

Fuel Motion Inc.
every drop goes farther with FMI



ALTERNATE ENERGY SOLUTION

Electricity Storage with BMS



Set yourself free

ENERGY MANAGED SYSTEM

EMS

Smart Power. Several hours Backup. Small size.
Environmentally Friendly: **Go Green**



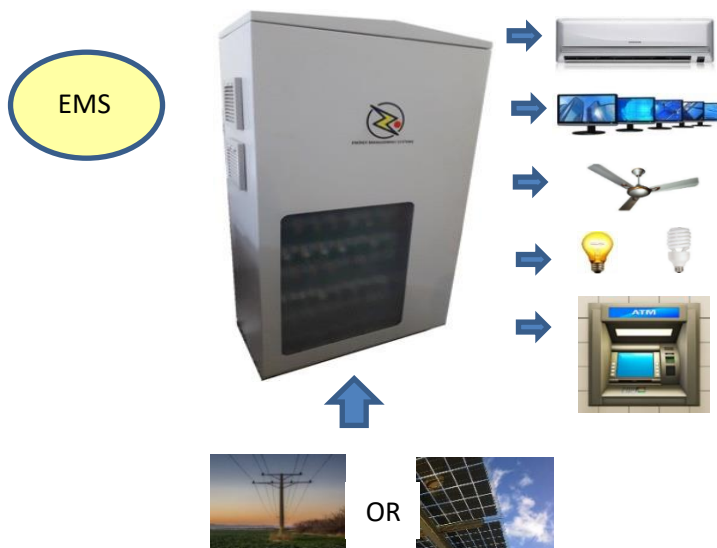
EMS is a Power System which gives pure, problem free electric power constantly, backed by efficient BMS stored power, 100% online. No need for a standby, backup generator. Pollution free Alternate Energy Solution

Energy Managed System (EMS) is an Electrical Power Supply, for all sensitive electronic/electrical equipment with Energy storage capability and provides several hours backup during power outage/load shedding.

Features include high density energy storage from Ultra Safe, long life reliable, maintenance free Lithium-Iron Phosphate cells, smart Battery Management System (BMS), high end software algorithms, intelligent cloud-based monitoring, reporting and controlling system. All packaged in one, for ten years of hassle-free performance.

EMS gives clean electric power with double conversion, completely isolated, eliminating Grid issues (high voltage, fluctuations, surges, spikes, frequency variation, EMI, phase shift, etc.), protecting customer electronic equipment (connected to EMS) from damage due to Grid issues. Protection is 24/7 all year round for ten years . It is an environment friendly, green concept, providing financial savings and considerable intangible benefits over its ten years life.

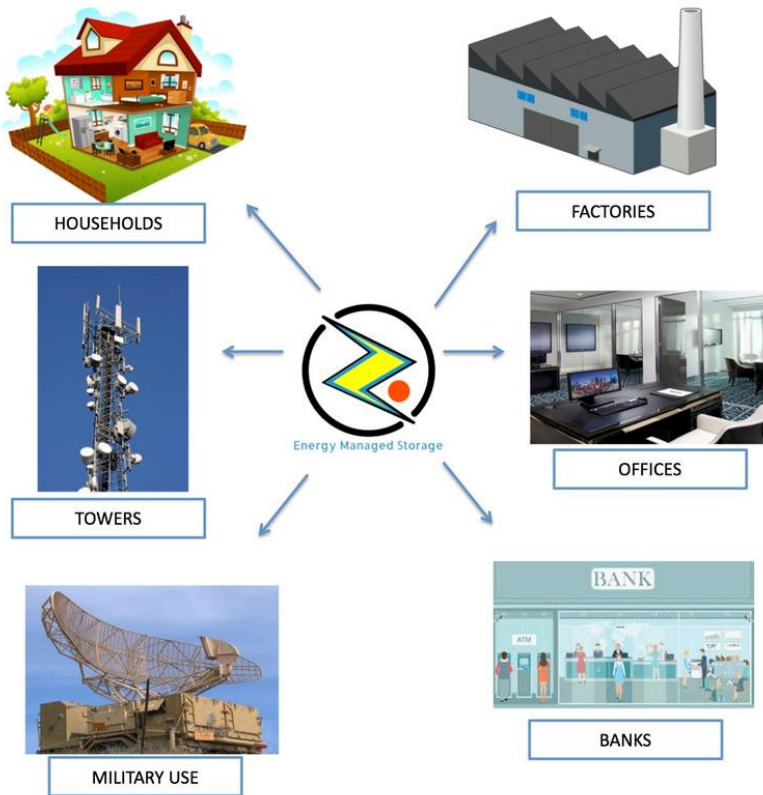
Relatively small steel box package includes an inverter, line conditioner, fast charger, LiFePO4 cells storage and several microprocessors-controlled hardware and Wi-Fi. Remotely connected to Command & Control Centre (Virtual NOC)



