



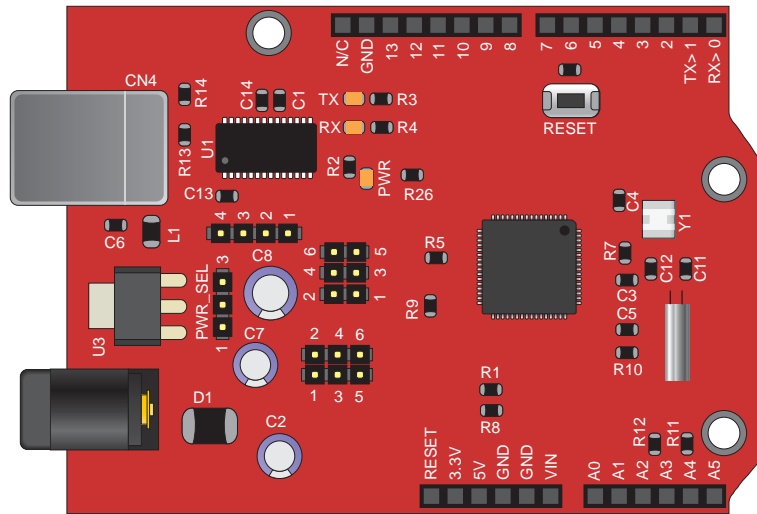
BASIC MICRO

TECHNOLOGY AT WORK

Mad Hatter Microcontroller Board
Data Sheet

Feature Overview:

- 100% Arduino Shield Compatible
- Uses BASIC, C or ASM
- 25% Faster
- 32 Bit Processor
- 56K Code Space
- 4K Scratch Pad Ram
- Graphical Debugger (ICD)
- LDO Power Regulator
- FTDI USB
- 2 UARTs
- I2C
- Fast Analog

