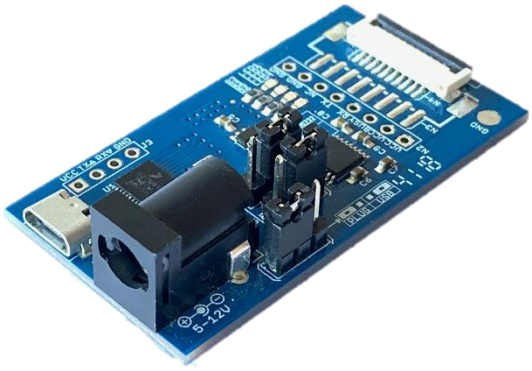
Represented by:
FIRST Components s.r.l.
www.first-components.com
sales@first-components.com
+39 0332 1888005

PAB_02V01

USB Communication Adaptor



Description

Proculus Accessory Board Model 02 (PAB_02) is a USB↔UART converter. It's used to connect a Proculus LCM into a computer, primarily for development and debugging purposes.

PAB_02 is provided in different variants, each with the adequate connectors for your application.

Note: PAB_02 must be used with **UnicView Terminal** software provided by Proculus Technologies.

Features

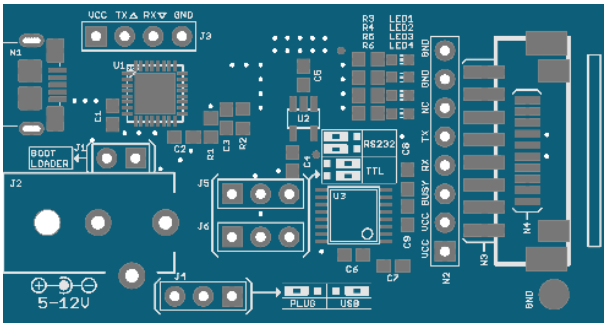
- Selectable LCM power supply.
- Compatible with RS232 and TTL/CMOS levels.
- Updateable firmware.
- Fully compatible with UnicView Terminal software.
- Orderable in several different connector options.
- Uses USB HID (not a virtual COM).

Applications

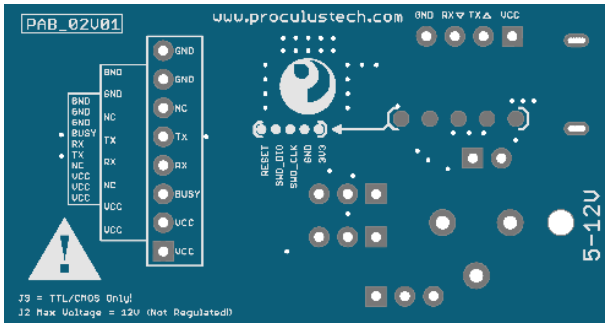
- Prototyping and testing.
- Development.

