

# Electronic Interface Module

## OPERATION MANUAL

*KS73A (Follow up amplifier)*

*EIM-COM*

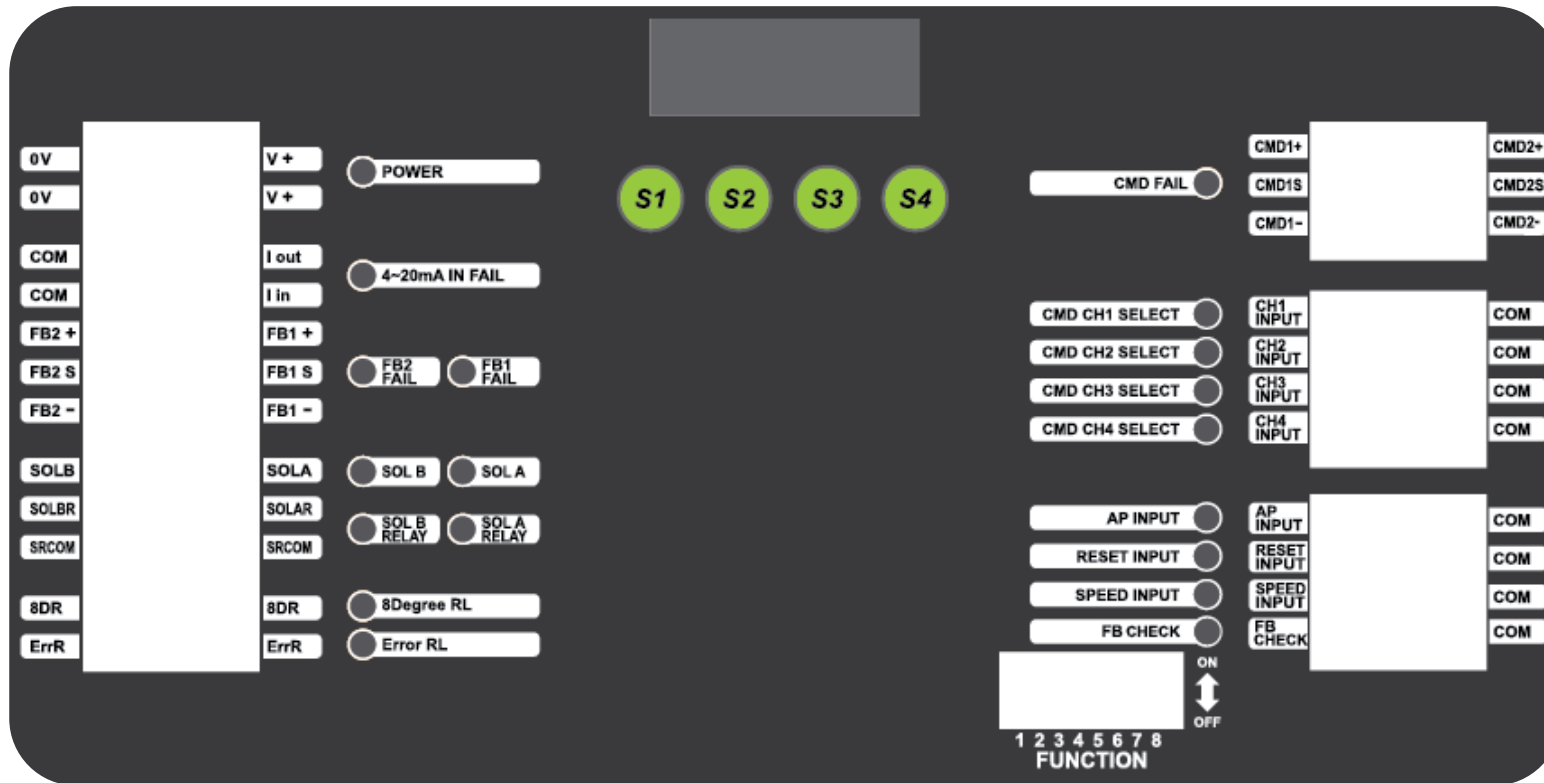
*EIM-JSnDP*

# CONTENTS

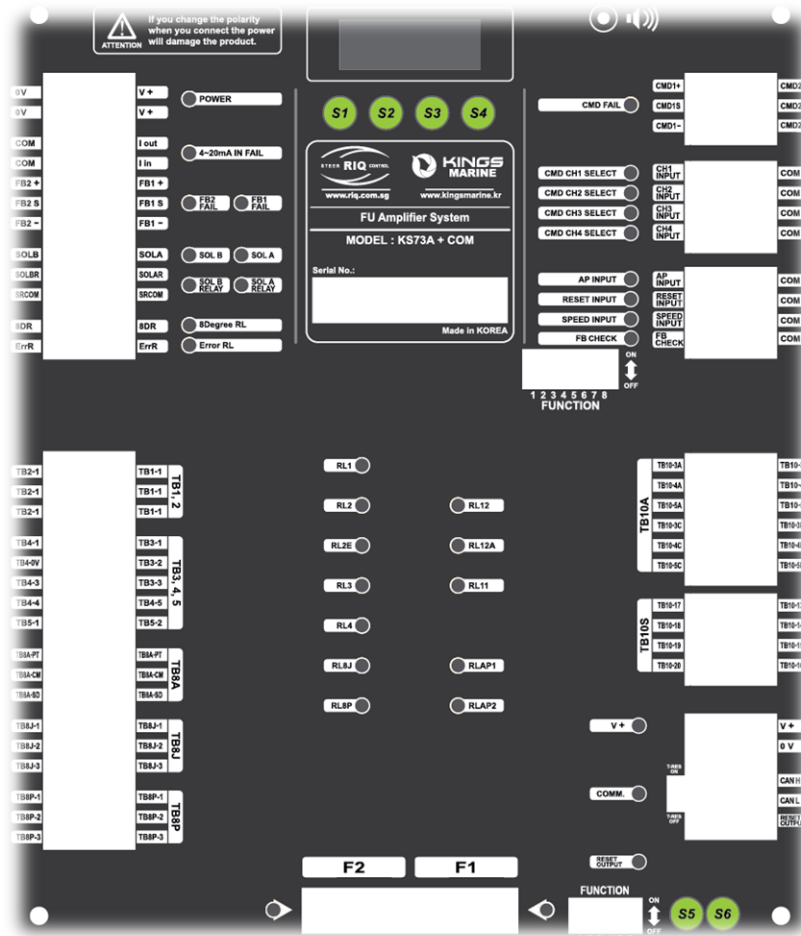
DESCRIPTION	PAGE
1. Hardware configuration -----	3
2. System solution -----	4
3. Terminal assignment -----	5
4. Dip switch -----	6
5. FND display -----	7
6. Key operation -----	8
7. Wiring	
7.1 Power supply -----	9
7.2 Input terminal -----	10
7.3 Output terminal -----	17

8. Calibration mode	
8.1 CMD calibration	-----22
8.2 FEED BACK calibration	-----24
8.3 4-20mA input calibration	-----27
8.4 4-20mA input direction	-----27
8.5 4-20mA output calibration	-----28
8.6 4-20mA output direction	-----28
9. Operation mode	
9.1 AP(Auto pilot) mode	-----29
9.2 JSnDP(4-20mA) mode	-----30
9.3 CMD mode	-----31
9.4 Sensitivity adjustment mode	-----32
9.5 CMD channel mode	-----32
9.6 Fall in mode	-----33
9.7 Fall to zero mode	-----34
9.8 Feed back check mode	-----35
10. Error message & trouble shooting	-----36

