SUPERSWITCH

UNIVERSAL SHARING UNIT

INSTALLATION AND OPERATIONS MANUAL

Give a Rose to your computer

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ELECTRONICS

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Revision 0. Printed in the United States of America

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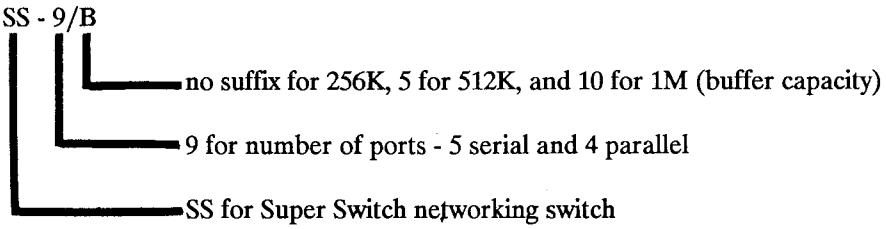
FOREWORD

This manual contains information for the installation and operation of Super Switch, an intelligent data switching unit. Super Switch consists of a switch unit and a separate wall mount power adapter. The base model of Super Switch has 256K bytes of memory, expandable to 512K bytes or 1M bytes of memory. The model number is described below.



INTRODUCTION

The Super Switch is a versatile microprocessor controlled switch that allows several computers or terminals to have shared access to several peripheral devices, such as a printer, a modem, or a host computer. The selection is done either automatically by sending data to the default destination or by sending a code to select a new destination. Any port may communicate to any other port. Pairs of ports may communicate simultaneously.

Data from each port is sent to its destination immediately if the destination device is available. Otherwise the data is queued by priority for its turn to access the shared device. Memory is dynamically allocated to allow any device as much memory as it requires. The serial ports allow different baud rates and protocols to operate independently on each port with full duplex communication. Parallel ports may be configured as either computer or printer ports. Ports configured to be printers may have automatic form feed and initialization strings enabled. Computer or modem ports may also send initialization strings.

On serial ports, a status command allow viewing of all jobs in the job queue. A cancel command allows removal of a job from the job queue. The timeout enable command controls the disconnect timer to allow connection to a device for an extended period. Baud rates may be changed by command. A configuration menu allows easy setup and saving of all parameters in non-volatile memory.

All the equipment is interconnected with cables to Super Switch. The cable connection points to Super Switch are on its rear. Also on the rear is the connection for the external power adapter and an on/off power switch. Super Switch's front panel has 13 LEDs which display status information and two switches which are used to control the LED display and for diagnostic purposes.

QUICK SETUP LIST

CABLING

1. Cable your computer or terminal to port 0 with the proper cable.
   For PCs this is a printer cable or crossed (null modem) cable.
   Do not use a straight through cable. **Be sure you are using the correct cable.**

2. Connect the power adapter and turn the Super Switch on.
   The power light should glow green. LEDs should sequence.
   BUF, DATA, and BUSY LEDS will be on for any errors.

CONFIGURATION

3. For a PC connected to port 0 run a terminal emulator communication program
   such as Crosstalk, Smartcom, or one supplied by Rose Electronics.
   Set your computer or terminal to 9600 baud, no parity, 8 bits, 1 stop bit, and full duplex.

4. Type in the 3 characters !@C and the configuration menu will appear.

5. You will be prompted to enter a choice of two character select codes
   (followed by a carriage return) for the item you wish to configure.
   You will be prompted for all the proper responses.
   Enter TY to choose the device type for each port.
   Enter PR to change the protocol of any ports.
   Enter DE to choose the default destination of your computers or modems.
   Enter SA to save the changes.
   Enter EX to exit the configuration menu.
   A configuration termination message appears.

OPERATION

6. Turn off power to the Super Switch.

7. Connect your other serial device cables with the correct cables for your computers, printers, and modems.
   The cables are usually crossed for printers and computers and are usually straight through for modems.
   Connect your parallel ports to computers with parallel printer cables
   and to printers with male to male Centronics cables.
   Cables must be wired correctly according to the section on cabling

8. Power on the Super Switch. LEDs again sequence as before.

9. Send data from your application program or print program.
   Data will be routed to the default destination port.

10. Send the command !@n where n is the port number 0-8 of your destination.
    The characters !@n may be imbedded in a file, sent from a print program, sent from an application program
    sent from batch files, or sent from a utility such as Rose Electronics' **MasterLink**.
    Data will be routed to the destination chosen.

11. Read this manual and reconfigure to enable other features as desired.

INSTALLATION

In unpacking your unit you should verify that you have received both the Super Switch system unit and the wall mount power transformer as well as this manual. Installation consists of two parts, cabling and configuration.

Cabling requires connecting the proper cables from the Super Switch to your computers and peripherals. Cables are supplied separately and are available from Rose Electronics. Recommended cable pinouts for popular devices are shown in TABLE I and you may call us to get cable pinouts for those devices not listed. Cabling also includes connecting the external wall mount adapter to an AC receptacle and connecting the other end to the power input on Super Switch.

To configure Super Switch you must connect a terminal or a computer running a terminal emulator program to port 0 of Super Switch. You then access the configuration menu and choose the items from the menu to configure Super Switch to your particular equipment.

PARALLEL CABLING

Since a parallel port may be configured to be either a computer or a printer port, you should not connect any cables unless the device to be connected matches the factory default configuration or you have configured the port as desired.

The factory default is that port 8 is a printer port. All other parallel ports are configured as computer ports. The factory default destination of all computer ports is to port 8.

There is a distance limitation on parallel printer cables. A safe distance is 25 feet or less. This distance may be exceeded with caution. The maximum distance that a cable may be run is dependent upon the construction of the cable and its routing. For extended distances shielded cable should be used. Routing near fluorescent lights or machines that may create electrical noise, such as elevator motors or air conditioning compressors, should be avoided. Typically a cable run for 100 feet will work reliably but there is no guarantee. Rose Electronics can construct the proper cabling to your specified length.

The parallel computer to Super Switch cables are the same ones that would normally connect your computer to your printer. You probably already have one of these cables. Super Switch uses industry standard female Centronics connectors, the same as used on most parallel printers. So, instead of connecting your computer cable to your printer, connect it to the parallel port on Super Switch which is configured to be a computer port.

The Super Switch to printer cable should have 36 pin male Centronics connectors at each end. Connect this cable from your printer to the parallel port on Super Switch which is configured to be a printer port.

SERIAL CABLING

Since there is no industry standardization with RS232 cabling, caution must be observed when interconnecting your equipment with Super Switch. A few popular cabling pinouts are given in Table I. Refer to Appendix A for further Super Switch pinout information. Generally there are four groups of signals that must be connected.

