Autonics

INTELLIGENT DISPLAY UNIT
(Serial Input)
DS/DA-S Series
INSTRUCTION MANUAL

Thank you for choosing our Autonics products.
Please read the following safety considerations before use.

■ Safety Considerations

※Please observe all safety considerations for safe and proper product operation to avoid hazards.

※Safety considerations are categorized as follows.
⚠**Warning** Failure to follow these instructions may result in serious injury or death.
⚠**Caution** Failure to follow these instructions may result in personal injury or product damage.

※The symbols used on the product and instruction manual represent the following
⚠ symbol represents caution due to special circumstances in which hazards may occur.

⚠ Warning

1. **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, fire, or economic loss.
2. **Do not disassemble or modify the unit. Please contact us if necessary.**
   Failure to follow this instruction may result in fire.

⚠ Caution

1. **Do not use the unit outdoors.**
   Failure to follow this instruction may result in shortening the life cycle of the unit or product malfunction.
2. **Use the unit within the rated specifications.**
   Failure to follow this instruction may result in shortening the life cycle of the unit.
3. **Do not use water or oil-based detergent when cleaning the unit. Use dry cloth to clean the unit.**
   Failure to follow this instruction may result in fire.
4. **Do not use the unit where flammable or explosive gas, humidity, direct sunlight, radiant heat, vibration, or impact may be present.**
   Failure to follow this instruction may result in fire or explosion.
5. **Keep dust and wire residue from flowing into the unit.**
   Failure to follow this instruction may result in fire or product damage.

■ Model

1) Basic unit

Model	Display method	Size	Model	Display method	Size
DS16-□S	7 Segment	W16×H24mm	**DA22-□S**	16 Segment	W20×H33mm
DS22-□S		W20×H33mm	**DA40-□S**		W40×H60mm
DS40-□S		W40×H60mm	**DA60-□S**		W60×H96mm
DS60-□S		W60×H96mm			

2) Expansion unit

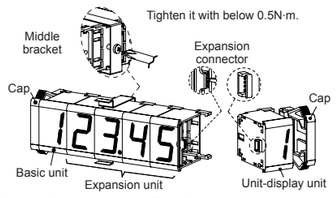
Model	Display method	Size	Model	Display method	Size
DS16-□E	7 Segment	W16×H24mm	**DA22-□E**	16 Segment	W20×H33mm
DS22-□E		W20×H33mm	**DA40-□E**		W40×H60mm
DS40-□E		W40×H60mm	**DA60-□E**		W60×H96mm
DS60-□E		W60×H96mm			

※□ indicates color: R(Red), G(Green)

■ Connection Of Units

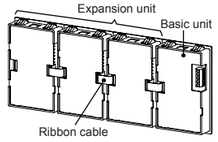
1) DS16/D□22

- Connect a basic unit, expansion units, a unit-display unit from the left and connect the caps the end of right and left.
- The middle bracket (sold separately) helps to protect deflection when connecting over 7 units. Use one middle bracket per 7 units.
- The basic unit supplies the power for expansion units and the unit-display unit and DATA input.

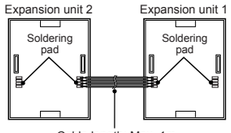


2) D□40/D□60

Connect expansion connectors of units using a ribbon cable (accessory) as (figure 1).
If the distance between expansion units is far as (figure 2), you can connect the cable at the soldering pad.
To use a soldering pad, remove the protection cover which only expansion units have.



(figure 1)



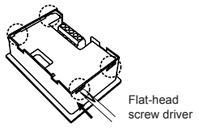
(figure 2)

※You can use both the 7 segment display method model and the 16 segment display method model mixed.

■ Remove Of Protection Cover

To operate the function set switch of the D□40, D□60 models, you should remove the protection cover.
Press the connection parts (4 points) of the protection cover at the top/bottom of the product with a flat-head screwdriver and the protection cover is removed.

⚠ **Caution: Before removing the protection cover, power must be turned OFF.**



※The above specifications are subject to change and some models may be discontinued without notice.