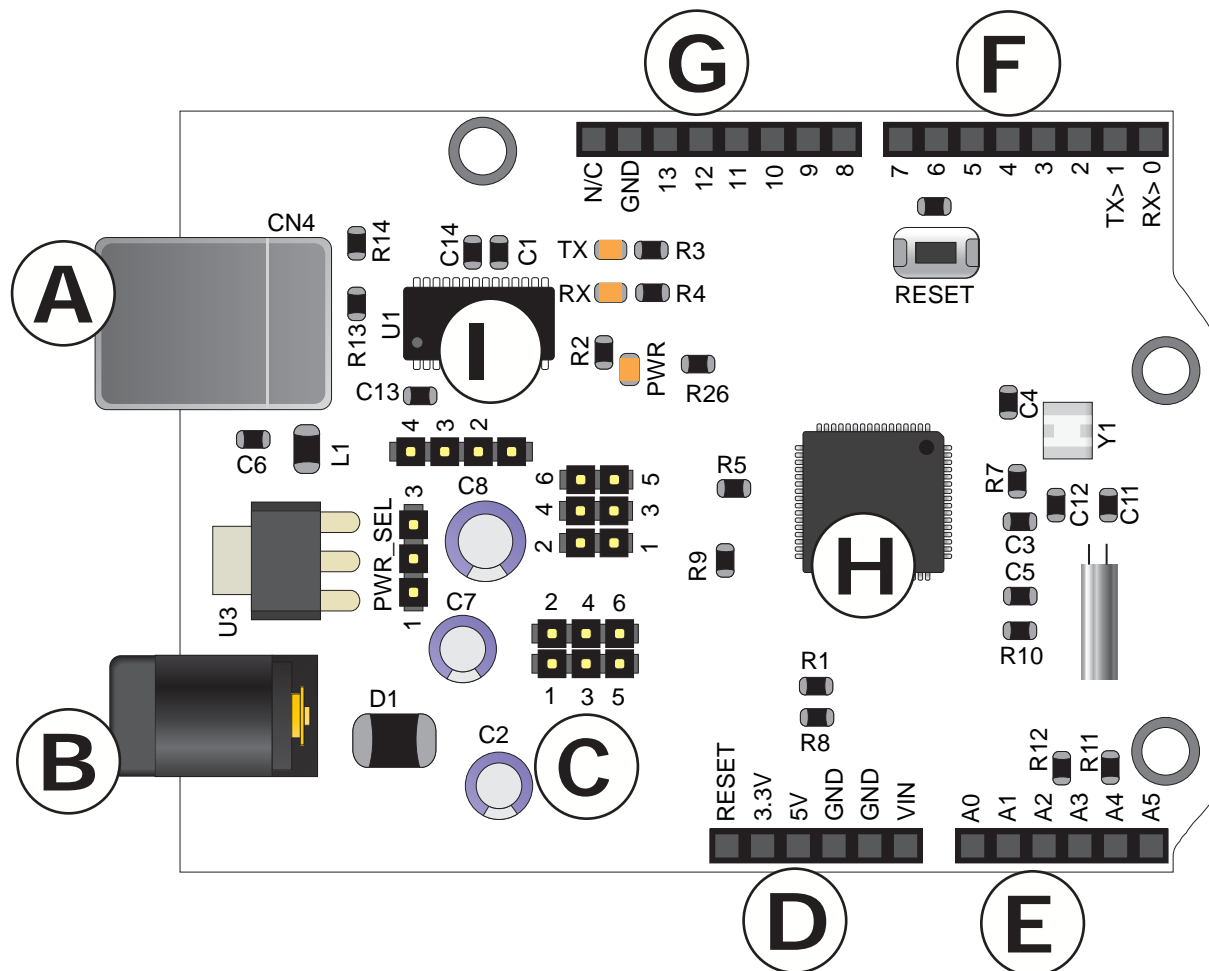


Overview

The Mad Hatter is 100% Arduino shield compatible board. It is pin out and hardware compatible with all available shield boards. The Mad Hatter is programmed in an easy to use BASIC language. It has 56K flash for your programs and 4K of scratch memory for variables and other functions. On average it is 25% faster than an standard Arduino. With the include BASIC language its also easier to learn. The syntax is very easy to understand and is well documented in a 300 page plus manual.

The Mad Hatter board also includes a fully functional graphical debugger. Also know as an ICD. This feature makes it easy to debug your program in real time. Something not possible on a standard Arduino. The software used to program the Mad Hatter Microcontroller Board is full IDE suite. The IDE includes context sensitive help so you never have to stop mid program and lookup command syntax.

Hardware Overview:



- A: Standard USB Connector.
- B: 2.1MM Center Positive Power Jack.
- C: TX/RX Breakout Header.
- D: Power Header.
- E: Analog I/O Header.
- F: Digital I/O Header.
- G: Digital I/O Header.
- H: 32 Bit Processor.
- I: FTDI USB Micro.

Setup

The Mad Hatter Microcontroller board is programmed using the Basic Micro Studio software. It is available for free from Basicmicro.com under the downloads section. Basic Micro Studio first setup and use is documented in the BasicATOM syntax manual. The Mad Hatter Microcontroller board is functionally equivalent to the BasicATOM Pro 40 module.

Download Sketches

Basic Micro Studio is used to create your sketches or programs. The language is based on a subset of BASIC. The syntax manual is available under Basicmicro.com downloads section.

Arduino Shields

The Mad Hatter Microcontroller board has been designed to be compatible with all the available Arduino shields. Most shields use the primary UART of the Arduino. The Mad Hatter board has 2 UARTS giving it a unique advantage in you don't need to disconnect the shield when downloading your sketch to the board. You can use the second UART to communicate to the shield. All other Arduino hardware features are mimicked on the Mad Hatter board. This includes controllable pull-up resistors, analog, I2C, SPI and so on.

Sketch Library

We have created sample programs for several Arduino shields. These programs or sketches are available under the library menu in Basic Micro Studio. We are adding new sample programs for shields all the time. If you have a shield you don't see a sample program for email us at sales@basicmicro.com we will be glad to add it.

