

DG-4120

DIGITAL GAUGE COUNTER

INSTRUCTION MANUAL

4. BCD OUT

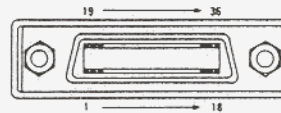
4-1 Explanation of BCD OUT connector

The BCD OUT connector on the rear panel is used to connect the BCD output, polarity output, decimal point output, error output, hold input, reset input, BUSY input and print command output signals to the equipment.

The pin arrangement of each signal is as shown below:

Pin No.	Signal	Pin No.	Signal
1	1×10^0	19	4×10^4
2	2×10^0	20	8×10^4
3	4×10^0	21	N.C
4	8×10^0	22	N.C
5	1×10^1	23	N.C
6	2×10^1	24	N.C
7	4×10^1	25	Polarity output (+)
8	8×10^1	26	Polarity output (-)
9	1×10^2	27	D.P 3 decimal point output
10	2×10^2	28	D.P 4 decimal point output
11	4×10^2	29	N.C
12	8×10^2	30	Error output
13	1×10^3	31	Hold input
14	2×10^3	32	Reset input
15	4×10^3	33	BUSY input
16	8×10^3	34	N.C.
17	1×10^4	35	Print command output
18	2×10^4	36	Common

Pin arrangement



Receptacle : DX10A-36S

Applicable plug : DX40-36P

Die-cast cover : DX36-CV1

Applicable cable:

Conductor size; AWG#30

Conductor composition; 7/0.1

Insulator O.D.; $\phi 0.5$

Cable UL style; UL20276/UL2789

4-2 Explanation of Signals

① BCD output

Pins 1 to 20

Positive/negative logic switching, 5-digit parallel output

Open collector output

② Polarity output

Pin 25 (+ output) and pin 26 (- output)

Open collector output

● When negative logic is selected with bit switch 3 set to ON:

If measured value is positive (+);

pin 25 (+ output): ON, pin 26 (- output): OFF

If measured value is negative (-);

pin 25 (+ output): OFF, pin 26 (- output): ON

If reset;

pin 25 (+ output): ON, pin 26 (- output): OFF

* If positive logic is selected by setting bit switch 3 to OFF, the ON and OFF status of output are all reversed.

③ Decimal point output

Pin 27 (when D.P 3 and minimum measuring unit of $10 \mu\text{m}$ are selected),

Pin 28 (when D.P 4 and minimum measuring unit of $1 \mu\text{m}$ are selected)

Open collector output

- When negative logic is selected by setting bit switch 3 to ON:

If $1\ \mu\text{m}$ is selected by setting bit switch 1 to ON:

Pin 27 (D.P 3): OFF, pin 28 (D.P 4): ON

If $10\ \mu\text{m}$ is selected by setting bit switch 1 to OFF:

Pin 27 (D.P 3): ON, pin 28 (D.P 4): OFF

* If positive logic is selected by setting bit switch 3 to OFF, the ON and OFF status of output are all reversed.

④ Error output

Pin 30

Open collector output

If error counting occurs in the counter circuit of this equipment, ON signal will be issued. This ON signal will continue until it is reset.

⑤ Print command output

Pin 35

Open collector output

If hold signal or BUSY signal is entered and the displayed value and BCD output turn into hold state, the print command signal will be issued as a negative pulse.

⑥ Hold Input

Pin 31

If Lo level voltage signal is entered, the displayed value and BCD output data are set in the hold status, and the print command signal is issued. This signal maintains the hold status during the period of Lo level. However, the counter circuit is carrying out the counting operation in response to the input signal sent from the gauge sensor. Accordingly, if the hold status is canceled, the displayed value and BCD output data will be changed to the values obtained at that moment of cancellation.

⑦ Reset Input

Pin 32

If Lo level voltage signal is entered, the displayed value and BCD output data, and error indication and error output are reset. The reset status will continue as long as this signal remains at Lo level.

⑧ BUSY Input

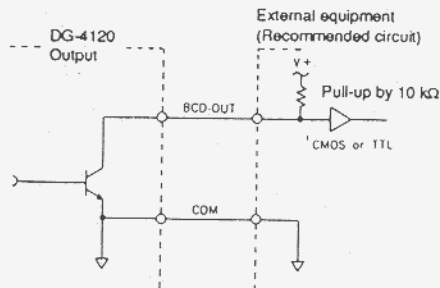
Pin 33

The same status as that of hold input

4-3 Recommended Interface

① BCD output, polarity output, decimal point output, error output, print command output

The recommended interface circuit is shown below:

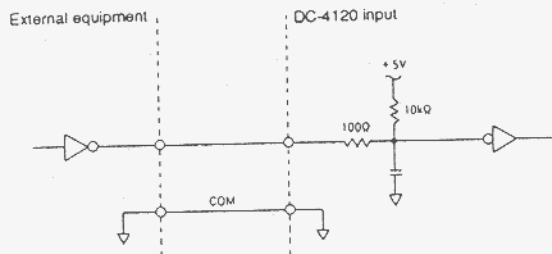


Output format	Open collector output
Output IC	74LS07
Withstand voltage	30 V max*
Maximum sink current	40 mA max
Residual voltage	0.5 V max

* To improve the reliability, use of a power supply system with +24 V or lower voltage is recommended.

