LICHUAN

LCDA808H

Digital Hybrid Servo Drivers

Product overview

Lichuan LCDA808H easy servo drives are based on the latest DSP technology and advanced control algorithm of combing brushless servo and stepper systems. They are featured with closed position loop, offering huge torque, excellent acceleration & quick response, no torque reservation, high standstill stiffness, extra low noise & heating, smooth motor movement, no hunting, no overshooting for almost zero settling time, and no tuning for almost all applications.

Application field

Due to combining the features of both brushless servo drives and stepper drives, Lichuan series easy servo drives are suitable for both upgrading conventional stepper systems, and replacing brushless servo systems which have closed loop and high torque requirements.

clients have successfully implemented LCDA808H driven easy servo systems in applications such asdesktop CNC routers, small CNC mills, laser cutters / engravers, dental mills, electronic assembly & inspection equipments, labeling equipments, pick & place machines, X-Y tables, scientific instruments.

Function

➤ Voltage input range：50~80VAC

➤ Max peak current：8A

➤ Subdivision：200~51200ppr

➤ Pulse mode：pulse+direction,CW,CCW

➤ Pulse response frequency：0～200KHz

➤ Closed-loop controls to eliminate lose of steps, stall or movement synchronizatio

➤ High starting torque and quick response

➤ Smooth motor movement with no vibration

➤ Excellent respond time, quick acceleration, and very high high-speed torque (30% over open-loop)

➤ Load-dependent dynamic current output from drive to motor to significantly motor heating deduction

➤ Isolated control inputs of Pulse, Direction and Enable

➤ No tuning for plug and play setup

➤ On-board HMI for easy setup and configuration

➤ In-position and fault outputs to external motion controllers for complete system controls.

➤ Over voltage, over-current, and position-error protection

➤ Servo control for stepper motors with encoders up to NEMA 42

Electrical index

- Voltage input range：AC：50V~80V （Generally75V）
- Max output current：8A
- Pulse mode：pulse+direction 、CW/CCW
- Logic input current：10~20mA
- Pulse response frequency：0~200kHz
- insulation resistance：500M

Using Environment and Parameters

- Save temperature：-20℃～80℃
- Using temperature：0℃～55℃
- Using humidity：90%RH（no condensation）
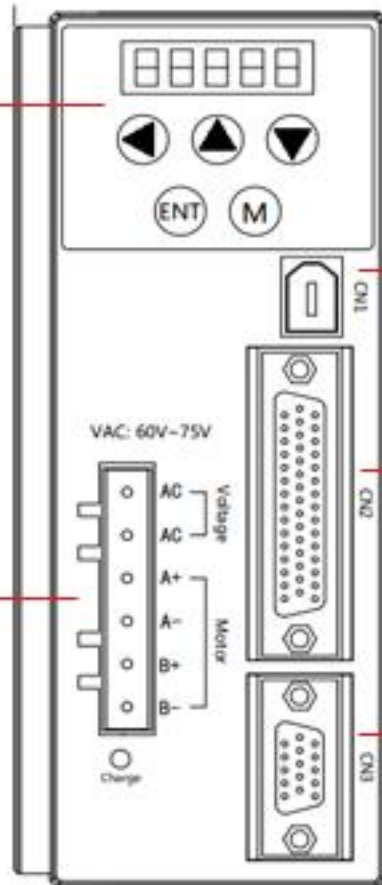- Shake frequency：less than 0.5G（4.9m/s2）
- 10Hz～60Hz（Not run continuously）