Appearance

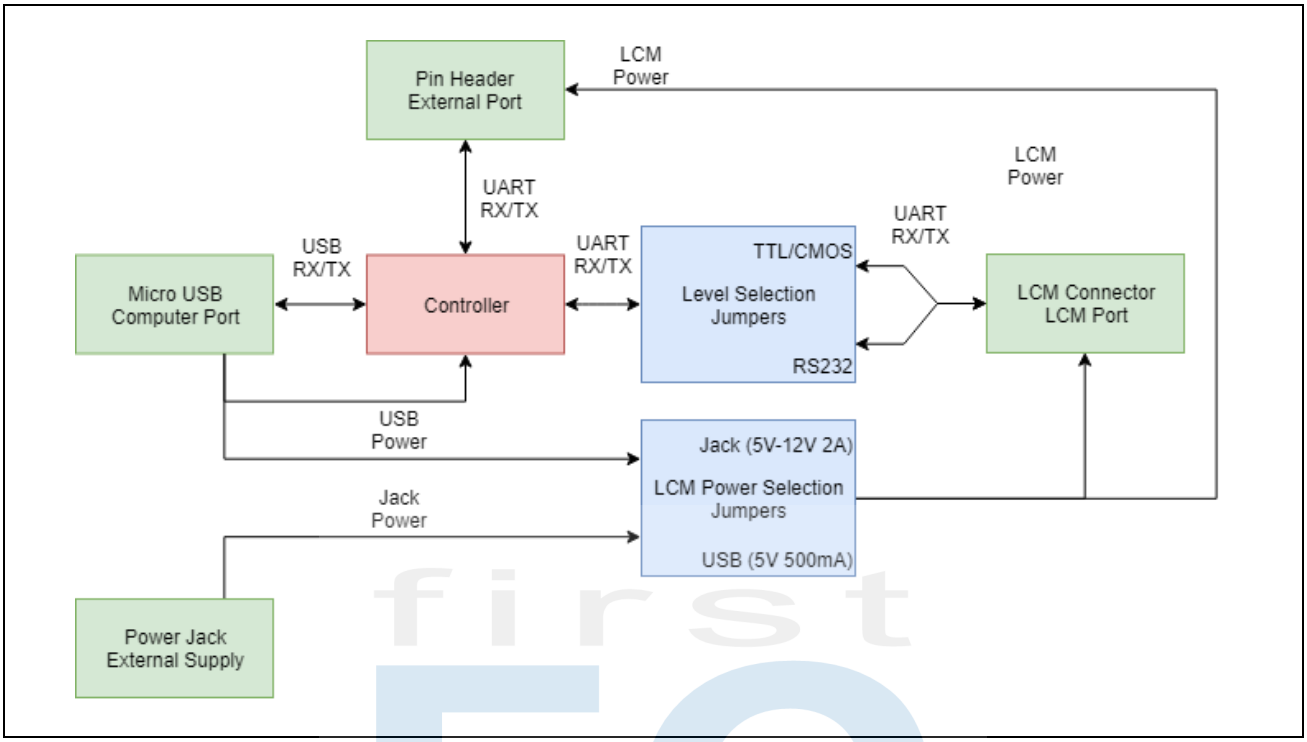
Top View



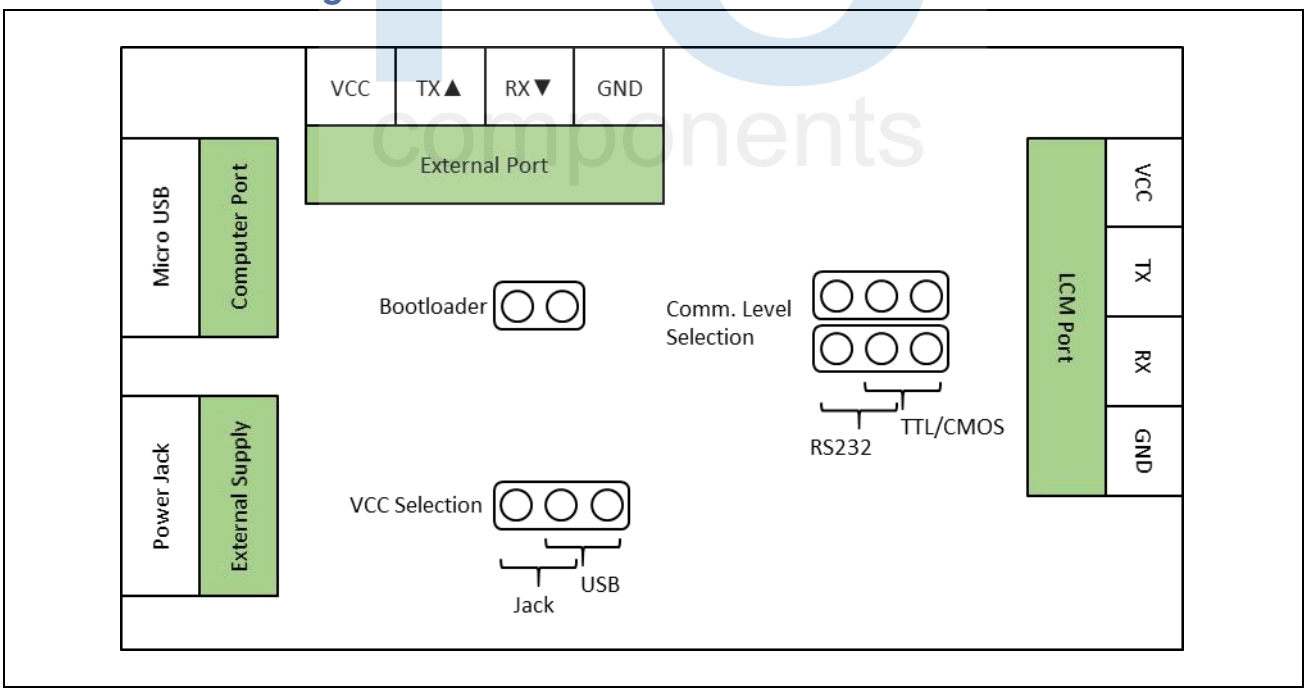
Bottom View



Simplified Electrical Diagram



Connection Diagram



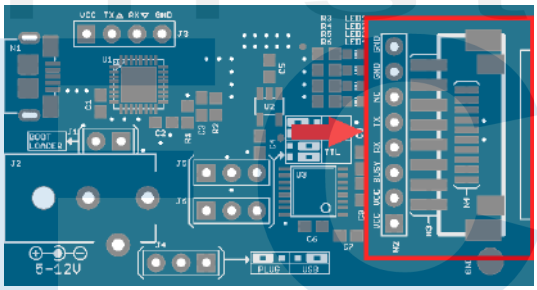
Pinout

N2, N3 and N4 Connectors Signal Description

These connectors compose the **LCM Port**. Only one type of connector is usually soldered.

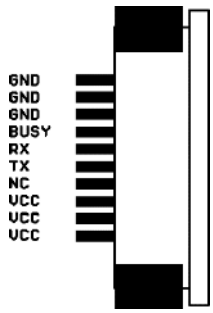
Signal	Details
VCC(1)	LCM Supply Voltage
GND	Common Supply Ground
TX(2)(3)	TX (from the board). Connects to the LCM's RX
RX(2)(3)	RX (from the board). Connects to the LCM's TX
NC	Not Connected. Do not use this pin
BUSY	Not used on AD LCMs. Do not use this pin

Note 1: From USB (5V) or external power supply (5V - 12V). See section "Power Supply" for more information.
