

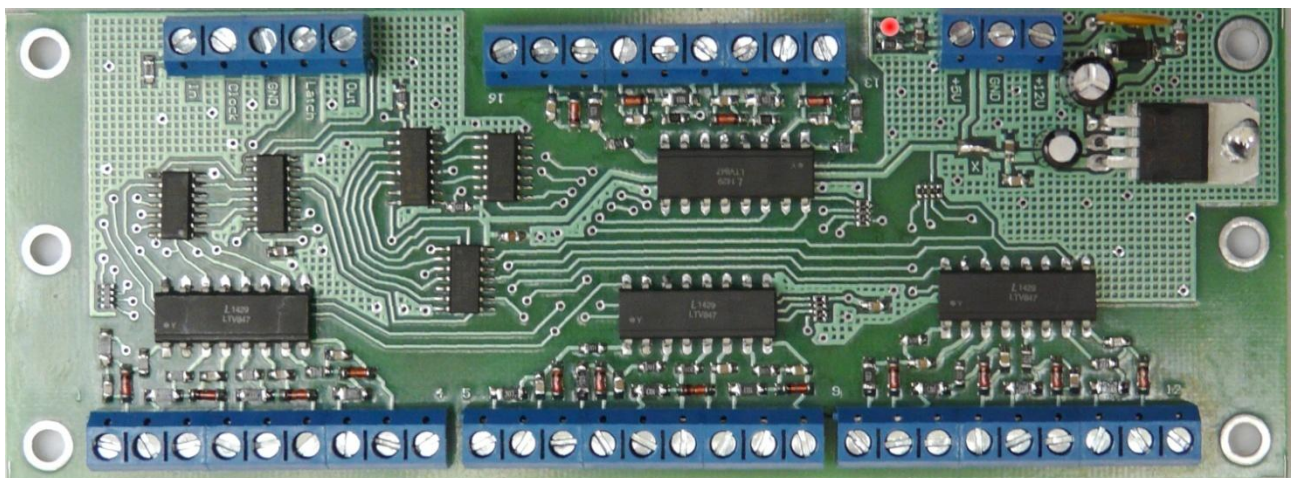
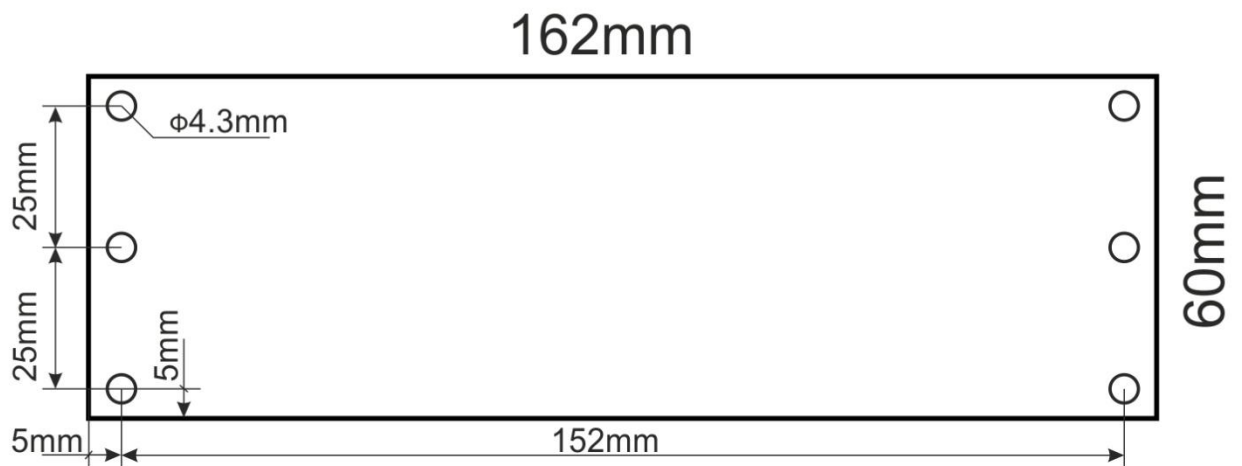
STEDI16PX

