

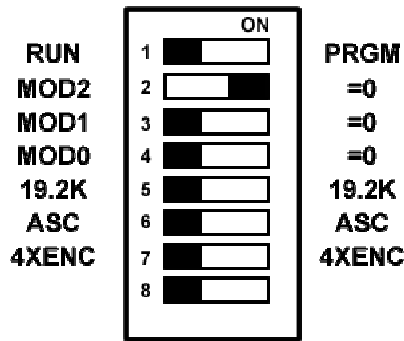
Overview:

Solutions Cubed, LLC, created the Motion Mind test software as a development tool for use during testing. The software is provided “as is” and is not guaranteed to work on all computer systems. It has been compiled to work with Windows OS 98 and Window OS XP. If prompted during installation to replace or retain your computer’s drivers it is recommended that you retain the drivers already on your system. If for some reason you cannot install or use this software you can switch to ASCII mode and use a simple terminal program to program/control the Motion Mind.

Hardware:

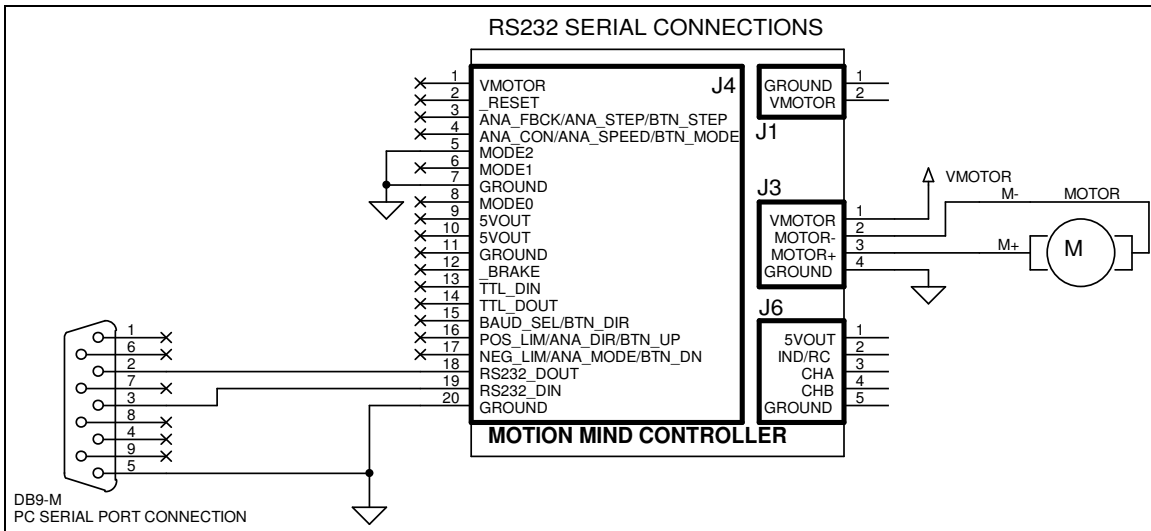
You’ll need to set the DIP switches for binary communication (ASCII-no connection) and 19.2KBPS communication. For starters you can also set the mode to serial open loop control (mode 3). See below for switch settings. Connect to your PC serial port using the connection shown below.

