# Sigineer Off Grid Modbus RS485 RTU Protocol

V0.11

2017-8-09

Sigineer Power CO.,LTD

For Solar Inverter models of
M3000H-24LV
M3000H-48LV
M3000H-48BP-LV
M5000H-48BP
M6000L-48SP
M6000L-48
M120000L-48SP
M120000L-48

# 1 Data format

| Address | Function | Data | CRC check |
|---------|----------|------|-----------|
| 8 bits | 8 bits | N×8bits | 16bits |

**Valid slave device addresses are in the range of 0 – 247 decimal.**

**The individual slave devices are assigned addresses in the range of 1 – 247.**

**0 is the broadcast address**

**It is 16bits (two bytes) unsigned integer for each holding and input register;**

# 2 Command Format

Function 3 Read holding register

```
QUERY

                          Example
Field Name                (Hex)

Slave Address             11
Function                  03
Starting Address Hi       00
Starting Address Lo       6B
No. of Points Hi          00
No. of Points Lo          03
Error Check (LRC or CRC)  —
```

```
RESPONSE

                          Example
Field Name                (Hex)

Slave Address             11
Function                  03
Byte Count                06
Data Hi (Register 40108)  02
Data Lo (Register 40108)  2B
Data Hi (Register 40109)  00
Data Lo (Register 40109)  00
Data Hi (Register 40110)  00
Data Lo (Register 40110)  64
Error Check (LRC or CRC)  —
```

Response Error:

    11 0x80|0x03 Errornum CRC    (Errornum as a byte)

Function 4 Read input    register

QUERY

| Field Name | Example (Hex) |
| --- | --- |
| Slave Address | 11 |
| Function | 04 |
| Starting Address Hi | 00 |
| Starting Address Lo | 08 |
| No. of Points Hi | 00 |
| No. of Points Lo | 01 |
| Error Check (LRC or CRC) | — |

RESPONSE

| Field Name | Example (Hex) |
| --- | --- |
| Slave Address | 11 |
| Function | 04 |
| Byte Count | 02 |
| Data Hi (Register 30009) | 00 |
| Data Lo (Register 30009) | 0A |
| Error Check (LRC or CRC) | — |

Response Error:

11 0x80|0x04 Errornum CRC    (Errornum as a byte)

Function 6 Preset single register

QUERY

| Field Name | Example (Hex) |
| --- | --- |
| Slave Address | 11 |
| Function | 06 |
| Register Address Hi | 00 |
| Register Address Lo | 01 |
| Preset Data Hi | 00 |
| Preset Data Lo | 03 |
| Error Check (LRC or CRC) | — |

```
RESPONSE

                           Example
Field Name                 (Hex)

Slave Address              11
Function                   06
Register Address Hi        00
Register Address Lo        01
Preset Data Hi             00
Preset Data Lo             03
Error Check (LRC or CRC)   —
```

Response Error:

    11 0x80|0x06 Errornum CRC    (Errornum as a byte)

Function 16 Preset multiple register

```
QUERY

                           Example
Field Name                 (Hex)

Slave Address              11
Function                   10
Starting Address Hi        00
Starting Address Lo        01
No. of Registers Hi        00
No. of Registers Lo        02
Byte Count                 04
Data Hi                    00
Data Lo                    0A
Data Hi                    01
Data Lo                    02
Error Check (LRC or CRC)   —
```

```
RESPONSE

                           Example
Field Name                 (Hex)

Slave Address              11
Function                   10
Starting Address Hi        00
Starting Address Lo        01
No. of Registers Hi        00
No. of Registers Lo        02
Error Check (LRC or CRC)   —
```

Response Error:

    11 0x80|0x10 Errornum CRC    (Errornum as a byte)

# 3 Device Message Transmission Mode / Framing

RTU Mode

When controllers are setup to communicate on a Modbus network using RTU (Remote Terminal Unit) mode, each 8–bit byte in a message contains two 4–bit hexadecimal characters. Each message must be transmitted in a continuous stream.

The format for each byte in RTU mode is:

Coding System: 8–bit binary, hexadecimal 0–9, A–F

Two hexadecimal characters contained in each

8–bit field of the message

Bits per Byte:

1 start bit

8 data bits, least significant bit sent first

None parity

1 stop bit

Error Check Field: Cyclical Redundancy Check (CRC)

The baud rate of the transmission is:

Baud Rate: 9600 bps

Minimum CMD period (RS485 Time out): 850ms.

