SERIAL I/O MODULE INSTALLATION / OPERATION WHEN USING T&D VER. 5.2 OR 5.3

APPENDIX
B

In This Appendix...

Note: This Appendix only applies if you are using the Serial I/O Module with Think & Do versions 5.2 or 5.3. Use Chapter 3 if using the Serial I/O Module with Think & Do Studio version 6.0 or later, including Think & Do 8.0.

Only Think & Do WinPLCs (H2-WPLC1-TD and H2-WPLC2-TD) support the H2-SERIO module.

H2–SERIO(-4) Overview

The Scope of This Appendix

This chapter introduces the use of the H2-SERIO and H2-SERIO-4 modules using the WinPLC with Think & Do versions 5.2 or 5.3.

This chapter will not describe in detail how to build a project or connect to a WinPLC. Depending on which version of Think & Do you are using, further information can be found in:

Chapter 2 of this manual, Workbench Utility Operation

Appendix A of this manual, Using The ESP Utility To Set Up The WinPLC

The Think & Do Studio Learning Guide, Chapter 2.

The basic steps in using this module are:

1. Install the Serial I/O module in the base.

2. Connect power to the base.

3. Bring up Think & Do.

4. Select the WinPLC as the target.

5. Connect to the WinPLC.

H2-SERIO   **H2-SERIO-4**

WinPLC   **H2-SERIO**

Add Serial Ports to Your WinPLC or EBC(100)

The H2-SERIO and H2-SERIO-4 modules plug into the DL205 I/O base and are 3 port serial I/O modules for use with the H2-WPLC-x (WinPLC) and the H2-EBC/H2-EBC100. These additional serial ports give the H2-WPLC-x and H2-EBC(100) the ability to connect with a wide range of serial devices, such as barcode scanners, scales, printers and modems.

The H2-SERIO module has three RS-232C ports, while the H2-SERIO-4 module has two RS-232C ports and one RS-422/485 port.

A WinPLC can support up to three H2-SERIO(-4) modules for a total of ten serial ports (including the one on the WinPLC itself). Port numbers are assigned from left to right across the base. For example, on a WinPLC the onboard port is Com 1:

• The first H2-SERIO(-4) module would have ports Com 2, Com 3 and Com 4.

• The next H2-SERIO(-4) module would have Com 5, Com 6 and Com 7.

• The final H2-SERIO(-4) module would have Com 8, Com 9 and Com 0.

An H2-EBC100 can support up to eight H2-SERIO(-4) modules; the limits are the power budget and number of slots in the base.

The H2-SERIO(-4) modules can reside in any slot of the DL205 base; they do not have to be installed next to each other.

Setting Communication Parameters Using Think & Do

Use I/O View to set baud rate, parity, data bits, and stop bits for each port. Choose from 1200 to 115,200 baud communication speeds. Think & Do allows each port to be designated as a MODBUS slave or a generic serial device. Each port on the H2–SERIO(-4) module is capable of hardware handshaking.

Specifications

H2-SERIO / H2-SERIO-4 Specifications		
	H2-SERIO	**H2-SERIO-4**
Module Type	Intelligent module for use with H2–WPLC-xx or H2-EBC(100)	
Approvals	cUL Listed, file number E185989	
Number of Serial Ports per Module	3 ports: all RS-232 (RJ12 jack)	3 ports: 2 RS-232 ports (RJ12 jack) and 1 RS-422/485 5 position terminal strip
Signals	RS-232: CTS, RXD, TXD RTS, GND RTS transmision delay times: 5, 50, 250 and 500 ms	RS-232: CTS, RXD, TXD RTS, GND RTS transmission delay times: 5, 50, 250 and 500 ms
		RS-422 (4 wire) : TX+, TX-, RX-, RX+, GND RS-485 (2 wire): Data+, Data-, GND
Number of Modules Supported per H2-WinPLC-xx	3	
Number of Modules Supported per H2-EBC(100)	8	
Recommended Cables	Belden 9729 or equivalent	RS-232 ports: Belden 9729 or equivalent RS-422/RS-485 terminal: 16-28 AWG solid or stranded conductor (1.5mm2) Wire strip length: 0.24-0.27 inches (6-7 mm); Screw torque: 1.7 in-ibs (0.2 Nm)
Protocols Supported	Serial ASCII and Modbus RTU slave	
Power Consumption	80 mA @ 5 VDC	
Baud Rates	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200	
Parity	None, odd, even	
Start and Stop Bits	1, 2	
Operating Environment	0 to 60°C (32°F to 140°F), 5% to 95% RH (non-condensing); No corrosive gases, Pollution level 2; Vibration: MIL STD 810C 514.2; Shock: MIL STD 810C 516.2	
Storage Temperature	-20 to 70°C (-4°F to 158°F)	
Firmware Note	The H2-EBC requires firmware version v2.1383 or later to support the H2-SERIO or H2-SERIO-4.	

