

# 7 Segment Display Unit

## 7 Segment Display unit large(W31.9×H56.9mm) and High bright LED

### ■ Features

- Selectable Decimal (0 ~ 9) or Hexa-decimal (0 ~ 9, A ~ F) indication code
- Selectable positive or negative input logic
- Selectable serial or parallel data input method
- Power source : 12-24VDC
- Wide range on signal input voltage level (Low : 0-1.2VDC, High : 4.5-24VDC)
- Able to connect as multi-stages
- Easy to read large, 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.**

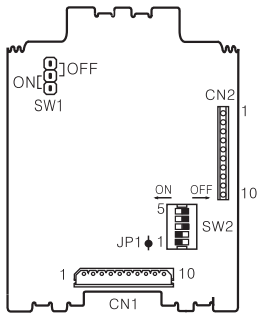
### ■ Specifications

Model	<b>D1SC-N</b>
Indication	Red (7 Segment LED Display)
Power supply	12-24VDC
Allowable voltage range	90 ~ 110% of rated voltage
Current consumption	Max. 70mA
Max. clock speed	Max. 3kHz [When duty rate is 1:1 (ON:OFF)]
Input	<ul style="list-style-type: none"> <li>• Parallel : Parallel 4Bit Binary Data, Zero Blank, Latch, Decimal point</li> <li>• Serial : Serial 4Bit or 5Bit (Decimal point), Clock, Zero Blank, Latch, Decimal point (When not select Serial DOT)</li> </ul>
Input logic	Selectable positive or negative logic by slide switch
Input impedance	12kΩ
Input level	High : 4.5-24VDC, Low : Max. 0-1.2VDC
Insulation resistance	Min. 100MΩ (at 500VDC)
Noise strength	The square wave noise by simulator (pulse width:1μs)
	±300V between power terminals
	±300V between input terminals
Ambient temperature	0 ~ +60℃ (at non-freezing status)
Storage temperature	-10 ~ +85℃ (at non-freezing status)
Ambient humidity	35~85%RH
Weight	Approx. 100g

※The Max. clock speed is when the duty rate is 1:1.

# D1SC-N

## Terminal diagram and function



(Rear terminal layout)

©SW1, SW2(DIP SW) mode selection

SW NO	Function
SW1	* ON Negative logic
	OFF Positive logic
SW2	* ON Progressing by 10(Decimal)
	OFF Progressing by 16(Hexa decimal)
	* ON Parallel
	OFF Serial
	ON Serial DOT (Have)
	* OFF Serial DOT (None)
	ON Serial Data OUT (Have)
	* OFF Serial Data OUT (None)
	ON Blank OUT (Have)
	* OFF Blank OUT (None)

