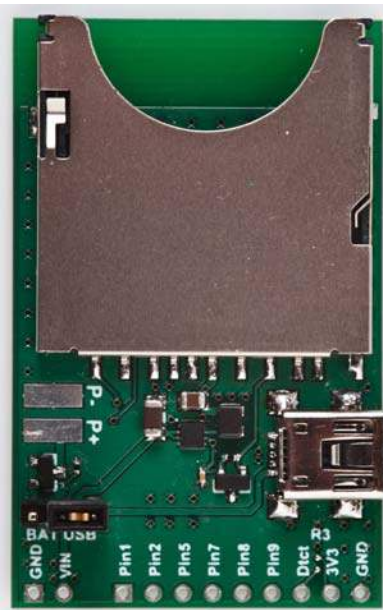
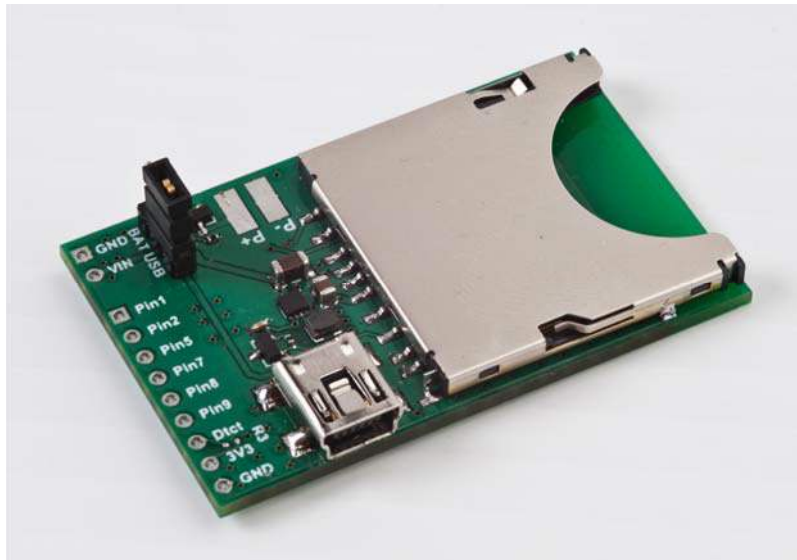




April Development Board

April is a very simple board with the minimum required components for an imp001-based device.



Pinout chart



The Electric Imp April Breakout Board GPIO

WAKE | **PC** | **PWM** | **DAC** | **ADC**

PTPG TRIGGER

GND				
3V3				
DTCT	I ² C	SPI	UART	
Pin 9	i2c89 SDA	spi189 MISO	uart1289 RX	
Pin 8	i2c89 SCL	spi189 MOSI	uart1289 TX	
Pin 7		spi257 MOSI		uart57 RX
Pin 5		spi257 SCLK		uart57 TX
Pin 2	i2c12 SDA	spi257 MISO	uart1289 RTS	uart12 RX
Pin 1	i2c12 SCL	spi189 SCLK	uart1289 CTS	uart12 TX
VIN				
GND				

I²C

SPI

UART

Notes:

- The DTCT pin (Pin 8) is linked to the card presence switch on April's SD card slot. The signal is connected to GND whenever a card is present in the slot.
- VIN is set to the input voltage of either the battery or the USB power source.
- April can operate from any DC voltage from 3.3V to 17V, and tolerates voltages in 17V
- The 3V3 pin delivers 3.3V, 100mA.
- The three-pin jumper selects the DC input source: connect the middle pin to USB or BATT
- In GPIO mode you may choose to pull up to 3V3.
- Pins 1 and 2 have higher capacitance than other pins: if a pin is used for high-speed signaling, it is recommended that the other not be used for analog sampling.
- The wake pin (Pin 1) can be used to wake the chip from a deep sleep, but only if the pin is configured with this capability before the chip goes into deep sleep. To configure the pin for this role, use the following code: `hardware.pin1.configure("GPIO", "IN", "WAKEUP", function() return gpio_irq_wakeup(1)`
- I²C** (Serial Peripheral Interface) has some advantages over PC, including higher data transfer rates. SPI also has a duplex capability for simultaneous two-way communication. SPI devices are 'master' or 'slave' - the master device controls the timing signals. The Imp's SPI implementation uses three wires: SCL (Serial Clock), MISO (Master In Slave Out), Slave In (Input) and MOSI (Master Out Slave In). Slave In (Input) and MOSI are the data transfer lines. The fourth SPI wire is CS (Slave Select). Instead of a formal CS line, you can use any of the Imp's other 10 pins.
- UART** (Universal Asynchronous Receiver/Transmitter) is a two-wire bus that doesn't use a clock to synchronize the transmission of data. Instead, a 'start bit' is added to the data to tell the receiver to listen. Next come the bits that make up the 'word' being sent. Bit zero is sent first; the bits are sent at set time intervals. If the two devices use a parity bit for error checking, that is sent next. Finally, at least one 'stop bit' is sent. Word length, parity and the number of stop bits have to be agreed in advance. The two participants can send data simultaneously.

[Click for larger version](#)

Power

Power can be supplied using a USB Mini-B cable from a USB Charger or a standard USB Port, though the data lines are not connected to anything. Optionally, a battery connector can be soldered to the battery pads P+ and P-. April can operate from any DC voltage from 3.3V to 17V, and tolerates voltages down to -12V. This is helpful for any application with removable batteries where they may be inserted backwards by the user. You may select between USB power and battery power by placing a shunt on the power select header. Please note that April does not have any circuitry for charging a battery and you should never short USB power to the battery pack.

April uses the TI TPS62172 DC/DC Buck Power supply for 3.3V. It can provide an additional 100mA at 3V3 to any boards connected to April. However, if your application requires more than 100mA at 3V3, it must have its own supply.

The three-pin jumper allows selection of the DC input source: the jumper between the middle pin and the side labeled USB for USB power, and the other way for battery pack power (soldering the input leads onto the P+ and P- pads).

Signals

All of the signals from the imp come out to a header. For descriptions of pin of function see the [imp001 pin mux](#).

Card Detect

If your application requires the card detect signal, it must be pulled up by soldering an 0402 resistor R3 or on an external board. The signal is connected to GND whenever a card is present in the slot, so we recommend using a 100k Ω or higher resistor to save power.

VIN

This pad is connected to the input voltage being fed to the board — either the USB 5V supply or the reverse-voltage protected battery pads.

Hardware Design Files

- [Schematics](#)
- [Gerber Files](#)
- [Bill of Materials](#)
- [Altium Source Files](#)