Parallel Data Port

The parallel data interface supports IEEE 1284 bidirectional parallel communications in nibble mode. The parallel interface provides a means of communication that typically is faster than the serial interface methods. In this method, the bits of data that make up a character are sent all at one time over several wires in the cable, one bit per wire.

When communicating via the parallel port, the values selected on the print engine must be the same as those used by the host equipment connected to the print engine. Port selection for status information is determined by the channel sending the request. The parallel port can be set for bidirectional or unidirectional communication. The default setting is bidirectional.

Parallel Cabling Requirements

A standard 36-pin parallel connector is available on the back of the print engine for connection to the data source. An IEEE-1284 compatible bidirectional parallel data cable is required when this communication method is used. The required cable must have a standard 36-pin parallel connector on one end that is plugged into the mating connector located at the rear of the print engine. The other end of the cable connects to the print engine connector at the host computer. Port selection for status information is determined each time the print engine is turned on.

Parallel Port Interconnections

Table 8 shows the pin configuration and function of a standard computer-to-printer parallel cable.

Table 8 • Parallel Cable Pin Configuration

36-Pin Connectors	Description
1	nStrobe/HostClk
2–9	Data Bits 1–8
10	nACK/PtrClk
11	Busy/PtrBusy
12	PError/ACKDataReq
13	Select/Xflag
14	nAutoFd/HostBusy
15	Not used
16, 17	Ground
18	+5 V at 750 mA The maximum current draw may be limited by option configuration. To enable this capability, a qualified service technician must install a jumper on the print engine's main logic board on JP1, pins 2 and 3.
19–30	Ground

Table 8 • Parallel Cable Pin Configuration (Continued)

36-Pin Connectors	Description
31	nInit
32	nFault/NDataAvail
33, 34	Not used
35	+5 V through a 1.8 KΩ Resistor
36	NSelectin/1284 active

Serial Data Port

To communicate using the serial data port of the print engine, you must choose the number of data bits, parity, and handshaking. Parity applies only to data transmitted by the print engine because the parity of received data is ignored.

The values selected must be the same as those used by the host equipment connected to the print engine. Default print engine settings are 9600 baud, 8 data bits, no parity, and XON/XOFF. The print engine will accept any host setting for stop bits.

Hardware Control Signal Descriptions

For all RS-232 input and output signals, the print engine follows both the Electronics Industries Association (EIA) RS-232 and the Consultative Committee for International Telegraph and Telephone (CCITT) V.24 standard signal level specifications.

When DTR/DSR handshaking is selected, the Data Terminal Ready (DTR) control signal output from the print engine controls when the host computer may send data. DTR ACTIVE (positive voltage) permits the host to send data. When the print engine places DTR in the INACTIVE (negative voltage) state, the host must not send data.

Note • When XON/XOFF handshaking is selected, data flow is controlled by the ASCII Control Codes DC1 (XON) and DC3 (XOFF). The DTR Control lead has no effect.

Request To Send (RTS) is a control signal from the print engine that is connected to the Clear To Send (CTS) input at the host computer.

Pin Configuration

Connect the serial data cable to the female DB-9 connector on the back of the print engine. For all RS-232 connections through a DB-25 cable, use a DB-9 to DB-25 interface module (see *DB-9 to DB-25 Connections* on page 72).

Table 9 shows the pin configuration of the serial data connector.

Table 9 • Serial Connector Pin Configuration

Pin No.	Name	Description
1	–	Unused and unterminated
2	RXD	Receive data—data input to print engine
3	TXD	Transmit data—data output from print engine
4	DTR	Data terminal ready—output from print engine
5	SG	Signal ground
6	DSR	Data set ready—input to print engine
7	RTS	Request to send—output from print engine

Table 9 • Serial Connector Pin Configuration (Continued)

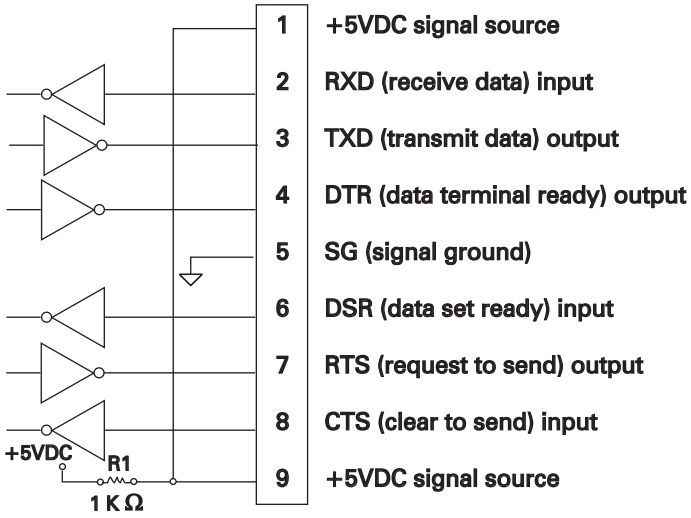
Pin No.	Name	Description
8	CTS	Clear to send—input to print engine
9	+5 VDC	+5 VDC at 750 mA The maximum current draw may be limited by option configuration. **Important •** To enable this capability, a qualified service technician must install a jumper on the print engine's main logic board on JP1, pins 2 and 3.

