



## Application Note #4422

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### Connecting to an Ethernet Controller from Windows

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This application note details how to connect to a Galil Ethernet controller from Windows 98se, ME, NT4, 2000, or XP using the DMC Smart Terminal.

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# 1 Introduction

This note details how to connect a Galil Ethernet controller (DMC-2xxx, 14x5/6, 3xxx, IOC-7007, or CDS-3310) to a computer running Windows 98se, ME, NT4, 2000, or XP with a properly installed network interface card (NIC). The first section shows how to connect to a brand new (or master reset) controller, the second shows how to connect to an existing controller (one that already has an IP address), and the third shows how to set the controller's IP address via the serial port.

## 2 Connecting to a Brand New (or Master Reset) Controller

Follow these steps if you have just received your Galil Ethernet controller from the factory or you have master reset the controller (with the MR jumper and cycling power, MRST DIP switch and cycling power, or ctrl-R ctrl-S). **DO NOT MASTER RESET THE CONTROLLER UNLESS YOU HAVE A BACKUP OF THE GALIL APPLICATION SOURCE CODE.** The controller does not have an IP address by factory default, so it must be assigned one before Ethernet communication is possible.

- (1) Connect the PC to the controller with an Ethernet Cable. Use a straight-thru cable if going to a hub and use a crossover cable if the controller is directly connected to the PC.

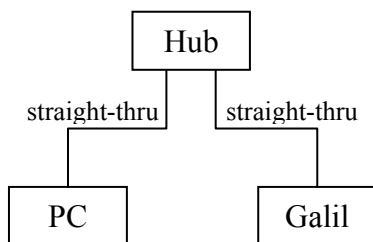


Figure 1. A computer connected to a Galil controller through a hub via straight-thru Ethernet cables.

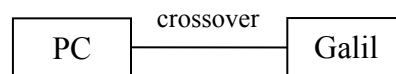


Figure 2. A computer connected to a Galil controller directly via a crossover Ethernet cable.



Figure 3. The ends of a straight-thru Ethernet cable. Side by side, the color code is the same.

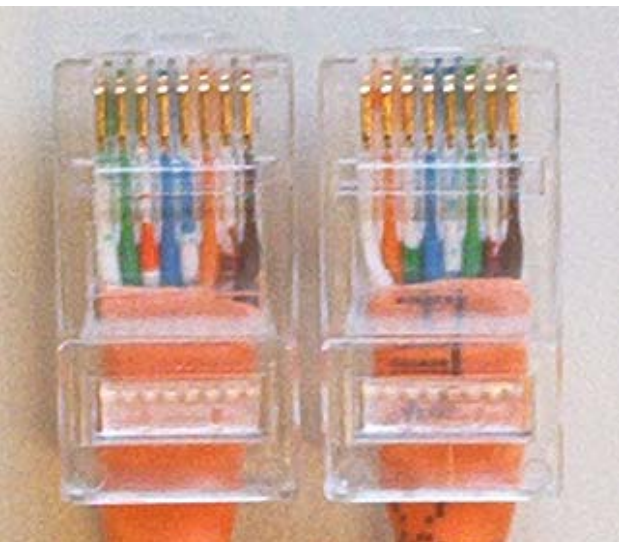


Figure 4. The ends of a crossover Ethernet cable. Note how the green and orange wires are swapped.

- (2) Check that the controller’s GREEN LINK LIGHT IS ON. If not, go back to step one and check your Ethernet cable(s).

The Ethernet indicator lights on a DMC-14x5, 34x5, 1416, 21x2, 21x3 and 31x3 should correspond to the following table:

Light	State
Error (ERR)	off
Power (PWR)	ON
Activity (ACT or TX)	blinks every 5 seconds*
Link (LNK or LN)	ON

\*This should occur even with the cable unplugged. This light may blink more frequently (with the cable plugged in) due to network traffic.

