# Applicator Interface Board Overview

The applicator interface board provides a robust electrical signal interface between the printer and the outside world via a standard DB15 connector. The applicator **input** signals allow an external device to control when the printer prints. The applicator **output** signals provide handshaking and status information to the external host.

The applicator output voltage can be set to three levels (0V, 5V, 24V) through the Set-Get-Do (SGD) command shown in Table 3. The applicator provides 5V or 24V power to run the I/O interface and to power small external loads. All output signals are open collector with a light pull-up resistor built in. All signals and power are galvanically isolated from the host printer. The applicator provides a jumper to connect printer and applicator grounds, if required, but the default setting is isolation (see Change the Applicator Interface Board Jumper Configuration on page 79).

**IMPORTANT:**

- The 0V setting must be used when an external voltage is provided.
- The applicator output power supply can sustain momentary short circuits but may be damaged with long-term shorts. There are no user-replaceable fuses on the applicator interface board.

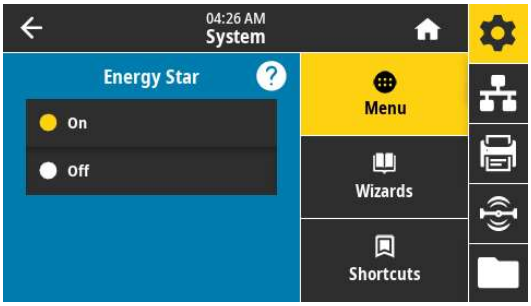
**Table 3** Applicator Interface Board Specifications

| | |
|---|---|
| Output voltage selections | • 0V (required setting when voltage is supplied externally)<br>• 5VDC (±10%) <= 1.0 A<br>• 24VDC (±10%) <= 0.5 A<br>Set by the following SGD command:<br>`! U1 setvar "device.applicator.voltage" "X"`<br>where X is 0, 5, or 24 to indicate the desired voltage. The printer must be power cycled before the setting takes effect.<br>**NOTE:** A high-voltage lockout jumper installed on the applicator interface PCBA prevents the output from going above 5V, even if the SGD is sent for 24V output. This precaution prevents accidental damage to external equipment. The jumper must be repositioned to allow for 24V operation. The default setting is for 5V operation. |
| Pull-up resistor on output | 10K +/- 5% |
| Pull-up resistor on input | 4.7K +/- 5% |
| Output signal current sink | <= 7 mA |
| User-supplied voltage range when output voltage set to 0V | 0–24 Volts |

## Energy Star Effect on the Applicator Interface Board

If the Energy Star feature is enabled and the printer goes to sleep, the applicator interface board shuts down. If the applicator interface board needs to remain on at all times, disable the Energy Star feature in one of the following ways:

- Set the Energy Star user menu item to OFF (on the Home screen, touch **Menu > System > Energy Saving > Energy Star**):




- Send the SGD command for disabling Energy Star:

```
! U1 setvar "power.energy_star.enable" "off"
```

  To reenable Energy Star, send the SGD command with the value "on".