H2-SERIO(-4) Wiring: RS-232

RS-232

6 pin RJ12 Phone
Type Jack – both ports
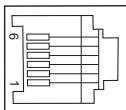
H2-SERIO(-4) RS-232 Pin Descriptions		
1	0V	Power (-) connection (GND)
2	CTS	Clear to Send
3	RXD	Receive data (RS-232)
4	TXD	Transmit data (RS-232)
5	RTS	Request to Send
6	0V	Signal Ground (GND)

NOTE: The serial port on–board the WinPLC has a different pinout from the H2–SERIO module. Refer to page 1–7 for the WinPLC serial port pin assignments.

H2-SERIO-4 Wiring: RS-422/485

NOTE: Set DIP Switch
for desired operation

OFF   ON

NO TERM   120 OHM
RS422   RS485
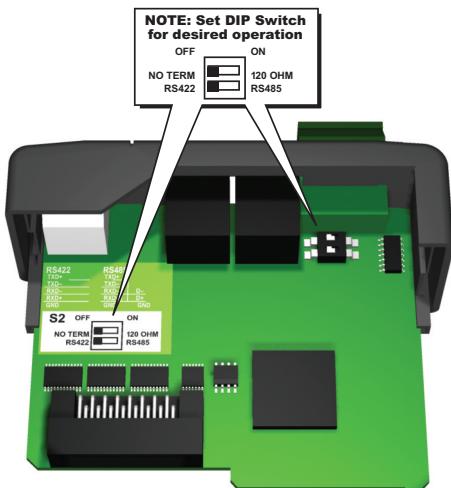
Set DIP switch S2 on the H2-SERIO-4 to:
1. Activate or deactivate the internal 120Ω termination resistor.
2. Select RS-422 or RS-485 operation.

RS-422
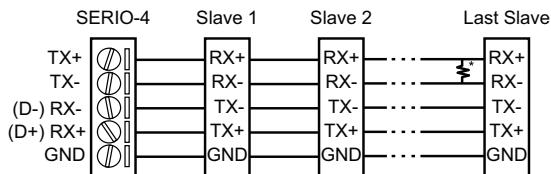
SERIO-4	Slave 1	Slave 2	Last Slave
TX+	RX+	RX+	RX+
TX-	RX-	RX-	RX-
(D-) RX-	TX-	TX-	TX-
(D+) RX+	TX+	TX+	TX+
GND	GND	GND	GND

(H2-SERIO-4 contains an optional 120Ω termination resistor between RX+ and RX-; use DIP switch S2 to activate or deactivate resistor.)

* User Supplied 120Ω Termination Resistor

RS-485

SERIO-4	Slave 1	Slave 2	Last Slave
TX+			
TX-			
(D-) RX-	D-	D-	D-
(D+) RX+	D+	D+	D+
GND	GND	GND	GND
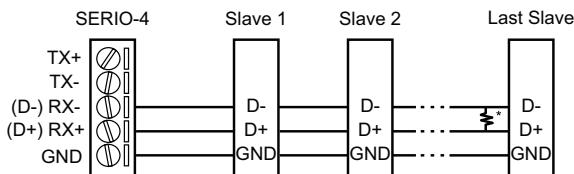
(H2-SERIO-4 contains an optional 120Ω termination resistor between RX+ and RX-; use DIP switch S2 to activate or deactivate resistor.)

