



DRIVE CARD

INSTRUCTION MANUAL

(DGBL-D)



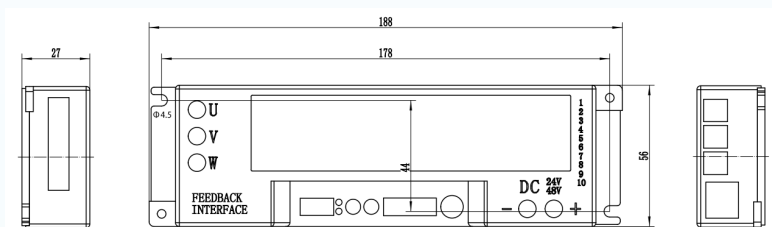
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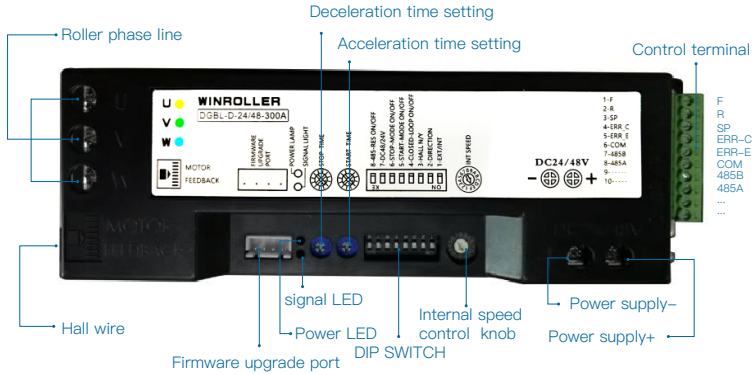
Technical Terms

DC brushless motor	The motor is composed of permanent magnet rotor and winding stator. This kind of motor has the advantages of simple structure, high reliability, good stability, high efficiency and strong adaptability, so it has been widely used.
Hall Sensor	Because the brushless motor cancels the carbon brush, the motor itself cannot run and needs to rely on the external driver to run. The Hall sensor is installed inside the motor to feed back the position signal to the driver.
LED	LED, used to indicate the status of the drive system.
PNP/NPN	Logic level of effective control signal: NPN indicates that the low level is effective, that is, connected with DC-effective; PNP indicates that the high level is effective, that is, DC+is effective.
PLC	Industrial Programmable Logic Controller.
Speed open loop / closed loop	Speed Open Loop: The roller speed decreases as the load increases. Speed Closed Loop: As long as the load is within the roller's rated torque, the roller speed does not change with variations in the load.

Dimensions



Controller Layout



No.	Item	Function
1	Power supply + & Power supply -	DC power input
2	Control terminal	Control signal I/O interface, some functions are used in conjunction with DIP switch
3	DIP switch	Functional switch
4	Internal speed control knob	16-level speed regulation, used in conjunction with DIP switch code
5	Acceleration time setting	Set the start acceleration time, 0-2. 5s, which is used in conjunction with DIP switch code, and knob clockwise rotation, time increased.
6	Deceleration time setting	Set the stop deceleration time, 0-2. 5s, which is used in combination with DIP switch code, and knob clockwise rotation, time increased.
7	Power LED & Signal LED	Power indicator&device status indicator
8	Firmware upgrade interface	Firmware upgrade
9	Roller phase line&roller hall line	Motor roller phase line and Hall line plug

Wiring Diagram



I/O Control

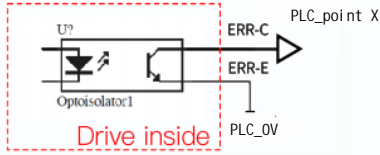
1. Run is valid, forward
2. F/R valid, reverse
3. The internal speed control knob is used for speed regulation, or 0–10V analog voltage is input at SP port for speed regulation, and the DIP switch number 1 is used for selection

485 bus control

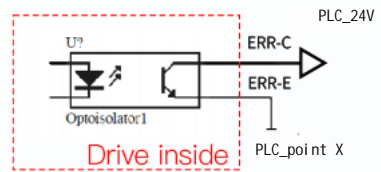
1. Connect 485 upper computer
2. The agreement is a free agreement, modebus RTU, see page 7–9
3. Before formal use, set the 485 communication address of the controller.
4. 485 directly controls the electric roller, start and stop, running direction and speed. If the upper computer is disconnected after 485 commands the roller to run, the roller is still running.

