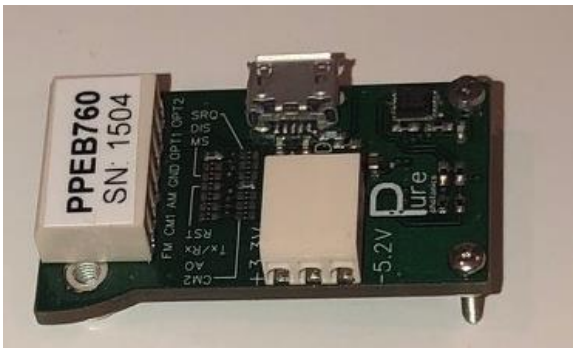
Application Note for PPCL700 Plug-on board PPEB760

Contents

Product description

The PPEB760 is a small plug-on board that fits on top of a Pure Photonics PPCL700 sensor-grade micro-ITLA. It provides a convenient means to communicate with the PPCL700 as it converts the standard low-voltage RS-232 interface to a micro-USB input that can be directly connected to any PC or laptop. It also provides inputs for the +3.3V and -5.2V power supplies.



The above functionality is the same as PPEB600. However, this interface does not have the same mechanical fit and if not handled very carefully can apply an undue force on the connector, potentially resulting in failure.

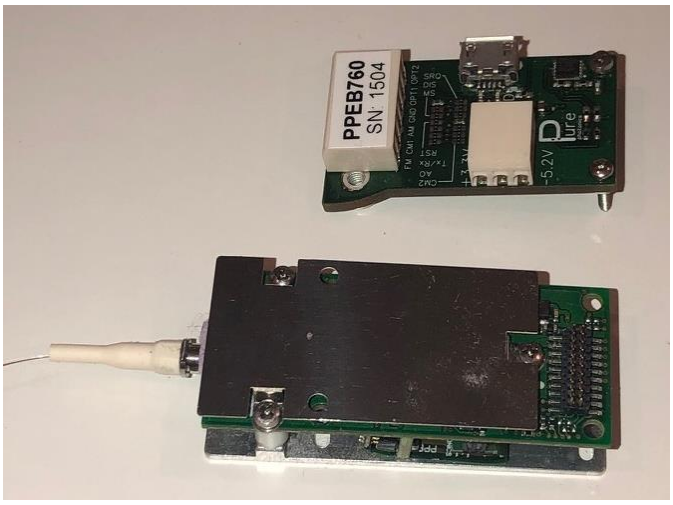
In addition, the PPEB760 routes several of the inputs and outputs hardware lines (some optional) to a 6-pin output wire terminal. 4 of the outputs are pre-set. 2 of the outputs can be customer configured based on resistor settings (skilled technician needed to change the 0402 resistors).

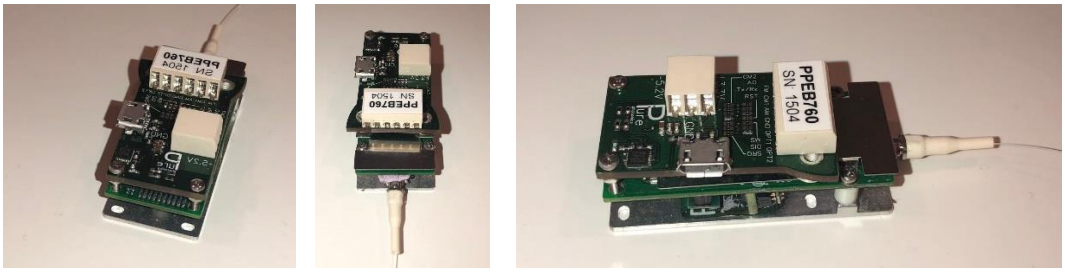
Along with a mechanical interface (heatsink) this allows convenient integration in a user system, without expensive evaluation boards and or a custom integration effort.

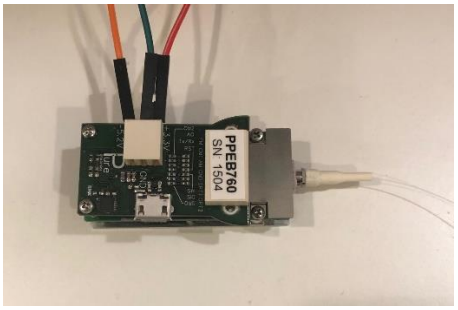
[not fully functional] The PPEB760 comes with screws for permanent installation onto the PPCL700 and which make connector alignment more convenient.

