**Modbus RTU Protocol**

2.6 Modbus\_RTU

2.6 function code of Modbus\_RTU protocol

The following table lists only the function codes to which this protocol applies.

|  |  |  |  |
| --- | --- | --- | --- |
| function code | Function code type | explain | remark |
| 0x03 | Public function code | Read the register | Contains reads to a single register and multiple registers |
| 0x10 | Public function code | write the register | Contains writes to a single register and multiple registers |

2.6.1(0x03)

2.6.1 read register (function code: 0x03)

1 PDU Request the PDU

|  |  |  |
| --- | --- | --- |
| data structure | data length | data range |
| function code | 1  1 byte | 0x03 |
| Starting register address | 2  2 byte | 0x0000~0xFFFF |
| Number of registers | 2  2 byte | 0x0001~ 0x007D |

2 PDU Normal response PDU

|  |  |  |
| --- | --- | --- |
| data structure | data length | data range |
| function code | 1  1 byte | 0x03 |
| byte count | 1  1 byte | N×2 |
| Register values | N×2  N×2 byte |  |

N= Note: N= number of registers

3 PDU Abnormal response PDU

|  |  |  |
| --- | --- | --- |
| data structure | data length | data range |
| wrong code | 1  1 byte | 0x83 |
| exception code | 1  1 byte | “”  See "exception code" for details. |

4 give a typical example

107 3 PDU

Request to read out three consecutive register values starting at address 107 (describe PDU only) :

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| request |  | normal response | | exceptional response | |
| field name | * field value | field name | field value | field name | field value |
| function code | 0x03 | function code | 0x03 | wrong code | 0x83 |
| Hi  Starting address Hi | 0x00 | byte count | 0x06 | exception code | 0x04 |
| Lo  Starting address Lo | 0x6B | [107]Hi  Register [107] Hi | 0x02 |  |  |
| Hi  Number of registers Hi | 0x00 | [107]Lo  Register [107] Lo | 0x2B |  |  |
| Lo  Register number Lo | 0x03 | [108]Hi  Register [108] Hi | 0x00 |  |  |
|  |  | [108]Lo  Register [108] Lo | 0x00 |  |  |
|  |  | [109]Hi  Register [109] Hi | 0x00 |  |  |
|  |  | [109]Lo  Register [109] Lo | 0x64 |  |  |

2.6.2 (0x10)

2.6.2 write register (function code: 0x10)

1 PDU

Request the PDU

|  |  |  |
| --- | --- | --- |
| data structure | data length | data range |
| function code | 1  1 byte | 0x10 |
| Starting register address | 2  2 byte | 0x0000~0xFFFF |
| Number of registers | 2  2 byte | 0x0001~0x007B |
| byte count | 1  1 byte | N×2 |
| Register values | N×2  N×2 byte |  |

N=

Note: N= number of registers

2 PDU

Normal response PDU

|  |  |  |
| --- | --- | --- |
| data structure | data length | data range |
| function code | 1  1 byte | 0x10 |
| Starting register address | 2  2 byte | 0x0000~0xFFFF |
| Number of registers | 2  2 byte | 0x0001~0x007B |

3 PDU

Abnormal response PDU

|  |  |  |
| --- | --- | --- |
| data structure | data length | data range |
| wrong code | 1  1 byte | 0x90 |
| exception code | 1  1 byte | “”  See "exception code" for details. |

4

give a typical example

0x000A 0x0102 1 PDU

Request to write 0x000A and 0x0102 to the two registers starting at address 1 (describing only PDU) :

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| request |  | normal response |  | exceptional response | |
| field name | * field value | field name | field value | field name | field value |
| function code | 0x10 | function code | 0x10 | wrong code | 0x90 |
| Hi  Starting address Hi | 0x00 | Hi  Starting address Hi | 0x00 | exception code | 0x04 |
| Lo  Starting address Lo | 0x01 | Lo  Starting address Lo | 0x01 |  |  |
| Hi  Number of registers Hi | 0x00 | Hi  Number of registers Hi | 0x00 |  |  |
| Lo  Register number Lo | 0x02 | Lo  Register number Lo | 0x02 |  |  |
| byte count | 0x04 |  |  |  |  |
| Hi  Register value Hi | 0x00 |  |  |  |  |
| Lo  Register value Lo | 0x0A |  |  |  |  |
| Hi  Register value Hi | 0x01 |  |  |  |  |
| Lo  Register value Lo | 0x02 |  |  |  |  |

