



# Technical Specification Accessories

[www.ilcd.com](http://www.ilcd.com)





copyright © 2024  
demmel products GmbH

## **Accessories Specification**

Version 1.0

Mar 18, 2024

# Contents

<b>1</b>	<b>Connectivity</b>	<b>2</b>
1.1	Wifi Module . . . . .	2
1.2	Ethernet Module (Linux) . . . . .	2
1.3	Ethernet Module (JPro) . . . . .	3
1.4	RS232 . . . . .	3
1.5	RS485 . . . . .	8
<b>2</b>	<b>Cables</b>	<b>10</b>
2.1	Speaker Cable . . . . .	10
2.2	CAN Cable . . . . .	10
2.3	Power Cable . . . . .	11
2.4	40 Pin FFC Cable . . . . .	11
<b>3</b>	<b>Development Kit</b>	<b>12</b>
3.1	Starter Kit . . . . .	12
3.2	5V Power Supply . . . . .	13
3.3	Debug Board . . . . .	13

Welcome to the demmel products accessories document. Here you will find information regarding our accessories. These products are divided into the following chapters:

- **Connectivity:** These are devices which provide an interface for various protocols and can be used for development or as part of your toolchain.
- **Cables:** Custom cables for various interfaces.
- **Development Kit:** These items are there to help you develop your applications.

Should any questions remain unanswered please don't hesitate to contact us via [support@demmel.com](mailto:support@demmel.com) or via +43-1-689470-0

# Part 1

## Connectivity

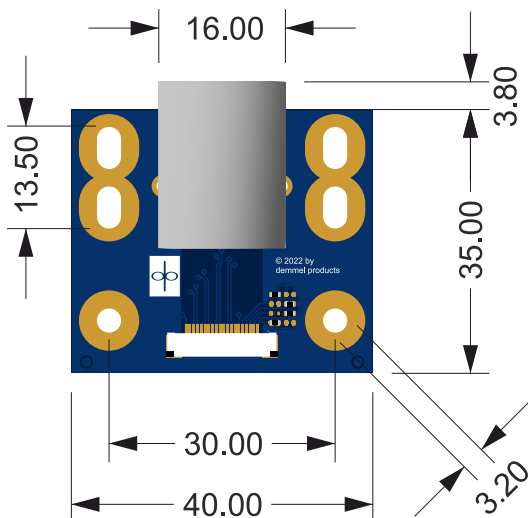
### 1.1 Wifi Module

This third party module can be purchased from demmel products. It uses Intel's AX200 chip and is capable of Wi-Fi 6 at both 2.4 and 5GHz and Bluetooth 5.0. It connects to the panel via the M.2 Key E standard. The screw needed to fasten the module to the iLCD panel as well as 2 antennae are included with every delivery.



### 1.2 Ethernet Module (Linux)

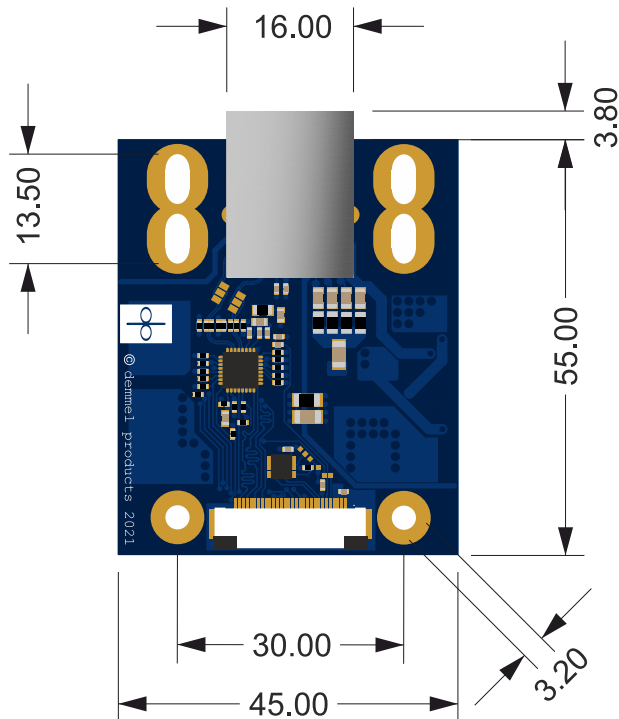
This expansion board features an RJ45 connector that can be linked to the FFC Ethernet port on the iLCD module via a Flex PCB.