Install Size （mm）
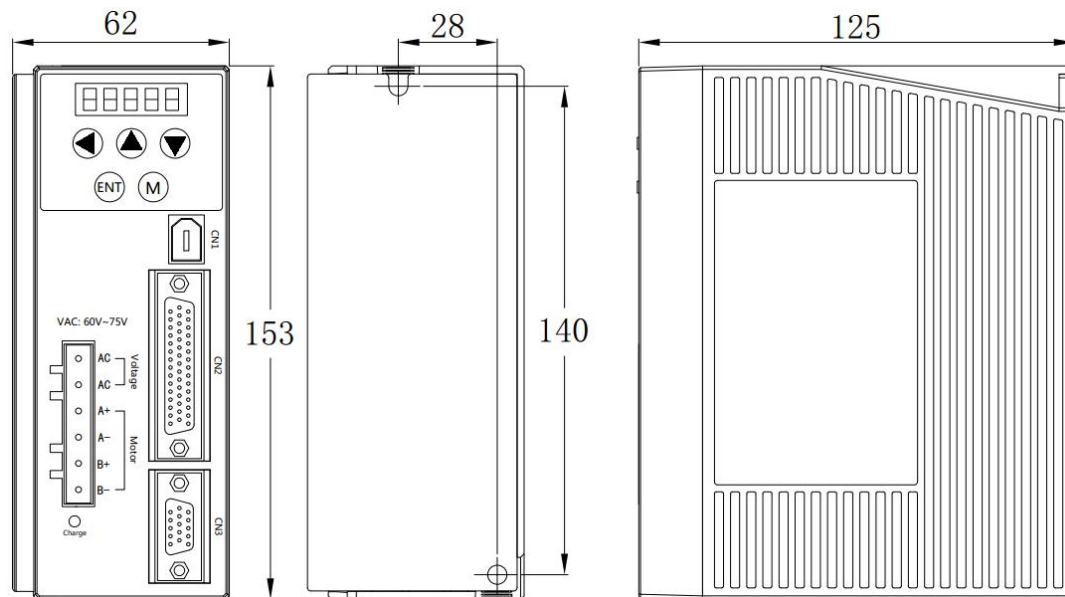
Drive Appearance and Interfaces
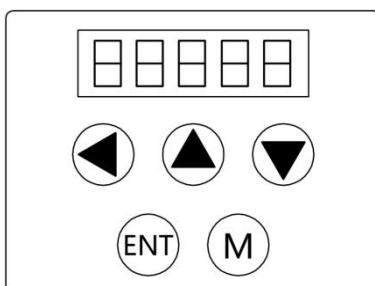
On-board HMI
Self-test,
On-board
Configuration

CN1
RS232
Configuration
Port

CN2
Control Signal
Connector
Pulse, Direction, Enable
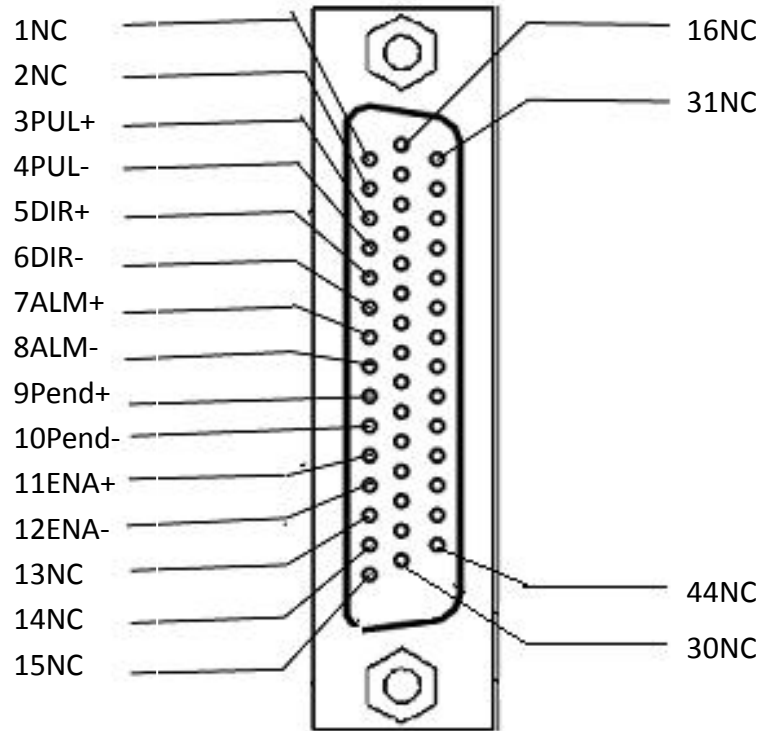Inputs and Fault
Output

