### 3.2.7 Standard IO

The printer comes with Standard IO providing external connections as shown in Figure 3-28.

*Note: If the External USB is not included on the Standard IO, the USB Port is located within the ink compartment (Figure 3-28).*
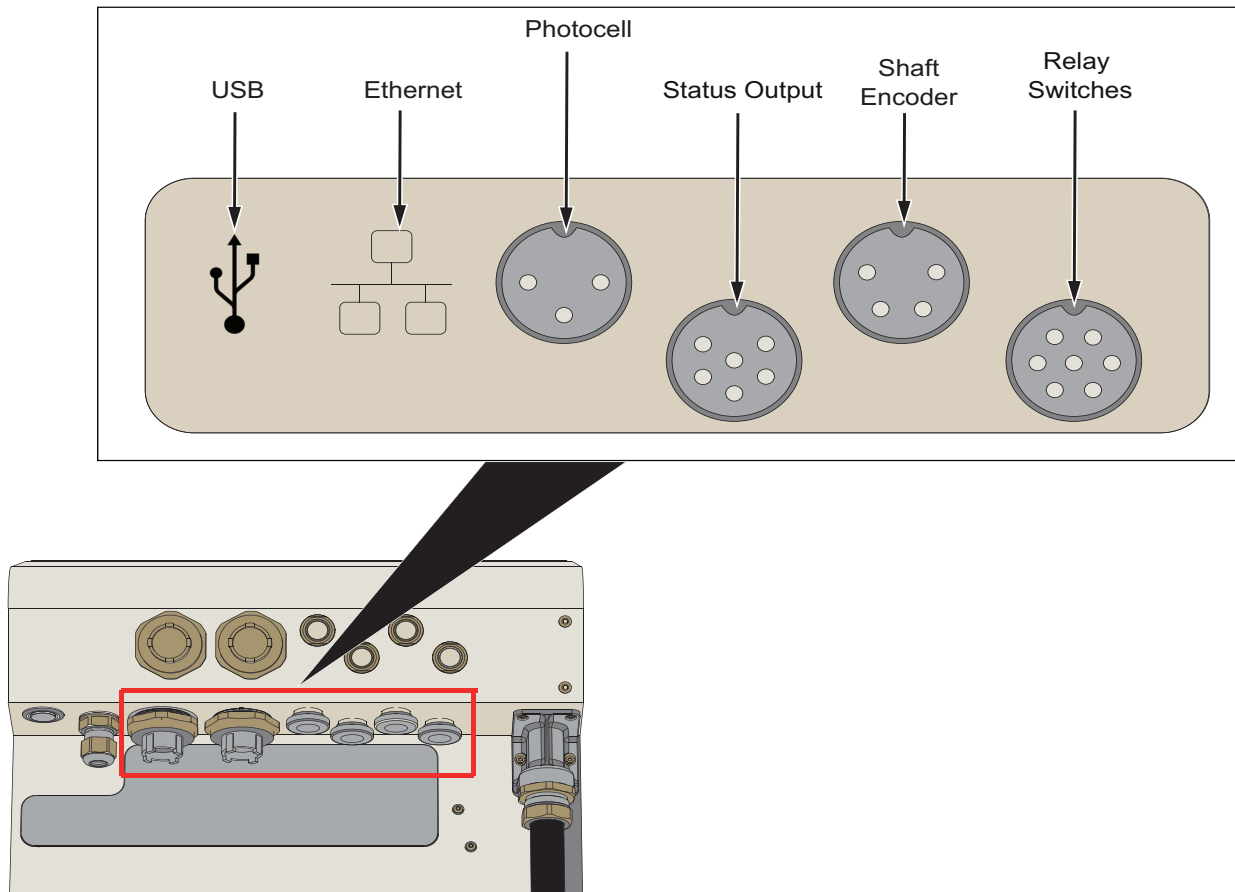


*Figure 3-28: Standard IO*

#### 3.2.7.1 USB

The USB Port is used to provide an external connection for import and export of files to the printer via USB.

The USB port can also be used to provide RS232 connectivity through the USB to RS232 Converter cable.