**[remark] Baud rate: 9600bps RS232 or RS485**

**[remark]** Reserved words, reserved bytes, reserved bits, and unsupported registers a re all filled with 0x00.

**[remark]** this protocol is for Microinverter,string inverter and storage inverter

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Addr** | **Register meaning** | **R/W** | **data range** | **unit** | **note** |
| Intrinsic attribute region | | | | | |
| 000 | Device type | R |  |  | 0X0200  0X0300  0X0400 MI |
| 001 | Modbus address | R | [1,247] |  | MI |
| 002 | Communication protocol version | R | ‘0’~’9’; ‘A’~’Z’ |  | 0x 0102 1.2 MI |
| 003 | SN byte 01 | R | ‘0’~’9’; ‘A’~’Z’ |  | The serial number is ten ASCII characters,  If "AH12345678",  Byte 01 is 0x41 (A),  The 02nd byte is 0x48 (H),  ……  The 09th byte is 0x37 (7),  The tenth byte is 0x38 (8).  MI |
| SN byte 02 |
| 004 | SN byte 03 | R | ‘0’~’9’; ‘A’~’Z’ |  |
| SN byte 04 |
| 005 | SN byte 05 | R | ‘0’~’9’; ‘A’~’Z’ |  |
| SN byte 06 |
| 006 | SN byte 07 | R | ‘0’~’9’; ‘A’~’Z’ |  |
| SN byte 08 |
| 007 | SN byte 09 | R | ‘0’~’9’; ‘A’~’Z’ |  |
| SN byte 10 |
| 008 | Rated Power | R | 0x0000 |  | * 2 single-phase inverter * 3three-phase inverter   8Single-phase storage inverter |
| 009 | undefined | R | 0x0000 |  |  |
| 010 | 1  Delivery time byte 01 | R | [0,255] | Year | Based on the year 2000MI |
| 2  Delivery time byte 02 | [1,12] | Month |
| 011 | 3  Delivery time byte 03 | R | [1,31] | Day |
| 4  Delivery time byte 04 | [0,23] | Hour |
| 012 | 5  Delivery time byte 05 | R | [0,59] | Minute |
| 6  Delivery time byte 06 | [0,59] | Sec |
| 013 | Firmware version of  control board | R |  |  | MI |
| 014 | Firmware version of communication board | R |  |  |
| 015 | Safety type | R |  |  | MI |
| 016 | Rated power low word | R |  | 0.1W | MI |
| 017 | Rated power high word | R |  | 0.1W | MI |
| 018 | MPPT  MPPT number and phases | R | [1,8]/[1,3] |  | MI 0x0503: five-mppts three-phase |
| 019 | undefined | R | 0x0000 |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variable attribute area | | | | | | |
| 020 | Remote Lock | R/W |  |  |  | |
| 021 | self-check time | R/W | [0,1000] | S | MI | |
| 022 | 1  system time byte 01 | R/W | [0,255] | Year | MI 20 00  Based on the year 2000 | |
| 2  system time byte 02 |  | [1,12] | Month |
| 023 | 3  system time byte 03 | R/W | [1,31] | Day |
| 4  system time byte 04 |  | [0,23] | Hour |
| 024 | 5  system time byte 05 | R/W | [0,59] | Minute |
| 6  system time byte 06 |  | [0,59] | Sec |
| 025 | Minimum insulation impedance | R/W | [100,20000] | 0.1KΩ |  | |
| 026 | Dc voltage upper limit | R/W | [2000,10000] | 0.1V |  | |
| 027 | Grid voltage Upper limit | R/W | [1600,5500] | 0.1V | MI | |
| 028 | Grid voltage Lower limit | R/W | [1600,5500] | 0.1V | MI | |
| 029 | Grid frequency upper limit | R/W | [4500,6500] | 0.01 Hz | MI | |
| 030 | Grid frequency lower limit | R/W | [4500,6500] | 0.01 Hz | MI | |
| 031 | grid current Upper limit | R/W | [10,20000] | 0.1A |  | |
| 032 | Starting voltage upper limit | R/W | [7000,9000] | 0.1V |  | |
| 033 | Starting voltage lower limit | R/W | [4500,9000] | 0.1V |  | |
| 034 | OverFrq\_Derate\_point | R/W | [4500,6500] | 0.01HZ | MI | |
| 035 | OverFrq\_De\_rate | R/W | [0,100] |  | MI | |
| 036 | Internal temperature upper limit | R/W | [500,3000] | 0.1℃ |  | |
| 037 | Communication address | R | 0x0000 | - | MI | |
| 038 | Communication baud rate | R | 0x0000 | - | MI | |
| 039 | Power factor regulation | R/W | [0,2000] | 0.001 | The value after the true value is offset by +1000For example  -0.852 is 148  0 is 1000  0.982 is1982 | |
| 040 | Active power regulation | R/W | [0,1200] | 0.1%/1% | 800 80.0% MI  If 800, adjust to 80.0% | |
| 041 | Reactive power regulation | R/W | [0,1200] | 0.1% | 800 80.0%  If 800, adjust to 80.0% | |
| 042 | Apparent power regulation | R/W | [0,1200] | 0.1% | 800 80.0%  If 800, adjust to 80.0% | |
| 043 | Switch on and off enable | R/W | [0,1] | - | 0 1MI 2  0: power off 1: power on | |
| 044 | Factory reset enable | R/W | [0,1] |  | 0: disable 1: enable | |
| 045 | Self-checking time | R/W | [0,1] | - | 0-360 seconds | |
| 046 | Island protection enable | R/W | [0,1] |  | MI  0: disable 1: enable | |
| 047 | MPPT  MPPT number | R/W | [0,1] | - |  | |
| MI |
| 048 | GFDI  GFDI enable | R/W | [0,1] | - | MI  0: disable 1: enable | |
| 049 | RCD  RCD enable | R/W | [0,1] | - | 0: disable 1: enable | |
| MI |
| 050 | RISO  RISO enable | R/W | [0,1] |  | 0: disable 1: enable | |
| 051 | GridStandard | R/W | [0,20] |  | 1, 2, 3,4EN50438 5,MI  1, China 2, Brazil 3, India 4, EN50438 5, others | |
| 052 | PV  PV curve enable | R/W | [0,1] |  | 0: disable 1: enable | |
| 053 | Low voltage across enable |  |  |  | 0: disable 1: enable | |
| 054 | EEPROM  EEPROM initial enabled | R/W | [0,2] | - | 0: MI  1: EEPROM  2: EEPROM  0: normal operation  1: initialize the control board EEPROM  2: initialize the communication board EEPROM | |
| 055 | 1  Factory only | R/W | [0,3] | - | Bit0 ()  Bit1  Bit2 LED,  Bit3 | |
| 056 | Limter  Limter function enable | R/W | 0x0000 | - |  | |
| 057 | PowerWH Factor | R/W |  | -0.01 | 100 mean 1  111 mean 1.11 | |
| 058 | RSD  RSD enable | R/W | 0x0001 | - |  | 0x0001 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Run the data area in real time | | | | | | | | | | | | | |
| 059 | run state | | | R | | | [0,5] | | | - | | | MI  See the code table of running state |
| 060 | DayActive PowerWh | | | R | | | [-32768,32767] | | | 0.1kWh | | | MI  Signed int |
| 061 | DayReactive PowerWh | | | R | | | [-32768,32767] | | | 0.1kVarh | | | Signed int |
| 062 | Day Grid Work Time | | | R | | | [0,65535] | | | S | | |  |
| 063 | Total\_Active\_PowerWh low word | | | R | | | [0,0xFFFFFFFF] | | | 0.1kWh | | | MI  Signed int |
| 064 | Total\_Active\_PowerWh high word | | | R | | |
| 065 | String | Total\_Reactive\_PowerWh low word | | R | | | [0,0xFFFF] | | | 0.1kVarh | | |  |
| Hybird | PVSG:Month\_PV\_PowerWh | |  | | | 1kwh | | |
| MI | 1 | | 0.1kwh | | |
| 066 | String | Total\_Reactive\_PowerWh high word | | R | | | [0,0xFFFF] | | | 0.1kVarh | | |  |
| Hybird | Month\_Load\_PowerWh | | 1kwh | | |
| 0.1kwh | | |
| MI | 2 | |
| 067 | String | Total Work time low word | | R | | | [0,0xFFFF] | | | 0.1h | | |  |
| Hybird | SG: Month\_Grid\_PowerWh | | 1kwh | | |
| MI | 3 | | 0.1kwh | | |