## Change the Applicator Interface Board Jumper Configuration

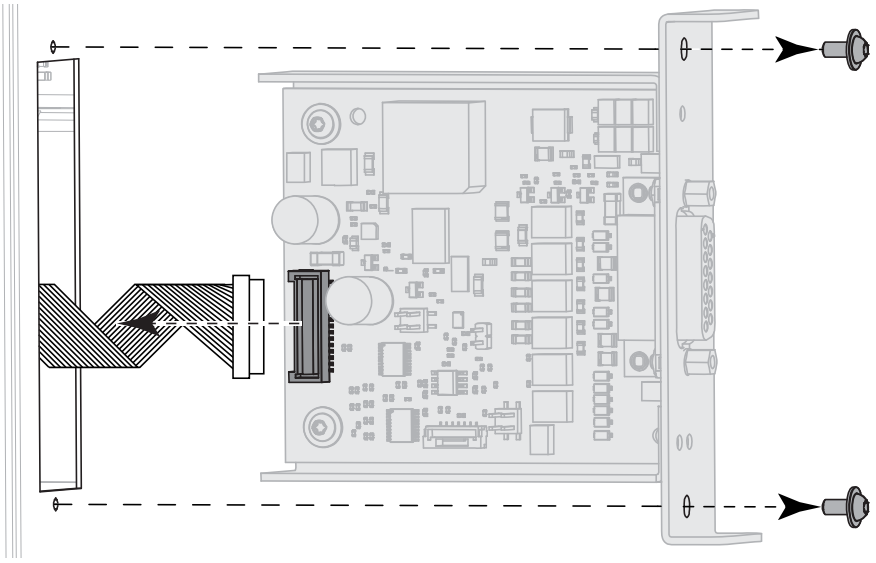
The applicator provides a jumper to connect printer and applicator grounds, if required, but the default setting is isolation. Follow the instructions in this section if you need to change the default settings.

**CAUTION:** Turn off (O) the printer and disconnect it from the power source before performing the following procedure.

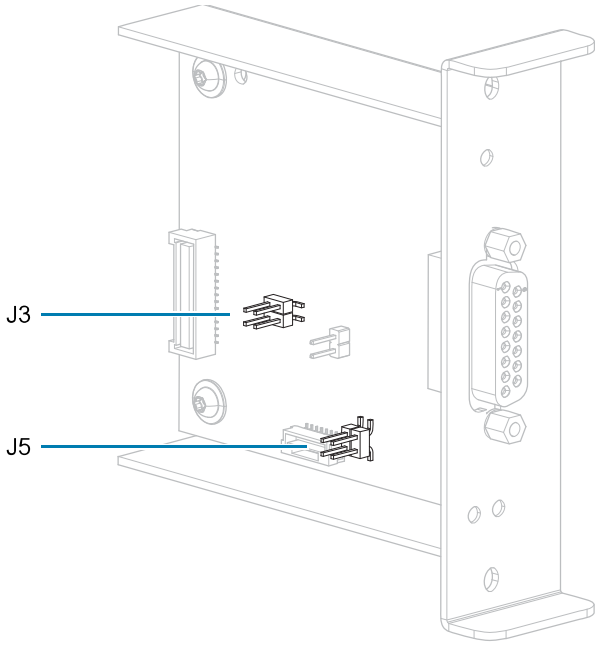
**CAUTION—ESD:** Observe proper electrostatic safety precautions when handling static-sensitive components such as circuit boards and printheads.

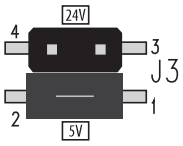
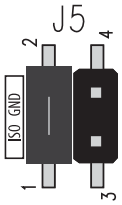
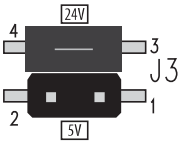
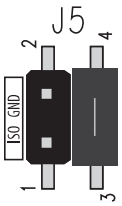
**IMPORTANT:** A qualified service technician must perform this installation. If the print engine is installed improperly, it could fall out of the applicator and cause injury. The keyhole and the center mounting bolt are designed to support the print engine and assist in installing and removing the four mounting screws.

1. To access the applicator interface board:
   a. Remove the two mounting screws securing the applicator interface board.
   b. Slide out the applicator interface board.
   c. Disconnect the applicator cable from the applicator interface board, making sure to keep the end of the cable from falling inside the printer.

