PowerMount-P960-2007kWh Series

Modbus Interface Definitions

Issue 02

Date 2026-04-08

Change History

Issue	Date	Change Description
01	2025-10-14	Initial release.
02	2026-04-08	Updated the model and Figure 1-1 in chapter 1, updated item 364 and added item 419 and 420 in chapter 2, deleted item 703 in chapter 3, deleted the battery pack register definitions section, updated gain coeff. and unit for item 15065, 15066, 15067, 15068, and added the explanation for 15066.

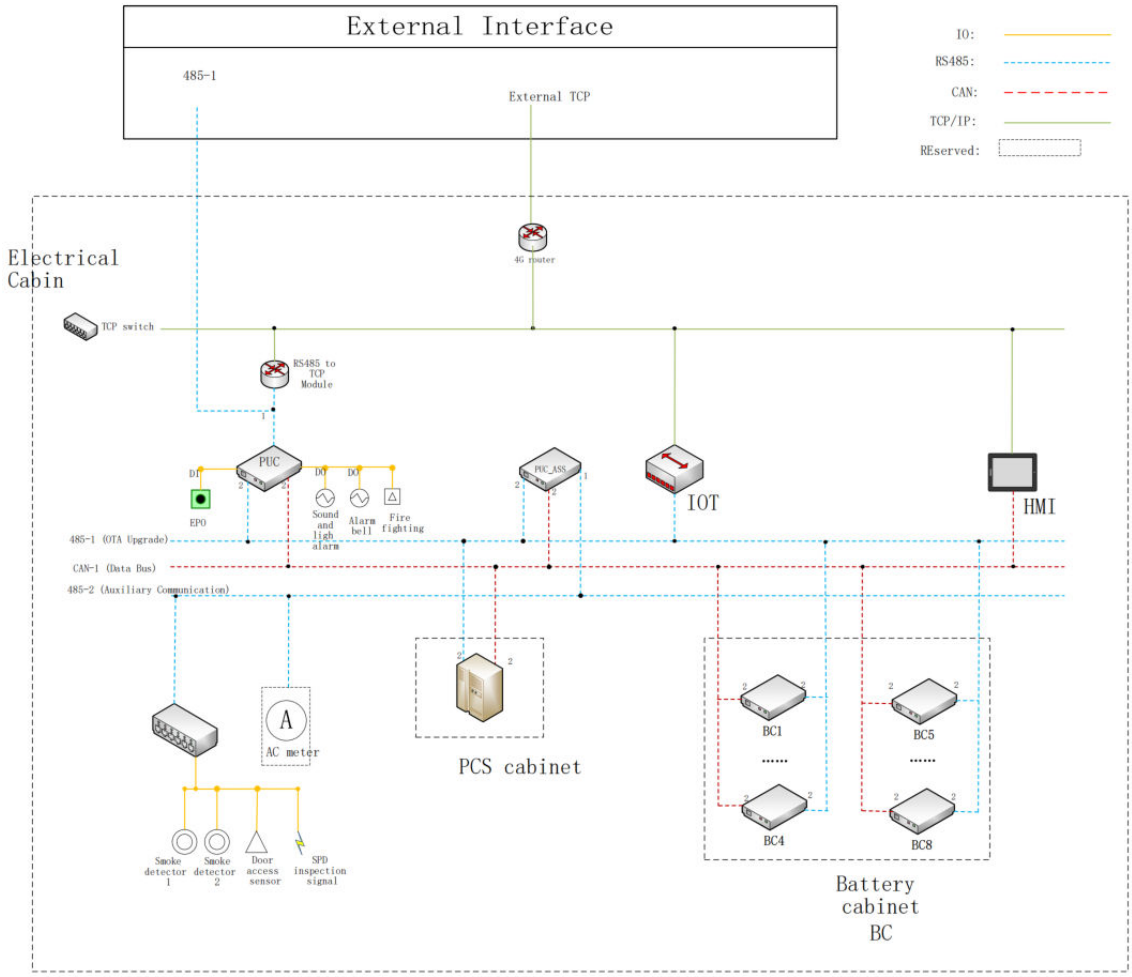
Content

1. MODBUS Communication Guide

The Modbus Application Protocol is a widely used communication protocol that is currently used in PV and ESS communication. The Modbus protocol has been developed for reading data from or writing data to clearly defined data areas.

This document describes the Modbus protocol for third-party EMS to manage Dunext's energy storage cabinets through ESS controller (PUC), which can be used to standardize the development of third-party EMS.

Figure 1-1 Communication Overview



- The default ID of ESS controller (PUC) is 0x01.
- The IP address of ESS controller (PUC) is 192.168.1.100, Port:502

Table 1-1 Terms and Abbreviations

Terms	Description
U16	16-bit unsigned integer
I16	16-bit signed integer
RO	Read-only data
RW	Data that is readable and writable
Gain Coefficient	The read data multiplied by the coefficient equals the real data

Table 1-2 Function Code

Function Code	Modbus Command	Function
0x03	Read Register	Obtain one or more register values
0x06	Set single Register	Write the specified values into a register

For example,

Modbus RTU (RS485)

CRC16 polynomial (0x8005): x^16 + x^15 + x^2 + 1

Table 1-3 Modbus RTU Read Data Message Format (Operating Status)

Host Transmission	Slave Address	Function Code	Register Address	Number of Registers	Check Code
	01	03	01 2C	00 01	443F

Slave Transmission	Slave Address	Function Code	Register Address	Data	Check Code
	01	03	01 2C	00 02	043E

Modbus TCP

Table 1-4 Modbus TCP Read Data Message Format (Operating Status)

Host Transmission	MBAP							Function Code	Data			
	Transaction ID		Protocol ID		Bytes of Next Field		Unit ID		Register Address		Number of Registers	
Frame Data	00	00	00	00	00	06	01	03	01	2C	00	01

