

Bus type stepper motor driver

EC-57

Serial port download communication instruction manual V1.0

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1. Communication function

1.1 Basic communication parameters

surface1.1 Basic communication parameters

Basic communication parameters	describe
Hardware Interface	UART
Baud rate	9600
Communication Protocol	MODBUS-RTU
Check digit	NO(default)
Stop bits	1 Bit (default)
Data bits	8Bit
Number of devices	1 individual

1.2 MODBUS Register address definition

Table 1.2 Register address definition table

index	Sub-index	name	illustrate	type	property	default value	scope
2000	0	Slave Address	EC address, serial port address is fixed to 0x01	UINT16_t	R/W/S	1	0~65535
2001	0	Slave address source	0: From the dial switch 1: Derived from 2150h 2: From ESC EEPROM	UINT16_t	R/W/S	0	0~1
2002	0	Motor running direction	0: The motor running direction remains unchanged 1: Motor direction is reversed	UINT16_t	R/W/S	0	0~1
2003	1	Loading machine current reduction time	After stopping operation, nms reduces current	UINT16_t	R/W/S	50	10~3000

	2	Lock machine current reduction percentage	Stop the current of the lock machine	UINT16_t	R/W/S	50	0~100
2004	0	Peak current		UINT16_t	R/W/S	1000	100~7000
2005	0	Segment settings	Number of pulses required for one revolution	UINT16_t	R/W/S	1000	6400~51200
2006	0	Disable mode setting	0: Do not lock the machine when disabled 1: Lock the machine when disabled	UINT16_t	R/W/S	0	0~1
2007	0	Current loop self-regulation enabled	Current loop PI power-on automatic tuning function: 0: Disable 1: Enable	UINT16_t	R/W/S	1	0~1
2008	0	Current loop KP	When auto-tuning is enabled, this item is read-only; When disabled, users can rewrite	UINT16_t	R/W/S	300	50~32767
2009	0	Current loop KI	When auto-tuning is enabled, this item is read-only; When disabled, users can rewrite	UINT16_t	R/W/S	30	10~2000
200a	0	Current loop Kc	Automatically acquired, no modification by customers allowed	UINT16_t	R/S	75	0~32767
200b	0	Soft start time		UINT16_t	R/W/S	0	10~3000
200c	0	Soft start enable	0: Disable, 1: Enable	UINT16_t	R/W/S	0	0~1
200d	0	Bus voltage		UINT16_t	R	0	0~65535
200e	0	Out-of-tolerance alarm enable	0: Do not detect out-of-tolerance alarm 1: Detect out-of-tolerance and alarm	UINT16_t	R/W/S	0	0~1
200f	0	Out-of-tolerance angle alarm	Out of tolerance x° alarm	UINT16_t	R/W/S	0	0~360
2010	0	Total number of external positions H	The accumulated value of the received position command is 16 bits high	UINT16_t	R	0	0~65535
2011	0	Total number of external locations L	The accumulated value of the received position command is lower 16 bits ; Write: Writing 1 clears the counter	UINT16_t	R/W	0	0~65535
2012	0	Speed limit	r/min	UINT16_t	R/W	1600	0~3000

2013	0	Automatic movement after power on	0: Normal standby after power-on; 1: After power on, the motor rotates 30 degrees forward and then reverses 15 degrees, then standby	UINT16_t	R/W/S	0	0~1
2014	0	Input IO status	(bit0 corresponds to out1)	UINT16_t	R	0	0~65535
2015	0	FIR filter enable	0: No filtering, 1: Filtering	UINT16_t	R/W/S	0	0~1
2016	0	FIR filter time constant		UINT16_t	R/W/S	1000	50~25600
2017	0	Speed reference		UINT16_t	R	0	0~32767
2018	0	Position error	The difference between the encoder position and the command position	INT16_t	R/W/S	1000	- 32768~32767
2019	0	Open/Closed Loop Selection	Open or closed loop selection: 0: Open loop mode 1: Closed loop mode	UINT16_t	R/W/S	0	0~1
201a	1	Driver software version		UINT16_t	R	1	0~32767
	2	Hardware version	none	UINT16_t	R	0	0~32767
	3	Bus level software version		UINT16_t	R	1	0~32767
201b	0	Fault detection selection	Software detection fault selection bit: 1: Enable. 0: Disable this fault detection bit0: overcurrent bit1: overvoltage bit2: EEPROM bit3: Command overspeed bit11: op amp failure	UINT16_t	R/W/S	0xc3	0~65535
201c	1	Fault List 1	The most recent alarm record, the others are historical alarms Record	UINT16_t	R/W/S	0	0~65535
	2	Fault List 2		UINT16_t	R/W/S	0	0~65535
	3	Fault List 3		UINT16_t	R/W/S	0	0~65535
	4	Fault List 4		UINT16_t	R/W/S	0	0~65535
	5	Fault List 5		UINT16_t	R/W/S	0	0~65535
	6	Fault List 6		UINT16_t	R/W/S	0	0~65535

