



Hãy nói theo cách của bạn

**M1 COMMUNICATION LIMITED LIABILITY**

# COMPANY PROFILE



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# INTRODUCTION



M1 COMMUNICATION'S HEADQUARTER OFFICE



Granted the 1st title of "Hero of People's Armed Forces" in 1985



Granted the 2nd title of "Hero of People's Armed Forces" in 2015



The Certificate ISO 9001:2015



The Certificate ISO 14001:2015

## HISTORY TIMELINE

M1 company exceeded the threshold of 2.000 billion dong (~ 93 million USD)

2016

M1 company firstly exceeded the threshold of 1.000 billion dong (~ 48 million USD)

2014

M1 was merged into Viettel Group

2009

M1 was renamed to "M1 Communication Factory"

1965

M1 was awarded the 2nd title of "Hero of the People's Armed Forces" in 2015

2015

Official name is M1 One-Member Limited Liability Company

2010

M1 was awarded the title of "Hero of People's Armed Forces"

1985

Ho Chi Minh president signed the decree to establish the enterprise of Radio The Voice of Vietnam

1945



# VISION , MISSION, CORE VALUE

## VISION

To be one of the leading telecommunication electronics manufacturers in Vietnam and positioned as a Vietnamese prestigious brand name over the world.

## MISSION

"Product Quality is the key element of our company"

## CORE VALUE

"THE LEADING BRAND-THE TOP QUALITY-THE BEST CHOICE"

Having over 70-year experience in the field of manufacturing military and non-military products, M1 continuously expands infrastructure, improves human resource qualification, and upgrades existing equipments to develop market share domestically and internationally.

## PRODUCTS AND SERVICES



Manufacturing  
Military Equipment



Manufacturing  
Telecommunication  
and Electronic  
equipments that  
serves for domestic  
and foreign markets



Researching and  
designing terminal  
equipment such as  
Mobile phone,  
smart phone



Manufacturing  
Power Equipment  
(DC, AC, Solar  
Charger)



Providing ODM, JDM,  
EMS, OEM services for  
other companies



Providing  
Technique Repair  
Services for  
Telecommunica-  
tion Equipment at  
Domestic and  
Foreign countries



Leasing measuring  
instruments about  
Information  
Technology and  
Telecommunication