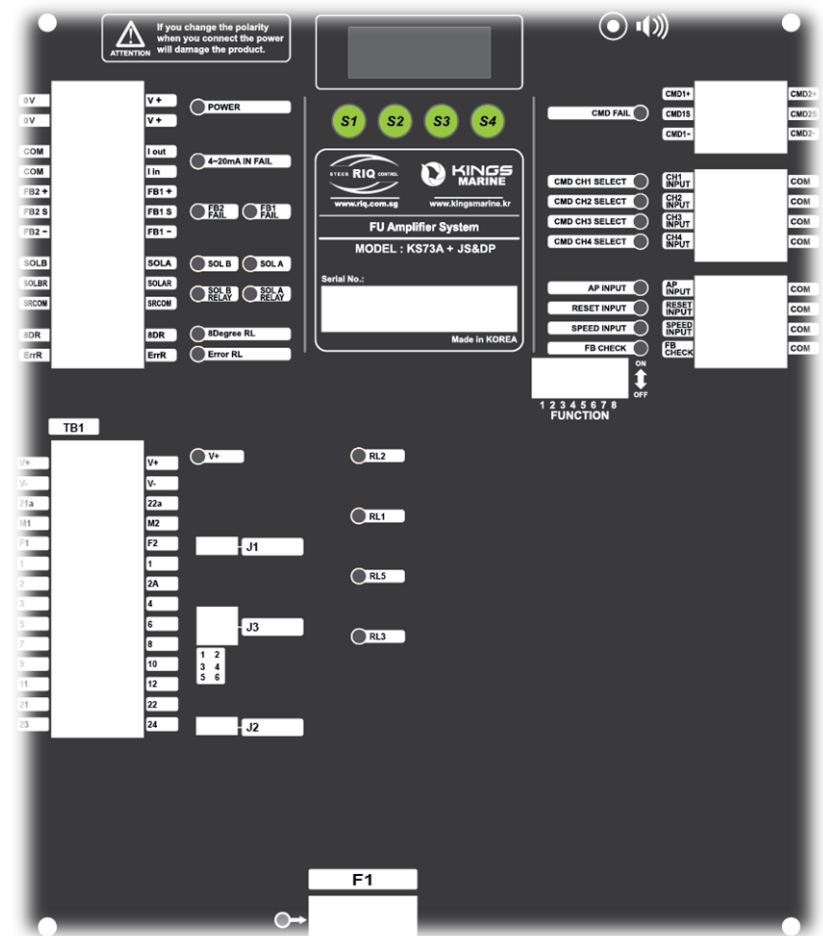
# 1. Hardware configuration



## 2. System solution



<KS73A/EIM-COM>



<KS73A/EIM-JS&DP>

### 3. Terminal assignment

No.	Assignment	No.	Assignment	Assignment	No.	Assignment	No.
1	OV	2	V+ (DC 24V)	CMD 2 +	26	CMD 1+	25
3	OV	4	V+ (DC 24V)	CMD 2 Sensor	28	CMD 1 Sensor	27
				CMD 2-	30	CMD 1-	29
5	4~20mA Output Com	6	4~20mA Output				
7	4~20mA Input Com	8	4~20mA Input				
9	FEED BACK 2 +	10	FEED BACK 1+				
11	FEED BACK 2 Sensor	12	FEED BACK 1 Sensor				
13	FEED BACK 2 -	14	FEED BACK 1 -				
				CH 1 Input	32	CH 1 Input COM	31
				CH 2 Input	34	CH 2 Input COM	33
				CH 3 Input	36	CH 3 Input COM	35
				CH 4 Input	38	CH 4 Input COM	37
15	SOLENOID B	16	SOLENOID A	AP(Auto Pilot) Input	40	AP(Auto Pilot) Input COM	39
				Reset Input	42	Reset Input COM	41
17	SOLENOID B Relay	18	SOLENOID A Relay	Speed Input	44	Speed Input COM	43
19	SOLENOID COM	20	SOLENOID COM	FD Check input	46	FD check COM	45
21	8 Degree Relay	22	8 Degree COM				
23	Error Relay	24	Error Relay COM				

## 4. Dip switch

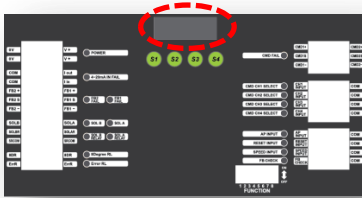


ON/OFF	DIP 1	DIP 2	DIP 3	DIP 4	DIP 5	DIP 6	DIP 7
<b>ON</b>	MASTER	45°	4-20mA Input	FB1 Alone	CMD1 Alone	Enable Calibration & Test mode	Fall in Mode
<b>OFF</b>	SLAVE	35°	CMD Input	FB1, FB2	CMD1, CMD2	Disable Calibration & Test mode	Fall to Zero
<b>Default</b>	ON	OFF	ON with JsnDP OFF with COM	OFF	OFF	OFF	OFF

\*Make sure if set DIP Switch 4 **OFF**, FEED BACK 1, 2 wiring should be connected. Calibration data automatically save to FB1&FB2. (Meanwhile, If set DIP Switch 4 **ON**, FEED BACK 1 wiring need alone. Calibration data save to FB1 itself.)

\*Make sure if set DIP Switch 5 **OFF**, CMD 1, 2 wiring should be connected. Calibration **MUST** be done separately by CMD 1&CMD2 (Meanwhile, If set DIP Switch 5 **ON**, CMD 1 wiring need alone. Calibration data save to CMD 1 itself.)

## 5. FND Display



### [Digit status on FND display]

**X----**: Master or Slave

Ex) “A” : Set “Master(DIP 1 ON)”

“S” : Set “Slave(DIP 1 OFF)”

**-X---**: CMD input mode or JsnDP(4-20mA) input mode.

Ex) “1 or 2” : Set “CMD input mode(DIP 3 OFF, Current CMD operation number)”

“J” : Set “JsnDP(4-20mA) input mode(DIP 3 ON)”

**--X--**: Normal mode or AP(Auto pilot) mode

Ex) “-” : Set “Normal mode(Terminal 39-40 NOT connected)”

“P” : Set “AP(Auto Pilot) mode(Terminal 39-40 connected)”

**---X-**: Low(Speed) or Fast(Speed)

Ex) “L” : Set “Low speed(Terminal 43-44 NOT connected)”

“F” : Set “Fast speed(Terminal 43-44 connected)”

**----X**: Current set CH input selection(Channel) number.(DIP 3 OFF)

Ex) “1” : CH input selection(Channel) “1”