| 068 | String | Total Work time high word | | R | | | [0,0xFFFF] | | | 0.1h | | | DLN  LCD statistics, DLN high status reversed |
| Hybird | PVYear\_PV\_PowerWh  Low word | | 0.1kwh | | |
| MI | 4 | | 0.1kwh | | |
| 069 | String | inverter efficiency | | R | | | [0,999] | | | 0.1% | | |  |
| Hybird | PVYear\_PV\_PowerWh  high word | | 0.1kwh | | |
| MI | 1 | |
| 070 | String | AB  Grid voltage AB | | R | | | [0,9999] | | | 0.1V | | |  |
| Hybird | * Day\_Batt\_Charge \_PowerWh | | 0.1kwh | | |
| MI | 1 | |
| 071 | String | BC   * Grid voltage BC | | R | | | [0,9999] | | | 0.1V | | |  |
| Hybird | * Day\_Batt\_Discharge\_PowerWh | | 0.1kwh | | |
| MI | 2 | |
| 072 | String | AC  Grid voltage AC | | R | | | [0,9999] | | | 0.1V | | |  |
| Hybird | * tatol\_Batt\_charge\_PowerWh\_low word | | 0.1kwh | | |
| MI | 2 | |
| 073 | String | A  Grid voltage A | | R | | | [0,9999] | | | 0.1V | | | MI |
| Hybird | * tatol\_Batt\_charge\_PowerWh \_high\_word | | 0.1kwh | | |
|  |  | |
| 074 | String inverter | B  Grid voltage B | | R | | | [0,9999] | | | 0.1V | | |  |
| Hybird inverter | * tatol\_Batt\_Discharge\_PowerWh\_low word | | 0.1kwh | | |
| MI | 3 | |
| 075 | String | C  Grid voltage C | | R | | | [0,9999] | 0.1V | | | | |  |
| Hybird | * tatol\_Batt\_Discharge\_PowerWh\_high\_word | | 0.1kwh | | | | |
| MI | 3 | |
| 076 | String | A  Grid current A | | R | | | [0,65535] | 0.1A | | | | | MI |
| Hybird | Day\_GridBuy\_Power Wh | | 0.1kwh | | | | |
| 077 | String | B  Grid current B | | R | | | [0,65535] | 0.1A | | | | |  |
| Hybird | Day\_GridSell\_Power Wh | | 0.1kwh | | | | |
| MI | 4 | |
| 078 | String inverter | C  Grid current C | | R | | | [0,65535] | 0.1A | | | | |  |
| Hybird | Total\_GridBuy\_Power Wh\_low word | | 0.1kwh | | | | |
| MI | 4 | |
| 079 | Grid frequency | | | R | | | [0,9999] | 0.01Hz | | | | | MI |
| 080 | String | Displays low power bytes | | R | | 0x0000 | | 0.1W | | | | |  |
| Hybird | Total\_Grid Buy\_Power Wh\_high word | | 0.1kwh | | | | |
|  |  | |
| 081 | String | Displays high power bytes | | R | | 0x0000 | | 0.1W | | | | |  |
| Hybird | Total\_GridSell\_Power Wh\_low word | | 0.1kwh | | | | |
|  |  | |
| 082 | String inverter | Input\_active\_ power\_low word | | R | | [0,0xFFFFFFFF] | | 0.1W | | | | |  |
| Hybird | Total\_GridSell\_Power Wh\_high word | | 0.1kwh | | | | |
| 083 | String | Input active power high word | | R | |  | | 0.1W | | | | |  |
| Hybird | Generator daily operating time | | 0.1 | | | | | 24024 |
| 084 | String | output apparent power low word | | R | | [0,0xFFFF] | | 0.1VA | | | | |  |
| Hybird | SG:Day\_Load\_Power Wh | | 0.1kwh | | | | |
| 085 | String | output apparent power high word | | R | | [0,0xFFFF] | | 0.1VA | | | | |  |
| Hybird | Total\_Load\_Power Wh\_low word | | 0.1kwh | | | | |
| 086 | String | Output active power low word | | R | | [0,0xFFFF] | | 0.1W | | | | | MI |
| Hybird | Total\_Load\_Power Wh\_high word | | 0.1kwh | | | | |
| 087 | String | Output active power high word | | R | | [0,0xFFFF] | | 0.1W | | | | |
| Hybird | Year\_Load\_Power Wh\_low word | | 0.1kwh | | | | |
| 088 | String | Output reactive power low word | | R | | [0,0xFFFF] | | 0.1Var | | | | |  |
| Hybird | Year\_Load\_Power Wh\_high word | | 0.1kwh | | | | |
| 089 | Output reactive power high word | | | R |  | | |  | | | |  | |
|
| 090 | (DC)  Radiator temperature (DCTransformer temperature) | | | R | [0,3000] | | | 0.1℃ | | | | MI | |
| 091 | IGBT (AC)  IGBT temperature (Radiator temperature) | | | R | [0,3000] | | | 0.1℃ | | | | -56.2℃ 438  0℃ 1000  50.5 ℃ 1505  -56.2℃indicated as 438  0℃ indicated as 1000  50.5 ℃indicated as 1505 | |
| 092 | 1 ()  inductance 1 temperature (Void) | | | R | [0,3000] | | | 0.1℃ | | | |  | |
| 093 | power factor | | | R | R/W | | | [0,1000] | | | | \*1000 | |
| 094 | SD  SD Card Status | | | R | [0,3000] | | | 0.1℃ | | | | 1000 SD2000   * 1000 indicated as SD fault2000 normal | |
| 095 | environment temperature | | | R | [0,3000] | | | 0.1℃ | | | |  | |
| 096 | PV  historyPV PowerWh low word | | | R | [0,0xFFFFFFFF] | | | 0.1kWh | | | |  | |
| 097 | PV  historyPV PowerWh high word | | | R | 0.1kWh | | | |  | |
| 098 | String inverter | | RCD  RCD leak current | R | [0,65535] | | | | 0.01A | | |  | |
| Hybird | | Year\_GridSell\_Power Wh\_low word | 0.1kwh | | |
| 099 | String | | Limter  Limter power | R | 0x0000 | | | | 1W | | |  | |
| Hybird | | Year\_GridSell\_Power Wh\_high word | 0.1kwh | | |
| 100 | Other test flag bits | | | R | 0x0000 | | |  | | | Bit0  Bit1 CAN 1  Bit8 RS485  Bit9 CAN  Bit10 1234  Bit0 arc communication sign  Bit8 li-ion battery interface RS485  Bit9 Li-ion battery interface CAN  Bit10 buttons 1 2 3 4  Bit11 1 | | |
| 101 | 1  Warning message word 1 | | | R | [0,65535] | | | - | | | See the alarm information coding table | | |
| 102 | 2  Warning message word 2 | | | R | [0,65535] | | |  | | | See the alarm information coding table | | |
| 103 | 1  Fault information word 1 | | | R | [0,65535] | | |  | | | MI  See the fault information coding table | | |
| 104 | 2  Fault information word 2 | | | R | [0,65535] | | |  | | | See the fault information coding table | | |
| 105 | 3  Fault information word 3 | | | R | [0,65535] | | |  | | | See the fault information coding table | | |
| 106 | 4  Fault information word 4 | | | R | [0,65535] | | |  | | | See the fault information coding table | | |
| 107 | Corrected\_AH | | | R | [0,1000] | | | 1AH | | | 100 is 100AH | | |
| 108 | PV  Day PV PowerWh | | | R | [0,65535] | | | 0.1kWh | | |  | | |
| 109 | 1  Dc voltage 1 | | | R | [0,65535] | | | 0.1V | | | MI | | |
| 110 | 1  Dc current 1 | | | R | [0,65535] | | | 0.1A | | | MI | | |
| 111 | 2  Dc voltage 2 | | | R | [0,65535] | | | 0.1V | | | MI | | |
| 112 | 2  Dc current 2 | | | R | [0,65535] | | | 0.1A | | | MI | | |
| 113 | 3  Dc voltage 3 | | | R | [0,65535] | | | 0.1V | | | MI | | |
| 114 | 3  Dc current 3 | | | R | [0,65535] | | | 0.1A | | | MI | | |
| 115 | 4  Dc voltage 4 | | | R | [0,65535] | | | 0.1V | | | MI | | |
| 116 | 4  Dc current 4 | | | R | [0,65535] | | | 0.1A | | | MI | | |
| 117 | undefined | | | R | 0x0000 | | | - | | | undefined | | |
| 118 | undefined | | | R | 0x0000 | | |  | | |  | | |
| ~~119~~ | ~~PV4 PV3 PV2 PV1~~  ~~Whether the damage~~ | | | ~~R~~ | ~~0x0000~~ | | |  | | | ~~0x0000~~  ~~Means no damage,~~  ~~0x1000 PV4~~  ~~Indicates that PV4 is corrupt~~  ~~0x0100 PV3~~  ~~Denotes PV3 corruption~~ | | |