SPI / Serial Expansion board

Ver. 1.2.2016

Features

- ▬ **SPI / Serial command port.**
- ▬ **Can be managed from 3.3 ... 5V logic.**
- ▬ **74HC165 based logic.**
- ▬ **16 Digital Inputs with Optocouplers 0..24V.** Rin=10k.
- ▬ **Power Voltage:** +12V,+5V, +3.3V.
- ▬ **Power Current:** 2mA.
- ▬ **Dimensions:** 162 x 60 x 20 mm
- ▬ **Weight:** 75 gr



Board Application

This board adds 16 digital inputs with Optocouplers to your controller.

It is managed through a serial interface, typically SPI. You can connect multiple boards sequentially according to your needs. You can combine different models of our boards.

The board uses a minimum number of wires for the control, only 3 - Output, Clock, Latch. The board is designed to loads minimal your controller. Input current is resistor 22k to GND (0.23mA for 5V VDD) for Clock, Latch and same to VDD for Input.

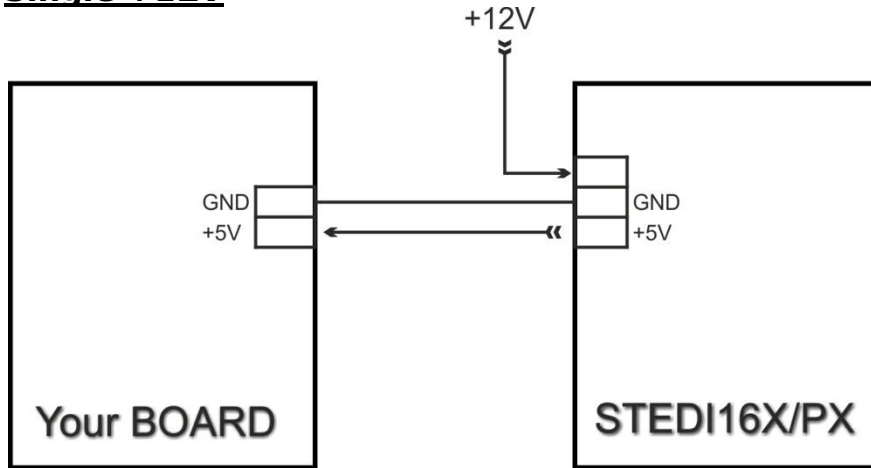
You can use this board to obtain +5V for your board from +12V Voltage.

Check Voltage of CPU in your board (Rasberry PI, Arduino ...). If this voltage is 3.3V, you must power logic (ONLY) of STEDIxxx form 3.3V (check next page) !

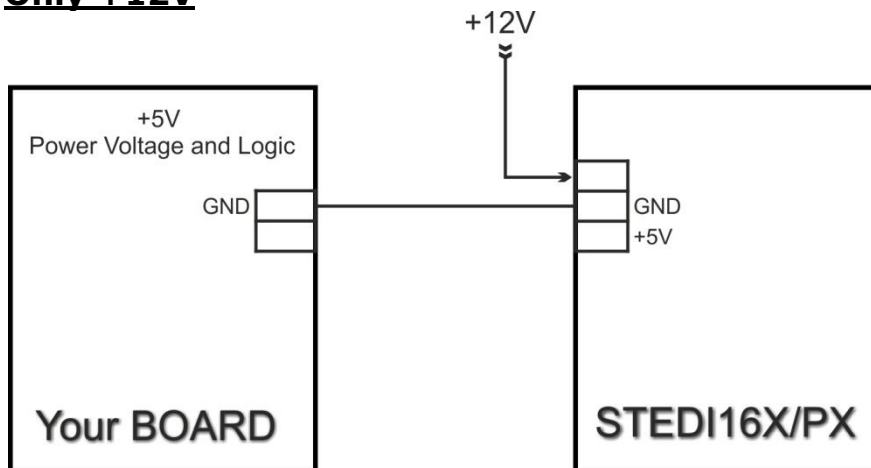
Power

You can power this board with +12V or +5V or +3.3V. External voltage can be +5V or +3.3V.