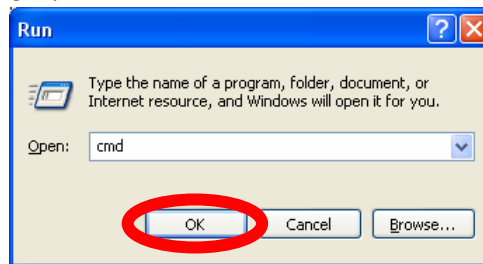


Figure 5. Controller indicator lights for DMC-14x5, 34x5, or 1416 (LED positions for 21x2, 21x3, and 31x3 are the same)

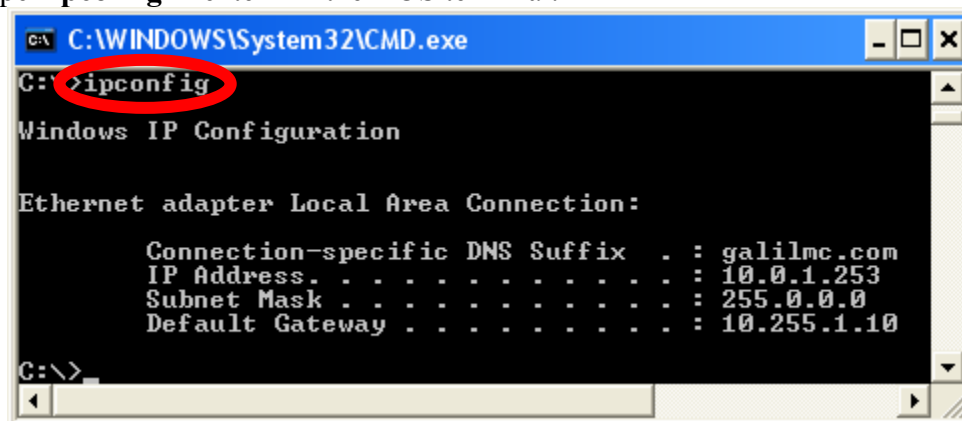
The Ethernet indicator lights on a DMC-22x0, CDS-3310 and IOC-7007 are as follows:

Light	Function
Link (L, LNK, LINK or LN)	Link when on, or blinking with activity
Speed (100, SPD or SP)	On with 100Mbps Connection
Full (C, FUL or FL)	On with Full-Duplex, blinking when there are collisions

- (3) Go to the Windows start menu , click on **Run...** and type in “cmd” to bring up a DOS terminal. Click OK.




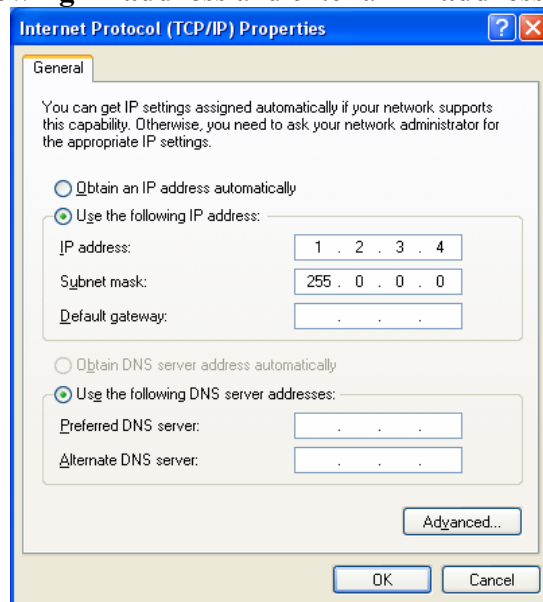
- (4) Type “ipconfig” <enter> in the DOS terminal.