"\*" : Factory default setting

©JP1: Selection of minus(-) indication

ON	7 Segment	(ON)	(OFF)
OFF	Minus		

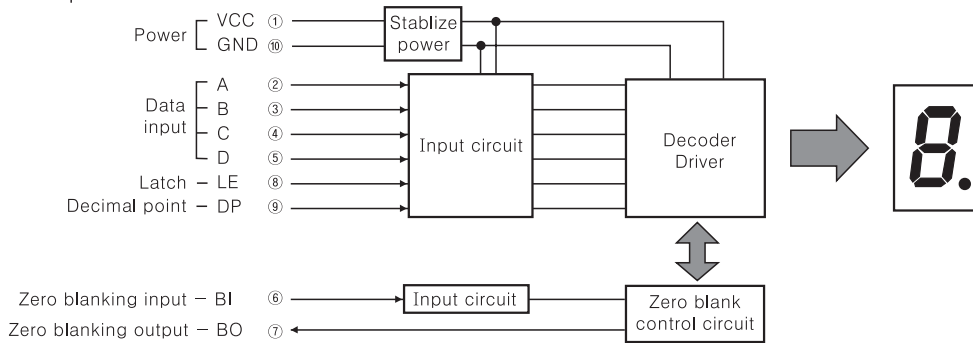
\*JP1 Factory default setting : ON

©Operation function by terminal CN1 and CN2

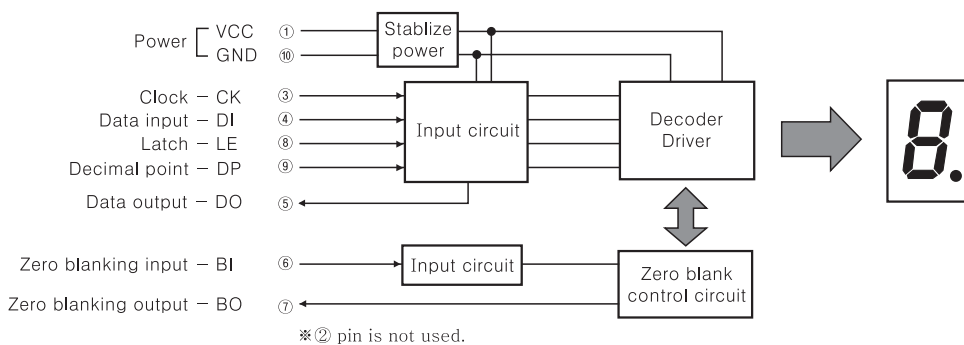
Terminal No.	Parallel input		Serial input	
	Code	Function	Code	Function
1	VCC	12-24VDC	VCC	12-24VDC
2	A	$2^0$	NC	Don't connect anything
3	B	$2^1$	CK	Clock input
4	C	$2^2$	DI	Data input
5	D	$2^3$	DO	Data output
6	BI	Zero blank input	BI	Zero blank input
7	BO	Zero blank output	BO	Zero blank output
8	LE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

## Block diagram

©Parallel input



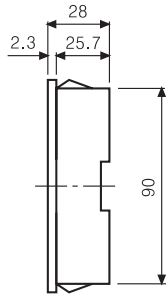
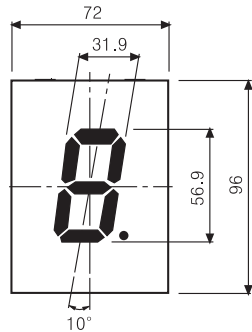
©Serial input



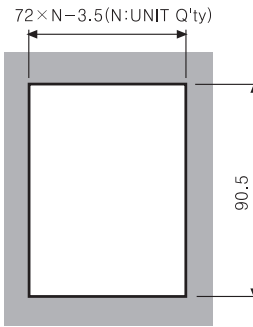
\*② pin is not used.

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## Dimensions



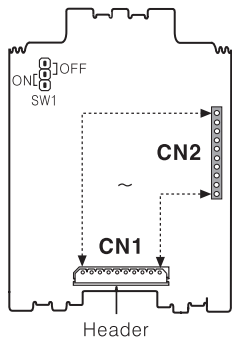
●Panel cut-out



※Applicable panel thickness : 2 ~ 4mm

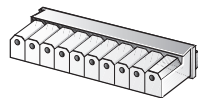
Unit : mm

## Accessories

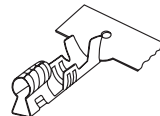


### Connector specification(CN1)

- Connector maker : Korea Morex.
  - Housing : 5264-10
  - Header : 5264-10A (Straight)
  - Terminal : 5263 (PBT)
- Using cable specification
  - AWG#22-#28 (Cable diameter:  $\phi$  1.9mm Max.)
  - Sheding length of wire cover: 2.4 ~ 2.9mm



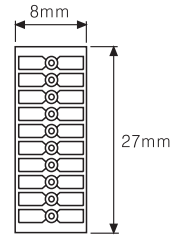
Housing(5264-10)



Terminal(5263 [PBT])

### CN2 : Connector for multi-stage

- This connector must be used with connection PCB.
- CN1 and CN2 must be connected as below drawing.



