

#### **3Tech Corporate Limited**

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www.3tech.net

**Telecom Energy Solution** 

Superior power solutions for off grid telecom

Power • People



## About 3Tech

For over 20 years, 3Tech has been providing reliable prime and standby power solution to telecommunication industries worldwide. Our professional team delivered numerous complete solutions from design, installation, commissioning and ongoing maintenance to more than 30 telecom operators, over 20,000 generator sets have been delivered and still currently in operation on site. From 2006 and afterward, we have been awarded "Global Best Partner" prize by ZTE and Huawei respectively, which makes 3Tech establish the position among telecommunication industry.





## Our mission

To be the most credible, world class guality and best value power solution provider in the globe.

## Our vision

To fascinate and attain customers with high-valued power solution products and E&M turnkey solutions and to achieve high customer satisfaction in the globe.

## 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 meter, over 140 employees. Annual output reaches 100MVA.

#### **Tellhow Sci-Tech Corporate Limited**

Located in Xiaolan Economic Development Zone, Nanchang, China, covers an area of over 150,000 square meters, over 400 employees. Annual output reaches 1,500MVA.

#### LionRock Corporate Nigeria Limited

Located in Lagos, Nigeria, covers an area of over 8,000 square meters with over 90 employees. Annual output reaches 50MVA.

# LionRock<sup>®</sup> Telecom Energy

LionRock Telecom Energy Series offers simple, yet efficient and reliable full range of equipment power supply solutions, with output capacity coverage from 30A to 2000A. Telecom Energy products include embedded power supply, photovoltaic system, battery system, AC and DC power distribution system, control management system and data monitoring system.

Mono-crystalline Solar Module





P9-P22

Telecom DC Power System

LionRock Telecom Energy / 6

# LionRock<sup>®</sup> Hybrid Power Solution

#### The benefits of LionRock hybrid power solution

With a hybrid solution from LionRock, operators can now substitute, partially or in full, the diesel generators and make use of renewable energy. Our solutions are fully integrated, all energy sources and equipments are managed by a single controller. The benefits have been realized by numerous operators and LionRock hybrid solutions contribute to saving energy, diesel and money in thousands of installations.





### **Fully integrated**

Up to 80% opex reduction

Reduced CO<sub>2</sub> emissions

every drop.

Modularity

meet higher load requirements.

> 96% efficiency

The combination of optimized gensets and efficient

exploitation of the power generated by solar panels,

will significantly reduce the diesel consumption and

associated transportation cost. Even if you may not be

able to completely replace diesel by renewable energy,

LionRock solution will make sure you get the most out of

There are a lot of off grid telecom installations powered by diesel generators today. These represent an enormous

Many generators serving as the main energy source are operated in an inefficient way. By optimizing the control and using our solution, not only the energy is replaced kWh by kWh, but the emissions per kWh drop significantly.

potential for reduction of environmental footprint.

With the modular design, our systems can be easily adapted to various power input sources and scaled to

Whether input power comes from solar panels, diesel generators or mains, our HE power conversion equipment

will make sure that power loss is minimized.

The fully integrated rectifier system can be applied to various power supply application scenarios. Unified configuration user-friendly learning, reduce over all maintenance costs.





### Telecom DC Power System—DC Power System

TEP 600R/48 System is a compact and intelligent power system containing up to SP48/3000 rectifiers, SC501 controller module, AC connection and DC connection. It supports remote monitoring and management with SNMP. In addition, easy installation and compact size can also be value-added features.



