NetSure™ Lithium Battery Modbus Table V1.2

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1 About this Document

This document is for battery vendors who wish to display key battery operating data and alarms via Vertiv's NetSure™ Control Unit (NCU). Vertiv refers to this functionality as 'Monitoring Mode'.

Monitoring Mode can be enabled by programming the Modbus Table in the BMS per the information contained within this document and making an RS-485 connection between the battery and the Vertiv™ NetSure™ Power System.

For additional information regarding Monitoring Mode, necessary NCU adjustments and RS-485 connections to specific power plants, please see our NetSure™ Lithium Battery Application Guide.

2 Communication Configuration

Configuration

(9600 N 8 1)

BMS board dip code range is 0～15.
BMS software's base address is 38.
The BMS communication address is (38+x),
x = BMS board dip code.
Example: BMS board dip code is 1, the BMS communication address is 38 + 1 = 39.

3 Function List

Table 3.1 Function Code List

Code	Child Code	Caption	Description
0x04	--	Read Analog Value	Support Single/Multi Continuous Register(s)
0x11	--	Read Product Information	Style/Version/SerialNumber

4 Command Format

Note 1: MSB is High Byte; LSB is Low Byte.

Note 2: One register includes two bytes, if a register only has one byte, put it in LSB.

4.1 Send Command Format

Idx	0	1	2	3	4	5	6	7
Caption	ADDR	CMD	MSB	LSB	MSB	LSB	LSB	MSB
Description	Reg Addr	Cmd	Register Start Addr		Register Count		CRC Check	

Note: Both the Register Start Addr and Register Count fields need to be zero for the 0x11 command.

4.2 Main Response Command Format

Idx	0	1	2	3	4	5	6		L+1	L+2	L+3	L+4
Caption	ADDR	CMD	Length	MSB	LSB	MSB	LSB	...	MSB	LSB	LSB	MSB
Description	Reg Addr	Cmd	Data length (L=n*2)	1Reg Value		2Reg Value		...	nReg Value		CRC Check	

4.3 Error Response Command Format

Idx	0	1	2	3	4
Caption	ADDR	CMD + 128	ErrCode	LSB	MSB
Description	RegAddr	Cmd +128	Error Code	CRC Check	

4.4 0x11 Response Command Format

Idx	0	1	2	3	4	5	6	L+1	L+2	L+3	L+4
Caption	ADDR	CMD	Length	BYTE1 ... BYTEn						LSB	MSB
Description	Reg Addr	Cmd	Data Length L = n	Product Style+'*'+Software Version+'*' +Hardware Version+'*'+Serial Number Version+'*'						CRC Check	

5 Data Information

Note 1: 0xFFFF indicates “Not Valuable”.

Note 2: One register includes two bytes, if a register only has one byte, put it in LSB.

RegId	Original Name	NCU Display Name	Unit	Bytes	Scale Factor	Offset	PDU#Value	Minimum Data Value	Maximum Data Value
0x1000	Pack Volt	Battery Voltage	V	2	0.01	0	5343#53.43	0	64
0x1001	Current	Current	A	2	0.1	-10000	9505#-49.5	-999	+999
0x1002	Remain Capacity	Battery Remaining (Ah)	Ah	2	0.1	0	560#56	0	2000
0x1003	Average Cell T	Average Cell Temperature	℃	2	0.1	-400	300#-10	-40	+120
0x1004	Env T	BMS Temperature	℃	2	0.1	-400	300#-10	-40	+120
0x1005	Warning Flag	Warning	#	2	1	0	See Following Table	0x0000	0xffff
0x1006	Protection Flag	Protection	#	2	1	0	See Following Table	0x0000	0xffff
0x1007	Fault/Status	Fault	#	2	1	0	See Following Table	0x0000	0xffff
0x1008	SoC	State of Charge (SoC)	%	2	0.01%	0	12.34#1234	0	100
0x1009	SoH	State of Health (SoH)	%	2	0.01%	0	12.34#1234	0	100
0x100B	Energy Discharge	Energy Discharge (kWh)	kWh	2	0,001	0	1000#	1.0	65535
0X100E	Cycle Count	Cycle Count	#	2	0	0	123#123	0	65535

