Electrical Databook and Design Guide

Rev #: 4.03

Date: 02 August 2021

Revision History

Doc. Version	SW Release	Date	Details

4.03	R4.2.3	02-Aug-21	• Updated 3.7 Print Module PassThrough PCA – renamed Wiper Low Switch to Wiper Out Switch and added description for the switches
			• Updated 4.6 Emergency Stop (E-Stop) Connector – added description and graphic for the E-stop switch
			• Updated the following figures:
			  • Figure 1 – DuraFlex Modules
			  • Figure 9 – Print Module PassThrough PCA Diagram
			  • Figure 13 – E-Stop Switch Circuitry
			  • Figure 16 – DuraFlex Electrical Block Diagram
			• Updated Table 7 – Connector Specifications – removed the Wire Color column for QAI cables (RJ12)
			• Updated Table 8 – Print Module PassThrough PCA Connections
			• Changed "FFC Cable" to "FFC"
			• Minor editorial updates

4.02	R4.2.3	30-Apr-21	• Added 1.5 Glossary • Added 1.6 Additional Documentation or Access • Minor editorial updates
4.01	R4.2.3	24-Mar-21	Deleted Section 5.4 Cable Drawings
4.00	R4.2.3	23-Mar-21	Initial release

Contents

1 Introduction 5

1.1 Aim and Audience 5
1.2 Prerequisites and Scope 5
1.3 Typographic Conventions 5
1.4 Related Documentation 5
1.5 Glossary 6
1.6 Additional Documentation or Access 6

2 DuraFlex Printing System 7

3 Electrical Overview 8

3.1 Datapath PCA 9
3.2 Mechanical Controller PCA 10
3.3 Pressure Sensor PCA 12
3.4 Pinch Valve PCA 12
3.5 Printhead Power PCAs 13
3.6 BIDS PassThrough PCA 14
3.6.1 QAI Cables (RJ12) 15
3.7 Print Module PassThrough PCA 15

4 OEM Interfaces 17

4.1 Power Supply Connector 18
4.2 Ethernet Connections 18
4.3 OEM Connector 18
4.4 Encoder Connector 19
4.5 Printer Signal Combiner 20
4.6 Emergency Stop (E-Stop) Connector 20
4.7 Motor Fuse 21

5 Assembly Overview 22

5.1 Media Path Setup 22
5.2 IDS Setup 22
5.3 WIMM Setup 22

6 N-Wide Electrical Connections 23

6.1 Power Wiring 23
6.2 BIDS Electrical Cable 23
6.3 WIMM Electrical Cable 23
6.4 Ethernet Cables 23
6.5 Encoder Cable 23
6.6 TOF Cable 23
6.7 PSC (Printer Signal Combiner) Ethernet Cable 23

Appendix – Peripheral Hardware 24

Encoder 24
TOF Sensor 24

Appendix – Block Diagram 25

Figures

Figure 1 – DuraFlex Modules 7
Figure 2 – DuraFlex Electrical Overview 8
Figure 3 – Datapath PCA Diagram 9
Figure 4 – Mechanical Controller PCA Diagram 10
Figure 5 – Pressure Sensor PCA Diagram 12
Figure 6 – Pinch Valve PCA Diagram 12
Figure 7 – Printhead Power PCA Diagram 13
Figure 8 – BIDS PassThrough PCA Diagram 14
Figure 9 – Print Module PassThrough PCA Diagram 16
Figure 10 – Electrical Module Diagram 17
Figure 11 – Encoder Signals 19
Figure 12 – TOF Sensor Signals 19
Figure 13 – E-Stop Switch Circuitry 20
Figure 14 – Example Encoder 24
Figure 15 – Example TOF Sensor 24
Figure 16 – DuraFlex Electrical Block Diagram 25

Tables

Table 1 – Datapath PCA Connections 9
Table 2 – Mechanical Controller PCA Connections 11
Table 3 – Pressure Sensor PCA Connections 12
Table 4 – Pinch Valve PCA Connections 12
Table 5 – Printhead Power PCA Connections 13
Table 6 – BIDS PassThrough PCA Connections 14
Table 7 – Connector Specifications 15
Table 8 – Print Module PassThrough PCA Connections 16
Table 9 – OEM Interfaces 17
Table 10 – Power Supply Connector Pinout 18
Table 11 – OEM 10-Pin Connector Pinout 18
Table 12 – Encoder DB9 Connector Pin Details 19

1 Introduction

This document is part of the OEM-facing technical documentation suite for Memjet DuraFlex® module-based printing systems. It references, and therefore requires access to, additional documentation available for download from your Memjet Partner Site.

Other Databook and Design Guides provide technical detail about specific modules for targeted engineering audiences.

1.1 Aim and Audience

This document describes the electrical interface for Original Equipment Manufacturers (OEMs) who are designing and building a DuraFlex printing system.

It is intended for electrical design engineers and developers who are responsible for integrating their equipment with Memjet DuraFlex systems.

1.2 Prerequisites and Scope

The reader is expected to be familiar with Memjet inkjet printing technology, its applications, and implementation.

This document does not describe the internal electrical design of the DuraFlex Modules, or details that are specific to Memjet components within a DuraFlex system.

1.3 Typographic Conventions

Throughout this document, the following typographic conventions are used:

`Code Character`	`Courier` font is used to identify HTTP GET and POST commands with associated arguments, as well as references to source code, job states, registry settings, directory/file names, XCI commands, and XML settings.
Bold	Text that appears on-screen in the user interface is shown in **bold font**. This includes UI buttons, engine states, warning codes, and fault codes.
Yellow Highlighting	Yellow highlighting indicates sections that are new or updates in this version of the document, compared to the previous version.

1.4 Related Documentation

Other documents, besides this guide, provide further details for specific readers:

- *System Overview* – For OEM managers and non-technical personnel charged with evaluating the DuraFlex components for use within their products. This document describes the DuraFlex concept and Memjet-supplied DuraFlex components and gives an overview of the operational considerations. It introduces the components an OEM is required to design and manufacture to ensure the DuraFlex Modules function as designed in a DuraFlex-based print engine.
- *Mechanical and Fluidic Databook and Design Guide* – For mechanical design engineers and developers, providing details of the Memjet hardware modules and components (including printhead and maintenance system) and specifications of the ink delivery system fluidics.
- *Electrical Databook and Design Guide* – For electrical design engineers and developers, providing details of the Memjet power requirements, electronic assemblies, and connections.

- *Software Databook and Design Guide* – For software and firmware engineers who need to understand the software interfaces, commands, scripts, and reference software applications.
- *Demo GUI User Guide* – For OEM personnel using the DuraFlex Demo GUI reference application.
- *Installation and Commissioning Guide* – For OEM personnel who are installing and commissioning a new printing system.
- *Operations Guide* – For OEM engineers and operators to perform operational tasks.
- *Troubleshooting Guide* – For OEM engineers and technicians to identify symptoms and resolve issues.
- *Service and Repair Guide* – For OEM engineers and technicians to perform DuraFlex inspection and maintenance tasks and component and consumable replacement.
- *Job Submission Library Guide* – For OEM software engineers to incorporate the Job Submission Library (JSL) into their chosen Raster Image Processor (RIP).
- *Technical Bulletins* – For various audiences to announce product or process update or to provide specifics on single-subject technical topics.
- *CAD and Schematics* – For various audiences to provide detailed dimensions related to specific areas.

Note:	All technical documentation is available on your Memjet Partner Site.

1.5 Glossary

For terms, acronyms, and abbreviations used in this guide and some product-specific terms, see the *DuraFlex Glossary*.

Note:	This document is hyperlinked to the glossary. For offline reading, download the DuraFlex Glossary file from your Memjet Partner Site.

1.6 Additional Documentation or Access

For additional product-related technical documents, go to your Memjet Partner Site.