demmel products RJ45 board (DPA-ETH-i.MX), dimensions in mm

### 1.3 Ethernet Module (JPro)

This expansion board features an RJ45 connector that can be linked to the FFC Ethernet port on the iLCD module via a top to top Flex PCB. A complete guide to using Ethernet with the F-Series may be found online under this link: [Ethernet Application Note](#) or by visiting our website and navigating to [Service>Downloads](#) and selecting the Ethernet Application Note. Mounting angles and a set of screws and nuts are contained in every delivery.



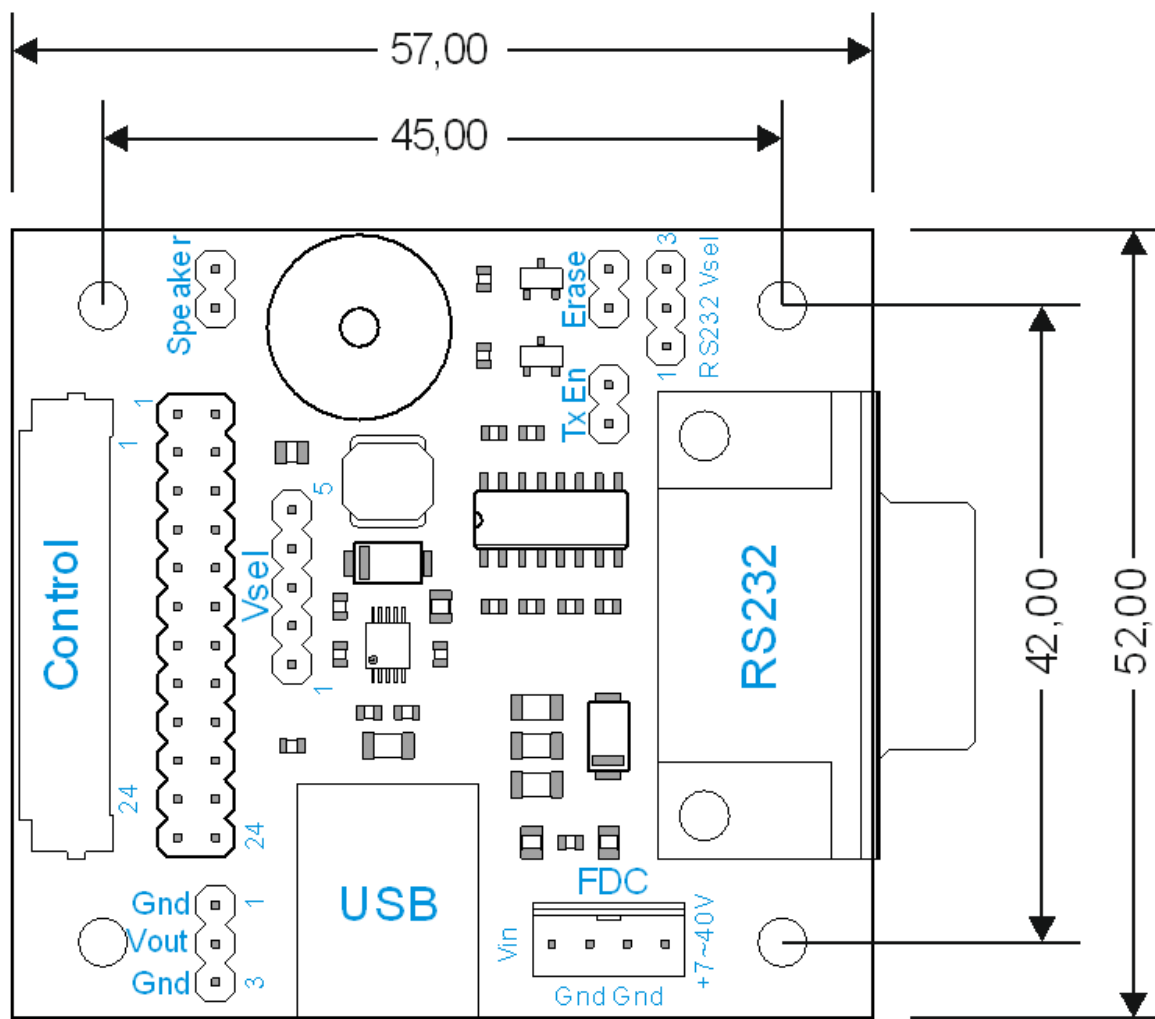
demmel products RJ45 board (DPA-ETH)-F, dimensions in mm

