Precision Controlled Servo Direct Drive Motor Roller(IR)

Drive Instructions

Version Number1.1

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更新记录 Change Record

DCR#	版本 Rev.	日期 Date	备注 Remark
1	1.0	14/08/2020	File Creation
2	1.1	6/12/2020	1. Add company information 2. Add wiring diagram

公司信息 Co. Info.

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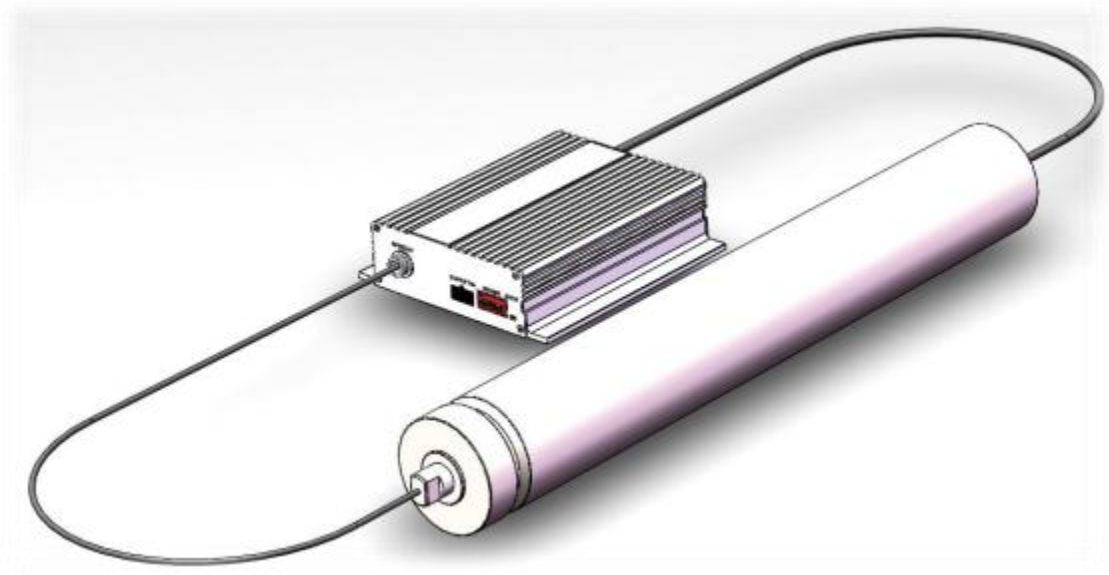
Noun analysis

servo	An automatic control system that allows the output of an object's position,orientation, state, etc. to vary with any change in input (or given value)
Servo motor roller	Motor roller for applying the servo system
Direct Drive	Direct Drive is a new type of motor direct and motion execution part, that is, the motor drives the machine to run directly ,there is no reducer and other intermediate mechanical transmission link combination.

Product Introduction



Direct drive electric roller is a kind of electric roller driven directly by the rotor without using a reducer. The moving component in the direct drive electric drum system is only the rotor itself.Compared to electric drums with a reducer, it has higher driving efficiency, lower running noise, faster response speed and longer service life. The direct drive electric drum also has a high torque inertia ratio, which is very suitable for application occasions that require fast start stop.

Advantages of Direct Drive Electric Roller

- ✓ low noise
- ✓ high reliability
- ✓ longevity of service
- ✓ efficient and energy-saving
- ✓ continuously speed selection
- ✓ express setup
- ✓ multiple protection mechanisms
- ✓ cost optimization solutions
- ✓ high dynamic performance
- ✓ high torque to power ratio
- ✓ high positional accuracy
- ✓ simple system integration
- ✓ compact design
- ✓ multiple transmission types
- ✓ high hygiene
- ✓ high speed
- ✓ high power density
- ✓ high mechanical efficiency
- ✓ the shortest roller is small
- ✓ low maintenance
- ✓ 485 bus control support

Rotary servo control, position sensor using rotary encoder, electric roller without any electronic components, strong environmental adaptability, and no fear of static electricity threat, zero maintenance of equipment. 12 bit commercial A/D inverter, 5 pairs pole motor design, with a resolution of up to 20480 and a minimum recognition angle as low as 0.0176 °. High precision position recognition, high precision real-time control, and response speed as low as 0.05s.

Depend on excellent performance, our servo direct drive electric roller products are commonly used for

1) Industries with high hygiene requirements, such as the food and packaging industry. Servo direct drive electric roller provides cleaning and lubrication without the use of oil and grease quiet operation. With its unique gearless design, it provides the perfect solution for driving conveyors.

