TRIO
MOTION | TECHNOLOGY

Doc No.:	**AN-219**
Version:	**1.0**
Date:	**08 September 2008**
Subject:	**Storing projects in EPROM**

APPLICATION NOTE

www.triomotion.com

1. Background

Trio coordinators can be split into 2 categories those with battery backed memory and those without. This application note is aimed at the first group with the battery backed memory.

Often we receive messages asking how a customer can recover a lost project, this is usually caused by leaving the coordinator to run from battery backed memory. The project can be lost due to the battery going flat or the memory being corrupted.

There is a chance that if you cycle the power to the coordinator during power up you can corrupt the battery backed memory. This can happen due to a voltage spike on the supply or a safety switch tripping.

2. Backup project

The best way of preventing program loss is to keep a backup of the project. This could be on a CD which is delivered with the machine or on a backed up server. It is important not to rely on the controller for the only copy of your project. Your machine may fail 10 years down the line and people will not want to have to write the project from scratch again!

If you have a machine with no backup, now would be a good time to go and save one…

3. Backup VR's and TABLE

Table and VR values can be lost when you change controller or the battery goes flat. Often values are manually written into the controller and not backed up. Both the table and VR's can be written into the startup file. If you are using larger areas of table this can result in a large startup file, which may be to big for your available memory. The table can be saved to your PC or an SD card using Motion Perfect 2.

If you have a machine with VR or table data that is not backed up, now would be a good time to go and save it…

4. Corrupted memory

You can usually load the project over a corrupted memory but occasionally there can be difficulties.

In this situation connect via the command line in Motion Perfect and type the command "NEW ALL". This will clear the memory for you to load the project again.

Figure 1 Shows the startup message on a MC206X, you can see the memory has been corrupted by the message: %[ERROR 80] – Directory structure invalid. I have then printed the directory using the DIR command. Again you can see that the 'directory is corrupt'. After a NEW ALL you can see that the memory is no longer corrupt and you can load the project again from your backup.

```
…
RAM selected for power up
FLASHSTICK allowed

Total memory available: 402727

Checking SDCARD: No TRIOINIT.BAS
%[Error 80] – Directory structure invalid
>>DIR
RAM selected for power up
Memory available: 402727
Selected program: None
Directory is CORRUPT
Program          Source Code   Run Type Code Type
---------------- ------ ------ -------- ---------
MENU                 23     18 Auto(-1) Normal
STARTUP           15045  17008 Manual   Normal
RESET_SERIAL        118    118 Manual   Normal
DPR_TEST           3317   2127 Manual   Normal
TABLE                 0  20196 Table
OK
>>NEW ALL
OK
>>DIR
RAM selected for power up
Memory available: 486389
Selected program: None
Directory is UNLOCKED
Program          Source Code   Run Type Code Type
---------------- ------ ------ -------- ---------
TABLE                 0  20196 Table
OK
>>
```

Figure 1Corrupted memory

5. Preventing corrupted memory

It is not recommended to run the programs from the battery backed memory; this should only be used during development. When the coordinator is commissioned you should make sure that the programs are fixed in EPROM. This is a permanent area of memory that the project is loaded from on power up. If the battery goes flat or there is a power loss the project will be loaded and compiled as normal.

The EPROM has a limited number of write cycles but this is in the region of 2 million writes so it is unlikely that you will wear it out in normal use.

