# SOFARSOLAR

# ModBus-RTU Communication Protocol

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# 1. General Information

The guide is to give you the definition of the protocol between Inverter and AP(Application Program and data Logger Devices ,hereinafter to as ‘AP.’).Through the protocol ,data packet will be transmitted between AP and Inverter.

About the setting of communication,the query data length is 8 bits;the parity is set to none and the stop bits is one.The [Baud](javascript:void(0);) [rate](javascript:void(0);) is 9600bps.

# 2. Modbus Function Format

## 2.1 Packet Format

Query

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Slave  Address | Function  Code | Starting  Address | Number of Registers | CRC16 |
| 1 byte | 1 byte | 2 bytes | 2 bytes | 2 bytes |
| 0xxx | 0xxx | Hi ByteLo Byte | Hi Byte Lo Byte | Lo Byte Hi Byte |

Response

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Slave  Address | Function  Code | Byte  Count | Register-1  value | ... | Register-N  value | CRC16 |
| 1 byte | 1 byte | 1 byte | 2 bytes | N-2 | 2 bytes | 2 bytes |
| Byte | Byte | Byte | Hi Byte Lo Byte | ... | HiByte Lo Byte | Lo Byte Hi Byte |

## 2.2 Description

|  |  |
| --- | --- |
| Slave Address | 8-bit value representing the slave being address(1-31) |
| Function Code | Read the real time data(0x03)  Read [product](javascript:void(0);) [information](javascript:void(0);)(0x04) |
| Starting Address (Hi) | The High byte of the Starting Address |
| Starting Address (Lo) | The Low byte of the Starting Address |
| Number of Registers ( Hi) | The High byte of the Register number |
| Number of Registers ( Lo) | The Low byte of the Register number |
| ByteCount | The bytes count of registers being requested |
| CRC16 Lo | The Low byte of the error check value |
| CRC16 Hi | The High byte of the error check value |

# 3. Instruction

## 3.1 Read the real time data(Function Code 0x03)

Through the 0x03 function code, queries allow the register information, data format is as follows：

### 3.1.1 [data](javascript:void(0);) [frame](javascript:void(0);) [format](javascript:void(0);)

Packet format of AP Request：

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Slave  Address | Function  Code | Starting  Address | Number of Registers | CRC16 |
| 1 byte | 1 byte | 2 bytes | 2 bytes | 2 bytes |
| 0xxx | 0x03 | Hi ByteLo Byte | Hi Byte Lo Byte | Lo Byte Hi Byte |

Packet format of Inverter Request：

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Slave  Address | Function  Code | Byte  Count | Register-1  value | 。。。 | Register-N  value | CRC16 |
| 1 byte | 1 byte | 1 byte | 2 bytes | N-2 | 2 bytes | 2 bytes |
| Byte | Byte | Byte | Hi Byte Lo Byte | 。。。 | HiByte Lo Byte | Lo Byte Hi Byte |

[Example](javascript:void(0);)（query the state of the Inverter ）：

Query ：

|  |  |
| --- | --- |
| Slave Address | 0x01 |
| Function Code | 0x03 |
| Starting Address Hi | 0x00 |
| Starting Address Lo | 0x00 |
| Number of Registers Hi | 0x00 |
| Number of Registers Lo | 0x01 |
| CRC16 Lo | 0x84 |
| CRC16 Hi | 0x0A |

[response](javascript:void(0);)：

|  |  |
| --- | --- |
| Slave Address | 0x01 |
| Function Code | 0x03 |
| Byte Count | 0x02 |
| Register-1 value Hi | 0x00 |
| Register-1 value Lo | 0x00 |
| CRC16 Lo | 0xB8 |
| CRC16 Hi | 0x44 |

