

D1AA

Number, alphabet, symbol etc. displayable 60kinds of characters
Data input method selection and change function(Serial or Parallel method)
Input logic selection and change function(Positive/Negative logic)

■ Features

- Data input selection and change function
: Parallel or Serial method
- Displayable number, alphabet, symbol etc.
60kinds of characters
- Wide range of input signal level
: Low : 0–1.2VDC, High : 4.5–24VDC
- Input logic selection and change function
: Positive / Negative logic input
- 12–24VDC power supply
- Multi stage connection available
- Clear display by high brightness LED



■ Applications

- Display for PLC
- Display for computer
- Various display

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

■ Specifications

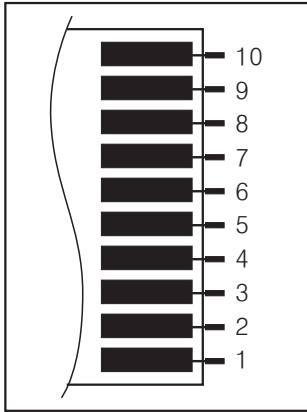
Model	D1AA-RN	※ D1AA-GN
Display method	Red(16 Segment)	Green(16 Segment)
Power supply	12–24VDC ±10%	
Current consumption	12VDC : Max. 32mA, 24VDC : Max. 25mA	
Display character	0 to 9, A to Z, decimal point, symbol(24kinds)	
Character size	W11×H22mm	
Input	• Parallel : Parallel 6bit binary data, latch, decimal point • Serial : 6bit or 7bit(Decimal point) data, clock, latch, decimal point(When not selecting serial DOT)	
Input level	High : 4.5–24VDC, Low : 0–1.2VDC	
Max. response frequency	Max. 3kHz(Except for STATIC input type)	
Input resistance	20kΩ	
Output	Data out [Serial DATA input case]	
Input logic	Selectable and changeable positive(PNP) or negative(NPN) (By inner soldering)	
Noise strength	The square wave noise by simulator(pulse width:1 μs, display time:1ns, polarity:±, 100times/every sec.) • Between power terminals : ±300V • Between input terminals : ±300V	
Ambient temperature	0 to 60°C (at non-freezing status)	
Storage temperature	–10 to 85°C (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.

16 Segment Display Unit

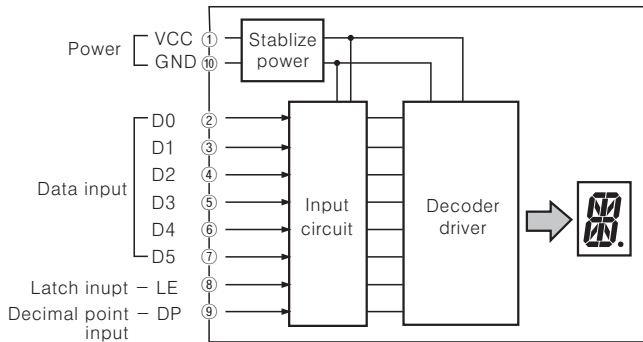
Terminal layout



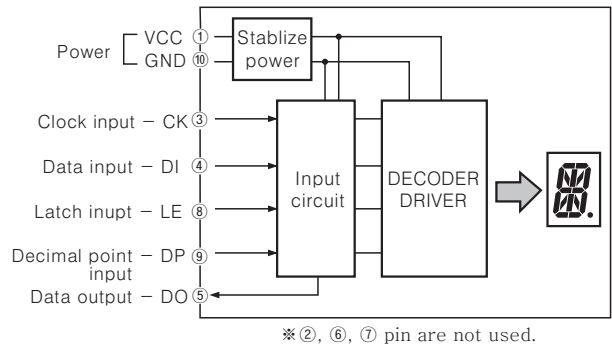
Terminal No.	Input	Parallel input		Serial input	
	Code	Function	Code	Function	
1	VCC	12-24VDC	VCC	12-24VDC	
2	D0	Data input	NC	Don't connect anything	
3	D1		CK	Clock input	
4	D2		DI	Data input	
5	D3		DO	Data output	
6	D4		NC	Don't connect anything	
7	D5	NC			
8	LE	Latch input	LE	Latch input	
9	DP	Decimal point input	DP	Decimal point input	
10	GND	0V	GND	0V	