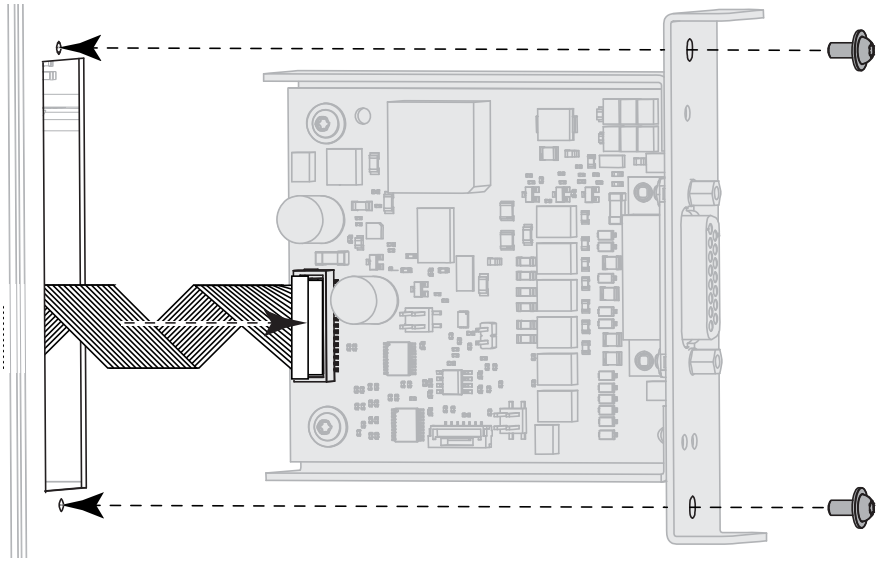


2. Configure the jumpers on the applicator board, as appropriate for your system.




| Jumper J3 — High-Voltage Lockout | | Jumper J5 — Ground Isolation Jumper | |
|---|---|---|---|
|   | **J3 Pins 1 and 2 connected** V out = 5V max (default) |   | **J5 Pins 1 and 2 connected** isolated (default) |
|   | **J3 Pins 3 and 4 connected** V out = 0V, 5V, 24V |   | **J5 Pins 3 and 4 connected** not isolated |

3. To reinstall the applicator interface board:
   a. Connect the applicator cable to the new applicator interface board.
   b. Insert the new applicator interface board, and secure it using the two new screws.



4. Reconnect the AC power cord and interface cables, and then turn on the printer power.
5. If necessary, change your Energy Star setting (see Energy Star Effect on the Applicator Interface Board on page 78).
6. If necessary, change the voltage using the **`device.applicator.voltage`** SGD command (see Table 3 on page 77). Then power cycle the printer.

