W 32 × H 57 mm 7-segment Display Units

D1SC-N Series

INSTRUCTION MANUAL

TCD210086AC

Autonics

Thank you for choosing our Autonics product.
Read and understand the instruction manual and manual thoroughly before using the product.
For your safety, read and follow the below safety considerations before using.
For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.
Keep this instruction manual in a place where you can find easily.
The specifications, dimensions, etc. are subject to change without notice for product improvement. Some models may be discontinued without notice.
Follow Autonics website for the latest information.

Safety Considerations

- Observe all 'Safety Considerations' for safe and proper operation to avoid hazards.
- ⚠ symbol indicates caution due to special circumstances in which hazards may occur.

⚠ Warning Failure to follow instructions may result in serious injury or death.

01. Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss. (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)
Failure to follow this instruction may result in personal injury, economic loss or fire.
02. Do not use the unit in the place where flammable/explosive/corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact or salinity may be present.
Failure to follow this instruction may result in explosion or fire.
03. Install on a device panel to use.
Failure to follow this instruction may result in fire.
04. Do not connect, repair, or inspect the unit while connected to a power source.
Failure to follow this instruction may result in fire.
05. Check 'Unit description and function setting' before wiring.
Failure to follow this instruction may result in fire.
06. Do not disassemble or modify the unit.
Failure to follow this instruction may result in fire.

⚠ Caution Failure to follow instructions may result in injury or product damage.

01. Use the unit within the rated specifications.
Failure to follow this instruction may result in fire or product damage.
02. Use a dry cloth to clean the unit, and do not use water or organic solvent.
Failure to follow this instruction may result in fire.
03. Keep the product away from metal chip, dust, and wire residue which flow into the unit.
Failure to follow this instruction may result in fire or product damage.

Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- 12 - 24 VDC⎓ model power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
- Install a power switch or circuit breaker in the easily accessible place for supplying or disconnecting the power.
- Keep away from high voltage lines or power lines to prevent inductive noise. In case installing power line and input signal line closely, use line filter or varistor at power line and shielded wire at input signal line.
  Do not use near the equipment which generates strong magnetic force or high frequency noise.
- This unit may be used in the following environments.
  - Indoors (in the environment condition rated in 'Specifications')
  - Altitude max. 2,000 m
  - Pollution degree 2
  - Installation category I

Product Components

- Product × 1
- Insturction manual × 1
- Connector × 1
- Housing [5264-10] × 1
- Terminal [5263 (PBT)] × 1
- Sub-PCB for multi-stage connection × 1

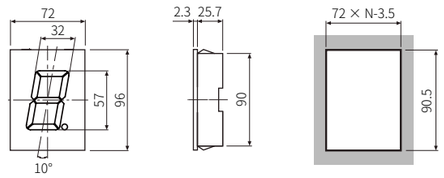
Specifications

Model	D1SC-N
Display method	7-segment LED (red)
Power supply	12 - 24 VDC⎓
Permissible voltage range	90 to 110 % of rated voltage
Current consumption	≤ 70 mA
Character size (W×H)	32 × 57 mm
Display character	Decimal number: 0 to 9, decimal point, Minus Hexadecimal number: 0 to 9, A to F, decimal point, Minus
Input method	Parallel: Parallel 4-bit data, LATCH, Zero Blanking, decimal point Serial: Serial 4/5-bit data, CLOCK, Zero Blanking, LATCH, decimal point 01)
Input resistance	12 kΩ
Input level	High: 4.5 - 24 VDC⎓, Low: 0 - 1.2 VDC⎓
Max. Clock 02)	≤ 3 kHz
Output	Data output (serial input), Zero Blanking output
Input logic	Positive logic (PNP), negative logic (NPN) selectable (function set switches)
Insulation resistance	≥ 100 MΩ (500 VDC⎓ megger)
Noise immunity	± 300 V the square wave noise (pulse width: 1 μs) by the noise simulator
Ambient temperature	0 to 60 °C, storage: -10 to 85 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH (no freezing or condensation)
Weight	≈ 100 g

01) When applying the serial 4-bit input.
02) Max. Clock is for 50 : 50 (%) of duty ratio (ON, OFF ratio).