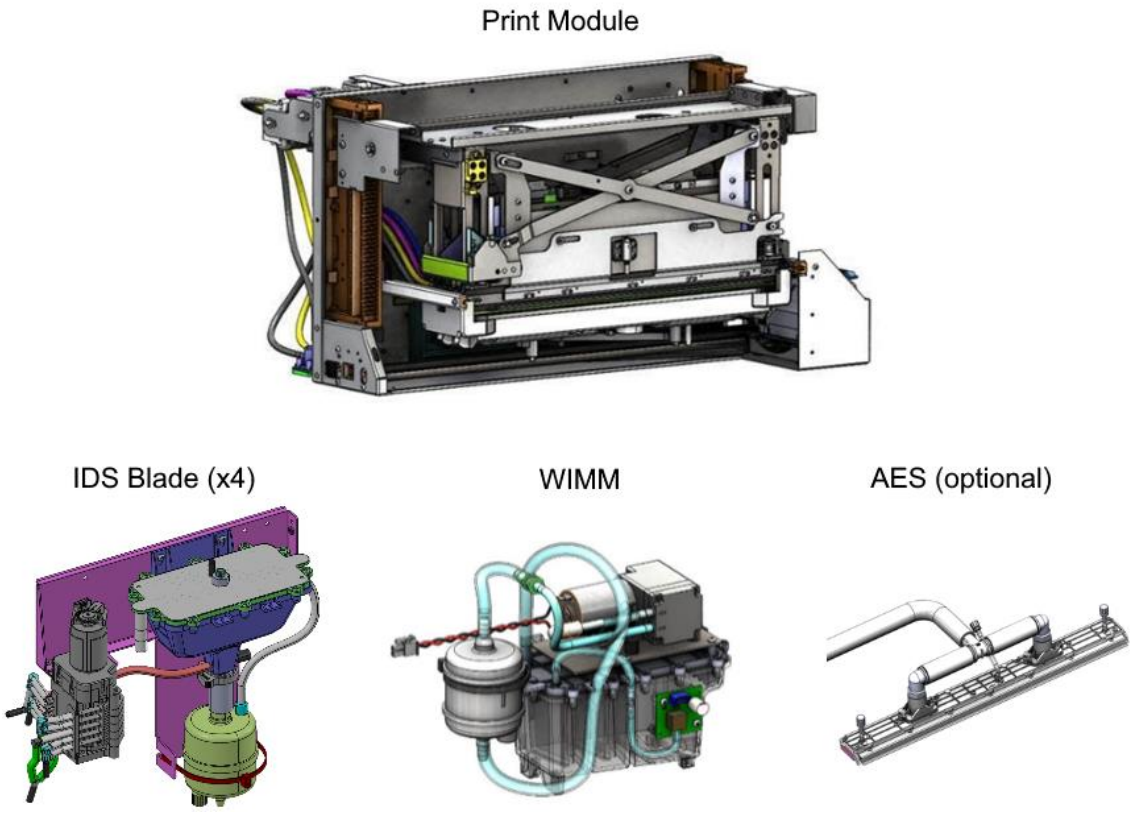
If you need Partner Site access, enter a case in Service Desk (*https://OEMsupport.memjet.com*), send an email to Memjet Customer Support (*customer.support@memjet.com*), or contact your Technical Account Manager.

2 DuraFlex Printing System

DuraFlex provides a cost-effective, 4-color, A3 printing solution designed for multiple markets across desktop, labels, mini press, and wide-format applications. A DuraFlex printing system delivers high print quality output using pigment ink technology. This flexible system is scalable to meet wider print width requirements (up to four A3 printheads wide).

Each DuraFlex print unit consists of a Print Module, a 4-color (CMYK) Ink Delivery System (IDS) with BIDS PassThrough PCA, a Waste Ink Management Module (WIMM), and an optional Aerosol Extraction System (AES) that are integrated with OEM components to form a functional printing system.

Figure 1 – DuraFlex Modules



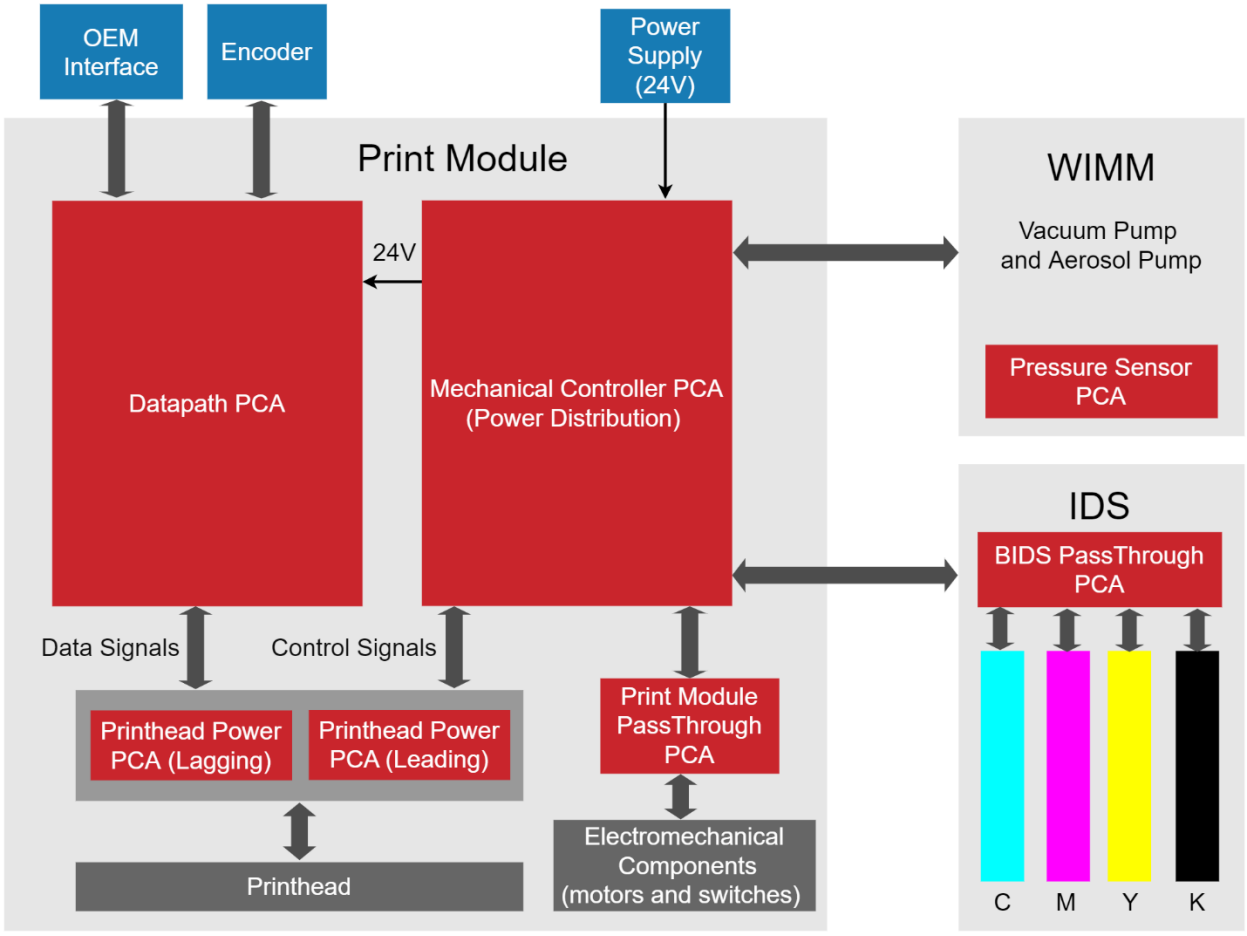
3 Electrical Overview

The DuraFlex system contains several printed circuit assembly (PCA) boards. *Figure 2* shows the electrical connections between the DuraFlex PCA boards.

The PCA boards include:

- Datapath PCA
- Mechanical Controller PCA
- Pressure Sensor PCA
- Pinch Valve PCA
- Printhead Power PCAs (leading and lagging)
- BIDS PassThrough PCA
- Print Module PassThrough PCA

Figure 2 – DuraFlex Electrical Overview



Memjet Confidential

3.1 Datapath PCA

The Datapath PCA contains an Intel microprocessor and multiple software components, including an internal RIP (embedded RIP) mode to render print jobs into raw print data and a custom FPGA to drive the printhead.

The Datapath PCA has two configurations: one configuration contains a single 1 Gigabit Ethernet (GbE) port, the other contains 2 ports; 1 GbE and 10 GbE. The 1 GbE interface is used for transmitting PDF files to the internal RIP. In the external RIP (RIP bypass) mode, typically in an N-wide configuration, both 10 GbE and 1 GbE interfaces are used:

- 1 GbE interface: Used for the OEM to control the print unit.
- 10 GbE interface: Used for transferring print data from an external RIP (supplied by the OEM).