Fault Alarm Signal Output

NPN connection: output low level



NPN connection: output high level



DIP Function

No.	Item	Function	OFF	ON
1	NT/EXT	Internal and external speed regulation switch	Internal speed control knob	SP port input 0–10V analog voltage
2	DIRECTION	Roller default steering switch	–	–
3	HALL Y/N	Sensible/non-inductive switch	sensible	non-inductive
4	Peak Current	6A/13A	6A	13A
5	START/STOP TIME	Acceleration speed setting	Start at the largest speed	The acceleration time can be adjusted after opening, and the adjustment range is 0–2.5s
6	STOP TIME	Deceleration speed setting	Inertia stop	The deceleration time can be adjusted after opening, and the adjustment range is 0–2.5s
7	24V/48V	Voltage adaptation	24V	48V
8	485 RES	485 terminal resistance switch	Without terminal resistance	Access terminal resistance

Remark:

1. The dialing function description on the sticker on the front of the drive may not be updated in time, please refer to this manual!

Rotation Speed

1. Internal knob speed adjustment

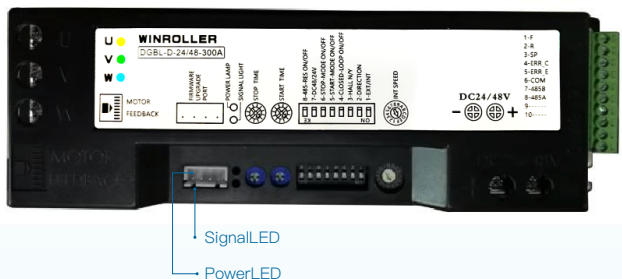
- 1) DIP switch dial 1#OFF, 4#ON, internal knob to control the speed;
- 2) Motor rotating speed = rotary speed in the following table * 2 rpm;
- 3) Roller speed = Motor rotating speed / velocity ratio
(For ratio, please see the parameter table at the lower left corner of the roller outline drawing.)

HIGH SPEED 16 Gears - Dial code 1#OFF, 4#ON							
Gear	Rotary Speed	Gear	Rotary Speed	Gear	Rotary Speed	Gear	Rotary Speed
0	200	4	600	8	1000	C	1400
1	300	5	700	9	1100	D	1500
2	400	6	800	A	1200	E	1600
3	500	7	900	B	1300	F	1700

2. SP port speed regulation

- 1) DIP switch dial 1#ON, SP port input 0–10V analog voltage;
- 2) Motor rotating speed = (SP port voltage * 163 + 80) * 2 rpm;
- 3) Roller speed = Motor rotating speed / velocity ratio
(For ratio, please see the parameter table at the lower left corner of the roller outline drawing.)

Status Description



1. Status description

Power LED State(Red))	Driver State	Description
Light off	Power off	-
Light on	Power on	-

Signal LED State(Green)	Roller / Drive State	Description
Light off	Stand by	-
Light on	Roller normal running	-
Flash one time and stop for two seconds, cycle	Power anomaly	Power supply undervoltage or overvoltage, beyond the working range
Flash two times and stop for two seconds, cycle	Hall anomaly	The sensor is subject to electromagnetic interference or damage, and the status is abnormal.
Flash three times and stop for two seconds, cycle	Motor stall	The motor cannot rotate, has heavy load or is stuck.
Flash four times and stop for two seconds, cycle	Overcurrent	Short circuit between motor phases or driver power module
Flash five times and stop for two seconds, cycle	roller overheating	The temperature of electric roller is higher than the protection threshold.
Over five times, cycle	Other drive or roller failure	-

2. Common exception handling methods

Electric roller/controller status	State Description
Power anomaly	Use a multimeter to measure the voltage of the power terminal of the drive, and observe whether the voltage drops during startup and operation, and whether the drop range is within the allowable range; If there is obvious voltage drop, please shorten the cable length between the power supply and the drive, or thicken the cable diameter; If there is no abnormality, replace the drive.
Hall anomaly	Switch DIP dial number 3 to ON
Motor stall	1. switch dip dial number 3 to ON 2. please contact the factory if operation 1 does not work
Other drive or roller failure	Please contact the factory

485 Protocol

1. Instruction sequence and related description:

1) The drive has no address by default. You need to send the address setting frame to set the address first; The address setting frame is a broadcast command. All drives on the same 485 bus will respond to the command. Please connect the drives separately when setting different addresses; The drive only responds to address setting frame within 30s after power-on.

