

# SolaX Power Energy Storage Inverter MODBUS Communication protocols





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## Foreword

- Protocol Version Revision History**

Protocol Version Revision History				
Date	Version	Author	Reviewer	Audit Date
2025/5/30	V001.00	Ziyin Fang, Yanchong Tang		
2025/8/8	V001.01	Yanchong Tang		
2026/2/10	V001.02	Yanchong Tang		

- Changelog**

Changelog	
Version	Description
V001.00	<p><b>Added:</b></p> <ol style="list-style-type: none"> <li>1. ARM/DSP version numbers (0x03:0x007B~0x007C).</li> <li>2. FactoryName (0x0007~0x000D)</li> <li>3. (Real Time Info/RTC).</li> <li>4. Table 3.3.3 (Inverter System Info).</li> <li>5. Electricity meter parameters (reactive power, voltage, current: 0x04:0x00C1~0x00D3).</li> <li>6. Dual battery system parameters (0x03:0x0200~0x0213).</li> <li>7. New VPP readback location (0x03:0x01A0~0x1BF).</li> <li>8. Appendices A-D.</li> <li>9. Example for Table 3.2.1 (Inverter Firmware Info).</li> <li>10. Example for Table 3.5 (Read or Write Inverter Operating Parameters).</li> <li>11. "Gain" attribute added to all tables.</li> <li>12. Table 3.5.2 (Inverter GRID Port Output Power Limit).</li> </ol> <p><b>Modified:</b></p> <ol style="list-style-type: none"> <li>1. VPP function description update.</li> <li>2. "Unit" attribute content revised.</li> </ol>
V001.01	<p><b>Added:</b></p> <ol style="list-style-type: none"> <li>1. Bat discharge/charge energy statistical datas(Table 3.4)</li> <li>2. Add PgridBias and BiasPower settings(Table 3.5.2)</li> <li>3. Add VPPExitIdleEn Setting (Table 3.5.8)</li> <li>4. Add Meter2/CT2 Power(Table 3.3.5)</li> </ol> <p><b>Modified:</b></p> <ol style="list-style-type: none"> <li>1. AC and EPS power supplement “active”description</li> <li>2. Modify some parameters address in (Table 3.5.4)</li> <li>3. Modify PeakShavingPeriodBPeakLimits1 and PeakShavingPeriodB PeakLimits2 in (Table 3.5.1)</li> <li>4. Modify EVChargerComStatus and AdaptBoxComStatus in(Table 3.5.6)</li> </ol>



V001.02	<p><b>Added:</b></p> <ol style="list-style-type: none"> <li>1. Add Main breaker current limit to (Table 3.5.2)</li> <li>2. Add FeedinEnergy Today (0x00AE–0x00AF) to Table 3.4.</li> <li>3. Add FeedinEnergy Total (0x00AA–0x00AB) to Table 3.4.</li> <li>4. Add Table 3.5.11 EPS (Off-Grid) Settings Parameter.</li> </ol> <p><b>Modified:</b></p> <ol style="list-style-type: none"> <li>1. GridReactivePower_R_Meter has been changed from 0x00C0~0x00C1 to 0x00DE~0x00DF (Table 3.3.5)</li> <li>2. GridReactivePower_S_Meter has been changed from 0x00C2~0x00C3 to 0x00E0~0x00E1 (Table 3.3.5)</li> </ol>
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- **Inverter List**

Inverter Name	Inverter ID	Min. Firmware Version	Max. PV Channel	Max. Bat Channel
X1-Hybrid G4	0x0F		2	1
X1-IES	0x17		2	1
X1-IES-A	0x29		0	1
X1-VAST	0x22		4	2
X3-Hybrid G4	0x0E		2	1
X3-Hybrid G4 PRO	0x20		3	2
X3-IES	0x18		2	1
X3-IES-A	0x28		0	1
X3-IES-P	0x23		3	1
X3-ULTRA	0x19		3	2
X3-AELIO	0x1F		6	2

Information Type	Function Code	Register Address
Inverter Name	0x03	0x000E~0x0014
Inverter ID	0x03	0x0015
Min. Firmware Version	0x03	0x0080
Max. PV Channel	0x04	0x001B
Max. Bat Channel	0x03	0x0059

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# 1 Information on this Document

## 1.1 Introduction

The MODBUS protocol is a common standard device-level communication protocol. This document describes and illustrates the MODBUS protocol for the SolaX Power Energy Storage Inverter System, which is used to standardize and constrain subsequent third-party integration development. The SolaX Power Energy Storage Inverter system communicates over MODBUS based serial links, which are based on RTU links and follow the MODBUS RTU format convention. This document focuses on information specific to the SolaX Power Energy Storage Inverter System. For details about the standard protocols used by SolaX inverters and some customized interaction methods and examples, please read Protocols Overview.

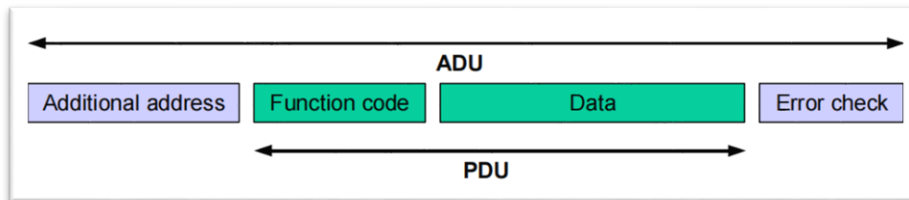
## 1.2 Abbreviation

Abbr.	Explanation
RO	Read Only
WO	Write Only
RW	Read and Write
U8	An Unsigned Byte (8-bit)
U16	An Unsigned Word (16-bit)
S16	A Signed Word (16-bit)
U32	An Unsigned Double Word (32-bit)
S32	A Signed Double Word (32-bit)
STR	Character String
Bitfield16	16-bit Data
Bitfield32	32-bit Data
MSB	Most Significant Bit
LSB	Least Significant Bit
-	N/A
S	Second
X1	Single Phase
X3	Three Phases
ADU	Application Data Unit
PDU	Protocol Data Unit
REV	Reserved
★	There is a write limit that prohibits frequent operations
VPP Mode	Remote Power Control, mainly used for Virtual Power Plant (VPP) control

## 2 Protocol Overview

### 2.1 Protocol Type

- **MODBUS RTU (For RS485)**
  - Address: 1 (default)
  - Baud Rate: 19200 (default)
  - Data bits: 8
  - Stop Bit: 1
  - Parity: None
  - Frame format:



The MODBUS protocol defines a simple protocol data unit (PDU) independent of the underlying communication layers. The mapping of MODBUS protocol on specific buses or network can introduce some additional fields on the application data unit (ADU).

**Note:** The slave address of the MODBUS RTU in the SolaX Power energy storage system represents the address of the inverter. The address range is assigned as follows:

Broadcast Address	Slave Address	Reserved
0	1–247	248–255

The size of the MODBUS PDU is limited by the size constraint inherited from the first MODBUS implementation on Serial Line network (Max. RS485 ADU = 256 bytes).

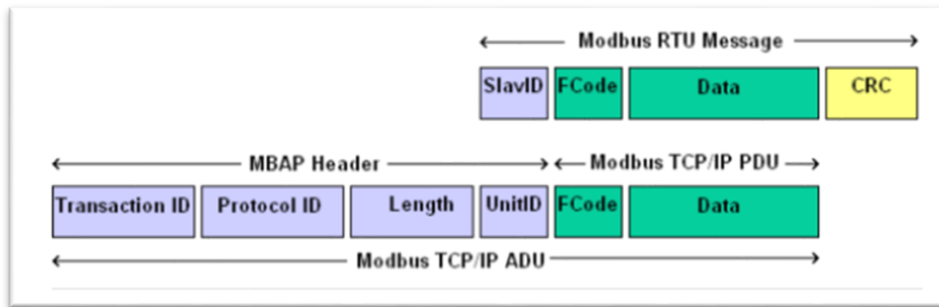
**Therefore:**

MODBUS PDU for serial line communication = 256 - Server address (1 byte) - CRC (2 bytes) = 253 bytes.

**Consequently:**

RS485 ADU = 253 bytes + Server address (1 byte) + CRC (2 bytes) = 256 bytes.

- **Modbus TCP (For Monitoring Module)**
  - Port: 502
  - Transaction ID: No compulsory requirements
  - Protocol ID: No compulsory requirements
  - Unit ID: No compulsory requirements, use 0x01 by default
  - Frame format:



**Note:** The inverter itself does not support **Modbus TCP** functionality. Function expansion must be completed through SolaX's monitoring module. Since it is used for external expansion, the query cycle should be controlled within approximately 1 second.

## 2.2 Reading and Writing of Data

### 2.2.1 MODBUS Command Type

Type	Hexadecimal Value	Data Volume (Number of Registers)*
Read Holding Registers	0x03	1 to 125
Read Input Registers	0x04	1 to 125
Write Single Registers	0x06	1
Write Multiple Registers	0x10	1 to 123

\*: Number of MODBUS registers transferable as a data block per command (16 bit)

### 2.2.2 Register Address, Width and Data Block

A MODBUS register is 16 bits wide. For wider data items, connected MODBUS registers are used and considered as data blocks. The address of the first MODBUS register in a data block is the start address of the data block.

### 2.2.3 Data Transmission

With data storage in the Motorola format "Big Endian", data transmission begins with the high byte and then the low byte of the MODBUS register.

#### 2.2.4 Time Request

Timing Parameter	Value
The least interval time between two instructions	1 sec
Character-gap time out (silent time between 2 packages)	>100 ms
Response timeout	1 sec

## 2.2.5 Data Format Description

- Data Format (Read Holding Register)**

<b>Master Request Format</b>			
<b>Field Name</b>	<b>Number of Bytes</b>	<b>Content Format</b>	<b>Example</b>
<b>Slave ID</b>	1 byte	0x00~0xFF (Inverter default 0x01)	0x01
<b>Function Code</b>	1 byte	0x03	0x03
<b>Start Register Address</b>	2 bytes Address MSB Address LSB	0x0000-0xFFFF	0x03 0x24
<b>Register Number</b>	2 bytes Data MSB Data LSB	N	0x00 0x01
<b>CRC</b>	2 bytes CRC MSB CRC LSB	0x0000-0xFFFF	0xC4 0x45
<b>Slave Normal Response</b>			
<b>Slave ID</b>	1 byte	0x00~0xFF (Inverter default 0x01)	0x01
<b>Function Code</b>	1 byte	0x03	0x03
<b>Byte Number</b>	1 byte Data	2*N	0x02
<b>Register Data</b>	N*2 bytes Data MSB Data LSB	0x0000-0xFFFF	0x00 0x00
<b>CRC</b>	2 bytes CRC MSB CRC LSB	0x0000-0xFFFF	0xB8 0x44
<b>Slave Fault Response</b>			
<b>Slave ID</b>	1 byte	0x00~0xFF (Inverter default 0x01)	0x01
<b>Fault Code</b>	1 byte	0x83	0x83
<b>Abnormal Code</b>	1 byte	0x01 or 0x02 or 0x03 or 0x04	0x02
<b>CRC</b>	2 bytes CRC MSB CRC LSB	0x0000-0xFFFF	0xC5 0x3B

- Data Format (Read Input Register)**

<b>Master Request Format</b>			
------------------------------	--	--	--

Field Name	Number of Bytes	Content Format	Example
Slave ID	1 byte	0x00~0xFF (Inverter default 0x01)	0x01
Function Code	1 byte	0x04	0x04
Start Register Address	2 bytes Address MSB Address LSB	0x0000-0xFFFF	0x04 0x15
Register Number	2 bytes Data MSB Data LSB	N	0x00 0x01
CRC	2 bytes CRC MSB CRC LSB	0x0000-0xFFFF	0x21 0x3E
<b>Slave Normal Response</b>			
Slave ID	1 byte	0x00~0xFF (Inverter default 0x01)	0x01
Function Code	1 byte	0x04	0x04
Byte Number	1 byte Data	2*N	0x02
Register Data	N*2 bytes Data MSB Data LSB	0x0000-0xFFFF	0x00 0x00
CRC	2 bytes CRC MSB CRC LSB	0x0000-0xFFFF	0xB9 0x30
<b>Slave Fault Response</b>			
Slave ID	1 byte	0x00~0xFF (Inverter default 0x01)	0x01
Fault Code	1 byte	0x84	0x84
Abnormal Code	1 byte	0x01 or 0x02 or 0x03 or 0x04	0x02
CRC	2 bytes CRC MSB CRC LSB	0x0000-0xFFFF	0xC2

• **Data Format (Write Single Register)**

<b>Master Request Format</b>			
<b>Field Name</b>	<b>Number of Bytes</b>	<b>Content Format</b>	<b>Example</b>
Slave ID	1 byte	0x00~0xFF (Inverter default 0x01)	0x01
Function Code	1 byte	0x06	0x06
Register Address	2 bytes Address MSB Address LSB	0x0000-0xFFFF	0x06 0x16
Value	2 bytes Data MSB Data LSB	0x0000-0xFFFF	0x00 0x01
CRC	2 bytes CRC MSB CRC LSB	0x0000-0xFFFF	0xA9 0x46
<b>Slave Normal Response</b>			
Slave ID	1 byte	0x00~0xFF (Inverter default 0x01)	0x01
Function Code	1 byte	0x06	0x06
Register Address	2 bytes Address MSB Address LSB	0x0000-0xFFFF	0x06 0x16
Value	2 bytes Data MSB Data LSB	0x0000-0xFFFF	0x00 0x01
CRC	2 bytes CRC MSB CRC LSB	0x0000-0xFFFF	0xA9 0x46
<b>Slave Fault Response</b>			
Slave ID	1 byte	0x00~0xFF (Inverter default 0x01)	0x01
Fault Code	1 byte	0x86	0x86
Abnormal Code	1 byte	0x01 or 0x02 or 0x03 or 0x04	-
CRC	2 bytes CRC MSB CRC LSB	0x0000-0xFFFF	0xC3 0xA1

• **Data Format (Write Multiple Register)**

<b>Master Request Format</b>			
<b>Field Name</b>	<b>Number of Bytes</b>	<b>Content Format</b>	<b>Example</b>
Slave ID	1 byte	0x00~0xFF (Inverter default 0x01)	0x01
Function Code	1 byte	0x10	0x10
Register Address	2 bytes Address MSB Address LSB	0x0000-0xFFFF	0x10 0x00
Register Number	2 bytes Number MSB Number LSB	0x0001-0x007B	0x00 0x07
Byte Number	1 byte	2*N	0x0E
Value	2*N bytes Data MSB Data LSB	0x0000-0xFFFF	0x58 0x42 0x34 0x30 0x34 0x30 0x30 0x30 0x30 0x30 0x30 0x30 0x30 0x30 0x30
CRC	2 bytes CRC MSB CRC LSB	0x0000-0xFFFF	0x57 0xEA
<b>Slave Normal Response</b>			
Slave ID	1 byte	0x00~0xFF (Inverter default 0x01)	0x01
Function Code	1 byte	0x10	0x10
Register Address	2 bytes Address MSB Address LSB	0x0000-0xFFFF	0x10 0x00
Register Number	2 bytes Number MSB Number LSB	0x0001-0x007B	0x00 0x07



Field Name	Number of Bytes	Content Format	Example
CRC	2 bytes CRC MSB CRC LSB	0x0000-0xFFFF	0x85 0x0B
<b>Slave Fault Response</b>			
Slave ID	1 byte	0x00~0xFF (Inverter default 0x01)	0x01
Fault Code	1 byte	0x90	0x90
Abnormal Code	1 byte	0x01 or 0x02 or 0x03 or 0x04	0x02
CRC	2 bytes CRC MSB CRC LSB	0x0000-0xFFFF	0xCD 0xC1

### 2.3 MODBUS Exception Codes

Only some of the MODBUS exception responses are listed here. For more details, please visit the MODBUS website: <http://www.modbus.org>.

