

# Serial Ports

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## Introduction

XA series gas chromatographs have four serial ports. Two extra serial ports can be added via the expansion slots in the card cage.

## Changing the line drivers

The following table lists the relevant traits of the GC's serial ports.

Port Name	Port Mode	Port Location on the back plane	Communication Modes Supported
Port 0	RS232	TB1	Modbus ASCII/RTU
	RS422, RS485	TB2	
Port 1	RS232	TB5	Modbus ASCII/RTU
	RS422, RS485	TB6	
Port 2	RS232	TB8	Modbus ASCII/RTU
	RS422, RS485	TB9	
Port 3 (DB9 connector)	RS232	J23 (LAPTOP-PC)	Modbus ASCII/RTU Direct Connection through MON 20/20

**Note:** Port 3 can be used to set up a direct-to-PC connection. See the appropriate GC manual for more information.

The factory setting for each port is RS-232. To change the setting of a serial port, do the following:

1. Start MON 20/20 and connect to the GC.
2. Select **Communication...** from the *Applications* menu. The *Communication* window displays.
3. Select the appropriate mode from the *Port* drop-down list for the appropriate serial port. The options are **RS232** or **RS485** or **RS422**.
4. Click **OK**.
5. Close MON 20/20.
6. Turn off the GC.
7. Locate and remove the Base I/O board, which is located in the card cage in the GC's lower enclosure.

8. Consult the following table, which shows the correct switch settings for each mode. The first column lists the port number; the first row lists the communications mode. The table cell at which the desired port and the desired mode intersect contains the appropriate switch settings for that configuration.

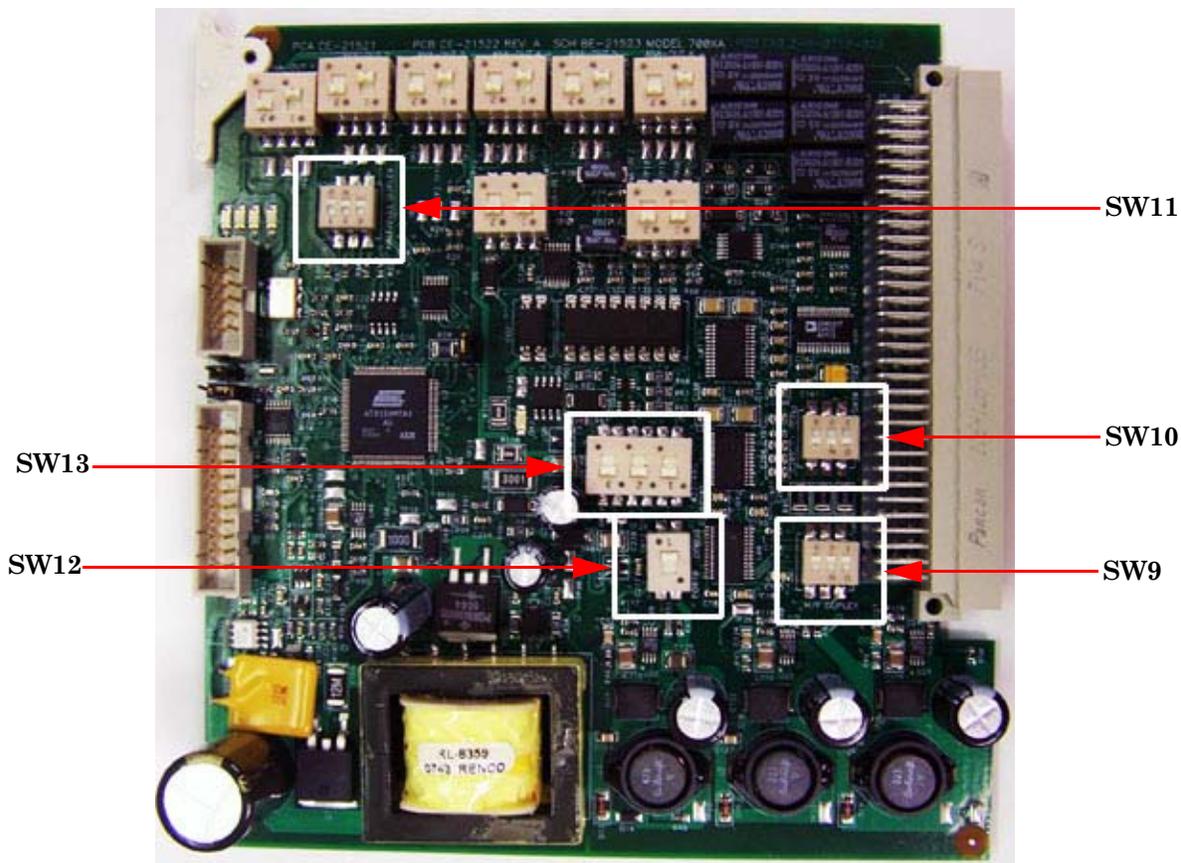
**Note:** Port 0 corresponds with channel “1” on each switch; Port 1 corresponds with channel “2” on each switch; Port 2 corresponds with channel “3” on each switch.

