

MiSUMi

Motorized Drum Driver Controller

with Hall Driver (N1 Type, 1:1)

Quick Start Guide

Ver1.0

Version Change Record

Version	Time	Description
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1. Professional Terminology

1. Brushless DC motor: A brushless DC motor consists of a permanent-magnet rotor and a wound stator. This type of motor offers a simple structure, high reliability, stable performance, high efficiency, and strong adaptability, and is therefore widely used.
2. Hall sensor: A device installed inside the motor to provide rotor position feedback.
3. PNP: Active high, general power supply range: 15~30V
4. NPN: Active low, general power supply range: 0~0.8V
5. DIP: A DIP switch used to manually change the operating status of the motorized roller.
6. Digital signal: A signal representing discrete values and controlled through I/O points.
7. Analog signal: A continuously varying signal controlled by analog voltage or current to achieve stepless speed control.
8. Braking resistor: A component used to dissipate regenerative energy during motor braking by converting the motor's back EMF generated during stopping into heat, thereby preventing potential damage.
9. EXT: External interface.
10. LED: Light-emitting diode, used to indicate the status of the drive system.

2. Basic Functions

- Closed-loop speed control
- 15-step DIP speed setting
- Stepless speed control via 2.3–10 V analog voltage
- 4-step digital speed control
- 16-step acceleration/deceleration time setting
- Two-wire forward/reverse operation
- Electronic brake / servo brake switching
- Dual LED status display
- Fault output function
- Built-in braking resistor
- Switchable PNP/NPN I/O input control
- 24V/48V fast switching
- Speed control priority: DIP speed setting (digital speed control), stepless speed control (analog speed control)

3. Matching Drum Parameter Specifications

Rated voltage of the drum	Voltage Range (V)	Rated Power (W)	Rated Current (A)	Starting Current (A)
DC 24V	20~26	35	2.5±0.5	6.25±0.5
		50	3.2±0.5	8±0.5
		80	4.5±0.5	11.25±0.5
DC 48V	40~52	35	1.3±0.5	3.25±0.5
		50	1.6±0.5	4±0.5
		80	2.3±0.5	5.75±0.5

4. Power Supply Requirements

drum power	Switching power supply power	Suggested wire diameter	Suggested wire length
35W	≥80W	0.75mm ² (4A)	≤12 meters
50W	≥120W	0.75mm ² (4A)	≤9 meters
80W	≥200W	1mm ² (6A)	≤9 meters

***Note: In multi-roller applications, it is recommended to use a higher-capacity power supply and avoid undersized single power supplies. For example:**

For 35 W motorized rollers, a 450 W power supply can support 9 to 11 rollers when the rollers are started sequentially. As a general guideline, the power supply can be selected at 1.2 to 1.5 times the total rated power of the motorized rollers.

5. Controller Layout

Sequence Position	Function	Description
1	Power	Control card power supply (1.5mm ² max) Use wire gauge 28~16AWG
2	Roller Terminal	9-pin roller terminal
3	LED	Power indicator and status indicator
4	Firmware upgrade port	Micro upgrade port
5	SPEED	Speed dial adjustment
6	Special Function	forward and reverse rotation, braking mode, etc.
7	RAMP	Acceleration/Deceleration Dip Switch Adjustment
8	Signal Terminal	Control signal input and error signal output, using wire gauge 28~16AWG (1.5mm ² max)

***Note: Use crimp terminals for signal and power cables. It is recommended to use wires up to 1 mm² with matching crimp terminals (E10xx). For long cable runs, the power input must use 1.5 mm² wires.**

6. DIP Switch Settings

6.1 DIP Speed---Speed Setting (Connect Start Signal to Speed A)

Speed 1	Speed 2	Speed 3	Speed 4	Start Speed A motor speed (rpm/min)
ON	ON	ON	ON	6960
OFF	ON	ON	ON	6496
ON	OFF	ON	ON	6032
OFF	OFF	ON	ON	5568
ON	ON	OFF	ON	5104
OFF	ON	OFF	ON	4640
ON	OFF	OFF	ON	4176
OFF	OFF	OFF	ON	3712
ON	ON	ON	OFF	3248
OFF	ON	ON	OFF	2784
ON	OFF	ON	OFF	2320
OFF	OFF	ON	OFF	1856
ON	ON	OFF	OFF	1392
OFF	ON	OFF	OFF	928
ON	OFF	OFF	OFF	700
OFF	OFF	OFF	OFF	6960

