

High frequency inverter external communication protocol

1. Definition of communication interface

The external communication adopts UART communication, and the communication settings are: baud rate 2400bps, 8 data bits, 1 stop bit, no parity check, no flow control. The communication method adopts the half-duplex communication method. At the same time, only one of the master and the slave can send data, and the other can receive data. The external communication is initiated by the external controller (upper computer), and the inverter controller responds (does not actively initiate communication). Communication frame is MODBUS protocol frame.

2. Communication frame definition (frame structure)

slave address field	1-31 (decimal) (31 is broadcast address)
function code	0x03: Read multiple parameters 0x06: Write a single parameter 0x10: Write multiple parameters 0x17: Master-slave synchronization data 0x41: Firmware upgrade
data field	The data field includes the address field and the data payload field
CRC field	16bit CRC check value

2.1. Communication frame command and frame description

CRC check range is frame address-CRC field (excluding CRC field).

2.1.1. 0x03 read multiple registers

The function code (command) is used to read the contents of a continuous block in the register. The request protocol data unit specifies the starting register address and the number of registers. In the corresponding register data, each register data contains two bytes (the binary number is right-aligned in each byte). For each register, the first byte is high and the second byte is low. For example, request to read register 0x0001-0x0002:

ask	y/Hexy	answer	y/Hexy
slave address	01	slave address	01
Order	03	Order	03
Register start address high	00	number of bytes	04
Register start address low	01	Register value high bit (01)	0F
High register number	00	Register value low (01)	A0
Low register number	02	Register value high bit (02)	01
CRC low bit	-	Low register value (02)	C2
CRC high	-	CRC low bit	-
		CRC high	-

2.1.2. 0x06 write a single register

This function code (command) is used to write a holding register in the slave device. The request specifies the address of the register to be written. The normal response is the reply to the request, and then returns the written value of the contents of the register. For example, it is required to write the address of register 0x0008 to write the value of 0xAAAA:

ask	y/Hexy	answer	y/Hexy
slave address	01	slave address	01
Order	06	Order	06
Register start address high	00	Register start address high	00
Register start address low	08	Register start address low	08
register value high	AA	register value high	AA
register value low	AA	register value low	AA
CRC low bit	-	CRC low bit	-
CRC high	-	CRC high	-

2.1.3. 0x10 write multiple registers

This function code (command) is used to write a segment (sequence) of continuous address values into registers. The value to be written is the requirement specified in the data field. The data is a two-byte number register. normal response Return the function code, start address and register write quantity. For example, the data written to register 0x0001 address is data 0x1194, and the data written to register 0x0002 address is 0x01CC.

ask	y/Hexy	answer	y/Hexy
slave address	01	slave address	01
Order	10	Order	10
Register start address high	00	Register start address high	00
Register start address low	01	Register start address low	01
High register number	00	High register number	00
Low register number	02	Low register number	02
number of bytes	04	CRC low bit	-
Register value high (01)	11	CRC high	-
Register value low (01)	94		
Register value high bit (02)	11		
Low register value (02)	CC		
CRC low bit	-		
CRC high	-		

3. Data register definition

3.1. Information Data register definition

Address(Hex) Size(Word)	register name	Data Type	On/Off	Unit	Attribute	Register Description	Remark
0xF800	1	Type	INT16U	0		R DeviceType	Firmware Catalogo-0x40 High Frequency Inverter

0xF801	-	SubType	INT16U 0	-	-	R	Subclass	Device subclass 0x0204: 3024 (3000VA/24V) 0x0408: 5048 (5000VA/48V)
0xF804	-	Serial number	INT16U 0	-	-	R	number/SN addition, the machine model passes identification	The SN code is a 14-digit pure number, such as: SN=01354820250001, then: SN[0]-0135(decimal) serial SN[1]-4820; In SN[2]-2500; code SN[3]-0100; SN[4]-0000; invalid value: 0x00
0xF80B	-	CPU1 FW Version	INT16U 2	-	-	R	CPU1 FW Version Invalid value:	0xFFFF
0xF80C	-	CPU2 FW Version	INT16U 2	-	-	R	CPU2 FW Version Invalid value:	0xFFFF

