Off/ON-Grid Energy Storage Inverter Modbus Protocol

Protocol Version: V2.6.3

Revised by: Bruce
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V2.0.0: 1. Added grid-connected standard configuration-related registers based on Home Storage Inverter V1.6 2. Updated fault alarm table
V2.1.0: 1. Added nameplate information C7B4-C7C6 required for IEEE1547 communication certification 2. Added fan speed duty cycle information register 757E 3. Added grid-connected reactive power dynamic adjustment rate register
V2.1.0: 1. Added external current calibration coefficients, BB9C-BB9E 2. Swapped the meanings of CBAA and CBAB registers; previous descriptions did not match actual functions.
V2.2.0 1. Added A0B1 register to configure battery rated AH data. 2. Added special-purpose registers 0xFE06–0xFE19 3. Added registers C7AC-C7B3 to transmit machine operation log data.
V2.3.0 1. Added FE15 register to select whether to enable WiFi power management scheduling. 2. Adjusted the definition of the A088 register to enable the anti-backflow grid feed switch.
V2.40 1. Updated special-purpose registers after FE06, adding scheduling registers for six parallel machines 2. Added registers 7541-7543 to display data from the third PV channel. 3. Added grid-tie self-test related registers: A0F2-A0F3, 9C48, 75BB-75DD, 7599 4. Added intelligent socket for inverter power generation compensation to A034 register definition.

V2.50 1. Calibration registers BBBA-BBC3 2. Added battery type options 14-17, representing 10-13 series lithium iron phosphate battery types. 3. Added register A076 for backflow prevention accuracy calibration. 4. Added second output for certain home storage models; corresponding control registers are A077-A079. 5. Adjusted the multiplier for the slope registers of the F(P) curve (A0BE-A0BF). 6. Added register A083: Enables charging without neutral line when grid power is available.
V2.60 1. Added PV3-PV4 voltage/current/power display registers (7541-7546) 2. Added A0F4-A0F7 grid-tie F-P curve freeze point registers 3. Added A082 balcony AC coupling enable register 4. Added A0B2 mixed grid mode battery maximum discharge current register 5. Added FE14 parameter setting and alarm information update flag register 6. Added FE1B-FE1F energy management PV single-channel power registers
V2.62 1. Added micro-inverter grid-connected power and current registers (758A-758B) 2. Added feed-in electricity and utility electricity consumption statistics (CB6C-CB72) 3. Added BMS heating film alarm and status register (75B3)
V2.63 1. Added Belgium to grid connection standards 2. Added Ruiju and Wendi custom protocols to BMS protocol

Home Storage Inverter MODBUS Protocol Format Specification

This document defines a protocol adhering to the Modbus-RTU communication protocol, supporting function codes 03, 06, and 10, with a maximum of 32 registers read or written per operation.

2. Serial Communication Parameters

9600,n,8,1, indicating baud rate 9600, 8 data bits, no parity.

RS485 connection is master-slave. Default inverter address is 1, configurable. Supports universal address 255. In one-to-one host-inverter connections, address 255 enables communication access to the inverter, with the inverter responding to the queried address.

3. Data Format

Slave Address	Function Code	Data Length or Data Content	CRC Check
1 byte	1 byte	N bytes	2 bytes
Slave Address Range: 01H~FEH Host Broadcast Address: 0 Universal Address: FFH	Read multiple registers	Command-dependent	Check range: All data from the slave address up to the point before the CRC check. Transmission Order: The CRC calculation yields a 16-bit result. During actual transmission, the low-order byte must be sent first, followed by the high-order byte.
	Writing a Single Register		
	Writing Multiple Registers		
	Invalid		

3.1 Data Frame Format for Reading

Host Frame Format:

Slave Address	Functi	Data Field				CRC Check	
1 byte	1 byte	4 bytes				2 bytes	
Actual Address	03H	Register Address High Byte	Register Address Low Byte	High byte of register count N, typically 00H	Low byte of register count N (N ⩽ 32)	CRC_L	CRC_H

Slave data frame format:

Slave Address	Functi	Data Field						CRC Check	
1 byte	1 byte	(2*N+1) bytes						2 bytes	
		1 byte	1 byte	1 byte	1 byte	1 byte	…		
Actual Address	03H	Byte length of returned data	Returned data					CRC_L	CRC_H
			Value of Register 1		Value of Register 2		…		
			High byte	Low byte	High byte	Low byte	…		

Slave error frame format:

Slave Address	Functi	Error code	CRC Check	
1 byte	1 byte	1 byte	2 bytes	
Actual Address	83H	See error code table	CRC_L	CRC_H

3.2 Multiple Data Frame Writing Format

Host Frame Format:

Slave Address		Data Field						CRC Check	
1 byte	1 byte	5+2*N bytes						2 bytes	
		1 byte	1 byte	1 byte	1 byte	1 byte	2*N bytes		
Actual Address	10H	Register Address		Number of Registers		Data Length	Values of N registers High byte first Low byte last	CRC_L	CRC_H
		High byte	Low byte	High byte	Low byte	2*N			

Slave response frame format:

Slave Address		Data Length				CRC Check	
1 byte	1 byte	1 byte	1 byte	1 byte	1 byte	2 bytes	
Actual Address	10H	Register Address		Number of Registers			
		High byte	Low byte	High byte	Low byte	CRC_L	CRC_H

Slave error frame format:

Slave Address		Error code	CRC Check	
1 byte	1 byte	1 byte	2 bytes	
Actual Address	90H	See error code table	CRC_L	CRC_H

3.3 Single Data Frame Write Format

Host Frame Format:

Slave Address		Data Field				CRC Check	
1 byte	1 byte	1 byte	1 byte	1 byte	1 byte	2 bytes	
Actual Address	06H	Register Address		Register Value		CRC_L	CRC_H
		High byte	Low byte	High byte	Low byte		

Slave response frame format:

Slave Address		Data Field				CRC Check	
1 byte	1 byte	1 byte	1 byte	1 byte	1 byte	2 bytes	
Actual Address	06H	Register Address		Register Value		CRC_L	CRC_H
		High byte	Low byte	High byte	Low byte		

Slave error frame format:

Slave Address		Error code	CRC Check	
1 byte	1 byte	1 byte	2 bytes	
Actual Address	86H	See error code table	CRC_L	CRC_H

3.4 Error Code Table

Code	Name	Meaning
01H	Illegal Command	The slave device may not support this command
02H	Invalid Data Address	The register address requested by the master exceeds the valid register address range defined by the slave.
03H	Illegal Data Value	The value requested by the host for the register exceeds the range defined by the slave for that register value
04H	Operation Failed	The parameter was set to an invalid value during the parameter write operation, or the slave's current state does not support executing this command.
05H	Password error	The password written to the password verification address is incorrect.
06H	Data frame error	When the data frame length in the frame information sent by the host is incorrect, or when the CRC check bit in the RTU format differs from the check value calculated by the slave device.
07H	Parameter is read-only	The parameter modified during the host write operation is a read-only parameter.
08H	Parameters cannot be	The parameter modified during the host write operation is a parameter that cannot be changed during operation.
09H	Password protection	When the host performs a read or write operation, if a user password is set but the password lock has not been unlocked, the system will report that it is locked.
0AH	Length error	Number of registers read/written exceeds maximum supported count 32
0BH	Insufficient Permissions	Insufficient privileges to perform this operation

4. CRC Check Calculation

The CRC field verifies the entire frame content, encompassing all data from the slave address up to the point preceding the CRC check. The slave recalculates the CRC check data and compares it with the verification value in the received data stream to determine the validity of the received data. The CRC field consists of two bytes of 16-bit binary data, transmitted in the order of the low-order byte first, followed by the high-order byte.

Three methods exist for calculating the CRC check value, all yielding identical results. Choose freely based on practical circumstances.

Method 1: Bitwise Cyclic Redundancy Check

```
unsigned int crc_cal_value(unsigned char* data_value, unsigned char data_length)
{
    int i;
    unsigned int crc_value = 0xffff;
    while (data_length--)
    {
        crc_value ^= *data_value++;
        for (i = 0; i < 8; i++)
        {
           if(crc_value & 0x0001)
               crc_value = (crc_value >> 1) ^ 0xa001;
           else
               crc_value = crc_value >> 1;
        }
    }
    return(crc_value);
}
```

Method 2: Byte Lookup Table Approach

```
 static unsigned int auchCRCHi[] =
{0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,
 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,
 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,
 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,
 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,
 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,
 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,
 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,
};
```

/* CRC value for the lower byte */

```
static unsigned int auchCRCLo[] =
{
0x00, 0xC0, 0xC1, 0x01, 0xC3, 0x03, 0x02, 0xC2, 0xC6, 0x06, 0x07, 0xC7, 0x05, 0xC5, 0xC4, 0x04,
0xCC, 0x0C, 0x0D, 0xCD, 0x0F, 0xCF, 0xCE, 0x0E, 0x0A, 0xCA, 0xCB, 0x0B, 0xC9, 0x09, 0x08, 0xC8,
0xD8, 0x18, 0x19, 0xD9, 0x1B, 0xDB, 0xDA, 0x1A, 0x1E, 0xDE, 0xDF, 0x1F, 0xDD, 0x1D, 0x1C, 0xDC,
0x14, 0xD4, 0xD5, 0x15, 0xD7, 0x17, 0x16, 0xD6, 0xD2, 0x12, 0x13, 0xD3, 0x11, 0xD1, 0xD0, 0x10,
0xF0, 0x30, 0x31, 0xF1, 0x33, 0xF3, 0xF2, 0x32, 0x36, 0xF6, 0xF7, 0x37, 0xF5, 0x35, 0x34, 0xF4,
0x3C, 0xFC, 0xFD, 0x3D, 0xFF, 0x3F, 0x3E, 0xFE, 0xFA, 0x3A, 0x3B, 0xFB, 0x39, 0xF9, 0xF8, 0x38,
0x28, 0xE8, 0xE9, 0x29, 0xEB, 0x2B, 0x2A, 0xEA, 0xEE, 0x2E, 0x2F, 0xEF, 0x2D, 0xED, 0xEC, 0x2C,
0xE4, 0x24, 0x25, 0xE5, 0x27, 0xE7, 0xE6, 0x26, 0x22, 0xE2, 0xE3, 0x23, 0xE1, 0x21, 0x20, 0xE0,
0xA0, 0x60, 0x61, 0xA1, 0x63, 0xA3, 0xA2, 0x62, 0x66, 0xA6, 0xA7, 0x67, 0xA5, 0x65, 0x64, 0xA4,
0x6C, 0xAC, 0xAD, 0x6D, 0xAF, 0x6F, 0x6E, 0xAE, 0xAA, 0x6A, 0x6B, 0xAB, 0x69, 0xA9, 0xA8, 0x68,
0x78, 0xB8, 0xB9, 0x79, 0xBB, 0x7B, 0x7A, 0xBA, 0xBE, 0x7E, 0x7F, 0xBF, 0x7D, 0xBD, 0xBC, 0x7C,
0xB4, 0x74, 0x75, 0xB5, 0x77, 0xB7, 0xB6, 0x76, 0x72, 0xB2, 0xB3, 0x73, 0xB1, 0x71, 0x70, 0xB0,
0x50, 0x90, 0x91, 0x51, 0x93, 0x53, 0x52, 0x92, 0x96, 0x56, 0x57, 0x97, 0x55, 0x95, 0x94, 0x54,
0x9C, 0x5C, 0x5D, 0x9D, 0x5F, 0x9F, 0x9E, 0x5E, 0x5A, 0x9A, 0x9B, 0x5B, 0x99, 0x59, 0x58, 0x98,
0x88, 0x48, 0x49, 0x89, 0x4B, 0x8B, 0x8A, 0x4A, 0x4E, 0x8E, 0x8F, 0x4F, 0x8D, 0x4D, 0x4C, 0x8C,
0x44, 0x84, 0x85, 0x45, 0x87, 0x47, 0x46, 0x86, 0x82, 0x42, 0x43, 0x83, 0x41, 0x81, 0x80, 0x40,
};

/* Function returns CRC as unsigned short type    */
/* Parameter puchMsg   :  Message used for CRC calculation */
/* Parameter usDataLen :  Number of bytes in the message    */
unsigned int CRC16(unsigned int * puchMsg, unsigned int usDataLen)
{
   unsigned int uchCRCHi = 0xFF; /* Initialize the high byte of the CRC */
   unsigned int uchCRCLo = 0xFF; /* Initialize CRC low byte */
   unsigned int uchCRCHi = 0xFF; /* CRC lookup table index */

   while (usDataLen--)    /* Process entire message buffer */
   {
      uIndex = uchCRCLo ^ *puchMsg++; /* Calculate CRC */
      uchCRCLo = uchCRCHi ^ auchCRCHi[uIndex];
      uchCRCHi = auchCRCLo[uIndex];
   }
   return (uchCRCHi << 8 | uchCRCLo);
}
```

Method 3: Byte Lookup Table Method

```
Static unsigned int tblCRC[] =
{
 0x0000,0xC1C0,0x81C1,0x4001,0x01C3,0xC003,0x8002,0x41C2,
 0x01C6, 0xC006, 0x8007, 0x41C7, 0x0005, 0xC1C5, 0x81C4, 0x4004,
 0x01CC, 0xC00C, 0x800D, 0x41CD, 0x000F, 0xC1CF, 0x81CE, 0x400E,
 0x000A, 0xC1CA, 0x81CB, 0x400B, 0x01C9, 0xC009, 0x8008, 0x41C8,
 0x01D8, 0xC018, 0x8019, 0x41D9, 0x001B, 0xC1DB, 0x81DA, 0x401A,
 0x001E, 0xC1DE, 0x81DF, 0x401F, 0x01DD, 0xC01D, 0x801C, 0x41DC,
 0x0014, 0xC1D4, 0x81D5, 0x4015, 0x01D7, 0xC017, 0x8016, 0x41D6,
 0x01D2,0xC012,0x8013,0x41D3,0x0011,0xC1D1,0x81D0,0x4010,
 0x01F0, 0xC030, 0x8031, 0x41F1, 0x0033, 0xC1F3, 0x81F2, 0x4032,
 0x0036, 0xC1F6, 0x81F7, 0x4037, 0x01F5, 0xC035, 0x8034, 0x41F4,
 0x003C, 0xC1FC, 0x81FD, 0x403D, 0x01FF, 0xC03F, 0x803E, 0x41FE,
 0x01FA,0xC03A,0x803B,0x41FB,0x0039,0xC1F9,0x81F8,0x4038,
 0x0028, 0xC1E8, 0x81E9, 0x4029, 0x01EB, 0xC02B, 0x802A, 0x41EA,
 0x01EE,0xC02E,0x802F,0x41EF,0x002D,0xC1ED,0x81EC,0x402C,
 0x01E4, 0xC024, 0x8025, 0x41E5, 0x0027, 0xC1E7, 0x81E6, 0x4026,
 0x0020,0xC1E2,0x81E3,0x4023,0x01E1,0xC021,0x8020,0x41E0,
```

```
0x0022,0xC1E2,0x81E3,0x4023,0x01E1,0xC021,0x8020,0x41E0,
0x01A0, 0xC060, 0x8061, 0x41A1, 0x0063, 0xC1A3, 0x81A2, 0x4062,
0x0066, 0xC1A6, 0x81A7, 0x4067, 0x01A5, 0xC065, 0x8064, 0x41A4,
0x006C, 0xC1AC, 0x81AD, 0x406D, 0x01AF, 0xC06F, 0x806E, 0x41AE,
0x01AA, 0xC06A, 0x806B, 0x41AB, 0x0069, 0xC1A9, 0x81A8, 0x4068,
0x0078, 0xC1B8, 0x81B9, 0x4079, 0x01BB, 0xC07B, 0x807A, 0x41BA,
0x01BE,0xC07E,0x807F,0x41BF,0x007D,0xC1BD,0x81BC,0x407C,
0x01B4, 0xC074, 0x8075, 0x41B5, 0x0077, 0xC1B7, 0x81B6, 0x4076,
0x0072, 0xC1B2, 0x81B3, 0x4073, 0x01B1, 0xC071, 0x8070, 0x41B0,
0x0050, 0xC190, 0x8191, 0x4051, 0x0193, 0xC053, 0x8052, 0x4192,
0x0196, 0xC056, 0x8057, 0x4197, 0x0055, 0xC195, 0x8194, 0x4054,
0x019C, 0xC05C, 0x805D, 0x419D, 0x005F, 0xC19F, 0x819E, 0x405E,
0x005A, 0xC19A, 0x819B, 0x405B, 0x0199, 0xC059, 0x8058, 0x4198,
0x0188,0xC048,0x8049,0x4189,0x004B,0xC18B,0x818A,0x404A,
0x004E, 0xC18E, 0x818F, 0x404F, 0x018D, 0xC04D, 0x804C, 0x418C,
0x0044, 0xC184, 0x8185, 0x4045, 0x0187, 0xC047, 0x8046, 0x4186,
0x0182, 0xC042, 0x8043, 0x4183, 0x0041, 0xC181, 0x8180, 0x4040,
};
/* Function returns CRC as unsigned short type    */
/* Parameter puchMsg: Message used for CRC calculation */
/* Parameter usDataLen: Number of bytes in the message    */
unsigned int CRC16(unsigned int * puchMsg, unsigned int usDataLen)
{
   unsigned int uchCRCHi = 0xFF; /* Initialize the high byte of the CRC */
   unsigned int uchCRCLo = 0xFF; /* Initialize CRC low byte */
   unsigned int uIndex;      /* CRC lookup table index */
   unsigned int hi, low;

   while (usDataLen--)    /* Process entire message buffer */
   {
      uIndex = uchCRCLo ^ *puchMsg++; /* Calculate CRC */
      hi = tblCRC[uIndex] >> 8;
      low = tblCRC[uIndex] & 0xff;
      uchCRCLo = uchCRCHi ^ hi;
      uchCRCHi = low;
   }
   return (uchCRCHi << 8 | uchCRCLo);
}
```

