DINGS'

Precision Motion Specialist

DS-CL28/42-SA Integrated closed loop drive

- Integrated motor + Encoder +Driver+ controller+ Network
- Embedded controller
- Closed loop system
- Without Gain adjustment
- High Resolution/Fast Response

NEW

DINGS
Precision Motion Specialist

■ DS-CL28-SA Basic knowledge

● Summary

Integrated Closed Loop Stepper Technology, with controller and driver at the end of the motor. Using an integrated high resolution encoder (16000 PPR), the real-time motor position is updated every 50us. Up to 16 axes can be controlled simutaneously via RS485. All motion commands are executed with parameters saved in Flash ROM. The movement library (DLL) can be used with 64-bit Windows 2000/XP, and can be saved in Flash ROM.
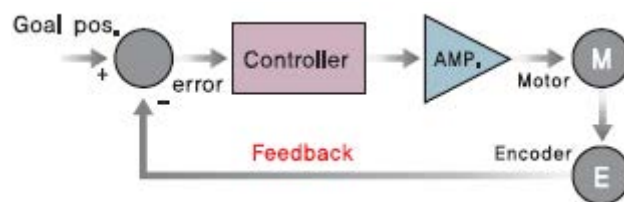
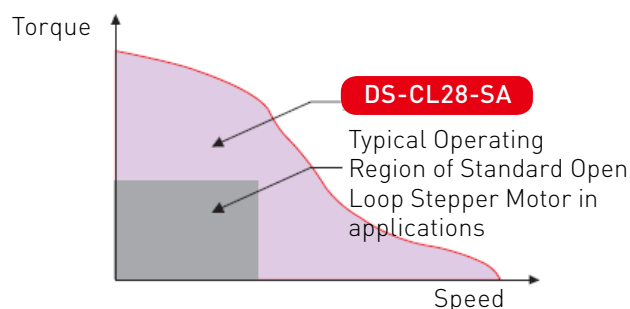| Parameters	
Input Voltage	24VDC±10%
Control Method	Closed loop control with 32bit ARM
Multi Axes Driver	Max 16 axes through Star Topology
Location table	256 movement command steps (continuous cycle Jump etc)
Board Current Consumption	Max 500mA(Except motor current)
Ambient Temperature	Use:0~55℃ Storage:-20~70℃
Ambient Humidity	Use:35~85%RH (Non-Condensing) Storage:10~90%RH (Non-Condensing)
Anti-knock	0.5G
Rotation Speed	0~3000rpm
Encoder Resolution (P/R)	Max 16000PPR
Protection Functions	Multiple alarm function, Reference practical manual
Rotational Direction	CW/CCW (Selectable by parameter)
Digital Inputs	4 programmable input (Photocoupler)
Digital Output	Does not supprt
Communication interface	RS-485 Serial communication with PC Transmission speed: 115200 (bps)
Position Control	Incremental mode Data range: -2147483648 to +2147483647 (pulse) Pules speed: Max 800 (kpps)
Return to Origin	Origin sensor, ±Limit sensor, Z phase, Torque
GUI	User interface program with in windows
Software	Ezi-Motion GUI / Motion library (DLL) for Windows 2000/XP/7/8/10

● Feature

1. With motion parameters being stored in Flash ROM, up to 16 axes can be controlled through RS485 and PC.

2. Using an integrated high resolution encoder (16000 PPR), the real-time motor position is updated every 50us.
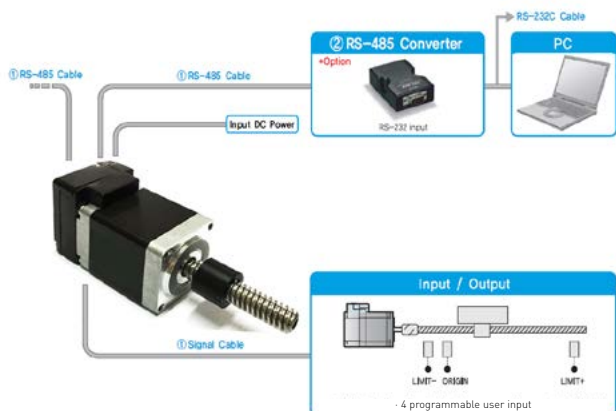

3. Integrated encoder with dynamic closed loop control allows motor to operate at maximum speed with maximum torque without step loss.