* User Supplied 120Ω Termination Resistor

Using Think & Do to Set Serial Port Parameters

Check Think & Do Version First

You will need Version 5.2 of Think & Do, to recognize the H2–SERIO(-4) module. To determine whether you have the right version, open the Project Binder. As the Project Binder opens, you may notice a screen that tells you which Version of Think & Do you are opening. That screen disappears as the Project Binder opens.

After the Project Binder is open, you can click on "Help," and the bottom menu option, "About Project Binder," will tell you which Version you are using.
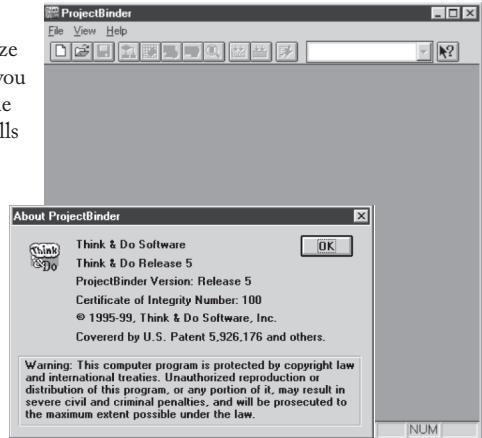
New Project Using H2–SERIO(-4) Module

Start a new project by clicking on the blank document button. A dialog box will pop up asking you to "Choose Runtime Target." Select "Windows CE – Think & Do WinPLC."

You will see a new Untitled Project open. Next, click on the "Tools" menu and select I/O View.
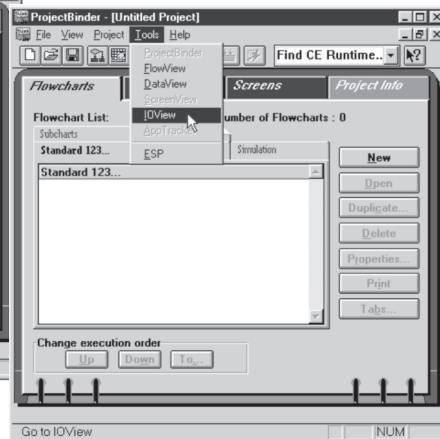
Notice in I/O View that the drivers for the DL205 backplane and the WinPLC serial port are already loaded. You will see them graphically represented in the left pane of the I/O View window.
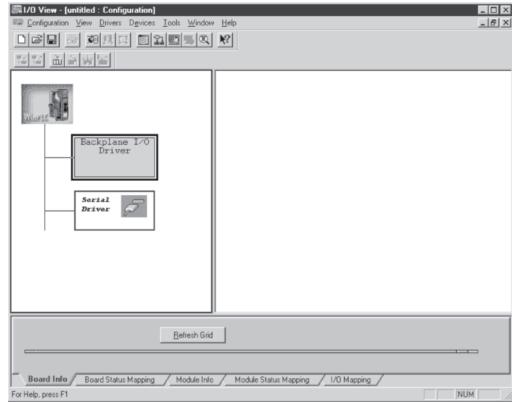
Connecting to the WinPLC

Prior to the next step, you will need to install the H2–WPLC1–TD and the H2–SERIO module in your DL205 base. Please refer to the guidelines elsewhere in this publication for information about installation, power wiring, and Ethernet connections. The WinPLC must be recognized on the network to proceed. Use "Think & Do ESP" to establish your link to the WinPLC, as described on pages 1–12 through 1–15.

The next step is to click on "Configuration" and select "Connect."

Think & Do recognizes the DL205 base as you have configured it. The WinPLC is displayed in the CPU-slot, and the Serial I/O module is displayed in the slot where you have installed it.

Click on the Serial Driver in the left pane of the I/O View window. You will see a port configuration box for each serial port Think & Do recognizes. In our example to the right, Think & Do sees four serial ports. One is on the WinPLC and the other three are on the Serial I/O module.

Notice that the ports are numbered COM 1 through COM 4 in Think & Do. COM 1 is on the WinPLC. COM 2 through COM 4 are on the first Serial I/O module in the base. Think & Do counts the serial ports from top to bottom (on the Serial I/O module) and from left to right in terms of slot position.

