

SPL Hub

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1. DESCRIPTION

The SPL Hub is a statistical time division multiplexer for multiplexers. It is designed for use with DCB SPL or SR series statistical multiplexers. Hubs are available in 2, 4, 6, 8, or 10 channels.

Hubs are typically used to combine data from two or more multiplexers at a host and deliver it across a single high speed link to a remote location. At this location, a multiplexer can be installed for local port access to the host. Tail circuit modems are then attached to the remaining ports to feed other remote locations in the same geographical location.

The composite link between hubs must be synchronous up to 64 Kbps. Connections to local multiplexers must be asynchronous. Modem tail circuits may be either sync or async.

2. SPECIFICATIONS

2.1 Product

2.1.1 Data Ports

Speed

Synchronous to 19.2 Kbps (56 Kbps on 2 Port units)

Asynchronous at 300, 1200, 1800, 2400, 4800, 9600, or 19200 bps (38400 bps on 2, 4 or 6 port units)

Interface

RS-232D, implemented in DB-25 female connectors

2.1.2 Network Port

Speed

Synchronous only, to 64 Kbps

Interface

RS-232D, implemented in DB-25 male connector

2.2 Environmental

Operation: 0 to 65° C, 10 to 85% relative humidity

Storage: -40 to 85° C, 10 to 85% relative humidity

2.3 Physical / Electrical

10.25" W x 9.75" D x 2.25" H

120 VAC external power supply

40 watts, .36 amps maximum

2.4 Network Management Port Commands

Help Port

Show Configuration

Configure Ports

Type

Hub ID

Port ID

NMP Parity

Disconnect NMP

Repeat Last Command

Reset

3. INSTALLATION

3.1 Unpacking

The following is included with each SPL Hub:

- Hub and external power supply
- Cable for connecting the network port to a modem or DSU
- Manual
- Information regarding warranty, maintenance contracts and repair

3.2 Location

Place the Hub in a clear area where you can reach the front panel for setup and the rear panel to connect the cables. The Hub has an external power supply that requires a properly grounded 120 VAC outlet. The total power cord length is about 12 feet.

3.3 Setup

Each port on the hub must be configured properly for the attached device. See Section 4 for configuration switch locations and settings.

3.4 Connections

3.4.1 Network Port

The network port must be connected to a synchronous modem or DSU. A 25 conductor straight through cable is supplied for this connection.

3.4.2 Direct Connection to a Multiplexer

Multiplexer network (composite) ports are connected directly to hub ports using straight through cables. DCB multiplexers are shipped with a cable for connecting the multiplexer to a modem. This cable should also be used to connect the multiplexer to a hub.

Multiplexer network ports must be set for asynchronous operation when connected to a hub. For SPL series multiplexers this is done with switches. Consult your SPL manual for network switch settings. For SR series multiplexers, optional ASYNC firmware is required.

3.4.3 Connection to Modem Tail Circuits

Tail circuits are used to extend a multiplexer from a remote hub location to other remote locations. This can be done using modems, DSU/CSUs, line drivers, or other appropriate equipment.

If the equipment is synchronous (supplies transmit and receive clocks on pins 15 and 17) then the hub port should be set for synchronous. If asynchronous equipment is attached, set the hub port for the appropriate async speed.

If synchronous modems are used, one of them should be set for Slave clock.

A crossover (null modem) cable is required for this connection. See Section 6 for cable configuration.

4. CONTROLS AND INDICATORS

4.1 Switches

The front panel of the Hub is held in place with magnets. It can be easily removed by pulling on the small handles provided. Behind this panel are one or more circuit boards. Each circuit board has several banks of switches called DIP switches.

