



ener-Gfriend *traveller*

A mobile alternative energy pack to power laptop/tablet computers (DC to DC) anywhere
& any time

Also included a fold-up LED reading light

To be used by field engineers, travellers, for e-schooling projects, off grid living university students and for small off-grid offices.

Designed, developed and manufactured by **Betta Lights** South Africa



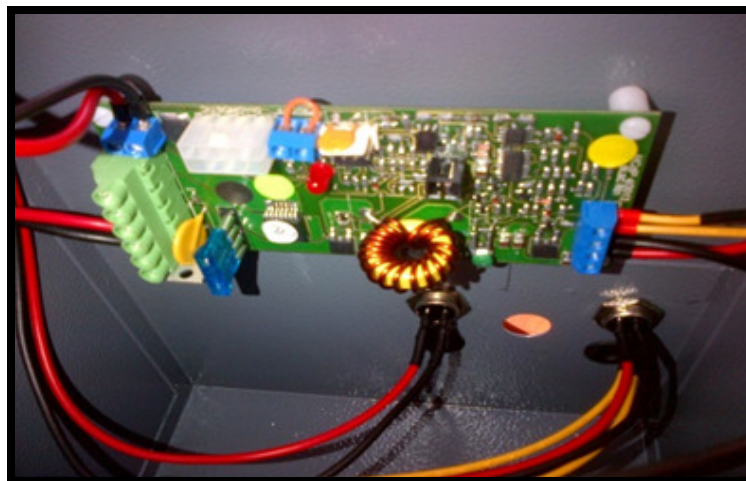
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Power pack



Item	Power pack: Traveller ^(model) to power laptop and tablet computers anytime and anywhere
Operating voltage	12 volt DC
Operating environment	-20 ⁰ C to - 65 ⁰ C
Ports	<ol style="list-style-type: none"> 1. Solar panel port 2. LED reading lamp port 3. Laptop DC charge port 4. USB port for tablet computer 5. External battery charge port through AC charger
Battery Box material	HR 486 LLDPE Rotational moulded
Battery Box Vicat softening temperature (ASTM D1525)	120 ⁰ C
LED Status indicators	<ol style="list-style-type: none"> 1. Battery status 2. Solar charge status
Key sub-systems	<ol style="list-style-type: none"> 1. Solar Betta MPPT charge controller 2. DC to DC converter with adjustable voltage and USB port 3. 20W solar panel 4. 12 Ah lead crystal battery 5. Reading lamp 6. <i>Optional item: 220 AC Betta Lights battery charger</i>
Fuse	External panel mount Fuse holder with 15Amp fuse

Solar Charge Controller



Item	Betta MPPT solar charge controller
Operating voltage	12 volt DC
Operating environment	-20 ⁰ C to - 65 ⁰ C
Incorporated Value System	Energy efficiency, ease of installation, low maintenance and its ability to operate in high and low temperature environments, while protecting the system and equipment
Wattage maximum	160 watt 12 volt solar panel
Protections	<ol style="list-style-type: none"> 1. Over Charge protection 2. Over discharge protection and low voltage reconnect voltage 3. Thermal protection of battery 4. Overload protection 5. The unit can withstand 100 ⁰ C operational temperature without damaging itself. When the unit's temperature reaches 65⁰ C, the unit shuts all operational functions down, and monitors the situation. When the temperature drops, full functionality resumes, with no loss of data or settings 6. Reverse polarity 7. Reverse current
Battery status indicator	LED status indicate when the unit is charging, and what the battery status is
MPPT	The unit has MPPT functionality, and has an energy conversion efficiency of up to 96.9%