MODBUS Exception Codes		
Code	Name	Description
01	ILLEGAL FUNCTION	The function code received in the query is not an allowable action for the server. This may be because the function code is only applicable to newer devices, and was not implemented in the unit selected. It could also indicate that the server is in the wrong state to process a request of this type, for example because it is not configured and is being asked to return register values.
02	ILLEGAL DATA ADDRESS	The data address received in the query is not an allowable address for the server. More specifically, the combination of reference number and transfer length is invalid.
03	ILLEGAL DATA VALUE	A value contained in the query data field is not an allowable value for server. This indicates a fault in the structure of the remainder of a complex request, such as that the implied length is incorrect.
04	SERVER DEVICE FAILURE	Specialized use in conjunction with programming commands. The server has accepted the request and is processing it, but a long duration of time will be required to do so. This response is returned to prevent a timeout error from occurring in the client.

## 3 Inverter Register

### 3.1 Inverter Register Overview

Function Code	Address	Application
0x03	0x0000~0x01FF	Read inverter model information and configuration parameters
	0x0300~0x04FF	Read battery model information
0x04	0x0000~0x017F	Read inverter and battery real-time data
	0x01DD~0x02ED	Read inverter parallel system data
0x06	0x0000~0x02FF	Write inverter and battery single configuration parameter
0x10	0x0000~0x007B	Write inverter and battery multiply configuration parameters
	0x007C~0x008A	VPP mode control (old interface)
	0x00A0~0x00A8	VPP mode control (new interface)

### 3.2 Firmware Info (Function Code: 0x03)

#### 3.2.1 Inverter Firmware Info

Read Register (Function Code:0x03)	Variable	Description	Unit	Gain	Data Format	Length
0x0000~0x0006	InverterSN	Inverter serial number	-	1	STR	7
0x0007~0x000D	Factory Name	Factory name	-	1	STR	7
0x000E~0x0014	Inverter Name	Inverter name	-	1	STR	7
0x007D	Firmware Version DSPMinor	Minor DSP software version	-	1	U16	1
0x007E	Hardware Version	Hardware version	-	1	U16	1
0x007F	Firmware Version DSPMajor	Major DSP software version	-	1	U16	1
0x0080	Firmware Version ARMMajor	Major ARM software version	-	1	U16	1

Read Register (Function Code:0x03)	Variable	Description	Unit	Gain	Data Format	Length
0x0082	Firmware Version Modbus	Current software supports the Modbus protocol document version	-	1	U16	1
0x0083	Firmware Version ARMMinor	Major ARM software version	-	1	U16	1
0x0084	Firmware Version ARMBoot	ARM Bootloader version	-	1	U16	1
0x00AA~0x00AE	ModuleSN	Communication module serial number	-	1	STR	5
0x00BA	Rated Output Power	Inverter rated AC output power	W	1	U16	1
0x005A~0x005B	MaxPV outputpower	Max. PV output power	W	1	U16	1
0x0015	InverterType	Details in " <a href="#">Appendix A: Inverter Type List</a> "	-	1	U16	1
0x007B	Firmware VersionDSP	The full version of the DSP firmware	-	1	U16	1
0x007C	Firmware VersionARM	The full version of the ARM firmware	-	1	U16	1

Example:

Step 1: Read "Inverter Serial Number".

Field Name	Master Request Value	Slave Response Value
Slave ID	0x01	0x01
Function Code	0x03	0x03
Start Address	0x00 0x00	-
Register Quantity	0x00 0x07	-
Byte Count	-	0x0E
Value Data	-	0x48 0x34 0x36 0x30 0x32 0x41 0x4C 0x35 0x33 0x38 0x34 0x30 0x39 0x39 (H4602AL5384099)
CRC Checksum	0x04 0x08	0x63 0x26

So the Inverter Serial Number is: H4602AL5384099



Step 2: Read "The Version of the Modbus Protocol Supported by The Firmware"

Field Name	Master Request Value	Slave Response Value
Slave ID	0x01	0x01
Function Code	0x03	0x03
Start Address	0x00 0x82	-
Register Quantity	0x00 0x01	-
Byte Count	-	0x02
Value Data	-	0x00 0x64
CRC Checksum	0x24 0x22	0x63 0x26

So the current software supports the Modbus protocol version of V001.00

Step 3: Read "The ARM Firmware Version"

Field Name	Master Request Value	Slave Response Value
Slave ID	0x01	0x01
Function Code	0x03	0x03
Start Address	0x00 0x80	-
Register Quantity	0x00 0x04	-
Byte Count	-	0x08
Value Data	-	0x00 0x01 (ARM Major) 0x00 0x00 0x00 0x07 0x00 0x09 (ARM Minor)
CRC Checksum	0x45 0xE1	0xF4 0xD0

ARM Firmware Full Version = ARM Major \* 100 + ARM Minor.

So the current ARM firmware version is V001.09

FirmwareVersionARM is a full version with a content of 109 in the register.

**Note:** FirmwareVersionARM is only supported for FirmwareVersionModbus ≥ V001.00 Version.

### 3.2.2 Battery Firmware Info

- BMS 1 Info

Read Register (Function Code:0x03)	Variable	Description	Unit	Gain	Data Format	Length
0x0059	BatPortNum	Total Bat Port Number	-	1	U16	1
0x0300	BMS1_Subsystem_Num	BMS1 Number	-	1	U16	1
Read	Variable	Description	Unit	Gain	Data Format	Length

<b>Register (Function Code:0x03)</b>						
0x0301	BMS1_Master Version	BMS1 Master Version	-	1	U16	1
0x0302	BMS1_Slave1 Version	BMS1 Slave1 Version	-	1	U16	1
0x0303	BMS1_Slave2 Version	BMS1 Slave2 Version	-	1	U16	1
0x0304	BMS1_Slave3 Version	BMS1 Slave3 Version	-	1	U16	1
0x0305	BMS1_Slave4 Version	BMS1 Slave4 Version	-	1	U16	1
0x0306	BMS1_Slave5 Version	BMS1 Slave5 Version	-	1	U16	1
0x0307	BMS1_Slave6 Version	BMS1 Slave6 Version	-	1	U16	1
0x0308	BMS1_Slave7 Version	BMS1 Slave7 Version	-	1	U16	1
0x0309	BMS1_Slave8 Version	BMS1 Slave8 Version	-	1	U16	1
0x030A	BMS1_Slave9 Version	BMS1 Slave9 Version	-	1	U16	1
0x030B	BMS1_Slave10 Version	BMS1 Slave10 Version	-	1	U16	1
0x030C	BMS1_Slave11 Version	BMS1 Slave11 Version	-	1	U16	1
0x030D	BMS1_Slave12 Version	BMS1 Slave12 Version	-	1	U16	1
0x030E	BMS1_Slave13 Version	BMS1 Slave13 Version	-	1	U16	1
0x030F~ 0x0315	BMS1_MasterSN	BMS1 Master SN	-	1	STR	7
0x0316~ 0x031C	BMS1_Slave1SN	BMS1 Slave1 SN	-	1	STR	7
0x031D~ 0x0323	BMS1_Slave2SN	BMS1 Slave2 SN	-	1	STR	7
0x0324~ 0x032A	BMS1_Slave3SN	BMS1 Slave3 SN	-	1	STR	7
0x032B~ 0x0331	BMS1_Slave4SN	BMS1 Slave4 SN	-	1	STR	7
<b>Read</b>	<b>Variable</b>	<b>Description</b>	<b>Unit</b>	<b>Gain</b>	<b>Data Format</b>	<b>Length</b>

Register (Function Code:0x03)						
0x0332~ 0x0338	BMS1_Slave5SN	BMS1 Slave5 SN	-	1	STR	7
0x0339~ 0x033F	BMS1_Slave6SN	BMS1 Slave6 SN	-	1	STR	7
0x0340~ 0x0346	BMS1_Slave7SN	BMS1 Slave7 SN	-	1	STR	7
0x0347~ 0x034D	BMS1_Slave8SN	BMS1 Slave8 SN	-	1	STR	7
0x034E~ 0x0354	BMS1_Slave9SN	BMS1 Slave9 SN	-	1	STR	7
0x0355~ 0x035B	BMS1_Slave10SN	BMS1 Slave10 SN	-	1	STR	7
0x035C~ 0x0362	BMS1_Slave11SN	BMS1 Slave11 SN	-	1	STR	7
0x0363~ 0x0369	BMS1_Slave12SN	BMS1 Slave12 SN	-	1	STR	7
0x036A~ 0x0370	BMS1_Slave13SN	BMS1 Slave13 SN	-	1	STR	7

- **BMS2 Info**

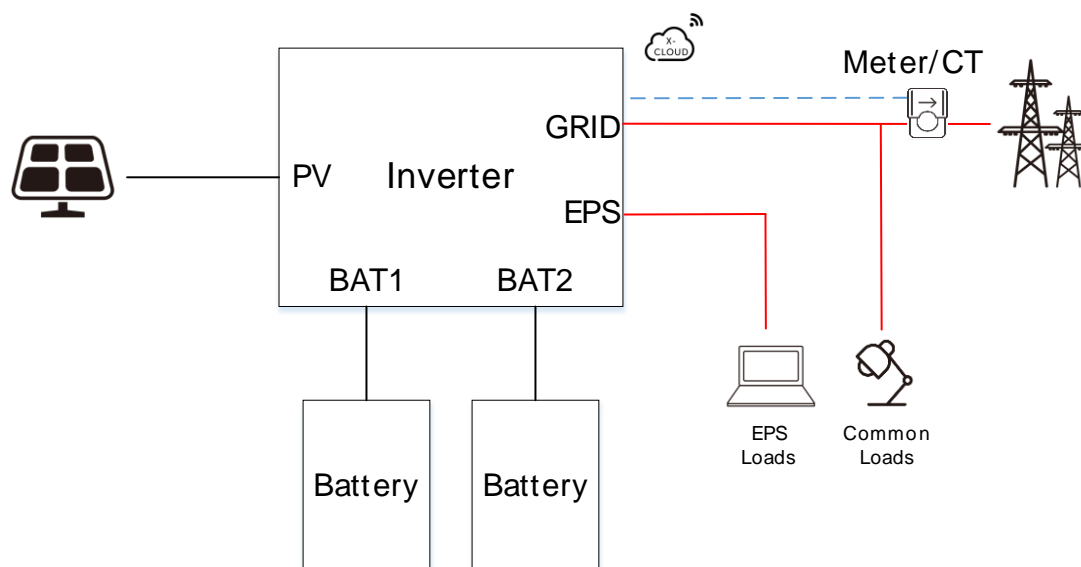
Register (Function Code:0x03)	Variable	Description	Unit	Gain	Data Format	Length
0x0380	BMS2_Subsystem_Num	BMS2 Number	-	1	U16	1
0x0381	BMS2_Master Version	BMS2 Master Version	-	1	U16	1
0x0382	BMS2_Slave1 Version	BMS2 Slave1 Version	-	1	U16	1
0x0383	BMS2_Slave2 Version	BMS2 Slave2 Version	-	1	U16	1
0x0384	BMS2_Slave3 Version	BMS2 Slave3 Version	-	1	U16	1
0x0385	BMS2_Slave4 Version	BMS2 Slave4 Version	-	1	U16	1
0x0386	BMS2_Slave5 Version	BMS2 Slave5 Version	-	1	U16	1
Register	Variable	Description	Unit	Gain	Data Format	Length

<b>(Function Code:0x03)</b>						
0x0387	BMS2_Slave6 Version	BMS2 Slave6 Version	-	1	U16	1
0x0388	BMS2_Slave7 Version	BMS2 Slave7 Version	-	1	U16	1
0x0389	BMS2_Slave8 Version	BMS2 Slave8 Version	-	1	U16	1
0x038A	BMS2_Slave9 Version	BMS2 Slave9 Version	-	1	U16	1
0x038B	BMS2_Slave10 Version	BMS2 Slave10 Version	-	1	U16	1
0x038C	BMS2_Slave11 Version	BMS2 Slave11 Version	-	1	U16	1
0x038D	BMS2_Slave12 Version	BMS2 Slave12 Version	-	1	U16	1
0x038E	BMS2_Slave13 Version	BMS2 Slave13 Version	-	1	U16	1
0x038F~ 0x0395	BMS2_MasterSN	BMS2 Master SN	-	1	STR	7
0x0396~ 0x039C	BMS2_Slave1SN	BMS2 Slave1 SN	-	1	STR	7
0x039D~ 0x03A3	BMS2_Slave2SN	BMS2 Slave2 SN	-	1	STR	7
0x03A4~ 0x03AA	BMS2_Slave3SN	BMS2 Slave3 SN	-	1	STR	7
0x03AB~ 0x03B1	BMS2_Slave4SN	BMS2 Slave4 SN	-	1	STR	7
0x03B2~ 0x03B8	BMS2_Slave5SN	BMS2 Slave5 SN	-	1	STR	7
0x03B9~ 0x03BF	BMS2_Slave6SN	BMS2 Slave6 SN	-	1	STR	7
0x03C0~ 0x03C6	BMS2_Slave7SN	BMS2 Slave7 SN	-	1	STR	7
0x03C7~ 0x03CD	BMS2_Slave8SN	BMS2 Slave8 SN	-	1	STR	7
0x03CE~ 0x03D4	BMS2_Slave9SN	BMS2 Slave9 SN	-	1	STR	7
0x03D5~ 0x03DB	BMS2_Slave10SN	BMS2 Slave10 SN	-	1	STR	7
<b>Register</b>	<b>Variable</b>	<b>Description</b>	<b>Unit</b>	<b>Gain</b>	<b>Data Format</b>	<b>Length</b>



(Function Code:0x03)						
0x03DC~ 0x03E2	BMS2_Slave11SN	BMS2 Slave11 SN	-	1	STR	7
0x03E3~ 0x03E9	BMS2_Slave12SN	BMS2 Slave12 SN	-	1	STR	7
0x03EA~ 0x03F0	BMS2_Slave13SN	BMS2 Slave13 SN	-	1	STR	7

### 3.3 Inverter Real-Time Info (Function Code: 0x04)



- PV: Refer to "3.3.4 Inverter PV Port Info".
- GRID (On-Grid): Refer to "3.3.5 Inverter GRID Port Info (On-Grid Category)".
- EPS (Off-Grid): Refer to "3.3.5 Inverter GRID Port Info (Off-Grid Category)".
- Meter/CT: Refer to "3.3.5 Inverter GRID Port Info (Meter/CT Category)".
- BAT1/BAT2: Refer to "3.3.6 Inverter BAT Port Info".

