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# Telecom Energy Solution

Power Solutions for Telecom

Power • People





# About 3Tech

For over 20 years, 3Tech has been providing reliable power solutions to telecommunication industries worldwide. Our professional team delivered thousands of complete solutions from design, installation, commissioning and ongoing maintenance to more than 30 telecom operators, over 40,000 generator sets have been delivered and in operation on site. 3Tech was awarded by both ZTE and Huawei “Global Best Partner” prize, which further recognize our contribution in the telecommunication industry.

## Our mission

To fascinate and attain customers with high-valued Energy Solutions Products and the most satisfying users in the globe.

## Our vision

To become a comprehensive and innovative world-class supplier of Energy Solutions.

## Manufacturing facilities

### 3Tech Power (Dongguan) Corporation Limited

Located in Dongguan, the most developed manufacture and industrial area in China. Certified as High-Tech Enterprise, with a plant area of 12,000 square meters, over 150 employees. Annual output over 5000 units.





# LionRock<sup>®</sup> Telecom Energy

LionRock Telecom Energy Solutions offer simple, efficient and reliable full range of power supply equipment at various output capacities to meet all applications. Telecom Energy products include

embedded power supply, photovoltaic system, battery system, AC and DC Rectification & power distribution system, control management system and data monitoring system.

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Solar System

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OwlEye Smart Control and Monitoring System



# LionRock® Hybrid Power Solutions



## The benefits of LionRock hybrid power solutions

With our LionRock Hybrid Power Solution, operators can now partially, or even completely substitute the traditional diesel generators and make use of renewable energy. Our solutions are fully integrated, all energy sources and equipment are managed by our proprietary controller, developed specifically for telecom application. The benefits are realized by numerous operators. LionRock hybrid solutions contribute to saving energy, fossil fuel and money in thousands of installations.



## Up to 80% OPEX reduction

By optimized generator, renewable energy and battery storage operation, fossil fuel and related maintenance cost will be reduced substantially. Even if all energy may not be completely replaced fossil fuel by renewable energy, LionRock hybrid power solutions will make sure you get the most out of every drop.

## Reduce carbon footprint

There are a lot of off grid telecom installations powered by generators today. These represent enormous potentials for reduction of carbon footprint. Many generators serving as the main energy source are operated in an inefficient way. By optimizing the control with LionRock hybrid solutions, the emission per kWh drops significantly.

## Modularity

With the modular design, our systems can be easily adapted to various power input sources and scaled to meet higher load requirements.

## > 96% efficiency

Whether input power comes from solar panels, generators or mains power, our high efficiency power conversion equipment make sure that power loss is minimized.

## Fully integrated

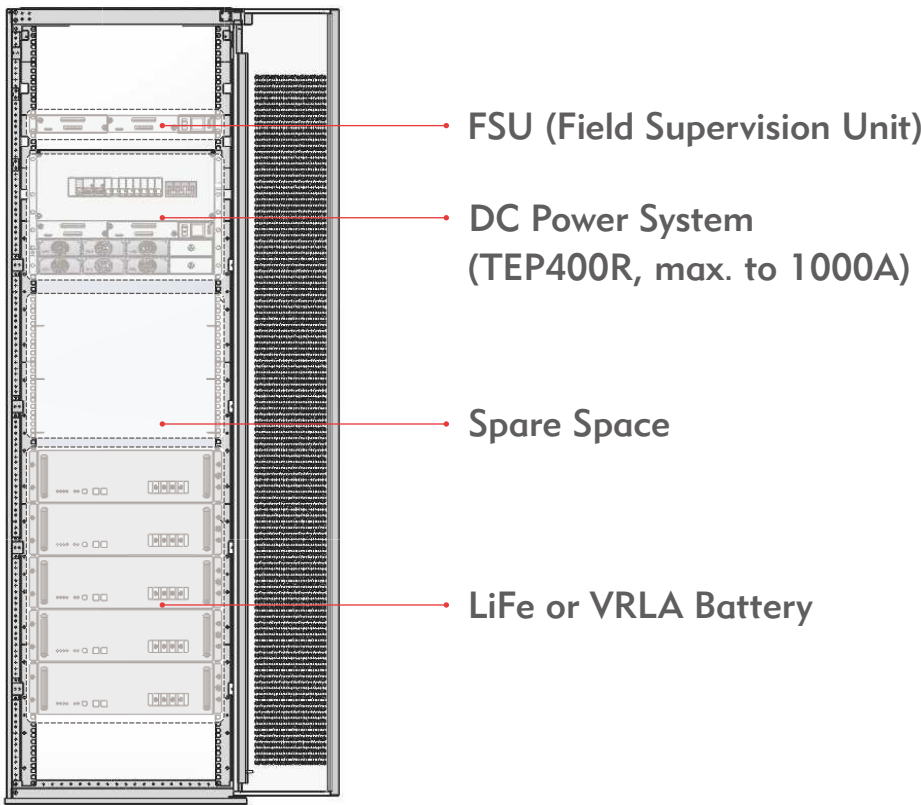
The fully integrated rectifier system can be used for various power supply applications. Unified configuration, convenient to be operated, helps to reduce the overall maintenance cost.