Note 2: Supports **RS232** or **TTL/CMOS** levels. See section "Jumper Description" for more information.
Note 3: See section "Serial Communication" for more information on UART connections.

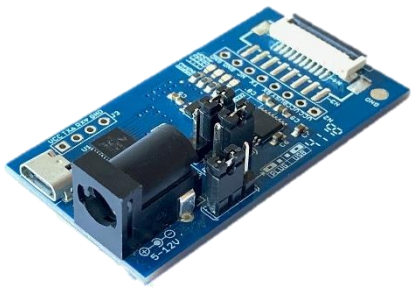


N4 - FFC (Flat Flexible Cable) Connector

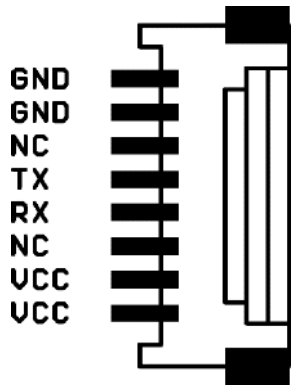
Caution — The FFC Cable contacts should be facing down (towards the board), with the blue tape facing up (away from the board).







N3 - Ribbon Connector

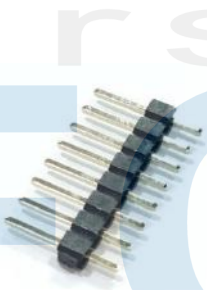






N2 - Pin Header Connector







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No Connector

No connectors available.

Wires can be soldered to the Pin Header empty through-holes.