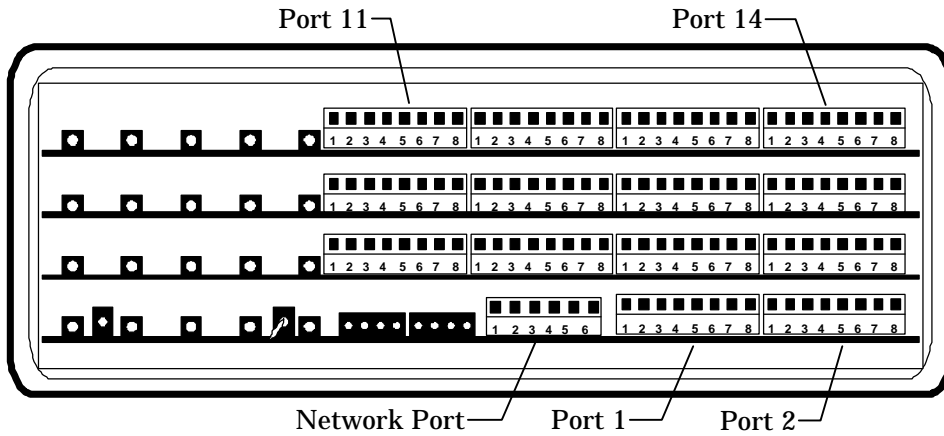


Figure 1
Configuration Switches

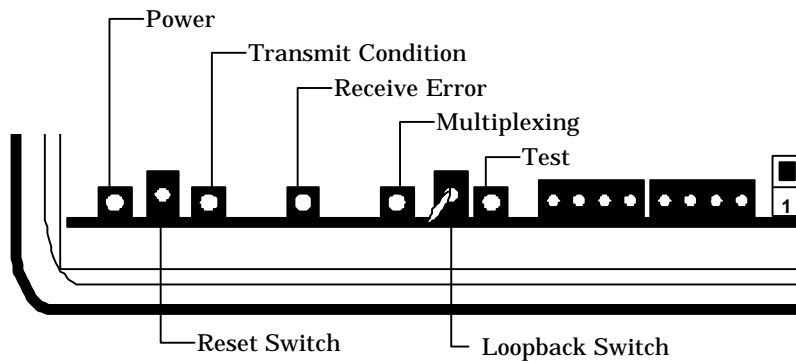


Figure 2
Indicators and Special Switches

4.1.1 Network Switch

All sections of the 6-position network switch must be down.

4.1.2 Port Switches

Ports are configured using the 8-position DIP switches. Position 1 sets sync or async operation. Positions 2 and 3 are used to set port parity for async mode only. Positions 4 and 5 are not used. Positions 6 thru 8 are used to set the asynchronous speed.

Port Switch	1	2	3	6	7	8
Sync	UP					
Async	DOWN					
8 None		DOWN	DOWN			
8 Even		UP	DOWN			
8 Odd		UP	UP			
38400				UP	UP	DOWN
19200				UP	UP	UP
9600				DOWN	DOWN	DOWN
4800				DOWN	DOWN	UP
2400				DOWN	UP	DOWN
1800				DOWN	UP	UP
1200				UP	DOWN	DOWN
300				UP	DOWN	UP

4.1.3 Loopback Switch

The loopback switch is a three position toggle switch located on the bottom circuit board between the Multiplexing and Test indicators (Figure 2). This switch is normally set to the center position. When pushed to the right, local loopback is enabled to all ports.

4.1.4 Reset Switch

The reset switch is a small pushbutton switch located on the bottom circuit board between the Power and Transmit Condition indicators (Figure 2). Pressing this switch will reset the hub. If this fails to clear a problem, disconnect power from the unit for five seconds and then reconnect.

4.2 Indicators

There are five indicators visible on the front panel. These indicators provide information about the hub's operation. You should become familiar with which lights are on during normal operation. If this pattern changes, there may be a problem.

The indicators and their function are:

POWER

ON when power is applied to the unit.

TRANSMIT CONDITION

OFF - There is no DCD from the attached modem or DSU. This indicates that the communications link is down.

ON - DCD is present from the attached modem or DSU. This indicator will also be on if no modem is connected to the hub because DCD defaults high.

RECEIVE ERROR

Flashes when a data error is detected.

MULTIPLEXING

Flickers when the hub is active.

TEST

ON when the loopback switch is set to the right.

Besides these five main indicators there are eight smaller indicators located behind the front panel directly to the left of the network switch.