RS-232 Interface Connections

The print engine is configured as Data Terminal Equipment (DTE). Figure 11 shows the internal connections of the print engine's RS-232 connector.

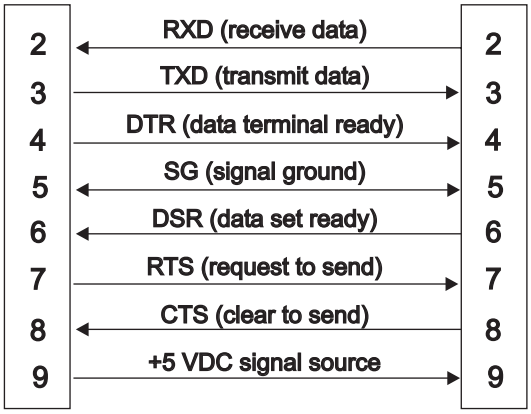
Note • Use a null modem (crossover) cable to connect the print engine to a computer or any other DTE device.

Figure 11 • RS-232 DB9 MLB Connections



When the print engine is connected via its RS-232 interface to Data Communication Equipment (DCE) such as a modem, use a standard RS-232 (straight-through) interface cable. Figure 12 illustrates the connections required for this cable.

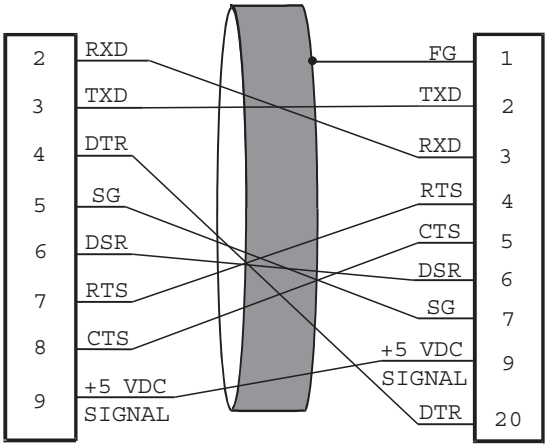
Figure 12 • RS-232 to DCE Cable Connectors



DB-9 to DB-25 Connections

To connect the print engine's RS-232 DB-9 interface to a DB-25 connector, an interface adapter is required. A generic DB-25 adapter can be used, although the +5 VDC signal source would not be passed through the adapter. Figure 13 shows the connections required for the DB-9 to DB-25 interface.

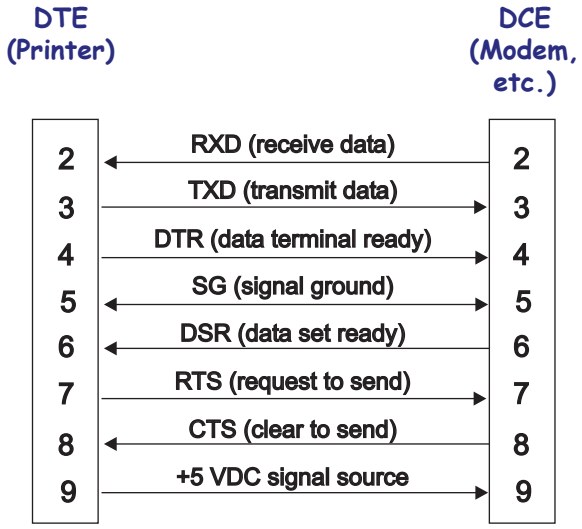
Figure 13 • DB-9 to DB-25 Cable Connections



Modem Connection

When the print engine is connected via its RS-232 interface to Data Communication Equipment (DCE) such as a modem, use a standard RS-232 (straight-through) interface cable. Figure 14 shows the connections required for this cable.

