

20-Port Serial Switch



User's Guide



Product Features

- 20 ports of relay isolated serial interfaces.
- On-board μ P with EEPROM.
- Manual or batch-file operation via simple text menus.
- Ability to broadcast through multiple ports simultaneously.
- Support for any baud rate or data format after connection.

Device Requirements

- Any three-wire RS-232 source and targets may be connected.
- Baud rates of 9600, 19,200, 38400, and 115,200 are supported for communications with the menu system. Any baud rate (ie. 110 baud to 2Mbaud) may be used to communicate with attached devices.

Capabilities and Limitations

A crosspoint data switch provides a link from one host device (such as a controlling PC or modem) to several attached devices (such as routers, servers, cable receivers, radios, or sensors). Use the switch to control several serial devices from a single port. The switch provides a cost-effective alternative to multi-port serial cards when you only need to communicate with one device at a time.

The switch can broadcast data to multiple devices simultaneously. It receives from only one device at a time. There is no buffering or memory within a crosspoint switch. Characters transmitted when a port is turned off are ignored. Only data on pins 2 & 3 of the DB-9 is switched. Handshaking isn't switched.

Hardware Setup

A 5V wall adapter provides regulated DC power to the switch. The maximum current drain of 600mA occurs when all ports are switched on. Normal power consumption is under 1W.

Two types of ports are provided, console and device. The control (console) port can connect with a PC via a straight-through cable, or to a modem via a crossover cable. The control port pinout is:

Pin 2 = RX Receive Data (data from devices A-T and from the switch to control port)

Pin 3 = TX Send Data (data to switch processor and to devices A-T from the control port)

Pin 5 = Ground

Handshaking lines are strapped for no flow control (always on). Pins 1, 6 and 4 are strapped. Pins 7 & 8 are also strapped.

Device ports labeled A-T connect up to 20 managed devices.

Device port pinout is:

Pin 2 = TX Transmit Data (data to devices A-T)

Pin 3 = RX Receive Data (data from devices)

Pin 5 = Ground

Handshaking lines are strapped for no flow control (always on). Pins 1, 6 and 4 are strapped. Pins 7 & 8 are also strapped.

Note that data from the control device flows is from pin 3 of the control port to pin 2 of the device ports A-T. Returning data from the A-T device ports pin 3 flows back to pin 2 of the control port. The switch itself is essentially a “crossover” device. Connect a PC or terminal to the control port at 9600, N,8,1 when first connecting to the switch. Set flow control to “none”.

Menu Operation

Press ~ (tilde), wait at least ½ a second, and press ~ again to enter the menu. Once the menu is entered, communication with attached devices is disabled. The following message appears:

```
Serial Switch Unit Name: Serial Switch
Enter Command (? for help):
```

Valid commands are:

- | | |
|-----------------|---|
| A-T | Toggle the specified port
This command enables (connect) or disables (disconnect) a single device port 1-20 (1=A, 2=B...20=T). Port switching is performed after exiting the menu with the “X” or “ESC”. |
| Z | Enable all 20 ports for broadcast
This enables simultaneous transmission from the control port to all attached devices. This is useful when configuring a number of identical devices. Port switching is performed after exiting the menu with the “X” or “ESC”. |
| W | Disable all ports.
Any enabled ports will be disabled after exiting the menu with the “X” or “ESC”. |
| U | Set baud rate.
Note that the baud rate of the switch may be different than the baud rates of the attached devices. This baud rate is used only by the menus. You may transmit at any other baud rate or send non standard bit streams to the attached devices after switching. Baud rates of 9600, 19,200, 38400, and 115,200 are supported. All baud rates operate at 8 bits, no parity and no handshaking. Be sure to write down the baud rate you select. If you forget the setting, you’ll need to try all four baud rates. |
| Y | Change Unit or Port Name.
It can be useful to label ports and label the switch. For example, Port 1 might be “Cisco Router”. These settings are limited to 16 characters and are saved immediately in non-volatile EEPROM. |
| V | Show port settings
This command displays the settings (on or off) of each port, along with the unit names. |
| 1 | Toggle delay
Toggle the delay requirement between the attention characters. |
| X or Esc | Escape
Either an ASCII “X” 0x58 or ESC 0x1B may be used to exit the menu at which time the crosspoint relays are enabled. |

