## **Protocol of Single Communication Address Mode**

### **1.1 Input Registers, Function code (Hex): 04**

|  |  |  |
| --- | --- | --- |
| **Address****(Register)** |  **Input Register Parameter**  |  **Modbus** **Protocol Start** **Address Hex** |
|  **Description** | **Length****(bytes)** | **Data****Format** | **Units** | **Hi****Byte** | **Lo****Byte** |
| **Below are registers of CH01** |
| 30001 | Phase 1 line to neutral volts  | 4 | Float | V | 00 | 00 |
| 30003 | Phase 2 line to neutral volts  | 4 | Float | V | 00 | 02 |
| 30005 | Phase 3 line to neutral volts  | 4 | Float | V | 00 | 04 |
| 30007 | Phase 1 current  | 4 | Float | A | 00 | 06 |
| 30009 | Phase 2 current  | 4 | Float | A | 00 | 08 |
| 30011 | Phase 3 current  | 4 | Float | A | 00 | 0A |
| 30013 | Phase 1 active power  | 4 | Float | W | 00 | 0C |
| 30015 | Phase 2 active power  | 4 | Float | W | 00 | 0E |
| 30017 | Phase 3 active power  | 4 | Float | W | 00 | 10 |
| 30019 | Phase 1 apparent power  | 4 | Float | VA | 00 | 12 |
| 30021 | Phase 2 apparent power  | 4 | Float | VA | 00 | 14 |
| 30023 | Phase 3 apparent power  | 4 | Float | VA | 00 | 16 |
| 30025 | Phase 1 reactive power  | 4 | Float | VAr | 00 | 18 |
| 30027 | Phase 2 reactive power  | 4 | Float | VAr | 00 | 1A |
| 30029 | Phase 3 reactive power  | 4 | Float | VAr | 00 | 1C |
| 30031 | Phase 1 power factor (1)  | 4 | Float | None | 00 | 1E |
| 30033 | Phase 2 power factor (1)  | 4 | Float | None | 00 | 20 |
| 30035 | Phase 3 power factor (1)  | 4 | Float | None | 00 | 22 |
| 30037 | Phase 1 phase angle  | 4 | Float | Degrees | 00 | 24 |
| 30039 | Phase 2 phase angle  | 4 | Float | Degrees | 00 | 26 |
| 30041 | Phase 3 phase angle  | 4 | Float | Degrees | 00 | 28 |
| 30043 | Average line to neutral volts  | 4 | Float | V | 00 | 2A |
| 30047 | Average line current  | 4 | Float | A | 00 | 2E |
| 30049 | Sum of line currents  | 4 | Float | A | 00 | 30 |
| 30053 | Total system power  | 4 | Float | W | 00 | 34 |
| 30057 | Total system volt amps  | 4 | Float | VA | 00 | 38 |
| 30061 | Total system VAr  | 4 | Float | VAr | 00 | 3C |
| 30063 | Total system power factor (1)  | 4 | Float | None | 00 | 3E |
| 30067 | Total system phase angle  | 4 | Float | Degrees | 00 | 42 |
| 30071 | Frequency of supply voltages  | 4 | Float | Hz | 00 | 46 |
| 30073 | Total import active energy  | 4 | Float | kWh | 00 | 48 |
| 30075 | Total export active energy  | 4 | Float | kWH | 00 | 4A |
| 30077 | Total import reactive energy  | 4 | Float | kVArh | 00 | 4C |
| 30079 | Total export reactive energy  | 4 | Float | kVArh | 00 | 4E |
| 30081 | Total apparent energy  | 4 | Float | kVAh | 00 | 50 |
| 30083 | Ah  | 4 | Float | Ah | 00 | 52 |
| 30085 | Total system power demand (2) | 4 | Float | W | 00 | 54 |
| 30087 | Maximum total system power demand (2) | 4 | Float | W | 00 | 56 |
| 30089 | Import active power demand | 4 | Float | W | 00 | 58 |
| 30091 | Import active power max demand | 4 | Float | W | 00 | 5A |
| 30093 | Export active power demand | 4 | Float | W | 00 | 5C |
| 30095 | Export active power max. demand | 4 | Float | W | 00 | 5E |
| 30101 | Total system VA demand  | 4 | Float | VA | 00 | 64 |
| 30103 | Maximum total system VA demand  | 4 | Float | VA | 00 | 66 |
| 30105 | Neutral current demand  | 4 | Float | Amps | 00 | 68 |
| 30107 | Maximum neutral current demand  | 4 | Float | Amps | 00 | 6A |
| 30109 | Total system reactive power demand (2) | 4 | Float | VAr | 00 | 6C |
| 30111 | Maximum total system reactive power demand(2) | 4 | Float | VAr | 00 | 6E |
| 30201 | Line 1 to Line 2 volts  | 4 | Float | V | 00 | C8 |
| 30203 | Line 2 to Line 3 volts  | 4 | Float | V | 00 | CA |
| 30205 | Line 3 to Line 1 volts  | 4 | Float | V | 00 | CC |
| 30207 | Average line to line volts  | 4 | Float | V | 00 | CE |
| 30225 | Neutral current  | 4 | Float | A | 00 | E0 |
| 30235 | Phase 1 L/N volts THD | 4 | Float | % | 00 | EA |
| 30237 | Phase 2 L/N volts THD | 4 | Float | % | 00 | EC |
| 30239 | Phase 3 L/N volts THD | 4 | Float | % | 00 | EE |
| 30241 | Phase 1 Current THD | 4 | Float | % | 00 | F0 |
| 30243 | Phase 2 Current THD | 4 | Float | % | 00 | F2 |
| 30245 | Phase 3 Current THD | 4 | Float | % | 00 | F4 |
| 30249 | Average line to neutral volts THD  | 4 | Float | % | 00 | F8 |
| 30251 | Average line current THD  | 4 | Float | % | 00 | FA |
| 30259 | Phase 1 current demand  | 4 | Float | A | 01 | 02 |
| 30261 | Phase 2 current demand  | 4 | Float | A | 01 | 04 |