Figure 3 – Datapath PCA Diagram

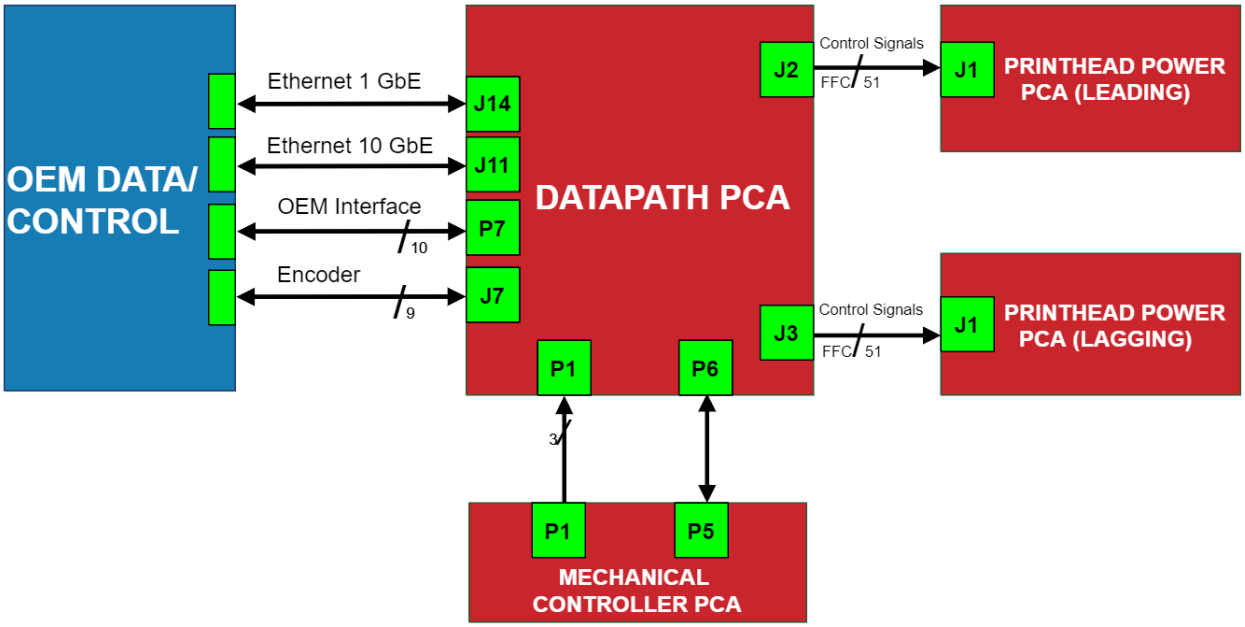


Table 1 – Datapath PCA Connections

Connector	Connection Endpoint	Cable Name and Length
J2	J1 on Printhead Power PCA (Leading)	51-pin FFC (500 mm)
J3	J1 on Printhead Power PCA (Lagging)	51-pin FFC (500 mm)
J7	OEM Encoder	OEM-provided, length is application dependent
J11	Network (Ethernet 10 GbE) – for N-Wide	• Use CAT-6 network cables (Ethernet) for up to 10 m with 10 GbE. • Use CAT-6a network cables for up to 100 m with 10 GbE.
J14	Network (Ethernet 1 GbE)	Use CAT-5e network cables for up to 100 m with 1 GbE.
P1	P1 on Mechanical Controller PCA	CBL_PD_TO_DATAPATH_24V (150 mm)
P6	P5 on Mechanical Controller PCA	CBL_DATAPATH_MECH_COMMS (150 mm)
P7	OEM Interface	OEM-provided, length is application dependent

3.2 Mechanical Controller PCA

The Mechanical Controller PCA provides power distribution and control for electromechanical system components. It contains an STM32 microprocessor which controls mechatronic parts such as lift, cap, and wiper motors, ink refill pumps, and monitors sensors used to control these components. It also controls the Waste Ink Management Module (WIMM).

Figure 4 – Mechanical Controller PCA Diagram

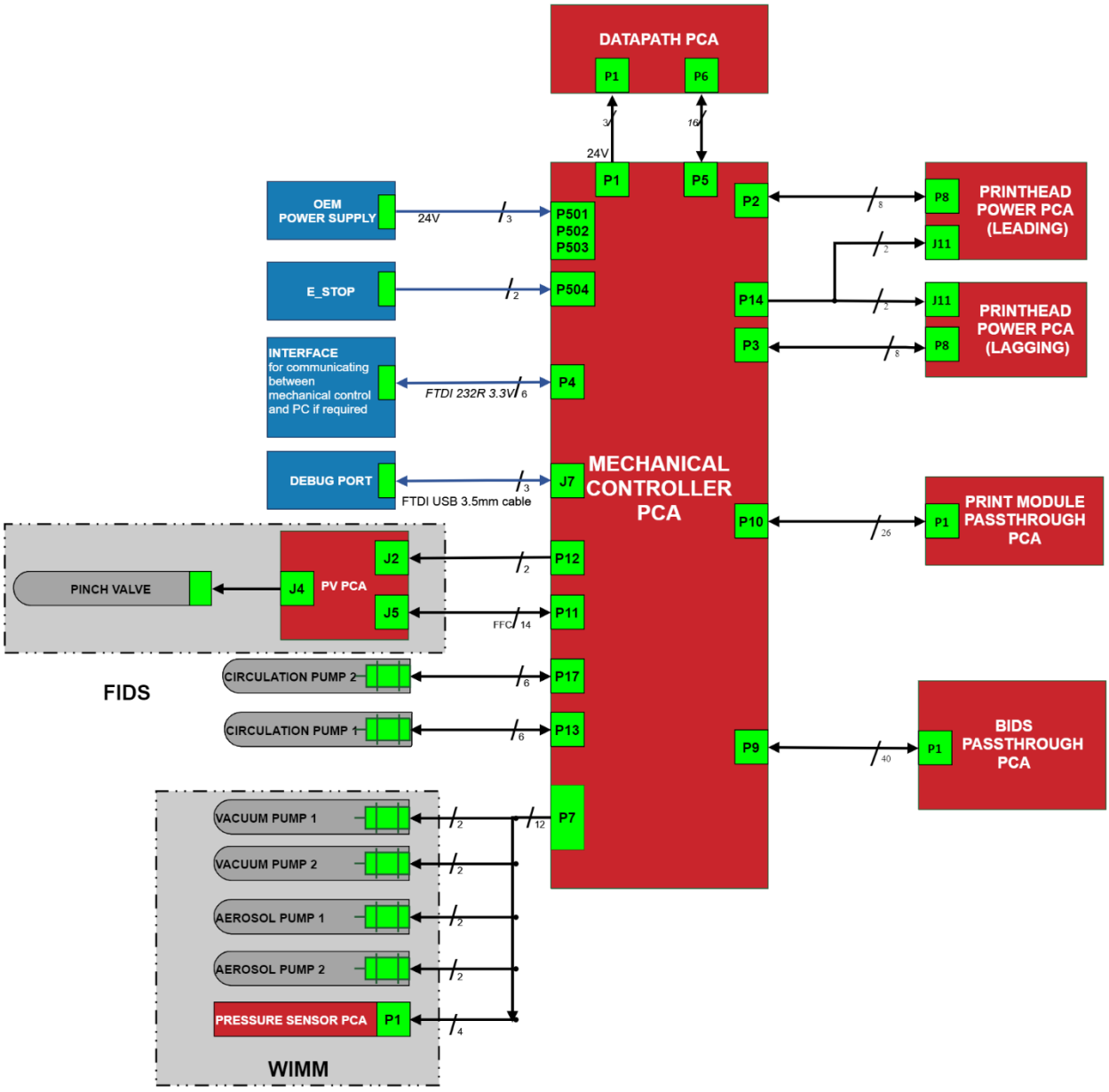


Table 2 – Mechanical Controller PCA Connections

Connector	Connection Endpoint	Cable Name and Length
J7	Debug port	FTDI USB 3.5 mm cable
P1	P1 on Datapath PCA	CBL_PD_TO_DATAPATH_24V (150 mm)
P2	P8 on Printhead Power PCA (Leading)	CBL_EM_TO_PH_BOARD_COMM (520 mm)
P3	P8 on Printhead Power PCA (Lagging)	CBL_EM_TO_PH_BOARD_COMM (520 mm)
P4	Interface for communicating between Mechanical Controller PCA and Client PC if required	FTDI 232R 3.3V 6-pin cable
P5	P6 on Datapath PCA	CBL_DATAPATH_MECH_COMMS (150 mm)
P7	Pressure Sensor PCA Vacuum Pump 1 Vacuum Pump 2 Aerosol Pump 1 Aerosol Pump 2	CBL_EM_TO_WIMM (1 m)
P9	P1 BIDS PassThrough PCA	CBL_EM_TO_BIDS (1 m)
P10	P1 on Print Module PassThrough PCA	CBL_EM_TO_PM (230 mm)
P11	J5 on Pinch Valve PCA	14-pin FFC (500 mm)
P12	J2 on Pinch Valve PCA	CBL_EM_TO_FIDS_PV_24V (600 mm)
P13	Circulation Pump 1	CBL_EM_to_CIRC_PUMPS (300 mm)
P14	J11 on Printhead Power PCA (Leading) J11 on Printhead Power PCA (Lagging)	CBL_PH_Board_24V (520 mm)
P17	Circulation Pump 2	CBL_EM_TO_PUMPS (300 mm)
P501 P502 P503	OEM Power Supply Unit	CBL_OEM_24V (1.5 m)
P504	E-Stop	OEM-provided, length is application dependent

3.3 Pressure Sensor PCA

The Pressure Sensor PCA sends feedback to the Mechanical Controller PCA and regulates the pressure in the WIMM via the vacuum pump.