| 120 | Debug Data | | | R | 0x0000 | | |  | | |  | | |
| 121 | Debug Data | | | R | 0x0000 | | |  | | |  | | |
| 122 | Debug Data | | | R | 0x0000 | | |  | | |  | | |
| 123 | Debug Data | | | R | 0x0000 | | |  | | |  | | |
| 124 | Debug Data | | | R | 0x0000 | | |  | | |  | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 198 | Input\_active\_ power\_low word | R | 1W |  |  |
| 199 | Input active power high word | R | 1W |  |  |
| 200 | Day\_Load\_Power Wh |  | 0.01kwh |  |  |
| 201 | history\_Load\_Power Wh\_low word |  | 0.1kwh |  |  |
| 202 | history\_Load\_Power Wh\_high word |  | 0.1kwh |  |  |
| 203 | Meter\_active\_ power\_low word | R | 1W |  | int Signed int |
| 204 | Meter active power high word | R | 1W |  | int Signed int |
| 205 | Day\_ GridSell \_Power Wh |  | 0.01kwh |  |  |
| 206 | history\_ GridSell \_Power Wh\_low word |  | 0.1kwh |  |  |
| 207 | history\_ GridSell \_Power Wh\_high word |  | 0.1kwh |  |  |
| 208 | Day\_ GridBuy \_Power Wh |  | 0.01kwh |  |  |
| 209 | history\_ GridBuy \_Power Wh\_low word |  | 0.1kwh |  |  |
| 210 | history\_ GridBuy \_Power Wh\_high word |  | 0.1kwh |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | | | | |
| 150 | L1-N  Grid side voltage L1-N | R |  | 0.1V |  |
| 151 | L2-N  Grid side voltage L2-N | R |  | 0.1V |  |
| 152 | L1-L2  Grid side voltage L1-L2 | R |  | 0.1V |  |
| 153 | L1-L2  Voltage at middle side of relay L1-L2 | R |  | 0.1V |  |
| 154 | L1-N  inverter output voltage L1-N | R |  | 0.1V |  |
| 155 | L2-N  inverter output voltage L2-N | R |  | 0.1V |  |
| 156 | L1-L2 inverter output voltage L1-L2 | R |  | 0.1V |  |
| 157 | L1  Load voltage L1 | R |  | 0.1V |  |
| 158 | L2  Load voltage L2 | R |  | 0.1V |  |
| 159 |  | R |  |  |  |
| 160 | L1  Grid side current L1 | R |  | 0.01A | int Signed int |
| 161 | L2  Grid side current L2 | R |  | 0.01A | int Signed int |
| 162 | LimterL1  Grid external Limter current L1 | R |  | 0.01A | int Signed int |
| 163 | LimterL2  Grid external Limter current L2 | R |  | 0.01A | int Signed int |
| 164 | L1  Inverter output current L1 | R |  | 0.01A | int Signed int |
| 165 | L2  Inverter output current L2 | R |  | 0.01A | int Signed int |
| 166 | Gen  Gen Do micro inverse power input | R |  | 1W |  |
| 167 | L1  Grid side L1 power | R |  | 1W | int Signed int |
| 168 | L2  Grid side L2 power | R |  | 1W | int Signed int |
| 169 | L1L2  Total power of grid side L1L2 | R |  | 1W | int 00  Signed int  > 0 BUY  < 0 SELL |
| 170 | Limter1 Grid external Limter1 power | R |  | 1W | int Signed int |
| 171 | Limter2  Grid external Limter2 power | R |  | 1W | int Signed int |
| 172 | Grid external Total Power | R |  | 1W | int Signed int |
| 173 | L1  inverter outputs L1 power | R |  | 1W | int Signed int |
| 174 | L2  inverter outputs L2 power | R |  | 1W | int Signed int |
| 175 | inverter output Total power | R |  | 1W | int Signed int |
| 176 | L1  Load side L1 power | R |  | 1W | int Signed int |
| 177 | L2  Load side L2 power | R |  | 1W | int Signed int |
| 178 | load side Total power | R |  | 1W | int Signed int |
| 179 | L1  Load current L1 | R |  | 0.01A | int Signed int |
| 180 | L2  Load current L2 | R |  | 0.01A | int Signed int |
| 181 | undefined | R |  |  |  |
| 182 | battery temperature | R | [0,3000] | 0.1℃ | +1000 120020.0℃  Real value of offset + 1000 1200 is 20.0 ℃ |
| 183 | battery voltage | R |  | 0.01V | 410041.0V  4100 mark of 41.0 V |
| 184 | battery capacity | R | [0,100] | 1% |  |
| 185 | undefined | R |  |  |  |
| 186 | PV1  PV1 input power | R |  | 1W |  |
| 187 | PV2  PV2 input power | R |  | 1W |  |
| 188 | PV3  PV3 input power | R |  | 1W |  |
| 189 | PV4  PV4 input power | R |  | 1W |  |
| 190 | * Battery output power | R |  | 1W | int Signed int |
| 191 | Battery output current | R |  | 0.01A | int Signed int |
| 192 | * load frequency | R |  | 0.01Hz |  |
| 193 | Inverter output frequency | R |  | 0.01Hz |  |
| 194 | Grid side relay status | R |  |  | * Disconnect   closed |
| 195 | Generator side relay status | R |  |  | 4  Low 4 indicates the state of generator relay  0not attached  1 actuation  2vacancy  3Represents the suction and closing of the generator under operation  4  The high 4 bits indicate the switch signal  0 power off  1 power on |
| 196 |  | R |  |  |  |
| 197 |  | R |  |  |  |
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|  | | | | | | | | | | |
| 200 | Control Mode | | | R/W | - | | | - | 0x0000 Lead-Battery, four-stage charging method  0x0001 Lithium battery | |
| 201 | Equalization V | | | R/W | [3800,6100] | | | 0.01V | 1480 means 14.8v | |
| 202 | Absorption V | | | R/W | [3800,6100] | | | 0.01V | 1440 means 14.4v | |
| 203 | Float V | | | R/W | [3800,6100] | | | 0.01V | 1440 means 14.4v | |
| 204 | Batt Capacity | | | R/W | [0,2000] | | | 1 Ah | 200 means 200AH | |
| 205 | Lithium battery capacity of LCD | | | R/W |  | | | 1% |  | |
| 206 | 1  Battery low temperature protection point 1 | | | R/W |  | | | 0.1℃ | 1000 120120.1℃  Real value migration such as 1000 to 1201 said 20.1 ℃ | |
| 207 | Equalization day cycle | | | R/W | [0 90] | | | Day |  | |
| 208 | Equalization time | | | R/W | [0 20] | | | 0.5Hour | 0.5  Resolution 0.5 h | |
| 209 | TEMPCO | | | R/W | [0,50] | | | 1mV/℃ | int Signed int | |
| 210 | Max A Charge | | | R/W | [0,185] | | | 1A | 0-185A | |
| 211 | Max A discharge | | | R/W | [0,185] | | | 1A | 0-185A | |
| 212 | undefined | | | R/W |  | | |  |  | |
| 213 | battery operates according to voltage or capacity | | | R/W |  | | |  | * According to the voltage * According to the capacity   2 no battery | |
| 214 | Lithium battery wake up sign bit | | | R/W |  | | |  | 0 enabled  1 Disable | |
| 215 | battery resistance value | | | R/W | [0,6000] | | | mΩ |  | |
| 216 | Battery charging efficiency | | | R/W | [0-100] | | | 0.1% | 98398.3%  983 is 98.3% | |
| 217 | ShutDown  battery capacity ShutDown | | | R/W | [0,100] | | | 1% | Low capacity cutoff point | |
| 218 | Restart  battery capacityRestart | | | R/W | [0,100] | | | 1% | Protection recovery point | |
| 219 | LowBatt  battery capacityLowBatt | | | R/W | [0,100] | | | 1% |  | |
| 220 | ShutDown  battery voltageShutDown | | | R/W | [3800,6100] | | | 0.01V | cutoff 41V  Low protection point cutoff 41V | |