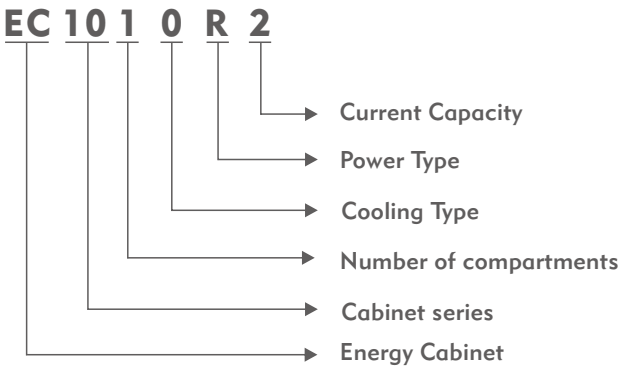
# Telecom DC Power System



## Telecom Indoor Cabinet



### Model Interpretation



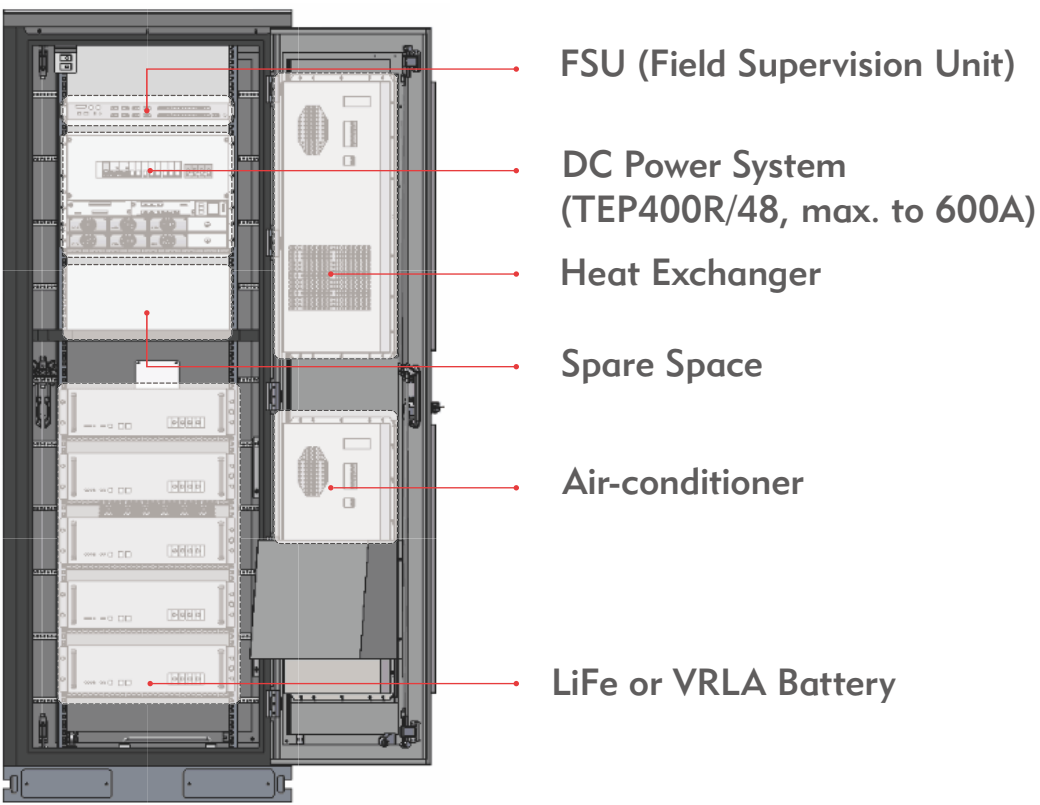
Power Type	
R	Rectifier
S	Solar
H	Hybrid
V	No power sys

Cooling Type	
0	Natural Wind
1	Fan
2	Heat Exchanger
3	Air Conditioner
4	1Type+2Type
5	2Type+3Type
6	1Type+3Type

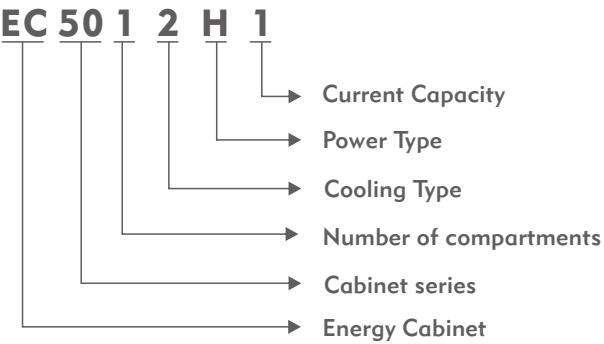
Current Capacity	
2	200A
4	400A
6	600A
20	2000A
30	3000A

Cabinet series	
10	Width=600mm

## Telecom Outdoor Cabinet



### Model Interpretation



Power Type	
R	Rectifier
S	Solar
H	Hybrid
V	No power sys

Cooling Type	
0	Natural Wind
1	Fan
2	Heat Exchanger
3	Air Conditioner
4	1Type+2Type
5	2Type+3Type
6	1Type+3Type

Current Capacity	
2	200A
4	400A
6	600A

Cabinet series	
50	Width=650mm
60	Width=800mm

# Telecom DC Power System



## Telecom Indoor Cabinet

The EC1000 series telecom power indoor cabinet is new platform generation designed to fit customer needs, configuration flexibility and supports variety of applications. The equipment cabin reserves 19-inch rack space for other equipments. The cabinet is well suited for power, batteries and telecom equipment.

### Features

- Small size, easy deployment
- Compact design for installation of equipment
- Intelligent battery management function helps to prolong battery lifespan
- Easy installation & maintenance by front door design
- Wide operating DC input range
- Full galvanic isolation
- Advanced max power point tracking routines
- Support CAN communication
- Open protocol of maintenance interface
- Anti-theft design

### General Specification

System	Dimension (W x D x H)	600mm x 600mm x 2000mm
	Cabinet Color	Black: RAL 9004
	Maintenance Mode	From the front
	Cabinet Material	Hull, inside frame & base: steel
	Cable Entry Detail	Cable entry from top of cabinet
Input	AC Voltage	200-277/346-480VAC, Three phase; 50/60Hz
	DC Voltage	-40V ~ -60VDC; max 200A
	Solar Input	100 ~ 430VDC
	Surge Protection	40kA
Output	Voltage	-48VDC
	Surge Protection	15kA



EC1010H8



EC1010R4

### Scenarios

- Indoor
- Solar/diesel/grid hybrid system

## Telecom Indoor Cabinet

EC1030R20 is LionRock's new generation telecom power system for central equipment room with digitalization, multiple racks and large capacity. The system is of great power density, excellent performance, easy maintenance and strong expandability. Single cabinet output is 2000A. It supports three rectifier cabinets to operate in parallel so that the max output can reach 6000A.