GROUP 1 - Transmit and Receive signals
GROUP 2 - Flow control signals
GROUP 3 - Enable signals
GROUP 4 - Signal grounds and shields

GROUP 1 - Transmit and Receive signals

These signals are responsible for carrying the data information between devices. Super Switch receive (pin 3) must be wired to your equipment transmit. Super Switch transmit (pin 2) must be wired to your equipment receive. A device such as a printer which does not send data to the Super Switch does not require any connection to Super Switch receive except when XON/XOFF flow control is used.

GROUP 2 - Flow control signals

These signals are used to regulate the flow of data. A printer uses a busy out signal to inhibit a computer from sending it data faster than it can print. A computer uses a busy in signal for the printer to tell it to stop transmitting data. A modem does not utilize these signals for flow control but uses a software flow control protocol such as XON/XOFF. A printer or a computer may also utilize a software flow control protocol.

A printer will usually have its busy out signal on either pin 11, 19, or 20. This pin must be wired to DSR (pin 6) on the Super Switch for hardware flow control to work. Consult your printer manual for the proper pin.

A computer will usually have its busy in signal on either pin 5, 6, or 20. This pin must be wired to DTR (pin 20) on the Super Switch for hardware flow control to work. Consult your computer manual for the proper pin.

Neither busy in or busy out are required when using the XON/XOFF protocol. However, busy in on the Super Switch is always active and will inhibit transmission of data from Super Switch when the signal is low. This allows a computer to use both XON/XOFF and DTR flow control to support varying application programs.

Busy in on Super Switch (DSR, pin 6) is not normally wired from a computer. When data is sent to a computer, such as from a modem or another computer, a hardware handshake is not normally used. Instead a more flexible software block protocol is normally used. If pin 6 is wired, care must be observed when the attached computer is not powered on. The signal is in an undefined state and the port may appear busy to Super Switch. This may cause the computer powered off to stay connected to its destination, keeping other ports from accessing the destination device. A termination pullup of 1K ohm from DSR (pin 6) to RTS (pin 4) at the Super Switch can prevent this from occurring.

GROUP 3 - Enable signals

These signals are used to enable the transmitter or receiver. They are normally used to support modems. Certain computers and printers have these signals as inputs which must be high before their interfaces will operate. These must be connected to a signal which is normally always high, either on the computer or printer's own interface or from the Super Switch.

Super Switch's RTS (pin 4) will be high when Super Switch is powered on and may be used as an enable to your equipment. Super Switch's CTS (pin 5) and DCD (pin 8) must be high to allow Super Switch to transmit and to receive. They should not be used for flow control signals. These pins may be left unconnected since internal pullups will set them high. These pins are normally left unconnected for computer and printer connections. They may be tied to signals which will be high when your equipment is powered on. These signals when connected to modems will allow the interface to operate properly, but are not required.

GROUP 4 Signal grounds and shields

Super Switch signal ground (pin 7) must always be connected to the equipment signal ground. Serial cabling can be routed in excess of 50 feet with caution. The maximum distance that a cable may be run is dependent upon the construction of the cable and its routing. For extended distances shielded cable should be used. Routing near fluorescent lights or machines that may create electrical noise, such as elevator motors or air conditioning compressors, should be avoided. There is a tradeoff between cable length and baud rate. The further you run the slower you must go. With low capacitance cable, runs up to 250 feet at 9600 baud will usually work, but it is not guaranteed. Rose Electronics can construct the proper cabling to your specified length.

MODEM CONTROL

The Super Switch interprets the DSR signal differently for a port configured as a modem. It will not inhibit the transmit of data but instead passes this signal to the DTR pin of the originating port. By connecting the DCD pin of the modem to DSR(pin 6) on the Super Switch, the carrier detect signal can be sent to the computer. The computer must have its busy in and carrier detect input wired together and connected to DTR (pin 20) on Super Switch. Since the modem will usually have its DCD and DSR wired together, a one to one cable will work with nearly all asynchronous modems.

TABLE I
COMMON SERIAL CABLING

Example cables:

IBM PC SS	IBM AT SS	HP LASER SS	MODEM SS	MACINTOSH SS
2 ---- 3	2 ---- 2	3 ---- 2	2 ---- 2	3 ---- 7
3 ---- 2	3 ---- 3	7 ---- 7	3 ---- 3	4 ---- 3
7 ---- 7	5 ---- 7	20 ---- 6	4 ---- 4	7 ---- 20
5-6-8 - 20	1-6-8 - 20		5 ---- 5	8 ---- 2
			6 ---- 6	
			7 ---- 7	
			8 ---- 8	
			20 ---- 20	

CONFIGURATION

A dumb terminal or a PC emulating a dumb terminal must be connected to port 0. The PC or terminal must be set to 9600 baud, 8 bits, no parity, 1 stop bit. For a PC connected to port 0 run a terminal emulator or communication program such as Crosstalk, Smartcom, or one supplied by Rose Electronics. The program must be configured for the protocol described and set for full duplex. Then put it in the local or terminal emulator mode.

Enter the three characters !@C and the configuration menu will be displayed. The configuration menu displays the setup parameters for all ports and allows you to change them. The item to be changed is selected with a two letter abbreviation of the configuration item and carriage return. You are further prompted to answer questions appropriate for each parameter.

Possible responses to the prompt are listed in parentheses. Responses may be entered in either upper or lower case. A final carriage return is required to enter the response. You may use the backspace key to correct your entry. Entering only a return to a prompt will leave that parameter unchanged except for the initialization string entry, which will clear the string. Replying with a return only to a Y/N (yes/no) prompt will be interpreted as a no. You will be prompted for all responses and messages for invalid responses will be given.