Wait for minimum 850ms to send a new CMD after last CMD. Suggestion is 1s;

Maximum Data Length Define:

Maximum read data length is 45 words in read command;

Maximum update data length is 45 words in preset command;

Read or update registers NO. should in the range of times of 45,

eg: 1~45 or 96~123 are OK,    but 40~60 is not OK;

Note:

Except the CEI0-21 and VDE-AR-N 4105 power management registers, you should refer the manufactory's suggestion when writing other registers;

# 4 Register map

**It is 16bits (two bytes) unsigned integer for each holding and input register;**

4.1 Holding Reg

| Reg NO. | Variable Name | Description | Customer Write | Value | Unit | Initial value | Note |
|---|---|---|---|---|---|---|---|
| 00 | On/Off | The Standby On/Off state and the AC output DisEN/EN state; The low byte is the Standby on/off(1/0), the high byte is the AC output disable/enable (1/0). | | 0x0000: Standby off, Output enable; 0x0001: Standby on, Output enable; 0x0100: Standby off, Output disable; 0x0101: Standby on, Output disable; | | 0 | |
| 01 | OutputConfig | AC output set | W | 0: BAT First; 1: PV First; 2: UTI First; | | 0 | |
| 02 | ChargeConfig | Charge source set | W | 0: PV first; 1: PV&UTI; 2: PV Only; | | 0 | |
| 03 | UtiOutStart | Uti Output Start Time | W | 0-23 | H(hour) | 0 | |
| 04 | UtiOutEnd | Uti Output End Time | W | 0-23 | H(hour) | 0 | |
| 05 | UtiChargeStart | Uti Charge Start Time | W | 0-23 | H(hour) | 0 | |
| 06 | UtiChargeEnd | Uti Charge End Time | W | 0-23 | H(hour) | 0 | |
| 07 | PVModel | PV Input Mode | W | 0:Independent; 1: Parallel; | | 0 | |
| 08 | ACInModel | AC Input Mode | W | 0: APL,90-280VAC; 1: UPS,170-280VAC; | | 0 | |
| 09 | Fw version H | Firmware version (high) | | | ASCII | | |
| 10 | Fw version M | Firmware version (middle) | | | | | |
| 11 | Fw version L | Firmware version (low) | | | | | |
| 12 | Fw version2 H | Control Firmware version (high) | | | ASCII | | |
| 13 | Fw version2 M | Control Firmware | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | version (middle) | | | | | |
| 14 | Fw version2 L | Control Firmware version (low) | | | | | |
| 15 | LCD language | LCD language | W | 0-1 | | 1 | English |
| 16 | | | | | | | |
| 17 | | | | | | | |
| 18 | OutputVoltType | Output Volt Type | W | 0: 208VAC; 1: 230VAC 2: 240VAC | | 1 | |
| 19 | OutputFreqType | Output Freq Type | W | 0: 50Hz; 1: 60Hz | | 0 | |
| 20 | OverLoadRestart | Over Load Restart | W | 0:Yes; 1:No; 2: Swith to UTI; | | 0 | Yes(over Load 1mins to restart, after over Load three times to stop output) |
| 21 | OverTempRestart | Over Temperature Restart | W | 0:Yes; 1:No; | | 0 | Yes(over Temperature to restart , after over Temperature three times to stop output) |
| 22 | BuzzerEN | Buzzer on/off enable | W | 1:Enable; 0:Disable; | | 1 | |
| 23 | Serial NO. 5 | Serial number 5 | W | | ASCII | | |
| 24 | Serial No. 4 | Serial number 4 | W | | | | |
| 25 | Serial No. 3 | Serial number 3 | W | | | | |
| 26 | Serial No. 2 | Serial number 2 | W | | | | |
| 27 | Serial No. 1 | Serial number 1 | W | | | | |
| 28 | Moudle H | Inverter Moudle (high) | W | | | | **Can be set at standy state Only** |
| 29 | Moudle L | Inverter Moudle (low) | W | **P-battery type:** 0: Lead_Acid; 1: Lithium; 2: CustomLead_Acid; **U-user type:** 0: No verndor; 1: Sigineer; 2: CPS; 3: Haiti; | | | **Can be set at standy state Only** |