Block diagram

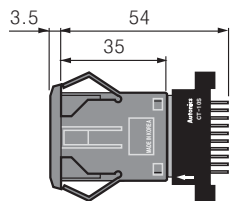
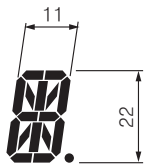
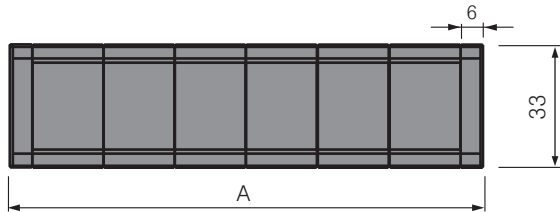
Parallel input



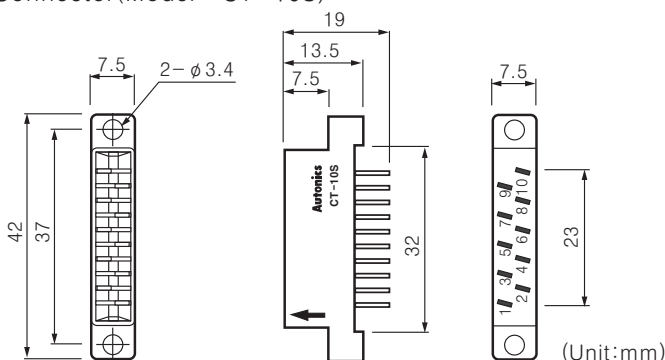
Serial input



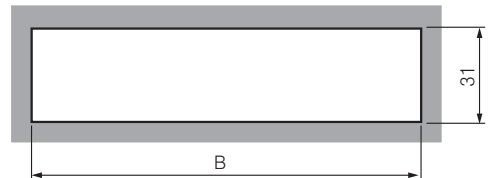
Dimensions



Connector (Model: CT-10S)



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

Cap



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

(A) Photo electric sensor

(B) Fiber optic sensor

(C) Door/Area sensor

(D) Proximity sensor

(E) Pressure sensor

(F) Rotary encoder

(G) Connector/Socket

(H) Temp. controller

(I) SSR/Power controller

(J) Counter

(K) Timer

(L) Panel meter

(M) Tacho/Speed/Pulse meter

(N) Display unit

(O) Sensor controller

(P) Switching power supply

(Q) Stepping motor & Driver & Controller

(R) Graphic/Logic panel

(S) Field network device

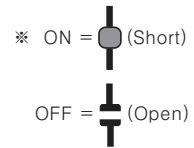
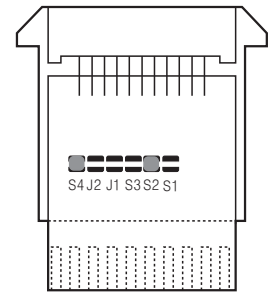
(T) Production stoppage models & replacement

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Operation specification

Selection of switch Operation	*1 S1	S2	S3	S4	*2 J1	*3 J2	Bit 1digit
		ON=Paralle OFF=Serial	ON=Serial with DOT OFF=Serial without DOT	Negative logic : S4=ON Positive logic : S4=OFF	Serial data out		
Parallel decimal negative logic	×	ON	OFF	S4=ON	OFF	OFF	—
Parallel decimal positive logic	×	ON	OFF	S4=OFF	OFF	OFF	—
Serial decimal without DOT negative logic	×	OFF	OFF	S4=ON	ON	OFF	6bit
Serial decimal without DOT positive logic	×	OFF	OFF	S4=OFF	ON	OFF	6bit
Serial decimal with DOT negative logic	×	OFF	ON	S4=ON	ON	OFF	*4 7bit
Serial decimal with DOT positive logic	×	OFF	ON	S4=OFF	ON	OFF	*4 7bit

◎Function selection switch position



(※1) There is no function for S1. It does not matter if it is ON or OFF.

(※2) J1 must be OFF in parallel operation.