Batch File Operation

Manual and batch file control function and syntax is identical. There are three important considerations when using batch files:

1. The switch doesn't react instantly to commands. It takes approximately 1/20th of a second for the crosspoint switch to complete a switching command. To compensate for this, either use a delay command or send a few null characters. Nulls are normally ignored by RS-232 devices. At 9600 baud, 40 nulls are required. Be sure to insert a delay between the ~ attention characters to enable the switch. You can disable this delay to simplify your batch file and speed up switching. Do this only if you're certain the two attention characters will not be inadvertently sent in the data stream.
2. The exact syntax of a command is important. For example, "Echo ~>COM1" and "ECHO ~>COM1" are different. Windows will send the space character 0x20 after the ~ in the second example. From within a program, it's sometimes desirable to use write(port, str, strlen(str)) instead of fprintf() which will buffer the output string.
3. Again, only one port can "listen" at a time. You may transmit simultaneously to multiple ports.

Communicating from Programs

In Windows, you can configure a serial port using the mode command in a system() function call:

```
system( "mode com1: baud=9600 parity=n data=8 stop=1" )
```

Type mode /? in at command line prompt for full details. Once a port is set up, a com port can be opened as a stream I/O device using stdio:

```
char menuresponse[128] ;
FILE* portfp = fopen( "com1:", "w+" ) ;
fprintf( portfp, "~" ) ; /*send tilde */
Delay (500);           /* wait 500ms */
fprintf( portfp, "~" ) ; /*send second tilde */
fgets( menuresponse, sizeof( response ), portfp ) ;
/* you're in to the menu, send commands next */
printf( menuresponse ) ;
```

You can also use C++ fstream I/O. The Win32 API has comprehensive low level functions for serial I/O, but the simpler stdio function works for many applications. For information on W32 serial communications, see:

http://msdn.microsoft.com/library/default.asp?url=/library/en-us/dnfiles/html/msdn_serial.asp

For Linux serial communications, try:

<http://www.atnf.csiro.au/people/rgooch/linux/docs/devfs.html>

Alternate Attention Character `

The default attention character is tilde ~ decimal 126, 0x7E
To select the alternate ` character decimal 96 0x60, move the switch toward the center of the serial switch. You can use different attention characters or baud rates to “daisy chain” multiple switches in series.

Hayes Command Reference

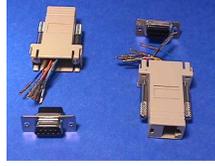
These Hayes commands are commonly used with attached modems. Check Wikipedia for a full list.

+++ (pause)	Attention characters
ATDT 408 555 1212	Dials out to (408) 555-1212
AT A	Answers incoming call
ATS0=1	Sets modem to answer after 1 ring
ATS37=8	Sets modem to 9600 baud

Telnet Option

The Telnet option module adds Ethernet connectivity to the control port. Visit www.digital-loggers.com/telnet.html or call (408) 330-5599 for more information. A pushbutton switch is provided to reset the Telnet module to default IP setting. This button has no effect if the Telnet module is not installed.

Accessories



DLI stocks RJ-45 to DB-9 and DB-25 adapters, as well as cable. These adapters allow you to insert pins in any order, so you can create crossover or straight-through cables easily. Flat phone-type satin cord makes a clean installation, particularly with Cisco, Sun and Dish Network equipment. Call (408) 330-5599 for connectors or cables.

Support

Please visit www.digital-loggers.com for manuals and accessories. If we haven't answered your questions here, please call (408) 330-5599 or send an email to support@digital-loggers.com. We'll be glad to help. Kudos, suggestions, gripes? Send them all to engineering@digital-loggers.com