#### 3.3.1 Inverter Status

Category	Read Register (Function Code:0x04)	Variable	Description	Unit	Gain	Data Format	Length
Inverter State	0x0009	InverterRun Mode	Details in "Appendix B: Inverter Working Mode"	-	1	U16	1
	0x0054	InverterLock State	Unlock Status allows parameter configuration <ul style="list-style-type: none"> <li>• 0: Locked</li> <li>• 1: Unlocked</li> </ul>	-	1	U16	1

Category	Read Register (Function Code:0x04)	Variable	Description	Unit	Gain	Data Format	Length		
Inverter Error Code	0x0040	InverterFaultMessage_LSB	Details in "Appendix C: Error Code Description"	-	1	Bitfield3 2	2		
	0x0041	InverterFaultMessage_MSB		-	1				
	0x005E	InvFault-Message_Extend_LSB		-	1	Bitfield3 2	2		
	0x005F	InvFault-Message_Extend_MSB		-	1				
Manager Error Code	0x0043	MangerFaultMessage		-	1	Bitfield 16	1		
BMS1 Error Code	0x0044	BMS1Fault-Message_LSB		Details in "Appendix C: Error Code Description"	-	1	Bitfield3 2	2	
	0x0045	BMS1Fault-Message_MSB			-	1			
	0x00D6	BMS1Fault-Message_Extend_LSB			-	1	Bitfield3 2	2	
	0x00D7	BMS1Fault-Message_Extend_MSB			-	1			
BMS2 Error Code	0x012A	BMS2Fault-Message_LSB			Details in "Appendix C: Error Code Description"	-	1	Bitfield3 2	2
	0x012B	BMS2Fault-Message_MSB				-	1		
	0x0307	BMS2Fault-Message_Extend_LSB				-	1	Bitfield3 2	2
	0x0308	BMS2Fault-Message_Extend_MSB	-			1			

### 3.3.2 Real Time Info (RTC)

- Reading RTC Time

Read Register (Function Code:0x03)	Variable	Description	Unit	Gain	Data Format	Length
0x0085	RTC-Seconds	Real Time - Seconds	S	1	U16	1
0x0086	RTC-Minutes	Real Time - Minutes	Min	1	U16	1
0x0087	RTC-Hours	Real Time - Hours	Hour	1	U16	1
0x0088	RTC-Days	Real Time - Days	-	1	U16	1
0x0089	RTC-Months	Real Time - Months	-	1	U16	1
0x008A	RTC-Years	Real Time - Years	-	1	U16	1

- Setting RTC Time

Write Register (Function Code:0x10)	Variable	Description	Unit	Gain	Data Format	Length
0x0000	RTC-Seconds	Real Time – Seconds 0~59	S	1	U16	1
0x0001	RTC-Minutes	Real Time – Minutes 0~59	Min	1	U16	1
0x0002	RTC-Hours	Real Time – Hours 0~23	Hour	1	U16	1
0x0003	RTC-Days	Real Time – Days 1~31	-	1	U16	1
0x0004	RTC-Months	Real Time – Months 1~12	-	1	U16	1
0x0005	RTC-Years	Real Time – Years 0~99	-	1	U16	1

### 3.3.3 Inverter System Info

Read Register (Function Code:0x04)	Variable	Description	Unit	Gain	Data Format	Length
0x0032~0x0033	PvPowerSum	Sum of all PV power in real time	W	1	U32	2
0x0034~0x0035	OnGridPowerSum	On-Grid total active power of the inverter (positive for output; negative for Input )	W	1	S32	2
0x0036~0x0037	OffGridPowerSum	Off-Grid total active power of the inverter	W	1	S32	2
0x0038~0x0039	BatPowerSum	Total power of battery system (positive for charge; negative for discharge )	W	1	S32	2
0x003A~0x003B	BatSysInstalled Capacity	Total capacity of battery system	Wh	1	U32	2
0x003C	BatSystemSOC	Total SOC of battery system	%	1	U16	1
0x003D	BatSystemSOH	Total SOH of battery system	%	1	U16	1

### 3.3.4 Inverter PV Port Info

Note that the number of MPPTs and PV strings may vary across different models. If you have any questions, please contact the relevant technical support team for assistance.

Read Register (Function Code:0x04)	Variable	Description	Unit	Gain	Data Format	Length
0x001B	MPPTCount	Total PV number, indicating the number of all PV strings of the inverter	-	1	U16	1
0x0003	PvVoltage1	PV1 Voltage	V	10	U16	1
0x0004	PvVoltage2	PV2 Voltage	V	10	U16	1
0x0122	PvVoltage3	PV3 Voltage	V	10	U16	1
0x0005	PvCurrent1	PV1 Current	A	10	U16	1
0x0006	PvCurrent2	PV2 Current	A	10	U16	1
0x0123	PvCurrent3	PV3 Current	A	10	U16	1
0x000A	PvPower1	PV1 Power	W	1	U16	1
0x000B	PvPower2	PV2 Power	W	1	U16	1
0x0124	PvPower3	PV3 Power	W	1	U16	1
0x0028	PvVoltage4	PV4 Voltage	V	10	U16	1
0x0029	PvVoltage5	PV5 Voltage	V	10	U16	1
0x002A	PvVoltage6	PV6 Voltage	V	10	U16	1
0x002B	PvCurrent4	PV4 Current	A	10	U16	1
0x002C	PvCurrent5	PV5 Current	A	10	U16	1
0x002D	PvCurrent6	PV6 Current	A	10	U16	1
0x002E	PvPower4	PV4 Power	W	1	U16	1
0x002F	PvPower5	PV5 Power	W	1	U16	1
0x0030	PvPower6	PV6 Power	W	1	U16	1
0x0032~0x0033	PvPowerSum	Sum of all PV power in real time	W	1	U32	2

### 3.3.5 Inverter GRID Port Info

Category	Read Register (Function Code:0x04)	Variable	Description	Unit	Gain	Data Format	Length
-	0x001A	GridStatus	<ul style="list-style-type: none"> <li>• 0: On-Grid</li> <li>• 1: Off-Grid</li> </ul>	-	1	U16	1
On-Grid	0x0000	GridVoltage (X1)	On-Grid voltage for single-phase inverter	V	10	U16	1
	0x0001	GridCurrent (X1)	On-Grid current for single-phase inverter	A	10	S16	1
	0x0002	GridPower (X1)	On-Grid active power for single-phase inverter	W	1	S16	1
	0x0007	GridFrequency (X1)	On-Grid frequency for single-phase inverter	Hz	100	U16	1
	0x006A	GridVoltage_R (X3)	R-phase On-Grid voltage for three-phase inverter	V	10	U16	1
	0x006B	GridCurrent_R (X3)	R-phase On-Grid current for three-phase inverter	A	10	S16	1
	0x006C	GridPower_R (X3)	R-phase On-Grid active power for three-phase inverter	W	1	S16	1

Read Register (Function Code:0x04)	Variable	Description	Unit	Gain	Data Format	Length
0x006D	GridFrequency_R(X3)	R-phase On-Grid frequency for three-phase inverter	Hz	100	U16	1
0x006E	GridVoltage_S (X3)	S-phase On-Grid voltage for three-phase inverter	V	10	U16	1
0x006F	GridCurrent_S (X3)	S-phase On-Grid current for three-phase inverter	A	10	S16	1
0x0070	GridPower_S (X3)	S-phase On-Grid active power for three-phase inverter	W	1	S16	1
0x0071	GridFrequency_S(X3)	R-phase On-Grid frequency for three-phase inverter	Hz	100	U16	1
0x0072	GridVoltage_T (X3)	T-phase On-Grid voltage for three-phase inverter	V	10	U16	1
0x0073	GridCurrent_T (X3)	T-phase On-Grid current for three-phase inverter	A	10	S16	1
0x0074	GridPower_T (X3)	T-phase On-Grid active power for three-phase inverter	W	1	S16	1

Read Register (Function Code:0x04)	Variable	Description	Unit	Gain	Data Format	Length
0x0075	GridFrequency_T(X3)	T-phase On-Grid frequency for three-phase inverter	Hz	100	U16	1
0x0034~0x0035	OnGridPower Sum	On-Grid total power of the inverter. (positive for Output; negative for Input )	W	1	S32	2
0x0060~0x0061	GridReactive PowerSum	On-Grid total reactive power of the inverter	Var	1	S32	2
0x0062~0x0063	GridApparent PowerSum	On-Grid total apparent power of the inverter	VA	1	U32	2
0x0064	GridReactive Power_R	R-phase On-Grid reactive power	Var	1	S16	1
0x0065	GridReactive Power_S	S-phase On-Grid reactive power	Var	1	S16	1
0x0066	GridReactive Power_T	T-phase On-Grid reactive power	Var	1	S16	1
0x0067	GridApparent Power_R	R-phase On-Grid apparent power	VA	1	U16	1
0x0068	GridApparent Power_S	S-phase On-Grid apparent power	VA	1	U16	1
0x0069	GridApparent Power_T	T-phase On-Grid apparent power	VA	1	U16	1

	Read Register (Function Code:0x04)	Variable	Description	Unit	Gain	Data Format	Length
	0x0088~0x0089	OnGridRun Time	On-Grid run time • 0x88: LSB • 0x89: MSB	Hour	10	S32	2
Off-Grid (EPS)	0x004C	OffGridVoltage (X1)	Off-Grid voltage for single-phase inverter	V	10	U16	1
	0x004D	OffGridCurrent(X1)	Off-Grid current for single-phase inverter	A	10	U16	1
	0x004E	OffGridPower (X1)	Off-Grid power for single-phase inverter	VA	1	U16	1
	0x004F	OffGrid Frequency	Off-Grid frequency for inverter	Hz	100	U16	1
	0x0076	OffGridVolt_R (X3)	R-phase Off-Grid voltage for three-phase inverter	V	10	U16	1
	0x0077	OffGridCurrent_R(X3)	R-phase Off-Grid current for three-phase inverter	A	10	U16	1
	0x0078	OffGridPower_R(X3)	R-phase Off-Grid active power for three-phase inverter	W	1	S16	1
	0x0079	OffGridPower Apparent_R (X3)	R-phase Off-Grid apparent power for three-phase inverter	VA	1	U16	1

Read Register (Function Code:0x04)	Variable	Description	Unit	Gain	Data Format	Length
0x007A	OffGridVolt_S (X3)	S-phase Off-Grid voltage for three-phase inverter	V	10	U16	1
0x007B	OffGridCurrent_S(X3)	S-phase Off-Grid current for three-phase inverter	A	10	U16	1
0x007C	OffGridPower_S(X3)	S-phase Off-Grid active power for three-phase inverter	W	1	S16	1
0x007D	OffGridPower Apparent _S(X3)	S-phase Off-Grid apparent power for three-phase inverter	VA	1	U16	1
0x007E	OffGridVolt_T (X3)	T-phase Off-Grid voltage for three-phase inverter	V	10	U16	1
0x007F	OffGridCurrent_T(X3)	T-phase Off-Grid current for three-phase inverter	A	10	U16	1
0x0080	OffGridPower_T(X3)	T-phase Off-Grid active power for three-phase inverter	W	1	S16	1
0x0081	OffGridPower Apparent_T (X3)	T-phase Off-Grid apparent power for three-phase inverter	VA	1	U16	1

	Read Register (Function Code:0x04)	Variable	Description	Unit	Gain	Data Format	Length
	0x008A~0x008B	OffGridRun Time	Off-grid run time • 0x8A: LSB • 0x8B: MSB	Hour	10	S32	2
	0x0036~0x0037	OffGridPower Sum	Off-Grid total active power of the inverter	W	1	S32	2
Meter/CT	0x0046~0x0047	FeedinPower	The power at Grid connection point measured by Meter or CT (Positive values: The power to grid; Negative Values: The power from grid) • 0x46: LSB • 0x47: MSB	W	1	S32	2
	0x0082~0x0083	FeedinPowerR-phase(X3)	R-phase feed-in Power (Meter or CT) • 0x82: LSB • 0x83: MSB	W	1	S32	2
	0x0084~0x0085	FeedinPowerS-phase(X3)	S-phase feed-in power (Meter or CT) • 0x84: LSB • 0x85: MSB	W	1	S32	2
	Read Register (Function Code:0x04)	Variable	Description	Unit	Gain	Data Format	Length

0x0086~ 0x0087	FeedinPowerT-phase(X3)	T-phase feed-in power (Meter or CT) • 0x86: LSB • 0x87: MSB	W	1	S32	2
0x00D2~ 0x00D3	GridReactive Power_Total_Meter	Total reactive power (Meter or CT)	Var	1	S32	2
0x00DE~ 0x00DF	GridReactive Power_R_ Meter	R-phase reactive power (Meter or CT)	Var	1	S32	2
0x00E0~ 0x00E1	GridReactive Power_S_ Meter	S-phase reactive power (Meter or CT)	Var	1	S32	2
0x00D4~ 0x00D5	GridReactive Power_T_ Meter	T-phase reactive power (Meter or CT)	Var	1	S32	2
0x00C4	GridPower Factor Total_Meter	Total grid power factor (Meter or CT)	%	1	S16	1
0x00C5	GridPower Factor_R_ Meter	R-phase grid power factor (Meter or CT)	%	1	S16	1
0x00C6	GridPower Factor_S_ Meter	S-phase grid power factor (Meter or CT)	%	1	S16	1
0x00C7	GridPower Factor_T_ Meter	T-phase grid power factor (Meter or CT)	%	1	S16	1
0x00C8	GridFrequencyMeter	Grid frequency (Meter or CT)	Hz	100	U16	1
<b>Read Register (Function Code:0x04)</b>	<b>Variable</b>	<b>Description</b>	<b>Unit</b>	<b>Gain</b>	<b>Data Format</b>	<b>Length</b>
0x00C9	GridVoltage TotalMeter	Total grid voltage (Meter or CT)	V	10	U16	1

	0x00CA	GridVoltage_R_Meter	R-phase grid voltage (Meter or CT)	V	10	U16	1
	0x00CB	GridVoltage_S_Meter	S-phase grid voltage (Meter or CT)	V	10	U16	1
	0x00CC	GridVoltage_T_Meter	T-phase grid voltage (Meter or CT)	V	10	U16	1
	0x00CD	GridCurrent TotalMeter	Total grid current (Meter or CT)	A	10	S16	1
	0x00CE	GridCurrent_R_Meter	R-phase grid current (Meter or CT)	A	10	S16	1
	0x00CF	GridCurrent_S_Meter	S-phase grid current (Meter or CT)	A	10	S16	1
	0x00D0	GridCurrent_T_Meter	T-phase grid current (Meter or CT)	A	10	S16	1
	0x00B8	Meter1_CommunicationSate	Communication Sate of Meter1 • 0:Com Error • 1:Normal	-	1	U16	1
Meter2/CT2	0x00B9	Meter2_CommunicationSate	Communication Sate of Meter2 • 0:Com Error • 1:Normal	-	1	U16	1
	0x00A8~ 0x00A9	FeedinPowerMeter2	The power value of Electricity Meter 2 or CT2 (It is positive when used under the MicroGrid function) • 0xA8: LSB • 0xA9: MSB	W	1	S32	1
	0x00B2~ 0x00B3	FeedinPower_Rphase_Meter2	• 0xB2: LSB • 0xB3: MSB	W	1	S32	1



	0x00B4~ 0x00B5	FeedinPower_Sphase_Meter2	<ul style="list-style-type: none"> <li>• 0xB4: LSB</li> <li>• 0xB5: MSB</li> </ul>	W	1	S32	1
	0x00B6~ 0x00B7	FeedinPower_Tphase_Meter2	<ul style="list-style-type: none"> <li>• 0xB6: LSB</li> <li>• 0xB7: MSB</li> </ul>	W	1	S32	1