| 221 | Restart  battery voltageRestart | | | R/W | [3800,6100] | | | 0.01V | Reboot /recover 52V | |
| 222 | LowBatt  battery voltageLowBatt | | | R/W | [3800,6100] | | | 0.01V | 46V Discharge depth 46V | |
| 223 | Maximum operating time of generator | | |  |  | | | 0.1 hours | 12012  120 is 12 hours | |
| 224 | Generator cooling time | | |  |  | | | 0.1 hours | 12012  120 is 12 hours | |
| 225 | Generator charging Starting voltage point | | | R/W | [0000 6300] | | | 0.01V | The battery voltage is less than this value | |
| 226 | Generator charging starting capacity point | | | R/W | [0000 6300] | | | 1% | The battery capacity is less than this value | |
| 227 | Generator charges the battery current | | | R/W | [0000 185] | | | 1A | The generator charges the battery | |
| 228 | Grid charging Start voltage point o | | | R/W | [0000 6300] | | | 0.01v |  | |
| 229 | Grid charging start capacity point | | | R/W | [0000 6300] | | | 1% |  | |
| 230 | * Grid charge the battery current | | | R/W | [0000 185] | | | 1A | Grid charge the battery current | |
| 231 | Generator is charged to enable | | | R/W |  | | |  |  | |
| 232 | Grid is charged to enable | | | R/W |  | | |  |  | |
| 233 | SolarPSU   * Solar Input as PSU | | | R/W | [0 1 ] | | |  | 0solar 1PSU  0 is solar 1 is PSU | |
| 234 | Force on generator as load function | | | R/W |  | | |  | 2351  The premise is that register 234 has enabled 1   * 0 Do not force   1 force | |
| 235 | generator input is enabled as the load output | | | R/W |  | | |  | 0  Disable generator input  1 Enable generator input as load output  2  Enable as inverter input | |
| 236 | OFF  SmartLoad OFF batt Voltage | | | R/W | [3800 6300] | | | 0.01V |  | |
| 237 | OFF  SmartLoad OFF batt | | | R/W | [0000 100] | | | 1% |  | |
| 238 | ON  SmartLoad ON batt  Voltage | | | R/W | [3800 6300] | | | 0.01V |  | |
| 239 | ON  SmartLoad ON batt | | | R/W | [0000 100] | | | 1% |  | |
| 240 | PWM   * PWM Test Enable | | | R/W |  | | |  | 0  default  1 pwm  To enter the PWM test function | |
| 241 | solar  minimum solar power required to start a generator | | | R/W | [0,8000] | | | 1W |  | |
| 242 | Gen\_Grid\_Signal On | | |  |  | | |  |  | |
| 243 | Energy management model | | |  |  | | |  | |  | | --- | | 0Battery priority mode | | 1Load first mode | | |
| 244 | limit  limit control function | | | R/W |  | | | 0/1 | 0x00  sell electricity enabled  0x01 built-in enabled  0x02  extraposition enabled | |
| 245 | Limit the maximum power output of the grid connection | | | R/W | [0,8000] | | | 1W | Represents total power | |
| 246 | External current sensor clamp phase | | | R/W | [xx,00] | | | 1W | [11][12] | |
| 247 | Solar sell | | | R/W |  | | |  | 0x00 solar Don't sell 0x01 solar sell | |
| 248 | Time of Use Selling enabled | | | R/W |  | | |  | 0 Disable  0xFF enabled | |
| 249 | undefined  undefined | | | R/W |  | | |  |  | |
| 250 | 1  Sell mode time point 1  Sell mode time point 1 | | | R/W | [0000 2359] | | |  | 23592359  2359 means time 23:59 | |
| 251 | 2  Sell mode time point 2 | | | R/W | [0000 2359] | | |  |  | |
| 252 | 3  Sell mode time point 3 | | | R/W | [0000 2359] | | |  |  | |
| 253 | 4  Sell mode time point 4 | | | R/W | [0000 2359] | | |  |  | |
| 254 | 5  Sell mode time point5 | | | R/W | [0000 2359] | | |  |  | |
| 255 | 6  Sell mode time point6 | | | R/W | [0000 2359] | | |  |  | |
| 256 | 1  Sell mode time point 1 power | | | R/W | [0000 8000] | | | 1W | Affected by the maximum discharge power of the battery | |
| 257 | 2  Sell mode time point 2 power | | | R/W | [0000 8000] | | | 1W |  | |
| 258 | 3 Sell mode time point 3 power | | | R/W | [0000 8000] | | | 1W |  | |
| 259 | 4 Sell mode time point 4 power | | | R/W | [0000 8000] | | | 1W |  | |
| 260 | 5 Sell mode time point 5 power | | | R/W | [0000 8000] | | | 1W |  | |
| 261 | 6 Sell mode time point 6 power | | | R/W | [0000 8000] | | | 1W |  | |
| 262 | 1 Sell mode time point 1 voltage | | | R/W | [0000 6300] | | | 0.01V | Is affected by the battery voltage | |
| 263 | 2 Sell mode time point 2 voltage | | | R/W | [0000 6300] | | | 0.01V |  | |
| 264 | 3 Sell mode time point 3 voltage | | | R/W | [0000 6300] | | | 0.01V |  | |
| 265 | 4 Sell mode time point 4 voltage | | | R/W | [0000 6300] | | | 0.01V |  | |
| 266 | 5 Sell mode time point 5 voltage | | | R/W | [0000 6300] | | | 0.01V |  | |
| 267 | 6 Sell mode time point 6 voltage | | | R/W | [0000 6300] | | | 0.01V |  | |
| 268 | 1 1 capacity | | | R/W | [0,100] | | | 1% |  | |
| 269 | 2 2 capacity | | | R/W | [0,100] | | | 1% |  | |
| 270 | 3 3 capacity | | | R/W | [0,100] | | | 1% |  | |
| 271 | 4 4 capacity | | | R/W | [0,100] | | | 1% |  | |
| 272 | 5 5 capacity | | | R/W | [0,100] | | | 1% |  | |
| 273 | 6 6 capacity | | | R/W | [0,100] | | | 1% |  | |
| 274 | 1  Time point 1 charge enable | | | R/W | [0,1] | | |  |  | |
| 275 | 2  Time point 2 charge enable | | | R/W | [0,1] | | |  |  | |
| 276 | 3  Time point 3 charge enable | | | R/W | [0,1] | | |  |  | |
| 277 | 4  Time point 4 charge enable | | | R/W | [0,1] | | |  |  | |
| 278 | 5  Time point 5 charge enable | | | R/W | [0,1] | | |  |  | |
| 279 | 6  Time point 6 charge enable | | | R/W | [0,1] | | |  |  | |
| 280 | Microinverter export to grid cutoff | | | R/W | [0,1] | | |  | Bit0-3 0:Disable 1:enable  Bit4-7 0:Gen peak-shaving disable  1:Gen peak-shaving enable  Bit8-11 0:Grid peak-shaving disable  1:Grid peak-shaving enable  Bit12-16 On Grid always on | |
| 281 |  | | | R/W | [0,1] | | |  |  | |
| 282 | Restore connection time | | | R/W | [10 300] | | |  |  | |
| 283 | Solar Arc Fault   * Solar Arc Fault Mode turned on | | | R/W | [0 1] | | |  | * 0x00 Close * 0x01 open   0x02 0201  Arc fault reset, the inverter received 02 that the LCD issued a clear mark, and then automatically back to 01 | |
| 284 | Grid Mode | | | R/W | [0 1 ] | | |  | 0= general standard  1= UL1741&IEE1547  2= CPUC RULE21  3= SRD-UL1741  …… | |
| 285 | Grid Frequency | | | R/W | [0 1] | | |  | 0x00 50HZ  0x01 60hz | |
| 286 | Grid Type | | | R/W | [0 3 ] | | |  | 0x00 240V/230V/220V  Single-phase 240 v / 230 v / 220 v  0x01 120V/240V  Stands for two-phase 120V/240V  0x02 208V 120120V  Represents the three-phase system 208V 120 degrees 120V  0X03 120V Single Phase | |
| 287 | Grid Vol High | | | R/W | [1800 2700] | | | 0.1V |  | |
| 288 | Grid Vol Low | | | R/W | [1800 2700] | | | 0.1V |  | |
