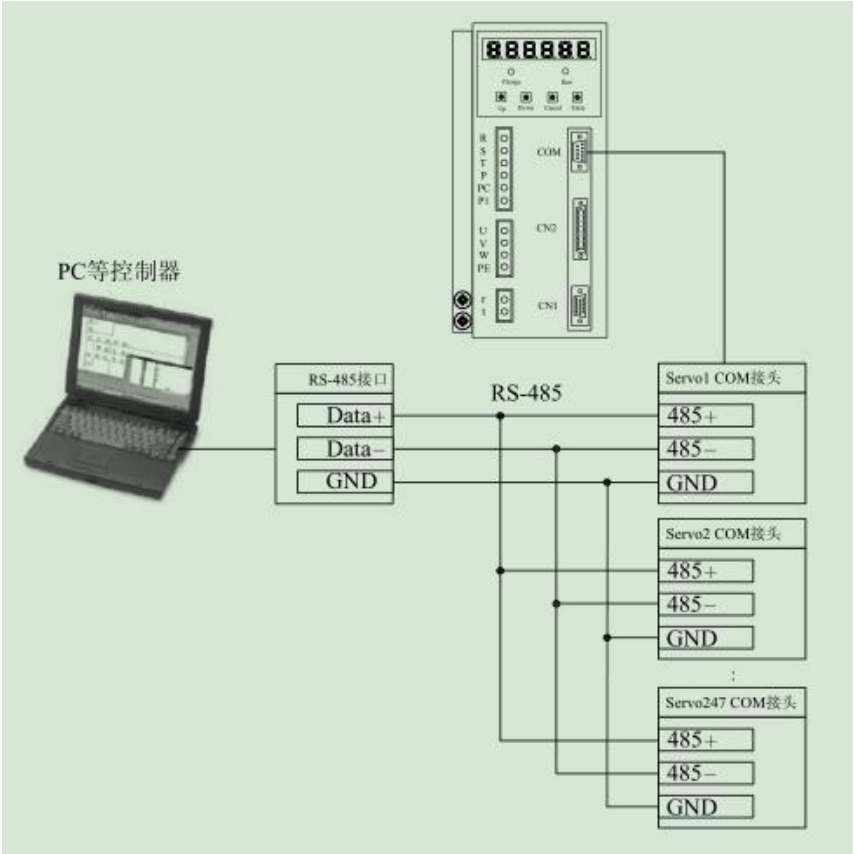
One. Hardware connection

Drive debugging software communication description

Servo drive through RS-485 serial communication interface and host computer connection, using modbus communication agreement and host computer for data exchange, can achieve read, modify the parameters of the servo drive, monitor the status of the servo system and other functions. The wiring description is as follows:



two Modbus Communication Protocol 1. Communication Settings

Before communication, the driver and communication-related parameters should be set in advance. The host computer will communicate with the driver according to the corresponding communication setting parameters.

Paramet	Parameter	Parameter	Defaul	Parameter
PA80	Communication	1 to 63	1	
PA81	Communication baud rate	0 ~ 10	2	0:48,00bps 1:9,600Bps 2:19,200bps 3:38 400bps 10:9,[illegible]
PA82	Communication check bit	0 to 2	0	0: parity check 1: parity

2. Data frame format

3.

Our drive ModBus communication adopts RTU mode, the sent characters are expressed in hexadecimal number. The frame format of the body is defined as follows:

Substat	Functio	data	CRC check code
1 byte	1 byte	N bytes	2 bytes, low bytes

Where, the data format (11 bits) when each byte is transmitted is as follows:

Startin	Data	Parity bits	Stop bit
1 bit	8	0 bit (no check), 1 bit (odd or even	2 bits (no check), 1 bit

Data is sent with low in front and high in back. **3. Read and write the drive parameters**

(1) Parameter readout (multiple parameters can be read continuously) request:

Substati	Function	Starting		Number of		CRC check code	
1 byte	1 byte	2 bytes		2 bytes		2 bytes	
Drive Station	0x03	High byte	Low bytes	High byte	Low bytes	Low byte	High bytes

Response:

Substati	Function	Register bytes		Register			CRC check code	
1 byte	1 byte	1 byte		N*2 bytes			2 bytes	
Drive Station	0x03	High byte	Low bytes	High word	Low word	.	Low byte	High bytes

(2) Write request for arguments:

Substati	Function	Starting		Register		CRC check code	
1 byte	1 byte	2 bytes		2 bytes		2 bytes	
Drive Station	0x06	High byte	Low bytes	High bytes	Low bytes	Low byte	High bytes

Response:

