Serie UE-T 48V/51.2V Li-ion Battery
User´s Manual

End User Documentation
Rev3.0

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WARNING: Explosion, Electrocution, Or Fire Hazard

A battery can present a risk of electric shock, burns from high short circuit current, fire, or explosion.

Observe proper precautions.

Ensure the cables are properly sized.

Ensure clearance requirements are strictly enforced   around the batteries.

Ensure the area around the batteries is well ventilated and clean of debris.

Always use insulated tools. Avoid dropping tools onto batteries or other electrical parts.

If a battery must be removed, always remove the grounded terminal from the battery first. Make sure all devices are disconnected.

All devices must be disconnected when update the BMS software.

DO NOT short the battery terminals.

DO NOT incinerate, crush, or disassemble.

DO NOT reverse connections (polarity) from charger to battery.

DO NOT operate battery beyond published voltage and current limits.

IMPORTANT

When installing batteries, leave adequate clearance between batteries.

When replacing batteries, use the same part number of batteries.

Avoid any fall or collision during the installation process.

Do not remove the battery components. The maintenance of the battery should be carried out by a professional engineer.

Do not expose the Li-ion battery to heat in excess of 55°C during operation, 60 °C in storage; Do not incinerate or expose to open flames.

Rack Mounted Li-ion Battery

The rack-mounted telecom li-ion batteries are designed for the telecom and Residential Energy Storage market. This series combines safe and reliable LiFePO4 prismatic cells with dedicated BMS to guarantee high reliability, safety, and scalability when used with different telecom systems. The product can be installed in a 19" or 21" standard cabinet or rack.

This document is intended for use by anyone required to install and operate rack mounted Li-ion batteries. Be sure to review this manual carefully to identify any potential safety risks before proceeding.

The owner must be familiar with all the features of this product before proceeding.

Failure to install or use this product as instructed can result in damage to the product that may not be covered under the limited warranty.

Product Introduction

The 48V/51.2V rack mounted Li-ion battery is shown in Figure 1.

Figure 1. 48V30Ah Li-ion battery appearance

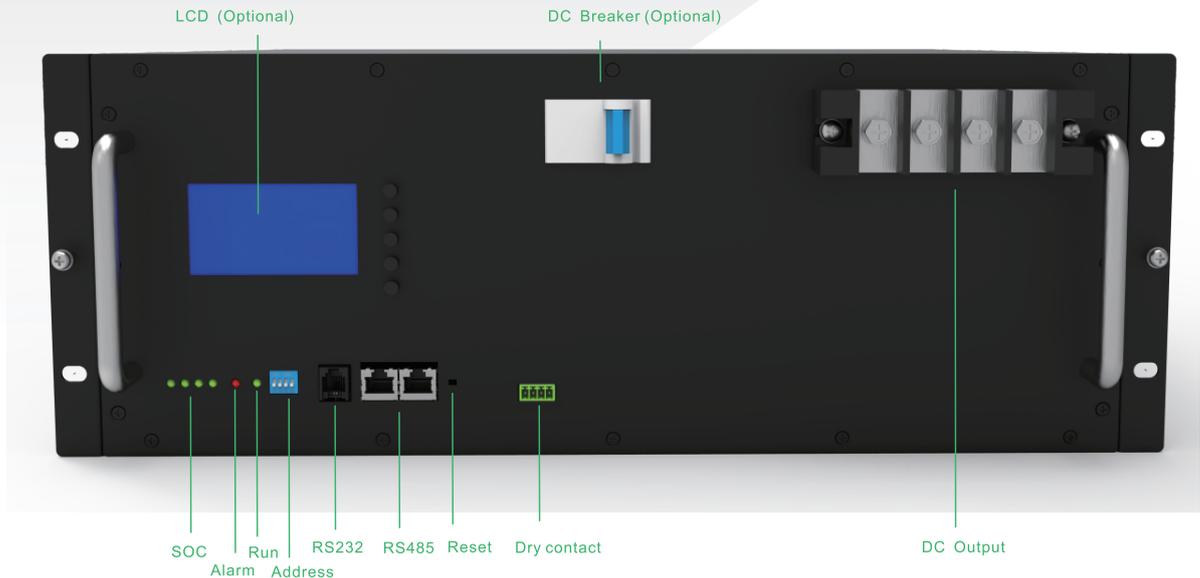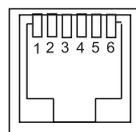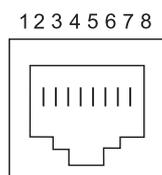The front panel of the battery is shown in Figure 2.

