D1SA

Bright LED(W11×H22mm) and 12-24VDC power supply
Data input method selection and change function(Serial or Parallel method)
Input logic selection and change function(Positive/Negative logic)

▣Features

- ●Selectable decimal(0 to 9) or hexa-decimal(0 to 9, A to F) indication code
- ●Input logic selection and change function : Positive / Negative logic input
- ●Data input selection and change function : Parallel or Serial method
- ●12-24VDCpower supply
- ●Wide range of input singal level (Low : 0-1.2VDC, High : 4.5-24VDC)
- ●Multi stage connection available
- ●Clear display by high brightness LED
- ●Zero blank function built-in

▣Applications

- ●Display for PLC
- ●Display for computer
- ●Various display

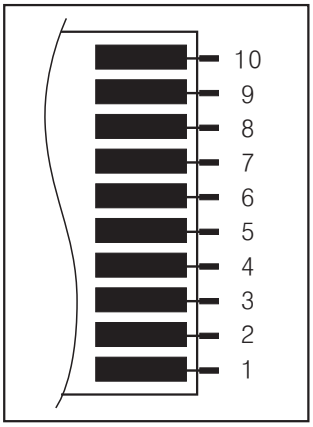
⚠ **Please read "Caution for your safety" in operation manual before using.**

▣Specifications

Model	D1SA-RN	※ D1SA-GN
Display method	Red(7 Segment)	Green(7 Segment)
Power supply	12-24VDC ±10%	
Current consumption	12VDC : Max. 32mA, 24VDC : Max. 25mA	
Display character	• Decimal number : 0 to 9, decimal point • Hexa decimal number : 0 to 9, A to F, decimal point	
Character size	W11×H22mm	
Input	• Parallel : Parallel 4bit binary data, latch, zero blank, decimal point • Serial : Serial 4bit or 5bit(Decimal point), clock, zero blank, latch, decimal point(When not selecting serial DOT)	
Input level	High : 4.5-24VDC, Low : 0-1.2VDC	
Max. response frequency	Max. 3kHz	
Input resistance	20kΩ	
Output	Data out [Serial DATA input case], zeor blank out	
Input logic	Selectable and changeable positive(PNP) or negative(NPN)(By inner soldering)	
Noise strength	The square wave noise by simulator(pulse width:1 ㎲, display time:1㎳, polarity:±, 100times/every sec.) • Between power terminals : ±300V • Between input terminals : ±300V	
Ambient temperature	0 to 60℃(at non-freezing status)	
Storage temperature	-10 to 85℃(at non-freezing status)	
Ambient humidity	35 to 85%RH	
Unit weight	Approx. 22g(Include right/left cap)	

※Green LED type is optional.
※The max. response frequency is when the duty ratio is 1:1.