2) Industries that require quick response and simple control, such as the express delivery industry. Free to choose fixed speed, instantaneous driving power up to 1500W, in the single package table 1800 times / h cycle operation, the overall 20,000 efficient express sorting system of pieces /hour. it is perfectly capable of handling the sorting role.

Main specifications and parameters

1.Motor Parameter

Item	Unit	Specifications	Remarks
motor type	-	brushless direct drive motor (DGDD)	
motor form	-	outer rotor motor	
voltage	V	DC 48	voltage range ±10%
pole number	p	10	10p=5 pole pairs
rated power range	W	400	controllable
speed range	rpm	60~762	Program can be modified to increase controllable
rated torque	N.m	6	speed up to 1600rpm
Instantaneous max torque	N.m	18	no more than 4 s
Working system	-	S2	25% intermittent working system

2.driver parameter

Item	Unit	Specifications	Remarks
type	-	DC brushless servo driver	
input rated voltage	V	DC48	
rated power	W	400	25% intermittent working system
size	mm	155*147*39	
communication		RS485	38400bps,N,8,1
power interface	-	plug 42000-6P(5557)	nylon(PA66 ）, UL94V-2/0
		terminal 42000-21RT(5556)	phosphor bronze(C5191) Wire gauge :0.12~0.5mm^2,26~20AWG Outer diameter of wire ：1.1~1.9mm
communication interface	-	plug 42000-10P(5557)	nylon(PA66 ）, UL94V-2/0
		terminal 42000-01RT(5556)	phosphor bronze(C5191) Wire gauge ：0.032~0.08mm^2,32~28AWG Outer diameter of wire ：0.5~1.0mm
motor interface	-	special interface	
Encoder interface	-	special interface	
working temperature	℃	-20~+85	default
working humidness	-	< 85% non condensing	

Driver Installation Dimensions

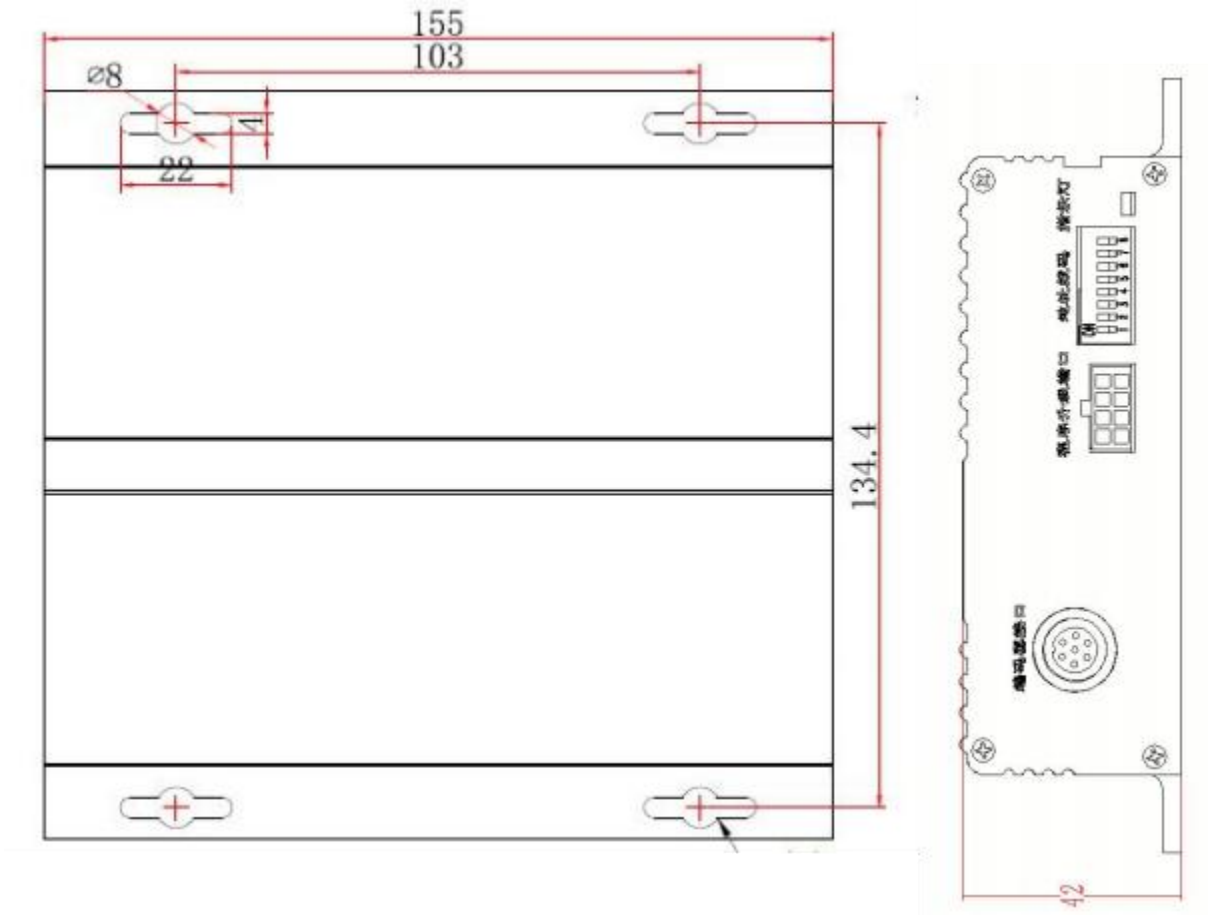
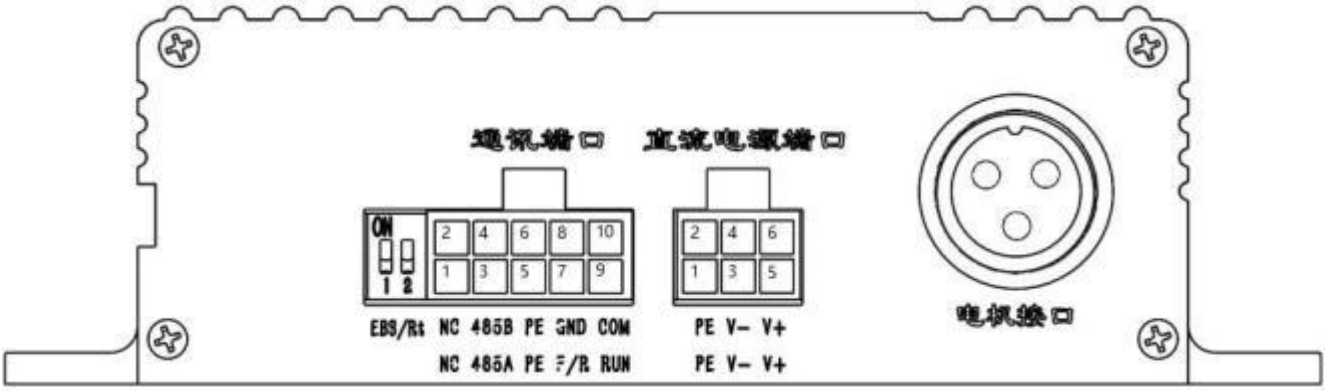