LCD (Optional)   DC Breaker (Optional)

SOC   Run   RS232 RS485 Reset Dry contact   DC Output
   Alarm Address

Figure 2. Front panel of Li-ion battery

Rj11 (RS232) PIN MAP

1 2 3 4 5 6

RJ11

RJ11 PIN	Description
1, 2,6	NC
3	TX
4	RX
5	GND

RJ45 (RS485) PIN MAP

1 2 3 4 5 6 7 8

RJ45

RJ45 PIN	Description
1, 8	RS485-B
2, 7	RS485-A
3, 6	GND
4, 5	CANH，CANL

ADD SWITCH

ADD	1#	1#	1#	1#	Remark
0	OFF	OFF	OFF	OFF	Pack 0
1	ON	OFF	OFF	OFF	Pack 1 Master Battery
2	OFF	ON	OFF	OFF	Pack 2
3	ON	ON	OFF	OFF	Pack 3
4	OFF	OFF	ON	OFF	Pack 4
5	ON	OFF	ON	OFF	Pack 5
6	OFF	ON	ON	OFF	Pack 6
7	ON	ON	ON	OFF	Pack 7
8	OFF	OFF	OFF	ON	Pack 8
9	ON	OFF	OFF	ON	Pack 9
10	OFF	ON	OFF	ON	Pack 10
11	ON	ON	OFF	ON	Pack 11
12	OFF	OFF	ON	ON	Pack 12
13	ON	OFF	ON	ON	Pack 13
14	OFF	ON	ON	ON	Pack 14
15	ON	ON	ON	ON	Pack 15

Dry Contact

The DRY1 and DRY2 is open in default.

In charge process, once the battery is almost fully charged or any other alarm information, the DRY 1 will become close to send signal to UPS to stop charging.

In discharge process, once the battery is almost fully discharge or any other alarm information, the DRY 2 will become close to send signal to UPS to stop discharge.

Upower

LED Indicator Description

Status	Nominal Warning Protection	RUN	ALM	SOC				Description
Shut down	Dormancy	OFF	OFF	OFF	OFF	OFF	OFF	
Standby	Nominal	Flash 1	OFF	Follow module capacity				Standby
Standby	Warning	Flash 1	Flash 3	Follow module capacity				Module at low voltage
Charge	Nominal	ON	OFF	Follow module capacity，The LED with the highest battery indicator Flash 2				
Charge	Warning	ON	Flash 3	Follow module capacity，The LED with the highest battery indicator Flash 2				overcharge alarm no Flash
Charge	Over-charge Protection	Flash 1	OFF	ON	ON	ON	ON	LED turn to standby if no power supply
Charge	Temperature, over-current, Failure protection	OFF	ON	OFF	OFF	OFF	OFF	Stop charging
Discharge	Nominal	Flash 3	OFF	Follow module capacity				
Discharge	Warning	Flash 3	Flash 3	Follow module capacity				
Discharge	Under voltage Protection	OFF	OFF	OFF	OFF	OFF	OFF	Stop discharging
Discharge	Temperature, over-current, short circuit, failure protection	OFF	ON	OFF	OFF	OFF	OFF	Stop discharging
Failure		OFF	ON	OFF	OFF	OFF	OFF	Stop charging and discharging

Note:
Flash 1: light 0.25s/off 3.75s
Flash 2: light 0.5s/ off 0.5s
Flash 3: light 0.5s / off 1.5s

RESET Button

When the battery in dormancy mode, press reset button 3~6s and release, the system will be activated.

When the battery in working mode, press reset button 3~6s and release, the system will turn to dormancy mode.

When the battery in working mode, press reset button 6~10s and release, the BMS will be reset and all LED indicators will be light 1.5s at the same time..

History Record

The BMS can restore 500 logs about historical alarm / protection data, the logs can be read by BMS PC software.