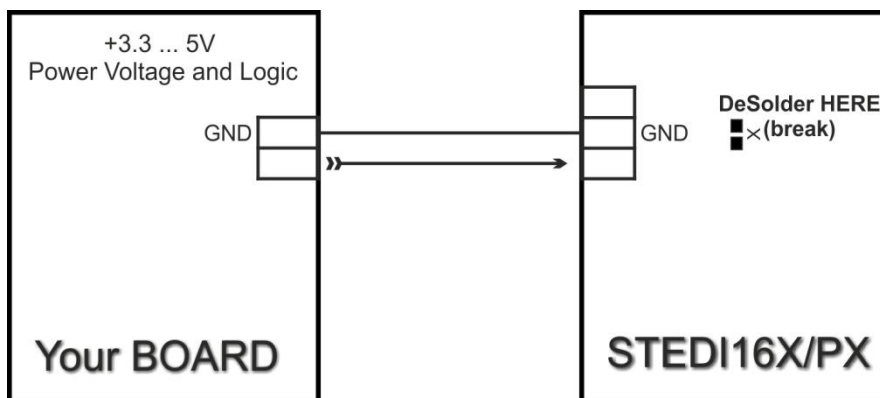
Single +12V



Only +12V

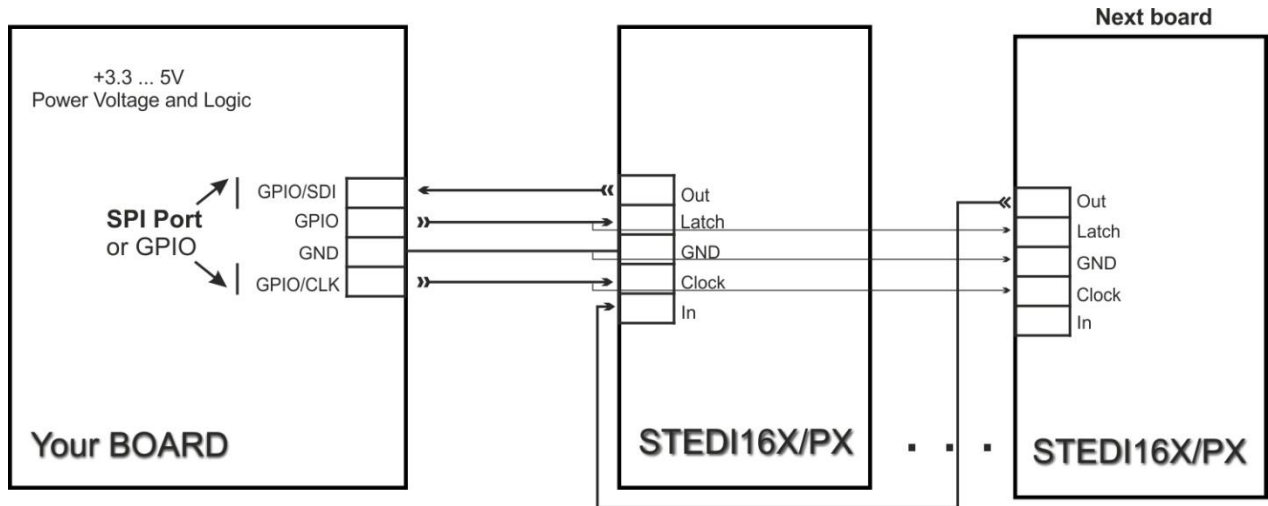


Powered from your board



Command port

This controller is based on 74HC165. Practically you read the register.



It is desirable that the wires between the boards to be minimal short. This affects the maximum speed at which you can maintain stable communication. There are no other limits for speed.