### 3.2.7.2 Ethernet Connector

The Ethernet connector is used to connect the printer to a remote computer or network to import data or control the printer remotely.
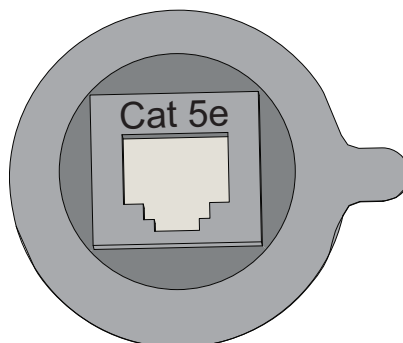
*Figure 3-29: Ethernet Connector*

*Note: Figure 3-29 represents the view of the connector from the back of the printer.*

### 3.2.7.3 Product Detector (Print Trigger) 1 Connector

The product detector connector is used to connect a product detector which provides a signal to the printer when a product is detected. The printer provides a +15 VDC, 200 mA output for use by a photoelectric cell (PEC), inductive proximity detector. The print trigger connector is a 3 way DIN connector. The pin functions are shown in Table 3-11.

*Note: Photoelectric cell (PEC) is also called as inductive proximity detector or product detector (PD).*

The default configuration is NPN (current sinking input). This input can be changed to PNP (sourcing input) on UI by navigating to *Tools > Line Setup > Print Trigger > PD Sensor Type*.

If the input is configured for PNP the maximum input voltage will be +24 VDC and the maximum current is 60 mA.
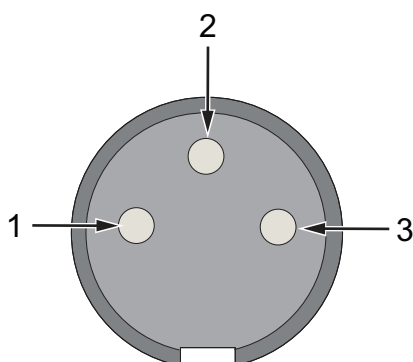
*Figure 3-30: Print Trigger 1 Connector Pin Diagram*

*Note: Figure 3-43 represents the view of the connector from the back of the printer.*

| Pin | Function |
|-----|----------|
| DIN Pin 1 | +15 VDC supply to sensor |
| DIN Pin 2 | Sensor output |
| DIN Pin 3 | 0 VDC common |

*Table 3-1: Print Trigger 1 Connector Pinouts*

*Note: The mating cable (male, 3 pin DIN connector -P/N: 500-0036-578) is used to interface other product detectors to the printer.*

### 3.2.7.4 Shaft Encoder Connector

The printer provides a nominal +15 VDC, 200 mA output for use by a shaft encoder with a maximum frequency of 100 kHz. The printer looks for NPN open collector input (only) for the encoder signals. The printer uses pulses (leading and trailing edges) from both channels (Channel A and Channel B) of the shaft encoder. For more information, refer Line Speed. The shaft encoder connector is a 4 way DIN connector. The pin allocation is shown in  Table 3-2 on page 3-20.



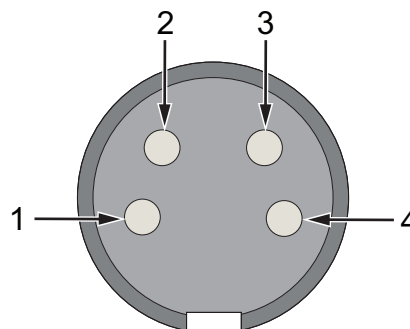*Figure 3-31: Shaft Encoder Connector Pin Diagram*

*Note: Figure 3-31 represents the view of the connector from the back of the printer.*

| Pin | Function |
|-----|----------|
| DIN Pin 1 | +15 VDC supply to shaft encoder |
| DIN Pin 2 | Shaft encoder input 'A' |
| DIN Pin 3 | Shaft encoder input 'B' |
| DIN Pin 4 | 0 VDC common |

*Table 3-2: Shaft Encoder Connector Pinouts*

*Note: The shaft encoder output must be of the PUSH/PULL type or open collector with pull-up resistor.*

*Note: The mating cable (male, 4 pin DIN connector - P/N: 500-0036-581) is used to interface other shaft encoders to the printer.*

#### 3.2.7.5 Status Output Connector

The printer provides an output for a set of status (alert) lights through the status output connector. This provides +24 VDC output, the printer will switch in a ground to turn on the light. This is a 6- way DIN connector. The pin allocation is shown in  Table 3-3 on page 3-21 and Figure 3-32.