Figure 5 – Pressure Sensor PCA Diagram

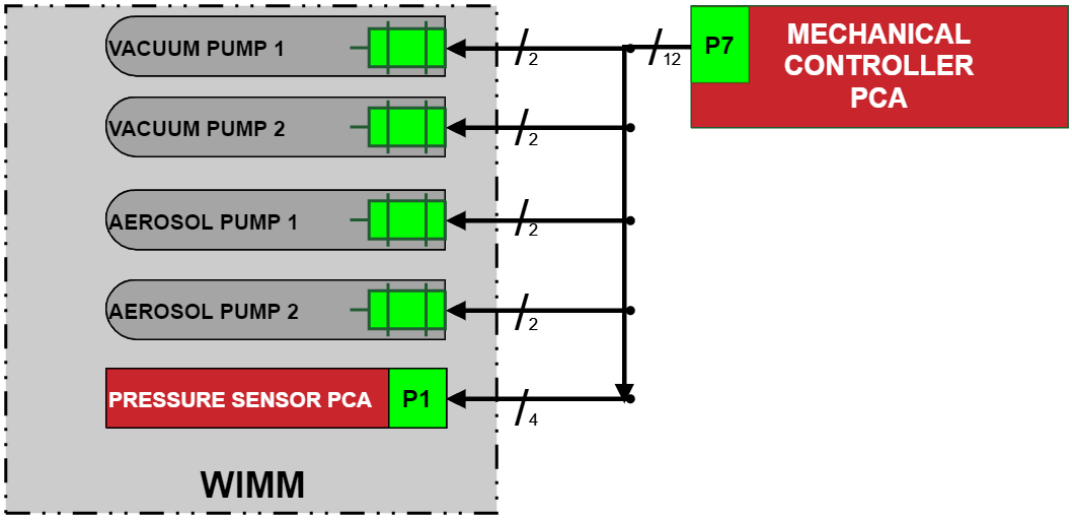


Table 3 – Pressure Sensor PCA Connections

Connector	Connection Endpoint	Cable Name and Length
P1	P7 on Mechanical Controller PCA	CBL_EM_TO_WIMM (1 m)

3.4 Pinch Valve PCA

The Pinch Valve PCA connects the Pinch Valve and the Mechanical Controller PCA.

Figure 6 – Pinch Valve PCA Diagram

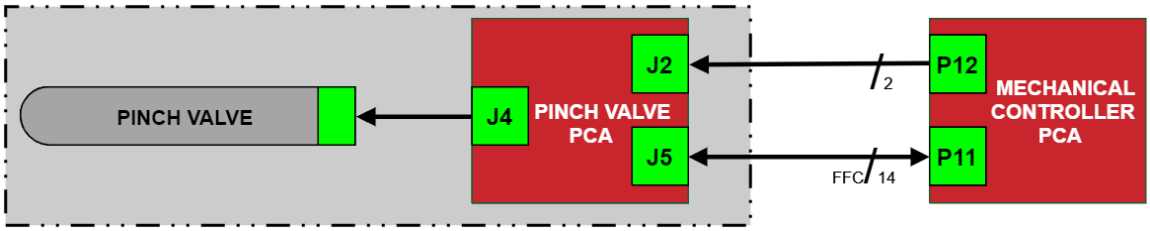


Table 4 – Pinch Valve PCA Connections

Connector	Connection Endpoint	Cable Name and Length
J2	P12 on Mechanical Controller PCA	CBL_EM_TO_FIDS_PV_24V (600 mm)
J4	Pinch Valve	OEM-provided, length is application dependent
J5	P11 on Mechanical Controller PCA	Pinch Valve FFC (500 mm)

3.5 Printhead Power PCAs

The Printhead Power PCAs (leading and lagging) supply power to the printhead. Each PCA powers one half of the printhead, either the leading or the lagging side.

Figure 7 – Printhead Power PCA Diagram

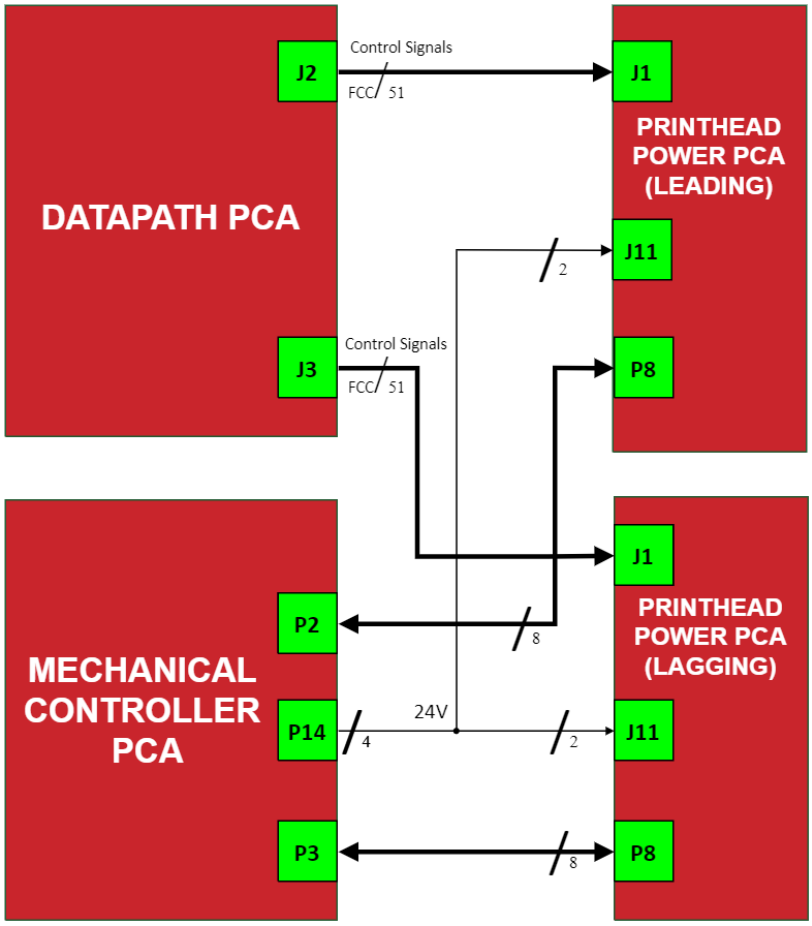


Table 5 – Printhead Power PCA Connections

Connector	Connection Endpoint	Cable Name and Length
J1 (Leading)	J2 on Datapath PCA	51-pin FFC (500 mm)
J1 (Lagging)	J3 on Datapath PCA	51-pin FFC (500 mm)
P8 (Leading)	P2 on Mechanical Controller PCA	CBL_EM_TO_PH_BOARD_COMMS (520 mm)
P8 (Lagging)	P3 on Mechanical Controller PCA	CBL_EM_TO_PH_BOARD_COMMS (520 mm)
J11 (Lagging), J11(Leading)	P14 on Mechanical Controller PCA	CBL_PH_BOARD_24V (520 mm)

3.6 BIDS PassThrough PCA

The BIDS PassThrough PCA connects the IDS Blades to the Print Module. It connects four refill pumps (CMYK), eight ink level sensors (two per color), a temperature sensor, and Memjet Quality Assurance Infrastructure (QAI). The QAI executes on the Datapath PCA, which passes the information to BIDS via the Mechanical Controller PCA.