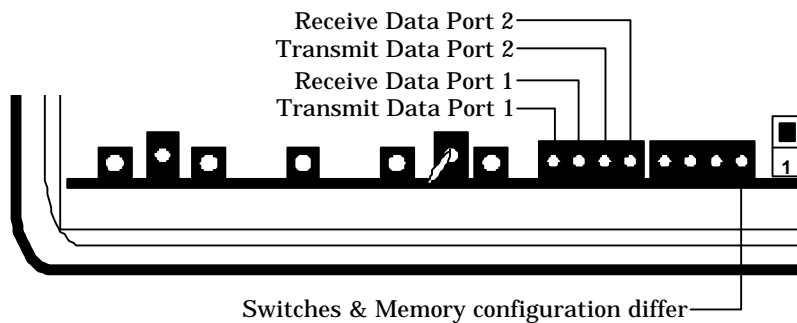


Figure 3
Mini LEDs

5. EXECUTIVE PORT

5.1 Introduction

The Executive Port (Exec) provides access to vital system information. By connecting a terminal or modem to the Exec Port, this information is at your finger tips.

5.2 Connections and Setup

The Exec port is accessed through a DE-9S connector on the rear of the unit. To connect to the Exec port, use one of the cables shown in Section 6.

5.2.1 Using a Terminal

Set your terminal for 9600 bps and 8 data bits, no parity and one stop bit. Use the cable described in Section 6 to connect the Exec port to the terminal.

5.2.2 Using a Modem

To use a dial-in modem for remote access you must fix the DTE interface speed of the modem at 9600 bps, 8 data bits, no parity and one stop bit. Refer to your modem manual for appropriate setup procedures. Connection to the modem must be made using the Exec port to modem cable shown in Section 6.

5.3 Using the Executive Port

To activate the Exec port, press the ENTER key. When you see **AT YOUR COMMAND >>**, the Exec port is active and ready for your commands. Type H<Enter> to display the command set.

5.4 Commands

5.4.1 Help (H)

<u>COMMAND</u>		<u>PARAGRAPH</u>
Help	H	5.4.1
Help Port	HP	5.4.2
Show Config	SC	5.4.3
Config Ports	CP	5.4.4
Type	TY	5.4.5
HUB ID	ID	5.4.6
PORT ID	PID	5.4.7
NMP Parity	P	5.4.8
Disconnect NMP	BYE	5.4.9
Repeat Last Command	*	5.4.10
Reset	RESET	5.4.11

5.4.2 Help Port

The Help Port (HP) command displays switch settings for the 8-position port configuration switches.

5.4.3 Show Config

The Show Config (SC) command shows the current port configuration settings and port identifiers for all ports. Use this command to verify proper port configuration.

5.4.4 Config Ports

The Config Ports (CP) command is used to set ports for sync or async operation and to set the async speed and parity. If port configuration is set using this command, an asterisk appears on the Show Config screen next to settings that differ from the switches, and a mini LED flashes.

5.4.5 Type

The Type (TY) command displays information about the local hub including number of ports and firmware version.

5.4.6 Hub ID

The Hub ID (ID) command allows you to enter an identifier for the local hub. This ID can be up to 15 characters.

5.4.7 Port ID

The Port ID (PID) command allows you to enter identifiers for each hub port. This is handy for documenting which port serves which remote location. Port IDs can be up to 15 characters.

5.4.8 Parity

The Parity command (P) sets the parity for the executive port. The factory default is SPACE.

5.4.9 Disconnect NMP

The BYE command toggles the CTS output from the executive port. This is used to disconnect equipment such as dial-up modems or the DCB Access Switch.

5.4.10 Repeat Last Command

To repeat the last command, simply press the "*" key. This is handy for repeating screens of constantly changing data.

5.4.11 Reset

The Reset command resets the local hub. This is equivalent to pressing the reset pushbutton.