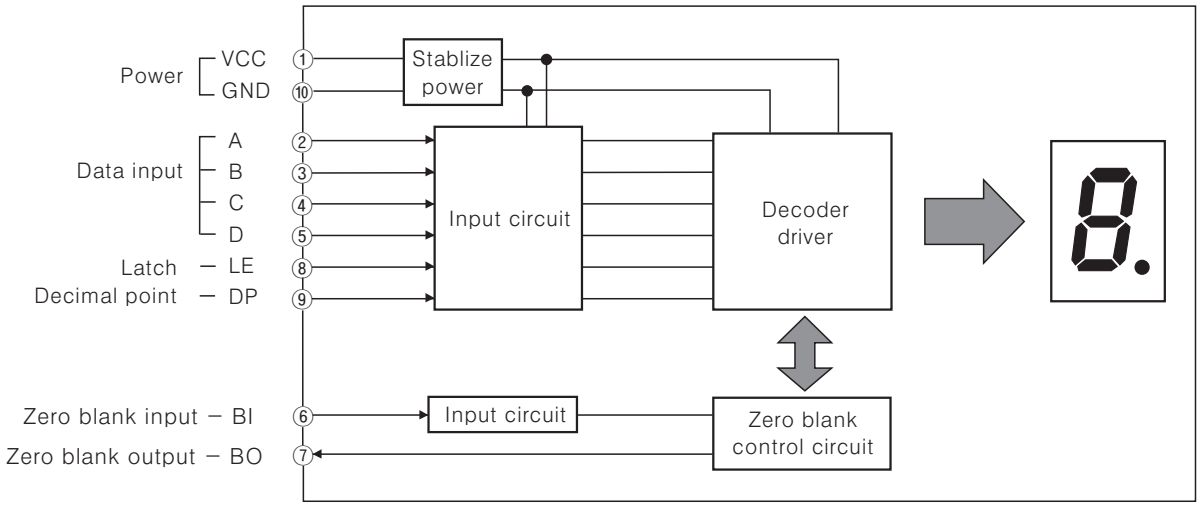
▣Terminal layout



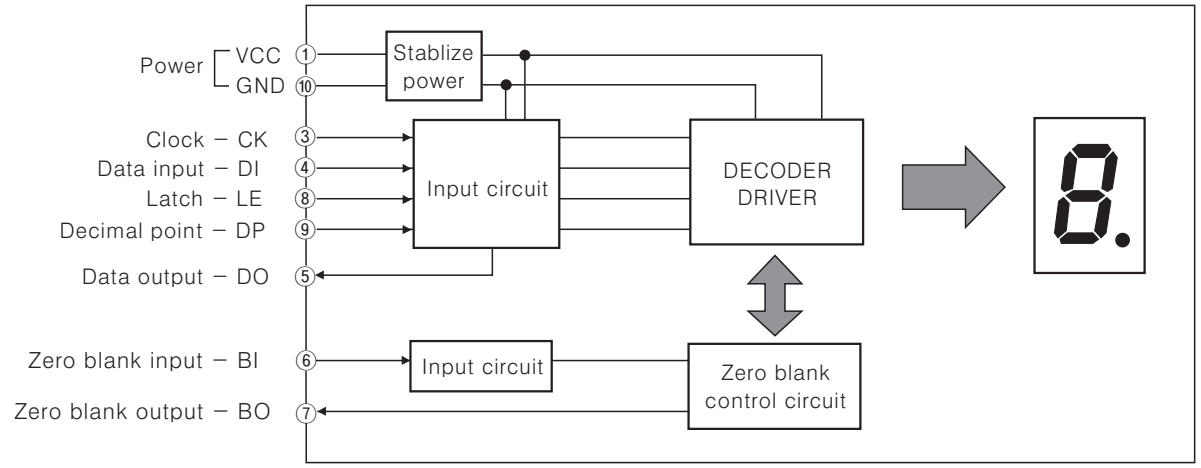
Input / Terminal No.	Parallel input		Serial input	
	Code	Function	Code	Function
1	VCC	12-24VDC	VCC	12-24VDC
2	A	2^0 } Data input	NC	Don't connect anything
3	B	2^1 } Data input	CK	Clock input
4	C	2^2 } Data input	DI	Data input
5	D	2^3 } Data input	DO	Data output
6	BI	Zero blank input	BI	Zero blank input
7	BO	Zero blank output	BO	Zero blank output
8	LE	Latch input	LE	Latch input
9	DP	Decimal point input	DP	Decimal point input
10	GND	0V	GND	0V

▣Block diagram

◎Parallel input

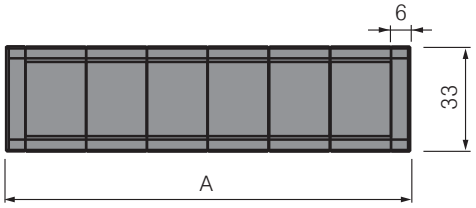


◎Serial input

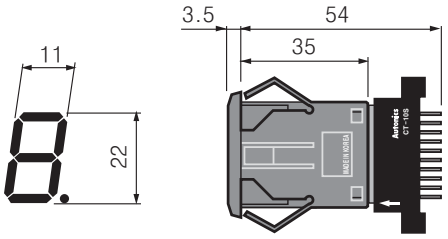


※② pin is not used.

▣Dimensions



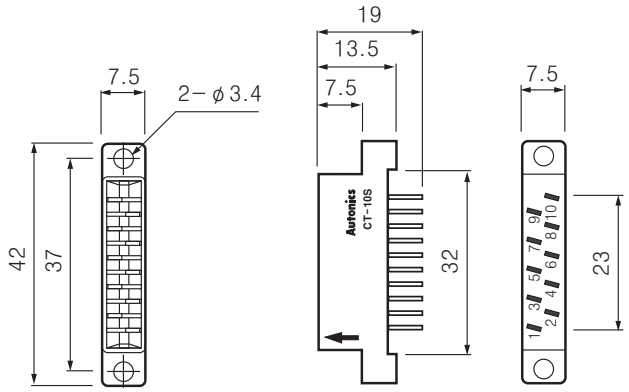
●Panel cut-out



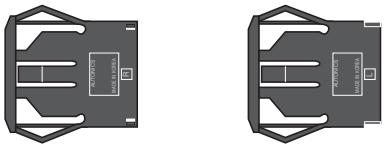
●Panel cut-out chart (Unit:mm)

Digit (N)	Dimension A (20×N+12)	Dimension B (20×N+10)
1	32	30±0.1
2	52	50±0.1
3	72	70±0.1
4	92	90±0.1
5	112	110±0.1
6	132	130±0.1
7	152	150±0.1
8	172	170±0.1

●Connector(Model : CT-10S)



●Cap



●Red FND : DAR(L) - R (Left/Right 1set)
●Green FND : DAR(L) - BL (Left/Right 1set)
※Cap is optional(1set).

