True third-generation upgraded version
DC buck-boost power supply · CC/CV/CW

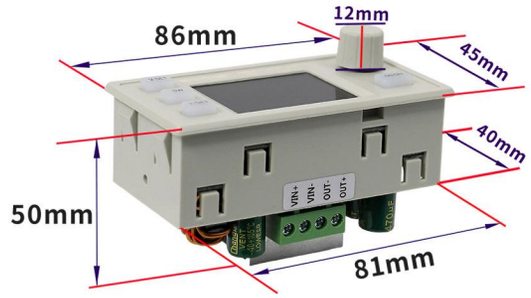
Product parameters

Product name: DC buck-boost power supply
Model: XY-SK150X
Input voltage: 6-36.00V
Output voltage: 0.0-36.00V
Output current：0-7.000A;
Accuracy of voltage: +0.5%+1 word
Power output: 150W
Accuracy of current: ±0.5%+3 word
Resolution of voltage: 0.01V
Resolution of current: 0.001A
Storage data group: 10 groups
Number of buttons: 5
Screen size: Over 1.8-inch LCD with a viewable area of 38*29mm
Buzzer: YES
Soft start: YES
Efficiency of conversion: About 88%
Output ripple typical value:vpp-150mv
MPPT function: Support MPPT solar charging
Product size：86x50x45mm；Package size：104x70x52mm
weight：104g，with packaging 124g

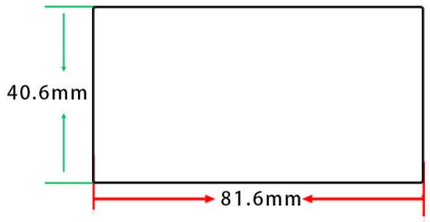
Protection mechanism

Anti-reverse：YES　　Anti-backflow：YES
Input under-voltage (LVP)：5.5-36V, default 5.5V
over-voltage (OVP)：0-38V, default 38V
over-current (OCP)：0-7.2A, default 7.2A
over-power (OPP)：0-180W, default 160W
over-temp (OTP)：60-110°C, default is 110 °C
over-time out (OHP)：1 minute -99 hours 59 minutes，off by default
over-capacity (OAH)：0-9999Ah，off by default
over-energy (OPH)：0-4200KWh，off by default
EXT over-temp(ETP)：0-110°C, off by default

Product size



The recommended opening size is as folows:



Button Function

VSET Button
Short Press: Set voltage CV
Long Press: Enter or exit the callout data group Ul

SW Button
Short Press: Switch between input!output voltage or shift
Long Press: Enter or exit the system settings Ul

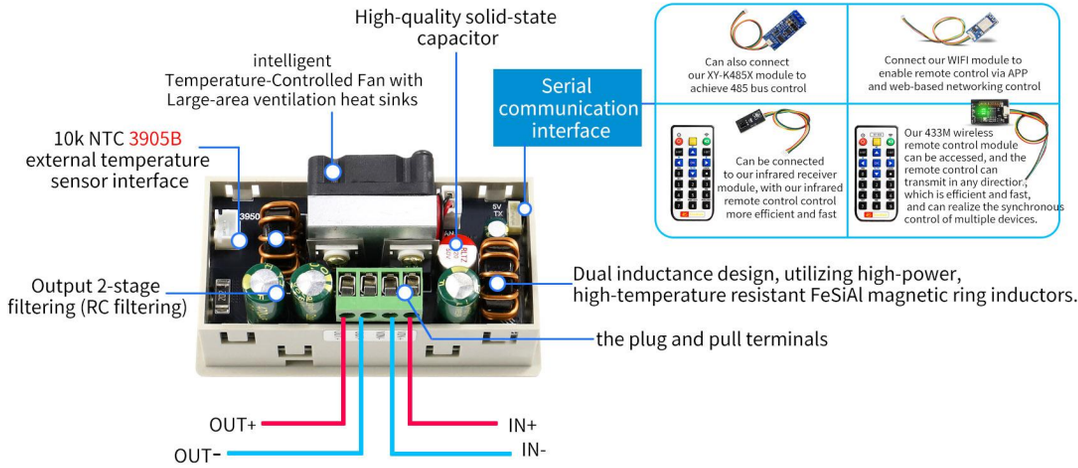
ISET Button
Short Press: Set current CC
Long Press: Enter or exit the data group settings Ul

Encoder Button
Short Press: Switch between outputpower w/capacity Ah/ energy wh/time h/temperature °C/display in rotation
Long Press: Turn on/off the key lock