② Hold input, reset input, and BUSY input

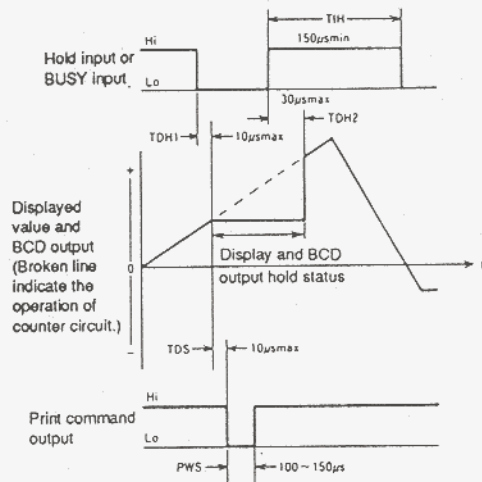
The recommended interface circuit is shown below:



Lo level input voltage	0 to 1.4 V
Hi level input voltage	3 to 5.25 V
Input impedance	1 k Ω min

4-4 Timing Chart

① Timing chart for hold input, BUSY input and print command output



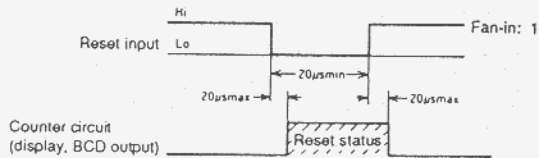
- TDH1** Time interval between input of hold signal and actual holding of display value and BCD output data. The maximum length is 10 μ s.
- TDH2** Time interval between cancellation of hold signal and actual cancellation of hold status. The maximum length is 30 μ s.
- TDS** Time interval between holding of the display value and BCD output data and output of print command signal. The maximum length is 10 μ s.

PWS Pulse width of print command signal. It is 100 to 150 μs .

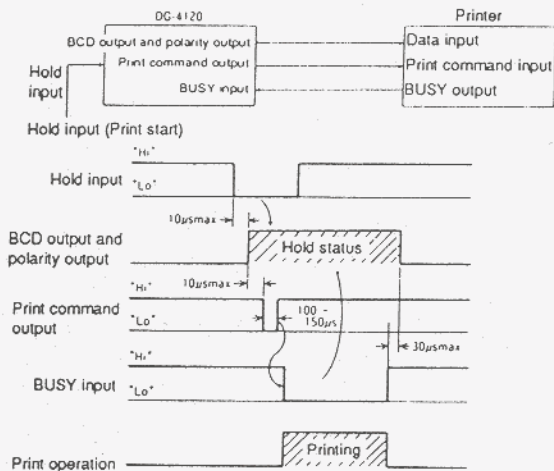
TIH Time interval between cancellation of hold signal and re-inputting of the hold signal. The minimum length is 150 μs . If hold signal is entered in shorter interval, print command signal may not be issued.

② Reset input timing chart

The reset input signal must have a pulse width of minimum 20 μs . The time interval between input of reset signal and actual creation of reset status, or the interval between cancellation of reset signal and actual cancellation of reset status must be maximum 20 μs .



③ Printer command output timing chart



In the diagram shown above, the printer is started at the leading edge of the print command pulse signal. The hold input must be maintained at Lo level until the BUSY input turns Lo.

5. SPECIFICATIONS

Applicable Gauge Sensors

Model	Measuring range	Resolution	Model	Measuring range	Resolution
AS-1012	10 mm	1 μ m	GS-112	10 mm	1 μ m
AS-1012L	10 mm	1 μ m	GS-251	25 mm	10 μ m
AS-2012	10 mm	1 μ m	GS-332	30 mm	1 μ m
BS-102	10 mm	10 μ m	GS-503	50 mm	10 μ m
BS-112	10 mm	1 μ m	GS-551	5 mm	1 μ m
GS-001	100 mm	10 μ m	GS-5011	50 mm	1 μ m
GS-102	10 mm	10 μ m			

Counter Signal Input Section

Type of Amplification: 2-channel waveform shaping

Signal waveform : Square wave and 90° phase difference signal

Input impedance : 47 k Ω , min

Input level : Lo; 0 to 1.4 V
Hi; 3 to 5.25 V

Frequency range : DC to 75 KHz

Input plug receptacle : R03-R6F (Manufactured by Tajimi-Radio)

Pin number and signal assignment are shown below.