- Input Grid/Solar
- Output 220/120 VAC & 360 VDC
- Base models 5 & 10 KW
 - Up to 5 One-ton air conditioners
 - 100% online & double conversion for Computers/ servers and critical load
 - ATM machines
 - Lights, Fans



NUMEROUS APPLICATIONS



- EMS- small size and safe enables its installation inside the building
- Replaces standby generator
- Ideal for cell towers, data centers
- Higher power and capacity requirements can be met by customized design

Two models: EMS & SLC

Same features but different capacity

EMS

EMS Installed inside a bank branch for air conditioners

Model EMS1010



SLC Power
5 KW AC/DC
Battery storage capacity 6 KWH

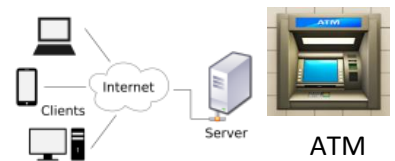
EMS Power
10 KW AC/DC
Battery storage capacity 10 KWH

SLC

Model SLC0506



SLC 60% smaller than EMS. Ideal application is **Critical Load**



Several hours of backup during power outage/ Load shedding

Remove standby Generator → Use Clean Power/Storage from EMS



Cut the high operational cost of running a generator



- Diesel
- Maintenance
- Pilferages
- Idle running
- Breakdowns



No Pollution



No Noise



No Vibrations



No Heat

Environmentally Friendly



Storage made from Lithium Iron Phosphate LFP batteries

A paradigm shift in using Lithium batteries, instead of Lead Acid. A high tech BMS technology, an innovation and proprietary of Fuel Motion Inc. (FMI) Silicon Valley, USA is the key to our success.

Lithium Iron Phosphate (LFP) vs Lead Acid (LA) Battery Comparison and Benefits

Features & Characteristics

- LFP has more than 3500 cycles vs ~350 for (VRLA) LA
- Long life of >10yrs makes it environmentally friendly
- LFP does not discharge any toxic fumes
- LFP(LiFePO4) is the safest and most stable Li chemistry
- LFP is 3x less by volume & 80% less by footprint
- LFP has 4x less weight vs LA for same capacity
- LFP temp range is -10C to 60C vs 5C to 40C for LA
- LFP is 98% efficient (charge/discharge) vs 60% for LA
- LFP ~1 Kwh gives the same capacity as ~2 Kwh LA
- LFP fully charged in 3 hours vs 10 hours for LA
- LFP Battery cost is ~20% lower over 5 years than LA
- LFP Achieves 60% cost saving over 10 years
- LFP mandatory requirement is a Battery Management System (BMS) for battery protection and controlled operation.

Benefit

- Longer duration
- Recyclable
- Install indoor
- Non-flammable, non-hazardous
- Small housing
- Easy transport
- Anywhere
- Capacity utilized
- Save storage cost
- Fast charging
- Low cost
- No replacement
- Safety, battery life, capacity and storage

Replace Lead Acid batteries with Lithium batteries and save money



SAVINGS FOR CUSTOMER FROM EMS

- Battery cost savings
- No replacement of batteries for ten years, battery replacement Labor saved
- Replacing Generator/UPS, capex saving
- Customer equipment protected, savings from expensive repairs
- Less floor area required save in space cost
- Potential fire due to short circuit protected, save in fire insurance premium
- Energy savings by running Inverter air conditioners directly with DC Volt
- Saving energy through rate arbitrage, peak shaving



Don't use Lead acid batteries its Hazardous



Lead Acid Battery

5 KWH capacity Lead Acid backup system from APC

Higher capacity 6 KWH FMI



Lithium Cell



FMI Unique Offer

Monitoring: FMI provides “Battery Management as a Service” BMaaS. This advance technology enables monitoring of all installed EMS through cloud connectivity (Virtual NOC) 24/7. The monitoring ensures proactive after sales service; oblivious to customer the maintenance issues are resolved.