## OPERATIONAL CAPACITY



05 Total area **15.000** M<sup>2</sup>



04 SMT LINES



**4.000.000** PCBA SMT/year



HUMAN  
RESOURCE

**>850** PEOPLE



TOTAL AREA  
WHOLE COMPANY

**60.000** M<sup>2</sup>



**160.000** components/h



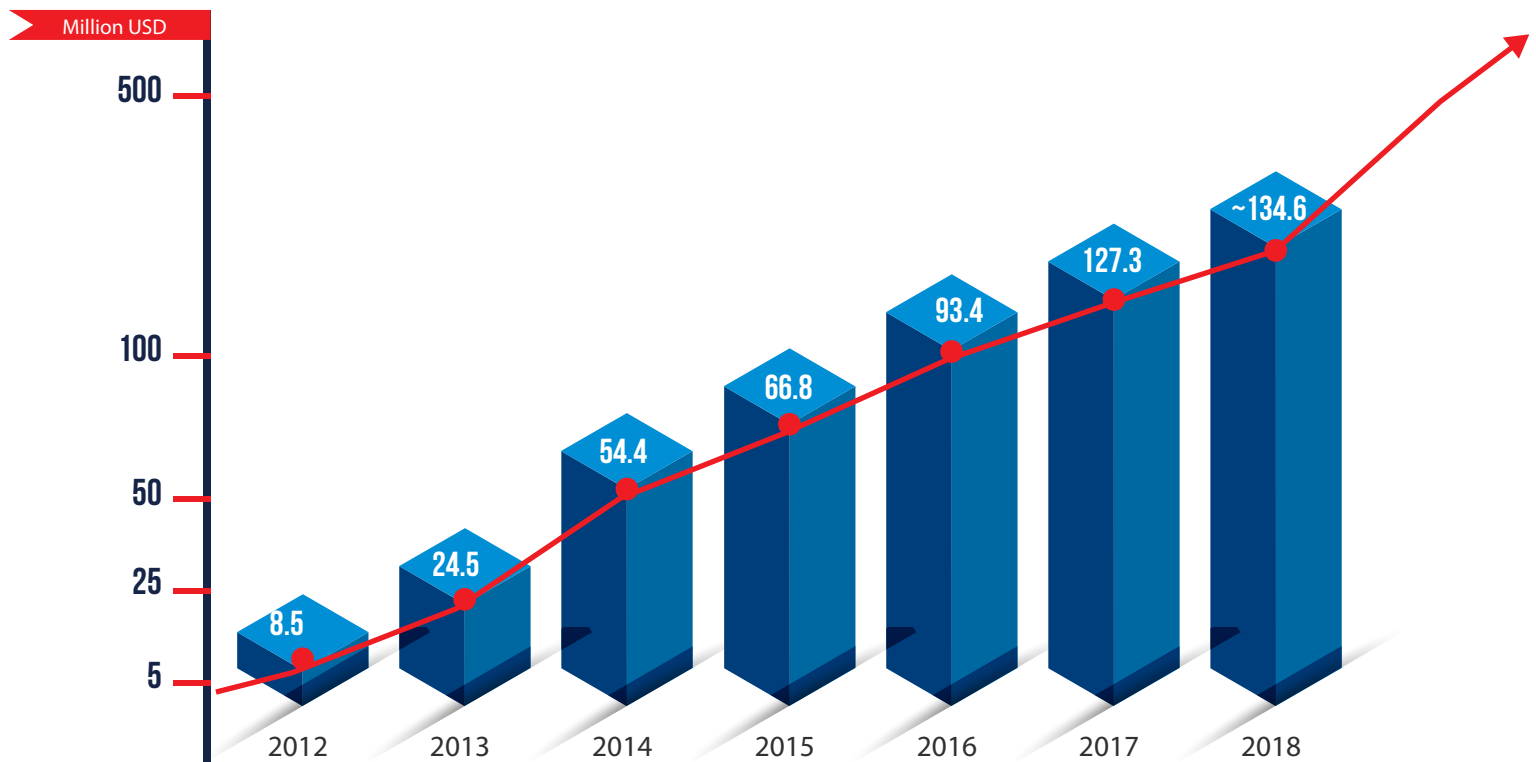
**4.000.000** mobile phones/year

R&D Engineer

**93** PEOPLE



## REVERNUE - MARKET SHARE



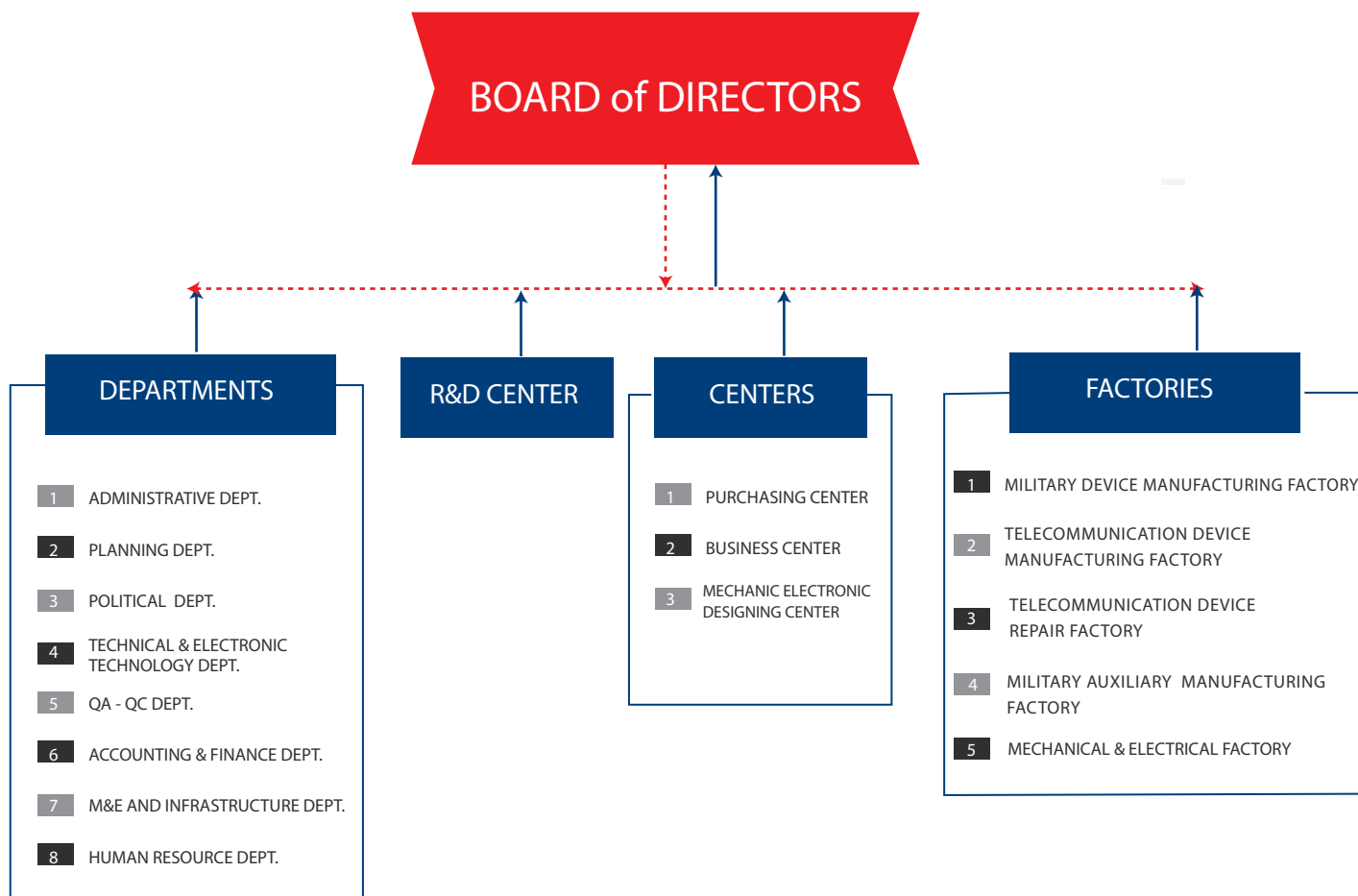
M1'S REVENUE GROWTH CHART

### MARKET SHARE

M1's products were sold at 10+ countries including Viettel's markets and foreign markets: Tanzania, Mozambique, Laos, Myanmar, Haiti, Cambodia, Timor-Leste, Cameroon, Peru, Burundi, etc.









# ON/OFF-GRID PSB POWER SYSTEM

## 1 ADVANTAGES OF ON-GRID/OFF-GRID PSB POWER SYSTEM

1

Design modules, pre-assembled cabinet and minimize ground space required for its compact casing, multiple input/output energy.

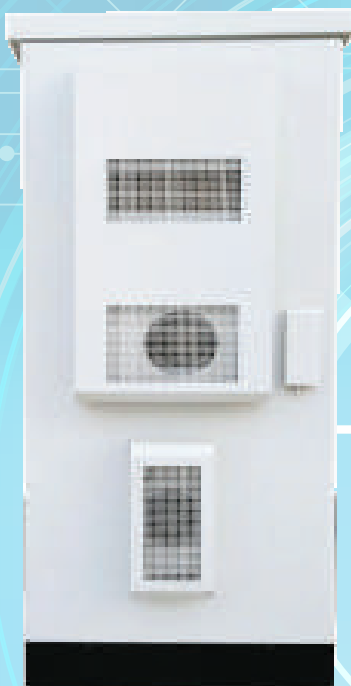
2

Save money for construction and installation.

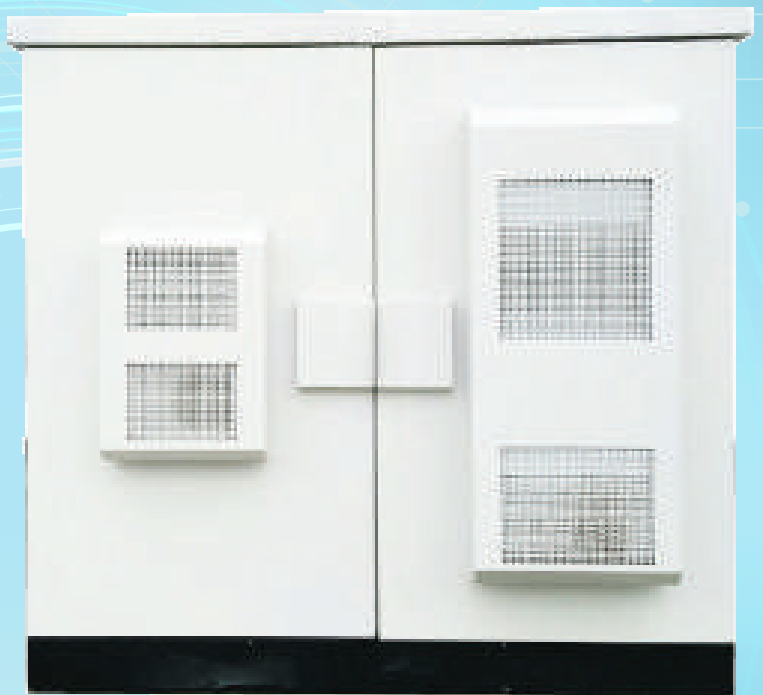
3

Integrate Hybrid power, Solar, Generator, ATS, Energy and Environmental monitoring into Management System.