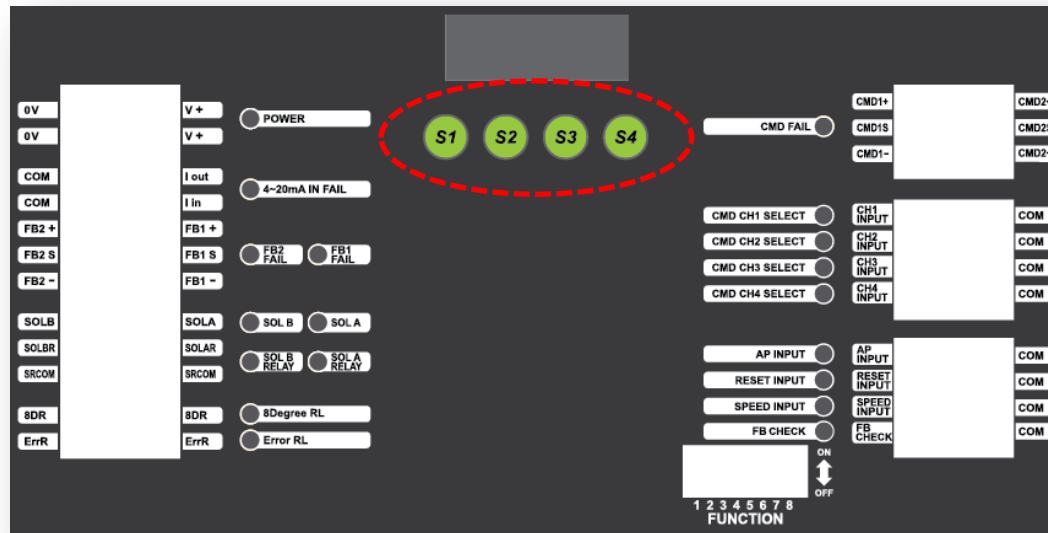
“2” : CH input selection(Channel) “2”

“3” : CH input selection(Channel) “3”

“4” : CH input selection(Channel) “4”



## 6. Key operation



6.1 Switch 1(“S1”): Go back to previous mode & escape

6.2 Switch 2(“S2”): Change to Data(Setting & Adjusting value)

6.3 Switch 3(“S3”): Mode selection & Save to data

6.4 Switch 4(“S4”): Enter to Mode

## 7. Wiring

### 7.1 Power supply: DC24V

-Terminal number 1(0V) --- 2(V+ / DC 24V)

-Terminal number 3(0V) --- 4(V+ / DC 24V)

No.	Assignment	No.	Assignment	Assignment	No.	Assignment	No.
1	0V	2	V+ (DC 24V)	CMD 2 +	26	CMD 1+	25
3	0V	4	V+ (DC 24V)	CMD 2 Sensor	28	CMD 1 Sensor	27
				CMD 2-	30	CMD 1-	29
5	4~20mA Output Com	6	4~20mA Output				
7	4~20mA Input Com	8	4~20mA Input				
9	FEED BACK 2 +	10	FEED BACK 1+				
11	FEED BACK 2 Sensor	12	FEED BACK 1 Sensor				
13	FEED BACK 2 -	14	FEED BACK 1 -				
				CH 1 Input	32	CH 1 Input COM	31
15	SOLENOID B	16	SOLENOID A	CH 2 Input	34	CH 2 Input COM	33
				CH 3 Input	36	CH 3 Input COM	35
17	SOLENOID B Relay	18	SOLENOID A Relay	CH 4 Input	38	CH 4 Input COM	37
19	SOLENOID COM	20	SOLENOID COM				
				AP(Auto Pilot) Input	40	AP(Auto Pilot) Input COM	39
21	8 Degree Relay	22	8 Degree COM	Reset Input	42	Reset Input COM	41
23	Error Relay	24	Error Relay COM	Speed Input	44	Speed Input COM	43
				FD Check input	46	FD check COM	45

## 7.2 Input terminal

- 4~20mA Analogue: Terminal number 7(COM) --- 8(input)

**\*Make sure when DIP 3 OFF, AP(Auto Pilot) mode activated 7(COM) --- 8(input) work on the “Slave” of KS73A**

**\*Make sure when DIP 3 ON, 7(COM) --- 8(input) work by JSnDP**

No.	Assignment	No.	Assignment	Assignment	No.	Assignment	No.
1	OV	2	V+ (DC 24V)	CMD 2 +	26	CMD 1+	25
3	OV	4	V+ (DC 24V)	CMD 2 Sensor	28	CMD 1 Sensor	27
				CMD 2-	30	CMD 1-	29
5	4~20mA Output Com	6	4~20mA Output				
7	4~20mA Input Com	8	4~20mA Input				
9	FEED BACK 2 +	10	FEED BACK 1+				
11	FEED BACK 2 Sensor	12	FEED BACK 1 Sensor				
13	FEED BACK 2 -	14	FEED BACK 1 -	CH 1 Input	32	CH 1 Input COM	31
				CH 2 Input	34	CH 2 Input COM	33
15	SOLENOID B	16	SOLENOID A	CH 3 Input	36	CH 3 Input COM	35
				CH 4 Input	38	CH 4 Input COM	37
17	SOLENOID B Relay	18	SOLENOID A Relay				
19	SOLENOID COM	20	SOLENOID COM	AP(Auto Pilot) Input	40	AP(Auto Pilot) Input COM	39
				Reset Input	42	Reset Input COM	41
21	8 Degree Relay	22	8 Degree COM	Speed Input	44	Speed Input COM	43
23	Error Relay	24	Error Relay COM	FD Check input	46	FD check COM	45

- FEED BACK 1 input: Terminal number 10(+) --- 12(Sensor) --- 14(-)

- FEED BACK 2 input: Terminal number 9(+) --- 11(Sensor) --- 13(-)

**\*Make sure when DIP 4 ON, only FEED BACK 1 work.**

**\*Make sure when DIP 4 OFF, both FEED BACK 1 & EED BACK 2 work.**

No.	Assignment	No.	Assignment	Assignment	No.	Assignment	No.
1	OV	2	V+ (DC 24V)	CMD 2 +	26	CMD 1+	25
3	OV	4	V+ (DC 24V)	CMD 2 Sensor	28	CMD 1 Sensor	27
				CMD 2-	30	CMD 1-	29
5	4~20mA Output Com	6	4~20mA Output				
7	4~20mA Input Com	8	4~20mA Input				
9	FEED BACK 2 +	10	FEED BACK 1+				
11	FEED BACK 2 Sensor	12	FEED BACK 1 Sensor				
13	FEED BACK 2 -	14	FEED BACK 1 -				
				CH 1 Input	32	CH 1 Input COM	31
15	SOLENOID B	16	SOLENOID A	CH 2 Input	34	CH 2 Input COM	33
				CH 3 Input	36	CH 3 Input COM	35
17	SOLENOID B Relay	18	SOLENOID A Relay	CH 4 Input	38	CH 4 Input COM	37
19	SOLENOID COM	20	SOLENOID COM				
				AP(Auto Pilot) Input	40	AP(Auto Pilot) Input COM	39
21	8 Degree Relay	22	8 Degree COM	Reset Input	42	Reset Input COM	41
23	Error Relay	24	Error Relay COM	Speed Input	44	Speed Input COM	43
				FD Check input	46	FD check COM	45

- CMD 2: Terminal number 26(+) --- 28(Sensor) --- 30(-)

- CMD 1: Terminal number 25(+) --- 27(Sensor) --- 29(-)

**\*Make sure when DIP 5 OFF, both CMD 1 & CMD 2 activated, Meanwhile DIP 5 ON, CMD 1 alone activated.**

No.	Assignment	No.	Assignment	Assignment	No.	Assignment	No.
1	OV	2	V+ (DC 24V)	CMD 2 +	26	CMD 1+	25
3	OV	4	V+ (DC 24V)	CMD 2 Sensor	28	CMD 1 Sensor	27
				CMD 2-	30	CMD 1-	29
5	4~20mA Output Com	6	4~20mA Output				
7	4~20mA Input Com	8	4~20mA Input				
9	FEED BACK 2 +	10	FEED BACK 1+				
11	FEED BACK 2 Sensor	12	FEED BACK 1 Sensor				
13	FEED BACK 2 -	14	FEED BACK 1 -				
15	SOLENOID B	16	SOLENOID A	CH 1 Input	32	CH 1 Input COM	31
				CH 2 Input	34	CH 2 Input COM	33
				CH 3 Input	36	CH 3 Input COM	35
				CH 4 Input	38	CH 4 Input COM	37
17	SOLENOID B Relay	18	SOLENOID A Relay	AP(Auto Pilot) Input	40	AP(Auto Pilot) Input COM	39
19	SOLENOID COM	20	SOLENOID COM	Reset Input	42	Reset Input COM	41
				Speed Input	44	Speed Input COM	43
21	8 Degree Relay	22	8 Degree COM	FD Check input	46	FD check COM	45
23	Error Relay	24	Error Relay COM				