**Note:** The board is available as DPA-ETH-F-POE, which contains a transformer enabling power over Ethernet.

### 1.4 RS232

DPA-PCBRS232-2x is an interface board for connecting a color iLCD panel with 20/24-pin FFC cable to the USB port or RS232 port. Input voltage can be 5V or 7 - 40V with an integrated switcher. A mini-speaker for signalling is included.

### 1.4.1 Connectors and Jumpers



demmel products RS232 board (DPA-PCBRS232-2x)

### 1.4.2 Control Connector (Control)

The DPA-PCBRS232-2x is connected with the iLCD panel via the corresponding FFC cable. Please note, that the 20/24-pin FFC cable enclosed with the DPA-PCBRS232-2x must be inserted with the contact surface upwards as the FFC connector is a top-contact model. The same is true for the FFC connector on the iLCD panel itself. As the board is intended to be used with the parts showing upwards when it is connected with the iLCD panel (display surface showing upwards as well), the FFC cable has the contact surface on the opposite sides on the two ends to accomplish a correct connection between DPA-PCBRS232-2x board and iLCD panel. The DPA-PCBRS232-20 has a 20pin connector and is used for the following displays: DPP-CTS2432, DPP-CTS2440, DPP-CxP3224-2, DPP-CxP3224A, DPP-Cx4827, DPP-Cx3224-2, DPP-Cx6448 The DPA-PCBRS232-24 has a 24pin connector and is used for the following displays: DPP-Cx8048, DPP-Cx1060, DPP-Cx1060A

### 1.4.3 Speaker on Jumper (Speaker)

When a jumper is connected to this connector, the Relay 0 output is connected to the DPA-PCBRS232-2x board's speaker via a resistor.

### 1.4.4 Transmit Enable Jumper (TxEn)

When a jumper is connected to this connector, the RS232 transmission to the iLCD panel is enabled.

### 1.4.5 Erase Jumper (Erase)

When a jumper is connected to this connector, the iLCD panel erases all user data from the Flash memory at boot time. A corresponding message is shown on the LCD. Please remove the jumper after startup to avoid consecutive erasing of Flash contents at the next startup.

### 1.4.6 Serial Port Connector (RS232)

This 9-pin Sub-D female connector allows the driving application or PC to send and receive data from and to the iLCD module via standard RS232 signals. The pinning matches the standard layout of a PC's serial port. The pins are connected with the iLCD's serial port 1.

Pin On Sub-D	Direction	Description
1	-	RS232 Power In
6	-	Not connected
7	Out	RX - data sent from the iLCD module to the controlling application / PC
3	In	RTS – not in use, but connected to the iLCD's RS232 driver
81)	In	TX – data sent from the controlling application / PC to the iLCD module
4	Out	CTS – iLCD's output for hardware flow control
9	-	Not connected
5	-	Not connected

Note:

- 1) See iLCD's command description about why you should connect this pin and when it is not necessary to use hardware flow control.

### 1.4.7 USB Connector (USB)

This connector enables you to connect iLCD's USB port to a USB port on a PC via a standard USB cable.

Pin	Direction	Description
1	-	VCC + 5V
2	In/Out	USB-
3	In/Out	USB+
4	-	Ground



### 1.4.8 Power Supply Configuration Connector (Vsel)

Only one jumper is allowed to be set to select the power source for the iLCD module as follows:

Jumper nects	con-	Description
1 & 2		Enables the power supply connector's pin 4 (VCC) and RS232 if RS232 Vsel is set to 2 and 3
2 & 3		Enables supplying the iLCD module via the USB port
3 & 4		Enables supplying the iLCD module via the USB port
4 & 5		Enables supplying the iLCD module via the switcher

---

**Note:** Please note, that the DPP-Cx8048, DPP-Cx1060 and DPP-Cx1060A iLCD panels can not be supplied via the USB port, as the USB port allows to draw a maximum of 500 mA only, which is exceeded by the DPP-Cx8048, DPP-Cx1060 and DPP-Cx1060 iLCD panels. Trying to draw more than 500 mA from a USB port can damage your PC under worst circumstances! When the Jumper is set to 4 and 5 the iLCD is powered with the onboard switcher. The output of the switcher is 5V. Using it with an iLCD panel with 3/3.3V will damage the iLCD panel!