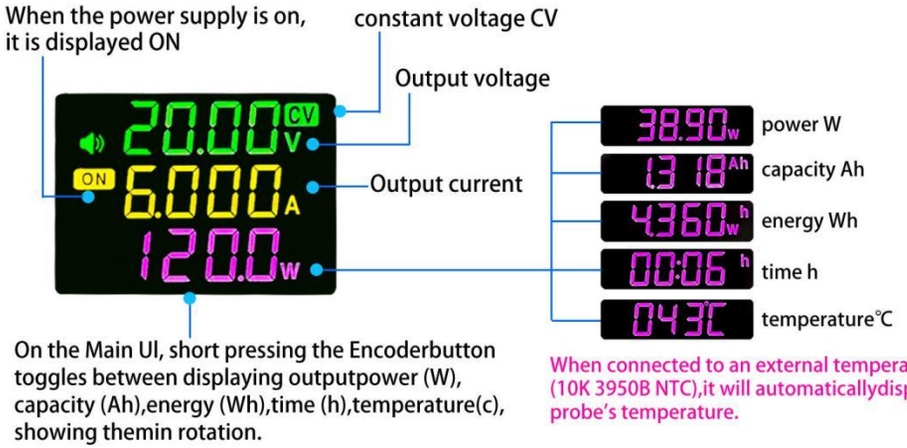
Power Button
Short Press: Turn on/off the power output
Long Press: Reset in the capacity Ah/ energy Wh/time h Ul by long pressing

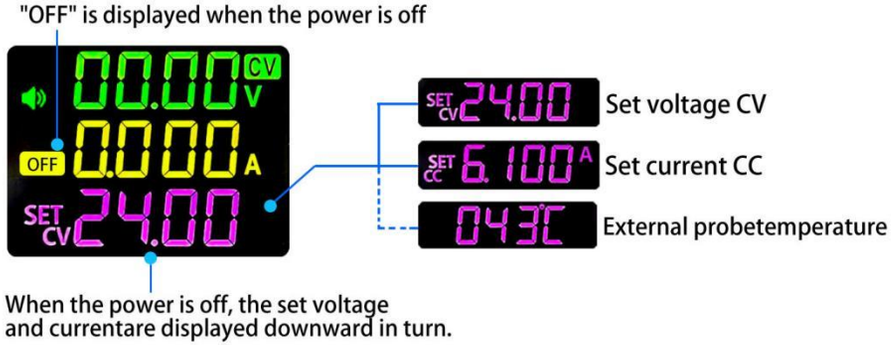
Main Ul

Introduction to Functional Interfaces and Wiring



Product UI function details



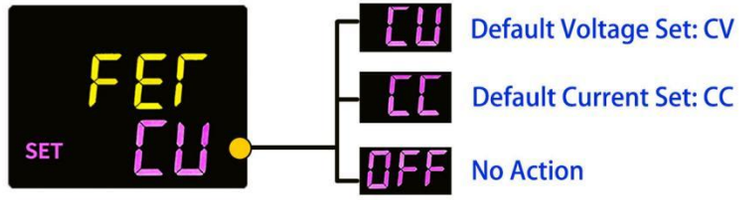


Set the voltage/current

1.Set the voltage/current

On the main UI, short press the VSET button to set the voltage. The LCD will display VSET in the lower row, and "CV" will flash to indicate that the voltage setting position is selected and blinking. Then, short press the SW button or the encoder button to switch the voltage setting position. Adjust the value by rotating the encoder. After setting is complete, short press the VSET button to exit and save. To set the current, short press the ISET button, and the setting steps are the same as for voltage.

2.Quick Setting of Voltage or Current



In the system parameter settings UI , set the parameter FET to CV or CC. Rotate the encoder on the main UI to enter the voltage or current setting UI. Rotate the encoder to quickly set the voltage or current.

3.Input/output voltage display

On the main UI, press the SW button briefly to switch between input and output voltage displays.

4.Checking power (W)/capacity (Ah)/energy (Wh)/time (h)

On the main UI, press the encoder button briefly to switch between displaying power (W)/capacity (Ah)/energy (Wh)/time (h)/temperature (℃) in rotation.

5.key lock

On the main UI, press and hold the encoder button for 2 seconds to lock the set voltage and current to prevent misoperation; press and hold the encoder button for 2 seconds after locking to unlock.