4. By regulating current and using the encoder to detect mechanical home, the integrated unit can function closed loop without any external limit switches and perform torque control.
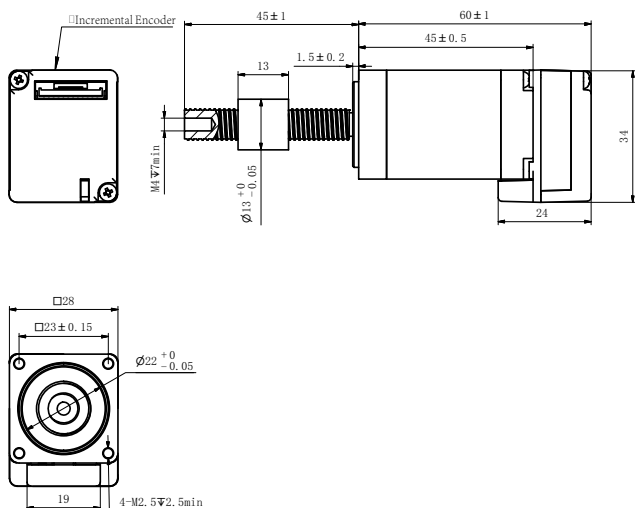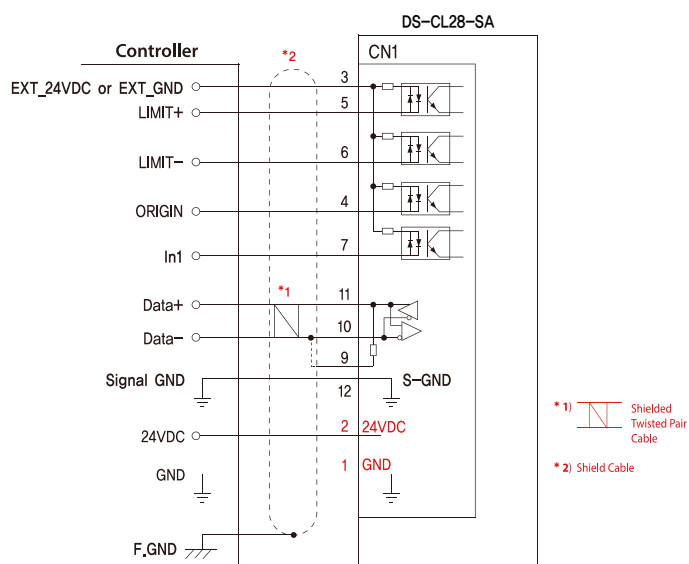
System layout

Typical connection

DS-CL28-SA

Controller		CN1
EXT_24VDC or EXT_GND		3
LIMIT+		5
LIMIT–		6
ORIGIN		4
In1		7
Data+		11
Data–		10
		9
Signal GND		12 S–GND
24VDC		2 24VDC
GND		1 GND
F.GND		

*1) Shielded Twisted Pair Cable
*2) Shield Cable

Input /Output Port definitions

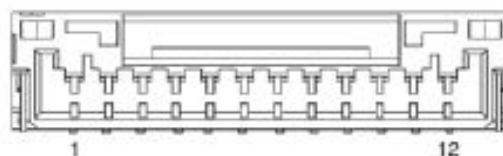| Port	Function	Description
1	GND	Power GND
2	+24V	+24V Power Input
3	I/O Common	Input/Output Signal common terminal
4	IN1	User Input (User Input1)
5	IN2	User Input (User Input2)
6	IN3	User Input (User Input3)
7	IN4	User Input (User Input4)
8	Reserved	Reserved
9	Termination	Termination resistor setting
10	Data- (B)	Communication signal (RS-485)
11	Data+ (A)	Communication signal (RS-485)
12	S-GND	Communication signal GND (RS-485)

Port signal

Size

Optional accessories

FAS –RCR (RS-232C RS -485 converter)

Item	Specifications
Comm. speed	Max 1152Kbps
Comm. Distance	RS-232C: Max 15m RS-485: Max 1.2km
Connecter	RS-232C: DB9 RS-485: RJ-45
Size	50x75x23mm
Weight	38g
Power	Self-Powered RS-232C (DC5~24V external power available)