4. Units and Dimensions

Physical Quantity	Multiplier	Description
Voltage (AC/DC)	10	16-bit unsigned integer, range 0 to 65535, corresponding to 0V to 6553.5V
Current (AC/DC)	10	16-bit unsigned integer, range 0 to 65535, corresponding to 0 A to 6553.5 A 16-bit signed integer, range -32,767 to 32,767, corresponding to -3,276.7 A to 3,276.7 A
Frequency	100	16-bit unsigned integer, range 0 to 65535, corresponding to 0 Hz to 655.35 Hz
Power (AC/DC combined)	1	16-bit unsigned integer, range 0 to 65535, corresponding to 0W to 65535W
Power Factor	1000	16-bit signed integer, range -32767 to 32767. 1000 represents 1.000
Energy	10	32-bit unsigned integer, range 0 to 4,294,967,295, corresponding to 0 kWh to 4,294,967,295.5 kWh 16-bit unsigned integer, range 0 to 65535, corresponding to 0 kWh to 6553.5 kWh
Battery capacity	1	16-bit unsigned integer, range 0 to 65535, corresponding to 0 AH to 65535 AH
Temperature	10	16-bit signed integer, range -32,767 to 32,767, corresponding to -3,276.7° C to 3,276.7° C
Note: For 32-bit data, the lower 16 bits reside at the lower addresses of the register, while the upper 16 bits occupy the higher addresses. For example, the 32-bit data 0x12345678 is stored at addresses 0x0001 and 0x0002. In the register table, the arrangement is: address 0x0001 = 0x5678, address 0x0002 = 0x1234.		

Off/ON-Grid Energy Storage Inverter MODBUS Protocol Table

Notes:
1. Graved-out font indicates temporarily inactive registers 2. Multiplier refers to the actual value as a multiple of the register value. For example, a multiplier of 0.1

Address	Len	Name	English Name	Read/ Write	Mult.	Unit	Display Format	Signed/Unsigned	Minimum	Maximum	Default	Remarks
P00 Machine Analog Signal												
7530	1	Battery Voltage	BattVolt	R	0.1	V	%.1fV	None				Battery voltage, e.g., 505 indicates 50.5V
7531	1	Battery current	BattCurr	R	0.1	A	%.1fA	Yes				Battery current, e.g., 600 indicates 60.0A; Positive current indicates discharge; negative current indicates charging
7532	1	Battery State of Charge (SOC)	BattSoc	R	1	-	%d	None				Battery remaining capacity percentage
7533	1	Battery charging power	Battery Charge Power	R	1	W	%d	None				Battery charging power
7534	1	AC Charging Current	LineChgCurr	R	0.1	A	%.1fA	Yes				Grid charging current 200 indicates 20.0A
7535	1	PV Charge Current	PvChgCurr	R	0.1	A	%.1fA	Yes				PV charging current 200 indicates 20.0A
7536	5	Battery Reserve	Battery Reserve	R	1	-	%d	None				Battery-related analog quantity reserved
753B	1	Channel 1 PV panel voltage	Pv1Volt	R	0.1	V	%.1fV	None				PV Board 1 Voltage
7530	1	Channel 1 PV Panel Current	Pv1Current	R	0.1	A	%.1fA	None				PV1 Current
753D	1	Output power of PV panel 1	Pv1Power	R	1	W	%dW	None				PV1 Power
753E	1	Second PV Panel Voltage	Pv2Volt	R	0.1	V	%.1fV	None				PV Panel 2 Voltage
753F	1	Current of PV Panel 2	Pv2Curr	R	0.1	A	%.1fA	None				PV2 Current
7540	1	Output power of PV panel 2	Pv2Power	R	1	W	%dW	None				PV2 Power
7541	1	Third PV panel voltage	Pv3Volt	R	0.1	V	%.1fV	None				PV Panel 3 Voltage (Applicable to some models)
7542	1	Third PV panel current	Pv3Curr	R	0.1	A	%.1fA	None				PV3 Current (Applicable to some models)
7543	1	Output power of the 3rd PV array	Pv3Power	R	1	W	%dW	None				PV3 Power (Applicable to some models)
7544	1	4th PV Panel Voltage	Pv4Volt	R	0.1	V	%.1fV	None				PV Panel 4 Voltage (Applicable to select models)
7545	1	4th PV Panel Current	Pv4Curr	R	0.1	A	%.1fA	None				PV4 Current (Applicable to certain models)
7546	1	4th PV Panel Output Power	Pv4Power	R	1	W	%dW	None				PV4 Power (Applicable to certain models)
7547	1	PV Reserved	PvReserve	R	1	-	%d	None				PV-Related Analog Quantity Reserved
7548	1	Phase A Output Voltage	OutVoltA	R	0.1	V	%.1fV	None				Phase A Output Voltage
7549	1	Phase A Output Current	OutCurrA	R	0.1	A	%.1fA	Yes				Phase A Output Current
754A	1	Output Frequency	OutFreq	R	0.01	Hz	%.2fHz	None				5000 indicates 50Hz
754B	1	Phase A inverter inductor current	Inverter Current A	R	0.1	A	%.1fA	Yes				Phase A inverter inductor current
754C	1	Phase A Output Active Power	OutW_A	R	1	W	%dW	Yes				Phase A Output Active Power
754D	1	Phase A apparent power	OutVA_A	R	1	VA	%dVA	Yes				Phase A apparent power
754E	1	Phase A Output Load Factor	LoadPercentA	R	1	%	%d%	None				Phase A Load Percentage
754F	1	Phase A Conventional Load Active Power	NormalLoadW_A	R	1	W	%dW	Yes				Phase A active power of conventional load (external CT sampling)
7550	1	Phase B Output Voltage	OutVoltB	R	0.1	V	%.1fV	None				Phase B output voltage (available only on three-phase units)
7551	1	Phase B Output Current	OutCurrB	R	0.1	A	%.1fA	Yes				Phase B output current, available only for three-phase units
7552	1	Phase B inverter inductor current	Inverter Current B	R	0.1	A	%.1fA	Yes				Phase B inverter inductor current, available only for three-phase units
7553	1	Phase B output active power	OutW_B	R	1	W	%dW	Yes				Phase B output active power, available only for three-phase units
7554	1	Phase B output apparent power	OutVA_B	R	1	VA	%dVA	Yes				Phase B apparent power output (available only for three-phase units)
7555	1	Phase B Output Load Factor	LoadPercentB	R	1	%	%d%	None				Phase B load percentage, available only for three-phase units
7556	1	Phase B conventional load active power	NormalLoadW_B	R	1	W	%dW	Yes				Phase B active power for conventional loads (external CT sampling)
7557	1	Phase C output voltage	OutVoltC	R	0.1	V	%.1fV	None				Phase C output voltage, available only in three-phase units
7558	1	Phase C output current	OutCurrC	R	0.1	A	%.1fA	Yes				Phase C output current, available only for three-phase units
7559	1	Phase C Inverter Inductance Current	Inverter Current C	R	0.1	A	%.1fA	Yes				Phase C inverter inductor current, available only for three-phase units
755A	1	Phase C Output Active Power	OutW_C	R	1	W	%dW	Yes				Phase C output active power, available only for three-phase units
755B	1	Phase C Output Apparent Power	OutVA_C	R	1	VA	%dVA	Yes				Phase C apparent power output (available only for three-phase units)
755C	1	Phase C Output Load Factor	LoadPercentC	R	1	%	%d%	None				Phase C load percentage (available only for three-phase units)
755D	1	Phase C conventional load active power	NormalLoadW_C	R	1	W	%dW	Yes				Phase C active power for conventional load (external CT sampling)
755E	1	Total active power output	OutSumW	R	1	W	%dW	Yes				Total active power output
755F	1	Total Appearance Power	OutSumVA	R	1	VA	%dVA	Yes				Total Appearance Power
7560	1	Overall output load factor	SumLoadPercent	R	1	%	%d%	None				Overall output load factor
7561	1	Phase A generation active power	GeneratedPowerP_A	R	1	W	%dW	Yes				Phase A Active Power Generation: Positive values indicate power generation fed into the grid, negative values indicate charging power drawn from the grid. Grid output active power
7562	1	Phase B generation active power	GeneratedPowerP_B	R	1	W	%dW	Yes				Phase B Generation Active Power: Positive values indicate power generation fed into the grid, negative values indicate charging power drawn from the grid. Grid output is active.
7563	1	Phase C generation active power	GeneratedPowerP_C	R	1	W	%dW	Yes				Phase C active power generation: Positive values indicate power generation fed into the grid, negative values indicate charging power drawn from the grid. Grid output is active.
7564	1	Phase A generation active power	GeneratedPowerS_A	R	1	VA	%dVA	Yes				Phase A Generation Power: Positive values indicate power generation fed into the grid, negative values indicate power absorption from the grid for charging. Grid output is active.
7565	1	Phase B generation active power	GeneratedPowerS_B	R	1	VA	%dVA	Yes				Phase B power output: Positive values indicate grid-connected power generation feeding into the utility grid; negative values indicate charging power being drawn from the utility grid. Utility grid output is active.
7566	1	Phase C Generation Power	GeneratedPowerS_C	R	1	VA	%dVA	Yes				Phase C inverter apparent power: Positive values indicate grid-connected power generation feeding into utility grid; negative values indicate charging power absorption from utility grid. Utility grid output is active.
7567	1	Inverter Phase A Reactive Power	GeneratedPowerQ_A	R	1	var	%dvar	Yes				Inverter Phase A Reactive Power: Positive indicates leading reactive power, negative indicates lagging reactive power (mains output active; some models lack this data)
7568	1	Inverter Phase B Reactive Power	GeneratedPowerQ_B	R	1	var	%dvar	Yes				Inverter Phase B Reactive Power. A positive value indicates leading reactive power, while a negative value indicates lagging reactive power (available when utility power is output; some models do not provide this data).
7569	1	Inverter Phase C Reactive Power	GeneratedPowerQ_C	R	1	var	%dvar	Yes				Inverter Phase C Reactive Power. A positive value indicates leading reactive power, while a negative value indicates lagging reactive power (available when utility power is output; some models do not provide this data).
756A	1	Mains Phase A Voltage	LineVoltA	R	0.1	V	%.1fV	None				Mains Phase A Voltage