Constant monitoring of all systems installed



Special Care We offer protection of customer electrical equipment from damage by Grid

Warranty: Fuel Motion offers Ten years (unconditional) warranty for the Lithium batteries (all inclusive, Parts & Labor). This is possible because of BMaaS.



After Sales: Our motto “Customer never calls to report system problems” This service includes preventative and predictive maintenance ensuring high probability of “No Breakdown”.



Safety of Lithium Battery: FMI top priority is safety, therefore, the Lithium Iron Phosphate LifePO4 chemistry cells which are Ultra Safe are installed in EMS. The Battery Management System ensures additional safety.

BMaaS (BATTERY MANAGEMENT AS A SERVICE)

SUMMARY



Clean Energy Supplied 24/7 from Grid or Solar input

- **Go Green**
- **No pollution, vibrations or noise as in a generator**
- **No fumes, toxic vapors, emissions as in Lead acid battery**
- **Sensitive electrical/ electronic equipment protected from damage by Grid.**
- **Protection 24/7 all the year round for 10 years**

Compact design and improved performances

- **Ultra-safe Lithium batteries**
- **Small footprint**
- **100 % on-line, Replaces UPS**
- **99 % Storage efficiency**
- **Extra safety inbuilt**
- **Double Conversion**
- **Completely Isolated from Grid**
- **Line Conditioner effective**
- **Works in extreme temperatures**
- **Several hours of backup power from storage**

Extended Life, Warranty and monitoring service

- **10 Years battery life**
- **5 years electronic parts warranty**
- **10 Years Unconditional warranty of battery**
- **Monitoring and maintenance service available for 10 years under the maintenance contract**



Technical Specifications

	EMS1010	SLC0506
Topology	Online	
Output		
Output Ac Voltage	220VAc ~ 1P ±5%	120VAc ~ 1P ±5%
Output Voltage Frequency	50Hz-60Hz	60Hz
Output Ac Current	27 A	20 A
Power	6.5KVA-12.5KVA	5 KVA
Waveform	Pure Sine wave	
Topology	Pure Isolated	
Input		
Input Connection	5-Wire (3P-N-PE)	3-Wire (1P-N-PE)
Input Voltage	260V AC -470V AC	90VAc – 280VAc
Input Voltage Frequency	40-70Hz	
Topology	Pure Isolation with Double Conversion	
Connection	Standard 20A	
Batteries and Runtime		
Battery Type	Lithium Iron Phosphate (LiFePO4)	
Usable Battery Capacity	10 KWh	6 KWh
Minimum Usable Capacity (SoC)	7% (BMS Disconnects System at this SOC)	
Depth of Discharge (DoD)	93%	
Cycle Life @ 80% DoD	>3500	
Nominal Battery Voltage	360 VDC	190 VDC
Maximum Battery Discharge Current	30A	
Maximum Output Power	11 KW @ 380 VDC	6KW @ 192VDC
Continuous Output Power	10 KW @ 360 VDC	5KW @ 192VDC
Charging Time	3 Hrs	3 Hrs
Stackable	Yes	Yes
Communication and Management		
Internal Communication Protocol	CAN Bus, UART	
System to Cloud Storage Communication	Wi-Fi 802.11, MQTT	
Physical		
Dimensions (batteries in the box)	14" X 24" X 40"	12" X 24" X 28"
Weight including Batteries	264.5lb (120 Kg)	143.3lb (65 kg)
Environmental		
Operating Environment	23 – 140 °F (-5 – 60 °C)	
Operating elevation	Operating elevation 0-10000 feet (0-3000 meters)	
Storage Temperature	Storage temperature 5 – 113 °F (-15 – 45 °C) short term storage	
Storage relative humidity	Storage relative humidity 0 – 95%, non-condensing	
Storage elevation	Storage elevation 0-50000 feet (0-15000 meters)	
Conformance		
Compliant Standards	EN61851-21-2, class A, EN61851-1, EN61851-23, UL-1778	
Protections (All Models)		
BMS Safety	Each Single Cell	Over Temperature Over Voltage Under Voltage
3-Layers Protection System	EMS Firmware Protection Protocols. Cloud Alert Server Autonomous Protection. Cloud Data Analytics (Predictive Protection).	
Input Safety	Over Voltage Under Voltage Startup	230VAc - 280VAc ≤ 90VAc No Overshoot (Soft Start)
Output Safety	AC Over Voltage AC Under Voltage AC Over Load, Short Circuit	