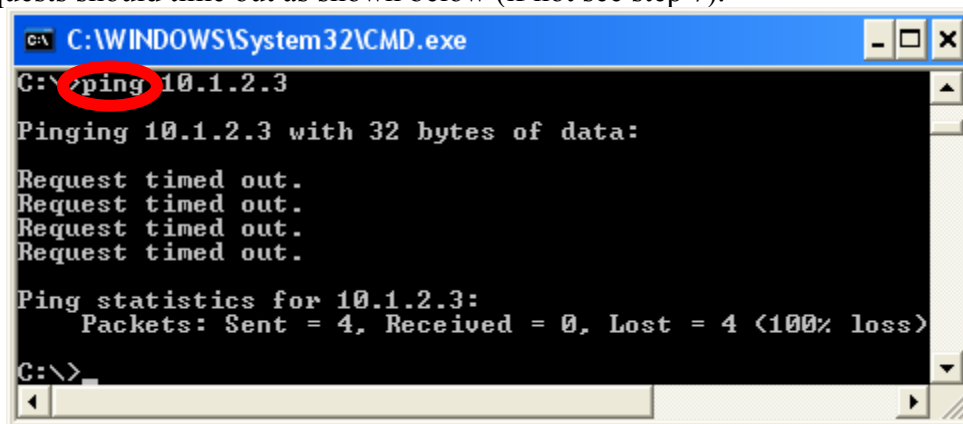
- (5) Note the IP Address and Subnet Mask of the PC. Choose an IP address for the controller that is on the subnet (any subnet fields that are 255 indicate that the corresponding fields of the controller's IP address need to be the same as the PC's IP address). In this example, we choose 10.1.2.3 for the controller's IP address (the first field, 10, must remain the same). **DO NOT USE THE IP ADDRESS IN THIS EXAMPLE.**

If ipconfig does not report a valid IP address (e.g. 0.0.0.0) or the PC is not connected to a computer network, you may need to assign a static PC IP address. To do this, go to the

Windows start menu , Settings, Control Panel, Network Connections, Local Area Connection, General Tab, Properties, General Tab, Internet Protocol (TCP/IP), Properties. Select **Use the following IP address** and enter an **IP address** and **Subnet mask** for the PC.



- (6) **Ping** the controller IP Address you have chosen (to ensure it is not already taken). The requests should time out as shown below (if not see step 7).



- (7) If there are replies as shown below (meaning the IP address is already taken), go back to step 5 and choose a different IP address for the controller.

```


C:\WINDOWS\System32\CMD.exe
C:\>ping 10.0.51.50

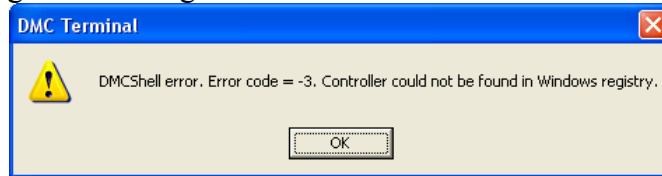
Pinging 10.0.51.50 with 32 bytes of data:
Reply from 10.0.51.50: bytes=32 time<1ms TTL=128
Reply from 10.0.51.50: bytes=32 time<1ms TTL=128
Reply from 10.0.51.50: bytes=32 time<1ms TTL=128
Reply from 10.0.51.50: bytes=32 time<1ms TTL=128


Ping statistics for 10.0.51.50:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

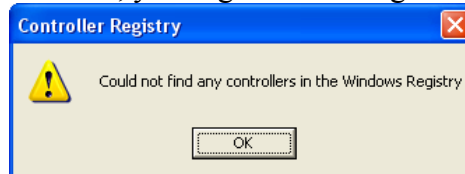
```

(8) Install DMC [Smart Terminal](#) (if not already installed).

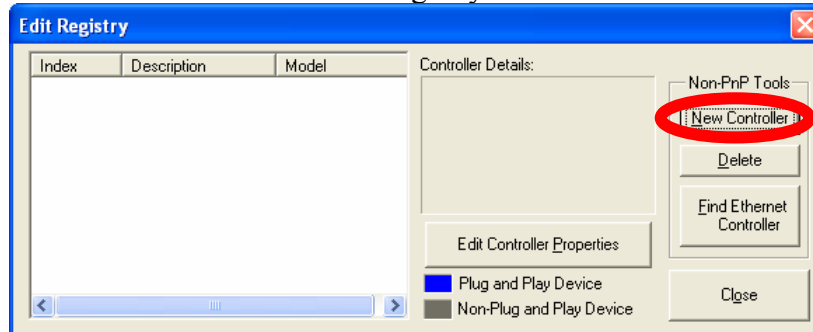
(9) **Open DMC Smart Terminal** . If this is the first controller you have connected to from this PC, you'll get the message below. Click OK.