### 3.3.6 Inverter BAT Port Info

Read Register (Function Code:0x04)	Variable	Description	Unit	Gain	Data Format	Length
0x0017	BMS1ConnectState	<ul style="list-style-type: none"> <li>0: Disconnected</li> <li>1: Connected</li> </ul>	-	1	U16	1
0x001F	BMS2ConnectState	<ul style="list-style-type: none"> <li>0: Disconnected</li> <li>1: Connected</li> </ul>	-	1	U16	1
0x0018	Bat1Temperature	BMS1 ambient temperature	°C	1	S16	1
0x0131	Bat2Temperature	BMS2 ambient temperature	°C	1	S16	1
0x0014	BatVoltageCharge1	BMS1 voltage	V	10	S16	1
0x0015	BatCurrentCharge1	BMS1 current	A	10	S16	1
0x0016	BatpowerCharge1	BMS1 power	W	1	S16	1
0x0127	BatVoltageCharge2	BMS2 voltage	V	10	S16	1
0x0128	BatCurrentCharge2	BMS2 current	A	10	S16	1
0x0129	BatpowerCharge2	BMS2 power	W	1	S16	1
0x0019	BDCStatus	BMS charging and discharging status <ul style="list-style-type: none"> <li>0: Discharge</li> <li>1: Charge</li> <li>2: Stop</li> </ul>	-	1	U16	1
0x001C	Battery1Capacity	BMS1 SOC	%	1	U16	1
0x012D	Battery2Capacity	BMS2 SOC	%	1	U16	1
0x00BF	BMS1_SOH	BMS1 SOH	%	1	U16	1
0x0311	BMS2_SOH	BMS2 SOH	%	1	U16	1
0x0024	BMS1_ChargeMax Current	BMS1 charge Max. current	A	10	U16	1
0x0025	BMS1_DischargeMax Current	BMS1 discharge Max. current	A	10	U16	1
0x0026 ~0x0027	BMS1_Battery Capacity	BMS1 battery capacity	Wh	1	U32	2
0x00BA	BMS1_CellTemp High	BMS1 cell high temperature	°C	10	S16	1
0x00BB	BMS1_CellTempLow	BMS1 cell low temperature	°C	10	S16	1
0x00BC	BMS1_CellVoltage High	BMS1 cell high voltage	V	1000	U16	1

Read Register (Function Code:0x04)	Variable	Description	Unit	Gain	Data Format	Length
0x00BD	BMS1_CellVoltage Low	BMS1 cell low voltage	V	1000	U16	1
0x0309	BMS2_ChgMax Current	BMS2 charge Max. current	A	10	U16	1
0x030A	BMS2_DischgMax Current	BMS2 discharge Max. current	A	10	U16	1
0x030B~0x030C	BMS2_Battery Capacity	BMS2 battery capacity	Wh	1	U16	1
0x0300	Battery2_TempHigh	BMS2 cell high temperature	°C	10	S16	1
0x0301	Battery2_TempLow	BMS2 cell low temperature	°C	10	S16	1
0x0302	Bat2_CellVoltage High	BMS2 cell high voltage	V	1000	U16	1
0x0303	Bat2_CellVoltage Low	BMS2 cell low voltage	V	1000	U16	1
0x003C	BatSystemSOC	Total SOC of battery system	%	1	U16	1
0x003D	BatSystemSOH	Total SOH of battery system	%	1	U16	1
0x0038~0x0039	BatPowerSum	Total power of battery system (positive for charge; negative for discharge )	W	1	S32	2
0x003A~0x003B	BatSysInstalled Capacity	Total capacity of battery system	Wh	1	U32	2
0x00A2~0x00A3	BatMaxAllowed ChgPower	Battery Max. allowed charge power	W	1	U32	2
0x00A4~0x00A5	BatMaxAllowed DischgPower	Battery Max. allowed discharge power	W	1	U32	2

### 3.4 Inverter History Data (Function Code: 0x04)

Category	Read Register (Function Code:0x04)	Variable	Description	Unit	Gain	Data Format	Length
On-Grid	0x0050	Etoday_togrid	Today's On-Grid output energy (Inverter GRID Port)	kWh	10	U16	1
	0x0052~0x0053	Etotal_togrid	Total On-Grid output energy (Inverter GRID Port) • 0x52: LSB • 0x53: MSB	kWh	10	U32	2
	0x0091	EchargeToday	Today's On-Grid input energy (Inverter GRID Port)	kWh	10	U16	1
	0x0092~0x0093	EchargeTotal	Total On-Grid input energy (Inverter GRID Port) • 0x92: LSB • 0x93: MSB	kWh	10	U32	2
EPS (Off-Grid)	0x0090	Off-grid YieldToday	Total On-Grid output energy (Inverter EPS Port)	kWh	10	U16	1
	0x008E~0x008F	Off-grid YieldTotal	Today's Off-Grid output energy (Inverter EPS Port) • 0x8E: LSB • 0x8F: MSB	kWh	10	U32	2

Category	Read Register (Function Code:0x04)	Variable	Description	Unit	Gain	Data Format	Length
Meter /CT_1	0x0098~ 0x0099	FeedinEnergy Today	Today's output energy (Meter1 or CT1) • 0x98: LSB • 0x99: MSB	kWh	100	U32	2
	0x0048~ 0x0049	FeedinEnergy Total	Total output energy (Meter1 or CT1) • 0x48: LSB • 0x49: MSB	kWh	100	U32	2
	0x009A~ 0x009B	ConsumEnergyT oday	Today's input energy (Meter1 or CT1) • 0x9A: LSB • 0x9B: MSB	kWh	100	U32	2
	0x004A~ 0x004B	ConsumEnergyT otal	Total input energy (Meter1 or CT1) • 0x4A: LSB • 0x4B: MSB	kWh	100	U32	2
Meter /CT_2	0x00B0~ 0x00B1	ConsumEnergyT oday	Today's input energy (Meter2 or CT2) • 0xB0: LSB • 0xB1: MSB	kWh	100	U32	2

	0x00AC~ 0x00AD	ConsumEnergyT otal	Total input energy (Meter2 or CT2) • 0xAC: LSB • 0xAD: MSB	kWh	100	U32	2
	0x00AE~ 0x00AF	FeedinEnergy Today	Today's output energy (Meter2 or CT2) • 0xAE: LSB • 0xAF: MSB	kWh	100	U32	2
	0x00AA~ 0x00AB	FeedinEnergy Total	Total output energy (Meter2 or CT2) • 0xAA: LSB • 0xAB: MSB	kWh	100	U32	2
<b>Category</b>	<b>Read Register (Function Code:0x04)</b>	<b>Variable</b>	<b>Description</b>	<b>Unit</b>	<b>Gain</b>	<b>Data Format</b>	<b>Length</b>
PV	0x0094~ 0x0095	SolarEnergy Total	Total PV energy (Inverter PV Port) • 0x94: LSB • 0x95: MSB	kWh	10	U32	2
	0x0096	SolarEnergy Today	Today's PV energy (Inverter PV Port)	kWh	10	U16	1
Bat	0x001D~ 0x001E	Bat Discharge Energy Total	Total Bat Discharge energy (Inverter Bat Port)	kWh	10	U32	2

			<ul style="list-style-type: none"> <li>• 0x1D: LSB</li> <li>• 0x1E: MSB</li> </ul>				
	0x0020	Bat Discharge Energy Today	Today's Bat Discharge energy (Inverter Bat Port)	kWh	10	U16	1
	0x0021~ 0x0022	Bat Charge Energy Total	Total Bat Charge energy (Inverter Bat Port) <ul style="list-style-type: none"> <li>• 0x1D: LSB</li> <li>• 0x1E: MSB</li> </ul>	kWh	10	U32	2
	0x0023	Bat Charge Energy Today	Today's Bat Charge energy (Inverter Bat Port)	kWh	10	U16	1

### 3.5 Read or Write Inverter Operating Parameters

**Notice:** When using the “**Write Single Registers (0x06)**” and “**Write Multiple Registers (0x10)**” function, some registers will be written to EEPROM if they are changed (these parameters can be saved after power off). However, the EEPROM has a **write cycle limit**; excessive operations may cause irreversible hardware damage. **Registers marked with ★** are subject to this constraint. If you have any questions regarding usage, please contact technical support promptly. The total number of allowed writes to EEPROM is approximately 1,000,000.

Write Register (Function Code: 0x06)	Read Register (Function Code: 0x03)	Variable	Description	Unit	Gain	Data Format	Length	Notice
0x0000	-	Unlock Password	Unlock password 0000~9999	-	1	U16	1	-
0x001C	0x00DA	Inverter OutPut Switch	System ON/OFF • 1=ON • 0=Off	-	1	U16	1	★
0x0039	0x00E0	User Password	User password 0000~9999	-	1	U16	1	★
0x003A	0x00E1	Advance Password	Advance password 0000~9999	-	1	U16	1	★
0x0047	0x00BB	Language	<ul style="list-style-type: none"> <li>• 0: English</li> <li>• 1: German</li> <li>• 2: French</li> <li>• 3: Polish</li> <li>• 4: Spanish</li> <li>• 5: Portuguese</li> <li>• 6: Italian</li> <li>• 7: Chinese</li> <li>• 8: Ukrainian</li> <li>• 9: Brazilian Portuguese</li> </ul>	-	1	U16	1	★
Write Register	Read Register	Variable	Description	Unit	Gain	Data Format	Length	Notice



(Function Code: 0x06)	(Function Code: 0x03)							
0x0009	0x001D	Safety Code	Details in "Appendix D: Safety Code Description"	-	1	U16	1	★

Example:

Step 1: Write "UnlockPassword (Function Code:0x06, Address: 0x0000) Register".

Field Name	Master Request Value	Slave Normal Response	Slave Fault Response
Slave ID	0x01	0x01	0x01
Function Code	06	0x06	0x86
Start Address	0x00 0x00	0x00 0x00	-
Register Quantity	-	-	-
Byte Count	-	-	-
Value Data	XX XX (Advance Password)	XX XX (Advance Password)	0x04
CRC Checksum	XX XX	XX XX	0x43 0xA3

Step 2: Write "InverterOutPutSwitch (Function Code:0x06, Address: 0x001C) Register".

Field Name	Master Request Value	Slave Normal Response	Slave Fault Response
Slave ID	0x01	0x01	0x01
Function Code	0x06	0x06	0x86
Start Address	0x00 0x1C	0x00 0x1C	-
Register Quantity	-	-	-
Byte Count	-	-	-
Value Data	0x00 0x01	0x00 0x01	0x04
CRC Checksum	0x89 0xCC	0x89 0xCC	0x43 0xA3

Step 3: Read "InverterOutputSwitch Register (Function Code:0x03, Address: 0x00DA)"; Wait for 500 ms after writing. If the read value does not match the written value, the writing operation is considered to have failed.

Field Name	Master Request Value	Slave Normal Response
Slave ID	0x01	0x01
Function Code	0x03	0x03
Start Address	0x00 0xDA	-
Register Quantity	0x00 0x01	-
Field Name	Master Request Value	Slave Normal Response
Byte Count	-	0x02

Value Data	-	0x00 0x01
CRC Checksum	0xA5 0xF1	0x79 0x84

### 3.5.1 Inverter Work Mode Parameters

For detailed description of the operating modes, please refer to the *User Manual*.

Work Mode	Write Register (Function Code: 0x06)	Read Register (Function Code: 0x03)	Variable	Description	Unit	Gain	Data Format	Length	Notice
-	0x001F	0x008B	Inverter Work Mode	<ul style="list-style-type: none"> <li>• 0: Self Use Mode</li> <li>• 1: Feed-in Priority Mode</li> <li>• 2: Back Up Mode</li> <li>• 3: Manual Mode</li> <li>• 4: Peak Shaving Mode</li> <li>• 5:TOU Mode</li> </ul>	-	1	U16	1	★
Self Use Mode	0x0061	0x0093 (Hi)	SelfUse DischargeMinSOC	Self-use mode discharge cut-off SOC: 10%~100%	%	1	U8 (Hi)	1	★
	0x0062	0x0093 (Lo)	SelfUse ChargeFromGrid Enable	Whether to allow electricity from the grid <ul style="list-style-type: none"> <li>• 0: Disable</li> <li>• 1: Enable</li> </ul>	-	1	U8 (Lo)		★

	Write Register (Function Code: 0x06)	Read Register (Function Code: 0x03)	Variable	Description	Unit	Gain	Data Format	Length	Notice
	0x0063	0x0094	SelfUse Charge UpperSOC	This value will be enabled if SelfUse ChargeFromGrid Enable is 1. 10%~100%	%	1	U16	1	★
Feed-in Priority Mode	0x0064	0x0095 (Hi)	Feedin Charge Upper SOC	Feed-in mode charging cut-off SOC 10%~100%	%	1	U8 (Hi)	1	★
	0x0065	0x0095 (Lo)	Feedin DischargeMinSOC	Feed-in mode discharging cut-off SOC 10%~100%	%	1	U8 (Lo)		★
Backup Mode	0x0066	0x0096 (Hi)	BackUp Charge UpperSOC	Backup mode charging cut-off SOC 30%~100%	%	1	U8 (Hi)	1	★
	0x0067	0x0096 (Lo)	BackUp DischargeMinSOC	Backup mode discharging cut-off SOC 30%~100%	%	1	U8 (Lo)		★
Manual	0x0020	0x008C	Manual Mode	<ul style="list-style-type: none"> <li>• 0: Stop charging &amp; discharging</li> <li>• 1: Force charging</li> <li>• 2: Force discharging</li> </ul>	-	1	U16	1	★

Work Mode	Write Register (Function Code: 0x06)	Read Register (Function Code: 0x03)	Variable	Description	Unit	Gain	Data Format	Length	Notice
Peak Shaving Mode	0x00EA (Lo)	0x014F (Hi)	Peak Shaving Dischar Period P1_Start Minute	Peak shaving mode discharging period 1 start time: 0-59	Min	1	U8	1	★
	0x00EA (Hi)	0x014F (Lo)	Peak Shaving Dischar Period P1_Start Hour	Peak shaving mode discharging period 1 start time: 0-23	Hour	1	U8		★
	0x00EB (Lo)	0x0150 (Hi)	Peak Shaving Dischar Period P1_Stop Minute	Peak shaving mode discharging period 1 stop time: 0-59	Min	1	U8	1	★
	0x00EB (Hi)	0x0150 (Lo)	Peak Shaving Dischar Period P1_Stop Hour	Peak shaving mode discharging period 1 stop time: 0-23	Hour	1	U8		★
	0x00EE	0x0153	Peak Shaving Period B Peak Limits 1	Peak shaving mode discharging period 1 power limit	W	• X 1: 1 X3: 0.1	U16	1	★

Write Register (Function Code: 0x06)	Read Register (Function Code: 0x03)	Variable	Description	Unit	Gain	Data Format	Length	Notice
0x00EC (Lo)	0x0151 (Hi)	Peak Shaving Dischar PeriodP2_Start Minute	Peak shaving mode discharging period 2 start time: 0-59	Min	1	U8	1	★
0x00EC (Hi)	0x0151 (Lo)	Peak Shaving Dischar PeriodP2_StartHour	Peak shaving mode discharging period 2 start time 0-23	Hour	1	U8		★
0x00ED (Lo)	0x0152 (Hi)	Peak Shaving Dischar PeriodP2_Stop Minute	Peak shaving mode discharging period 2 stop time: 0-59	Min	1	U8	1	★
0x00ED (Hi)	0x0152 (Lo)	Peak Shaving Dischar PeriodP2_StopHour	Peak shaving mode discharging period 2 stop time: 0-23	Hour	1	U8		★
0x00EF	0x0154	Peak Shaving Period DPeak Limits2	Peak shaving mode discharging period 2 power limit	W	<ul style="list-style-type: none"> <li>• X1: 1</li> <li>X3: 0.1</li> </ul>	U16	1	★
0x00F0	0x0155	Peak Shaving PeriodA Charge From GridEn	Enable charging from grid in Period A: <ul style="list-style-type: none"> <li>• 0: Disable</li> <li>• 1: Enable</li> </ul>	-	1	U16	1	★

	Write Register (Function Code: 0x06)	Read Register (Function Code: 0x03)	Variable	Description	Unit	Gain	Data Format	Length	Notice
	0x00F1	0x0156	Peak Shaving PeriodA Charge Power Limits	Charging power value from grid in Period A: 0~Inverter rated power	W	• X 1: 1 X3: 0.1	U16	1	★
	0x00F2	0x0157	Peak Shaving PeriodA MaxSOC	Max. SOC charged from grid in Period A: 10%~100%	%	1	U16	1	★
	0x00F3	0x0158	Peak Shaving PeriodC Reserved_SOC	Peak shaving mode reserved SOC in Period C: 10%~100%	%	1	U16	1	★
TOU Mode	-	0x016E	TOU_ModeTotal MinSOC	Min SOC of the system in TOU mode: 10~100%	%	1	U8 (Lo)	1	-
			TOU_ModeWork Mode	Sub mode of TOU mode • 0xA0: SelfUse • 0xA1: Allow Charging • 0xA2: Force Discharging • 0xA3: BatteryOff • 0xA4: Peak Shaving	-	1	U8 (Hi)		-
		0x016F	TOU_Mode Selfuse MinSOC	Discharging minimum SOC (TOU-SelfUse) 10~100%	%	1	U16	1	-

