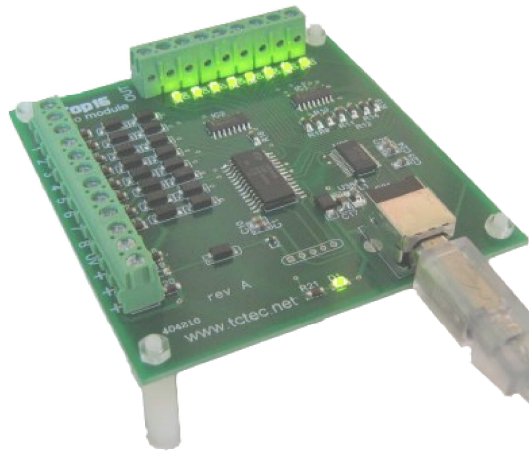


Top16 USB IO Module

User Manual

Version 1.7



www.tctec.net

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Product Description

The Top16 IO module is an Input\Output module consisting of 8 open collector outputs and 8 high impedance analog + digital inputs.

Each output can sink 250mA (all on), or individually 350mA, this enables direct control of devices such as solenoids, door strikes and relays.

Each output can also provide PWM (pulse width modulation) output of 8 bit resolution (0x00 to 0xFF) at 7.8 kHz.

The USB interface is provided by FTDI DLL and drivers, as well as a DLL or command –line application provided by tctec.

System Requirements

1. Top16 manager requires MS Windows 2000, XP or Vista with the DotNET runtime.
2. DLL available for Linux and MS Windows.

Specifications

Maximum current consumption (exclude “+” outputs)	100 mA
Supply:	USB powered
Dimensions:	86 mm x 92mm x 20mm
Digital Output/input maximum update frequency	60Hz
Maximum input voltage	30 Volts
Open collector output rating	30Volts 350mA, 250mA(all on)
Input Logic Low (0)	< 1 Volt
Input Logic High (1)	> 4 Volts
Analog read frequency	20 Hz
Analog input	12bit / multi-gain, 10mV offset
PWM (on all outputs)	7.8 kHz, 8 bit (0x00 to 0xFF)

Software

top16.dll

API for controlling from custom applications.

Top16 Manager

MS windows application for changing board names, testing board inputs and outputs.

Please check for the latest software at:

www.tctec.net

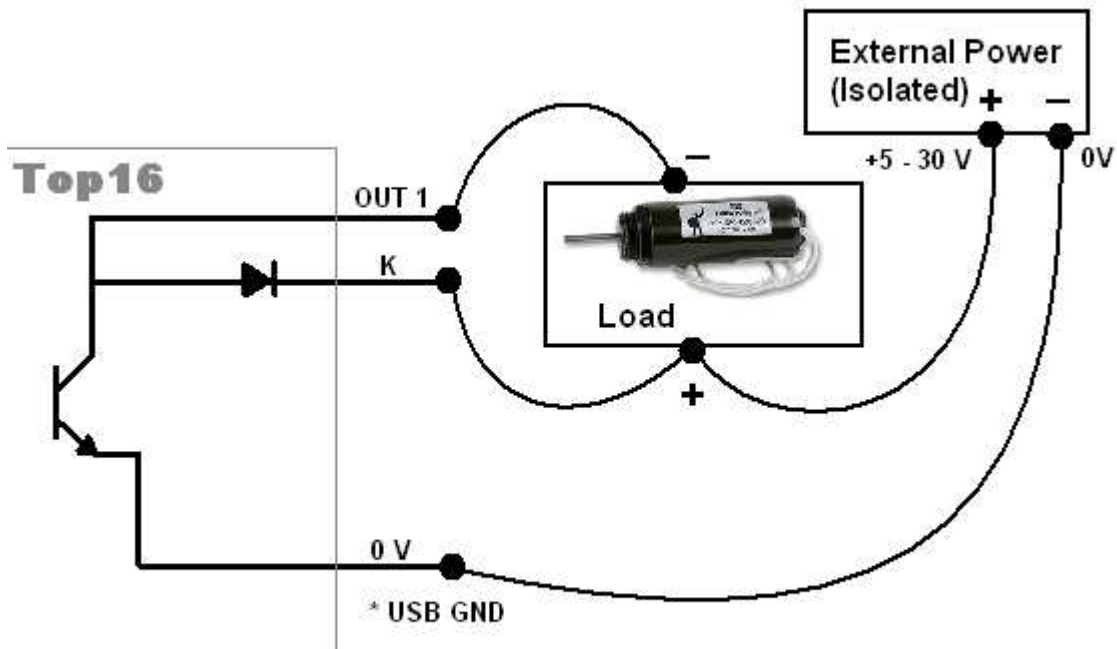
Connecting Outputs

Each output is the collector of a transistor which effectively connects the output to 0V (when output is ON) and will sink up to 250mA (all outputs on) or 350mA (single output on). When the output is OFF it is a high impedance.

The 'K' output must be connected to the external positive supply. This provides a diode clamp for voltage spikes that occur when switching an inductive load. The 'K' output prevents the transistor being damaged when a high voltage 'spike' occurs between Load-negative and Load-positive when the load is switched off.