2) After setting the address, the parameter setting frame and operation command frame can be sent to control the roller start and stop (the message contains direction and speed information). Each action (start and stop, speed change, steering, etc.) needs to send a parameter setting frame and an operation command frame.

3) Address setting sending sequence: the upper computer sends the address setting frame (8 bytes), and the drive returns the address response frame (4 bytes).

4) Control transmission timing: the upper computer sends the parameter setting frame (8 bytes), the driver returns the parameter response frame (4 bytes), and the upper computer sends the operation command frame (8 bytes).

2. Communication format

No.	Item	Parameter	Remark
1	Maximum number of addresses	127	By setting address setting frame
2	Communication format	38400, N, 8, 1	
3	Check mode	Frame check	XOR operation
4	Termination resistor	120Ω	DIP Dial 8#, Switch to -ON, but not -OFF

3. Address setting frame

byte	Item	Parameter	Remark
1	Start symbol	F5H	
2	Address value	B7=0 B6-B0= Address value	Address value 7bit, byte2.B6-B0; Value Range 1-127
3	Address value operation command	B7-B1=0 B0=operation command	The operation command is 1bit, byte3 B0; Take 1 read address; Take 0 to write the address
4	Reserve	00H	
5	Reserve	00H	
6	Reserve	00H	
7	Reserve	00H	
8	check character	B7-B0= check character	XOR byte 2 to byte 7
Message example: F5 01 00 00 00 00 00 01 Message meaning: set the address value to 1			

4. Address reply frame

byte	Item	Parameter	Remark
1	Start symbol	F5H	
2	Address value	B7=0 B6-B0=Address value	The address value is 7bit, byte2. B6-B0; Value range 1-127
3	Response content	0X5A	
4	Check character	B7-B0= check character	XOR of byte 2 and byte 3 (XOR)
Message example: F5 01 5A 5B Message meaning: address setting successful return			

5. Parameter setting frame

byte	Item	Parameter	Remark
1	Start symbol	85H/95H	85H drive returns parameter response frame, 95H drive does not return parameter response frame
2	Direction, address	B7=0 B6= direction B5–B0= Address low six position	Direction is 1 bit, byte2. B6, take 0 forward rotation, take 1 reverse rotation The address value is 7bit, the upper 1 bit of byte6.B3+the lower 6 bits of byte2.B5–B0; Value range 1–127
3	Operating speed_ L7	B7=0 B6–B0= Speed value low 7 position	The speed value is 8bit, byte3.B6–B0 is the low 7 bits, byte4.B6–B0 is the high 7 bits, and the value range is 1–175 Roller rotating speed = speed *10*2/ Roller reduction ratio rpm (Refer to the outline drawing of roller for speed ratio)
4	Operating speed_ H1	B7–B1=0 B0= Speed value high 1 bit	
5	Reserve	00H	
6	Extension bit	B7–B4=0 B3= Address value high 1 bit B2–B0=0	
7	Reserve	00H	
8	Check character	B7–B0= check character	XOR byte 2 to byte 7
<p>Message example: 85 41 32 00 00 00 00 73 Message meaning: No. 1, reverse rotation, motor speed 2540rpm Message example: 85 01 00 00 00 00 00 01 Message meaning: No. 1, stop</p>			

6. Parameter response frame

byte	Item	Parameter	Remark
1	Start symbol	99H	
2	Address value	B7=0 B6–B0= Address value	The address value is 7bit, byte2.B6–B0; Value range 1–127

3	Parameter response frame	B7–B6=0 B5= Motor Run Failure B4= No action command before parameter B 3 = N o parameter before action command B2= Hall Error B1= Overcurrent protection B0=0	If there is an exception, set the corresponding bit to 1; if there is no exception, set it to 0 Byte3. B5 set to 1 – motor start failure Byte3. B4 set to 1 – drive continuously receives two parameter setting frames Byte3.B3 is set to 1 – the drive receives two running command frames in succession Byte3.B2 set 1 – Hall signal abnormal Byte3.B1 set 1 – phase line overcurrent
4	Check Character	B7–B0= check character	XOR of byte 2 and byte 3 (XOR)
Message example: 99 01 24 25 Message meaning: No. 1, abnormal: motor operation failure&Hall error			