NOTE: Accessories should be purchased separately

▪ DS-CL28-SA Setting and Operating

Motor — Controller

Status LED

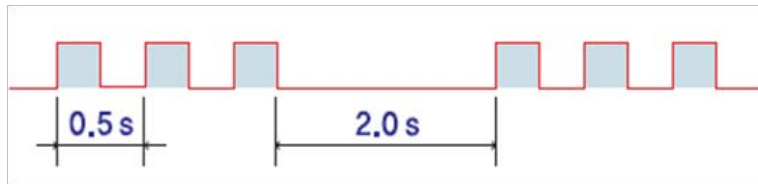Power / Communication / Input,Output connector — Motor
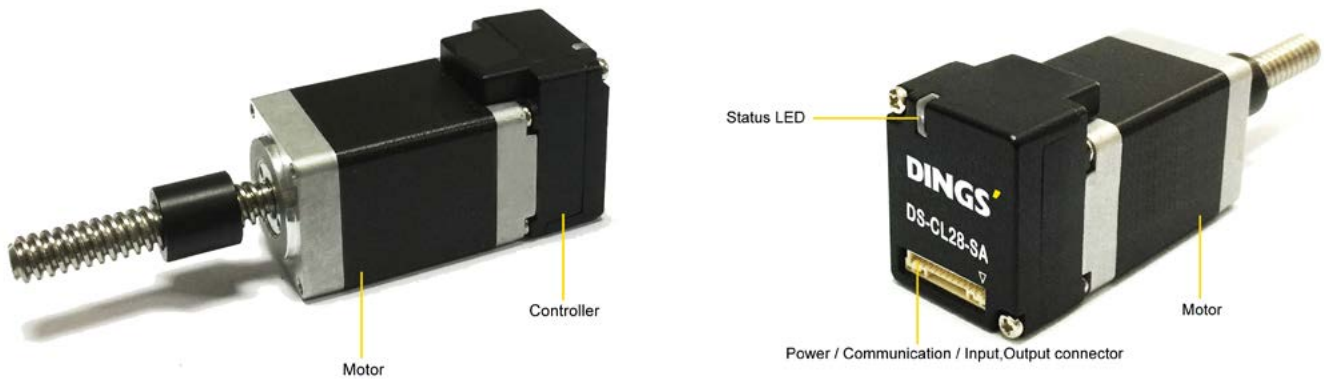
● **Status LED**

In the case of DS-CL28-SA series products, status of LED can be checked by LED color lighting on / off and blinking.

| Status	Function		On/Off status
Disable	Green: Red:	– – – –	Green light flashing, Red light off
Enable	Green: Red:	─────	Green light flashing, Red light off
Enable & Communication	Green: Red:	───── • •	Green light on. Red light flashing
In Motion	Green: Red:	───── ─────	Green & Red light on
Inposition deviation	Green: Red:	············· ·············	Green and red light alternately flashing
Alarm	Green: Red:	▬ ▬ ▬ ▬	Red light flashing repeat as many as alarm number

● **Protection function and status LED flash times**

Times	Protection	Conditions
1	Over Current Error	The current through power devices in inverter exceeds the limit value
2	Over Speed Error	Motor speed exceed 3000rpm
3	Step Out Error	Position values is higher than specified value in motor stop status
4	Over Load Error	The motor is continously operated more than 5 second under a load exceeding the max. torque
5	Over Temperature Error	Inside temperature of drive exceeds 85°C
6	Over Regeneratived Voltage Error	Back-EMF more than high limit value
7	Motor Connect Error	The power is ON without connection of the motor cable to drive
8	Encoder Connect Error	Cable connection error with Encoder connector in drive
9	Low Input Voltage Error	The power supplied to the motor is less than low limit value
10	Inposition Error	After operation is finished, a position error occurs
12	ROM Error	Error occurs during tuning execution
15	Position Overflow Error	Position error value is higher than 90 ° in motor stop state

Alarm LED flash (ex: Position tracking error)
Default value can be changed by parameter (Refer to Manual)