756B	1	Phase A Grid Current	Line Current A	R	0.1	A	%.1fA	Yes	Mains Phase A Current, Signed Positive indicates energy output to the grid, negative indicates energy fed back into the grid
756C	1	Mains Frequency	LineFreq	R	0.01	Hz	%.2fHz	None	Mains Frequency
756D	1	Mains Phase B Voltage	LineVoltB	R	0.1	V	%.1fV	None	Mains Phase B Voltage (Available only for three-phase units)
756E	1	Mains Phase B Current	Line Current B	R	0.1	A	%.1fA	Yes	Mains Phase B Current, available only for three-phase units, signed Positive indicates energy output to the grid, negative indicates energy injection into the grid
756F	1	Mains Phase C Voltage	LineVoltC	R	0.1	V	%.1fV	None	Mains Phase C Voltage (Available only for three-phase units)
7570	1	Mains Phase C Current	LineCurrentC	R	0.1	A	%.1fA	Yes	Mains Phase C Current (Available only for three-phase meters, signed) Positive indicates energy output to the grid, negative indicates energy injection into the grid
7571	1	Grid Phase A Apparent Power	Line Power VA_A	R	1	VA	%dVA	Yes	Line Power VA Phase A Apparent Power: Positive indicates power flowing out to the utility grid, negative indicates power flowing into the utility grid
7572	1	Grid Phase B Apparent Power	LinePowerVA_B	R	1	VA	%dVA	Yes	Line Power VA Phase B Apparent Power: Positive indicates power output to the mains, negative indicates power input to the mains (not available on some models)
7573	1	Grid Phase C Apparent Power	LinePowerVA_C	R	1	VA	%dVA	Yes	Line Power Phase C Apparent Power: Positive indicates power output to the mains, negative indicates power input from the mains (not available on some models)
7574	1	Line Power A Active Power	LinePowerW_A	R	1	W	%dW	Yes	Line Power Phase A Active Power: Positive indicates power flowing out of the line, negative indicates power flowing into the line (not available on some models)
7575	1	Line Power Phase B Active Power	LinePowerW_B	R	1	W	%dW	Yes	Line B active power: Positive indicates power flowing from the utility grid, negative indicates power flowing into the utility grid (not available on some models)
7576	1	Line Power Phase C Active Power	LinePowerW_C	R	1	W	%dW	Yes	Line C active power. Positive indicates power output to the utility grid; negative indicates power input from the utility grid (not available on some models)
7577	1	Positive bus voltage	BusVoltP	R	0.1	V	%.1fV	None	Bus Voltage
7578	1	Negative bus voltage	BusVoltN	R	0.1	V	%.1fV	None	Bus Voltage
7579	1	Temperature at sampling point 1	Temperature1	R	0.1	℃	%.1f℃	Yes	Use according to actual model sampling points
757A	1	Temperature at sampling point 2	Temper2	R	0.1	℃	%.1f℃	Yes	Use according to actual model sampling points
757B	1	Temperature at Sampling Point 3	Temper3	R	0.1	℃	%.1f℃	Yes	Use according to actual model sampling points
757C	1	Temperature at sampling point 4	Temperature4	R	0.1	℃	%.1f℃	Yes	Use according to actual model sampling points
757D	1	Insulation Resistance	SIR	R	1	kΩ	%dkΩ	None	Insulation Resistance
757E	1	Fan Speed Control Duty Cycle	FanDuty	R	1	%	%d%	None	Inverter Fan Speed Control Duty Cycle
757F	5	Other Analog Quantities Reserved	OtherReserve	R	1	-	%d	None	Other Reserve Analog Quantities
7584	1	Phase A Grid-Side Active Power	GridPowerW_A	R	1	W	%dW	Yes	Grid-side Phase A active power (external CT sampling, applicable to select models)
7585	1	Phase B Grid-Side Active Power	GridPowerW_B	R	1	W	%dW	Yes	Grid-side Phase B Active Power (External CT Sampling, Available on Select Models)
7586	1	Phase C Grid-Side Active Power	GridPowerW_C	R	1	W	%dW	Yes	Grid-side Phase C Active Power (External CT Sampling, Available on Select Models)
7587	1	Phase A Grid-Side Current	GridCurr_A	R	0.1	VA	%.1fA	Yes	Grid-side Phase A Current (External CT Sampling, Available on Select Models)
7588	1	Phase B Grid-Side Current	GridCurr_B	R	0.1	VA	%.1fA	Yes	Grid-side Phase B Current (External CT sampling, available on select models)
7589	1	Phase C Grid-Side Current	GridCurr_C	R	0.1	VA	%.1fA	Yes	Grid-side Phase C Current (External CT sampling, available on select models)
758A	1	Micro-inverter AC-coupled generation power	MicroInv_PowerW	R	1	W	%dW	Yes	Microinverter AC-coupled generation power (flowing into inverter is positive, flowing out is negative; applicable to balcony models)
758B	1	Microinverter AC-coupled grid-connected current	MicroInv_Curr	R	0.1	A	%.1fA	Yes	Microinverter AC Coupled Grid-Connected Current (Positive flow toward inverter, negative flow away from inverter; applicable to balcony models)
758C	8	Grid Analog Signal Retention	Grid_Reserve	R	1	-	%d	None	Grid-Side Analog Signal Retention
P01 Machine Status Signal									
7594	1	Machine Power-On Status	Startup Status	R	1	-	%d	None	0: Initialization phase 1: Standby state 2: Grid-connected state 3: Inverter state
7595	1	Output Status	OutStatus	R	1	-	%d	None	0: No Output 1: Grid output 2: Inverter output 3: Grid Overload 4: Inverter overload
7596	1	Charging Status	Change Status	R	1	-	%d	None	0: Charging disabled 1: Constant current charging 2: Constant-voltage charging 4: Float charging 8: Battery Activation in Progress 16: Battery self-test in progress
7597	1	Machine Parallel Operation Mode	ParaMode	R	1	-	%d	None	0: Single Unit 1: Parallel Operation 2: Phase-based reference phase 3: Phase 120° out of phase with reference phase 4: Phase offset by 180° from the reference phase 5: First phase in three-phase 6: Second phase of the three-phase system 7: Third phase of the three-phase system
7598	1	Energy-saving mode	EcoMode	R	1	-	%d	None	0: Non-energy saving mode 1: Enter Energy-Saving Mode
7599	1	Grid-connected self-test status	OnGridCheckStatus	R	1	-	%d	None	0: Grid self-test not performed 1: Grid connection self-test in progress 2: Grid connection self-check completed
759A	1	Output dry contact 1 status	DryContact1	R	1	-	%d	None	0: Dry contact open 1: Dry contact closed
759B	1	Output dry contact 2 status	DryContact2	R	1	-	%d	None	0: Dry contact open 1: Dry contact closed
759D	1	Password protection status flag	PasswordStatus	R	1	-	%d	None	0: User did not enter password 1: User password entered 4: Manufacturer password entered
759D	8	System Status Bits	SysStateFlag	R	1	-	%d	None	System status information, comprising 8 registers, each with 8×16 bits. Each bit represents one system status.
75A5	8	System Alarm Bit	SysAlarmFlag	R	1	-	%d	None	System-wide alarm information, comprising 8 registers, each with 8*16 bit positions. Each bit position represents one system-wide alarm.See Table 1: Fault Description
75AD	1	DER Operation Status	DER Operation State	R	1	-	%d	None	DER Operation State 0 = Not applicable/Unknown 1 = Off 2 = Operational mode 3 = Test mode
75AE	1	DER Grid Connection Status	DERConnectState	R	1	-	%d	None	DER Grid Connection Status 0 = Connected 1 = Available 2 = Operating 3 = Test 4 = Fault/Error
75AF	1	DER Alarm Information	DER Alarm Status	R	1	-	%d	None	Bitmap 0 = DER_FAULT_OVER_CURRENT 1 = DER_FAULT_OVER_VOLTAGE 2 = DER_UNDERVOLTAGE_FAULT 3 = DER_FAULT_OVER_FREQUENCY 4 = DER_UNDER_FREQUENCY_FAULT 5 = DER_FAULT_VOLTAGE_IMBALANCE 6 = DER_FAULT_CURRENT_IMBALANCE 7 = DER_FAULT_EMERGENCY_LOCAL 8 = DER_FAULT_EMERGENCY_REMOTE 9 = DER_FAULT_LOW_POWER_INPUT 10 = DER_FAULT_PHASE_ROTATION

75B0	1	Inverter Status	DERInverterState	R	1	-	%d	None				0-N/A 1-off 2 - sleeping auto-shutdown] or DER is at low output power/voltage 3 - Starting up or ON but not producing power 4 - tracking MPPT power point 5 - forced power reduction/derating 6 - Shutting down 7 - One or more faults exist 8 - Standby (service on unit)] - DER may be at high output voltage/power 9 - Test mode
75B1	1	Battery Status	DERBattState	R	1	-	%d	None				0 - storage charging 1 - storage discharging 2-Storage Holding
75B2	1	Local/Remote Control Status	RemoteCtrlStatus	R	1	-	%d	None				0-local control 1-remote control
75B3	1	BMS Heating Film Status	BMSHeatStatus	R	1	-	%d	None				0: Heating Film Off 1: Heating film enabled
75B4	7	Status information retained 1	StatusReserve	R	1	-	%d	None				Reserve
75BB	1	Phase A self-test first-stage overvoltage trigger value	GridOVLevel1_ResultA	R	0.1	V	%.1fV	None	100	3000	2645	Self-test-derived Phase A Trigger Grid First-Order Overvoltage Protection Point
75BC	1	Phase A self-test first-stage overvoltage delay time	GridOVDelayTime1_ResultA	R	0.02	s	%.2fs	None	0.04	1200	0.12	Self-test-derived Phase A trigger network first-order overvoltage delay time
75BD	1	Phase A self-test second-stage overvoltage trigger value	GridOVLevel2_ResultA	R	0.1	V	%.1fV	None	100	3000	2645	Phase A grid second-stage overvoltage protection trigger point detected during self-test, 59.S2 test item
75BE	1	Phase A self-test second-stage overvoltage delay time	GridOVDelayTime2_ResultA	R	0.02	s	%.2fs	None	0.04	1200	0.12	Self-test obtained Phase A trigger grid second-order overvoltage delay time, 59.S2 test item
75BF	1	Phase A self-test first-stage undervoltage trigger value	GridUVLevel1_ResultA	R	0.1	V	%.1fV	None	0	3000	1840	Self-test obtained Phase A contact grid first-order undervoltage protection point, 27.S1 test item
75C0	1	Phase A self-test first-stage undervoltage delay time	GridUVDelayTime1_ResultA	R	0.02	s	%.2fs	None	0.04	1200	1.5	Self-test obtained Phase A grid-connected first-stage undervoltage delay time, 27.S1 test item
75C1	1	Phase A self-test second-stage undervoltage trigger value	GridUVLevel2_ResultA	R	0.1	V	%.1fV	None	0	3000	575	Self-test obtained Phase A grid-connected second-stage undervoltage protection point, 27.S2 test item
75C2	1	Phase A self-test second-stage undervoltage delay time	GridUVDelayTime2_ResultA	R	0.02	s	%.2fs	None	0.04	1200	0.5	Self-test obtained Phase A trigger network second-stage undervoltage delay time, 27.S2 test item
75C3	1	Phase A self-test 10-minute overvoltage protection threshold	OV10minValue_ResultA	R	0.1	V	%.1fV	None	0	3000	2530	Phase A mains overvoltage points detected during self-test lasting 10 minutes, 59.S1 test item
75C4	1	Phase B self-test first-stage overvoltage trigger value	GridOVLevel1_ResultB	R	0.1	V	%.1fV	None	100	3000	2645	Self-test-derived Phase B Trigger Grid First-Order Overvoltage Protection Point
75C5	1	Phase B self-test first-stage overvoltage delay time	GridOVDelayTime1_ResultB	R	0.02	s	%.2fs	None	0.04	1200	0.12	Self-test-derived Phase B trigger network first-order overvoltage delay time
75C6	1	Phase B self-test second-stage overvoltage trigger value	GridOVLevel2_ResultB	R	0.1	V	%.1fV	None	100	3000	2645	Phase B detected triggering grid second-stage overvoltage protection point during self-test, 59.S2 test item
75C7	1	Phase B self-test second-stage overvoltage delay time	GridOVDelayTime2_ResultB	R	0.02	s	%.2fs	None	0.04	1200	0.12	Self-test obtained Phase B trigger grid second-order overvoltage delay time, 59.S2 test item
75C8	1	Phase B self-test first-stage undervoltage trigger value	Grid Under-Voltage Level 1 Result B	R	0.1	V	%.1fV	None	0	3000	1840	Self-test obtained Phase B grid-connected first-stage undervoltage protection point, 27.S1 test item
75C9	1	Phase B self-test first-stage undervoltage delay time	GridUVDelayTime1_ResultB	R	0.02	s	%.2fs	None	0.04	1200	1.5	Self-test obtained B-phase contact grid first-order undervoltage delay time, 27.S1 test item
75CA	1	Secondary undervoltage trigger value for Phase B self-test	GridUVLevel2_ResultB	R	0.1	V	%.1fV	None	0	3000	575	Self-test obtained Phase B contact grid second-stage undervoltage protection point, 27.S2 test item
75CB	1	Phase B self-test second-stage undervoltage delay time	GridUVDelayTime2_ResultB	R	0.02	s	%.2fs	None	0.04	1200	0.5	Self-test obtained Phase B trigger network second-stage undervoltage delay time, 27.S2 test item
75CC	1	Phase B self-test 10-minute overvoltage protection threshold	OV10minValue_ResultB	R	0.1	V	%.1fV	None	0	3000	2530	Self-test detected Phase B continuous 10-minute mains overvoltage point, 59.S1 test item
75CD	1	Phase C self-test first-stage overvoltage trigger value	GridOVLevel1_ResultC	R	0.1	V	%.1fV	None	100	3000	2645	Self-test-derived Phase C Trigger Grid First-Order Overvoltage Protection Point
75CE	1	Phase C self-test first-stage overvoltage delay time	GridOVDelayTime1_ResultC	R	0.02	s	%.2fs	None	0.04	1200	0.12	Self-test-derived Phase C Triggered Grid First-Order Overvoltage Delay Time
75CF	1	Second-order overvoltage trigger value from Phase C self-test	GridOVLevel2_ResultC	R	0.1	V	%.1fV	None	100	3000	2645	Self-test detected Phase C grid second-stage overvoltage protection trigger point, 59.S2 test item
75D0	1	Phase C self-test second-stage overvoltage delay time	GridOVDelayTime2_ResultC	R	0.02	s	%.2fs	None	0.04	1200	0.12	Self-test detected Phase C grid second-stage overvoltage delay time, 59.S2 test item
75D1	1	Phase C self-test first-stage undervoltage trigger value	Grid Under-Voltage Level 1 Result C	R	0.1	V	%.1fV	None	0	3000	1840	Self-test obtained Phase C grid-connected first-stage undervoltage protection point, 27.S1 test item
75D2	1	Phase C self-test first-stage undervoltage delay time	GridUVDelayTime1_ResultC	R	0.02	s	%.2fs	None	0.04	1200	1.5	Self-test obtained Phase C trigger network first-stage undervoltage delay time, 27.S1 test item
75D3	1	Secondary undervoltage trigger value for Phase C self-test	GridUVLevel2_ResultC	R	0.1	V	%.1fV	None	0	3000	575	Self-test obtained Phase C grid-connected second-stage undervoltage protection point, 27.S2 test item
75D4	1	Secondary undervoltage delay time for Phase C self-test	GridUVDelayTime2_ResultC	R	0.02	s	%.2fs	None	0.04	1200	0.5	Self-test obtained Phase C trigger network second-stage undervoltage delay time, 27.S2 test item
75D5	1	Phase C self-test 10-minute overvoltage protection threshold	OV10minValue_ResultC	R	0.1	V	%.1fV	None	0	3000	2530	Self-test detected Phase C continuous 10-minute mains overvoltage point, 59.S1 test item
75D6	1	Self-test first-order overfrequency trigger value	GridOFLevel1_Result	R	0.01	Hz	%.2fHz	None	40	70	51.5	Self-test obtained trigger network first-stage overfrequency protection point, 81>.S1 test item
75D7	1	Self-test first-order overfrequency delay time	GridOFDelayTime1_Result	R	0.02	s	%.2fs	None	0.04	1200	0.1	Self-test obtained trigger network first-order overfrequency delay time, 81> .S1 test item
75D8	1	Self-test second-order overfrequency trigger value	GridOFLevel2_Result	R	0.01	Hz	%.2fHz	None	40	70	51.5	Self-test obtained trigger network second-order overfrequency protection point, 81> .S2 test item
75D9	1	Self-test second-order overfrequency delay time	GridOFDelayTime2_Result	R	0.02	s	%.2fs	None	0.04	1200	0.1	Self-test obtained second-order overfrequency delay time for grid tripping, 81> .S2 Test Item
75DA	1	Self-test first-order underfrequency trigger value	GridUFLevel1_Result	R	0.01	Hz	%.2fHz	None	40	70	47.5	Self-test obtained trigger network first-order underfrequency protection point, 81<.S1 test item
75DB	1	Self-test first-order underfrequency delay time	GridUFDelayTime1_Result	R	0.02	s	%.2fs	None	0.04	1200	0.1	Self-test obtained trigger grid first-order underfrequency delay time, 81<.S1 Test Item
75DC	1	Self-test second-order underfrequency trigger value	GridUFLevel2_Result	R	0.01	Hz	%.2fHz	None	40	70	47.5	Self-test obtained trigger grid second-order underfrequency protection point, 81<.S2 Test Item
75DD	1	Self-test second-order underfrequency delay time	GridUFDelayTime2_Result	R	0.02	s	%.2fs	None	0.04	1200	0.1	Self-test-derived grid-triggered second-order underfrequency delay time, 81<.S2 Test Item
							P02 System Information					
9A4C	128	System alarm details 1-128	AlarmDetail	R	1		%d	None				System-wide alarm information, totaling 128 alarms. Each alarm corresponds to each bit position in the system-wide alarm message.
9ACC	1	BMS Request Charge Voltage	BmsReqChgVolt	R	0.1	V	%.1fV	None				Maximum charging voltage requested by BMS
9ACD	1	BMS Request for Discharge Limit Voltage	BmsReqEodVolt	R	0.1	V	%.1fV	None				BMS-requested end-of-discharge (EOD) point
9ACE	1	BMS Request Charge Current	BMS Request Charge Current	R	0.1	A	%.1fA	None				BMS-requested maximum charging current (total current for battery parallel system)
9ACF	1	BMS Request Discharge Limit Current	BmsReqDisChgCurr	R	0.1	A	%.1fA	None				BMS Maximum Allowed Discharge Current
9AD0	5	Reserve	BMSReserve	R	1	-	%d	None				
9AD5	1	Total Battery Power	BattSumPower	R	0.01	kW	%.2fkW	Yes				Total battery power in parallel system. Positive values indicate discharge; negative values indicate charging (accumulated output from each unit; not available on some models).
9AD6	9	System Battery Reserve	Sys_BattReserve	R	1	-	%d	None				Reserve
9ADF	1	Total Power Output of Phase A External PV Panels	ExtPvSumOutW_A	R	0.01	kW	%.2fkW	Yes				Total power of external grid-connected inverters (directly sampled from external CT; data unavailable for some models)
9AE0	1	Total power output of Phase B external PV panels	ExtPvSumOutW_B	R	0.01	kW	%.2fkW	Yes				Total power of external grid-connected inverters (directly measured via external CT; data unavailable for some models)
9AE1	1	Total power output of external PV panel Phase C	ExtPvSumOutW_C	R	0.01	kW	%.2fkW	Yes				Total power of external grid-connected inverters (directly measured via external CT; data unavailable for some models)
9AE2	12	Data retention for external PV panels in the system	Sys_PvReserve	R	1	-	%d	None				