Pin No.	A	B	C	D	E	F
Signal	SIG1	SIG2	+5V	---	COM	---

Count Display Section

Counting system : Reversible counting

No. of counter digits: Decimal 5 digits

No. of display digits : One digit for polarity and five digits for numerals

Display range : 0.000 to ± 99.999

0.00 to ± 999.99

Minimum measuring unit: 1 μ m/10 μ m

Zero suppression : Digits at left of 1 mm digit are zero-suppressed.

Display section : 7-segment red LED

Character height : 10.16 mm

BCD output section

Input plug receptacle: DX10-36S (Manufactured by Hirose)

- ① BCD output : Positive or negative logic, parallel, open collector output in five digits
- ② Polarity output : Positive or negative logic, open collector output
- ③ Decimal point output:
Positive or negative logic, open collector output
- ④ Error output : If counting error occurs in the counter circuit of this equipment, ON signal is issued as an open collector output.
- ⑤ Print command output:
When the display value and BCD output data are set in the hold status by the input of hold signal or BUSY signal, a negative pulse, print command signal is issued as open collector output.

Common to ① to ⑤

Output form	Open collector output
Output IC	74LS07
Withstanding voltage	30 V max*
Excessive sink current	40 mA max
Residual voltage	0.5 V max

* To improve the reliability, use of a power supply system with +24 V or lower voltage is recommended.

- ⑥ Hold input : When Lo level voltage signal is fed, the display value and BCD output data are set in the hold status. The hold status continues as long as this signal remains at Lo level.

- ⑦ Reset input : When Lo level voltage signal is fed, the display value and BCD output data and error indication and error output are reset. The reset status continues as long as this signal remains at Lo level.
- ⑧ BUSY input : When Lo level voltage signal is fed, the display value and BCD output data are set in the hold status. The hold status continues as long as this signal remains at Lo level.

Common to ④ to ⑧

Lo level input voltage	0 to 1.4 V
Hi level input voltage	3 to 5.25 V
Input impedance	1 kΩ min

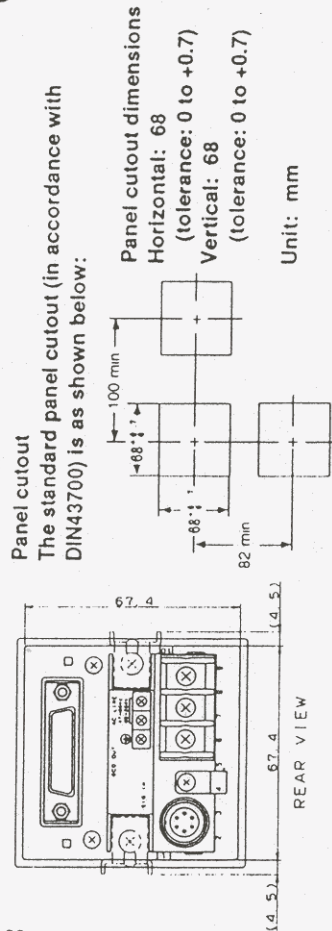
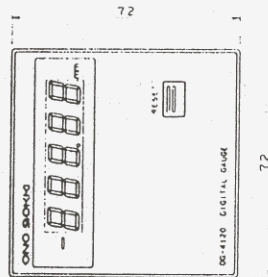
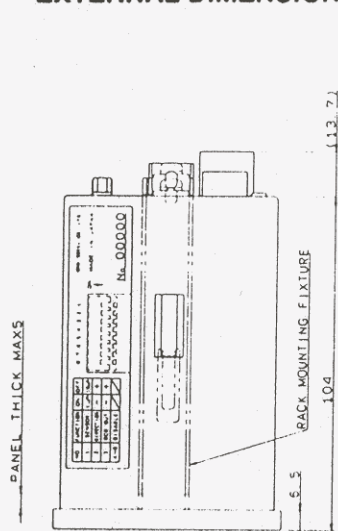
Power supply section

- Source voltage : 90 to 264 VAC, 50/60 Hz
- Power consumption : Approx. 7 VA (at 100 V AC)
- Withstanding voltage: 1500 V AC/one minute
- Insulation resistance : 10 MΩ or higher when measured with 500 V DC megger

Others

- Operating temperature range: 0 to 40°C
- Storage temperature range : -10 to 55°C
- External dimensions : 72 (W) × 114 (L) × 72 (H) mm
- Weight : 370 g
- Accessories : Instruction manual
Panel fixtures
- Option : BCD output cable
AA-8005: for RQ-381 printer (3 m)
AA-8006: for DA-108 D/A converter (3 m)
AA-8007: One-end open type (5 m)

EXTERNAL DIMENSIONS



Panel cutout
The standard panel cutout (in accordance with DIN43700) is as shown below:

Panel cutout dimensions
Horizontal: 68
(tolerance: 0 to +0.7)
Vertical: 68
(tolerance: 0 to +0.7)

Unit: mm