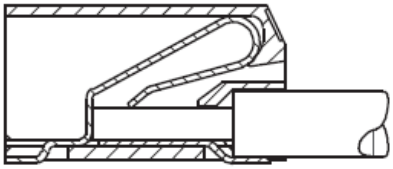
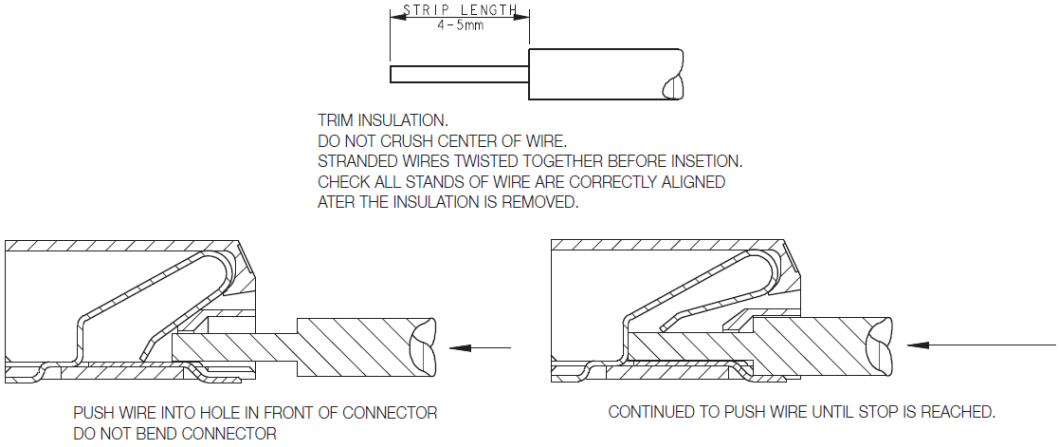
Installation instructions

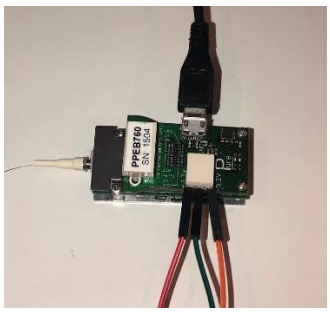
The PPCL700 micro-ITLA is an ESD sensitive opto-electronic component. Please apply the proper ESD pre-cautions before touching the micro-ITLA and the plug-on board.

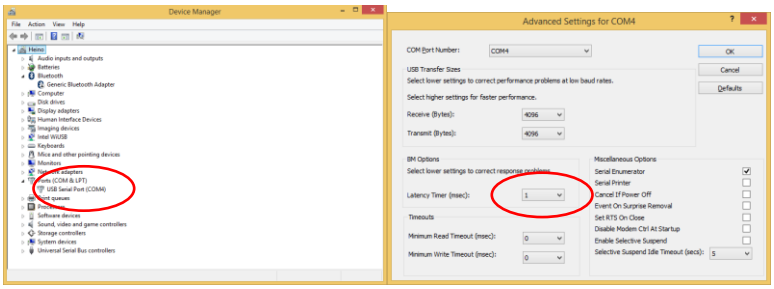
1. The Micro-ITLA plug-on board is shown below along the PPCL700. On the topside, the micro-USB connector is located, along with the 3 pin connector for +3.3V, GND and -5.2V (left to right in picture) and a 6 pin connector for inputs/outputs (FM, CM1, AM, GND, OPT1 and OPT2, from bottom to top in picture). On the right side 2 alignment pins are shown and on the left side standoffs are shown that will rest on the PPCL700 shield. Between the 2 wire connectors there is a selector grid for OPT1 and OPT2. By default SRQ line is connected to OPT1 and RST line is connected to OPT2.
   a. 

2. On the bottom side there is 20pin female Samtec connector.
3. Using the alignment pins, push the PPEB760 gently on the connector. With the alignment pins, the connector should be well aligned, but be careful not to apply too much stress. A gentle downward force will click the connector in place. The standoffs in the back should be resting on the shield.
   a. 