---

### 1.4.9 RS232 Power Configuration Connector (RS232 Vsel)

Only one jumper is allowed to be set to select the power source for the iLCD module as follows:

Jumper nects	con-	Description
1 & 2		Enables supplying the iLCD module via the switcher with RS232 Power In
2 & 3		Enables supplying the iLCD module directly with the RS232 Power In, if Vsel is set to 1 and 2

---

**Note:** Please note, that the DPP-Cx8048, DPP-Cx1060 and DPP-Cx1060A iLCD panels can not be supplied via the USB port, as the USB port allows to draw a maximum of 500 mA only, which is exceeded by the DPP-Cx8048, DPP-Cx1060 and DPP-Cx1060 iLCD panels. Trying to draw more than 500 mA from a USB port can damage your PC under worst circumstances! When the Jumper is set to 4 and 5 the iLCD is powered with the onboard switcher. The output of the switcher is 5V. Using it with an iLCD panel with 3/3.3V will damage the iLCD panel!

---

### 1.4.10 Power Supply Connector (FDC)

This connector applies the 5V power supply to the iLCD module if there is no USB port connected to the module. The connector used for this connection is the same as the power supply connector for a 3 ½" floppy disk drive, and has the same pinning.

---

**Note:** Please note, that all iLCD panels mentioned in this document are available in a 3/3.3V variant optionally as well. If you connect an iLCD panel with 3/3.3V supply to the DPA-PCBRS232-2x, you must use 3/3.3V instead of the 5V supply, otherwise the iLCD panel would be damaged! Supplying the board plus the iLCD panel via USB port is not possible in this case!

---

Pin	Description
+7~40V	Connected to the switcher via RS232 Vsel, can be +7 ~ +40V
GND	Ground
GND	Ground
Vin	VCC (+5V / +3/3.3V)

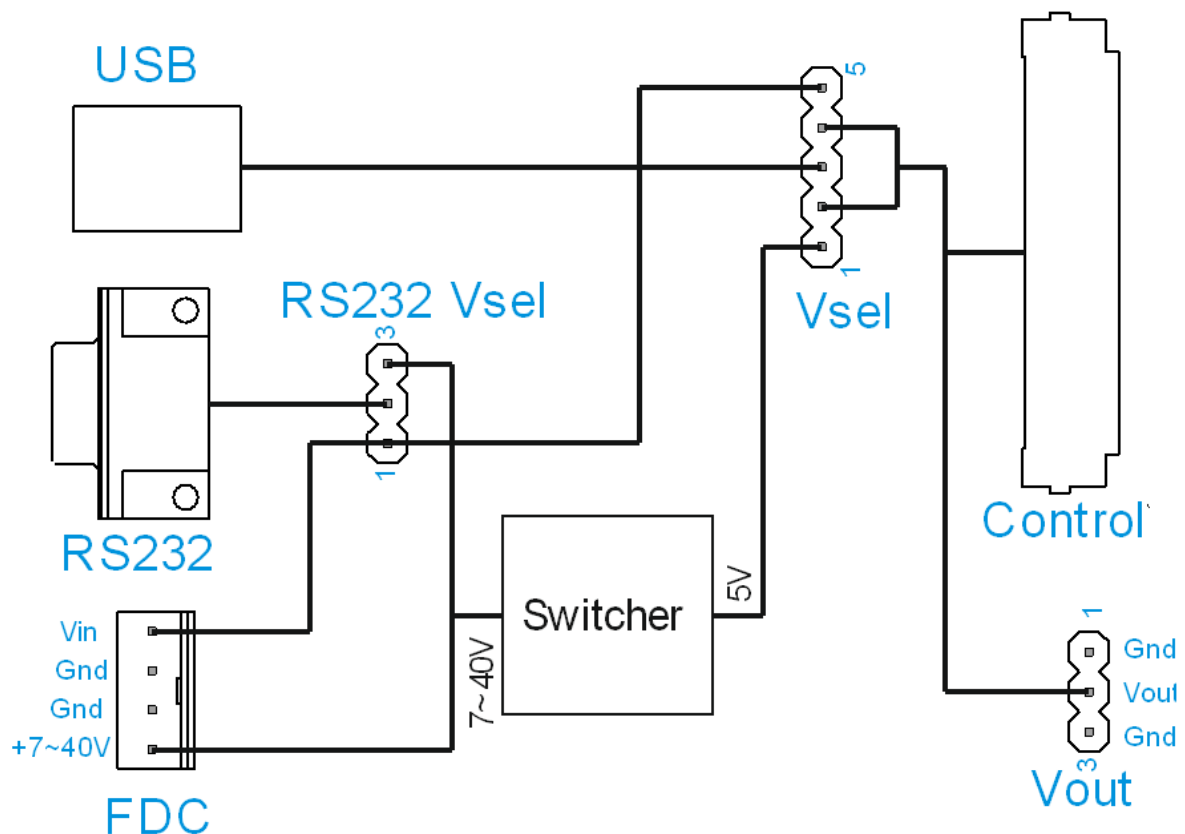
### 1.4.11 Power Out Connector (Vout)