| | | | | M-power rate:<br>3: 3KW;<br>5:5KW;<br>S-Aging;<br>0: Normal Mode;<br>1: Aging Mode; | | | |
|---|---|---|---|---|---|---|---|
| 30 | Com Address | Communicate address | W | 1~254 | | 1 | |
| 31 | FlashStart | Update firmware | W | 0x0001: own<br>0X0100: control broad | | | |
| 32 | Reset User Info | Reset User Information | W | 0x0001 | | | |
| 33 | Reset to factory | Reset to factory | W | 0x0001 | | | |
| 34 | MaxChargeCurr | Max Charge Current | W | 10~130 | 1A | 70 | |
| 35 | BulkChargeVolt | Bulk Charge Volt | W | 500~580 | 0.1V | 564 | |
| 36 | FloatChargeVolt | Float Charge Volt | W | 500~560 | 0.1V | 540 | |
| 37 | BatLowToUtiVolt | Bat Low Volt Switch To Uti | W | 444~514 | 0.1V | 464 | |
| 38 | FloatChargeCurr | Float Charge Current | W | 0~80 | 0.1A | | |
| 39 | Battery Type | Battery Type | W | 0: Lead_Acid;<br>1: Lithium;<br>2: CustomLead_Acid; | | 1 | **Can be set at standy state Only** |
| 40 | Aging Mode | Aging Mode | W | 0: Normal Mode;<br>1: Aging Mode; | | 0 | **Can be set at standy state Only** |
| | | | | | | | |
| | | | | | | | |
| 43 | DTC | Device Type Code | | &*6 | | | |
| 44 | | | | | | | |
| 45 | Sys Year | System time-year | W | Year offset is 2000 | | | |
| 46 | Sys Month | System time- Month | W | | | | |
| 47 | Sys Day | System time- Day | W | | | | |
| 48 | Sys Hour | System time- Hour | W | | | | |
| 49 | Sys Min | System time- Min | W | | | | |
| 50 | Sys Sec | System time- Second | W | | | | |
| 51 | | | | | | | |
| 57 | | | | | | | |
| 58 | | | | | | | |
| 59 | Manufacturer Info 8 | Manufacturer information (high) | | | ASCII | | |
| 60 | Manufacturer Info 7 | Manufacturer information (middle) | | | | | |
| 61 | Manufacturer | Manufacturer | | | | | |

| | Info 6 | information (low) | | | | | |
|---|---|---|---|---|---|---|---|
| 62 | Manufacturer Info 5 | Manufacturer information (high) | | | | | |
| 63 | Manufacturer Info 4 | Manufacturer information (middle) | | | | | |
| 64 | Manufacturer Info3 | Manufacturer information (low) | | | | | |
| 65 | Manufacturer Info 2 | Manufacturer information (low) | | | | | |
| 66 | Manufacturer Info 1 | Manufacturer information (high) | | | ASCII | | |
| 67 | FW Build No. 4 | Control FW Build No. 2 | | | ASCII | | |
| 68 | FW Build No. 3 | Control FW Build No. 1 | | | | | |
| 69 | FW Build No. 2 | COM FW Build No. 2 | | | | | |
| 70 | FW Build No. 1 | COM FW Build No. 1 | | | ASCII | | |
| 71 | | | | | | | |
| 72 | Sys Weekly | Sys Weekly | W | 0-6 | | | |
| 73 | ModbusVersion | Modbus Version | | Eg：207 is V2.07 | Int(16bits) | | |
| … | | | | | | | |
| 76 | Rate Watt H | Rate active power(high) | | | 0.1W | | |
| 77 | Rate Watt L | Rate active power(low) | | | 0.1W | | |
| 78 | Rate VA H | Rata apparent power (high) | | | 0.1VA | | |
| 79 | Rate VA L | Rate apparent power (low) | | | 0.1VA | | |
| 80 | Factory | The ODM Info code | | | | | |
| …. | | | | | | | |
| 161 | | | | | | | |
| 162 | BLVersion2 | Boot loader version2 | R | | | | M3 bootloader version |

4.2 Input Reg

(Some of input Registers can be wrote by Manufacturer, write address offset is 0x1000, start at 0x1000.　can not be wrote by customer.)

