Hack-Key

Your circuit needs USB connectivity? Hack-Key does the job!

The Hack-Key is a compact USB-to-serial converter which you can easily configure by sliding switches. It uses an FTDI chip, supports 3.3 V and 5 V systems and is compatible with most Arduino boards. The Hack-Key is your key to numerous microcontroller projects.

Features

- original FT232RL-chip from FTDI
- pinout compatible to many Arduino boards
- three led indicators
- sliding switches for easy configuration
- selectable voltage: 3.3 V and 5 V
- switch between DTR and RTS signals
- over-current protection by self-resetting fuse
- power supply for connected circuit
- compact dimensions (only 25 mm x 28 mm)
- mounting holes
- connector can be mounted upright or flat
- drivers available for Windows, Mac OS X and Linux

Applications

Development tool

The Hack-Key is ideally suited as a development tool for microcontroller projects.

Its main advantage is its versatility and easy configuration. All switches and signals are labeled. No matter whether your target circuit uses 3.3 V or 5 V or whether you need a DTR-signal to automatically reset your Arduino or a RTS-signal for hardware handshaking - just flip a switch and the Hack-Key is setup.

Three leds tell you the current state of operation:

Led	Color	Meaning
PWR	green	USB power is on.
RX	yellow	Data is transferred to the PC.
TX	red	PC is sending data to the target circuit.

Supplying the target circuit

Hack-Key is able to supply your circuit with power using pin 3 (Vout). The maximum allowed current is given by the following table.

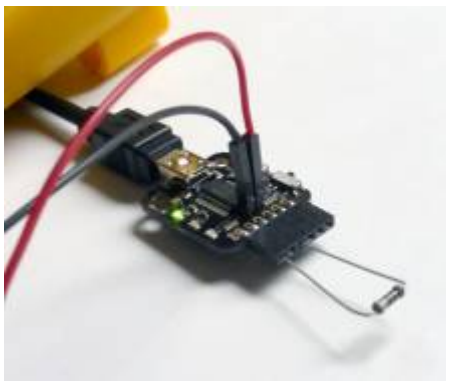
Voltage	Maximum current
3,3 V	50 mA
5,0 V	250 mA

If your circuit needs more current than the Hack-Key is able to provide you must use an external power supply. In this case the supply by the Hack-Key must be cut off to avoid having two power supplies working against each other. For that simply remove the jumper plug from the Hack-Key.

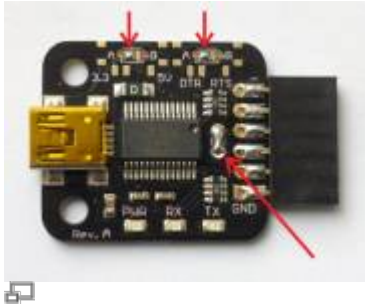
To protect your USB-port against short-circuit the current draw of the Hack-Key is limited to 500 mA by a self-resetting poly-fuse.

Measuring supply current

With the jumper plug removed you can easily measure the current consumption of your circuit. Just connect a current meter to the jumper pins (upper pin = positive, lower pin = negative meter input).



Application in final product



Configuring by solder bridges

If the Hack-Key should be used in a final product, the feature of easy configuring is not needed and often not desired, because misconfiguration might be an additional source of error. For this use case omit the sliding switches and the jumper pin header. Instead configure the Hack-Key by solder bridges. This is done very quickly and ensures that the end user won't be able to inadvertently change the configuration.

Because of its small dimensions the Hack-Key will fit almost anywhere. With the two mounting holes (diameter 3 mm) it can be firmly attached to the housing making it steady and rugged.

Assembly kit

Hack-Key kit

Contents

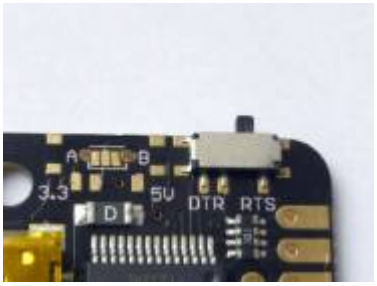
- 1 pre-assembled Hack-Key printed circuit board
- 2 mini SMD sliding switches
- 1 pin header (2 pins)
- 1 jumper plug
- 1 female connector (6 pins)

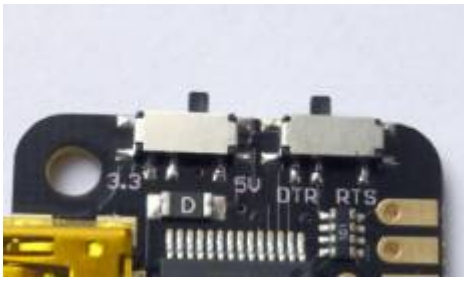
Building instructions

You need elementary soldering skills as well as the apropriate tools. For the SMD switches you should be able to do fine soldering works.

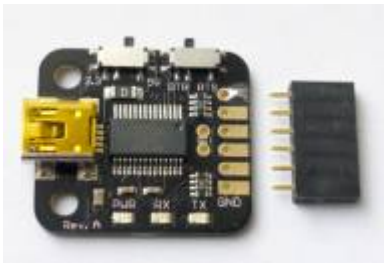
1. First you assemble the two sliding switches. Put a switch onto the board so that its nubs fit into the small drill holes. Solder one pin and check for a correct position with the switch resting flat on the board. Then solder the remaining pins. In the same way mount the second switch.

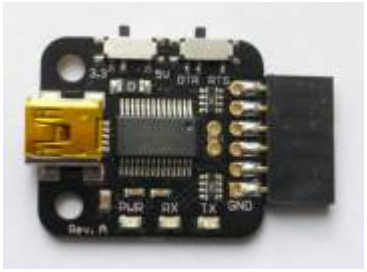
   You also have the option to omit the switches and configure the Hack-Key by two solder dots (see "Application in final product").



2. Now you solder the connector. It can be mounted flat with the board or perpendicular to the board.





3. Finally go for the pin header. If you want the Hack-Key to supply power to your circuit place the jumper plug on both pins. Otherwise place the jumper plug on only a single pin. This way you cannot lose the jumper plug.


Before the Hack-Key can be used, one must usually install the appropriate Driver for the operating system.

Driver

Normally the Hack-Key integrates into the operating system of the host computer as a virtual COM port (VCP). You can access it as a serial interface. The latest drivers for your operating system can be found on the FTDI website.

Switches

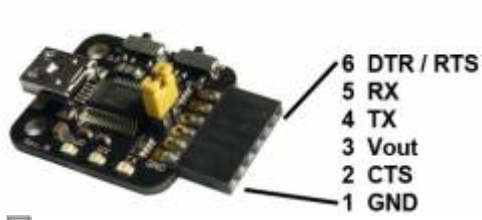
The left switch S1 selects the supply and signal voltage of the target circuit (see "Supplying the target circuit". You can choose between 3.3 V and 5 V, depending on whether the connected target system operates with 3.3 V or 5 V levels.

With the right switch S2, the handshake signal is selected. Here RTS and DTR are available. This setting is only relevant for specific applications. For programming Arduino boards leave the switch in position DTR.

As an alternative you can configure the Hack-Key with two drops of solder omitting the switches (see "Application in final product").

Connectors

Female pin header connector



Pinout

The pinout matches the pinout of most Arduino boards. Pin 1 is identified by a square pad, the other pads are round.

Pin	Signal
1	GND
2	CTS
3	Vout (3.3 V / 5 V)
4	TX (output)
5	RX (input)
6	DTR / RTS

USB

The USB connector is a standard USB connector of type mini-B.

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