### **General specification**

System	Dimension	312mm(l
	Weight	29 kg
	Installation Mode	In a 19-ir
	Cabling Mode	From the
	Maintenance Mode	From the
lagut	AC Input	200-240/
input	DC1 Input	-40 Vdc t
	Voltage	-42 Vdc t
Output	Capacity	Rectifier /
	Battery Branch	400 A bre
Output Distribution	LLVD Branch	2x80 A N
	BLVD Branch	1x63 A N
Surge Drotection	AC Input	N/A
Surgerrotection	DC Output	20kA (8/2
	Operating Temperature	-40 °C to to +65 ° damage)
Environment	Storage Temperature	-40 °C to
	Operating Relative Humidity	5% to 95
	Altitude	0 to 200

#### **Features**

- 19" sub-rack, easy to be embedded into all standard kinds of telecom equipment, with structured design, strong commonality and easy installation
- Compact structure, higher power density
- Small volume, save installation space and cost
- Sub-rack installed, facilitate customer configuration
- Hot-swappable modules without injury, on-line maintenance, quick and easy
- Wide range of input rectifier module, adapt to the strong adaptability for the grid
- Perfect battery management, improve the battery life, keep the battery good working condition
- With variety of alarms and protective functions (eg. over current, over voltage, over temperature, etc.)
- Management priority: grid > battery > DG

Remark: MPPT: Maximum Power Point Tracking; HFSM: High Frequency Switch Module





#### H)×483mm(W)×400mm(D)

nch rack

e top, right & left

e front

/346-415 Vac, three-phase, 50/60 Hz, Max. 35 A

to -60 Vdc, Max. 200 A

to -58 Vdc (typical: -48 Vdc )

Max. 400 A

reaker

MCB, 2x63 A MCB

MCB, 4x32 A MCB, 1x16 A MCB

/20 μs)

o +65 °C (load needs derating to 80% at +45 °C °C, system can start at -40 °C to -33 °C without

o +70°C

5% (no condensation)

0 m

### Telecom DC Power System—ATS

Transfer switches are traditionally applied between a mains and a generator set for emergency and standby power systems.





#### Features

- Large LCD display
- RS485 communication
- Measure and display voltage and frequency
- Over/under voltage, loss of phase, reverse phase

### **General specification**

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

Operating Temperature	-20°C ~ 65°C
Storage Temperature	-40°C ~ 70°C
Operating Relative Humidity	5% ~ 95%
Altitude	0 ~ 2000m





#### **Telecom Energy Indoor Cabinet**

3Tech has a self-developed telecom indoor cabinet system that can be applied to hybrid grid/diesel/solar cabinets. The power system can be flexibly applied to scenarios like indoor stations and the central computer room. The system can cope with a wide range of AC input, equipped with a full range of lightning protection system, with comprehensive battery management, automatic sleep function and energy-saving modules.





## General specification

	Dimension	2000mm(
	Weight	56kg (with
	Installation Mode	Indoor cei
	Cabling Mode	From the
System	Maintenance Mode	From the
	Cabinet Material	Hull, insid
	Cabinet Color	Black
	Grounding Bar	5 × M5,
	Cable Entry Detail	Cable entry
	Inner Rack & Space	34 U, 19-
Equipment Cabin	Protection Level	IP20 (EN
	Cooling Mode	Natural h
	Power Model	Smart SYS
	AC Input	200-240/3
	DC1 Input	-42 Vdc to
	Voltage (Output)	-42 Vdc to
	Capacity (Output)	Max. 400
Power System	Battery Branch	2 × 200 /
	LLVD Branch	2 × 80 A
	BLVD Branch	4 × 32 A
	AC Input (SPD)	According
	DC Output (SPD)	10/20 kA
	Signal Input & Output	6 DI, 2 AI
	Noise	≤83dB (A
Optional Accessories	Lighting	LED
Optional Accessories	Sensor	Smoke, w
	Operating Temperature	-10 °C to
Environment	Storage Temperature	- 40 °C to
	Operating Relative Humidity	5% to 95%
	Altitude	0 to 4000

#### **Features**

- Small size, easy deployment
- Compact design for installation of equipment
- High rectifier efficiency up to 96.5%
- MPPT modules and HFSM modules are hotswappable to simplify operation
- Intelligent battery management function helps to prolong battery lifespan
- Easy installation & maintenance by front door design



#### $n(H) \times 600 mm(W) \times 600 mm(D)$

ithout DC power system and battery)

ement floor installation

e top

e front

ide frame, & base: steel

#### $, 3 \times M8$

ry from top of cabinet, 50 mm diameter holes, 5 left & 5 right

9-inch rack

60529)

heat radiation

YS400AN

)/346-415 Vac, three-phase, 50/60 Hz, Max 35A

to -58 Vdc, Max. 300 A

to -58Vdc (typical: -48 Vdc)

A 0

) A breaker

A MCB

A MCB,  $2 \times 16$  A MCB,  $2 \times 10$  A MCB

ng to the ACDU or ATS

A (8/20 μs)

AI, 1 SMOKE, 1 TEM\_HUM, 1 WATER, 6 DO etc.