5.1. *Fixing in EPROM using Motion Perfect 2*

It is very simple to fix the prject, all you have to do is click the "Fixed" radio button in the top left of Motion Perfect as shown in Figure 2. You are then asked to stop any running programs and to confirm the action. After the programs are fixed you are no longer able to edit them in the editor, similar to
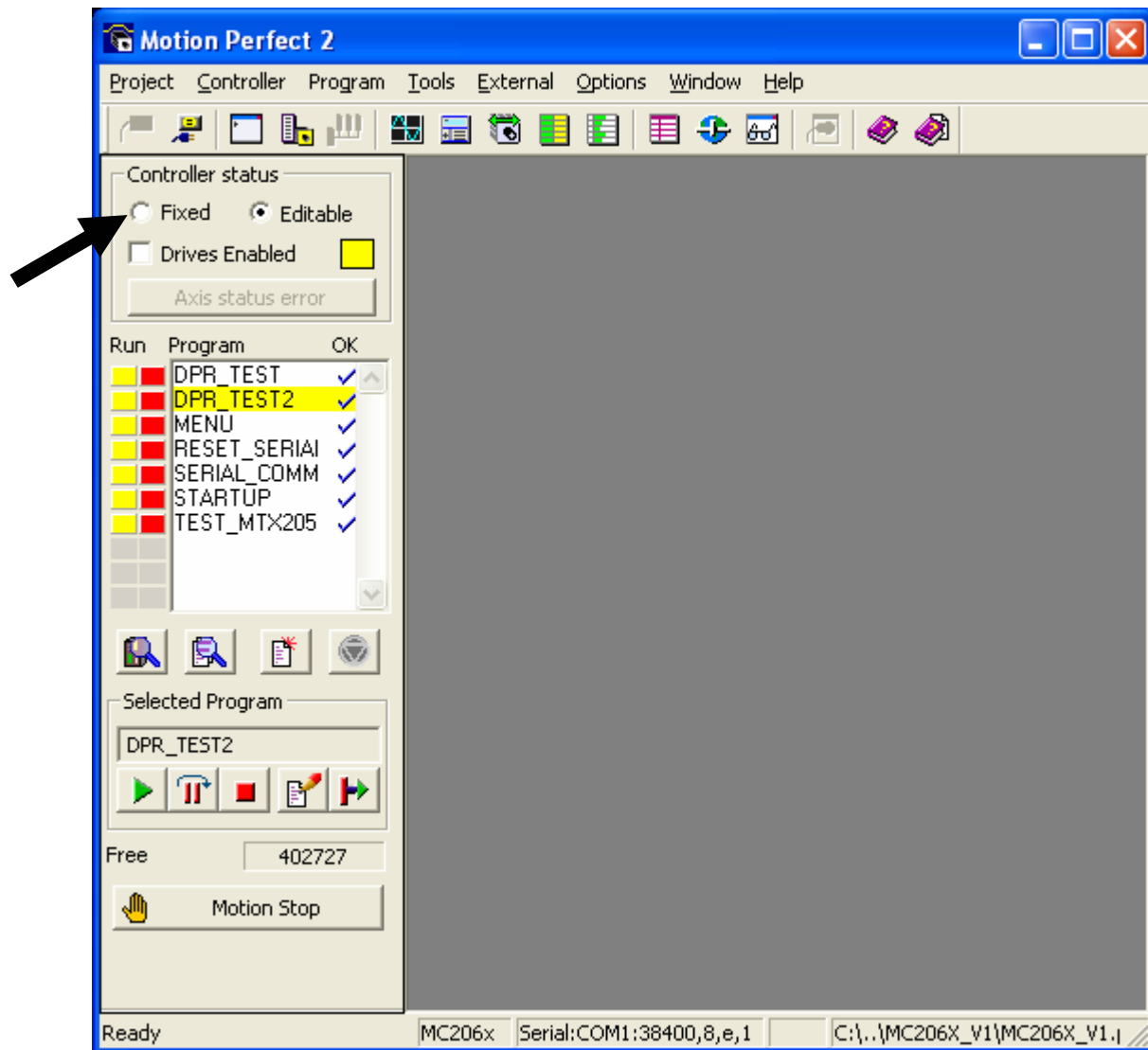
when the programs are running.

Figure 2 Fixing using MP2

It is important not to forget to do this after you have finished commissioning a machine or making any adjustments.

5.2. *Fixing in EPROM using the command line*

To fix the program in EPROM you simply use the command EPROM. This stores the program but it will not run from EPROM on start up. To enable start up from EPROM you must set POWER_UP=1 as in Figure 3.

```
>>EPROM
Erasing Application area of FLASH
Programming
Verifying
>>POWER_UP=1
>>
```

Figure 3 Fixing using command line

5.3. Checking the programs are fixed

There are a few methods of checking if the programs are fixed, the simplest is to connect to motion perfect and look at the Controller Status radio buttons. On connection to a coordinator if the programs are fixed you will receive a message informing you that you cannot edit them.
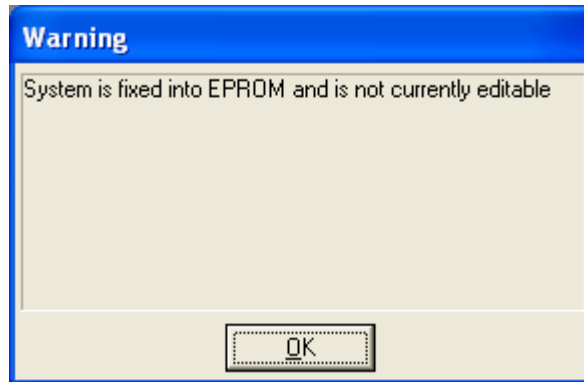

Figure 4 MP2 Fixed warning

The power up state is also displayed in the start up message, as shown by the bold text in Figure 5.

```
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

Total memory available: 440484

Checking SDCARD: No TRIOINIT.BAS
Compiling SERIAL_COMMS
Linking SERIAL_COMMS
Pass=4
```

Figure 5 EPROM selected start up

The final method of checking that your projects have been fixed is using the DIR command, where again you can see that EPROM is selected for power up.

```
>>DIR
EPROM selected for power up
Memory available: 402727
Selected program: DPR_TEST2
Directory is UNLOCKED
Program          Source Code    Run Type  Code Type
---------------- ------ ------  --------  ---------
SERIAL_COMMS        584    393 Manual    Normal
MENU                 23     18 Auto(-1)  Normal
STARTUP           15045  17008 Manual    Normal
RESET_SERIAL        118    118 Manual    Normal
DPR_TEST           3317   2127 Manual    Normal
TABLE                 0  20196 Table
OK
```

Figure 6 EPROM selected DIR