### 3.1.2 Data Address Table

**[Operating](javascript:void(0);) [state](javascript:void(0);)**

00： wait

01：check

02：Normal

03：Fault

04：Permanent

**Fault Message：**

Byte0

|  |  |  |
| --- | --- | --- |
| bit | Error Message | [ID](javascript:void(0);) code(detailed) |
| Bit0 | GridOVP | ID01 Grid Over Voltage Protection |
| Bit1 | GridUVP | ID02 Grid Under Voltage Protection |
| Bit2 | GridOFP | ID03 Grid Over Frequency Protection |
| Bit3 | GridUFP | ID04 Grid Under Frequency Protection |
| Bit4 | PVUVP | ID05 PV Under Voltage Protection |
| Bit5 | GridLVRT | ID06 Grid Low Voltage Ride through |
| Bit6 | [reserve](javascript:void(0);) | ID07 |
| Bit7 | [reserve](javascript:void(0);) | ID08 |

Byte1

|  |  |  |
| --- | --- | --- |
| bit位 | Error Message | [ID](javascript:void(0);) code(detailed) |
| Bit0 | PVOVP | ID09 PV Over Voltage Protection |
| Bit1 | IpvUnbalance | ID10 PV Input Current Unbalance |
| Bit2 | PvConfigSetWrong | ID11 PV Input Mode Configure wrong |
| Bit3 | GFCIFault | ID12 Ground-Fault circuit interrupters Fault |
| Bit4 | PhaseSequenceFault | ID13 Phase sequence Fault |
| Bit5 | HwBoostOCP | ID14 hardware boost over current protection |
| Bit6 | HwAcOCP | ID15 Hardware AC over current protection |
| Bit7 | AcRmsOCP | ID16 The Grid current is too high |

Byte2

|  |  |  |
| --- | --- | --- |
| bit | Error Message | [ID](javascript:void(0);) code(detailed) |
| Bit0 | HwADFaultIGrid | ID17 The Grid current sampling is error |
| Bit1 | HwADFaultDCI | ID18 The DCI sampling is error |
| Bit2 | HwADFaultVGrid | ID19 The Grid voltage sampling is error |
| Bit3 | GFCIDeviceFault | ID20 GFCI device sampling is error |
| Bit4 | MChip\_Fault | ID21 Main chip fault |
| Bit5 | HwAuxPowerFault | ID22 Hardware auxiliary power fault |
| Bit6 | BusVoltZeroFault | ID23 Bus voltage zero fault |
| Bit7 | IacRmsUnbalance | ID24 The output current is not balanced |

Byte3

|  |  |  |
| --- | --- | --- |
| bit | Error Message | [ID](javascript:void(0);) code(detailed) |
| Bit0 | BusUVP | ID25 Bus under voltage protection |
| Bit1 | BusOVP | ID26 Bus over voltage protection |
| Bit2 | VbusUnbalance | ID27 Bus voltage unbalance |
| Bit3 | DciOCP | ID28 The DCI is too high |
| Bit4 | SwOCPInstant | ID29 The Grid current is too high |
| Bit5 | SwBOCPInstant | ID30 The input current is too high |
| Bit6 | reserved | ID31 |
| Bit7 | reserved | ID32 |

Byte4，byte5

|  |  |  |
| --- | --- | --- |
| bit | Error Message | [ID](javascript:void(0);) code(detailed) |
| Bit0 | reserved | 33/41 |
| Bit1 | reserved | 34 /42 |
| Bit2 | reserved | 35/43 |
| Bit3 | reserved | 36/44 |
| Bit4 | reserved | 37/45 |
| Bit5 | reserved | 38/46 |
| Bit6 | reserved | 39/47 |
| Bit7 | reserved | 40/48 |

Byte6

|  |  |  |
| --- | --- | --- |
| bit | Error Message | [ID](javascript:void(0);) code(detailed) |
| Bit0 | ConsistentFault\_VGrid | ID49 The grid voltage sampling value between the master and slave DSP is Vary widely |
| Bit1 | ConsistentFault\_FGrid | ID50 The grid frequency sampling value between the master and slave DSP is Vary widely |
| Bit2 | ConsistentFault\_DCI | ID51 The DCI sampling value between the master and slave DSP is Vary widely |
| Bit3 | ConsistentFault\_GFCI | ID52 The GFCI sampling value between the master and slave DSP is Vary widely |
| Bit4 | SpiCommLose | ID53 The communication between the master and slave DSP is fail |
| Bit5 | SciCommLose | ID53 The communication between the slave and communication board is fail |
| Bit6 | RelayTestFail | ID55 The relay is fault |
| Bit7 | PvIsoFault | ID56 The insulation resistance between the PV array and the earth is too low |