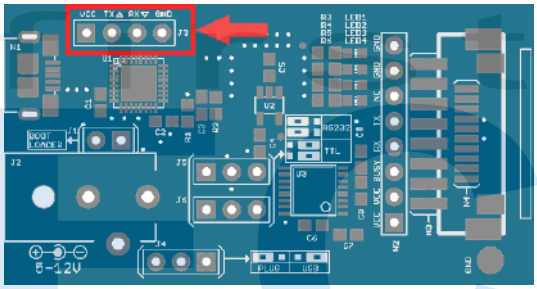


J3 Header Signal Description

This connector is the **External Port**. You can solder wires or pin headers and connect an external circuit to the PAB_02 board.

Signal	Details
VCC[4]	LCM Supply Voltage
GND	Common Supply Ground
TX▲[5][6]	TX (from the board). Connects to external circuit RX
RX▼[5][6]	RX (from the board). Connects to external circuit TX

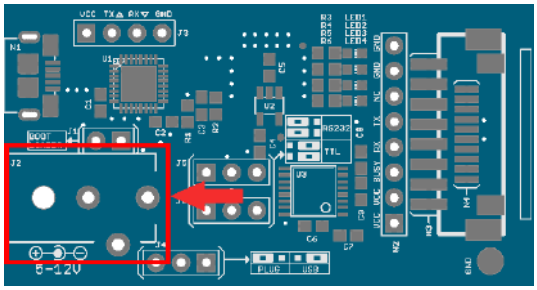
Note 4: From USB (5V) or external power supply (5V - 12V). See section "Power Supply" for more information.
Note 5: Supports **TTL/CMOS** levels only.
Note 6: See section "Serial Communication" for more information on UART connections.



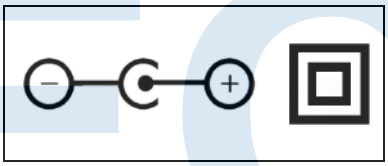
Power Jack

External power supply plug for the LCM. Used to supply voltage to the LCM when **more than 5V or 200mA** is required to power the LCM.

Voltage range: 5V to 12V (please verify your LCM's supply voltage before connecting the power).



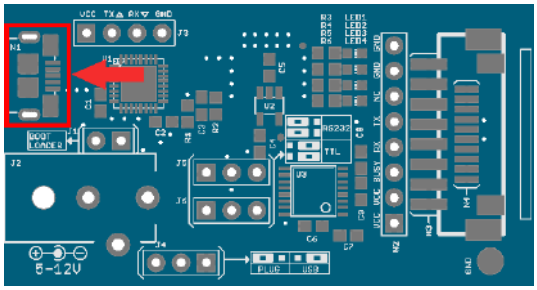
This connector is a center positive J4 Jack. Please only use insulated and center positive power supplies, identified by these symbols:



Warning Verify the correct LCM power supply voltage before turning the power on.

Micro USB

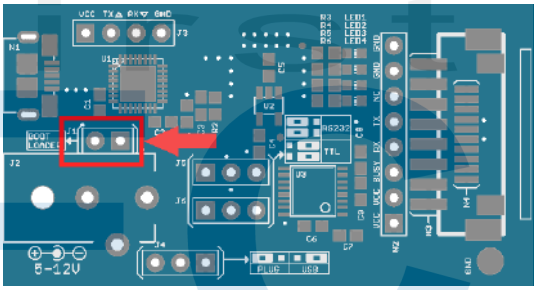
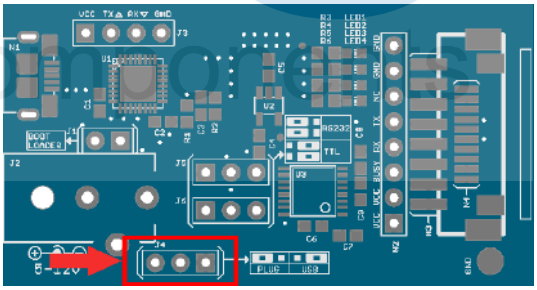
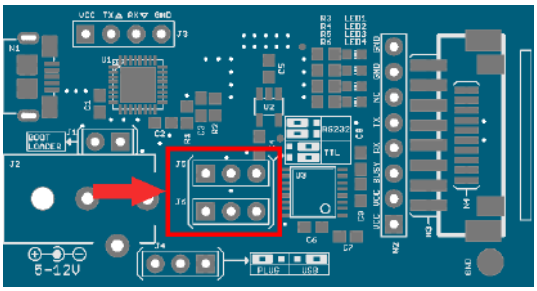
This is the **Computer Port**. It is a client USB port for connection to a computer. Can supply power to the LCM when **5V and less than 200mA** are required to power the LCM. Please use only certified USB cables.