Read Register (Function Code: 0x03)	Variable	Description	Unit	Gain	Data Format	Length	Notice
0x0170	TOU_Mode Charge From GridEn	Allow power from mains to enable the switch (TOU- Allow Charging) <ul style="list-style-type: none"> <li>• 0xA0: Disable</li> <li>• 0xA1: Enable</li> </ul>	-	1	U8 (Lo)	1	-
	TOU_Mode Charge StopSOC	Charging stop SOC (TOU- Allow Charging) 10~100%	%	1	U8 (Hi)		-
0x0171	TOU_Mode Dischg Power LimitRate	The discharging power limit rate on the rated power of the inverter. (TOU- Force Discharging) 0~100%	%	1	U8 (Lo)	1	-
	TOU_Mode DischargeMinSOC	Min. discharging SOC (TOU- Force Discharging) 10~100%	%	1	U8 (Hi)		-
0x0172~0x0173	TOU_Mode Peak Shaving Limit	Peak shaving limit value (TOU- Peak Shaving)	W	1	U32	2	-

### 3.5.2 Inverter GRID Port Output Power Limit

Write Register (Function Code: 0x06)	Read Register (Function Code: 0x03)	Variable	Description	Unit	Gain	Data Format	Length	Notice
0x0042	0x00B6	Export Power Limit	Power control value supplied by the inverter to the grid • (0~60000) (X1) • (0~30000) (X3)	W	• X1: 1 • X3: 0.1	U16	1	★
0x0011	0x0025	Export Power Percentage	Export power control limit percentage 0~100% (Inverter GRID Port)	%	1	U16	1	★
0x008D	0x00B2	PgridBias	0:Disable 1:Grid 2:INV	-	-	U16	1	★
0x0119	0x005D	BiasPower	Set the bias power 1-500	W	1	U16	1	★
0x0071	0x00D7	MainBreaker CurrentLimit	Main breaker current limit • (10~100)(X1) • (10~250)(X3)	A	1	U16	1	★

### 3.5.3 Inverter Charge and Discharging period

Write Register (Function Code: 0x06)	Read Register (Function Code: 0x03)	Variable	Description	Unit	Gain	Data Format	Length	Notice
0x0068 (Lo)	0x0097 (Hi)	ChargePeriod1StartMinute	Start time of Charging Period 1 0-59	Min	1	U8	1	★

0x0068 (Hi)	0x0097 (Lo)	ChargePeriod1StartHour	Start time of Charging Period 1 0-23	Hour	1	U8		★
<b>Write Register(Function Code: 0x06)</b>	<b>Read Register(Function Code: 0x03)</b>	<b>Variable</b>	<b>Description</b>	<b>Unit</b>	<b>Gain</b>	<b>Data Format</b>	<b>Length</b>	<b>Notice</b>
0x0069 (Lo)	0x0098 (Hi)	ChargePeriod1EndMinute	End time of Charging Period 1 0-59	Min	1	U8	1	★
0x0069 (Hi)	0x0098 (Lo)	ChargePeriod1EndHour	End time of Charging Period 1 0-23	Hour	1	U8		★
0x006A (Lo)	0x0099 (Hi)	Discharge Period1 StartMinute	Start time of Discharging period 1 0-59	Min	1	U8	1	★
0x006A (Hi)	0x0099 (Lo)	Discharge Period1 StartHour	Start time of Discharging period 1 0-23	Hour	1	U8		★
0x006B (Lo)	0x009A (Hi)	Discharge Period1 EndMinute	End time of Discharging period 1 0-59	Min	1	U8	1	★
0x006B (Hi)	0x009A (Lo)	Discharge Period1 EndHour	End time of Discharging period 1 0-23	Hour	1	U8		★
0x006C	0x009B	SetChrg& Dischrg Period2Enable	Whether to use period 2. • 0: Disable • 1: Enable	-	1	U16	1	★

0x006D (Lo)	0x009C (Hi)	ChargePeriod2StartMinute	Start time of Charging Period 2 0-59	Min	1	U8	1	★
0x006D (Hi)	0x009C (Lo)	ChargePeriod2StartHour	Start time of Charging Period 2 0-23	Hour	1	U8		★
<b>Write Register(Function Code: 0x06)</b>	<b>Read Register(Function Code: 0x03)</b>	<b>Variable</b>	<b>Description</b>	<b>Unit</b>	<b>Gain</b>	<b>Data Format</b>	<b>Length</b>	<b>Notice</b>
0x006E (Lo)	0x009D (Hi)	ChargePeriod2EndMinute	End time of Charging Period 2 0-59	Min	1	U	1	★
0x006E (Hi)	0x009D (Lo)	ChargePeriod2EndHour	End time of Charging Period 2 0-23	Hour	1	U8		★
0x006F (Lo)	0x009E (Hi)	Discharge Period2 StartMinute	Start time of Discharging period 2 0-59	Min	1	U8	1	★
0x006F (Hi)	0x009E (Lo)	Discharge Period2 StartHour	Start time of Discharging period 2 0-23	Hour	1	U8		★
0x0070 (Lo)	0x009F (Hi)	Discharge Period2 EndMinute	End time of Discharging period 2 0-59	Min	1	U8	1	★
0x0070 (Hi)	0x009F (Lo)	Discharging period2 EndHour	End time of Discharging period 2 0-23	Hour	1	U8		★

### 3.5.4 Inverter-Battery System Parameters

Write Register (Function Code: 0x06)	Read Register (Function Code: 0x03)	Variable	Description	Unit	Gain	Data Format	Length	Notice
-	0x005C	InvMaxSetBatCur	Inverter Max. battery current setting	A	10	U16	1	-
0x0024	0x0090	BatChargeMaxCurrent	Battery charge Max. current (The range reference InvMaxSetBatCur)	A	10	U16	1	★
0x0025	0x0091	BatDischargeMaxCurrent	Battery discharge Max. current (The range reference InvMaxSetBatCur)	A	10	U16	1	★
0x00E0	0x010E	BatChargeMaxSOC	Lithium battery charger upper limit 10%~100%	%	1	U16	1	★
0x00CF	0x00A3	BatHeatingEn	Battery heating Enable switch • 0: Disable • 1: Enable	-	1	U16	1	★
0x00D0 (Lo)	0x00A4 (Hi)	HeatingPeriod1StartMinute	Start time of battery heating period 1 0-59	Min	1	U8	1	★
0x00D0 (Hi)	0x00A4 (Lo)	HeatingPeriod1StartHour	Start time of battery heating period 1 0-23	Hour	1	U8		★
0x00D1 (Lo)	0x00A5 (Hi)	HeatingPeriod1EndMinute	End time of battery heating period 1 0-59	Min	1	U8	1	★
0x00D1 (Hi)	0x00A5 (Lo)	HeatingPeriod1EndHour	End time of battery heating period 1 0-23	Hour	1	U8		★
Write Register	Read Register (Function Code: 0x03)	Variable	Description	Unit	Gain	Data Format	Length	Notice

(Function Code: 0x06)								
0x00D2 (Lo)	0x00A6 (Hi)	Heating Period2StartMinute	Start time of battery heating period 2 0-59	Min	1	U8	1	★
0x00D2 (Hi)	0x00A6 (Lo)	Heating Period2StartHour	Start time of battery heating period 2 0-23	Hour	1	U8		★
0x00D3 (Lo)	0x00A7 (Hi)	Heating Period2EndMinute	End time of battery heating period 2 0-59	Min	1	U8	1	★
0x00D3 (Hi)	0x00A7 (Lo)	Heating Period2EndHour	End time of battery heating period 2 0-23	Hour	1	U8		★
0x00E1	0x010F	BatChargeToEVC	Battery charge to EVC switch • 0: Disable • 1: Enable	-	1	U16	1	★
0x009A	0x00A2	BatExtendFunction	Battery expansion switch • 0: Disable • 1: Enable	-	1	U16	1	★

**Note:** For Inverters with multiple battery ports, the "BatteryChargeMaxCurrent" and "BatteryDisChargeMaxCurrent" set will be evenly distributed to each battery port.

### Dual Battery System Parameters

The inverter with dual battery function only supports the following parameters. See "[Appendix A: Inverter Type List](#)" for specific inverter type.

Write Register (Function Code: 0x06)	Read Register (Function Code: 0x03)	Variable	Description	Unit	Gain	Data Format	Length	Notice
0x0200	0x0400	Bat1ChargeMaxSoC	Lithium battery1 charger upper limit 10%~100%	%	1	U16	1	★
0x0201	0x0401	Bat2ChargeMaxSoC	Lithium battery2 charger upper limit 10%~100%	%	1	U16	1	★
Write Register	Read Register	Variable	Description	Unit	Gain	Data Format	Length	Notice

(Function Code: 0x06)	(Function Code: 0x03)							
Write Register (Function Code: 0x06)	Read Register (Function Code: 0x03)	Variable	Description	Unit	Gain	Data Format	Length	Notice
0x0202	0x0402	Bat1Charge MaxCurrent	Battery1 charge Max. current (The range reference InvMaxSetBatCur)	A	10	U16	1	★
0x0203	0x0403	Bat2Charge MaxCurrent	Battery2 charge Max. current (The range reference InvMaxSetBatCur)	A	10	U16	1	★
0x0204	0x0404	Bat1 Discharge MaxCurrent	Battery1 discharge Max. current (The range reference InvMaxSetBatCur)	A	10	U16	1	★
0x0205	0x0405	Bat2 Discharge MaxCurrent	Battery2 discharge Max. current (The range reference InvMaxSetBatCur)	A	10	U16	1	★
0x0206	0x0406	Bat1Extend Function	Battery1 expansion switch <ul style="list-style-type: none"> <li>• 0: Disable</li> <li>• 1: Enable</li> </ul>	-	1	U16	1	★
0x0207	0x0407	Ba2Extend Function	Battery2 expansion switch <ul style="list-style-type: none"> <li>• 0: Disable</li> <li>• 1: Enable</li> </ul>	-	1	U16	1	★
0x0208	0x0408	Bat1Bat HeatingEn	Battery1 heating enable switch <ul style="list-style-type: none"> <li>• 0: Disable</li> <li>• 1: Enable</li> </ul>	-	1	U16	1	★
0x0209	0x0409	Bat2Bat HeatingEn	Battery2 heating Enable switch <ul style="list-style-type: none"> <li>• 0: Disable</li> <li>• 1: Enable</li> </ul>	-	1	U16	1	★

0x020A	0x040A	Bat1Heat Level	Battery1 heating level • 0: Low • 1: Medium • 2: High	-	1	U16	1	★
0x020B	0x040B	Bat2Heat Level	Battery2 heating level • 0: Low • 1: Medium • 2: High	-	1	U16	1	★
0x020C (Lo)	0x040C (Hi)	Bat1Heating Period1 StartMinute	Start time of battery1 heating period 1 0-59	Min	1	U8	1	★
0x020C (Hi)	0x040C (Lo)	Bat1Heating Period1 StartHour	Start time of battery1 heating period 1 0-23	Hour	1	U8		
0x020D (Lo)	0x040D (Hi)	Bat1Heating Period1 EndMinute	End time of battery1 heating period 1 0-59	Min	1	U8	1	★
0x020D (Hi)	0x040D (Lo)	Bat1Heating Period1 EndHour	End time of battery1 heating period 1 0-23	Hour	1	U8		
0x020E (Lo)	0x040E (Hi)	Bat1Heating Period2 StartMinute	Start time of battery1 heating period 2 0-59	Min	1	U8	1	★
0x020E (Hi)	0x040E (Lo)	Bat1Heating Period2 StartHour	Start time of battery1 heating period 2 0-23	Hour	1	U8		
<b>Write Register (Function Code: 0x06)</b>	<b>Read Register (Function Code: 0x03)</b>	<b>Variable</b>	<b>Description</b>	<b>Unit</b>	<b>Gain</b>	<b>Data Format</b>	<b>Length</b>	<b>Notice</b>
0x020F (Lo)	0x040F (Hi)	Bat1Heating Period2 EndMinute	End time of battery1 heating period 2 0-59	Min	1	U8	1	★

0x020F (Hi)	0x040F (Lo)	Bat1Heating Period2 EndHour	End time of battery1 heating period 2 0-23	Hour	1	U8		
0x0210 (Lo)	0x0410 (Hi)	Bat2Heating Period1 StartMinute	Start time of battery2 heating period 1 0-59	Min	1	U8	1	★
0x0210 (Hi)	0x0410 (Lo)	Bat2Heating Period1 StartHour	Start time of battery2 heating period 1 0-23	Hour	1	U8		
0x0211 (Lo)	0x0411 (Hi)	Bat2Heating Period1 EndMinute	End time of battery2 heating period 1 0-59	Min	1	U8	1	★
0x0211 (Hi)	0x0411 (Lo)	Bat2Heating Period1 EndHour	End time of battery2 heating period 1 0-23	Hour	1	U8		
0x0212 (Lo)	0x0412 (Hi)	Bat2Heating Period2 StartMinute	Start time of battery2 heating period 2 0-59	Min	1	U8	1	★
0x0212 (Hi)	0x0412 (Lo)	Bat2Heating Period2 StartHour	Start time of battery2 heating period 2 0-23	Hour	1	U8		
0x0213 (Lo)	0x0413 (Hi)	Bat2Heating Period2 EndMinute	End time of battery2 heating period 2 0-59	Min	1	U8	1	★
0x0213 (Hi)	0x0413 (Lo)	Bat2Heating Period2 EndHour	End time of battery2 heating period 2 0-23	Hour	1	U8		

### 3.5.5 Meter/CT Parameters

Write Register (Function Code: 0x06)	Read Register (Function Code: 0x03)	Variable	Description	Unit	Gain	Data Format	Length	Notice
0x00AA	0x0115	Meter CTSelect	<ul style="list-style-type: none"> <li>• 0: Meter</li> <li>• 1: CT</li> </ul>	-	1	U16	1	★
0x00A1	0x0109	Meter1_ID	Meter1 ID: 1~200	-	1	U16	1	★
0x00A2	0x010A	Meter2_ID	Meter2 ID: 1~200	-	1	U16	1	★
0x00A4	0x010B	Direction MeterCT1	<ul style="list-style-type: none"> <li>• 0: Positive</li> <li>• 1: Negative</li> </ul>	-	1	U16	1	★
0x00A5	0x010C	Direction MeterCT2	<ul style="list-style-type: none"> <li>• 0: Positive</li> <li>• 1: Negative</li> </ul>	-	1	U16	1	★
0x00F5	0x00B3	CT Installation Check	<ul style="list-style-type: none"> <li>• 0: Disable</li> <li>• 1: Enable</li> </ul>	-	1	U16	1	★