Slave Transmission	MBAP							Function Code	Data		
	Transaction ID		Protocol ID		Bytes of Next Field		Unit ID		Bytes of Response Data	Response Data	
Frame Data	00	00	00	00	00	05	01	03	02	00	02

2. PUC Register Definitions

PUC information address 300-599

300-499: PUC summary data

500-599: Device status

Table 2-1 PUC Register Definitions

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
300	0x012C	RO	Working status	U16	1	N/A	1 Shutdown 2 Running 3 Fault
301	0x012D	RO	Working mode	U16	1	N/A	1 Grid connection 2 Off-grid 3 Grid connection and off-grid 11 Debugging
302	0x012E	RO	Allowable discharge active power limit	I16	0.1	kW	
303	0x012F	RO	Allowable charging active power limit	I16	0.1	kW	
304	0x0130	RO	System grid voltage	U16	0.1	V	
305	0x0131	RO	System grid active power	I16	0.1	kW	
306	0x0132	RO	Load voltage	I16	0.1	V	
307	0x0133	RO	Load active power	U16	0.1	kW	
308	0x0134	RO	MPPT total power	U16	0.1	kW	
319	0x013F	RO	Grid input active electric energy high level	U16	0.01	kWh	
320	0x0140	RO	Grid input active electric energy low level	U16	0.01	kWh	
321	0x0141	RO	Power grid output active electric energy high position	U16	0.01	kWh	
322	0x0142	RO	Grid output	U16	0.01	kWh	

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
			active electric energy low level				
323	0x0143	RO	Load output active electric energy high position	U16	0.1	kWh	
324	0x0144	RO	Load output active energy low position	U16	0.1	kWh	
325	0x0145	RO	PV input active energy high position	U16	0.1	kWh	
326	0x0146	RO	PV input active energy low position	U16	0.1	kWh	
338	0x0152	RO	IO input	U16	1	N/A	Bit0: Smoke sensor 1 Bit1: Smoke sensor 2 Bit2: Fan Bit3: Lightning protection Bit4: Lightning protection2 Bit5: Emergency stop Bit6: AC circuit breaker Bit7: reserved Bit8: reserved Bit9: Access control
339	0x0153	RO	IO output	U16	1	N/A	Bit0: operating light Bit1: warning light Bit2: fault light Bit3: fan Bit4: audio and visual alarm Bit5: alarm Bit6: Fire alarm signal
340	0x0154	RO	Alarm 0	U16	1	N/A	Bit0: Fan abnormality Bit1: Meter communication interruption Bit2: RS485 communication interruption Bit3: Access control triggered Bit4: Reserved Bit5: PMC communication interruption Bit6: Reserved

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
							Bit7: Reserved Bit8: HMI communication interruption Bit9: Reserved Bit10:Reserved Bit11:ASS communication interruption Bit12:Reserved Bit13:Reserved Bit14:IO controller 1 communication interruption Bit15:IO controller 2 communication interruption
341	0x0155	RO	Alarm 1	U16	1	N/A	Bit0: BC is available or not Bit1: ACDC is available or not Bit2: DCDC is available or not Bit3: MPPT is available or not Bit4: All ACDC fail Bit5: All MPPT fail Bit6: Smoke sensor 1 Bit7: Smoke sensor 2 Bit8: AC circuit breaker disconnected Bit9: Lightning protection1 Bit10: Lightning protection2 If PCS, DCDC, MPPT, or BC fails, the corresponding device will be unavailable
342	0x0156	RO	Fault 0	U16	1	N/A	Bit0: Emergency stop Bit1: Continuous startup failure Bit2: Smoke sensor fails Bit3: Reserved Bit4: Reserved When two smoke sensors are triggered, the smoke sensor fault is reported
343	0x0157	RO	Fault 1	U16	1	N/A	Bit0: All BC fail Bit1: Reserved Bit2: All DCDC fail Bit3: Reserved

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
							Bit4: Reserved Bit5: Reserved Bit6: Reserved Bit7: Reserved
344	0x0158	RO	Alarm 2	U16	1	N/A	Bit0: Battery cabinet 1 has a large voltage difference Bit1: Battery cabinet 2 has a large voltage difference Bit2: Battery cabinet 3 has a large voltage difference Bit3: Battery cabinet 4 has a large voltage difference Bit4: Battery cabinet 5 has a large voltage difference Bit5: Battery cabinet 6 has a large voltage difference Bit6: Battery cabinet 7 has a large voltage difference Bit7: Battery cabinet 8 has a large voltage difference Bit8: Battery cabinet 9 has a large voltage difference Bit9: Battery cabinet 10 has a large voltage difference
345	0x0159	RO	IO2 input	U16	1	N/A	Bit0: PV1 Circuit Breaker Bit1: PV2 Circuit Breaker Bit2: PV3 Circuit Breaker Bit3: PV4 Circuit Breaker Bit4: PV5 Circuit Breaker Bit5: PV6 Circuit Breaker Bit6: PV7 Circuit Breaker Bit7: PV8 Circuit Breaker Bit8: PV9 Circuit Breaker Bit9: PV10 Circuit Breaker
346	0x015A	RO	Alarm 3	U16	1	N/A	Bit0: PV1 Lightning Protection Bit1: PV2 Lightning Protection Bit2: PV3 Lightning Protection Bit3: PV4 Lightning Protection Bit4: PV5 Lightning Protection Bit5: PV6 Lightning Protection Bit6: PV7 Lightning Protection Bit7: PV8 Lightning Protection