(A), satisfy the GR63 standard

water, door switch, temperature & humidity etc.

o + 45 °C

to + 70 °C

5% (no condensation)

)0 m

#### **Telecom Energy Outdoor Cabinet**

3Tech offer 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.





#### 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

	•		
	Dimension	2200mm(H)×800mm(W)×1200mm(D)	
		Weight	395kg (Excluding battery)
	Sustam	Installation Mode	Ground-mounted
	System	Maintenance Mode	From the front and back
		Cable Routing	From the bottom
	Cabinet Color	Light grey: RAL 7035	
Input Output	AC Input	200-240/346-415VAC, Three phase; 50/6	
		DC Input	-40V ~ -60VDC; max 200A
	Voltage	-48VDC	
Output Distribution Space	Outeut Distribution	LLVD	80A×2, 63A×2
	BLVD	63A×1, 32A×4, 16A×1	
	Space	Spare Space	14U, 19-inch rack
	Battery Space	Max 700Ah	

#### Cooling system

Equ	lipment Cabin	EX 12
Bat	tery Cabin	DC05

#### **Optional accessories**

General specification

Lighting	LED
Sensor	Smoke

#### **Operating conditions**

Operating Temperature	-10°C
Storage Temperature	-40°C
Operating Relative Humidity	5% ~
Altitude	0~20
Protection Level	IP55
Noise	≤65dl



60Hz, 35A max

2HDLC1D 120W/K cooling capacity

HONC1A 500W air conditioner

e, water, door switch, temperature & humidity, etc.

 $\sim 50^{\circ}$ C (Including solar radiation)

~ 70°C

95%

000m

BA@1.5m

### **Telecom Energy Indoor Cabinet**



### **Telecom Energy Outdoor Cabinet**





### Telecom DC Power System—Controller Module



#### **Features**

- The standard 1U\*2U structure can save more space
- RS485 or Ethernet interface for PC connection locally or remote, and the stronger WEB server is recommended
- Front panel LCD and four buttons for on-site using • without PC
- Easily configurable file upload/download via USB or PC
- Easily update software via controller or USB or PC
- GPRS or 3G function is optional •
- Advanced battery management, both Lead-acid battery and Lithium-battery

#### General specification

- Up to 86 digital outputs can be supported
- Up to 46 digital inputs can be supported
- Multiple LVDs control
- Battery mid-point monitoring
- Authority management and operator access levels protection
- Event log (up to 90000 records, totally)
- Alarm log (up to 10000 records)
- More user-selectable languages
- Programmable Logic Control (PLC) function, more flexible requirments can be supported
- susceptibility give module better reliability

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

### Telecom DC Power System—Rectifier Modules



### **Features**

- High efficiency and highest power density
- Digitalized control
- High reliability design
- Disconnect mains when hazardous input
- Excellent EMC performance

#### General specification

	AC Supply	Nominal: 22
	Frequency	45-300Hz
	Power Factor	>0.99
Inputs	Input current	≤15Arms a
	THD	<5% at 100
	Input protection	Varistors for
	Output power	3000W at n
	Output Current	56.6A±0.5
	Voltage Regulation	±0.6% from
	Efficiency	Typical 95%
DC Outputs	Current sharing	≤±5% unb
	Holdup time	>10ms, (56.
	Efficiency	Typical: 95%
	Output protection	Overvoltage protection; (
	Ripple and Noise	<200mV peo



- Lower interference and excellent susceptibility give • module better reliability
- Global approvals

