

# PV MPPT CHARGE CONTROLLER

**MX60**



The OutBack MX60 Maximum Power Point Tracking (MPPT) charge controller enables your PV system to achieve its highest possible performance. The MPPT feature can give you up to **30% or more power** from your PV panels!

Rated for up to **60 amps** of DC output current, the OutBack MX60 can be used with battery systems from 12 to 60 vdc with PV open circuit voltage as high as **140 voc**. The MX60's setpoints are fully adjustable to allow use with virtually any battery type, chemistry and charging profile.

The OutBack MX60 allows you to use a higher output voltage PV array with a lower voltage battery - such as charging a 24 vdc battery with a 48 vdc PV array. This reduces wire size and power loss from the PV array to the battery location while maximizing the performance of your system and **saving you money!**

The OutBack MX60 comes standard with an easy to use and understand display. The four line, 80 character, backlit LCD display is used for programming and monitoring of the system's operation including built-in **Data Logging** with 64 days of memory. Daily and Total PV production in Amp hours & kWh and is user resettable.

The OutBack MX60 can also be connected to the OutBack MATE system controller and display to allow monitoring from a distant location - **up to 1000 feet (305M) away**. The MATE also includes an opto-isolated RS232 port for connection to a PC computer for system monitoring. Please see; [www.RightHandEng.com/OutBack](http://www.RightHandEng.com/OutBack) for a free PC software trial version!

SPECIFICATIONS	MX60
Output Current	60 amps DC Rated Adjustable to 70 amps Maximum
Nominal Battery Voltage	12, 24, 32, 36, 48, 54 or 60 VDC (programmable)
PV Open Circuit Voltage	140 VDC Maximum
Standby Power Consumption	1 watt typical
Charging Regulation Methods	Five Stage: Bulk, Absorption, Float, Silent, Equalization
Voltage Regulation Setpoints	13 - 80 VDC
Equalization Voltage	Up to to 5.0 VDC above Absorb Setpoint Adjustable Timer - Auto Terminate
Temperature Compensation	-5.0mV/°C/Cell
Voltage Step-Down Capability	Can charge a 12 or 24 VDC battery from a 48V nominal PV array
Power Conversion Efficiency (typical)	99% @ 50 amps Output, 48V battery and 48V array
Digital Display	4 line 80 character backlit LCD Display (30 different screens also available in <b>Spanish!</b> )
Remote Interface	RJ 45 Modular Connector CAT 5 Cable 8 wire
Operating Temperature Range	-40° to 60°C Power derated above 25°C
Environmental Rating	Indoor Type 1
Conduit Knockouts	Two 1/2" & 3/4" on the back; One 3/4" & 1" on each side; Two 3/4" & 1" on the bottom
Warranty	Two years parts and labor Optional Extended Warranty Available
Dimensions	Enclosure: 14.5 " H x 5.75" W x 5.75" D Shipping box: 17.75" H x 10" W x 7" D
Shipping Weight	12 lbs. - 5.4 kg

*Specifications subject to change without notice. Please check our web site for additional specifications and application guidelines.*

**MX60** 60 Amp MPPT Charge controller.....\$649.00  
**RTS** Remote Temperature Sensor.....\$29.00



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## The MX60 PV MPPT Advantage

### GET THE PV ARRAY PERFORMANCE YOU PAID FOR!

10 PV modules rated for 180 watts each with an "old style" pwm charge controller = 1400 watts output  
10 PV modules rated for 180 watts each with an **OutBack MX60** MPPT installed = 1750 watts output  
**Increased Output with the OutBack MX60 = 350 watts more**

**INSTALLED PV COST AVERAGES \$6.00 PER WATT. YOU DO THE MATH.**

### GET MORE POWER WHEN YOU NEED IT THE MOST!

After a winter storm, when your batteries are at their lowest voltage and your PV modules are their coldest, the **OutBack MX60** power point tracking charge controller can increase the PV array performance by up to 40%.

***THAT'S LIKE HAVING FOUR MORE PV MODULES!***

### ***What our customers are saying about the MX60.***

April 11, 2003

Dear OutBack,

I just wanted to let you know how pleased I am with my new MX60 charge controllers.