## Applicator Interface Pin Configuration

**Figure 7** DB15 Connector

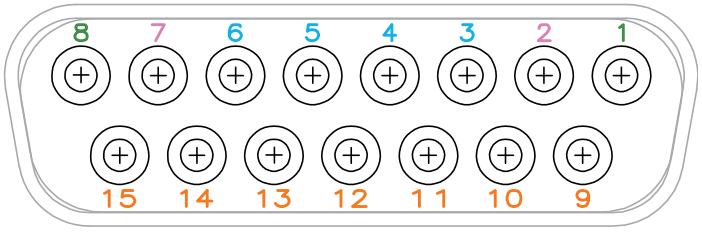



**Figure 8** External Pinouts

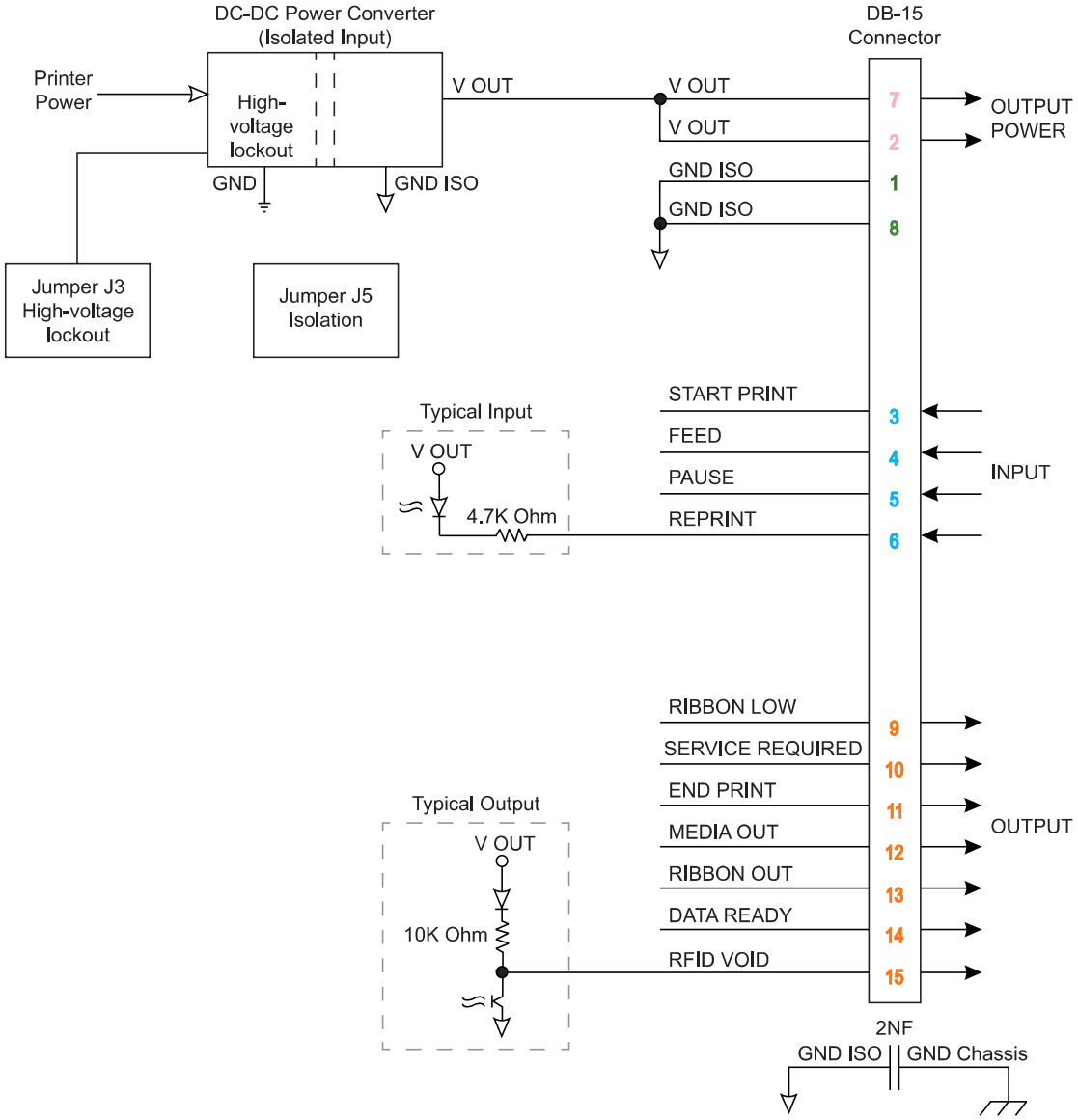


**Table 4** Applicator Interface Connector Pin Configuration

| Pin No. | Signal Name | Signal Type | Description |
|---|---|---|---|
| 1 | GROUND ISOLATED | Ground | Using jumper J5, this pin can be configured as isolated or non-isolated from the printer circuit ground (see Change the Applicator Interface Board Jumper Configuration on page 79). Default position is set to isolation. |
| 2 | VOUT | Power | Programmable output voltage of 0V, 5VDC, 24VDC. Voltage selection done by SGD command. Depending on configuration, jumper J3 will lock out 24V operation (see Change the Applicator Interface Board Jumper Configuration on page 79). If set in 5V position, only 0V and 5V will be available. If set to 24V position, 0V, 5V and 24V will be available, depending on the SGD command. Default is 5V configuration. |
| 3 | START PRINT | Input | See Applicator Signals on page 85 for more information about the start and end print signals.<br>• **Pulse Mode—**The label printing process begins on the HIGH to LOW transition of this signal if a format is ready. Deassert this signal HIGH to inhibit printing of a new label.<br>• **Level Mode—**Assert LOW to enable the printer to print if a label format is ready. When deasserted HIGH, the printer completes the label that is printing then stops and waits for this input to be reasserted LOW. |
| 4 | FEED | Input | When the printer is idle or has been paused, assert this input LOW to trigger repeated feeding of blank labels. Deassert 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 printer to reprint the last label.<br>• If the Reprint feature is disabled, this input is ignored. |
| 7 | VOUT | Power | Programmable output voltage of 0V, 5VDC, 24VDC. Voltage selection done by SGD command. Depending on configuration, jumper J3 will lock out 24V operation (see Change the Applicator Interface Board Jumper Configuration on page 79). If set in 5V position, only 0V and 5V will be available. If set to 24V position, 0V, 5V and 24V will be available, depending on the SGD command. Default is 5V configuration. |