20/230Vac 1 ph; Tolerances: 85-300Vac 1ph

at nominal input;  $\leq$  18Arms at 187Vdc input

0% load; <10% at 50% load

r transient protection (5KA 8/20uS Surge protection)

nominal input

A@normal input

n 5% to 50% load or from 50% to 100% load

%, max 96%

balance of average current of all paralleled modules

.07A constant current when output voltage from 53.5V to 43.2V %, max: 96%

shutdown; Short circuit proof; High temperature Output fuse

ak to peak, 20MHZ bandwidth <2mV rms psophometric

### Telecom DC Power System—VRLA Battery



#### Features

- Extra long life design, design life is 20 years
- Superior PSoC and deep cycling performance
- Excellent quick charge performance, reduce charging time by 30%

#### **Technical Parameters**

Nominal voltage: V	2
Capacity: Ah	650 (10hr, 1.80V/ cell, 25°C)
Weight: kg	41.5
Dimensions: L*W*H (mm)	212*207*358
Total height (mm)	372
Internal resistance (full charged): m $\Omega$	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 limited: 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 affected by temperature:	105% @ 40°C / 85% @ 0°C / 60% @ -20°C
Design life@25°C:	20 years

• High potential fuel savings when used with hybrid

genset applications

## Telecom DC Power System—LiFe Battery



#### Features

- More cabinet for value generating equipment
- Less weight for pole mounted sites
- No active cooling system required
- Simplified power system (no BFU required)

#### **Technical Parameters**

Nominal voltage: V	48
Capacity [C/5]: Ah	50
Energy [C/5]: Wh	2560
Dimensions: L*W*H (mm)	475*482
Weight: kg	38±1
Voltage window: V	40~57
Charge voltage: V	56.5
Standard charge current: A	1.0I <sub>10</sub>
Max. Output power: W	4500
Recharge time: h	0.1C*6hi
Lifetime @ +25℃	> 12 yea
Cycle life	> 4000 t
Operating temperature	-20°C~6
Transport standard	UN38.3
Storage temperature and duration	-40°C~7
EMC standard compliance	EN55022
Safety standard compliance	TLC, CE,



- High operational reliability
- Lifetime more than 10 years
- Optimal management

2.6\*130

r (standard)

ars

times

60°C

70°C, 12 months at normal temperature

22/EN61000

, UL1642, CQC, QC/T743, YDT2344.1, UN38.3, GR1089

# Mono-crystalline Solar Module



For a period of twenty-five (25) years commencing on the Warranty Start Date, loss of power output of the nominal power output measured at Standard Test Conditions (STC) for the Product(s) shall not exceed:

- For Polycrystalline Products: 2.5% in the first year, thereafter 0.7% per year, ending with 80.7% in the 25th year after the Warranty Start Date
- For Monocrystalline Products: 3 % in the first year, thereafter 0.7% per year, ending with 80.2% in the 25th year after the Warranty Start Date

#### Features

- Several decades of experience in manufacturing, the complete PV chain including silicon materials, ingot, wafer, solar glass, solar cell and module. 3Tech are ISO90001 & ISO14001 certified factory, ensure excellent raw materials and production with high customer satisfaction
- Modules certified by TUV Rheinland (IEC61215, IEC 61730 standards) under the extreme conditions (temperature, load, impact) with good performance. Pass strict tests of solar modules including Salt-mist Corrosion Test, Fire Test, Ammonia Resistance Test, PID Test, Sand Abrasion Test and Carbon Footprint Assessment in TUV
- The good weak light performance (morning, evening and cloudy day) has been tested and approved by professional third-party
- Guaranteeing from 0 to +6W as power tolerance, customers 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



### **Typical Electrical Characteristics**

Solar cells	Mono
Max-power	300
Power Tolerance	0 to +
Voltage at Pmax (Vmp)	32.6
Current at Pmax (Imp)	9.20
Open-Circuit Voltage (Voc)	39.4
Short-Circuit Current (Isc)	10.01
Max-System Voltage (VDC)	1000
Cell Efficiency	20.7
Module Efficiency	18.4
No.of Bypass Diodes (pcs.)	3
Max.Series Fuse (A)	15A
Temperature Coefficient of Pmax	-0.43%
Temperature Coefficient of Voc	-0.32%
Temperature Coefficient of Isc	0.04%
Nominal Operating Cell Temperature	45±2

