Dover Motion DMCM Quick Start Guide

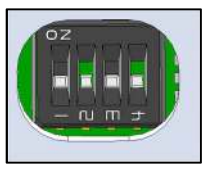
This guide covers the basic steps for using a DMCM stage controller with Pro-Motion for basic control & testing. See the DMCM User Guide for additional information.

1) The USB drive included with the DMCM has the following materials:
   a. 36105-01 (C-Motion Startup Guide & Examples)
   b. 41-1264.pdf (DMCM User Guide)
   c. 41-1265.pdf (DMCM Quick Start Guide)
   d. ######_Config.txt (Pro-Motion Configuration)

2) Connect all peripherals to the DMCM – See the DMCM User Guide for more details
   a. Connect the motor cable to J1
   b. Connect the encoder you will be using to the controller to J2 – be sure to set SW5 to either analog or digital mode.
   c. Connect the communications adapter to J3
   d. Connect power cable to PWR, then turn the supply on 24-48V

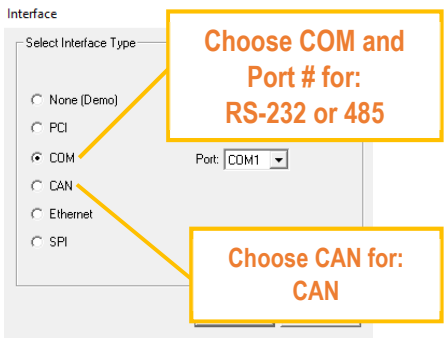
3) Download and install the Pro-Motion user interface from the provided USB
   a. Install file is named: Pro-Motion5.20.exe Note the DMCM requires Pro-Motion version 5.20 (this version has the best support for all features available on the DMCM)

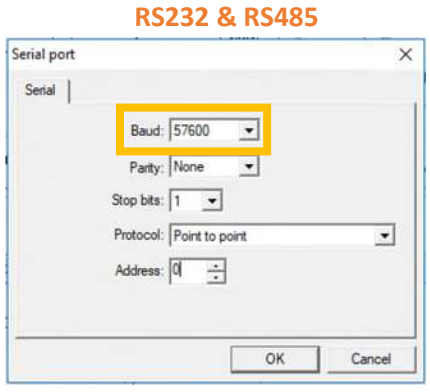
4) The User Guide (41-1264.pdf) and troubleshooting section below have information on the DIP switches for communications setup. The DMCM ships with these switches pre-set per the order

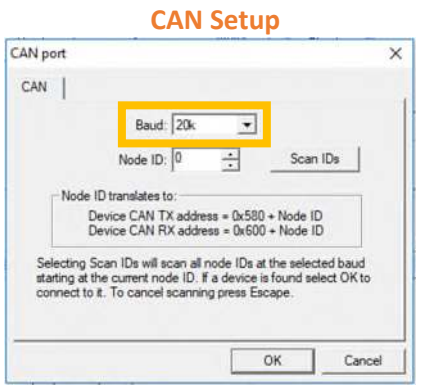


Switch No.	1	2	3	4
RS232	ON	ON	N/A	N/A
RS485 Low Z Full Duplex	ON	OFF	OFF	ON
RS485 Low Z Half Duplex	ON	OFF	OFF	OFF
RS485 High Z Full Duplex	ON	OFF	ON	ON
RS485 High Z Half Duplex	ON	OFF	ON	OFF
CAN	OFF	N/A	N/A	N/A

5) Start Pro-Motion, and the "Select Interface Type" window opens automatically
   a. Select the communications type (COM or CAN) for the DMCM
   b. Non-zero addresses must use "Multi-drop" serial mode
   c. The default Address for RS-485 is 0 or as ordered
   d. The default Node ID for CAN is 0 or as ordered