	7	Fault List 7		UINT16_t	R/W/S	0	0~65535
	8	Fault List 8		UINT16_t	R/W/S	0	0~65535
	9	Fault List 9		UINT16_t	R/W/S	0	0~65535
201d	0	Clear fault log	0: Do not clear, 1: Clear historical alarms	UINT16_t	R/W	0	0~1
201e	0	Clear current alarm	0: Do not clear, 1: Clear alarm	UINT16_t	R/W	0	0~1
201f	0	Motor does not move code	23: Current mode is not supported 30: Command overspeed	UINT16_t	R	0	0~32767
2020	0	Mode 1 in place selection	0: Planning is completed and in place 10: The arrival signal comes from the driver	UINT16_t	R/W/S	0	0~32767
2021	0	Input digital IO port level Sexual configuration	0: No change 1: Invert (bit0 corresponds to out1)	UINT16_t	R/W/S	0	0~1
2022	1	Input digital IO port 1 function choose	1: origin signal 2: positive limit 4: Negative limit 8: Quick stop 16 custom; 32: probe1 function 64: probe2 function	UINT16_t	R/W/S	32	0~255
	2	Input digital IO port 2 function choose	1: origin signal 2: positive limit 4: Negative limit 8: Quick stop 16 custom; 32: probe1 function 64: probe2 function	UINT16_t	R/W/S	1	0~255
	3	Input digital IO port 3 function choose	1: origin signal 2: positive limit 4: Negative limit 8: Quick stop 16 custom; 32: probe1 function	UINT16_t	R/W/S	2	0~255
	4	Input digital IO port 4 function choose	1: origin signal 2: positive limit 4: Negative limit 8: Quick stop 16 custom; 32: probe1 function	UINT16_t	R/W/S	4	0~255

	5	Input digital IO port 5 function choose	1: origin signal 2: positive limit 4: Negative limit 8: Quick stop 16 custom; 32: probe1 function	UINT16_t	R/W/S	16	0~255
2023	1	Input digital IO port 1 filter time		UINT16_t	R/W/S	1000	50~60000
	2	Input digital IO port 2 filter time		UINT16_t	R/W/S	1000	50~60001
	3	Input digital IO port 3 filter time		UINT16_t	R/W/S	1000	50~60002
	4	Input digital IO port 4 filter time		UINT16_t	R/W/S	1000	50~60003
	5	Input digital IO port 5 filter time		UINT16_t	R/W/S	1000	50~60004
2024	0	Output polarity configuration	bit0-2 controls the output polarity of out1-3 , 0 low level; 1 high level	UINT16_t	R/W/S	0	0~1
2025	1	Output port 1 function settings	bit0: alarm output (default) bit1: Output in place bit4: Master control output	UINT16_t	R/W/S	1	0~255
	2	Output port 2 function settings	bit0: alarm output (default) bit1: Output in place bit4: Master control output	UINT16_t	R/W/S	1	0~255
	3	Output port 3 function settings	bit0: alarm output (default) bit1: Output in place bit4: Master control output	UINT16_t	R/W/S	4	0~255
2030	0	Save/Restore Manufacturer parameters	bit0: save factory parameters bit1: Restore factory parameters to factory settings Note: Only used for serial port download parameters	UINT16_t	W/S	0	0~255

1.3 MODBUS Common function codes

1.3.1 Read Holding Register Command 03

(1) Master->Slave data:

01 03 2000 00 0001 4B F4

Device address Function code Register address Sub-address Read register number CRCcheck

The host sends a maximum speed register query command to the slave.