(※3) J2 must be OFF always.

(※4) 1bit will be added, if DOT used in serial operation.

※Note : Please use it according to operation specification, otherwise product might be damaged.

⇒ Factory specification(Negative logic paralle) S1 : OFF, S2 : ON, S3 : OFF, S4 : ON, J1 : OFF, J2 : OFF

Input data chart

Upper 2bit data(PNP type) in positive logic				Lower 4bit data(PNP type) in positive logic								
D5	D4	D5	D4	D5	D4	D5	D4	Data input(H=High level, L=Low level)				
L	L	L	H	H	L	H	H	Hexa decimal	D3	D2	D1	D0
0H	1H	2H	3H	0H	L	L	L	0H	L	L	L	L
Blank	P	Blank	0	1H	L	L	L	1H	L	L	L	H
A	Q	Blank	1	2H	L	L	H	2H	L	L	H	L
B	R	"	2	3H	L	L	H	3H	L	L	H	H
C	S	⊗	3	4H	L	H	L	4H	L	H	L	L
D	T	\$	4	5H	L	H	L	5H	L	H	L	H
E	U	%	5	6H	L	H	H	6H	L	H	H	L
F	V	Blank	6	7H	L	H	H	7H	L	H	H	H
G	W	'	7	8H	H	L	L	8H	H	L	L	L
H	X	:	8	9H	H	L	L	9H	H	L	L	H
I	Y	:	9	AH	H	L	H	AH	H	L	H	L
J	Z	*	9	BH	H	L	H	BH	H	L	H	H
K	[+	0	CH	H	H	L	CH	H	H	L	L
L	\	^	1	DH	H	H	L	DH	H	H	L	H
M]	-	1	EH	H	H	H	EH	H	H	H	L
N	^	~	2	FH	H	H	H	FH	H	H	H	H
O	~	/	2									

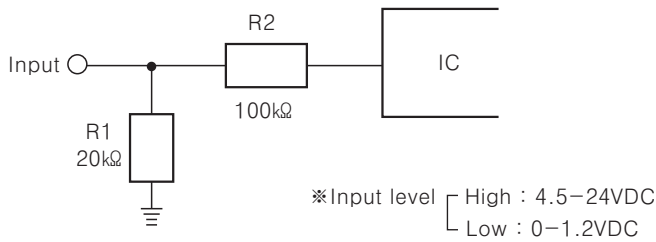
※Negative logic(NPN type) : Data input level of D5, D4, D3, D2, D1, D0 will be opposite stage.

※Blank : Even though data is input as signal, it does not display.

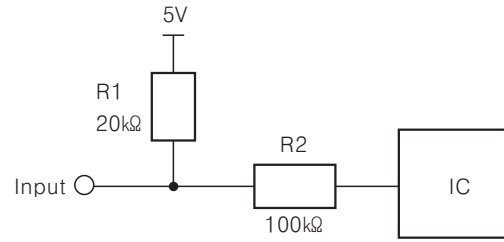
16 Segment Display Unit

Input circuit

◎Positive logic



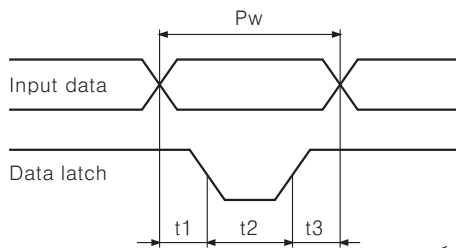
◎Negative logic



Input timing

◎Parallel input

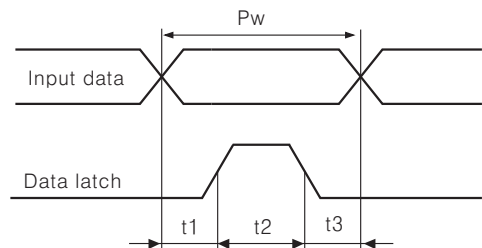
●Positive logic(S4: OFF)