- CHANNEL 1: Terminal number 32(Input) --- 31(COM)
- CHANNEL 2: Terminal number 34(Input) --- 33(COM)
- CHANNEL 3: Terminal number 36(Input) --- 35(COM)
- CHANNEL 4: Terminal number 38(Input) --- 37(COM)

**\*Make sure the CMD channel maximum mode able to limit 1 to 4 channel calibration data and save.**

**\*Make sure if CMD channel not connected KS73A system would not working(DIP 3 **OFF** / CMD input mode).**

No.	Assignment	No.	Assignment	Assignment	No.	Assignment	No.
1	OV	2	V+ (DC 24V)	CMD 2 +	26	CMD 1+	25
3	OV	4	V+ (DC 24V)	CMD 2 Sensor	28	CMD 1 Sensor	27
				CMD 2-	30	CMD 1-	29
5	4~20mA Output Com	6	4~20mA Output				
7	4~20mA Input Com	8	4~20mA Input				
9	FEED BACK 2 +	10	FEED BACK 1+				
11	FEED BACK 2 Sensor	12	FEED BACK 1 Sensor				
13	FEED BACK 2 -	14	FEED BACK 1 -				
				CH 1 Input	32	CH 1 Input COM	31
				CH 2 Input	34	CH 2 Input COM	33
				CH 3 Input	36	CH 3 Input COM	35
				CH 4 Input	38	CH 4 Input COM	37
15	SOLENOID B	16	SOLENOID A	AP(Auto Pilot) Input	40	AP(Auto Pilot) Input COM	39
				Reset Input	42	Reset Input COM	41
17	SOLENOID B Relay	18	SOLENOID A Relay	Speed Input	44	Speed Input COM	43
19	SOLENOID COM	20	SOLENOID COM	FD Check input	46	FD check COM	45
21	8 Degree Relay	22	8 Degree COM				
23	Error Relay	24	Error Relay COM				

-AP(Auto pilot): Terminal number 40(Input) --- 39(COM)

No.	Assignment	No.	Assignment	Assignment	No.	Assignment	No.
1	OV	2	V+ (DC 24V)	CMD 2 +	26	CMD 1+	25
3	OV	4	V+ (DC 24V)	CMD 2 Sensor	28	CMD 1 Sensor	27
				CMD 2-	30	CMD 1-	29
5	4~20mA Output Com	6	4~20mA Output				
7	4~20mA Input Com	8	4~20mA Input				
9	FEED BACK 2 +	10	FEED BACK 1+				
11	FEED BACK 2 Sensor	12	FEED BACK 1 Sensor				
13	FEED BACK 2 -	14	FEED BACK 1 -				
				CH 1 Input	32	CH 1 Input COM	31
				CH 2 Input	34	CH 2 Input COM	33
				CH 3 Input	36	CH 3 Input COM	35
				CH 4 Input	38	CH 4 Input COM	37
15	SOLENOID B	16	SOLENOID A	AP(Auto Pilot) Input	40	AP(Auto Pilot) Input COM	39
				Reset Input	42	Reset Input COM	41
17	SOLENOID B Relay	18	SOLENOID A Relay	Speed Input	44	Speed Input COM	43
19	SOLENOID COM	20	SOLENOID COM	FD Check input	46	FD check COM	45
21	8 Degree Relay	22	8 Degree COM				
23	Error Relay	24	Error Relay COM				

-RESET: Terminal number 42(Input) --- 41(COM)

No.	Assignment	No.	Assignment	Assignment	No.	Assignment	No.
1	OV	2	V+ (DC 24V)	CMD 2 +	26	CMD 1+	25
3	OV	4	V+ (DC 24V)	CMD 2 Sensor	28	CMD 1 Sensor	27
				CMD 2-	30	CMD 1-	29
5	4~20mA Output Com	6	4~20mA Output				
7	4~20mA Input Com	8	4~20mA Input				
9	FEED BACK 2 +	10	FEED BACK 1+				
11	FEED BACK 2 Sensor	12	FEED BACK 1 Sensor				
13	FEED BACK 2 -	14	FEED BACK 1 -				
15	SOLENOID B	16	SOLENOID A	CH 1 Input	32	CH 1 Input COM	31
				CH 2 Input	34	CH 2 Input COM	33
				CH 3 Input	36	CH 3 Input COM	35
				CH 4 Input	38	CH 4 Input COM	37
17	SOLENOID B Relay	18	SOLENOID A Relay	AP(Auto Pilot) Input	40	AP(Auto Pilot) Input COM	39
19	SOLENOID COM	20	SOLENOID COM	Reset Input	42	Reset Input COM	41
				Speed Input	44	Speed Input COM	43
21	8 Degree Relay	22	8 Degree COM	FD Check input	46	FD check COM	45
23	Error Relay	24	Error Relay COM				



-SPEED: Terminal number 44(Input) --- 43(COM)

**\*Make sure when 44(Input) --- 43(COM) activated “FAST” Speed mode.**

**\*Make sure when 44(Input) --- 43(COM) **NOT** activated “SLOW” Speed mode.**

No.	Assignment	No.	Assignment	Assignment	No.	Assignment	No.
1	OV	2	V+ (DC 24V)	CMD 2 +	26	CMD 1+	25
3	OV	4	V+ (DC 24V)	CMD 2 Sensor	28	CMD 1 Sensor	27
				CMD 2-	30	CMD 1-	29
5	4~20mA Output Com	6	4~20mA Output				
7	4~20mA Input Com	8	4~20mA Input				
9	FEED BACK 2 +	10	FEED BACK 1+				
11	FEED BACK 2 Sensor	12	FEED BACK 1 Sensor				
13	FEED BACK 2 -	14	FEED BACK 1 -				
				CH 1 Input	32	CH 1 Input COM	31
15	SOLENOID B	16	SOLENOID A	CH 2 Input	34	CH 2 Input COM	33
				CH 3 Input	36	CH 3 Input COM	35
				CH 4 Input	38	CH 4 Input COM	37
17	SOLENOID B Relay	18	SOLENOID A Relay				
19	SOLENOID COM	20	SOLENOID COM				
				AP(Auto Pilot) Input	40	AP(Auto Pilot) Input COM	39
21	8 Degree Relay	22	8 Degree COM	Reset Input	42	Reset Input COM	41
23	Error Relay	24	Error Relay COM	Speed Input	44	Speed Input COM	43
				FD Check input	46	FD check COM	45

-FEED BACK Check: Terminal number 46(Input) --- 45(COM)