TABLE II
CONFIGURATION MENU

```
Super Switch configuration revision 1.1  Copyright (C) 1987 Rose
Electronics
Memory installed = 512K   Timeout =   10 Seconds   Prefix = !@

PORT TYPE      NAME   INIT STRING DEST     PRI  TIMEOUT  PROTOCOL
  0  Computer  PORT 0             PORT 8   Low  On       9600,N,8,1,DTR
  1  Computer  PORT 1             PORT 8   Low  On       9600,N,8,1,DTR
  2  Computer  PORT 2             PORT 8   Low  On       9600,N,8,1,DTR
  3  Computer  PORT 3             PORT 8   Low  On       9600,N,8,1,DTR
  4  Computer  PORT 4             PORT 8   Low  On       9600,N,8,1,DTR
  5  Computer  PORT 5             PORT 8   Low  On       Parallel
  6  Computer  PORT 6             PORT 8   Low  On       Parallel
  7  Computer  PORT 7             PORT 8   Low  On       Parallel

PORT TYPE      NAME   INIT STRING  FF                   PROTOCOL
  8  Printer   PORT 8              Off                   Parallel

TI - TIMEOUT       PX - PREFIX        TY - TYPE            NA - NAME
DE - DESTINATION   PY - PRIORITY      TE - TIMEOUT ENABLE  PR - PROTOCOL
FF - FORM FEED     IN - INIT STRING   SA - SAVE CHANGES    EX - EXIT

Enter choice (TI,PX,TY,NA,DE,PY,TE,PR,FF,IN,SA,EX)
```

CONFIGURATION ITEMS

TIMEOUT

The timeout is used to automatically disconnect a device from its destination. This is most commonly used for an automatic connection to share a printer. Each port uses this timeout value as the period to measure data activity. When no data activity occurs for this timeout period the port is subject to disconnection. Each port has a timer to be reloaded with this timeout value. The timer is reloaded with the timeout value when data is received. The timer is also reloaded when the receive buffer on the port is full. For serial ports the timer is also reloaded when data is transmitted from the destination.

The factory default is 10 seconds, but may be changed to be from 1 to 255 seconds. The one second timeout should not be used for normal operation. To change the timeout enter TI to the choice prompt and enter the new timeout.

Enter choice (TI,PX,TY,NA,DE,PY,TE,PR,FF,IN,SA,EX) TI
Enter timeout (1-255) 20

PREFIX

The prefix is a series of up to 8 characters that identifies data being sent to the Super Switch as a command and not as data. All commands are preceded by this string of characters including the cancel, configuration, destination, format, print configuration, status, and timeout enable commands. The factory default is the two characters !@. The prefix may be changed to be up to 8 characters long. If the factory default is unacceptable for some reason, the prefix should be changed to an unlikely sequence of characters that would not normally occur in a data stream. A valid command is stripped out of the data stream and not sent to the destination device. A new prefix is not stored in the non-volatile memory until the save command is issued. To change the prefix enter PX to the choice prompt and enter the new prefix. A carriage return or null may not be part of the prefix.

Enter choice (TI,PX,TY,NA,DE,PY,TE,PR,FF,IN,SA,EX) PX
Enter prefix (up to 8 characters) *&^%$#@

TYPE

The type identifies to the Super Switch what type of device is connected to each port. The possible choices for a parallel port are computer or printer. The possible choices for a serial port are computer, printer, or modem. Port 0 may not be configured to be a printer. To connect a plotter use the printer as a device type. To change the type enter TY to the choice prompt. Enter the port number from 0 to 8. Then enter the device type C, P, or M. You may configure the type for the next port by answering Y to the next port prompt or N to return to the main prompt.

Enter choice (TI,PX,TY,NA,DE,PY,TE,PR,FF,IN,SA,EX) TY
Enter port number (8) 1
Port 1 Enter device type (C=computer,P=printer,M=modem) C Next port (Y/N) N

NAME

The name provides a familiar identification for a port number. It is used for ease of reference in the configuration menu and is also used in the status display described later. The name may consist of up to 8 characters. To change the name enter NA to the choice prompt. Enter the port number from 0 to 8 and then the name.

Enter choice (TI,PX,TY,NA,DE,PY,TE,PR,FF,IN,SA,EX) NA
Enter port number (0-8) 0
Port 0 Enter port name (up to 8 characters) PC Next port (Y/N) N

DESTINATION

The destination is the default device to which data will be sent when the Super Switch is initially powered up. You may not choose the destination to be itself or a parallel computer. Ports configured as printers may not be configured for this parameter. You may enter port 9 as a null destination. The data from a port will be discarded when its destination is the null destination. To change the destination enter DE to the choice prompt. Enter the port number followed by the destination port number.

Enter choice (TI,PX,TY,NA,DE,PY,TE,PR,FF,IN,SA,EX) DE
Enter port number (0-8) 3
Port 3 Enter default destination (0-9) 4 Next port (Y/N) Y
Port 4 can't be configured with this parameter Next port (Y/N) N

PRIORITY

The priority allows a port to override the order of queued jobs. If several ports are sending data to a common device and several jobs are queued up, data from a high priority port will be placed higher in the queue than a low priority device. Jobs currently transmitting to their destination are not disturbed but are allowed to terminate normally. Ports configured as printers may not be configured for this parameter. To change the priority enter PY to the choice prompt. Enter the port number followed by the priority H or L.

Enter choice (TI,PX,TY,NA,DE,PY,TE,PR,FF,IN,SA,EX) PY
Enter port number (0-8) 2
Port 2 Enter default priority (H=high,L=low) H Next port (Y/N) N

TIMEOUT ENABLE

This sets the default timeout enable. The timeout enable command allows a connection to be made uninterruptible. This is most suited for connecting to modems where an automatic disconnection is not desired. It is also useful for extended sessions where there may be no data activity for periods of time longer than the timeout duration, such as communicating to a mainframe or a plotter. Ports configured as printers may not be configured for this parameter. To change the timeout enable mode enter TE to the choice prompt. Enter the port number followed by Y to enable the timeout or N to disable the timeout. Refer to the timeout enable command in the operation section for further information.

Enter port number (0-8) 2
Port 2 Enable timeout (Y/N) ? N Next port (Y/N) N

PROTOCOL

The protocol is only configurable for serial ports. The protocol consists of the baud rate, parity, word length, number of stop bits, and flow control. You may configure the protocol separately for each port. The port is reconfigured to the new protocol but is not saved in non-volatile memory until the save command is issued. To change the protocol enter PR to the choice prompt and answer the subsequent prompts.

Enter choice (TI,PX,TY,NA,DE,PY,TE,PR,FF,IN,SA,EX) PR
Enter port number (0-8) 0
Port 0 Enter baud rate
(19200,9600,7200,4800,3600,2400,1800,1200,600,300,150,134.5,110,75,50) 1200
Enter parity type (N=None,E=Even,O=Odd,M=mark,S=Space) E
Enter word length (5,6,7,8) 7
Enter stop bits (1,2) 1
Enter flow control (D=DTR X=XON/XOFF) X Next port (Y/N) N

INITIALIZATION STRING

The initialization string when enabled is sent at the beginning of a job. If the destination is a computer the string comes from from the originator of the conversation. If the destination is a printer, the printer port originates the string. This string is sent at the beginning of each new job. The string may be up to 8 characters long. To change the initialization string enter IN to the choice prompt and enter the port number and string. Entering return only will disable the sending of the string. Non printable characters such as escape may be entered and will be displayed on the configuration menu as periods. Carriage return, line feed, or a null may not be part of the string.