9AEE	1	Backup Load Phase A Total Active Power	BackUpSumOutW_A	R	0.01	kW	%.2fkW	Yes				Parallel System Phase A Total Output Active Power (Cumulative output from each unit; data unavailable for some models)
9AEF	1	Backup Load Phase B Total Active Power	BackUpSumOutW_B	R	0.01	kW	%.2fkW	Yes				Parallel System Phase B Total Output Active Power (Cumulative output from each unit; data unavailable for some models)
9AF0	1	Backup Load Phase C Total Active Power	BackUpSumOutW_C	R	0.01	kW	%.2fkW	Yes				Total active power output on Phase C of the parallel system (cumulative output from each unit; data unavailable for some models)
9AF1	1	Backup Load Phase A Total Apparent Power	BackUpSumOutVA_A	R	0.01	kVA	%.2fkVA	Yes				Parallel system Phase A total output apparent power (cumulative output from each unit; data unavailable for some models)
9AF2	1	Backup Load Phase B Total Apparent Power	BackUpSumOutVA_B	R	0.01	kVA	%.2fkVA	Yes				Total apparent power output of Phase B in the parallel system (sum of outputs from each machine; data unavailable for some models)
9AF3	1	Backup Load Phase C Total Apparent Power	BackUpSumOutVA_C	R	0.01	kVA	%.2fkVA	Yes				Total apparent power output of Phase C in the parallel system (sum of outputs from each machine; data unavailable for some models)
9AF4	1	Normal Load Phase A Total Active Power	NormalSumLoadW_A	R	0.01	kW	%.2fkW	None				Total conventional load active power of Phase A in the parallel system (calculated; not available for some models)
9AF5	1	Normal Load Phase B Total Active Power	NormalSumLoadW_B	R	0.01	kW	%.2fkW	None				Total conventional load active power of Phase B in parallel system (calculated; data unavailable for some models)
9AF6	1	Normal Load Phase C Total Active Power	NormalSumLoadW_C	R	0.01	kW	%.2fkW	None				Total conventional load active power of Phase C in the parallel system (calculated; not available for some models)
9AF7	1	Normal Load Phase A Total Apparent Power	NormalSumLoadVA_A	R	0.01	kVA	%.2fkVA	None				Parallel System Phase A Total Conventional Load Apparent Power (Requires CT Direct Sampling, Reserved)
9AF8	1	Normal Load Phase B Total Apparent Power	NormalSumLoadVA_B	R	0.01	kVA	%.2fkVA	None				Parallel System Phase B Total Conventional Load Apparent Power (Requires CT Direct Sampling, Reserved)
9AF9	1	Normal Load Phase C Total Apparent Power	NormalSumLoadVA_C	R	0.01	kVA	%.2fkVA	None				Normal Sum Load VA Phase C (Requires CT direct sampling, reserved)
9AFA	1	Total active power of inverter Phase A	GeneratedSumPowerP_A	R	0.01	kW	%.2fkW	Yes				Active Power of Phase A Inverter in Parallel System: Positive values indicate power generation fed into the grid, negative values indicate power absorption from the grid for charging. Grid output active power.
9AFB	1	Inverter Phase B Total Active Power	GeneratedSumPowerP_B	R	0.01	kW	%.2fkW	Yes				Parallel System B-Phase Inverter Active Power: Positive values indicate power generation fed into the grid, negative values indicate charging power drawn from the grid. Grid output is active.
9AFC	1	Total active power of inverter Phase C	GeneratedSumPowerP_C	R	0.01	kW	%.2fkW	Yes				Active power of Phase C in parallel system. Positive values indicate power generation fed into the grid, negative values indicate power absorption from the grid for charging. Grid output is active.
9AFD	1	Total apparent power of inverter Phase A	GeneratedSumPowerS_A	R	0.01	kVA	%.2fkVA	Yes				Parallel system Phase A inverter apparent power: Positive values indicate power generation to the grid, negative values indicate power absorption from the grid for charging. Grid output is active.
9AFE	1	Total apparent power of inverter phase B	GeneratedSumPowerS_B	R	0.01	kVA	%.2fkVA	Yes				Parallel system B-phase inverter apparent power: Positive values indicate power generation to the grid, negative values indicate power absorption from the grid for charging. Grid output is active.
9AFF	1	Total apparent power of inverter phase C	GeneratedSumPowerS_C	R	0.01	kVA	%.2fkVA	Yes				Parallel System C-Phase Inverter Apparent Power: Positive values indicate power generation to the grid, negative values indicate power absorption from the grid for charging. Grid output is active.
9B00	6	System Output Data Reserved	Sys_OutReserve	R	1	-	%d	None				Reserve
9B06	1	Total Active Power of Grid Phase A	LineSumPowerW_A	R	0.01	kW	%.2fkW	Yes				Phase A active power of grid A requires direct CT sampling. Positive indicates power flowing out to the utility grid; negative indicates power flowing into the utility grid.
9B07	1	Grid Phase B Total Active Power	LineSumPowerW_B	R	0.01	kW	%.2fkW	Yes				Grid Phase B Active Power: Requires direct CT measurement. Positive indicates power flowing out to the grid; negative indicates power flowing into the grid (not available on some models).
9B08	1	Grid Phase C Total Active Power	LineSumPowerW_C	R	0.01	kW	%.2fkW	Yes				Grid Phase C Active Power: Requires direct CT sampling. Positive indicates power flowing out to the grid; negative indicates power flowing into the grid (not available on some models)
9B09	11	System mains data retention	Sys_LineReserve	R	1	-	%d	None				Reserve
							P03 System Control Command					
9C40	1	Power Control	OnOffCtrl	W	1	-	%x	None	0	1	0	0: Power Off 1: Power On Other: No action
9C41	1	Machine Restart Control	Restart Control	W	1	-	%x	None	0	1	0	1: Restart Other: No Action
9C42	1	Clear Data Control	Recovery Control	W	1	-	%x	Yes	-32768	32767	0	0xAA: Redo factory settings 0xBB: Clear statistics 0xCC: Clear history Redo factory values: Clears all accumulated data and fault records, resets parameters to default state. Takes effect after reboot.
9C43	1	Clear Current Alarm Control	Alarm Clear Control	W	1	-	%x	None	0	1	0	1: Clear Other: No action
9C44	1	Disable charging control	Change Control	W	1	-	%x	None	0	1	0	1: Disable Charging 0: Redo charging
9C45	1	AC Output Disable Control	AcOutTurnOff	RW	1	-	%x	Yes	0	1	0	0: No shutdown 1: Turn off (Effective for balcony energy storage units)
9C46	1	Recalibrate sampling after restart	ResetSampleZero	RW	1	-	%x	Yes	-32768	32767	0	0xA5: Recalibrates sampling zero offset at next power-on; other values are invalid . Takes effect after reboot; startup time will increase
9C47	1	User settings not saved when enabled	NoSaveUserSettingEn	RW	1	-	%x	Yes	0	1	0	0: Default save enabled. 1: P_04 user settings parameters are not saved (for applications where the master controller frequently adjusts user parameters, preventing memory corruption).
9C48	1	Grid-tie self-test function enabled	OnGridSelfTestEn	W	1	-	%x	None	0	1	0	Write 1 to initiate grid connection self-test. This register is write-only; read value is 0. (Currently required only for Italian certification)
9C49	1	Control Reserved	CtrlReserved	W	1	-	%x	Yes	-32768	32767	0	
							P04 User-defined parameter settings					
A028	1	Load Power Priority	OutPriority	RW	1	-	%d	None	0	3	1	0: Solar power takes priority. When solar or battery power is unavailable, the system switches to utility grid output. 1: Grid priority power supply. When grid power is unavailable, the machine switches back to inverter output, with energy supplied by battery or PV or both 2: Battery priority. When battery is unavailable, utility grid power is prioritized 3: Hybrid priority. Combines inverter and utility power output (invalid for off-grid units)
A029	1	System Voltage Setting	OutVoltSet	RW	0.1	V	%.1fV	None	100	264	120	Voltage settings for US standard units: 100, 105, 110, 120; settings for European and Chinese standard units: 200, 210, 220, 230, 240
A02A	1	System Frequency Level	OutFreqSet	RW	0.01	Hz	%.2fHz	None	40	70	50	The default frequency for US standard machines is 60Hz; the default for European and national standard machines is 50Hz
A02B	1	Mains Voltage Range Setting	Line Range Set	RW	1	-	%d	None	0	2	0	0: UPS Mode, 1: APL Mode, 2: Generator Mode (This setting is unavailable in Hybrid mode)
A02C	1	Parallel Operation Mode Setting	ParaModeSet	RW	1	-	%d	None	0	10	0	0: Single Unit 1: Parallel Operation 2: Phase-based reference phase 3: Phase 120° out of phase with reference phase 4: Phase offset by 180° from the reference phase 5: First phase in three-phase 6: Second phase of the three-phase system 7: Third phase of the three-phase system
A02D	1	Energy-saving Mode Enable	EcoEn	RW	1	-	%d	None	0	1	0	1: Enable energy-saving mode

A02E	1	Charging Priority Setting	ChgPriority	RW	1	-	%d	None	0	3	2	0: Solar priority; grid charging activates only when solar is unavailable 1: Grid power priority; PV charging only activates when grid power is unavailable 2: Hybrid mode, charging from both grid power and PV simultaneously, prioritizing PV. 3: PV only: no grid charging.
A02F	1	Maximum single-unit charging current	MaxChgCurrSet	RW	0.1	A	%.1fA	None	0	300	80	Total charging current setting for single unit
A030	1	PV Maximum Charging Current	ChgCurrByPvSet	RW	0.1	A	%.1fA	None	0	300	80	Maximum current setting for PV charging to battery
A031	1	Maximum Mains Charging Current	ChgCurrByLineSet	RW	0.1	A	%.1fA	None	0	200	60	Maximum current setting for grid charging to battery
A032	1	Local Communication Address Setting	CommIdSet	RW	1	-	%d	None	1	254	1	Maximum setting in standalone mode is 254. Maximum ID in parallel mode is determined by the number of supported parallel units.
A033	1	Buzzer Mute Enable	MuteEn	RW	1	-	%d	None	0	1	0	1: Mute
A034	1	Energy Feed-in Settings	On Grid Set	RW	1	-	%d	None	0	5	0	Effective in Hybrid mode 0: During utility power output, generated power supplements the backup load 1: Fixed power feed-in to grid during utility power output 2: Grid anti-reverse flow during utility output (requires external current CT sensor) 3: Grid anti-reverse flow during utility output (external wireless meter/wireless CT; inverter self-schedules based on WiFi module's power meter/CT data) 4: Grid anti-reverse flow during utility power output (external wired electricity meter) 5: During utility power output, power generation compensates smart outlets (requires WiFi module + smart outlet)
A035	1	Battery Charge Completion Current Setting	ChgFullCurrSet	RW	0.1	A	%.1fA	None	0	15	3	Battery full charge current threshold
A036	1	Inverter Mode N-G Connection Enable	NG_FuncEn	RW	1	-	%d	None	0	1	0	Inverter Mode Neutral and Ground Connection Function
A037	1	Leakage Current Detection Enabled	LeakageCheckEn	RW	1	-	%d	None	0	1	0	Leakage Current Detection Enabled
A038	1	User Password Setting Value	UserPassWord	RW	1	-	%d	Yes	-32768	32767		User Password Value
A039	1	User Password Input Value	PasswordSet	RW	1	-	%d	Yes	-32768	32767		User-entered password value
A03A	3	Current Machine Time	PresentTime	RW	1	-	%d	None	0			0xA03A: High 8 bits: Year (starting from 2000), Low 8 bits: Month 0xA03B: High 8 bits: Day, Low 8 bits: Hour 0xA03C: High 8 bits: Minutes, Low 8 bits: Seconds
A03D	1	Control Flag 1	CtrlFlag1	RW	1	-	%d	Yes	-32768	32767		Control flag bits, each bit representing a function
A03E	1	Battery Activation Enable	BattActiveSet	RW	1	-	%d	None	0	1	1	0: Battery activation disabled, 1: Battery activation enabled
A03F	1	Grid Active Power Setting	OnGridActivePowerSet	RW	1	W	%d	None	0	15000	0	Grid-connected active power setting (invalid for off-grid units).For balcony energy storage units, this register defines the feed-in power during anti-reverse mode.
A040	1	Grid-connected reactive power setting	OnGridReactivePowerSet	RW	1	Var	%d	Yes	-15000	15000	0	Grid-Connected Reactive Power Settings (Not applicable for off-grid units)
A041	1	Hybrid Priority Enable	Hybrid Priority En	RW	1	-	%d	None	0	1	0	1: Enables priority power output in hybrid grid mode; excess power is then used for charging (not applicable for off-grid units)
A042	1	Grid-Connected Power Factor Setting	OnGridPFSet	RW	0.01		%.2f	Yes	-1	1	1	Applicable to hybrid grid models. Adjustment range: -90 to -100, 90 to 100 (Not applicable for off-grid units)
A043	1	Grid Standard Setting	GridStandardSet	RW	1	-	%d	None	0	100	0	Grid Standard Settings During Grid Connection 0: No grid connection standard 1: VDE4105 (Germany) 2: IEEE 1547 (UL) 3: CEI 021 (Italy) 4: VDE 0126 (Germany) 5: EN 50549 (European Standard) 6: EN50549_SE (Sweden) 7: EN50549_DK1 (Denmark) 8: EN50549_DK2 (Denmark) 9: SI4777 (Israel) 10: TOR_Z1 (Austria) 11: EN50549_POLAND (Poland) 12: EN50549_CZECH (Czech Republic)
A044	1	Insulation Resistance Detection Enabled	ISODetectEn	RW	1		%d	None	0	1	0	Insulation resistance detection enabled (not applicable for off-grid units)
A045	1	Low Insulation Resistance Threshold	LowIsoValue	RW	1	kΩ	%dkΩ	Yes	-32768	32767	20	Fault reported if insulation resistance falls below this value (Not applicable for off-grid units)
A046	1	Maximum Mains Input Power Setting	MaxLinePower	RW	1	W	%d	None	0	35000	15000	Maximum input power from utility grid. Exceeding this limit causes bypass overload; use with external circuit breaker.
A047	1	External CT Host Read	ExtCtGetHostEn	RW	1	-	%d	None	0	1	0	1: Enabled, 0: Disabled. In a multi-unit parallel system, only one unit may be configured. For single-unit systems, each unit requires separate configuration.
A048	1	Output Phase Setting	OutPhaseDiffSet	RW	1	-	%d	None	0	2	0	Phase difference setting between cameras in multi-camera mode. (Configurable when no output; invalid for single-phase machines) 0: Phase difference 0 degrees, 1: Phase difference 120 degrees (positive sequence), 2: Phase difference 180 degrees, 3: Phase difference 120 degrees (negative sequence)
A049	1	Power-Turbo Enable	PowerTurboEn	RW	1		%d	None	0	1	0	1: Enabled, 0: Disabled. When enabled, output power is stabilized at rated power, but output voltage will decrease accordingly. When voltage drops to 180V, the unit will shut off output. This mode is suitable for resistive loads such as water heaters with power exceeding the unit's rated power but less than 1.6 times the rated power. (Effective for outdoor power supply single units)
A04A	1	Overload Self-redo Redo Enabled	AC0verloadRestartEn	RW	1		%d	None	0	1	1	0: Disabled, output cannot resume after overload. 1: Enabled, output does a redo following overload.
A04B	1	Grid Connection Voltage Upper Limit	GridConnectVoltMax	RW	1	V	%d%	None	5	150	109	Maximum voltage allowed for inverter grid connection during initial grid synchronization*%Vn
A04C	1	Grid Connection Voltage Lower Limit	GridConnectVoltMin	RW	1	V	%d%	None	5	150	85	Minimum voltage allowed for grid connection during initial grid synchronization: *%Vn
A04D	1	Grid Connection Upper Frequency Limit	GridConnectFreqMax	RW	0.01	Hz	%.2fHz	None	40	70	50.1	Set the maximum frequency allowed for the inverter to connect to the grid during the first grid connection
A04E	1	Grid connection frequency lower limit	Grid Connect Frequency Minimum	RW	0.01	Hz	%.2fHz	None	40	70	47.5	Minimum frequency at which the inverter is permitted to connect to the grid during the initial grid connection
A04F	1	Grid reconnection voltage upper limit	GridReconnectVoltMax	RW	1	V	%d%	None	5	150	109	Set the maximum voltage allowed for the inverter to connect to the grid during subsequent grid connections. *%Vn
A050	1	Grid reconnection voltage lower limit	GridReConnectVoltMin	RW	1	V	%d%	None	5	150	85	Minimum voltage allowed for grid connection when reconnecting to the grid for the first time*%Vn
A051	1	Grid Reconnect Upper Frequency Limit	GridReconnectFreqMax	RW	0.01	Hz	%.2fHz	None	40	70	50.1	Maximum frequency allowed for grid connection when setting non-initial grid connection
A052	1	Grid Reconnect Frequency Lower Limit	GridReconnectFrequencyMin	RW	0.01	Hz	%.2fHz	None	40	70	47.5	Set the minimum frequency at which the inverter is permitted to connect to the grid during non-initial grid connection
A053	1	First-order overvoltage trigger value	GridOVLevel1	RW	1	V	%d%	None	5	150	115	Trigger point for first-order overvoltage protection in the grid *%Vn
A054	1	First-order overvoltage delay time	GridOVDelayTime1	RW	0.02	s	%.2fs	None	0.04	1200	0.12	Grid Overvoltage First-Order Trigger Delay Time
A055	1	Second-stage overvoltage trigger value	GridOVLevel2	RW	1	V	%d%	None	5	150	115	Grid Overvoltage Protection Trigger Point*%Vn
A056	1	Second-stage overvoltage delay time	GridOVDelayTime2	RW	0.02	s	%.2fs	None	0.04	1200	0.12	Grid Overvoltage Trigger Delay Time Level 2
A057	1	First-level undervoltage trigger value	GridUVLevel1	RW	1	V	%d%	None	0	150	80	Grid Undervoltage Trigger Point Level 1*%Vn
A058	1	First-level undervoltage delay time	GridUVDelayTime1	RW	0.02	s	%.2fs	None	0.04	1200	1.5	Grid First-Level Undervoltage Trigger Delay Time
A059	1	Secondary Undervoltage Trigger Value	GridUVLevel2	RW	1	V	%d%	None	0	150	25	Grid Second-Level Undervoltage Protection Trigger Point *%Vn
A05A	1	Secondary Undervoltage Delay Time	GridUVDelayTime2	RW	0.02	s	%.2fs	None	0.04	1200	0.5	Grid Second-Level Undervoltage Trigger Delay Time
A05B	1	10 min Overvoltage Protection Threshold	OV10minProtectValue	RW	1	V	%d%	None	5	150	110	Triggers protection when mains voltage exceeds this value for 10 minutes*%Vn