| 289 | Grid Hz High | | | R/W | [4500 6500] | | | 0.01Hz |  | |
| 290 | Grid Hz Low | | | R/W | [4500 6500] | | | 0.01Hz |  | |
| 291 |  | | | R/W | [1 0] | | |  | 0 disable  1 enabled | |
| 292 | GEN peak shaving Power | | | R/W | [0 16000] | | | 1w |  | |
| 293 | GRID peak shaving Power | | | R/W | [0 16000] | | | 1w |  | |
| 294 | SmartLoad Open Delay | | | R/W | [1 120] | | | 1Minute |  | |
| 295 | PF | | | R/W | [800 1200] | | |  | 80080% 1200120%  800 for 80%, 1200 for 120% | |
| 296 | Type of inverter | | | R/W | [0 1] | | |  | 0 European single phase  1 North American biphasic | |
| 297 | ARC\_facTory\_B  ARC\_facTory\_B high word | | | R/W | [0,65535] | | |  | High and status combination, with numerical display can be | |
| 298 | Low word | | | R/W | [0,65535] | | |  |
| 299 | ARC\_facTory\_IARC\_facTory\_I high word | | | R/W | [0,65535] | | |  |  | |
| 300 | Low word | | | R/W | [0,65535] | | |  |  | |
| 301 | ARC\_facTory\_F  ARC\_facTory\_F high word | | | R/W | [0,65535] | | |  |  | |
| 302 | Low word | | | R/W | [0,65535] | | |  |  | |
| 303 | ARC\_facTory\_D  ARC\_facTory\_D high word | | | R/W | [0,65535] | | |  |  | |
| 304 | Low word | | | R/W | [0,65535] | | |  |  | |
| 305 | ARC\_facTory\_T  ARC\_facTory\_T high word | | | R/W | [0,65535] | | |  |  | |
| 306 | Low word | | | R/W | [0,65535] | | |  |  | |
| 307 | ARC\_facTory\_C  ARC\_facTory\_C high word | | | R/W | [0,65535] | | |  |  | |
| 308 | Low word | | | R/W | [0,65535] | | |  |  | |
| 309 | ARC\_facTory\_Frz  ARC\_facTory\_Frz high word | | | R/W | [0,65535] | | |  |  | |
| 310 | Low word | | | R/W | [0,65535] | | |  |  | |
| 311 |  | | | R/W |  | | |  |  | |
| 312 | charging voltage | | | R/W |  | | | 0.01V |  | |
| 313 | discharge voltage | | | R/W |  | | | 0.01V |  | |
| 314 | charging current limiting | | | R/W |  | | | 1A |  | |
| 315 | Discharge current limiting | | | R/W |  | | | 1A |  | |
| 316 | * real time Capacity | | | R/W |  | | | 1% |  | |
| 317 | real time voltage | | | R/W |  | | | 0.01V |  | |
| 318 | * real time current | | | R/W |  | | | 1A |  | |
| 319 | * real time temp | | | R/W |  | | | 0.1C | 10000 120020.0 800 -20.0C  1000 corresponds to 0 degrees  1200 means 20.0 degrees  800 means -20.0C | |
| 320 | Maximum charge current limit | | | R/W |  | | | 1A |  | |
| 321 | Maximum discharge current limiting | | | R/W |  | | |  |  | |
| 322 | Lithium battery alarm position | | | R/W |  | | |  | 0x0001 | |
| 323 | Lithium battery fault location | | | R/W | [0,65535] | | |  |  | |
| 324 | 2  Lithium battery symbol 2 | | | R/W | [0,65535] | | |  | * Bit0 Vacancy   Bit1 Strong impact marks | |
| 325 | Lithium battery type | | | R/W |  | | |  | 0x0000  PYLON SOLAX  CAN  0x0100 RS485modbus  0x0200 KOK  0x0300 keith  0X0400  0X0500 485 | |
| 326 |  | | |  |  | | |  |  | |
| 327 |  | | |  |  | | |  |  | |
| 328 |  | | |  |  | | |  |  | |
| 329 |  | | |  |  | | |  |  | |
| 330 |  | | | R/W |  | | |  | Bit0 01  Bit1 beep 01 | |
| 331 | CA\_LHVRT  California low pressure high pressure through CA\_LHVRT enable | | | R/W | [0,1] | | |  | 0: disable 1: enable | |
| 332 | CA\_HV2 | | | R/W | [1000,3000] | | | 0.1V |  | |
| 333 | CA\_HV1 | | | R/W |  | | |  |  | |
| 334 | CA\_LV1 | | | R/W |  | | |  |  | |
| 335 | CA\_LV2 | | | R/W |  | | |  |  | |
| 336 | CA\_LV3 | | | R/W |  | | |  |  | |
| 337 | CA\_HV2\_Time | | | R/W | [0,300] | | |  | 0 is 0.16S | |
| 338 | CA\_HV1\_Time | | | R/W |  | | |  |  | |
| 339 | CA\_LV1\_Time | | | R/W |  | | |  |  | |
| 340 | CA\_LV2\_Time | | | R/W |  | | |  |  | |
| 341 | CA\_LV3\_Time | | | R/W |  | | |  |  | |
| 342 | CA\_LHFRT  California low frequency high frequency traverses CA\_LHFRT enable | | | R/W |  | | |  |  | |
| 343 | CA\_HF2 | | | R/W | [4500,6500] | | | 0.01Hz |  | |
| 344 | CA\_HF1 | | | R/W |  | | |  |  | |
| 345 | CA\_LF1 | | | R/W |  | | |  |  | |
| 346 | CA\_LF2 | | | R/W |  | | |  |  | |
| 347 | CA\_HF2\_Time | | | R/W | [0,300] | | |  |  | |
| 348 | CA\_HF1\_Time | | | R/W |  | | |  |  | |
| 349 | CA\_LF1\_Time | | |  |  | | |  |  | |
| 350 | CA\_LF2\_Time | | |  |  | | |  |  | |
| 351 | CA\_QV  California CA\_QV enable | | |  |  | | |  |  | |
| 352 | CA\_QV\_V1 | | |  | [1000,3000] | | |  |  | |
| 353 | CA\_QV\_V2 | | |  |  | | |  |  | |
| 354 | CA\_QV\_V3 | | |  |  | | |  |  | |
| 355 | CA\_QV\_V4 | | |  | [-44,+44] | | | 0.01 |  | |
| 356 | CA\_QV\_Q1 | | |  |  | | |  |  | |
| 357 | CA\_QV\_Q2 | | |  |  | | |  |  | |
| 358 | CA\_QV\_Q3 | | |  |  | | |  |  | |
| 359 | CA\_QV\_Q4 | | |  |  | | |  |  | |
| 360 | CA\_FW  California CA\_FW enable | | |  |  | | |  |  | |
| 361 | CA\_Fstart | | |  |  | | |  |  | |
| 362 | CA\_Fstop | | |  |  | | |  |  | |
| 363 | CA\_VW  California CA\_VW enable | | |  |  | | |  |  | |
| 364 | CA\_Vstart | | |  |  | | |  |  | |
| 365 | CA\_Vstop | | |  |  | | |  |  | |
| 366 | Normal upward slope | | | R/W | [1 100] | | | 1% |  | |
| 367 | Soft start rise rate | | | R/W | [1 100] | | | 1% | 100%  default 100% | |
| 368 |  | | |  |  | | |  |  | |
| 369 |  | | |  |  | | |  |  | |
| 370 |  | | |  |  | | |  |  | |
|  |  | | |  |  | | |  |  | |
|  |  | | |  |  | | |  |  | |
| 390 | Solar1Wind  Solar1 do Wind Input can make | | | R/W | [0,1] | | |  | 0: disable 1: enable | |
| 391 | Solar2Wind  Solar2 do Wind Input can make | | | R/W | [0,1] | | |  | 0: disable 1: enable | |
| 392 | * Voltage 1 | | | R/W | [500,5000] | | | 0.1V |  | |
| 393 | * Voltage 2 | | | R/W |  | | | 0.1V |  | |
| 394 | Voltage 3 | | | R/W |  | | | 0.1V |  | |
| 395 | Voltage 4 | | | R/W |  | | | 0.1V |  | |
| 396 | Voltage 5 | | | R/W |  | | | 0.1V |  | |
| 397 | Voltage 6 | | | R/W |  | | | 0.1V |  | |
| 398 | Voltage 7 | | | R/W |  | | | 0.1V |  | |
| 399 | Voltage 8 | | | R/W |  | | | 0.1V |  | |
| 400 | Voltage 9 | | | R/W |  | | | 0.1V |  | |
| 401 | Voltage 10 | | | R/W |  | | | 0.1V |  | |
| 402 | Voltage 11 | | | R/W |  | | | 0.1V |  | |
| 403 | Voltage 12 | | | R/W |  | | | 0.1V |  | |
| 404 | * Current 1 | | | R/W | [0-200] | | | 0.1A |  | |
| 405 | Current 2 | | | R/W |  | | | 0.1A |  | |
| 406 | Current 3 | | | R/W |  | | | 0.1A |  | |
| 407 | Current 4 | | | R/W |  | | | 0.1A |  | |
| 408 | Current 5 | | | R/W |  | | | 0.1A |  | |
| 409 | Current 6 | | | R/W |  | | | 0.1A |  | |
| 410 | Current 7 | | | R/W |  | | | 0.1A |  | |
| 411 | Current 8 | | | R/W |  | | | 0.1A |  | |
| 412 | Current 9 | | | R/W |  | | | 0.1A |  | |