| Lamp color | Function |
|------------|----------|
| Green | Print Ready Output |
| Yellow | Warning Output |
| Red | Fault Output |

*Note: For 24 VDC, the maximum current rating is 900 mA.*



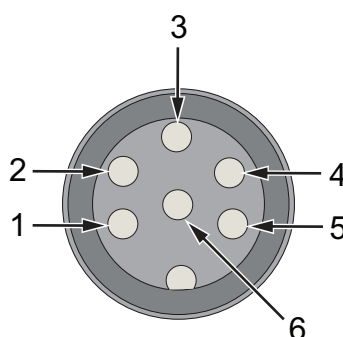*Figure 3-32: Status Output Connector Pin Diagram*

*Note: Figure 3-32 represents the view of the connector from the back of the printer.*

| Pin | Function |
|-----|----------|
| DIN Pin 1 | Red lamp negative supply |
| DIN Pin 2 | Amber lamp negative supply |
| DIN Pin 3 | Green lamp negative supply |
| DIN Pin 4 | +24 VDC supply to the strobe/siren |
| DIN Pin 5 | Strobe/siren negative supply |
| DIN Pin 6 | +24 VDC common to the traffic lights |

*Table 3-3: Status Output Connector Pinouts*

*Note: The mating cable (male, 6 pin DIN connector - P/N: 500-0036-577).*

### 3.2.7.6  Relay Switches

The relay switches connector (see Figure 3-33) is a 7 way DIN connector. This connector supports the following relays:

• Relay 'A', you can use the relay to provide a 'Print Ready' output.

• Relay 'B', you can use the relay to provide a 'Warning' output.

These relays have electrical ratings of 1 - 30 VDC, 500 mA maximum. It is suggested to use +24 VDC. For example, if the printer is in a print ready state, the normally open (N.O.) contacts closes and informs the host that the printer is in a print ready state. If the printer is removed from the print mode for any reason (removed from print), printer faults out, thus opens the contacts. The pin allocation is shown in  Table 3-4.
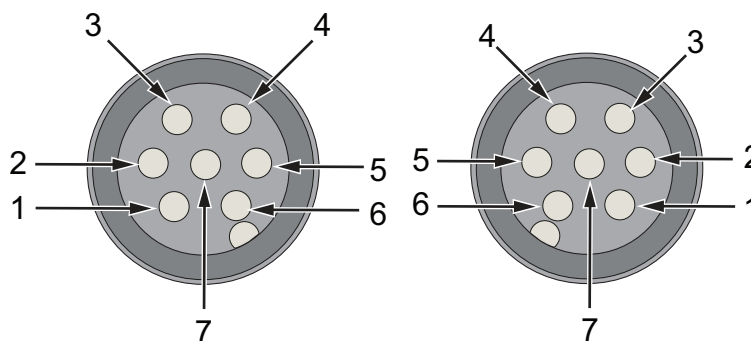


*Figure 3-33: Relay Switches Connector Pin Diagram*

*Note: Female connector (see Figure 3-33) represents the view of the connector from the back of the printer.*

| Connector Pin | | Function | Wire Color |
|---|---|---|---|
| **Female Pin** | **Male Pin** | | |
| DIN Pin 1 | DIN Pin 6 | Relay A - Normally open contact | White |
| DIN Pin 2 | DIN Pin 5 | Relay A - Normally closed contact | Red |
| DIN Pin 3 | DIN Pin 4 | Relay A - Common contact | Black |
| DIN Pin 4 | DIN Pin 3 | Relay B - Normally open contact | Green |
| DIN Pin 5 | DIN Pin 2 | Relay B - Normally closed contact | Blue |
| DIN Pin 6 | DIN Pin 1 | Relay B - Common contact | Brown or Orange |
| DIN Pin 7 | DIN Pin 7 | Not used | - |

*Table 3-4: Relay Switches Connector Pinouts*

*Note: The mating cable - P/N SP378810 (male, 7 pin DIN connector - P/N: 500-0036-583).*

*Note: These outputs are cold contact relays. It will not supply control voltage to the host system. If the host is going to send a control voltage through these contacts, it is suggested to use +24 VDC.*

*Note: RS232 is available through a USB to RS232 converter cable. To connect to an RS232 DB-9 male connector on a host PC, use RS232 to 5 pin DIN (3m) connector cable. Refer to IPB manual (P/N: 463287-01) for the required part numbers.*

### 3.2.8 Expanded IO

Additional connectivity is available through the addition of Expansion Board and RS232 connector as shown in Figure 3-34 to the printer, for external devices.