Byte7

|  |  |  |
| --- | --- | --- |
| bit | Error Message | [ID](javascript:void(0);) code(detailed) |
| Bit0 | OverTempFault\_Inv | ID57 The inverter temp is too high |
| Bit1 | OverTempFault\_Boost | ID58 The boost temp is too high |
| Bit2 | OverTempFault\_Env | ID59 The [environment](javascript:void(0);) temp is too high |
| Bit3 | PEConnectFault | ID60 The inverter is not connect the PE wire |
| Bit4 | reserved | ID61 |
| Bit5 | reserved | ID 62 |
| Bit6 | reserved | ID 63 |
| Bit7 | reserved | ID 64 |

Byte8

|  |  |  |
| --- | --- | --- |
| bit | Error Message | [ID](javascript:void(0);) code(detailed) |
| Bit0 | unrecoverHwAcOCP | ID65 The grid current is too high,and has cause unrecoverable fault |
| Bit1 | unrecoverBusOVP | ID66 The bus voltage is too high,and has cause unrecoverable fault |
| Bit2 | unrecoverIacRmsUnbalance | ID67 The grid current is unbalance,and has cause unrecoverable fault |
| Bit3 | unrecoverIpvUnbalance | ID68 The input current is unbalance,and has cause unrecoverable fault |
| Bit4 | unrecoverVbusUnbalance | ID69 The bus voltage is unbalance,and has cause unrecoverable fault |
| Bit5 | unrecoverOCPInstant | ID70 The grid current is too high,and has cause unrecoverable fault |
| Bit6 | unrecoverPvConfigSetWrong | ID65 PV Input Mode Configure wrong,and has cause unrecoverable fault |
| Bit7 | reserved | 72 |

Byte9

|  |  |  |
| --- | --- | --- |
| bit位 | Error Message | [ID](javascript:void(0);) code(detailed) |
| Bit0 | reserved | 73 |
| Bit1 | unrecoverIPVInstant | ID74 The input current is too high.and has cause unrecoverable fault |
| Bit2 | unrecoverWRITEEEPROM | ID75 The EEPROM is fault |
| Bit3 | unrecoverREADEEPROM | ID76 The EEPROM is fault |
| Bit4 | unrecoverRelayFail | ID77 The relay is fault, and has cause unrecoverable fault |
| Bit5 | reserved | ID 78 |
| Bit6 | reserved | ID 79 |
| Bit7 | reserved | ID 80 |

**Inverter alert message Message：**

byte0

|  |  |  |
| --- | --- | --- |
| bit位 | Error Message | [ID](javascript:void(0);) code(detailed) |
| Bit0 | OverTempDerating | ID81 The inverter has derated because of the temperature is too high |
| Bit1 | OverFreqDerating | ID82 inverter has derated because of the grid frequency is too high |
| Bit2 | RemoteDerating | ID83 inverter has derated by remote control |
| Bit3 | RemoteOff | ID84 inverter has shut down by remote control |
| Bit4 | reserved | ID85 |
| Bit5 | reserved | ID86 |
| Bit6 | reserved | ID87 |
| Bit7 | reserved | ID88 |

**Inverter alert message：byte1**

|  |  |  |
| --- | --- | --- |
| bit | Error Message | [ID](javascript:void(0);) code(detailed) |
| Bit0 | reserved | reserved |
| Bit1 | reserved | reserved |
| Bit2 | reserved | reserved |
| Bit3 | reserved | reserved |
| Bit4 | reserved | reserved |
| Bit5 | reserved | reserved |
| Bit6 | reserved | reserved |
| Bit7 | reserved | reserved |