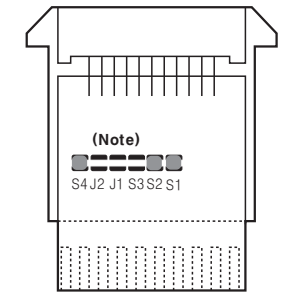
(Unit : mm)

▣Operation specification

Selection of switch / Operation	S1	S2	S3	S4	J1	J2	Bit 1digit
	ON= Decimal OFF=Hexa decimal	ON=Parallel OFF=Serial	ON=Serial with DOT OFF=Serial without DOT	Negative logic : S4=ON Positive logic : S4=OFF	Serial data out	Zero blank out	
Parallel dicimal negative logic	ON	ON	OFF	S4=ON	※1 OFF	ON	——
Parallel dicimal positive logic	ON	ON	OFF	S4=OFF	※1 OFF	ON	——
Parallel hexa dicimal negative logic	OFF	ON	OFF	S4=ON	※1 OFF	ON	——
Parallel hexa dicimal positive logic	OFF	ON	OFF	S4=OFF	※1 OFF	ON	——
Serial decimal without DOT negative logic	ON	OFF	OFF	S4=ON	ON	ON	4bit
Serial decimal without DOT positive logic	ON	OFF	OFF	S4=OFF	ON	ON	4bit
Serial decimal with DOT negative logic	ON	OFF	ON	S4=ON	ON	ON	※2 5bit
Serial decimal with DOT positive logic	ON	OFF	ON	S4=OFF	ON	ON	※2 5bit
Serial hexa decimal without DOT negative logic	OFF	OFF	OFF	S4=ON	ON	ON	4bit
Serial hexa decimal without DOT positive logic	OFF	OFF	OFF	S4=OFF	ON	ON	4bit
Serial hexa decimal with DOT negative logic	OFF	OFF	ON	S4=ON	ON	ON	※2 5bit
Serial hexa decimal with DOT positive logic	OFF	OFF	ON	S4=OFF	ON	ON	※2 5bit

(※1) J1 must be OFF in parallel operation
(※2) 1bit will be added, if DOT used in serial operation.
※Note : Please use it according to operation specification, otherwise product might be damaged.

◎Function selection switch position



※ON= (Short) OFF = (Open)

※**(Note)** J2 must be ON when using zero blank function.

☞ Factory default
: Parallel dicimal negative logic
(S1: ON, S2: ON, S3: OFF,
S4: ON, J1: OFF, J2: OFF)

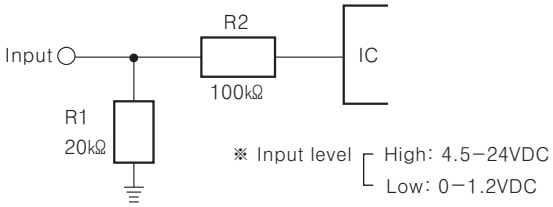
▣Input data chart

Indication		Negative input						Positive input					
Hexa decimal	Decimal	D	C	B	A	BI	LATCH	D	C	B	A	BI	LATCH
Zero bank	Zero blank	H	H	H	H	H	H	L	L	L	L	H	L
0	0	H	H	H	H	L	H	L	L	L	L	L	L
1	1	H	H	H	L	X	H	L	L	L	H	X	L
2	2	H	H	L	H	X	H	L	L	H	L	X	L
3	3	H	H	L	L	X	H	L	L	H	H	X	L
4	4	H	L	H	H	X	H	L	H	L	L	X	L
5	5	H	L	H	L	X	H	L	H	L	H	X	L
6	6	H	L	L	H	X	H	L	H	H	L	X	L
7	7	H	L	L	L	X	H	L	H	H	H	X	L
8	8	L	H	H	H	X	H	H	L	L	L	X	L
9	9	L	H	H	L	X	H	H	L	L	H	X	L
A	Blank	L	H	L	H	X	H	H	L	H	L	X	L
b	Blank	L	H	L	L	X	H	H	L	H	H	X	L
C	Blank	L	L	H	H	X	H	H	H	L	L	X	L
d	Blank	L	L	H	L	X	H	H	H	L	H	X	L
E	Blank	L	L	L	H	X	H	H	H	H	L	X	L
F	Blank	L	L	L	L	X	H	H	H	H	H	X	L
HOLD		X	X	X	X	X	L	X	X	X	X	X	H