| 413 | Current 10 | | | R/W |  | | | 0.1A |  | |
| 414 | Current 11 | | | R/W |  | | | 0.1A |  | |
| 415 | Current 12 | | | R/W |  | | | 0.1A |  | |
| 416 |  | | |  |  | | |  |  | |
| 417 | 1 | | | R/W | -- | | | -- | Bit0 1:Parallel Enable  0: Parallel Disable  Bit1 1:Master 0:Slave  Bit2-7 Void  Bit8-9 Phase(00:A,01:B,10:C,11:void)  Bit10-15 Modbus SN(0-63) | |
| 418 | 2 | | | R | -- | | | -- | Bit0-4 A Phase inverter Num  Bit5-9 B Phase inverter Num  Bit10-14 C Phase inverter Num  Bit15 Void | |
| 419 |  | | |  |  | | |  |  | |
| 420 |  | | |  |  | | |  |  | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Addr. |  | | | R/W | Range | Unit | note |
| For Hybird inverter Real-time data 3  Fifteen Battery packs ID num.(this is only for TIAN-POWER) | | | | | | | |
|  | ID | | |  |  |  |  |
|  |  | |  |  |  |  |  |
| 500 | 11 | | | R | ‘0’- ‘9’ ‘A’- ‘Z’ |  | ASCII |
| 12 | | |
| 501 | 13 | | | R |  |  |  |
| 14 | | |
| 502 | 15 | | |  |  |  |  |
| 16 | | |
| 503 | 17 | | |  |  |  |  |
| 18 | | |
| 504 | 19 | | |  |  |  |  |
| 110 | | |
| 505 | 111 | | |  |  |  |  |
| 112 | | |
| 506 | 21 | | | R | ‘0’- ‘9’ ‘A’- ‘Z’ |  | ASCII |
| 22 | | |
| 507 | 23 | | | R |  |  |  |
| 24 | | |
| 508 | 25 | | |  |  |  |  |
| 26 | | |
| 509 | 27 | | |  |  |  |  |
| 28 | | |
| 510 | 29 | | |  |  |  |  |
| 210 | | |
| 511 | 211 | | |  |  |  |  |
| 212 | | |
| 512 | 31 | | | R | ‘0’- ‘9’ ‘A’- ‘Z’ |  | ASCII |
| 32 | | |
| 513 | 33 | | | R |  |  |  |
| 34 | | |
| 514 | 35 | | |  |  |  |  |
| 36 | | |
| 515 | 37 | | |  |  |  |  |
| 38 | | |
| 516 | 39 | | |  |  |  |  |
| 310 | | |
| 517 | 311 | | |  |  |  |  |
| 312 | | |
| 518 | 41 | | | R | ‘0’- ‘9’ ‘A’- ‘Z’ |  | ASCII |
| 42 | | |
| 519 | 43 | | | R |  |  |  |
| 44 | | |
| 520 | 45 | | |  |  |  |  |
| 46 | | |
| 521 | 47 | | |  |  |  |  |
| 48 | | |
| 522 | 49 | | |  |  |  |  |
| 410 | | |
| 523 | 411 | | |  |  |  |  |
| 412 | | |
| 524 | 51 | | | R | ‘0’- ‘9’ ‘A’- ‘Z’ |  | ASCII |
| 52 | | |
| 525 | 53 | | | R |  |  |  |
| 54 | | |
| 526 | 55 | | |  |  |  |  |
| 56 | | |
| 527 | 57 | | |  |  |  |  |
| 58 | | |
| 528 | 59 | | |  |  |  |  |
| 510 | | |
| 529 | 511 | | |  |  |  |  |
| 512 | | |
| 530 | 61 | | | R | ‘0’- ‘9’ ‘A’- ‘Z’ |  | ASCII |
| 62 | | |
| 531 | 63 | | | R |  |  |  |
| 64 | | |
| 532 | 65 | | |  |  |  |  |
| 66 | | |
| 533 | 67 | | |  |  |  |  |
| 68 | | |
| 534 | 69 | | |  |  |  |  |
| 610 | | |
| 535 | 611 | | |  |  |  |  |
| 612 | | |
| 536 | 71 | | | R | ‘0’- ‘9’ ‘A’- ‘Z’ |  | ASCII |
| 72 | | |
| 537 | 73 | | | R |  |  |  |
| 74 | | |
| 538 | 75 | | |  |  |  |  |
| 76 | | |
| 539 | 77 | | |  |  |  |  |
| 78 | | |
| 540 | 79 | | |  |  |  |  |
| 710 | | |
| 541 | 711 | | |  |  |  |  |
| 712 | | |
| 542 | 81 | | | R | ‘0’- ‘9’ ‘A’- ‘Z’ |  | ASCII |
| 82 | | |
| 543 | 83 | | | R |  |  |  |
| 84 | | |
| 544 | 85 | | |  |  |  |  |
| 86 | | |
| 545 | 87 | | |  |  |  |  |
| 88 | | |
| 546 | 89 | | |  |  |  |  |
| 810 | | |
| 547 | 811 | | |  |  |  |  |
| 812 | | |
| 548 | 91 | | | R | ‘0’- ‘9’ ‘A’- ‘Z’ |  | ASCII |
| 92 | | |
| 549 | 93 | | | R |  |  |  |
| 94 | | |
| 550 | 95 | | |  |  |  |  |
| 96 | | |
| 551 | 97 | | |  |  |  |  |
| 98 | | |
| 552 | 99 | | |  |  |  |  |
| 910 | | |
| 553 | 911 | | |  |  |  |  |
| 912 | | |
| 554 | 101 | | | R | ‘0’- ‘9’ ‘A’- ‘Z’ |  | ASCII |
| 102 | | |
| 555 | 103 | | | R |  |  |  |
| 104 | | |
| 556 | 105 | | |  |  |  |  |
| 106 | | |
| 557 | 107 | | |  |  |  |  |
| 108 | | |
| 558 | 109 | | |  |  |  |  |
| 1010 | | |
| 559 | 1011 | | |  |  |  |  |
| 1012 | | |
| 560 | 111 | | | R | ‘0’- ‘9’ ‘A’- ‘Z’ |  | ASCII |
| 112 | | |
| 561 | 113 | | | R |  |  |  |
| 114 | | |
| 562 | 115 | | |  |  |  |  |
| 116 | | |
| 563 | 117 | | |  |  |  |  |
| 118 | | |
| 564 | 119 | | |  |  |  |  |
| 1110 | | |
| 565 | 1111 | | |  |  |  |  |
| 1112 | | |
| 566 | 121 | | | R | ‘0’- ‘9’ ‘A’- ‘Z’ |  | ASCII |
| 122 | | |
| 567 | 123 | | | R |  |  |  |
| 124 | | |
| 568 | 125 | | |  |  |  |  |
| 126 | | |
| 569 | 127 | | |  |  |  |  |
| 128 | | |
| 570 | 129 | | |  |  |  |  |
| 1210 | | |
| 571 | 1211 | | |  |  |  |  |
| 1212 | | |
| 572 | 131 | | | R | ‘0’- ‘9’ ‘A’- ‘Z’ |  | ASCII |
| 132 | | |
| 573 | 133 | | | R |  |  |  |
| 134 | | |
| 574 | 135 | | |  |  |  |  |
| 136 | | |
| 575 | 137 | | |  |  |  |  |
| 138 | | |
| 576 | 139 | | |  |  |  |  |
| 1310 | | |
| 577 | 1311 | | |  |  |  |  |
| 1312 | | |
| 578 | 141 | | | R | ‘0’- ‘9’ ‘A’- ‘Z’ |  | ASCII |
| 142 | | |
| 579 | 143 | | | R |  |  |  |
| 144 | | |
| 580 | 145 | | |  |  |  |  |
| 146 | | |
| 581 | 147 | | |  |  |  |  |
| 148 | | |
| 582 | 149 | | |  |  |  |  |
| 1410 | | |
| 583 | 1411 | | |  |  |  |  |
| 1412 | | |
| 584 | 151 | | | R | ‘0’- ‘9’ ‘A’- ‘Z’ |  | ASCII |
| 152 | | |
| 585 | 153 | | | R |  |  |  |
| 154 | | |
| 586 | 155 | | |  |  |  |  |
| 156 | | |
| 587 | 157 | | |  |  |  |  |
| 158 | | |
| 588 | 159 | | |  |  |  |  |
| 1510 | | |
| 589 | 1511 | | |  |  |  |  |
| 1512 | | |
|  |  | | |  |  |  |  |
| 600 | PACK1 | Module Voltage | |  |  |  |  |
| 601 | Module Current | |  |  |  |  |
| 602 | Temperater-AVE | |  |  |  |  |
| 603 | SOC | |  |  |  |  |
| 604 | Remain Capacity | |  |  |  |  |
| 605 | Total Capacity | |  |  |  |  |
| 606 | Charge Voltage | |  |  |  |  |
| 607 | Charge Current | |  |  |  |  |
| 608 | Discharge Current | |  |  |  |  |
| 609 | Max Cell V | |  |  |  |  |
| 610 | Min Cell V | |  |  |  |  |
| 611 | Cycle number | |  |  |  |  |
| 612 | Warming | |  |  |  |  |
| 613 | Fault | |  |  |  |  |
| 614 | PACK2 | Module Voltage | |  |  |  |  |
| 615 | Module Current | |  |  |  |  |
| 616 | Temperater-AVE | |  |  |  |  |
| 617 | SOC | |  |  |  |  |
| 618 | Remain Capacity | |  |  |  |  |
| 619 | Total Capacity | |  |  |  |  |
| 620 | Charge Voltage | |  |  |  |  |
| 621 | Charge Current | |  |  |  |  |
| 622 | Discharge Current | |  |  |  |  |
| 623 | Max Cell V | |  |  |  |  |
| 624 | Min Cell V | |  |  |  |  |
| 625 | Cycle number | |  |  |  |  |
| 626 | Warming | |  |  |  |  |
| 627 | Fault | |  |  |  |  |
| 628 | PACK3 | Module Voltage | |  |  |  |  |
| 629 | Module Current | |  |  |  |  |
| 630 | Temperater-AVE | |  |  |  |  |
| 631 | SOC | |  |  |  |  |
| 632 | Remain Capacity | |  |  |  |  |
| 633 | Total Capacity | |  |  |  |  |
| 634 | Charge Voltage | |  |  |  |  |
| 635 | Charge Current | |  |  |  |  |
| 636 | Discharge Current | |  |  |  |  |
| 637 | Max Cell V | |  |  |  |  |
| 638 | Min Cell V | |  |  |  |  |