6.Data Group Function

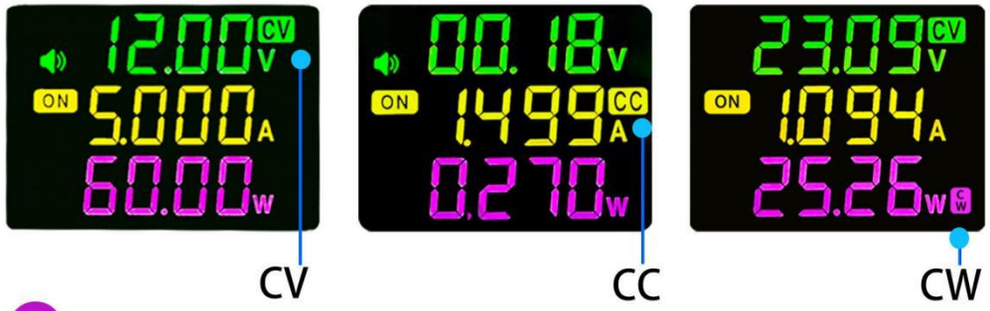
This product has a total of 10 data groups from Cd0 to Cd9.

Press and hold the VSET button on the main UI to access the data group UI.

You can press VSET/ISET briefly to switch between constant voltage (CV) and constant current (CC) settings. It supports quick viewing and modification of voltage and current in the data group, as well as SW shift operation.

After confirming the data group, press and hold the VSET/SW button or press the encoder button briefly to select the desired data group.

Introduction to CV/CC/CW



1 When the constant power function is not turned on, the power supply only has the functions of constant voltage (CV) and constant current (CC), which automati-cally switch based on the load;

1.1 When the load current is less than the set constant current value, the power supply is in the constant voltage mode, where the output voltage is the set voltage value CV, and the current is adaptive;

1.2 When the load current exceeds the set constant current value, the power supply automatically enters the constant current mode. At this time, the output current is the set constant current value CC, and the voltage is adaptive;

2 After the constant power function is turned on, the constant current value defaults to the maximum value , and the constant voltage value CV serves as the initial voltage (set to a reasonable value based on actual conditions). After the power supply is turned on, the equivalent resistance R of the load is calculated using Ohm's law R=U/I. Then, the corresponding voltage can be calculated based on the set constant power value using the power formula P=U /R. At this point, the constant power point algorithm automatically follows, and the constant power is achieved.

Constant Power Switch and Constant Power Value Setting

1. Press and hold SW on the main UI to enter system set.
2. Press ISET/VSET briefly to switch to the "-CP-" constant power switch option. Press ON to enable constant power and OFF to disable it.
3. After enabling constant power, press ISET briefly on the main interface to modify the value of constant power.

Data Group Parameter Set

Press and hold the ISET button on the main interface to enter the settings menu. The first parameter is to select the data group Cd0-9.

Press VSET briefly to select the next parameter, and press ISET briefly to select the previous parameter. After completing the settings, press and hold the ISET/SW/encoder button to exit the settings UI.

Data Group Selection Cd0-Cd9	Rotate the encoder to select the desired data group Cd0-Cd9. For example, if Cd2 is selected, subsequent parameter settings will be for the Cd2 data group.

Setting Voltage CV 	Briefly press SW or the encoder button to select the position, and rotate the encoder to adjust the value. For instance, setting 12.00 will result in a CV voltage of 12.00V when this data group is accessed.
Setting Current CC 	Briefly press SW or the encoder button to select the position, and rotate the encoder to adjust the value. For example, setting 6.000 will result in a CC current of 6.000A when this data data group is accessed. Note: The CV and CC modes switch automatically based on the load. When the load reaches the set CC value, it automatically switches to CC mode.
LVP Settings (Input Under -Voltage Protection) 	Briefly press SW or the encoder button to select the position, and rotate the encoder to adjust the value. For instance, if LVP is set to 12.00V, theoutput will be shut off for protection when the input voltage drops below 12.00V. After protection, "LUP" will be displayed on the bottom line. Press any button to cancel the alarm. When the input voltage rises above LUP, protection is automatically canceled.
OVP Settings (Over-Voltage Protection) 	Short press SW or encoder button to select the position, rotate the encoder to adjust the value. For instance, if OVP is set to 24.00, when the output voltage exceeds 24.00V, the output will be shut off for protection, thus protecting the load from burnout due to overvoltage. After protection, "OVP" will be displayed on the bottom line. Press any button to cancel the alarm.
OCP Setting (Over-Current Protection) 	Short press SW or encoder button to select the position, rotate the encoder to adjust the value. Short press SW or encoder button to select the position, rotate the encoder to adjust the value. For example, if OCP is set to 2.000, when the output current exceeds 2.000A, the output will be shut off forprotection, protect -ing the load from burnout due to overcurrent.
OPP Setting (Over-Power Protection) 	Short press SW or encoder button to select the position, rotate the encoder to adjust the value. For instance, if OPP is set to 100.0W, when the output power exceeds 100.0W, the output will be shut off forprotection, preventing the load from burnout due to overpower. After protection, "OPP" will be displayed on the bottom line. Press any button to cancel the alarm.

