

Description

The Ackalyte BaseTee is a carrier board for the Teensy 3.6, expanding upon the Teensy's features by providing Ethernet, quad-channel audio, a USB-A connector for host applications, and up to 15 single-ended and differential-signal LED channels. Teensy pins are also broken out to Arduino-style headers, providing a means for taking advantage of the Teensy's remaining resources, further enhancing the user's possibilities.

As the BaseTee utilizes a modified version of the OctoWS2811 library, 15 channels of LEDs can be updated simultaneously, making it quite useful for LED projects. Also, when used in conjunction with Ackalyte LED adapters, LED data can be transmitted 50m over Cat 5e pass-through cables with ease.

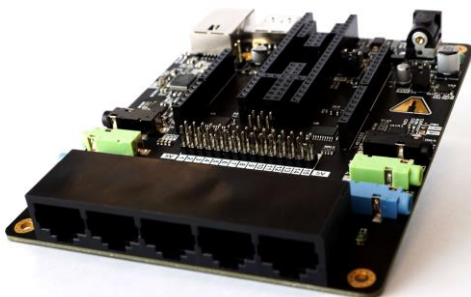
Smart switching enables the BaseTee to be powered by a battery connected to the Teensy via micro USB-B in-lieu of a power supply connected to the DC barrel jack.

Features

- Teensy 3.6 compatible with pins broken out to Arduino-style headers
- Capable of driving up to 512 LEDs per channel
- 10/100 Ethernet
- EEPROM containing Ethernet MAC address
- Quad-channel audio
- USB-A connector for USB-host applications
- 3.5mm jacks for headphone, line-in and line-out (two of each)
- Up to 15 LED channels (5V) – Raw and differential signal formats accessible via 100mil header and RJ45 jacks respectively.
- Up to 3 LED channels per RJ45 jack
- Wide input voltage range (9 – 24V)
- Can be powered by 2.1mm DC barrel jack or by battery via micro USB-B (600mA MAX)

Ethernet

A 10/100 Ethernet link is available via the embedded WIZnet W5500 chip, communicating with the Teensy via SPI. If desired, a globally-unique MAC address stored in the on-board EEPROM (I2C address: 0b1010XXX) can be utilized to ensure there will never be any two devices with the same MAC address.



Quad-Channel Audio

Two SGTL5000XNAA3 codecs provide simultaneous CD-quality stereo headphone, line-in and line-out audio via I2S with the Teensy. Each codec has three color-coded 3.5mm audio jacks, and a microphone connection.

Black	Headphone
Green	Line-out
Blue	Line-in

15 LED Channels

Single-ended 5V LED data is available on a standard 100mil-pitch header, along with a ground pin for each channel. In addition to this header, these 15 channels of LEDs are also presented as differential signals at the 5-port jack. This allows data to be transmitted over large distances using Cat 5e patch cables (N.B. these are not Ethernet signals). The Teensy 3.6 is capable of driving up to 512 pixels.

Supported LEDs

The BaseTee supports the following 5V logic LEDs: APA102, SK6812RGBW, WS2811, WS2812B

USB Host

The Teensy 3.6's USB host functionality is presented via a standard USB-A jack, allowing communication with a number of devices, such as a keyboard or mouse.

For added control, shorting across header P6 permits the user to enable/disable this USB functionality. Leaving header P6 open results in the Teensy controlling this functionality.

Input Power Flexibility

The BaseTee's wide input-voltage range (9 – 24 VDC) allows for compatibility with a large number of power supplies. For lower power-consuming tasks, power can instead be supplied by a battery

connected to the Teensy 3.6's micro USB-B port. If both the battery and a power supply inserted into the DC barrel jack are connected concurrently, power from the DC power jack will be used instead of power from the battery.