Figure 8 – BIDS PassThrough PCA Diagram

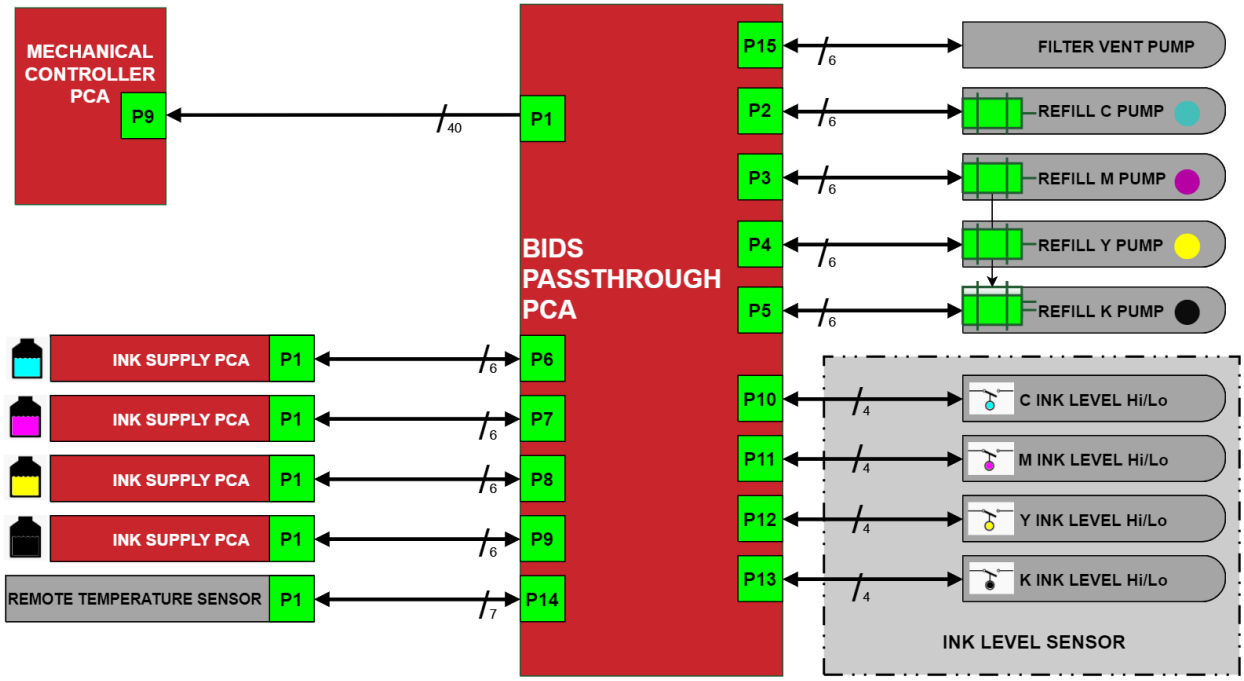


Table 6 – BIDS PassThrough PCA Connections

Connector	Connection Endpoint	Cable Name and Length
P1	P9 on Mechanical Controller PCA	CBL_EM_TO_BIDS (1 m)
P2	Refill Pump Cyan	CBL_BIDS_TO_PUMPS (650 mm)
P3	Refill Pump Magenta	CBL_BIDS_TO_PUMPS (650 mm)
P4	Refill Pump Yellow	CBL_BIDS_TO_PUMPS (650 mm)
P5	Refill Pump Black	CBL_BIDS_TO_PUMPS (650 mm)
P6	P1 on Ink Supply PCA Cyan	CBL_QAI_BIDS_TO_BAG (length is OEM-defined)
P7	P1 on Ink Supply PCA Magenta	CBL_QAI_BIDS_TO_BAG (length is OEM-defined)
P8	P1 on Ink Supply PCA Yellow	CBL_QAI_BIDS_TO_BAG (length is OEM-defined)
P9	P1 on Ink Supply PCA Black	CBL_QAI_BIDS_TO_BAG (length is OEM-defined)
P10	Ink Level Sensor Cyan	Cable and connector included.
P11	Ink Level Sensor Magenta	Cable and connector included.
P12	Ink Level Sensor Yellow	Cable and connector included.
P13	Ink Level Sensor Black	Cable and connector included.
P14	P1 on Remote Temperature Sensor	CBL_BIDS_TO_REMOTE_TEMP_SENSOR (650 mm)
P15	Filter Vent Pump	CBL_BIDS_TO_FILTERVENT (800 mm)

3.6.1 QAI Cables (RJ12)

The OEM needs to fabricate the QAI cables (RJ12) that connect the BIDS PassThrough PCA to the bulk ink supply, named CBL_QAI_BIDS_TO_BAG.

The connectors for this cable are produced by ASSMANN (manufacturing part number A-MO-6/6 F50).

Table 7 – Connector Specifications

Connector 1 Plugs into BIDS PassThrough PCA (P6, P7, P8, P9)		Cable	Connector 2 Plugs into Ink Supply PCA (P1)	
Pin #	Description		Pin #	Description
1	DET	• Manufacturer: ASSMANN • Manufacturing Part Number: AT-K-26-6-S/100 • Gauge: 26 AWG • Standard: 6P6C straight through • Length: OEM to define	1	DET
2	LSS_DAT		2	LSS_DAT
3	GND		3	GND
4	LSS_CLK		4	LSS_CLK
5	5V or 3.3V		5	5V or 3.3V
6	2.5V		6	2.5V

3.7 Print Module PassThrough PCA

The Print Module PassThrough PCA provides a passthrough between the Mechanical Controller PCA and Print Module mechatronic parts. It controls the lift, cap, and wiper motors, and monitors the following eight switches:

- Lift Home Switch – detects the printhead cradle at RAISE position.
- Lift Cap Switch – detects the printhead cradle at CAP position.
- Lift Print Switch – detects the printhead cradle at PRINT position.
- Cap Home Switch – detects the printhead cap at HOME position.
- Cap Capper Switch – detects the printhead cap at CAP position.
- Wiper Home Switch – detects the wiper cartridge at HOME position.
- Wiper Present Switch – detects the wiper cartridge is present.
- Wiper Out Switch – detects when microfiber material in wiper cartridge is used up.