**Communication board inner message：byte0**

|  |  |  |
| --- | --- | --- |
| bit | Error Message | [ID](javascript:void(0);) code(detailed) |
| Bit0 | Fan1 alarm | ID91 Fan1 alarm |
| Bit1 | Fan2 alarm | ID92 Fan2 alarm |
| Bit2 | Lightning protection alarm | ID93 Lightning protection alarm |
| Bit3 | Software version is not consistent | ID94 Software version is not consistent |
| Bit4 | Communication board EEPROM fault | ID95 The communication board EEPROM is fault |
| Bit5 | RTCFatult | ID96 RTC clock chip is fault |
| Bit6 | InValidCountry | ID97 The country is invalid |
| Bit7 | SDfault | ID98 The SD card is fault |

**Communication board inner message：byte1**

|  |  |  |
| --- | --- | --- |
| bit | Error Message | ID code(detailed) |
| Bit0 | Fan3 alarm | ID90 Fan3 alarm |
| Bit1 | reserved | reserved |
| Bit2 | reserved | reserved |
| Bit3 | reserved | reserved |
| Bit4 | reserved | reserved |
| Bit5 | reserved | reserved |
| Bit6 | reserved | reserved |
| Bit7 | reserved | reserved |

Inverter Data Address table

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Address | Define | | | Variable type | | | length | | | | | range | | Default value | | Remarks | |
| 0x0000 | [Operating](javascript:void(0);) [state](javascript:void(0);) | | | Uint | | | 16 | | | | |  | |  | | Only Low-Byte availability | |
| 0x0001 | Fault1 | | | Uint | | | 16 | | | | |  | |  | | High-Byte:byte1  Low-Byte:byte0 | |
| 0x0002 | Fault2 | | | Uint | | | 16 | | | | |  | |  | | High-Byte:byte3  Low-Byte:byte2 | |
| 0x0003 | Fault3 | | | Uint | | | 16 | | | | |  | |  | | High-Byte:byte5  Low-Byte:byte4 | |
| 0x0004 | Fault4 | | | Uint | | | 16 | | | | |  | |  | | High-Byte:byte7  Low-Byte:byte6 | |
| 0x0005 | Fault5 | | | Uint | | | 16 | | | | |  | |  | | High-Byte:byte9  Low-Byte:byte8 | |
|  |  | | |  | | |  | | | | |  | |  | |  | |
| PV Input Message | | | | | | | | | | | | | | | | | |
| Address | Define | Variable type | | | | Length | | | | range | | | Default value | | | Remarks | |
| 0x0006 | PV1 voltage | Uint | | | | 16 | | | | 0-1000V | | |  | | | Unit:0.1V | |
| 0x0007 | PV1 current | int | | | | 16 | | | | 0-100A | | |  | | | Unit:0.01A | |
| 0x0008 | PV2 voltage | Uint | | | | 16 | | | | 0-1000V | | |  | | | Unit:0.1V | |
| 0x0009 | PV2 current | int | | | | 16 | | | | 0-100A | | |  | | | Unit:0.01A | |
| 0x000A | PV1 power | Uint | | | | 16 | | | | 0-100kw | | |  | | | Unit:0.01kw | |
| 0x000B | PV2 power | Uint | | | | 16 | | | | 0-100kw | | |  | | | Unit:0.01kw | |
| Output Grid Message | | | | | | | | | | | | | | | | | |
| Address | Define | Variable type | | | length | | | | range | | | | Default value | | | Remarks | |
| 0x000C | Output active power | Uint | | | 16 | | | |  | | | |  | | | Unit:0.01kW | |
| 0x000D | Output reactive power | int | | | 16 | | | |  | | | |  | | | Unit:0.01kVar | |