| 639 | Cycle number | |  |  |  |  |
| 640 | Warming | |  |  |  |  |
| 641 | Fault | |  |  |  |  |
| 642 | PACK4 | Module Voltage | |  |  |  |  |
| 643 | Module Current | |  |  |  |  |
| 644 | Temperater-AVE | |  |  |  |  |
| 645 | SOC | |  |  |  |  |
| 646 | Remain Capacity | |  |  |  |  |
| 647 | Total Capacity | |  |  |  |  |
| 648 | Charge Voltage | |  |  |  |  |
| 649 | Charge Current | |  |  |  |  |
| 650 | Discharge Current | |  |  |  |  |
| 651 | Max Cell V | |  |  |  |  |
| 652 | Min Cell V | |  |  |  |  |
| 653 | Cycle number | |  |  |  |  |
| 654 | Warming | |  |  |  |  |
| 655 | Fault | |  |  |  |  |
| 656 | PACK5 | Module Voltage | |  |  |  |  |
| 657 | Module Current | |  |  |  |  |
| 658 | Temperater-AVE | |  |  |  |  |
| 659 | SOC | |  |  |  |  |
| 660 | Remain Capacity | |  |  |  |  |
| 661 | Total Capacity | |  |  |  |  |
| 662 | Charge Voltage | |  |  |  |  |
| 663 | Charge Current | |  |  |  |  |
| 664 | Discharge Current | |  |  |  |  |
| 665 | Max Cell V | |  |  |  |  |
| 666 | Min Cell V | |  |  |  |  |
| 667 | Cycle number | |  |  |  |  |
| 668 | Warming | |  |  |  |  |
| 669 | Fault | |  |  |  |  |
| 670 | PACK6 | Module Voltage | |  |  |  |  |
| 671 | Module Current | |  |  |  |  |
| 672 | Temperater-AVE | |  |  |  |  |
| 673 | SOC | |  |  |  |  |
| 674 | Remain Capacity | |  |  |  |  |
| 675 | Total Capacity | |  |  |  |  |
| 676 | Charge Voltage | |  |  |  |  |
| 677 | Charge Current | |  |  |  |  |
| 678 | Discharge Current | |  |  |  |  |
| 679 | Max Cell V | |  |  |  |  |
| 680 | Min Cell V | |  |  |  |  |
| 681 | Cycle number | |  |  |  |  |
| 682 | Warming | |  |  |  |  |
| 683 | Fault | |  |  |  |  |
| 684 | PACK7 | Module Voltage | |  |  |  |  |
| 685 | Module Current | |  |  |  |  |
| 686 | Temperater-AVE | |  |  |  |  |
| 687 | SOC | |  |  |  |  |
| 688 | Remain Capacity | |  |  |  |  |
| 689 | Total Capacity | |  |  |  |  |
| 690 | Charge Voltage | |  |  |  |  |
| 691 | Charge Current | |  |  |  |  |
| 692 | Discharge Current | |  |  |  |  |
| 693 | Max Cell V | |  |  |  |  |
| 694 | Min Cell V | |  |  |  |  |
| 695 | Cycle number | |  |  |  |  |
| 696 | Warming | |  |  |  |  |
| 697 | Fault | |  |  |  |  |
| 698 | PACK8 | Module Voltage | |  |  |  |  |
| 699 | Module Current | |  |  |  |  |
| 700 | Temperater-AVE | |  |  |  |  |
| 701 | SOC | |  |  |  |  |
| 702 | Remain Capacity | |  |  |  |  |
| 703 | Total Capacity | |  |  |  |  |
| 704 | Charge Voltage | |  |  |  |  |
| 705 | Charge Current | |  |  |  |  |
| 706 | Discharge Current | |  |  |  |  |
| 707 | Max Cell V | |  |  |  |  |
| 708 | Min Cell V | |  |  |  |  |
| 709 | Cycle number | |  |  |  |  |
| 710 | Warming | |  |  |  |  |
| 711 | Fault | |  |  |  |  |
| 712 | PACK9 | Module Voltage | |  |  |  |  |
| 713 | Module Current | |  |  |  |  |
| 714 | Temperater-AVE | |  |  |  |  |
| 715 | SOC | |  |  |  |  |
| 716 | Remain Capacity | |  |  |  |  |
| 717 | Total Capacity | |  |  |  |  |
| 718 | Charge Voltage | |  |  |  |  |
| 719 | Charge Current | |  |  |  |  |
| 720 | Discharge Current | |  |  |  |  |
| 721 | Max Cell V | |  |  |  |  |
| 722 | Min Cell V | |  |  |  |  |
| 723 | Cycle number | |  |  |  |  |
| 724 | Warming | |  |  |  |  |
| 725 | Fault | |  |  |  |  |
| 726 | PACK10 | Module Voltage | |  |  |  |  |
| 727 | Module Current | |  |  |  |  |
| 728 | Temperater-AVE | |  |  |  |  |
| 729 | SOC | |  |  |  |  |
| 730 | Remain Capacity | |  |  |  |  |
| 731 | Total Capacity | |  |  |  |  |
| 732 | Charge Voltage | |  |  |  |  |
| 733 | Charge Current | |  |  |  |  |
| 734 | Discharge Current | |  |  |  |  |
| 735 | Max Cell V | |  |  |  |  |
| 736 | Min Cell V | |  |  |  |  |
| 737 | Cycle number | |  |  |  |  |
| 738 | Warming | |  |  |  |  |
| 739 | Fault | |  |  |  |  |
| 740 | PACK11 | Module Voltage | |  |  |  |  |
| 741 | Module Current | |  |  |  |  |
| 742 | Temperater-AVE | |  |  |  |  |
| 743 | SOC | |  |  |  |  |
| 744 | Remain Capacity | |  |  |  |  |
| 745 | Total Capacity | |  |  |  |  |
| 746 | Charge Voltage | |  |  |  |  |
| 747 | Charge Current | |  |  |  |  |
| 748 | Discharge Current | |  |  |  |  |
| 749 | Max Cell V | |  |  |  |  |
| 750 | Min Cell V | |  |  |  |  |
| 751 | Cycle number | |  |  |  |  |
| 752 | Warming | |  |  |  |  |
| 753 | Fault | |  |  |  |  |
| 754 | PACK12 | Module Voltage | |  |  |  |  |
| 755 | Module Current | |  |  |  |  |
| 756 | Temperater-AVE | |  |  |  |  |
| 757 | SOC | |  |  |  |  |
| 758 | Remain Capacity | |  |  |  |  |
| 759 | Total Capacity | |  |  |  |  |
| 760 | Charge Voltage | |  |  |  |  |
| 761 | Charge Current | |  |  |  |  |
| 762 | Discharge Current | |  |  |  |  |
| 763 | Max Cell V | |  |  |  |  |
| 764 | Min Cell V | |  |  |  |  |
| 765 | Cycle number | |  |  |  |  |
| 766 | Warming | |  |  |  |  |
| 767 | Fault | |  |  |  |  |
| 768 | PACK13 | Module Voltage | |  |  |  |  |
| 769 | Module Current | |  |  |  |  |
| 770 | Temperater-AVE | |  |  |  |  |
| 771 | SOC | |  |  |  |  |
| 772 | Remain Capacity | |  |  |  |  |
| 773 | Total Capacity | |  |  |  |  |
| 774 | Charge Voltage | |  |  |  |  |
| 775 | Charge Current | |  |  |  |  |
| 776 | Discharge Current | |  |  |  |  |
| 777 | Max Cell V | |  |  |  |  |
| 778 | Min Cell V | |  |  |  |  |
| 779 | Cycle number | |  |  |  |  |
| 780 | Warming | |  |  |  |  |
| 781 | Fault | |  |  |  |  |
| 782 | PACK14 | Module Voltage | |  |  |  |  |
| 783 | Module Current | |  |  |  |  |
| 784 | Temperater-AVE | |  |  |  |  |
| 785 | SOC | |  |  |  |  |
| 786 | Remain Capacity | |  |  |  |  |
| 787 | Total Capacity | |  |  |  |  |
| 788 | Charge Voltage | |  |  |  |  |
| 789 | Charge Current | |  |  |  |  |
| 790 | Discharge Current | |  |  |  |  |
| 791 | Max Cell V | |  |  |  |  |
| 792 | Min Cell V | |  |  |  |  |
| 793 | Cycle number | |  |  |  |  |
| 794 | Warming | |  |  |  |  |
| 795 | Fault | |  |  |  |  |
| 796 | PACK15 | Module Voltage | |  |  |  |  |
| 797 | Module Current | |  |  |  |  |
| 798 | Temperater-AVE | |  |  |  |  |
| 799 | SOC | |  |  |  |  |
| 800 | Remain Capacity | |  |  |  |  |
| 801 | Total Capacity | |  |  |  |  |
| 802 | Charge Voltage | |  |  |  |  |
| 803 | Charge Current | |  |  |  |  |
| 804 | Discharge Current | |  |  |  |  |
| 805 | Max Cell V | |  |  |  |  |
| 806 | Min Cell V | |  |  |  |  |
| 807 | Cycle number | |  |  |  |  |
| 808 | Warming | |  |  |  |  |
| 809 | Fault | |  |  |  |  |