Jumper Description

This table describes all the jumper selectors on the PAB_02:

Jumper	Description	Usage
J1	Bootloader enable	Short-circuit its two pins before powering PAB_02 to enter Bootloader mode
J4	LCM Power Supply selection (**VCC signal**). See section "Power Supply" for more information.	**Left position:** LCM is powered from the external power supply (plug) **Right position:** LCM is powered from the Micro USB port
J5, J6	LCM Communication Electrical Level selection (**TX and RX signals**)	**Left position:** LCM communication level is RS232 **Right position:** LCM communication level is TTL/CMOS

Jumper	Description
J1	
J4	
J5, J6	

Serial Communication

The PAB_02 board has 3 connection points, called **Ports**. Each Port has different communication and power supply capabilities:

Port	Description	Details
Computer Port	**HID USB** communications with the computer	**UnicView Terminal** software needed for USB communication
LCM Port	**UART** communications with the LCM	• TTL/CMOS or RS232 (selectable). • The communication level and power supply should match the LCM connected to this Port.
External Port	**UART** communications with external circuitry	• TTL/CMOS only. • Commonly used for debugging and sniffing purposes.

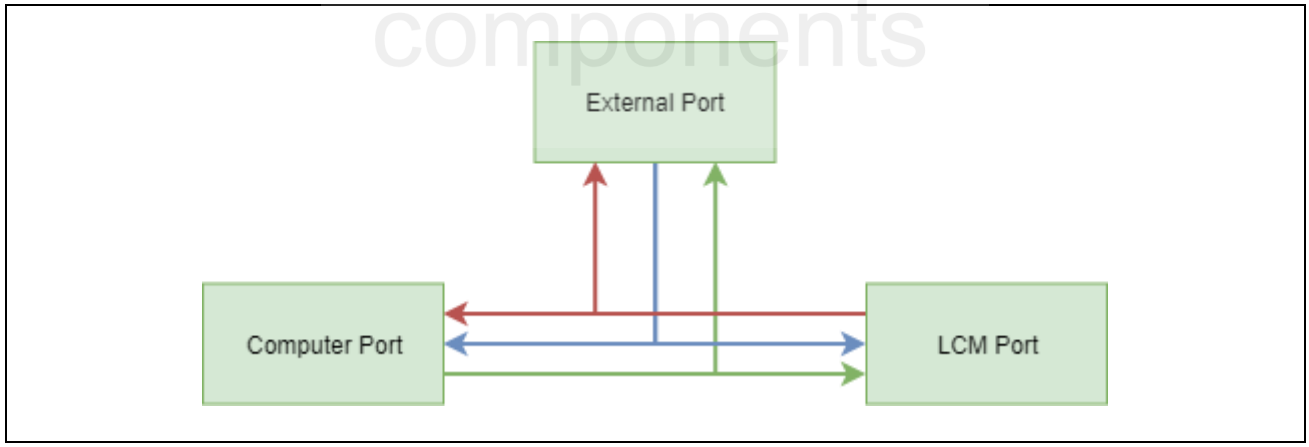
Info

Maximum baudrate: **921600**bps.

For baudrates greater than 500kbps, **receiving** data in LCM Port and Computer Port uninterruptedly may cause data loss.

Both the LCM Port and the External Port operate at the same baudrate.

When a Port receives a new serial message, it always sends it to the other two Ports, as illustrated in the following diagram:



For example, if the computer sends a message to the board (through the **Computer Port**), the message is sent to the **External Port** and to the **LCM Port**.