OAH Setting (Over-Capacity Protection) 	Short press the power button to turn on/off the over-capacity protection function. ---- This function is off by default. Short press the power button to activate this function, then short press SW or encoder button to select the position, rotate the encoder to adjust the value. Long press the power button to switch the decimal point position(0.000Ah, 00.00Ah, 000.0Ah, 0000Ah). The maximum setting is 9999Ah. For example, if OAH is set to 2.000Ah, when the cumulative output capacity exceeds 2.000Ah, the output will be shut off for protection. After protection, "OPP" will be displayed on the bottom line. Press any button to cancel the alarm and reset the cumulative capacity.
OPH Setting (Over-Energy Protection) 	Short press the power button to turn on/off the over-energy protectionfunction. ---- This function is off by default. Short press the power button to activate this function, then short press SW or encoder button to select the position, rotate the encoder to adjust the value. Long press the power button to switch the decimal point position (0.000Wh, 00.00Wh, 000.0Wh, 0000Wh, 0.0.0.0Wh (representing 0000KWh)). The maximum setting is 4200KWh. For instance, if OPH is set to 500.0Wh,when the cumulative output energy exceeds 500.0Wh, the output will be shut off for protection. After protection, "OPH" will be displayed on the bottom line. Press any button to cancel the alarm and reset the cumulative energy.
OHP Setting (Over-Time Protection) 	Short press the power button to turn on/off the over-time protection function. ---- This function is off by default. Short press the power button to activate this function, then short press SW orencoder button to select the position, rotate the encoder to adjust the value. The minimum unit is 1 minute, and the maximum setting is 99:59 (99 hours 59 minutes). For example, if OHP is set to 02:30, when the output is on for more than 2 hours and 30 minutes, the output will be shut off for protection. After protection, "OHP" will be displayed on the bottom line. Press any button to cancel the alarm and reset the cumulative time.

OTP Setting (Over-Temperature Protection) 	Short press SW or encoder button to select the position, rotate the encoder to adjust the value in units of ℃ or °F (Switch between ℃ or °F in the system settings interface). For instance, if OTP is set to 90℃, whenthe PCB temperature near the power transistor reaches 90℃, the output willbe shut off for protection. After protection, "OTP" will be displayed on the bottom line. Press any button to cancel the alarm. When the temperature drops below OTP, the protection will be automatically canceled.
ETP Settings (External Over -Temperature Protection) 	Press the power button briefly to enable/disable the external over -temperature protection function, which is defaulted to "off" when disabled. To enable this function, briefly press the power button, then press the SW or encoder button to select the position, and rotate the encoder to adjust the value. For example, if the ETP is set to 60℃, upon connecting an external temper-ature probe (10K, NTC probe), the output will automatically shut off for protection when the temperature exceeds 60℃. After protection is activated, "ETP" will be displayed on the bottom row. Press any button to cancel the alarm, and the protection will be automat-ically lifted when the temperature falls below the ETP setting. Application Scenario: Attach the external temperature probe to the load (such as a rechargeable battery). When the load temper -ature exceeds the set temperature, the output will be shut off for protection, effectively preventing the load from overheating and damaging.
PON Settings (Power-On Output) 	Rotate the encoder to select between OFF (output off upon power-on) and ON (output on upon power-on). For example, if PON is set to OFF, then the output is off when the power is justpowered on, you need to press the power button to open the output; Otherwise, the output is directly turned on after the power-on.

System Parameter Set

Press and hold the SW button on the main interface to enter the settings menu. The first parameter is the buzzer setting (bEP). Press VSET briefly to select the next parameter and press ISET briefly to select the previous parameter.

After completing the settings, press and hold the SW/encoder button to exit the settings.

bEP Settings (Beeper Enable) 	Rotary encoder to turn on/off the beeper. For example, selecting OFF will disable the beeper, and there will be no keystroke prompt tone or alarm one.
b-L Settings (LCD Brightness Adjustment) 	Rotary encoder to adjust the brightness level. 1-5 levels, factory default is level 5 (brightest).
C-F Settings (Choice between Celsius ° C and Fahrenheit ° F) 	Rotary encoder to select 'C' or '°F' Meeting the needs of different countries and regions worldwide.
FET Settings (Quick Adjustment of Voltage, Current, or Power) 	Rotary encoder to select CV/CC/OFF/CP. CV: Quickly adjust voltage using the rotary encoder on the main interface. CC: Quickly adjust current using the rotary encoder on the main interface. OFF: No action when rotating the encoder on the main interface. CP: Quickly adjust power using the rotary encoder on the main interface (when constant power is enabled).
Add Settings (Power Supply Address) 	Pressing the SW/encoder button briefly to select the bit, and rotate the encoder to adjust the numerical value. Value range: 1~247, factory default is 001. The product with serial communication is a low-cost comm -unication power supply that supports the standard ModBus protocol and can be networked through 485 modules or WIFI modules.
bRE Settings (Communication Baud Rate Settings) 	Rotary encoder to set different values from 0-8. 0:9600 1: 14400 2: 19200 3:38400 4: 56000 5: 576000 6:115200 7: 2400 8: 4800 默认6波特率115200

PPT Settings (MPPT Solar Charging Settings)

Rotary encoder to turn on/off the MPPTfunction.
OFF: Disable. ON: Enable.