Jumpers

The Mad Hatter Microcontroller board has a few jumpers that come pre-configured but allow you to customize the board. The board source power is controlled by the PWR_SEL (A) jumper. USB powered select 1-2. External power jack select 2-3. The board comes preset for power jack (2-3).

USB Breakout Header

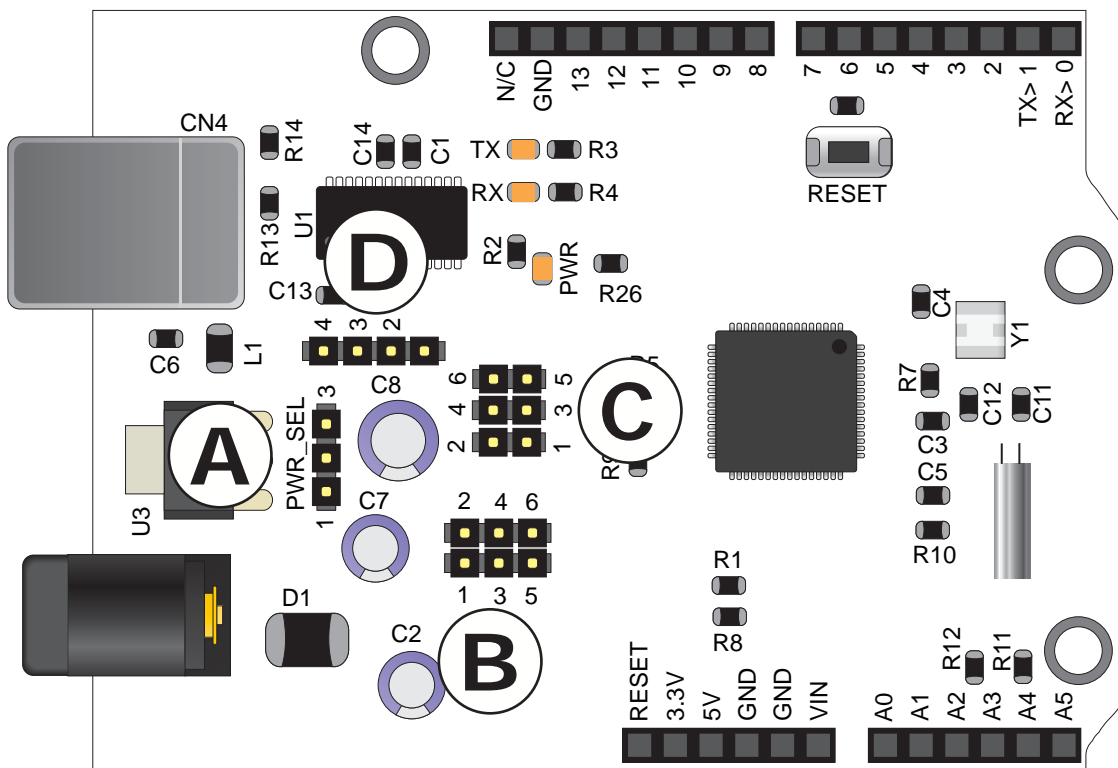
The USB and first UART are available on CN6 (B). Pins 1-2 are TX-RX from the FTDI. Pins 3-4 are TX-RX from the main processor. These must be jumpered to download your program to the Mad Hatter board. You can disconnect them to use in your own circuits.

Reset Header

Pins 4 and 3 from jumper block CN7 (C) need to be jumpered. This is the reset circuit. RTS from the FTDI is used to control the reset. Pin 6 is for an external reset you can wire to your own circuits. Pulling this pin low will cause a reset.