### 3.5.6 Energy Storage Integrated System Communication Parameters

Write Register (Function Code: 0x06)	Read Register (Function Code: 0x03)	Variable	Description	Unit	Gain	Data Format	Length	Notice
0x00C9	0x00AF	ModBus RTU Address	Address of ModBus RTU 1~255	-	1	U16	1	★
0x00CA	0x00B0	ModBus RTU Baud Rate	<ul style="list-style-type: none"> <li>0:115200</li> <li>1:57600</li> <li>2:56000</li> <li>3:38400</li> <li>4:19200</li> <li>5:14400</li> <li>6:9600</li> </ul>	bit/s	1	U16	1	★
0x008F	0x013E	485CommFunSelect	<ul style="list-style-type: none"> <li>0: Modbus 485</li> <li>1: EV Charger</li> <li>2: DataHub</li> <li>3: Adatpter Box</li> <li>4: EVC &amp; Adapter Box</li> </ul>	-	1	U16	1	★
0x00F9	0x015C	EVCharger Addr	<ul style="list-style-type: none"> <li>Address of EV Charger: 1~255</li> <li>Address default: 0x46</li> </ul>	-	1	U16	1	★
0x00FB	0x015E	AdaptBox Addr	<ul style="list-style-type: none"> <li>Address of Adapter Box: 1~255</li> <li>Address default: 0x60</li> </ul>	-	1	U16	1	★
Write Register (Function Code: 0x06)	Read Register (Function Code: 0x04)	Variable	Description	Unit	Gain	Data Format	Length	Notice
-	0x00A0	EVCharger ComStatus	Communication connection status with EV Charger <ul style="list-style-type: none"> <li>0: Disconnected</li> <li>1: Connected</li> </ul>	-	1	U16	1	-

-	0x00A1	AdaptBoxComStatus	Communication connection status with Adapter Box <ul style="list-style-type: none"> <li>• 0: Disconnected</li> <li>• 1: Connected</li> </ul>	-	1	U16	1	-
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### 3.5.7 Generator Operating Parameters

Category	Write Register (Function Code: 0x06)	Read Register (Function Code: 0x03)	Variable	Description	Unit	Gain	Data Format	Length	Notice
-	0x00C7	0x0131	ExternalGeneratorEn	<ul style="list-style-type: none"> <li>• 0: Disable</li> <li>• 1: ATS Control</li> <li>• 2: Dry Contact</li> </ul>	-	1	U16	1	★
ATS&Dry Contact	0x00C8	0x0132	ExternalGeneratorMaxCharge	External generator Max. charge 0~ Inverter Rated Power	W	<ul style="list-style-type: none"> <li>• X1: 1</li> <li>• X3: 0.1</li> </ul>	U16	1	★
	0x0109	0x016B	ChargeFromGenEnable	Charge from generator enable <ul style="list-style-type: none"> <li>• 0: Disable</li> <li>• 1: Enable</li> </ul>	-	1	U16	1	★
	0x010A	0x016C	ChargeFromGenChargeSOC	Charge from generator charge stop SOC 10~100%	%	1	U16	1	★
	0x010B	0x0148	GenMinPower	Generator Min. run power 0~60000	W	1	U16	1	★
Only Dry Contact	0x00E3	0x0140	StartGenMethod	<ul style="list-style-type: none"> <li>• 0: Reference SOC</li> <li>• 1: Immediately</li> </ul>	-	1	U16	1	★

	0x00E4	0x0141	Switch OnSOC	Switch on SOC (reference SOC) 10%~100%	%	1	U16	1	★
	<b>Write Register (Function Code: 0x06)</b>	<b>Read Register (Function Code: 0x03)</b>	<b>Variable</b>	<b>Description</b>	<b>Unit</b>	<b>Gain</b>	<b>Data Format</b>	<b>Length</b>	<b>Notice</b>
	0x00E5	0x0142	Switch OffSOC	Switch off SOC (reference SOC) 10%~100%	%	1	U16	1	★
	0x00E6	0x0143	MaxRun Time	Max. run time (1~60000)	Min	1	U16	1	★
	0x00E7	0x0145	MinRest Time	Min. rest time (1~60000)	Min	1	U16	1	★
	0x00E8 (Hi)	0x0146 (Lo)	Allow Work Start timeHour	Allow work start time hour 0~23	Hour	1	U8	1	★
	0x00E8 (Lo)	0x0146 (Hi)	Allow Work Start time Minute	Allow work start time minute 0-59	Min	1	U8	1	★
	0x00E9 (Hi)	0x0147 (Lo)	Allow Work Stop Time Hour	Allow work start time hour 0-23	Hour	1	U8	1	★
	0x00E9 (Lo)	0x0147 (Hi)	Allow Work Stop Time Minute	Allow work start time minute 0-59	Min	1	U8	1	★
Work Period	0x0100 (Hi)	0x0162 (Lo)	Gen Charge Start Hour	Generator charging period 1 start time 0-23	Hour	1	U8	1	★

Write Register (Function Code: 0x06)	Read Register (Function Code: 0x03)	Variable	Description	Unit	Gain	Data Format	Length	Notice
0x0100 (Lo)	0x0162 (Hi)	Gen Charge Start Minute	Generator charging period 1 start time 0-59	Min	1	U8	1	★
0x0101 (Hi)	0x0163 (Lo)	Gen Charge EndHour	Generator charging period 1 end time 0-23	Hour	1	U8	1	★
0x0101 (Lo)	0x0163 (Hi)	Gen Charge End Minute	Generator charging period 1 end time 0-59	Min	1	U8	1	★
0x0102 (Hi)	0x0164 (Lo)	Gen Dis-charge Start Hour	Generator discharging period 1 start time 0-23	Hour	1	U8	1	★
0x0102 (Lo)	0x0164 (Hi)	Gen Dis-charge Start Minute	Generator discharging period 1 start time 0-59	Min	1	U8	1	★
0x0103 (Hi)	0x0165 (Lo)	Gen Dis-charge EndHour	Generator discharging period 1 end time 0-23	Hour	1	U8	1	★
0x0103 (Lo)	0x0165 (Hi)	Gen Dis-charge End Minute	Generator discharging period 1 end time 0-59	Min	1	U8	1	★

Write Register (Function Code: 0x06)	Read Register (Function Code: 0x03)	Variable	Description	Unit	Gain	Data Format	Length	Notice
0x0104	0x0166	Gen Period2 Set Enable	Enable period 2 setting in generator mode • 0: Disable • 1: Enable	-	1	U16	1	★
0x0105 (Hi)	0x0167 (Lo)	GenP2 Charge Start Hour	Generator charging period 2 start time 0-23	Hour	1	U8	1	★
0x0105 (Lo)	0x0167 (Hi)	GenP2 Charge Start Minute	Generator charging period 2 start time 0-59	Min	1	U8	1	★
0x0106 (Hi)	0x0168 (Lo)	GenP2 Charge EndHour	Generator charging period 2 end time 0-23	Hour	1	U8	1	★
0x0106 (Lo)	0x0168 (Hi)	GenP2 Charge End Minute	Generator charging period 2 end time 0-59	Min	1	U8	1	★
0x0107 (Hi)	0x0169 (Lo)	GenP2 Dis-charge Start Hour	Generator discharging period 2 start time 0-23	Hour	1	U8	1	★
0x0107 (Lo)	0x0169 (Hi)	GenP2 Dis-charge Start Minute	Generator discharging period 2 start time 0-59	Min	1	U8	1	★
Write Register	Read Register	Variable	Description	Unit	Gain	Data Format	Length	Notice

(Function Code: 0x06)	(Function Code: 0x03)								
0x0108 (Hi)	0x016A (Lo)	GenP2 Dis-charge EndHour	Generator discharging period 2 end time 0-23	Hour	1	U8	1	★	
0x0108 (Lo)	0x016A (Hi)	GenP2 Dis-charge End Minute	Generator discharging period 2 end time 0-59	Min	1	U8	1	★	

### 3.5.8 Inverter Parameters to Use the VPP function

Detailed functional features of this section are described in the VPP documentation.

- New Vpp Control Registers (Function Code: 0x10)

Read Register (Function Code: 0x03)	Write Register (Function Code: 0x10)	Variable	Description	Unit	Gain	Data Format	Length
0x01A0	0x00A0	VPP Mode Num	VPP mode number <ul style="list-style-type: none"> <li>• 0: VPP Disable</li> <li>• 1: Power Control Mode</li> <li>• 2: Electric Quantity Target Control Mode</li> <li>• 3: SOC Target Control Mode</li> <li>• 4: Push Power - Positive/Negative Mode</li> <li>• 5: Push Power - Zero Mode</li> <li>• 6: Self-Consume - Charge/Discharge Mode</li> <li>• 7: Self-Consume - Charge Only Mode</li> <li>• 8: PV&amp;BAT Individual Setting – Duration Mode</li> <li>• 9: PV&amp;BAT Individual Setting – Target SOC Mode</li> </ul>	1	1	U16	1
While VPP Mode = 0 (VPP Disable) Write Register Address (0x00A0) Read Register Address (0x01A0)							
While VPP Mode = 1 (Power Control Mode) Write Register Address (0x00A0~0x00A7) Read Register Address (0x01A0~0x01A7)							

Read Register (Function Code: 0x03)	Write Register (Function Code: 0x10)	Variable	Description	Unit	Gain	Data Format	Length
0x01A1	0x00A1	Exec Mode	<p>New VPP mode execution behavior:</p> <ul style="list-style-type: none"> <li>• 0x0001: interrupt mode. The new mode will immediately interrupt the current mode and start execution.</li> <li>• 0x0002: wait mode. The new mode will wait until the current mode completes its execution before starting.</li> </ul>	1	1	U16	1
0x01A2	0x00A2	AcW Target (LSB)	Target active power value at the inverter's AC port (positive for absorbing active power, negative for outputting active power)	W	1	S32	2
0x01A3	0x00A3	AcW Target (MSB)					
0x01A4	0x00A4	AcVar Target (LSB)	Target reactive power value at the inverter's AC port (positive for absorbing reactive power, negative for outputting reactive power)	W	1	S32	2
0x01A5	0x00A5	AcVar Target (MSB)					1
0x01A6	0x00A6	Exec Duration	ExecDuration represents the execution time of the mode. If the mode defines a WaitTimeout, the device will wait for new instructions after the duration; otherwise, it will exit the current mode.	S	1	U16	1
Read Register	Write Register	Variable	Description	Unit	Gain	Data Format	Length

(Function Code: 0x03)	(Function Code: 0x10)						
0x01A7	0x00A7	WaitTime out	If the duration in the mode, ExecDuration, is reached, or other control targets (such as ACTargetEnergy, TargetSoc, etc.) are achieved, the device will enter a waiting state for the next new command. This waiting period will last for the duration of WaitTimeout. If no new command is received during this period, the device will exit the current VPP mode.	S	1	U16	1
While VPP Mode = 2 (Electric Quantity Target Control Mode) Write Register Address (0x00A0~0x00A6) Read Register Address (0x01A0~0x01A6)							
0x01A1	0x00A1	Exec Mode	New VPP mode execution behavior: <ul style="list-style-type: none"> <li>• 0x0001: interrupt mode. The new mode will immediately interrupt the current mode and start execution.</li> <li>• 0x0002: wait mode. The new mode will wait until the current mode completes its execution before starting.</li> </ul>	-	1	U16	1
Read Register	Write Register	Variable	Description	Unit	Gain	Data Format	Length

(Function Code: 0x03)	(Function Code: 0x10)						
0x01A2	0x00A2	AcWh Target (LSB)	AC port input/output energy target	Wh	1	U32	2
0x01A3	0x00A3	AcWh Target (MSB)					
0x01A4	0x00A4	AcW Target (LSB)	Target active power value at the inverter's AC port (positive for absorbing active power, negative for outputting active power)	W	1	S32	2
0x01A5	0x00A5	AcW Target (MSB)					
0x01A6	0x00A6	Wait Timeout	If the duration in the mode, ExecDuration, is reached, or other control targets (such as ACTargetEnergy, TargetSoc, etc.) are achieved, the device will enter a waiting state for the next new command. This waiting period will last for the duration of WaitTimeout. If no new command is received during this period, the device will exit the current VPP mode.	S	1	U16	1
While VPP Mode = 3 (SOC Target Control Mode) Write Register Address (0x00A0~0x00A5) Read Register Address (0x01A0~0x01A5)							

Read Register (Function Code: 0x03)	Write Register (Function Code: 0x10)	Variable	Description	Unit	Gain	Data Format	Length
0x01A1	0x00A1	Exec Mode	<p>New VPP mode execution behavior:</p> <ul style="list-style-type: none"> <li>• 0x0001: interrupt mode. The new mode will immediately interrupt the current mode and start execution.</li> <li>• 0x0002: wait mode. The new mode will wait until the current mode completes its execution before starting.</li> </ul>	-	1	U16	1
0x01A2	0x00A2	Soc Target	Target SOC	%		U16	1
0x01A3	0x00A3	AcW Target (LSB)	Target active power value at the inverter's AC port (positive for absorbing active power, negative for outputting active power)	W	1	S32	2
0x01A4	0x00A4	AcW Target (MSB)					

Read Register (Function Code: 0x03)	Write Register (Function Code: 0x10)	Variable	Description	Unit	Gain	Data Format	Length
0x01A5	0x00A5	WaitTimeout	If the duration in the mode, ExecDuration, is reached, or other control targets (such as ACTargetEnergy, TargetSoc, etc.) are achieved, the device will enter a waiting state for the next new command. This waiting period will last for the duration of WaitTimeout. If no new command is received during this period, the device will exit the current VPP mode.	S	1	U16	1
While VPP Mode = 4 (Push Power - Positive/Negative Mode) Write Register Address (0x00A0~0x00A2) Read Register Address (0x01A0~0x01A2)							
0x01A1	0x00A1	BatW Target (LSB)	Battery charge/discharge power target (positive for discharge, negative for charge)	W	1	S32	2
0x01A2	0x00A2	BatW Target (MSB)					

Read Register (Function Code: 0x03)	Write Register (Function Code: 0x10)	Variable	Description	Unit	Gain	Data Format	Length
0x01A3	0x00A3	WaitTime out	If the duration in the mode, ExecDuration, is reached, or other control targets (such as ACTargetEnergy, TargetSoc, etc.) are achieved, the device will enter a waiting state for the next new command. This waiting period will last for the duration of WaitTimeout. If no new command is received during this period, the device will exit the current VPP mode.	S	1	U16	1
0x01A4	0x00A4	Next Motion	Mode to be executed by the device after remote control timeout: <ul style="list-style-type: none"> <li>• 0xA0: exit current VPP mode and switch to user work mode.</li> <li>• 0xA1: exit current VPP mode and switch to VPP mode 6.</li> </ul>	-	1	U16	1
While VPP Mode = 5 (Push Power -Zero Mode) Write Register Address (0x00A0~0x00A2) Read Register Address (0x01A0~0x01A2)							

Read Register (Function Code: 0x03)	Write Register (Function Code: 0x10)	Variable	Description	Unit	Gain	Data Format	Length
0x01A1	0x00A1	WaitTimeout	If the duration in the mode, ExecDuration, is reached, or other control targets (such as ACTargetEnergy, TargetSoc, etc.) are achieved, the device will enter a waiting state for the next new command. This waiting period will last for the duration of WaitTimeout. If no new command is received during this period, the device will exit the current VPP mode.	S	1	U16	1
0x01A2	0x00A2	Next Motion	Mode to be executed by the device after remote control timeout: <ul style="list-style-type: none"> <li>• 0xA0: exit current VPP mode and switch to user work mode.</li> <li>• 0xA1: exit current VPP mode and switch to VPP mode 6.</li> </ul>	-	1	U16	1
While VPP Mode = 6 (Self-Consume - Charge/Discharge Mode) Write Register Address (0x00A0~0x00A2) Read Register Address (0x01A0~0x01A2)							