$Pw = t1 + t2 + t3$

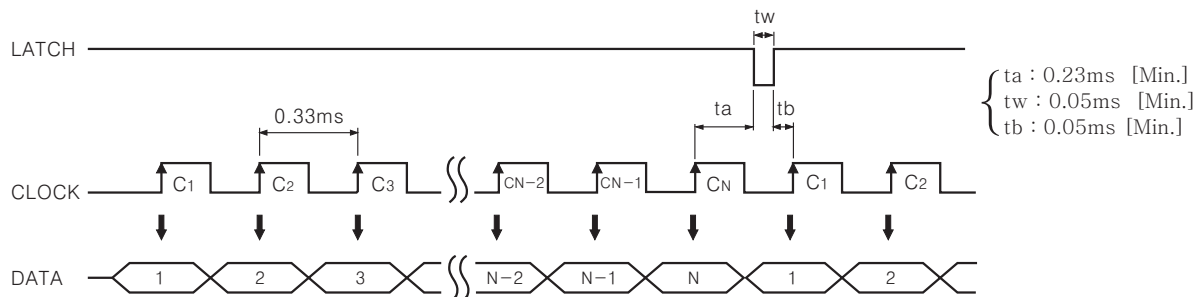
- $Pw : 0.33\text{ms [Min.]}$
- $t1 : 0.05\text{ms [Min.]} \rightarrow$ Data latch
- $t2 : 0.23\text{ms [Min.]} \rightarrow$ Data shift
- $t3 : 0.05\text{ms [Min.]} \rightarrow$ Data latch

●Negative logic(S4: ON)

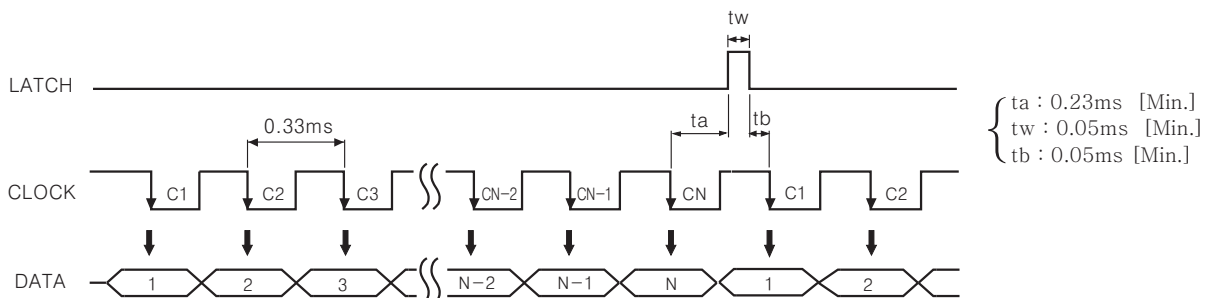


◎Serial input

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



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



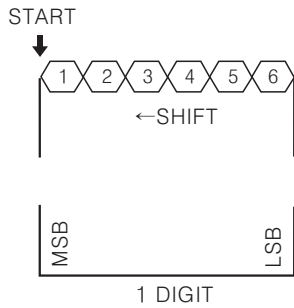
(A)	Photo electric sensor
(B)	Fiber optic sensor
(C)	Door/Area sensor
(D)	Proximity sensor
(E)	Pressure sensor
(F)	Rotary encoder
(G)	Connector/Socket
(H)	Temp. controller
(I)	SSR/Power controller
(J)	Counter
(K)	Timer
(L)	Panel meter
(M)	Tacho/Speed/Pulse meter
(N)	Display unit
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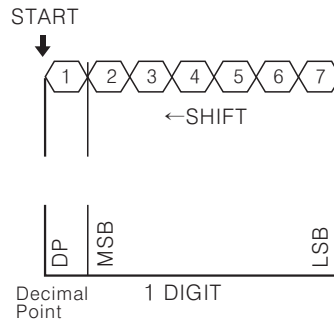
■ Data input method for serial

○ Single input method

● 6Bit Data input(S3:OFF, J1:ON)