DC to DC converter

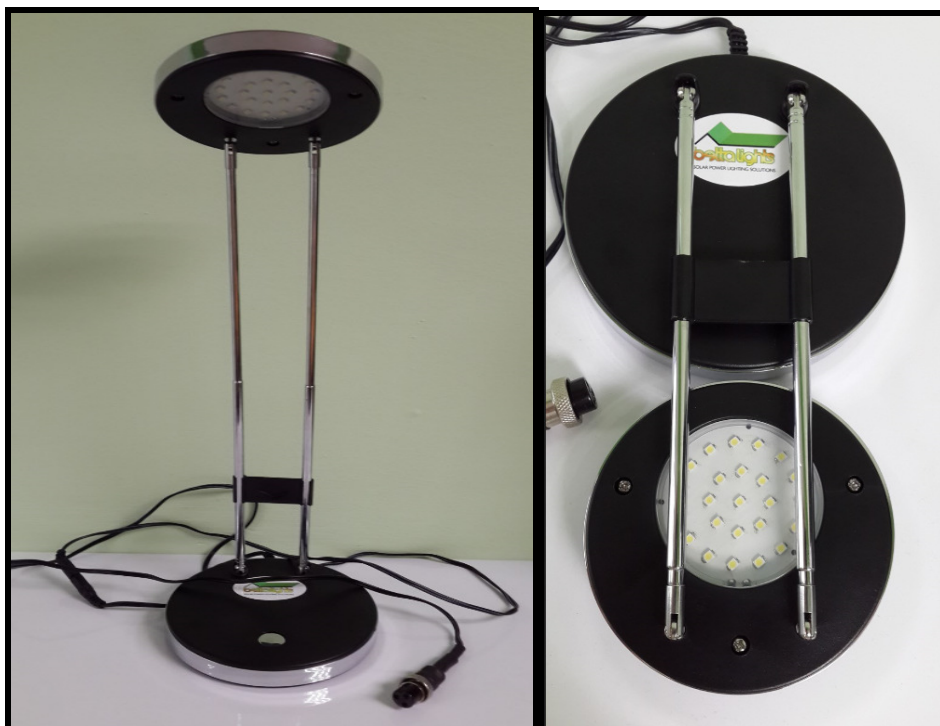


Item	Betta DC to DC converter
Operating voltage	12 volt DC
Operating environment	-20 ⁰ C to - 65 ⁰ C
Output Voltage settings	15, 15, 16, 17, 18, 19, 19.5, 20, 22, 24 and 5 volt USB
Efficiency	93%
USB Current	2 Amp



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Foldable LED reading light



Item	Foldable 12 volt LED reading lamp
LED Bulb	1.3 watt, 12 volt, 1300 lumen output, resulting in 200 lux on working level
Operating voltage	DC(12V)
Luminary efficiency	>90%
Effective beam angle	130 deg.
Foldable	Foldable light head and foot piece
Colour temperature	4000 - 5000K
Light colour	Pure White
Operating environment	-20 ⁰ C to - 65 ⁰ C
IP level	IP55
Expected life	50,000 hours
Fitting type for bulb	E27



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22 Ah Lead Crystal batteries



Item	Lead Crystal, Deep cycle, maintenance free
Voltage	12V
Amp Hour	1 x 12 Ah
Operating environment	-20° C to - 65° C
Expected battery life	7 years
Discharge features	100% DOD without damaging the battery. Expected cycles at 100% DOD = 400, and at 33% DOD = 2600
Shelf life	Up to 2 years without significant self-discharge



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Solar Panel



Item	PV panel, 12 volt, 20Watt, foldable
IP level	IP65
Panel cable length	6 m
Panel watt	20
Cell type	Polymer Solar Cells
Output	18 volt



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Laptop computer tips



Item	Laptop tips and computer cable with connection to ener-G-friend
Universal tip set	14 tips for various laptop computers for various makes and models
Cable length	1 m ; with special connector for laptop linking



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Carry bag



Item	Carry bag
material	Rug with straps
Pockets	Pockets for: <ol style="list-style-type: none"> 1. Ener-G-friend 2. Laptop 3. LED reading lamp 4. Mobile solar panel 5. Cabling for laptop and tips 6. Mobile phone
Inner sleeve	Yes, for laptop computer protection