If you install additional Serial I/O modules at a later time, be aware that the module's slot position determines its COM number. If you install a Serial I/O module between an existing Serial I/O module and the CPU, your port settings will remain the same, but the COM number will change.
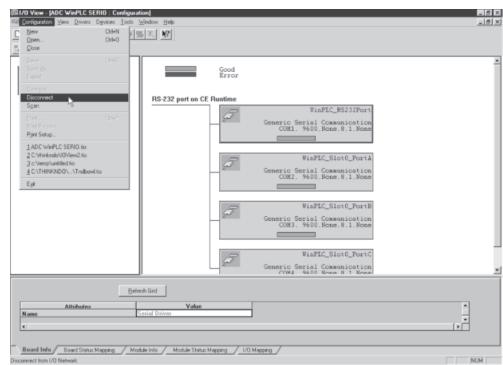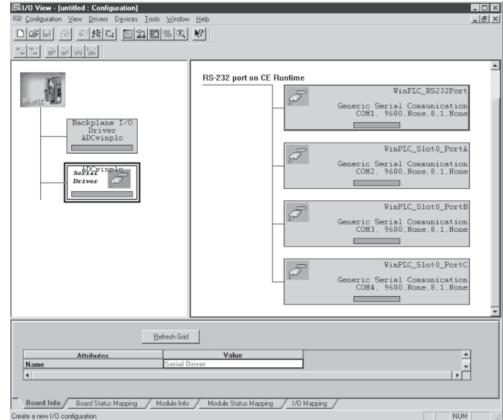
NOTE: You must be disconnected from the WinPLC and the I/O base in order to change the serial port parameters on the H2–SERIO(-4) module. To disconnect, you have two choices. You can click on Configuration/Disconnect as shown above, or you can physically disconnect the WinPLC by removing power or by removing the Ethernet cable.

Now, click on "Configuration" and select Disconnect. Think & Do will ask if you want to save the configuration. If you want to re-use this I/O Configuration later, click yes. If you click yes, you will see the "Save I/O Configuration As" screen. Name the configuration and click save.
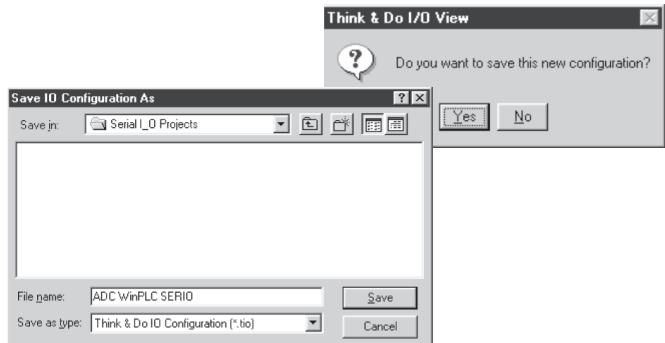
Setting Serial Port Parameters

To set the serial port parameters, click on the Serial Driver in the left pane of the I/O View window. You will see a port configuration box for each serial port Think & Do recognizes. In our example to the right, Think & Do sees four serial ports. One is on the WinPLC and the other three are on the Serial I/O module.
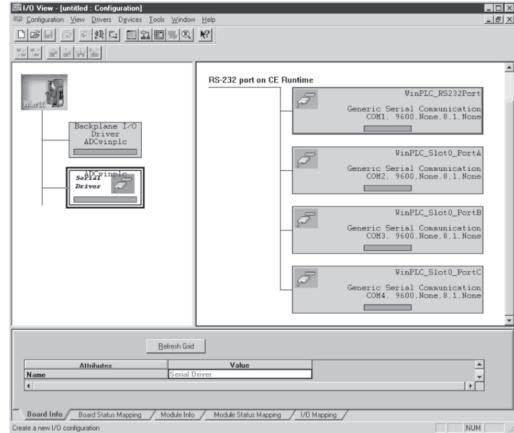
Expand the Window Pane

Position your cursor on the line that separates the upper window panes from the lower window pane. Move this line up by dragging your mouse. Click on the tab at the bottom of the lower window pane marked Module Info. You will see a screen that looks similar to the one shown here. Pull-down menus allow you to change the serial port parameters.

Select the port whose parameters you want to change by clicking on that port in the upper right pane. Make the changes in the lower pane, and save the changes using the Ctrl + S keys.