6.2 DIP Speed---Speed Setting (Connect Start Signal to Speed B)

Speed 1	Speed 2	Speed 3	Speed 4	Start Speed B motor speed (rpm/min)
ON	ON	ON	ON	1740
OFF	ON	ON	ON	1624
ON	OFF	ON	ON	1508
OFF	OFF	ON	ON	1392
ON	ON	OFF	ON	1276
OFF	ON	OFF	ON	1160
ON	OFF	OFF	ON	1044
OFF	OFF	OFF	ON	928
ON	ON	ON	OFF	812
OFF	ON	ON	OFF	700

ON	OFF	ON	OFF	700
OFF	OFF	ON	OFF	700
ON	ON	OFF	OFF	700
OFF	ON	OFF	OFF	700
ON	OFF	OFF	OFF	700
OFF	OFF	OFF	OFF	1740

6.3 DIP Speed---Speed Setting (Connect Start Signal to Speed A and Speed B)

Speed 1	Speed 2	Speed 3	Speed 4	Start Speed A and Speed B Motor speed (rpm/min)
ON	ON	ON	ON	4524
OFF	ON	ON	ON	4222
ON	OFF	ON	ON	3920
OFF	OFF	ON	ON	3619
ON	ON	OFF	ON	3317
OFF	ON	OFF	ON	3016
ON	OFF	OFF	ON	2505
OFF	OFF	OFF	ON	2412
ON	ON	ON	OFF	2111
OFF	ON	ON	OFF	1809
ON	OFF	ON	OFF	1508
OFF	OFF	ON	OFF	1206
ON	ON	OFF	OFF	904
OFF	ON	OFF	OFF	700
ON	OFF	OFF	OFF	700
OFF	OFF	OFF	OFF	4524

***Note:**

- 1) DIP speed settings can be combined with digital input speed control;
- 2) The DIP switches are arranged from top to bottom. The upper switch (4) is the most significant bit and the lower switch (1) is the least significant bit, following binary speed-setting rules;
- 3) Linear speed calculation: $\text{Linear speed (m/min)} = \text{motor speed (rpm)} \div \text{gear ratio} \times \text{roller diameter (m)} \times 3.14159$

6.4 DIP Ramp---Acceleration/Deceleration Time Setting

Ramp1	Ramp2	Ramp3	Ramp4	Time(s)
ON	ON	ON	ON	2.00
OFF	ON	ON	ON	1.88
ON	OFF	ON	ON	1.76
OFF	OFF	ON	ON	1.64
ON	ON	OFF	ON	1.52
OFF	ON	OFF	ON	1.40
ON	OFF	OFF	ON	1.28
OFF	OFF	OFF	ON	1.16
ON	ON	ON	OFF	1.04
OFF	ON	ON	OFF	0.92
ON	OFF	ON	OFF	0.80
OFF	OFF	ON	OFF	0.68
ON	ON	OFF	OFF	0.56
OFF	ON	OFF	OFF	0.44
ON	OFF	OFF	OFF	0.32
OFF	OFF	OFF	OFF	0.20

***Note:**

- 1) Acceleration/deceleration time, braking distance, and braking repeatability are positively correlated;
- 2) The longer the acceleration and deceleration time, the smaller the impact on the power supply.

6.5 DIP Special Functions - Settings

sequence	Function	ON state	OFF state	Description
1	DIR	CW	CCW	If the DIR pin is left unconnected, mutual interference may occur.
2	A/D	Start	Not started	Enables analog speed control via Speed C
3	BRAKE	servo brake	Electronic Brake	ON provides holding force
4	PNP/NPN	PNP	NPN	Factory default PNP

5	DC24V/48V	48V	24V	Factory default 24V
6	Discharge	Discharge	Shorted	For high-precision repeat positioning, enable the discharge function. This mode places higher demands on the power supply. In shorted mode, power supply requirements are lower, and the braking energy is absorbed inside the motor.

***Note:**

- 1) When using an external 24 V roller, set the DC24V/48V DIP switch to OFF and use a 24 V external power supply.
- 2) When using an external 48 V roller, set the DC24V/48V DIP switch to ON and use a 48 V external power supply.
- 3) Do not configure a 24V drum with a 48V power supply.