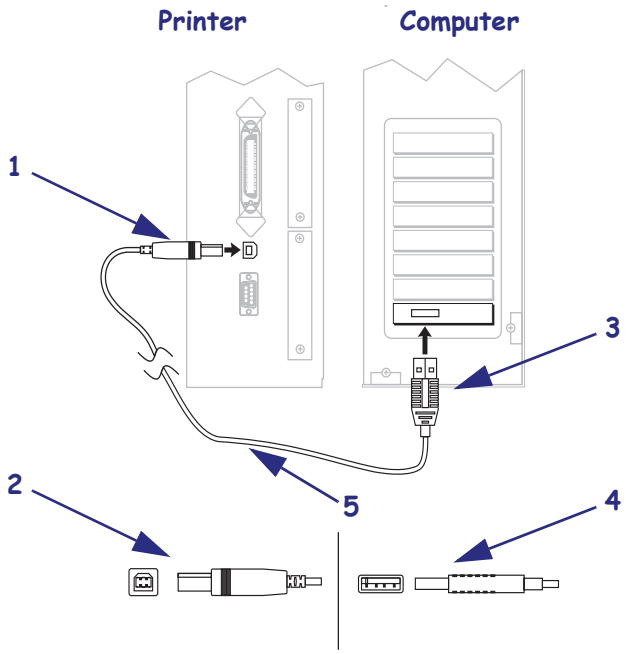
Figure 14 • RS-232 Cable Connections



USB 2.0 Port

A USB 2.0 port (which is USB 1.1 and 1.0 compatible) is available to connect your printer to the host equipment. The industry-standard USB cable has an A-male connector on one end and a B-male connector on the other end as shown in Figure 15.

Figure 15 • USB Connectors



1	“B” male connector, attaching to printer
2	“B” male connector, detail
3	“A” male connector, attaching to computer
4	“A” male connector, detail
5	Maximum cable length = 16.4 ft. (5 m)

Note • Use a USB 2.0-certified compliant cable no longer than 16.4 ft (5 m) long. A cable that meets these requirements is available from Zebra (part number 33011).

Applicator Interface Connector

An external DB-15 connector is present on the rear panel of the print engine for communication with a customer applicator. An optional DB-15 to DB-9 adapter cable (Zebra part number 49609) is available to accommodate existing DB-9 interfaces.

The print engine ships with the following caution label over the optional applicator port:

Caution:
Configured for non - isolated 5V internal power.
Reconfigure before applying external voltage.

- For +5V non-isolated mode (internal power), no configuration is necessary.
- For +5V to +28V isolated mode (external power), the jumpers on the applicator interface board must be reconfigured. Follow the instructions in *Applicator Interface Board Reconfiguration* on page 83.

Applicator Signals

The print engine communicates with a customer applicator through a series of signals on the pins in the DB-15 connector. Each pin causes different things to happen when the signal is active (asserted) or not active (deasserted). *Applicator Interface Connector Pin Configuration* on page 77 provides additional information about each pin and signal.

The following timing diagrams show how applicator signals function in each applicator mode during the stages of printing a label.

Figure 16 • Applicator Signals (Mode 1)

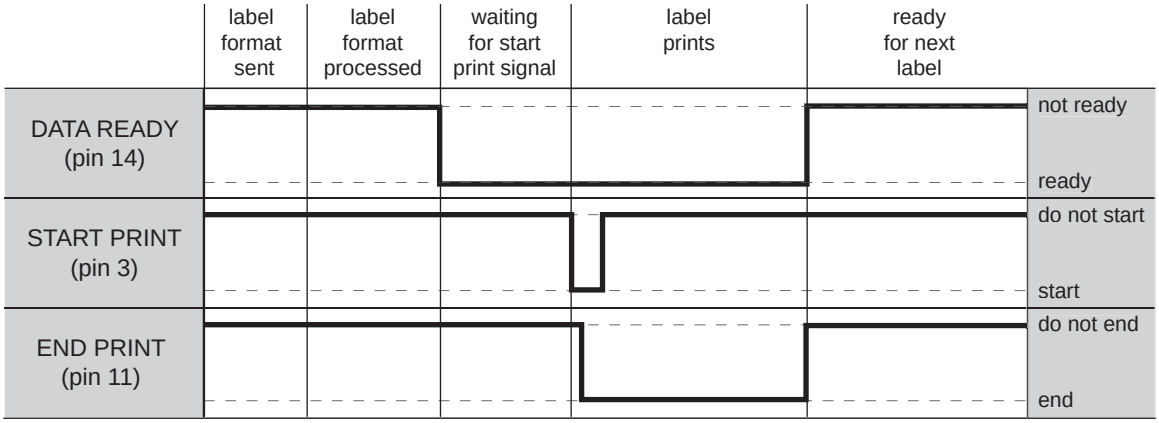


Figure 17 • Applicator Signals (Mode 2)