Can power the iLCDs DPP-Cx6448 (V2 and newer), DPP-Cx8048, DPP-Cx1060 and DPP-Cx1060A with the 3 pin Power connector.

Pin #	Pin Name	Direction	Primary Function Description
1	GND	-	Ground pin
2	VCC	-	5V
3	GND	-	Ground pin

### 1.4.12 Power Supply

In the following block diagram shows the different ways how you can supply the display.



demmel products RS232 schematic (DPA-PCBRS232-2x)

Supply via	Voltage Input	RS232 Vsel position	Vsel position	Voltage output (Control/Vout)
USB	5V	-	2-3 or 3-4	5V
RS232	3.3V	1-2	4-5	3.3V
RS232	5V	1-2	4-5	5V
RS232	7~40V	2-3	1-2	5V
FDC Vin	3.3V	-	4-5	3.3V
FDC Vin	5V	-	4-5	5V
FDC +7~40V	7~40V	-	1-2	5V

## 1.5 RS485

This expansion board converts the UART signal from the iLCD Linux panel into half-duplex RS485 differential signaling over a twisted pair of wires. The board also provides access to the mounting holes for a 2 row 24 pin header of the Control Port.

### 1.5.1 Specifications

Recommended Bi-rate 1)2)	Maximum Bi-rate 2)	Isolation Voltage 3)	Supply Voltage (Pin 1)	Delay (Auto mode) 4)	ALERT on
115.2 kBit	125 kBit	1500 V	5 V	800 $\mu$ s	Logic high

1) This is the bitrate for which “Auto” mode is optimized. 2) For volume orders this value may be adjusted. 3) Two self-resetting fuses are tripped at higher voltages. 4) In “Auto” mode TX is held in enabled mode for 800  $\mu$ s after gg idle before it is disabled.

### 1.5.2 Modes

RX is enabled by default. Therefore in order to send data, TX must be actively enabled. There are two ways of doing this, Auto and Manual (Pin10/Pin15). These modes are set via on-board jumpers according to the following table:

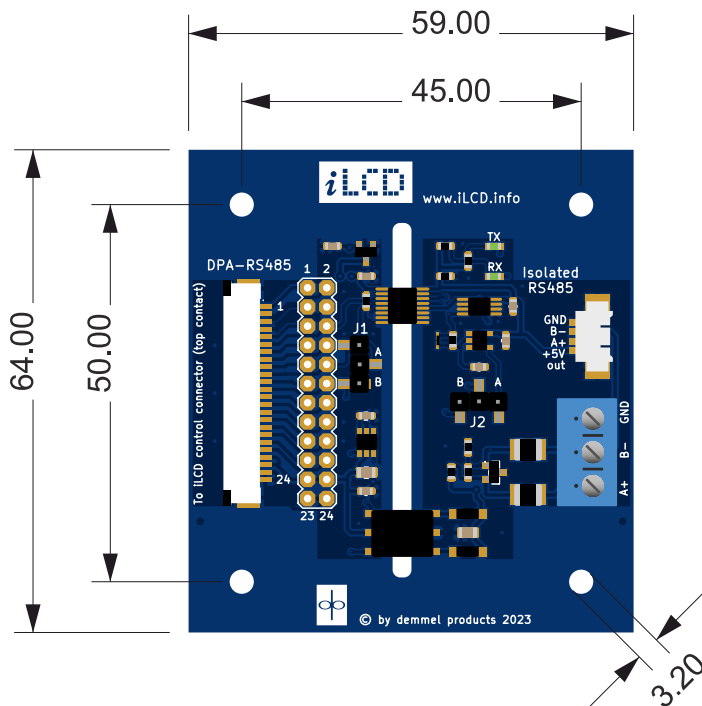
TX enable	J1 pos A	J1 pos B
J2 pos A	Auto	Auto
J2 pos B	Manual (Pin 10)	Manual (Pin 15)