**ON-GRID PSB  
POWER SYSTEM**



**OFF-GRID PSB  
POWER SYSTEM**



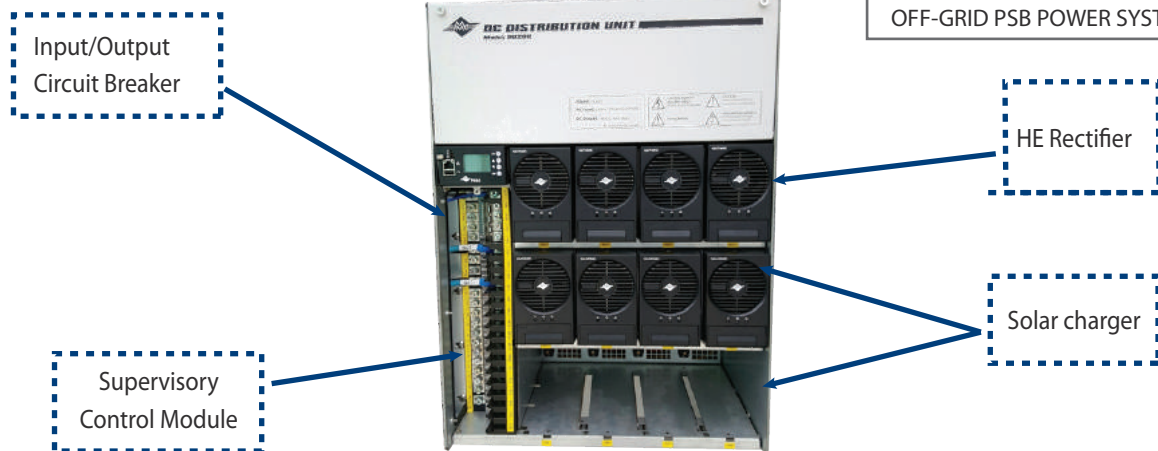
## 2 OFF-GRID PSB POWER SYSTEM

### TECHNICAL FEATURES

- Be used for stations that have no electricity.
- Apply Advanced Switch Technology with high efficiency and density of capacity to Rectifier.
- Be protected by software and hardware.
- Manage batteries to each cell and manage 3.000 warning specification records.
- Provide communication ports that allow to connect network flexibly and monitor remotely.



OFF-GRID PSB POWER SYSTEM



### SPECIFICATIONS

#### Rectifier PW48-3100HE

02 modules (expandable to 4 modules)

- ▶ Input Voltage range: 80-295VAC; frequency 45 to 65 Hz
- ▶ DC Output Voltage Range: -42 to -58VDC (Adjustable)
- ▶ Rated output Power: 3100W @  $U_{dc} \geq 48VDC$
- ▶ Max output current: 70 A
- ▶ Peak Efficiency:  $\approx 96.5\%$

#### Solar charger

03 modules (expandable to 8 modules)

- ▶ Input Voltage range: 58-150VDC
- ▶ DC Output Voltage Range: -42 to -58VDC (Adjustable)
- ▶ Rated Output Power: 3000W @  $U_{dc} \geq 48VDC$
- ▶ Max output current: 65A
- ▶ Peak Efficiency: 97,80%
- ▶ Technology: Switching technology intergrated Maximum Power Point Tracking Algorithm (MPPT).

#### Battery

- ▶ Lithium Polime Battery: 06 packs 48V-75Ah included

#### Monitor and Control Unit

- ▶ Monitor and Control-PS02: LCD Graphic 128x64, Able to set parameters by 04 buttons on module, or by computer at site or from remote Server
- ▶ Digital Input/Digital Output: 16 DI/16 DO
- ▶ Control Genset: Based on DC Low and Block time.
- ▶ Communication: LAN, RS485, Modbus RTU, RS485 for fuel sensor.

#### Structure of Cabinet

- ▶ Dimension (HxWxD): 1850mm x 1950mm x 730mm
- ▶ Space for battery:  $\geq WxDxH$  (920x630x1560 mm)
- ▶ 19" Rack Standard. Able to set 06 strings 48V-75Ah Li-Ion Battery
- ▶ Installation mode: 19" rack parts connect with floor, roof by bolts