Power
Connector
or
Motor
Connector

VAC: 60V~75V

AC
AC
A+
A-
B+
B-

Voltage

Motor

Charge

CN3
Feedback Signal
Connector
Encoder Connection

On-board HMI

Key symbol	Key note
◀	Input bit (blinking) left shift
▲	Switching sub menu, add value
▼	Switching sub menu, reduce value
ENT	Enter sub menu,determine input
M	Can switch between modes

CN2 – Control Signal Connector

1NC
2NC
3PUL+
4PUL-
5DIR+
6DIR-
7ALM+
8ALM-
9Pend+
10Pend-
11ENA+
12ENA-
13NC
14NC
15NC

16NC
31NC

44NC
30NC

CN3 – Feedback Signal Connector

1EA+
2EB+
3GND
4NC
5NC

6NC
11EA-
12EB-
13VCC
14NC
15NC
10NC
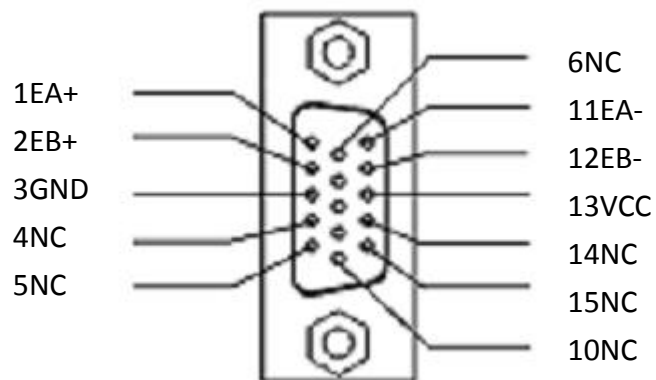
Power supply and motor wire connection

VAC:50V~75V

A+
A-
B+
B-
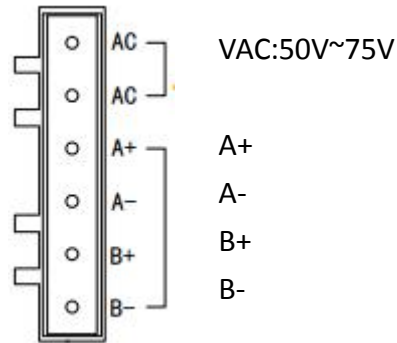
Driver terminal description

1 Power terminal definition

No.	Symbol	Function definition
1	AC	AC power terminal
2	AC	Generally connect AC 75V
3	A+	Motor power line terminal color see label on motor
4	A-	
5	B+	
6	B-	

2 Driver control terminal definition（44 pin DB Plug）

Pin	Symbol	Description	Pin	Symbol	Description
3	PUL+	Pulse input plus	8	ALM-	Alarm output minus
4	PUL-	Pulse input minus	9	Pend+	Position completion output plus
5	DIR+	Direction input plus	10	Pend-	Position completion output minus
6	DIR-	Direction input minus	11	ENA+	enable input plus
7	ALM+	Alarm output plus	12	ENA-	enable input minus