Enter choice (TI,PX,TY,NA,DE,PY,TE,PR,FF,IN,SA,EX) IN
Enter port number (0-8) 4
Port 4 Enter initial string (up to 8 characters) E Next port (Y/N) N

FORM FEED

The form feed is used only for ports configured as printers to eject to the next page following the end of a job. When enabled the last character of a print job is examined. If it is a form feed no action is taken so as not to waste paper. If it is not a form feed, one is added. This parameter may not be used for computer or modem ports. To change the form feed enter FF to the choice prompt, give the port number and answer yes to enable the form feed or no to disable the form feed.

Enter choice (TI,PX,TY,NA,DE,PY,TE,PR,FF,IN,SA,EX) FF
Enter port number (0-8) 4
Port 4 Enable form feed ? (Y=yes,N=no) Y Next port (Y/N) N

SAVE

The save command is used to store the prefix and protocol in non-volatile memory. All other parameters are stored instantly in non-volatile memory. Subsequently powering up the unit will use the newly saved parameters as the power up settings. The intention of this command is to allow configuring your equipment with temporary parameters. Changing the protocol and prefix to values which are not compatible with your application software can potentially prevent you from accessing the unit. The previous parameters stored in non-volatile memory can be restored by cycling the power to the Super Switch. There is also a provision to restore the default parameters to the unit, discussed in the section describing the diagnostic mode. To save the parameters, enter SA to the choice prompt. A prompt to enter yes or no to prevent accidental entry has been included. You must answer Y to this prompt for the parameters to be saved.

Enter choice (TI,PX,TY,NA,DE,PY,TE,PR,FF,IN,SA,EX) SA
Are you sure ? (Y=yes,N=no) Y

EXIT

This command is used to exit the configuration menu and return port 0 to the active mode. Enter EX to the choice prompt. An exit message is then displayed.

Enter choice (TI,PX,TY,NA,DE,PY,TE,PR,FF,IN,SA,EX) EX
Configuration terminated

POWER UP TESTS

POWER UP INITIAL DISPLAY

Push in the power switch to turn the unit on. Super Switch goes through a power up self-test which tests the main functions of its electronics. The leftmost LED labelled power should glow green and the other red LEDs should all turn on. Then the unit will cycle through four tests lighting up LEDs 1 through 4 as each test is performed. Errors are indicated by the BUF, DATA, and BUSY LEDs turning on and the unit halting. See TABLE III for the full sequence of the power up LED display and TABLE IV for error displays.

PROGRAM CHECKSUM TEST

Test 1 checks the validity of its program by performing a checksum test. A program checksum error shows on the LEDs as error 1, as shown in TABLE IV, and will immediately halt the unit indicating a fatal error and that the unit must be serviced.

BUFFER MEMORY SIZING AND READ/WRITE TEST

Test 2 determines the amount of buffer memory present and indicates the amount via the status LEDs as shown in TABLE III and tests the buffer memory to ensure that all memory locations are operational. Any failure will cause the error 2 condition to be displayed, indicating that a buffer memory data error has occurred. The unit will not continue its further tests and will halt. An error indicates that the unit requires servicing.

STATIC RAM READ/WRITE TEST

Test 3 verifies the static ram. A read/write test is performed on all locations. The unit will halt and display error 3 if there is a problem. The unit must be serviced if this occurs.

NON-VOLATILE RAM CHECKSUM TEST

The fourth and final power up test is for the non-volatile memory. A checksum test is performed. An error shown by the LEDs as error 4 indicates that the data in the non-volatile memory has been corrupted. To attempt to rewrite the default parameters push the advance pushbutton. If the error condition goes out, the unit may be powered up again to see if it halts at error 4 again. If it still displays error 4, a fatal error has occurred and servicing is required.

If the unit recovers from the error the configuration parameters have been returned to their default settings and the unit must be reconfigured. This condition does not normally occur. If it does it indicates that possibly the unit has been subjected to a strong static discharge or surge on its incoming power or signal lines. The other possibility is an internal chip failure.

TABLE III LED POWER UP DISPLAY

1st	●	●	●	●	●	●	●	●	●	●	●	●	All LEDS on
2nd	o	o	o	o	●	o	o	o	o	o	o	o	Test 1 EPROM checked
3rd	o	o	o	o	o	●	o	o	o	o	o	●	Test 2: 64K buffer test
	o	o	o	o	o	●	o	o	o	o	●	●	Test 2: 256K buffer test
	o	o	o	o	o	●	o	o	o	●	●	●	Test 2: 512K buffer test
	o	o	o	o	o	●	o	o	●	●	●	●	Test 2: 1M buffer test
4th	o	o	o	o	o	o	●	o	o	o	o	o	Test 3: Static ram test
5th	o	o	o	o	o	o	o	●	o	o	o	o	Test 4: NV ram test
6th	o	o	o	o	⊠	o	o	o	o	o	o	o	Unit operational

TABLE IV LED ERROR DISPLAY

●	●	●	o	●	o	o	o	o	o	o	o	Error 1 EPROM checksum failure
●	●	●	o	o	●	o	o	o	o	o	o	Error 2 RAM buffer error
●	●	●	o	o	o	●	o	o	o	o	o	Error 3 Static ram error
●	●	●	o	o	o	o	●	o	o	o	o	Error 4 Non volatile ram error

TABLE V LED BUFFER CAPACITY DISPLAY

●	o	o	o	⊠	o	o	o	o	o	o	o	Buffer is less than 1/8 full
●	o	o	o	●	⊠	o	o	o	o	o	o	Buffer is 1/8 to 1/4 full
●	o	o	o	●	●	⊠	o	o	o	o	o	Buffer is 1/4 to 3/8 full
●	o	o	o	●	●	●	⊠	o	o	o	o	Buffer is 3/8 to 1/2 full
●	o	o	o	●	●	●	●	⊠	o	o	o	Buffer is 1/2 to 5/8 full
●	o	o	o	●	●	●	●	●	⊠	o	o	Buffer is 5/8 to 3/4 full
●	o	o	o	●	●	●	●	●	●	⊠	o	Buffer is 3/4 to 7/8 full
●	o	o	o	●	●	●	●	●	●	●	⊠	Buffer is more than 7/8 full
●	o	o	o	●	●	●	●	●	●	●	●	Buffer is full

LEGEND:

o indicates LED is not lit
● indicates LED is lit
⊠ indicates LED is flashing

OPERATION

Following configuration, operation consists of sending data and commands to route data to selected destinations. A command consists of the prefix, a command character, and optional command operands. There are seven commands. They are the destination, timeout enable, status, cancel, format, configuration, and print configuration commands. The description of the syntax of the command in the following text may use the default prefix (!@) in the syntax description. If you have changed the prefix you must use the new prefix in the command.