A05C	1	First-level overfrequency trigger value	GridOFLevel1	RW	0.01	Hz	%.2fHz	None	40	70	51.5	Triggering Grid Level 1 Overfrequency Protection Point
A05D	1	First-level overfrequency delay time	GridOFDelayTime1	RW	0.02	s	%.2fs	None	0.04	1200	0.1	Grid OF Level 1 Overfrequency Delay Time
A05E	1	Second-Order Overfrequency Triggering Value	GridOFLevel2	RW	0.01	Hz	%.2fHz	None	40	70	51.5	Triggering Grid Second-Order Overfrequency Protection Point
A05F	1	Second-order overfrequency delay time	GridOFDelayTime2	RW	0.02	s	%.2fs	None	0.04	1200	0.1	Grid Second-Order Overfrequency Trigger Delay Time
A060	1	First-order underfrequency trigger value	GridUFLevel1	RW	0.01	Hz	%.2fHz	None	40	70	47.5	Grid First-Order Underfrequency Protection Trigger Point
A061	1	First-order underfrequency delay time	GridUFDelayTime1	RW	0.02	s	%.2fs	None	0.04	1200	0.1	Grid First-Order Underfrequency Trigger Delay Time
A062	1	Second-order underfrequency trigger value	GridUFLevel2	RW	0.01	Hz	%.2fHz	None	40	70	47.5	Triggering Grid Second-Order Underfrequency Protection Point
A063	1	Second-order underfrequency delay time	GridUFDelayTime2	RW	0.02	s	%.2fs	None	0.04	1200	0.1	Grid Trigger Second-Order Underfrequency Delay Time
A064	1	Grid-connected startup wait time	StartOnGridDelay	RW	0.02	s	%.2fs	None	0	1200	60	Self-test time during initial inverter startup
A065	1	Grid Power Ramp-Up Rate	Loading Slope	RW	1	%	%Pn/min	None	3	6000	300	A percentage requirement in certain countries or regions for the incremental power output per minute during the inverter's initial startup. 0 indicates this function is disabled. Example: When set to 10, the startup loading slope is: 10% Prated/min
A066	1	Grid reconnection delay time	OnGridReconnectDelay	RW	0.02	s	%.2fs	None	0	1200	300	Self-test duration for inverters during non-initial grid connection
A067	1	Grid Reconnection Power Ramp-up Rate	ReLoadingSlope	RW	1	%	%Pn/min	None	3	6000	300	Percentage of power increase per minute that the inverter can output during non-initial startup, as required by standards in certain countries or regions. 0: Indicates this function is disabled Example: When set to 10, the startup loading slope is: 10% rated power per minute
A068	1	Grid Active Dynamic Rate	PowerDynamicRate	RW	1	%	%Pn/min	None	6	6000	300	Regulatory requirements in certain countries or regions mandate that the dynamic change in active power of the inverter be expressed as a percentage of rated power. 0: Indicates this function is disabled Example: When set to 10, the derating slope is: 10% Prated/min
A069	1	Anti-islanding Enable	IslandEn	RW	1	-	%d	None	0	1	1	0: Disable anti-islanding function 1: Enable anti-islanding function
A06A	1	High-voltage ride-through enabled	HVRTEn	RW	1	-	%d	None	0	1	0	0: Disable high-voltage ride-through function 1: Enable high-voltage ride-through function
A06B	1	Low Voltage Ride Through Enabled	LVRTEn	RW	1	-	%d	None	0	1	0	0: Disable low voltage ride-through function 1: Enable low voltage ride-through function
A06C	1	Fixed Reactive Power Grid-Tie Enabled	Constant Reactive Power Enable	RW	1	-	%d	None	0	1	0	0: Disabled 1: Enabled
A06D	1	Fixed PF Grid Connection Enabled	ConstPfEn	RW	1	-	%d	None	0	1	0	0: Disabled 1: Enabled
A06E	1	F-P Curve Enable	F_PCurveEn	RW	1	-	%d	None	0	1	0	0: Disable 1: Enable F-P curve
A06F	1	P-Q curve enable	P_QCurveEn	RW	1	-	%d	None	0	1	0	0: Disabled 1: Enable (CosΦ curve)
A070	1	U-P Curve Enable	U_PCurveEn	RW	1	-	%d	None	0	1	0	0: Disabled 1: Enabled U-P Curve
A071	1	U-Q curve enabled	U_QCurveEn	RW	1	-	%d	None	0	1	0	0: Disabled 1: Enable U-Q curve
A072	1	DRM Enable	DRMEn	RW	1	-	%d	None	0	1	0	0: Disabled 1: Enable (DEMAND RESPONSE MODES)
A073	1	Remote Shutdown Enable	Remote Turn Off En	RW	1	-	%d	None	0	1	0	0: Disabled 1: Enabled
A074	1	Inverter Service Enabled	Permitservice	RW	1	-	%d	None	0	1	1	0: Disabled 1: Enabled
A075	1	Grid-Connected Reactive Power Dynamic Slope	ReActPowerDynamicRate	RW	1	%	%Pn/min	None	6	6000	300	Regulatory requirements in certain countries or regions mandate that the dynamic change in active power of the inverter be expressed as a percentage of rated power. 0: Indicates this function is disabled Example: When set to 10, the derating slope is: 10% Prated/min
A076	1	Backflow prevention compensation dead zone	MinMainSupplyPower	RW	1	-	%d	Yes	-500	500	50	The minimum power supplied to the load by the utility grid during backflow prevention steady-state operation. This register can be used to calibrate the effectiveness of backflow prevention.
A077	1	Battery Inverter Power Supply Second Output Time	AuxOutBattTime	RW	1	1	min	None	0	1000	0	During pure battery off-grid operation, the minimum delay setting in minutes disconnects the secondary output. 0 disables the secondary output function (applicable to some models).
A078	1	Undervoltage Shutdown Second Output Voltage	AuxOutBattLowVolt	RW	0.1	V	%.1fV	None	18	60	50	During pure battery off-grid operation without PV connection, the second output disconnects when voltage falls below this value. (Applies to lead-acid batteries) Available on select models.
A079	1	Secondary Output SOC for Low-Voltage Shutdown	AuxOutBattLowSoc	RW	1	W	%d	None	0	100	20	Pure battery off-grid operation without PV connection: Disconnects the second output when SOC falls below this value. (Effective when BMS communication succeeds) Applicable to some models.
A07A	8	Reserve	reserve	RW	1	-	%d	None	0			Reserve
A082	1	AC Coupling Function Enabled	AC_CoupleEn	RW	1	-	%d	None	0	1	0	AC Coupling Enable Bit (Effective for Balcony Units) 0: Disabled 1: Enabled
A083	1	Charging enabled without neutral line in utility grid	NoZeroLineChgEn	RW	1		%d	None	0	1	0	Mains Power Connection Charging occurs at 230V mains voltage. During this process, the output terminal must not be used with 120V loads; only 230V loads are permitted. 7.2kW Phase-Split Machine Effective
A084	1	Anti-reverse flow external device selection	FeedIntoGridMethod	RW	1	-	%d	None	0	65535	0	Reserved for customer customization
A085	1	CT-sampled active power of grid phase A	GridActPower_CT_A	W	1	W	%d	Yes				Low SOC capacity alarm. Active during BMS communication.
A086	1	CT-sampled grid phase B active power	GridActPower_CT_B	W	1	W	%d	Yes				Active power of Phase B grid collected by external smart CT/meter, dispatched by external main controller/WiFi module
A087	1	CT-sampled active power of grid phase C	GridActPower_CT_C	W	1	W	%d	Yes				Active power of Phase C grid collected by external smart CT/meter, dispatched by external main controller/WiFi module
A088	1	Anti-backflow Grid Feed Enabled	FeedIntoGridEn	W	1	W	%d	None	0	1	0	In anti-reverse mode, power feed-in to the grid is permitted. The feed-in power level is set via the A03F register: 1 enables grid feed-in, 0 disables grid feed-in
A089	1	Anti-reverse flow grid connection maximum power setting	Max On-Grid Active Power	RW	1	W	%d	None	0	15000	0	Maximum power generation in anti-reverse flow mode (effective for balcony energy storage units)
A08A	1	Maximum Grid Input Current Setting	MaxLineCurr	RW	0.1	A	%.1fA	None	5	1000	40	Maximum input current from utility power. Exceeding this limit triggers bypass overload protection based on external circuit breaker configuration.
A08B	1	Smart Plug Power	SmartMeterPower	RW	1	W	%Dw	None	0	60000	0	Issued by external master control/WiFi module; inverter controls based on this data (requires smart meter anti-reverse mode to be enabled)
A08C	1	Battery Class Setting	BatType	RW	1	-	%d	None	0	14	3	0 : User define 1 : SLD 2 : FLD 3 : GEL 4: 14-cell Lithium iron phosphate 5: 15-cell Lithium iron phosphate 6: 16 series Lithium iron phosphate 7: 7 series Lithium iron phosphate 8: 8 Series Lithium Iron Phosphate 9: 9-series Lithium iron phosphate 10: 7-series ternary lithium battery 11: 8-series ternary lithium battery 12: 13 series ternary lithium battery 13: 14-series ternary lithium battery 14: 10-series Lithium iron phosphate 15: 11-series lithium iron phosphate 16: 12-series Lithium iron phosphate
A08D	1	Constant Voltage Charge Voltage Setting	CvVolt	RW	0.1	V	%.1fV	None	18	60	56	Constant Voltage (CV) Charge Voltage Setting
A08E	1	Float Charge Voltage Setting	FloatVolt	RW	0.1	V	%.1fV	None	18	60	56	Float Charge Voltage Setting
A08F	1	Battery Overvoltage Alarm Voltage Setting	BattOverVolt	RW	0.1	V	%.1fV	None	18	70	60	Battery overvoltage alarm triggers software alert and halts charging when exceeding this value
A090	1	Constant-voltage charging time setting	CvChgTimeSet	RW	1	-	%dmin	None	5	900	120	Battery constant voltage (CV) charging duration setting, in minutes
A091	1	Voltage setting for returning to constant-voltage charging	CvChgBackVolt	RW	0.1	V	%.1fV	None	18	60	54	After the battery is fully charged, rapid charging will resume when the voltage drops to this value