#### Auto

By setting Jumper 2 to position A, the board runs in “Auto” mode. This means that TX is automatically enabled whenever a packet is transmitted. TX is disabled after the last bit is sent after a delay of 800  $\mu$ s as confred via an RC circuit. By default Auto mode is optimized for 115.2 kBit.

### Manual (Pin10/Pin15)

By setting Jumper 2 to position B, TX can be tied to the corresponding pin (pins 10 or 15, depending on Jumper 1). In this mode TX can be enabled via software by setting the pin to logic high.



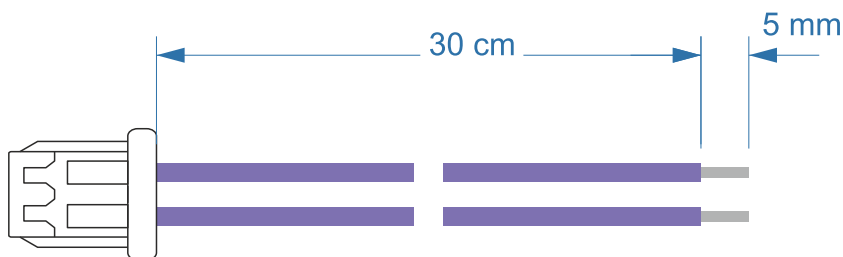
demmel products RS485 board (DPA-RS485), dimensions in mm.

**Warning:** Due to a production error Version 1 (DPA-RS485-V1) the silkscreen indicating positions A and B of Jumper 1 is reversed. Please ignore the indications on the silkscreen in V1 and instead refer to the positions indicated in this schematic.

## Cables

### 2.1 Speaker Cable

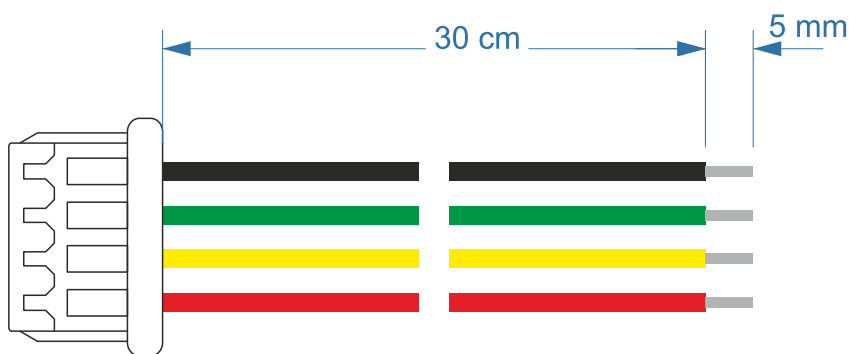
This custom-made Molex 53261-0271 connector fits the audio connector on the iLCD JPro modules. The two purple wires can be connected to any 4 to 8 Ohm speaker. The cables themselves are 28 AWG.



demmel products speaker connector (DPA-C-SPKR)