FTDI Breakout Header

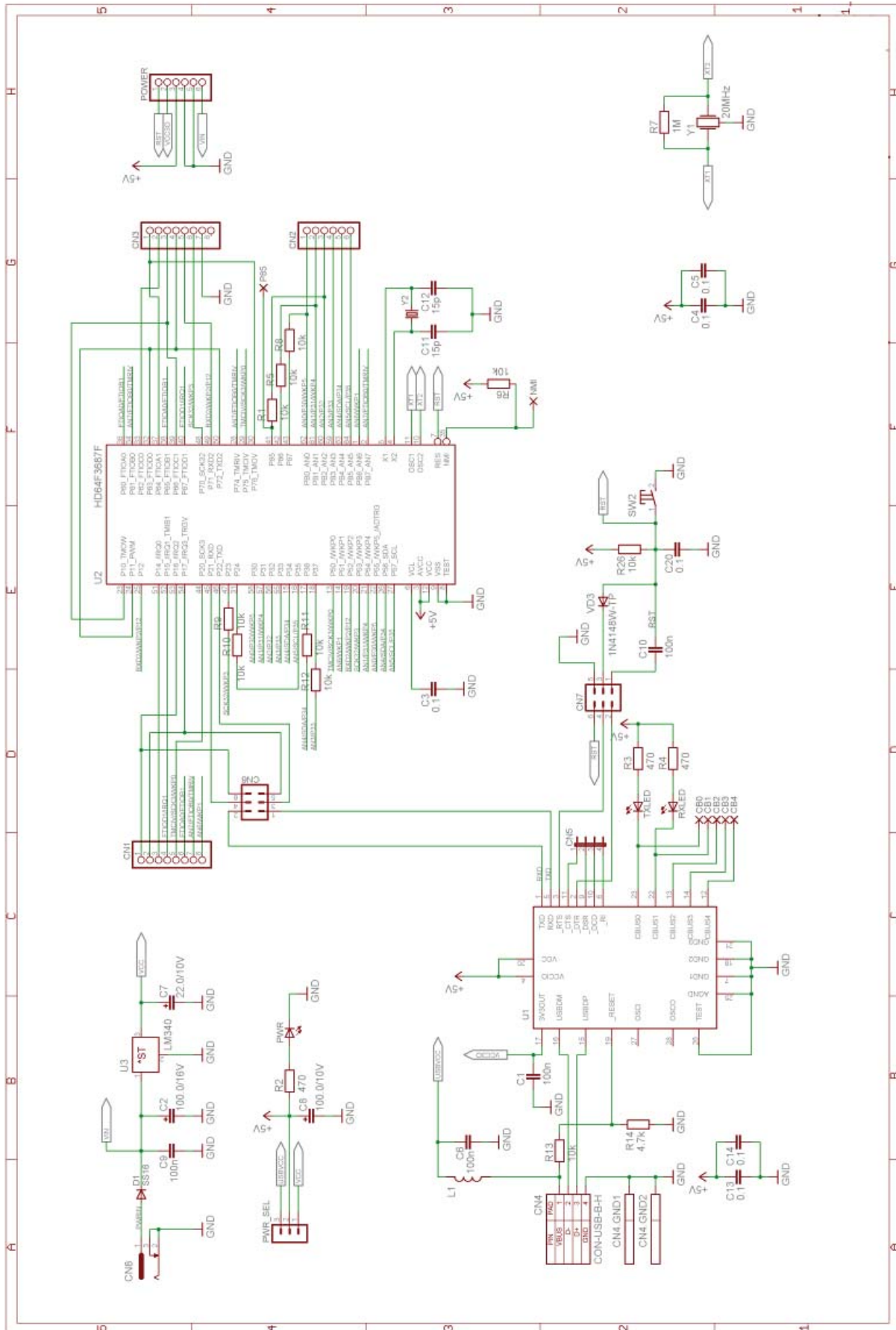
Header CN5 (D) is for the extra pins on the FTDI. They are available to use in your own projects. The FTDI has 4 controllable pins.



