Ningbo Longwell Electric Technology CO.,LTD

Yuyao,Zhejiang Province,China 315400

Phone: 86 574 6218 9863

Fax: 86 574 6218 9863

sales@zjlongwell.com

www.longwellfans.com

Communication format

1.1 UART parameters

Start bit：1 bit

Data bits：8 bit

Parity completion：1 bit （Even parity）

Stop bit：1 bit

1.2 Baud rate:

The factory default baud rate is 9600, which can be set

1.3 Frame Checking

A checksum CRC 16 is formed across the entire telegram

1.4 Protocol frame

Host to slave：

Addresscode	Cmdcode	Date	16CRCL	16CRCH

Slave to host：

1) When reading or writing does not hold the register correctly

Addresscode	Cmdcode	Date	16CRCL	16CRCH

2) When setting out of range or holding register setting error, register address error (frame length: 5)

Addresscode	Cmdcode	exception code	16CRCL	16CRCH

3) Keep register Settings correct (frame length: 5)

Addresscode	Cmdcode	Correct code	16CRCL	16CRCH

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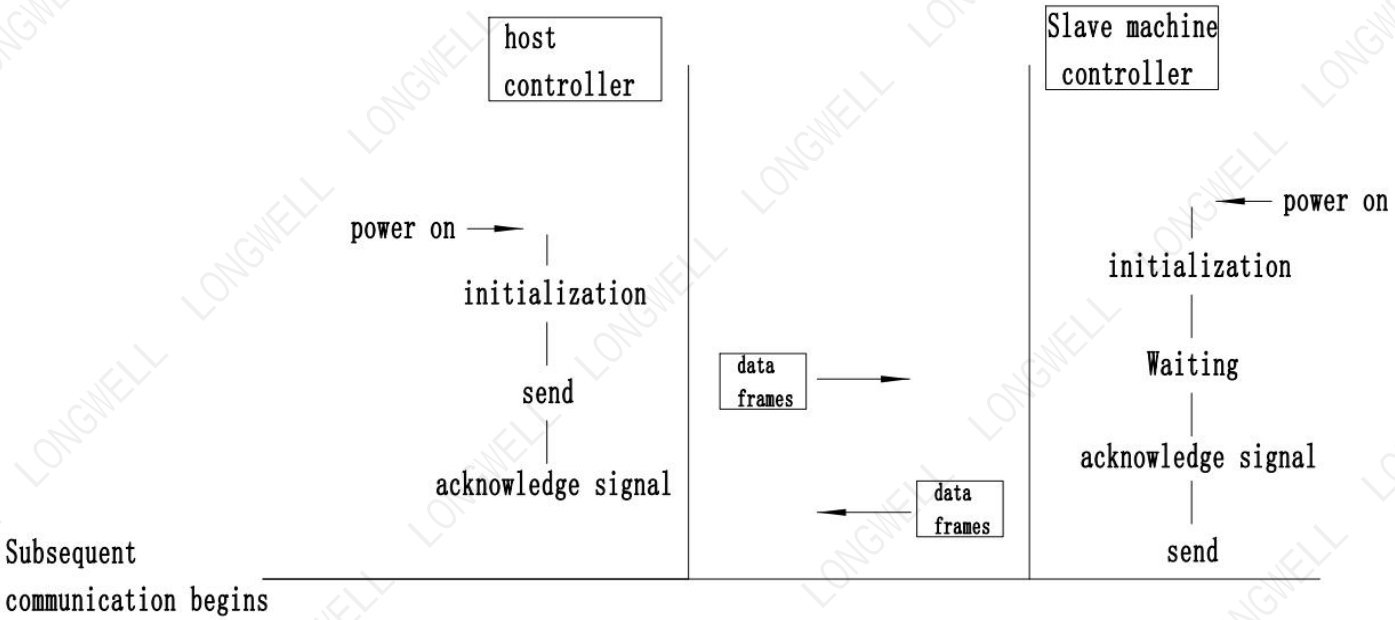
Communication timing

2.1 The DC fan motor drive module is the slave controller (hereinafter referred to as the slave controller). If the slave controller completes the power-on reset and initialization before the host controller (hereinafter referred to as the host controller), the slave will be in the communication waiting state until it correctly receives the first data frame sent from the host, and then the slave will send data to the host.