### Features

- Efficient and energy-saving design
- Digital design, stable performance
- Strong capacity expandability
- Excellent battery health management

### Scenarios

- Core equipment room
- Large aggregation site
- Data center

### General Specification

System	Dimension (W x D x H)	600mm x 600mm x 2000mm
	Weight	225kg
	Rectifier	2 - 40
Input	AC Input	200-277/346-480 VAC, Three phase; 50/60Hz, 400A max
	Surge Protection	40kA
Output	Voltage	-48VDC
	Capacity	2000A max
	Battery Distribution	2 x (2x1250A) Fuse
	BLVD	10x400A Fuse, 2x63A MCB
	Surge Protection	15kA
DC Distribution EC1010D (Optional)	Dimension (W x D x H)	600mm x 600mm x 2000mm
	Weight	202kg
	Output Distribution	24 x 630A Fuse
	Surge Protection	15kA



EC1030R20-D1



# Telecom DC Power System



## Telecom Outdoor Cabinet

3Tech also offers outdoor cabinet solutions that enable simple deployment, high system efficiency, versatility and energy saving. The energy cabinet integrates various monitoring system functions to provide a safe and reliable operating environment for the main equipment.



EC6025R4

EC5012H1

EC5013

### Scenarios

- Outdoor
- Solar/diesel/grid hybrid system

### Features

- Wide input voltage range: 80VAC ~ 300VAC and 100VDC ~ 430VDC
- Power module supports hot swapping, easy installation and maintenance
- Power supply compact structure, save space and installation costs
- High efficiency (rectifier ≥96%, DC conversion ≥98%)
- Remote management can be achieved through dry contacts or serial ports communication

## Outdoor Cabinet - 50 series

### General Specification

System	Dimension (WxDxH)	650mm x 650mm x 1600mm
	Weight	157kg
	Installation	Ground-mounted
	Maintenance	From the front
	Cable Routing	From the bottom
	Cabinet Color	Light grey: RAL 7035
Input	AC Input	200-277/346-480VAC, Three phase; 50/60Hz, 35A max
	DC Input	-40V ~ -60VDC; max 200A
	Solar Input	100 ~ 430VDC; max 15A x 2
Output	Voltage	-48VDC
	Rectifier	Max 400A
	Solar	Max 100A
Output Distribution	LLVD	16A x 1, 32A x 2, 63A x 2, 100A x 1
	BLVD	32A x 2, 63A x 2, 100A x 1
Space	Spare Space	10U height, 19-inch width rack

Remark: LLVD: Load Low Voltage Distribution; BLVD: Battery Low Voltage Distribution

### Cooling System (Optional)

Equipment Cabinet	120/150W/K heat exchanger cooling capacity
Battery Cabinet	600/1000W air-conditioner

### Optional Accessories

Lighting	LED
Sensor	Smoke, water, door switch, temperature & humidity etc

### Operating Conditions

Operating Temperature	-10°C ~ 45°C (Including solar radiation)
Storage Temperature	-40°C ~ 70°C
Operating Relative Humidity	5% ~ 95% (w/o derating)
Altitude	0 ~ 2000m (1°C temperature derating per 200m over 2000m to 4000m)
Protection Level	IP55
Noise level (SPL)	≤65dBA@1.5m

# Telecom DC Power System



## Outdoor Cabinet - 60 series

### General Specification

System	Dimension (W x D x H)	800mm x 1200mm x 2050mm (including base 800 x 950 x 100mm)
	Weight	425kg (Excluding battery)
	Installation	Ground-mounted
	Maintenance	From the front and back
	Cable Routing	Entry bottom
	Cabinet Color	Light grey: RAL 7035
Input	AC Voltage	200-277/346-480VAC, Three phase; 50/60Hz, 35A max
	DC Voltage	-40VDC ~ -60VDC; max 200A
Output	Voltage	-48VDC
	Capacity	400A max
Output Distribution	BLVD	100A x 2, 32A x 2, 16A x 1
	LLVD	63A x 2, 32A x 2, 16A x 2
Space	Spare Space	17U height, 19-inch width rack
	Battery Space	Max 44U height, 19-inch width rack

### Cooling System (Optional)

Equipment Cabinet	120/150/180W/K heat exchanger cooling capacity
Battery Cabinet	600/1000/1500W air-conditioner

### Optional Accessories

Lighting	LED
Sensor	Smoke and water, detectors, door switch, temperature & humidity sensor available

### Operating Environment

Operating Temperature	-10°C ~ 45°C (Including solar radiation)
Storage Temperature	-40°C ~ 70°C
Operating Relative Humidity	5% ~ 95% (w/o condensation)
Altitude	0 ~ 2000m (1°C temperature derating per 200m over 2000m ~ 4000m)
Protection Level	IP55
Noise	≤65dBA@1.5m

## Automatic Transfer Switches - ATS

Transfer switches are traditionally applied between mains and generator supply as back up system.



ATS - 63A



ATS - 125A

### Features

- Capacity: 63A/125A
- Large LCD display
- RS485 communication
- Measure and display voltage and frequency
- Over/under voltage, loss of phase, reverse phase
- Programmable timer delay automatic operation protection
- AC voltage sensing and monitor
- Output status monitoring
- Manual operation available

### General Specification

		63A	125A
System	Dimension (W x D x H)	482mm x 310mm x 175mm	482mm x 310mm x 220mm
	Weight	23kg	
	Installation Mode	4U height, 19-inch width rack	5U height, 19-inch width rack
	Maintenance Mode	From the front	
	Cable Routing	From the right and left	
Input	Voltage	200-240/346-415VAC, Three phase; 50/60Hz, 63A max	200-240/346-415VAC, Three phase; 50/60Hz, 125A max
Output	Voltage	200-240/346-415VAC, Three phase; 50/60Hz, 63A max	200-240/346-415VAC, Three phase; 50/60Hz, 125A max
Surge Protection	AC Input	20/40kA (8/20μs)	

### Operating Conditions

Operating Temperature	-20°C ~ 65°C
Storage Temperature	-40°C ~ 70°C
Operating Relative Humidity	5% ~ 95% (w/o condensation)
Altitude	0 ~ 4000m