Read Register (Function Code: 0x03)	Write Register (Function Code: 0x10)	Variable	Description	Unit	Gain	Data Format	Length
0x01A1	0x00A1	WaitTime out	If the duration in the mode, ExecDuration, is reached, or other control targets (such as ACTargetEnergy, TargetSoc, etc.) are achieved, the device will enter a waiting state for the next new command. This waiting period will last for the duration of WaitTimeout. If no new command is received during this period, the device will exit the current VPP mode.	S	1	U16	1
0x01A2	0x00A2	Next Motion	Mode to be executed by the device after remote control timeout: <ul style="list-style-type: none"> <li>• 0xA0: exit current VPP mode and switch to user work mode.</li> <li>• 0xA1: exit current VPP mode and switch to VPP mode 6.</li> </ul>	-	1	U16	1
<p>While VPP Mode = 7 (Self-Consume - Charge Only Mode)  Write Register Address (0x00A0~0x00A2)  Read Register Address (0x01A0~0x01A2)</p>							

Read Register (Function Code: 0x03)	Write Register (Function Code: 0x10)	Variable	Description	Unit	Gain	Data Format	Length
0x01A1	0x00A1	Wait Timeout	If the duration in the mode, ExecDuration, is reached, or other control targets (such as ACTargetEnergy, TargetSoc, etc.) are achieved, the device will enter a waiting state for the next new command. This waiting period will last for the duration of WaitTimeout. If no new command is received during this period, the device will exit the current VPP mode.	S	1	U16	1
0x01A2	0x00A2	Next Motion	Mode to be executed by the device after remote control timeout: <ul style="list-style-type: none"> <li>• 0xA0: exit current VPP mode and switch to user work mode.</li> <li>• 0xA1: exit current VPP mode and switch to VPP mode 6.</li> </ul>	-	1	U16	1
<p>While VPP Mode = 8 (PV&amp;BAT Individual Setting – Duration Mode)  Write Register Address (0x00A0~0x00A7)  Read Register Address (0x01A0~0x01A7)</p>							
Read Register (Function Code: 0x03)	Write Register (Function Code: 0x10)	Variable	Description	Unit	Gain	Data Format	Length

0x01A1	0x00A1	Exec Mode	<p>New VPP mode execution behavior:</p> <ul style="list-style-type: none"> <li>• 0x0001: interrupt mode. The new mode will immediately interrupt the current mode and start execution.</li> <li>• 0x0002: wait mode. The new mode will wait until the current mode completes its execution before starting.</li> </ul>	-	1	U16	1
0x01A2	0x00A2	PvW Target (LSB)	PV power limit	W	1	U32	2
0x01A3	0x00A3	PvW Target (MSB)					
0x01A4	0x00A4	BatW Target (LSB)	Battery charge/discharge power target (positive for discharge, negative for charge)	W	1	S32	2
0x01A5	0x00A5	BatW Target (MSB)					
<b>Read Register (Function Code: 0x03)</b>	<b>Write Register (Function Code: 0x10)</b>	<b>Variable</b>	<b>Description</b>	<b>Unit</b>	<b>Gain</b>	<b>Data Format</b>	<b>Length</b>

0x01A6	0x00A6	WaitTime out	If the duration in the mode, ExecDuration, is reached, or other control targets (such as ACTargetEnergy, TargetSoc, etc.) are achieved, the device will enter a waiting state for the next new command. This waiting period will last for the duration of WaitTimeout. If no new command is received during this period, the device will exit the current VPP mode.	S	1	U16	1
0x01A7	0x00A7	NextMotion (When TimeOut)	Mode to be executed by the device after remote control timeout: <ul style="list-style-type: none"> <li>• 0xA0: exit current VPP mode and switch to user work mode.</li> <li>• 0xA1: exit current VPP mode and switch to VPP mode 6.</li> </ul>	-	1	U16	1
While VPP Mode = 9 (PV&BAT Individual Setting – Target SOC Mode) Write Register Address (0x00A0~0x00A8) Read Register Address (0x01A0~0x01A8)							
<b>Read Register (Function Code: 0x03)</b>	<b>Write Register (Function Code: 0x10)</b>	<b>Variable</b>	<b>Description</b>	<b>Unit</b>	<b>Gain</b>	<b>Data Format</b>	<b>Length</b>

0x01A1	0x00A1	ExecMode	<p>New VPP mode execution behavior:</p> <ul style="list-style-type: none"> <li>• 0x0001: interrupt mode. The new mode will immediately interrupt the current mode and start execution.</li> <li>• 0x0002: wait mode. The new mode will wait until the current mode completes its execution before starting.</li> </ul>	-	1	U16	1
0x01A2	0x00A2	PvW Target (LSB)	PV power limit	W	1	U32	2
0x01A3	0x00A3	PvW Target (MSB)					
0x01A4	0x00A4	BatW Target (LSB)	Battery charge/discharge power target (positive for discharge, negative for charge)	W	1	S32	2
0x01A5	0x00A5	BatW Target (MSB)					
0x01A6	0x00A6	Soc Target	Target SOC (Range 0~100%)	%	1	U16	1
<b>Read Register (Function Code: 0x03)</b>	<b>Write Register (Function Code: 0x10)</b>	<b>Variable</b>	<b>Description</b>	<b>Unit</b>	<b>Gain</b>	<b>Data Format</b>	<b>Length</b>

0x01A7	0x00A7	WaitTime out	If the duration in the mode, ExecDuration, is reached, or other control targets (such as ACTargetEnergy, TargetSoc, etc.) are achieved, the device will enter a waiting state for the next new command. This waiting period will last for the duration of WaitTimeout. If no new command is received during this period, the device will exit the current VPP mode.	S	1	U16	1
0x01A8	0x00A8	Next Motion (When TimeOut)	Mode to be executed by the device after remote control timeout: <ul style="list-style-type: none"> <li>• 0xA0: exit current VPP mode and switch to user work mode.</li> <li>• 0xA1: exit current VPP mode and switch to VPP mode 6.</li> </ul>	-	1	U16	1

Write Register (Function Code: 0x06)	Read Register (Function Code: 0x03)	Variable	Description	Unit	Gain	Data Format	Length	Notice
0x00F4	0x00B4	VPPExitIdleEn	VPP Exit Idle switch <ul style="list-style-type: none"> <li>• 0: Disable</li> <li>• 1: Enable</li> </ul>	-	-	U16	1	★

Example

Step 1: Write "UnlockPassword (Function Code:0x06, Address: 0x0000) Register" and "AdvancePassword Register (Function Code:0x03, Address: 0x00E1) ".

Field Name	Master Request Value	Slave Normal Response
Slave ID	0x01	0x01
Function Code	0x06	0x06
Start Address	0x00 0x00	0x00 0x00



Register Quantity	-	-
Byte Count	-	-
Value Data	XX XX (Advance Password)	XX XX (Advance Password)
CRC Checksum	XX XX	XX XX



Step 2: Write "VPP Mode 1: (Power Control) Command Mode (Function Code:0x10, Address: 0x00A0)".

The AC port shall discharge at 1000 W for a duration of 100 seconds, with a timeout of 100 seconds.

Field Name	Master Request Value	Slave Normal Response
Slave ID	0x01	0x01
Function Code	0x10	0x10
Start Address	0x00 0xA0	0x00 0xA0
Register Quantity	0x00 0x08	0x00 0x08
Byte Count	0x10	-
Value Data	<ul style="list-style-type: none"> <li>• 0x00 0x01 (VPP Mode:1)</li> <li>• 0x00 0x01 (ExecMode:1)</li> <li>• 0xFC 0x18 0xFF 0xFF (ACActivePower: -1000W)</li> <li>• 0x00 0x00 0x00 0x00 (ACReactivePower: 0Var)</li> <li>• 0x00 0x64 (ExecDuration:100 S)</li> <li>• 0x00 0x64 (WaitTimeOut:100 S)</li> </ul>	-
CRC Checksum	5F 77	0xC1 0xED

• Old Vpp Control Registers (Function Code: 0x10)

Write Register (Function Code: 0x10)	Variable	Description	Unit	Gain	Data Format	Length
0x007C	VPP Mode Num	<p>VPP mode number</p> <ul style="list-style-type: none"> <li>• 0: VPP Disable</li> <li>• 1: Power Control Mode</li> <li>• 2: Electric Quantity Target Control Mode</li> <li>• 3: SOC Target Control Mode</li> <li>• 4: Push Power - Positive/Negative Mode</li> <li>• 5: Push Power - Zero Mode</li> <li>• 6: Self-Consume - Charge/Discharge Mode</li> <li>• 7: Self-Consume - Charge Only Mode</li> </ul>	-	1	U16	1
0x007D	Exec Mode	<p>New VPP mode execution behavior:</p> <ul style="list-style-type: none"> <li>• 0x0001: interrupt mode. The new mode will immediately interrupt the current mode and start execution.</li> <li>• 0x0002: wait mode. The new mode will wait until the current mode completes its execution before starting.</li> </ul>	-	1	U16	1
0x007E	AcW Target (LSB)	Target active power value at the inverter's AC port (positive for absorbing active power, negative for outputting active power)	W	1	S32	2
0x007F	AcW Target (MSB)					

Write Register (Function Code: 0x10)	Variable	Description	Unit	Gain	Data Format	Length
0x0080	AcVar Target (LSB)	Target reactive power value at the inverter's AC port (positive for absorbing reactive power, negative for outputting reactive power)	Var	1	S32	2
0x0081	AcVar Target (MSB)					
0x0082	Exec Duration	ExecDuration represents the execution time of the mode. If the mode defines a WaitTimeout, the device will wait for new instructions after the duration; otherwise, it will exit the current mode.	S	1	U16	1
0x0083	Soc Target	Target SOC	%	1	U16	1
0x0084	AcWh Target (LSB)	AC port input/output energy target	Wh	1	U32	2
0x0085	AcWh Target (MSB)					
0x0086	Charge Discharge Power 0x0086 (LSB)	Target active power value at the inverter's AC port (positive for absorbing active power, negative for outputting active power)	W	1	S32	2
0x0087	Charge Discharge Power 0x0087 (MSB)					

Write Register (Function Code: 0x10)	Variable	Description	Unit	Gain	Data Format	Length
0x0088	Wait Timeout	If the duration in the mode, ExecDuration, is reached, or other control targets (such as ACTargetEnergy, TargetSoc, etc.) are achieved, the device will enter a waiting state for the next new command. This waiting period will last for the duration of WaitTimeout. If no new command is received during this period, the device will exit the current VPP mode.	S	1	U16	1
0x0089	BatWTarget (LSB)	Battery charge/discharge power target (positive for discharge, negative for charge)	W	1	S32	2
0x008A	BatWTarget (MSB)					

### 3.5.9 Inverter Parallel System

- Setting the "Inverter to support Parallel System"

Write Register (Function Code: 0x06)	Read Register (Function Code: 0x03)	Variable	Description	Unit	Gain	Data Format	Length
0x00C6	0x0130	Parallel Setting	<ul style="list-style-type: none"> <li>0: Free</li> <li>1: Master</li> <li>2: Slave</li> </ul>	-	1	U16	1
0x001B	0x00A9	Match Resistance(X3)	<p>For a three-phase inverter, it is necessary to select two inverters in the parallel system to turn on this resistance.</p> <ul style="list-style-type: none"> <li>0: Disable</li> <li>1: Enable</li> </ul>	-	1	U16	1

- Reading the "Parallel System Real Time Data"

Read Register	Variable	Description	Unit	Gain	Data Format	Length
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<b>(Function Code: 0x04)</b>						
0x01DD	SystemInv Num	SystemInvNum	-	1	U16	1
0x01E0~ 0x01E1	InvActive PowerAll_R	Inverter active power of phase R (parallel inverter system)	W	1	S32	2
0x01E2~ 0x01E3	InvActive PowerAll_S	Inverter active power of phase S (parallel inverter system)	W	1	S32	2
0x01E4~ 0x01E5	InvActive PowerAll_T	Inverter active power of phase T (parallel inverter system)	W	1	S32	2
0x01E6~ 0x01E7	InvReactivePowerAll_R	Inverter reactive power of phase R (parallel inverter system)	VA	1	S32	2
0x01E8~ 0x01E9	InvReactivePowerAll_S	Inverter reactive power of phase S (parallel inverter system)	VA	1	S32	2
0x01EA~ 0x01EB	InvReactivePowerAll_T	Inverter reactive power of phase T (parallel inverter system)	VA	1	S32	2
0x01EC~ 0x01ED	InvCurrent All_R	Inverter current of phase R (parallel inverter system)	A	10	S32	2
0x01EE~ 0x01EF	InvCurrent All_S	Inverter current of phase S (parallel inverter system)	A	10	S32	2
0x01F0~ 0x01F1	InvCurrent All_T	Inverter current of phase T (parallel inverter system)	A	10	S32	2
0x01F2~ 0x01F3	PvPower Channel1All	PV power of channel 1 (parallel inverter system)	W	1	U32	2
0x01F4~ 0x01F5	PvPower Channel2All	PV power of channel 2 (parallel inverter system)	W	1	U32	2
<b>Read Register (Function Code: 0x04)</b>	<b>Variable</b>	<b>Description</b>	<b>Unit</b>	<b>Gain</b>	<b>Data Format</b>	<b>Length</b>

0x01F6~ 0x01F7	PvCurrent Channel1All	PV current of channel 1 (parallel inverter system)	A	10	U32	2
0x01F8~ 0x01F9	PvCurrent Channel2All	PV current of channel 2 (parallel inverter system)	A	10	U32	2
0x01FA~ 0x01FB	BatPowerAll	Battery power (parallel inverter system)	W	1	S32	2
0x01FC ~0x01FD	BatCurrent All	Battery current (parallel inverter system)	A	10	S32	2
0x01FE ~0x01FF	Charge PowerLimitA ll	Total charging power limit (parallel inverter system)	W	1	S32	2
0x0200~ 0x0201	Discharge PowerLimitA ll	Total charging power limit (parallel inverter system)	W	1	S32	2
0x0202~ 0x0203	PvPowerAll	Total PV power (parallel inverter system)	W	1	U32	2

### 3.5.10 Resetting the Inverter (Function Code: 0x06)

Write Register (Function Code:0x06)	Variable	Description	Unit	Gain	Data Format	Length
0x001D	FactoryReset	Factory reset <ul style="list-style-type: none"> <li>• 0: Disable</li> <li>• 1: Enable</li> </ul>	-	1	U16	1
0x005F	ResetMgrEE	Reset inverter parameters to default values <ul style="list-style-type: none"> <li>• 0: Disable</li> <li>• 1: Enable</li> </ul>	-	1	U16	1
0x002F	ResetMeter1Energy	Reset the energy from Meter1 or CT1 <ul style="list-style-type: none"> <li>• 0: Disable</li> <li>• 1: Enable</li> </ul>	-	1	U16	1
Write Register (Function Code:0x06)	Variable	Description	Unit	Gain	Data Format	Length

0x00A3	ResetMeter2Energy	Reset the energy from Meter2 or CT2 <ul style="list-style-type: none"> <li>• 0: Disable</li> <li>• 1: Enable</li> </ul>	-	1	U16	1
0x00DB	ResetErrorLog	Reset the historical error record <ul style="list-style-type: none"> <li>• 0: Disable</li> <li>• 1: Enable</li> </ul>	-	1	U16	1
0x00DC	ResetInverterEnergy	Reset Inverter energy <ul style="list-style-type: none"> <li>• 0: Disable</li> <li>• 1: Enable</li> </ul>	-	1	U16	1

### 3.5.11 EPS (Off-Grid) Settings Parameter

Write Register (Function Code: 0x06)	Read Register (Function Code: 0x03)	Variable	Description	Unit	Gain	Data Format	Length
0x0043	0x00B7	EPS Mute	Enable/Disable Mute in EPS (Off-Grid) mode. <ul style="list-style-type: none"> <li>• 0: Disable</li> <li>• 1: Enable</li> </ul>	-	1	U16	1
0x0044	0x00B8	EPS_MinSoc	Battery discharges to the specified SOC and exits EPS mode. <ul style="list-style-type: none"> <li>• Be between 10% and 25% (inclusive).</li> <li>• Be less than the value of EPS_Restart_Soc by at least 5. (i.e., <math>\leq</math> EPS_Restart_Soc - 5)</li> </ul>	%	1	U16	1