SW1 Dip Switch Settings



PC Serial Port Connections

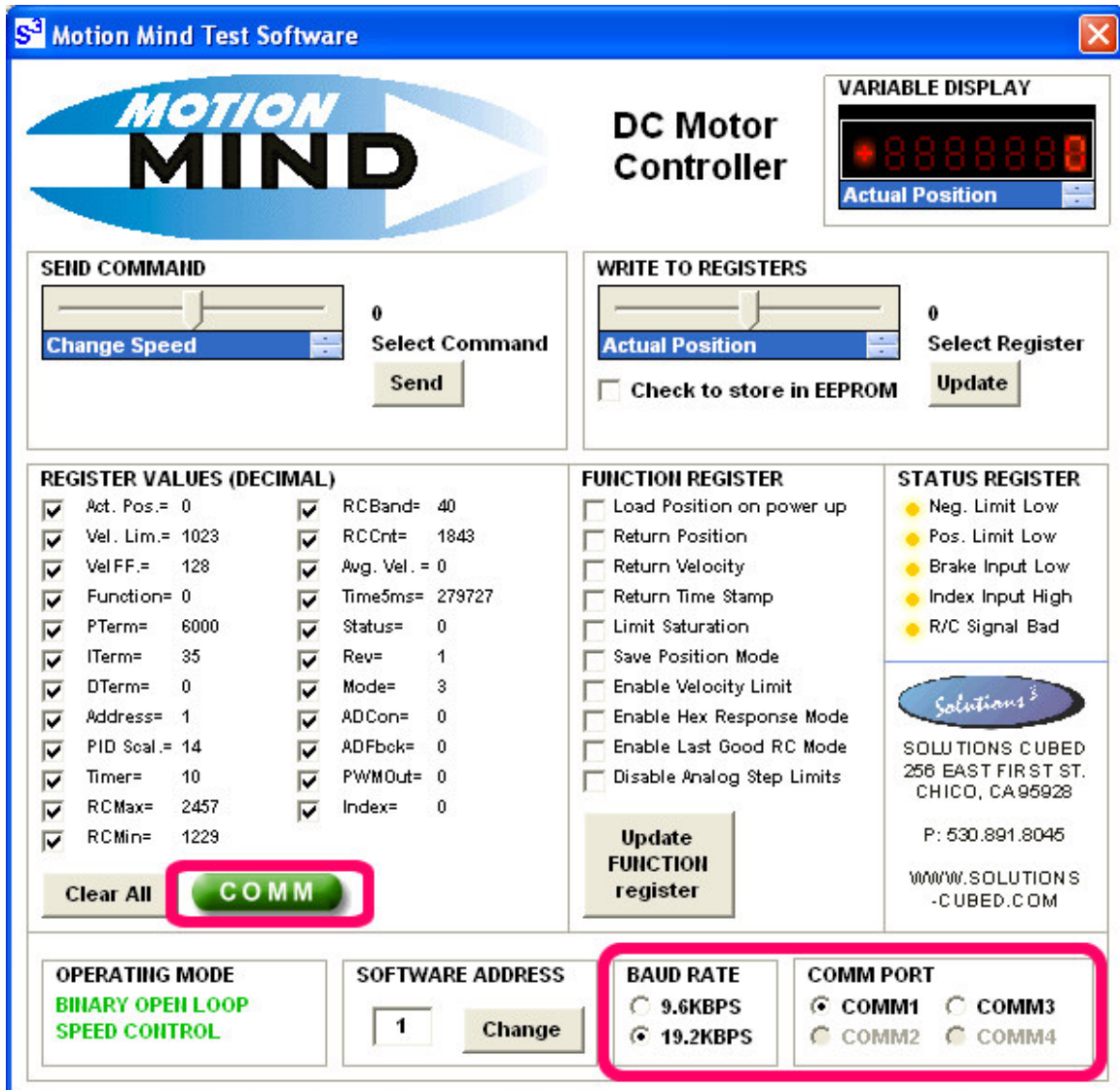
(If mode is selected via DIP switch (SW1) the connections to MODE2, 1, 0 (J4) should be left unconnected)



Connections are shown for a DB9 male, which is the connector on the computer serial port. The pin connections are the same for a DB9 female type connector. Using a DB9 female may be worthwhile when you are connecting to a DB9 cable.

Getting Started:

If you have everything connected correctly, the program is installed, and power is applied to the Motion Mind you should see a window like that below. The “COMM” graphic will be green if binary communication between the computer and the Motion Mind is okay. If it is red check the hardware settings and the software communication settings. The pink rounded rectangles shown on the image are for reference and will not show on the program.



Reading Registers:

Once communication is successful you can select the registers you want read from the Motion Mind by left-clicking the checkbox to the left of the register names (in the “REGISTER VALUES” box). Next to the “COMM” status image is a button that selects all registers or de-selects all registers.

When the software first starts up all of the registers will be read and their contents displayed.

Modifying Registers:

To modify the contents of Motion Mind registers you use the Write Command. With this software you can write data to all modifiable registers with the “WRITE REGISTERS” window. The only exception is the FUNCTION register that has been broken down into specific bits for easier understanding.

The example shown here writes a value of 10 to the ADDRESS register and stores it in EEPROM memory. Note: if you actually do change the address from its default of 1 you'll need to change the value in the “SOFTWARE ADDRESS” box at the bottom of the window.

Step 1: Select the register to modify by left clicking on the up or down arrow next to the register name. These arrows navigate through a list of registers. Once you see the register you want to modify left click on the register name (it will be highlighted in blue).

Step 2: Select the slider by left clicking (and holding down) the handle with your mouse. You may now slide the slider back and forth. A text value to the right of the slider will change values as you move the slider. Use the left-right arrow keys on your keyboard to make smaller changes in the value. Once you have a value you want move on to step 3.

Step 3: If you want the new register value to be a power-on default value you'll need to store it in EEPROM. To do this, left click the “Check to store in EEPROM” checkbox. If you're just experimenting with values you can skip this step.

Step 4: Left click the “Update” button. If you're reading the register you just changed you should see the value change in “REGISTER VALUES” window.



Sending Commands:

Sending commands is similar to modifying registers.

Step1: Select the command by scrolling through the list of commands (up/down arrows) and left clicking the command you want to send (it will be highlighted in blue).