| 0x000E | Grid frequency | Uint | | | 16 | | | |  | | | |  | | | Unit:0.01Hz | |
| 0x000F | A-phase voltage | Uint | | | 16 | | | |  | | | |  | | | Unit:0.1V | |
| 0x0010 | A-phase current | Uint | | | 16 | | | |  | | | |  | | | Unit:0.01A | |
| 0x0011 | B-phase voltage | Uint | | | 16 | | | |  | | | |  | | | Unit:0.1V | |
| 0x0012 | B-phase current | Uint | | | 16 | | | |  | | | |  | | | Unit:0.01A | |
| 0x0013 | C-phase voltage | Uint | | | 16 | | | |  | | | |  | | | Unit:0.1V | |
| 0x0014 | C-phase current | Uint | | | 16 | | | |  | | | |  | | | Unit:0.01A | |
| Inverter Generation message | | | | | | | | | | | | | | | | | |
| Address | Define | | | Variable type | | | | Length | | | range | | | | Default value | | Remarks |
| 0x0015 | Total production high-byte | | | Uint | | | | 16 | | | 0-65536 | | | |  | | Unit:1kWh |
| 0x0016 | Total production low-byte | | | Uint | | | | 16 | | | 0-65536 | | | |  | |
| 0x0017 | Total generation time high-byte | | | Uint | | | | 16 | | | 0-65536 | | | |  | | Unit:1 hour |
| 0x0018 | Total generation time low-byte | | | Uint | | | | 16 | | | 0-65536 | | | |  | |
| 0x0019 | Today production | | | Uint | | | | 16 | | | 0-1000V | | | |  | | Unit:0.01kWh |
| 0x001A | Today generation time | | | Uint | | | | 16 | | | 0-65536 | | | |  | | Unit:1 Minute |
| Inverter inner message | | | | | | | | | | | | | | | | | |
| Address | Define | | Variable type | | Length | | | | Range | | | | Default value | | | Remarks | |
| 0x001B | Inverter module temperature | | int | | 16 | | | |  | | | |  | | |  | |
| 0x001C | Inverter inner temperature | | int | | 16 | | | |  | | | |  | | |  | |
| 0x001D | Inverter Bus voltage | | Uint | | 16 | | | | 0-1000V | | | |  | | | Unit:0.1V | |
| 0x001E | PV1 voltage sample by slave CPU | | Uint | | 16 | | | | 0-1000V | | | |  | | | Unit:0.1V | |
| 0x001F | PV1 current sample by slave CPU | | Uint | | 16 | | | | 0-100A | | | |  | | | Unit:0.01A | |
| 0x0020 | Count-down time | | Uint | | 16 | | | |  | | | |  | | |  | |
| 0x0021 | Inverter alert message | | Uint | | 16 | | | |  | | | |  | | |  | |
| 0x0022 | Input mode | | Uint | | 16 | | | |  | | | |  | | | 0x00: in parallal  0x01: in dependent | |
| 0x0023 | Communication board inner message | | Uint | | 16 | | | |  | | | |  | | |  | |
| 0x0024 | Insulation of PV1+ to ground | |  | |  | | | |  | | | |  | | |  | |
| 0x0025 | Insulation of PV1+ to ground | |  | |  | | | |  | | | |  | | |  | |
| 0x0026 | Insulation of PV - to ground | |  | |  | | | |  | | | |  | | |  | |
| 0x0027 | Country | |  | |  | | | |  | | | |  | | |  | |
|  |  | |  | |  | | | |  | | | |  | | |  | |
|  |  | |  | |  | | | |  | | | |  | | |  | |
|  |  | |  | |  | | | |  | | | |  | | |  | |
|  |  | |  | |  | | | |  | | | |  | | |  | |
|  |  | |  | |  | | | |  | | | |  | | |  | |
|  |  | |  | |  | | | |  | | | |  | | |  | |
|  |  | |  | |  | | | |  | | | |  | | |  | |