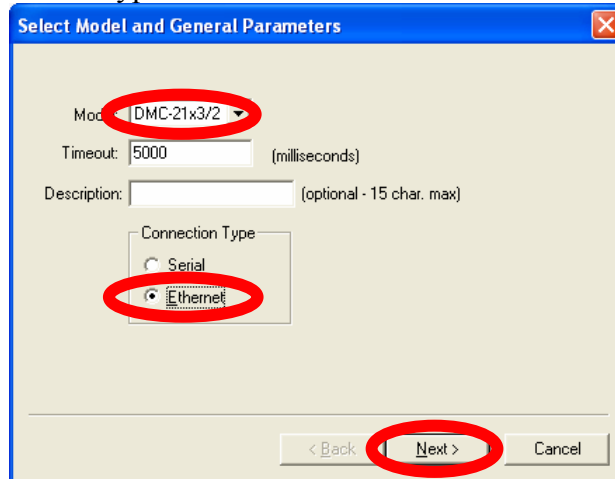
(10) Click on the **View Registered Controllers Button** . If this is the first controller you have connected to from this PC, you'll get the message below. Click OK.



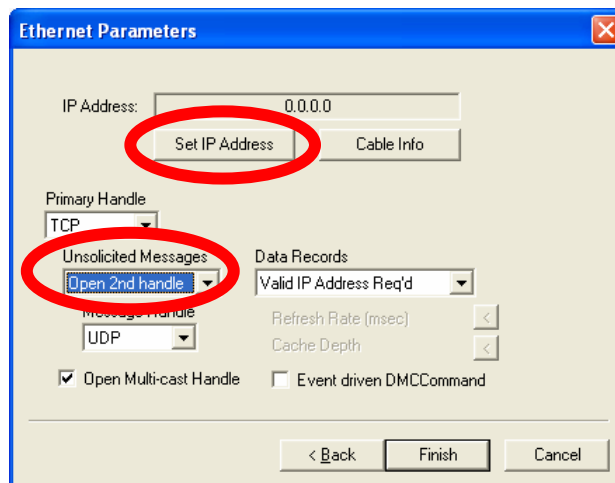
(11) Click on **New Controller** on the Edit Registry Screen



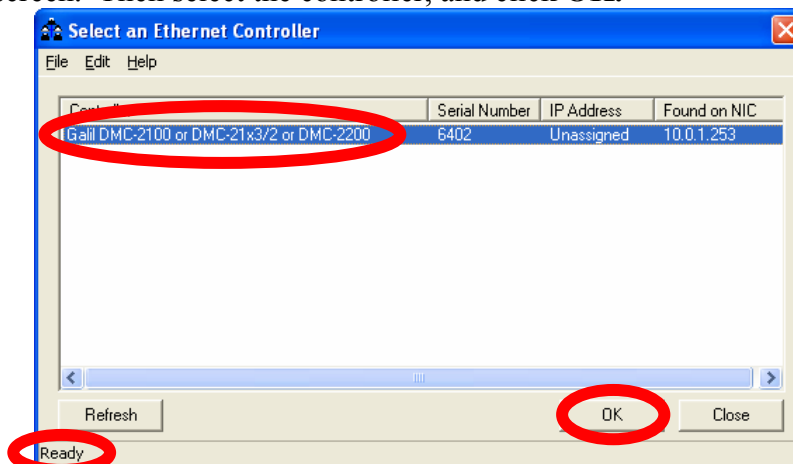
- (12) Select your controller from the **Model** dropdown menu (select DMC-2102 for 21x3). Select **Ethernet** for Connection Type. Click **Next**.



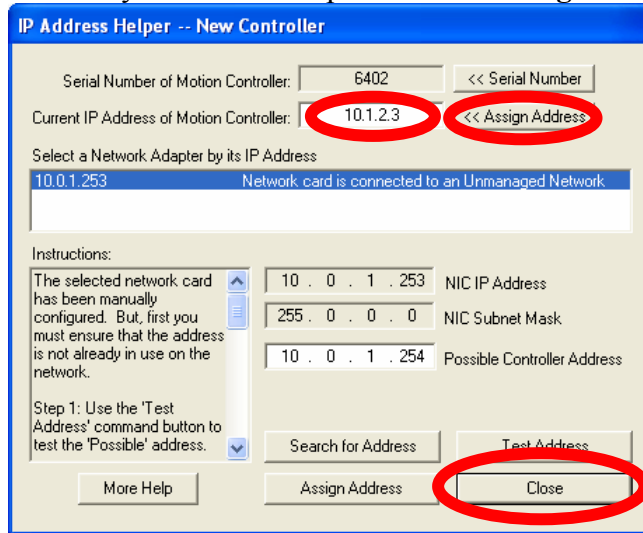
- (13) Select **Open 2nd handle** so that MG commands in your program will come over the Ethernet. Click on **Set IP Address**.