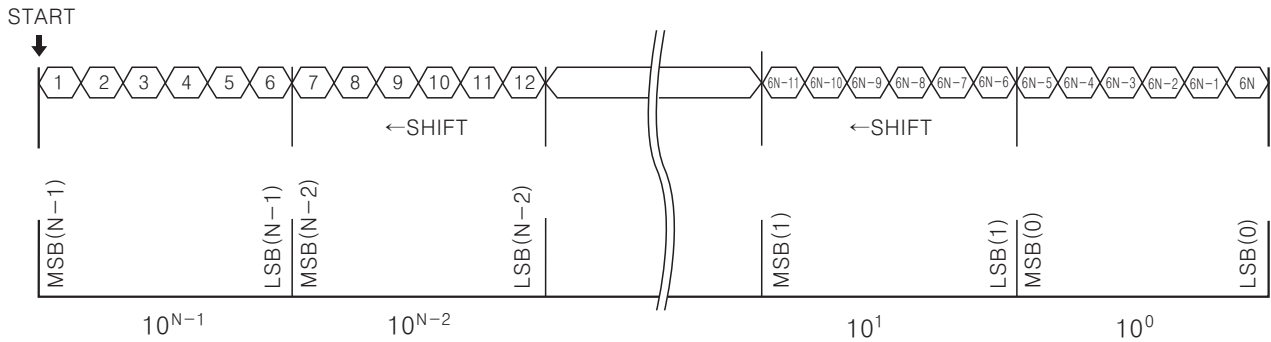


● 7Bit Data input(S3:ON, J1:ON)

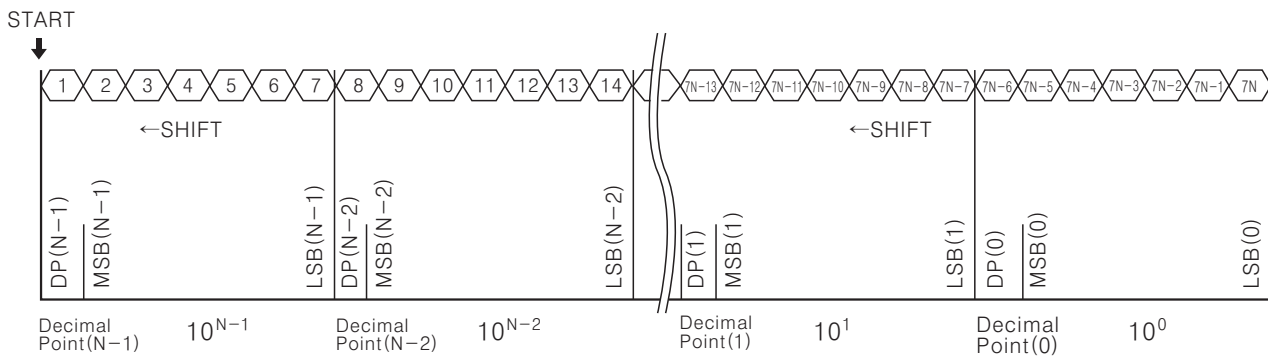


○ Multi-stage connection input method

● 6Bit Data input(S3:OFF, J1:ON)



● 7Bit Data input(S3:ON, J1:ON)