| Reg NO. | Variable Name | Description | Value | Unit | Note |
|---|---|---|---|---|---|

| 00 | System Status | System run state | 0: Standby;<br>1; （**No Use**）<br>2: Discharge;<br>3: Fault;<br>4: Flash;<br>5: PV charge;<br>6: AC charge;<br>7: Combine charge;<br>8: Combine charge and Bypass;<br>9: PV charge and Bypass;<br>10: AC charge and Bypass;<br>11: Bypass;<br>12: PV charge and Discharge; | | |
|----|---------------|------------------|---|---|---|
| 01 | Vpv1 | PV1 voltage | | 0.1V | |
| 02 | Vpv2 | PV2 voltage | | 0.1V | |
| 03 | Ppv1 H | PV1 charge power (high) | | 0.1W | |
| 04 | Ppv1 L | PV1 charge power (low) | | 0.1W | |
| 05 | Ppv2 H | PV2 charge power (high) | | 0.1W | |
| 06 | Ppv2 L | PV2 charge power (low) | | 0.1W | |
| 07 | Buck1Curr | Buck1 current | | 0.1A | |
| 08 | Buck2Curr | Buck2 current | | 0.1A | |
| 09 | OP_Watt H | Output active power (high) | | 0.1W | |
| 10 | OP_Watt L | Output active power (low) | | 0.1W | |
| 11 | OP_VA H | Output apparent power (high) | | 0.1VA | |
| 12 | OP_VA L | Output apparent power (low) | | 0.1VA | |
| 13 | ACChr_Watt H | AC charge watt (high) | | 0.1W | |
| 14 | ACChr_Watt L | AC charge watt (low) | | 0.1W | |
| 15 | ACChr_VA H | AC charge apparent power (high) | | 0.1VA | |
| 16 | ACChr_VA L | AC charge apparent power (low) | | 0.1VA | |
| 17 | Bat Volt | Battery volt (M3) | | 0.01V | |
| 18 | BatterySOC | Battery SOC | 0~100 | 1% | |
| 19 | Bus Volt | Bus Voltage | | 0.1V | |
| 20 | Grid Volt | AC input Volt | | 0.1V | |
| 21 | Line Freq | AC input frequency | | 0.01Hz | |
| 22 | OutputVolt | AC output Volt | | 0.1V | |
| 23 | OutputFreq | AC output frequency | | 0.01Hz | |
| 24 | Ouput DCV | Ouput DC Volt | | 0.1V | |

| 25 | InvTemp | Inv Temperature | | 0.1C | |
| 26 | DcDc Temp | DC-DC Temperature | | 0.1C | |
| 27 | LoadPercent | Load Percent | 0~1000 | 0.1% | |
| 28 | Bat_s_Volt | Battery-port volt (DSP) | | 0.01V | |
| 29 | Bat_Volt_DSP | Battery-bus volt (DSP) | | 0.01V | |
| 30 | Time total H | Work time total (high) | | 0.5S | |
| 31 | Time total L | Work time total (low) | | 0.5S | |
| 32 | Buck1_NTC | Buck1 Temperature | | 0.1C | |
| 33 | Buck2_NTC | Buck2 Temperature | | 0.1C | |
| 34 | OP_Curr | Output Current | | 0.1A | |
| 35 | Inv_Curr | Inv Current | | 0.1A | |
| 36 | AC_InWatt H | AC input watt (high) | | 0.1W | |
| 37 | AC_InWatt L | AC input watt (low) | | 0.1W | |
| 38 | AC_InVA H | AC input apparent power (high) | | 0.1VA | |
| 39 | AC_InVA L | AC input apparent power (low) | | 0.1VA | |
| 40 | Fault bit | fault bit | &*1 | | |
| 41 | Warning bit | Warning bit | &*1 | | |
| 42 | fault value | fault value | | | |
| 43 | warning value | warning value | | | |
| 44 | DTC | Device Type Code | &*6 | | |
| 45 | Check Step | Product check step | 1:PV1 charge power check; 2:PV2 charge power check; 3:AC charge Power check | | |
| 46 | Production Line Mode | Production Line Mode | 0: Not at Production Line Mode; 1: Production Line Mode; 2: Production Line Clear Fault Mode; | | |
| 47 | ConstantPowerOKFlag | Constant Power OK Flag | 0: Not OK; 1: OK; | | |
| 48 | Epv1_today H | PV Energy today | | | |
| 49 | Epv1_today L | PV Energy today | | 0.1kWh | |
| 50 | Epv1_total H | PV Energy total | | | |
| 51 | Epv1_total L | PV Energy total | | 0.1kWh | |
| 52 | Epv2_today H | PV Energy today | | | |