No.	Assignment	No.	Assignment	Assignment	No.	Assignment	No.
1	OV	2	V+ (DC 24V)	CMD 2 +	26	CMD 1+	25
3	OV	4	V+ (DC 24V)	CMD 2 Sensor	28	CMD 1 Sensor	27
				CMD 2-	30	CMD 1-	29
5	4~20mA Output Com	6	4~20mA Output				
7	4~20mA Input Com	8	4~20mA Input				
9	FEED BACK 2 +	10	FEED BACK 1+				
11	FEED BACK 2 Sensor	12	FEED BACK 1 Sensor				
13	FEED BACK 2 -	14	FEED BACK 1 -				
				CH 1 Input	32	CH 1 Input COM	31
15	SOLENOID B	16	SOLENOID A	CH 2 Input	34	CH 2 Input COM	33
				CH 3 Input	36	CH 3 Input COM	35
17	SOLENOID B Relay	18	SOLENOID A Relay	CH 4 Input	38	CH 4 Input COM	37
19	SOLENOID COM	20	SOLENOID COM				
				AP(Auto Pilot) Input	40	AP(Auto Pilot) Input COM	39
21	8 Degree Relay	22	8 Degree COM	Reset Input	42	Reset Input COM	41
23	Error Relay	24	Error Relay COM	Speed Input	44	Speed Input COM	43
				FD Check input	46	FD check COM	45

### 7.3 Output terminal

- 4-20mA Analogue output: Terminal number 5(COM) --- 6(Output)

**\*Make sure when DIP 3 ON/OFF, AP mode activated 5(COM) -- 6(output) work on the “Master(DIP 1 ON)” of KS73A only**

**\*Make sure when DIP 3 OFF, 5(COM) -- 6(output) work on the “Slave(DIP 1 OFF)” of KS73A only**

**\*Make sure when DIP 3 ON, 5(COM) -- 6(output) work on KS73A**

No.	Assignment	No.	Assignment	Assignment	No.	Assignment	No.
1	OV	2	V+ (DC 24V)	CMD 2 +	26	CMD 1+	25
3	OV	4	V+ (DC 24V)	CMD 2 Sensor	28	CMD 1 Sensor	27
				CMD 2-	30	CMD 1-	29
5	4~20mA Output Com	6	4~20mA Output				
7	4~20mA Input Com	8	4~20mA Input				
9	FEED BACK 2 +	10	FEED BACK 1+				
11	FEED BACK 2 Sensor	12	FEED BACK 1 Sensor				
13	FEED BACK 2 -	14	FEED BACK 1 -				
15	SOLENOID B	16	SOLENOID A	CH 1 Input	32	CH 1 Input COM	31
				CH 2 Input	34	CH 2 Input COM	33
				CH 3 Input	36	CH 3 Input COM	35
				CH 4 Input	38	CH 4 Input COM	37
17	SOLENOID B Relay	18	SOLENOID A Relay	AP(Auto Pilot) Input	40	AP(Auto Pilot) Input COM	39
19	SOLENOID COM	20	SOLENOID COM	Reset Input	42	Reset Input COM	41
				Speed Input	44	Speed Input COM	43
21	8 Degree Relay	22	8 Degree COM	FD Check input	46	FD check COM	45
23	Error Relay	24	Error Relay COM				

- [FET] SOLENOID-B: Terminal number 15
  - [FET] SOLENOID-A: Terminal number 16
- \*Make sure Terminal 15 & 16 sinking to -ve directly.**

No.	Assignment	No.	Assignment	Assignment	No.	Assignment	No.
1	OV	2	V+ (DC 24V)	CMD 2 +	26	CMD 1+	25
3	OV	4	V+ (DC 24V)	CMD 2 Sensor	28	CMD 1 Sensor	27
				CMD 2-	30	CMD 1-	29
5	4~20mA Output Com	6	4~20mA Output				
7	4~20mA Input Com	8	4~20mA Input				
9	FEED BACK 2 +	10	FEED BACK 1+				
11	FEED BACK 2 Sensor	12	FEED BACK 1 Sensor				
13	FEED BACK 2 -	14	FEED BACK 1 -				
15	SOLENOID B	16	SOLENOID A	CH 1 Input	32	CH 1 Input COM	31
				CH 2 Input	34	CH 2 Input COM	33
				CH 3 Input	36	CH 3 Input COM	35
				CH 4 Input	38	CH 4 Input COM	37
17	SOLENOID B Relay	18	SOLENOID A Relay	AP(Auto Pilot) Input	40	AP(Auto Pilot) Input COM	39
19	SOLENOID COM	20	SOLENOID COM	Reset Input	42	Reset Input COM	41
				Speed Input	44	Speed Input COM	43
21	8 Degree Relay	22	8 Degree COM	FD Check input	46	FD check COM	45
23	Error Relay	24	Error Relay COM				

- **[Relay]** SOLENOID-B: Terminal number 17(Relay) --- 19(COM)
- **[Relay]** SOLENOID-A: Terminal number 18(Relay) --- 20(COM)

No.	Assignment	No.	Assignment	Assignment	No.	Assignment	No.
1	OV	2	V+ (DC 24V)	CMD 2 +	26	CMD 1+	25
3	OV	4	V+ (DC 24V)	CMD 2 Sensor	28	CMD 1 Sensor	27
				CMD 2 -	30	CMD 1-	29
5	4~20mA Output Com	6	4~20mA Output				
7	4~20mA Input Com	8	4~20mA Input				
9	FEED BACK 2 +	10	FEED BACK 1+				
11	FEED BACK 2 Sensor	12	FEED BACK 1 Sensor				
13	FEED BACK 2 -	14	FEED BACK 1 -				
				CH 1 Input	32	CH 1 Input COM	31
15	SOLENOID B	16	SOLENOID A	CH 2 Input	34	CH 2 Input COM	33
				CH 3 Input	36	CH 3 Input COM	35
				CH 4 Input	38	CH 4 Input COM	37
17	SOLENOID B Relay	18	SOLENOID A Relay				
19	SOLENOID COM	20	SOLENOID COM	AP(Auto Pilot) Input	40	AP(Auto Pilot) Input COM	39
				Reset Input	42	Reset Input COM	41
21	8 Degree Relay	22	8 Degree COM	Speed Input	44	Speed Input COM	43
23	Error Relay	24	Error Relay COM	FD Check input	46	FD check COM	45

- 8 Degree Relay: Terminal number 21(Relay) --- 22(COM)

No.	Assignment	No.	Assignment	Assignment	No.	Assignment	No.
1	OV	2	V+ (DC 24V)	CMD 2 +	26	CMD 1+	25
3	OV	4	V+ (DC 24V)	CMD 2 Sensor	28	CMD 1 Sensor	27
				CMD 2-	30	CMD 1-	29
5	4~20mA Output Com	6	4~20mA Output				
7	4~20mA Input Com	8	4~20mA Input				
9	FEED BACK 2 +	10	FEED BACK 1+				
11	FEED BACK 2 Sensor	12	FEED BACK 1 Sensor				
13	FEED BACK 2 -	14	FEED BACK 1 -				
				CH 1 Input	32	CH 1 Input COM	31
15	SOLENOID B	16	SOLENOID A	CH 2 Input	34	CH 2 Input COM	33
				CH 3 Input	36	CH 3 Input COM	35
				CH 4 Input	38	CH 4 Input COM	37
17	SOLENOID B Relay	18	SOLENOID A Relay				
19	SOLENOID COM	20	SOLENOID COM				
				AP(Auto Pilot) Input	40	AP(Auto Pilot) Input COM	39
21	8 Degree Relay	22	8 Degree COM	Reset Input	42	Reset Input COM	41
23	Error Relay	24	Error Relay COM	Speed Input	44	Speed Input COM	43
				FD Check input	46	FD check COM	45

- Error(Fail) Relay: Terminal number 23(Relay) --- 24(COM)