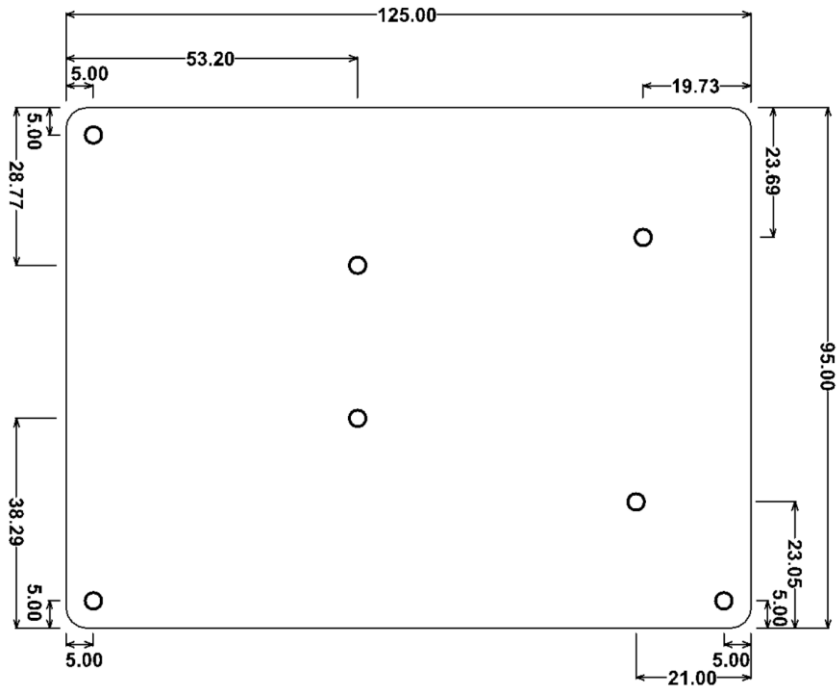
Arduino-Style Headers

Unused Teensy pins have been connected to standard 100mil headers arranged in the familiar Arduino format. Pin number labelling can be found on the rear of the BaseTee.

Technical Specifications

Power Supply	9 – 24VDC via 2.1mm barrel jack (1.1A polyfused), or 5VDC via Teensy 3.6 micro-USB connector
Power Consumption	7.2W (800mA 9V input)
USB	USB-A
Data Output	5x RJ45 jacks (up to 3 channels per port, 15 total), 100mil-pitch header
Ethernet	RJ45, 10/100
Supported LEDs	APA102C, SK6812RGBW, WS2811, WS2812B
Dimensions (Typical)	125 mm (L) x 95 mm (W) x 16.85 mm (H)
Weight (Typical)	38g
Operating Temp.	0°C to 50°C
Storage Temp.	15°C to 30°C

Mounting Holes



M3 mounting and Arduino hole locations in mm

Pin Descriptions

Teensy Pin	Type	Description
0	O	W5500 SPI MOSI
1	I	W5500 SPI MISO
2	O	Channel 1 LED data
3	O	W5500 reset (active low)
4	N/A	N.C.
5	O	Channel 8 LED data
6	O	Channel 5 LED data
7	O	Channel 3 LED data
8	O	Channel 4 LED data
9	O	I2S clock signal for both audio codecs
10	I	W5500 interrupt
11	O	System master clock for audio codecs
12	I/O	Arduino D2 pin
13	I	I2S data from audio codec A
14	O	Channel 2 LED data
15	I/O	Arduino D3 pin
16	I/O	Arduino D4 pin
17	I/O	Arduino D5 pin
18	I/O	I2C data. Connected to both audio codecs and EEPROM
19	O	I2C clock. Connected to both audio codecs and EEPROM
20	O	Channel 6 LED data
21	O	Channel 7 LED data
22	O	I2S data to audio codec A
23	O	I2S word select (LRCLK)
24	I/O	Arduino D6 pin
25	I/O	Arduino D7 pin
26	O	I2S data to audio codec B
27	I/O	Arduino D8 pin
28	I	I2S data from audio codec B

29	I/O	Arduino D9 pin
30	I/O	Arduino D10 pin
31	O	W5500 SPI chip select (active low)
32	O	W5500 SPI clock
33	I/O	Arduino D1 pin
34	I/O	Arduino D0 pin
35	I	Channel A line-in plug detect
36	I/O	Arduino A0 pin
37	I/O	Arduino A1 pin
38	I/O	Arduino A2 pin
39	I/O	Arduino A3 pin
40	I/O	Arduino D11 pin
41	I/O	Arduino D12 pin
42	I	Channel A line-out plug detect
43	I/O	Arduino D13 pin
44	O	Arduino ICSP SPI MOSI
45	I	Arduino ICSP SPI MISO
46	O	Arduino ICSP SPI SCK
47	O	Channel 9 LED data
48	O	Channel 10 LED data
49	I	Channel B line-in plug detect
50	I	Channel B line-out plug detect
51	O	Channel 14 LED data
52	O	Channel 13 LED data
53	O	Channel 12 LED data
54	O	Channel 15 LED data
55	O	Channel 11 LED data
56	I/O	Arduino I2C data
57	O	Arduino I2C clock
A10	O	USB-A output enable
A11	N/A	N.C.
A21	I/O	Arduino A4 pin
A22	I/O	Arduino A5 pin