Substati	Function	Starting		Register		CRC check code	
1 byte	1 byte	2 bytes		2 bytes		2 bytes	
Drive Station	0x06	High byte	Low bytes	High bytes	Low byte	Low byte	High bytes

Three. Parameter Description

(1) Control parameters (0x0000 ~ 0x0FFF)

Communications	Read and	Parameter names	Parameter	Default value	Parameter units
0x0000	RW	Parameter password	PA0	315	*
0x0001	RW	Model code	PA1	50	*
0x0002	RO	Software version	PA2	082200	*
0x0003	RW	Initial status display	PA3	0	*
0x0004	RW	Control mode selection	PA4	0	*
0x0005	RW	Speed loop proportional gain	PA5	150	rad/s
0x0006	RW	Velocity loop integral time constant	PA6	200	0.1 ms
0x0007	RW	Torque instruction filter time constant	PA7	40	0.01 ms
0x0008	RW	Velocity feedback filter time constant	PA8	30	0.01 ms
0x0009	RW	Position loop proportional gain	PA9	40	1/s
0x000A	RW	Position feedforward gain	PA10	0	%
0x000B	RW	Position feedforward filter cutoff frequency	PA11	300	Hz
0x000C	RW	Position instruction pulse divider molecule	PA12	1	*
0x000D	RW	Position instruction pulse divider denominator	PA13	1	*
0x000E	RW	Position instruction pulse input method	PA14	0	*
0x000F	RW	Position instruction pulse direction	PA15	0	*
0x0010	RW	Locate finish range	PA16	20	Pulse
0x0011	RW	Location out-of-range detection	PA17	400	*100 pulses
0x0012	RW	Position out-of-sync detected or not	PA18	0	*
0x0013	RW	Position instruction Smooth filtering	PA19	0	0.1 mS
0x0014	RW	Invalid drive disable input	PA20	1	*
0x0015	RW	JOG running speed	PA21	120	r/min
0x0016	RW	Inner and outer speed selection	PA22	1	*

0x0017	RW	Maximum speed limit	PA23	3000	r/min
0x0018	RW	Internal Speed 1	PA24	0	r/min
0x0019	RW	Internal speed 2/ Zero current	PA25	100	r/min
0x001A	RW	Internal Speed 3	PA26	300	r/min
0x001B	RW	Internal speed 4	PA27	- 100.	r/min
0x001C	RW	Arrival speed	PA28	5	r/min
0x001D	RW	Analog torque instruction input gain	PA29	50	0.1 V / 100%
0x001E	RW	User torque overload alarm value	PA30	200	%
0x001F	RW	Torque overload detection time	PA31	0	mS
0x0020	RW	Control mode switching allowed	PA32	0	*
0x0021	RW	Torque instruction direction reversed	PA33	0	*
0x0022	RW	Internal CCW torque limit	PA34	300	*
0x0023	RW	Internal CW torque limit	PA35	- 300.	*
0x0024	RW	Instruction pulse signal filtering coefficient	PA36	1	*
0x0025	RW	Instruction direction signal filtering coefficient	PA37	0	*
0x0026	RW	External torque limits	PA38	100	%
0x0027	RW	Analog torque instruction zero drift compensation	PA39	0	Numeric amount
0x0028	RW	Acceleration time constant	PA40	100	mS
0x0029	RW	Deceleration time constant	PA41	100	mS
0x002A	RW	Multi-function terminal switching	PA42	0001	Binary
0x002B	RW	Analog speed Instruction input gain	PA43	300	r/min/ V
0x002C	RW	Analog speed instruction direction reversed	PA44	0	*
0x002D	RW	Analog quantity speed instruction zero drift	PA45	0	Numeric amount
0x002E	RW	Analog speed instruction filter	PA46	300	Hz
0x002F	RW	Lock delay on-setting when the motor is enabled	PA47	80	×10mS
0x0030	RW	Enable the delay off setting when the motor is shut off	PA48	0	×10mS
0x0031	RW	Analog voltage threshold value speed control	PA49	0	r/min
0x0032	RW	Speed limit when torque is controlled	PA50	2500	r/min