No.	Assignment	No.	Assignment	Assignment	No.	Assignment	No.
1	OV	2	V+ (DC 24V)	CMD 2 +	26	CMD 1+	25
3	OV	4	V+ (DC 24V)	CMD 2 Sensor	28	CMD 1 Sensor	27
				CMD 2-	30	CMD 1-	29
5	4~20mA Output Com	6	4~20mA Output				
7	4~20mA Input Com	8	4~20mA Input				
9	FEED BACK 2 +	10	FEED BACK 1+				
11	FEED BACK 2 Sensor	12	FEED BACK 1 Sensor				
13	FEED BACK 2 -	14	FEED BACK 1 -				
				CH 1 Input	32	CH 1 Input COM	31
15	SOLENOID B	16	SOLENOID A	CH 2 Input	34	CH 2 Input COM	33
				CH 3 Input	36	CH 3 Input COM	35
				CH 4 Input	38	CH 4 Input COM	37
17	SOLENOID B Relay	18	SOLENOID A Relay				
19	SOLENOID COM	20	SOLENOID COM				
				AP(Auto Pilot) Input	40	AP(Auto Pilot) Input COM	39
21	8 Degree Relay	22	8 Degree COM	Reset Input	42	Reset Input COM	41
23	Error Relay	24	Error Relay COM	Speed Input	44	Speed Input COM	43
				FD Check input	46	FD check COM	45

## 8. Calibration mode

### 8.1 CMD calibration with KS71A

: Before you install, do the calibration as follows. The calibration process should be done **CMD 1 and CMD 2 separately**. Also calibration process has “Minimum”, “Center” and “Maximum” After finish calibration, it able to select and calibrate again one position “Minimum” or “Center” or “Maximum” independently.

#### [CMD 1 calibration process]

- Press “S3” until show “Calib” then press “S4”
  - Show “**CMD 1**” then press “S4” then select Channel 1 ~ 4 by “S2” then press “S4”
    - Ex) If set Channel 1, it show “CH 1”
    - If set Channel 2, it show “CH 2”
    - If set Channel 3, it show “CH 3”
    - If set Channel 4, it show “CH 4”
- \*Make sure each channel 1 ~ 4 it has their own particular calibration data.**
- Show “CH 1 Lo” then KS71A unit turn to “Minimum” location then press “S3”(At this time press “S4” just pass to next step)
  - Show “CH 1 mid” then KS71A unit turn to “Center” location then press “S3” (At this time press “S4” just pass to next step)
  - Show “CH 1 Hi” then KS71A unit turn to “Maximum” location then press “S3”(At this time press “S4” just pass to next step)
- \*Make sure if on display showing “BAD”, it mean “CMD 1” calibration error occurred, it should be shown “PASS”.**



**[CMD 2 calibration process]**

- Press “S3” until show “Calib” then press “S4”
- Show “CMD 1” then press “S3” until show “**CMD 2**” then press “S4”
- Show “**CMD 2**” then press “S4” then select Channel 1 ~ 4 by “S2” then press “S4”
  - Ex) If set Channel 1, it show “CH 1”
  - If set Channel 2, it show “CH 2”
  - If set Channel 3, it show “CH 3”
  - If set Channel 4, it show “CH 4”

**\*Make sure each channel 1 ~ 4 it has their own particular calibration data.**

- Show “CH 1 Lo” then KS71A unit turn to “Minimum” location then press “S3”(At this time press “S4” just pass to next step)
- Show “CH 1 mid” then KS71A unit turn to “Center” location then press “S3” (At this time press “S4” just pass to next step)
- Show “CH 1 Hi” then KS71A unit turn to “Maximum” location then press “S3”(At this time press “S4” just pass to next step)

**\*Make sure if on display showing “BAD”, it mean “CMD 2” calibration error occurred, it should be shown “PASS”.**

## 8.2 FEED BACK calibration with Governor

: Before you install, do the calibration as follows. The calibration process should be done **FEEDBACK 1 and FEEDBACK 2 separately**. Also calibration process has “Minimum”, “Center” and “Maximum” After finish calibration, it able to select and calibrate again one position “Minimum” or “Center” or “Maximum” independently.

### [FEEDBACK 1 calibration process]

- Press “S3” until show “Calib” then press “S4”
  
- Show “CMD” then press “S3” until show “FEED 1” then press “S4”  
\*Make sure if Dip Switch 4 set “ON”, “FEED 1” calibration would be done alone. Meanwhile If Dip Switch 4 set “OFF” “FEED 1” calibration data save to “FEED 2” automatically.
  
- Show “Lo max” then Governor unit turn to “Minimum” location then press “S3”(At this time press “S4” just pass to next step)
- Show “mid max” then Governor unit turn to “Center” location then press “S3”(At this time press “S4” just pass to next step)
- Show “Hi max” then Governor unit turn to “Maximum” location then press “S3”(At this time press “S4” just pass to next step)  
\*Make sure if on display showing “BAD”, it mean calibration error occurred, it should be shown “PASS”.

**[FEEDBACK 2 calibration process]**

- Press “S3” until show “Calib” then press “S4”
  
- Show “CMD” then press “S3” until show “FEED21” then press “S4”  
**\*Make sure if Dip Switch 4 set “ON”, “FEED 1” calibration would be done alone. Meanwhile If Dip Switch 4 set “OFF” “FEED 1” calibration data save to “FEED 2” automatically.**
  
- Show “Lo max” then Governor unit turn to “Minimum” location then press “S3”(At this time press “S4” just pass to next step)
- Show “mid max” then Governor unit turn to “Center” location then press “S3”(At this time press “S4” just pass to next step)
- Show “Hi max” then Governor unit turn to “Maximum” location then press “S3”(At this time press “S4” just pass to next step)  
**\*Make sure if on display showing “BAD”, it mean calibration error occurred, it should be shown “PASS”.**

### 8.3 4-20mA Analogue input calibration with Multi-meter

: Before install, do calibration as follow progress

- Press “S3” until show “FUN.SET(Function setting” )then press “S4”
- Press “S3” until show “**remt(4-20mA input mode)**” then press “S4”
- Show “low” then use Multi-meter unit set to 4mA analogue input correctly then press “S3”  
(At this time 4mA raw data range is **1 ~ 500**. Press “S1” and “S2” this raw data able to change correctly)
- Show “hi” then use Multi-meter unit set to 20mA analogue input correctly then press “S3”  
(At this time 20mA raw data range is **501 ~1000**. Press “S1” and “S2” this raw data able to change correctly)

**\*Make sure if on display showing “BAD”, it mean calibration error occurred, it should be shown “PASS”.**

### 8.4 4-20mA Analogue input calibration direction selection

- Show “direct” then press “S4”
- Show “0” or “1” press by “S2” then press “S3” to save  
Make sure,  
“0” is 4-20mA normal(正) output. Meanwhile “1” is 4-20mA reverse(负) output

## 8.5 4-20mA Analogue output calibration with Multi-meter

- Press “S3” until show “FUN.SET(Function setting” )then press “S4”
- Press “S3” until show “4 20(4-20mA output mode)” then press “S4”
- Show “low” then use Multi-meter unit double check and set correct 4mA analogue output then press “S3”  
(At this time 4mA raw data range is 1 ~ 500. Press “S1” and “S2” this raw data able to change correctly)
- Show “hi” then use Multi-meter unit double check and set correct 20mA analogue output then press “S3”  
(At this time 20mA raw data range is 501 ~1000. Press “S1” and “S2” this raw data able to change correctly)