| 30263 | Phase 3 current demand  | 4 | Float | A | 01 | 06 |
| 30265 | Maximum phase 1 current demand  | 4 | Float | A | 01 | 08 |
| 30267 | Maximum phase 2 current demand  | 4 | Float | A | 01 | 0A |
| 30269 | Maximum phase 3 current demand  | 4 | Float | A | 01 | 0C |
| 30335 | Line 1 to line 2 volts THD  | 4 | Float | ％ | 01 | 4E |
| 30337 | Line 2 to line 3 volts THD  | 4 | Float | ％ | 01 | 50 |
| 30339 | Line 3 to line 1 volts THD  | 4 | Float | ％ | 01 | 52 |
| 30341 | Average line to line volts THD  | 4 | Float | ％ | 01 | 54 |
| 30343 | Total active Energy (3) | 4 | Float | kWh | 01 | 56 |
| 30345 | Total reactive Energy (3) | 4 | Float | kVArh | 01 | 58 |
| 30347 | L1 import active Energy | 4 | Float | kWh | 01 | 5A |
| 30349 | L2 import active Energy | 4 | Float | kWh | 01 | 5C |
| 30351 | L3 import active Energy | 4 | Float | kWh | 01 | 5E |
| 30353 | L1 export active Energy | 4 | Float | kWh | 01 | 60 |
| 30355 | L2 export active Energy | 4 | Float | kWh | 01 | 62 |
| 30357 | L3 export active Energy | 4 | Float | kWh | 01 | 64 |
| 30359 | L1 total active Energy | 4 | Float | kWh | 01 | 66 |
| 30361 | L2 total active Energy | 4 | Float | kWh | 01 | 68 |
| 30363 | L3 total active Energy | 4 | Float | kWh | 01 | 6A |
| 30365 | L1 import reactive energy | 4 | Float | kVArh | 01 | 6C |
| 30367 | L2 import reactive energy | 4 | Float | kVArh | 01 | 6E |
| 30369 | L3 import reactive energy | 4 | Float | kVArh | 01 | 70 |
| 30371 | L1 export reactive energy | 4 | Float | kVArh | 01 | 72 |
| 30373 | L2 export reactive energy | 4 | Float | kVArh | 01 | 74 |
| 30375 | L3 export reactive energy | 4 | Float | kVArh | 01 | 76 |
| 30377 | L1 total reactive energy | 4 | Float | kVArh | 01 | 78 |
| 30379 | L2 total reactive energy | 4 | Float | kVArh | 01 | 7A |
| 30381 | L3 total reactive energy | 4 | Float | kVArh | 01 | 7C |
| 30397 | Net active energy (4) (Net=Import-export) | 4 | Float | kWh | 01 | 8C |
| 30399 | Net reactive energy | 4 | Float | kVArh | 01 | 8E |
| 31409 | Net L1 active energy | 4 | Float | kWh | 05 | 80 |
| 31411 | Net L2 active energy  | 4 | Float | kWh | 05 | 82 |
| 31413 | Net L3 active energy  | 4 | Float | kWh | 05 | 84 |
| 31415 | Net L1 reactive energy  | 4 | Float | kVArh | 05 | 86 |
| 31417 | Net L2 reactive energy  | 4 | Float | kVArh | 05 | 88 |
| 31419 | Net L3 reactive energy  | 4 | Float | kVArh | 05 | 8A |
| 32649 | Maximum value of total active power | 4 | Float | W | 0A | 58 |
| 32655 | Maximum value of L1 active power | 4 | Float | W | 0A | 5E |
| 32657 | Maximum value of L2 active power | 4 | Float | W | 0A | 60 |
| 32659 | Maximum value of L3 active power | 4 | Float | W | 0A | 62 |
| 32673 | Maximum value of L1 current | 4 | Float | A | 0A | 70 |
| 32675 | Maximum value of L2 current | 4 | Float | A | 0A | 72 |
| 32677 | Maximum value of L3 current | 4 | Float | A | 0A | 74 |
| 32683 | Maximum value of L1 L-N voltage | 4 | Float | V | 0A | 7A |
| 32685 | Maximum value of L2 L-N voltage | 4 | Float | V | 0A | 7C |
| 32687 | Maximum value of L3 L-N voltage | 4 | Float | V | 0A | 7E |
| 32689 | Maximum value of line 1 to line 2 voltage | 4 | Float | V | 0A | 80 |
| 32691 | Maximum value of line 2 to line3 voltage | 4 | Float | V | 0A | 82 |
| 32693 | Maximum value of line 3 to line 1 voltage | 4 | Float | V | 0A | 84 |
| 32695 | Minimum value of total active power | 4 | Float | W | 0A | 86 |
| 32701 | Minimum value of L1 active power | 4 | Float | W | 0A | 8C |
| 32703 | Minimum value of L2 active power | 4 | Float | W | 0A | 8E |
| 32705 | Minimum value of L3 active power | 4 | Float | W | 0A | 90 |
| 32719 | Minimum value of L1 current | 4 | Float | A | 0A | 9E |
| 32721 | Minimum value of L2 current | 4 | Float | A | 0A | A0 |
| 32723 | Minimum value of L3 current | 4 | Float | A | 0A | A2 |
| 32729 | Minimum value of L1 L-N voltage | 4 | Float | V | 0A | A8 |
| 32731 | Minimum value of L2 L-N voltage | 4 | Float | V | 0A | AA |
| 32733 | Minimum value of L3 L-N voltage | 4 | Float | V | 0A | AC |
| 32735 | Minimum value of L1 to L2 voltage | 4 | Float | V | 0A | AE |
| 32737 | Minimum value of L2 to L3 voltage | 4 | Float | V | 0A | B0 |
| 32739 | Minimum value of L3 to L1 voltage | 4 | Float | V | 0A | B2 |
| **For CH02, CH03 and CH04’s registers,** **CH02’ registers is CH01 + 3000;** **CH03’ registers is CH01 + 6000;** **CH04’ registers is CH01 +9000.****For example, the registers of V1 of CH01 , CH02, CH03, CH04 are below:****CH01: 30001 ; CH02: 33001; CH03: 36001; CH04: 39001** |