I have just installed a PV array system on our houseboat. An integral part of the system are the two MX60 charge controllers.

I did a market search to determine which charge controller I should buy. I first settled upon a solar boost 50 unit, but when I read the specifications for the unit and found out how limited it was, I was very discouraged.

I am an electrical engineer at Boeing Satellite Systems. I was heavily involved in the design of the Space Station Electrical Power System and now I design electrical power systems for satellites. I hold a patent for PV array voltage control and battery charging from PV arrays. I tell you this because I want you to know that I consider myself an expert in PV array electronics.

I was about to design my own charge controller for the Houseboat when I discovered your MX60. It has all of the features that I would expect in a High Efficiency charge controller. I bought two of them, installed them in the houseboat. I connected them so that they operate parallel. They tracked to the Peak Power Point just as advertised.

Thanks for providing such a good product.

Robert Wilde  
Boeing Satellite Systems

P.S. Is OutBack a publicly held company? I would like to buy stock.

## SAVE MONEY ON YOUR WIRE COSTS !

### Typical Savings Calculation:

40 amp / 24 vdc PV array charging a 24 vdc battery 125 feet away - needs 250 ft of #4/0 AWG wire @ \$ 2.00 /ft = \$500.00  
 - OR -

20 amp / 48 vdc PV array charging a 24 vdc battery 125 feet away - needs 250 ft #2 AWG wire @ \$ 0.80/ft = \$200.00

## **SAVINGS ON WIRE COST - \$300.00!**

### WIRE DISTANCE CHARTS

The following charts show maximum distance in feet of various gauge two conductor copper wire from the PV array to the MX60 MPPT PV charge controller with a 1.5% maximum voltage drop. Using a higher voltage PV array with a low voltage battery system allows you to use a much smaller wire size, or go up to 5 times as far with the same gauge wire.

#### 12 Volt PV Array

16V MPP Typical  
 Distance in Feet (two wires)  
 1.5% Voltage Drop  
 12 Volt Battery

Amps	#8	#6	#4	#2	#1/0	#2/0	#4/0
8	22	35	57	90	145	180	290
10	18	28	45	72	115	145	230
15	12	19	30	48	76	96	150
20	9	14	22	36	57	72	116
30	6	9	15	24	38	48	77
40	4	7	11	18	29	36	56
50	3	5	9	14	23	29	46
60	3	4	7	12	19	24	38

#### 24 Volt PV Array

32V MPP Typical  
 Distance in Feet (two wires)  
 1.5% Voltage Drop  
 12 or 24 Volt Battery System

Amps	#8	#6	#4	#2	#1/0	#2/0	#4/0
8	45	71	114	180	290	360	580
10	36	57	91	145	230	290	460
15	24	38	60	96	153	192	300
20	18	29	45	72	115	145	232
30	12	19	30	48	77	97	154
40	9	14	23	36	58	72	112
50	7	11	18	29	46	58	86
60	6	9	15	24	38	48	77

#### 48 Volt PV Array

64V MPP Typical  
 Distance in Feet (two wires)  
 1.5% Voltage Drop  
 12, 24 or 48 Volt Battery System

Amps	#8	#6	#4	#2	#1/0	#2/0	#4/0
8	90	142	228	360	580	720	1160
10	72	114	182	290	460	580	920
15	48	76	120	192	306	384	600
20	36	58	90	144	230	290	464
30	24	38	60	96	154	194	308
40	18	28	46	72	116	144	224
50	14	22	36	58	92	116	172
60	12	19	30	48	77	97	154

#### 60 Volt PV Array

80V MPP Typical  
 Distance in Feet (two wires)  
 1.5% Voltage Drop  
 12, 24, or 48 Volt Battery System

Amps	#8	#6	#4	#2	#1/0	#2/0	#4/0
8	112	177	285	450	725	900	1450
10	90	142	227	362	575	725	1150
15	60	95	150	240	382	480	750
20	45	72	112	180	287	362	580
30	30	47	75	120	192	230	385
40	22.5	35	57	90	145	180	280
50	17.5	27	45	72	115	145	215
60	15	23	37	60	96	121	192