Software Example:

Usually Latch Impulse must be 1T of SPI speed.

```
//Power ON board
```

```
Latch_IN=1;
```

```
.....
```

```
Function Read_Inputs(){
```

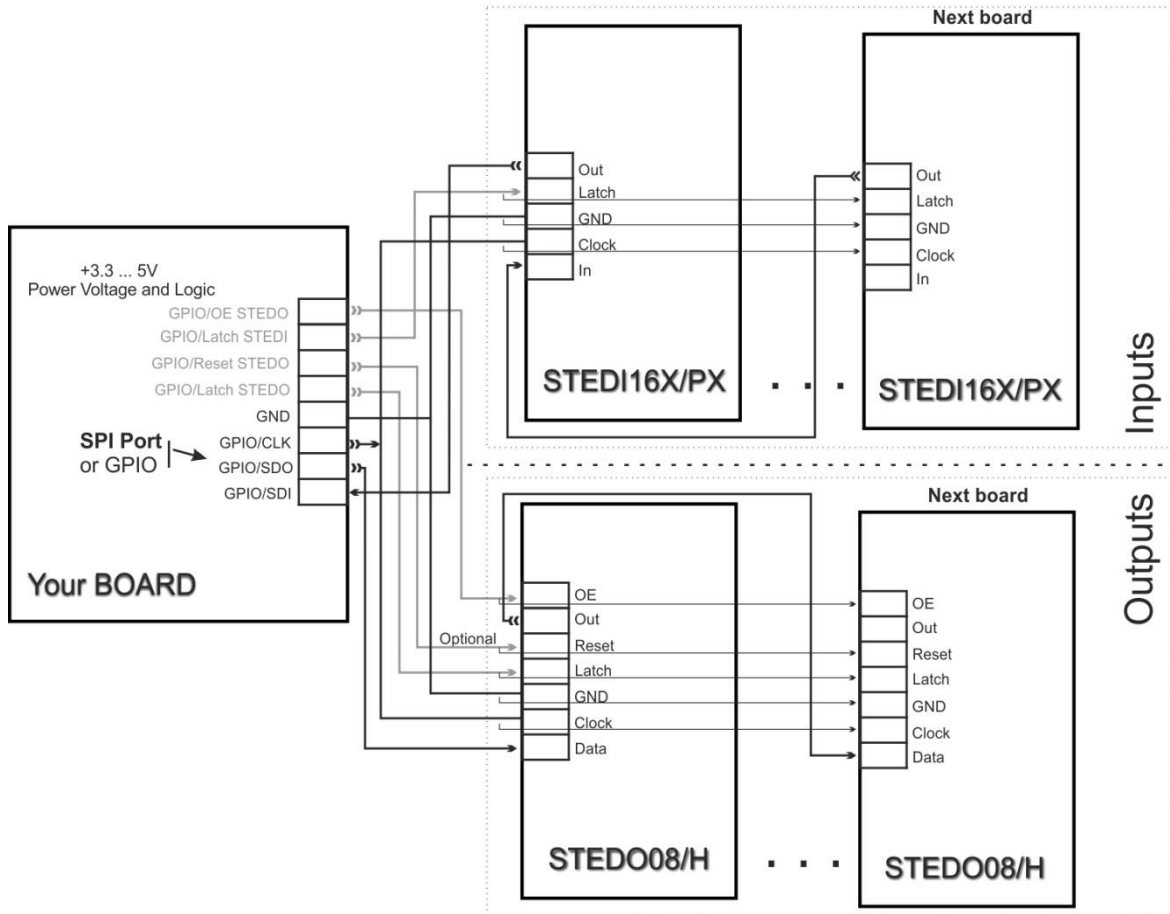
```
  Latch_IN=0; Wait_1T_SPI; Latch_IN=1; //latch inputs to register 74HC165
  Send dummy byte to SPI port; Read SPI and save to variable; //inputs 0..7
  Send dummy byte to SPI port; Read SPI and save to variable; //inputs 8..15
```

```
  ...
```

```
  Send dummy byte to SPI port; Read SPI and save to variable; //inputs N
}
```