Multi-stage connector

## Input data chart

Indication				Negative input					Positive input						
Minus		7 Segment		D	C	B	A	BI	LATCH	D	C	B	A	BI	LATCH
Hexa decimal	Decimal	Hexa decimal	Decimal												
Zero Blank	Zero Blank	Zero Blank	Zero Blank	H	H	H	H	H	H	L	L	L	L	H	L
Blank	Blank	0	0	H	H	H	H	L	H	L	L	L	L	L	L
Blank	Blank	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
Blank	Blank	7	7	H	L	L	L	X	H	L	H	H	H	X	L
-	-	8	8	L	H	H	H	X	H	H	H	L	L	X	L
-	-	9	9	L	H	H	L	X	H	H	H	L	H	X	L
-	Blank	A	Blank	L	H	L	H	X	H	H	H	H	L	X	L
-	Blank	b	Blank	L	H	L	L	X	H	H	H	H	H	X	L
Blank	Blank	c	Blank	L	L	H	H	X	H	H	H	L	L	X	L
-	Blank	d	Blank	L	L	H	L	X	H	H	H	L	H	X	L
-	Blank	E	Blank	L	L	L	H	X	H	H	H	H	L	X	L
-	Blank	F	Blank	L	L	L	L	X	H	H	H	H	H	X	L
HOLD		HOLD		X	X	X	X	X	L	X	X	X	X	X	H

※ "X" : Either high or low level can be input.

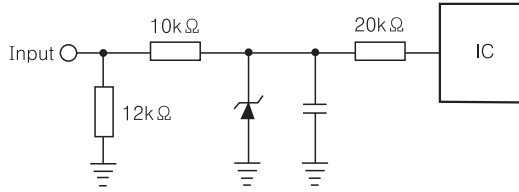
※ In case of indicating minus(-), JP1 must be OFF.

※ - : Minus indication

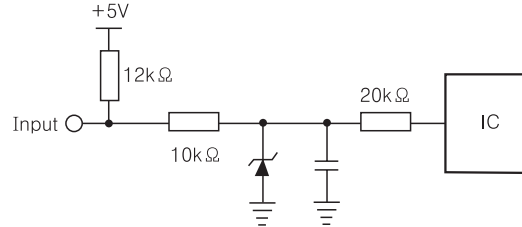
# D1SC-N

## Input circuit

○Positive logic (SW1 : OFF)



○Negative logic (SW1 : ON)

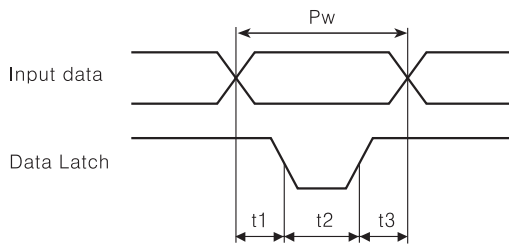


\*Input level High : 4.5-24VDC, Low: 0-1.2VDC

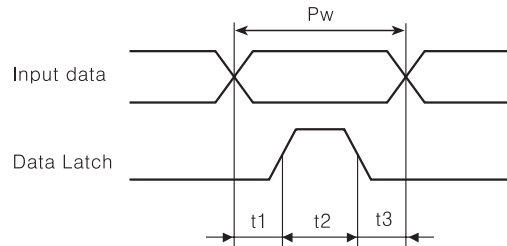
## Input timing

○Parallel input

●Positive logic (SW1 : OFF, SW2-② : ON)



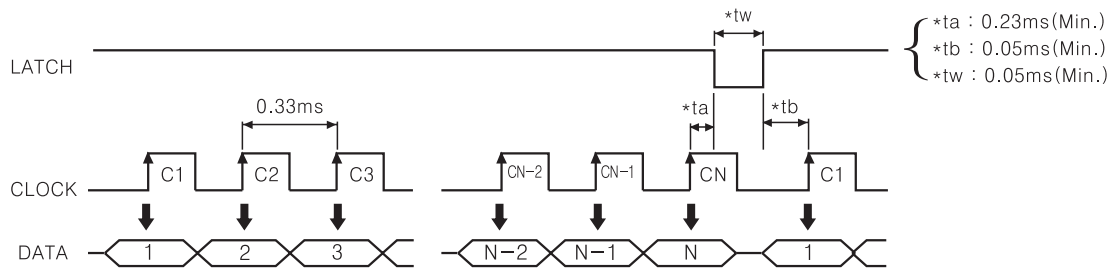
●Negative logic (SW1 : ON, SW2-② : ON)