Power Supply

The PAB_02 board is powered from the Micro USB port (5V). The LCM connected to PAB_02 can be powered either from the Micro USB port or from the Power Jack (using an external power supply).

⚠	Caution	Never connect the **VCC signal** on the **Header J3** if the **jumper J4** is in the **USB** (right) position.

Jumper J4 Position	VCC Signal	Voltage Range	Max Current
USB (right)	Connected USB 5V voltage	5V	200mA
PLUG (left)	Connected to external power supply from Jack	5V to 12V	2000mA

⚠	Warning	Verify the correct LCM power supply voltage before turning the power on.

LED Indicators

PAB_02 has 4 LED status indicators:

LED	Function
1	**Blinking red** when PAB_02 is powered-on
2	**Toggles** when a message is received (RX) from external circuitry (J3)
3	**Toggles** when a message is received (RX) from the LCM (N2, N3 or N4)
4	**Toggles** when a message is sent from the PC (TX)

Updating the firmware (Bootloader mode)

UnicView Terminal can update PAB_02 in a fully automated mode. If, however, the PAB_02 firmware is corrupt and UnicView Terminal can't update the board, you can force it to enter Bootloader mode to flash the firmware manually.

To enter Bootloader mode:

1. Power PAB_02 **off**.
2. Short-circuit **J1** (using tweezers, for example).
3. Power PAB_02 **on**.

PAB_02 will remain in Bootloader mode until a new firmware is flashed or until it resets. The board will reset 5 seconds after a successful firmware update.

Typical Applications

PAB_02 is commonly used to:

- Connect an LCM to a computer for development and debugging.
- Provide power to an LCM without a controlling board.
- RS232 to TTL/CMOS converter between the External Port (TTL/CMOS) and the LCM Port (RS232).

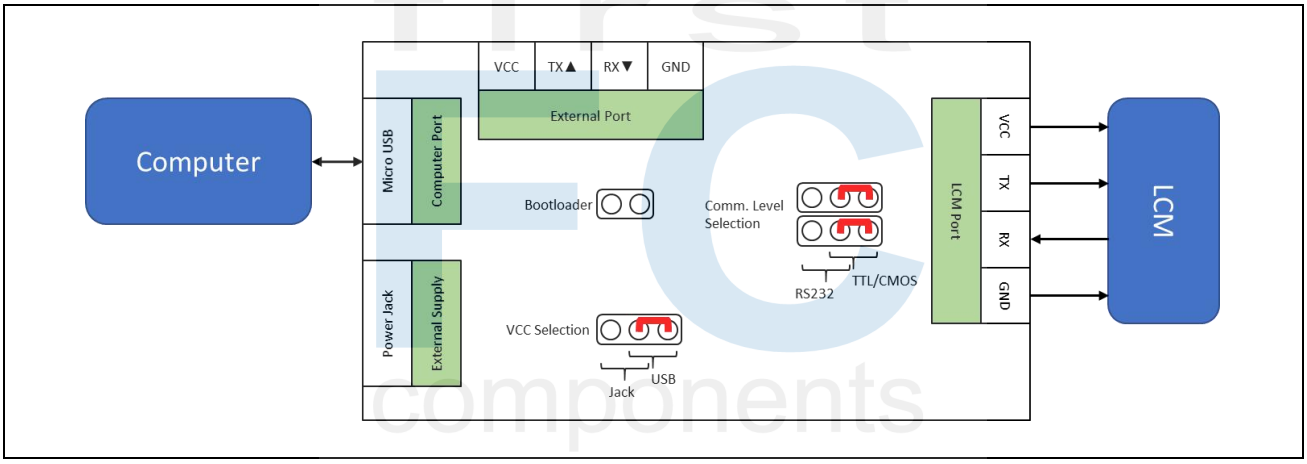
Note

PAB_02 is provided *as is* and doesn't necessarily comply to any certifications or standards. As such, we recommend PAB_02 to be used **only for development purposes**.