Figure 1 Installation dimensions (Unit mm)

Driver Interface Definition

1. interface definition 1



interface	type	pin	pin difinition	remark
EBS/Rt	DIP	1	non	non
		2	Rt	RS485 terminal resistance 120Ω,ON-internal terminal resistance shorting
Communication port	42000-10P	1,2	NC	NC
		3	485A	RS485 communication A
		4	485B	RS485 communication B
		5,6	PE	ground port
		7	F/R	invert enable port,level polarity according to COM port 注1
		8	Ref_GND	signal reference site
		9	RUN	forward enable port,level polarity according to COM port 注1
		10	COM	common port 注 1
motor interface	-	-	-	special interface
interface	42000-6P	1,2	PE	ground connection
		3,4	V-	48Vnegative pole
		5,6	V+	48Vpositive pole

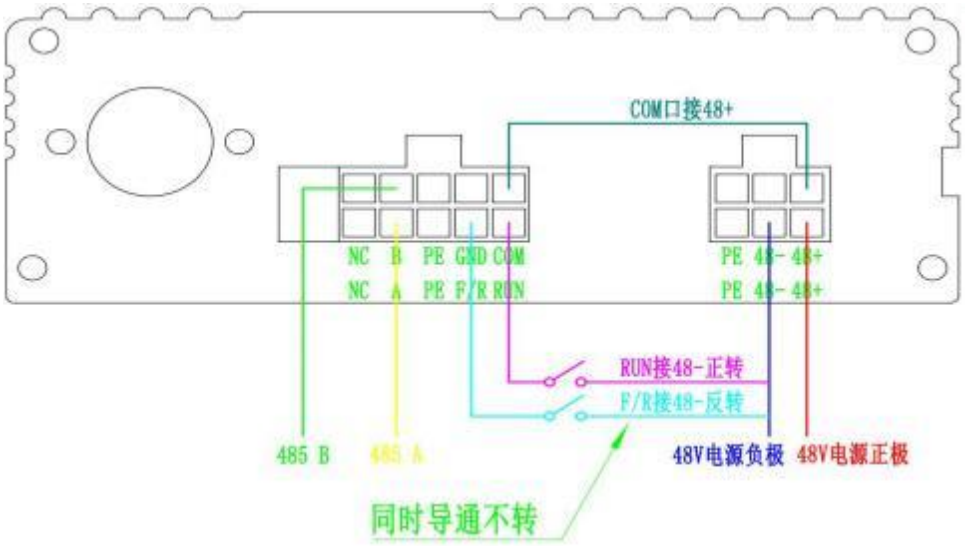
注 1：

1.COM port connect power "-"，RUN、F/R connect "+" effective；COM port connect power "+"、RUN、F/Rconnect "-" effective.

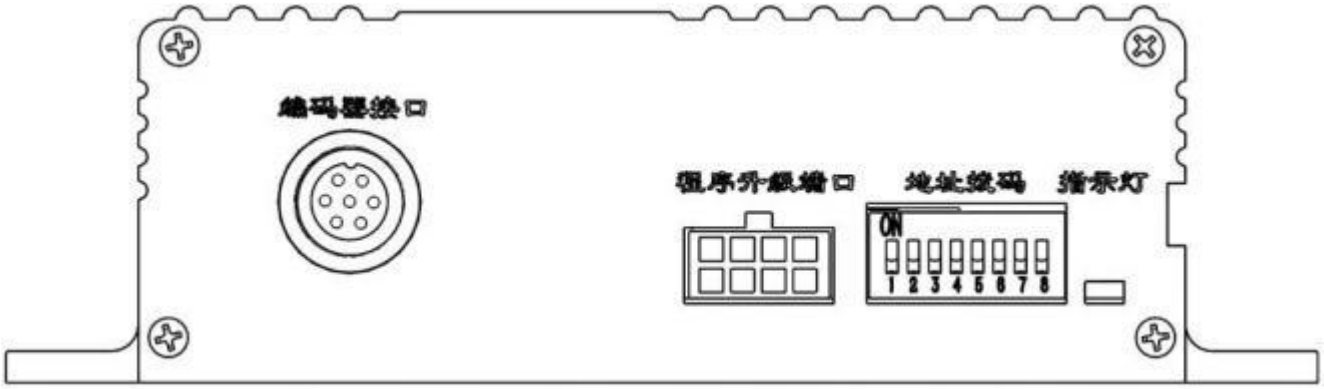
2.RUNeffective then forward；F/Reffective then reverse；RUN and F/Rboth effective then brake-stop，both ineffective then inertia-stop.

3.after 485 signal in correct format,the driver shields the function of IO,and recovers after power restart。

4.the wiring diagram as below：



2. interface definition 2



interface	type	pin	pin definition	remark
upgrade interface	-	-	-	software upgrade port
status lamp	-	-	-	build - in 2 led lamp , red and green
address dip	DIP	1	1	address =X1*1+X2*2+X3*4+X4*8+X5*16+X6*32+ X7*64+X8*128 X1~7：ON=1,OFF=0; address set range：1~255
		2	2	
		3	4	
		4	8	
		5	16	
		6	32	
		7	64	
		8	128	

lamp status definition

1.red LED lamp is power lamp,steady on after power on

2.green LED lamp is status lamp as below:

No	Flashes	discretion	handling method
1	uniform flashes	ok	-
2	flashes 2 times in 2s	undervoltage/overvoltage	e c h e c k if 48V v o lt a g e
3	flashes 3 times in 2s	overcurrent	check if overload
4	flashes 4 times in 2s	locked rotor	check if the motor is stuck
5	flashes 5 times in 2s	rotatory fault	check if the cable connection is secure
6	flashes 6 times in 2s	non	Contact suppliers
7	flashes 7 times in 2s	non	
8	flashes 8 times in 2s	non	

remark ：the driver and drum housing should be well drounded

RS485 communication and protocol definition

1. preface

(1)the instruction frame sent by the upper computer is 8 bytes,start byte is unique,start byteB7=1,subsequent byte B7=0.

(2)RS485 frame sending timing :

after control center sends run parameter frame,the driver return a reply frame,then the control center sends the run command frame.for each command frame must be preceded by a parameter frame,otherwise the drive has no action.