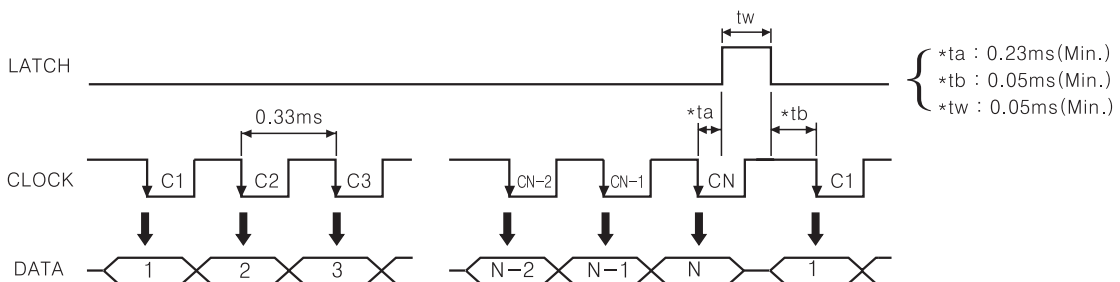
$$Pw = t1 + t2 + t3 \left\{ \begin{array}{l} Pw : 0.33\text{ms (Min.)} \\ t1 : 0.05\text{ms (Min.)} \rightarrow \text{Data Latch} \\ t2 : 0.23\text{ms (Min.)} \rightarrow \text{Data Shift} \\ t3 : 0.05\text{ms (Min.)} \rightarrow \text{Data Latch} \end{array} \right.$$

○Serial input

●Positive logic (SW1 : OFF, SW2-② : OFF, SW2-④ · ⑤ : ON) : Clock max. 3kHz



●Negative logic (SW1 : ON, SW2-② : OFF, SW2-④ · ⑤ : ON) : Clock max. 3kHz

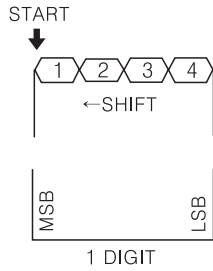


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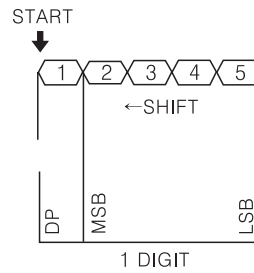
## Input time

### Single input method

●4Bit Data input(SW2-②:OFF, SW2-③:OFF, SW2-④:ON, SW2-⑤:ON)

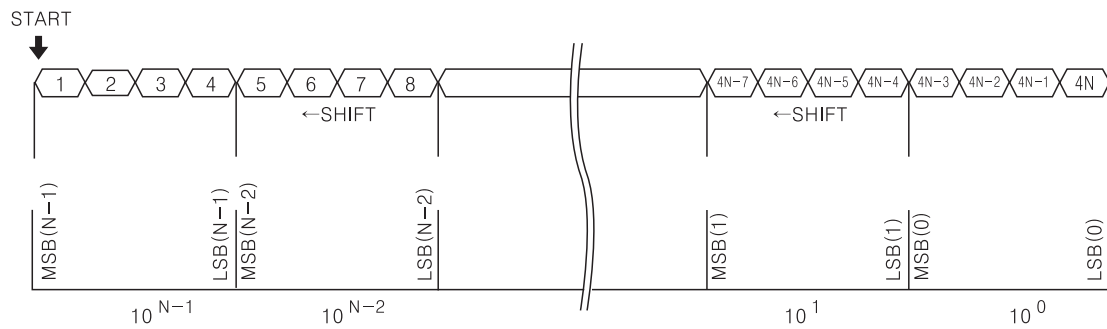


●5Bit Data input(SW2-②:OFF, SW2-③:ON, SW2-④:ON, SW2-⑤:ON)