\*STC Conditions (1000W/m², 1.5AM and 25  $^\circ\!\!C$  Cell temperature)





-Crystalline 156.75\*156.75mm 60pcs (6\*10)-5 busbars

-6w

(IEC), 600V (UL)

%/°C

%∕°C

2℃

# **DC Generator Sets**



#### Applications

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

#### Features

- Available in all voltages from 12 to 266 Vdc
- Currently available from 4.5kW to 26 kW
- Microprocessor Controlled
- Variable Speed Design
- Rare Earth, Permanent Magnet Generator
- Direct Connection to Battery Bus (No Transfer Switch)
- Temperature compensated battery charging
- Automatic three step charging circuit consisting of bulk rate, overcharge (equalize) rate, and float rate
- Alternator exceeds 92% efficiency
- 1,000 hours Maintenance-free
- Low Fuel Consumption: Fuel saving range from 40%-60%
- Expansion Capacity: DC generators can be connected in parallel

Model			LRP6D	LRP9D	LRP13.5D	LRP17.6D	LRP20D	LRP27D
Output Ratings	Voltage	Vdc	42-58	42-58	42-58	42-58	42-58	42-58
	Prime	kW	5	8	12	16	18	24
	Standby	kW	6	9	13.5	17.6	20	27
Engine Manufacturer			Perkins	Perkins	Perkins	Perkins	Perkins	Perkins
Engine Model			402D-05	403D-07	403D-11	403D-15	404D-22G	404D-22
Engine Speed		rpm	1200~3000	1200~2800	1200~3000	1200-2800	1800	1650-3000
Bore		mm	67	67	77	84	84	84
Stroke		mm	72	72	81	90	100	100
Cylinders			2L	3L	3L	3L	4L	4L
Dimensions, L*W*H		mm	1480*800*1400	1600*800*1400	1600*800*1400	1600*800*1400	1600*800*1400	1600*800*1400
Weight		kg	361	381	415	575	853	893





- Maintenance Cost: Extend service period up to 1,000 hours, maintenance cost saving 50%-70%
- Compatibility: DC gensets do not impose by load of switch mode like AC gensets
- Low EMI emissions: DC gensets will have no alternator parts to wear
- Low Noise Level: Noise is further reduced by eliminating the brushes, slip rings and the alternator fan
- Intelligent management of battery charging: Automatic three-step charging circuit consists of bulk rate, overcharge, and float. Battery life is extended
- Automatic Temperature Compensation:
  A temperature sensor is placed on the battery
- Comprehensive system protection

## **OwlEye Remote Monitoring and Control Solution**

OwlEye is a remote monitoring and control solution for telecom tower sites. It enables users to monitor status of the equipment, manage and analyze data and receive

alarm notifications at the off-site workstations or via smart phones, greatly reducing expensive and time consuming travel to remote sites.



#### **Multi-site Dashboard**

The locational information on the base station can be displayed on google Map. Base stations can be sorted by generation or operation status. More information like base station category, latitude, longitude, equipment status and maintenance personnel are also displayed. It brings you intuitive overview of multiple base stations via GIS.

#### **SMS & Email Notifications**

Administrators and maintenance engineers can monitor base stations and get notified for alarms in real time by APP, SMS or encrypted E-mails. The system delivers an easy to monitor you an easy way to monitor the sites, get notifications and record maintenance work on the move.

#### **Data Visualization & Analysis**

The system provides various types of graphic presentation for data visualization. Events are classified and indexed in accordance with time or devices. Data can be imported from and exported to PDF, CSV or Excel formats. It brings you data support for delicacy management.

#### Real Time Monitoring

It features comprehensive equipment monitoring. Topology of equipment and network is displayed with real time data. A wide variety of equipment is supported in the system, including generators, security systems, air conditioning systems, PV panels and DC power supply, etc. The system brings you comprehensive equipment monitoring.



**OwlEye Remote Monitoring and Control Solution** 

OwlEye Remote Monitoring and Control Solution / 28