Figure 9 – Print Module PassThrough PCA Diagram

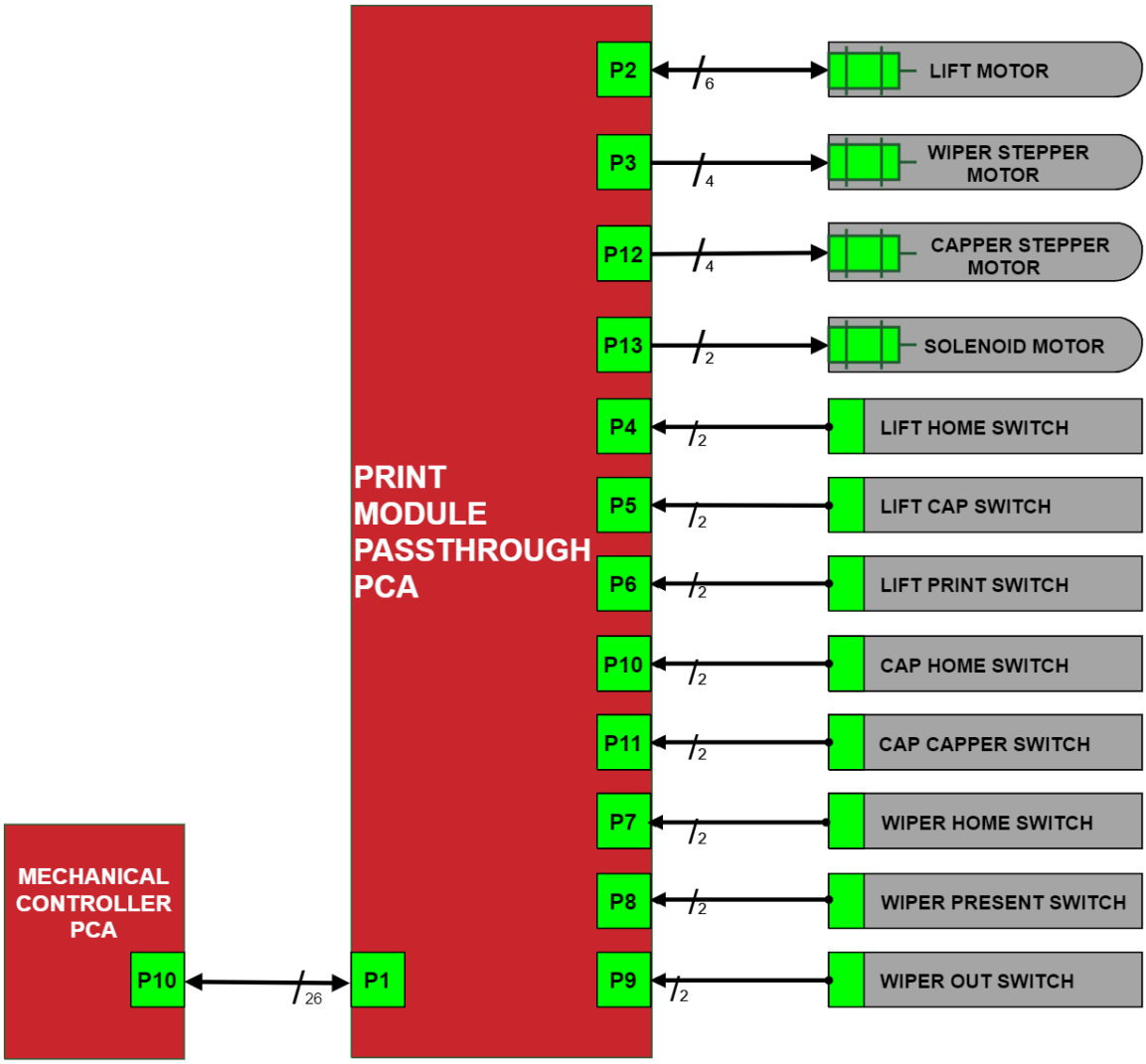


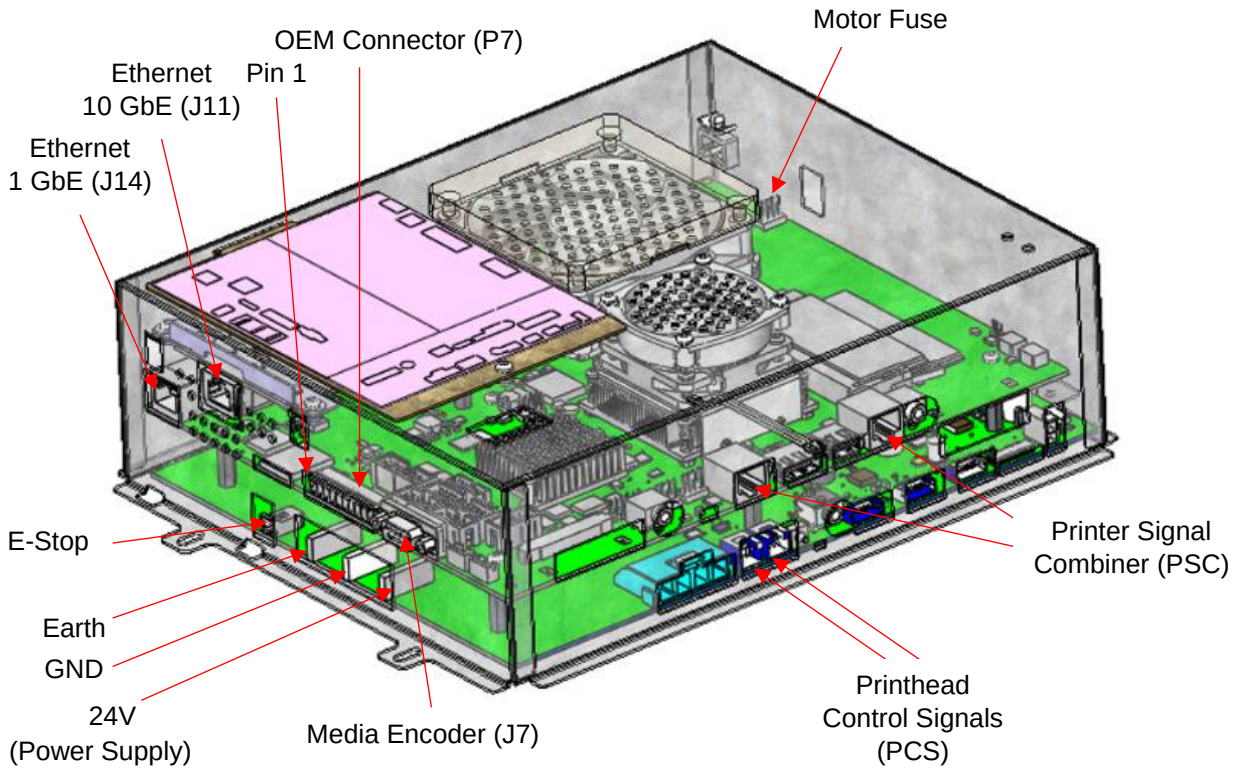
Table 8 – Print Module PassThrough PCA Connections

Connector	Connection Endpoint	Cable Name and Length
P1	P10 on Mechanical Controller PCA	CBL_EM_TO_PM (230 mm)
P2	Lift Motor	Cable included.
P3	Wiper Stepper Motor	Cable included.
P4	Lift Home Switch	EASM_LIFT_HOME_SWITCH (200 mm)
P5	Lift Cap Switch	EASM_LIFT_CAP_SWITCH (200 mm)
P6	Lift Print Switch	EASM_LIFT_PRINT_SWITCH (250 mm)
P7	Wiper Home Switch	EASM_WIPER_HOME_SWITCH (420 mm)
P8	Wiper Present Switch	CBL_WIPER_PRESENT_SWITCH (540 mm)
P9	Wiper Out Switch	CBL_WIPER_OUT_SWITCH (540 mm)
P10	Cap Home Switch	EASM_CAP_HOME_SWITCH (300 mm)
P11	Cap Capper Switch	CBL_CAP_CAPPER_SWITCH (420 mm)
P12	Capper Stepper Motor	Cable included.
P13	Solenoid Motor	Cable included.

4 OEM Interfaces

DuraFlex provides interfaces for the OEM to communicate with the Electrical Module.

Figure 10 – Electrical Module Diagram



The table below lists the OEM electrical interfaces with the DuraFlex system.

Table 9 – OEM Interfaces

Interface Name	Description	Additional Details
Power Supply connector	24V ±10%. Up to 1,000 W	*4.1 Power Supply*
1 GbE network	Printer control and internal RIP interface	*4.2 Ethernet Connections*
10 GbE network	External RIP interface	*4.2 Ethernet Connections*
OEM Connector	A 10-way terminal block. Currently only supports Top of Form (TOF).	*4.3 OEM Connector*
Encoder connector	Media encoder signals	*4.4 Encoder*
Printer Signal Combiner	Used in N-wide printing systems	*4.5 Printer Signal Combiner*
E-Stop connector	Printer Motor Emergency Stop	*4.6 Emergency Stop (E-Stop) Connector*
Motor Fuse	Motor electrical protection	*4.7 Motor Fuse*
Printhead Control Signals	Print Module printing direction	*6 N-Wide Electrical Connection*

4.1 Power Supply Connector

Memjet recommends a 1,000W 24V DC power supply for most configurations. Actual power consumption depends on the coverage. Therefore, less power is required for smaller capacity systems. For example, an A3 printing system requires a 550W power supply at 200% coverage, and a 710W power supply at 300% coverage (power consumption is estimated based on systems that do not include Printer Control Software or media handling hardware). Memjet recommends an example power supply (manufacturing part number HRPG-1000-24) that OEMs can source from vendors. OEMs also have the option to purchase another power supply unit with similar specifications.

For N-wide systems, each Print Module should be wired directly to the power supply (not daisy-chained) and maintain a star-wired distribution of power.

The power is supplied via Terminal Lugs, for example:

- **Manufacturer:** TE Connectivity
- **Description:** Terminals 250 FAST RCPT 10-8 0 Cut Strip

Table 10 – Power Supply Connector Pinout

Terminal	Description	Wire Type
P501	24V	8 AWG
P502	GND	
P503	EARTH	

4.2 Ethernet Connections

There are two RJ45 Ethernet connectors. The PES interface uses the 1 GbE connector. Print data is also carried on this connector when printing in the internal RIP mode. Unless in an electrically-noisy environment, CAT-5e Ethernet cables can be used for distances up to 100 m.

In the external RIP mode, print data is sent over the 10 GbE connector. Unless in an electrically-noisy environment, CAT-6 Ethernet cables can be used for distances up to 10 m, while CAT-6a Ethernet cables for distances up to 100 m.

For PES details, see the *DuraFlex Software Databook and Design Guide*.

4.3 OEM Connector

A 10-pin Molex connector (manufacturing part number 0395000010) provides access to several input/output signals. At this stage, it only supports the TOF input signal. Pin 1 is closest to the Ethernet connector (*Figure 10*).

Table 11 – OEM 10-Pin Connector Pinout

Pin #	Description	Direction	Signals/Type
1	+24V	Output	Current limit 100 mA; paralleled with DB9
2	+5V	Output	Current limit 250 mA; paralleled with DB9
3	Ground	N/A	N/A
4	TOF (Top of Form)	Input	Single-ended input 0-24V, 2.5V threshold
5	Media Spare	Input	Single-ended input 0-24V, 2.5V threshold
6	Ground	N/A	N/A
7	Reserved for future use	Input	N/A
8	Reserved for future use	Input	N/A
9	Reserved for future use	Output	N/A
10	Reserved for future use	Output	N/A

4.4 Encoder Connector

The encoder signal is supplied to the system via a DB9 (female) connector.