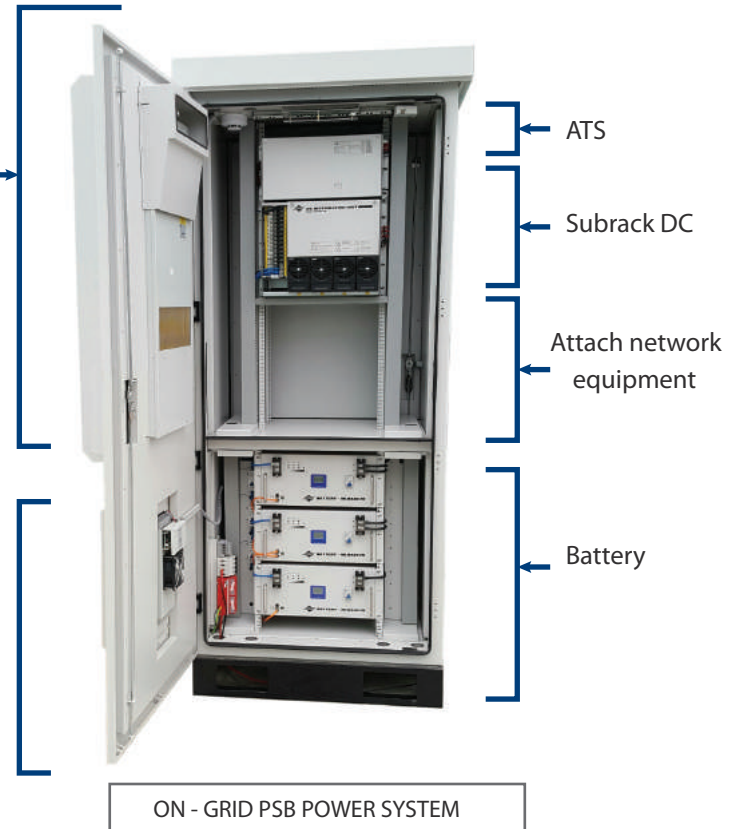
### 3 ON-GRID PSB POWER SYSTEM

#### TECHNICAL FEATURES

- Be used for stations that have electricity.
- Apply Advanced Switch Technology with high efficiency and density of capacity to Rectifier.
- Be protected by software and hardware.
- Manage batteries to each cell and manage 3.000 warning specification records.
- Provide communication ports that allow to connect network flexibly and monitor remotely.

HEX

Air Conditioner



#### Rectifier RECT48HE

02 modules ( expandable to 4 modules)

- ▶ Input Voltage range: 80-295VAC; frequency 45 to 65 Hz
- ▶ DC Output Voltage Range: -42 to -58VDC (Adjustable)
- ▶ Rated output Power: 3100W @  $U_{dc} \geq 48VDC$
- ▶ Max output current: 70 A
- ▶ Peak Efficiency:  $\approx 96.5\%$

#### Battery

- ▶ Lithium Polime Battery: 02 packs 48V-75Ah included

#### Monitor and Control Unit

- ▶ Monitor and Control modulePS02: LCD Graphic 128x64, Able to set parameters by 04 buttons on module, or by computer at site or from remote Server.
- ▶ Digital Input/Digital Output: 16 DI/ 16 DO
- ▶ Control Genset: Based on DC Low and Block time.
- ▶ Communication: LAN, RS485, Modbus RTU, RS485 for fuel sensor.

#### Structure of Cabinet

- ▶ Dimension (HxWxD): 2360mm x 950mm x 730mm
- ▶ Space for battery:  $\geq W \times D \times H$  (920x630x1560 mm) 19" Rack Standard
- ▶ Installation mode: 19" rack parts connect with floor, roof by bolts



# MODULES ARE USED IN SYSTEM

## 1 MINISHELTER

### FEATURES

- ▶ Cabinets are designed in accordance with outdoor standards with 19 inch rack for internal devices.
- ▶ Input voltage: 80VAC - 295VAC, 45 ÷ 65 Hz; 3phase /1phase.
- ▶ There are 2 AC inputs for grid power and stand-by generator.
- ▶ Controller automatically monitors the generator by the battery voltage or the alternative time.
- ▶ Nominal output voltage: -48VDC; Maximum current: 200A.
- ▶ It allows to plug 06 RECT48HE Rectifiers.
- ▶ Saving energy to improve the system efficiency.
- ▶ Display warning: LCD, LED, Siren.
- ▶ The system is monitored on site or remotely via RS485, USB
- ▶ Supports NOC warning via dry contact. Input / Output: 16DI / 16DO.
- ▶ DC distribution system: CBs for priority and non-priority loads.
- ▶ There are lightning protection devices in both AC and DC lines.
- ▶ Space of telecommunication equipment  $\geq 20U$ .
- ▶ Cabinet Size (HxWxD): 2.008 x 804 x 817 mm.



## 2 DAQ-V2 SYSTEM

### GENERAL

DAQ-V2 is an intermediate device that gathers data from DC cabinet and connects to a concentrated-management server (NMS), it supports functions such as monitor, transfer alarms and setup parameters remotely via SNMP protocol. So far DAQ-V2 can connect to three types of DC cabinet, they are: Emerson cabinet, ZTE cabinet, and Agissson.

### FEATURES

- ▶ Network Protocols: ICMP, IPv4, TCP, UDP, SNMP, HTTP.
- ▶ Support standard RS232, RS485 to connect to serial devices directly
- ▶ Support flexibly the third party.
- ▶ Monitor by Website base and control parameters
- ▶ Monitor information of parameters such as DC, AC, Rectifier and Batteries.
- ▶ Configure remotely LVD Voltage and high temperature warning level.
- ▶ Trap critical alarms by many servers including Rectifier Failure Alarm, AC Failure Alarm, High Temperature Alarm, etc.
- ▶ Gather data and monitor Emerson DC cabinet (M500D), Agissson DC cabinet (CPMU01) and ZTE DC cabinet (CSU) via RS232 or RJ45 port.