After enabling, press the SW or encoder button briefly to switch to setting the maximum power point coefficient. Rotate the encoder to adjust the coefficient value between 0.75-0.85, with a default of 0.8.

CW Settings (Constant Power CW ON/OFF)

To enable or disable the constant power CW function using a rotary encoder

After enabling constant power, pressISET briefly on the main interface to modify the value of constant power.

bCH Settings (Battery automatic charging threshold setting.)

Press the power button briefly to turn this function on or off ----This function is off by default.

When the battery voltage falls below the threshold, the power output isautomatically activated to commence charging.

For instance, if the threshold is set at 12.00V, when the battery voltage drops below 12.00V, the power output is automatically activated to start charging the battery.

Firmware version ⩾V125

bTF Setting (Charge Cutoff Current)

Press the power button briefly to turn this function on or off ----This function is off by default.

After enabling this function, press the SW or encoder button briefly to select the digit, and rotate the encoder to adjust the value in mA.

For example, if set to 10mA, when charging the battery, if the charging current is less than 10mA, it will be considered as fully charged, and the output will be disconnected to prevent overcharging and damaging the battery.

CLU Setting (Calibrate Output Voltage)

If the output voltage is inaccurate, you can calibrate it (do not connect any load during calibration).

1.Press and hold the power button to start calibration, and "01" will be displayed on the first line.
2.Measure the output voltage using a high-precision multi -meter and input the actual voltage into the third line (SW shift operation is supported).
3.Press the power button briefly to enter the second step of calibration, and "02" will be displayed on the first line.
4.Repeat step 2 and input the actual voltage into the third line.
5.Press the power button again briefly, and "03" will be dis -played on the first line. Wait for calibration to complete without any other operation. If successful, "SUC" will be displayed; if failed, "ERR" will be displayed.

Note: If calibration fails, you can try again. If you accidentally enter the calibration state, you can exit by pressing and holding the power button, and the parameters will not be saved after exiting.

CLA Setting (Calibrate Output Current)

If the output current is inaccurate, you can calibrate it.

1.Connect a multimeter in current mode or an electronic load (the electronic load needs to be set to the maximum range of the product) directly to the output terminal.
2.Press and hold the power button to start calibration, and "01" will be displayed on the first line. Input the actual current value from the multimeter or electronic load into the third line (SW shift operation is supported).
3.Press the power button briefly to enter the second step of calibration, and "02" will be displayed on the first line.
4.Repeat step 2 and input the actual current into the third line.
5.Press the power button again briefly and wait-for calibration to complete without any other operation. If successful, "SUC" will be displayed; if failed, "ERR" will be displayed.

Note: If calibration fails, you can try again. If you accidentally enter the calibration state, you can exit by pressing and hold -ing the power button, and the parameters will not be saved after exiting.

ZERO Setting (Current Zero Calibration)

If there is a small current withi n 100mA when the output is not connected to a load, you can press and hold the power button to calibrate the zero point. Do not connect any load to the output terminal during zero calibration

CLOF Setting **(Force Power Output Off When Switching Data Sets)** 	Rotate the encoder to select ON or OFF for this function. ON: Enable this function. After enabling, when switching data sets, the power will be forcibly turned off to prevent high voltage from damaging the load. OFF: Disable this function. After disabling, the power switch state will be maintained when switching data sets.
POFF **(ShutDown Function)** 	ON: Enable the ShutDown function. Press and hold the Power Key for 5 seconds to shut down;In the shutdown state, click the Power Key to start up; OFF: Disable the shutdown function;
RET Setting **(Restore Factory Settings)** 	Press and hold the power button ---- it stops blinking to restore factory settings.
WIFI Config **(Need WF-POW module)** 	Modify pairing mode with encoder -----: Invalid Wifi TOH: Touch Pair AP: AP Pair ROU: Connect Router nET: NetWorking
UER View **(Firmware Version Number)** 	The firmware version number of the program. The product will support firmware upgrades to access new features.