DESTINATION COMMAND

The destination command selects a new destination and consists of the prefix followed by the ascii number 0 through 9. For instance to select port 7 as the data destination port send the characters !@7 to the Super Switch. Any following data will be sent to port 7. Invalid destinations are to your own port or to a parallel computer. Note that the destination command does not make a connection. The connection is made by sending data to a port.

Port 9 is designated as a null port. Any data directed to this port will not be transmitted or queued. No jobs will be created and no record in the status display will be noticed. The destination in the configuration display will be shown as NULL. The destination command may be entered in several ways.

1. The destination command may be imbedded in a data file which is sent through the normal method of sending data.

2. The destination command may be predefined as a file and be sent separately. For instance if a laser printer is connected to port 3. A file called LASER may be created which has 3 characters in it, namely !@3, By printing or sending this file the destination is changed to port 3.

3. A setup string may be included as part of one of your application programs. Many of the popular spreadsheet, data base, and word processing programs have these strings to allow initialization of printers. The destination code may added as part of this string.

4. For PCs a memory resident pop up utility may be used to send the destination commands from an application program. This program, **MasterLink**, is available separately from Rose Electronics.

TIMEOUT ENABLE COMMAND

The timeout enable command is used to enable or disable the timeout for a port. It is used when a connection is to be maintained for periods longer than the timeout duration and there is no data activity. The timeout is normally disabled when communicating with a modem or a gateway to a mainframe. The timeout is normally enabled when used to communicate with a printer.

The syntax of the command is the prefix + Tn where n may be a 0 or a 1. If it is a 0 the timeout is disabled for the port sending the command. The 1 enables the timeout. A port may be disconnected by sending a new destination command. The port previously connected is then available for other users. The timeout enable or disable state would still be in effect from the previous timeout command when connecting to a new destination. It is the responsibility of the user to disconnect the port or enable the timeout to allow other users to access a port when one is finished using the port.

STATUS COMMAND

The status command displays all active and queued jobs. It is accessed from a serial port only by sending the prefix + S. The issuing of the status command will terminate any job in progress. A sample display is shown in TABLE VI. The jobs are displayed in ascending order of destination port. First the name of the port requesting the status and its current destination is displayed. A description label is then shown to describe the contents of each column. If only the label is displayed then no jobs are present.

A number is assigned to every job. This number is displayed in the job number field. This number can be used as an operand in the cancel command to remove a job from the job queue. The source is the name of the port originating the job. The destination is the port to which the data was sent.

The status field can be either connect, receive, transmit, queued, cancel, or waiting. Connect means a port is both transmitting and receiving. The receive indicates a job is being received but the destination is in use. Transmit shows that a queued job is now sending data to its destination. Queued means that a job has been received in its entirety and the destination is busy. Cancel in the status field results when the cancel command has been used to remove a job from the job queue. Waiting means a job has sent all of its data to its destination but the destination became busy before the job was disconnected.

The priority field shows the priority of the job. There are only two possible states, either high or low. The timeout field shows whether the job has its timeout enabled or disabled. The length shows how many bytes of memory the job is using.

TABLE VI
NETWORK STATUS DISPLAY

Network Status from AT Destination is LASER

JOBNUM	SOURCE	DEST	STATUS	PRIORITY	TIMEOUT	LENGTH
0	VAX	LASER	Connect	High	On	49518
1	VAX	LASER	Queued	High	On	100444
4	AT	LASER	Cancel	Low	On	2344
7	AT	LASER	Queued	Low	On	36543
2	VAX	LQ	Receive	High	On	1234
3	MAC	MODEM	Connect	Low	Off	0
5	PC	PLOTTER	Transmit	Low	On	95216
6	PC	MAINFRAM	Connect	Low	Off	12

CANCEL COMMAND

The cancel command is used to remove a job from the job queue. Either the last job sent to a port may be canceled or a particular job may be canceled. The number of the particular job to be canceled must be obtained from the status command described earlier.

The syntax of the command is the prefix + Knn where nn is either the job number from 00 to 63 or nn represents the characters LL for the last job. Sending the command will remove the job from the job queue. The cancel last job applies only to the last job sent to the port on which the cancel command is sent. If the job was queued, it will show in the status display as canceled. If it was transmitting, the job is immediately canceled.

FORMAT COMMAND

The format command is used to change the serial protocol of a port by command as opposed to by configuration which is the power up default setting. One is allowed to change the baud rate of any modem or your own port, all other ports are disallowed. Regardless of whether the port is a valid port or not and the syntax is correct or not the format command will be stripped out of the data stream. Note that when you change the format from your own port the result will take place immediately and you must change the baud rate of your attached terminal or computer to continue communication. The new rate is never saved in non-volatile memory. When the unit is powered off, the default state programmed during configuration is restored to all ports.

The syntax of the command is the prefix + Fnbbpwsc

where F is the letter F.
n is the port number to be changed (0-8)
bb is the first two numbers of the baud rate
19=19200 96=9600 72=7200 48=4800 36=3600
24=2400 18=1800 12=1200 60=600 30=300
15=150 13=134 11=110 75=75 50=50
p is the parity N=None, E=Even, O=Odd, M=mark, or S=Space
w is the word length 5,6,7, or 8
s is the number of stop bits 1 or 2
c is the flow control type D=DTR or X=XON/XOFF

examples using the default prefix:
!@F812E71X port 8 will be formatted to 1200 baud, even parity, seven bits, 1 stop bit, and XON/XOFF flow
!@F496N81D port 4 will be formatted for 9600 baud, no parity, eight bits, 1 stop bit, and DTR flow control

CONFIGURATION COMMAND

The configuration command is used to access the configuration menu from port 0 only. The syntax is the prefix + C. This command was described previously in the section on configuration. This command may be used while the system is on-line. If a parallel port is changed from computer to printer or vice versa, the Super Switch must have the power to it recycled before the effect occurs.

PRINT CONFIGURATION COMMAND

This command may be entered outside of the configuration menu to print the configuration display to the current destination. This command is valid from port 0 only. The syntax is the prefix + P. The display may be routed to any port by selecting a new destination with the destination command.

PRIORITY

All computer or modem ports may be configured to be either a low or a high priority. When sending data a high priority port will have its data put ahead of all low priority ports but behind all high priority jobs already started. Any job currently sending data to its destination is not disturbed or interrupted.