● Arrangement



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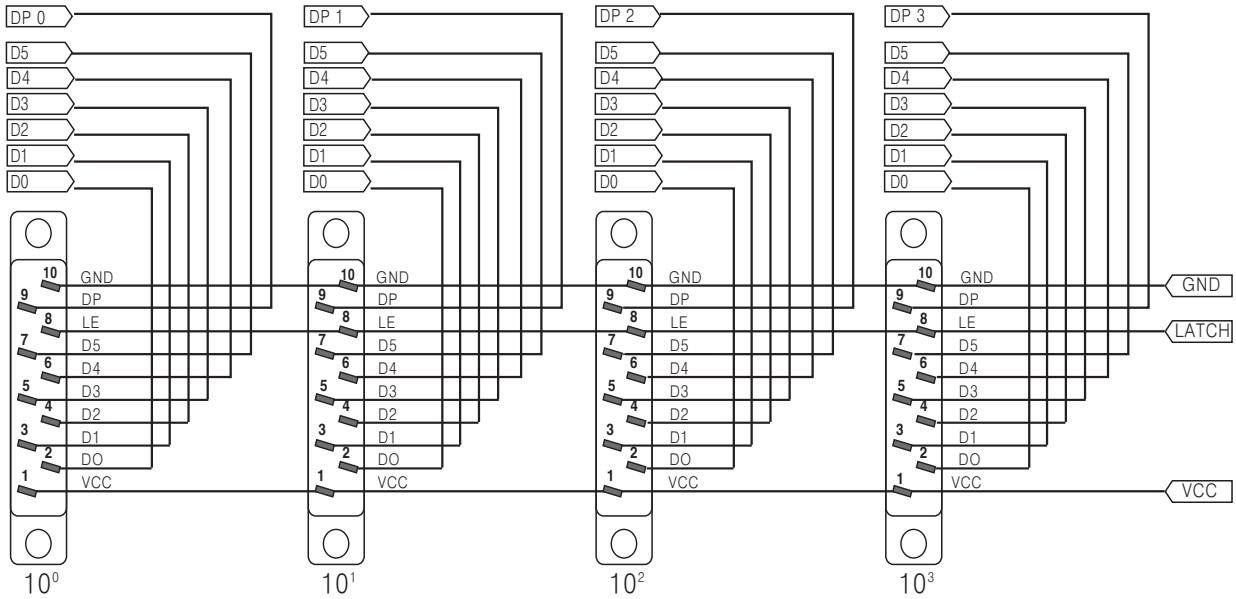


16 Segment Display Unit

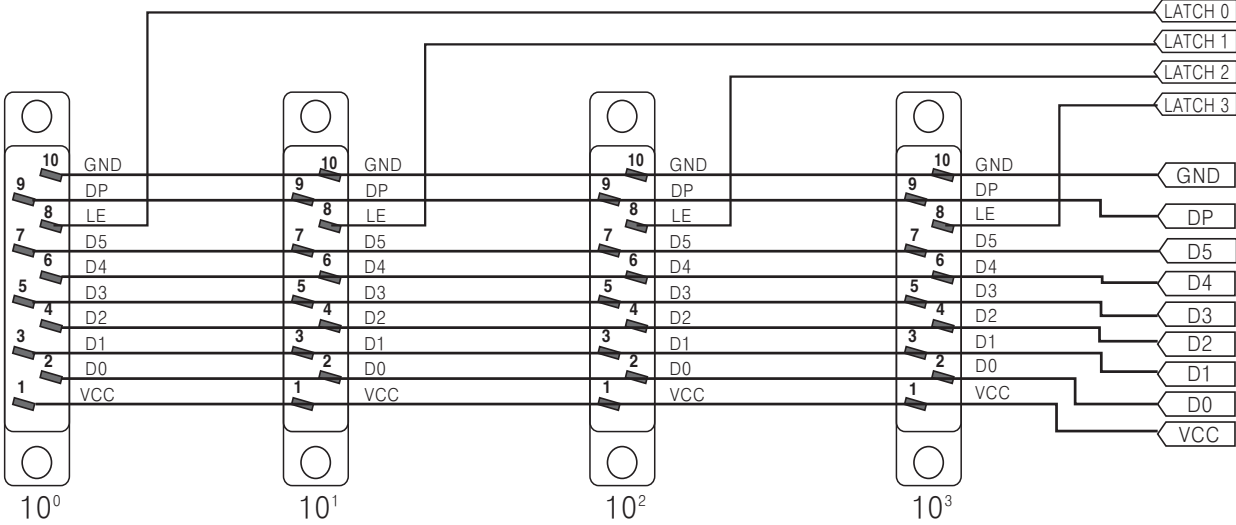
Multi-stage connection method

Parallel input : 4digit

Static connection . . . These diagrams are to wire at rear layout of the unit.