| 8 | GROUND ISOLATED | Ground | Using jumper J5, this pin can be configured as isolated or non-isolated from the printer circuit ground (see Change the Applicator Interface Board Jumper Configuration on page 79). Default position is set to isolation. |
| 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. |

**Table 4** Applicator Interface Connector Pin Configuration (Continued)

| Pin No. | Signal Name | Signal Type | Description |
|---|---|---|---|
| 10 | SERVICE REQUIRED | Output | Asserted LOW in the following circumstances:<br>• the printhead is open<br>• the ribbon or media is out<br>• the printer is paused<br>• an operational fault occurs<br>• a Resynch error occurs while the applicator Resynch mode is set to Error mode |
| 11 | END PRINT | Output | See Applicator Signals on page 85 for more information about the start and end print signals.<br>**NOTE:** A format (^XA ... ^XZ) that does not print will signal that it is being processed. However, it will not trigger an End Print signal because no motion/printing is required.<br>• **MODE 0—**The applicator port is OFF.<br>• **MODE 1—**Asserted LOW only while the printer is moving the label forward; otherwise deasserted HIGH.<br>• **MODE 2—**Asserted HIGH only while the printer is moving the label forward; otherwise deasserted LOW.<br>• **MODE 3—**(Default) Asserted LOW for 20 milliseconds when a label is completed and positioned. Not asserted during continuous printing.<br>• **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 when there is no media in the printer. |
| 13 | RIBBON OUT | Output | Asserted LOW when there is no ribbon in the printer. |
| 14 | DATA READY | Output | See Applicator Signals on page 85 for more information about this signal.<br>• Asserted LOW when sufficient data has been received to begin processing the next label format.<br>• Deasserted HIGH when printing/processing stops after the current label format, either due to a pause condition or the absence of a label format. |
| 15 | RFID VOID | Output | • Asserted LOW when the RFID transponder over the antenna is “voided.”<br>• Deasserted HIGH when the end print signal is asserted. |

## Applicator Signals

The following timing diagrams show how applicator signals function in each applicator mode during the stages of printing a non-RFID label. For more information about applicator signals during RFID operation, see the RFID Programming Guide 3.