INITIALIZATION AND FORM FEED

When the destination is a computer the initialization string may be used to identify the source of the data. The receiving computer can identify the source of the message and return an answer if necessary.

For a printer the initialization string is used so that the printer is not setup differently than the next user expects it to be. An office standard for each printer should be chosen to reset the printer to a known state. THe most common one is the printer reset command, usually escape E or Escape @. Refer to your printer manual for the characters to be sent.

The form feed is used to separate jobs from one another. It may be disabled if your computer sends form feeds on a regular basis. When it is enabled it is set to not waste paper. It will look at the end of a job and if a form feed exists it will not add one otherwise it will. This is very useful for users doing page prints which often do not have form feeds and for laser printers which must get a form feed to eject the page.

BUFFER USAGE

The Super Switch uses an intelligent algorithm to allocate memory. The buffer is dynamically allocated which means that any port can utilize as much buffer as required. The buffer is reclaimed to be used again as the data in the buffer is sent to its destination. As the memory becomes full, the reclaimed memory is first distributed to ports that are actively receiving and transmitting, so that a lockout due to the buffer being full will not occur. Ports which are receiving only and have not been connected to their destination are given allocated memory only when enough memory is available to allow the other active ports to continue. The only case where lockout could occur is where all destinations are busy and the buffer is full so that no buffer can be reclaimed. The buffer is divided into 256 allocation units. Each input port will always have 1 or 2 memory units allocated to it.

JOB ALLOCATION

Up to 64 jobs may be dynamically allocated. This is not the same as the memory allocation. Each job is stored in memory as a separate entity and subject to be connected to its destination as priority, queue position, cancel status, and external device flow control apply.

COMPUTER TO COMPUTER COMMUNICATION

Serial ports are full duplex connections. When data is sent the initiator of the job will control the connection of the destination port. The destination port when connected will have its commands disabled and data will flow transparently to the source port. When the destination is disconnected its command input is then enabled and it may then be the initiator of a conversation. The initialization string, if enabled, will be sent from the originating computer at the beginning of the conversation. If the destination replies, since this is a full duplex connection, no initialization string will be sent from the replying computer.

OPERATION WITH A PC

The Super Switch is designed to be easy to use with a PC. You use your existing application software programs and their normal access methods. Your individual application packages may require that you set up your communication parameters, such as which port you are to access (LPT1, LPT2, COM1, COM2, etc.) or the serial protocol parameters. These parameters need to be setup whenever you will be communicating with an external device such as a printer, a modem, or Super Switch. Consult your application software manual for information. Rose Electronics is knowledgeable in most of these programs. You may contact us for help.

SETTING UP THE SERIAL PORT

When using the serial port on the PC, you must setup the protocol. From DOS you must enter the mode command, MODE COM1:9600,n,8,1,P to initialize your serial port. If you have software which normally uses the parallel port as the default printer you should use the mode command, MODE LPT1:=COM1 to redirect data form the parallel port to the serial port. These commands are normally included in your AUTOEXEC.BAT file used to initialize your computer when it is booted.

SENDING THE DESTINATION COMMAND FROM A BATCH FILE

You may send the destination command through a batch file. A file for each port should be created which has the prefix and the port number. Assume you have a laser connected to port 7 and a plotter connected to port 8.

Create 2 files called LASER and PLOTTER. Each file should contain three characters, respectively !@7 and !@8. You could create the file with the copy command or a text editor. To use the copy command to create the file LASER with the three characters !@7 in it do the following:

COPY CON LASER	Type this to the dos prompt followed by return.
!@7^Z	Type this followed by return. Note : ^Z is the F6 key, don't type ^ or Z.
1 File(s) copied	DOS responds

Once the LASER and PLOTTER files are created, make another file called CONNECT.BAT which contains COPY %1 COM1: or COPY %1 LPT1: in it. To connect the laser type CONNECT LASER. To connect the plotter type CONNECT PLOTTER. DOS should reply with 1 file copied in each case.

ACCESSING A MODEM

When accessing a modem through the Super Switch it may be necessary to change the protocol parameters of the serial port. For instance, assume you are to communicate to a bulletin board which operates at 1200 baud, even parity, 7 bits, and you will use the XMODEM protocol (do not confuse this with XON/XOFF protocol). Your modem is attached to port 5. Issue the command !@F512E71D!@T0_. This command says program port 5 to be 1200 baud, even parity, seven bits, 1 stop bit, and DTR flow control; disable the timeout; and send the dummy character _ to establish a connection. When the character _ is sent the carrier detect line will fall and you will now be ready to dial. When you hang up you should issue the command !@F596N81D!@T1 to restore your port and enable the modem to be used by others. This command may be programmed into a modem initialization string, a script file, or a keyboard macro as you desire. It could also be put in a batch file which sets the commands before and after accessing the communication program.

LED DISPLAY INFORMATION

DISPLAY CONTROL

Following the successful completion of its power up test, Super Switch is ready for operation and displays current information on its LEDS. It scans between the three states of displaying buffer, data, and busy conditions. The current display state is shown by one of the BUF, DATA, or BUSY LEDs being lit. A state is displayed for five seconds until the next state is displayed. The corresponding LED is lit when its state is being displayed. The display can be stopped on any of the three states by pressing the select switch. The scan can be resumed by pressing the advance switch.

BUFFER DISPLAY

This is the first of the LED display states to be entered following the four power up tests. The BUF LED is lit indicating buffer information is being displayed and the LEDS labelled 1-8 indicate the percentage of total buffer used. The way the LEDs show unused buffer capacity is shown in TABLE V. The normal initial condition is for LED 1 to be flashing indicating a small amount of memory has been allocated for receiving data.

DATA DISPLAY

The data display shows the transfer of data on all the ports. The DATA LED will be lit indicating data flow information is being displayed. If any of LEDs 0-8 is lit it indicates that data is being transferred either in or out of the port with the LED lit. If a port is actively connected to its destination both the source and destination LEDs will glow steadily or flash as the data is transferred.

BUSY DISPLAY

The busy display indicates the flow control information on the port. The BUSY LED will be lit indicating data flow information is being displayed. For parallel printers, the printer's busy line is displayed on the corresponding LED 0-8. If the LED is continuously lit it means the printer is off line or disconnected. If it flashes it indicates normal transfer. If it is off then the printer is ready or may be powered off. For parallel computers normal transfer conditions will display the LED as either continuously on or flashing. Off means no data is being transferred. For serial ports the LED indicates the state of the DSR line, the DTR line or XON/XOFF state. When the LED is on it means the external device is asserting DSR low or XOFF or the Super Switch is asserting DTR low or XOFF due to a buffer full condition.