2. communication parameter

No.	item	parameter	remark
1	max site	255	address set by dip
2	communication format	38400,N,8,1	
3	check mode	frame check	
4	terminal resistance	120Ω	set by dip

3.run parameter setting frame

No.	term	parameter	remark
1	parameter setting start symbol	85H(o r 95H)	*run parameter reply frame is not returned when the start byte is 95
2	Direction,car number	B7=0 , B6=direction , B5-B0=car number 6 bits lower	number=byte6.B4~B3, B5-B0 address set by dip (range 1~255)
3	run speed	B7=0 , B6-B0=0~127	speed=(B6-B0)*6RPM (60RPM~762RPM)
4	delay run time 7 bits lower	B7=0 , B6-B0=0~127	time=(byte6.B0,B6-B0)*0.01S
5	run time /positioning steps	B7=0 , B6-B0=0~127	time=(byte6.B1, B6-B0)*0.01S steps=(byte6.B1, B6-B0)*1 step explain : Taking a 10 pole (5-pole) motor as an example for the number of running steps, The number of steps for one motor turn=the number of motor poles * the number of single cycle rotation sequences =5 * 6 =30
6	expansion bit	B7-B5=0 , B4~B3=car number 2 bits higher B2=0 time model, 1 positioning model(remark2)	

		B1=run time/steps number 8 bit B0=delay time number 8 bit	
7	change mark (serial-number)	B7=0 , B6-B0=progressive increase	serial-number only
8	check character	Byte 2-7 XOR	

remark2 : when positioning mode is set, when the object on the belt exceeds the positioning position due to inertia, the belt will reverse the calibration position.

4.run parameter response frame

No.	project	parameter	remark
1	car response start symbol	99H	
2	response car number	B7=0 , B6=0 , B5-B0=car number	
3	response content	B7-B6=0 , B5=motor failure , B4=no action instruction before parameter B3=no parameter before action instruction B2=0 , B1=overcurrent protection , B0=0	
4	check character	Byte 2-3 XOR	check character

5. run command frame (broadcast, no response frame required)

No	project	parameter	remark
1	Start symbol for car response	8AH	
2	Register group 1	B7=0 , B6 -B0=car 7-1	
3	Register group 2	B7=0 , B6 -B0=car 15-9	
4	Register group 3	B7=0 , B6 -B0=car 23-17	
5	Register group 4	B7=0 , B6 -B0=car 31-25	
6	Register group 5	B7=0 , B6 -B0=car 32,24,16,8	
7	Change indication (serial number)	B7=0 , B6 B0=progressive increase	Only indicate serial number
8	check character	Byte 2-7 XOR	

No.	project	parameter	remark
1	Start symbol for car response	8BH	
2	Register group 1	B7=0，B6 -B0=car 39-33	
3	Register group 2	B7=0，B6 -B0=c a r 47-41	
4	Register group 3	B7=0，B6 -B0=c a r 55-49	
5	Register group 4	B7=0，B6 -B0=c a r 63-57	
6	Register group 2	B7=0，B6 -B0=c a r 64,56,48,40	
7	Change indication (serial number)	B7=0，B6-B0=progressive increase	Only indicate serial number
8	check character	Byte 2-7 XOR	

Andsoon until 255sites

6. RS485 Debugging and Testing Software Description

1) Open the debugging test software as an administrator.

2) Choose the appropriate device port.

3) "Operation parameter setting " pull slider and selection box to set the motor operation parameters.

4) Press the "Set " button to set the motor parameters.

5) " Run command (broadcast) " tick the corresponding car number, "send " button to send the broadcast data.


直流无刷电机调试助手 Email:13485037330@163.com
通讯参数[波特率38400,8位数据,无校验,1位停止位]
串口:
打开
失败/运行 次数:
0
B5=电机运作失败
B4=参数之前无动作指令
B3=动作指令前无参数
B2=霍尔错误
B1=过流保护
运行参数设定
地址
1
CCW(左)
运行速度
0
转/分钟
位置模式
运行时间
255步
执行延时时间
0
毫秒
无返回
设置
运行命令(广播)
1 2 3 4 5 6 7 8
9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24
25 26 27 28 29 30 31 32
1-32
发送
发送设置
自动发送:
执行时间间隔:
500
毫秒
自动发送
手动发送:
单次发送

Other

1.Quality monitoring and inspection

All factory motors have tracking inspection table, which can be traced back to the size of each part; Motor insulation performance testing includes voltage endurance and turn to turn testing,100% inspection before leaving the factory; The motor performance testing adopts the back electromotive force method, which 100% checks the back electromotive force of all motors.

2. complete machine warranty cycle

The warranty period for the entire machine is one year, and any damage caused by abnormal use will incur a repair service fee.