Dimensions

- Unit: mm, For the detailed drawings, follow the Autonics website.
- N: number of units, panel thickness: 2 to 4 mm

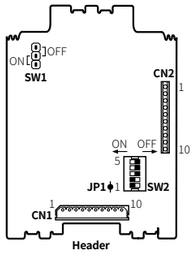


Input Data Chart

- X: Don't care, **- : Minus, Blank: Though entering the data, it will not display.
- In case of indicating minus (-), JP1 must be OFF.

Display				Negative logic (NPN) input					Positive logic (PNP) input				
Minus		7-segment		D	C	B	A	LAT CH	D	C	B	A	LAT CH
Hex.	Dec.	Hex.	Dec.										
Blank	Blank	0	0	H	H	H	H	H	L	L	L	L	L
Blank	Blank	1	1	H	H	H	L	H	L	L	L	H	L
**-	-	2	2	H	H	L	H	H	L	L	H	L	L
-	-	3	3	H	H	L	L	H	L	L	H	H	L
-	-	4	4	H	L	H	H	H	L	H	L	L	L
-	-	5	5	H	L	H	L	H	L	H	L	H	L
-	-	6	6	H	L	L	H	H	L	H	H	L	L
Blank	Blank	7	7	H	L	L	L	H	L	H	H	H	L
-	-	8	8	L	H	H	H	H	H	L	L	L	L
-	-	9	9	L	H	H	L	H	H	L	L	H	L
-	Blank	A	Blank	L	H	L	H	H	H	L	H	L	L
-	Blank	b	Blank	L	H	L	L	H	H	L	H	H	L
Blank	Blank	C	Blank	L	L	H	H	H	H	H	L	L	L
-	Blank	d	Blank	L	L	H	L	H	H	H	L	H	L
-	Blank	E	Blank	L	L	L	H	H	H	H	H	L	L
-	Blank	F	Blank	L	L	L	L	H	H	H	H	H	L
HOLD		HOLD		X	X	X	X	L	X	X	X	X	H

Unit Descriptions



■ CN1 connector spec.
- Manufacturer: MOREX CO.,LTD. (Korea)
- Housing: 5264-10
- Header: 5264-10A (Straight)
- Terminal: 5263 (PBT)

■ Cable spec.
- AWG22 to 28 (cable diameter: ≤ Ø 1.9 mm)
- Shedding length of wire cover: 2.4 to 2.9 mm

■ CN2 connector spec.
- Use with the auxiliary PCB (W 8 × H 27 mm) for connecting multi-stage.
- 1:1 correspondence with CN1 terminal

■ I/O terminal (CN1, CN2)

Terminal \ Input	Parallel input			Serial input	
	Code	Function		Code	Function
1	V+	12 - 24 VDC⎓		VCC	12 - 24 VDC⎓
2	A	2^0	Data input	N·C	-
3	B	2^1		CK	CLOCK input
4	C	2^2		DI	Data input
5	D	2^3		DO	Data output
6	BI	Zero Blanking input		BI	Zero Blanking input
7	BO	Zero Blanking output		BO	Zero Blanking output
8	LE	LATCH input		LE	LATCH input
9	DP	Decimal point input		DP	Decimal point input
10	GND	0 V		GND	0 V

■ Function set jumper (SW1) / Function set switches (SW2, JP1)

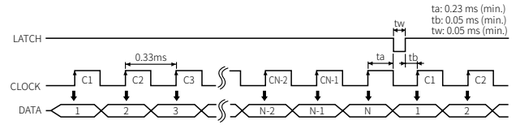
No.		ON	OFF	Function	Default
SW1		Negative logic (NPN)	Positive logic (PNP)	Input logic	ON
SW2	1	Decimal number	Hexadecimal number	Display characters	ON
	2	Parallel	Serial	Input	ON
	3	5-bit	4-bit	Select serial input	OFF
	4	Use	Not used	Serial data output 01)	OFF
	5	Use	Not used	Zero Blanking	OFF
JP1		7-segment display	Minus display	Minus display	ON

01) Set as ON in serial input, as OFF in parallel input.