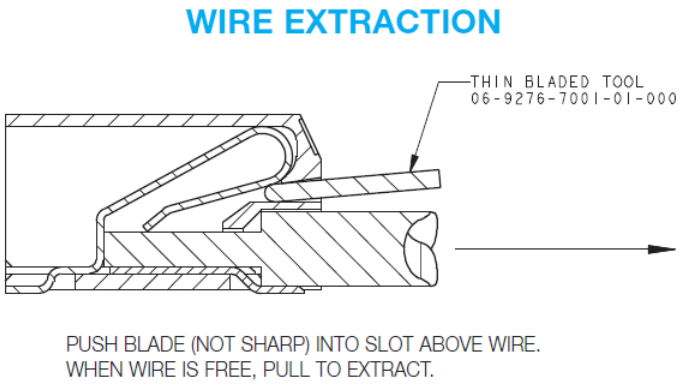
4. Connect the power supplies. The 3-port wire connector will take the GND line in the middle. The left side is the -5.2V line (side closest to the 20pin connector) and the right side takes the +3.3V line (side closest to the 6-port connector). Note that the port designation (+3.3V, GND, -5.2V) is also printed next to the connector. Be careful to not apply too much force onto the board to avoid stressing the connectors.
   a. 

   b. The white terminal can take wires with 18-24 AWG size
   c. The connector housing latches on to the wire. **Do not pull the wire back with force.**
   d. 
   e. 

5. Plug in the USB cable in the receptacle. Make sure not to apply too much force on the 20pin connectors. It is recommended to hold the board between fingers to stabilize it.
   a. 

6. Optionally, the input and output lines can be populated.
7. Apply power on the power supplies and the USB interface should be recognized. It should install as a virtual COM port (if this does not work, install VCP drivers from FTDI). Note that the USB interface is powered by the +3.3V line, so this will work even if the -5.2V is not applied.
8. Note that due to differences between the USB and RS-232 protocol, the default latency time in the driver is probably set too high. For most applications (slow communication) this is OK, however for firmware upgrade we have seen failures. We recommend to perform the following steps to resolve this issue (Windows 8, should be similar in other operating systems):
    a. Open the 'Windows Control Manager'
    b. Open 'Hardware and Sound'
    c. Open 'Device Manager'
    d. Find the COM ports
    e. Right-click the USB serial port and select 'Properties'
    f. Select the tab 'Port Settings' and click the 'Advanced' button
    g. Set the latency timer value to 1msec. You can also select the COM-port designation here.
    h. Close the windows and enjoy the plug-on board.
    i. 

9. For un-install of the hardware:
    a. Pull the micro-USB cable out of the receptacle
    b. For removal of the power supply wires, use a thin bladed tool and insert it above the wire. This should loosen the wire and allow you to pull the wire out.



    c.
    d. Remove the M1.6 screws
    e. Gently wiggle the 14-pin connector loose.

OPT1 and OPT2 selection

The OPT1 and OPT2 ports can be connected to several different ports on the laser. The signal is selected by a 0 ohm resistor in the matrix (see below). The pads on the left are for selecting OPT1 and the pads on the right are for selecting OPT2. For each row, only one position can be populated by a 0 Ohm resistor. Note that these are 0402 components and a qualified and experienced technician is needed to install these components (and remove at the other location).

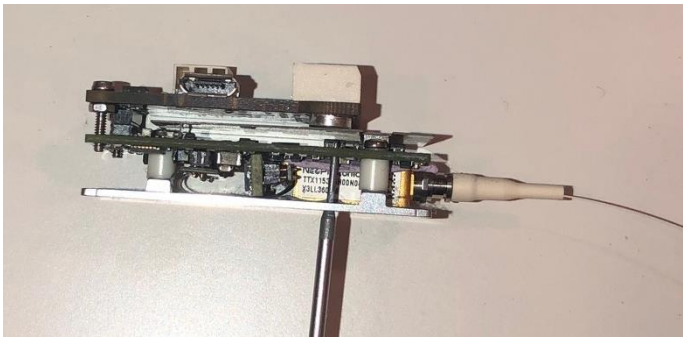
The available connections are (from top to bottom):

- SRQ
- DIS
- MS
- RST
- Tx/Rx: note for this selection the 0 ohm resistor needs to be installed at both OPT1 and OPT2. This selection provides access to the Tx and Rx (LVTTL) lines on the PPCL700. If these lines are floating, the USB connection can control the laser. If these lines are not floating, they will overrule the USB connection. TX is connected to the OPT1 port (i.e. communication from the laser to host) and the RX is connected to the OPT2 port (i.e. communication from the host to the laser).
- AO (analog output)
- CM2

By default, the connection is SRQ to OPT1 and RST to OPT2.

Mechanical Installation onto shield

The two standoffs have an internal thread of #2 and are aligned with the holes in the shield. These can be accessed through the bottom of the device.



The intent of the design is to insert a screw through the shield into the standoff. That would stabilize the configuration for long term operation. However, so far we only have found 1/8 screws which do not fit between the shield and the board. So this is not ideal.

If really intended for long term operation, it is possible to loosen the screws of the shield one by one to be able to lift it, enter the screw and then tighten it again. Make sure only one screw at a time is loosened.