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1、Protocol introduction

The communication protocol is MODBUS-RTU protocol, the product only supports function codes 0x03,0x06,0x10; the communication interface is TTL serial port;

2、Introduction of the communication protocol

Information transmission is asynchronous, and the Modbus-RTU mode is in 11-bit bytes

Word format (serial data)	The 10-bit binary
start bit	One
data bit	Eight
parity check bit	not have
stop bit	One

Data frame structure:

Data frame interval	address code	FC	data field	CRC verification
Of 3.5 bytes and above	1 Bytes	1 Bytes	N byte	2 Bytes

Before sending data, the rest time of data bus, i. e., no data transmission time is greater than 3.5 (e. g., baud rate is 9600 When 5ms) message sending to start with at least 3.5 bytes of time pause interval, the entire message frame must be as a series The continued data stream is refreshed if there is more than 3.5 bytes of pause before the frame is completed

Incomplete message and assume that the next byte is the address domain for a new message. Similarly, if a new message is less than Within 3.5 characters, then before the previous message begins, the receiving device will regard it as a continuation of the previous message.

1.1 Address code:

The address code is the first byte (8 bits) of each communication message frame, ranging from 1 to 255. This byte indicates the set by the user

The slave of the address will receive the information sent by the host machine. Each slave must have a unique address code and only the ground The slave of the address code can respond to the return information. When the information is returned, the data starts with the respective address code.host

The address code sent by the machine indicates the slave machine address that will be sent to, and the address code returned by the slave machine indicates the returned slave machine address.each other The address code required indicates where the information comes from.

1.2 Function code:

The function code is the second byte of each communication information frame transmission, and the function code defined by the ModBus communication regulation is 1 to 127. Send as a host request, tell the slave what action to perform through a function code. As a slave response, return return

The function code is the same as the function code sent from the host, and indicates that the slave has responded to the host and has performed related operations.

This machine only supports 0x03,0x06,0x10 functional codes.

FC	definition	Operation (binary)
0x03	Read register data	Reads the data for one or more registers
0x06	Write a single register	Write a set of binary data to a single register
0x10	Write multiple registers	Write multiple sets of binary data to multiple registers

1.3, and the data area

The data area includes what kind of information to be returned by the machine or what action to perform, which can be data (e. g., on Off volume input / output, analog volume input / output, register, etc.), reference address, etc. For example, the host passes by the function code

03 tells the value of the return register (including the starting address of the register to read and the length of the read register) The data returned includes the data length of the register and the data content.

0x03 Read the functional host format

address code	FC	Register start address	Number of register addresses n (1~32)	CRC check code
1 Bytes	1 Bytes	2 Bytes	2 Bytes	2 Bytes

0x03 Read function returns the format from the machine

address code	FC	Number of returned registers n * 2	Register data	CRC check code
1 Bytes	1 Bytes	1 Bytes	And 2 * n bytes	2 Bytes

0x06 Write a single register function host format

address code	FC	Register start address	Register data	CRC check code
1 Bytes	1 Bytes	2 Bytes	2 Bytes	2 Bytes

0x06 Write a single register function from the machine return format

address code	FC	Register start address	Register data	CRC check code
1 Bytes	1 Bytes	2 Bytes	Two bytes	2 Bytes

0x10 Write in a multiple-register function host format

address code	FC	Register start address	Number of register addresses n (1~32)	Write the number of bytes 2*n	Register data	CRC check code
1 Bytes	1 Bytes	2 Bytes	2 Bytes	1 Bytes	2 * n Bytes	2 Bytes

0x10 Write multiple registers from the host format

address code	FC	Register start address	Number of register addresses n	CRC check code
1 Bytes	1 Bytes	2 Bytes	2 Bytes	2 Bytes

Factory default port rate 115200 device address 1

Protocol register introduction (the data in a single register address is double-byte data)

name	explain	Byte number	radix point	unit	read-write	Register address (decimal system)	Register address (hexadecimal)
V-SET	Voltage setting	2	2	V	R/W	0	0x0000
I-SET	Current setting	2	3	A	R/W	1	0x0001
VOUT	Output voltage display value	2	2	V	R	2	0x0002
IOUT	Output current display value	2	3	A	R	3	0x0003
POWER	Output power display value	2	2	W	R	4	0x0004
UIN	Input voltage display value	2	2	V	R	5	0x0005
AH-LOW	Output AH is low by 16 bits	2	0	maH	R	6	0x0006
AH-HIGH	Output AH is high by 16 bits	2	0	maH	R	7	0x0007
WH-LOW	Output WH is low by 16 bits	2	0	mwH	R	8	0x0008
WH-HIGH	Output WH high by 16 bits	2	0	mwH	R	9	0x0009
OUT_H	Open time-length-hours	2	0	H	R	10	0x000A
OUT_M	Start length-	2	0	M	R	11	0x000B

