Mobile Light Tower & Power Supply

The **Solar Military Hybrid** light tower delivers state-of-the art LED lighting and power receptacles to road blocks, command posts, local and remote areas. One day of sunlight provides the retractable tower with 3 nights of clean, quiet, emission-free, renewable LED light.

CEG
Catalyst Energy Group

Reliable Pure Sine Wave Power Generation & Storage

CEG systems provide more hours of stored, pure sine wave energy because they feature a number of proprietary, seemlessly integrated components:

ENHANCED BATTERIES, PROPRIETARY CHARGE CONTROLLER - CEG's proprietary batteries, manufactured by a large, international battery company, contain a custom dielectric frame between positive and negative ions. The frame's impact on the ions enables faster charging and more storage hours. CEG's charge controller optimizes battery efficiency via a unique algorithm that monitors and controls the entire system and receives automatic software upgrades via Wi-Fi.

INTEGRATED PROPRIETARY POWER FACTOR UNITS - CEG Hybrid Power Generators incorporate proprietary Power Factor Capacitors which supply power to meet demand surges, thereby enhancing efficiency and prolonging battery amp hours.

CUSTOM INVERTERS - CEG's custom, high quality inverters contain fail-safe redundant printed circuit boards. This addresses the weak link in any energy storage system as inverters produce heat which can cause electronics to fail. Further enhancements to CEG inverters include over-sized wiring and copper clad connectors.

CE | APPROVED PRODUCT MCS BABT | IEC | PV CYCLE | TÜVRheinland | Clean Energy Council | c UL us | TÜV SÜD

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Company Overview

The inevitable ascension of renewable energy has now occurred, fostered not only by the emergence of innovative, economically attractive technologies but by the ability to connect those technologies to the appropriate customers. Incentive driven enterprises will be replaced by companies featuring both technologies and products that are financially and environmentally attractive and are supported by marketing and sales platforms that will let them access their appropriate markets. Those are the companies that will complete the transformation of renewable energy from a subsidized peripheral source of power into a mainstream supplier of overall energy needs.

Catalyst Energy Group (CEG) is precisely that combination. Possessing a large multi-national manufacturing capability, a cutting edge design and engineering laboratory and a sales and marketing team with international reach, CEG offers an innovative, uniquely effective and adaptable array of energy generation and storage products that feature unmatched performance in extraordinarily durable configurations. CEG's decades of manufacturing and engineering capabilities provide the capacity to accommodate the needs of large multi-national customers while its creative design laboratory relentlessly integrates refinements and innovation into each of its products.

The effectiveness of energy generation and storage systems is determined by some simple math. How efficiently does the product accumulate and store power and for how may KW or MW hours can it provide that power? In terms of KW hours, many of the smaller, and sometimes mobile "solar" units available, are actually conventional fossil fuel generators disguised as renewable products and too often the larger Megawatt units are one size fits all ponderous devices that output very few hours of stored energy. CEG products are different. In every configuration, they provide the vast majority of their power from the renewable source and in the larger sizes can be customized to specifically address the needs of the customer.

CEG systems range in size from 3 kW to 1 mW and are available in both mobile and stationary configurations with proprietary firmware capable of optimizing functionality to meet each customer's operating conditions. These systems don't function simply as a conduit, accumulating power and then transferring that power, but as a legitimate storage facility as gathered energy is always sent to batteries initially and then distributed at the times and at the volumes required by the customer. All products are engineered as plug and play, are designed to accommodate new technologies as they become viable and can be daisy chained to meet demand of any size.