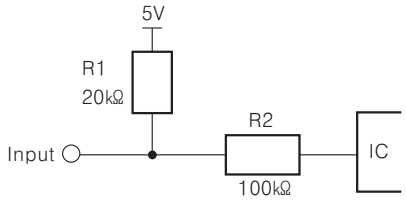
※"X" : Either high or low level can be input.
※Blank : If input signal as input DATA, it does not display.
※It connect BI terminal to VCC(High level), zero blanking will be run and connect GND(Low level) terminal, "0" will be displayed.

▣Input circuit

◎Positive logic



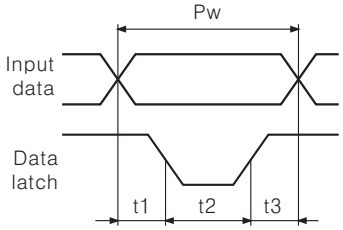
◎Negative logic



▣Input timing

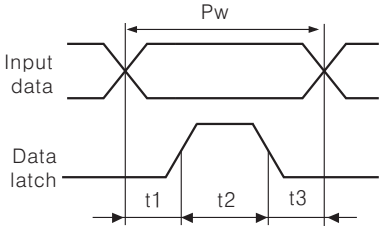
◎Parallel input

●Positive logic(S4:OFF)



Pw=t1+t2+t3
Pw : 0.33ms[Min.]
t1 : 0.05ms[Min.] → Data latch
t2 : 0.23ms[Min.] → Data shift
t3 : 0.05ms[Min.] → Data latch

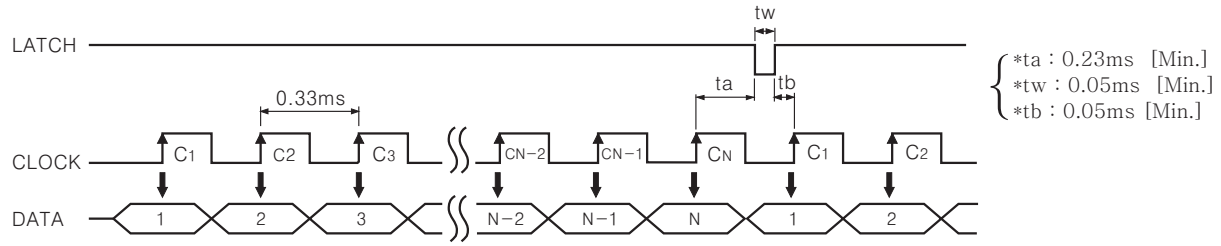
●Negative logic(S4:ON)



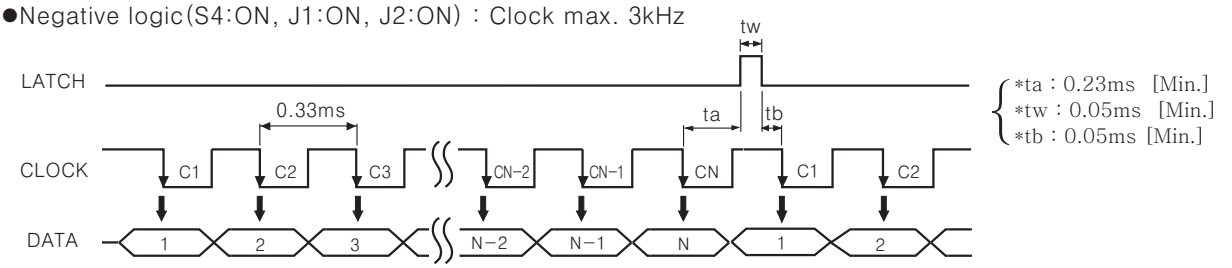
▣Input timing

◎Serial input

●Positive logic(S4:OFF, J1:ON, J2:ON) : Clock max. 3kHz



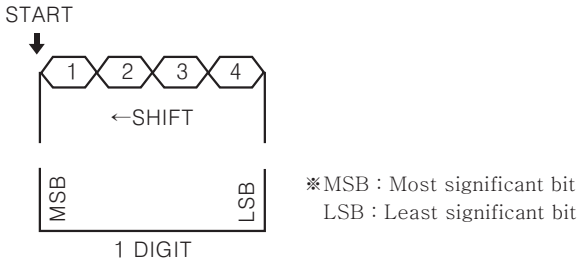
●Negative logic(S4:ON, J1:ON, J2:ON) : Clock max. 3kHz