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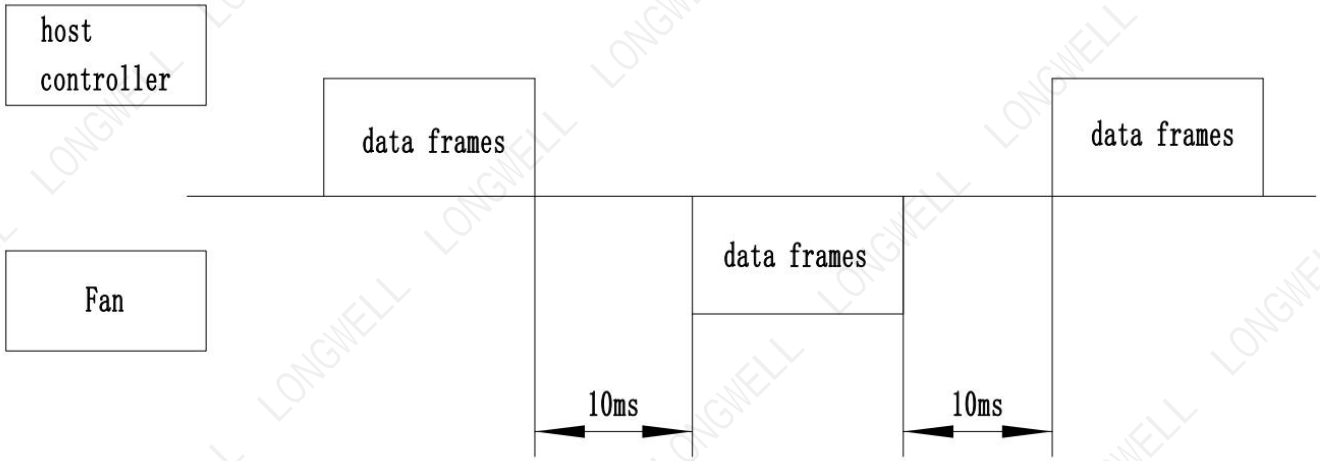
2.2 The slave at the specified address responds 10ms after receiving the host data correctly.



2.3 Unicast mode

The master addresses an individual slave. After receiving and processing the request, the slave returns a message (a 'reply') to the master .In this mode, a MODBUS transaction consists of 2 messages : a request from the master, and a reply from the slave.Each slave must have an unique address (from 1 to 247) so that it can be addressed independently from other nodes. The factory default address is 0x81.

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2.4 Broadcast mode

The master can send a request to all slaves. No response is returned to broadcast requests sent by the master. The broadcast requests are necessarily writing commands. Partial registers of alldevices must accept the broadcast for writing function. The address '0x00' is reserved to identify a broadcast exchange.

Note:

When a broadcast request is sent , no response is returned from the slaves. Nevertheless a delay (about 10mS) is respected by the Master in order to allow any slave to process the current request before sending a new one.

2.5 Conditions to be followed for communication data

Data sent from the machine to the host must comply with the following conditions. All conditions must be met. No The slave machine does not send data to the host and the host does not receive data from the slave machine.

1）Address code and verification code are recognized by the slave and host.

2）The checksum calculated from all the data is equal to the value of the checkbits, the last two in the data frame Bytes.

3）The instructions of the fan must be set within the specified range to be valid.

Communication protocol

3.1 Function Code

0X03 : Read holding register

The content of holding registers can be read out with this command.

0X04 ： Read input register

The content of input and state registers and fault code can be read out with this command.

0X06 ： Write single or holding register

The content of one holding register or signle register can be written with this command.

Annotation：The deposit not listed in this manual shall not be used in order to avoid anomalies.