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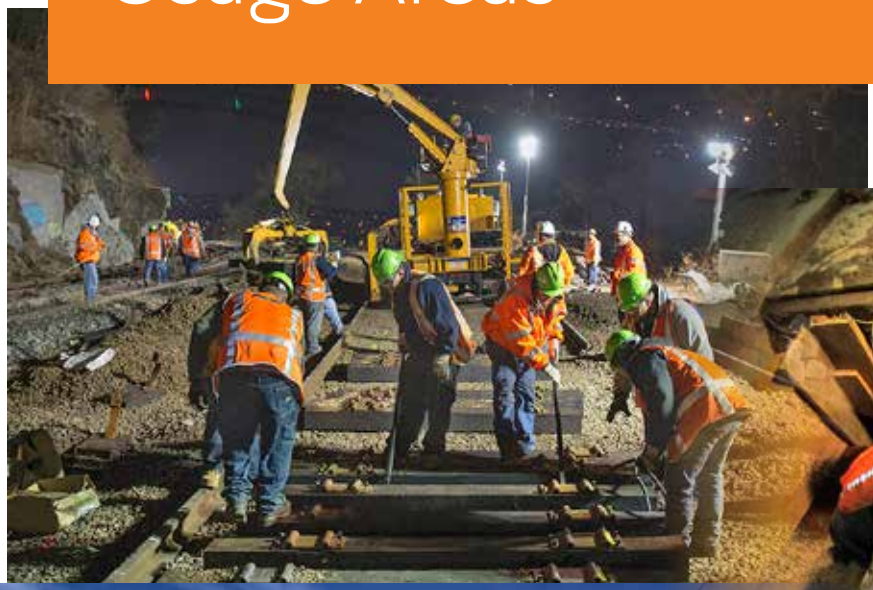
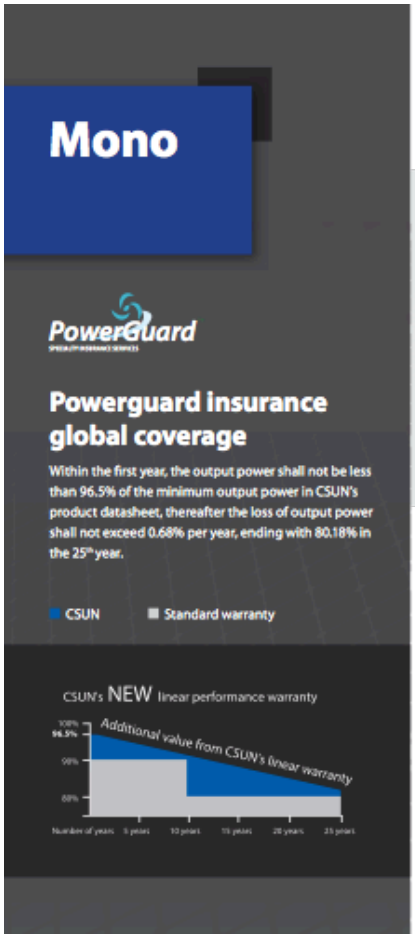
SOLAR MILITARY HYBRID LIGHT TOWER AND REMOTE POWER			
Power Generation			
SYSTEM AND EQUIPMENT	**MODEL C**	**MODEL B**	**MODEL A**
Electrical System	24 VDC	24 VDC	24 VDC
Solar Power	2400 W 8*300W	2400 W 8*300W	1800 W 6*300W
LED	4X150W +1 SPARE min 60,000Lm	4X150W +1 SPARE min 60,000Lm	4X150W +1 SPARE min 60,000Lm
PV Panel ratation	6 grade, Manual /Auto	6 grade, Manual /Auto	4 grade, Manual /Auto
Automated Tracking system	optional	optional	optional
Stabilization Support	4 Legs	4 legs	4 legs
WIND TURBINE	24 VDC 500W	24 VDC 500W	24 VDC 500W
Day Night Authometed Sensor / Manual	Astronomical Time Switch	Astronomical Time Switch	Astronomical Time Switch
Backup AC Power Generator			
Generator	NO	Aksa 2000, Auto operation 65Ah charger, gasoline 30 lbs tanks	Aksa 2000, Auto operation 65Ah charger, gasoline 30 lbs tanks
Power Storage & Backup AC Charger			
BATTERY STORAGE COMPT	fire and corrosion resistant insulated sandwich panels R15. cooling fan and dig temperature	fire and corrosion resistant insulated sandwich panels R15. cooling fan and dig temperature	fire and corrosion resistant insulated sandwich panels R15. cooling fan and dig temperature
Batteries	24VDC 1200 Ah	24VDC 1200 Ah	24VDC 900 Ah
Backup AC Charger	Rectifier 230 VAC /20A 50Hz	Rectifier 230 VAC /20A 50Hz	Rectifier 230 VAC /20A 50Hz
Battery Charger	MPPT 80A, LED display, memory	MPPT 80A, LED display, memory	MPPT 80A, LED display, memory
LED	4X150W +1 SPARE	4X150W +1 SPARE	4X150W +1 SPARE
CONTROL PANEL	lighting, cooling fan, temp control, 2A USB	lighting, cooling fan, temp control, 2A USB	lighting, cooling fan, temp control, 2A USB
Breakers	2 breakers spare	2 breakers spare	2 breakers spare
LIGHT TOWER & CONTROL MODULE			
LED life	50,000 Hours	50,000 Hours	50,000 Hours
LED IP class	IP67	IP67	IP67
Telescoping light tower	30 foot (9 m)	30 foot (9 m)	30 foot (9 m)
Comfort Pack	Automed light timer and Panic Alarm	Automed light timer and Panic Alarm	Automed light timer and Panic Alarm
MPPT Charger and connect to PC	yes	yes	yes
Protection Breakers Solar,light, elc sys.	yes	yes	yes
Cooling Fans	Yes	Yes	Yes
CUSTOMIZED TRAILER & HOUSING			
Safety Pack	Telestruts for solar platforms and outriggers/jacks for unit stabilization, fire extinguisher	Telestruts for solar platforms and outriggers/jacks for unit stabilization, fire extinguisher	Telestruts for solar platforms and outriggers/jacks for unit stabilization, fire extinguisher
Transit Pack	D rings for crane	D rings for crane	D rings for crane
Transit Pack	4 way forklift	4 way forklift	4 way forklift
Transit Pack	lockable hand brake	lockable hand brake	lockable hand brake
Transit Pack	Trailer brake lights, stop lights, reverse gear light	Trailer brake lights, stop lights, reverse gear light	Trailer brake lights, stop lights, reverse gear light
Transit Pack	16" spare tire and changing kit	16" spare tire and changing kit	16" spare tire and changing kit
Trailer	Duel axle	Duel axle	Single axle
WARANTY	2 years full incl battery. 5 years other parts	2 years full incl battery. 5 years other parts	2 years full incl battery. 5 years other parts
CUSTOM REQUESTED			
O&M manuals	parts list, logistics information, illustrated parts breakdown with exploded view diagrams.	parts list, logistics information, illustrated parts breakdown with exploded view diagrams.	parts list, logistics information, illustrated parts breakdown with exploded view diagrams.