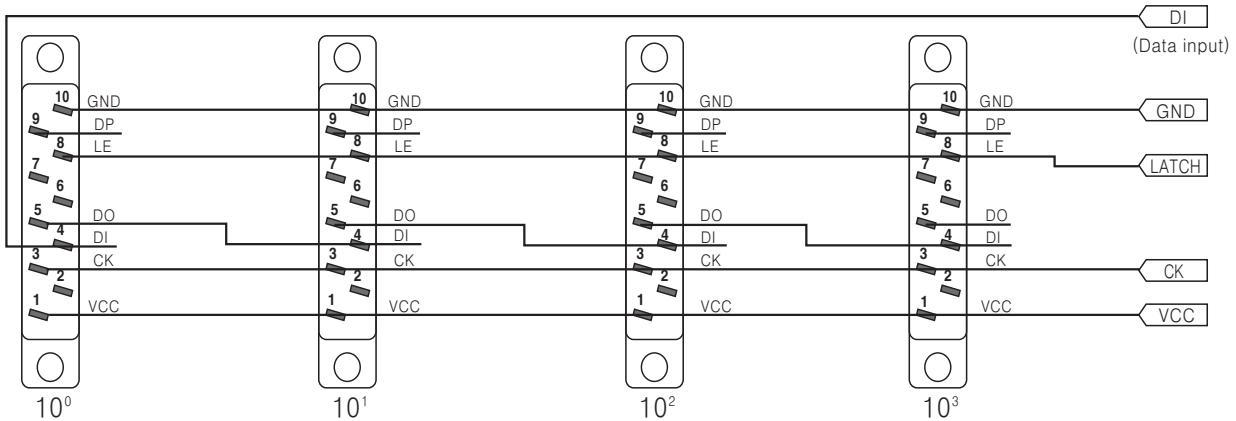


Dynamic connection . . . These diagrams are to wire at rear layout of the unit.



Serial input : 4digit

Serial connection . . . These diagrams are to wire at rear layout of the unit.



※DP display method in 6bit serial data input
 ▶ Positive logic : Connect DP terminal to VCC
 ▶ Negative logic : Connect DP terminal to GND

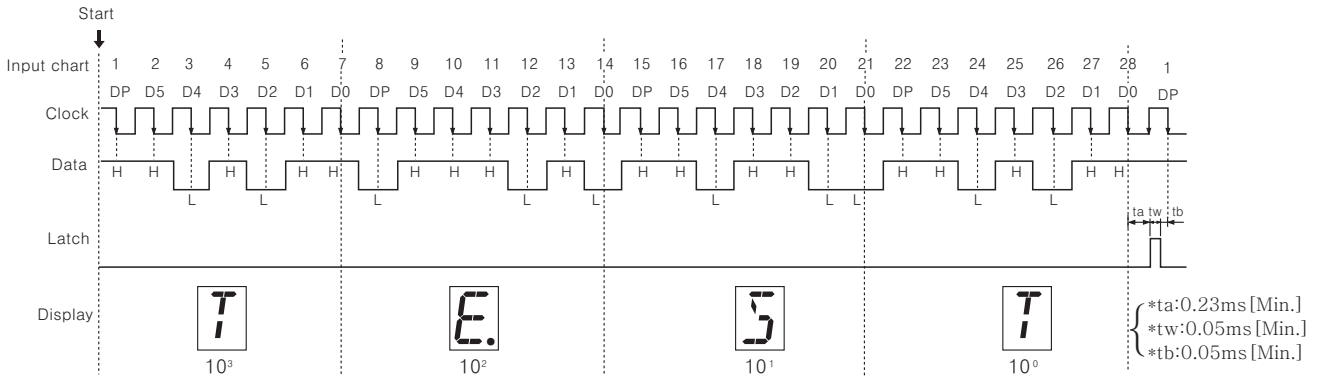
※DP display method in 7bit serial data input
 ▶ Input DP data added to 7bit serial data
 (DP Data is MSB of 7bit)

(A)	Photo electric sensor
(B)	Fiber optic sensor
(C)	Door/Area sensor
(D)	Proximity sensor
(E)	Pressure sensor
(F)	Rotary encoder
(G)	Connector/Socket
(H)	Temp. controller
(I)	SSR/Power controller
(J)	Counter
(K)	Timer
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Multi-stage connection method

Serial connection example

- ▶ Input mode : Negative logic of serial decimal with DOT- (S1: X, S2: OFF, S3: ON, S4: ON, J1: ON, J2: OFF)
- ▶ Display value : TE.ST



※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 6bit 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 7bit serial data input