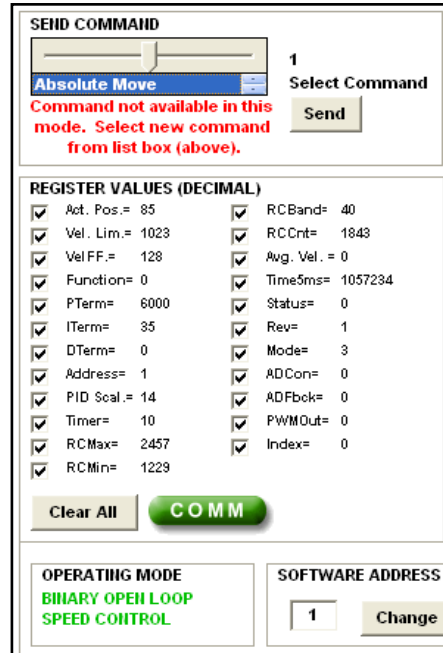
Step 2: Select the slider by left clicking the handle with your mouse. You may now slide the slider back and forth (while holding the left mouse button down). A text value to the right of the slider will change as you move the it. Use the left-right arrow keys on your keyboard to make smaller changes in the value. Once you have a value you want move on to step 3.

Step 3: Press the “Send” button. The command has been sent and will be implemented.

Not all operating modes use all available commands. For example, the open loop modes don't use the serial closed loop "Absolute Move" command. If the software is configured to read the MODE, STATUS, ADCON, and ADFBCK registers then it will decode your current operating mode and display a message if the command you have selected is not compatible with the operating mode you're using.

The closed loop position commands (Absolute Move and Relative Move) are broken down into two types of commands. They are the normal command, and the "short" version of the command. Since the slider doesn't work well for displaying both large and small numbers the short version of the command spans a much smaller movement range.

Two of the commands are useful in all modes of operation. These commands are the Restore Defaults, and Software Reset commands.



Modifying the FUNCTION Register:

Check the Motion Mind datasheet for the effect setting a FUNCTION bit will have on the controller before changing it. To change the settings just left click the check box of the FUNCTION bit you want to set or clear, and press the "Update FUNCTION Register" button. Updates to the FUNCTION register are written to EEPROM automatically by the software. Note that if you set the FUNCTION bits that append position, velocity, or time-stamp data to a binary response you will get communication errors when sending commands. The commands will still be executed, but this test software isn't designed to read or display the appended data. All of this data can already be read regularly and displayed in the "REGISTER VALUES" box.

Variable Display Box:

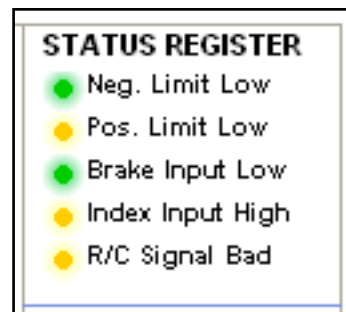
You might like to display some register data in a larger format. The "Variable Display" box in the upper right corner of the software window allows you to do that. Select the data you want to display by scrolling through the list with the up/down arrows to the right of the data name (and underneath the 7-segment LED display). Then left click on the data name, in this case Analog Control was selected. That information will now be displayed in the "Variable Display" box.



STATUS Register Box:

The various bits in the STATUS register are displayed in the "STATUS REGISTER" box. If the bit is asserted then the indicator will glow green. If it is not asserted then it will remain yellow.

See the Motion Mind datasheet for full details on the STATUS register and its contents.



Software Address, Baud Rate, Comm Port Settings:

If you modify the ADDRESS register in a Motion Mind the test software will update the new value (the value you just sent) and use it for future communications. However the next time you start the test software it will revert to an address of 1, and communication will fail. If you are using a Motion Mind with an address that is not 1, or have multiple Motion Minds connected to this software, the “Software Address” change window will be useful. Just enter the address of the Motion Mind you want to communicate with in the text box, and press the “Change” button. The software will use this new address value in future serial communication.

The software allows you to communicate with Motion Mind controllers at either allowable baud rate (9.6KBPS or 19.2KBPS). The baud rates are selected either by a jumper on the Motion Mind, or through the control connector on the Motion Mind (J4). The default value is 19.2KBPS. Make sure the baud rate the software is using matches the one you have selected on your hardware.

The test software will scan for available COMM ports (1 through 4 only) on your PC when the program is started. Available ports are displayed in black and the COMM port used by the software may be selected via the radio button to the left of the COMM port title.

SOFTWARE ADDRESS	BAUD RATE	COMM PORT
<input type="text" value="1"/> <input type="button" value="Change"/>	<input type="radio"/> 9.6KBPS <input checked="" type="radio"/> 19.2KBPS	<input checked="" type="radio"/> COMM1 <input type="radio"/> COMM3 <input type="radio"/> COMM2 <input type="radio"/> COMM4