



Reliance[®]
Precision Mechatronics LLP

Reliance Cool Muscle Quick Setup and Demo Guide

This document will assist a new user in setting up and programming a Reliance Cool Muscle. The programming will cover running the motor through the dynamic commands and through a program bank. It is assumed that the Cool Muscle is being run with the default factory parameters.

1.) Requirements

Hardware:

- 1.) 24V power supply (preferably COSEL LEP150 – XMUS)
- 2.) DB9 Y-cable (RCM1C3-2000)
- 3.) C-type Cool Muscle motor (RCM1-C-XXXXX)

Software:

- 1.) CoolWorks Lite 4.1.4 (<http://www.rpmechatronics.co.uk/>)

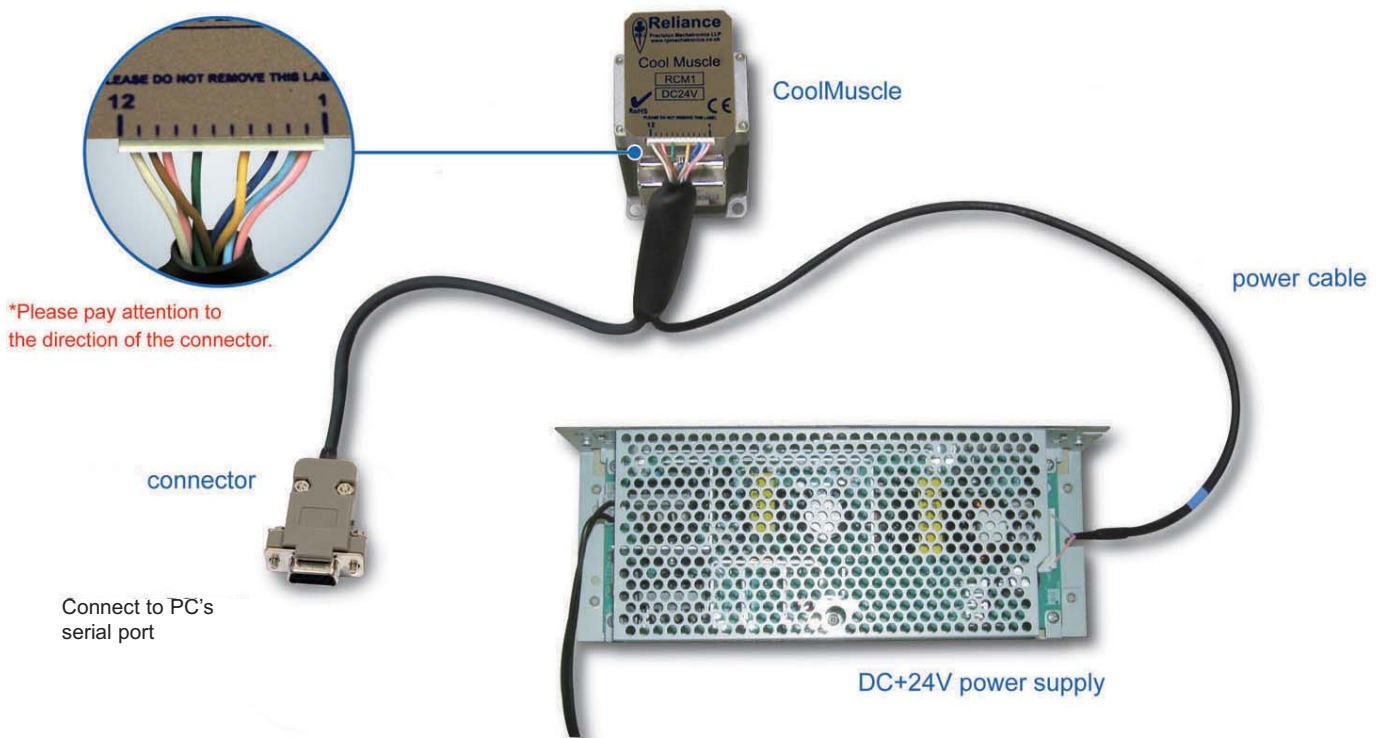


2.) Setup

Hardware:

- 1.) Connect the DB9 on the y-cable to the PC.
- 2.) Connect the white molex connector on the y-cable to the Cool Muscle
- 3.) With the power supply powered down connect the 24VDC leads from the y-cable to 24VDC terminals.
 - a. Pink → 24V
 - b. Blue → 0V

Example Showing Basic Connection Setup



Software:

- 1.) Start CoolWorks Lite 4.1.4
- 2.) Select the CommPort the CM is connected to and make sure the default baud-rate of 38400 is selected.
- 3.) Click the "Open Comm Port" button.