Table 12 – Encoder DB9 Connector Pin Details

Pin #	Description	Direction	Signal/Type
1	24V	Output	Current limit 100 mA; paralleled with OEM connector
2	Reserved for future use	Input	N/A
3	EncA_P	Input	Differential input minimum ±900 mV, max common mode voltage ±7V
4	Ground	N/A	N/A
5	EncB_P	Input	Differential input minimum ±900 mV, max common mode voltage ±7V
6	5V	Output	Current limit 250 mA; paralleled with OEM connector
7	TOF (Top of Form)	Input	Single-ended input 0-24V, 2.5V threshold
8	EncA_N	Input	Differential input minimum ±900 mV, max common mode voltage ±7V
9	EncB_N	Input	Differential input minimum ±900 mV, max common mode voltage ±7V

Figure 11 shows the front-end circuitry of encoder signals.

Figure 11 – Encoder Signals

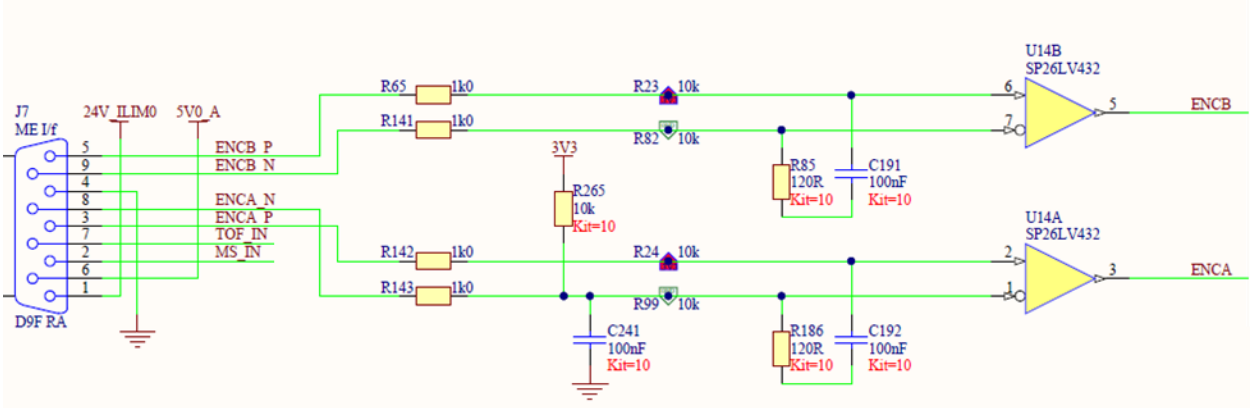
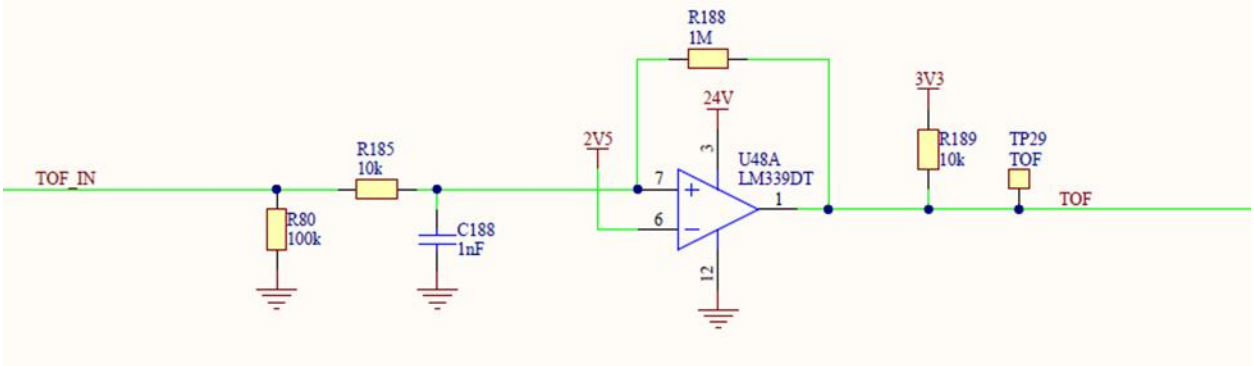


Figure 12 shows the front-end circuitry of TOF signals.

Figure 12 – TOF Sensor Signals



In an N-wide system, the encoder is only connected to the Print Module at the leftmost edge of the media. This signal is distributed to the other Print Modules via the PSC cable described in the following section.

4.5 Printer Signal Combiner

The Printer Signal Combiner (PSC) interface is not used in systems that are one printhead wide, known as 1-wide.

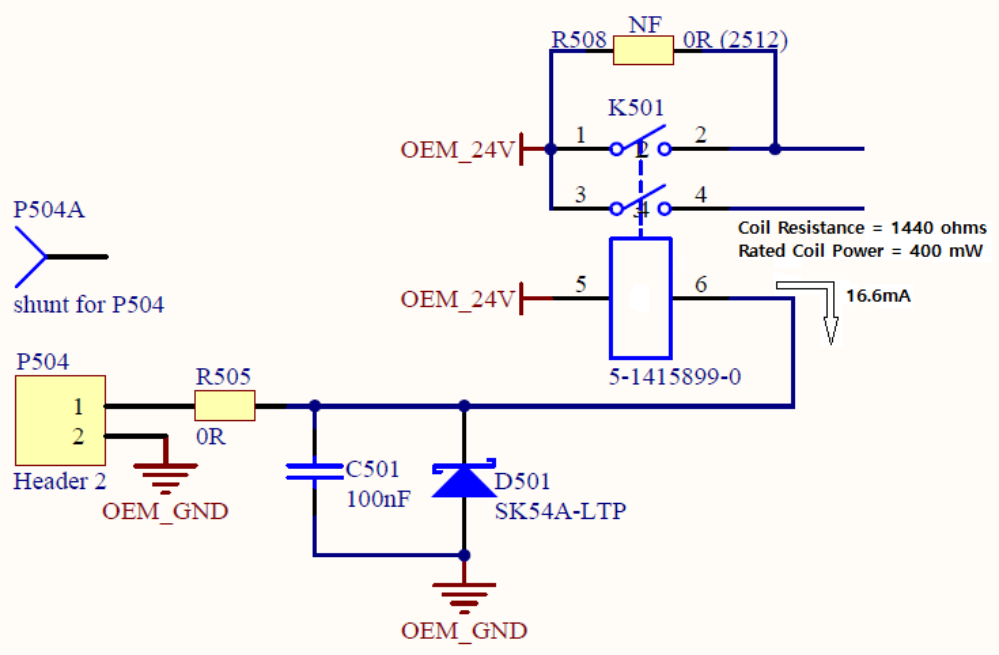
In N-wide systems, Print Modules are synchronized using the PSC connector (RJ45). Print Modules are daisy-chained starting with the leftmost Print Module (PM #1). PSC_OUT from PM #1 connects to PSC_IN of PM #2, PSC_OUT from PM #2 connects to PSC_IN of PM #3, and so on. The PSC_OUT connector on the last Print Module is not used.

4.6 Emergency Stop (E-Stop) Connector

The Electrical Module is delivered with a shunt fitted across the P504 link connector near the bottom of the Mechanical Controller PCA to allow an E-stop switch to be connected. This link must remain in place when an e-stop is not required. If the motors are run when the link is open, it will cause a software "Fault" condition which must be cleared to continue operation.

To install an E-stop switch, remove the shunt and connect the two pins on the E-stop connector to a normally-closed E-stop circuit (OEM-provided). When the E-Stop is activated, power will no longer be applied to the DuraFlex motors. Clear the fault condition to restart the system.

Figure 13 – E-Stop Switch Circuitry



The following is an example switch that can be used as an E-stop:

- **Manufacturer:** APEM
- **Description:** Emergency Stop Switches/E-Stop Switches DPDT NC-NON 24V 1A, Manufacture Part Number ES2P41653001

The following is an example connector that can be connected to P504:

- **Manufacturer:** TE Connectivity
- **Description:** CONN RECPT 2POS .1" POL UNLOAD, CONN SOCKET 22-26AWG CRIMP GOLD

4.7 Motor Fuse

A fuse protects the motors from excessive current. An example fuse is:

- **Manufacturer:** Littelfuse Inc.
- **Description:** Fuse Automotive 10A 32V DC Blade

5 Assembly Overview

The electrical components require some assembly. For detailed installation instructions, refer to the *DuraFlex Installation and Commissioning Guide*.

5.1 Media Path Setup

The OEM supplies an encoder and an optional Top of Form (TOF) sensor, if page synchronization is required, to connect the DuraFlex modules to the media path mechanism.