0x0045	0x00B9	EPS Frequency	Output frequency in EPS(Off-Grid) mode. <ul style="list-style-type: none"> <li>• 0: 50Hz</li> <li>• 1: 60HZ</li> </ul>	-	1	U16	1
0x008E	0x00A0	EPS_Resta rt_Soc	Charge to the specified SOC to restore EPS(Off- Grid) mode. <ul style="list-style-type: none"> <li>• Be between 15% and 100% (inclusive).</li> <li>• Be greater than or equal to the value of EPS_MinSoc plus 5. (i.e., <math>\geq</math> EPS_MinSoc + 5)</li> </ul>	%	1	U16	1

## Appendix A: Inverter Type List

Inverter Type List		
Code	Description	Dual Battery
0x0E	X3-Hybrid G4	NO
0x0F	X1-Hybrid G4	NO
0x17	X1-IES	NO
0x18	X3-IES	NO
0x19	X3-ULTRA	YES
0x20	X3-Hybrid G4 PRO	YES
0x22	X1-VAST	YES
0x23	X3-IES-P	NO
0x28	X3-IES-A	NO
0x29	X1-IES-A	NO
0x1F	X3-AELIO	YES
0x2B	X3-ULTRA-GLV	YES

## Appendix B: Inverter Working Mode

Inverter Working Mode		
Code	Description	Note
0	WaitMode	WaitMode When the input voltage is below startup voltage, the inverter is waiting to enter Checking state.
1	CheckMode	CheckMode When the input voltage is above startup voltage, the inverter is checking for the grid conditions to enter Normal state.
2	NormalMode	NormalMode The inverter is working normally.
3	FaultMode	FaultMode The inverter detects error and prompts error code
4	PermanentFaultMode	PermanentFaultMode The inverter detects error that cannot be automatically recovered
5	UpdateMode	UpdateMode The inverter is being updated
6	EPS check mode	EPS (Off-Grid) check mode The inverter is checking for conditions to enter EPS (Off-Grid) state.
7	EPS mode	EPS (Off-Grid) mode The inverter is working in Off-Grid state.
8	Self Test	Self Test The inverter is under Italian self test state.
9	IdleMode	IdleMode When the battery SOC reaches the minimum SOC and there is no sufficient PV input voltage, the battery goes into hibernation and the inverter enters Idle state.
Code	Description	Note

10	StandbyMode	<p>StandbyMode</p> <p>In battery allowed discharging period, and there is no sufficient PV input voltage and the power of load is lower than 100w. This state lasts 5 minutes, the inverter will enter Standby state.</p> <p>In battery charging period, and there is no sufficient PV input voltage and the battery SOC is larger than min SOC. This state lasts 10 minutes, the inverter will enter Standby state.</p> <p>In this state, it detects PV connection, load power, etc to determine whether to exit <b>Standby state</b> and enter <b>Normal state</b></p>
11	Fault Charging Mode	Fault charging mode is when the grid is faulty, the PV charges the battery and the Inverter does not output power
12~19	REV	Reserved for other mode
20	NormalMode (R)	<p>VPP Mode</p> <p>The inverter is under VPP control</p>
21	NormalMode (TOU-S)	<p>TOU-Self use</p> <p>The inverter is working under the work mode 'TOU' and is set to self use mode</p>
22	NormalMode (TOU-C)	<p>TOU-Charging</p> <p>The inverter is working under the work mode 'TOU' and is set to charging mode</p>
23	NormalMode (TOU-D)	<p>TOU-Discharging</p> <p>The inverter is working under the work mode 'TOU' and is set to discharging mode</p>
24	NormalMode (TOU-B)	<p>TOU-Battery off</p> <p>The inverter is working under the work mode 'TOU' and is set to battery-off mode</p>
25	NormalMode (TOU-P)	<p>TOU-Peak Shaving</p> <p>The inverter is working under the work mode 'TOU' and is set to peak shaving mode</p>
26	NormalMode (Gen)	<p>Generator Normal operation mode</p> <p>The inverter enters generator mode</p>
27	Wait ChargeMode	Waiting Charging Mode is when the inverter is shutdown, the PV charges the battery and the Inverter does not output power
28	NormalMode (SS)	<p>Smart Schedule mode</p> <p>The inverter is under the control of smart schedule mode</p>

## Appendix C: Error Code Description

For fault codes and troubleshooting, please refer to the dedicated Fault Code Reference & Handling Guide. Note that fault codes may vary across different Inverters. If you have any questions, please contact the relevant technical support team for assistance. The description of the faults in the following table is based on the X3-Hybrid G4 as an example. For specific details of the Inverter, please refer to the "Error Code".

### 1. Inverter Error Code

Inverter Error Code			
BYTE	BIT	Description	Possible Cause
BYTE0	BIT0	TZ Protect Fault	Trigger Hardware Protection
	BIT1	Grid Lost Fault	No voltage input from the power grid
	BIT2	Grid Volt Fault	The mains voltage exceeds the allowable range specified by the safety regulations
	BIT3	Grid Freq Fault	The mains frequency exceeds the allowable range specified by the safety regulations
	BIT4	PV Volt Fault	The PV voltage exceeds the Max. allowable range
	BIT5	Bus Volt Fault	Bus voltage overvoltage or excessive positive and negative voltage difference
	BIT6	Bat Volt Fault	Battery voltage exceeds the normal range allowed for operation.
BYTE1	BIT7	AC10mins Volt Fault	The mains voltage exceeds the allowable range specified by the safety regulations
	BIT8	DCI OCP Fault	Grid-connected DCI component exceeds the allowable threshold of safety regulations
	BIT9	DCV OCP Fault	Grid-connected DCV component exceeds the allowable threshold of safety regulations
	BIT10	SW OCP Fault	Software overcurrent protection caused by sudden current exceeding the limit
	<b>BIT</b>	<b>Description</b>	<b>Possible Cause</b>

	BIT11	RC OCP Fault	Grid leakage current exceeds the allowable threshold of safety regulations
	BIT12	Isolation Fault	Insulation test failed
	BIT13	Temp Over Fault	"Temperature sampling exceeds the temperature range
	BIT14	BatConnDir Fault	It could be low temperature or high temperature"
	BIT15	Off-grid Overload	Battery voltage reversed
BYTE2	BIT16	Arc Fault	Arcing Fault
	BIT17	Bat Power Low	Battery overcurrent in EPS mode
	BIT18	BMS Lost	ARM failed to establish communication with battery BMS system
	BIT19	Fan Fault	Fan fault detection: Only detect fan faults in aging mode, no error reported for normal shipments
	BIT20	Low Temp Fault	Temperature is too low
	BIT21	Parallel Fault	Abnormal communication between Inverters
	BIT22	Hard Limit Fault	Power exceeding hard limit in Australian standards
	BIT23	INV Volt Sample Fault	Incorrect CT/meter wiring
BYTE3	BIT24	Inner Comm Fault	Abnormal communication between DSP and ARM
	BIT25	INV EEPROM Fault	DSP's EEPROM cannot be read or written
	BIT26	RCD Fault	Self-test of leakage current detection circuit failed
	BIT27	Grid Relay Fault	Relay detection failed
	BIT28	Off-grid Relay Fault	Relay detection failed
	BIT29	PV ConnDir Fault	Detected negative value of PV current
	BIT30	Charger Relay Fault	Relay detection failed
	BIT31	Earth Relay Fault	Relay detection failed
<p><b>Note:</b> When communicating, the low byte comes first. When the corresponding BIT bit is 1, it means that the fault corresponding to this bit has occurred.</p>			

## 2. Manager Error Code

Manager Error Code			
BYTE	BIT	Description	Possible Cause
BYTE0	BIT0	Power Type Fault	Inverter power type detection failed
	BIT1	Port OC Warning	EPS port overcurrent
	BIT2	Mgr EEPROM Fault	Eeprom read/write failure
	BIT3	DataHubComErr	Unable to establish communication with Datahub
	BIT4	NTC Sample Invalad	External temperature sampling failure
	BIT5	Bat Temp Low	Lead-acid battery low temperature fault
	BIT6	Bat Temp High	Lead-acid battery high temperature fault
	BIT7	DSPRunBootFault	DSP runs on the boot program
	BIT8	Arc SelfTestFault	Arc detection failed
BYTE1	BIT9	Meter Fault	Unable to establish communication with Meter
	BIT10	Bypass Relay Fault	Bypass relay malfunction
	BIT11	ArcHW_Fault	Unable to communicate with the arc
	BIT12	ARMParaComFault	ARM parallel communication abnormality
	BIT13	Fan1 Fault	Fan 1 malfunction
	BIT14	Fan2 Fault	Fan 2 malfunction
	BIT15	ComTimeOut20305	Australia 2030.5 function communication timeout
<p><b>Note:</b> When communicating, the low byte comes first. When the corresponding BIT bit is 1, it means that the fault corresponding to this bit has occurred.</p>			

### 3. BMS Error Code

BMS Error Code			
BYTE	BIT	Description	Possible Cause

BYTE0	BIT0	BMS_External_Err	CAN Communication Failure with External Inverter
	BIT1	BMS_Internal_Err	Communication Failure between Battery Main Control and Battery Module, Battery Module and Battery Module
	BIT2	BMS_OverVoltage	High Single Cell or Total Voltage
	BIT3	BMS_LowerVoltage	Low Single Cell or Total Voltage
	BIT4	BMS_ChargeOverCurrent	Charging Current Exceeds Limit
	BIT5	BMS_DischargeOverCurrent	Discharge current exceeds limit
	BIT6	BMS_TemHigh	Overtemperature
	BIT7	BMS_TemLow	Low temperature
BYTE1	BIT8	BMS_CellImbalance	Large voltage difference between battery cells
	BIT9	BMS_Hardware_Protect	Battery PCBA error
	BIT10	BMS_Circuit_Fault	Battery circuit fault
	BIT11	BMS_Insulation_Fault	Battery system insulation fault, positive or negative terminal of the system is short-circuited to ground
	BIT12	BMS_VoltSensor_Fault	Voltage sampling line, sensor fault or disconnection
	BIT13	BMS_TempSensor_Fault	Temperature sampling line, sensor fault or disconnection
	BIT14	BMS_CurrSensor_Fault	Abnormal current sampling
	BIT15	BMS_Relay_Fault	No feedback or action from the relay, sticking
BYTE2	BIT16	BMS_Type_Unmatch	Battery type mismatch
	BIT17	BMS_Version_Unmatch	Software version mismatch
	BIT18	BMS_Manufacturer_Unmatch	Hardware version mismatch
	BIT19	BMS_SW&HW_Unmatch	Software and hardware mismatch
	BIT20	BMS_M&S_Unmatch	Master-slave mismatch
	BIT	Description	Possible Cause
	BIT21	BMS_CR_Unresponsive	No response to battery charging request
	BIT22	BMS_Software_Protect	Trigger software protection
	BIT23	BMS_536_Fault	Communication problem with sampling chip

BYTE3	BIT24	BMS_Selfchecking_Fault	Communication Failure between Battery Main Control and Battery Module, Battery Module and Battery Module
	BIT25	BMS_Tempdiff_Fault	Large temperature difference
	BIT26	BMS_Break	Battery sampling line disconnected
	BIT27	BMS_Flash_Fault	Storage chip fault
	BIT28	BMS_Precharge_Fault	Pre-charge resistor not connected
	BIT29	BMS_AirSwitch_Break	Battery circuit breaker tripped
	BIT30	BMS_ClusterCntMIS_Fault	Mismatch between parallel cluster quantity and dip switch quantity
	BIT31	BMS_ClusterComAddr_Fault	Cluster address duplicate

**Note:** When communicating, the low byte comes first. When the corresponding BIT bit is 1, it means that the fault corresponding to this bit has occurred.

BMS Error Code Table (Expand)			
BYTE	BIT	Description	Possible Cause
BYTE0	BIT0	B2I_UCellOverFault	Cell voltage high
	BIT1	B2I_UCellLowFault	Cell voltage low
	BIT2	B2I_SysFault	Bat System Fault
	BIT3	B2I_LineFlt	Cell temperature sampling fault
	BIT4	B2I_LinkerTempHi	Bat Linker Temp High
	BIT5	B2I_BatLinkerError	Bat Linker Error
	BIT6	B2I_FanError	Fan feedback abnormal fault
	BIT7	B2I_FireFault	Fire Fault
BYTE	BIT	Description	Possible Cause
BYTE1	BIT8	B2I_MSDFault	MSD Fault
	BIT9	Rev	
	BIT10		
	BIT11		
	BIT12		



	BIT13		
	BIT14		
	BIT15		
Note: When communicating, the low byte comes first. When the corresponding BIT bit is 1, it means that the fault corresponding to this bit has occurred.			

## Appendix D: Safety Code Description

Note that Safety codes may vary across different models. If you have any questions, please contact the relevant technical support team for assistance. The following is an example of the **X3-Hybrid G4**.

Code	Safety	Country
0	VDE0126	GERMANY
1	VDE4105	GERMANY
2	AS 4777_2020_A	AUSTRALIA
3	G98/1	UNITED KINGDOM
4	C10/11	BELGIUM
5	TOR	AUSTRIA
6	EN50549_NL	NETHERLANDS
7	Denmark2019_W	DENMARK
8	CEB	MAURITIUS
9	CEI 0-21	ITALY
10	South Africa	SOUTH AFRICA
11	GR_Island_LV	GREECE
12	UTE_C15_712	FRANCE
13	IEC61727	IEC
14	G99/1	UNITED KINGDOM
15	GR_Mainland_LV	GREECE
16	Guyana	FRANCE
17	C15_712_Is_50	FRANCE
18	C15_712_Is_60	FRANCE
19	New Zealand	NEW ZEALAND
20	Spain	SPAIN
21	Chile	CHILE
22	Israel	ISRAEL
23	CZECH 2023	CZECH
24	Spain_Island	SPAIN
25	EN50549_Poland	POLAND
26	EN50549_Portug	PORTUGAL
27	PEA_Thailand	THAILAND
28	MEA_Thailand	THAILAND
29	EN50549_Sweden	SWEDEN
30	Philippines60Hz	PHILIPPINES
31	Slovenia	SLOVENIA
32	Denmark_E	DENMARK
33	EN50549_EU	EUROPEAN UNION
34	AS 4777_2020_B	AUSTRALI

<b>Code</b>	<b>Safety</b>	<b>Country</b>
35	AS 4777_2020_C	AUSTRALI
36	User-Defined	USER-DEFINED
37	Romania	ROMANIA
38	CEI 0-16	ITALY
39	ACEA	ITALY
40	Chile MT_R	CHILE
41	Chile MT_U	CHILE
42	Czech_2022_2	CZECH REPUBLIC
43	G98/NI-1	UNITED KINGDOM
44	G99/NI-1	UNITED KINGDOM
45	G99/NI_Type B	UNITED KINGDOM
46	CQC	CHINA
47	Brazil_3P_380	BRAZIL
48	Brazil_3P_220	BRAZIL
49	EN50549_Estonia	ESTONIA
50	Switzerland	SWITZERLAND
51	Greece_MV	GREECE
52	EN50549_1	EUROPEAN UNION
53	Lithuania	LITHUANIA
54	Finland	FINLAND
55	Madeira	MADERIA
56	Hungary	HUNGRAY
57	Slovakia	SLOVAKIA
58	DEO-Romania	ROMANIA
59	Norway	NORWAY
60	Cyprus 2025	CYPRUS
61	Ireland	IRELAND