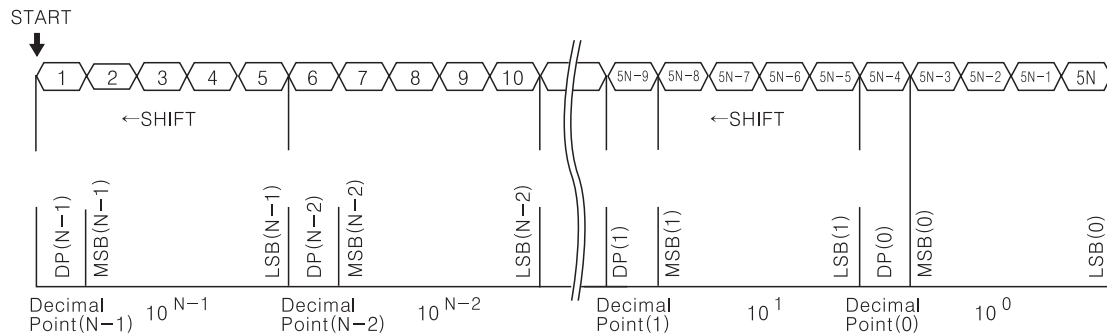


### Multi-stage connection input method

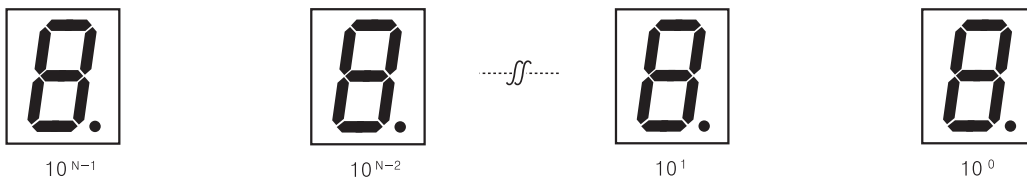
●4Bit Data input(SW2-②:OFF, SW2-③:OFF, SW2-④:ON, SW2-⑤:ON)



●5Bit Data input(SW2-②:OFF, SW2-③:ON, SW2-④:ON, SW2-⑤:ON)