7. Run Command Frame

1) Address 1–32

byte	Item	Parameter	Remark
1	Start symbol	8AH	
2	Address selection 1	B7=0 B6–B0= Add No. 7–1	Set the bit corresponding to the address of the frame to be executed for parameter setting to 1, for example, for actions 1 and 3, set byte2 B0 and byte2.B2 are set to 1, that is, byte2=05H
3	Address selection2	B7=0 B6–B0= Add No. 15–9	
4	Address selection3	B7=0 B6–B0= Add No. 23–17	
5	Address selection4	B7=0 B6–B0=Add No. 31–25	
6	Address selection5	B7–B4=0 B3–B0=Add No. 32,24,16,8	
7	Reserve	00H	
8	Check Character	B7–B0= check character	XOR byte 2 to byte 7

2)Address 33–64

byte	Item	Parameter	Remark
1	Start Symbol	8BH	
2	Address selection 1	B7=0 B6–B0=Add No. 39–33	
3	Address selection2	B7=0 B6–B0=Add No. 47–41	
4	Address selection3	B7=0 B6–B0=Add No. 55–49	
5	Address selection4	B7=0 B6–B0=Add No. 63–57	
6	Address selection5	B7–B4=0 B3–B0=Add No. 64,56,48,40	
7	Reserve	00H	
8	Check character	B7–B0=check character	XOR byte 2 to byte 7
Message example: 8B 01 00 00 00 00 00 01 Message meaning: No. 33, execute command according to parameter setting frame			

3) The addresses after the 65th also refers to this.

The starting symbol of address 65–96 is 8CH,

The corresponding starting symbol of address 97–127 is 8DH (no address 128)

4) A 485 module is recommended to have a drive with no more than 31 addresses to prevent bus conflicts and overload of the 485 module.

Caution

Installation notes

1. Before assembly, confirm whether the drive is damaged.
2. The drive shall not fall or be used incorrectly. It is strictly prohibited that conductive objects (such as metal chips) fall into the shell to avoid short circuit damage to internal components.
3. Use in places with corrosive gas, harmful gas, dust and moisture will cause low service life. If such substances exist on site, please check and confirm in advance.
4. Do not remove the housing of the drive, which may cause damage, failure and other problems.

Electrical installation

1. Electrical installation must be carried out by professional electrical installation personnel.
2. Installation, movement and wiring must be operated without voltage.
3. When the motor cable and the driver are plugged in and out, do not use excessive force to avoid unpredictable damage to the connector.
4. Please confirm the power supply (DC), voltage ($DC24V \pm 5\%$), specification of electric roller and other items, and connect them accurately.
5. One driver cannot drive multiple electric rollers.
6. Make the wiring according to the port explanation to prevent the drive from being damaged due to wrong wiring.
7. For the DC power supply to the drive circuit, please use the type of insulation transformer composed of two times.
8. Please control the wiring length between the electric roller and the drive within 1m. If it is more than 1m, it may lead to abnormal operation.

Test & Run

Test

Make fully inspection before the first time trial run:

- 1)Ensure that the wiring complies with the manual instructions and electrical regulations;
- 2)Ensure that all bolts are tightened without looseness;
- 3)Confirm that the interface is not loose;
- 4)Check all protective devices;
- 5)Make sure that no one is in the dangerous area of the conveyor.

Run

Connect the wire according to the instructions, turn on the power supply, pay attention to the flashing of LED light, and continue after confirming that there is no error. If it is internal speed regulation, turn the knob to the first gear, and observe whether it operates normally. Only when it is normal can it be adjusted to the high gear.

Accident

1. Stop the conveyor immediately and turn off the power.
2. In case of an accident, take first aid measures and call the emergency number.
3. Check the instructions.
4. Notify relevant personnel and ask professional personnel to eliminate the fault.

Guarantee

Abnormal use, artificial damage or disassembly are not covered by the warranty.

Maintenance

- 1.Do not touch the connection terminal of the drive within 30 seconds after turning off the power supply, which may cause the electric shock due to residual voltage.
2. Regularly check whether the drive and wire are damaged.



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Learn more

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