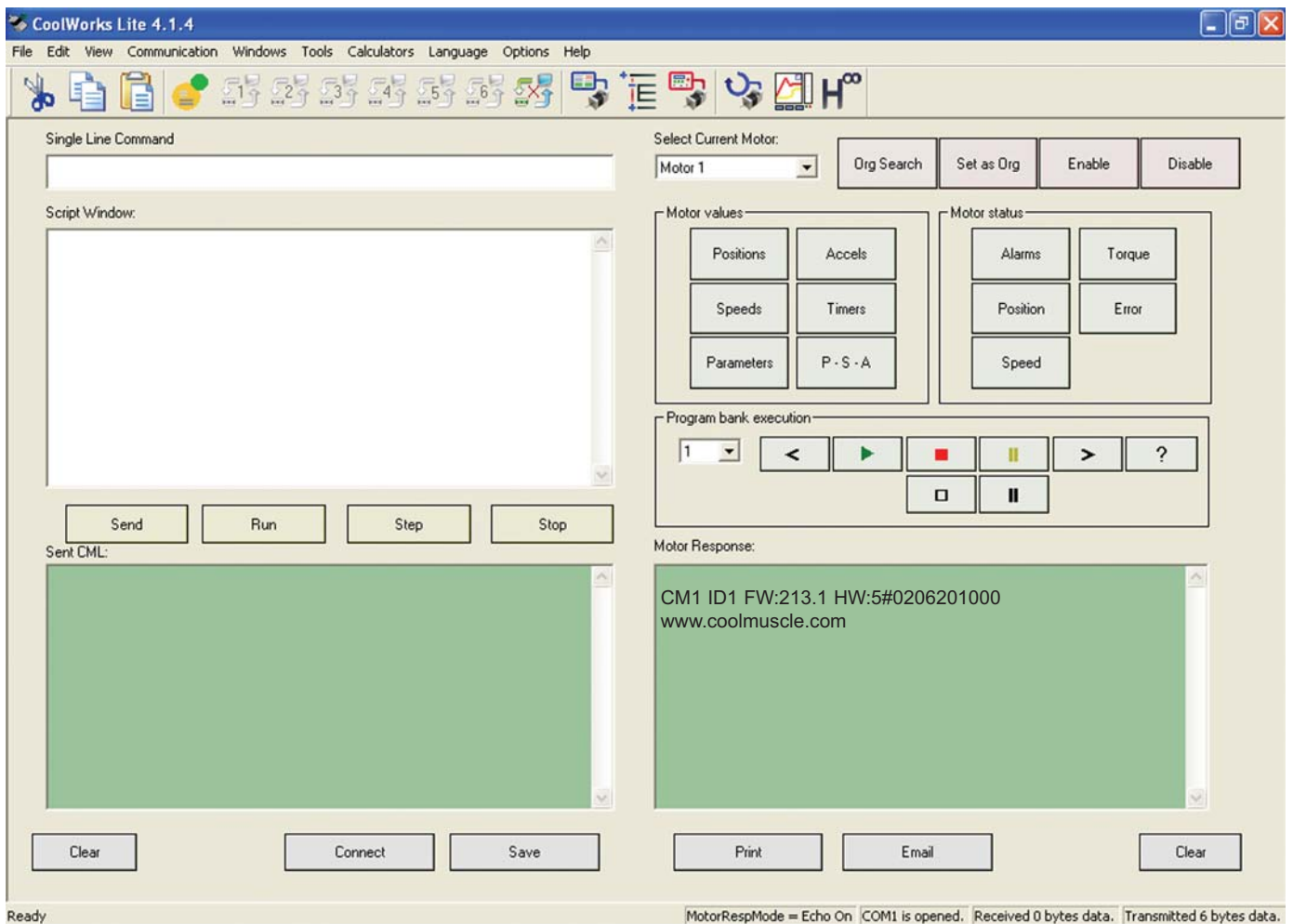
3.) Powering up the Cool Muscle

The Cool Muscle is now ready to be powered on. There should be no cable ends spare and CWLite is open in the terminal window. The picture below shows the terminal window.

- 1.) Switch on the 24VDC supply

When the motor is powered it automatically transmits the version and serial number to the serial port. This data should be seen in the 'motor response' window. It will follow a format similar to:

```
CM1 ID1 FW:2.13 HW:5 #0206201000
```



Seeing this data is important in that it indicates the motor is powered and communicating. If not double check all the above steps



4.) Dynamic move

The dynamic move is the easiest way to run the Cool Muscle. This method is also often used when a windows application is controlling the motor.