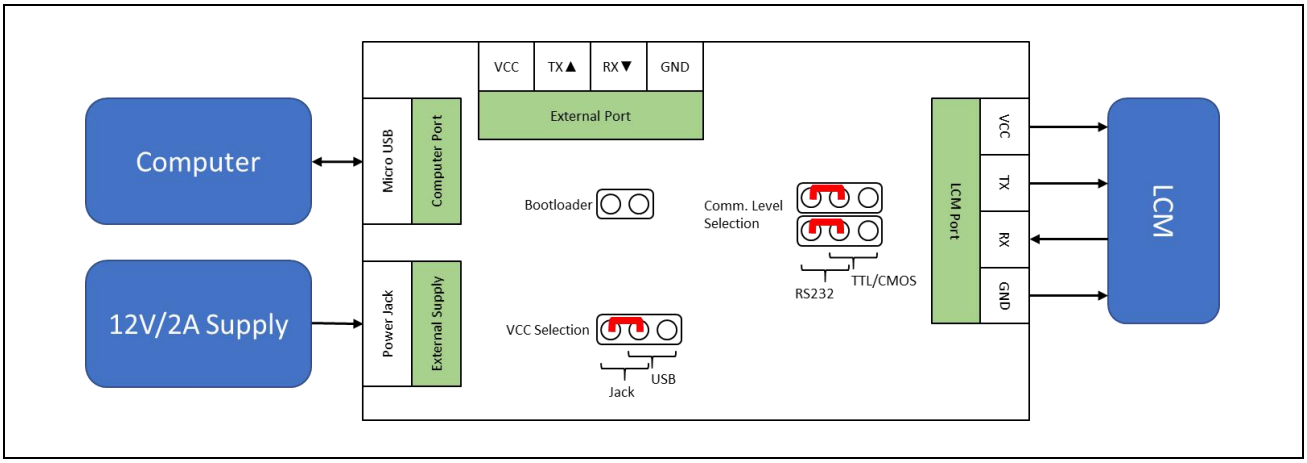
Examples

Using as PC to LCM communication tool

LCM specifications: 5V, 200mA, TTL/CMOS.