■ Specifications

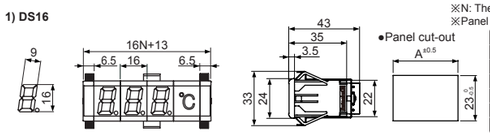
Model	Basic unit	**DS16-□S**	**D□22-□S**	**D□40-□S**	**D□60-□S**
	Expansion unit	**DS16-□E**	**D□22-□E**	**D□40-□E**	**D□60-□E**
Input method		Serial			
Display color		Red, Green (selectable by model)			
Power supply		12-24VDC			
Allowable voltage range		90 to 110% of rated voltage			
Current consumption	Red type	Max. 20mA	Max. 25mA	Max. 55mA	Max. 65mA
	Green type	Max. 15mA	Max. 20mA	Max. 40mA	Max. 45mA
Character size		W9×H16mm	W11.2×H22.5mm	W22.4×H40mm	W33.6×H60mm
Max. clock※1		Max. 2kHz			
Input logic		Selectable Positive logic (PNP), Negative logic (NPN) (change by function set switch)			
Input resistance		20kΩ			
Input level		High: 4.5-24VDC, Low: 0-1.2VDC			
Display character		Displays 64 types of character and sign (0 to 9, A to Z, 27 signs, dot)			
The number of max. multi-stage connection		24 units			
Noise resistance		±500V the square wave noise (pulse width: 1μs) by the noise simulator			
Environ-ment	Ambient temp.	-10 to 55℃, storage: -25 to 65℃			
	Ambient humi.	35 to 85%RH, storage: 35 to 85%RH			
Accessory	Basic unit	Right/Left cap: 1	Right/Left cap: 1 Connector: 1	—	
	Expansion unit	—		Ribbon cable (50mm) : 1	
Protection structure		IP40 (front part)			
Approval		CE			
Weight※2	Basic unit	Approx. 52g (approx.12g)	Approx. 58g (approx. 17g)	Approx. 63g (approx. 28g)	Approx. 110g (approx. 60g)
	Expansion unit	Approx. 77g (approx.12g)※3	Approx. 92g (approx. 17g)※3	Approx. 63g (approx. 28g)	Approx. 110g (approx. 60g)

※1: Max. Clock is for 1:1 of duty ratio (ON, OFF ratio).
※2: The weight includes packaging. The weight in parentheses is for unit only.
※3: This is 3 units' weight as packaging unit and the weight in parentheses is only unit weight.
※Environment resistance is rated at no freezing or condensation.

■ Dimensions

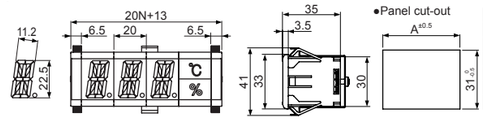
(unit: mm)
※N: The number of units
※Panel thickness: 1.5 to 4mm

1) DS16



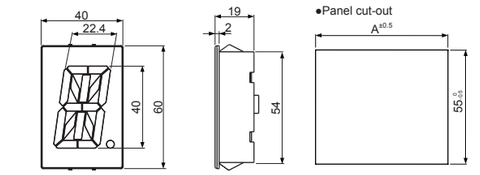
Unit (N)	A (16N+11)
1	27
2	43
3	59
4	75
5	91
:	:

2) DS22/DA22



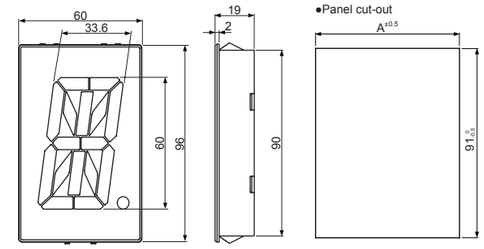
Unit (N)	A (20N+11)
1	31
2	51
3	71
4	91
5	111
:	:

3) DS40/DA40



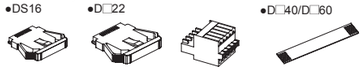
Unit (N)	A (40N-2)
1	38
2	78
3	118
4	158
5	198
6	238
7	278
8	318
9	358
10	398
:	:

4) DS60/DA60



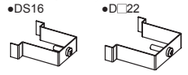
Unit (N)	A (60N-3)
1	57
2	117
3	177
4	237
5	297
6	357
7	417
8	477
9	537
10	597
:	:

5) Accessory



Cap Cap Connector Ribbon cable (50mm)

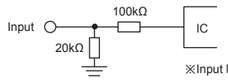
6) Sold separately (middle bracket)



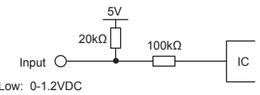
BK-D16R BK-D22R

■ Input Circuit

●Positive logic (PNP) input



●Negative logic (NPN) input



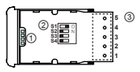
※Input level
High: 4.5-24VDC, Low: 0-1.2VDC

■ Part Descriptions And Function Setting

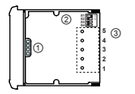
Only the basic unit model has the function set switch and the input terminal.
The DS16, D□22 models have them at the side, and the D□40, D□60 models have them at the rear.