● **Network ID Setting Switch**
The network ID of DS-CL28-SA series can be set using Ezi-Moiton Plus-R GUI (Version 6.40.7.12 or later).
After connecting the communication, the setting window appears by selecting the product and press the right button of the mouse
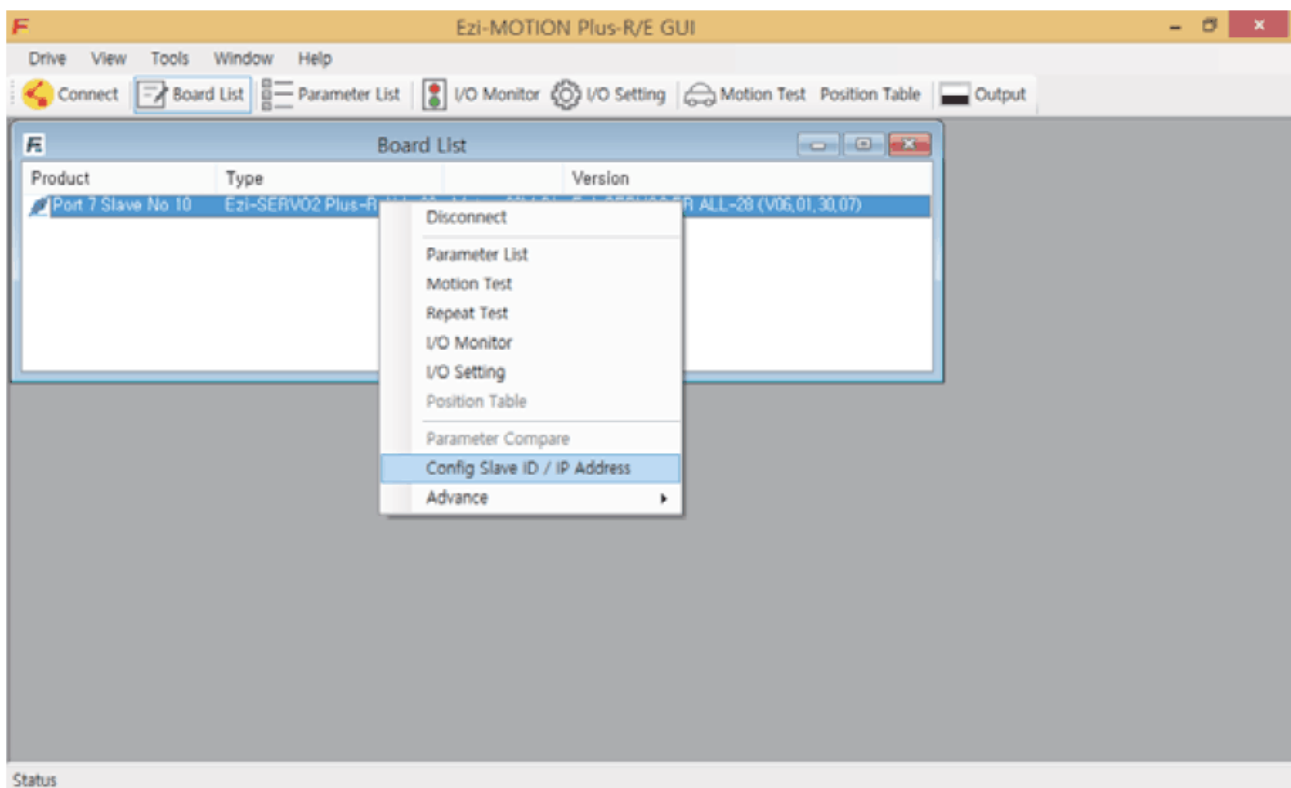
■ DS-CL42-SA Basic knowledge

● Summary

Closed-loop stepper motor integrate. At the end of motor drive integrated control system. Including high resolution encoder, every 50μs update the motor position in real time. Integrated motion control through the RS485 communication to the computer, also can connected 16 shaft at the same time. All of the moving conditions are performed by a parameter saved in the FLASHROM. The movement library (DLL) provides the maximum 64-bit program of Windows2000 / XP, can be save in FLASHROM memory !