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
							Bit8: PV9 Lightning Protection Bit9: PV10 Lightning Protection
355	0x0163	RO	AC software version	U16	1	N/A	
356	0x0164	RO	AC boot version	U16	1	N/A	Read 0x080E0094
357	0x0165	RO	ACDC protocol version	U16	1	N/A	Determine ACDC Resolution Protocol by Protocol Version
358	0x0166	RO	DCDC protocol version	U16	1	N/A	Determine ACDC Resolution Protocol by Protocol Version
359	0x0167	RO	MPPT protocol version	U16	1	N/A	Determine ACDC Resolution Protocol by Protocol Version
360	0x0168	RO	IOT software version	U16	N/A	N/A	
361	0x0169	RO	ASS software version	U16	N/A	N/A	
362	0x016A	RO	PMC software version	U16	N/A	N/A	
363	0x016B	RO	PMC software boot version	U16	N/A	N/A	
364	0x016C	RO	HMI software version	U16	N/A	N/A	
365	0x016D	RO	Year	U16	1	N/A	
366	0x016E	RO	Month	U16	1	N/A	
367	0x016F	RO	Day	U16	1	N/A	
368	0x0170	RO	Hour	U16	1	N/A	
369	0x0171	RO	Minute	U16	1	N/A	
370	0x0172	RO	Second	U16	1	N/A	
371	0x0173	RO	Summary of PCS status	U16	1	N/A	1: Stop 2: Running 3: Fault
372	0x0174	RO	Summary of PCS AC active power	I16	0.1	kW	
373	0x0175	RO	Summary of PCS AC current	I16	0.1	A	
374	0x0176	RO	Summary of PCS AC phase A voltage	U16	0.1	V	
375	0x0177	RO	Summary of PCS AC phase B voltage	U16	0.1	V	
376	0x0178	RO	Summary of PCS AC phase C	U16	0.1	V	

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
			voltage				
377	0x0179	RO	Summary of BMS status	U16	1	N/A	1: Stop 2: Running 3: Fault
378	0x017A	RO	Summary of BMS pack voltage	U16	0.1	V	
379	0x017B	RO	Summary of BMS pack current	I16	0.1	A	
380	0x017C	RO	Summary of BMS pack SOC	U16	1	N/A	
381	0x017D	RO	Summary of BMS pack SOH	U16	1	N/A	
382	0x017E	RO	Summary of DCDC status	U16	1	N/A	1: Stop 2: Running 3: Fault
383	0x017F	RO	Summary of DCDC high-voltage side voltage	U16	0.1	V	
384	0x0180	RO	Summary of DCDC high-voltage side current	I16	0.1	A	
385	0x0181	RO	Summary of DCDC high-voltage side power	I16	0.1	kW	
386	0x0182	RO	Summary of DCDC low-voltage side voltage	U16	0.1	V	
387	0x0183	RO	Summary of DCDC low-voltage side current	I16	0.1	A	
388	0x0184	RO	Summary of DCDC low-voltage side power	I16	0.1	kW	
389	0x0185	RO	Summary of MPPT status	U16	1	N/A	1: Stop 2: Running 3: Fault
390	0x0186	RO	Summary of MPPT high-voltage side	U16	0.1	V	

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
			voltage				
391	0x0187	RO	Summary of MPPT high-voltage side current	I16	0.1	A	
392	0x0188	RO	Summary of MPPT high voltage side power	I16	0.1	kW	
393	0x0189	RO	Summary of MPPT low voltage side voltage	U16	0.1	V	
394	0x018A	RO	Summary of MPPT low voltage side current	I16	0.1	A	
395	0x018B	RO	Summary of MPPT low voltage side power	I16	0.1	kW	
406	0x0196	RO	Summary of maximum IGBT temperature	U16	0.1	℃	
407	0x0197	RO	Summary of minimum IGBT temperature	U16	0.1	℃	
408	0x0198	RO	Consistent BC version numbers	U16	1	N/A	1: consistent 0: inconsistent
409	0x0199	RO	Summary of BC version numbers	U16	1	N/A	
410	0x019A	RO	Consistent ACDC version numbers	U16	1	N/A	1: consistent 0: inconsistent
411	0x019B	RO	Summary of ACDC version number high byte	U16	1	N/A	
412	0x019C	RO	Summary of ACDC version number low byte	U16	1	N/A	
413	0x019D	RO	Consistent DCDC version numbers	U16	1	N/A	1: consistent 0: inconsistent

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
414	0x019E	RO	Summary of DCDC version number high byte	U16	1	N/A	
415	0x019F	RO	Summary of DCDC version number low byte	U16	1	N/A	
416	0x01A0	RO	Consistent MPPT version numbers	U16	1	N/A	1: consistent 0: inconsistent
417	0x01A1	RO	Summary of MPPT version number high byte	U16	1	N/A	
418	0x01A2	RO	Summary of MPPT version number low byte	U16	1	N/A	
419	0x01A3	RO	BC version number matches	U16	N/A	N/A	
420	0x01A4	RO	Summary of BC version numbers	U16	N/A	N/A	
427	0x01AB	RO	SOC verification flag	U16	1	N/A	0 Normal 1 Need to be fully charged and discharged
428	0x01AC	RO	Total DC power of battery cabinet	I16	0.1	kW	
429	0x01AD	RO	Reserved	U16	N/A	N/A	
430	0x01AE	RO	Cluster number with highest cell voltage	I16	1	N/A	
431	0x01AF	RO	Battery cabinet number with highest cell voltage	I16	1	N/A	
432	0x01B0	RO	System highest cell voltage	U16	0.001	V	
433	0x01B1	RO	Cluster number with lowest cell voltage	U16	1	N/A	
434	0x01B2	RO	Battery cabinet number with lowest cell voltage	U16	1	N/A	