- **Encoder** – The encoder measures media speed. It must be located on the media path immediately before the print zone. The DuraFlex system uses the information to generate printhead nozzle ejection firing pulses.
- **TOF Sensor** – The TOF sensor provides a signal indicating that the media has entered the print zone. It may also be installed immediately before the print zone.

The DuraFlex system use these signals to determine when to begin printing. The encoder signal connection is described in *Table 12*, and the TOF signal can be connected using either *Table 11* or *Table 12*.

Refer to the Peripheral Hardware Appendix for an example encoder and TOF sensor that can be used in the DuraFlex printing system.

Configuration parameters for the encoder and TOF sensor are described in the *DuraFlex Installation and Commissioning Guide*.

5.2 IDS Setup

Connect the electrical cables supplied by Memjet. See the *DuraFlex Installation and Commissioning Guide* for more information.

5.3 WIMM Setup

Connect the electrical cables supplied by Memjet. See the *DuraFlex Installation and Commissioning Guide* for more information.

6 N-Wide Electrical Connections

Systems that are wider than 1 printhead (1-wide) are referred to as N-wide (where "N" represents the actual number of printheads, with a maximum of 4).

In N-wide systems, the Printhead Control Signal connector (*Figure 10*) must be physically swapped on each Print Module that has been installed in a reversed position. A “reversed” Print Module has the printhead on the media entry side.

6.1 Power Wiring

The power supply connector (24V, GND and EARTH) is a 3-core cable that can be routed along the surface of the print bar on the edge outside of the engines. The connector should turn upwards below the power terminals of the Electrical Module enclosure and connect to the terminals. Strain relief is recommended.

6.2 BIDS Electrical Cable

The Dual IDS is controlled only by Print Engine #1 (Leading). No electrical connection needs to be made to Print Engine #2 (Trailing). The electrical wiring is routed from the BIDS socket to the mounting rail. It should then route up the edge of the Print Engine, along the top of the assembly and then run down to the BIDS socket on the Electrical Module enclosure.

6.3 WIMM Electrical Cable

Each WIMM must be controlled by the Print Engine that it services. Therefore, a cable must run from each WIMM to the appropriate Print Engine connector on the Electrical Module enclosure. The cable should run up the end of the Print Engine and over the top with the BIDS wiring.

6.4 Ethernet Cables

Each Print Module must be connected to the Client PC with a 10 GbE interface. The Client PC is required to run on an independent 1 GbE interface. These cables should be routed alongside the power cables on the surface of the print bar.

6.5 Encoder Cable

Connect the DB9 (serial) encoder cable to Print Engine #1 (Leading).

6.6 TOF Cable

Connect the TOF cable to the Print Engine #1 (Leading).

6.7 PSC (Printer Signal Combiner) Ethernet Cable

Connect PSC_OUT of Print Engine #1 (Leading) to PSC_IN of Print Engine #2 (Trailing) using a standard CAT 5 Ethernet cable. This will pass the encoder timing and TOF signals to Print Engine #2 (Trailing).

Appendix – Peripheral Hardware

Encoder

Memjet recommends the TR1 encoder (manufacturing part number TR1-U1R4-3600NV1RHV-K00) shown below.

OEMs have the option to purchase another encoder with similar specifications. OEMs need to purchase the encoder and its associated cabling from vendors.

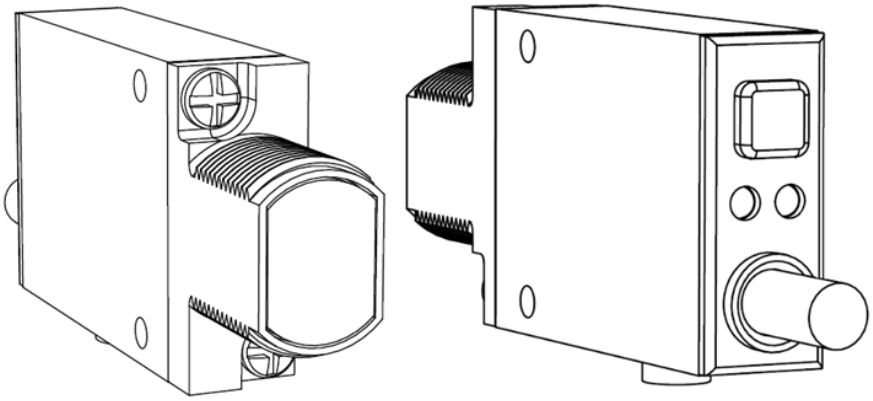
Figure 14 – Example Encoder

TOF Sensor

Memjet recommends the TOF sensor (manufacturing part number SME312DQD) shown below.

OEMs have the option to purchase another TOF sensor with similar specifications. OEMs need to purchase the TOF sensor and its associated cabling from vendors.

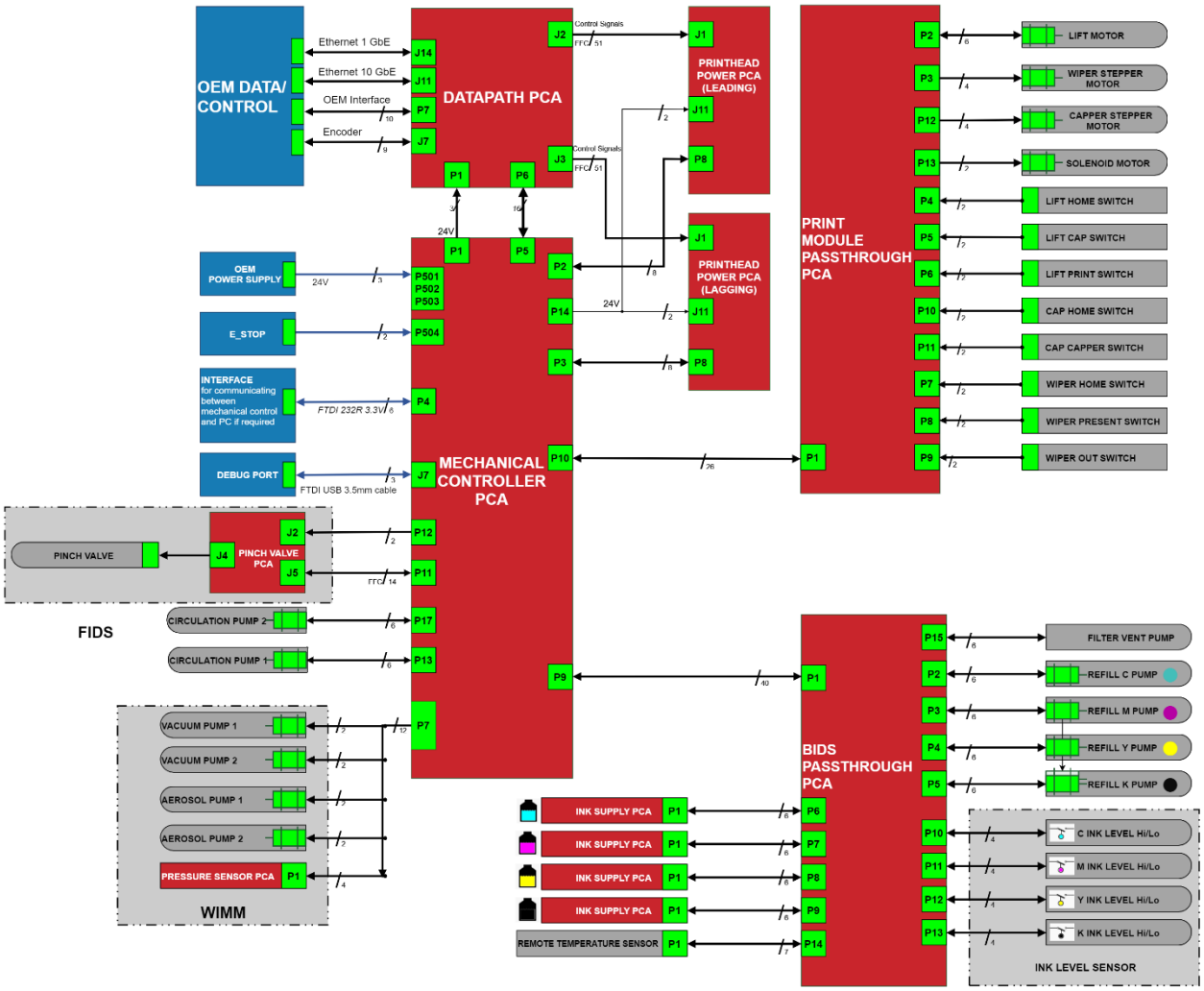
Figure 15 – Example TOF Sensor



Appendix – Block Diagram

Figure 16 shows a complete view of the electrical connections in the DuraFlex system.

Figure 16 – DuraFlex Electrical Block Diagram



Memjet Confidential