A092	1	Battery Switchover to Mains Voltage Point Setting	Inv2LineVolt	RW	0.1	V	%.1fV	None	18	60	44	When mains power is available, switching to mains operation occurs if battery voltage falls below this value
A093	1	Mains-to-battery voltage point setting	LineBack2InvVolt	RW	0.1	V	%.1fV	None	18	60	56	In non-mains priority output mode, switching to inverter operation occurs when battery voltage exceeds this value.
A094	1	Battery Undervoltage Alarm Point Setting	BattLowVolt	RW	0.1	V	%.1fV	None	18	60	46	Voltage below this value triggers an alarm
A095	1	Battery Low Voltage Delayed Shutdown Point Setting	BattDelayOffVolt	RW	0.1	V	%.1fV	None	18	60	44	Battery voltage below this value triggers delayed shutdown or delayed mains power switchover logic
A096	1	Battery EOD voltage setting	BattEodVolt	RW	0.1	V	%.1fV	None	18	60	42	Battery voltage below this value triggers immediate shutdown or switches to mains power enable.
A097	1	Battery voltage delayed shutdown time setting	BattDelayOffTime	RW	1	S	%ds	None	0	120	5	After the battery voltage falls below the delayed shutdown threshold, the device will shut down or switch to mains power after the specified number of seconds.
A098	1	Battery EOD Clear Voltage	BattEodBackVolt	RW	0.1	V	%.1fV	None	0	60	50	When battery voltage exceeds this value, the battery EOD alarm is cleared.
A099	1	BMS Function Settings	BmsSet	RW	1	-	%d	None	0	2	0	0: Disable BMS; 1: Enable 485-BMS; 2: Enable CAN-BMS
A09A	1	BMS Protocol Settings	BmsProtocol	RW	1	-	%d	None	0	60	0	0: Raysun 1: PAI NENG 2: Aoguan 3: Oulite 4: Guoxuan 5: Sunwoda 6: Changfeng 7: Daqin 9: Paicheng 10: CETC 11: Maitian 12: Anshi 13: Pieneng-3.5 15: Meizhi-3.5 16: Tianji 17: Ruiju 18: Wanda
A09B	1	Battery SOC Low Alarm Value Setting	BatSocLowAlarm	RW	1	-	%d	None	0	100	15	Low SOC capacity alarm. Active during BMS communication.
A09C	1	Battery SOC Low Shutdown Point Setting	BatStopSOC	RW	1	-	%d	None	0	100	5	Discharge cutoff SOC. Active during BMS communication.
A09D	1	Battery Full SOC Threshold Setting	BattFullSOC	RW	1	-	%d	None	0	100	100	Battery SOC above this value is considered fully charged. Active during BMS communication.
A09E	1	SOC threshold for inverter switching to utility power	Inv2LineSOC	RW	1	-	%d	None	0	100	10	Battery SOC below this value triggers switch to utility power operation. Valid during BMS communication.
A09F	1	Grid-to-inverter SOC threshold setting	LineBack2InvSOC	RW	1	-	%d	None	10	100	100	Battery SOC above this value triggers switchback to inverter operation. Effective during BMS communication.
A0A0	1	Scheduled Grid Charging Enable	OnTimeChargeEn	RW	1	-	%d	None	0	1	0	0: Disabled 1: Enabled
A0A1	1	Stage 1 Start Charging Time	ChargeStartTime1	RW	1	h/m	%d	None	0	5947	0	High 8 bits represent hours + Low 8 bits represent minutes: 23*256+59==5947
A0A2	1	Stage 1 End of Charge Time	ChargeEndTime1	RW	1	h/m	%d	None	0	5947	2048	High 8 bits represent hours + Low 8 bits represent minutes: 23*256+59==5947
A0A3	1	Stage 2 Start Charging Time	ChargeStartTime2	RW	1	h/m	%d	None	0	5947	0	High 8 bits represent hours + Low 8 bits represent minutes: 23*256+59==5947
A0A4	1	Phase 2 End Charging Time	ChargeEndTime2	RW	1	h/m	%d	None	0	5947	0	High 8 bits represent hours + Low 8 bits represent minutes: 23*256+59==5947
A0A5	1	Stage 3 Start Charging Time	ChargeStartTime3	RW	1	h/m	%d	None	0	5947	0	High 8 bits represent hours + Low 8 bits represent minutes: 23*256+59==5947
A0A6	1	End of Stage 3 charging time	ChargeEndTime3	RW	1	h/m	%d	None	0	5947	0	High 8 bits represent hours + Low 8 bits represent minutes: 23*256+59==5947
A0A7	1	Enable Timed Battery Discharge	OnTimeDischgEn	RW	1	-	%d	None	0	1	0	0: Disabled 1: Enabled
A0A8	1	Stage 1 discharge start time	DischgStartTime1	RW	1	h/m	%d	None	0	5947	0	High 8 bits represent hours + Low 8 bits represent minutes: 23*256+59==5947
A0A9	1	Stage 1 discharge end time	DischgEndTime1	RW	1	h/m	%d	None	0	5947	0	High 8 bits represent hours + Low 8 bits represent minutes: 23*256+59==5947
A0AA	1	Stage 2 discharge start time	DischgStartTime2	RW	1	h/m	%d	None	0	5947	0	High 8 bits represent hours + Low 8 bits represent minutes: 23*256+59==5947
A0AB	1	Stage 2 discharge end time	DischgEndTime2	RW	1	h/m	%d	None	0	5947	0	High 8 bits represent hours + Low 8 bits represent minutes: 23*256+59==5947
A0AC	1	Stage 3 Start Discharge Time	DischgStartTime3	RW	1	h/m	%d	None	0	5947	0	High 8 bits represent hours + Low 8 bits represent minutes: 23*256+59==5947
A0AD	1	3-stage end-of-discharge time	DischgEndTime3	RW	1	h/m	%d	None	0	5947	0	High 8 bits represent hours + Low 8 bits represent minutes: 23*256+59==5947
A0AE	1	Battery SOC Setting	BattSocSet	W	1	%	%d	None	0	100	0	Write-only register; default value is 0 upon read. Cannot be set after BMS is enabled.
A0AF	1	Independent enable for parallel battery banks	BattPackNotUnion	RW	1	%	%d	None	0	1	0	Default parallel configuration for battery packs. If the inverter and battery pack form a complete system, set this value to 1
A0B0	1	Battery Forced Charge Stop SOC Setting	ForceChgStopSoc	RW	1	-	%d	None	1	100	5	When the inverter receives a BMS forced charging command, it will forcibly enter charging mode if charging is possible. It will exit forced charging mode once the battery SOC reaches this set value, and the inverter will continue operating in the current customer-set operating mode. (Applicable to some models)
A0B1	1	Battery Pack Rated Ah	BattPackRateAh	RW	1	Ah	%d	None	10	2000	200	Total capacity of battery packs connected per machine (applicable to some models)
A0B2	1	Maximum discharge current for hybrid network mode battery	BattHybridCurrLimit	RW	0.1	A	%.1fA	None	0	350	200	Sets the maximum battery discharge current for hybrid network mode based on battery configuration (applicable to select models). The default value is the maximum current supported by the device's hardware.
A0B3	7	Battery Set Reserve	BattSetReserve	RW	1	-	%d	None	0			Reserve
A0BA	1	FP Overfrequency Threshold	FP_OF_Start	RW	0.01	Hz	%.2fHz	None	40	70	50.2	When grid frequency exceeds this value, inverter active power output begins to decrease
A0BB	1	FP Undervoltage Start Point	FP_UF_Start	RW	0.01	Hz	%.2fHz	None	40	70	49.8	When grid frequency falls below this value, the inverter's active power output begins to increase
A0BC	1	FP Overfrequency End Point	FP_OF_End	RW	0.01	Hz	%.2fHz	None	40	70	51.5	When grid frequency exceeds this value, the inverter's active power output ceases to decrease
A0BD	1	FP Underfrequency Endpoint	FP_UF_End	RW	0.01	Hz	%.2fHz	None	40	70	47.5	When grid frequency exceeds this value, the inverter's active power output will not continue to increase
A0BE	1	FP Overfrequency Derating Slope	FP_OF_DropSlope	RW	1	%	%Pn/Hz	None	1	2000	50	Overfrequency load reduction slope, default 50%Pn/Hz (some standards define in s; conversion formula: (Δf/fn)/(ΔP/Pn). 5% represents 400%Pn/Hz)
A0BF	1	FP Underfrequency Load Slope	FP_UF_LoadSlope	RW	1	%	%Pn/Hz	None	1	2000	50	Underfrequency loading slope, default 50%Pn/Hz (some standards define in s; conversion formula: (Δf/fn)/(ΔP/Pn), where 5% represents 400%Pn/Hz)
A0C0	1	FP Active Open-Loop Response Time	FP_ActivePowerRespTr	RW	0.1	s	%ds	None	0.2	120	10	Tr: Active power open-loop response time on the FP curve. Active power must reach 90% of the target value within Tr*n time.
A0C1	1	PQ_P1-Point Active Power	PQ_P1	RW	1	%	%d%	Yes	-100	100	20	Ratio of Active Power Output at PQ Curve Point P1 to Rated Active Power Output
A0C2	1	PQ_Q1 Point Reactive Power	PQ_Q1	RW	1	%	%d%	Yes	-100	100	0	PQ curve Q1 point lagging reactive power to maximum reactive power ratio (In some grid standards, this value corresponds to the power factor during under-excitation)
A0C3	1	PQ_P2 Point Active Power	PQ_P2	RW	1	%	%d%	Yes	-100	100	50	Ratio of Output Active Power at PQ Curve Point P2 to Rated Output Active Power
A0C4	1	PQ_Q2 Point Reactive Power	PQ_Q2	RW	1	%	%d%	Yes	-100	100	0	Ratio of lagging reactive power at point Q2 on the PQ curve to maximum reactive power (In some grid standards, this value represents the power factor during under-excitation)
A0C5	1	PQ_P3 Point Active Power	PQ_P3	RW	1	%	%d%	Yes	-100	100	100	Ratio of output active power at point P3 on the PQ curve to rated output active power
A0C6	1	PQ_Q3 point reactive power	PQ_Q3	RW	1	%	%d%	Yes	-100	100	-44	Ratio of lagging reactive power at point Q3 on the PQ curve to maximum reactive power (In some grid standards, this value represents the power factor during under-excitation)
A0C7	1	PQ_P1n Point Active Power	PQ_P1n	RW	1	%	%d%	Yes	-100	100	-20	Ratio of active power absorbed at point P'1 on the PQ curve to rated active power absorption

A0C8	1	PQ_Q1n Point Reactive Power	PQ_Q1n	RW	1	%	%d%	Yes	-100	100	0	Ratio of leading reactive power at point Q'1 to maximum reactive power on the PQ curve (In some grid standards, this value is the power factor during over-excitation)
A0C9	1	PQ_P2n Point Active Power	PQ_P2n	RW	1	%	%d%	Yes	-100	100	-50	Ratio of Output Active Power at PQ Curve Point P2 to Rated Output Active Power
A0CA	1	PQ_Q2n Point Reactive Power	PQ_Q2n	RW	1	%	%d%	Yes	-100	100	0	Ratio of leading reactive power to maximum reactive power at point Q'2 on the PQ curve (In some grid standards, this value represents the power factor during over-excitation)
A0CB	1	PQ_P3n Point Active Power	PQ_P3n	RW	1	%	%d%	Yes	-100	100	-100	Ratio of output active power at point P3 on the PQ curve to rated output active power
A0CC	1	PQ_Q3n Point Reactive Power	PQ_Q3n	RW	1	%	%d%	Yes	-100	100	44	Ratio of leading reactive power to maximum reactive power at point Q'3 on the PQ curve (In some grid standards, this value represents the power factor during over-excitation)
A0CD	1	Enter PQ curve voltage	PQ_EnableVolt	RW	1	V	%d%	None	5	150	85	Grid voltage must exceed this value to enter the PQ curve (CosΦ curve)
A0CE	1	Exit PQ curve voltage	PQ_DisableVolt	RW	1	V	%d%	None	5	150	109	Grid voltage must be below this value to enter the PQ curve (CosΦ curve)
A0CF	1	UP_V1 Point Voltage	UP_V1	RW	1	%	%d%	None	0	150	105	U-P Curve V1 Point Voltage*%Vn
A0D0	1	UP_P1 Point Active Power	UP_P1	RW	1	%	%d%	Yes	-100	100	100	U-P curve P1 point output active power to rated output active power ratio; negative values indicate active power absorption
A0D1	1	UP_V2 Point Voltage	UP_V2	RW	1	%	%d%	None	0	150	110	U-P curve voltage at point V2
A0D2	1	UP_P2 point active power	UP_P2	RW	1	%	%d%	Yes	-100	100	20	Ratio of Active Power Output at Point P2 to Rated Active Power Output on U-P Curve; Negative Values Indicate Active Power Absorption
A0D3	1	UP Active Open-Loop Response Time	UP_ActPowerRespTr	RW	0.1	s	%ds	None	0.2	120	10	Active Power Open-Loop Response Time Tr on U-P Curve: Active power must reach 90% of the target value within Tr*n time.
A0D4	1	UP_V3 Point Voltage	UP_V3	RW	1	%	%d%	None	0	150	110	U-P curve voltage at point V3
A0D5	1	UP_P3 point active power	UP_P3	RW	1	%	%d%	Yes	-100	100	20	Ratio of Active Power Output at Point P3 to Rated Active Power Output on U-P Curve; Negative Values Indicate Active Power Absorption
A0D6	1	UP_V4 Point Voltage	UP_V4	RW	1	%	%d%	None	0	150	110	U-P curve voltage at point V4
A0D7	1	UP_P4 point active power	UP_P4	RW	1	%	%d%	Yes	-100	100	20	Ratio of Active Power Output at Point P3 to Rated Active Power Output on U-P Curve; Negative Values Indicate Active Power Absorption
A0D8	1	UQ_Vref voltage	UQ_Vref	RW	1	V	%d%	None	5	150	100	
A0D9	1	UQ_V1 voltage	UQ_V1	RW	1	V	%d%	None	5	150	92	U-Q curve V1 point voltage
A0DA	1	UQ_Q1 reactive power	UQ_Q1	RW	1	%	%d%	Yes	-100	100	25	Ratio of reactive power to apparent power at point Q1 on the U-Q curve (defined in some certifications as the ratio of reactive power to rated reactive power)
A0DB	1	UQ_V2 Voltage	UQ_V2	RW	1	V	%d%	None	5	150	96	U-Q curve voltage at point V2
A0DC	1	UQ_Q2 Reactive Power	UQ_Q2	RW	1	%	%d%	Yes	-100	100	0	UQ Curve Q2 Point Reactive Power to Apparent Power Ratio (Partial certifications define this as the ratio of reactive power to rated reactive power)
A0DD	1	UQ_V3 Voltage	UQ_V3	RW	1	V	%d%	None	5	150	105	U-Q curve voltage at point V3
A0DE	1	UQ_Q3 Reactive Power	UQ_Q3	RW	1	%	%d%	Yes	-100	100	0	UQ Curve Q3 Point Reactive Power to Apparent Power Ratio (Partial certifications define this as the ratio of reactive power to rated reactive power)
A0DF	1	UQ_V4 Voltage	UQ_V4	RW	1	V	%d%	None	5	150	108	U-Q curve voltage at point V4
A0E0	1	UQ_Q4 Reactive Power	UQ_Q4	RW	1	%	%d%	Yes	-100	100	-25	UQ Curve Q4 Point Reactive Power to Apparent Power Ratio (Partial certifications define this as the ratio of reactive power to rated reactive power)
A0E1	1	UQ reactive open-loop response time	UQ_ReActPowerRespTr	RW	0.1	s	%ds	None	0.2	120	10	Tr: Active power open-loop response time on the U-Q curve. Active power must reach 90% of the target value within Tr*n time.
A0E2	1	Verf Auto-Regulation Enabled	UQ_VrefAutoEn	RW	1	-	%d	None	0	1	0	0: Disable Vref auto-adjustment 1: Enable Vref auto-adjustment
A0E3	1	Vref open-loop response time	UQ_VrefRespTr	RW	0.1	s	%ds	None	0.2	6000	10	U-Q curve: Vref open-loop response time Tr when Vref auto-adjustment enable lag is active
A0E4	1	Enter UQ curve power	UQ_EnablePower	RW	1	%	%d%	Yes	0	100	20	Only when the active power and rated active power ratio exceed this value will the system enter UQ curve mode
A0E5	1	Exit UQ curve power	UQ_DisablePower	RW	1	%	%d%	Yes	0	100	10	Exit UQ curve when the ratio of active power to rated active power falls below this value
A0E6	1	High-Voltage First-Order Voltage Crossing Point	HVRT_Level1	RW	1	V	%d%	None	5	150	110	Trigger Grid First-Order High-Voltage Breakdown Voltage Point*%Vn
A0E7	1	High-voltage first-order ride-through delay time	HVRT_Level1Time	RW	0.02	s	%.2fs	None	0.04	1200	60	Triggering Grid First-Level High-Voltage Ride-Through Protection Time
A0E8	1	High-voltage second-level ride-through voltage point	HVRT_Level2	RW	1	V	%d%	None	5	150	115	Triggering Grid Second-Level High-Voltage Ride-Through Voltage Point*%Vn
A0E9	1	High-voltage second-level ride-through delay time	HVRT_Level2Time	RW	0.02	s	%.2fs	None	0.04	1200	5	Triggering Grid Second-Level High-Voltage Ride-Through Protection Time
A0EA	1	High-voltage third-level ride-through voltage point	HVRT_Level3	RW	1	V	%d%	None	5	150	120	Triggering Grid Third-Level High-Voltage Ride-Through Voltage Point*%Vn
A0EB	1	High-Voltage Third-Level Ride-Through Delay Time	HVRT_Level3Time	RW	0.02	s	%.2fs	None	0.04	1200	0.1	Triggering Grid Level 3 High Voltage Ride-Through Protection Time
A0EC	1	Low-voltage first-stage ride-through voltage threshold	LVRT_Level1	RW	1	V	%d%	None	5	150	80	Triggering Grid First-Level Low-Voltage Ride-Through Voltage Point*%Vn
A0ED	1	Low-voltage first-level ride-through delay time	LVRT_Level1Time	RW	0.02	s	%.2fs	None	0.04	1200	2.8	Grid-Side Level 1 Low Voltage Ride-Through Protection Time
A0EE	1	Low-voltage second-level ride-through voltage threshold	LVRT_Level2	RW	1	V	%d%	None	5	150	50	Triggering Grid Second-Level Low Voltage Ride-Through Voltage Point *%Vn
A0EF	1	Low-voltage second-level ride-through delay time	LVRT_Level2Time	RW	0.02	s	%.2fs	None	0.04	1200	1.5	Grid-Triggered Second-Level Low Voltage Ride-Through Protection Time
A0F0	1	Low-voltage third-level ride-through voltage point	LVRT_Level3	RW	1	V	%d%	None	5	150	25	Triggering Grid Level 3 Low Voltage Ride Through Voltage Point *%Vn
A0F1	1	Low-voltage third-level ride-through delay time	LVRT_Level3Time	RW	0.02	s	%.2fs	None	0.04	1200	0.16	Trigger Grid Level 3 Low Voltage Ride Through Protection Time
A0F2	1	Grid-tie self-test voltage change slope	OnGridTestVoltSlop	RW	0.01	-	%.2f%Vn/s	None	0.01	0.05	0.05	On-grid self-test voltage slope, normally not exceeding 0.05Vn/s
A0F3	1	Grid-connection self-test frequency change slope	OnGridTestFreqSlop	RW	0.01	-	%.2f%Hz/s	None	0.01	0.05	0.05	Grid-tie self-test frequency change slope, normally not exceeding 0.05Hz/s
A0F4	1	F_P Curve Power Start Delay Time	F_P_StartDelay	RW	0.02	-	%.2fs	None	0.06	1200	0.06	Grid-Connected F_P Curve Power Start Delay Time
A0F5	1	F_P Curve Power Redo Delay Time	F_P_RecoverDelay	RW	0.02	-	%.2fs	None	0.06	1200	0.06	Grid-connected F_P curve power redo delay time
A0F6	1	F_P Curve Overfrequency Load Shedding Power Redo Frequency	F_P_OF_Recover	RW	0.01	Hz	%.2Hz	None	50	70	50.05	Grid-connected F_P curve overfrequency derating power redo frequency
A0F7	1	F_P curve underfrequency load power redo frequency	F_P_UF_Recover	RW	0.01	Hz	%.2Hz	None	40	60	49.95	Grid-Connected F_P Curve Underfrequency Load Power Redo Frequency
A0F8	1	WiFi Clear Network Status Register	WiFi_Clear_Net	RW	1	-	%d	None	0	1	0	Energy Control Cloud Grid Clear Status Register (Customer Customization)
A0F9	1	Reserve	Reserved_Set	RW	1	-	%d	None	0	1	0	Reserve