### Arrangement

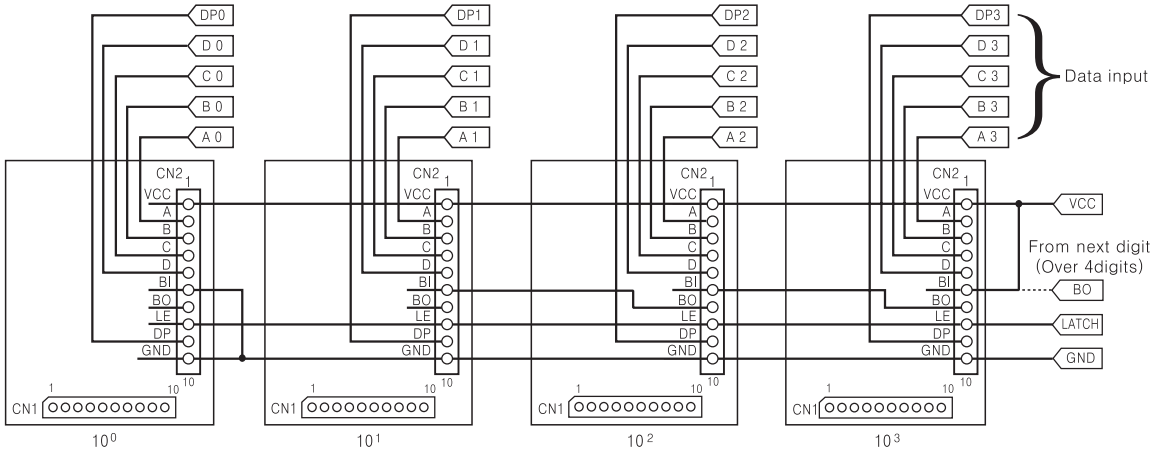


# D1SC-N

## Multi-stage connection method

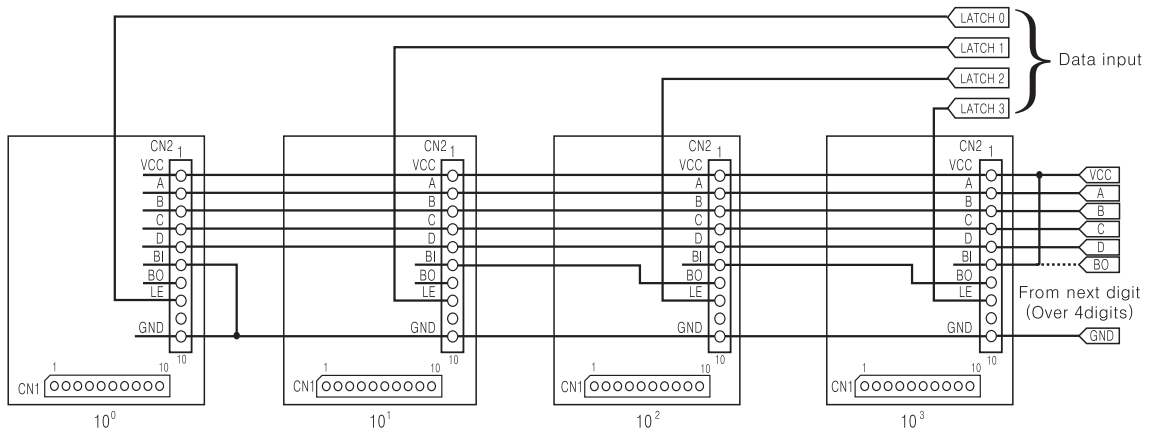
Parallel input (These diagrams are to wire at rear layout of the unit)

• Static connection (Zero Blanking method) : 4digit



\*CN1 terminal can be used since CN1 and CN2 are corresponded to 1:1.

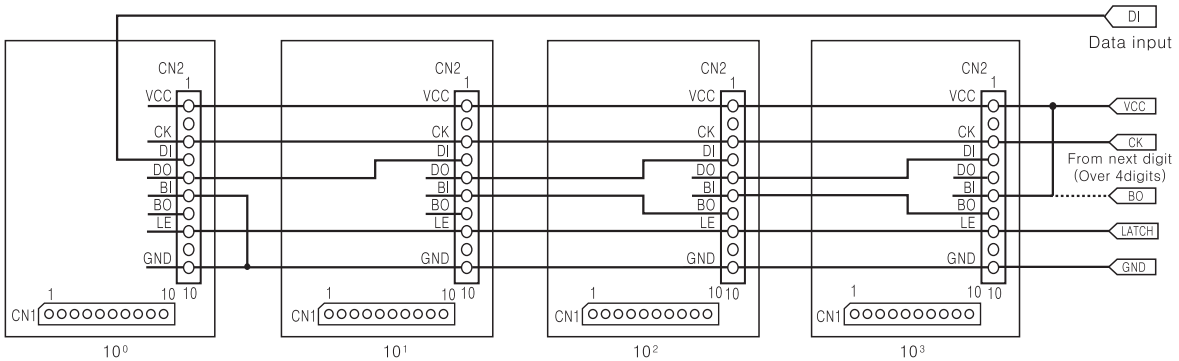
• Dynamic connection (Zero blanking method) : 4digit



\*CN1 terminal can be used since CN1 and CN2 are corresponded to 1:1.