Pin Assignment Overview

Arduino	Mad Hatter	Mad Hatter Functions
A0	P14	<ul style="list-style-type: none"> • General purpose I/O Pin. • Analog to Digital (A/D) AN0. • Internal pull-up / pull-down capable.
A1	P15	<ul style="list-style-type: none"> • General purpose I/O Pin. • Analog to Digital (A/D) AN1. • Internal pull-up / pull-down capable.
A2	P16	<ul style="list-style-type: none"> • General purpose I/O Pin. • Analog to Digital (A/D) AN2. • Internal pull-up / pull-down capable.
A3	P17	<ul style="list-style-type: none"> • General purpose I/O Pin. • Analog to Digital (A/D) AN3. • Internal pull-up / pull-down capable.
A4	P18	<ul style="list-style-type: none"> • General purpose I/O Pin. • Analog to Digital (A/D) AN4. • Internal pull-up / pull-down capable.
A5	P19	<ul style="list-style-type: none"> • General purpose I/O Pin. • Analog to Digital (A/D) AN3. • Internal pull-up / pull-down capable.
0	P0	<ul style="list-style-type: none"> • General purpose I/O Pin. • UART1 RX Pin. • Interrupt input pin.
1	P1	<ul style="list-style-type: none"> • General purpose I/O Pin. • UART1 TX Pin. • Interrupt input pin.
2	P2	<ul style="list-style-type: none"> • General purpose I/O Pin. • Interrupt input pin.
3	P3	<ul style="list-style-type: none"> • General purpose I/O Pin. • Interrupt input pin. • PWM Output Pin. • Capture / Compare Pin.
4	P4	<ul style="list-style-type: none"> • General purpose I/O Pin. • Interrupt input pin. • UART1 SPI SCK Pin. • PWM Output Pin.
5	P5	<ul style="list-style-type: none"> • General purpose I/O Pin. • PWM Output Pin. • Capture / Compare Pin.
6	P6	<ul style="list-style-type: none"> • General purpose I/O Pin. • PWM Output Pin. • Capture / Compare Pin. • Analog to Digital (A/D) AN7.
7	P7	<ul style="list-style-type: none"> • General purpose I/O Pin. • Analog to Digital (A/D) AN6.
8	P8	<ul style="list-style-type: none"> • General purpose I/O Pin. • PWM Output Pin. • Capture / Compare Pin.

Arduino	Mad Hatter	Mad Hatter Functions
9	P9	<ul style="list-style-type: none"> • General purpose I/O Pin. • PWM Output Pin. • Capture / Compare Pin.
10	P10	<ul style="list-style-type: none"> • General purpose I/O Pin. • PWM Output Pin. • Capture / Compare Pin.
11	P11	<ul style="list-style-type: none"> • General purpose I/O Pin. • PWM Output Pin. • UART2 TX, MOSI. • Capture / Compare Pin.
12	P12	<ul style="list-style-type: none"> • General purpose I/O Pin. • UART2 RX, MISO.
13	P13	<ul style="list-style-type: none"> • General purpose I/O Pin. • PWM Output Pin. • UART2 SPI SCK Pin.
VREF	N/C	<ul style="list-style-type: none"> • Pin not internally connected.
GND	GND	<ul style="list-style-type: none"> • Power and signal ground.
3.3V	3.3V	<ul style="list-style-type: none"> • 3.3V voltage. Max current 40mA.
5V	5V	<ul style="list-style-type: none"> • 5V voltage. Max current 500mA.
VIN	VIN	<ul style="list-style-type: none"> • Voltage Input. Max input voltage 13V.



Electrical Characteristics

Characteristic	Value (Units)
VIN Range (min - max)	6 – 13VDC
Current Draw (Sleep mode)	10 mA
Current Draw (Idle)	40 mA
3.3V Max Current	40mA
5V Max Current	500mA
I/O Voltages (Low / High)	0.0V / 5.0V
I/O Logic	TTL
Memory (RAM)	4 KB
Memory (Flash)	56 KB
Temperature Range	-20 to +75 C

Warranty

Basic Micro warrants its products against defects in material and workmanship for a period of 1 year. If a defect is discovered, Basic Micro will, at our discretion, repair, replace, or refund the purchase price of the product in question. Contact us at support@basicmicro.com. No returns will be accepted without the proper authorization.

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Contacts

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Discussion List

A web based discussion board is maintained at <http://www.basicmicro.com>

Technical Support

Technical support is made available by sending an email to support@basicmicro.com. Email will be answered within 48 hours. All general syntax and programming questions, unless deemed to be a software issue, will be referred to the on-line discussion forums.