**1.2 The addresses below are for the total measurement for all loads:**

|  |  |  |
| --- | --- | --- |
| **Address****(Register)** |  **Input Register Parameter**  |  **Modbus** **Protocol Start** **Address Hex** |
|  **Description** | **Length****(bytes)** | **Data****Format** | **Units** | **Hi****Byte** | **Lo****Byte** |
| 312049 | Sum of line currents. | 4 | Float | A | 2F | 10 |
| 312053 | Total system power. | 4 | Float | W | 2F | 14 |
| 312057 | Total system volt amps. | 4 | Float | VA | 2F | 18 |
| 312061 | Total system VAr. | 4 | Float | VAr | 2F | 1C |
| 312073 | Total import active energy  | 4 | Float | kWh | 2F | 28 |
| 312075 | Total export active energy  | 4 | Float | kWH | 2F | 2A |
| 312077 | Total import reactive energy  | 4 | Float | kVArh | 2F | 2C |
| 312079 | Total export reactive energy  | 4 | Float | kVArh | 2F | 2E |
| 312081 | Total apparent energy  | 4 | Float | kVAh | 2F | A0 |
| 312343 | Total active Energy (3) | 4 | Float | kWh | 30 | 36 |
| 312345 | Total reactive Energy (3) | 4 | Float | kVArh | 30 | 38 |
| 312397 | Net Total Active Energy  | 4 | Float | kWh | 30 | 6C |
| 312399 | Net Total Reactive Energy | 4 | Float | kVArh | 30 | 6E |

**Note:**

**(1).** The power factor value indicates the direction of the current. Positive value refers to forward current, negative value refers to reverse current.

For example, PF=0.98, it means the current is forward flow;

if PF= -0.98, it means the current is reverse flow.

**(2).** The power sum demand calculation is based on total power = import power – export power.

**(3).** Total Energy = Import energy + Export energy. For example: total active energy = import active energy + export active energy.

**(4).** Net Energy = Import energy – Export energy. For example: Net active energy = import active energy – export active erergy.