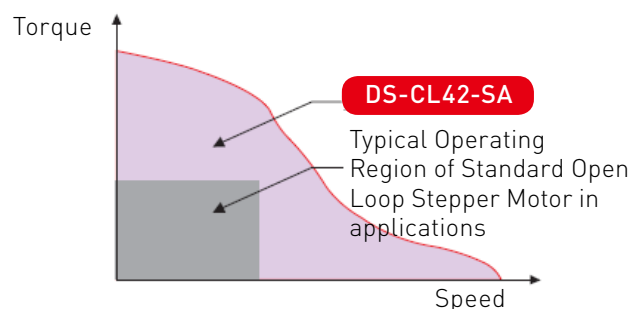| Parameters	
Input Voltage	24VDC±10%
Control Method	Closed loop control with 32bit ARM
Multi Axes Driver	Max 16 axes through daisy-chain
Location table	256 movement command steps (continuous cycle Jump etc)
Board Current Consumption	Max 500mA(Except motor current)
Ambient Temperature	Use:0~55℃ Storage:-20~70℃
Ambient Humidity	Use:35~85%RH (Non-Condensing) Storage:10~90%RH (Non-Condensing)
Anti-knock	0.5G
Rotation Speed	0~3000rpm
Encoder Resolution (P/R)	Max 10000PPR
Protection Functions	Multiple alarm function, Reference practical manual
Rotational Direction	CW/CCW (Selectable by parameter)
Digital Inputs	7 programmable input (Photocoupler)
Digital Output	3 programmable output, Brake
Communication interface	RS-485 Serial communication with PC Transmission speed: 115200 (bps)
Position Control	Incremental mode Data range: -2147483648 to +2147483647 (pulse) Pules speed: Max 500 (kpps)
Return to Origin	Origin sensor, ±Limit sensor, Z phase, Torque
GUI	User interface program with in windows
Software	Ezi-Motion GUI / Motion Library [DLL] for Windows 2000/XP/7/8/10

● Feature

1. With motion parameters being stored in Flash ROM, up to 16 axes can be controlled through RS485 and PC.

2. Using an integrated high resolution encoder (10000 PPR), the real-time motor position is updated every 50us.
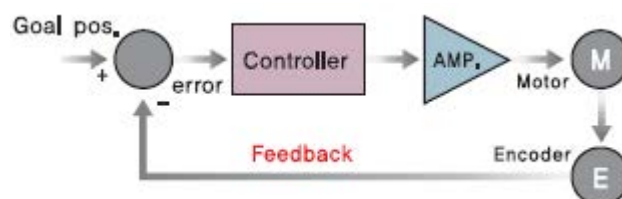

3. Integrated encoder with dynamic closed loop control allows motor to operate at maximum speed with maximum torque without step loss.

4. By regulating current and using the encoder to detect mechanical home, the integrated unit can function closed loop without any external limit switches and perform torque control.

● System layout


● Typical connection

DS-CL42-SA
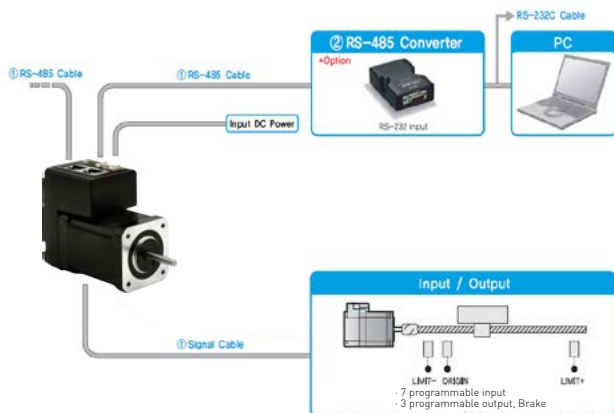
Input /Output Port definitions

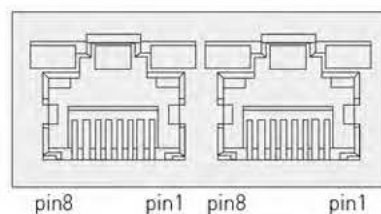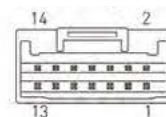| Port	Function	Description
1	Input Common	Input Signal common terminal
2	Ouput Common	Output Signal common terminal
3	BRAKE+	Brake +24V
4	BRAKE-	Brake GND
5	IN1	User Input (User Input1)
6	IN2	User Input (User Input2)
7	IN3	User Input (User Input3)
8	IN4	User Input (User Input4)
9	IN5	User Input (User Input5)
10	IN6	User Input (User Input6)
11	OUT1	User Output (User Output1)
12	OUT2	User Output (User Output2)
13	IN7	User Input (User Input7)
14	OUT3	User Output (User Output3)
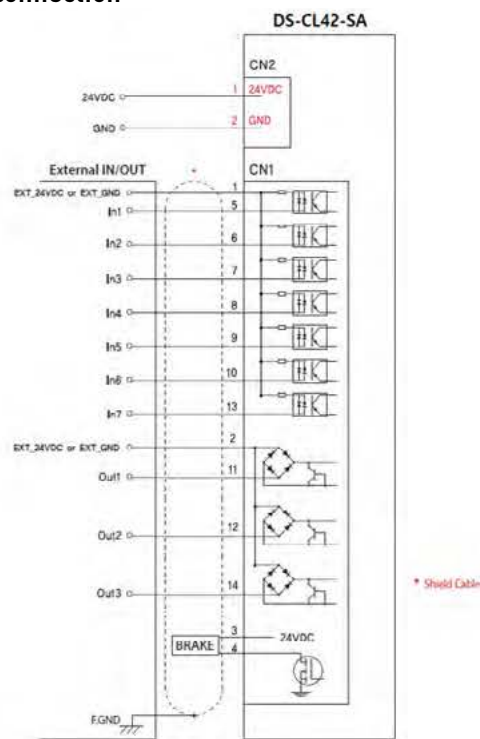
● Power Connector