### 2.2 CAN Cable

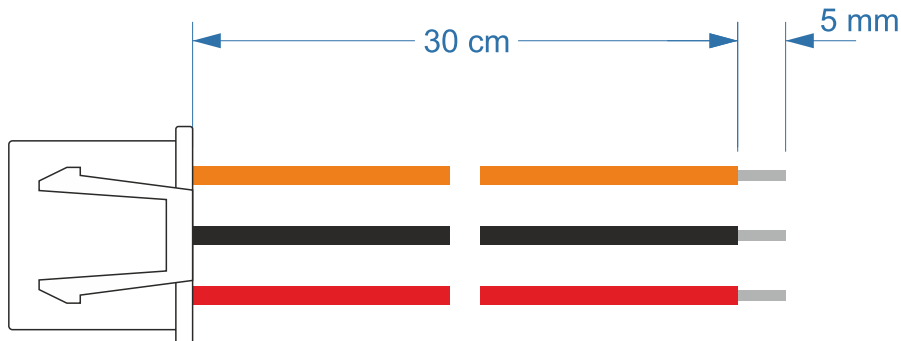
This custom-made Molex 53261-0471 connector fits the CAN connector on the iLCD Linux modules. The cable color coding conforms to the regular CAN-Bus standard. The cables themselves are 28 AWG.



demmel products CAN connector (DPA-C-CAN)

## 2.3 Power Cable

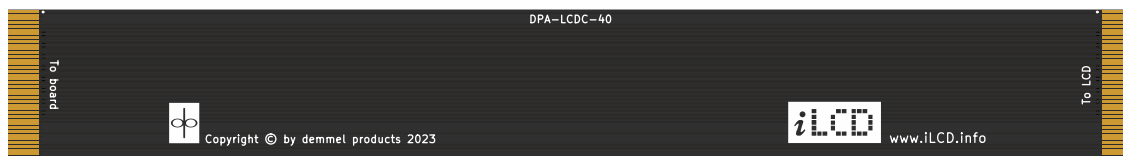
This custom-made JST XHP-3 equivalent connector fits the power connector on the iLCD Linux modules. Please contact us for custom lengths. The cables themselves are 22 AWG. The orange wire connects to the 7-30V input and the red cable connects to the 5V input.



demmel products power connector (DPA-C-PWR)

## 2.4 40 Pin FFC Cable

This shielded 40-pin flex PCB cable conveniently connects the MIPI or LVDS output to extension boards of the Pure-X series.



demmel products 40 pin FFC connector (DPA-LCDC40)