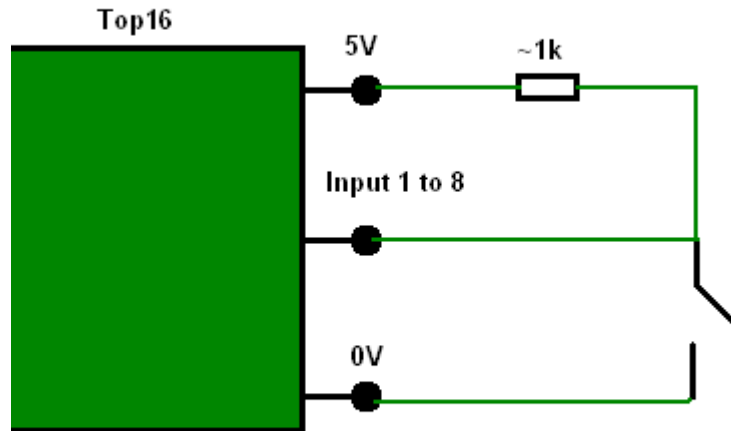
The outputs share a common 'K' output.

The output must never exceed the maximum voltage rating.



0V is also USB ground, Ground-loops can occur between the external supply negative and the Top16 0V. To prevent this, the external supply must be isolated from ground (transformer supply), or share a common ground with the PC.

Connecting Switches and Buttons

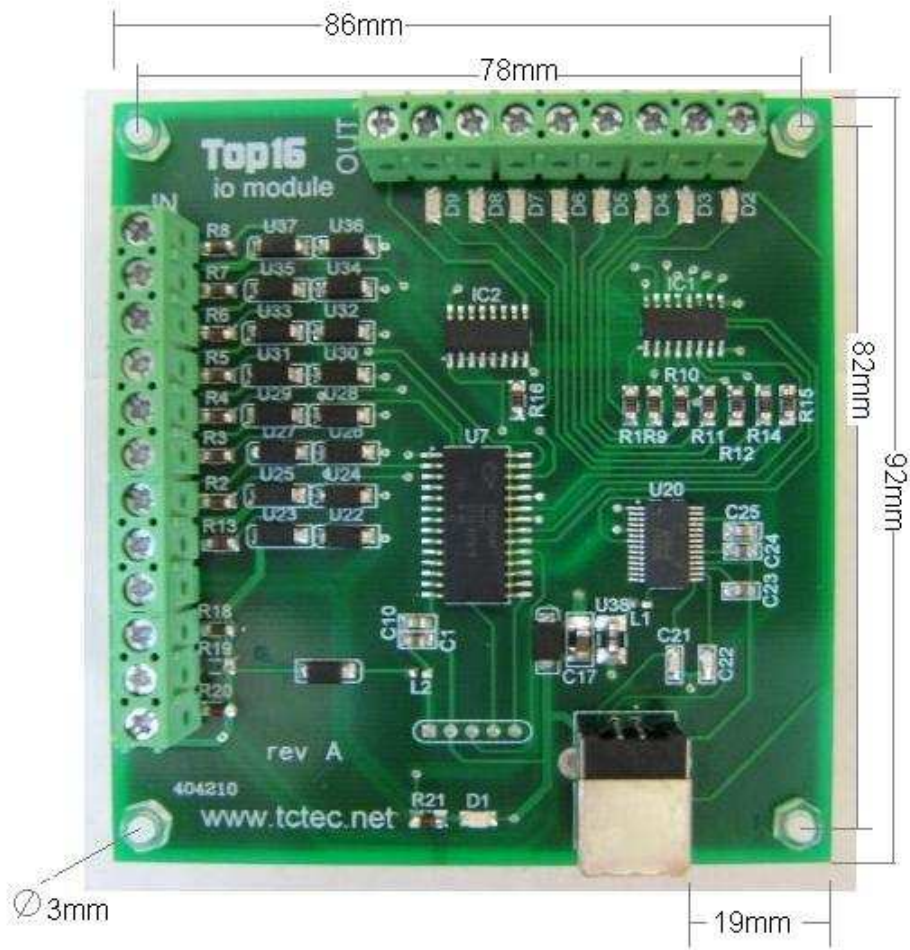


Inputs must be pulled high or low by connecting to 5V or 0V with a 1k to 10 k resistor. The diagram above shows the input normally high (logic 1), closing the switch will bring the input low (logic 0).

Terminals

Terminal	
OUT 1	Open collector output
OUT 2	Open collector output
OUT 3	Open collector output
OUT 4	Open collector output
OUT 5	Open collector output
OUT 6	Open collector output
OUT 7	Open collector output
OUT 8	Open collector output
K	Common diode output. Connect to external supply positive (if external supply is used)
IN 1	Analog / Digital input
IN 2	Analog / Digital input
IN 3	Analog / Digital input
IN 4	Analog / Digital input
IN 5	Analog / Digital input
IN 6	Analog / Digital input
IN 7	Analog / Digital input
IN 8	Analog / Digital input
0 V	Zero volts, USB negative (GND)
+	+5 Volts from USB supply via 1 ohm resistance.

Physical Dimensions



Change Log

13-Oct-2010

Hardware Version-C, output resistors to +5v output changed from 27 ohms to 1 ohm.

Disclaimer

This device should not be used in applications where failure may result in death or injury without proper consideration and design of associated system architecture and redundant safety features.

The manufacturer, tctec pty ltd accepts no responsibility for injury, death or loss caused by the use or misuse of this device.