PROBLEM DETERMINATION

If there is a problem please read the following section to help discover the source of the problem. A separate description is given for serial and parallel devices. Please refer to the proper section. This description is given in an outline form. Find your problem at the roman numerals and do the tests as described. If it passes go to the next heading. Once a failure occurs the problem is one of the conditions described in the next sub-heading. If you can not find the problem listed contact Rose Electronics for assistance.

SERIAL DEVICES

I. NOTHING HAPPENS WHEN SENDING DATA

A) VERIFY DATA IS BEING SENT

Put the Super Switch in the DATA display mode by using the select and advance pushbuttons. Send data and observe if the data LED 0-8 corresponding to the port on which you are sending data is lighting up. If not there are several possible problems.

1) IMPROPER CABLE WIRING

This is the most common cause of problems. Refer to the section on serial cable wiring and pay attention to the following possible causes.

a) Transmit and receive are reversed.

b) Signal ground is not connected.

c) Busy in of the computer is not connected correctly to busy out (pin 20) of the Super Switch. Also see section IA3 below.

2) PROTOCOL DOES NOT MATCH

The protocol of the Super Switch does not agree with the computer. The port 0 default is set to 9600 baud, no parity, 8 bits, 1 stop bit, hardware handshake with DSR and DTR. If you are communicating with Super Switch for the first time, your computer must be set to these parameters. Otherwise verify that your computer matches the protocol as previously configured.

3) FLOW CONTROL INHIBITED

The computer is inhibited from sending data by a flow control condition. Switch the Super Switch to the BUSY display. If the busy LED is lit on the corresponding port then your computer is telling Super Switch not to send data or Super Switch's buffer is full. Switch to the BUF display to see if the buffer is full. If the buffer is not full then the cable is either wired incorrectly or your software is improperly configured to send data. When using the XON/XOFF protocol the hardware handshake, DSR (pin 6 on Super Switch), is still active. If DSR is connected it must be high for the port to operate. It also may be left unconnected and will be pulled high internally.

B) VERIFY DESTINATION

Disconnect the cable from the destination port. Put the Super Switch in the DATA display mode. Observe the LED of the destination port. If it lights then the destination is correct.

1) INCORRECT DESTINATION

The destination has not been selected correctly. Verify that you have not configured the port as a printer, in which case it will ignore destination commands. If another port LED lights then the data has been directed to the other port. Reissue the destination command.

2) FLOW CONTROL INHIBITED

See section IA3 above. If the device is a printer, switching the printer between on and off line will make the corresponding port LED go from off to on in BUSY display mode.

C) VERIFY DESTINATION DEVICE

1) IMPROPER CABLE WIRING

See section IA1 above

2) PROTOCOL DOES NOT MATCH

See section IA2 above. Pay attention to the fact that your computer may be sending 8 bits of information with the eighth bit high and your destination device may not recognize data with the 8th bit high. You can set the destination device protocol to 7 bits and mark parity. This may occur with DEC equipment.

II. GARBLED DATA RECEIVED AT DESTINATION DEVICE

A) PROTOCOL DOES NOT MATCH

Refer to sections IA2 and IC2 above.

B) FLOW CONTROL NOT WIRED CORRECTLY

Refer to sections IA3 and IB2 above.

C) WIRING INTERFERENCE

This may occur for computers which are a long distance from the Super Switch. The cable should be properly shielded. The routing of the cable should avoid machinery which may generate electrical noise. Also see section IVA below.

III.MISSING BLOCKS OF DATA ON PRINTER

A) FLOW CONTROL NOT WIRED CORRECTLY

Refer to sections IA3 and IB2 above.

IV. BUFFER IS FULL BUT NOBODY IS SENDING DATA

A) COMPUTERS POWERED OFF SENDING NOISE DATA

It is possible that a computer which has been powered off is getting noise coupled into its cable. This may occur for computers which are located far away from the Super Switch. To prevent this a 1K ohm resistor should be installed on the Super Switch end of the cable from RTS(pin 4) to RCV(pin 3). Also see section IIC above.

V. MODEM IS ALREADY CONNECTED WHEN RUNNING COMMUNICATION SOFTWARE

A) CONNECTION NOT ESTABLISHED

A connection to Super Switch is not established until data is sent. The carrier detect signal will not be passed through until the connection is made. So first send a dummy character to the modem. The DCD pin on the modem should be connected to pin 6 of Super Switch which will directly be sent to pin 20 of Super Switch on the computer port, which should be connected to pin 8 of the computer. Refer to the section on modems in the SERIAL CABLING section for more information.

B) IMPROPER CABLE WIRING

The data carrier on the modem or the computer is not wired properly.

Refer to the section on modems in SERIAL CABLE WIRING.

VI. COMPUTER LOCKS UP

A) BUFFER IS FULL

Put the Super Switch in the BUFFER display mode. If LEDS 1-8 are all lit the buffer is full and you must wait for a destination device to accept some data for there to be more buffer space. If this happens frequently, you need to install more buffer.

B) FLOW CONTROL IMPROPERLY WIRED

The computer is inhibited from sending data due to incorrect wiring. Refer to sections IA3 and IB2 above.

PARALLEL DEVICES

VI. NOTHING HAPPENS WHEN SENDING DATA

A) VERIFY DATA IS BEING SENT

Put the Super Switch in the DATA display mode by using the select and advance pushbuttons. Send data and observe if the data LED 0-8 corresponding to the port being sent data lights up. If not there are several possible problems.

1) PORT NOT CONFIGURED AS A COMPUTER

Configure the port to be a computer. Refer to the configuration section.

2) IMPROPER CABLE WIRING

This is not usually a problem try connecting your computer directly to a parallel printer and see if it works. If not get the correct cable.

3) BUFFER FULL

Put the Super Switch in the BUFFER display mode. If all light are lit the buffer is full and you must wait for a destination device to accept some data for there to be more buffer space. If this happens frequently, you need to install more buffer.

B) VERIFY DESTINATION DEVICE

Put Super switch in the BUSY display mode. Switching the printer between on and off line will make the corresponding port LED go from off to on in BUSY display mode. Put the printer on line. Put the Super Switch in the DATA display mode. Observe the LED of the destination port. If it lights data is being sent.

1) PORT NOT CONFIGURED AS A PRINTER

Configure the port to be a printer. Refer to the configuration section.

2) INCORRECT DESTINATION

The destination has not been selected correctly. If another port LED lights then the data has been directed to the other port. Reissue the destination command.