BMS PC Software Download: http://120.27.63.138:8181/attach_files/rack_48v/128

SNMP MIB File Download: http://120.27.63.138:8181/attach_files/rack_48v/57

MASTER BATTERY

BMS Parameters- 15S

S/N	Parameters		Default Setting	Adjustable or not	Remark
1	Cell Over-voltage protection	Cell OV alarm	3500mV	Adjustable	
		Cell OV protection	3650mV	Adjustable	
		Delay time	1.0S±0.5S	Adjustable	
	Cell OV protection release	Release voltage	3380mV	Adjustable	
		Discharge release	Discharge current > 1A		
2	Cell Low-voltage protection	Cell LV alarm	2900mV	Adjustable	
		Cell LV protection	2800mV	Adjustable	
		Delay time	1S	Adjustable	
	Cell LV protection release	Release voltage	2900mV	Adjustable	
		Charge release	connect to charger		
3	System Over-voltage protection	System OV alarm	52.5V	Adjustable	
		System OV protection	54.0V	Adjustable	
		Delay time	1.0S	Adjustable	
	System OV protection release	Release voltage	50.7V	Adjustable	
		Discharge release	Discharge current > 1A		
4	System Low-voltage protection	System LV alarm	43.5V	Adjustable	
		System LV protection	42.0V	Adjustable	
		Delay time	1S	Adjustable	
	System LV protection release	Release voltage	43.5V	Adjustable	
		Charge release	connect to charger		
5	Charge Over-current protection	OC alarm	1.1* Rated Capacity	Adjustable	
		OC protection	1.2* Rated Capacity	Adjustable	
		Delay time	1.0S	Adjustable	
	Charge OC protection release	Automatic release	1min automatic release		
		Discharge release	discharge current > 1A		

S/N	Parameters		Default Setting	Adjustable or not	Remark
6	Discharge Over-current protection	OC Alarm-1	1.1* Rated Capacity	Adjustable	
		OC protection	1.2* Rated Capacity	Adjustable	
		Delay time	1.0S	Adjustable	
	Discharge Over-current protection release	Automatic release	It will be automatically released after 1min. If it repeat 10 times, the state will be locked.		
		Discharge release			
		Charge release	charge current > 1A		
8	Short circuit protection	Short circuit proteciton	Yes		
		Release voltage	Charge the battery		
			Remove the load		
9	MOS high temperature protection	MOS HT alarm	90℃	Adjustable	
		MOS HT protection	110℃	Adjustable	
		MOS protection release	85℃	Adjustable	
10	Cell temperature	Charge low temperature alarm	0℃	Adjustable	
		Charge low temperature protection	-5℃	Adjustable	
		Charge low temperature protection release	0℃	Adjustable	
		Charge high temperature alarm	60℃	Adjustable	
		Charge high temperature protection	65℃	Adjustable	
		Charge high temperature protection release	60℃	Adjustable	
		Discharge low temperature alarm	-15℃	Adjustable	
		Discharge low temperature protection	-20℃	Adjustable	
		Discharge low temperature protection release	-15℃	Adjustable	
		Discharge high temperature alarm	65℃	Adjustable	
		Discharge high temperature protection	70℃	Adjustable	
		Discharge high temperature protection release	60℃	Adjustable	

MASTER
BATTERY

S/N		Parameters	Default Setting	Adjustable or not	Remark
11	Ambient temperature	Ambient low temperature alarm	-20℃	Adjustable	
		Ambient low temperature protection	-25℃	Adjustable	
		Ambient low temperature protection release	-20℃	Adjustable	
		Ambient high temperature alarm	65℃	Adjustable	
		Ambient high temperature protection	70℃	Adjustable	
		Ambient high temperature protection release	65℃	Adjustable	

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BATTERY

Transportation & Storage

Transportation requirement

The product passes the certifications of the UN38.3 (UN38.3: Section 38.3 of the sixth Revised Edition of the Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria) and SN/T 0370.2-2009 (Part 2: Performance Test of the Rules for the Inspection of Packaging for Exporting Dangerous Goods). This product belongs to class 9 dangerous goods.

The SOC is 30%~50% when shipped from factory.

The product can be delivered to the site directly and transported by land and water. The packing case must be secured for transportation, compliant with related national standards,

and printed with marks such as anti-collision and moisture prevention. Dispose of waste ESMs in strict accordance with local laws and regulations.

Protect the packing case with the product from the following situations:

- Being dampened by rains, snows, or falling into water
- Falling or mechanical impact
- Being upside-down or tilted

Storage

The rack mounted Li-ion battery can be stored in an environment with temperatures between -40°C and +60°C and between 10% and 90% relative humidity, non-condensing. For long storage periods at 25°C, charge the battery every 6 months. For temperatures above 40°C, charge the battery every quarter.

- Do not store the Li-ion battery at temperatures above 60°C.
- Keep away from heat sources (such as a heater)

Charging Batteries

The constant current (CC) chargers is recommended strongly.