| 53 | Epv2_today L | PV Energy today | | 0.1kWh | |
| 54 | Epv2_total H | PV Energy total | | | |
| 55 | Epv2_total L | PV Energy total | | 0.1kWh | |
| 56 | Eac_chrToday H | AC charge Energy today | | | |
| 57 | Eac_chrToday L | AC charge Energy today | | 0.1kWh | |
| 58 | Eac_chrTotal H | AC charge Energy total | | | |
| 59 | Eac_chrTotal L | AC charge Energy total | | 0.1kWh | |
| 60 | Ebat_dischrToday H | Bat discharge Energy today | | | |
| 61 | Ebat_dischrToday L | Bat discharge Energy today | | 0.1kWh | |
| 62 | Ebat_dischrTotal H | Bat discharge Energy total | | | |
| 63 | Ebat_dischrTotal L | Bat discharge Energy total | | 0.1kWh | |
| 64 | Eac_dischrToday H | AC discharge Energy today | | | |
| 65 | Eac_dischrToday L | AC discharge Energy today | | 0.1kWh | |
| 66 | Eac_dischrTotal H | AC discharge Energy total | | | |
| 67 | Eac_dischrTotal L | AC discharge Energy total | | 0.1kWh | |
| 68 | ACChrCurr | AC Charge Battery Current | | 0.1A | |
| 69 | AC_DisChrWatt H | AC discharge watt (high) | | 0.1W | |
| 70 | AC_DisChrWatt L | AC discharge watt (low) | | 0.1W | |
| 71 | AC_DisChrVA H | AC discharge apparent power (high) | | 0.1VA | |
| 72 | AC_DisChrVA L | AC discharge apparent power (low) | | 0.1VA | |
| 73 | Bat_DisChrWatt H | Bat discharge watt (high) | | 0.1W | |
| 74 | Bat_DisChrWatt L | Bat discharge watt (low) | | 0.1W | |
| 75 | Bat_DisChrVA H | Bat discharge apparent power (high) | | 0.1VA | |
| 76 | Bat_DisChrVA L | Bat discharge apparent power (low) | | 0.1VA | |
| 77 | Bat_Watt H | Bat watt (high) | **(signed int 32)** | 0.1W | |
| 78 | Bat_Watt L | Bat watt (low) | Positive:Battery Discharge Power; Negative: Battery Charge Power; | 0.1W | |
| 79 | Reserved | Not Used | | | |
| 80 | BatOverCharge | Battery Over Charge Flag | 0:Battery not over | | |

| | | | charge;<br>1:Battery over charge; | | |
|---|---|---|---|---|---|
| 81 | MpptFanSpeed | Fan speed of MPPT Charger | 0~100 | 1% | |
| 82 | InvFanSpeed | Fan speed of Inverter | 0~100 | 1% | |
| | | | | | |
| 90 | BMS_Status | Status from BMS | Detail information, refer to document: Sigineer xxSxxP ESS Protocol; | | |
| 91 | BMS_Error | Error infomation from BMS | | | |
| 92 | BMS_ WarnInfo | Warning info from BMS | | | |
| 93 | BMS_SOC | SOC from BMS | | | |
| 94 | BMS_ BatteryVolt | Battery voltage from BMS | | | |
| 95 | BMS_ BatteryCurr | Battery current from BMS | | | |
| 96 | BMS_ BatteryTemp | Battery temperature from BMS | | | |
| 97 | BMS_ MaxCurr | Max. charge/discharge current from BMS | | | |
| 98 | BMS_ ConstantVolt | CV voltage from BMS | | | |
| 99 | BMS_ BMSInfo | BMS Information from BMS | | | |
| 100 | BMS_ PackInfo | Pack Information from BMS | | | |
| 101 | BMS_ UsingCap | Using Cap from BMS | | | |
| 102 | BMS_ Cell1_Volt | Cell1_Voltage from BMS | | | |
| … | … | … | | | |
| 117 | BMS_ Cell16_Volt | Cell16_Voltage from BMS | | | |
| 118 | BMS2_Status | Status from BMS2 | Detail information, refer to document: Sigineer xxSxxP ESS Protocol; | | |
| 119 | BMS2_Error | Error infomation from BMS | | | |
| 120 | BMS2_ WarnInfo | Warning info from BMS2 | | | |
| 121 | BMS2_SOC | SOC from BMS2 | | | |
| 122 | BMS2_ BatteryVolt | Battery voltage from BMS2 | | | |
| 123 | BMS2_ BatteryCurr | Battery current from BMS2 | | | |
| 124 | BMS2_ BatteryTemp | Battery temperature from BMS2 | | | |
| 125 | BMS2_ MaxCurr | Max. charge/discharge current from BMS2 | | | |
| 126 | BMS2_ ConstantVolt | CV voltage from BMS2 | | | |
| 127 | BMS2_ BMSInfo | BMS Information from BMS2 | | | |
| 128 | BMS2_ PackInfo | Pack Information from BMS2 | | | |
| 129 | BMS2_ UsingCap | Using Cap from BMS2 | | | |
| 130 | BMS2_ Cell1_Volt | Cell1_Voltage from BMS2 | | | |
| … | … | … | | | |
| 145 | BMS2_ Cell16_Volt | Cell16_Voltage from BMS2 | | | |
| | | | | | |
| 180 | Solar1_Status | Solar Charger1 Status | | | |
| 181 | Solar1_FaultCode | Solar Charger1 FaultCode | | | |
| 182 | Solar1_WarningCode | Solar Charger1 WarningCode | | | |