P07 Product Basic Information

C738	1	Model Code	MachCode	R	1	-	%d	None				
C739	1	Product Class	ProductType	R	1	-	%d	None				0: Single Camera 10: Multi-camera 20: Three-phase camera
C73A	12	Manufacturer Name	ManufacturerName	RW	1	-	%s	None				Manufacturer Name
C746	30	Product Serial Number	SourceSN	RW	1	-	%s	None				Original Manufacturer Serial Number
C764	1	Main Chip Software Version 1	HwVer_M1	R	1	-	%x	None				
C765	1	Main Chip Software Version 2	HwVer_M2	R	1	-	%x	None				

C766	1	Slave Chip Software Version 1	HwVer_S1	R	1	-	%x	None			
C767	1	From Chip Software Version 2	HwVer_S2	R	1	-	%x	None			
C768	1	Modbus Protocol Version	ProtocolVer	R	1	-	%x	None			
C769	1	BMS Version	BMS Version	R	1	-	%x	None			
C76A	2	Software library version	LibVer	R	1	-	%x	None			Reserve space for two library versions
C76C	20	Software Compilation Time	CpuBuildTime	R	1	-	%s	None			String format, with the lower 8 bits of each register valid and the upper 8 bits invalid
C780	20	Customer-defined serial number	CustomSN	RW	1	-	%s	None			Reserved for OEM customization
C794	24	Reserve	PrdReserve	R	1	-	%s	None			
C7AC	1	Single fault record word length	FaultRecWordLen	R	1	-	%s	None			Word length occupied by a complete fault record (applicable to some models)
C7AD	1	Single setting record word length	SetRecWordLen	R	1	-	%s	None			Word length occupied by a complete setting record (valid for some models)
C7AE	1	Total Number of Rated History Records	FaultRecRateNum	R	1	-	%d	None			Total capacity of machine-recorded history entries (applicable to some models)
C7AF	1	Number of Existing History Records	FaultRecSumNum	R	1	-	%d	None			Number of recorded history entries (applicable to some models)
C7B0	1	Current history pointer	FaultRecPoint	R	1	-	%d	None			Location of the most recent historical record (applicable to some models)
C7B1	1	Total Number of Rated History Records	SetRecRateNum	R	1	-	%d	None			Total capacity for machine settings records (applies to some models)
C7B2	1	Number of Existing History Records	SetRecSumNum	R	1	-	%d	None			Number of recorded settings (Applicable to some models)
C7B3	1	Current history pointer	SetRecPoint	R	1	-	%d	None			Position of the latest configuration record (Applicable to some models)
C7B4	1	Rated Active Power	Rated_OutputW	R	1	W	%dW	None			This data is available only for models certified for IEEE 1547 grid connection.
C7B5	1	Active Power at Maximum Reactive Power Injection	MaxW_AtInjectVar	R	1	W	%dW	None			This data is available only for models certified for IEEE 1547 grid connection.
C7B6	1	Power Factor at Maximum Injected Reactive Power	MaxPF_InjectVar	R	0.01	-	%.2f	None			This data is available only for models certified for IEEE 1547 grid connection.
C7B7	1	Active Power at Maximum Reactive Power Absorption	MaxW_AtAbsorbVar	R	1	W	%dW	None			This data is available only for models certified for IEEE 1547 grid connection.
C7B8	1	Power Factor at Maximum Var Absorption	MaxPF_AtAbsorbVar	R	0.01	-	%.2f	None			This data is available only for models certified for IEEE 1547 grid connection.
C7B9	1	Maximum apparent discharge power	MaxOutputVA	R	1	VA	%dVA	None			This data is available only for models certified for IEEE 1547 grid connection.
C7BA	1	Reactive power and voltage power control capability	PowerCtrlLevel	R	1	-	%d	None	0	2	2	0 = Not specified 1 = Category A **2 = Category B**This data is available only for models certified for IEEE 1547 grid connection.
C7BB	1	Voltage and Frequency Ride-Through Capability Level	RideThroughLevel	R	1	-	%d	None	1	3	3	0 = Not specified 1 = Category I 2 = Category II **3 = Category III** This data is available only for IEEE 1547 grid-connected certified models.
C7BC	1	Maximum injected reactive power	MaxInjectVar	R	1	var	%dvar	None			This data is available only for models certified for IEEE 1547 grid connection.
C7BD	1	Maximum Absorbed Reactive Power	MaxAbsorbVar	R	1	var	%dvar	None			This data is available only for models certified for IEEE 1547 grid connection.
C7BE	1	Rated Charging Power	Rated_ChgW	R	1	W	%dW	None			This data is available only for models certified for IEEE 1547 grid connection.
C7BF	1	Maximum Apparent Charging Power	Rated_ChgVA	R	1	W	%dVA	None			This data is available only for models certified for IEEE 1547 grid connection.
C7C0	1	Rated AC Voltage	Rated_Grid_Volt	R	1	V	%dV	None			This data is available only for models certified for IEEE 1547 grid connection.
C7C1	1	Maximum Allowable AC Voltage	MaxGridVolt	R	1	V	%dV	None			This data is available only for models certified for IEEE 1547 grid connection.
C7C2	1	Minimum Permissible AC Voltage	MinGridVolt	R	1	V	%dV	None			This data is available only for models certified for IEEE 1547 grid connection.
C7C3	2	Supported Control Mode Flag	GridCtrlModeFlag	R	1	-	%x	None			Refer to Table 2: Control Mode Support Specifications for details. This data is only available for models certified for IEEE 1547 grid connection.
C7C5	1	Reactive Susceptance	Reactive Susceptance	R	1E-06	S	%ds	None			Reactive susceptance that remains connected to the Area EPS in the cease to energize and trip state This data is available only for models certified for IEEE 1547 grid connection.
C7C6	2	IANA Manufacturer Number	IANA_EnterpriseID	RW	1	-	%d	None			Requires application to IANA, U32 type, low byte first, high byte second This data is only available for models certified for IEEE 1547 grid connection.
							P08 System Statistics				
CB20	7	PV Power Generation Historical Data for the Past 7 Days	PVEnergy Last 7 Days	R	0.1	kWh	%.1fkWh	None			Daily power generation data occupies one register. For example, if today is March 10, the PV power generation data for the past 7 days is as follows: CB20: March 9 (yesterday) generation CB21: March 8 (day before yesterday) generation CB22: March 7th generation CB23: March 6th generation CB24: March 5th generation CB25: March 4th Power Generation CB26: March 3 power generation
CB27	7	Battery Charge Power Historical Data for the Past 7 Days	Battery Charge Energy Last 7 Days	R	0.1	kWh	%.1fkWh	None			
CB2E	7	Battery discharge energy historical data for the past 7 days	Battery Discharge Change Energy Last 7 Days	R	0.1	kWh	%.1fkWh	None			
CB35	7	Grid charging energy consumption historical data for the past 7 days	Line Charge Energy Last 7 Days	R	0.1	kWh	%.1fkWh	None			
CB3C	7	Load consumption data for the past 7 days	LoadConsumptionLast7days	R	0.1	kWh	%.1fkWh	None			
CB43	7	Load consumption from utility power over the past 7 days	LoadConsumptionFromLineLast 7days	R	0.1	kwh	%.1fkWh	None			
CB4A	1	Reserve	EnergyReserved0	R	0.1	kwh	%.1fkWh	None			
CB4B	1	Daily Grid Power Input Side Feed-in Electricity	InvToLinePowerToday	R	0.1	kWh	%.1fkWh	None			Daily Grid Power Input Side Feed-in Electricity
CB4C	1	Daily AC Generation	GeneratedACPowerToday	R	0.1	kWh	%.1fkWh	None			Inverter AC power generation for the day.
CB4D	1	Battery Charge for the Day	BatChgEnergyToday	R	0.1	kWh	%.1fkWh	None			Total Battery Charge Energy for the Day
CB4E	1	Battery Discharged Energy Today	BatDischgEnergyToday	R	0.1	kWh	%.1fkWh	None			Total battery discharge energy for the day
CB4F	1	Daily PV generation	PvGeneratedEnergyToday	R	0.1	kWh	%.1fkWh	None			Total PV Generation for the Day.
CB50	1	Load electricity consumption for the day	Used Energy Today	R	0.1	kWh	%.1fkWh	None			Total electricity consumed by load on the day.
CB51	1	Total operating days	WorkDaysTotal	R	1	d	%d	None			
CB52	2	Battery Cumulative Charge	BatChgEnergyTotal	R	0.1	kWh	%.1fkWh	None			Low byte first, high byte second