7. Signal Terminal Description

Serial Number	Function	"Description"
1	COMMON	Connect to PLC 0V
2	24V EXT	24V input voltage, supplies power to ERROR
3	ERROR	Fault output signal, PNP/NPN configurable
4	DIR	Interface for PLC-controlled electric drum rotation direction NPN 24V: Same as DIP switch setting direction 0V: DIP switch set in reverse direction PNP 0V: Same direction as DIP switch setting 24V: DIP switch set in reverse direction
5	Speed C	When all speed DIP switches are set to OFF, it functions as an analog signal input port. 0-2V is for braking, 2.3 ~ 10V is for stepless speed regulation (requires setting the A/D dip switch to ON)
6	Speed B	As an input port for the start signal, it is combined with Speed A for speed control. In PNP mode, 24V serves as the start signal In NPN mode, 0V serves as the start signal.
7	Speed A	As an input port for the start signal, it is combined with Speed B for speed regulation. In PNP mode, 24V serves as the start signal In NPN mode, 0V serves as the start signal.

Digital speed control combination and DIP switch speed control combination in PNP mode

Speed C	Speed B	Speed A	Motor speed (rpm)
L	L	H	100% of the current DIP switch speed
L	H	L	25% of the current DIP switch speed
L	H	H	65% of the current DIP switch speed
H	L	L	10% of the current DIP switch speed
H	L	H	50% of the current DIP switch speed

H	H	L	15% of the current DIP switch speed
H	H	H	75% of the current DIP switch speed
L	L	L	0

Combination of Digital Speed Control and DIP Switch Speed Control in NPN Mode

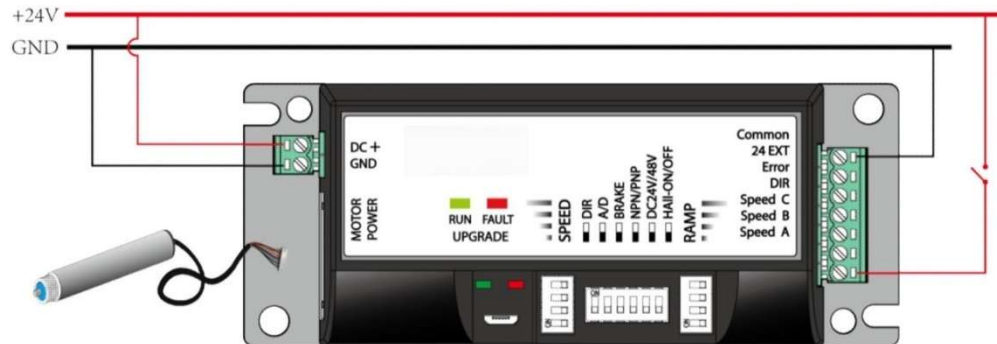
Speed C	Speed B	Speed A	Motor speed (rpm)
H (High Impedance)	H (High Impedance)	L	100% of the current DIP switch speed
H (High Impedance)	L	H (High Impedance)	25% of the current DIP switch speed
H (High Impedance)	L	L	65% of the current DIP switch speed
L	H (High Impedance)	H (High Impedance)	10% of the current dip switch speed
L	H (High Impedance)	L	50% of the current DIP switch speed
L	L	H (High Impedance)	15% of the current DIP switch speed
L	L	L	75% of the current DIP switch speed
H (High Impedance)	H (High Impedance)	H (High Impedance)	0

***Note:**

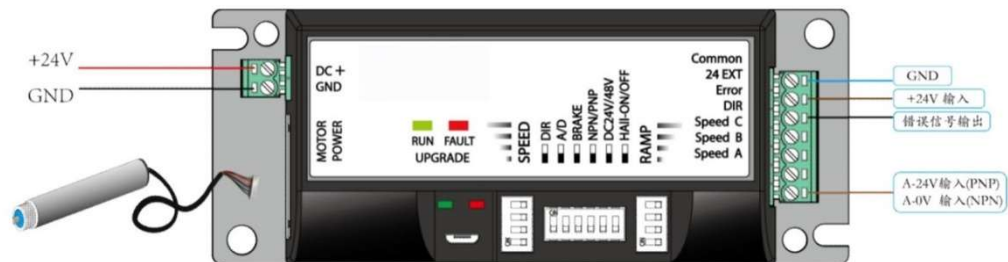
- 1) When the motor speed is below 700 rpm/min, the motor operates at 700 rpm/min;
- 2) When all speed dip switches are set to OFF, the digital combination speed control for Speed A and Speed B takes the highest speed.
Percentage of 6960 rpm/min (i.e., when the speed dip switches are all ON = all OFF during digital speed control).