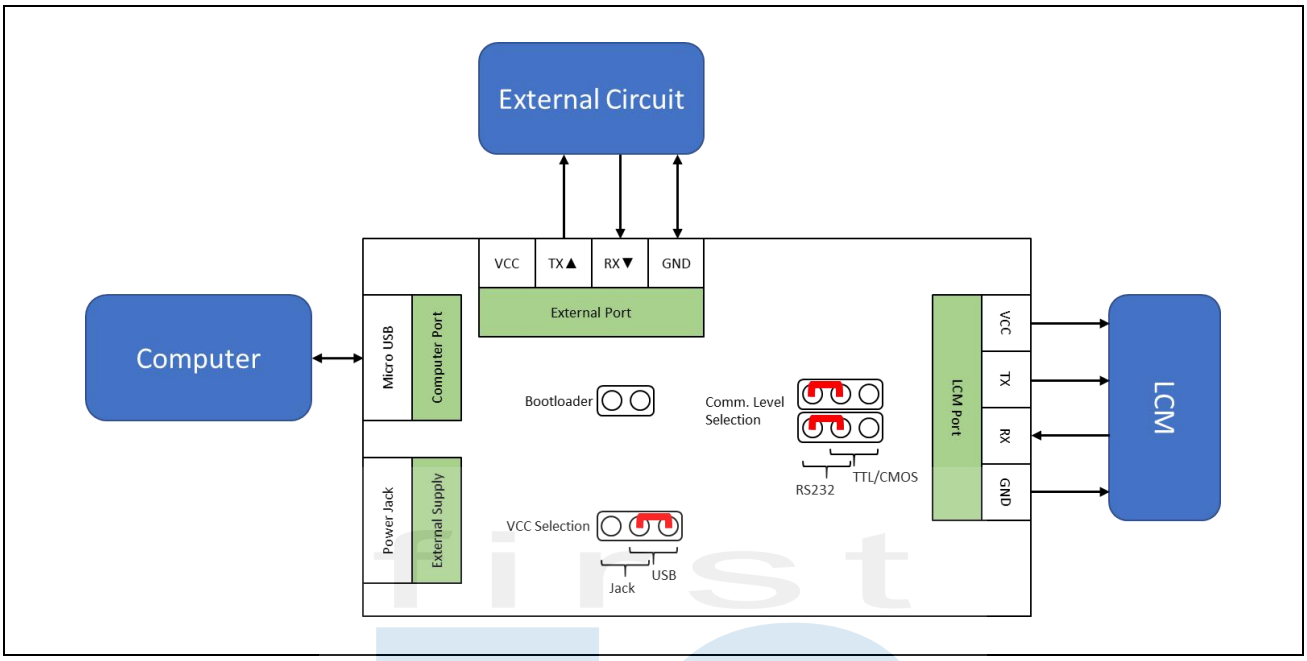


LCM specifications: 12V, 700mA, RS232.



Using as RS232 to TTL/CMOS converter

LCM specifications: 5V, 200mA, RS232.



first FC components

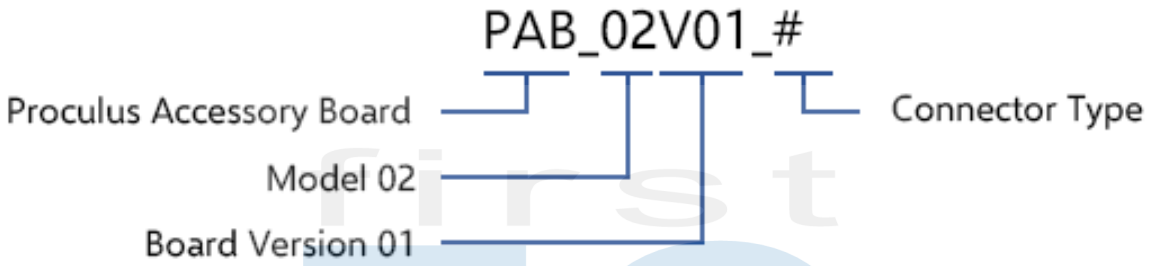
Ordering Information

Connector Types

The following table describes the available connectors and their respective symbols.

Connector	Symbol	Details
FFC (Flat Flexible Cable) Connector	F	10-pin, 1.0 mm pitch, Dual contact
Ribbon Cable Connector	R	8-pin, 2.0 mm pitch
Pin Header	P	8-pin, 2.56 mm pitch, Straight, upwards
No Connector	N	None

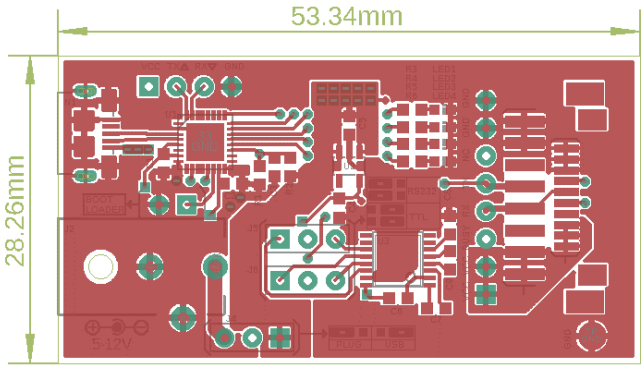
Part Number Selection



You can order PAB_02 in any configuration of pre-assembled connector types. The following table lists part numbers all available configurations:

Connector Type	Connector
PAB_02V01_F	FFC
PAB_02V01_FP	FFC and Pin Header
PAB_02V01_R	Ribbon
PAB_02V01_RP	Ribbon and Pin Header
PAB_02V01_P	Pin Header
PAB_02V01_N	No Connector

Mechanical Information



Dimensions are given in millimeters.

Revision History

Revision Number	Revision Date	Description	Pages Changed
1	July 2019	Initial release.	-
2	October 2019	PAB_02V01_FP and PAB_02V01_RP variants added. Orientation of the Pin Header connector added.	12

first FC components

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