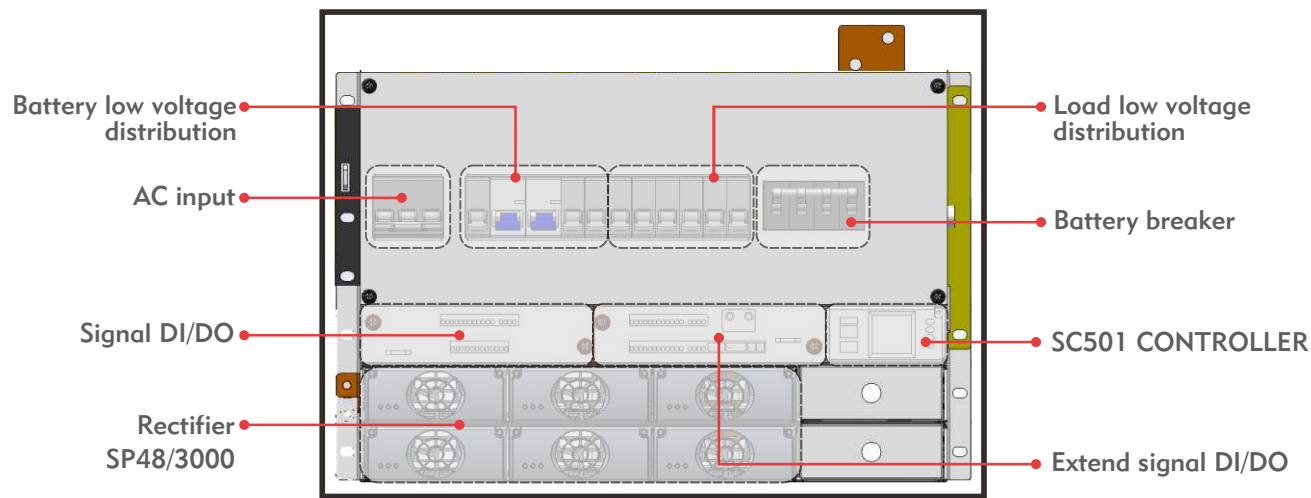
# Telecom DC Power System



## DC Power System

TEP System is a compact and intelligent power system containing SP48/3000 rectifiers, SC501 controller module, AC connection and DC connection.

It supports remote monitoring and management with SNMP. It is easy to install and of compact size.



### Features

- 19'' sub-rack, easy to be embedded into all standard telecom equipment, with structures design, strong commonality and easy installation
- Compact structure, high power density
- Sub-rack installed, facilitate customer configuration
- Hot-swappable modules without damage
- On-line maintenance, quick and easy
- Wide range of input rectifier module, possible strong adaptability for the grid
- Perfect battery management, improve the battery life, keep the battery in good working condition
- With variety of alarms and protective functions (eg. over current, over voltage, over temperature, etc.)
- Management priority: grid over battery over generator



TEP400R/48



TEP300R-D1H1

### General Specification

		TEP400R/48	TEP300R-D1H1
System	Dimension (W x D x H)	483mm x 400mm x 312mm	483mm x 400mm x 133mm
	Weight	29kg	18kg
	Installation Mode	19-inch width rack	
	Cabling Mode	From the top, right & left	
	Maintenance Mode	From the front	
Input	AC Input	200-277/346-480Vac, three phase, 50/60Hz, Max. 35A	
Output	Voltage	-42Vdc to -58Vdc (typical: -48Vdc)	
	Capacity	Rectifier Max. 400A	Rectifier Max. 300A
Output Distribution	Battery	400A breaker	4x125A MCB
	LLVD	2x63A MCB, 2x32A MCB, 2x16A MCB	2x100A MCB, 1x63A MCB, 2x32A MCB
	BLVD	1x16A MCB, 2x100A MCB, 2x32A MCB	2x100A MCB, 2x63A MCB
Surge Protection	AC Input	20/40kA (8/20μs)	40kA (8/20μs)
	DC Output	15/40kA (8/20μs)	20kA (8/20μs)
Environment	Operating Temperature	-40°C to +65°C (load needs derating to 80% at +45°C to +65°C, system can start at -40°C to -33°C without damage)	
	Storage Temperature	-40 °C to +70 °C	
	Operating Relative Humidity	5% to 95% (without condensation)	
	Altitude	0 to 2000m (1°C per 200m temperature derating from 2000 to 4000m)	

Remark: TEP200R and TEP600R are available, modular expandable to 2000A  
LLVD: Load Low Voltage Distribution; BLVD: Battery Low Voltage Distribution

# Telecom DC Power System



## Controller Module



### Features

- The standard 1U\*2U structure reduces space
- RS485 and Ethernet interface for computer connection locally or remote
- Front panel LCD display and four buttons for on-site operation without computer
- Easily configuration file upload/download via USB or computer
- Easy update software for controller via USB or computer
- GPRS or 3G/4G function in optional
- Advanced battery management, both Lead-acid battery and Lithium-battery
- Support up to 86 digital outputs
- Support up to 46 digital inputs
- Multiple LVDs control
- Battery mid-point monitoring
- Multi-level access authority management
- Event log (up to 90,000 records)
- Alarm log (up to 10,000 records)
- More user-selectable languages
- Programmable Logic Control (PLC) function, more flexible requirements can be supported
- Low-interference and excellent susceptibility enhance reliability

### General Specification

Analog Inputs	1 bus voltage	Additional 4 SC210 boards
	1 load current	Additional 10 SC210 boards
	2 battery voltages	Additional 72 SC340 boards
	2 battery currents	Additional 6 SC210 boards
	2 load fuse alarms	Additional 6 SC210 boards
	2 battery mid-points	Additional 6 SC210 boards
	2 temperatures	Additional 10 SC320-AI boards
Digital Inputs	6	Additional 40 SC320-DI boards
Digital Outputs	6	Additional 80 SC320-DI boards
LVDs	2	Additional 6 SC210 boards

## Rectifier Modules



### Features

- High efficiency and high power density
- Digital control
- High reliability design
- Automatic disconnect during hazardous input
- Excellent EMC performance
- Low-interference and excellent susceptibility enhance reliability