**\*Make sure if on display showing “BAD”, it mean calibration error occurred, it should be shown “PASS”.**

## 8.6 4-20mA Analogue output calibration direction selection

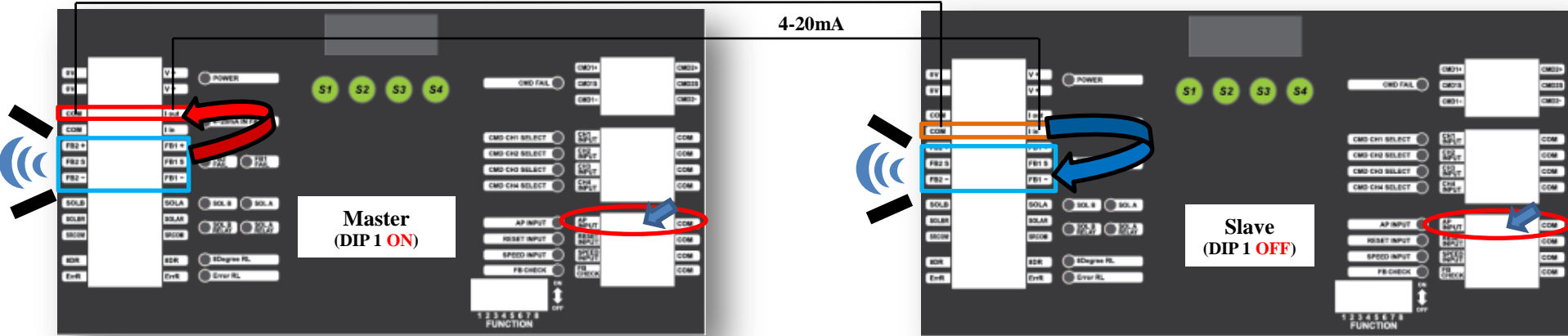
- Show “direct” then press “S4”
- Show “0” or “1” press by “S2” then press “S3” to save  
Make sure,  
“0” is 4-20mA normal(正) output. Meanwhile “1” is 4-20mA reverse(负) output

# 9. Operation mode

## 9.1 AP(Auto pilot) mode

: AP(Auto pilot) mode Activated condition as below.

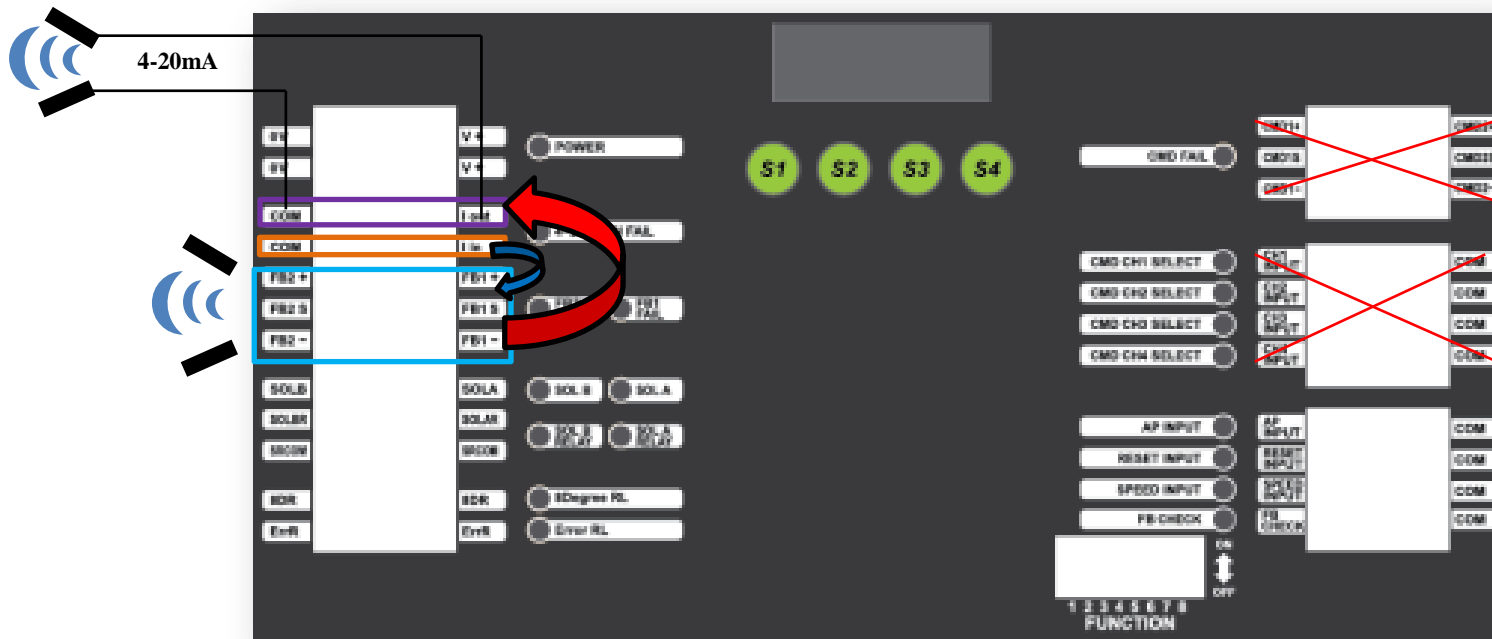
- POWER OFF, DIP Switch 3 **OFF** of Master(KS73A) & Slave(KS73A) then POWER ON.
- On “Master” AP input activated
- On “Master” SOLENOID stopped and start 4-20mA Analogue output toward “Salve”
- On “Slave” AP input also activated.
- On “Slave” “CMD” stopped and FEED BACK only able to work by 4-20mA analogue input from “Master”



## 9.2 JSnDP(4-20mA) input mode

: JSnDP(4-20mA) mode Activated condition as below.

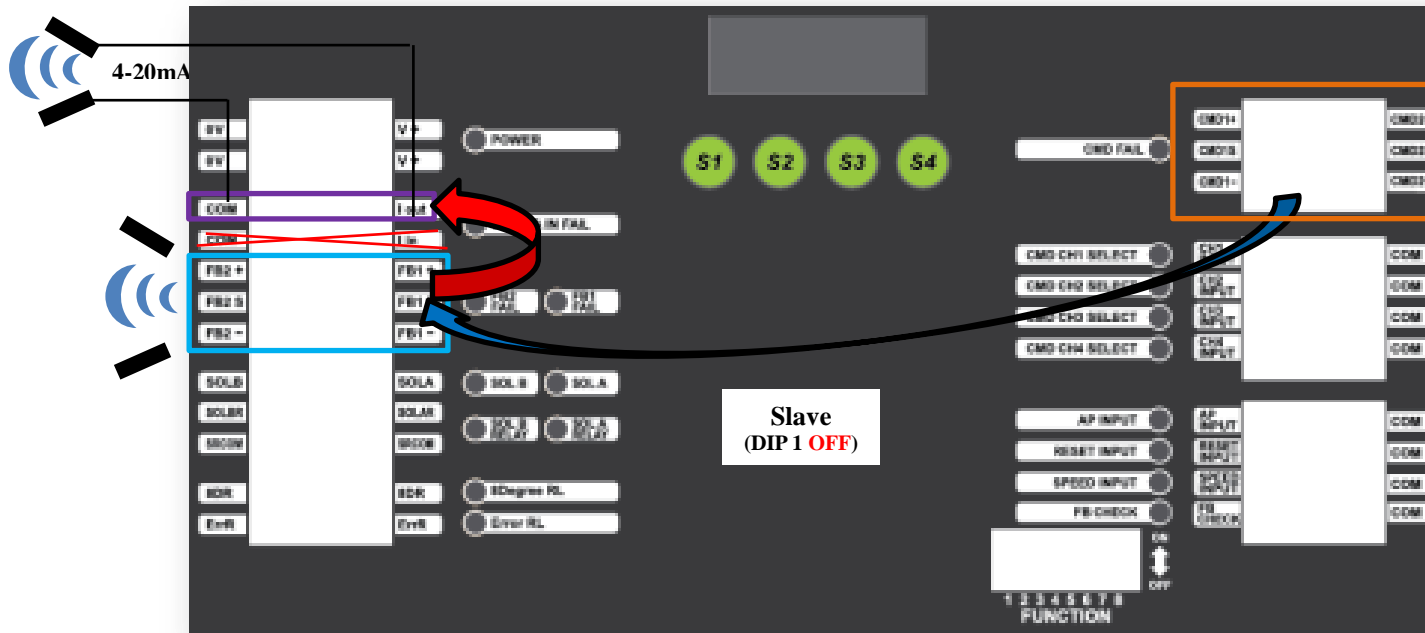
- POWER OFF, DIP Switch 3 **ON** then POWER ON
- On “Master” or “Slave” of KS73A CMD(FU LEVER) input signal not working
- 4-20mA input signal instead CMD(FU LEVER), control to FEED BACK 1 & 2
- From FEED BACK 1 & 2 control to the 4-20mA output.