▣Data input method for serial

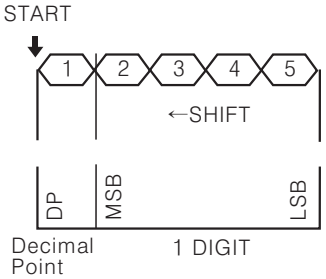
◎Single input method

●4Bit Data input(S3:OFF,J1:ON,J2:ON)



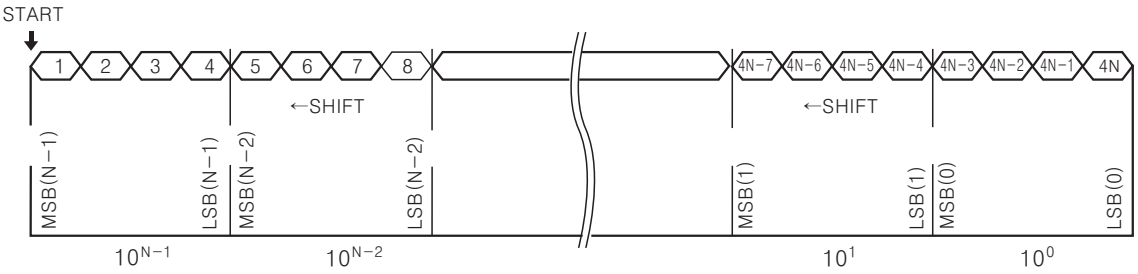
※MSB : Most significant bit
LSB : Least significant bit

●5Bit Data input(S3:ON,J1:ON,J2:ON)

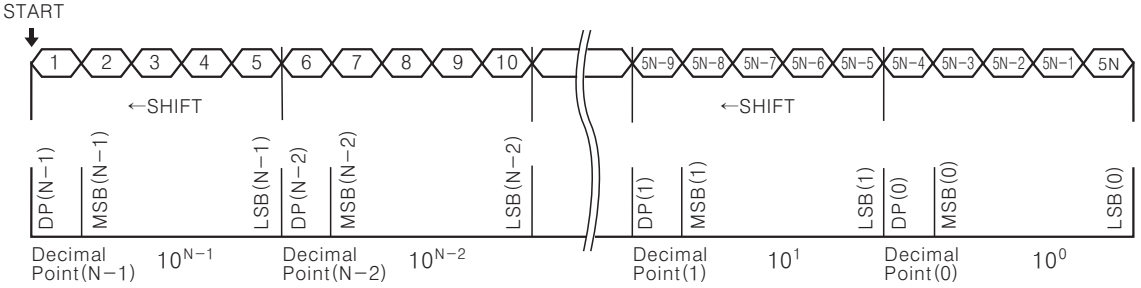


◎Multi-stage connection input method

●4Bit Data input(S3:OFF, J1:ON, J2:ON)



●5Bit Data input(S3:ON, J1:ON, J2:ON)