### 3.1.3 Read built-in combiner data address table

Address table

Alarm table

Byte0

|  |  |  |
| --- | --- | --- |
| bit | Description | Remarks |
| Bit0 |  | PV11 over voltage alarm |
| Bit1 |  | PV12 over voltage alarm |
| Bit2 |  | PV13 over voltage alarm |
| Bit3 |  | PV14 over voltage alarm |
| Bit4 |  | reserved |
| Bit5 |  | reserved |
| Bit6 |  | reserved |
| Bit7 |  | reserved |

Byte1

|  |  |  |
| --- | --- | --- |
| bit | Description | Remarks |
| Bit0 |  | PV21 over voltage alarm |
| Bit1 |  | PV22 over voltage alarm |
| Bit2 |  | PV23 over voltage alarm |
| Bit3 |  | PV24 over alarm voltage |
| Bit4 |  | reserved |
| Bit5 |  | reserved |
| Bit6 |  | reserved |
| Bit7 |  | reserved |

Byte2

|  |  |  |
| --- | --- | --- |
| bit | Description | Remarks |
| Bit0 |  | PV11 under voltage alarm |
| Bit1 |  | PV12 under voltage alarm |
| Bit2 |  | PV13 under voltage alarm |
| Bit3 |  | PV14 under voltage alarm |
| Bit4 |  | reserved |
| Bit5 |  | reserved |
| Bit6 |  | reserved |
| Bit7 |  | reserved |

Byte3

|  |  |  |
| --- | --- | --- |
| bit位 | Description | Remarks |
| Bit0 |  | PV21 under voltage alarm |
| Bit1 |  | PV22 under voltage alarm |
| Bit2 |  | PV23 under voltage alarm |
| Bit3 |  | PV24 under voltage alarm |
| Bit4 |  | reserved |
| Bit5 |  | reserved |
| Bit6 |  | reserved |
| Bit7 |  | reserved |

Byte4

|  |  |  |
| --- | --- | --- |
| bit位 | Description | Remarks |
| Bit0 |  | PV11 Reflux alarm |
| Bit1 |  | PV12 reflux alarm |
| Bit2 |  | PV13 reflux alarm |
| Bit3 |  | PV14 reflux alarm |
| Bit4 |  | reserved |
| Bit5 |  | reserved |
| Bit6 |  | reserved |
| Bit7 |  | reserved |

Byte5

|  |  |  |
| --- | --- | --- |
| bit位 | Description | Remarks |
| Bit0 |  | PV21 reflux alarm |
| Bit1 |  | PV22 reflux alarm |
| Bit2 |  | PV23 reflux alarm |
| Bit3 |  | PV24 reflux alarm |
| Bit4 |  | reserved |
| Bit5 |  | reserved |
| Bit6 |  | reserved |
| Bit7 |  | reserved |

Byte6

|  |  |  |
| --- | --- | --- |
| bit位 | Description | Remarks |
| Bit0 |  | PV11 over current alarm |
| Bit1 |  | PV12 over current alarm |
| Bit2 |  | PV13 over current alarm |
| Bit3 |  | PV14 over current alarm |
| Bit4 |  | reserved |
| Bit5 |  | reserved |
| Bit6 |  | reserved |
| Bit7 |  | reserved |

Byte7

|  |  |  |
| --- | --- | --- |
| bit位 | Description | Remarks |
| Bit0 |  | PV21 over current alarm |
| Bit1 |  | PV22 over current alarm |
| Bit2 |  | PV23 over current alarm |
| Bit3 |  | PV24 over current alarm |
| Bit4 |  | reserved |
| Bit5 |  | reserved |
| Bit6 |  | reserved |
| Bit7 |  | reserved |

Byte8

|  |  |  |
| --- | --- | --- |
| bit位 | Description | Remarks |
| Bit0 |  | PV11 Fuse alarm |
| Bit1 |  | PV12 Fuse alarm |
| Bit2 |  | PV13 Fuse alarm |
| Bit3 |  | PV14 Fuse alarm |
| Bit4 |  | reserved |
| Bit5 |  | reserved |
| Bit6 |  | reserved |
| Bit7 |  | reserved |