### 1.3 Holding Register, Function code (Hex): 03(read) / 10(write)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| AddressRegister | Parameter |  Modbus Protocol Start Address Hex |  Valid range | Mode |
| High Byte | Low Byte |
| 40001 | Demand Time | 00 | 00 | Read minutes into first demand calculation. When the Demand Time reaches the Demand Period then the demand values are valid.**Length : 4 byte****Data Format : Float** | ro |
| 40003 | Demand Period | 00 | 02 | Write demand period: 0~60 minutes, Default 60.Range: 0~60, 0 means function closed**Length : 4 byte****Data Format : Float** | r/w |
| 40005 | Slide time | 00 | 04 | Default 1, min.Range ：1 ~ (Demand Period -1).**Length : 4 byte****Data Format : Float** | r/w |
| 40011 | System Type | 00 | 0A | Write system type: 1 = 1P2W;2 = 3P3W;3 = 3P4W,(default);4 = 1P3W;**Length : 4 byte****Data Format : Float**(KPPA is asked) | r/w |
| 40015 | Key Parameter Programming Authorization (KPPA) | 00 | 0E | Read: to get the status of the KPPA0 = not authorized；1 = authorizedWrite the correct password to get KPPA, enable to program key parameters.**Length : 4 byte****Data Format : Float** | r/w |
| 40021 | Modbus address | 00 | 14 | Write the Modbus address for the whole meterIn one communication address mode, only one address is to be set.Address: 1 to 247 for MODBUS Protocol, default 1.**Length : 4 byte****Data Format : Float** | r/w |
| 40025 | Password | 00 | 18 | Read: to get the password of the meterWrite: to program the new password of the meterDefault 1000**Length : 4 byte****Data Format : Float** | r/w |
| 40053 | CT2 | 00 | 34 | CT2 = 100mV**Length : 4 byte****Data Format : Float** | ro |
| 40061 | Backlit time | 00 | 3C | Default 60, minRange 0~121，0 means backlit always on ，121 means backlit always off**Length : 4byte****Data Format : Float** | r/w |
| 40257 | CT1 of L1 on CH01 | 01 | 00 | CT1 Range 1-9999A default 100，**Length : 4 byte****Data Format : Float** Note：Access permission is required to set up | r/w |
| 40259 | CT1 of L2 on CH01 | 01 | 02 | CT1 Range 1-9999A，default 100，**Length : 4 byte****Data Format : Float** Note：Access permission is required to set up  | r/w |
| 40261 | CT1 of L3 on CH01 | 01 | 04 | CT1 Range 1-9999A，default 100，**Length : 4 byte****Data Format : Float** Note：Access permission is required to set up  | r/w |
| 40263 | CT1 of L1 on CH02 | 01 | 06 | CT1 Range 1-9999A，default 100，**Length : 4 byte****Data Format : Float** Note：Access permission is required to set up  | r/w |
| 40265 | CT1 of L2 on CH02 | 01 | 08 | CT1 Range 1-9999A，default 100，**Length : 4 byte****Data Format : Float** Note：Access permission is required to set up  | r/w |
| 40267 | CT1 of L3 on CH02 | 01 | 0A | CT1 Range 1-9999A，default 100，**Length : 4 byte****Data Format : Float** Note：Access permission is required to set up  | r/w |
| 40269 | CT1 of L1 on CH03 | 01 | 0C | CT1 Range 1-9999A， default 100，**Length : 4 byte****Data Format : Float** Note：Access permission is required to set up  | r/w |
| 40271 | CT1 of L2 on CH03 | 01 | 0E | CT1 Range 1-9999A， default 100，**Length : 4 byte****Data Format : Float** Note：Access permission is required to set up  | r/w |
| 40273 | CT1 of L3 on CH03 | 01 | 10 | CT1 Range 1-9999A， default 100，**Length : 4 byte****Data Format : Float** Note：Access permission is required to set up  | r/w |
| 40275 | CT1 of L1 on CH04 | 01 | 12 | CT1 Range 1-9999A， default 100，**Length : 4 byte****Data Format : Float** Note：Access permission is required to set up  | r/w |
| 40277 | CT1 of L2 on CH04 | 01 | 14 | CT1 Range 1-9999A， default 100，**Length : 4 byte****Data Format : Float** Note：Access permission is required to set up  | r/w |
| 40279 | CT1 of L3 on CH04 | 01 | 16 | CT1 Range 1-9999A， default 100，**Length : 4 byte****Data Format : Float** Note：Access permission is required to set up  | r/w |
| 40281 | Current direction of CH01 | 01 | 18 | Range 0~7， default 00 = CT1 Frd，CT2 Frd ，CT3 Frd1 = CT1 Rev，CT2 Frd ，CT3 Frd2 = CT1 Frd ，CT2 Rev ，CT3 Frd3 = CT1 Rev ，CT2 Rev ，CT3 Frd4 = CT1 Frd ，CT2 Frd ，CT3 Rev5 = CT1 Rev ，CT2 Frd ，CT3 Rev6 = CT1 Frd ，CT2 Rev ，CT3 Rev7 = CT1 Rev ，CT2 Rev ，CT3 Rev 00 00功能代码（）default 000 00功能代码（） **Length: 4 byte****Data Format : Float** Note：Access permission is required to set up  | r/w |
| 40283 | Current direction of CH02 | 01 | 1A | Range 0~7，default 00 = CT1 Frd ，CT2 Frd ，CT3 Frd1 = CT1 Rev ，CT2 Frd ，CT3 Frd2 = CT1 Frd ，CT2 Rev ，CT3 Frd3 = CT1 Rev ，CT2 Rev ，CT3 Frd4 = CT1 Frd ，CT2 Frd ，CT3 Rev5 = CT1 Rev ，CT2 Rev ，CT3 Rev6 = CT1 Frd ，CT2 Rev ，CT3 Rev7 = CT1 Rev ，CT2 Rev ，CT3 Rev 00 00功能代码（）default 000 00功能代码（）**Length : 4 byte****Data Format : Float** Note：Access permission is required to set up  | r/w |
| 40285 | Current direction of CH03 | 01 | 1C | Range 0~7，default 00 = CT1 Frd ，CT2 Frd ，CT3 Frd1 = CT1 Rev ，CT2 Frd ，CT3 Frd2 = CT1 Frd ，CT2 Rev ，CT3 Frd3 = CT1 Rev ，CT2 Rev ，CT3 Frd4 = CT1 Frd ，CT2 Frd ，CT3 Rev5 = CT1 Rev ，CT2 Frd ，CT3 Rev6 = CT1 Frd ，CT2 Rev ，CT3 Rev7 = CT1 Rev ，CT2 Rev ，CT3 Rev 00 00功能代码（）default 000 00功能代码（）**Length : 4 byte****Data Format : Float** Note：Access permission is required to set up  | r/w |
| 40287 | Current direction of CH04 | 01 | 1E | Range 0~7，default 00 = CT1 Frd ，CT2 Frd ，CT3 Frd1 = CT1 Rev ，CT2 Frd ，CT3 Frd2 = CT1 Frd ，CT2 Rev ，CT3 Frd3 = CT1 Rev ，CT2 Rev ，CT3 Frd4 = CT1 Frd ，CT2 Frd ，CT3 Rev5 = CT1 Rev ，CT2 Frd ，CT3 Rev6 = CT1 Frd ，CT2 Rev ，CT3 Rev7 = CT1 Rev ，CT2 Rev ，CT3 Rev 00 00功能代码（）default 000 00功能代码（）**Length : 4 byte****Data Format : Float** Note：Access permission is required to set up  | r/w |
| 461447 | Ethernet communication Parameter | F0 | 06 | Ethernet communication parameter includes: IP address (4byte)，subnet mask (4byte)，default gateway (4byte)，IP port(2 byte)Data format：IP Address-Subnet mask-default gateway- IP port，High byte first.Default：IP Address = 192-168-1-200Subnet mask = 255-255-255-0Gate way = 192-168-1-1IP Port = 502Note: When the automatically acquiring IP address function is open, this register can be read only.**Length : 14byte****Data Format: Hex** | r/w |
| 461454 | Ethernet TCP/IP working mode | F0 | 0D | Ethernet TCP/IP working mode00 00 = slave mode (the Ethernet port is only used for TCP/IP communication for this meter);00 01 = master mode (the meter can be worked as an RS485-TCP/IP gateway. Via the Ethernet port, it can read the devices connected to its RS485 port on the same Bus line.)**Length : 2byte****Data Format: Hex****(KPPA is asked)** | r/w |
| 461455 | Acquire IP address automatically(DHCP) | F0 | 0E | Acquire IP address automatically00 00 = close 00 01 = open **Length : 2byte****Data Format: Hex****(KPPA is asked)** | r/w |
| 461457 | Reset historical data | F0 | 10 | **XX 00** = reset demand data**XX 03** =reset energy data**XX 04** =reset Maximum and Minimum datawhere，XX=00 means reset data of 4 channels r；XX=01 means reset data of CH01；XX=02 means reset data of CH02；XX=03 means reset data of CH03；XX=04 means reset data of CH04**Length** : 2 byte**Data Format** : Hex**Note: xx 03 is not available for all models. Only those meter has energy resettable function has this option.** | wo |
| 463793 | Running time | F9 | 30 | Continuous working period。Unit：hourIf write 0 into register, it means reset the running time.**Length : 4 byte****Data Format : Float** | r/w |
| 463795 | Load running time | F9 | 32 | The running time on loadUnit：hourIf write 0 into register, it means reset the loading running time. **Length : 4 byte****Data Format : Float****Note: when there is load detected on any channel, the time will counts.** | r/w |
| 464513 | Serial number | FC | 00 | Serial number**Length : 4 byte****Data Format : unsigned int32****Note: Only read** | ro |
| 464515 | Meter Code | FC | 02 | Meter code，fixed 00 86**Length : 4 byte****Data Format : Hex****Note: Only read** | ro |
| 464645 | Version number on display | FC | 84 | The version number showed on the display XX.YY**Data Format** ：the first byte means XX， the second byte means YY**Length : 2 byte****Data Format : Hex****Note: Only read** | ro |
| 464673 | Switch of ML work mode | FC | A0 | Switch of work mode of SDM630MCT-ML31 64：one address work mode；34 64：four addresses work mode；**Length : 2 byte****Data Format : Hex**(KPPA is asked) | r/w |