### 9.3 CMD input mode

: CMD input mode Activated condition as below.

- POWER OFF, DIP Switch 3 **OFF**, DIP Switch 1 **OFF** then POWER ON.
- On “Master” or “Slave” of KS73A 4-20mA input signal not working.
- CMD(FU LEVER) input signal instead 4-20mA input, control to FEED BACK 1 & 2
- From FEED BACK 1 & 2 control to the 4-20mA output.  
**\*Make sure if “Master(DIP 1 ON)” of KS73A there is NO 4-20mA Analogue signal output.**





#### **9.4 Sensitivity adjustment mode**

: Before install, the sensitivity of FEED BACK adjust as follow progress

- Press “S3” until show “FUN.SET(Function setting” )then press “S4”
- Press “S3” until show “Sensi” then press “S4” into Sensitivity adjustment mode
- “slow(If there is **NO** Speed input activated)” then press “S2” adjust 0(No sensitive) ~ 10(Very sensitive) then press “S3” to save.
- “fast(If there Speed input activated)” then press “S2” 0(No sensitive) ~ 10(Very sensitive) then press “S3” to save.

**\*Make sure Sensitivity adjustment mode can test and adjust 0(No sensitive) ~ 10(Very sensitive) in real time.**

#### **9.5 CMD Channel maximum setting mode**

: Before install, the CMD channel maximum set as follow progress

- Press “S3” until show “FUN.SET(Function setting” )then press “S4”
- Press “S3” until show “CMDCH” then press “S4” into CMD Channel maximum setting mode
- Press “S2” then make sure CMD Channel maximum 1 ~ 4 then, press “S3” to save.

**\*Make sure depend on CMD channel maximum the CMD calibration data & save has limitation.**

## 9.6 Solenoid(FET) and Solenoid relay output select mode

: Before install, FET and Solenoid relay output set as follow progress

- Press “S3” until show “FUN.SET(Function setting” )then press “S4”
- Press “S3” until show “rEla” then press “S4” into FET and Solenoid relay output select use
- Press “S2” then make sure “0” or “1” then, press “S3” to save.

“0”: FET use alone

“1” Both FET and solenoid relay output use.

**\*Make sure Default is “0”(use FET alone)**

## **9.7 Fall in Mode**

: After “Error” occurred, RUDDER activate as follow

- POWER OFF, DIP Switch 7 **ON** then POWER ON.
- After “Error” occurred RUDDER would stay nearby “last RUDDER position”.

## **9.8 Fall to Zero mode**

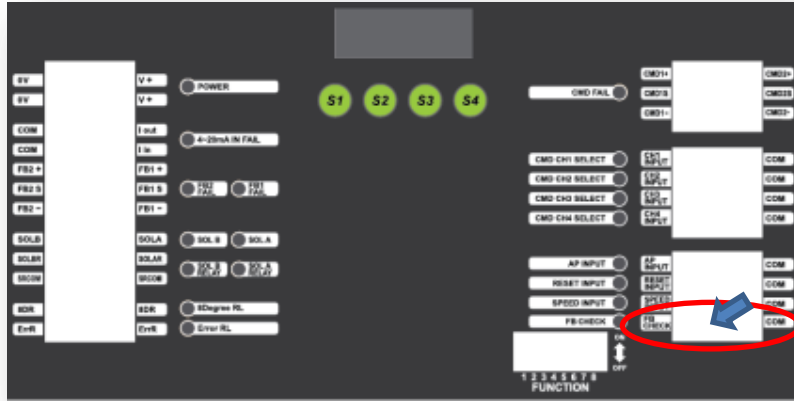
: After “Error” occurred, RUDDER activate as follow

- POWER OFF, DIP Switch 7 **OFF** then POWER ON.
- After “Error” occurred RUDDER back to “Zero(0)” Degree position.

### 9.8 FEED BACK check mode

: Before install, FEED BACK monitoring time set as follow progress

- “FEED BACK check input terminal activate



- Press “S3” until show “FUN.SET(Function setting )then press “S4”
- Press “S3” until show “FBCK(Feed back check mode)” then press “S4” into FEED BACK monitoring time set
- Press “S2” then make sure “1(1 sec)” ~ “50(50 sec)” then, press “S3” to save.

“1”: 1 second(minimum second)

“50”: 50 second(maximum second)

**\*Make sure Default is “3”(3 second)**

## 10. Error message

: On FND show "ERROR", When KS73A unit occur Error or mal-function the buzzer and Error Relay activated.

<b>Error code</b>	<b>Error detail range</b>	<b>Trouble shooting</b>
<b>E 1</b>	FEED BACK 1 error	Check Dip Switch "4" ON or OFF Check FEED BACK 1,2 terminal wiring Check FEED BACK 1 calibration
<b>E 2</b>	FEED BACK 2 Error	Check Dip Switch "4" ON or OFF Check FEED BACK 1,2 terminal wiring Check FEED BACK 1 calibration
<b>E 10</b>	EEPROM calibration data Error	Check all wiring Check all calibration procedure
<b>E 100</b>	EEPROM saved data error	Check all wiring Check all calibration progress
<b>E 1000</b>	CMD signal error	Check Dip Switch "1" ON or OFF Check Dip Switch "3" ON or OFF Check Dip Switch "5" ON or OFF Check CMD terminal wiring Check CMD calibration Check AP(Auto Pilot) mode activated Check CMD Channel input wiring

Error code	Error detail range	Trouble shooting
<b>E 2000</b>	Remote signal error	Check Dip Switch “1” ON or OFF Check Dip Switch “3” ON or OFF Check 4-20mA input terminal wiring Check 4-20mA calibration Check AP(Auto Pilot) mode activated
<b>E 4000</b>	CMD channel error	Check Dip Switch “5” ON or OFF Check CMD terminal wiring Check CMD calibration Check CMD Channel input wiring
<b>E 8000</b>	FEED BACK CHECK input	Check Dip Switch “4” ON or OFF Check FEED BACK 1,2 terminal wiring Check FEED BACK 1 calibration