0x0033	RW	Dynamic electronic gear	PA51	0	*
0x0034	RW	Second position instruction pulse divider molecule	PA52	1	*
0x0035	RW	Low 4-bit input terminals force ON input	PA53	0000	Binary
0x0036	RW	High 4-bit input terminals force ON input	PA54	0000	Binary
0x0037	RW	The lower 4-bit input terminal is reversed logically	PA55	0000	Binary
0x0038	RW	The higher four input terminals are reversed	PA56	0000	Binary
0x0039	RW	Output terminal logic invert	PA57	0010	Binary
0x003A	RW	Time Settings for Demo Mode 2	PA58	600	0.1 S
0x003B	RW	Presentation Mode selection	PA59	0	*
0x003C	RW	Current loop proportional gain	PA60	600	*
0x003D	RW	Current loop integral time constant	PA61	10	*
0x003E	RW	Reserved	PA62	10	*
0x003F	RW	Encoder zero offset	PA63	160	Pulse
0x0040	RW	Number of motor poles	PA64	4	*
0x0041	RW	Incremental encoder wire count	PA65	2500	Pulse
0x0042	RW	Encoder type of choice	PA66	0	*
0x0043	RW	Motor current rating	PA67	100	0.1 A
0x0044	RW	Moment of inertia ratio	PA68	100	*
0x0045	RW	Demo mode speed limit	PA69	2000	r/min
0x0046	RW	Drive feedback pulse output	PA70	10000	Pulse
0x0047	RW	Pulse output direction selection	PA71	0	*
0x0048	RW	Pulse output molecule	PA72	1	*
0x0049	RW	Pulse output denominator	PA73	1	*
0x004A	RW	Receive pulse frequency doubling switch	PA74	0	*
0x004B	RW	Full closed loop feedback low resolution	PA75	0	Pulse
0x004C	RW	Full closed loop feedback high resolution	PA76	0	Pulse
0x004D	RW	Second code dial feedback input direction selection	PA77	0	*
0x004E	RW	Sync position error alarm threshold	PA78	100	Pulse
0x004F	RW	Full closed loop feature selection	PA79	1	*

0x0050	RW	485 Address of the communication station	PA80	1	*
0x0051	RW	485 Communication baud rate	PA81	2	*
0x0052	RW	485 Communication parity selection	PA82	0	*
0x0053	RW	Reserved	PA83	0	
0x0054	RW	Shield battery 0#Alarm	PA84	0	*
0x0055	RW	3Allow alarm 3	PA85	0	
0x0056	RW	Torque control when torque reaches detection time	PA86	5	1ms
0x0057	RW	Torque control when torque reaches the detection torque	PA87	5	0.1 A
0x0058	RW	Parameter save	PA88	0	*
0x0059	RO	FPGA software version	PA89	2008	*
0x005A	RO	Encoder 16 bits low return value	PA90	0	decimal
0x005B	RO	Encoder cycle value is 16 bits higher	PA91	0	decimal
0x005C	RO	Encoder multi-turn value low 16-bit value	PA92	0	decimal
0x005D	RW	Speed proportional gain scaling factor	PA93	100	Decimal
0x005E	RW	Current proportional gain scaling factor	PA94	100	Decimal
0x005F	RO	Revolution monitoring	PA95	0	rpm
0x0060	RO	Current monitor	PA96	0	0.1 A
0x0061	RO	Alarm code Monitoring	PA97	0	decimal
0x0062	RW	Current integration time constant scaling factor	PA98	100	Decimal
0x0063	RW	Reset battery loss alarm number 0	PA99	0	*
PE group parameters					
0x0064	RO	Reserved	PE0	0	
0x0065	RO	Reserved	PE1	332	0.1 V
0x0066	RO	Reserved	PE2	171	0.01 mH
0x0067	RO	Reserved	PE3	171	0.01 mH
0x0068	RO	Reserved	PE4	38	0.01 Ω
0x0069	RO	Reserved	PE5	453	0.01 ms
0x006A	RO	Reserved	PE6	1111	10-6Kgm2
0x006B	RO	reserve	PE7	640	0.01 Nm

0x006C	RO	Reserved	PE8	0	
0x006D	RO	Reserved	PE9	0	
0x006E	RW	Notch function switch	PE10	0000	Binary
0x006F	RW	Notch automatic adjustment switch	PE11	0101	Binary
0x0070	RW	Segment 1notch filter frequency	PE12	0	Hz
0x0071	RW	Segment 1notch filter quality factor	PE13	80	0.01
0x0072	RW	Segment 1Notch depth	PE14	0	0.001
0x0073	RW	Segment 2notch filter frequency	PE15	0	Hz
0x0074	RW	Segment 2notch filter quality factor	PE16	80	0.01
0x0075	RW	Segment 2notch depth	PE17	0	0.001
0x0076	RW	Automatic trap velocity deviation threshold	PE18	50	rpm
0x0077	RW	Reserved	PE19		
0x0078	RW	Reserved	PE20		
0x0079	RW	Reserved	PE21		
0x007A	RW	Reserved	PE22		
0x007B	RW	Reserved	PE23		
0x007C	RW	Reserved	PE24		
0x007D	RW	Reserved	PE25		
0x007E	RW	Reserved	PE26		
0x007F	RW	Reserved	PE27		
0x0080	RW	Reserved	PE28		
0x0081	RW	Reserved	PE29		
0x0082	RW	Reserved	PE30		
0x0083	RW	Reserved	PE31		
0x0084	RW	Reserved	PE32		
0x0085	RW	Reserved	PE33		
0x0086	RW	Reserved	PE34		
0x0087	RW	Suppression filter suppression frequency	PE35	150	Hz
0x0088	RW	Suppression gain of the suppression filter	PE36	100	%