##

##  Protocol of Multi Communication Addresses Mode

### 2.1 Input Register, Function code (Hex): 04

|  |  |  |
| --- | --- | --- |
| **Address****(Register)** |  **Input Register Parameter**  |  **Modbus** **Protocol Start** **Address Hex** |
|  **Description** | **Length****(bytes)** | **Data****Format** | **Units** | **Hi****Byte** | **Lo****Byte** |
| **Below are registers for CH01, CH02, CH03 and CH04. The four channels registers are the same. But their communication address (001~247) is different.**  |
| 30001 | Phase 1 line to neutral volts  | 4 | Float | V | 00 | 00 |
| 30003 | Phase 2 line to neutral volts  | 4 | Float | V | 00 | 02 |
| 30005 | Phase 3 line to neutral volts  | 4 | Float | V | 00 | 04 |
| 30007 | Phase 1 current  | 4 | Float | A | 00 | 06 |
| 30009 | Phase 2 current  | 4 | Float | A | 00 | 08 |
| 30011 | Phase 3 current  | 4 | Float | A | 00 | 0A |
| 30013 | Phase 1 active power  | 4 | Float | W | 00 | 0C |
| 30015 | Phase 2 active power  | 4 | Float | W | 00 | 0E |
| 30017 | Phase 3 active power  | 4 | Float | W | 00 | 10 |
| 30019 | Phase 1 apparent power  | 4 | Float | VA | 00 | 12 |
| 30021 | Phase 2 apparent power  | 4 | Float | VA | 00 | 14 |
| 30023 | Phase 3 apparent power  | 4 | Float | VA | 00 | 16 |
| 30025 | Phase 1 reactive power  | 4 | Float | VAr | 00 | 18 |
| 30027 | Phase 2 reactive power  | 4 | Float | VAr | 00 | 1A |
| 30029 | Phase 3 reactive power  | 4 | Float | VAr | 00 | 1C |
| 30031 | Phase 1 power factor (1)  | 4 | Float | None | 00 | 1E |
| 30033 | Phase 2 power factor (1)  | 4 | Float | None | 00 | 20 |
| 30035 | Phase 3 power factor (1)  | 4 | Float | None | 00 | 22 |
| 30037 | Phase 1 phase angle  | 4 | Float | Degrees | 00 | 24 |
| 30039 | Phase 2 phase angle  | 4 | Float | Degrees | 00 | 26 |
| 30041 | Phase 3 phase angle  | 4 | Float | Degrees | 00 | 28 |
| 30043 | Average line to neutral volts  | 4 | Float | V | 00 | 2A |
| 30047 | Average line current  | 4 | Float | A | 00 | 2E |
| 30049 | Sum of line currents  | 4 | Float | A | 00 | 30 |
| 30053 | Total system power  | 4 | Float | W | 00 | 34 |
| 30057 | Total system volt amps  | 4 | Float | VA | 00 | 38 |
| 30061 | Total system VAr  | 4 | Float | VAr | 00 | 3C |
| 30063 | Total system power factor (1)  | 4 | Float | None | 00 | 3E |
| 30067 | Total system phase angle  | 4 | Float | Degrees | 00 | 42 |
| 30071 | Frequency of supply voltages  | 4 | Float | Hz | 00 | 46 |
| 30073 | Total import active energy  | 4 | Float | kWh | 00 | 48 |
| 30075 | Total export active energy  | 4 | Float | kWH | 00 | 4A |
| 30077 | Total import reactive energy  | 4 | Float | kVArh | 00 | 4C |
| 30079 | Total export reactive energy  | 4 | Float | kVArh | 00 | 4E |
| 30081 | Total apparent energy  | 4 | Float | kVAh | 00 | 50 |
| 30083 | Ah  | 4 | Float | Ah | 00 | 52 |
| 30085 | Total system power demand (2) | 4 | Float | W | 00 | 54 |
| 30087 | Maximum total system power demand (2) | 4 | Float | W | 00 | 56 |
| 30089 | Import active power demand | 4 | Float | W | 00 | 58 |
| 30091 | Import active power max demand | 4 | Float | W | 00 | 5A |
| 30093 | Export active power demand | 4 | Float | W | 00 | 5C |
| 30095 | Export active power max. demand | 4 | Float | W | 00 | 5E |
| 30101 | Total system VA demand  | 4 | Float | VA | 00 | 64 |
| 30103 | Maximum total system VA demand  | 4 | Float | VA | 00 | 66 |
| 30105 | Neutral current demand  | 4 | Float | Amps | 00 | 68 |
| 30107 | Maximum neutral current demand  | 4 | Float | Amps | 00 | 6A |
| 30109 | Total system reactive power demand (2) | 4 | Float | VAr | 00 | 6C |
| 30111 | Maximum total system reactive power demand(2) | 4 | Float | VAr | 00 | 6E |
| 30201 | Line 1 to Line 2 volts  | 4 | Float | V | 00 | C8 |
| 30203 | Line 2 to Line 3 volts  | 4 | Float | V | 00 | CA |
| 30205 | Line 3 to Line 1 volts  | 4 | Float | V | 00 | CC |
| 30207 | Average line to line volts  | 4 | Float | V | 00 | CE |
| 30225 | Neutral current  | 4 | Float | A | 00 | E0 |
| 30235 | Phase 1 L/N volts THD | 4 | Float | % | 00 | EA |
| 30237 | Phase 2 L/N volts THD | 4 | Float | % | 00 | EC |
| 30239 | Phase 3 L/N volts THD | 4 | Float | % | 00 | EE |
| 30241 | Phase 1 Current THD | 4 | Float | % | 00 | F0 |
| 30243 | Phase 2 Current THD | 4 | Float | % | 00 | F2 |
| 30245 | Phase 3 Current THD | 4 | Float | % | 00 | F4 |
| 30249 | Average line to neutral volts THD  | 4 | Float | % | 00 | F8 |
| 30251 | Average line current THD  | 4 | Float | % | 00 | FA |