The various connections made from the Expanded IO is provided in Figure 3-34.

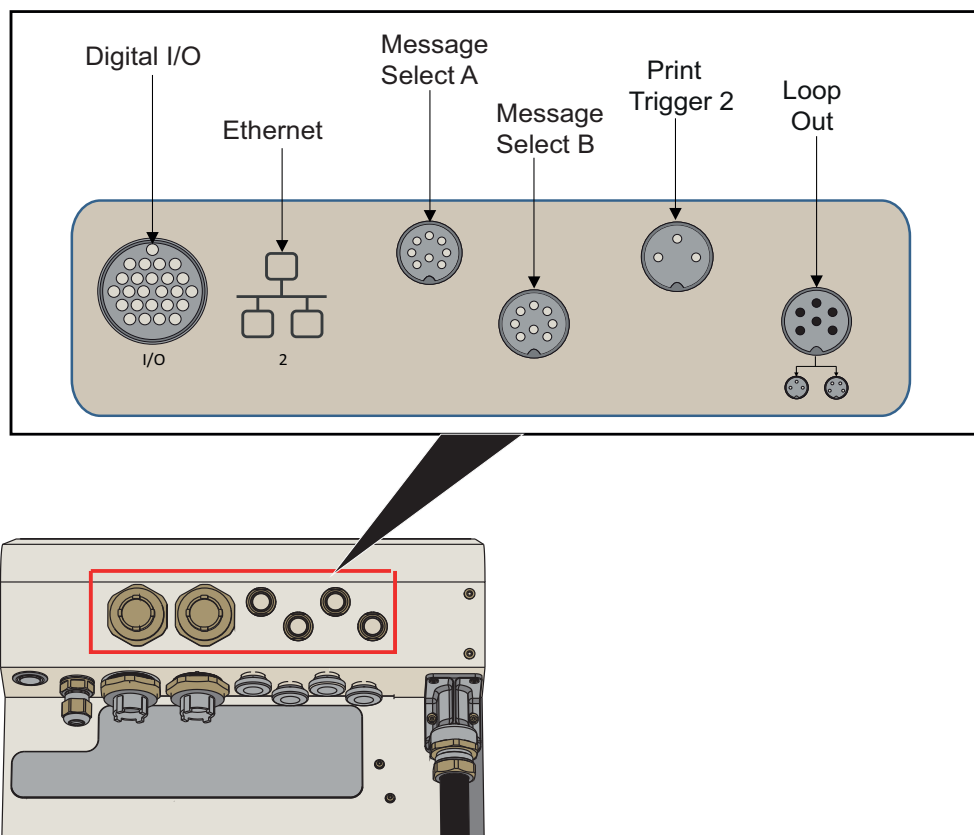*Output signal from photocell/shaft encoder as configured within the UI.*



*Figure 3-34: Expansion IO*

There are two options available for expanded IO:

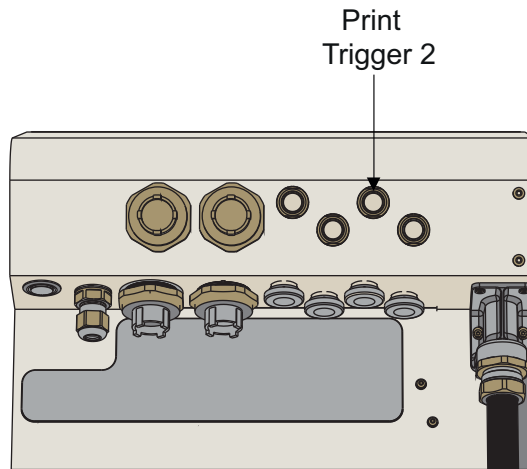• Expansion board connects the additional IO.
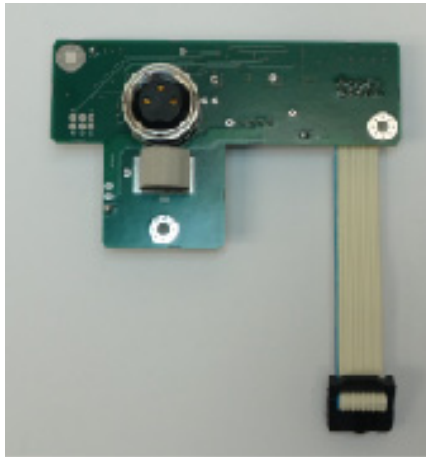


*Figure 3-35: Expansion Board*

• The PEC2 board connects to the MCB and provides a second photocell (Print Trigger 2) for traversing applications.

