



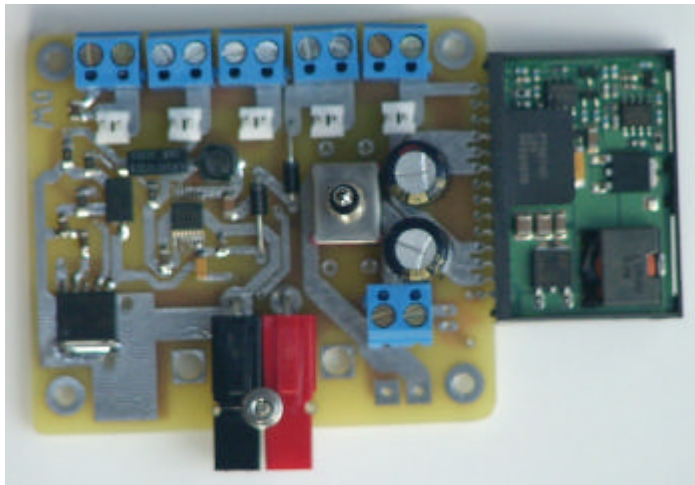
## Multiple DC Power Supply (MDC1) Functional Description:

The ultimate robot power supply – Six DC voltages efficiently generated from a single quad AA battery pack.

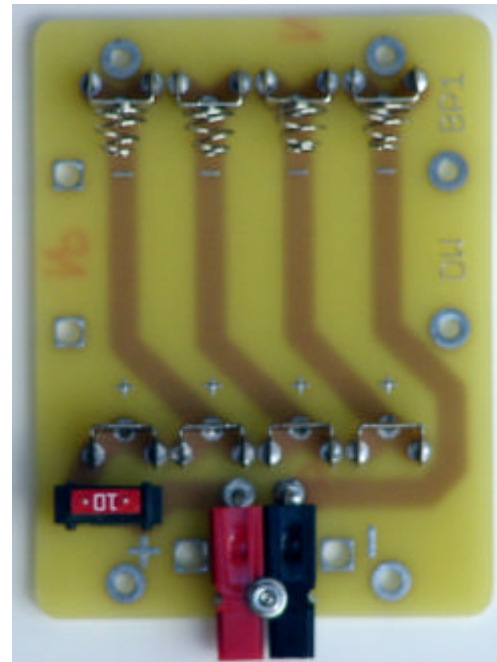
Robots use a wide range of sensors actuators and electronics, which all may have different voltage requirements. Common voltages needed are 3.3V (modern CPU's & IC's), 3.6V (Lithium battery), 4.8V (NiCad or NiMH battery pack), 5V (sensors and older IC's), 6V (servo motors), 9V (9V battery & internally regulated modules) and 12V (DC motors).

Using separate battery packs for each voltage requirement is bulky, heavy, difficult to wire and it is hard to ensure all batteries are charged properly, as they deplete at different rates. In addition, battery voltages may drop as their capacity is depleted, making it difficult to operate subsystems that require a constant voltage. Separate battery packs are also difficult to turn on in a coordinated sequence, especially when they need to be turned on simultaneously. The MDC1 power supply solves all of these issues.

The MDC1 power supply provides enough different output voltages and current to run almost any small robotic device using a single, small, robust, quick-change battery pack.



XJD Power Supply MDC1



XJD Battery Pack



## **Features**

### **Multiple Output Voltages**

- 3.3V @ 1 Amp (regulated)
- 2.5V – 4.5V adjustable @ 1 amp (regulated)
- 4.8V @ 10 Amp (raw battery output)
- 5V @ 1 Amp (regulated)
- 10V @ .3 Amp (regulated)
- 12V @ 1.5 Amp (regulated)

### **Quick Connect Battery Pack**

Allows spare battery packs to be quickly swapped in

### **Power Switch**

All output voltages are controlled via a single power switch

### **Simultaneous Power Up**

All output voltages are valid milliseconds after the main power switch is turned on.

### **Easier Power Distribution Wiring**

Multiple connectors accommodate many devices hooked up simultaneously

### **Bare Wire Terminals**

Bare lead wires may be simply connected to output power terminals by tightening captive screws.

### **Power Connectors on .1" Spacing**

Alternate power connections may be made to 2-pin slide-on connectors on each voltage

### **Fuse Protection**

Battery packs are protected from excessive current and short circuits by pluggable automotive style fuses



**MDC1 Connectors**



**Power Terminals**

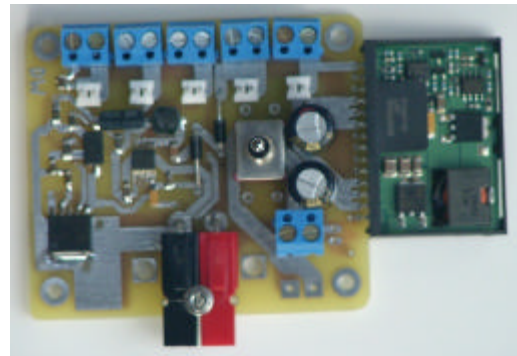


**Battery Pack Fuse**



**MDC1 Specifications**

The MDC1 is a multiple output DC supply operating from a quad AA battery pack or any power source that supplies 3.3 volts to 12 volts DC.



**MDC1**

**Electrical Characteristics**

Parameter	Min V	Nominal V	Max V	Current Amps
Input voltage	4.5		5.5	
Output voltage – 3.3 v		3.3		1
Output voltage – 3.6 v	2.5	3.6	4.5	1
Output voltage – 5 v		5		1
Output voltage – 10 v		10		.3
Output voltage – 12 v		12		1.5

**Physical Characteristics**

Parameter	Description
Interface connector	2-pin connector .1" pitch
Interface connector	Screw terminal – 14 gage to 24 gage wire
Size MDC1	7.2 x 10.4 cm
Size Battery Pack	7.4 x 10.4 cm
Mounting Method MDC1	Hole centers: 2.4" x 2.1"
Mounting Method Battery Pack	Hole centers: 1.7" x 3.4"
Shock Survival	5g
Operating Temperature Range	-10 to +60 deg C



## **MDC1 FAQ**

### **1. Why is 12 volts important?**

- Many of the most popular DC motors for small robots run off 12 Volts. Higher voltage DC motors use less current to provide the same power as low voltage motors and thus need thinner wire in their windings. This makes high-voltage motors smaller and lighter.
- It is desirable to run small portable motorized equipment and robots from low voltage battery packs, typically in the 4 to 6 volt range. AA cells are often used to take advantage of their small size, fast recharging cycles and universal availability.

### **2. Why are regulated DC voltages important?**

- Although batteries provide a nice clean DC voltage that can run most sensors and motors, many batteries, especially 12 Volt gel cells do not maintain a constant voltage as they discharge. This dropping voltage can affect sensor readings, which may be proportional to supply voltage.
- It can also affect motor speed, which may be crucial in operations where timing and speed are used. One example is when a 90-degree turn is made by timing how long to maintain the turn. If the motor speed changes as the battery discharges, a turn on a low battery may be incomplete.
- Many Integrated circuits require tightly regulated voltage supplies and may fail to operate if their supply voltages are not constant.

### **3. Why are robust battery packs important?**

- In order to keep mobile equipment and robots operating as continuously as possible, it is convenient to use a spare battery pack. Swapping a single battery pack is much quicker than swapping four batteries individually. Current battery packs, holding 4 AA cells, are not very robust and their connectors are not designed for many cycles of removal. The MDC1 power supply uses rugged PowerPole connectors to ensure trouble-free battery swapping.