| 183 | Solar1_BatVolt | Solar Charger1 battery voltage | | 0.01V | |
| 184 | Solar1_PV1Volt | Solar Charger1 PV1 voltage | | 0.1V | |
| 185 | Solar1_PV2Volt | Solar Charger1 PV2 voltage | | 0.1V | |
| 186 | Solar1_Buck1Curr | Solar Charger1 Buck1 current | | 0.1A | |
| 187 | Solar1_Buck2Curr | Solar Charger1 Buck2 current | | 0.1A | |
| 188 | Solar1_PV1ChrPower H | Solar Charger1 PV1 charge Power High 16 bit | | 0.1W | |
| 189 | Solar1_PV1ChrPower H | Solar Charger1 PV1 charge Power Low 16 bit | | 0.1W | |
| 190 | Solar1_PV2ChrPower H | Solar Charger1 PV2 charge Power High 16 bit | | 0.1W | |
| 191 | Solar1_PV2ChrPower H | Solar Charger1 PV2 charge Power Low 16 bit | | 0.1W | |
| 192 | Solar1_HS1Temp | Solar Charger1 Buck1 Temperature | | 0.1C | |
| 193 | Solar1_HS2Temp | Solar Charger1 Buck2 Temperature | | 0.1C | |
| 194 | Solar1_Epv1_today | Solar Charger1 PV1 Energy today | | 0.1k Wh | |
| 195 | Solar1_Epv2_today L | Solar Charger1 PV2 Energy today | | 0.1k Wh | |
| 196 | Solar1_Epv1_total H | Solar Charger1 PV1 Energy total High 16 bit | | 0.1k Wh | |
| 197 | Solar1_Epv1_total L | Solar Charger1 PV1 Energy total Low 16 bit | | 0.1k Wh | |
| 198 | Solar1_Epv2_total H | Solar Charger1 PV2 Energy total High 16 bit | | 0.1k Wh | |
| 199 | Solar1_Epv2_total L | Solar Charger1 PV2 Energy total Low 16 bit | | 0.1k Wh | |
| 200 | Solar2_Status | Solar Charger2 Status | | | |
| 201 | Solar2_FaultCode | Solar Charger2 FaultCode | | | |
| 202 | Solar2_WarningCode | Solar Charger2 WarningCode | | | |
| 203 | Solar2_BatVolt | Solar Charger2 battery voltage | | 0.01V | |
| 204 | Solar2_PV1Volt | Solar Charger2 PV1 voltage | | 0.1V | |
| 205 | Solar2_PV2Volt | Solar Charger2 PV2 voltage | | 0.1V | |
| 206 | Solar2_Buck1Curr | Solar Charger2 Buck1 current | | 0.1A | |
| 207 | Solar2_Buck2Curr | Solar Charger2 Buck2 current | | 0.1A | |
| 208 | Solar2_PV1ChrPower H | Solar Charger2 PV1 charge Power High 16 bit | | 0.1W | |
| 209 | Solar2_PV1ChrPower H | Solar Charger2 PV1 charge Power Low 16 bit | | 0.1W | |
| 210 | Solar2_PV2ChrPower H | Solar Charger2 PV2 charge Power High 16 bit | | 0.1W | |