Print
Trigger 2



*Figure 3-36: Print Trigger 2*



*Figure 3-37: PEC2*

### 3.2.8.1  Digital I/O

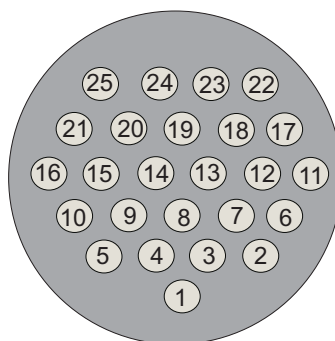The I/O 25 way connector (Bulgin Connector) is as shown in Figure 3-34.



*Figure 3-38: I/O 25 way Connector (Printer Side View - Female)*

*Note: Figure 3-34 represents the view of the connector from the back of the printer.*

| Pin | Function |
|-----|----------|
| 1 | +15 VDC Supply Voltage |
| 2 | Input 1+ |
| 3 | Input 1- |
| 4 | Input 2+ |
| 5 | Input 2- |
| 6 | Input 3+ |
| 7 | Input 3- |
| 8 | Input 4+ |
| 9 | Input 4- |
| 10 | Input 5+ |
| 11 | Input 5- |
| 12 | Common |
| 13 | Power +12 VDC to +24 VDC (Customer Supply Voltage) |
| 14 | Output 1 |
| 15 | Output 2 |
| 16 | Output 6 |
| 17 | Output 3 |
| 18 | Output 4 |
| 19 | Output 5 |
| 20 | Common |
| 21 | No Connection |

*Table 3-5:  I/O 25 Way Pinouts*

| Pin | Function |
|-----|----------|
| 22 | No Connection |
| 23 | No Connection |
| 24 | NA |
| 25 | Chassis Ground |

*Table 3-5:  I/O 25 Way Pinouts (continued)*

**Digital Input Configuration**

- Inputs can be configured for NPN or PNP configuration.
- Inputs can be configured to be opto isolated.

Following Input signals are available:

| Input Signal | |
|--------------|--------------|
| None | Stop Jet |
| Increment Counter | Enable Print |
| Reset Counter | Disable Print |

*Table 3-6: Input Signals*

When setting up Videojet 1880 inputs, there is an active polarity of the trigger settings. When working with a sinking input (NPN), where the control device is driving the input(-) side of the circuit, set edge to high for leading edge activation.

When working with a sourcing input (PNP), where the control device is driving the input(+) side of the circuit, set edge to high for leading edge activation.

**Digital Output Configuration**

- Outputs are only NPN (currently sinking).

Following Output signals are available:

| Output Signal | |
|---------------|---------------|
| None | Print Complete |
| Print Enabled | Fault Active |
| No Code No Run | Warning Active |

*Table 3-7: Output Signals*

*Note: Make sure to setup the inputs and outputs before assigning the ports within a message. Navigate to Tools > Printer Settings > Digital I/O to set the input and output parameters. For more information refer to Section 6.2.1.2 Digital I/O on page 6-8.*