Only the black channel on the appropriate switch should be adjusted.

	RS-232	RS-422 (Full Duplex/4-Wire)	RS-485 (Half Duplex/2-Wire)
Port 0			
Port 1			
Port 2			

For example, if you want to set Port 1 to RS-232, you would set channel “2” on SW13 to the left.

- To learn the location of a switch on the Base I/O board, consult the following graphic:



**Note:** The Base I/O board should be oriented with the ejector edge at the top, facing left.

- Make sure that SW12 is set to the down position; otherwise, Port 0 will not function.

**Note:** Ordinarily SW12 should **never** be adjusted. It is used by the factory for testing purposes. If it was somehow set to the top, be sure to return it to its factory-set position, which is the bottom position.

11. To enable **line termination** for a serial port, set the appropriate port switch on SW10 to the bottom position.
12. Replace the Base I/O board in the card cage.
13. Consult the following table, which shows the correct termination block wiring for

each mode and port. The first column lists the port number; the first row lists the communications mode. The table cell at which the desired port and the desired mode intersect contains the appropriate wiring for that configuration.

	RS-232	RS-422 (Full Duplex/4-Wire)	RS-485 (Half Duplex/2-Wire)
Port 0			
Port 1			
Port 2			



### Optional RS-232 serial ports

It is possible to install an optional RS-232 board in one or both of the expansion I/O slots provided on the GC's card cage in the electronics enclosure.

This extra port can be used for Modbus ASCII/RTU communications or to connect directly to a computer installed with MON 20/20.

To install an optional RS-232 board, do the following:

1. Start MON 20/20 and connect to the GC.
2. Select **I/O Cards...** from the *Tools* menu. The *I/O Cards* window displays.
3. Identify the appropriate card slot under the *Label* column and then select **Communications module - RS232** from the appropriate *Card Type* drop-down list.
4. Click **OK**.
5. Turn off the GC.
6. Install the RS-232 board into the appropriate I/O card slot in the GC's card cage.
7. Start the GC.

### Optional RS-485/RS-422 serial ports

It is possible to install an optional RS-485 board in one or both of the expansion I/O slots provided on the GC's card cage in the electronics enclosure. This card can be

configured in RS-422 (4-wire) or RS-485 (2-wire) mode. RS-485 mode is the standard setting; to configure the card for RS-422 mode, see "Configuring the optional RS-485 serial port to function as an RS-422 serial port" on page 7.

This extra port can be used for Modbus ASCII/RTU communications or to connect directly to a computer installed with MON 20/20. When used to connect to MON 20/20, the following limitations apply:

- Limited bandwidth.
- Supported on Windows XP<sup>®</sup> only—port won't work with Windows Vista<sup>®</sup> or Windows 7<sup>®</sup>.
- Must uncheck the **Use PPP protocol for serial connection (use SLIP if unchecked)** check box on the *Program Settings* window in MON 20/20.

### Installing an optional RS-485/RS-422 serial port card

To install an optional RS-485/RS-422 serial port card, do the following:

1. Start MON 20/20 and connect to the GC.
2. Select **I/O Cards...** from the *Tools* menu. The *I/O Cards* window displays.
3. Identify the appropriate card slot under the *Label* column and then select **Communications module - RS422/485** from the appropriate *Card Type* drop-down list.
4. Click **OK**.

5. Turn off the GC.
6. Install the RS-485/RS-422 serial port card into the appropriate expansion slot in the GC's card cage.
7. Start the GC.

### Configuring the optional RS-485 serial port to function as an RS-422 serial port

Use the following table to learn the correct jumper settings for configuring the optional RS-485 serial port to function as an RS-422 serial port:

Jumpers	RS-485 (Half Duplex/2-Wire)	RS-422 (Full Duplex/4-Wire)
J3	Half	Full
J5	Half	Full
	<b>Termination IN</b>	<b>Termination OUT</b>
J4	In	Out
J6	In	Out
	<b>TB1 Wire Terminals</b>	
	<b>RS-485 (Half Duplex/2-Wire)</b>	<b>RS-422 (Full Duplex/4-Wire)</b>
A	RxTx+	Rx+
B	RxTx-	Rx-
Y	NC	Tx+
Z	NC	Tx-

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