The charge voltage and current setting can refer to below table:
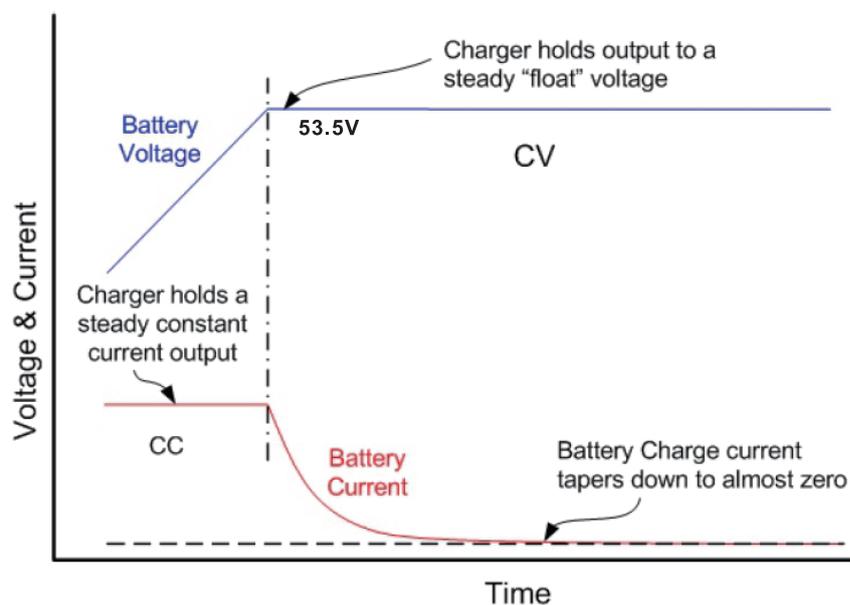
Recommended charge process for 48V30Ah:

Charge the battery at constant current <=30A until voltage reaches 53.5V, then charge at constant voltage 53.5V till charge current is 0A

Battery Voltage and Current During Recharge

BMS PC Software Operation

1. Download BMS PC software and Unzip to a local folder.

   http://120.27.63.138:8181/attach_files/rack_48v/57

2. Connect battery RS232 port to computer by RS232 to USB equipment:
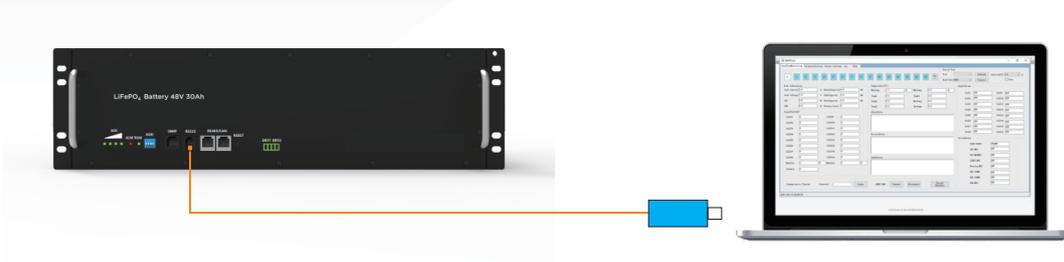
3. Check the battery ADD and make sure the ID=1

4. Double click " BMSTool.exe" to run BMS PC software.
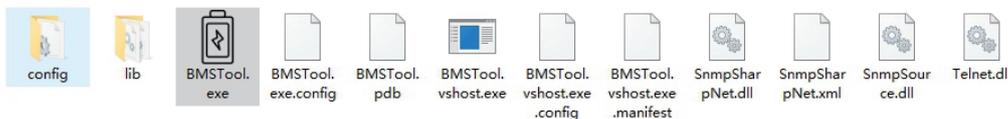
Battery ADD

If RS232 to USB device is connected well, the serial port will be listed

3. Click " Connect", the BMS detail information will be listed

BMSTool

RealTimeMonitoring | ParameterSetting | System Settings | System extension Settings | Logs | Help

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | Auto |

Serial Port
Port: COM5 Refresh Interval (S): 0.5
Baud Rate: 9600 Connect ☐ Save

Pack Information

Pack Current	0.0	A	Remain'Capacity	6.3	Ah
Pack Voltage	48.8	V	Full Capacity	30.0	Ah
SOC	21.0	%	Rated Capacity	30.0	Ah
SOH	100.0	%	Battery Cycle	1	

Temperature (℃)

MaxTemp	29.0	2	Min Temp	28.4	3
Temp 1	28.9		Temp 4	28.5	
Temp 2	29.0		MOS Temp	29.2	
Temp 3	28.4		Env Temp	31.0	

Equilibrium

Cell V1	OFF	Cell V1	OFF
Cell V1	OFF	Cell V1	OFF
Cell V1	OFF	Cell V1	OFF
Cell V1	OFF	Cell V1	OFF
Cell V1	OFF	Cell V1	OFF
Cell V1	OFF	Cell V1	OFF
Cell V1	OFF	Cell V1	OFF
Cell V1	OFF	Cell V1	OFF

Cell Voltage (mV)