### SPECIFICATIONS

- ▶ Dimension: 110mm x 92mm x 32mm
- ▶ Power range: 40 – 60 VDC
- ▶ Operating Temperature: 0 -70°C



DATA ACQUISITION FOR POWER SUPPLY SYSTEM DAQ-V2

### 3 PW48-2900 SYSTEM

#### GENERAL

PW48-2900 is Rectifier Power Supply to convert AC voltage to -48V DC, adjustable output. It designs base to DSP Technology for calculation and control.

#### SPECIFICATIONS

- ▶ AC input
  - ▷ Nominal Voltage: 200-250VAC
  - ▷ Full input voltage range: 90-290VAC, Frequency: 50-60Hz
- ▶ DC output
  - ▷ Output voltage: -42V ÷ -58VDC
  - ▷ Output power: 2900W at output voltage >48VDC
  - ▷ Maximum output current: 62A at -48VDC; Peak efficiency: 92%
  - ▷ Ripple and Noise: < 200mV
- ▶ Enviroment
  - ▷ Operating temperature: -10°C ÷ 70°C
  - ▷ Humidity: 0% ÷ 95%RH non-condensing
- ▶ Applicable Standards
  - ▷ EMC: EN55022, EN 61000-4-2, EN 61000-4-3, EN 61000-4-6.
  - ▷ Electrical Safety: QCVN 22:2010/ BTTTT

#### FEATURES

- ▶ Stability operating.
- ▶ Easy hot-swap replacing.
- ▶ Allowing increasing total power by parralel operating and sharing.
- ▶ High consersion efficiency: 92%
- ▶ High power density.
- ▶ A wide temperature range and wide input voltage range.



PW48-2900

### 4 DU200FO POWER SYSTEM

#### GENERAL

- ▶ The monitor module of Power Cabinet manages charging for battery; Controls Rectifier and Solar Converter to supply power for system; Monitors all measurement parameters (voltage, current, battery capacity, temperature, etc.); Warn directly and transmits data to server via Ethernet.
- ▶ DU200FO allows connecting peripherals to collect information such as monitoring Lead Acid battery's voltage, generator, cooling devices, and other equipment supported by RS485.

#### SPECIFICATIONS

- ▶ DC Outputs: Protected by CB, IEC 60898/IEC 60947 – 2
- ▶ Contactor for LVD: Quantity: 2  
Rated current : ≥200A, normal close
- ▶ CB for non-priority load: ≥ 6xCB63A, Icu ≥ 4.5kA
- ▶ CB for priority load: ≥ 3xCB40, 4xCB16A, Icu ≥ 6kA
- ▶ Terminal block for battery: ≥4 support for 35mm2 wire
- ▶ Surge protection device for DC output: Using MOV technology or equivalent  
In ≥ 20kA (08/20μs),  
Comply IEC61643 – class II or equivalent
- ▶ Bus bar requirement: Comply IEC60439-1 or equivalent.

#### SPECIFICATIONS OF SYSTEM

- ▶ Rated voltage: -48VDC
- ▶ Rated current: 200A
- ▶ Operating temperature range: 0° ÷ 50°C
- ▶ Operating Humidity range: 5% ÷ 95%, non-condensing



DU200FO POWER SYSTEM

## 5 PS02 MONITORING MODULE

### GENERAL

PS02 works as a supervising module in IPS which monitors system status, controls system parameters and gives alarm signals.

### FEATURES

- ▶ When connecting with Solar Charger and Rectifier, PS02 supports to monitor operating status of the system, battery charging modes, solar cell power, consumption energy, input and output parameters, etc.
- ▶ Display monitoring information includes Battery Temperature and Battery Ambient Temperature, Power Cabinet, Operating Status of Generator and ATS, Alarm for System Status.
- ▶ Users can configure and reconfigure working parameters of DC system.
- ▶ PS02 supports Ethernet connection with SNMP protocol.

### SPECIFICATIONS

- ▶ Range of input voltage:  $-40V \div -58V$
- ▶ Operating temperature :  $-10 - 65^{\circ}C$
- ▶ Operating humidity:  $5 \div 95\%$
- ▶ Display: Graphic LCD 128 x 64 (4 row x 16 column)
- ▶ Parameters setting methods: Direct configuring on device with buttons, and on site with computer connection via Ethernet port, accessing and controlling DC system remotely.



Monitoring module PS02

## 6 3000mAh SOLAR CHARGER

### GENERAL

Solar Chargers convert solar energy from solar cells to supply electricity to telecom devices or charge batteries on site.

### DC Input Voltage

- ▶ Nominal Input Voltage: 110 VDC
- ▶ Input Voltage Range: 58-150 VDC
- ▶ Maximum Input Current: 35 A

### DC Output Voltage

- ▶ Nominal Output Voltage: -48 VDC
- ▶ Output Voltage Range:  $-42 \div -58$  VDC
- ▶ Nominal Power: 3000W (with output voltage  $\geq -48$ VDC)
- ▶ Output Voltage Error (50% nominal power)
- ▶ Performance efficiency (loading at least 30% of nominal power):  $\geq 97\%$
- ▶ Maximum Output current: -48 VDC - 70A
- ▶ Reverse Polarity protection when connecting with solar panel and batteries.

