

It may be that Motion Perfect still cannot connect to the Motion Coordinator. Reasons for this include:

6.1.1. Project directory is corrupted.

Type DIR in the terminal. If the program names are mixed up and/or there are many * in the names and sizes, then the project is corrupted.



```

Terminal: Serial:COM5:9600,7,e,2
Terminal Edit Options
%[Error 80] - Directory structure invalid
>>
>>dir
RAM selected for power up
Memory available: 434075
Selected program: None
Directory is CORRUPT
Program      Source Code  Run Type  Code Type
-----
*TARTUP      1608      977 Manual   Normal
MAIN         6492     3002 Auto( 5) Normal
TUNING       422        0 Manual   Normal
DATUMING     1466        0 Manual   Normal
INITIALISE   3282      826 Manual   Normal
PLC          1388        0 Manual   Normal
AUTOM        7293     3607 Manual   Normal
MANUAL       688       463 Manual   Normal
VR_DATA     18466    20482 Manual   Normal
OK
>>
VT100 Log: Off Serial:COM5:9600,7,e,2

```

Figure 8. Example of Corrupted Project

Solution 1 is to set the Motion Coordinator to restore the project from the EPROM. In the terminal type:

```

>>POWER_UP=1
>>EX

```

The Motion Coordinator will power up and load the last project stored in EPROM, and if it is set to Autorun, it will try to run it.

Solution 2 is to clear the memory and then re-load from a backup on the PC. In the terminal type:

```
>>NEW ALL
>>
```

There will now be no programs in the Motion Coordinator and it will be possible to connect Motion Perfect.

6.1.2. Controller is LOCKed.

If the Motion Coordinator is locked with a LOCK code, it will not be possible to connect Motion Perfect.

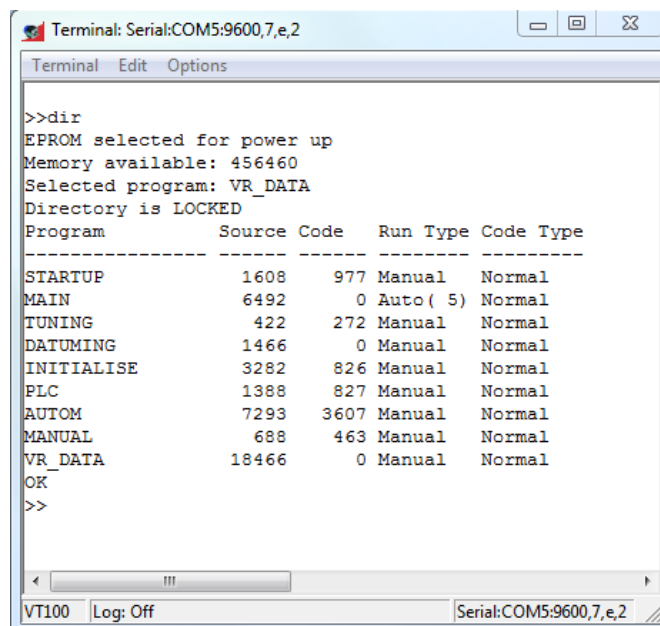


Figure 9. Locked controller

Solution is to contact the machine builder and obtain the LOCK code, then type in the terminal:

```
>>UNLOCK (12345)
```

Replace 12345 with the lock code provided.

6.1.3. Controller type is not in the Motion Perfect controller list.

Motion Perfect has a built-in list of all controllers which may be recognised. If the controller is a newer design than the version of Motion Perfect 2, then it will not be recognised and the “controller not found” message will be seen.

Solution is to download and install the latest version of Motion Perfect 2 from the Trio website at www.triomotion.com.

The latest version at the time of publishing this document is Motion Perfect V2.4.2.14. This version is good for all Motion Coordinator types in series 2 and 3 with an RS232 Serial programming port.

NOTE: Motion Coordinator Series 1, the CSC-DAC-MX, CSC-DAC-M and CSC-250-M cannot be used with Motion Perfect.