Cell V1	3252	Cell V9	3251
Cell V2	3233	Cell V10	3252
Cell V3	3252	Cell V11	3251
Cell V4	3251	Cell V12	3251
Cell V5	3251	Cell V13	3251
Cell V6	3251	Cell V14	3251
Cell V7	3251	Cell V15	3250
Cell V8	3252	Cell V16	0
MaxVolt	3252	10	MinVolt	3233	2
VoltDif	19				

Alarm Status
No Alarm

Protect Status
No Protect

Fault Status
No Fault

SwitchStatus

PACK STATU	STANDBY
CHG MOS	ON
DSG MOS	ON
LIMIT MOS	OFF
HEATING MOS	OFF
DRY CONN1	OFF	DRY1 status
DRY CONN2	OFF	DRY2 status
PRE MOS	OFF

Communication Normal   Password [____]   Login   LIMIT MOS   Connect   Disconnect   Forced Shutdown

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Battery information:
Total current,
Total voltage,
SOC,
SOH,
Remain capacity,
Rated capacity,
Cycle times.

Cells information:
Cell voltage

Alarm, Protection, Fault information

Temperature information:
Cell temperature
Environment temperature
BMS temperature (MOS)

Note:

DRY1 and DRY2 definition：
During charge process, Once the battery is almost charged fully or any other alarm information, the DRY1 will turn ON. Once the UPS receives this information, UPS will stop charging.
 During discharge process, Once the battery is almost fully discharged or any other alarm information, the DRY2 will turn ON. Once the UPS receives this information, UPS will stop discharging.

The Parameter setting change must be carried out by a professional engineer.

Optional -SNMP Function

Download MIB file http://120.27.63.138:8181/attach_files/rack_48v/58 Unzip to a local folder.
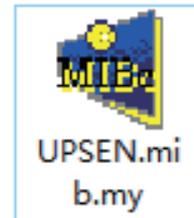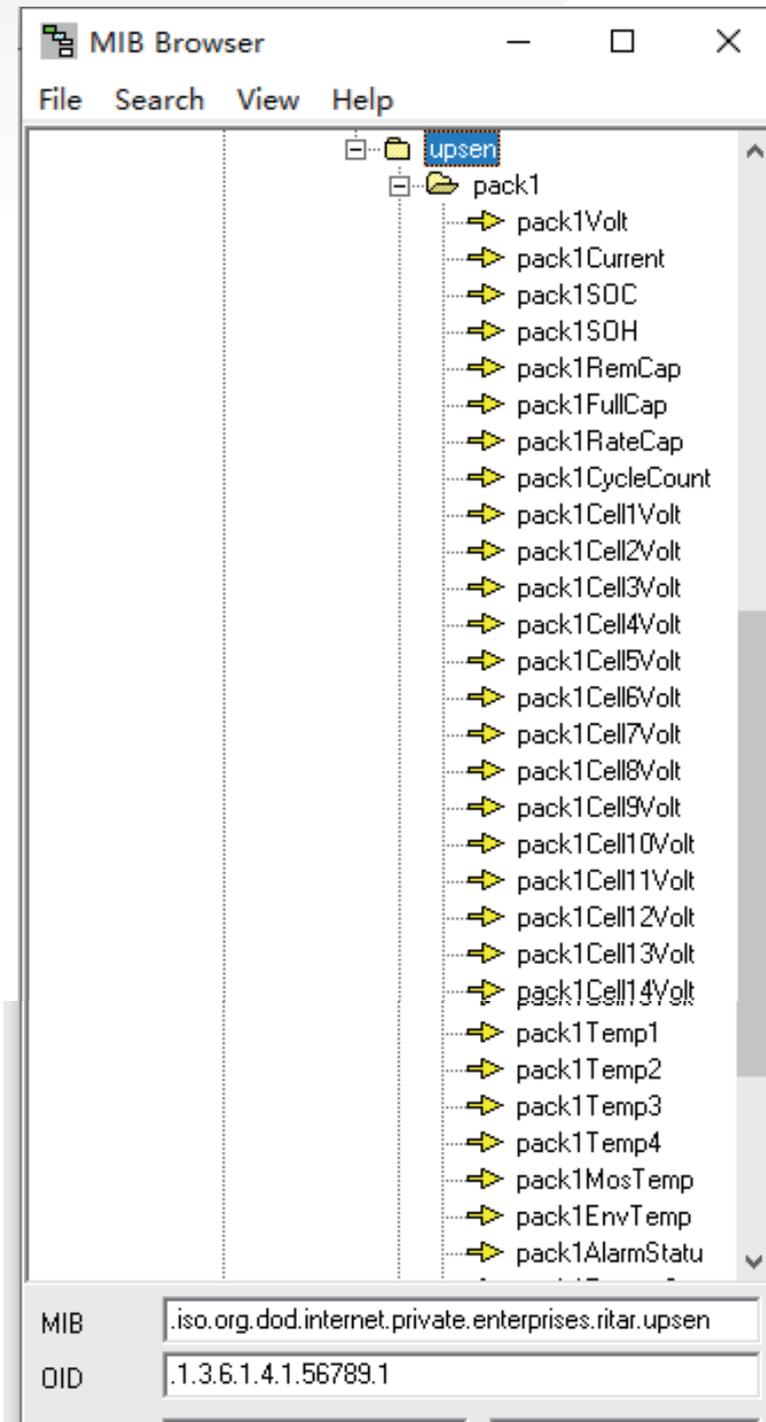
A skilled IT engineer is required to configure of SNMP function. All devices need to be in a local network and assign different IP addresses for different battery SNMP module.