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Communication protocol -Feedback code

3.2 Correct code

Format：

Addresscode	Cmdcode	Correct code	CRCL	CRCH

Example；

81 06 00 22 48

81 04 00 23 28

81 03 00 21 18

3.3 Exception code

Format：

Addresscode	Cmdcode	Exception code	CRCL	CRCH

Example；

81 06 01 E3 88　81 04 01 E2 E6　81 03 01 E0 D8

81 06 02 A3 89　81 04 02 A2 E9　81 04 02 A0 D9

Exception code：0X01　false command

0X02　The set point is out of range

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Communication protocol -CRC Generation

3.4 A procedure for generating a CRC:

1. Load a 16– bit register with FFFF [HEX] (all 1 ’s). Call this the CRC register.
2. Exclusive OR the first 8– bit byte of the message with the low–order byte of the 16– bit CRC register, putting the result in theCRC register.
3. Shift the CRC register one bit to the right (toward the LSB), zero–filling the MSB. Extract and examine the LSB.
4. (If the LSB was 0): Repeat Step 3 (another shift).(If the LSB was 1): Exclusive OR the CRC register with the polynomial value 0xA001 (1010 0000 0000 0001).
5. Repeat Steps 3 and 4 until 8 shifts have been performed. When this is done, a complete 8– bit byte will have beenprocessed.
6. Repeat Steps 2 through 5 for the next 8– bit byte of the message. Continue doing this until all bytes have been processed.
7. The final content of the CRC register is the CRC value.
8. When the CRC is placed into the message, its upper and lower

3.5 Fault relay feedback

1) When the motor is in normal operation or in normal standby, the relay is normally open.

2) When the motor fails, the relay closes.

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number	function command	Addresscode	command code	Register address		Data (hexadecimal)MSB First		CRCL	CRCH	remarks
1	Setting of speed regulation mode	0X81	0X06	0XD1	0X0F	0X00	0X00	0X9F	0X35	0x00 0X00 : 0- 10V /PWM; 0x00 0X02 : Modbus ; Factory default 0x00 0X02: Modbus;
2	Send speed command	0X81	0X06	0XD0	0X85	0X03	0XE8	0XBF	0X9D	Set1000 rpm; 0X03E8 = 100rpm , That is, set the speed as1000rpm send: 81 06 d0 85 03 e8 bf 9d Back: 81 06 d0 85 03 e8 bf 9d
3	Address setting	0X81	0X06	0XD1	0X0A	0X00	0X01	0X4E	0XF4	Address setting 81 06 d1 0a 00 01 4E F4 Address0X01; Address setting range: 1- 247
4	Baud rate setting	0X81	0X06	0XD1	0X09	0X00	0X00	0XFE	0XF5	Baud rate setting: 81 06 D1 09 00 02 FE F5 ; Address baud rate 9600 0x00 0X00 : 2400; 0x00 0X01 : 4800; 0x00 0X02 : 9600 0x00 0X03 : 14400; 0x00 0X04 : 19200 Baud rate setting range: 00 - 04 , Factory default 0x00 0X02 : 9600
5	Maximum speed limit setting	0X81	0X06	0XD1	0X88	0X08	0X56	0XA8	0XE2	0X0856 = 2134rpm , That is, the maximum speed is set as2134rpm Maximum speed setting 81 06 D1 88 08 56 A8 E2
6	Minimum speed limit setting	0X81	0X06	0XD1	0X8B	0X02	0XBC	0XDF	0XCD	0X02BC= 700rpm , That is, the minimum speed is set as700rpm Minimum speed setting 81 06 d 1 8b 02 bc df cd , rotate speed700 rpm
7	Read the bus voltage	0X81	0X04	0XD0	0X01	0X00	0X00	0X86	0XCA	Send: 81 04 d0 01 00 00 86 CA feedback: 81 04 D0 01 01 6B C6 B5 0X016B = 363 , Represents the bus voltage as363VDC
8	Read the set speed	0X81	0X04	0XD0	0X02	0X00	0X00	0X76	0XCA	Send: 81 04 d0 02 00 00 76 CA feedback: 81 04 D0 02 02 BC 76 1B 0X02BC = 700 , Represents the current set speed is700rpm

