

# SunDuino Processor

Processor, Solar Panel Charger & Battery Controller

Index Designs

## What It Does:

- Charges various battery types from DC source or Solar Panel. Supports Lead Acid, NiH, Li ...
- Prevents over discharge of battery.
- Provides regulated DC for Embedded Systems.
- Runs user C code 24/7 only 200ua battery drain.
- Thermally enhanced Aluminum PCB. (BB25E)
- Low cost version for low power applications..

## How It Works:

The SunDuino processor boards are integrated battery charger, DC regulator and UPS functions. A PIC18F26K20 with a tiny internal RTOS allows both user written applications to coexist with the internal software driven battery control systems. User applications can be written in C and compiled with the free XC8 compiler. Libraries for XC8 allow user application to integrate with power control functions forming complete battery powered control systems. Two digital bits allow user applications using to control external hardware via I2C IO. An On/Off control and analog input provide additional control capabilities.

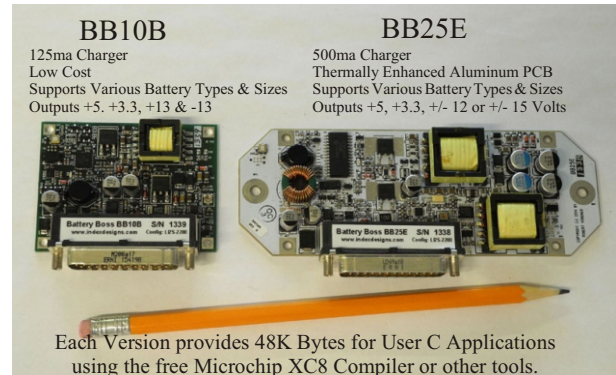
A low profile design with 100% SMT construction allows the BB25E to mount directly against target or heat sink surfaces. This result is a minimal use of target volume and simplified target assembly. A single 25 pin D connector provides all the power, battery, control and output connections. Extensive use of common mode chokes simplifies meeting EMI requirements.

## Connecting Power Inputs:

Power is applied to the SunDuino using DC power and battery connections located on the 25 pin D connector. When the DC input voltage is greater than the battery voltage power used by the output regulators will be drawn from the DC input. As the DC input voltage rises 1.5 volts above the battery voltage the battery charger will charge the battery if required. When the DC input fails the battery will power the DC converter.

## Using the Regulated Output

The SunDuino provides 4 regulated output, +5, +3.3, +15 and -15. Either the +5 or +3.3 output can be used for direct regulation while the other outputs are flyback regulated. A minimum load is required for flyback regulation of the other 3 outputs.



## Bootloader

SunDuino applications and battery configuration constants are managed using a bootloader application. A push button on the SunDuino aborts all current processes and prepares the SunDuino for updating. Either user applications or battery configuration files (.hex files) can be downloaded.

## Typical Specifications:

(Actual Specifications vary with version, battery type and size.)

Input Voltage Range	6.0 - 20 Volts
Output Power BB25E Output Power BB10B	15 - 25 Watts 10 - 15 Watts
Max. Output Current (BB10B has Lower Thermal Limits)	+5 and +3.3 Outputs @ 2 Amp +12 and -12 Outputs @ 100milliamp Minimum Load Current: 1ma
Size: BB25E Size: BB10B	PCB: 5.5 x 2.0 x 0.4 Inches Mounting Hole: 5.00 Inch Centers PCB: 2.6 x 2.0 x 0.6 Inches Mounting Holes: 2.35 x 1.75 Inches
No Load Full Operation	~ 40ma
App Running Current using SLEEP Mode	200ua
Full Load at 8.2 Volts	Approx. 2.5 Amps
Line Regulation	< 2%
Load Regulation	< 2% on Primary Output < 5% on Flyback Outputs
Standard Batteries: (Software Driven using EEPROM Tables)	Lead Acid (AGM) 12V 1.4 AHr Lead Acid (AGM) 12V 7.0 AHr Lead Acid (AGM) 12V 18.0 AHr Lithium Ion 7.4V 7.4V 1.4 AHr Nickel Hydride 9.6V 3.2 AHr

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