The default IP of SNMP module is 192.168.1.111, Press "Read" button, all default setting will be listed. it needs to change IP, Subnet, gateway according to Network Planning.

Hardware connection

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MASTER BATTERY

This chapter mainly introduce how to use MG-SOFT MIB Browser v10 to connect battery by SNMP. there are other SNMP server software can be used.

Install MG-SOFT MIB Browser v10 software for future application.
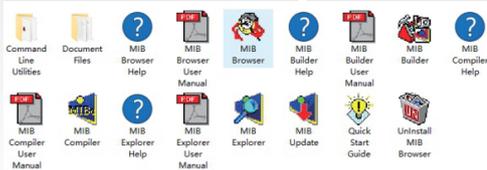
Step 1. Check the PC IP address, For the test environment, the PC IP address is 192.168.0.114, The subnet mask: 255.255.255.0, Gateway and DNS:192.168.0.1

Step 2. Modify battery IP address 192.168.0.10, click "Write" to save.

Note: For different site, the IP address need to be different

Step 3. Open MIB Browser, Ping Battery IP address to make sure the PC can do communication with Battery SNMP module.
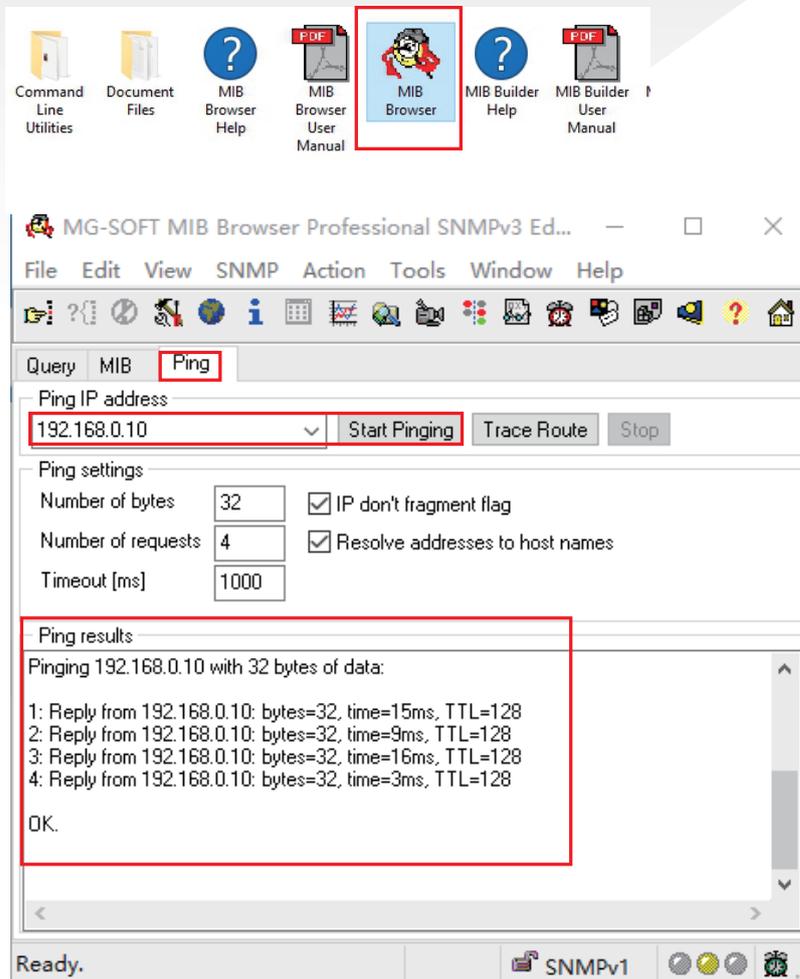
If it always shows Request timed out.