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
435	0x01B3	RO	System lowest cell voltage	U16	0.001	V	
436	0x01B4	RO	Cluster number with highest cell temperature	U16	1	N/A	
437	0x01B5	RO	Battery cabinet number with highest cell temperature	U16	1	N/A	
438	0x01B6	RO	System highest cell temperature	u16	1	℃	Range: -40~ 120℃, offset: -40℃
439	0x01B7	RO	Cluster number with lowest cell temperature	U16	1	N/A	
440	0x01B8	RO	Battery cabinet number with lowest cell temperature	U16	1	N/A	
441	0x01B9	RO	System lowest cell temperature	u16	1	℃	Range: -40~ 120℃, offset: -40℃
500	0x01F4	RO	BC1 working status	U16	1	N/A	1: Stop 2: Running 3: Fault 5: Communication interruption
501	0x01F5	RO	BC2 working status	U16	1	N/A	
502	0x01F6	RO	BC3 working status	U16	1	N/A	
503	0x01F7	RO	BC4 working status	U16	1	N/A	
504	0x01F8	RO	BC5 working status	U16	1	N/A	
505	0x01F9	RO	BC6 working status	U16	1	N/A	
506	0x01FA	RO	BC7 working status	U16	1	N/A	
507	0x01FB	RO	BC8 working status	U16	1	N/A	
508	0x01FC	RO	BC9 working status	U16	1	N/A	
509	0x01FD	RO	BC10 working status	U16	1	N/A	
510	0x01FE	RO	BC11 working status	U16	1	N/A	

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
511	0x01FF	RO	BC12 working status	U16	1	N/A	
512	0x0200	RO	BC13 working status	U16	1	N/A	
513	0x0201	RO	BC14 working status	U16	1	N/A	
514	0x0202	RO	BC15 working status	U16	1	N/A	
515	0x0203	RO	BC16 working status	U16	1	N/A	
516	0x0204	RO	BC17 working status	U16	1	N/A	
517	0x0205	RO	BC18 working status	U16	1	N/A	
518	0x0206	RO	BC19 working status	U16	1	N/A	
519	0x0207	RO	BC20 working status	U16	1	N/A	
520	0x0208	RO	ACDC1 working status	U16	1	N/A	1: Shutdown 2: On-grid 3: Off-grid 4: Fault 5: Communication interruption
521	0x0209	RO	ACDC2 working status	U16	1	N/A	
522	0x020A	RO	ACDC3 working status	U16	1	N/A	
523	0x020B	RO	ACDC4 working status	U16	1	N/A	
524	0x020C	RO	ACDC5 working status	U16	1	N/A	
525	0x020D	RO	ACDC6 working status	U16	1	N/A	
526	0x020E	RO	ACDC7 working status	U16	1	N/A	
527	0x020F	RO	ACDC8 working status	U16	1	N/A	
528	0x0210	RO	ACDC9 working status	U16	1	N/A	
529	0x0211	RO	ACDC10 working status	U16	1	N/A	
530	0x0212	RO	ACDC11 working status	U16	1	N/A	
531	0x0213	RO	ACDC12 working status	U16	1	N/A	

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
532	0x0214	RO	ACDC13 working status	U16	1	N/A	
533	0x0215	RO	ACDC14 working status	U16	1	N/A	
534	0x0216	RO	ACDC15 working status	U16	1	N/A	
535	0x0217	RO	ACDC16 working status	U16	1	N/A	
536	0x0218	RO	ACDC17 working status	U16	1	N/A	
537	0x0219	RO	ACDC18 working status	U16	1	N/A	
538	0x021A	RO	ACDC19 working status	U16	1	N/A	
539	0x021B	RO	ACDC20 working status	U16	1	N/A	
540	0x021C	RO	DCDC1 working status	U16	1	N/A	1: Stop 2: Running 3: Fault 4: Soft start 5: Communication interruption
541	0x021D	RO	DCDC2 working status	U16	1	N/A	
542	0x021E	RO	DCDC3 working status	U16	1	N/A	
543	0x021F	RO	DCDC4 working status	U16	1	N/A	
544	0x0220	RO	DCDC5 working status	U16	1	N/A	
545	0x0221	RO	DCDC6 working status	U16	1	N/A	
546	0x0222	RO	DCDC7 working status	U16	1	N/A	
547	0x0223	RO	DCDC8 working status	U16	1	N/A	
548	0x0224	RO	DCDC9 working status	U16	1	N/A	
549	0x0225	RO	DCDC10 working status	U16	1	N/A	
550	0x0226	RO	DCDC11 working status	U16	1	N/A	
551	0x0227	RO	DCDC12 working status	U16	1	N/A	
552	0x0228	RO	DCDC13 working status	U16	1	N/A	

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
553	0x0229	RO	DCDC14 working status	U16	1	N/A	
554	0x022A	RO	DCDC15 working status	U16	1	N/A	
555	0x022B	RO	DCDC16 working status	U16	1	N/A	
556	0x022C	RO	DCDC17 working status	U16	1	N/A	
557	0x022D	RO	DCDC18 working status	U16	1	N/A	
558	0x022E	RO	DCDC19 working status	U16	1	N/A	
559	0x022F	RO	DCDC20 working status	U16	1	N/A	
560	0x0230	RO	MPPT1 working status	U16	1	N/A	
561	0x0231	RO	MPPT2 working status	U16	1	N/A	
562	0x0232	RO	MPPT3 working status	U16	1	N/A	
563	0x0233	RO	MPPT4 working status	U16	1	N/A	
564	0x0234	RO	MPPT5 working status	U16	1	N/A	
565	0x0235	RO	MPPT6 working status	U16	1	N/A	
566	0x0236	RO	MPPT7 working status	U16	1	N/A	
567	0x0237	RO	MPPT8 working status	U16	1	N/A	
568	0x0238	RO	MPPT9 working status	U16	1	N/A	
569	0x0239	RO	MPPT10 working status	U16	1	N/A	
570	0x023A	RO	MPPT11 working status	U16	1	N/A	
571	0x023B	RO	MPPT12 working status	U16	1	N/A	
572	0x023C	RO	MPPT13 working status	U16	1	N/A	
573	0x023D	RO	MPPT14 working status	U16	1	N/A	