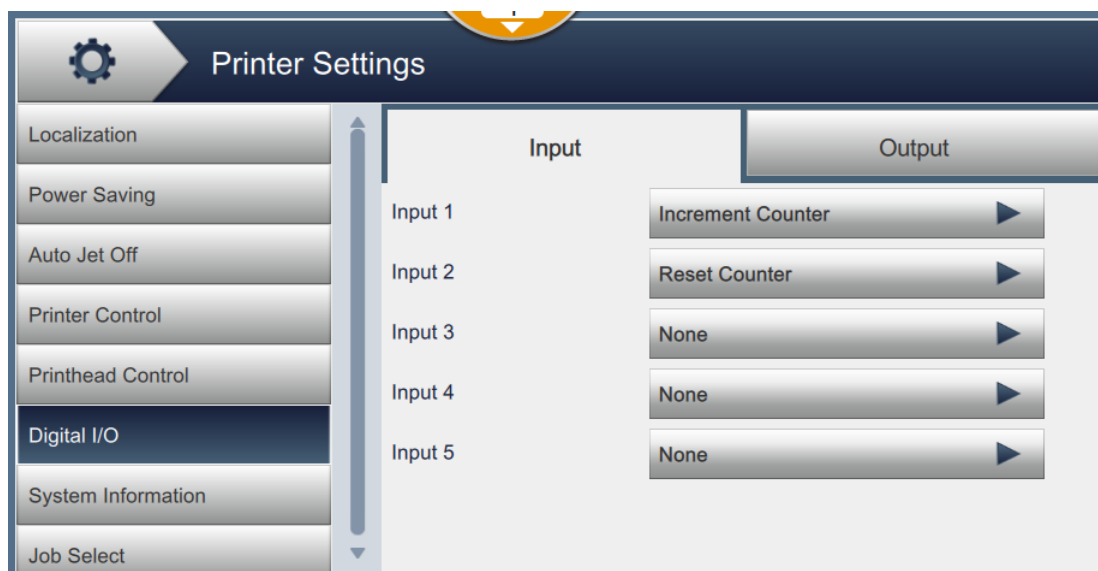*Figure 3-39: Digital I/O Screen*
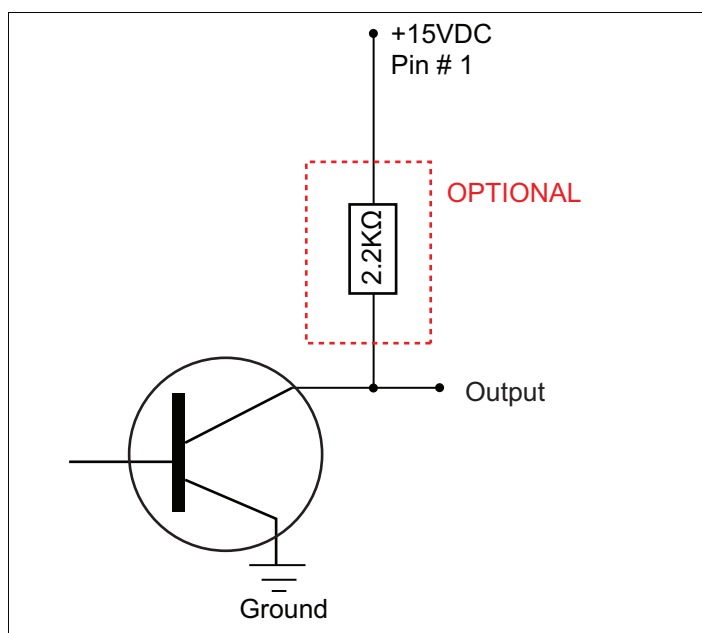
• **Opto Isolated Input Circuit:**



*Figure 3-40: Opto Isolated Input Circuit*

• **Output Circuit:**

All outputs print ready, warnings, fault, print complete are current sinking outputs (NPN) only, It is recommend to use a 1K or 2.2K pull-up resistor to the +15VDC (pin 13) to see the transition of the output. It is also recommended that this output drive a solid state relay if the customer would like a sourcing output.

*Note: If the customer has a +24VDC I/O, a recommended solid state relay to use is Videojet P/N: 377526.*

#### 3.2.8.2  Ethernet Connector

The Ethernet connector is used to connect the printer to a remote computer or network to import data or control the printer remotely.

Figure 3-29 on page 3-19 represents the view of the connector from the back of the printer.

#### 3.2.8.3  Message A and B Input Connector

There are eight external message inputs provided on expansion board with four inputs on message connector.