It needs to recheck

1. Battery turn on.

2. Router turn on.

3. Hardware connection between battery SNMP and router.

4. Battery and PC IP configuration.

Step 4. Run "MIB Complier" as Administrator , Open "UPSEN.mib.my" (Download from http://120.27.63.138:8181/attach_files/rack_48v/58)

RUN MIB Compiler as Administrator

Step 5. Run "MIB Complier" as Administrator , Open "UPSEN.mib.my" (Download from http://120.27.63.138:8181/attach_files/rack_48v/58)
Compile UPSEN.mib.my , Click "Save All" to MG-SOFT installation fold (Copy COMPANY-UNTITLED-MIB.smidb to C:\Program Files (x86)\MG-SOFT\MIB Browser\MIB\SMIDB),
Back to MIB Browser, MIB load page, load selected MIB modules (COMPANY-UNTITLED-MIB.smidb), change to Query page.

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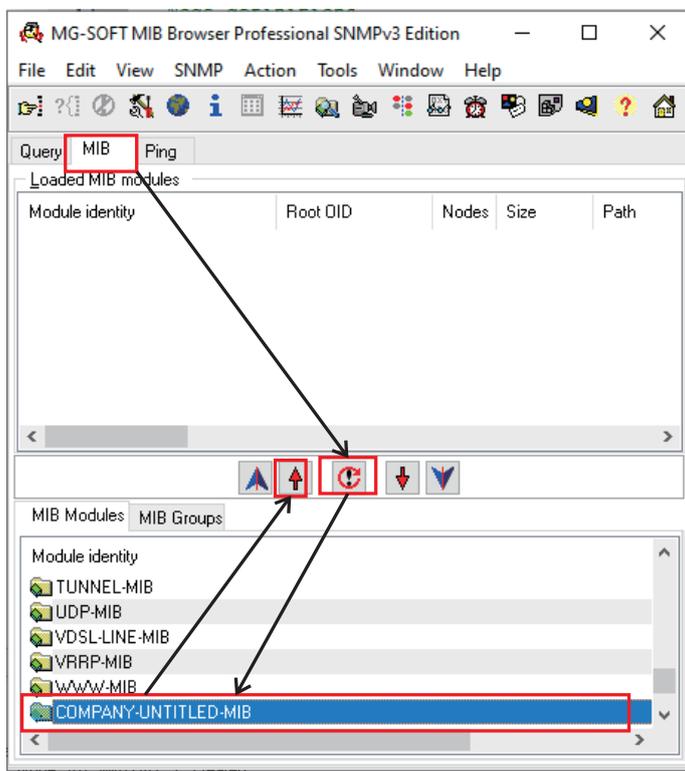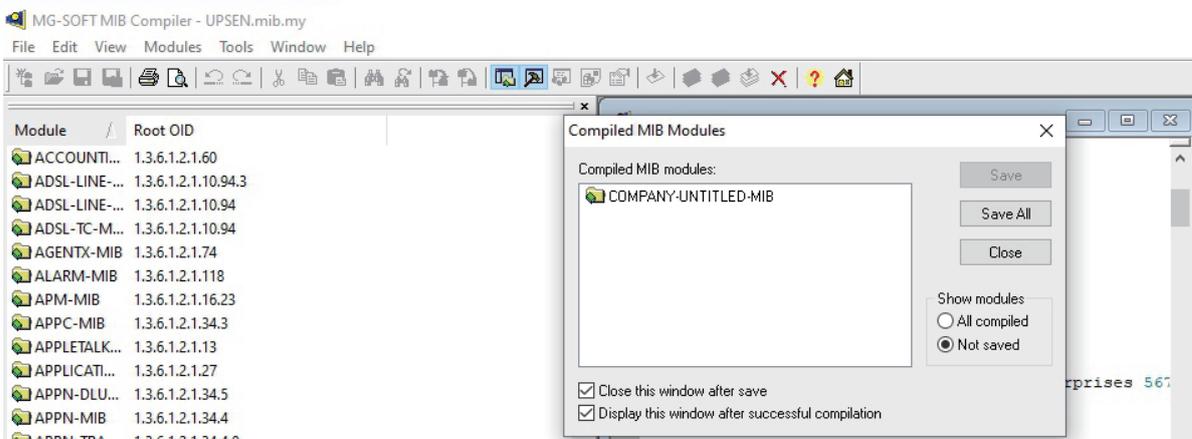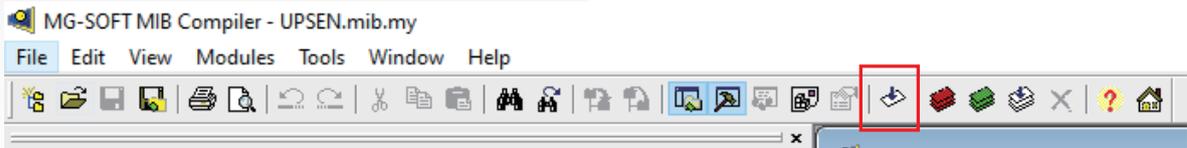
Step 5. Change IP to battery IP address (192.168.0.10), Change Read community.
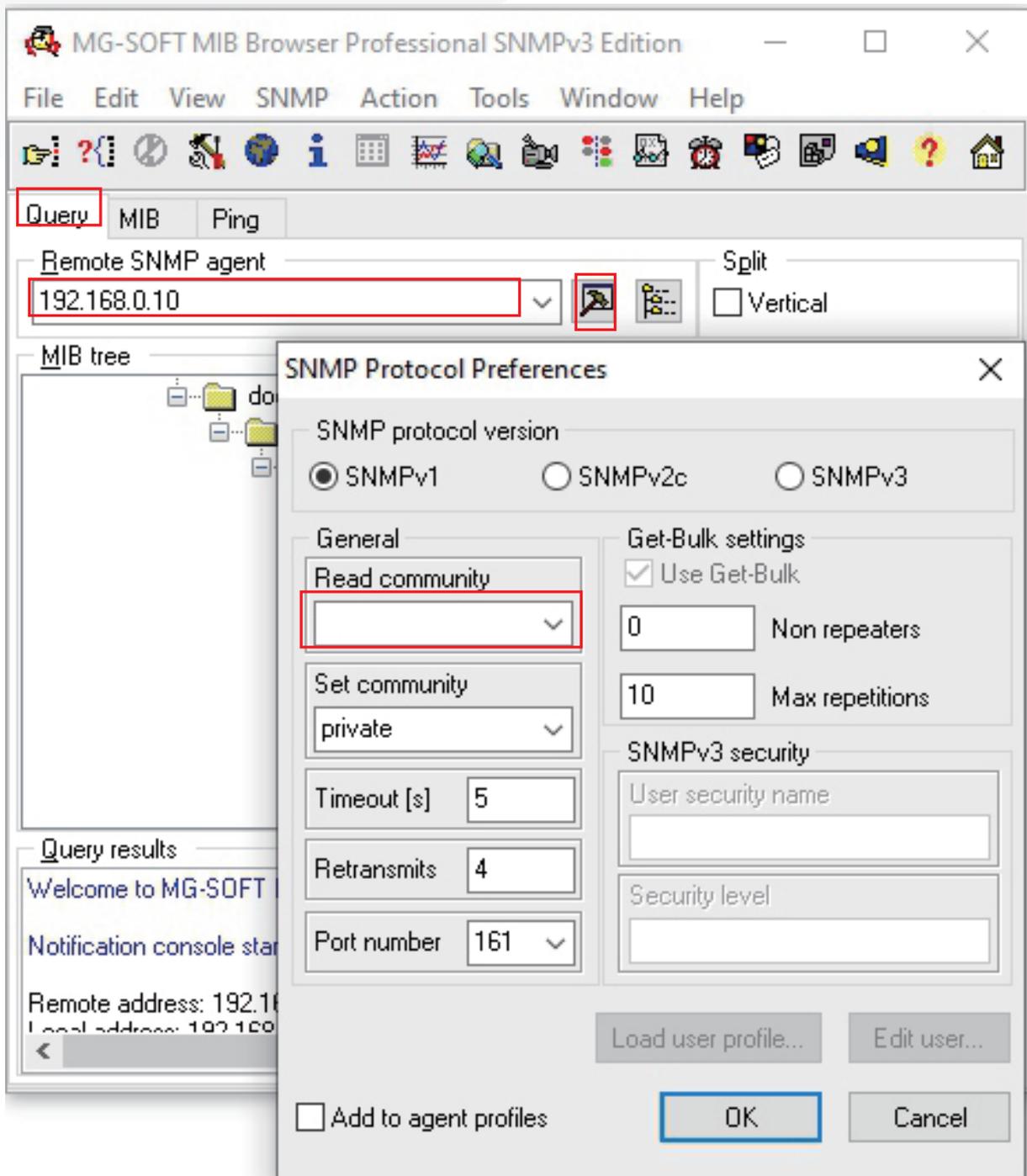
Step 5. MIB tree-upsen - Pack 1, Right click - Contack, walk, the battery real time monitor information will be listed

Optional -Gyroscope Anti-theft

The optional gyroscope anti-theft is provided to prevent unauthorized movement.
The BMS will lock battery and it needs to input password to unlock BMS.