3 Driver encoder terminal definition（15 Pin DB Plug）

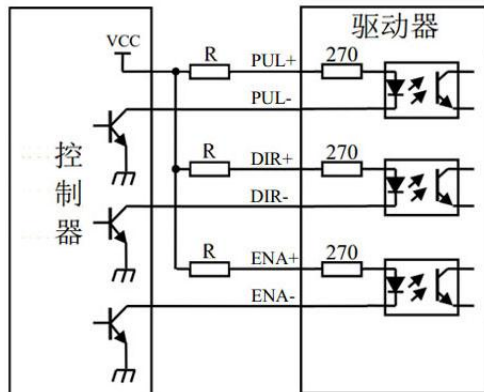| Pin	Symbol	Color	Description
1	EA+	Black	Encoder A signal plug
2	EB+	Yellow	Encoder B signal plug
3	GND	White	Encoder power ground
11	EA-	Blue	Encoder A signal minus
12	EB-	Green	Encoder B signal minus
13	VCC	Red	Encoder+5V input

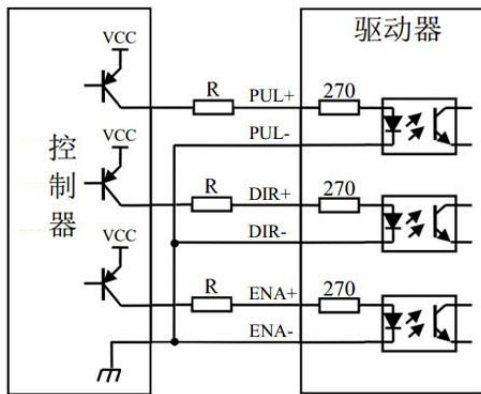# Control terminal wiring

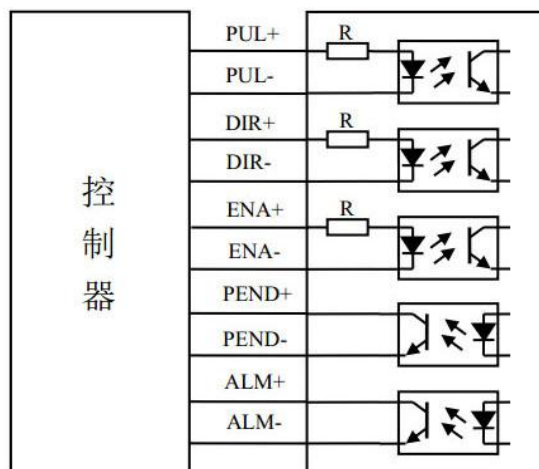Chart 2   Common-anode Wiring

Chart 3 Common-cathode wiring

Chart 4 Differential signal input and output signal method

Note：

When the control signal voltage VCC =24V , the current limiting resistance R = 3K；

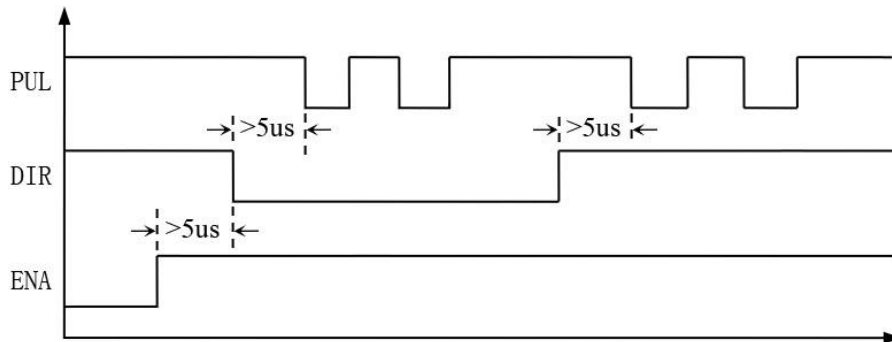When the control signal voltage VCC =5V , the current limiting resistance R = 0K