### SPECIFICATIONS

- ▶ Temperature range (without power derating:  $-5 \div 45^{\circ}C$ )
- ▶ Operating temperature:  $-10 \div 70^{\circ}C$
- ▶ Operating humidity:  $5 \div 95\%$ , non-condensing
- ▶ Safety standards: EN/IEC 60950
- ▶ Dimension (LxWxH): 293.5 x 84.5 x 133.5mm
- ▶ Weight: 3kg, MTBF: 250.000h



3000mAh SOLAR CHARGER



## 8 ATS SYSTEM

### GENERAL

ATS (Automatic Transfer Switch) automatically switches the load of telecom base station between two sources: power grid and stand-by generator.

### FEATURES

The auto switch is triggered when a DC LOW signal is generated by DC power cabinet; or controlled when two generators work in alternating mode.

### SPECIFICATIONS

► Type	Single/3 phase ATS
► ID	Wall-mounted box or rack-mounted box (19"/23")
► Display	Graphic LCD 128×64; Three LEDS for status indication
► Operating Mode	Auto/Off/Man
► Nominal Voltage/Frequency	220VAC – 50Hz
► Range of operating voltage	90VAC – 250VAC
► Nominal Current	60/40A(1 phase) ; 70A (3 phase)
► Device power supply	48VDC for ATS; 12VDC for starting supporter
► Reverse polarity protection	Yes
► Operating Temperature	0°C- 50°C
► Operating Humidity	0% ÷ 95%, non-condensing
► Length x Width x Height	437mm x 162mm x 237mm



AUTOMATIC TRANSFER SWITCH ATS

## 8 RECT48HE RECTIFIER

### GENERAL

RECT48HE is rectifier power supply which is designed to convert AC voltage to -48VDC, adjustable output. RECT48HE design is based on DSP Technology Foundation for calculating and control.

### FEATURES

- Stable operation.
- Easy to hot-swap replace.
- Allowing to increase capacity by operating parallel many modules.
- High capacity density: 96%
- Good working at wide temperature range and input voltage range.

### SPECIFICATIONS

- AC Input
  - ▷ Nominal Voltage 200-250 VAC; Full input voltage range: 85-290VAC
  - ▷ Frequency: 50-60Hz.
  - ▷ Power factor: 0.99 at 50% load or more
  - ▷ THD <5% at 50% load or more
- DC Output
  - ▷ Output voltage: -42V to -58 VDC
  - ▷ Output power 3000W at output voltage ≤ -48VDC
  - ▷ Maximum output current: 62.5A at -48VDC



## 9 MG08D POWERED GENERATOR

### FEATURES

- Configuration: KUBOTA - D1703
- Fuel: Diesel
- RPM: 1500 rpm
- 220 VAC/50Hz
- Prime: 8KW/ 8.8 KVA
- ATS: Yes
- Displacement: 7L
- Dimension (LxWxH): 1700x750x1087 mm
- Weight: 500 kg



## 10 CHARGED-DISCHARGED BATTERY

### GENERAL

Charge-Discharge Battery Equipment - BCD-4012  
Model evaluates and maintains the battery, which is based on a combination of charge and discharge modes.

### FEATURES

- Supports to minimize the amount of gas released into environment, not to be periodically maintained by alternative solution.
- Compact size and high capacity.

### SPECIFICATIONS

Specifications:	Requirement
Capacity:	450W
Input AC voltage:	220VAC/50Hz
Working voltage range:	100VAC-240VAC
Charging current:	30A
Discharging current:	40A
Protection:	Reverse protection; overheating the system.
Environmental temperature:	0 ÷ 50°C
Environmental humidity:	5 ÷ 95%



## GENERAL

Station monitoring system is the system that monitors, controls generator, battery, air conditioning at BTS to continuously monitor and operate effectively the equipment in the BTS.

#### AC power monitoring unit

- ▶ Monitoring the status of AC power supply: Yes / No.
- ▶ Monitoring operating parameters: voltage, current, capacity, power consumption.
- ▶ Warning abnormal status of the source: Over high voltage, low voltage.
- ▶ Monitoring ATS activity status (Communication supported ATS): auto / manual / off.

#### Generator control monitoring unit

- ▶ Monitoring the status of the switch and operating parameters of the generator: operating capacity, of cooling water, battery voltage.
- ▶ Warning when there is a problem or abnormal status
- ▶ Controlling generator in case of power-off or having power grid by program from centralized monitoring server.