❶Expansion connector
Using for connecting units.
Refer to '■ Connection of units'.

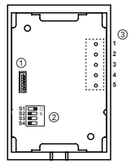
●DS16-□S



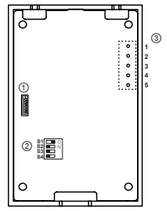
●D□22-□S



●D□40-□S



●D□60-□S



❷Function set switches

Factory default

No.	Switch OFF(■)	Switch ON(■)	Function
S1	Pos. logic (PNP)	Neg. logic (NPN)	Input logic
S2	Not used	Used	Zero Blanking
S3	Not used	Used	Decimal number display※1
S4	8-bit	5-bit※2	DATA input Bit

※1: Decimal number display: The other data except 0 to 9 are blanked.
※2: 5-bit data input is compatible with Autonics panel meter (MT4Y, MT4W).

❸Input terminals

No.	Code	Function
1	VCC	12-24VDC
2	GND	0V
3	DATA	Data input
4	CLOCK	CLOCK input
5	LATCH	LATCH input

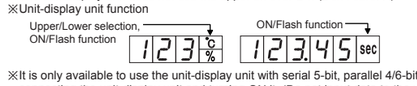
※For D□22-□S connect the connector to input terminal.

■ Input DATA Chart

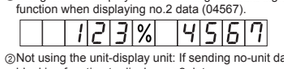
When selecting 5-bit data input, it displays only shaded part (0 to 9, A to F).
If there is no input data after supplying the power, the basic unit displays 'S'.
※This chart is for positive logic (PNP).

DS Series (7 Segment)								DA series(16 Segment)								DU series (unit)		High 2-bit		Low 4-bit		
D5	D4	D5	D4	D5	D4	D5	D4	D5	D4	D5	D4	D5	D4	D5	D4	D5	D4					
L	L	L	H	H	L	H	H	L	L	L	H	H	L	H	H	X	X	D3	D2	D1	D0	
0	0	0	G	9	W	9	]	0	0	0	G	W	W	W	]	No unit		L	L	L	L	
1	1	1	H	1	X	1		1	1	1	H	H	X	X	[	Upper-Lower OFF		L	L	L	H	
2	2	2	I	2	Y	2		2	2	2	I	I	Y	+	+	Upper-Lower ON		L	L	H	L	
3	3	3	J	3	Z	3		3	3	3	J	J	Z	:	:	Upper ON		L	L	H	H	
4	4	4	K	4	-1	4		4	4	4	K	K	-1	;	;	Lower ON		L	H	L	L	
5	5	5	L	5	(	5		5	5	5	L	L	(	<	<	Upper-Lower flashes		L	H	L	H	
6	6	6	M	6	)	6	H (h)	6	6	6	M	M	)	>	>	Upper flashes		L	H	H	L	
7	7	7	N	7	'	7	I	7	7	7	N	N	'	|	|	Lower flashes		L	H	H	H	
8	8	8	O	8	"	8	J	8	8	8	O	O	"	!	!		※1	H	L	L	L	
9	9	9	P	9	^	9	K	9	9	9	P	P	^	@	@			H	L	L	H	
A	A	A	Q	A	.	A	K	A	A	A	Q	Q	.	#	#			H	L	H	L	
b	B	b	R	b	/	b	N	b	B	b	R	R	/	$	$			H	L	H	H	
C	C	C	S	C	?	C	O	C	C	C	S	S	?	%	%			H	H	L	L	
d	D	d	T	d	-	d	T	d	D	d	T	T	-	&	&			H	H	L	H	
E	E	E	U	E	_	E	X	E	E	E	U	U	_	*	*			H	H	H	L	
F	F	F	V	F	=	F	Blank	F	F	F	V	V	=	Blank				H	H	H	H	

※1: If this data is not for the unit-display unit, it maintains former state.
※The unit-display unit does not use the upper bit over D4. (Don't care: X)
※Unit-display unit function



※It is only available to use the unit-display unit with serial 5-bit, parallel 4/6-bit Dynamic 1 input when connecting the unit-display unit and turning ON it. (Do not input data to the unit-display unit.)
※To display two data using zero blanking function
①Using the unit-display unit: If sending unit data signal after no.1 data (000123), it applies zero blanking function when displaying no.2 data (04567).