6. INTERFACE SIGNALS AND CABLING

6.1 Connector Location and Pin Reference

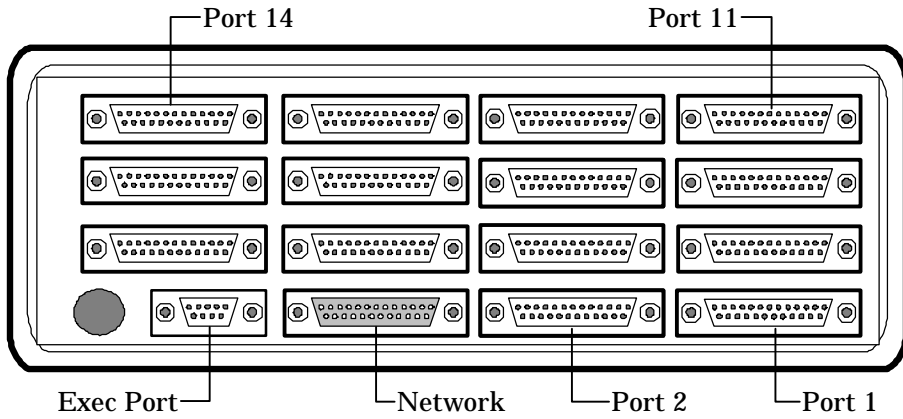


Figure 4
Connector Location - Rear View

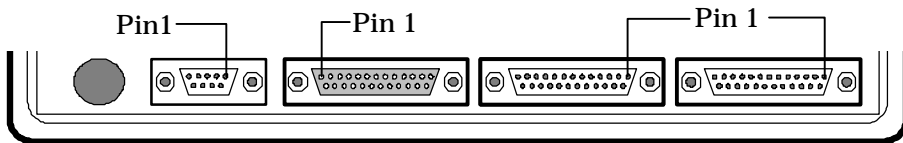


Figure 5
Connector Pin Reference

6.2 Port Interface

6.2.1 Network Port (DB-25P)

<u>Pin</u>	<u>Signal</u>	<u>In/Out</u>
1	Frame Ground	---
2	Transmit Data	OUT
3	Receive Data	IN
4	Request to Send	OUT
5	Clear to Send	IN
6	Data Set Ready	IN
7	Signal Ground	---
8	Data Carrier Detect	IN
15	Transmit Clock	IN
17	Receive Clock	IN
20	Data Terminal Ready	OUT

6.2.2 DTE Ports (DB-25S)

<u>Pin</u>	<u>Signal</u>	<u>In/Out</u>
1	Frame Ground	---
2	Transmit Data	IN
3	Receive Data	OUT
4	Request to Send	IN
5	Clear to Send	OUT
6	Data Set Ready	OUT
7	Signal Ground	---
8	Data Carrier Detect	OUT
20	Data Terminal Ready	IN

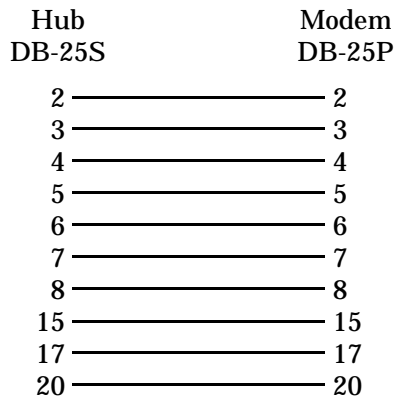
6.2.3 Exec Port (DE-9S)

<u>Pin</u>	<u>Signal</u>	<u>In/Out</u>
1	Frame Ground	---
2	Transmit Data	IN
3	Receive Data	OUT
4	Request to Send	IN
5	Clear to Send	OUT
6	Data Set Ready	OUT
7	Signal Ground	---
8	Data Carrier Detect	OUT

6.3 Cables

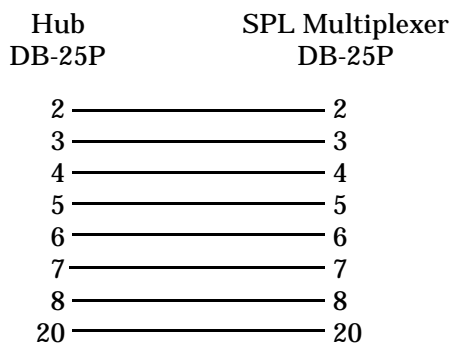
6.3.1 Network Port to Modem

A 25 conductor cable is supplied with the hub for this purpose. If a longer cable is needed, a minimum of 10 conductors are required.