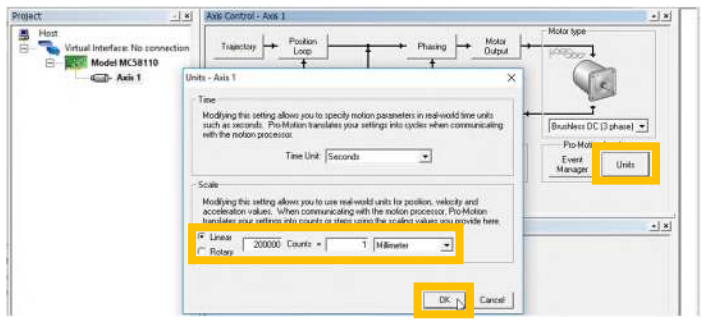




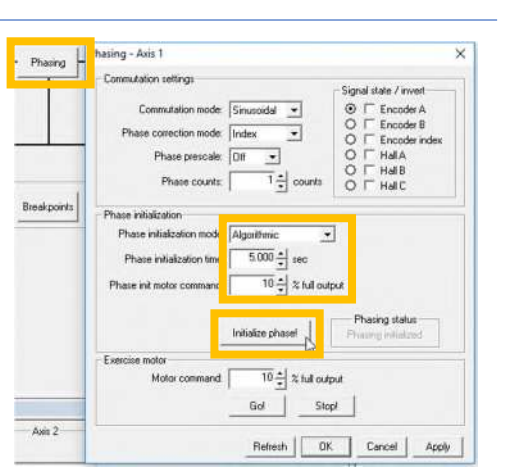


6) Set the Stage Units
   a. Click Units, select linear units, and enter one of the following numbers depending on the resolution of the encoder ordered.

Resolution	Counts/mm
1.25 nm	800,000
2.5 nm	400,000
5 nm	200,000
10 nm	10,000
1 µm	1000



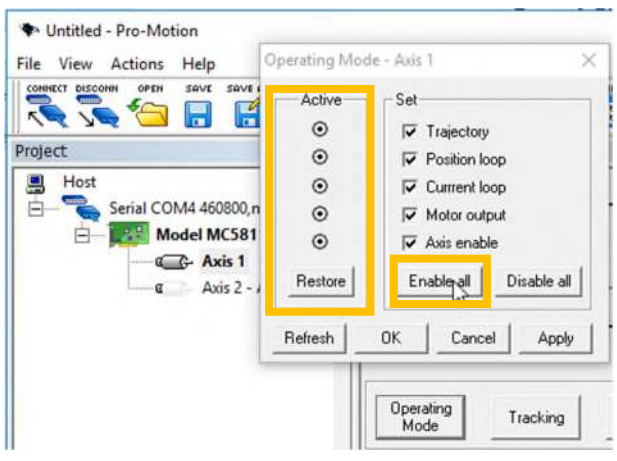
7) Click "No" if asked to calibrate feedback signals.
   a. This is factory set, and users should not need to recalibrate. See the DMCM User Guide for more information.



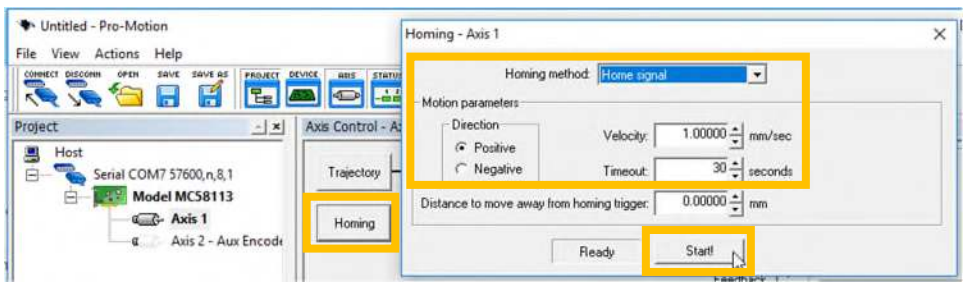
8) Ensure the encoder is reading a signal – verify that the actual position changes when you physically move the stage. Verify that the stage follows the Dover convention (+) positive travel is away from the cables. If it does not, check the "Encoder A" box in the top right and select "Apply", then re-check the direction of travel.