| 211 | Solar2_PV2ChrPower H | Solar Charger2 PV2 charge Power Low 16 bit | | 0.1W | |
|---|---|---|---|---|---|
| 212 | Solar2_HS1Temp | Solar Charger2 Buck1 Temperature | | 0.1C | |
| 213 | Solar2_HS2Temp | Solar Charger2 Buck2 Temperature | | 0.1C | |
| 214 | Solar2_Epv1_today | Solar Charger2 PV1 Energy today | | 0.1k Wh | |
| 215 | Solar2_Epv2_today | Solar Charger2 PV2 Energy today | | 0.1k Wh | |
| 216 | Solar2_Epv1_total H | Solar Charger2 PV1 Energy total High 16 bit | | 0.1k Wh | |
| 217 | Solar2_Epv1_total L | Solar Charger2 PV1 Energy total Low 16 bit | | 0.1k Wh | |
| 218 | Solar2_Epv2_total H | Solar Charger2 PV2 Energy total High 16 bit | | 0.1k Wh | |
| 219 | Solar2_Epv2_total L | Solar Charger2 PV2 Energy total Low 16 bit | | 0.1k Wh | |
| 220 | Solar_ConnectOKFlag | Slave Solar Connect OK Flag | 1：Solar Charger1；<br>2：Solar Charger2；<br>3：Solar Charger1 和 2； | | |
| 221 | Solar_BatVoltConsistFl ag | Check Slave Solar Battery Voltage Consist OK Flag | 1：Check Solar Charger1 电池电压 OK；<br>2：Check Solar Charger2 电池电压 OK；<br>3：Check Solar Charger1 和 2 电池电压 OK； | | |
| 222 | Solar_TypeSwState | Solar Charger Type Swtich State | 0:Master SolarCharger;<br>1:Slaver SolarCharger; | | |
| 223 | Solar_ModeSwState | Solar Charger Mode Swtich State | 0: Parallel Mode;<br>1:Single Mode; | | |
| 224 | Solar_AddrSwState | Solar Charger Addr Swtich State | 2~3; | | |
| | | | | | |
| 360 | BMS_ GaugeRM | Gauge RM from BMS | **Detail information, refer to document: Sigineer xxSxxP ESS Protocol;** | | |
| 361 | BMS_GaugeFCC | Gauge FCC from BMS | | | |
| 362 | BMS_ FW | BMS_ FW | | | |
| 363 | BMS_ DeltaVolt | Delta V from BMS | | | |
| 364 | BMS_ CycleCnt | Cycle Count from BMS | | | |
| 365 | BMS_ SOH | SOH from BMS | | | |
| 366 | BMS_ GaugeICCurr | Gauge IC current from BMS | | | |
| 367 | BMS_ MCUVersion | MCU Software version from BMS | | | |

| 368 | BMS_ GaugeVersion | Gauge Version from BMS | | | |
| 369 | BMS_ wGaugeFRVersion_ L | Gauge FR Version L16 from BMS | | | |
| 370 | BMS_ wGaugeFRVersion_H | Gauge FR Version H16 from BMS | | | |
| 371 | BMS2_ GaugeRM | Gauge RM from BMS2 | **Detail information, refer to document: Sigineer xxSxxP ESS Protocol;** | | |
| 372 | BMS2_GaugeFCC | Gauge FCC from BMS2 | | | |
| 373 | BMS2_ FW | BMS2_ FW | | | |
| 374 | BMS2_ DeltaVolt | Delta V from BMS2 | | | |
| 375 | BMS2_ CycleCnt | Cycle Count from BMS2 | | | |
| 376 | BMS2_ SOH | SOH from BMS2 | | | |
| 377 | BMS2_ GaugeICCurr | Gauge IC current from BMS2 | | | |
| 378 | BMS2_ MCUVersion | MCU Software version from BMS2 | | | |
| 379 | BMS2_ GaugeVersion | Gauge Version from BMS2 | | | |
| 380 | BMS2_ wGaugeFRVersion_ L | Gauge FR Version L16 from BMS2 | | | |
| 381 | BMS2_ wGaugeFRVersion_H | Gauge FR Version H16 from BMS2 | | | |
| | | | | | |
| | | | | | |

&*1: Off Grid Inverter fault code Bit(See &*8):

| Fault type value | Means(The message showed on the inverter when the inverter has fault) |
| --- | --- |
| 1~7、11~24、28~32 | "    Error: 99+x ", |
| 8 | Bat Voltage High |
| 9 | Over Temperature |
| 10 | Over Load |
| 25 | MOV Break |
| 26 | Over Current |
| 27 | Li-Bat Over Load |
| | |

&*5: Inverter Model: A , could be show: "T0 Q0 PF U1 M5 S1" or "00F151"

$\qquad$ Tx=(A&0XF00000)>>20

$\qquad$ Qx=(A&0X0F0000)>>16

$\qquad$ Px=(A&0x00F000)>>12

$\qquad$ Ux=(A&0x000F00)>>8

$\qquad$ Mx=(A&0x0000F0)>>4

$\qquad$ Sx=(A&0x00000F)