Byte9

|  |  |  |
| --- | --- | --- |
| bit位 | Description | Remarks |
| Bit0 |  | PV21 Fuse alarm |
| Bit1 |  | PV22 Fuse alarm |
| Bit2 |  | PV23 Fuse alarm |
| Bit3 |  | PV24 Fuse alarm |
| Bit4 |  | reserved |
| Bit5 |  | reserved |
| Bit6 |  | reserved |
| Bit7 |  | reserved |

Address table of combiner data

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Address | Define | Variable type | Length | Range | Default value | Remarks |
| 0x0100 | Alarm message table1 | Uint | 16 |  |  | High-byte:byte1  Low-byte:byte0 |
| 0x0101 | Alarm message table2 | Uint | 16 |  |  | High-byte:byte3  Low-byte:byte2 |
| 0x0102 | Alarm message table3 | Uint | 16 |  |  | High-byte:byte5  Low-byte:byte4 |
| 0x0103 | Alarm message table4 | Uint | 16 |  |  | High-byte:byte7  Low-byte:byte6 |
| 0x0104 | Alarm message table5 | Uint | 16 |  |  | High-byte:byte9  Low-byte:byte8 |
| DC input message | | | | | | |
| Address | Define | Variable type | Length | Range | Default value | Remarks |
| 0x0105 | String 1 voltage | Uint | 16 | 0-1000V |  | Unit:0.1V |
| 0x0106 | String 1 current | int | 16 | 0-100A |  | Unit:0.01A |
| 0x0107 | String 2 voltage | Uint | 16 | 0-1000V |  | Unit:0.1V |
| 0x0108 | String 2 current | int | 16 | 0-100A |  | Unit:0.01A |
| 0x0109 | String 3 voltage | Uint | 16 | 0-1000V |  | Unit:0.1V |
| 0x010A | String 3 current | int | 16 | 0-100A |  | Unit:0.01A |
| 0x010B | String 4 voltage | Uint | 16 | 0-1000V |  | Unit:0.1V |
| 0x010C | String 4 current | int | 16 | 0-100A |  | Unit:0.01A |
| 0x010D | String 5 voltage | Uint | 16 | 0-1000V |  | Unit:0.1V |
| 0x010E | String 5 current | int | 16 | 0-100A |  | Unit:0.01A |
| 0x010F | String 6 voltage | Uint | 16 | 0-1000V |  | Unit:0.1V |
| 0x0110 | String 6 current | int | 16 | 0-100A |  | Unit:0.01A |
| 0x0111 | String 7 voltage | Uint | 16 | 0-1000V |  | Unit:0.1V |
| 0x0112 | String 7 current | int | 16 | 0-100A |  | Unit:0.01A |
| 0x0113 | String 8 voltage | Uint | 16 | 0-1000V |  | Unit:0.1V |
| 0x0114 | String 8 current | int | 16 | 0-100A |  | Unit:0.01A |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 0x0115 to 0x011F | reserved |  |  |  |  |  |
|  |  |  |  |  |
|  | | | | | | |
|  |  |  |  |  |  |  |
|  | | | | | | |

## 3.2 Read [product](javascript:void(0);) [information](javascript:void(0);)（Function Code 0x04）

### 3.2.1 Read data format

By function code 0x04,query data message of every allowable register,command format as below:

Host station request message format:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Slave address | Function code | Starting  Address | Number of Registers | CRC16 |
| 1 byte | 1 byte | 2 bytes | 2 bytes | 2 bytes |
| 0xxx | 0x04 | Hi Byte Lo Byte | Hi Byte Lo Byte | Lo Byte Hi Byte |

Slave station request message format:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Slave  Addres | Function code | Byte  Count | Register-1  value | 。。。 | Register-N  value | CRC16 |
| 1byte | 1byte | 1byte | 1byte | N-2 | 1byte | 1byte |
| Byte | Byte | Byte | Hi Byte Lo Byte | 。。。 | Hi Byte Lo Byte | Lo Byte Hi Byte |