### General Specification

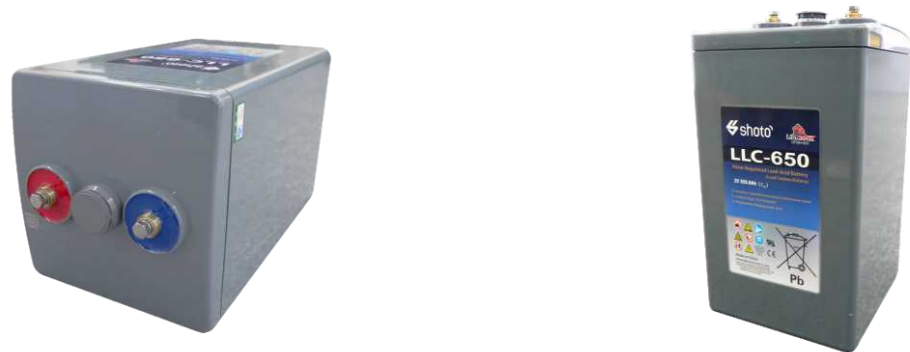
Inputs	AC Supply	Nominal: 220/230Vac 1 ph; Tolerances: 85-300Vac 1 ph
	Frequency	45-300Hz
	Power Factor	>0.99
	Input Current	≤15A rms at nominal input; ≤18A rms at 187Vdc input
	THD	<5% at 100% load; <10% at 50% load
DC Outputs	Input Protection	Varistors for surge protection (5kA 8/20us Surge protection)
	Output Capacity	3000W at nominal input
	Output Current	56.6A±0.5A with normal input
	Voltage Regulation	±0.6% from 5% to 50% load or from 50% to 100% load
	Efficiency	Typical 95%, max 96%
	Current Sharing	≥±5% of average total current of all paralleled modules
	Holdup Time	>10ms (56,07A constant current when output voltage from 53,5V to 43,2V)
	Efficiency	Max: 96%
	Output Protection	Overvoltage shutdown; Short circuit protection; High temperature protection; Output fuse
	Ripple and Noise	<200mV peak to peak, 20MHz bandwidth <2mV RMS psophometric



# Telecom DC Power System



## Lead-carbon Battery



### Features

- Extra long life, design life of 20 years
- Excellent quick charge performance, reduce charging time by 30%
- Superior PSoC and deep cycling performance
- Excellent fuel savings when used with hybrid system applications

### Technical Parameters

Nominal voltage: V	2
Capacity: Ah	650 (10hr, 1.80V/cell, 25°C), other capacity available
Weight: kg	41.5
Dimensions: L*W*H (mm)	212*207*358
Total height: (mm)	372
Internal resistance (full charged): mΩ	0.28 (25°C)
Short - circuit current: A	7500
Self discharge@25 °C:	Less than 4% after 30 days storage
Operating temperature range: °C	Discharge: -40 ~ 65 / Charge: -20 ~ 60 / Storage: -20 ~ 45
Recommended operating temperature: °C	-15 ~ 30
Recommended charging current: A	90
Maximum charging current: A	180
Charging voltage@35 °C: V/cell	Float: 2.23 / Equalize: 2.35
Temperature coefficient:	-3.3mV / cell / °C
Terminal:	M8
Container materials:	ABS
Capacity verse temperature:	105% @ 40 °C / 85% @ 0°C / 60% @ -20°C
Design life@25 °C:	20 years

## LiFe Battery

### Features

- Support parallel connection with monitor function
- Wide operating temperatures
- Build-in battery control system for efficient operation
- Less weight for pole mounted sites
- Option: anti-theft/dry contact



### General Specification

Performance Parameter	Product Model	LF48100S1
	Cathode Material	LiFePO4
	Nominal Voltage	48Vdc
	Nominal Charging Voltage	54Vdc
	Rated Capacity	100Ah (0.3C constant current discharging, 40.5V cut off)
	Energy	4800Wh
	Max Charge / Discharging Current	50A
	Life Cycle Character	≥3500 cycle (25°C, 0.2C constant current discharge to 80%DOD, then go for next cycle)
	Dimension (W x D x H)	442mm x 420mm x 133mm (excluding mounting ear)
	Weight	About 42kg±1kg
	Floating Charge Life	≥12 year
	Certification	UN38.8
	Installation Method	Rack mounted / Wall mounted
	Communication Interface	RS232/RS485
	Indicator State	ALM / RUN / SOC
	Parallel Communication	Maximum support for 16 sets of parallel
	Terminal Stud	M8, torque 4 N·m
	Alarm and Protection	Over voltage, under voltage, short circuit, overload, over current, over temperature, low temperature protection

### Operating Conditions

Operating Temperature	Charging: 0°C ~ 55°C / Discharging: -20°C ~ 50°C
Storage Temperature	-20°C ~ 60°C
Operating Relative Humidity	5% ~ 95%
Altitude	≤4000m

# Telecom DC Power System



## Distributed Blade Battery



### Features

- Small size, light weight
- Wide operating temperature -40°C ~ 55°C (without sun radiation)
- IP65 high degree of protection for harsh environment applications
- Support pole, wall, tower installation

### General Specification

Voltage	48VDC
Rated Charging Voltage	Boost charging: 55.5VDC
Capacity	25Ah (C5, 25°C)
Max Charge/Discharge Current	10A/30A (0°C ~ 45°C)
Weight	≤22kg
Dimension (W x D x H)	135mm x 330mm x 450mm
Natural Discharge Rate @ 25°C	<5% (90 days)
Communication Interface	CAN / RS485
Protection	Over charging, over discharging, short circuit, over current, over temperature protection
Certification	CE, UN38.3
Life	10 years @ 25°C
Operating Temperature	-40°C ~ 55°C
Transportation Temperature	-40°C ~ 60°C
Storage Temperature	0°C ~ 40°C
Relative Humidity	5% ~ 95% (without condensation)
Altitude	≤4000m
Max Parallel Number	8

## Distributed Blade Power

### Features

- Rapid Deployment, blade structure, Modular design
- Flexible design, Power Unit and Battery Power Support Modular Expansion
- Simple operation and maintenance, natural heat dissipation, free from daily maintenance