#### Supervision unit for air conditioning and ventilation

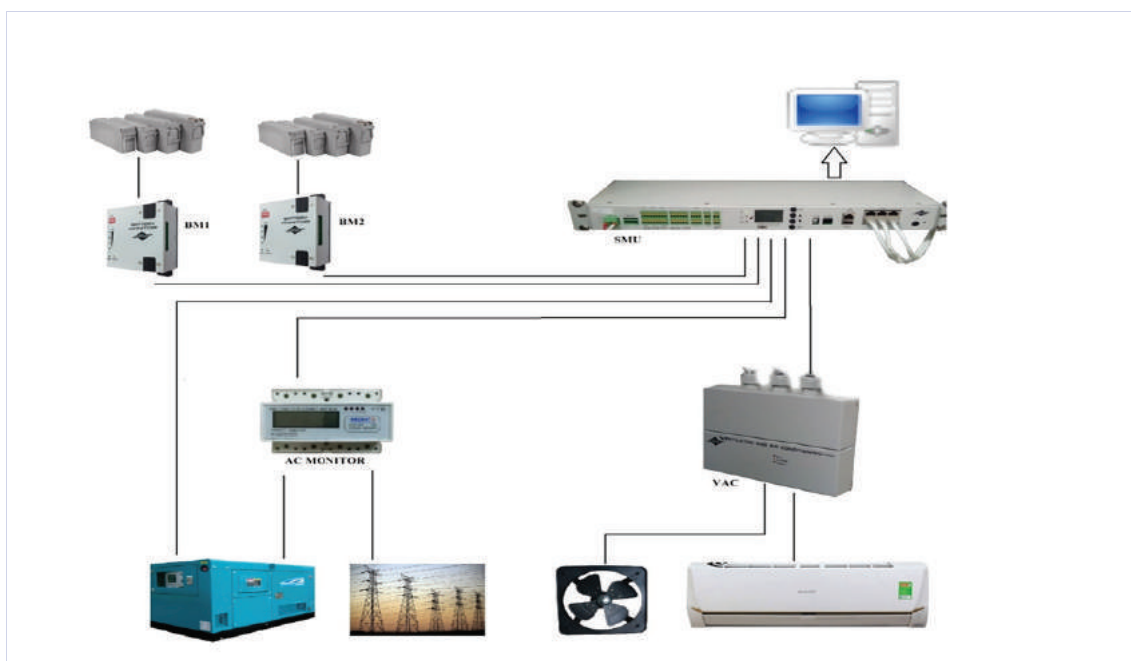
- ▶ Monitoring switching status of air conditioners and cooling fans.
- ▶ Warning abnormal conditions of the cooling system.
- ▶ Controlling the cooling system according to the program sent from the centralized monitoring server.

#### Battery monitoring unit

- ▶ Monitoring battery's operating parameters
- ▶ Controlling battery to charge cycle to prolong battery life warning when voltage is out of balance or battery temperature is high.

#### SMU Central Monitoring Unit

- ▶ Collecting of data from AC power monitoring unit, generator control monitor, supervision unit for air conditioning and ventilation, AC monitoring blocks, DC power cabinets with supporting Modbus .
- ▶ Connecting the monitoring units with central management server via SNMP, support for monitoring, alerts and remote settings as well as on the device.





## 12 (GPON) - ONT

### GENERAL

ONT (Optical Network Terminal) is a terminal device in Gigabit Passive Optical Network (GPON) which converts optical signal into electronic signal to transmit data from OLT device.

### SPECIFICATION

- ▶ Standard: GPON ITU-T G.984, Uplink speed 2.488Gbps, downlink speed 1.244 Gbps
- ▶ Connect Wi-Fi: Frequency 2.4 GHz  
Standard IEEE 802.11 b/g/n  
Encryption: WEP/WPA/WPA2, WPA-PSK/ WPA2-PSK
- ▶ Connect Internet: PPPoE/DHCP Client/Static IP mode
- ▶ Firewall: MAC filter, IP filter, URL filter



## OTHER EQUIPMENTS

### VTRACKING



### CAMERA



### MKIDS



### EXA-FEATURE PHONE



## TECHNICAL SERVICES

With the modern repairing line, our engineers can repair telecommunication equipments: Ericsson, Huawei, ZTE, Nokia, etc. Our annual repairing capacity is about 50.000 cards with successful rate is over 95% .

### ALL KINDS OF TELECOMMUNICATION EQUIPMENTS WE REPAIRED AS:

All kinds of receiver and transmitter, controller 2G, 3G and 4G from Ericsson, Huawei, ZTE, Nokia, etc.

Conference, television equipment, OTDA, optical splicing machine.

Microwave, Optical converter, PSTN, Router equipment, PDH, SDH, Metro, etc.

Power equipment of Emerson, Eltek, etc.



### Testing and Repairing Area

## CUSTOMER



## SUPPLIER







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