5.1 Warning Flag

Warning Flag		State and Original Name			NCU Long (Trap) Name	Short Name
Byte0	Bit0	1:Cell	OV Alarm	0:None	Cell Over Voltage Alarm	Cell OV Alarm
	Bit1	1:Cell	UV Alarm	0:None	Cell Under Voltage Alarm	Cell UV Alarm
	Bit2	1:Pack	OV Alarm	0:None	Pack Over Voltage Alarm	Pack OV Alarm
	Bit3	1:Pack	UV Alarm	0:None	Pack Under Voltage Alarm	Pack UV Alarm
	Bit4	1:Chg	OC Alarm	0:None	Charge Over Current Alarm	Chg OC Alarm
	Bit5	1:Disg	OC Alarm	0:None	Discharge Over Current Alarm	Disg OC Alarm
	Bit6	1:Cell	OT Alarm	0:None	Cell Over Temperature Alarm	Cell OT Alarm
	Bit7	1:Cell	UT Alarm	0:None	Cell Under Temperature Alarm	Cell UT Alarm
Byte1	Bit0	1:Env	OT Alarm	0:None	Environmental Over Temperature	Env OT Alarm
	Bit1	1:Env	UT Alarm	0:None	Environmental Under Temperature	Env UT Alarm
	Bit2	1:PCB	OT Alarm	0:None	PCB Over Temperature Alarm	PCB OT Alarm
	Bit3	1:SOC	Low Alarm	0:None	SOC Low Voltage Alarm	SOC Low Alarm
	Bit4	1:Diff	Volt Alarm	0:None	Diff Voltage Alarm	Diff Volt Alarm
	Bit5	Reserved			--	--
	Bit6	Reserved			--	--
	Bit7	Reserved			--	--

5.2 Protection Flag

Protection Flag		State and Original Name			NCU Long (Trap) Name	Short Name
Byte0	Bit0	1:Cell	OV Protect	0:None	Cell Over Voltage Protection	Cell OV Protect
	Bit1	1:Cell	UV Protect	0:None	Cell Under Voltage Protection	Cell UV Protect
	Bit2	1:Pack	OV Protect	0:None	Pack Over Voltage Protection	Pack OV Protect
	Bit3	1:Pack	UV Protect	0:None	Pack Under Voltage Protection	Pack UV Protect
	Bit4	1:SC	Protect	0:None	Short Circuit Protection	Short C Protect
	Bit5	1:OC	Protect	0:None	Over Current Protection	Over C Protect
	Bit6	1:Chg	OT Protect	0:None	Charge Over Temperature Protect	Chg OT Protect
	Bit7	1:Chg	UT Protect	0:None	Charge Under Temperature Protect	Chg UT Protect
Byte1	Bit0	1:Disg	OT Protect	0:None	Discharge Over Temp Protection	Disg OT Protect
	Bit1	1:Disg	UT Protect	0:None	Discharge Under Temp Protection	Disg UT Protect
	Bit2	Reserved			--	--
	Bit3	Reserved			--	--
	Bit4	Reserved			--	--
	Bit5	Reserved			--	--
	Bit6	Reserved			--	--
	Bit7	Reserved			--	--

5.3 Fault Flag / Status Flag

Fault Flag / Status Flag		State and Original Name	NCU Long (Trap) Name	Short Name
Byte0	Bit0	1:Front-end Sample Error 0:None	Front-end Sample Error	Front Smp Error
	Bit1	1:Temp Sense Disconnect 0:None	Temperature Sensor Disconnect	Temp Sense Disc
	Bit2	Reserved	--	--
	Bit3	Reserved	--	--
	Bit4	Reserved	--	--
	Bit5	Reserved	--	--
	Bit6	Reserved	--	--
	Bit7	Reserved	--	--
Byte1	Bit0	1:Charging 0:None	Charging	Charging
	Bit1	1:Discharging 0:None	Dischargung	Discharging
	Bit2	1:Chg MOS Connect 0:Chg MOS Disconnect	Charging MOSFET Connect	Chg MOS Cnct
	Bit3	1:Disg MOS Connect 0:Disg MOS Disconnect	Discharging MOSFET Connect	Disg MOS Cnct
	Bit4	1:Limit Current Enable 0:Limit Current Disable	Current Limit Enable	Crnt Limit Enbl
	Bit5	Reserved	--	--
	Bit6	Reserved	--	--
	Bit7	Reserved	--	--

6 Product Information

	Byte Count	Example	Description
Product Style	11(Max)	48LIB100	ASCII
Software Version	2(Fixed)	0x0A0A, Ver: V10.10	Hex, Version (1byte)+ Revision (1byte)
Hardware Version	5(Fixed)	0x010a0b0200 Ver: V01.10.11.02.00	Hex
Serial Number	30(Fixed)	14875113011800400025	ASCII

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