Lingkong Technology MotorRS485**Broadcast Communication Protocol**

V2.35

1.**Broadcast Mode**RS485**Bus parameters**

- Bus interface:RS485
- Baud Rate:1Mbps,2Mbps,4Mbps
- Data bits:8
- Parity: None
- Stop bits:1

2.**Broadcast Mode Commands**

The commands described in this protocol are used for high-speed communication and broadcast control of motors. One command can control up to4Motors

- You need to enable broadcast mode in the host computer andRS485The baud rate is set to1MbpsThe length of
- the command sent by the above master is always11byte.
- To prevent bus conflicts, each driver needs to set a differentID(respectively1,2,3,4,less than4The motor can be omitted). You can select it through the DIP switch on the driver boardID; or use the host computer to setID.
- The motor determines whether it is in the idle state of the bus1frame data, so the master needs to11The byte data is sent continuously. The master sends the command in
- the form of broadcast, and each driver board executes it after receiving the command, and after a period of time, itIDIn order (IDLow first) Send a reply to the master.

- Each command is composed of3Partial composition:Head + CMD + data + checksum, the specific instructions are as follows:

	Data length	illustrate
Head	1byte	0x02
CMD	1byte	Command Byte
data	8	Data accompanying the command
checksum	1byte	fromHeadarrivedataThe checksum of all bytes, with the high bits discarded

The commands currently supported by the motor are as follows:

Serial number	Order	Command Byte
1	Torque/Open loop control command	0x80
2	Speed control command	0x81
3	Position control commands	0x82
4	Mixed commands	0x88

2.1**Torque/Open loop control command**: Also includes4The torque current control value of each motor (MF, MGSeries) or open loop voltage control value (MSseries). Control volumetorqueValuefor16bitInteger data.MF,MGMotor, data range -2000 ~ +2000;forMSMotor, data range -850 ~ +850.

	illustrate	Remark
head	0x02	
CMD	0x80	
data[0]	#1MotortorqueValueLow Byte	
data[1]	#1MotortorqueValueHigh Byte	
data[2]	#2MotortorqueValueLow Byte	
data[3]	#2MotortorqueValueHigh Byte	
data[4]	#3MotortorqueValueLow Byte	

data[5]	#3MotortorqueValueHigh Byte	
data[6]	#4MotortorqueValueLow Byte	
data[7]	#4MotortorqueValueHigh Byte	
checksum	Checksum of all the above bytes	

For example, the master control1Motor sends torque current100,Towards#3Motor sends torque current -100The command data is as follows (HEX) :

02	80	64	00	00	00	9C	FF	00	00	81

Open Loop/Torque control command-Drive Reply: Same as the response of single motor torque control command

2.2**Speed   control command**: Also includes4The speed control value of each motor.speedValuefor16bitInteger data. Resolution is 1dps/LSB, due to data length limitations,speedValueThe speed range is (-32768 ~ 32767dps).

	illustrate	Remark
head	0x02	
CMD	0x81	
data[0]	#1MotorspeedValueLow Byte	
data[1]	#1MotorspeedValueHigh Byte	
data[2]	#2MotorspeedValueLow Byte	
data[3]	#2MotorspeedValueHigh Byte	
data[4]	#3MotorspeedValueLow Byte	
data[5]	#3MotorspeedValueHigh Byte	
data[6]	#4MotorspeedValueLow Byte	
data[7]	#4MotorspeedValueHigh Byte	
checksum	Checksum of all the above bytes	

For example, the master control2Motor transmission speed360dps,Towards#4Motor transmission speed -720The command data is as follows (HEX):

02	81	00	00	68	01	00	00	30	FD	19

Speed   control command-Drive Reply: Same as the response of single motor speed control command

2.3**Position control commands**: Also includes4The absolute position control value of each motor.angleValuefor16bitInteger data. Resolution is 0.01degree/LSB, due to data length limitations,angleValueThe angle range is (-327.68 ~ 327.67°).

	illustrate	Remark
head	0x02	
CMD	0x82	
data[0]	#1MotorangleValueLow Byte	
data[1]	#1MotorangleValueHigh Byte	
data[2]	#2MotorangleValueLow Byte	
data[3]	#2MotorangleValueHigh Byte	
data[4]	#3MotorangleValueLow Byte	
data[5]	#3MotorangleValueHigh Byte	
data[6]	#4MotorangleValueLow Byte	
data[7]	#4MotorangleValueHigh Byte	
checksum	Checksum of all the above bytes	

For example, the master control1Motor transmission angle180°、To#4Motor sending angle -90°The command data is as follows (HEX):

02	82	50	46	00	00	00	00	D8	DC	CE

Position control commands-Drive Reply: and single motor position control command1Same reply

2.4**Mixed commands**: Also includes4The commands executed by each motor are based onmotorCmdByte determination

	illustrate	Remark
head	0x02	
CMD	0x88	
data[0]	#1MotormotorCmdbyte	
data[1]	0x00	
data[2]	#2MotormotorCmdbyte	
data[3]	0x00	
data[4]	#3MotormotorCmdbyte	
data[5]	0x00	
data[6]	#4MotormotorCmdbyte	
data[7]	0x00	
checksum	Checksum of all the above bytes	

motorCmdThe supported commands are as follows:

Serial number	Order	motorCmdbyte
1	Reading the motor status1and error flag commands	0x9A
2	Clear motor error flag command	0x9B
3	Reading the motor status2Order	0x9C
4	Motor off command	0x80
5	Motor start command	0x88
6	Motor stop command	0x81

For example, the master control1Motor sends read status2,Towards#4The command data sent by the motor to stop is as follows (HEX) :

02	88	9C	00	00	00	00	00	81	00	CF

Mixed commands-Drive Reply: Same as the response to the single motor command

3.**other**

After the host completes sending the command, it needs to release the control of the bus so that the driver board can replyACKDue to bus speed and timing limitations:1Mbps Simultaneous control at baud rate4The maximum frequency of sending commands to each motor is about1KHz,2MbpsSimultaneous control at baud rate4The maximum frequency of sending commands to each motor is about2KHz;4MbpsSimultaneous control at baud rate4The maximum frequency of sending commands to each motor is about3.5KHz.

Due to the faster bus speed, it is recommended that the host useDMAThe function automatically reads the bus to prevent the loss of driver reply data due to long polling time or too frequent interruption