&*6: DTC(Device type code)

| Code No. | Device type | Note |
|---|---|---|
| 001xx | Inverter | 1 tracker and 1phase Grid connect PV inverter TL |
| 002xx | Inverter | 2 tracker and 1phase Grid connect PV inverter TL |
| 003xx | Inverter | 1 tracker and 1phase Grid connect PV inverter HF |
| 004xx | Inverter | 2 tracker and 1phase Grid connect PV inverter HF |
| 005xx | Inverter | 1 tracker and 1phase Grid connect PV inverter LF |
| 006xx | Inverter | 2 tracker and 1phase Grid connect PV inverter LF |
| 007xx | Inverter | 1 tracker and 3phase Grid connect PV inverter TL |
| 008xx | Inverter | 2 tracker and 3phase Grid connect PV inverter TL |
| 009xx | Inverter | 1 tracker and 3phase Grid connect PV inverter LF |
| 010xx | Inverter | 2 tracker and 3phase Grid connect PV inverter LF |
| …… | | |
| 10001 | Data logger | RF-ShineVersion |
| 10002 | Data logger | Web-ShinePano |
| 10003 | Data logger | Web-ShineWebBox |
| 10004 | Data logger | WL-WIFI Module |
| …… | | |
| 11001 | Confluence box | Confluence box 1 |
| …… | | |
| 031xx | PV Storage | Front 1 tracker PV Storage |
| 034xx | OffGrid | OffGrid SPF 3-5K |

&*7: Grid network power control command password:

Inverter is in lock state after power on; change the power control by network command should unlock inverter first; default pw is XXXXXX;

Unlock: send 0 to 3-135, then send password to 3-136~138; inverter will auto lock in 5min after unlocked;

Change PW: unlock first, then send 1 to 3-135, then send new password to 3-136~138;

Lock: send 0 or 2 to 3-135;

&*8: Off Grid Inverter fault code and warning code

| Fault code | | Warning code | |
|---|---|---|---|
| 0x00000001 | \ | 0x0001 | Battery voltage low warning |
| 0x00000002 | CPU A to B Communication error | 0x0002 | Over temperature warning |
| 0x00000004 | Battery sample inconsistent | 0x0004 | Over load warning |
| 0x00000008 | BUCK over current | 0x0008 | Fail to read EEPROM. |
| 0x00000010 | BMS communication fault | 0x0010 | Firmware version mismatch |
| 0x00000020 | Battery abnormal | 0x0020 | Fail to write EEPROM. |
| 0x00000040 | \ | 0x0040 | BMS warning |
| 0x00000080 | Battery voltage high | 0x0080 | Li-Battery over load warning |
| 0x00000100 | Over temperature | 0x0100 | Li-Battery aging warning |
| 0x00000200 | Over load | 0x0200 | Fan lock warning |
| 0x00000400 | \ | 0x0400 | \ |
| 0x00000800 | \ | 0x0800 | \ |
| 0x00001000 | \ | 0x1000 | \ |
| 0x00002000 | \ | 0x2000 | \ |
| 0x00004000 | \ | 0x4000 | \ |
| 0x00008000 | \ | 0x8000 | \ |
| 0x00010000 | Battery reverse connection | | |
| 0x00020000 | BUS soft start fail | | |
| 0x00040000 | DC-DC abnormal | | |
| 0x00080000 | DC voltage high | | |
| 0x00100000 | CT detect failed | | |
| 0x00200000 | CPU B to A Communication error | | |
| 0x00400000 | BUS voltage high | | |
| 0x00800000 | \ | | |
| 0x01000000 | MOV break | | |
| 0x02000000 | Output short circuit | | |
| 0x04000000 | Li-Battery over load | | |
| 0x08000000 | Output voltage high | | |
| 0x10000000 | \ | | |
| 0x20000000 | \ | | |
| 0x40000000 | \ | | |
| 0x80000000 | \ | | |

# 5 Set address

Refer to the Inverter user manual.    Always is :

Knock the pv inverter to let the lcd display to the "COM Addr: xxx", then double knock, if displays "Move", you should another double knock, until it displays a address number, then you can give a single knock to change the address, this address will be remembered when the lcd backlight off.

# 6 Notice

1) It can drive mostly 32 pv inverters for one rs485 comport.

2) There are only read input and hold registers commands even the newest version.

3) App user could only care the input register.

4) App user could not care the holding registers.

5) Except the CEI0-21 and VDE-AR-N 4105 power management registers, you should refer the manufactory's suggestion when writing the other registers;