Usage Areas



» Concerts, Festivals, Meeting Areas
» Roads, Railway Construction Areas » Mines
» Construction Sites
» Emergency Meeting Areas
» Agriculture and Events



CSUN energy for today

CSUN320-72M

Highest efficiency offer: QSAR™

QSAR™

CSUN320-72M CSUN310-72M
CSUN315-72M CSUN305-72M

19% Cell efficiency

320W Highest power output

10 years Material & workmanship warranty

25 years Linear power output warranty

- Higher efficiency – perfect for rooftop projects
- Positive tolerance offer
- Excellent current distribution performance reduces power loss
- Resistance against salt mist, ammonia, blowing sand and hail
- Certificated to withstand wind (2400 Pa) and snow load (5400 Pa)
- Excellent performance under weak light conditions
- Good temperature coefficient enables better output in high temperature regions

Electrical characteristics at Standard Test Conditions (STC)

Module	QSAR 320-72M	QSAR 315-72M	QSAR 310-72M	QSAR 305-72M
Maximum Power - Pmpp (W)	320	315	310	305
Positive power tolerance	0~3%	0~3%	0~3%	0~3%
Open Circuit Voltage - Voc (V)	45.9	45.8	45.7	45.6
Short Circuit Current - Isc (A)	9.01	8.92	8.86	8.79
Maximum Power Voltage - Vmpp (V)	37.4	37.2	37.1	36.9
Maximum Power Current - Impp (A)	8.56	8.47	8.36	8.27
Module efficiency	16.53%	16.27%	16.01%	15.75%

Electrical data relates to standard test conditions (STC) : irradiance 1000W/m² ; AM 1.5 ; cell temperature 25°C measuring uncertainty of power is within ±3%. Certified in accordance with IEC61215, IEC61730-1/2 and UL 1703

Electrical Characteristics at Normal Operating Cell Temperature (NOCT)

Module	QSAR 320-72M	QSAR 315-72M	QSAR 310-72M	QSAR 305-72M
Maximum Power - Pmpp (W)	235	231	227	224
Maximum Power Voltage - Vmpp (V)	34.5	34.4	34.2	34.0
Maximum Power Current - Impp (A)	6.81	6.71	6.64	6.59
Open Circuit Voltage - Voc (V)	42.2	42.1	42.0	41.9
Short Circuit Current - Isc (A)	7.27	7.19	7.15	7.09

Electrical data relates to normal operating cell temperature (NOCT): irradiance 800 W/m² ; wind speed 1 m/s ; cell temperature 45°C ambient temperature 20°C measuring uncertainty of power is within ±3%

Temperature Characteristics

Voltage Temperature Coefficient	-0,307%/K
Current Temperature Coefficient	+0,039%/K
Power Temperature Coefficient	-0,423%/K

Maximum Ratings

Maximum system voltage (V)	1000
Series fuse rating (A)	20
Reverse current overload (A)	27