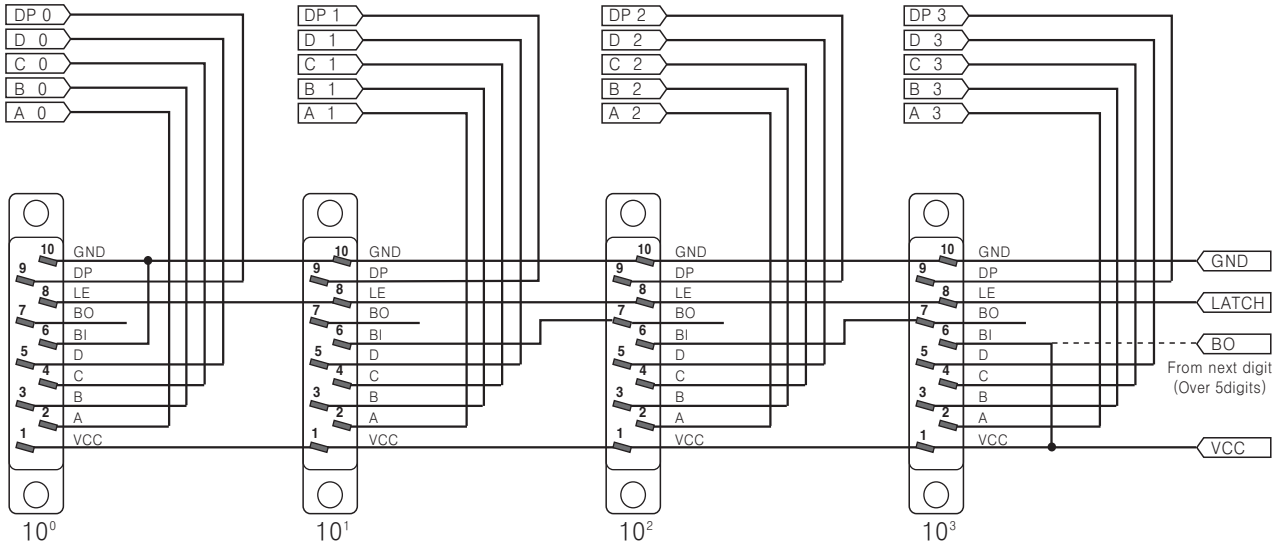


●Arragement

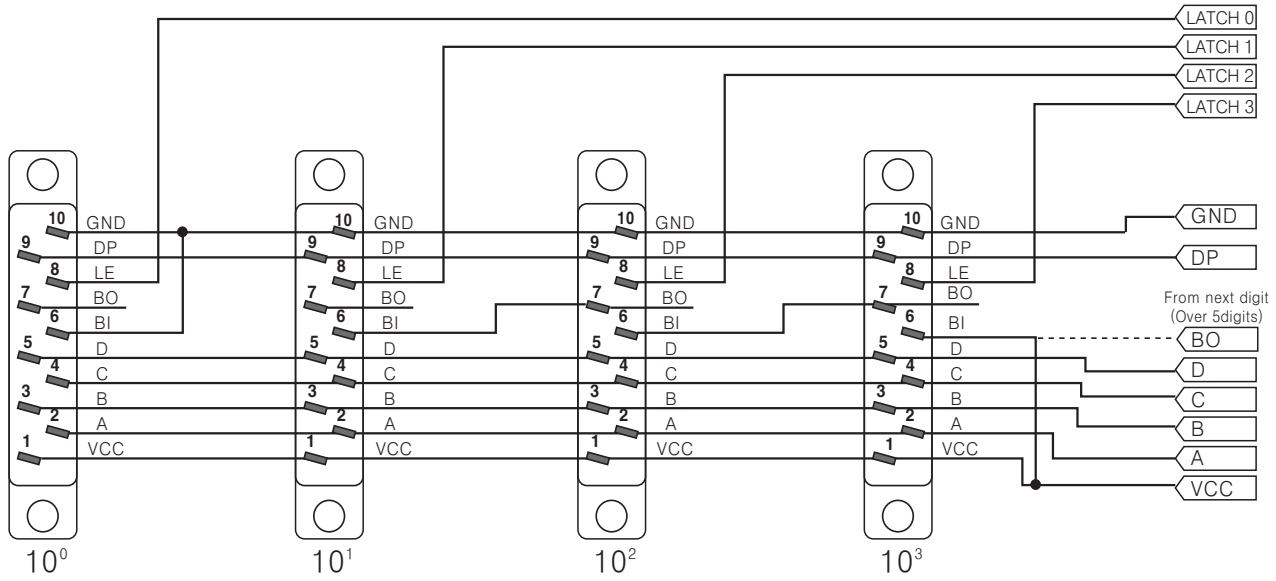
▣Multi-stage connection method

◎Parallel input : 4digit

●Static connection(Zero Blanking method) · · · These diagrams are to wire at rear layout of the unit.