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
574	0x023E	RO	MPPT15 working status	U16	1	N/A	
575	0x023F	RO	MPPT16 working status	U16	1	N/A	
576	0x0240	RO	MPPT17 working status	U16	1	N/A	
577	0x0241	RO	MPPT18 working status	U16	1	N/A	
578	0x0242	RO	MPPT19 working status	U16	1	N/A	
579	0x0243	RO	MPPT20 working status	U16	1	N/A	
580	0x0244	RO	PMC status	U16	1	N/A	1: Stop 2: Running 3: Fault 4: Communication interruption

3. PUC Control Register Definitions

PUC control information address 700-799

700-799: PUC Control and Parameter Configuration Information

Table 3-1 PUC Control Register Definitions

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
700	0x02BC	RW	Start/stop control	U16	1	N/A	2: Stop 6: Run
702	0x02BE	RW	Active power control	I16	0.1	kW	A negative value indicates battery charge and a positive value means battery discharge.
704	0x02C0	RW	Clear fault	U16	1	N/A	0: Not clear 1: Clear
705	0x02C1	RW	Electrical cabinet fan start temperature	U16	1	℃	40℃~60℃ (default 47℃)
706	0x02C2	RW	Electrical cabinet fan stop temperature	U16	1	℃	20℃~40℃ (default 40℃)
715	0x02CB	RW	Control right	U16	1	N/A	Control right configuration address is 0: 0：IOT control (485-2) 1：client control (485-1) 2：HMI control（CAN2）

4. BMS Register Definitions

BMS information address 15000-15999, offset 1000, total 20 BMS information.

Table 4-1 BMS Register Definitions

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
15000	0x3A98	RO	Operating status	U16	N/A	N/A	1 Shutdown 2 Running 3 Fault
15001	0x3A99	RO	Allowable discharge power limit	U16	0.1	kW	
15002	0x3A9A	RO	Allow charging power limit	U16	0.1	kW	
15003	0x3A9B	RO	Reserved	U16	N/A	N/A	
15004	0x3A9C	RO	Reserved	U16	N/A	N/A	
15005	0x3A9D	RO	Reserved	U16	N/A	N/A	
15006	0x3A9E	RO	Reserved	U16	N/A	N/A	
15007	0x3A9F	RO	Reserved	U16	N/A	N/A	
15008	0x3AA0	RO	Battery cabinet humidity	U16	0.1	%	
15009	0x3AA1	RO	Battery cabinet temperature	U16	0.1	℃	
15010	0x3AA2	RO	Reserved	U16	N/A	N/A	
15011	0x3AA3	RO	Reserved	U16	N/A	N/A	
15012	0x3AA4	RO	Detector PM2.5	U16	N/A	N/A	
15013	0x3AA5	RO	Detector temperature	U16	N/A	N/A	
15014	0x3AA6	RO	Detector CO concentration	U16	N/A	N/A	
15015	0x3AA7	RO	IO status	U16	1	N/A	Bit0: Exhaust Valve1 Bit1: Exhaust Valve2 Bit2: reserved Bit3: reserved Bit4: reserved Bit5: reserved Bit6: Smoke sensor 1 status Bit7: Smoke sensor 2 status Bit8: Fire extinguishing agent release

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
							Bit9: Water immersion state Bit10: Emergency stop signal Bit11: Trip signal Bit12: reserved Bit13: reserved bit14: reserved Bit15: External emergency signal
15016	0x3AA8	RO	System alarm 0	U16	1	N/A	Bit0: reserved Bit1: reserved Bit2: Air conditioning communication interruption Bit3: reserved Bit4: reserved Bit5: reserved Bit6: reserved Bit7: reserved Bit8: RS485 slave communication interruption Bit9: reserved Bit10: reserved Bit11: CAN2 communication interruption Bit12: Air conditioning2 communication interruption Bit13: IO controller communication interruption Bit14:Combustible gas communication interruption
15017	0x3AA9	RO	System alarm 1	U16	1	N/A	Bit0: Access control triggered Bit1: Fire sprinkler return inspection Bit2: Combustible gas Alarm
15018	0x3AAA	RO	System fault 0	U16	1	N/A	Bit0: reserved Bit1: reserved Bit2: reserved Bit3: Smoke sensor 1 triggered Bit4: Smoke sensor 2 triggered Bit5: reserved Bit6: Water immersion triggered Bit7: Jump action/EPO

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
							Bit8: Fire Release Control Bit9: Combustible gas fault Bit10: Disconnector disconnected Bit11: Exhaust valve open Bit12: External emergency signal
15019	0x3AAB	RO	System fault 1	U16	1	N/A	Bit0: Reserved Bit1: Reserved Bit2: BMS communication interruption Bit3: Reserved Bit4: Reserved Bit5: Reserved Bit6: Reserved Bit7: Reserved Bit8: Continuous startup failure
15020	0x3AAC	RO	Air conditioner 1 status	U16	1	N/A	1: Shutdown, 2: Power on, 3: Fault
15021	0x3AAD	RO	Air conditioner 2 status	U16	1	N/A	1: Shutdown, 2: Power on, 3: Fault
15022	0x3AAE	RO	Reserved	U16	N/A	N/A	Bit0: Temperature high limit Bit1: Temperature low limit Bit2: SOC high limit Bit3: SOC low limit Bit4: High voltage charge protection forbidden limit Bit5: Low voltage discharge protection forbidden limit Bit6: RS485 communication interruption limit Bit7: CAN communication interruption limit Bit8: Battery cabinet door opening limit
15024	0x3AB0	RO	Reserved	U16	N/A	N/A	
15025	0x3AB1	RO	Reserved	U16	N/A	N/A	
15027	0x3AB3	RO	Year	U16	1	N/A	
15028	0x3AB4	RO	Month	U16	1	N/A	
15029	0x3AB5	RO	Day	U16	1	N/A	
15030	0x3AB6	RO	Hour	U16	1	N/A	
15031	0x3AB7	RO	Minute	U16	1	N/A	