	minutes						
OUT_S	Open time-seconds	2	0	S	R	12	0x000C
T_IN	Internal temperature value	2	1	F/C	R	13	0x000D
T_EX	External temperature value	2	1	F/C	R	14	0x000E
LOCK	Key lock	2	0	-	R/W	15	0x000F
PROTECT	protect status	2	0	-	R/W	16	0x0010
CVCC	Constant pressure constant current state	2	0	-	R	17	0x0011
ONOFF	switched output	2	0	-	R/W	18	0x0012
F-C	The temperature symbol	2	0	-	R/W	19	0x0013
B-LED	Back brightness level	2	0	-	R/W	20	0x0014
SLEEP	Rest screen time	2	0	M	R/W	21	0x0015
MODEL	product model	2	0	-	R	22	0x0016
VERSION	Firmware version number	2	0	-	R	23	0x0017
SLAVE-ADD	From the machine address	2	0	-	R/W	24	0x0018
BAUDRATE_L	Baud rate	2	0	-	R/W	25	0x0019
T-IN-OFFSET	Internal temperature correction	2	1	F/C	R/W	26	0x001A
T-EX-OFFSET	External temperature	2	1	F/C	R/W	27	0x001B
	correction						
BUZZER	The buzzer switch	2	0	-	R/W	28	0x001C
EXTRACT-M	Quickly call up the data group	2	0	-	R/W	29	0x001D
DEVICE	device status	2	0	-	R/W	30	0x001E
MPPT-SW	MPPT switch	2	0	-	R/W	31	0x001F
MPPT-K	MPPT Maximum power point coefficient	2	0	-	R/W	32	0x0020
BatFul	Full current current	2	0	-	R/W	33	0x0021
CW-SW	Constant power switch	2	0	-	R/W	34	0x0022
CW	Constant power value	2	0	-	R/W	35	0x0023
V-SET	Voltage setting	2	2	V	R/W	80	0x0050
I-SET	Current setting	2	3	A	R/W	81	0x0051
S-LVP	Low pressure protection value	2	2	V	R/W	82	0x0052
S-OVP	Overpressure protection value	2	2	V	R/W	83	0x0053
S-OCP	Overflow protection value	2	3	A	R/W	84	0x0054
S-OPP	Overpower protection value	2	1	W	R/W	85	0x0055
S-OHP_H	Maximum output time-	2	0	H	R/W	86	0x0056

	-hours						
S-OHP_M	Maximum output time--minutes	2	0	M	R/W	87	0x0057
S-OAH_L	Maximum output AH is 16 bits lower	2	0	maH	R/W	88	0x0058
S-OAH_H	Maximum output AH is 16 bits higher	2	0	maH	R/W	89	0x0059
S-OWH_L	Maximum output WH is 16 bits lower	2	0	10mwH	R/W	90	0x005A
S-OWH_H	Maximum output WH is 16 bits high	2	0	10mwH	R/W	91	0x005B
S-OTP	Overtemperature protection value	2	0	F/C	R/W	92	0x005C
S-INI	Power output switch	2	0	-	R/W	93	0x005D
S-ETP	External pass, temperature protection	2	0	-	R/W	94	0x005E

Note 1: (0019H) Port rate register meaning 0:9600 1:14400 2:19200 3:38400 4:56000 5:576000 6:115200 (7:2400 8:4800, some equipment support)

Note 2: The product has M0-M9, each group has 14 data numbers 20-2D. M0 data group is the default, M1 and M2 data groups are the product panel, and M3-M9 is the ordinary storage array. The starting address of the data group is 0050H + data group number * 0010H. For example, the starting address of M3 data group is 0050H + 3 * 0010H=0080H.

Note 3: The read and write value of the key lock function is 0 and 1.0 is non-locked, and 1 is locked.

Note 4: Protection status register:

0: Normal operation, 1: OVP, 2: OCP, 3: OPP, 4: LVP, 5: OAH, 6: OHP, 7: OTP, 8: OEP, 9: OWH, 10: ICP 11: ETP

0: Alarm code	1: OVP overvoltage protection	2: OCP overcurrent protection	3: OPP, over-power protection
4: LVP input undervoltage protection	5: OAH maximum output capacity	6: OHP maximum output time	7: OTP over-temperature protection
8: OEP, with no output protection	9: OWH maximum energy output	10: ICP maximum input current protection	11: ETP, external temperature protection

Note 5: constant voltage constant current state read value is 0 and 1,0 is CV state and 1 is CC state.