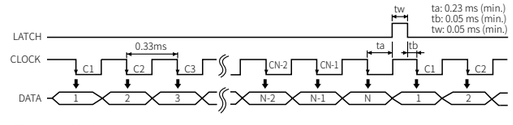
Input Timing

■ Serial input

- Based on the positive logic (PNP), use Serial data output and Zero Blanking
- Clock: max. 3 kHz

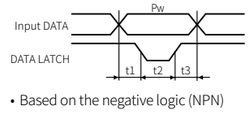


- Based on the negative logic (NPN), use Serial data output and Zero Blanking
- Clock: max. 3 kHz



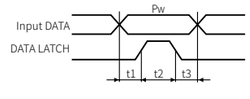
■ Parallel input

- Based on the positive logic (PNP)



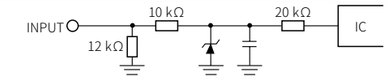
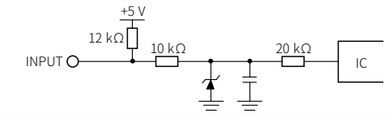
- Pw = t1+t2+t3
- Pw: 0.33 ms (min.)
- t1 (DATA Latch): 0.05 ms (min.)
- t2 (DATA Shift): 0.23 ms (min.)
- t3 (DATA Latch): 0.05 ms (min.)

- Based on the negative logic (NPN)



- Pw = t1+t2+t3
- Pw: 0.33 ms (min.)
- t1 (DATA Latch): 0.05 ms (min.)
- t2 (DATA Shift): 0.23 ms (min.)
- t3 (DATA Latch): 0.05 ms (min.)

Input Circuit

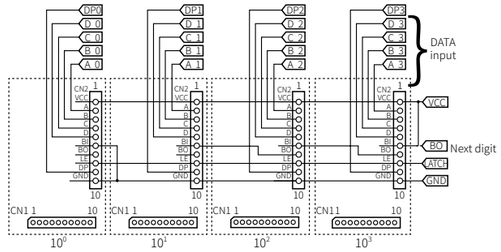
Positive logic (PNP)	
Negative logic (NPN)	

Multi-stage Connection

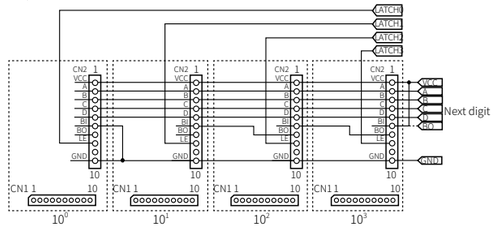
- Because CN1 and CH2 are corresponding with each other, CN1 can use instead (wiring connection).
- Based on the 4-digit, connection of rear part of the product, use Zero Blanking

■ Parallel input

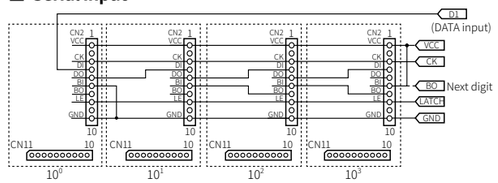
- Static Parallel



- Dynamic Parallel



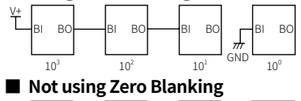
■ Serial input



Zero Blanking

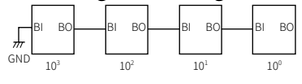
- This function removes '0' that is no meaning when displaying the data in the multi-stage connection.
- Set no. 5 position of SW2 (Zero Blanking) as ON.
- Set 10^0 as OFF to display '0'. Connect BI terminal to GND for deactivating Zero Blanking.

■ Using Zero Blanking



- Display e.g.: 10

■ Not using Zero Blanking



- Display e.g.: 10

Serial Decimal Point Input

	4-bit	5-bit
Positive logic (PNP)	Connect the DP input terminal (the digit for indicating DP) to VCC.	Input with including DP Data with Serial Data (DP Data = the highest-rank bit among 5-bit)
Negative logic (NPN)	Connect the DP input terminal (the digit for indicating DP) to GND.	

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