### Scenarios

- Indoor / outdoor distributed site
- RRU site
- Easy Macro site

### General Specification

Voltage Range	110/220VAC (80VAC - 300VAC); 240/336VDC (130VDC - 400VDC)
Frequency Range	50/60Hz (45Hz - 66Hz)
AC SPD	20kA (8/20μs)
Input Power Factor	≥0.99 (100% load)
Rated Output Power	3000W at 200VAC
Rated Output Voltage	54.5VDC
Efficiency at 220VAC	≥96% (peak) ; ≥95.5% (load)
DC SPD	10kA (8/20μs)
Load Output Branch	4 channels (1 channels high-power quick-plug terminals, 60A per channel, 3 channels quick connect terminal output interface, 40A per channel)
Operating Temperature Range	-40 ~ +55°C (Non-solar radiation)
Storage Temperature Range	-45 ~ +70°C
Relative Humidity	5% ~ 95%RH
Dimensions (W x D x H)	98mm x 309mm x 415mm
Weight	9.2kg
Alarm	Input undervoltage, input overvoltage, overtemperature, output overvoltage, etc.
Heat Dissipation	Natural heat dissipation
MTBF	5 x 10 <sup>5</sup> hours
IP Level	IP65
Installation Mode	Poles or wall-mounted
Wiring Method	From the bottom
Communication	RS485/CAN/Bluetooth/4G







Mono-crystalline Solar Module

Mono-crystalline solar panels have the highest efficiency since they are made out of the highest-grade silicon. The efficiency of mono-crystalline solar panels are typically up to 20%. Mono-crystalline solar panels last longest. Our solar panels are provided with manufacturers 25-year warranty. The solar panel performance will be affected if it is covered with dust, dirt and snow. Regular maintenance is important to ensure the best performance and output from the solar panels.

Features

- PV chain including silicon materials, wafer, solar glass, solar cell, solar module and solar project, and ISO9001 & ISO14001 certified factory, ensure excellent raw materials and production control.
  - Solar modules certified by TUV NORD (IEC61215 & IEC61730:2016) in the extreme conditions (Temperature, load, impact) with good performance. Pass TUV Salt Mist Corrosion Test, PID Test, Ammonia Resistance Test, Carbon Footprint Test, Fire Test, Sand Test, EMC and LVD Test.
- The good weak light performance (morning, evening and cloudy days) has been tested and approved by professional third-party.
  - Guarantee from 0 to +3% as power tolerance, customer can obtain 5.8% power more than conventional output.
  - 100% EL test before and after lamination, and finished products EL test, providing higher quality assurance.

Solar Panel



High Efficiency  
PERC Mono-Crystalline Solar Module  
(158.75×158.75 mm, 60 Cell (6×10) - 5BB PERC)



High Efficiency  
PERC Mono-Crystalline Solar Module  
(158.75×158.75mm, 72 Cell (6×12) - 5BB PERC)

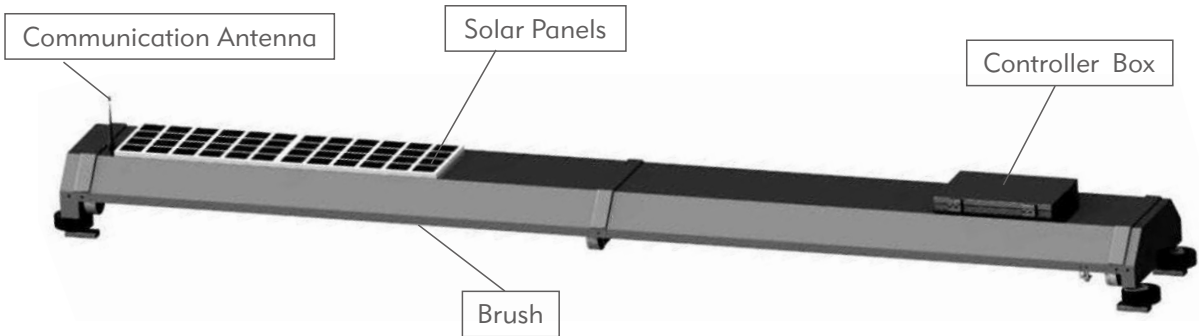
Typical Electrical Characteristics

Dimension	1670×1000×40/35mm		1980×1000×40mm	
Max - power	320W	330W	385W	395W
Power Tolerance	0 to +3%			
Voltage at Pmax (Vmp)	33.4V	33.8V	40.2V	40.6V
Current at Pmax (Imp)	9.58A	9.77A	9.58A	9.73A
Open-Circuit Voltage (Voc)	40.8V	41.2V	49.0V	49.4V
Short-Circuit Current (Isc)	10.07A	10.26A	10.08A	10.22A
Max - System Voltage (VDC)	1000			
Cell Efficiency	21.5%	22.1%	21.6%	22.2%
Module Efficiency	19.2%	19.8%	19.4%	19.9%
No.of Bypass Diodes (pcs.)	3			
Maximin.Series Fuse (A)	15A			
Temperature Coefficient of Pmax	-0.37%/°C			
Temperature Coefficient of Voc	-0.27%/°C			
Temperature Coefficient of Isc	0.04%/°C			
Nominal Operating Cell Temperature	45±2°C			

\*STC Conditions (1000W/m<sup>2</sup>, 1.5AM and 25 °C Cell temperature)  
\*Poly-Crystalline Solar Module is available as option.

## Solar Panel Intelligent Cleaning Robot

In practical applications of solar, the dust on the surface can block the solar radiation reach the solar cell, and reduce the output of each panel. It also affect the cooling of the solar panel during operation and hence reduce the performance. So timely clean up the dust on the surface of solar panels is particularly important.