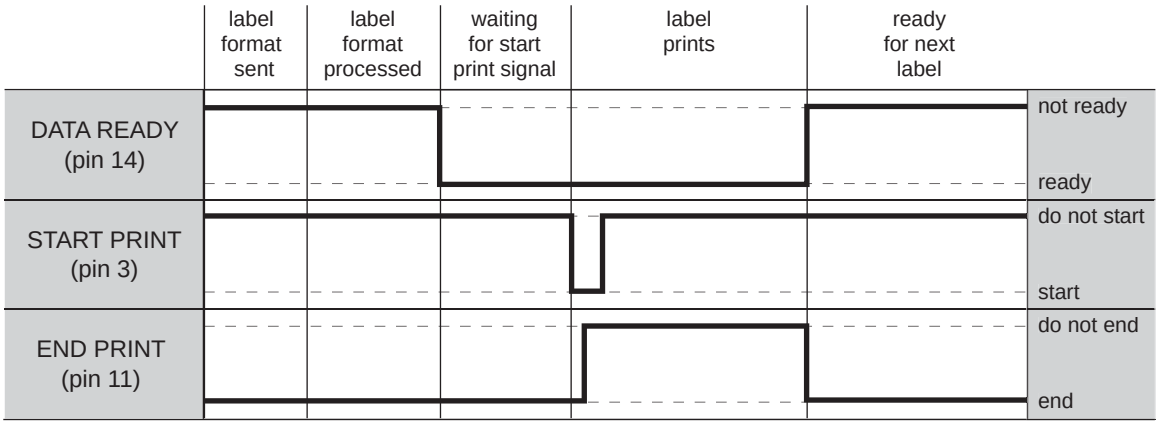


Figure 18 • Applicator Signals (Mode 3)

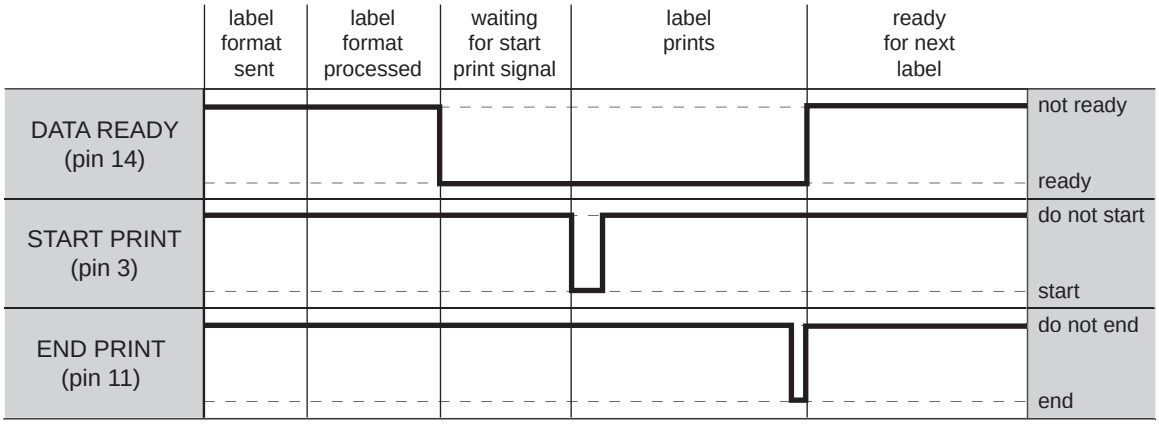
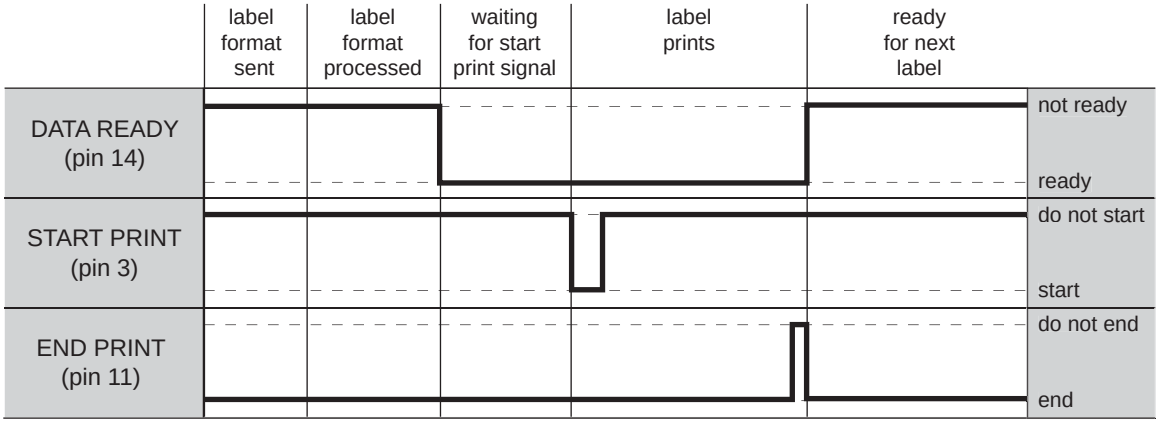