②Not using the unit-display unit: If sending no-unit data (HXXXLLLL) after no.1 data (00123), it applies zero blanking function to display no.2 data.
In this case, transmitted data should be added one to the display digits. (no-unit data is added)

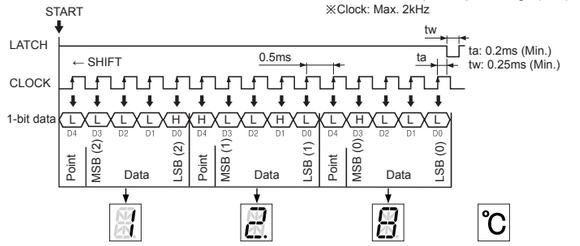
When do not using unit-display unit, no-unit data is used for data division. If it does not send no-unit data (HXXXLLLL), it displays no.1 data (00123) and no.2 data (04567) as one data.
Zero-blanking function is applied to no.1 data only.

※Do not transmit unit data to the basic unit/expansion unit. Unit division bit (D7) of unit data is used only for unit division. When transmitting unit data to the basic/expansion unit, unit division bit (D7) displays the ignored data value. Zero blanking does not operate normally.

■ Data Input Method

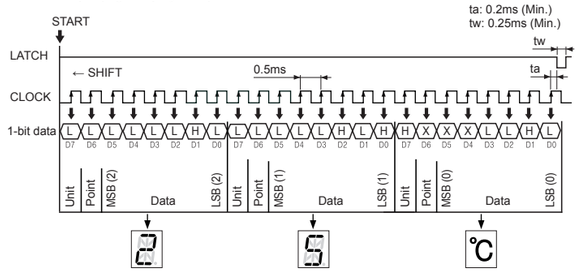
1) 5-bit Serial input (E.g.: Displays 12.8℃)

※These are examples for positive logic (PNP).
※Clock: Max. 2kHz



⚠ Caution: The unit-display unit is available only for turning ON. Do not input data to the unit-display unit.

2) 8-bit Serial input (E.g.: Displays 25℃)



■ Unit-display Unit

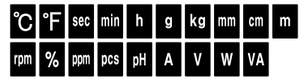
This unit is for displaying unit by inserting a name plate.
It has only 16, 22 sizes. (sold separately)

●Model

Size \ Color	Red	Green
16mm	DU16-R	DU16-G
22mm	DU22-R	DU22-G

1) Unit name plate type

It provides unit-printed name plates as an accessory. You can select the desired unit name plate and insert this plate. (Single-stage unit name plate: 19 types, Dual-stage unit name plate: 2 types)

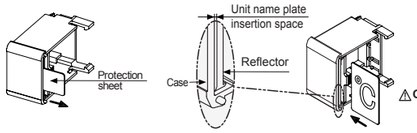


Single-stage unit name plate

Dual-stage unit name plate

2) Unit name plate insertion

Remove the protection sheet and insert the unit name plate at between the case and the reflector.



⚠**Caution: Be sure about the correct insert direction.**

■ Cautions During Use

1. This unit must be mounted on the Panel.
2. This is non-insulated product. Use insulated power for power supply.
3. Input signal line
   ①Shorten the cable distance between the external device and this product.
   ②Use shield cable when input wiring is long.
   ③Wire the input signal line separately from the power line.
4. Dielectric or insulation resistance test when this unit is installed in the control panel.
   ①Separate the unit from the control panel.
   ②Short circuit all terminals of the unit.
5. Do not use this unit at below places.
   ①Place where there are severe vibration or impact.
   ②Place where strong alkalis or acids are used.
   ③Place where there are direct ray of the sun.
   ④Place where strong magnetic field or electric noise are generated.
6. Installation environment
   ①It shall be used indoor ②Altitude max. 2,000m
   ③Pollution degree 2 ④Installation category I

※**Failure to follow these instructions may result in product damage.**

■ Major Products

■ Photoelectric Sensors
■ Fiber Optic Sensors
■ Door Sensors
■ Door Side Sensors
■ Area Sensors
■ Proximity Sensors
■ Pressure Sensors
■ Rotary Encoders
■ Connector/Sockets
■ Switching Mode Power Supplies
■ Control Switches/Lamps/Buzzers
■ I/O Terminal Blocks & Cables
■ Stepper Motors/Drivers/Motion Controllers
■ Graphic/Logic Panels
■ Field Network Devices
■ Laser Marking System (Fiber, Co_2, Nd:YAG)
■ Laser Welding/Cutting System
■ Temperature Controllers
■ Temperature/Humidity Transducers
■ SSRs/Power Controllers
■ Counters
■ Timers
■ Panel Meters
■ Tachometers/Pulse (Rate) Meters
■ Display Units
■ Sensor Controllers

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