| 30259 | Phase 1 current demand  | 4 | Float | A | 01 | 02 |
| 30261 | Phase 2 current demand  | 4 | Float | A | 01 | 04 |
| 30263 | Phase 3 current demand  | 4 | Float | A | 01 | 06 |
| 30265 | Maximum phase 1 current demand  | 4 | Float | A | 01 | 08 |
| 30267 | Maximum phase 2 current demand  | 4 | Float | A | 01 | 0A |
| 30269 | Maximum phase 3 current demand  | 4 | Float | A | 01 | 0C |
| 30335 | Line 1 to line 2 volts THD  | 4 | Float | ％ | 01 | 4E |
| 30337 | Line 2 to line 3 volts THD  | 4 | Float | ％ | 01 | 50 |
| 30339 | Line 3 to line 1 volts THD  | 4 | Float | ％ | 01 | 52 |
| 30341 | Average line to line volts THD  | 4 | Float | ％ | 01 | 54 |
| 30343 | Total active Energy (3) | 4 | Float | kWh | 01 | 56 |
| 30345 | Total reactive Energy (3) | 4 | Float | kVArh | 01 | 58 |
| 30347 | L1 import active Energy | 4 | Float | kWh | 01 | 5A |
| 30349 | L2 import active Energy | 4 | Float | kWh | 01 | 5C |
| 30351 | L3 import active Energy | 4 | Float | kWh | 01 | 5E |
| 30353 | L1 export active Energy | 4 | Float | kWh | 01 | 60 |
| 30355 | L2 export active Energy | 4 | Float | kWh | 01 | 62 |
| 30357 | L3 export active Energy | 4 | Float | kWh | 01 | 64 |
| 30359 | L1 total active Energy | 4 | Float | kWh | 01 | 66 |
| 30361 | L2 total active Energy | 4 | Float | kWh | 01 | 68 |
| 30363 | L3 total active Energy | 4 | Float | kWh | 01 | 6A |
| 30365 | L1 import reactive energy | 4 | Float | kVArh | 01 | 6C |
| 30367 | L2 import reactive energy | 4 | Float | kVArh | 01 | 6E |
| 30369 | L3 import reactive energy | 4 | Float | kVArh | 01 | 70 |
| 30371 | L1 export reactive energy | 4 | Float | kVArh | 01 | 72 |
| 30373 | L2 export reactive energy | 4 | Float | kVArh | 01 | 74 |
| 30375 | L3 export reactive energy | 4 | Float | kVArh | 01 | 76 |
| 30377 | L1 total reactive energy | 4 | Float | kVArh | 01 | 78 |
| 30379 | L2 total reactive energy | 4 | Float | kVArh | 01 | 7A |
| 30381 | L3 total reactive energy | 4 | Float | kVArh | 01 | 7C |
| 30397 | Net active energy (4) (Net=Import-export) | 4 | Float | kWh | 01 | 8C |
| 30399 | Net reactive energy | 4 | Float | kVArh | 01 | 8E |
| 31409 | Net L1 active energy | 4 | Float | kWh | 05 | 80 |
| 31411 | Net L2 active energy  | 4 | Float | kWh | 05 | 82 |
| 31413 | Net L3 active energy  | 4 | Float | kWh | 05 | 84 |
| 31415 | Net L1 reactive energy  | 4 | Float | kVArh | 05 | 86 |
| 31417 | Net L2 reactive energy  | 4 | Float | kVArh | 05 | 88 |
| 31419 | Net L3 reactive energy  | 4 | Float | kVArh | 05 | 8A |
| 32649 | Maximum value of total active power | 4 | Float | W | 0A | 58 |
| 32655 | Maximum value of L1 active power | 4 | Float | W | 0A | 5E |
| 32657 | Maximum value of L2 active power | 4 | Float | W | 0A | 60 |
| 32659 | Maximum value of L3 active power | 4 | Float | W | 0A | 62 |
| 32673 | Maximum value of L1 current | 4 | Float | A | 0A | 70 |
| 32675 | Maximum value of L2 current | 4 | Float | A | 0A | 72 |
| 32677 | Maximum value of L3 current | 4 | Float | A | 0A | 74 |
| 32683 | Maximum value of L1 L-N voltage | 4 | Float | V | 0A | 7A |
| 32685 | Maximum value of L2 L-N voltage | 4 | Float | V | 0A | 7C |
| 32687 | Maximum value of L3 L-N voltage | 4 | Float | V | 0A | 7E |
| 32689 | Maximum value of line 1 to line 2 voltage | 4 | Float | V | 0A | 80 |
| 32691 | Maximum value of line 2 to line3 voltage | 4 | Float | V | 0A | 82 |
| 32693 | Maximum value of line 3 to line 1 voltage | 4 | Float | V | 0A | 84 |
| 32695 | Minimum value of total active power | 4 | Float | W | 0A | 86 |
| 32701 | Minimum value of L1 active power | 4 | Float | W | 0A | 8C |
| 32703 | Minimum value of L2 active power | 4 | Float | W | 0A | 8E |
| 32705 | Minimum value of L3 active power | 4 | Float | W | 0A | 90 |
| 32719 | Minimum value of L1 current | 4 | Float | A | 0A | 9E |
| 32721 | Minimum value of L2 current | 4 | Float | A | 0A | A0 |
| 32723 | Minimum value of L3 current | 4 | Float | A | 0A | A2 |
| 32729 | Minimum value of L1 L-N voltage | 4 | Float | V | 0A | A8 |
| 32731 | Minimum value of L2 L-N voltage | 4 | Float | V | 0A | AA |
| 32733 | Minimum value of L3 L-N voltage | 4 | Float | V | 0A | AC |
| 32735 | Minimum value of L1 to L2 voltage | 4 | Float | V | 0A | AE |
| 32737 | Minimum value of L2 to L3 voltage | 4 | Float | V | 0A | B0 |
| 32739 | Minimum value of L3 to L1 voltage | 4 | Float | V | 0A | B2 |
| **CH01 shares the same register map to CH02, CH03 and CH04. For Multi communication addresses mode, the address for each channel must be set differently.**  |