8. Wiring Instructions

8.1 Quick Debugging of PNP Type (No PLC Required)



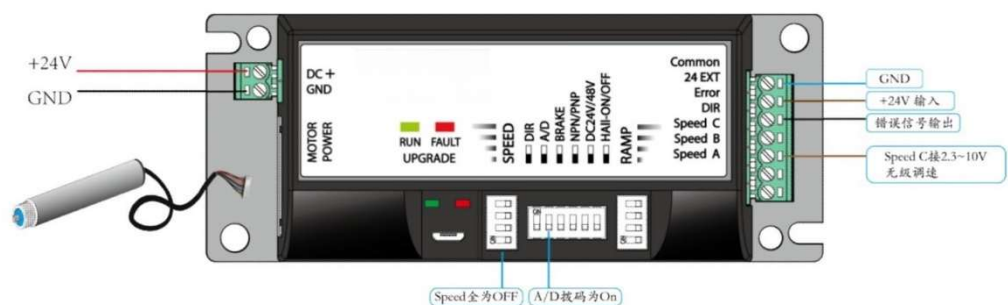
8.2 PLC as start signal, manual DIP speed setting



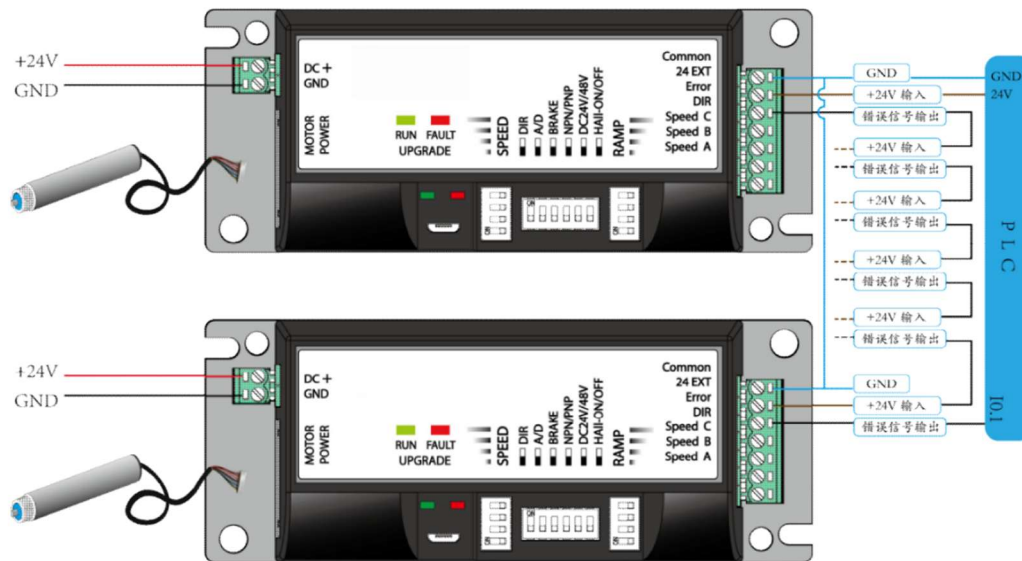
8.3 IO matching PLC digital speed control, PNP (high level active), NPN (low level active)



8.4 IO Matching PLC Analog Speed Control



8.5 Client error signal series connection (PNP only)



9. Fault Indicator Description

RUN (green)	FAULT (red)	Meaning
Always on	Off	Product ready
Flashing	Off	Motorized roller running
extinguish	Blink once	Hall signal abnormality
extinguish	Blinks 2 times	Overvoltage Protection
extinguish	Blink 3 times	Undervoltage abnormality
extinguish	Blink 4 times	Motor phase loss
extinguish	Blinks 5 times	Overcurrent protection
extinguish	Blinks 6 times	Motor stall
extinguish	Blinks 7 times	Temperature Protection
extinguish	Blink 8 times	Auto-recovery limit exceeded
extinguish	Blinks 9 times	Fuse failure

* Dual LED Fault Indicator

- 1) Output fault signals for different state combinations, with a continuous flashing interval of 0.5s, allowing for preliminary determination of the product's fault cause;
- 2) Description of ERROR fault output signal: The fault output signal can be set to either PNP mode (high level 24V indicates no fault, high impedance state indicates a fault) or NPN mode (low level indicates no fault, high impedance state indicates a fault), which can be switched via DIP switches.

10. Dimensions and Installation

11. Application Environment

Operating environment temperature	0°C~+55°C
Operating environment humidity	10%~85% (non-condensing)
Environmental temperature for transportation and storage	-40°C to +85°C
Vibration	2G or lower

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