Mechanical Characteristics

Dimensions	1956 × 990 × 50 mm
Weight	22.3 kg
Frame	Anodized aluminum profile
Front glass	White toughened safety glass, 3.2 mm
Cell Encapsulation	EVA (Ethylene-Vinyl-Acetate)
Back Sheet	Composite film
Cells	6 × 12 pieces monocrystalline solar cells series strings (156 mm × 156 mm)
Junction Box	Rated current ≥ 12A, IP ≥ 65, TUV & UL
Cable	Length 900 mm, 1 × 4 mm²
Connector	MC4/ compatible with MC4

FLEXmax Series

CONTINUOUS MPPT CHARGE CONTROLLERS

Three Reasons to Choose the FLEXmax Series Charge Controllers from OutBack Power:

1. DESIGNED FOR PERFORMANCE

- **The de facto standard in the industry**, from the originators of the multiple voltage MPPT charge controller and the first choice for system design professionals
- Innovative FLEXmax MPPT software algorithm is both continuous and active; increases PV array output by up to 30%
- Lower PV array voltage means maximum resistance from shading versus higher voltage controllers
- Full power output in ambient temperature up to 104°F (40°C)
- Battery voltages from 12 to 60VDC
- Greater than 98% peak efficiency; less than 1W self-consumption

2. ENGINEERED FOR RELIABILITY

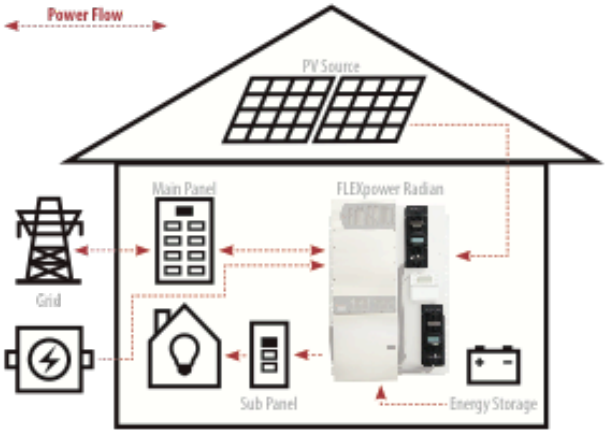
- **Extensive quality and reliability testing**, including Highly Accelerated Life Testing (HALT)
- 15 years of experience manufacturing products for fault intolerant, mission-critical applications
- Standard 5 year warranty (extended 10 year warranty available)

3. EASY-TO-INSTALL, MONITOR AND CONTROL

- **System configures quickly** with smart programming wizards (MATE3 required)
- Built in 4 line 80-character display for easy programming with no other equipment required
- Monitor, command and control from any internet-connected device with OPTICS RE
- Fully OutBack network integrated and programmable
- Programmable auxiliary control output for smart load controls
- Built-in 128 days of data logging
- Global technical support

FLEXmax 80 FLEXmax 60

OutBack FLEXmax Series Typical System Integration (w/ FLEXpower Radian):



OUTBACK POWER—MASTERS OF THE OFF-GRID. FIRST CHOICE FOR THE NEW GRID.

MAKE THE POWER

- FLEXpower Integrated Systems
- Inverter/Chargers & Charge Controllers

STORE THE ENERGY

- EnergyCell RE, GH, NC and OPzV Batteries
- Battery Enclosures and Racking

MANAGE THE SYSTEM

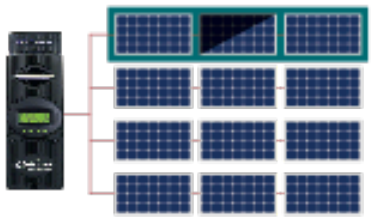
- OPTICS RE System Monitoring and Control
- MATE3 System Display and Communications