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
15032	0x3AB8	RO	Second	U16	1	N/A	
15033	0x3AB9	RO	BC software version number	U16	N/A	N/A	
15034	0x3ABA	RO	Boot version number	U16	N/A	N/A	
15035	0x3ABB	RO	Reserved	U16	N/A	N/A	
15036	0x3ABC	RO	Reserved	U16	N/A	N/A	
15037	0x3ABD	RO	Reserved	U16	N/A	N/A	
15038	0x3ABE	RO	Reserved	U16	N/A	N/A	
15039	0x3ABF	RO	Reserved	U16	N/A	N/A	
15040	0x3AC0	RO	Battery pack status	U16	N/A	N/A	1: Stop 2: Running 3: Fault
15041	0x3AC1	RO	Total battery pack voltage	U16	0.1	V	
15042	0x3AC2	RO	Battery pack current	U16	0.1	A	Range: -3000~3000A Offset: -3000A
15043	0x3AC3	RO	Battery pack SOC	U16	1	%	0~105
15044	0x3AC4	RO	Battery pack SOH	U16	1	%	0~100
15045	0x3AC5	RO	Maximum charging current	U16	0.1	A	Range: -3000~3000A Offset: -3000A
15046	0x3AC6	RO	Maximum discharge current	U16	0.1	A	Range: -3000~3000A Offset: -3000A
15047	0x3AC7	RO	DO status	U16	N/A	N/A	Bit2: Intermediate contactor Bit1: Reserved Bit0: Main contactor
15048	0x3AC8	RO	DI status	U16	N/A	N/A	Bit4: Repair switch Bit3: Isolation switch Bit2: Emergency stop signal Bit1: Intermediate contactor Bit0: Main contactor
15049	0x3AC9	RO	Highest cell voltage	U16	0.001	V	Range: 1~4.5V
15050	0x3ACA	RO	Lowest cell voltage	U16	0.001	V	Range: 1~4.5V
15051	0x3ACB	RO	Battery cell number with highest voltage	U16	1		Range: 0~300

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
15052	0x3ACC	RO	Battery cell number with lowest voltage	U16	1		Range: 0~300
15053	0x3ACD	RO	Highest cell temperature	U16	1	℃	Range: -40~120 ℃, offset: -40 ℃
15054	0x3ACE	RO	Lowest cell temperature	U16	1	℃	Range: -40~120 ℃, offset: -40 ℃
15055	0x3ACF	RO	Battery cell number with highest temperature	U16	1		Range: 0~300
15056	0x3AD0	RO	Battery cell number with lowest temperature	U16	1		Range: 0~300
15057	0x3AD1	RO	High voltage charge forbidden flag	U16	1		0: Normal 1: Charge forbidden
15058	0x3AD2	RO	Low voltage charge forbidden flag	U16	1		0: Normal 1: Discharge forbidden
15059	0x3AD3	RO	Battery pack alarm 0	U16	N/A	N/A	BIT0: Battery cell low voltage alarm BIT1: Battery cell high voltage alarm BIT2: Low voltage alarm of battery pack BIT3: Battery pack high voltage alarm BIT4: Low temperature charge alarm BIT5: High temperature charge alarm BIT6: Low temperature discharge alarm BIT7: High temperature discharge alarm BIT8: Battery pack charge overcurrent alarm BIT9: Battery pack discharge overcurrent alarm BIT10: Low voltage alarm of

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
							battery module BIT11: Battery module high voltage alarm BIT12: Single cell voltage differential alarm BIT13: SOC low alarm BIT14: Insulation low (KΩ) alarm BIT15: SOC high alarm
15060	0x3AD4	RO	Battery pack alarm 1	U16	N/A	N/A	
15061	0x3AD5	RO	Battery pack fault 0	U16	N/A	N/A	BIT0: Battery cell low voltage fault BIT1: Battery cell high voltage fault BIT2: Low voltage fault of battery pack BIT3: Battery pack high voltage fault BIT4: Low temperature charge fault BIT5: High temperature charge fault BIT6: Low temperature discharge fault BIT7: High temperature discharge fault BIT8: Battery pack charge overcurrent fault BIT9: Battery pack discharge overcurrent fault BIT10: Low voltage fault of battery module BIT11: Battery module high voltage fault BIT12: Single cell voltage differential fault BIT13: SOC low fault BIT14: Insulation low (KΩ) fault BIT15: SOC high fault
15062	0x3AD6	RO	Battery pack fault 1	U16	N/A	N/A	BIT0: Single cell voltage acquisition fault

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
							BIT1: Individual temperature acquisition fault BIT2: BMM communication fault BIT3: Input overvoltage fault BIT4: Input reverse fault BIT5: Circuit breaker/contactor fault BIT6: Temperature rise fault BIT7: Other faults
15063	0x3AD7	RO	Number of cycles	U16	N/A	N/A	
15064	0x3AD8	RO	Software version	U16	N/A	N/A	
15065	0x3AD9	RO	High precision SOC	U16	0.1	%	
15066	0x3ADA	RO	Differential voltage	U16	0.001	V	Range: 1~4.5V
15067	0x3ADB	RO	DC power	U16	0.1	kW	
15068	0x3ADC	RO	Average temperature	U16	1	N/A	
15100	0x3AFC	RO	Cell voltage information of battery pack	U16	0.001	V	Range: 1~ 4.5V
15549	0x3CBD	RO	Cell voltage information of battery pack	U16	0.001	V	Range: 1~ 4.5V
15550	0x3CBE	RO	Cell temperature information of battery pack	U16	1	℃	Range: -40~ 120℃, offset: -40℃
15999	0x3E7F	RO	Cell temperature information of battery pack	U16	1	℃	Range: -40~ 120℃, offset: -40℃

5. PCS Register Definitions

PCS information address 4000-4099, offset 100, total 20 PCS information.