3) IMPROPER CABLE WIRING

See section VIA2 above.

VII.GARBLED DATA RECEIVED AT DESTINATION DEVICE

A) WIRING INTERFERENCE

This may occur for computers which are a long distance from the Super Switch. The cable should be properly shielded with the chassis ground of the cable connected at one end only. The routing of the cable should avoid machinery which may generate electrical noise.

COMMAND SUMMARY

In the command syntax described below prefix indicates the currently programmed prefix. The + sign and spaces are used for descriptive purposes. For example to execute the configuration command with the default prefix you should send the three characters !@C.

Cancel stops a job from sending buffered data to its destination
Syntax: prefix + Knn
where K is the letter K
any job: nn is the job number 00 through 63
or
last job: nn represents the letters LL

Configuration accesses the configuration menu from serial port 0 only
Syntax: prefix + C
where C is the letter C

Destination selects the data destination
Syntax: prefix + n
where n is the new destination port number 0-9
(9 is the null destination port number)

Format sets the baud rate and protocol of a serial port
Syntax: prefix + Fnbbpwsc
where F is the letter F
n is the port number to be changed (0-8)
bb is the first two numbers of the baud rate
19=19200 96=9600 72=7200 48=4800 36=3600
24=2400 18=1800 12=1200 60=600 30=300
15=150 13=134 11=110 75=75 50=50
p is the parity N=None, E=Even, O=Odd, M=mark, or S=Space
w is the word length 5, 6, 7, or 8
s is the number of stop bits 1 or 2
c is the flow control type D=DTR or X=XON/XOFF

Print configuration prints the configuration menu to the current destination configuration (from port 0 only)
Syntax: prefix + P
where P is the letter P

Status displays a list of all jobs from any serial port
Syntax: prefix + S
where S is the letter S

Timeout enable enables a port to be disconnected from its source automatically when the timeout elapses
Syntax: prefix + Tn
where T is the letter T
n is the timeout enable; 1=timeout on or 0=timeout off

FACTORY DEFAULTS

Upon receiving the Super Switch from the factory the following default settings are installed.

Timeout	10 seconds
Prefix	!@
Type	Port 8 is parallel printer, all others are computers
Name	PORT x where x is the port number (0-8)
Destination	Port 8
Priority	Low
Timeout	On
Protocol	Serial:9600 baud, no parity, 8 bits, 1 stop bit, DTR Parallel: Ports 5-7 - computer; port 8 - computer
Form feed	Off
Initial string	None

DIAGNOSTIC MODE

This mode is used for the unit to continuously self test itself. The continuous self test mode is entered by pressing both front panel switches when the power is initially turned on. The unit will continuously go through its power up sequence and stop if it encounters an error, displaying the error on the LEDs and indicating servicing is required. To leave this mode power up the unit with no switches pressed.

RESTORING THE DEFAULT CONFIGURATION

When the diagnostic mode is in progress, pressing the select switch during test 4, enables the non-volatile ram to be restored to its factory default condition. The unit will stop on test 4. To load the default parameters push the advance switch. The unit should continue with its self test.

MAINTENANCE AND REPAIR

The exterior surface of the unit may be wiped with a damp cloth to keep it clean. The unit does not contain any jumpers or serviceable parts inside. Opening the unit invalidates the warranty except in the case of an authorized memory upgrade or firmware update. Any malfunction with the unit should be reported to a factory authorized repair center for service. Any problem with discrepancies in the operation of the unit according to this manual should be reported directly to the Technical Support department of Rose Electronics.

PINOUT SPECIFICATIONS

SERIAL MODEL

PIN	SIGNAL NAME	ACRONYM	I/O	DESCRIPTION
2	transmit data	TXD	output	serial data from port
3	receive data	RXD	input	serial data to port
4	request to send	RTS	output	always high
5	clear to send	CTS	input	must be high to transmit
6	data set ready	DSR	input	low inhibits transmit data
7	signal ground	GND	common	ground reference
8	data carrier detect	DCD	input	must be high to receive
20	data terminal ready	DTR	output	low should inhibit receive data

Pin 20 is the hardware flow control output.
Pin 6 is the hardware flow control input.
Pins 5, 6, and 8 have internal pullups to set them high when no signal is connected.
Do not use pins 5 or 8 as flow control inputs.

PARALLEL MODEL

PIN	SIGNAL NAME	COMPUTER PORT	PRINTER PORT	I/O DESCRIPTION
1	strobe/	input	output	data transfer when pulsed low
2	data 0	input	output	data LSB
3	data 1	input	output	.
4	data 2	input	output	.
5	data 3	input	output	.
6	data 4	input	output	.
7	data 5	input	output	.
8	data 6	input	output	.
9	data 7	input	output	data MSB
10	acknowledge/	output	input	pulsed low for data transfer
11	busy	output	input	when high inhibits flow of data
12	paper end	output low	input unused	when high printer is out of paper
13	select out	output high	input unused	select enable
14	autofeed/	input unused	output high	automatic paper feed
16	ground	-	-	wired common all ports
19-30	ground	-	-	wired common all ports
31	initial/	input unused	output high	when pulsed low resets printer
32	error	output low	input unused	when high printer has an error
33	ground	-	-	wired common all ports
36	select in/	input unused	output low	select enable

/ after a signal indicates it is active low

GENERAL SPECIFICATIONS

Serial ports
Electrical: RS232 -9 to +9 volts
Protocol: Asynchronous DTR/DSR, XON/XOFF
Baud rate: 50-19200 baud
Word length: 5, 6, 7, or 8
Parity: odd, even, mark, space, or none
Stop bits: 1 or 2

Parallel ports
Electrical: TTL levels
Protocol: Centronics compatible STB/ACK/BUSY interface

Size:
10.5" wide X 3.5" high X 5.0" deep

Chassis :
Painted tan aluminum enclosure
Rear mounted connectors
Black anodized 5.25" X 19" rack mount optional

Weight:
5 pounds

Power:
110 volt, 10 VA external wall mount adapter (standard)
220 volt, 10 VA external floor mount adapter (optional)
110 volt, 10 VA external floor mount adapter (optional)

Display:
Port select LEDS: 0-8
Status LEDs: Power, Buf, Data, Busy

Environment:
0 to 70 degrees C.
0 to 95% relative humidity

Connectors:
Serial: DB25 female
Parallel: Centronics 36 female

Signal lines used:
Serial: 4 signals switched, 2 input enables, 1 output enable
Parallel: 11 signals switched, 6 signals steady or unused

Setup configuration:
Stored in non-volatile memory

Warranty:
1 year parts and labor
Extended warranty available