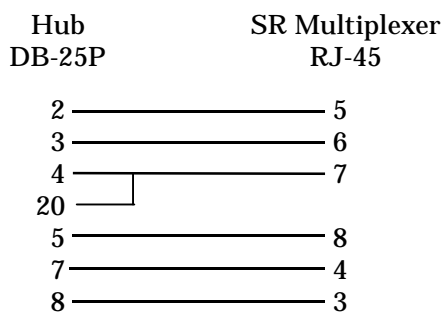


6.3.2 DTE Ports

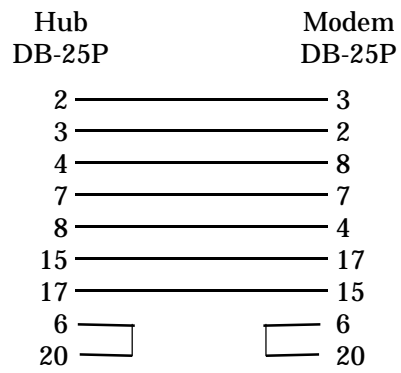
To a local SPL Multiplexer



To a local SR Multiplexer



To a Tail Circuit Modem

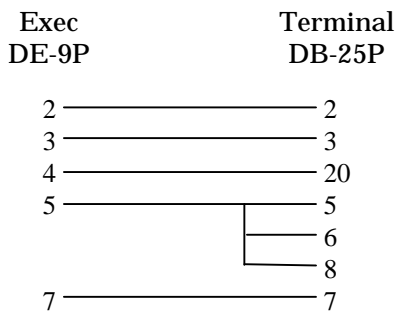


NOTE

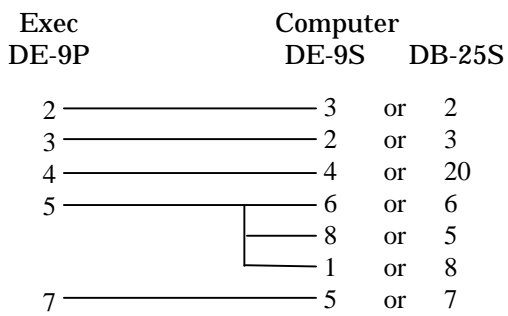
For asynchronous tail circuits, pins 15 and 17 are not required.

6.3.3 Exec Port

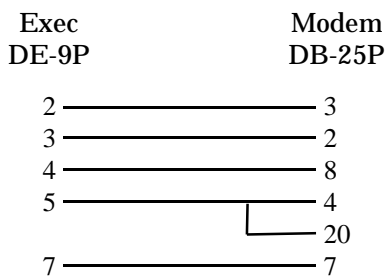
To a TERMINAL



To a PC (using terminal emulation)



To a dial-up MODEM for remote access



7. TROUBLESHOOTING

7.1 General Approach

1. When troubleshooting problems, a rational plan can save you many hours of frustration. The following is a brief outline of standard troubleshooting procedures.
2. Gather the facts to determine the exact nature of the problem.
3. Draw a picture of the system showing the equipment at both the host and remote ends and the phone lines or in-house wiring. Use this as a reference to note your observations, test steps and test results. A picture keeps you focused and often saves duplicate effort.
4. Record the front panel indications before changing anything. This is an important part of fact gathering
5. If you change anything, change only one thing at a time.

8. WARRANTY

All DCB products are warranted to be free of defects in materials and workmanship for one year. Data Comm for Business, Inc. will repair or replace any equipment proven to be defective within the warranty period. All warranty work is F.O.B. Champaign, IL. This warranty is exclusive of abuse, misuse, accidental damage, acts of God or consequential damages, etc. DCB liability shall not exceed the original purchase price.

All equipment returned for warranty repair must be accompanied by a Returned Material Authorization (RMA) number. To receive an RMA number, call (217) 352-3207 between the hours of 8 AM and 5 PM central time. Equipment must be shipped prepaid to DCB and will be returned at DCB's expense.

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