Table 5-1 PCS Register Definitions

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
4000	0x0FA0	RO	AC phase A voltage	U16	0.1	V	
4001	0x0FA1	RO	AC phase B voltage	U16	0.1	V	
4002	0x0FA2	RO	AC phase C voltage	U16	0.1	V	
4003	0x0FA3	RO	AC phase A current	I16	0.1	A	
4004	0x0FA4	RO	AC phase B current	I16	0.1	A	
4005	0x0FA5	RO	AC phase C current	I16	0.1	A	
4006	0x0FA6	RO	AC active power	I16	0.1	KW	
4007	0x0FA7	RO	AC reactive power	I16	0.1	KW	
4008	0x0FA8	RO	AC apparent power	I16	0.1	kVar	
4009	0x0FA9	RO	AC frequency	U16	0.01	kVA	
4010	0x0FAA	RO	Power factor	I16	0.001	Hz	
4011	0x0FAB	RO	DC port voltage	U16	0.1	V	
4012	0x0FAC	RO	DC port current	I16	0.1	A	
4013	0x0FAD	RO	DC port power	I16	0.1	KW	
4014	0x0FAE	RO	Module IGBT1 temperature	I16	0.1	℃	
4015	0x0FAF	RO	Module IGBT2 temperature	I16	0.1	℃	
4016	0x0FB0	RO	Module IGBT3 temperature	I16	0.1	℃	
4017	0x0FB1	RO	Module IGBT4 temperature	I16	0.1	℃	
4018	0x0FB2	RO	Module IGBT5 temperature	I16	0.1	℃	

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
4019	0x0FB3	RO	Module IGBT6 temperature	I16	0.1	℃	
4020	0x0FB4	RO	Module air inlet temperature	I16	0.1	℃	
4021	0x0FB5	RO	Module air outlet temperature	I16	0.1	℃	
4022	0x0FB6	RO	AC phase A active power	I16	0.1	KW	
4023	0x0FB7	RO	AC phase B active power	I16	0.1	KW	
4024	0x0FB8	RO	AC phase C active power	I16	0.1	KW	
4025	0x0FB9	RO	DC bus voltage	U16	0.1	V	
4026	0x0FBA	RO	Device Operating status word	U16	1		bit0: 0 shutdown 1 power on bit1~bit3: working status 1: shutdown 2: self-test 3: grid-connected operation 4: off-grid operation 5: standby bit4~bit5: charge and discharge status 0: standby 1: charging 2: discharging bit6~bit8: power derating status 0: no derating 1: temperature derating 2: derating due to low AC voltage 3: derating due to high DC voltage bit9: 0 slave 1 master bit10: 0 no fault 1 faulty bit11~bit15: reserved
4027	0x0FBB	RO	System comprehensive fault word (Fault 1)	U16	1		Bit0: Phase-Locked Loop (PLL) Alarm Bit1: DC side hardware soft start fault Bit2: AC side hardware soft

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
							start fault Bit3: DC software soft start fault Bit4: Grid resonance fault Bit5: Input impedance fault Bit6: Input impedance alarm Bit7: CANB communication abnormality alarm Bit8: System address conflict fault Bit9: System master address conflict fault Bit10: Module address abnormality fault Bit11: DC voltage sampling fault alarm Bit12: AC voltage sampling abnormality alarm Bit13: DC side main relay alarm Bit14: Bus Bar Voltage Imbalance Alarm Bit15: Overload alarm
4028	0x0FBC	RO	System environment fault word (Fault 2)	U16	1		Bit0: Positive busbar second level overvoltage alarm Bit1: Negative busbar second level overvoltage alarm Bit2: Module A1 phase overcurrent alarm Bit3: Module B1 phase overcurrent alarm Bit4: Module C1 phase overcurrent alarm Bit5: Module A2 phase overcurrent alarm Bit6: Module B2 phase overcurrent alarm Bit7: Module C2 phase overcurrent alarm Bit8: Auxiliary power supply fault Bit9: Parallel CANA communication fault

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
							Bit10: Fan 1 fault Bit11: Fan 2 fault Bit12: Fan 3 fault Bit13: Inverter overvoltage alarm Bit14: Inverter undervoltage alarm Bit15: Emergency stop failure
4029	0x0FBD	RO	System hardware fault word (Fault 3)	U16	1		Bit0: Grid high voltage alarm Bit1: Grid low voltage alarm Bit2: Grid high frequency alarm Bit3: Grid low frequency alarm Bit4: Busbar high voltage alarm Bit5: Busbar low voltage alarm Bit6: Positive busbar first level overvoltage alarm Bit7: Negative busbar first level overvoltage alarm Bit8: DC port overvoltage alarm Bit9: DC port undervoltage alarm Bit10: Grid phase sequence alarm Bit11: Inverter phase sequence alarm Bit12: Inverter amplitude locking alarm Bit13: AC output short circuit fault Bit14: AC current sampling fault Bit15: RS485 communication fault
4030	0x0FBE	RO	System temperature fault word (Fault 4)	U16	1		Bit0: Inlet high ambient temperature alarm Bit1: Outlet high ambient temperature alarm Bit2: Module A2 high temperature alarm Bit3: Module B2 high temperature alarm Bit4: Module C2 high