Control signal timing diagram
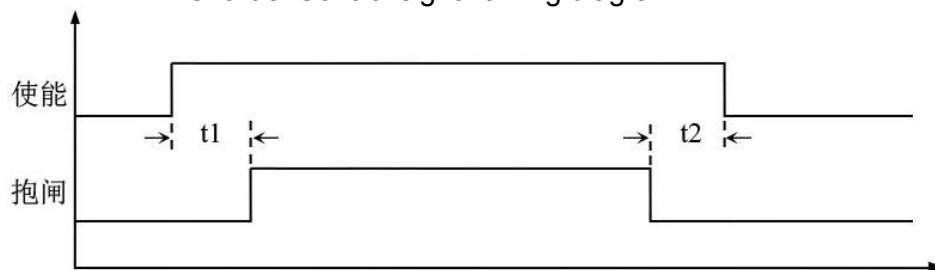

Chart 5 Control signal timing diagram

Chart 6 Motor brake signal control timing diagram

Note：t1: brake delay open time   t2: brake delay closing time

Parameter setting

This drive can be set directly by the driver's button panel to set the parameters,the debug panel and debugging steps are as follows:

1.Debug panel description

◀   Input bit (blinking) left shift

▲   Switching sub menu, add value

▼   Switching sub menu, reduce value

(ENT)   Enter sub menu,determine input

(M)   Can switch between modes

2.Data monitoring

LED display	Description
d00UEP	The current position error is converted to encoder pulses number
d015PF	Current speed feedback (rpm)
d025Pr	Current speed setting (rpm)
d03PLF	Pulse number after current position feedback encoder 4 frequency doubling,starting from the power up initialization
d04PLr	Current position given original pulse number, starting from the power up initialization
d05CUr	Current peak current (mA)
d06Err	Current fault value 01：overcurrent； 02：Overvoltage； 04：The limitation of position error

3.Operation flow

Res
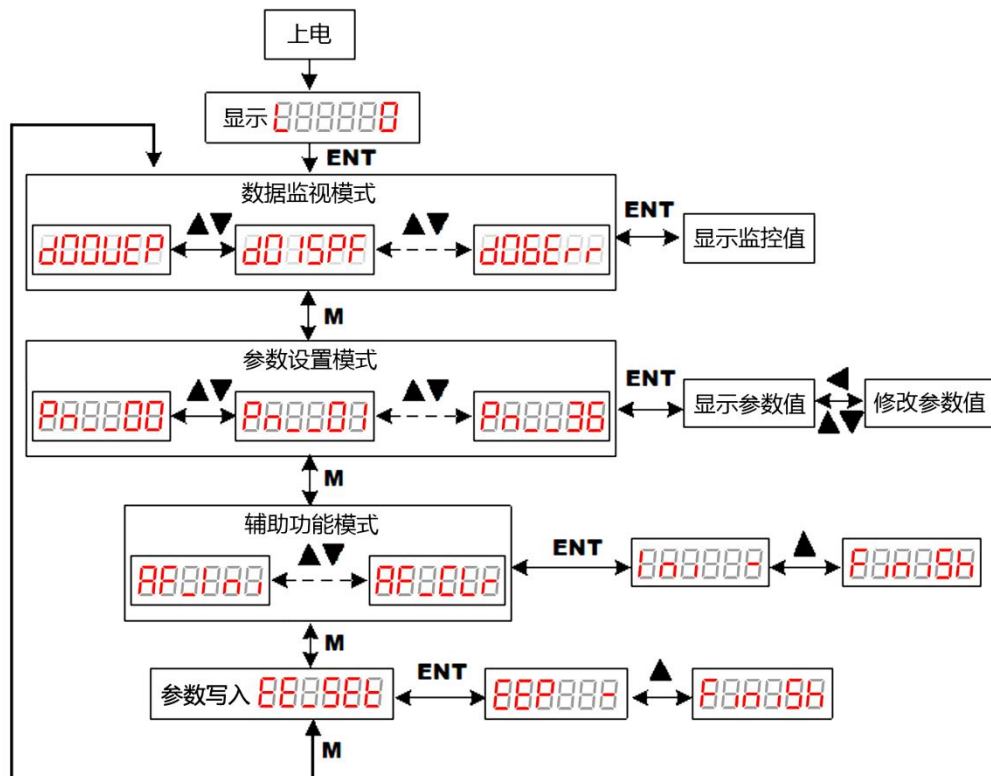
tore factory settings：press (M) key switch to "AF_Ini"，then press (ENT) key，display

"Inl -"，then press (▲) key，after showing "FiniSh" ,set completion.