Please input DP data with serial data. (DP data is highest-rank bit among 7bit)

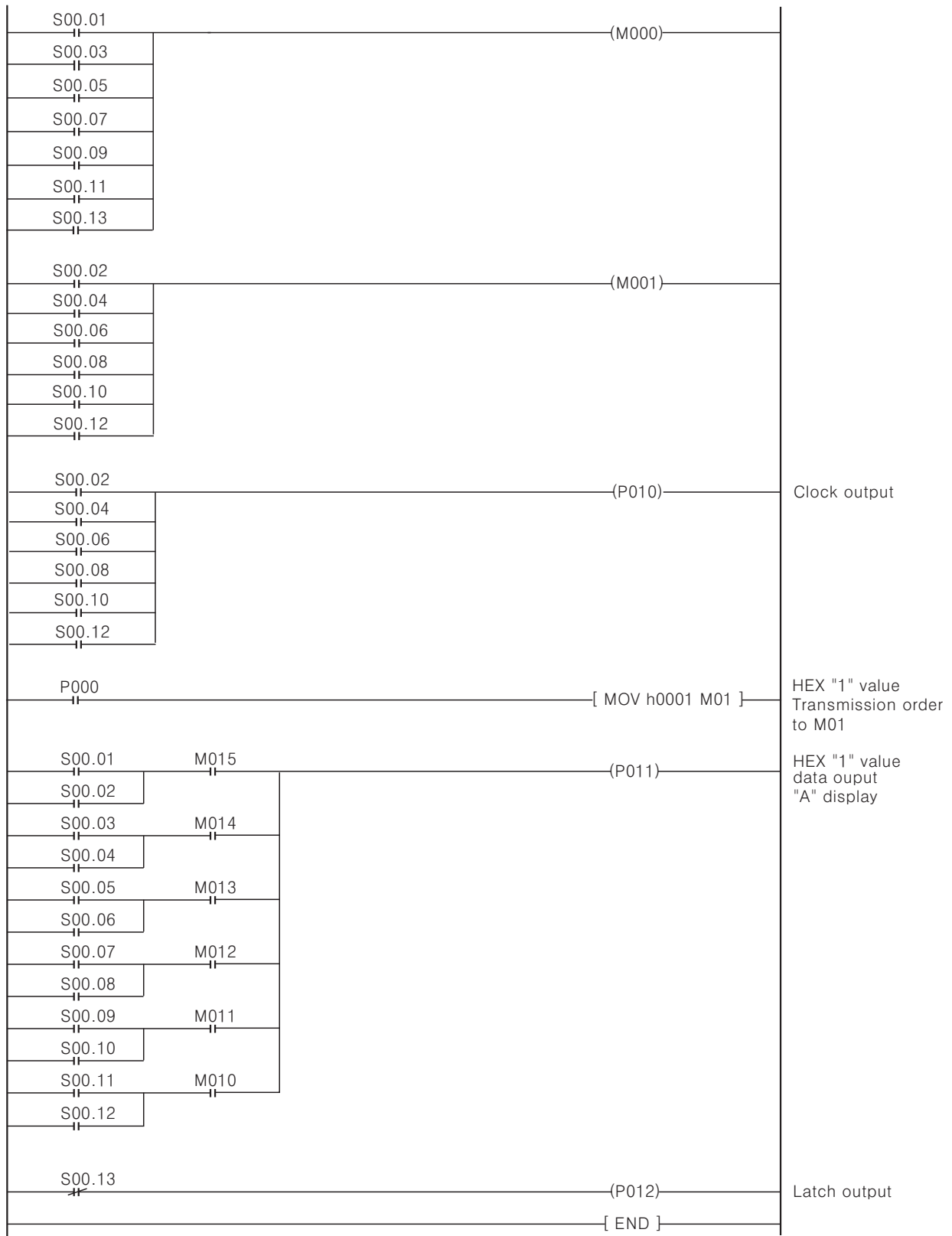
※In case of 7 bit serial data input, turn on S3 which is function selection switch, then transfer data.

The application of PLC program(Serial input type)

- ① Display unit : D1AA - □
- 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



16 Segment Display Unit



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