The printer uses the message inputs to select messages numbers coded in Binary Coded Decimal (BCD) format (00-99) with Message A as the least significant digit.
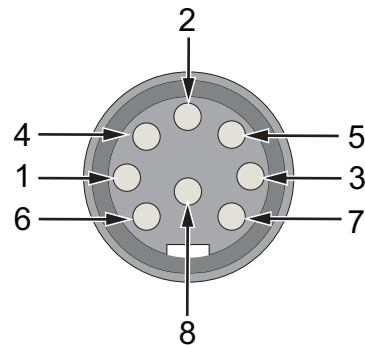


*Figure 3-41: Message A Input Connector*

*Figure 3-41 represents the view of the connector from the back of the printer.*

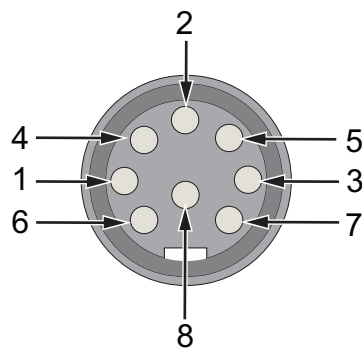| Pin | Function |
|-----|----------|
| DIN Pin 1 | 0 (Least significant bit +15 VDC supply) |
| DIN Pin 2 | 0 (Least significant bit input) |
| DIN Pin 3 | 1 (Second bit +15 VDC supply) |
| DIN Pin 4 | 1 (Second bit input) |
| DIN Pin 5 | 2 (Third bit +15 VDC supply) |
| DIN Pin 6 | 2 (Third bit input) |
| DIN Pin 7 | 3 (Most significant bit +15 VDC supply) |
| DIN Pin 8 | 3 (Most significant bit input) |

*Table 3-8: Message A Input Connector Pinouts*

*Figure 3-42: Message B Input Connector*

*Figure 3-42 represents the view of the connector from the back of the printer.*

| Pin | Function |
|---|---|
| DIN Pin 1 | 4 (Least significant bit +15 VDC supply) |
| DIN Pin 2 | 4 (Least significant bit input) |
| DIN Pin 3 | 5 (Second bit +15 VDC supply) |
| DIN Pin 4 | 5 (Second bit input) |
| DIN Pin 5 | 6 (Third bit +15 VDC supply) |
| DIN Pin 6 | 6 (Third bit input) |
| DIN Pin 7 | 7 (Most significant bit +15 VDC supply) |
| DIN Pin 8 | 7 (Most significant bit input) |

*Table 3-9: Message B Input Connector Pinouts*

| Input | Message Selection Bits | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 54 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| 99 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 |

*Table 3-10: Message Selection Bits - An Example*

### 3.2.8.4  Product Detector (Print Trigger) 2 Connector

The product detector connector, to be used to connect a product detector which provides a signal to the printer when a product is detected. This is used for the bi-directional (reverse print) input, used for traversing printhead applications. This input reverses the characters and message when it is triggered before Print Trigger 1 is triggered.

When the input is not active high, the printer will print the job as configured on the printer.

When PEC1 is triggered and the input is active low (on) and held low for all PEC1 inputs, the printer will print the job as opposite of what is configured on printer, thus reversing the code. This input is not a trigger signal but a direction signal.

The printer provides a +15 VDC, 200 mA output for use by a photoelectric cell (PEC), inductive proximity detector. The print trigger connector is a 3 way DIN connector. The pin functions are shown in Table 3-11.

*Note: Photoelectric cell (PEC) is also called as inductive proximity detector or product detector.*

The default configuration is NPN (current sinking input). This input can be changed to PNP (sourcing input) on UI by navigating to *Tools > Line Setup > Print Trigger > PD Sensor Type.*