CB54	2	Battery Cumulative Discharge Amount	BatDischgEnergyTotal	R	0.1	kWh	%.1fkWh	None	Low byte first, high byte second
CB56	2	Cumulative PV generation	PvGeneratedEnergyTotal	R	0.1	kWh	%.1fkWh	None	Low byte first, high byte second
CB58	2	Cumulative Load Electricity Consumption	Total Energy Used	R	0.1	kWh	%.1fkWh	None	Low byte first, high byte second
CB5A	1	Grid-connected charging energy consumption for the day	LineChgEnergyTday	R	0.1	kWh	%.1fkWh	None	Grid Charge Energy Today
CB5B	1	Load Electricity Consumption from Grid Power on Current Day	LoadConsumLineTday	R	0.1	kWh	%.1fkWh	None	
CB5C	1	Inverter operating time today	InvWorkTimeToday	R	1	min	%dmin	None	
CB5D	1	Bypass operating time on the day	LineWorkTimeToday	R	1	min	%dmin	None	
CB5E	3	Power-on time	PowerOnTime	R	1		%d	None	Time format refers to the current time register
CB61	2	Total Grid Power Charging	LineChgEnergyTotal	R	0.1	kWh	%.1fkWh	None	
CB63	2	Cumulative Load Power Consumption from Mains	LoadConsumLineTotal	R	0.1	kWh	%.1fkWh	None	
CB65	1	Cumulative inverter operating time	Inverter Work Time Total	R	1	h	%dh	None	Total load energy consumption from the battery side.
CB66	1	Cumulative Bypass Operation Time	Line Work Time Total	R	1	h	%dh	None	
CB67	2	Cumulative AC Power Generation	GeneratedACPowerTotal	R	0.1	kwh	%.1fkWh	None	Cumulative Inverter Power Generation
CB69	3	Statistical Data Time Backup	StacTimeBack	R	1	h	%dh	None	
CB6C	2	Cumulative Grid Power Input from Utility Grid	InvToLinePowerTotal	R	0.1	kwh	%.1fkWh	None	Total Grid Power Input from Grid Input Side
CB6E	1	Grid Power Output Today (Grid Side)	InvToGridPowerToday	R	0.1	kwh	%.1fkWh	None	Daily Power Generation to Grid (Effective when using external meter or CT)
CB6F	1	AC Power Consumption Today (Grid Side)	GridToInvPowerToday	R	0.1	kWh	%.1fkWh	None	Grid Power Consumption Today (Valid when using external meter or CT)
CB70	2	Cumulative grid-fed electricity (grid side)	GridToInvPowerTotal	R	0.1	kwh	%.1fkWh	None	Cumulative Power Fed to Grid (Valid when using external meter or CT)
CB72	2	Cumulative AC electricity consumption (grid side)	GridToInvPowerTotal	R	0.1	kWh	%.1fkWh	None	Cumulative Grid Power Consumption (Valid when using external meter or CT)
CB74	7	Total External PV Generation in the System Over the Past 7 Days	SumExtPVEnergy7day	R	0.1	kWh	%.1fkWh	None	
CB7B	7	Total Battery Charge in System Over Last 7 Days	SumBatChgEnergy7day	R	0.1	kWh	%.1fkWh	None	
CB82	7	Total Battery Discharge Energy in the System Over the Past 7 Days	SumBatDisChgEnergy7day	R	0.1	kWh	%.1fkWh	None	Aggregate data for the parallel system, not individual module data. Daily power generation data occupies one register. For example, today is March 10th, so the PV power generation data for the past 7 days is as follows: CB20: March 9 (yesterday) generation CB21: March 8 (day before yesterday) generation CB22: March 7th generation CB23: March 6th generation CB24: March 5th generation CB25: March 4th Power Generation CB26: Electricity Generation on March 3
CB89	7	Total Normal Load Energy Consumption in the System Over the Past 7 Days	SumNormLoadConsum7day	R	0.1	kWh	%.1fkWh	None	
CB90	7	Total electricity consumption of the system's backup load over the past 7 days	SumBackLoadConsum7day	R	0.1	kWh	%.1fkWh	None	
CB97	7	Total grid electricity consumption in the system over the past 7 days	SumLineSupplyEnergy7day	R	0.1	kWh	%.1fkWh	None	
CB9E	7	Total electricity fed into the grid by the system over the past 7 days	SumLineAbsorbEnergy7day	R	0.1	kWh	%.1fkWh	None	
CBA5	1	Total Daily External PV Generation in the System	SumExtPVEnergyToday	R	0.1	kWh	%.1fkWh	None	
CBA6	1	System battery total charge for the day	SumBatChgEnergyToday	R	0.1	kWh	%.1fkWh	None	
CBA7	1	Total discharge energy of system batteries for the day	SumBatDisChgEnergyToday	R	0.1	kWh	%.1fkWh	None	
CBA8	1	System total normal load electricity consumption for the day	SumNormLoadConsumToday	R	0.1	kWh	%.1fkWh	None	
CBA9	1	System Total Backup Load Daily Energy Consumption	SumBackLoadConsumToday	R	0.1	kWh	%.1fkWh	None	
CBAA	1	System Total Grid Electricity Consumption for the Day	SumLineSupplyEnergyToday	R	0.1	kWh	%.1fkWh	None	
CBAB	1	System total grid connection volume for the day	SumLineAbsorbEnergyToday	R	0.1	kWh	%.1fkWh	None	
CBAC	2	Total Cumulative Power Generation from External PV in the System	SumExtPVEnergyTotal	R	0.1	kWh	%.1fkWh	None	Aggregate data for the entire grid-connected system, not individual module data.
CBAE	2	System Total Battery Cumulative Discharge Energy	SumBatDisChgEnergyTotal	R	0.1	kWh	%.1fkWh	None	
CBB0	2	Total Cumulative Charge Energy of Batteries in the System	SumBatChgEnergyTotal	R	0.1	kWh	%.1fkWh	None	
CBB2	2	Total cumulative conventional load energy consumption in the system	SumNormLoadConsumTotal	R	0.1	kWh	%.1fkWh	None	
CBB4	2	Total backup load cumulative electricity consumption in the system	SumBackLoadConsumTotal	R	0.1	kWh	%.1fkWh	None	
CBB6	2	System Total Grid Cumulative Electricity Consumption	SumLineSupplyEnergyTotal	R	0.1	kWh	%.1fkWh	None	
CBB8	2	System Total Grid-Connected Cumulative Power Generation	SumLineAbsorbEnergyTotal	R	0.1	kWh	%.1fkWh	None	
P09 Fault History Record									
0F08	16	Fault records 0	FaultHistoryRecord00	RW	1		%d	None	
0F18	16	Fault Record 1	FaultHistoryRecord01	RW	1		%d	None	
0F28	16	Fault Record 2	FaultHistoryRecord02	RW	1		%d	None	
0F38	16	Fault Record 3	FaultHistoryRecord03	RW	1		%d	None	
0F48	16	Fault Record 4	FaultHistoryRecord04	RW	1		%d	None	
0F58	16	Fault Record 5	FaultHistoryRecord05	RW	1		%d	None	
0F68	16	Fault Record 6	FaultHistoryRecord06	RW	1		%d	None	
0F78	16	Fault Record 7	FaultHistoryRecord07	RW	1		%d	None	
0F88	16	Fault Record 8	FaultHistoryRecord08	RW	1		%d	None	
0F98	16	Fault Record 9	FaultHistoryRecord09	RW	1		%d	None	
0FA8	16	Fault Record 10	FaultHistoryRecord10	RW	1		%d	None	
0FB8	16	Fault Record 11	FaultHistoryRecord11	RW	1		%d	None	
0FC8	16	Fault Record 12	FaultHistoryRecord12	RW	1		%d	None	
0FD8	16	Fault Record 13	FaultHistoryRecord13	RW	1		%d	None	Each fault record occupies 16 addresses, with a total of 32 fault records stored. Internal data format definition for fault records: (defined by internal offset addresses) **0x00:** Fault code. Refer to the manual for specific definitions. A fault code value of 0 indicates the fault record is invalid. **0x01 – 0x03:** Time when the fault code occurred (first-generation devices do not include time). **0x04~0x0F:** Data packets captured at the time of fault occurrence, totaling 12 data points.
0FE8	16	Fault Record 14	FaultHistoryRecord14	RW	1		%d	None	
0FF8	16	Fault Record 15	FaultHistoryRecord15	RW	1		%d	None	
D008	16	Fault Record 16	FaultHistoryRecord16	RW	1		%d	None	
D018	16	Fault Record 17	FaultHistoryRecord17	RW	1		%d	None	
D028	16	Fault Record 18	FaultHistoryRecord18	RW	1		%d	None	
D038	16	Fault Record 19	FaultHistoryRecord19	RW	1		%d	None	
D048	16	Fault Record 20	FaultHistoryRecord20	RW	1		%d	None	
D058	16	Fault Record 21	FaultHistoryRecord21	RW	1		%d	None	
D068	16	Fault Record 22	FaultHistoryRecord22	RW	1		%d	None	
D078	16	Fault Record 23	FaultHistoryRecord23	RW	1		%d	None	

D088	16	Fault Record 24	FaultHistoryRecord24	RW	1		%d	None	
D098	16	Fault Record 25	FaultHistoryRecord25	RW	1		%d	None	
D0A8	16	Fault Record 26	FaultHistoryRecord26	RW	1		%d	None	
D0B8	16	Fault Record 27	FaultHistoryRecord27	RW	1		%d	None	
D0C8	16	Fault Record 28	FaultHistoryRecord28	RW	1		%d	None	
D0D8	16	Fault Record 29	FaultHistoryRecord29	RW	1		%d	None	
D0E8	16	Fault Record 30	FaultHistoryRecord30	RW	1		%d	None	
D0F8	16	Fault Record 31	FaultHistoryRecord31	RW	1		%d	None	

END

Note: Addresses 0x0438 to 0x439 are reserved for online upgrade command entry points. Registers starting at address FE06 are special-purpose registers and are only available on certain machines!!!

FDE8	1	Activation Status	SWActivedOkFlag	R	1		%d	None	
FDE9	1	AES Version	AesVer	R	1		%d	None	
FDEA	2	CPU Unique Code	DSP_UNI_ID	R	1		%x	None	
FDEC	6	Reserve	ActiveReserved20	R	1		%d	None	
FDF2	16	Encrypted Activation Code	ActiveCodeInput	W	1		%s	None	
FE02	4	Reserved2	ActiveReserved21	R	1		%d	None	
FE06	1	Battery SOC	Battery State of Charge	R	1	%	%d	None	
FE07	1	Battery Power	Battery Power	R	1	W	%d	Yes	Positive values indicate discharge, negative values indicate charging
FE08	1	AC Charging Power	AC Charge Power	R	1	W	%d	None	
FE09	1	Battery Chargeable Power	AllowChgPower	R	1	W	%d	None	
FE0A	1	Phase A AC_In Output Active Power	AcIn_OutputActivePowerA	R	1	W	%d	Yes	Power is positive when flowing into the grid and negative when absorbed from the grid
FE0B	1	Machine Rated Power	Inverter Rated Power	R	1	W	%d	None	
FE0C	1	Total PV Power	PvSumPower	R	1	W	%d	None	
FE0D	1	Battery Rated Power	BatteryRatedPower	R	1	W	%d	None	Reserved
FE0E	1	Battery Charge/Discharge Status	BatteryState	R	1	-	%d	None	0: Discharge, 1: Charge
FE0F	1	System Status	MachineState	R	1	-	%d	None	0: Normal, 1: Abnormal
FE10	1	Phase A Backup Load Active Power	BackUp_OutActivePowerA	R	1	W	%d	Yes	Positive values indicate power flowing out of the AcOut terminal; negative values indicate power flowing in (energy backfeed at the output terminal)
FE11	1	Phase B Backup Load Active Power	BackUp_OutActivePowerB	R	1	W	%d	Yes	Two/Three-Phase Inverters Only
FE12	1	Phase C Backup Load Active Power	Backup_OutActivePowerC	R	1	W	%d	Yes	Applicable to three-phase units
FE13	1	Parallel Operation Mode	ParallelMode	R	1	-	%d	None	0: Single Unit 1: Parallel Operation 2: Phase-based reference phase 3: Phase 120° out of phase with reference phase 4: Phase offset by 180° from the reference phase 5: First phase in three-phase 6: Second phase of the three-phase system 7: Third phase of the three-phase system
FE14	1	Parameter Settings and Alarm Information Updates	WifiSettingAlarmUpdate	RW	1	-	%d	None	Set the parameter and alarm information update flag. After reading this flag, WIFI will update the settings and alarm information and clear this flag.
FE15	1	WIFI Smart Scheduling Enabled	WifiAutoScheduleEn	RW	1	-	%d	None	0: Disable Wi-Fi smart scheduling. 1: Enable Wi-Fi smart scheduling. The inverter executes power response requests issued via Wi-Fi.
FE16	1	Phase A Inverter Grid-Connected Power	InvOngridPowerA	RW	1	W	%d	Yes	Positive values indicate grid-connected power, negative values indicate charging power
FE17	1	Phase B Inverter Grid-Connected Power	InvOngridPowerB	RW	1	W	%d	Yes	Two/Three-Phase Inverters Only
FE18	1	Phase C Inverter Grid-Connected Power	InvOngridPowerC	RW	1	W	%d	Yes	Applicable to three-phase units
FE19	1	Phase B AC_In Output Active Power	AcIn_OutputActivePowerB	R	1	W	%d	Yes	Positive power when feeding into the grid, negative power when drawing from the grid. Applicable only to two- or three-phase machines.
FE1A	1	Phase C AC_In Output Active Power	AcIn_OutputActivePowerC	R	1	W	%d	Yes	Positive when feeding into the grid, negative when drawing power from the grid. Used only for three-phase systems.
FE1B	1	PV1 Power	Ems_Pv1Power	R	1	W	%d	None	
FE1C	1	PV2 Power	Ems_Pv2Power	R	1	W	%d	None	
FE1D	1	PV3 Power	Ems_Pv3Power	R	1	W	%d	None	
FE1E	1	PV4 Power	Ems_Pv4Power	R	1	W	%d	None	
FE1F	7	Reserve	Reserved1	R	1	-	%d	None	FE06-FE25, a total of 32 registers for machine scheduling data of parallel machine ID 1
FE26	32	Machine scheduling data for ID2							32 registers for machine scheduling data with parallel ID 2, defined as FE26-FE45
FE46	32	Machine scheduling data for ID3							25 registers for machine scheduling data with parallel ID 3, defined as FE46-FE65
FE66	32	Machine scheduling data for ID4							32 registers for machine scheduling data of parallel machine ID 4, defined as FE66-FE85
FE86	32	Machine Scheduling Data for ID5							32 registers for machine scheduling data with parallel ID 5, defined as FE86-FEA5
FEA6	32	Machine scheduling data for ID6							A total of 32 registers are defined as machine scheduling data for parallel machine ID 6, defined as FEA6-FEC5

Table 1: Fault Description (0x75A5-0x75AC) BIT Position 1 Active

Bit0-15	0x75A5-Word0 (Alarms 1-16)	0x75A6-Word1 (Alarms 17-32)	0x75A7-Word2 (Alarms 33-47)	0x75A8-Word3 (Alarms 48-63)	0x75A9-Word4 (Alarms 64-79)	0x75AA-Word5 (Alarms 81-96)
Bit0	Low Battery Voltage Alert	Bus Short Circuit	Control CAN communication failure	BMS communication failure	Grid Voltage Overvoltage	Reserve
Bit1	Battery End-of-Discharge	PV Input Overvoltage	CAN communication failure	BMS Abnormal Alarm	Grid Voltage Undervoltage	Reserve
Bit2	Battery Current Software Overcurrent Alarm	PV Current Software Overcurrent	Parallel Mode Configuration Error	BMS battery over-temperature	Grid Frequency Overfrequency	Reserve
Bit3	Battery Hardware Overcurrent Alarm	PV Current Hardware Overcurrent	Parallel current sharing failure	BMS Battery Overcurrent	Grid Frequency Undercut	Reserve
Bit4	Battery Open Circuit	Low PV Insulation Resistance	Parallel ID conflict	BMS Battery Overvoltage	Grid Voltage 10-Minute Average Overvoltage	Reserve
Bit5	Battery Overvoltage Alarm	PV heat sink overtemperature	Battery inconsistency alarm in parallel operation	BMS Battery Undervoltage	Low-Voltage Ride-Through Anomaly	Reserve
Bit6	Low Battery Capacity Rate	Inverter heat sink overtemperature	Mismatched grid power	BMS Battery Low Temperature	High-Voltage Ride-Through Anomaly	Reserve
Bit7	Battery Low Capacity Shutdown	Transformer Overheating	Parallel synchronization signal anomaly	PD board communication error	System Grounding Abnormality	Reserve
Bit8	Bypass Output Overload	Mains Input Relay Short Circuit	Parallel firmware incompatibility	PD board abnormal alarm	DC Arc Detection Anomaly	Reserve
Bit9	Inverter Output Overload	Output relay short circuit	Parallel connection cable abnormality	BMS Pack Quantity Anomaly	Islanding Protection	Reserve
Bit10	Inverter AC Output Short Circuit	Fan failure	Product Serial Number Error	BMS upgrade alert	Reserve	Reserve
Bit11	Inverter hardware overcurrent alarm	EEPROM failure	System battery low voltage shutdown	BMS system fault	Reserve	Reserve
Bit12	Large DC Component Alarm on Inverter	SPI communication failure	Abnormal shutdown from chip	BMS Heating Film Failure	Reserve	Reserve
Bit13	Busbar hardware overvoltage	Model configuration error	Bus Unbalance		Reserve	Reserve
Bit14	Busbar Software Overvoltage	Busbar Soft Start Failure	External CT host configuration error		Reserve	Reserve
Bit15	Bus Undervoltage Alarm	Abnormal leakage current	Mains input phase anomaly		Reserve	Reserve

Table 2: Control Mode Support Description - Each Bit Represents One Mode	
C7C3	0 = Charge mode
	1 = Discharge mode
	2 = opModConnect (connect/disconnect—implies galvanic isolation)
	3 = opModEnergize (energize/de-energize)
	4 = opModFixedPFAbsorbW (fixed power factor setpoint when absorbing active power)
	5 = Fixed Power Factor Setpoint for Active Power Injection
	6 = Fixed Variance Mode (reactive power setpoint)
	7 = opModFixedW (charge/discharge setpoint)
	8 = opModFreqDroop (Frequency-Watt Parameterized mode)
	9 = opModFreqWatt (Frequency-Watt Curve mode)
	10 = opModHFRTMayTrip (High Frequency Ride-Through, May Trip mode)
	11 = opModHFRTMustTrip (High Frequency Ride-Through, Must Trip mode)
	12 = opModHVRTMayTrip (High Voltage Ride-Through, May Trip mode)
	13 = opModHVRTMomentaryCessation (High Voltage Ride-Through, Momentary Cessation mode)
	14 = opModHVRTMustTrip (High Voltage Ride-Through, Must Trip mode)
	15 = opModLFRTMayTrip (Low Frequency Ride-Through, May Trip mode)
C7C4	0 = opModLFRTMustTrip (Low Frequency Ride-Through, Must Trip mode)
	1 = opModLVRTMayTrip (Low Voltage Ride-Through, May Trip mode)
	2 = opModLVRTMomentaryCessation (Low Voltage Ride-Through, Momentary Cessation mode)
	3 = opModLVRTMustTrip (Low Voltage Ride-Through, Must Trip mode)
	20 = opModMaxLimW (maximum active power)
	21 = opModTargetVar (target reactive power)
	22 = opModTargetW (target active power)
	23 = opModVoltVar (Volt-Var mode)
	24 = opModVoltWatt (Volt-Watt mode)
	25 = opModWattPF (Watt-Power factor mode)
	26 = opModWattVar (Watt-Var mode)