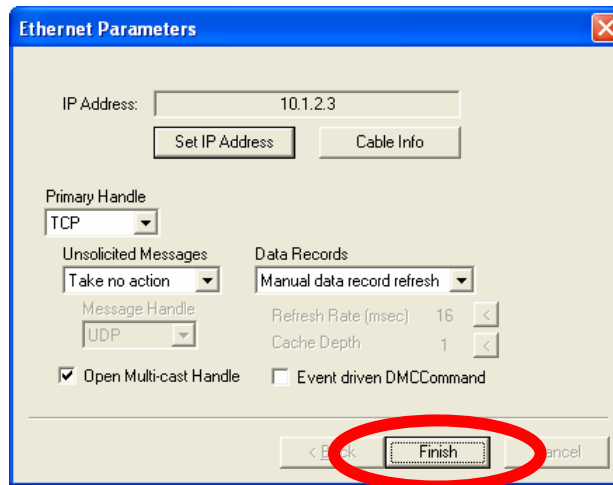
- (14) Wait for the Ready status in the lower left corner of the Show Galil Ethernet Controller Network screen. Then select the controller, and click **OK**.



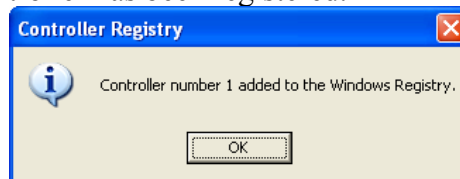
- (15) While depressing the control key, click in the **Current IP Address of Motion Controller** box. Enter the IP address you chose in step 6 and click **Assign Address**. Then click **Close**.



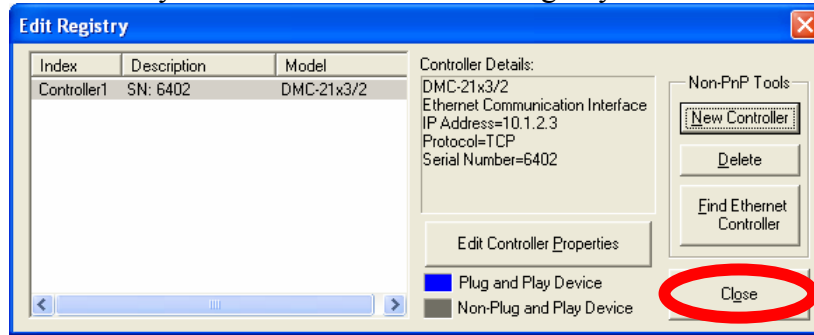
- (16) Click **Finish** in the **Ethernet Parameters** window.



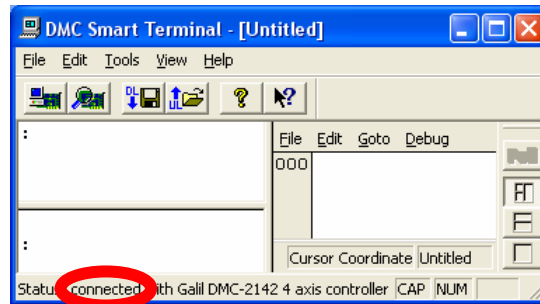
- (17) Click **OK** after the controller has been registered.



(18) You should now see your controller on the Edit Registry screen. Click **Close**.