9) Commutate the stage if a 3-phase motor is used (bipolar steppers and single-phase motors can skip this step) NOTE: This must be done for a 3-phase motor each time the DMCM is power cycled.
   a. Click on Phasing → Initialize Phase!
   b. This will cause the stage to move back and forth – do not interfere with the motion of the stage, this step is to synchronize the motor and encoder.
   c. See troubleshooting below, or the DMCM User Guide for more information.

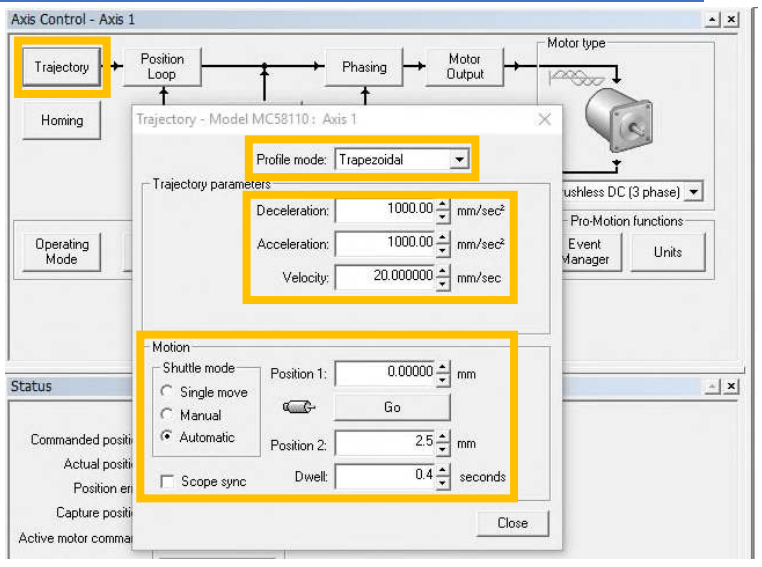
10) Enable the DMCM Servo with the Operating Mode
   a. Click Operating Mode → Enable All
   b. The DMCM servo should now be on and it will hold position
   c. The Active indicator for *ALL* items (Trajectory, Position loop, Current loop, Motor output, and Axis enable) must be "dotted" (active) as shown in the image to the right (see orange box). Otherwise the motor may be enabled, but the stage will not move
   d. NOTE, IF THE STAGE IS UNSTABLE / VIBRATING WHEN ENABLED CONFIRM THAT THE APPROPRIATE MASS HAS BEEN MOUNTED ON THE STAGE



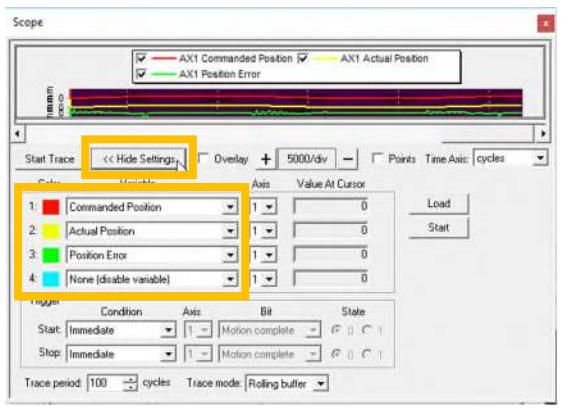
11) Homing the DMCM
   a. Prior to motion, each time the stage is powered off, or the motor is disabled, it will need to be homed before any position moves can be made
   b. Click “Homing”
   c. Enter the selections shown in the screenshot
   d. Click “Start!”



12) To move the DMCM controlled stage, click “Trajectory”
   a. “Profile mode” controls the style motion type, “Trapezoidal” and “S-curve” will be useful in most cases
   b. “Shuttle Mode” controls how the stage moves:
      i. “Single Move” moves the stage once to a set position
      ii. “Manual” moves the stage back and forth between two set positions each time “Go” is clicked
      iii. “Automatic” cycles back and forth between two positions with the set dwell time when “Go” is clicked, and stops when “Stop” is clicked
   c. “Scope sync” allows plotting to be automatically started at the same time as a movement, more details on setting up the Scope below