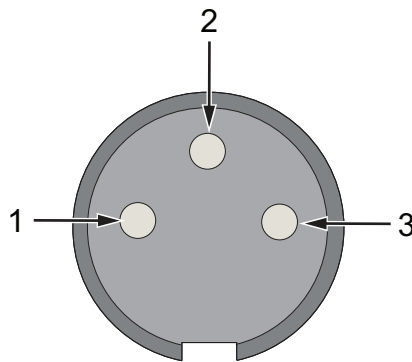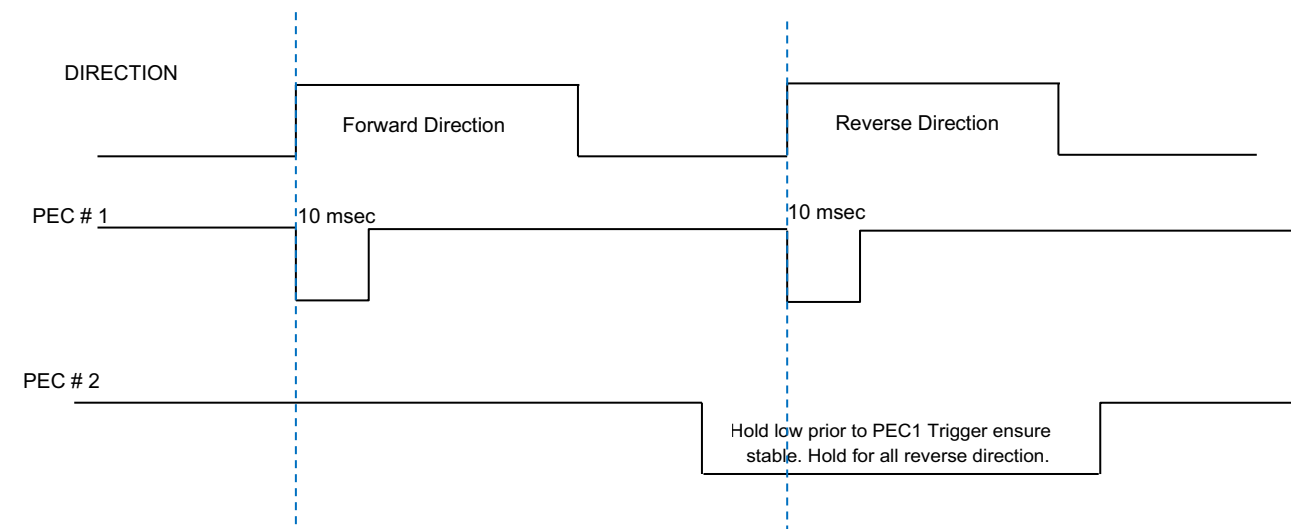If the input is configured for PNP the maximum input voltage will be +24 VDC and the maximum current is 60 mA.



*Figure 3-43: Print Trigger 2 Connector Pin Diagram*

*Note: Figure 3-43 represents the view of the connector from the back of the printer.*

| Pin | Function |
|-----|----------|
| DIN Pin 1 | +15 VDC supply to sensor |
| DIN Pin 2 | Sensor output |
| DIN Pin 3 | 0 VDC common |

*Table 3-11: Print Trigger 2 Connector Pinouts*

*Note: The mating cable (male, 3 pin DIN connector -P/N: 500-0036-578) is used to interface other product detectors to the printer.*

DIRECTION

Forward Direction

Reverse Direction

PEC # 1

10 msec

10 msec

PEC # 2

Hold low prior to PEC1 Trigger ensure stable. Hold for all reverse direction.

Print Output Orientation:

Print is normal reflect settings on UI

Printer is reverse opposite of what is set on printer's UI

*Figure 3-44: Bi-Directional Timing*

### 3.2.8.5 Loop Out

The Loop Out functionality allows 2 or more printers to be linked together.

The Loop Out cable allows up to two print trigger outputs and one shaft encoder output from one printer to be input to a second printer. The inputs to the printer can be used as required.
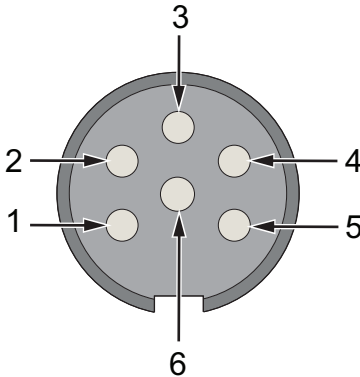
The pin allocation is shown in  Table 3-12.



*Figure 3-45: Loop Out Connector*

*Note: Figure 3-45 represents the view of the connector from the back of the printer.*

| Pin | Function |
|-----|----------|
| DIN Pin 1 | 0 VDC common |
| DIN Pin 2 | Sensor output (Print Trigger 1) |
| DIN Pin 3 | Sensor output (Print Trigger 2) |
| DIN Pin 4 | Shaft encoder input 'A' |
| DIN Pin 5 | Shaft encoder input 'B' |
| DIN Pin 6 | +15VDC supply |

*Table 3-12:  Loop Out Connector Pinouts*

### 3.2.9 Umbilical

The umbilical contains electrical wiring and ink system tubing from the printer to the printhead. The standard length of the umbilical is 3 m (9.84 ft). The 6 m (19.69 ft) optional umbilical is recommended for traversing applications. The 6 m (19.69 ft) umbilical provides additional strain relief to the printhead assembly to support traversing applications.