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
							temperature alarm Bit5: Module A1 high temperature alarm Bit6: Module B1 high temperature alarm Bit7: Module C1 high temperature alarm Bit8: Module A2 temperature sensor fault Bit9: Module B2 temperature sensor fault Bit10: Module C2 temperature sensor fault Bit11: Module A1 temperature sensor fault Bit12: Module B1 temperature sensor fault Bit13: Module C1 temperature sensor fault Bit14: AC constant voltage mode grid connection fault Bit15: DSP software version mismatch fault
4031	0x0FBF	RO	Software version number high byte	U16	1	N/A	
4032	0x0FC0	RO	Software version number low byte	U16	1	N/A	
4033	0x0FC1	RO	Hardware version number high byte	U16	1	N/A	
4034	0x0FC2	RO	Hardware version number low byte	U16	1	N/A	
4035	0x0FC3	RO	Reserved	U16	1	N/A	
4036	0x0FC4	RO	AC start/stop	U16	1	N/A	
4037	0x0FC5	RO	AC operating mode setting	U16	1	N/A	
4038	0x0FC6	RO	Active power setting	I16	0.1	KW	
4039	0x0FC7	RO	Module RS485	U16	1	N/A	

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
			communication address				
4040	0x0FC8	RO	Module CAN communication address	U16	1	N/A	
4041	0x0FC9	RO	RS485 communication baud rate	U16	1	N/A	
4042	0x0FCA	RO	CAN communication baud rate	U16	1	N/A	
4043	0x0FCB	RO	Fault 5	U16	1	N/A	Bit0: Reserved Bit1: Reserved Bit2: Reserved Bit3: PCS module: inverter island protection Bit4: Reserved Bit5: PCS module: grid-connected and off-grid switching error Bit6: Reserved Bit7: Reserved Bit8: Reserved Bit9: PCS module: AC bus voltage abnormality Bit10: PCS module: AC phase loss Bit11: Reserved Bit12: Reserved Bit13: PCS module: low battery level Bit14: PCS module: DC input overcurrent Bit15: Reserved
4044	0x0FCC	RO	Fault 6	U16	1	N/A	Bit0: PCS module: Phase-Locked Loop (PLL) failure Bit1: PCS module: high ambient temperature Bit2: PCS module: ambient temperature probe fault Bit3: PCS module: cabinet temperature probe fault

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
							Bit4: PCS module: high cabinet temperature Bit5: PCS module: off-grid voltage phase loss Bit6: PCS module: AC current harmonic abnormality Bit7~Bit15: reserved
4045	0x0FCD	RO	Fault 7	U16	1	N/A	Bit0: PCS module: 24V auxiliary power supply fault Bit1: Reserved Bit2: PCS module: grounding fault Bit3: Reserved Bit4: Reserved Bit5: PCS module: module current imbalance Bit6: Reserved Bit7: PCS module: DC relay open circuit Bit8: PCS module: parameter calibration abnormality Bit9: PCS module: busbar voltage imbalance Bit10: PCS module: insurance fault Bit11: PCS module: DSP initialization fault Bit12: Reserved Bit13: PCS module: CANA communication fault Bit14: PCS module: DC input reverse connection Bit15: PCS module: AC current DC component abnormality
4046	0x0FCE	RO	Fault 8	U16	1	N/A	Bit0: PCS module: transformer overtemperature Bit1: PCS module: U2 communication abnormality 2 Bit2: PCS module: BMS fault or DC switch disconnected Bit3: PCS module: lightning arrester fault

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
							Bit4: PCS module: overload timeout fault Bit5: PCS module: AC soft start failure Bit6: PCS module: synchronization signal fault 1 Bit7: reserved Bit8: PCS module: AC relay open circuit Bit9: PCS module: sampling zero point abnormality Bit10: PCS module: U2 communication abnormality 1 Bit11: PCS module: 15V auxiliary power supply fault Bit12: PCS module: module duplicate number fault Bit13: PCS module: RS485 communication fault Bit14: reserved Bit15: PCS module: excessive restarts
4047	0x0FCF	RO	Fault 9	U16	1	N/A	Bit0: PCS module: CPLD version fault Bit1: PCS module: hardware version fault Bit2: PCS module: DC relay short circuit Bit3: PCS module: DC busbar undervoltage Bit4: PCS module: AC relay short circuit Bit5: PCS module: synchronization signal fault 2 Bit6: PCS module: parameter mismatch Bit7: PCS module: CANC communication fault Bit8: PCS module: high ambient humidity Bit9: PCS module: BMS voltage abnormality

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
							Bit10: PCS module: BMS current abnormality Bit11: PCS module: BMS temperature abnormality Bit12: PCS module: BMS shutdown fault Bit13: PCS module: insulation detection abnormality Bit14: PCS module: hardware sampling abnormality Bit15: PCS module: remote communication loss
4048	0x0FD0	RO	Fault 10	U16	1	N/A	Bit0: Reserved Bit1: Reserved Bit2: Reserved Bit3: Reserved Bit4: PCS: PE-N contactor short circuit Bit5: PCS: PE-N contactor open circuit Bit6: PCS: N contactor short circuit Bit7: PCS: N contactor open circuit Bit8: PCS: Grid access abnormality Bit9: Reserved Bit10: PCS: Grid voltage distortion Bit11: PCS: Input dry contact 4 failure Bit12: PCS: Input dry contact 5 failure Bit13: Reserved Bit14: Reserved Bit15: Reserved
4049	0x0FD1	RO	Cumulative AC charging energy H	U16	1	kWh	
4050	0x0FD2	RO	Cumulative AC charging energy L	U16	1	kWh	

No.	Register Address (HEX)	Read/ Write	Signal Name	Data Type	Gain Coeff.	Unit	Explanation
4051	0x0FD3	RO	Cumulative AC discharging energy H	U16	1	kWh	
4052	0x0FD4	RO	Cumulative AC discharging energy L	U16	1	kWh	
4053	0x0FD5	RO	Single/parallel flag	U16	1	N/A	
4054	0x0FD6	RO	Number of parallel machines	U16	1	N/A	
4055	0x0FD7	RO	Local parallel address	U16	1	N/A	
4056	0x0FD8	RO	Master-slave identity	U16	1	N/A	