### Features

- The solar panel on the cleaning robot automatically generate electricity for the cleaning robot
- The cleaning system employs the soft spiral brush to clean the panel up to 95% efficient
- The status of multiple cleaning robots can be deleted and controlled by computer in real time
- The product can analyze mechanical and electrical faults by itself, and upload data to the management department to mobile phones and computers
- Suitable for dry weather like desert

### Applications



26 / Solar Panel Intelligent Cleaning Robot



## Maximum Power Point Tracking (MPPT)



### Features

- Max 98% efficiency, energy saving
- Modular design, compatible with Huawei 50A module system
- CAN communication
- Support hot-swap
- Wide temperature range
- Support voltage and current regulation
- Built-in fan cooling

### Telecom DC Power System - MPPT

Power	3000W
Input Voltage	187~430Vdc (full power range), 100~430Vdc (voltage range)
Input Current	≤18A rms at nominal input, ≤21A rms at 185Vdc input
Total Harmonic Distortion(THD)	<5% (full load); <10% (half load)
Output Voltage	53.5Vdc (rated); 42~58Vdc (adjustable)
Ripple and Noise	<200mVpp, 20MHz bandwidth
Maximum Output Current	56.6±0.5A
Efficiency	≥95.5%@normal; ≥96.2% max efficiency, MPPT efficiency≥99%
Environment	−40 to +75°C (operating temp), +50 to +75°C (derating apply)
Dimension (W x D x H)	108mm x 327.8mm x 41.6mm
Weight	2.5kg



# DC Generator Sets



## Applications

- Telecommunications
- Standby Power Supply
- Solar/Wind Hybrid Power option
- Rapid Electric Vehicle Charging



Saving  
40%-60%



Saving  
50%-70%

## Features

- Available in all voltages from 12 to 266 Vdc
- Currently available from 5 to 27 kW
- Proprietary microprocessor controller
- Variable speed design
- Rare earth, permanent magnet generator
- High efficiency: alternator exceeds 90%-95%
- Direct connection to battery bus (no transfer switch)
- Automatic three step charging circuit consisting of boost rate, equalizing charge, and float rate
- 1,000 hours maintenance-free system
- Low fuel consumption: fuel saving range from 40% - 60% against fixed speed AC genset
- Expandable: DC generators can be connected in parallel
- Maintenance cost: extend service period up to 1,000 hours, maintenance cost saving 50% - 70%
- Good compatibility performance
- Low EMI emissions
- Alternator has no bearing, couplings, brushes, slip rings, or rotating fields. There are no moving parts to wear.
- Automatic temperature compensation with temperature sensor inside the battery compartment
- Comprehensive system protection

Model		LRP8DR/DH	LRP12DR/DH	LRY16DR/DH	LRF27DR	LRH10DR-G	LRH15DR-G
Output capacity	Voltage Vdc	42-58	42-58	42-58	42-58	42-58	42-58
	Prime kW	8	12	16	27	10	15
	Standby kW	9	13.5	17.6	30	11	16
Fuel type		Diesel	Diesel	Diesel	Diesel	Gas	Gas
Engine Manufacturer		Perkins	Perkins	Yanmar	Forward	Kohler	Kohler
Engine Model		403D-11	403D-11	3TNV88	4JB1	CH740	CH1000
Engine Speed rpm		1200~3000	1200~3000	1200~3000	1500~3000	2200~3850	2200~3850
Bore mm		77	77	88	93	83	90
Stroke mm		81	81	90	102	67	78.5
Cylinders		3L	3L	3L	4L	2V	2V
Dimensions, L*W*H mm		1600*800*1280	1600*800*1280	1600*800*1280	2000*900*1280	1157*688*1156	1157*688*1156
Weight kg		670	680	750	850	43	56



# AC Generator Sets



## HK - A Major HK Telecom Operator

- 6 x LRT2535 LionRock open genset
- Dual redundant fuel system upgrade
- Switchboard and power cable installation
- Catalytic converters and mid level exhaust discharge



## Typical Features

- Set mount radiator with engine driven fan
- Cooling system standard for 40°C ambient
- Anti-vibration mounts between engine/alternator and baseframe
- Baseframe fuel tank
- Protective grille for fan and rotating parts
- Low noise-exhaust silencer with bellow
- Standard manual output breaker
- Coolant and oil drains with valve
- Easy operation - integrated control design reduces breakdowns and foolproof operation
- Easy maintenance - large and fully open doors on both sides for easy service
- Optional enclosure

## Applications

- Telecommunications
- Power station
- Data centre
- Mine sites
- Backup power of factory, hospital, bank, shopping mall etc. to meet these applications, capacity to 4000 kVA
- Electric and diesel fire jacket water heater for low temperature environment.
- Diesel fire jacket water heater suitable for off grid system

## Engine & Alternator





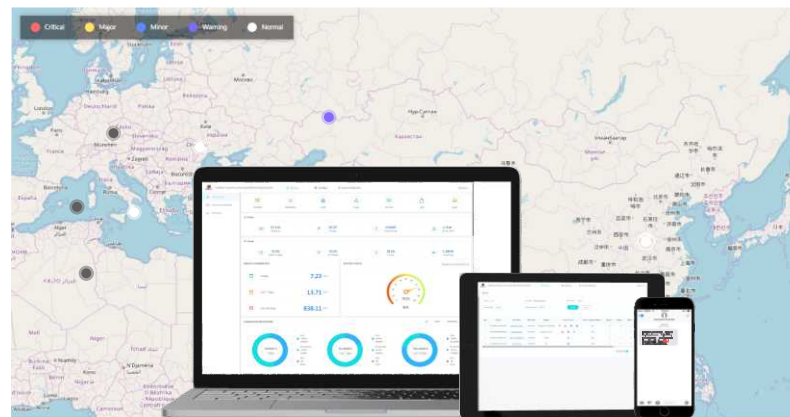
# Smart Control and Monitoring System



3Tech's OwlEye Smart Control and Monitoring System is designed for telecom sites and enables users to manage and monitor status, control equipment as well as analyze data. The web-based system provides a convenient way with user to monitor the equipment, identify alarms and receive alarm notifications by E-mail, SMS, significantly reducing the operation and maintenance costs. Depending on the demands of customers, we can offer both On-Cloud solution and On-Premises solution.

## Benefits including but not limited to:

- 24/7 Monitoring
- Multi-sites Management
- Data Analysis
- Alarm Management
- Device Remote Control Function
- Individual Site Schematic
- Security Management
- Location Tracking



## Multiple Sites Management System

The system makes multi-sites management possible and accessible regardless of how many sites to be monitored. It offers an overview of all sites including site information, user-customized parameters on real time basis and site update status in a single platform, and features to promptly filter the wanted sties by using smart site filtering function.