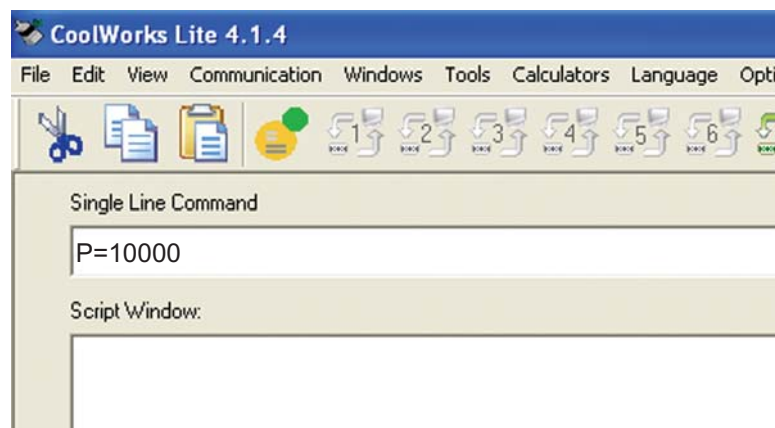
By default the motor is set to a resolution of 1000 pulses/rev. Registers P,S and A hold the Position, Speed and Acceleration values respectively. They are all relative to the resolution. Their units are as follows:

- P → pulses
- S → 100 * pulses/second
- A → K pulses/second²

In the dynamic move these registers will be set and then the '^' character is sent to start the move. Note: P is the absolute position and is not incremental.

In the single line command type each of the following individually with each followed by hitting the 'enter' key:

S = 20
A = 100
P = 10000



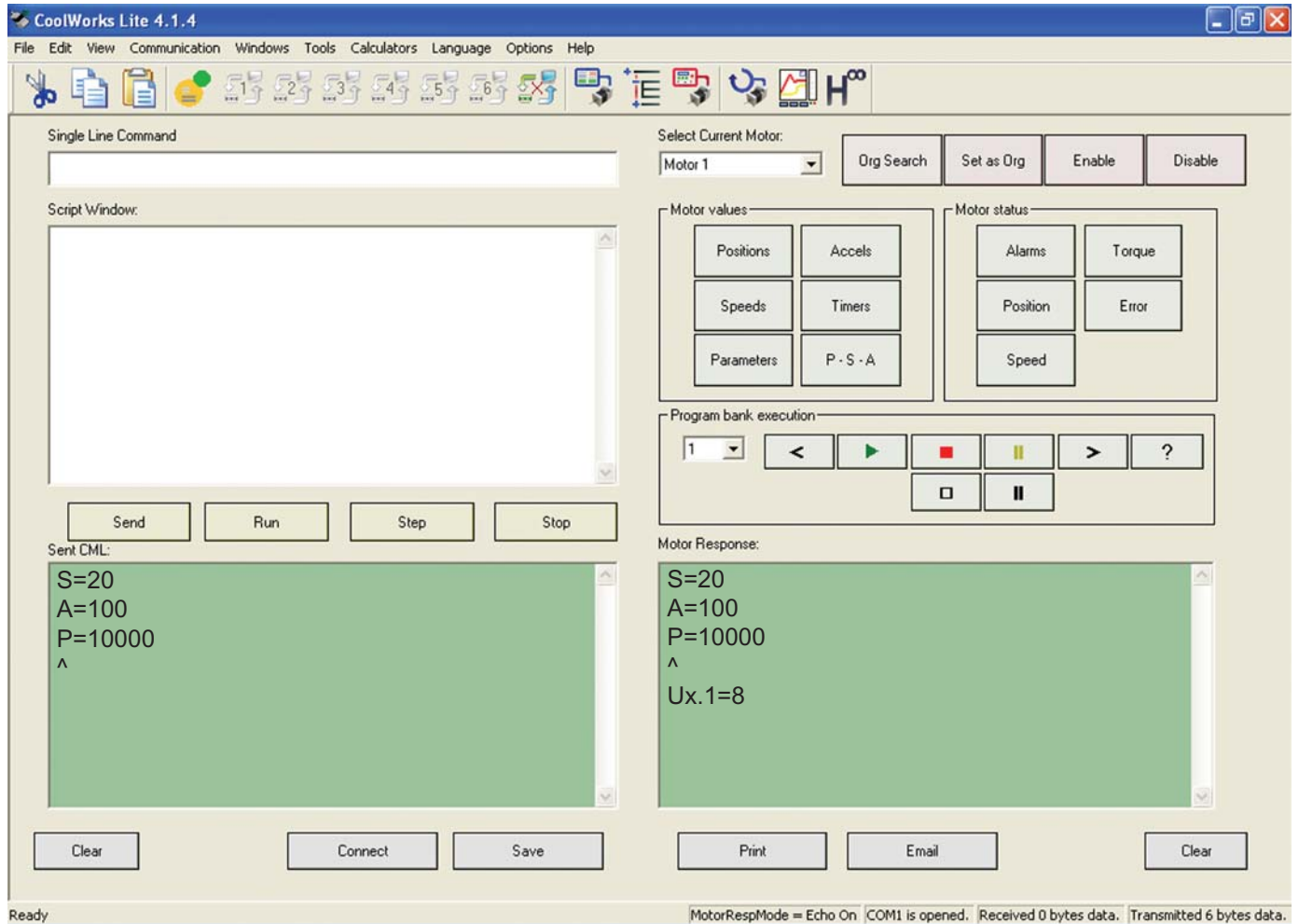
At this point with the registers set the motor can be run. Make sure there are no obstructions and the shaft is free to rotate. Send the following followed by the 'enter' key:

^

Since the default resolution is 1000 pulses/revolution the motor will rotate 10 times.



Notice the commands are echoed back and are visible in the Sent CML window and the Motor response window. The response "Ux.1=8" means that the motor is in position.



The motor should move 10 revolutions at a speed of 2000 pulses/rev. To move the motor again change the value of P and send ^.

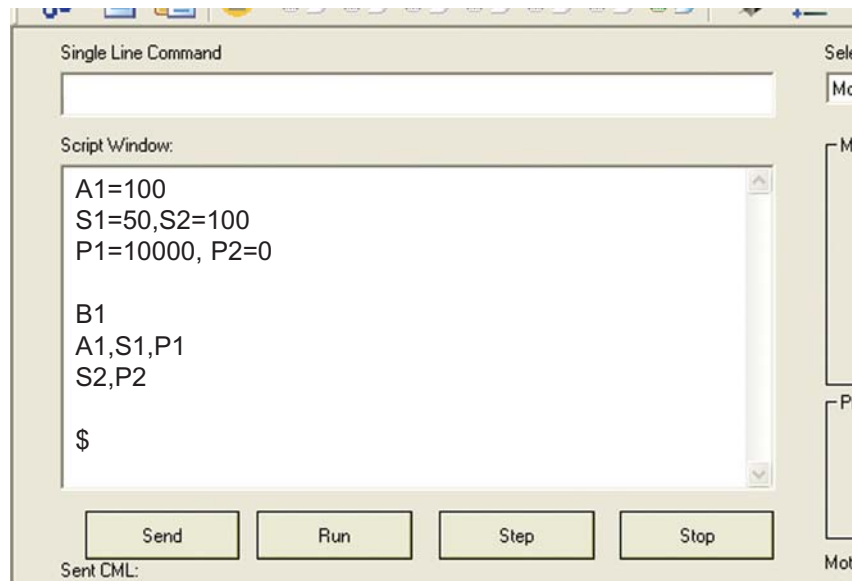


5.) Bank move

Program banks can be programmed to execute multiple moves with changes in speed and acceleration. Banks are stored and saved in the Cool Muscle and executed from inputs or the serial port. Values should be set before they are used in a bank. The dynamic values are not used in a bank.

Enter the following in the 'script window':

```
A1=100  
S1=50,S2=100  
P1=10000, P2=0  
  
B1  
A1,S1,P1  
S2,P2  
  
$
```