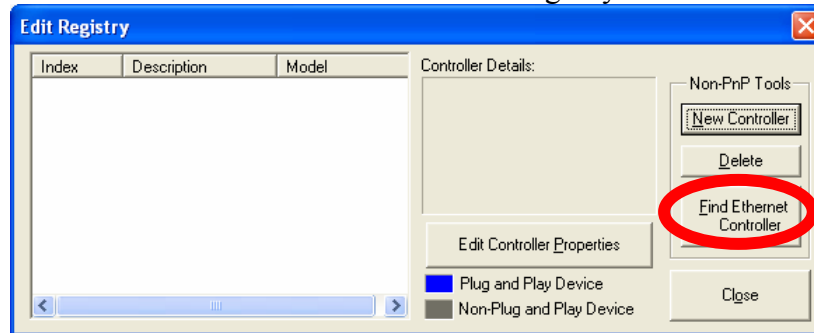
(19) Click on the **Connect to Controller** button . The Status bar at the bottom should show “connected”. The controller is now ready to communicate over Ethernet.



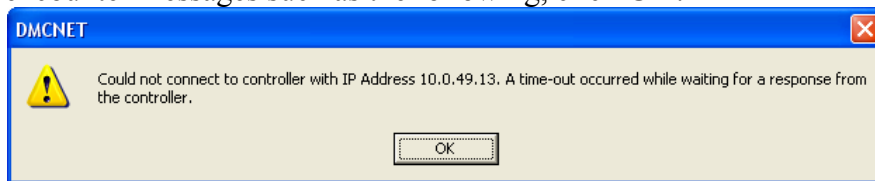
### 3 Connecting to an Existing Controller (with an IP Address)

Follow these steps if your controller already has an IP address (or you do not wish to master reset the controller).

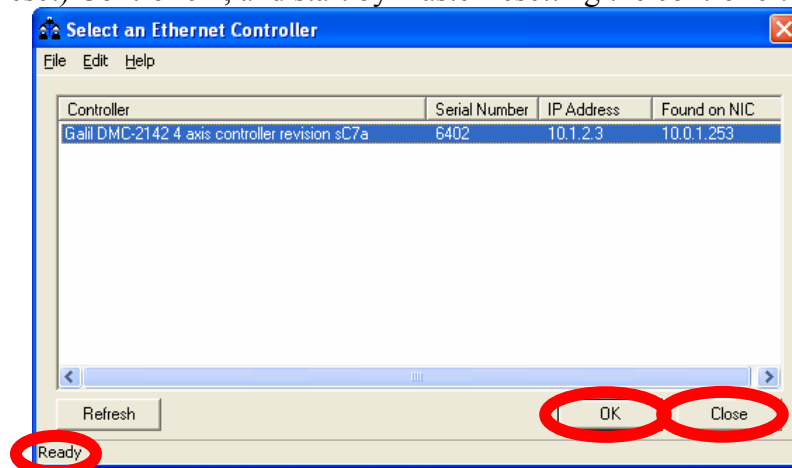
- (1) Follow steps **1, 2, and 8 to 10** (skip steps 3 to 7) from section 2, “Connecting to a Brand New (or Master Reset) Controller”.
- (2) Click on **Find Ethernet Controller** on the Edit Registry Screen.



- (3) If you encounter messages such as the following, click **OK**.



- (4) Wait for the **Ready** status in the lower left corner of the Select an Ethernet Controller screen. If your controller does not show up, follow section 2, “Connecting to a Brand New (or Master Reset) Controller”, and start by master resetting the controller.

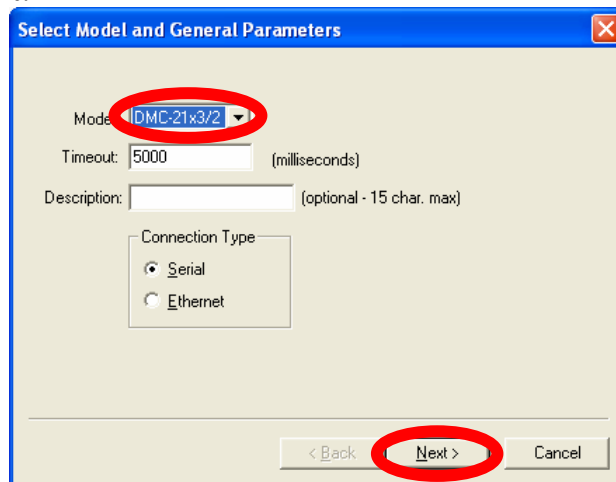


- (5) Click on the controller and click **OK**. Click **Close**.
- (6) In section 2, “Connecting to a Brand New (or Master Reset) Controller”, follow steps **16** and **17**, hit **Close** as in step **18** on the **Edit Registry** screen, then connect to the controller in step **19**. The controller is now ready to communicate via Ethernet.