## Data Analysis

The system shows energy consumption and generation of Today, past 7 days and past 30 days by multiple graphic presentations. The line chart supports sliding X-axis for detailed time frame. Data can be exported to PDF, CSV or Spreadsheet for ease sharing and further analysis.

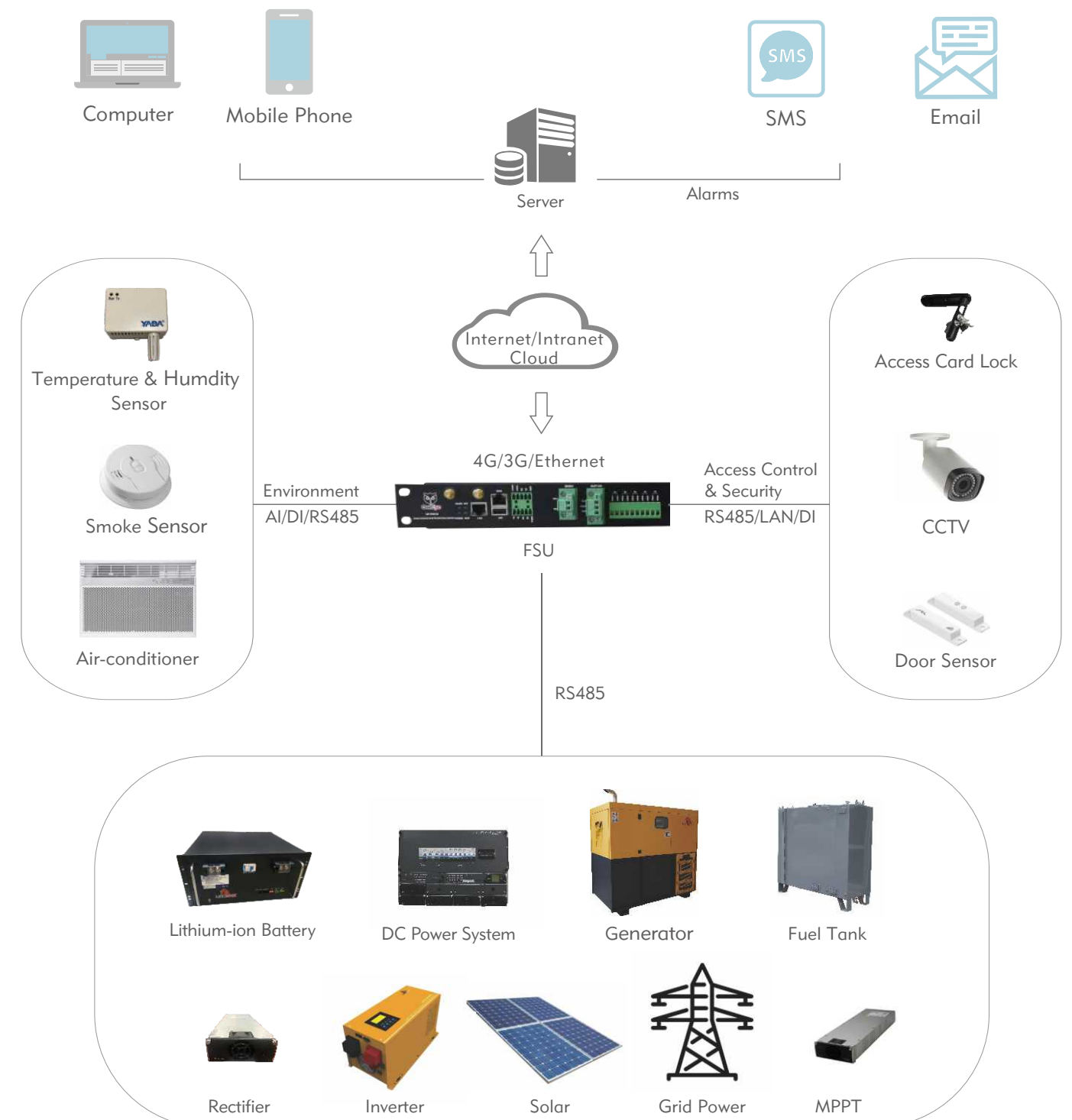
## Alarm Management System

By sending alarm notifications via E-mail and/or SMS, the system alerts users to any problems happening in real time to lower equipment damage. Meanwhile, the flexible system supports user-defined alarm rules and allows users to define alarm severity in the Administration Console.

## Site Schematic

The site schematic displays the major equipment in the site along with their operation status, energy flow directions as well as their important parameters.

## OwlEye Smart Control and Monitoring System



Our OwlEye FSU supports multiple interfaces like RS232, RS485, AI, DI as well as DO.



# Our Projects



## Middle East Country (Energy Cabinet)

- 48V 100Ah lithium battery
- Intelligent battery management system
- DCDC-12, input -48V DC, 160A, 1U high
- Smart card access for securing energy cabinet
- OwlEye Remote Monitoring System

## Chile (Hybrid Solution)

- LR9D LionRock diesel generator set
- 2000L bunded integrated base fuel tank
- 1000Ah battery bank
- Inverter (48VDC 2000W to 220VAC, 50Hz)
- Manual transfer switch for mobile generator
- 1000 hours maintenance free system



## Argentina (Hybrid Solution)

- 1.2kW load outdoor hybrid solution
- LRP22 LionRock diesel generator set
- Acoustic weatherproof enclosure
- 3.9kW poly-crystalline solar panels
- Mounting bracket at high level
- DC power system using 3kW rectifiers
- 48V 100Ah lithium battery

## Oman (Hybrid Solution)

- LRP20DH LionRock DC generator set
- 2200L base fuel tank
- 1000 hours maintenance free system
- OPzV2-780Ah battery bank (dual set)
- DC air conditioning.
- 7.68kW solar panels



## Algeria (Hybrid Solution)

- LRP45 LionRock diesel generator set
- 1500 hours maintenance free system
- PV panel 300Wp with cleaning robot
- Energy cabinet with DC air conditioning
- DC power system TEP600R
- OwlEye Remote Monitoring System
- Total output power reached 42kW