Models*	FLEXmax 80 (FM80-150VDC)	FLEXmax 60 (FM60-150VDC)
Nominal Battery Voltages	12, 24, 36, 48, or 60VDC (Single model, selectable via field programming at start-up)	12, 24, 36, 48, or 60VDC (Single model, selectable via field programming at start-up)
Maximum Output Current	80A @ 104°F (40°C) with adjustable current limit	60A @ 104°F (40°C) with adjustable current limit
NEC Recommended Solar Maximum Array STC Nameplate	**12VDC systems**: 1000W / **24VDC systems**: 2000W **48VDC systems**: 4000W / **60VDC systems**: 5000W	**12VDC systems**: 750W / **24VDC systems**: 1500W **48VDC systems**: 3000W / **60VDC systems**: 3750W
PV Open Circuit Voltage (VOC)	150VDC absolute maximum coldest conditions / 145VDC start-up and operating maximum	150VDC absolute maximum coldest conditions / 145VDC start-up and operating maximum
Standby Power Consumption	Less than 1W typical	Less than 1W typical
Power Conversion Efficiency	97.5% @ 80ADC in a 48VDC System (typical)	98.1% @ 60ADC in a 48VDC System (typical)
Peak Efficiency	60VDC input vs 48V battery at 55.1VDC (98.44%)	68VDC input vs 48V battery at 52.8VDC (98.31%)
Charging Regulation	Bulk, absorption, float, silent and equalization	Bulk, absorption, float, silent and equalization
Voltage Regulation Set points	13 to 88VDC user adjustable with password protection	13 to 88VDC user adjustable with password protection
Equalization Charging	Programmable voltage setpoint and duration, automatic termination when completed	Programmable voltage setpoint and duration, automatic termination when completed
Battery Temperature Compensation	Automatic with optional RTS installed / 5.0mV per °C per 2V battery cell	Automatic with optional RTS installed / 5.0mV per °C per 2V battery cell
Voltage Step-Down Capability	Down convert from any acceptable array voltage to any battery voltage. **Example**: 72VDC array to 24VDC battery; 60VDC array to 48VDC battery	
Programmable Auxiliary Control Output	12VDC output signal which can be programmed for different control applications (maximum of 0.2ADC)	
Status Display	3.1" (8 cm) backlit LCD screen, 4 lines with 80 alphanumeric characters total	3.1" (8 cm) backlit LCD screen, 4 lines with 80 alphanumeric characters total
Remote Display and Controller	Optional MATE3, MATE or MATE2	Optional MATE3, MATE or MATE2
Network Cabling	Proprietary network system using RJ-45 modular connectors with CAT5 cable (8 wires)	Proprietary network system using RJ-45 modular connectors with CAT5 cable (8 wires)
Data Logging	**Last 128 days of operation**: amp-hours, watt-hours, time in float, peak watts, amps, solar array voltage, maximum battery voltage, min. battery voltage and absorb time, accumulated amp-hours, and kWh of production	
Operating Temperature Range	-40 to 60°C (power automatically derated above 40°C)	-40 to 60°C (power automatically derated above 40°C)
Environmental Rating	Indoor Type 1	Indoor Type 1
Conduit Knockouts	One 1" (25.4mm) on the back; One 1" (25.4mm) on the left side; Two 1" (25.4mm) on the bottom	One 1" (25.4mm) on the back; One 1" (25.4mm) on the left side; Two 1" (25.4mm) on the bottom
Warranty	Standard 5-year / Available 10-year	Standard 5-year / Available 10-year
Weight (lb/kg)	**Unit**: 12.20 / 5.53 **Shipping**: 15.5 / 7	**Unit**: 11.65 / 5.3 **Shipping**: 14.9 / 6.8
Dimensions H x W x D (in/cm)	**Unit**: 16.25 x 5.75 x 4.5 / 41.3 x 14.6 x 11.4 **Shipping**: 19 x 9.5 x 8.5 / 48.3 x 24.1 x 21.6	**Unit**: 13.75 x 5.75 x 4.5 / 35 x 14.6 x 11.4 **Shipping**: 17 x 9.5 x 8.5 / 43.2 x 24.1 x 21.6
Options	Remote Temperature Sensor (RTS), HUB4, HUB10.3, MATE, MATE2, MATE3	Remote Temperature Sensor (RTS), HUB4, HUB10.3, MATE, MATE2, MATE3
Menu Languages	English & Spanish	English & Spanish
Certifications	ETL Listed to UL1741, CSA C22.2 No. 107.1	ETL Listed to UL1741, CSA C22.2 No. 107.1

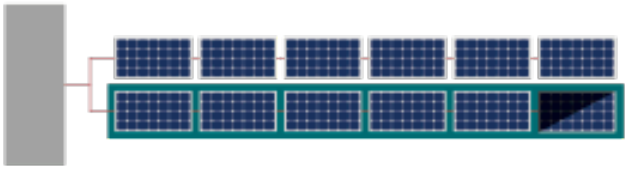
*Use appropriate wire size in accordance with NEC.

Low Voltage Charge Controller Advantage—Smaller string size reduces power output loss in the event of inadvertent module shading

OutBack FLEXmax 80 Charge Controller
Lower Voltage Four-String, 3780W Array (315W Modules)
Shading of a single module affects one string, resulting in a power output loss of up to 25%



Competitor Charge Controller
Higher Voltage Two-String, 3780W Array (315W Modules)
Shading of a single module affects one string, resulting in a power output loss of up to 50%



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