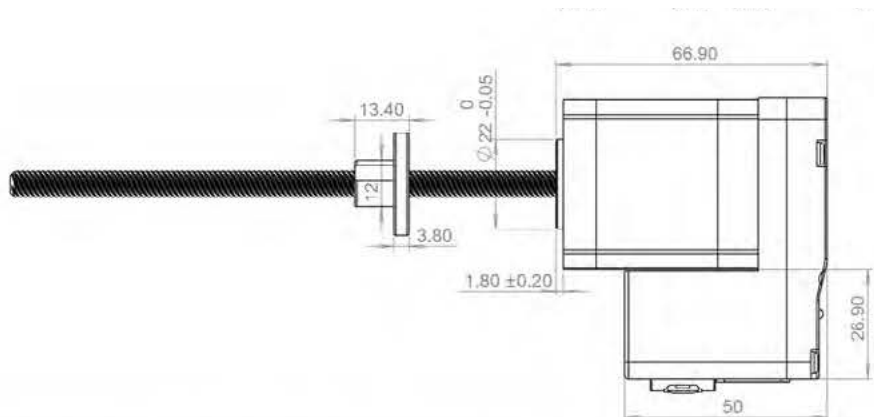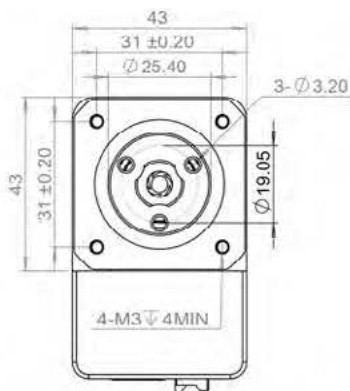| NO.	Function	I/O
1	24VDC	Input
2	GND	Input
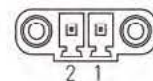
● RS-485 Communication Connector

NO.	Function	I/O	Function
1	GND	5	GND
2	GND	6	Data-
3	Data+	7	GND
4	GND	8	GND

● Port signal

● **Size**

Optional accessories	
FAS –RCR (RS-232C RS -485 converter)	
Item	Specifications
Comm. speed	Max 1152Kbps
Comm. Distance	RS-232C: Max 15m RS-485: Max 1.2km
Connecter	RS-232C: DB9 RS-485: RJ-45
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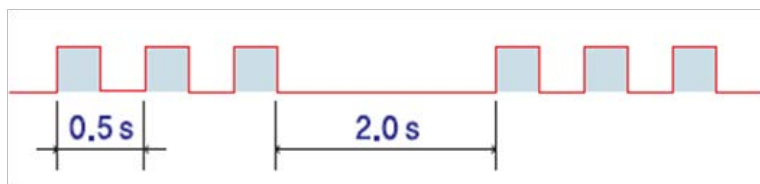
DS-CL42-SA Setting and Operating

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Enable & Communication	Green: Red:	▬▬▬▬▬▬ • •	Green light on. Red light flashing
In Motion	Green: Red:	▬▬▬▬▬▬ ▬▬▬▬▬▬	Green & Red light on
Inposition deviation	Green: Red:	• •	Green and red light alternately flashing
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Alarm LED flash (ex: Position tracking error)
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● **Network ID Setting Switch**

Position	ID Number	Position	ID Number
0	0	8	8
1	1	9	9
2	2	A	10
3	3	B	11
4	4	C	12
5	5	D	13
6	6	E	14
7	7	F	15