Note 6: The read and write value of switch output function are 0 and 1,0 is closed state and 1 is open state.

Note 7: The backlight brightness level is 0-5,0 is the darkest and 5 is the brightest.

Note 8: The write value of the quick call-up data group function is 0-9, and the corresponding data group data will be automatically called up after writing.

1.4 Error check code (CRC check):

The host machine or slave can use the verification code to distinguish whether the received information is correct. Due to the electronic noise or some other interference,

Error sometimes occur during the transmission of information. The error check code (CRC) can check the host or slave communication data

Whether the information in the sending process is wrong, the wrong data can be abandoned (whether sent or received), thus increasing the system Safety and efficiency of the system. MODBUS The CRC of the communication protocol (redundant cycle code) consists of 2 bytes, namely, the 16-bit binary number.

The CRC code is calculated by the sending device (host) and placed at the tail of the sending message frame. The device receiving the message (slave) is heavier

New calculation of the CRC received information, compare whether the calculated CRC is consistent with the received, if the two do not match, then

Indicates an error. When CRC check code is sent, the low is before and the high is behind.

Calculation method of the CRC code:

(1) The preset 116-bit register is hex FFFF (all 1); call this register is CRC register;
(2) Put the first 8-bit binary data (both the first byte of the communication information frame) and the low 8 of the 16-bit CRC register
Different positions or positions, put the results in the CRC register;
(3) Move the content of the CRC register to one right (toward the low) to fill the highest position with 0, and check the displacement after the right shift;
(4) If displacement is 0: repeat step 3 (move one bit right again); if displacement is 1: CRC register and multiple items
Formula A001 (10100000000000001);
(5) Repeat steps 3 and 4 until the right moves 8 times, so that the entire 8-bit data is processed;
(6) Repeat steps 2 to step 5 to process the next byte of the communication information frame;
(7) The high and low levels of the 16-bit CRC register obtained after calculating all the bytes of the communication information frame according to the above steps
Bytes for exchange;
(8) The final CRC register content is the CRC code.

3、Communication instances

Example 1: The host machine reads the output voltage and the output current display value

Message format sent by the host:

Host sent	Byte number	Send the message	remarks
From the machine address	1	01	Send to the with address 01
FC	1	03	Read the register
Register start address	2	0002H	Register start address
Number of register addresses	2	0002H	There are 2 bytes in total
CRC a sign or object indicating number	2	65CBH	The CRC codes are calculated by the host

For example, if the current display value is 05.00V,1.500A, the message format returned by the slave response:

From the machine response	Byte number	The information returned	remarks
From the machine address	1	01	From the machine 01
FC	1	03	Read the register
Number of read bytes	1	04	A total of 1 byte
Address is the contents of the 0002H register	2	01F4H	Output voltage display value
Address is the contents of the 0003H register	2	05DCH	Output current display value
CRC a sign or object indicating number	2	B8F4H	The CRC code is calculated by the slave machine

Example 2: The host machine should set the voltage to 24.00V

Message format sent by the host:

Host sent	Byte number	Send the message	remarks
From the machine address	1	01H	From the machine 01
FC	1	06H	Write a single register
Register address	2	0000H	Register address
Address is the contents of the 0000H register	2	0960H	Set the output voltage value
CRC a sign or object indicating number	2	8FB2H	The CRC codes are calculated by the host

Message format of the response returned after receiving from the machine:

From the machine response	Byte number	The information returned	remarks
From the machine address	1	01H	Send to the with address 01
FC	1	06H	Write a single

			register
Register address	2	0000H	Register start address
Address is the contents of the 0000H register	2	0960H	Set the output voltage value
CRC a sign or object indicating number	2	8FB2H	The CRC code is calculated by the slave machine

address			address 01
FC	1	10H	Write register
Register start address	2	0000H	Register start address
Number of register addresses	2	0002H	There are 2 bytes in total
CRC a sign or object indicating number	2	41C8H	The CRC code is calculated by the slave machine

Example 3: The host should set the voltage of 24.00V and the current of 15.00A.

Message format sent by the host:

Host sent	Byte number	Send the message	remarks
From the machine address	1	01H	From the machine 01
FC	1	10H	Write register
Register start address	2	0000H	Register start address
Number of register addresses	2	0002H	There are 2 bytes in total
Write the number of bytes	1	04H	A total of 1 byte
Address is the contents of the 0000H register	2	0960H	Set the output voltage value
Address is the contents of the 0001H register	2	05DCH	Set the output current value
CRC a sign or object indicating number	2	F2E4H	The CRC codes are calculated by the host

Message format of the response returned after receiving from the machine:

From the machine response	Byte number	The information returned	remarks
From the machine	1	01H	Send to the with