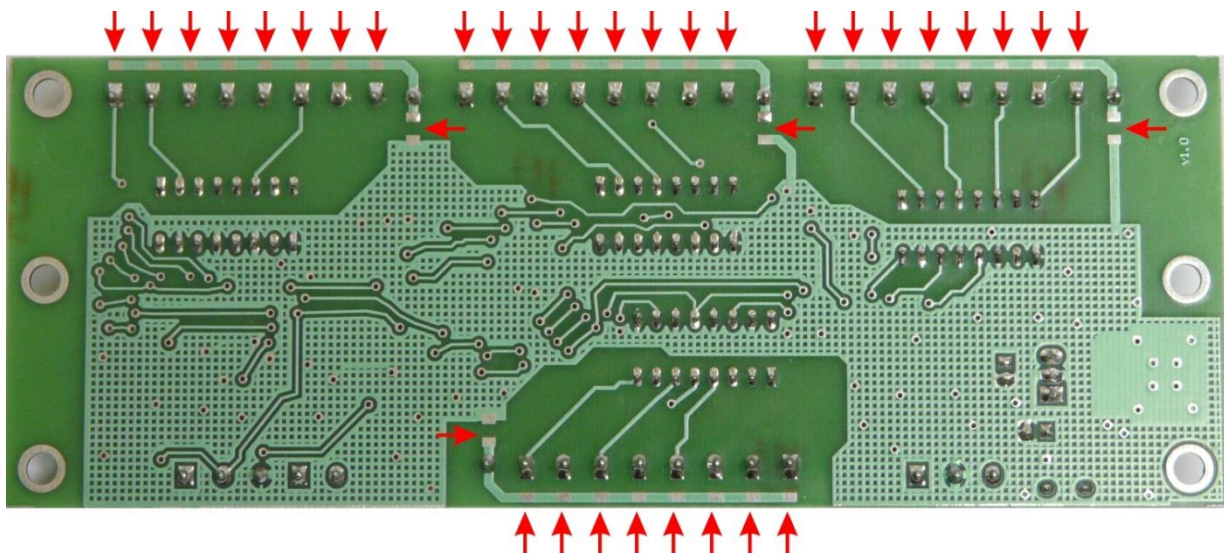
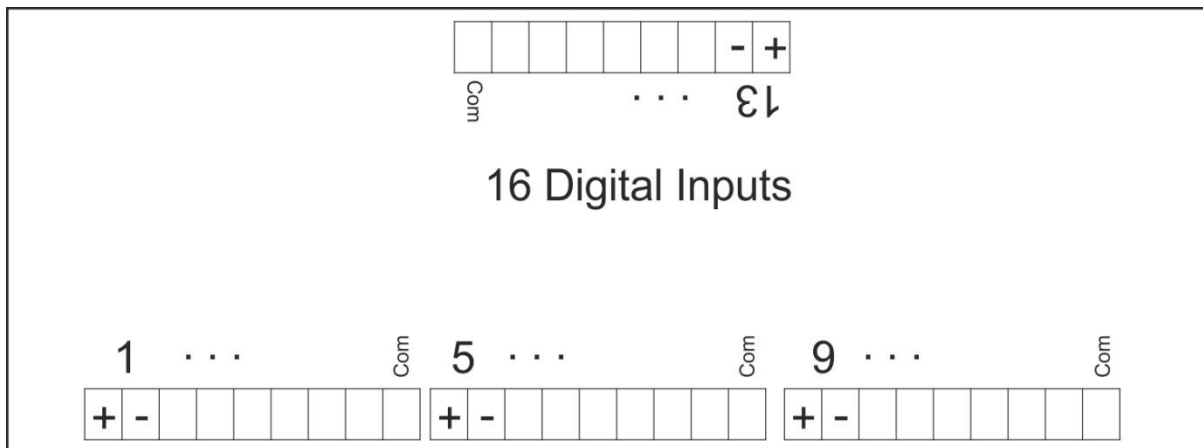
```
//According to your language, sometimes you do not need to send dummy
byte first, before read SPI port.
```

You can connect **ALL** our Expansion boards (**STEDOxx/STEDIxx**) to a **single SPI port**.



Inputs

Inputs are implemented with Optocouplers LTV847.
 When the input is not connected, it is assumed level **L**. Switch Level is about 6-7V DC. If you need different level please ask.
 You can solder at the bottom PCB, to limit external wires. Or use **Com** pin to apply external voltage to multiple input, or **Gnd**.



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