0x0089	RW	Damping coefficient of damping filter	PE37	0	%
0x008A	RW	Vibration suppression filter time compensation value1	PE38	0	0.01 ms
0x008B	RW	Vibration suppression filter time compensation value2	PE39	0	0.01 ms
0x008C	RW	Speed observation and friction compensation function	PE40	0	
0x008D	RW	Friction compensation gain	PE41	100	%
0x008E	RW	reserve	PE42	100	%
0x008F	RW	Friction compensation coefficient	PE43	0	%
0x0090	RW	Friction compensation frequency compensation value	PE44	0	0.1 Hz
0x0091	RW	Friction compensation gain compensation value	PE45	100	%
0x0092	RW	Speed observer gain	PE46	40	Hz
0x0093	RW	Speed observer gain compensation value	PE47	150	%
0x0094	RW	Reserved	PE48		
0x0095	RW	Reserved	PE49		
0x0096	RW	Number of motor running cycles during inertia	PE50	30	0.1 turn
0x0097	RW	Motor operating speed during inertia identification	PE51	1000	r/min
0x0098	RW	Motor acceleration during inertia identification	PE52	10	r/min/1ms
0x0099	RW	Inertia identification run pause time	PE53	0	0.01 S
0x009A	RW	Initial moment of inertia ratio for inertia	PE54	200	%
0x009B	RW	Velocity loop proportional gain in inertia	PE55	150	rad/s
0x009C	RW	Velocity loop integral time constant when inertia is	PE56	200	0.1 ms
0x009D	RW	Position feedforward gain in inertia identification	PE57	100	%
0x009E	RW	Velocity deviation threshold for inertia identification	PE58	500	rpm
0x009F	RW	Inertia identification position loop proportional	PE59	40	1/s
PF group parameters					
0x00A0	RW	Motor voltage	PF0	0	0-220V 1-380V
0x00A1	RW	Motor rating	PF1	0	0.01 Kw
0x00A2	RW	Motor current rating	PF2	0	0.01 A
0x00A3	RW	Motor torque rating	PF3	0	0.01 Nm

0x00A4	RW	Maximum torque of the motor	PF4	0	0.01 Nm
0x00A5	RW	Motor speed rating	PF5	0	1rpm
0x00A6	RW	Maximum motor speed	PF6	0	1rpm
0x00A7	RW	Motor moment of inertia	PF7	0	10-6Kgm2
0x00A8	RW	Number of magnetic poles of the motor	PF8	0	
0x00A9	RW	Motor phase resistance	PF9	0	0.01 Ω
0x00AA	RW	Motor D-axis inductance	PF10	0	0.01 mH
0x00AB	RW	Q-axis inductance for motor	PF11	0	0.01 mH
0x00AC	RW	Back electromotive force constant of motor	PF12	0	0.01 V/Krpm
0x00AD	RW	Motor torque constant	PF13	0	0.001 Nm/A
0x00AE	RW	Electrical time constant of motor	PF14	0	0.01 ms
0x00AF	RW	Motor mechanical time constant	PF15	0	0.01 ms
0x00B0	RW	Motor zero offset low 16 bits	PF16	0	
0x00B1	RW	Motor zero offset 16 bits higher	PF17	0	
0x00B2	RW	Motor encoder type	PF18	0	
0x00B3	RW	Motor encoder line count low 16 bits	PF19	0	
0x00B4	RW	Motor encoder line number low high	PF20	0	
0x00B5	RW	Motor encoder data write control word	PF21	0	

Note:

1. RW indicates that the parameter can be read and written, RO indicates that the parameter is read-only;

2. The parameters of address 0x0000 ~ 0x0063 correspond to drive parameters PA0~PA99; The parameters of address 0x0064 ~ 0x009F correspond to drive parameters PE0~PE59;

   For the servo shaft, the parameters of addresses 0x00A0 ~ 0x00E5 correspond to drive parameters PF0~PF69; Before reading the parameters, it is necessary to read the parameter 0x1000, judge the shaft type, and then display the parameter name corresponding to the part of the parameters;