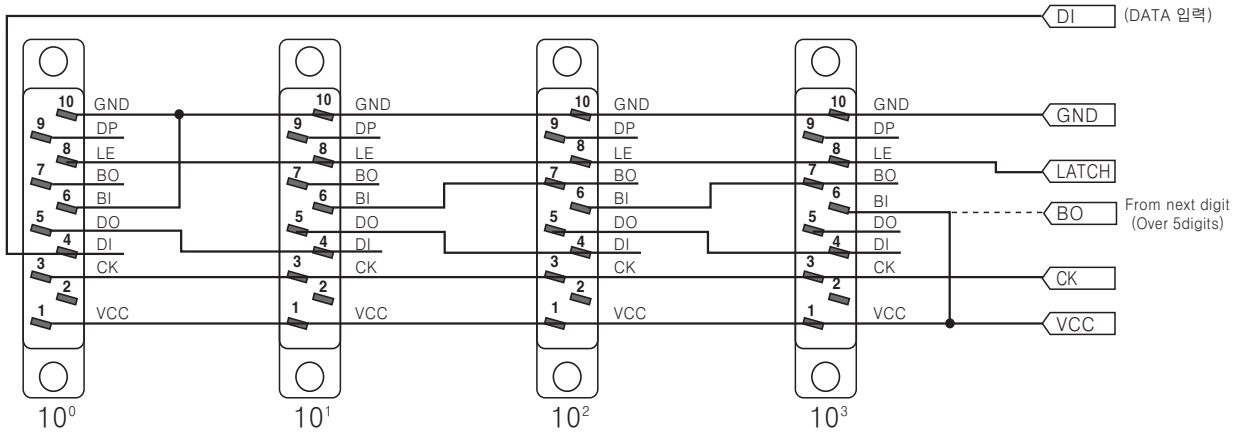


●Dynamic connection(Zero Blanking method) · · · These diagrams are to wire at rear layout of the unit.



◎Serial input : 4digit

●Serial connection(Zero Blanking method) · · · These diagrams are to wire at rear layout of the unit.

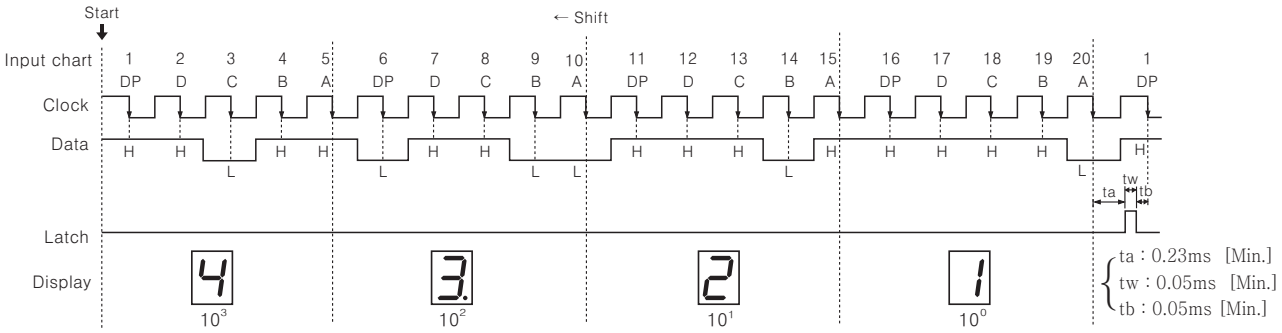


▣Multi-stage connection method

●Serial connection example

• Input mode : Negative logic of serial decimal with DOT
– SW1: ON, SW2(①: ON, ②: OFF, ③: ON, ④: ON, ⑤: ON), JP1: ON

• Display value : 43.21 data input



※Data is recorded when clock changes from high to low.

※In negative logic, data is read while latch signal is hold at high, but data is hold when it change to low.

▣Indicating decimal point for serial data

●DP indication for 4bit serial data input

1) Positive logic input : DP input terminal which is going to indicate DP connects with VCC.

2) Negative logic input : DP input terminal which is going to indicate DP connects with GND.

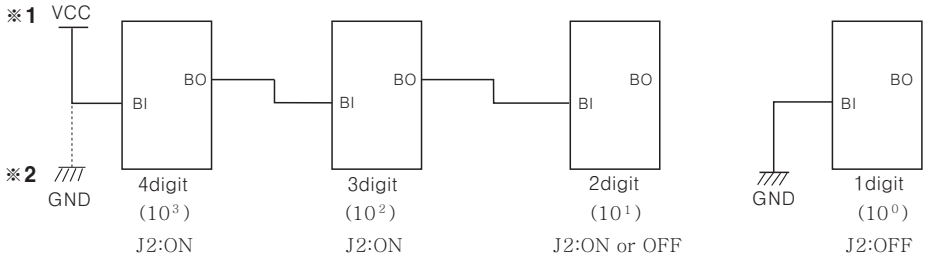
●DP indication for 5bit serial data input

Please input DP data with serial data. (DP data is highest-rank bit among 5bit)

※In case of 5 bit serial data input, turn on S3 which is function selection switch, then transfer data.

▣Zero blank method?

This function is to delete "0" which is no meanless in mult connection.