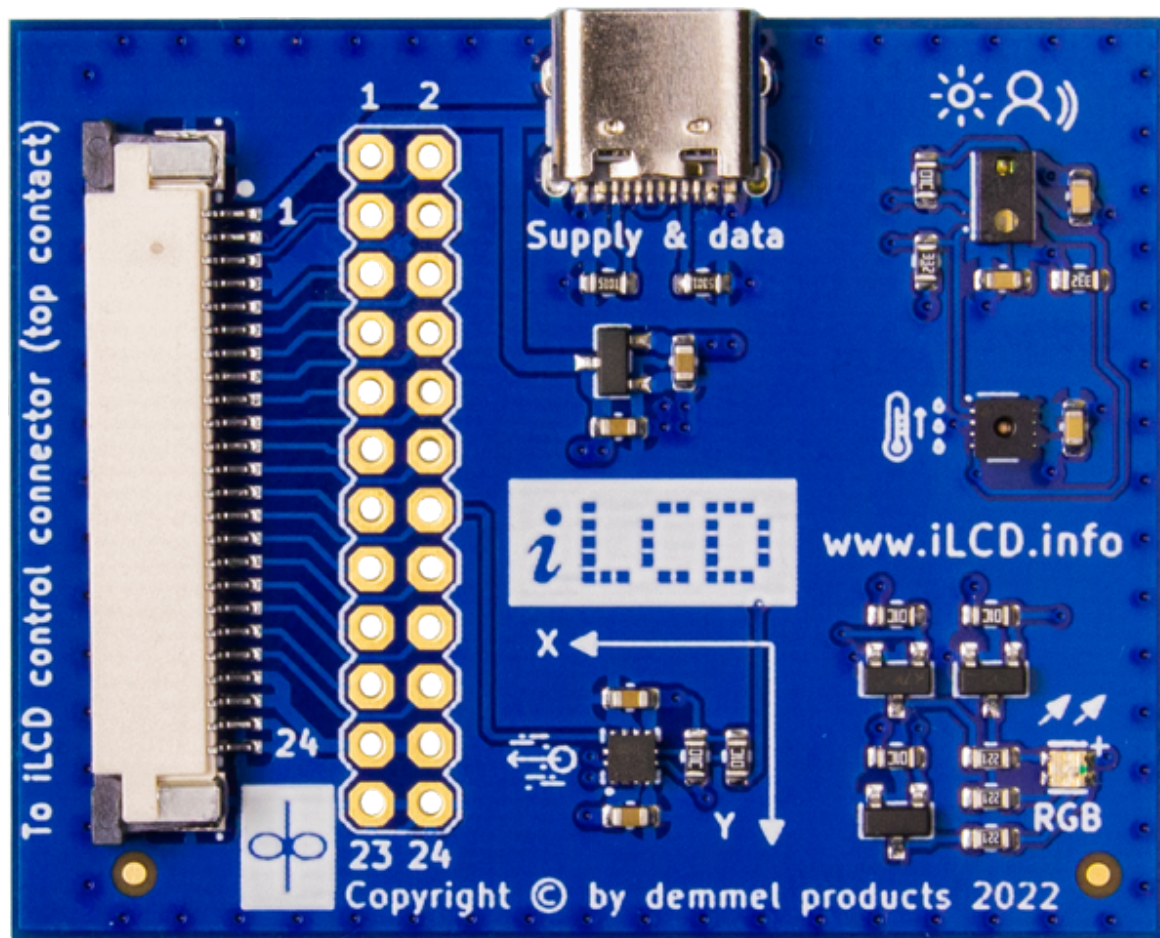
## Development Kit

### 3.1 Starter Kit

Get started even faster with demmel product's JPro Starter Kit. This compact PCB connects to the "Control" port of the iLCD Series and contains commonly used sensors and an RGB-LED. We've developed custom-made demo projects that interact with these peripherals, which are downloaded as example projects as part of the iLCD Manager Software or [HERE](#). These are freely available to be used as a template for your hardware projects or - if you decide to use the same sensors - implemented as-is.

The PCB includes:

- Proximity and lux-sensor
- Temperature and humidity sensor
- Acceleration sensor
- RGB LED



### 3.2 5V Power Supply

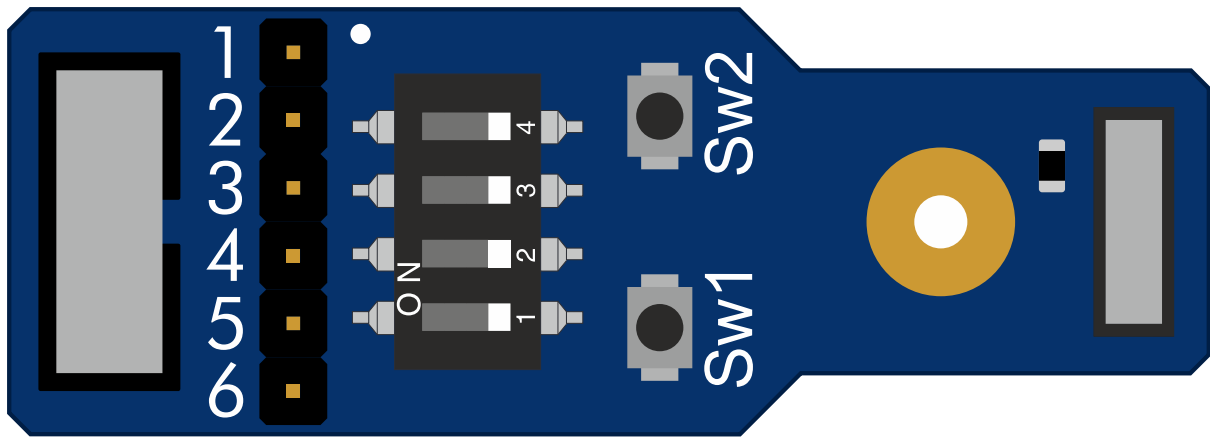
We are happy to provide a 5V power supply suitable for iLCD JPro boards with a USB-C or Micro-USB cable.

### 3.3 Debug Board

This Debug connector is necessary to access the serial Linux console. It connects to the Debug port on the bonded iLCD Linux panels and can be fastened by a screw which is included in the delivery. The numbers next to the jumpers detailed here indicate the pin numbers. Notice the white dot next to pin 1. A suitable cable with serial to USB converter is contained in the delivery.

The board comes in two variants: with and without switches.





Pin #	Primary Function
1	Ground
2	nc
3	5 Volt Power
4	UART_RX
5	UART_TX
6	nc