number	function command	Addresscode	command code	Register address		Data (hexadecimal)MSB First		CRCL	CRCH	remarks
9	Reading the actual speed	0X81	0X04	0XD0	0X03	0X00	0X00	0X27	0X0A	Send: 81 04 d0 03 00 00 27 0A feedback: 81 04 D0 03 07 D0 24 A6 0X07D0 = 2000 , Represents the current actual rotational speed as2000rpm
10	Read the bus current	0X81	0X04	0XD0	0X04	0X00	0X00	0X96	0XCB	Send: 81 04 d0 04 00 00 96 CB feedback: 81 04 D0 04 00 10 97 07 0X0010 = 16 , Represents the current bus current AD value as;
11	Reading the fault code	0X81	0X04	0XD0	0X07	0X00	0X00	0X66	0XCB	Send: 81 04 d0 07 00 00 66 CB feedback: 81 04 D0 07 00 12 E6 C6 0X0100\0X0200\0X0800:hardware fault; 0X0001:Motor transient overcurrent or control system undervoltage protection; 0X0002:spectrum energy ; 0X0004:Motor blocking protection; 0X0008:thermal protection ; 0X0010:current Abnormity;
12	Read the NTC sensing temperature	0X81	0X04	0XD0	0X09	0X00	0X00	0X07	0X08	Send: 81 04 d0 09 00 00 07 08 feedback: 81 04 D0 09 03 9B 46 53 0X039B = 923(Ta) Use Ta according to the temperature corresponding table (page24), and look up the corresponding temperature value in the table (℃

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Temperature correspondence table

Temperature correspondence table													
T[℃]	Ta	T[℃]	Ta	T[℃]	Ta	T[℃]	Ta	T[℃]	Ta	T[℃]	Ta	T[℃]	Ta
-40	1022	-17	1014	6	987	29	913	52	764	75	554	98	351
-39	1022	-16	1013	7	985	30	909	53	756	76	545	99	343
-38	1021	-15	1013	8	983	31	904	54	748	77	535	100	336
-37	1021	-14	1012	9	981	32	898	55	739	78	526	101	328
-36	1021	-13	1011	10	978	33	893	56	731	79	516	102	321
-35	1021	-12	1010	11	976	34	888	57	722	80	507	103	314
-34	1021	-11	1010	12	973	35	882	58	713	81	498	104	307
-33	1020	-10	1009	13	971	36	877	59	704	82	488	105	300
-32	1020	-9	1008	14	968	37	871	60	695	83	479	106	293
-31	1020	-8	1007	15	965	38	865	61	686	84	470	107	286
-30	1020	-7	1006	16	963	39	859	62	677	85	461	108	280
-29	1019	-6	1005	17	960	40	852	63	668	86	452	109	273
-28	1019	-5	1004	18	956	41	846	64	659	87	443	110	267
-27	1019	-4	1002	19	953	42	839	65	649	88	434	111	261
-26	1018	-3	1001	20	950	43	832	66	640	89	425	112	255
-25	1018	-2	1000	21	946	44	825	67	631	90	417	113	249
-24	1017	-1	998	22	943	45	818	68	621	91	408	114	243
-23	1017	0	997	23	939	46	811	69	612	92	400	115	237
-22	1017	1	995	24	935	47	804	70	602	93	391	116	232
-21	1016	2	994	25	931	48	796	71	592	94	383	117	226
-20	1016	3	992	26	927	49	788	72	583	95	375	118	221
-19	1015	4	990	27	922	50	780	73	573	96	367	119	216
-18	1015	5	989	28	918	51	772	74	564	97	359	120	210

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CUSTOMER APPROVAL

CUSTOMER SIGNATURE:	DATE :

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