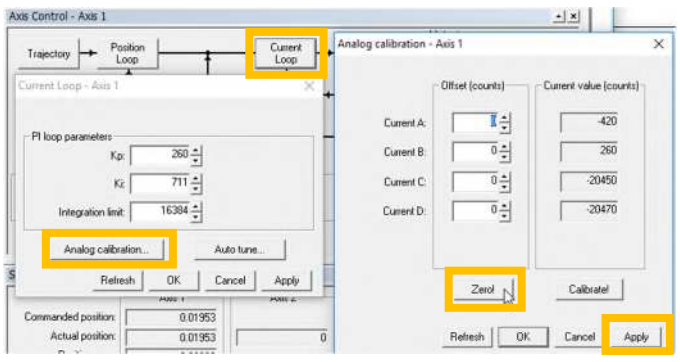


13) Using the “Scope” (or Plotting Tool)
   a. Click the “Scope” window button in the top ribbon to open the scope tool (see image to the right)
   b. Click “Show Settings” to choose items to plot
   c. Make sure that “Scope sync” is checked in the trajectory window
   d. Start a move (Click “Go” in the trajectory window) to start plotting



Troubleshooting Instructions

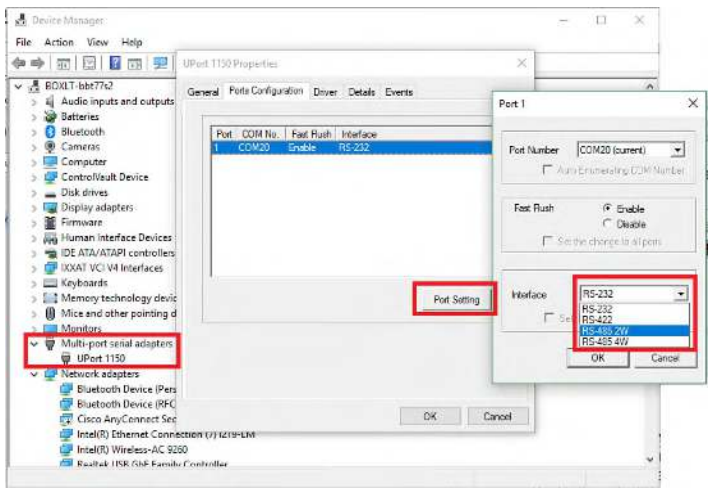
14) Does the stage behave erratically once it is enabled?
   a. The current feedback may have been incorrectly calibrated.
      i. Click “Current Loop” → “Analog calibration” → “Calibrate!” → “Apply”
   b. When using a 3-phase motor, not commutating the motor before enabling the control loops will result in erratic behavior or poor efficiency.
      i. If the encoder is counting the correct direction, but the stage won’t commutate: Click “Motor Output → ““Invert motor direction” → “Apply” and try to commutate again



15) Can’t connect to the stage
   a. Ensure the stage is connected to a 24-48V power supply, there should be a green power LED on the controller, visible by the feedback connector J2
   b. Ensure the correct port, address, and connection settings are used when connecting, use the Device Manager to find out which port numbers are in use
   c. Ensure you are plugged into the correct connector on the controller, J3 and J1 are both DE-9 connectors, but J3 is the comms port

Default Serial Settings						
Baud Rate	Data Bits	Parity	Stop Bits	Flow Control	Protocol	Address
57600	8	None	1	None	Point-to-Point	0

Default CAN Settings			
Baud Rate	Node ID	CAN TX Address	CAN RX Address
20k	8	0x580	0x600



16) The stage is unstable
   a. Ensure that the correct mass has been installed and securely fastened to the stage
   b. Ensure the stage is operating in the correct orientation (if applicable – counterbalances should be opposed to gravity)
   c. Ensure the stage is in a stable operating environment (stationary work surface, no ambient vibration, etc.)
   d. Re-load the configuration file included on the USB, see the DMCM User Guide for more detail
   e. The stage may need to be re-tuned, contact Dover Motion

Document	Revision	Date	Summary	ECO Number	Write/Revisor
41-1265	A	09/03/2019	Initial Release	DM10640	Griffin Whittredge
	B	11/18/2019	Move printing instructions to 43-0260	DM10784	Mark L'Italien