3.2, Realtime Data register definition

Address(Hex)	SIZE(Word)	register name	Data Type	Override	Unit	Attribute	Register	Description	Remark
0x1100	1	SettingDataSn	INT16U 0	-	-	-	R	The data in the serial number setting area of the setting parameter area has changed +1	
0x1101	-	Working mode	INT16U 0	-	-	-	R	mode/Mode	0=power-on mode/PowerOn/Mode 1=standby mode/Standby/Mode 2=bypass mode/Bypass/Mode 3=battery mode/Battery/Mode 4=fault mode/Fault/Mode 5=mains mode/Line/Mode 6=charging mode/PVCharge/Mode 0=no charge / No charge, 1=Constant current
0x1102	-	Battery charging stage	INT16U 0	-	-	-	R	stage/State	charge/Bulk charge 2=Constant voltage charge/Absorption charge 3=Float charge/Float charge
0x1103	-	Fault Code	INT16U 0	-	-	-	R	For fault code/Fault ID , see the high-frequency inverter fault alarm table for details	
0x1104	-	PowerFlowMsg	INT16U 0	-	-	-	R	energy flow information	b15: 0: Battery disconnected, 1: Battery connected b14: 0: Line abnormal, 1: Line normal b13: 0: PV input abnormal, 1: PV input normal b12: 0: Load connect unallowed 1: Load connect allowable b11b10: 00: No power flow, 01: Battery charging 10: Battery discharging b9b8: 00: No power flow, 01: Draw power from Line 10: Feed power to Line b7: 0: No power flow, 1: PV MPPT working b6: 0: No power flow, 1: Load connected b0: 0: Power flow version unsupported 1: Power flow version supported
0x1108	-	Battery voltage	INT16U -2	V	R	battery voltage	voltage		
0x1109	1	Battery current	INT16S 0	A	R	The battery current	Current	Positive and negative values, the negative value is the discharge current, and	
0x110A	1	Battery power	INT16S 0	W	R	Battery power	Power	Positive and negative values, the negative value represents the discharge power	
0x1111	-	AC output voltage	INT16U -1	V	R	AC output voltage	Voltage	AC input voltage	
0x1117	-	AC input voltage	INT16U -1	V	R	IN	Voltage	AC	
0x1119	-	AC input frequency	INT16U -2	Hz	R		Frequency	Input frequency	
0x111E	-	AC output active power	INT16S 0	WR	R	Output active power	Power/Watt		
0x111F	-	AC output apparent power	INT16U 0	VAR	R	Output apparent power	Power/W		
0x1120	-	Load percentage	INT16U 0	%	R	Duty ratio	Percent		
0x1126	-	PV input voltage	INT16U -1	V	R	PV input voltage	Voltage		
0x112A	-	PV input power	INT16S 0	W	R	PV power	Power/Watt		

3.3, Setting Data register definition

Address(Hex)	SIZE(Word)	register name	Data Type	Override	Unit	Attribute	Register	Description	Remark	Defaults	Setting Range Minimum	Setting Range Maximum	Setting Range Remarks	
0x211F	1	Battery cut-off voltage	INT16U -1	V	R/W			Discharge cut-off voltage	For model 3024, pcs=2 For model 5048, pcs=4	420	105	135	3024:21.0V~27.0V 5048: 42.0V~54.0V	
0x2122	-	Battery C.V charging voltage	INT16U -1	V	R/W			Constant voltage charging voltage		576	120	150	3024:24.0V~30.0V 5048: 48.0V~60.0V	
0x2123	-	Battery floating charging voltage	INT16S -1	V	R/W			Float charge voltage		544	120	150	3024:24.0V~30.0V 5048: 48.0V~60.0V	
0x2129	1	AC output frequency	INT8U	0	-	R/W	Frequency	Frequency	0=50Hz/1=60Hz 0=Main	0	0	1		
0x212A	1	Output source priority	INT8U	0	-	R/W	Priority	Output Priority	power priority Utility First 1=PV priority Solar First 2=PV battery main power Solar/Bat/Utility	0	0	2		
0x212B	1	Application Mode	INT8U	0	-	R/W	Application Mode	Application Mode	0=APL/1=LUPS	0x00	0	1		
0x212C	-	Charging source priority	INT8U	0	-	R/W	Charge Priority	charging priority	1=PV priority Solar First 2=PV and mains priority SolarAndUtility/First 3=PV SolarOnly only	-	-	3		
0x212D	1	Battery type	INT8U	0	-	R/W	battery type	battery type	0=Gel battery AGM 1=Flood battery 2=User defined 3=Lithium battery LiFePO4	0	0	3		
0x212E	-	Max. charging current	INT8U	0	A	R/W	Total charge current	Maximum charging current	One grid per 1A	60	10	100	10A~100A	
0x2130	-	Max. AC charging current	INT8U	0	A	R/W	AC charge current	Maximum mains current	One grid per 1A	30	10	100	10A~100A	
0x2131	-	Buzzer enable	INT8U	0	-	R/W	Buzzer	Buzzer	0=Disable/1=Enable	0x01	0	1		
0x2133	-	OverLoad restart enable	INT8U	0	-	R/W	Overload	restart enable bit	0=Disable/1=enable	0x00	0	1		
0x2134	-	Over temperature restart enable	INT8U	0	-	R/W	Over temperature	restart enable bit	0=Disable/1=enable	0x00	0	1		
0x2135	-	LCD backlight enable	INT8U	0	-	R/W	Backlight	Backlight	0=Disable/1=Enable	0x01	0	1		
0x2137	1	OverLoad to bypass	INT8U	0	-	R/W	Overload transfer	to bypass	0=Disable/1=enable	0x00	0	1		
0x2156	-	Battery back to charge voltage	INT16U -1	V	R/W			Battery low voltage to charge		460	110	135	3024:22.0V~27.0V 5048: 44.0V~54.0V	
0x2159	-	Battery back to discharge voltage	INT16U -1	V	R/W			high voltage to discharge	If it exceeds the maximum value, it will display FULL. For example, 5048 model, 60V is FULL	540	pcs + 1	150	120	3024: 24.0V~30.1V (30.1V means FULL) 5048: 48.0V~60.1V (60.1V means FULL)