**2.2 The addresses below are for the total measurement for all loads:**

|  |  |  |
| --- | --- | --- |
| **Address****(Register)** |  **Input Register Parameter**  |  **Modbus** **Protocol Start** **Address Hex** |
|  **Description** | **Length****(bytes)** | **Data****Format** | **Units** | **Hi****Byte** | **Lo****Byte** |
| 312049 | Sum of line currents. | 4 | Float | A | 2F | 10 |
| 312053 | Total system power. | 4 | Float | W | 2F | 14 |
| 312057 | Total system volt amps. | 4 | Float | VA | 2F | 18 |
| 312061 | Total system VAr. | 4 | Float | VAr | 2F | 1C |
| 312073 | Total import active energy | 4 | Float | kWh | 2F | 28 |
| 312075 | Total export active energy | 4 | Float | kWH | 2F | 2A |
| 312077 | Total import reactive energy | 4 | Float | kVArh | 2F | 2C |
| 312079 | Total export reactive energy | 4 | Float | kVArh | 2F | 2E |
| 312081 | Total apparent energy | 4 | Float | kVAh | 2F | 30 |
| 312343 | Total active Energy (3) | 4 | Float | kWh | 30 | 36 |
| 312345 | Total reactive Energy (3) | 4 | Float | kVArh | 30 | 38 |
| 312397 | Net Active Energy | 4 | Float | kWh | 30 | 6C |
| 312399 | Net Reactive Energy  | 4 | Float | kVArh | 30 | 6E |

**Note:**

**(1).** The power factor value indicates the direction of the current. Positive value refers to forward current, negative value refers to reverse current.

For example, PF=0.98, it means the current is forward flow;

if PF= -0.98, it means the current is reverse flow.

**(2).** The power sum demand calculation is based on total power = import power – export power.

**(3).** Total Energy = Import energy + Export energy. For example: total active energy = import active energy + export active energy.

**(4).** Net Energy = Import energy – Export energy. For example: Net active energy = import active energy – export active erergy.