Serial input (These diagrams are to wire at rear layout of the unit)

• Serial connection (Zero blanking method) : 4digit



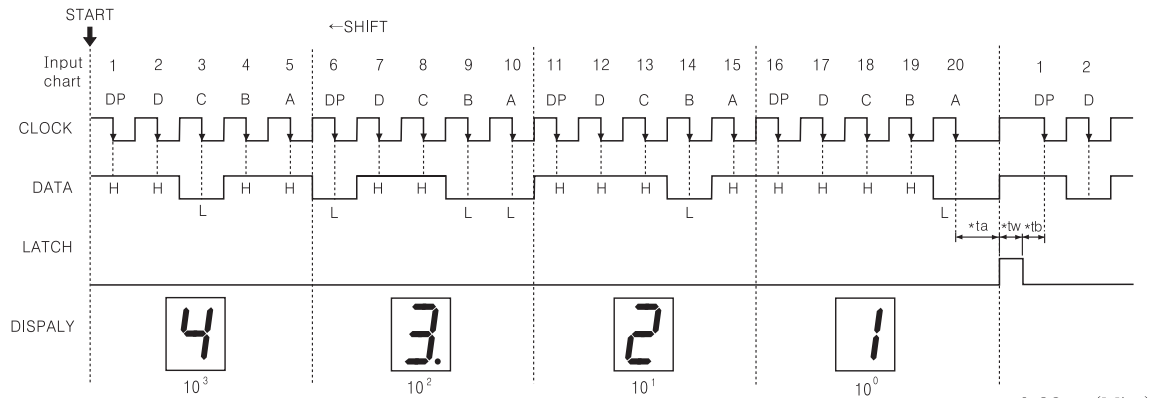
\*CN1 terminal can be used since CN1 and CN2 are corresponded to 1:1.

# 7 Segment Display 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 held at High, but data is held when it change to low.
- \*ta : 0.23ms (Min.)  
 \*tb : 0.05ms (Min.)  
 \*tw : 0.05ms (Min.)

## Zero blank method?

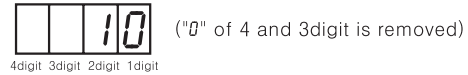
It is to remove "0" indication which has no meaning.

EX1) When indication value is "10" in 4digit LED

① Zero blanking function is not applied



② Zero blanking function is applied

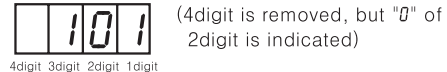


EX2) When indication value is "101" in 4digit LED

① Zero blanking function is not applied



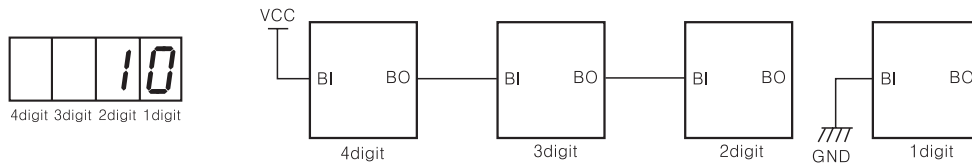
② Zero blanking function is applied



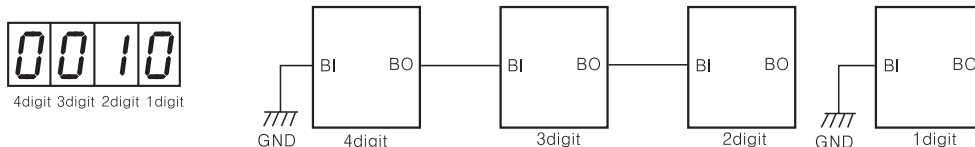
### How to use zero blanking of D1SC-N

BI input terminal of highest-rank digit must be connected with VCC, BI input terminals of lowest-rank digit must be connected with GND, but BI input terminals of middle-rank digit connect with BO terminal of one upper-digit.

1) Zero blanking function is applied [In case of indicating "10"]



2) Zero blanking function is not applied [In case of indicating "10"]



### 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 5 Bit)