Figure 19 • Applicator Signals (Mode 4)



Applicator Interface Connector Pin Configuration

The Applicator Interface Assembly is available in two versions: a +5 V I/O and a +24-28 V I/O. Table 10 lists the pin configurations and functions of the applicator interface connector for both +5 V and +24–28 V operation.

Table 10 • Applicator Interface Connector Pin Configuration

Pin No.	Signal Name	Signal Type	Description
1	I/O SIGNAL GROUND	I/O Signal Ground	Using jumper J5, this pin can be configured as isolated or non-isolated. When in non-isolated mode, the printer's +5V ground is connected to this pin. See Figure 20 on page 79 for location of jumpers.
2	I/O SIGNAL POWER	Power	Using jumper J4, this pin can be configured as isolated or non-isolated. When in non-isolated mode, the printer's +5V power supply is used and fused at 1 Amp. See Figure 21 on page 80 and Figure 22 on page 81. **Note •** Replace the fuse with one of the same type and rating only.
3	START PRINT	Input	• **Pulse Mode**—The label printing process begins on the HIGH to LOW transition of this signal if a format is ready. De-assert this signal HIGH to inhibit printing of a new label. • **Level Mode**—Assert LOW to enable the print engine to print if a label format is ready. When de-asserted HIGH, the print engine completes the label that is printing then stops and waits for this input to be reasserted LOW.
4	FEED	Input	When the print engine is idle or has been paused, assert this input LOW to trigger repeated feeding of blank labels. De-assert HIGH to stop feeding blank labels and register to the top of the next label.
5	PAUSE	Input	To toggle the current Pause state, this input must be asserted LOW for 200 milliseconds, or until the SERVICE REQUIRED output (pin 10) changes state.
6	REPRINT	Input	• If the Reprint feature is enabled, this input must be asserted LOW to cause the print engine to reprint the last label. • If the Reprint feature is disabled, this input is ignored.
7	+28 V (Fused at 0.5A) **Note •** Replace the fuse with one of the same type and rating only.	Power	The Interface Power Supply. Supplies power to external sensors as required. **Note •** If operating with +28V signals, pin 7 may be used to supply power to pin 2. However, this creates a non-isolated mode of operation with +28V signals.

Table 10 • Applicator Interface Connector Pin Configuration (Continued)

Pin No.	Signal Name	Signal Type	Description
8	POWER GROUND (+28 V DC Return)	Power Ground	The Interface Power Ground. **Note •** If pin 7 is used to supply power to pin 2, use this pin to supply ground to pin 1. However, this creates a non-isolated mode of operation.
9	RIBBON LOW	Output	Asserted LOW if the Supplies Warning feature is enabled and the amount of ribbon remaining on the supply spindle is below the threshold level.
10	SERVICE REQUIRED	Output	Asserted LOW in the following circumstances: • the printhead is open • the ribbon or media is out • the print engine is paused • an operational fault occurs • a Resynch error occurs while the applicator Resynch mode is set to Error mode
11	END PRINT	Output	• **MODE 0**—The applicator port is OFF. • **MODE 1**—Asserted LOW only while the print engine is moving the label forward; otherwise deasserted HIGH. • **MODE 2**—Asserted HIGH only while the print engine is moving the label forward; otherwise deasserted LOW. • **MODE 3**—(Default) Asserted LOW for 20 milliseconds when a label is completed and positioned. Not asserted during continuous printing. • **MODE 4**—Asserted HIGH for 20 milliseconds when a label is completed and positioned. Not asserted during continuous printing.
12	MEDIA OUT	Output	Asserted LOW while there is no media in the print engine.
13	RIBBON OUT	Output	Asserted LOW while there is no ribbon in the print engine.
14	DATA READY	Output	• Asserted LOW when sufficient data has been received to begin printing the next label. • Deasserted HIGH whenever printing stops after the current label, due to either a pause condition or the absence of a label format.
15	SPARE	Output	Unassigned.