**Figure 9** Applicator Signals (Mode 1)

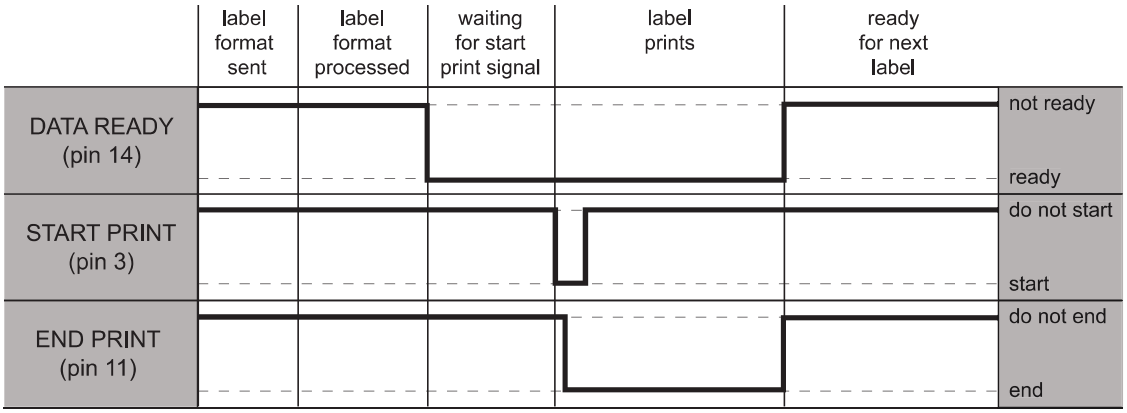



**Figure 10** Applicator Signals (Mode 2)

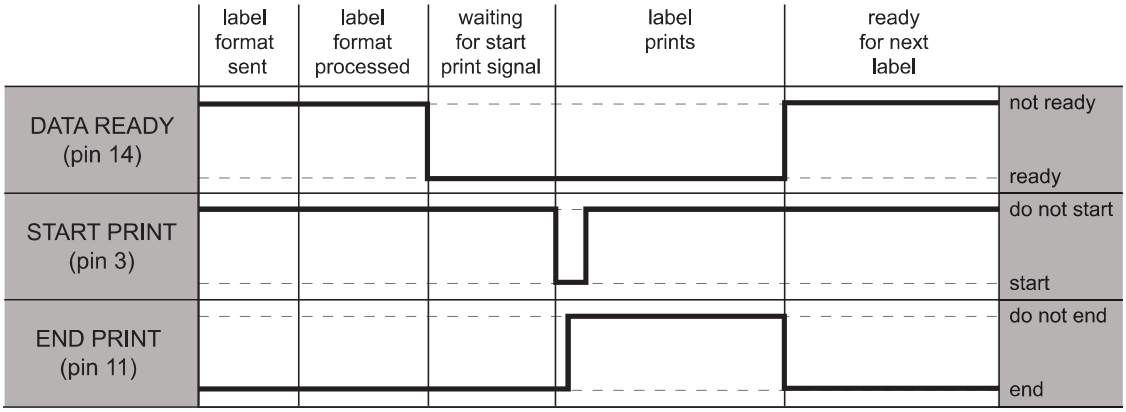



**Figure 11** Applicator Signals (Mode 3)

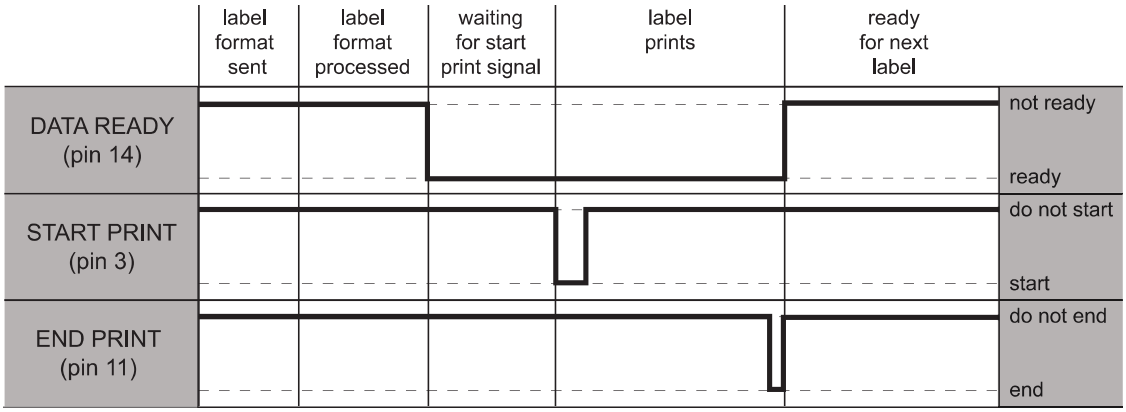


**Figure 12** Applicator Signals (Mode 4)