Slave->Master data:

01 03 02 0001 7984

Device Address Function code Returns the number of bytes Register Value CRCcheck

(2) Other examples of read holding register commands are as follows:

Master->Slave data: 01 03 20 00 00 00 04 8B F7

Slave->Master data: 01 03 08 0001 0002 0000 01 f4 fc

Note: The maximum number of queries cannot exceed 16 registers.

1.3.2 Write Single Register Command 06

(1) Master->Slave data:

01 06 2005 00 27 10 90 91

Device Address Function Code Register Address Sub-Address Writing Data CRCcheck

After receiving the command, the slave returns the same command for confirmation.

Slave->Master data:

01 06 2005 00 27 10 90 91

Device Address Function Code Register Address Sub-Address Writing Data CRCcheck

(2) Other examples of writing a single register command are as follows:

Master->Slave data:01 06 20 30 00 00 01 44 A1

Slave->Master data:01 06 20 30 00 00 01 44 A1

Master->Slave data:01 06 20 03 01 00 32 5A 30

Slave->Master data:01 06 20 03 01 00 32 5A 30

1.3.3 Write multiple registers command

(1) An example of a command to write multiple registers is as follows:

01 10 2000 00 0002 04 0001 0001 AC 49

Address Function Code Starting Address Sub-address Write Number Bytes Write Content Write Content CRC Check

After receiving the command, the slave returns the same command for confirmation.

Slave->Master data:

01 10 2000 00 0002 0956

Address function code starting address sub-address write number CRC Check

1.3.4 Communication error code

(1) CRC Verification Error:

If an error occurs during data transmission, the slave device calculates the value of a frame of data.CRCChecksum

Not for 85 C0, the slave discards this frame of data and does not return any data.

Master->Slave data:01 03 20 00 00 00 01 4BF3

Slave->Master data:01 83 01 80 F0

(2) Instruction code error:

If the function code requested by the host is not 03 or 06, the device returns the exception code 01.

Please refer to Table 1.3 for details.

Master->Slave Data: 01 02 00 00 00 00 04 0B E1

Slave->Host data: 01 82 02 C1 61

(3) Out of address range

Master->Slave data: 01 03 20 31 00 00 01 45 08

Slave->Master data: 01 83 03 01 31

Register address 0x2031 exceeds the register address definition range. The device returns an exception code

Code 03.

(4) Read address overflow:

If the host requests more data than can be read at one time, the device returns an exception code

04. Exception code 04 For details, please refer to Table 1.3.

Master->Slave data: 01 03 20 00 00 00 20 8B

Slave->Master data: 01 83 04 40 F3

Reading 32 data at a time exceeds the range and returns exception code 04

(5) Illegal reading and writing errors

Function code read and write attributes are divided into three types: read-only, write-only, and read-write.

The operation reports exception code 05.

Master->Slave Data: 01 03 20 30 00 00 01 44 F4

Slave->Master data: 01 83 05 81 33

Function code 0x2030 is a write-only function code, and its read operation will report exception code 05.

(6) Error in writing content

The content of the written function code exceeds its specified range.

Master->Slave data: 01 06 20 01 00 00 08 8A 5B

Slave->Host data: 01 86 06 C2 62

If the write function code is out of range, the exception code 06 is returned.

surface1.3 MODBUSException code

Code	name	meaning
01	CRCVerification Error	CRCVerification error.
02	Instruction code error	The slave receives03,06,16Function codes other than .
03	Exceeded function code address	The received data address exceeds the function code range.
04	Read the number of function codes overflow	At most once read16function code.
05	Illegal reading and writing of function code mistake	Function code read and write attributes are divided into three types: read-only, write-only, and read-write.

		An abnormal property operation error occurred.
06	Function code write content mistake	Write data beyond the specified range to the function code

2. Version Revision History

Version Number	illustrate	time
V1.0	Initial release	2018.10.18