### 3.2.2 Address table of read inverter’s manufacturer message

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Inverter’s Manufacturer message | | | | | | |
| Address | define | Variable type | length | range | Default value | Remarks |
| 0x2000 | Product code |  |  |  |  | 0：5KW  1：6KW  2：8KW  3：10KW  4：12KW  5：15KW  6：17KW  7：20KW  8：25KW  9：30KW |
| 0x2001 to 0x2007 | Manufacturer serial number |  |  |  |  |  |
| 0x2008 to 0x2009 | Software version code |  |  |  |  |  |
| 0x200A to 0x200B | Hardware version code |  |  |  |  |  |
| 0x200C to 0x200F | reserved |  |  |  |  |  |

Serial number definition table:

|  |  |  |
| --- | --- | --- |
| ID | Value | Remarks |
| 1 | ‘S’ | sofar,other value represent OEM product |
| 2-3 | “A1”or ”B1”or ”C1”or ”D1” | A1 (1-3K) ，B1（3-5K）， C1（10-20K),D1(30-43K) |
| 4 | E/C | E（English），C(Chinese) |
| 5-6 | "S0"or”S1”or”S2”or”"S3"or”S4”or”S5”or”S6” | Configure message |
| 7-8 | 10/30/50/06/08/10/12/15/17/20/25/30 | //If bit2、bit3 is A1 (1-3K)，10 represent 1000W  //If bit2、bit3 is B1（3-5K）30 represent 3000W  //If bit2、bit3 is C1（10-20K) represent 20000W  //If bit2、bit3 is D1(30-40K) represent 30000W |
| 9 | year | 00 year（0）01 year（1）02 year（2）03 year（3）04 year（4）05 year（5）06 year（6）07 year（7）08 year（8）09 year（9）10 year（A）11 year（B）12 year（C）13 year（D）14 year（E）15 year（F）16 year（G）17 year（H）18 year（I）19 year（J）20 year（K）21 year（L）22 year（M）23 year（N）24 year（O）25 year（P）26 year（Q）27 year（R）28 year（S）29 year（T）30 year（U）31 year（V）32 year（W）33 year（X）34 year（Y）35 year（Z） |
| 10 | month | 1 month（1）2 month（2）3 month（3）4 month（4）  5 month（5）6 month（6）7 month（7）8 month（8）  9 month（9）10 month（A）11 month（B）12 month（C） |
| 11 | day | 1date（1）2 date（2）3 date（3）4 date（4）5 date（5）6 date（6）7 date（7）8 date（8）9 date（9）10 date（A）11 date（B）12 date（C）  13date（D）14 date（E）15 date（F）16 date（G）17 date（H）18 date（I）19 date（J）20 date（K）21 date（L）22 date（M）23 date（N）24 date（O）25 date（P）26 date（Q）27 date（R）28 date（S）29 date（T）30 date（U）31 date（V） |
| 12-14 | xxx | 001（the number of production） |

**Example**

1. **Get the real-time data(function code 0x03)**

AP Request:

01 03 00 00 00 24 45 D1

Inverter response:

01 03 48 00 02 00 00 00 00 00 00 00 00 00 00 08 D5 01 A0 00 41 00 00 00 5E 00 00 00 59 00 00 13 87 09 05 01 85 00 00 00 00 00 00 00 00 00 00 00 8A 00 00 00 22 00 04 00 02 00 1C 00 26 0E 52 08 D5 00 41 00 1E 00 00 00 01 00 00 4E F2

The [Operating](javascript:void(0);) [state](javascript:void(0);) is:0x02(Normal)

1. **Get the [product](javascript:void(0);) [information](javascript:void(0);)(function code 0x04)**

AP Request:

01 04 20 00 00 10 FA 06

Inverter response:

01 04 20 00 02 53 42 31 45 53 30 34 30 45 38 47 30 31 34 56 31 37 30 56 31 30 30 00 00 00 00 00 00 00 00 5A BB

SN：SB1ES040E8G014

Software Version：V1.70

Hardware Version：V1.00