Clear alarm record： press (M) key switch to "AF_CLr"，then press (ENT) key，display

"CLr -"，then press (▲) key，after showing "FiniSh" ,set completion.

Parameter Write：press (M) key switch to"EE_SEt"，then press (ENT) key，display"EEP

-"，then press (▲) key for **5 seconds**，after showing"FiniSh",set completion.

4.Specific parameter description

No.	Name	Default value	Range	Note
0	Motor pulses number / roll	4000	400-60000	pulse/roll
1	Encoder pulses number / roll	4000	1000-60000	pulse/roll
2	Standby current percentage	40	1-100	Motor standby current percentage
3	Operating current percentage	100	1-100	Motor max operating current percentage
4	Input filter enable	0	0-1	0：Input pulse no filter； 1：Input pulse filter
5	Input filtering time	4000	50-51200	Input pulse filter time unit:us
6	Fault output resistance setting	0	0-1	0：Optocoupler cutoff when fault； 1：Optocoupler conduction when fault
7	Open/closed loop Control mode settings	1	0-1	0：open loop control； 1：closed loop control

8	Self tuning selection	1	0-1	1：Automatic setting of motor current loop parameters
9	Current loop Kp	1000	300-32767	Current loop ratio(The parameters are automatically obtained from the self tuning)
10	Current loop Ki	200	10-32767	Current loop integral coefficient(The parameters are automatically obtained from the self tuning)
11	Manufacturer parameters 0	512		Manufacturer parameters
12	Position loop Kp	1300	300-32767	Coefficient of position scale loop
13	Position loop Ki	200	20-32767	Position loop integral coefficient
14	Position loop Kd	200	20-32767	Position loop differential coefficient
15	Position loop compensation	250	20-32767	Position Loop Delay Compensation Coefficient
16	Low speed vibration resistance coefficient	0	0—32767	Low speed vibration damping coefficient
17	Position error limit	4000	1-65535	The position tracking error alarm threshold value
18	Position integral delay time	10	0-10000	ms
19	Enable the active level	1	0-1	0: Optocoupler conduction is enabled. 1: Optocoupler no conduction

				is enabled.
20	Not enabled motor status	0	0-1	0: Motor loose shaft when not enabled; 1: Motor lock axis when not enabled
21	Enable clear fault selection	0	0-1	0: Do not allow to clear fault; 1: Allow
22	Manufacturer parameter 1	0	0-1	Manufacturer parameters
23	Manufacturer parameter 2	0	0-1	Manufacturer parameters
24	Manufacturer parameter 3	0	0-1	Manufacturer parameters
25	Single and double pulse selection	0	0-1	0: pulse direction control mode; 1: Double pulse control mode
26	Impulse effective edge selection	0	0-1	0: Pulse rising edge valid; 1: Pulse falling edge valid.
27	Positive direction level setting	1	0-1	0: direction of the positive logic; 1: direction of the inversion logic;
28	Input pulse cutoff frequency setting	0	0-1	0：200KHz；1：500KHz
29	Test run acceleration	200	1-2000	Rps/s
30	Try running the highest speed	100	1-5000	0.01rps
31	Test run distance	100	1-65535	0.01r

32	Number of test runs	1	1-65535	Number of runs
33	Test run starting direction	1	0-1	0: reverse direction start 1: positive direction start
34	Test run time interval	100	1-65535	Interval between test runs Units：ms
35	Test run round-trip set	1	0-1	0：One-way； 1：Reciprocating
36	Test run start and stop settings	0	0-1	1: start the test run; 0: Stop the test run