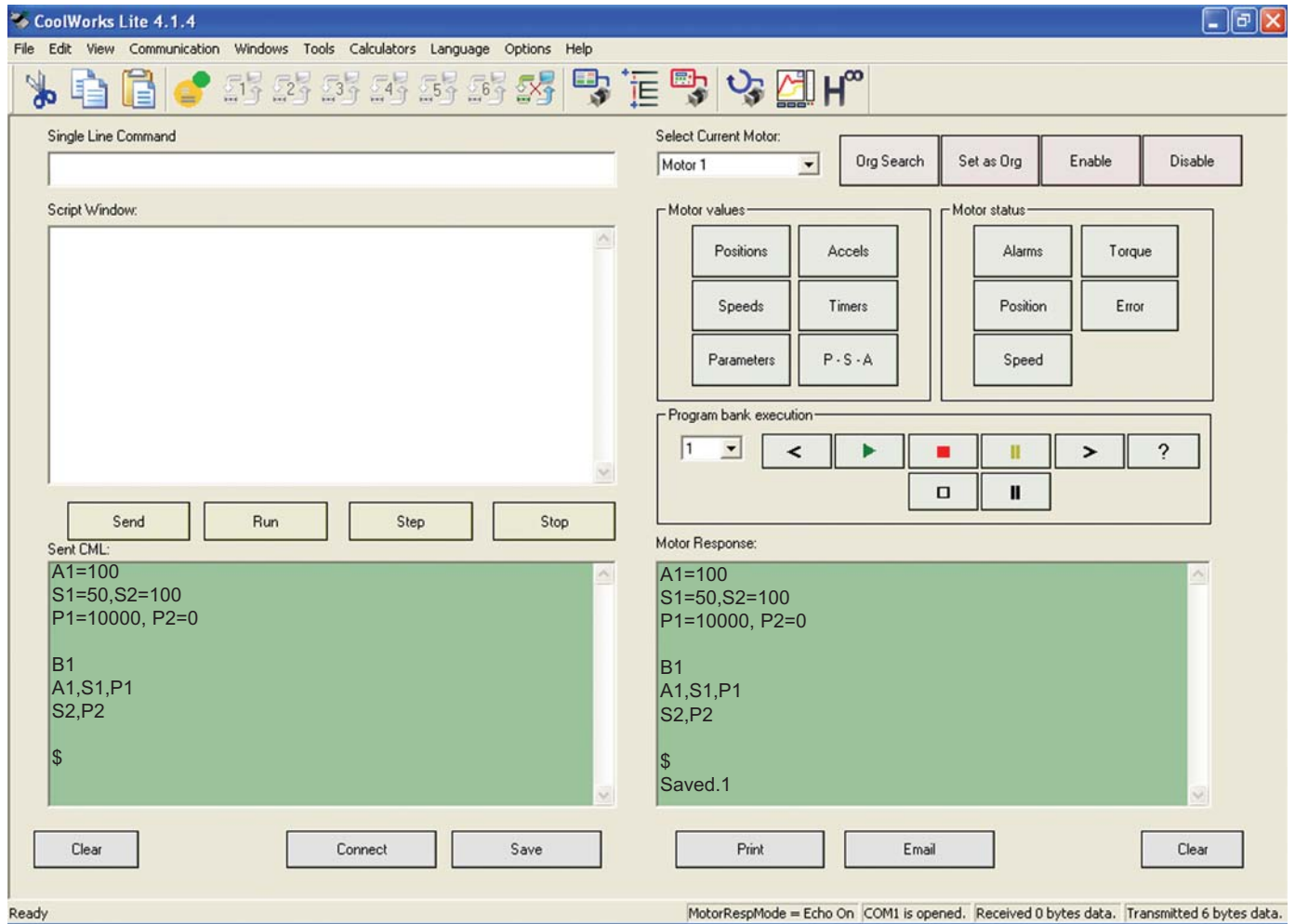
Click the 'send' button. The '\$' command will save the bank into the EEPROM. If the motor is powered down the bank is saved. In this example the motor will move to position P1 at acceleration A1 and speed S1. It will then move back to position P2 at speed S2.

Note that the speed and acceleration are set before a position is called. A position will always use the previous acceleration and speed. These must be set at least once before the first position is called.



Enter the following into the single line command and hit the 'enter' key:

[1



The motor should now move to P1 and then to P2. The bank can be repeated by sending [1 again.



6.) CoolWorks Lite

CoolWorks Lite has many features to assist in using, programming and accessing information on the Cool Muscle. Other than the Terminal Window there are a number other of pages that can be accessed from the Toolbar.

- 1.) Terminal
 - Program and directly access all motor information
- 2.) Motor browser
 - Visually access motor information
 - Use only with V2 firmware (not compatible with RT3)
- 3.) Jog motor
 - Basic jogging of Cool Muscle motor
- 4.) Reset motor
 - Reset the CM to its original factory parameters
- 5.) Graphing window
 - Graphing utility. Graph motor position, speed and torque vs time
 - Graph 2-axis for coordinated motion
- 6.) H-infinity tuning utility
 - Use the tuning window if control gains need to be changed.

The menu bar for all the windows

1 Main Menu
See Page 6 for details.

2 Tool bar
Select windows and functions through icons.

3 Status bar
Displays the motor status and other relevant CWL information.