※For applying zero blank function, turn on J2 switch on PCB at first. (Refer to N-11)

1) When do not use zero blank function(DATA is 10)

If connect BI terminal of MSB(10^3) to GND(※**2**), "0" will be displayed 3 digit and 4 digit. Ex) 00 10

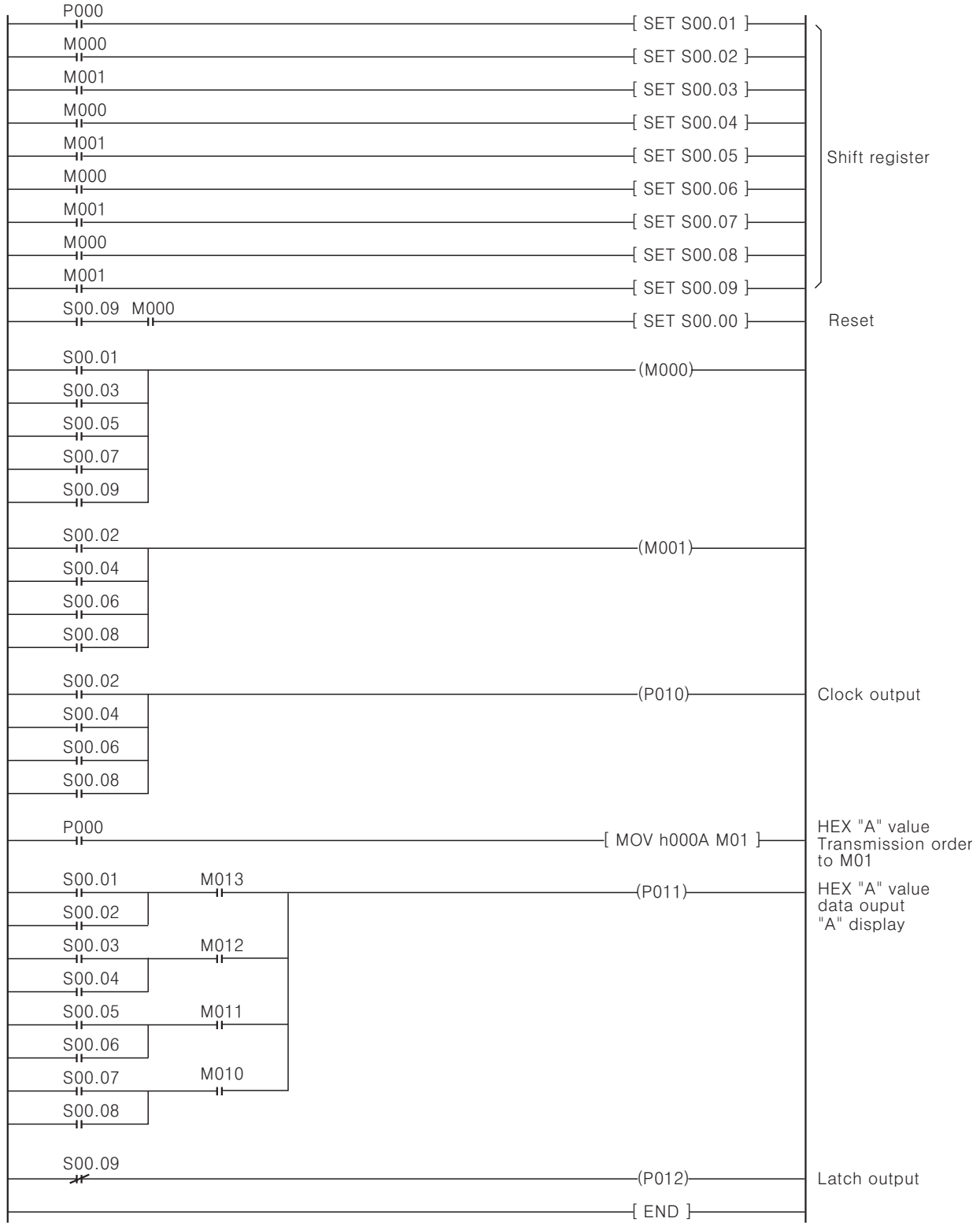
2) When zero blank function(DATA is 10)

If connect BI terminal of MSB(10^3) to VCC(※**1**), "0" will be deleted in 3 digit and 4 digit. Ex) 10

3) If connect BI terminal of LSB(10^0) to GND, "0" will be displayed not related to zero blank function.

▣The application of PLC program(Serial input type-7 Segment)

1 Display unit D1SA-□
2 Data transmission type : Serial input
3 Connection type : See serial connection type when using more than 2EA
4 Display result : " A " display
5 P.L.C : LSIS(LS Industrial Systems), Master-K Series
6 When using serial type, use TR output card of PLC
7 Negative logic



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