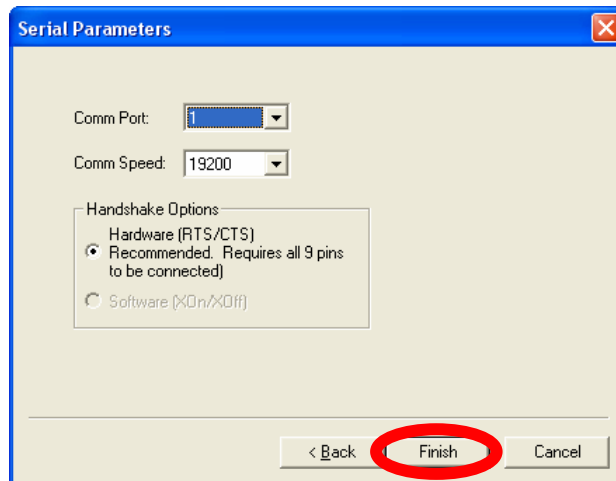
## 4 Assigning the IP Address through the Serial Port

This section describes an alternate way to assign an IP address to the controller from that described in section 2, “Connecting to a Brand New (or Master Reset) Controller”.

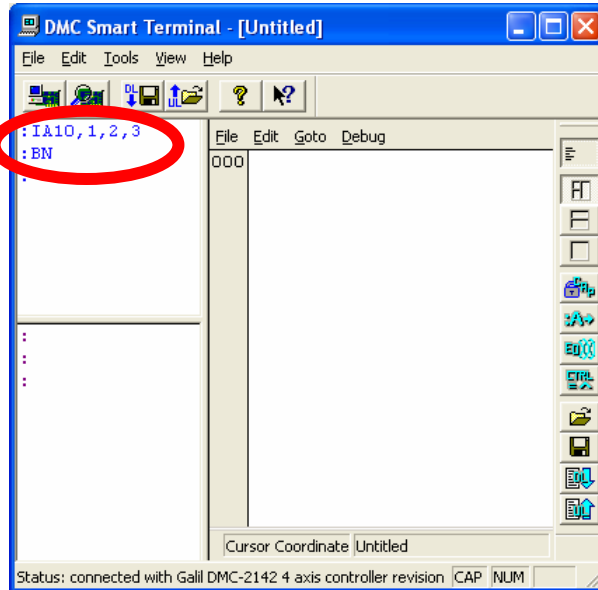
- (1) Ensure that the controller’s serial port baud rate is set to 19.2 kilobaud by checking that the DIP switch only has HSHK and 19.2K set (DMC-2000, 2100, 2200), or that no baud rate jumpers are installed (all other controllers).
- (2) Verify that the controller’s green power light is on (see step 2 of section 2).
- (3) Obtain a **9-pin straight-thru** serial cable and verify that all nine pins go straight through (pin 1 to 1, pin 2 to 2, pin 3 to 3...) using the continuity check on a voltmeter. This insures that it is not a null-modem cable, where pins 2 and 3 trade places.
- (4) Connect the controller’s main serial port (DMC-21x2/3, 14x5, and 3xxx have only one serial port) to the PC’s serial port with the serial cable.
- (5) Follow steps **1 to 11** in section 2, “Connecting to a Brand New (or Master Reset) Controller”.
- (6) Select your controller from the **Model** dropdown menu. Leave **Serial** as the Connection Type. Click **Next**.



- (7) Leave the defaults on the Serial Parameters screen and click **Finish**.



- (8) Follow steps **17 to 19** in section 2, “Connecting to a Brand New (or Master Reset) Controller”.
- (9) Type **IA** at the colon prompt followed by the controller IP address chosen in section 2 step 5 (with the four fields separated by three COMMAS—NOT PERIODS) and hit enter. Type in **BN** to burn the IP address to the controller’s non-volatile memory.



- (10) Follow the steps in Section 3, “Connecting to an Existing Controller (with an IP Address)”.