### 2.3 Holding Register，Function code (Hex) : 03(reade) / 10(write)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| AddressRegister | Parameter |  Modbus Protocol Start Address Hex |  Valid range | Mode |
| High Byte | Low Byte |
| 40001 | Demand Time | 00 | 00 | Read minutes into first demand calculation. When the Demand Time reaches the Demand Period then the demand values are valid.**Length : 4 byte****Data Format : Float** | ro |
| 40003 | Demand Period | 00 | 02 | Write demand period: 0~60 minutes, Default 60.Range: 0~60, 0 means function closed**Length : 4 byte****Data Format : Float** | r/w |
| 40005 | Slide time | 00 | 04 | Default 1, min.Range ：1 ~ (Demand Period -1).**Length : 4 byte****Data Format : Float** | r/w |
| 40011 | System Type | 00 | 0A | Write system type: 1 = 1P2W;2 = 3P3W;3 = 3P4W,(default);4 = 1P3W;**Length : 4 byte****Data Format : Float**(KPPA is asked) | r/w |
| 40015 | Key Parameter Programming Authorization (KPPA) | 00 | 0E | Read: to get the status of the KPPA0 = not authorized；1 = authorizedWrite the correct password to get KPPA, enable to program key parameters.**Length : 4 byte****Data Format : Float** | r/w |
| 40021 | Modbus address | 00 | 14 | Write the network port nodeAddress: 1 to 247 for MODBUS Protocol.CH01 default 001；CH02 default 002；CH03 default 003；CH04 default 004；**Length : 4 byte****Data Format : Float** | r/w |
| 40025 | Password | 00 | 18 | Read: to get the password of the meterWrite: to program the new password of the meterDefault 1000**Length : 4 byte****Data Format : Float** | r/w |
| 40053 | CT2 | 00 | 34 | CT2 = 100mV**Length : 4 byte****Data Format : Float** | ro |
| 40057 | Current Direction correction(when the external CT is connected reversely) | 00 | 38 | 0 = L1Frd，L2Frd，L3Frd1 = L1 Rev，L2Frd，L3Frd2 = L1Frd，L2 Rev，L3Frd3 = L1 Rev，L2 Rev，L3Frd4 = L1Frd，L2Frd，L3 Rev5 = L1 Rev，L2Frd，L3 Rev6 = L1 Frd，L2 Rev，L3 Rev7 = L1 Rev，L2 Rev，L3 RevDefault 000 00功能代码（）**Length : 4 byte****Data Format :Float**(KPPA is asked) | r/w |
| 40061 | Backlit time | 00 | 3C | Default 60, minRange 0~121，0 means backlit always on ，121 means backlit always off**Length : 4byte****Data Format : Float** | r/w |
| 40257 | CT1 of L1 | 01 | 00 | CT1 Range 1-9999A，default 100，**Length: 4 byte****Data Format : Float** Note：Access permission is required to set up  | r/w |
| 40259 | CT1 of L2  | 01 | 02 | CT1 Range 1-9999A， default 100，**Length : 4 byte****Data Format : Float**Note：Access permission is required to set up  | r/w |
| 40261 | CT1 of L2  | 01 | 04 | CT1 Range 1-9999A， default 100，**Length : 4 byte****Data Format : Float**Note：Access permission is required to set up  | r/w |
| 44097 | Modbus address of CH01 | 10 | 00 | Check the modbus address of CH01**Length : 4 byte****Data Format :Float**Note: The user can read and set any modbus address of all channels. | r/w |
| 44099 | Modbus address of CH02 | 10 | 02 | Check the modbus address of CH02. **Length : 4 byte****Data Format :Float**Note: The user can read and set any modbus address of all channels. | r/w |
| 44101 | Modbus address of CH03 | 10 | 04 | Check the modbus address of CH03.**Length : 4 byte****Data Format :Float**Note: The user can read and set any modbus address of all channels. | r/w |
| 44103 | Modbus address of CH04 | 10 | 06 | Check the modbus address of CH04**Length : 4 byte****Data Format :Float**Note: The user can read and set any modbus address of all channels. | r/w |
| 461447 | Ethernet communication Parameter | F0 | 06 | Ethernet communication parameter includes: IP address (4byte)，subnet mask (4byte)，default gateway (4byte)，IP port(2 byte)Data format：IP Address-Subnet mask-default gateway- IP port，High byte first.Default：IP Address = 192-168-1-200Subnet mask = 255-255-255-0Gate way = 192-168-1-1IP Port = 502Note: When the automatically acquiring IP address function is open, this register can be read only.**Length : 14byte****Data Format: Hex** | r/w |
| 461454 | Ethernet TCP/IP working mode | F0 | 0D | Ethernet TCP/IP working mode00 00 = slave mode (the Ethernet port is only used for TCP/IP communication for this meter);00 01 = master mode (the meter can be worked as an RS485-TCP/IP gateway. Via the Ethernet port, it can read the devices connected to its RS485 port on the same Bus line.)**Length : 2byte****Data Format: Hex****(KPPA is asked)** | r/w |
| 461455 | Acquire TCP IP address automatically(DHCP) | F0 | 0E | Acquire TCP IP address automatically00 00 = close 00 01 = open **Length : 2byte****Data Format: Hex****(KPPA is asked)** | r/w |
| 461457 | Reset historical data | F0 | 10 | **00 00 = reset demand info****Length : 2 byte****Data Format: Hex** | wo |
| 463793 | Running time | F9 | 30 | Continuous working period。Unit: hourIf write 0 into register, it means reset the running time.**Length : 4 byte****Data Format : Float** | r/w |
| 463795 | Load running time | F9 | 32 | The running time on loadUnit：hourIf write 0 into register, it means reset the on-load running time. Length : 4 byteData Format : FloatNote: when there is load detected on any channel, the time will counts. | r/w |
| 464513 | Serial number | FC | 00 | Serial number**Length : 4 byte****Data Format : unsigned int32****Note: Only read** | ro |
| 464515 | Meter Code | FC | 02 | Meter Code, fixed 00 86**Length : 4 byte****Data Format :Hex****Note: Only read** | ro |
| 464641 | Software version number | FC | 80 | Version number of software XX.YYData Format：the first byte means XX，the second byte meansYY**Length : 2 byte****Data Format : Hex****Note: Only read** | ro |
| 464643 | Hardware version number | FC | 82 | Version number of hardware XX.YYData Format：the first byte meansXX，the second byte meansYY**Length : 2 byte****Data Format : Hex****Note: Only read** | ro |
| 464645 | Version number on display | FC | 84 | The version number showed on the display XX.YYData Format：the first byte means XX， the second byte means YY**Length : 2 byte****Data Format : Hex****Note: Only read** | ro |
| 464673 | Switch of ML work mode | FC | A0 | Switch of work mode of SDM630MCT-ML；31 64：one address work mode；34 64：four addresses work mode；**Length : 2 byte****Data Format : Hex**(KPPA is asked) | r/w |

**Example:**

1, Read Input Registers

Example: Read “Phase 1 line to neutral volts”

Request: 01 04 00 00 00 02 71 CB

Where,01 = Meteraddress

04 = Function code

00 = High byte of registers starting address

00 = Low byte of registers starting address

00 =High byteofregistersnumber

02 = Low byteofregistersnumber

71 = CRC Low

CB = CRC High

Response: 01 04 04 43 66 33 34 1B 38

Where,01 = Meteraddress

04 = Function code

04= Byte count

43 =Data, (High Word,HighByte)

66 = Data, (High Word, LowByte)

33 =Data, (LowWord, HighByte)

34 = Data, (LowWord, LowByte)

1B = CRC Low

38 = CRC High

Note: 43 66 33 34(Hex) = 230.2 (Floating point)

2,Read Holding Registers

Example: Read “Slide time”

Request: 01 03 00 04 00 02 85 CA

Where,01 = Meteraddress

03 = Function code

00 = High byte of registers starting address

04 = Low byte of registers starting address

00 =High byteofregistersnumber

02 = Low byteofregistersnumber

85 = CRC Low

CA = CRC High

Response: 01 03 04 40 A0 00 00 EF D1

Where,01 = Meteraddress

03 = Function code

04= Byte Count

40 =Data, (High Word,HighByte)

A0 = Data, (High Word, LowByte)

00 =Data, (LowWord, HighByte)

00 = Data, (LowWord, LowByte)

EF = CRC Low

D1 = CRC High

Note: 40 A00000 (Hex)=5 (Floating point)

3,Write Holding Registers

Example:Write“System Type” = 4

Request: 01 10 00 0A 00 02 04 40 80 00 00 67 F8

Where,01 = Meteraddress

10 = Function code

00 = High byte of registers starting address

0A = Low byte of registers starting address

00 =High byteofregistersnumber

02 = Low byteofregistersnumber

04 = Byte Count

40 =Data, (High Word,HighByte)

80 = Data, (High Word, LowByte)

00 =Data, (LowWord, HighByte)

00 = Data, (LowWord, LowByte)

67 = CRC Low

F8 = CRC High

Note: 40 800000 (Hex)=4 (Floating point)

Response: 01 10 00 0A 00 02 61 CA

Where,01 = Meteraddress

10 = Function code

00 = High byte of registers starting address

0A = Low byte of registers starting address

00 =High byteofregistersnumber

02 = Low byteofregistersnumber

61 = CRC Low

CA = CRC High

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