Digital Indicator

Model : DLS-5033A

Revised. 2010-04-24

RoHS Compliant

§ 1. Outline

This instrument is a level monitor specifically designed for strain gauge trasnducers, ideal for load weight managament and control in platform scales, cranes, elevators, and similar equipment.

It is equipped wiht a five-point comparator function, and setting values can be easily changed using key operations. As an option, you can also select an isolated analog or current loop serial output signal that supports display via D/A concersion.

The power supply uses DC 24V (DC 20V to 27V) and an intergrated isolated DC/DC conerter isolated the power supply from the internal circuitry.

These specifications applies from program version P2.00.

§ 2. Specification

2－1. Analog and A/D conversion section

1). Input sensitivity	0.5 μ V/D or more (D : minimum) At 1.0mV/V input. Display resolution : Max. 1/9,999 At 0.5mV/V input. Display resolution : Max. 1/5,000	
2). Non-linearity	±0.03% FS ±1 count	
3). Temperature Characteristic Zero point : Sensitivity :	 ±0.005% FS/℃ (at input sensitivity : 1.0mV/V) ±0.005% Reading /℃	
4). Frequency response	Approx.1 Hz (-3db) Digital filter function settings : DF=8, AV=4	△1
5). Settling time (Response)	Approx.1 second (Factory settlings : DF=8, AV=4)	△1
6). Transducer power supply	DC 5V±5%, 60mA (Can be connected four 350Ω transducers)	

2－2. Display section

1). Measurement value display

Display element :	7 segment, 4 digit LED, Red, Character height = 8mm
Display range :	± 9999 (Zero suppression display)
Decimal point :	Can be set from 4 types (Non, 0.0, 0.00, 0.000)
Over display :	All digits flash If the signal is below - 3.3mV/V or above 3.3mV/V, or if the display value exceeds four digits, an over display will be displayed.
Unit :	kg. others are based on the attached unit sticker Type : (kg, g, t, N, kN, N•m, kN•m, kPa, mm, %)
Sampling period :	60msec. (16.7 times/sec)

2). Operation display

Display element :	LED, Red, 6 seg.
Display content :	SP (Set Point) 1, SP2, SP3, SP4, SP5, AZ (Auto Zero)

2－3. Zero Point / Sensitivity Adjustment

1). Zero Point Adjustment	Adjustable within the input signal range of -2.8 ～ +2.8mV/V (by key operation)
2). Sensitivity Adjustment	Adjustable span from -2.8 to +2.8mV/V (by key operation)
	※. The sum of initial tare value (zero point input value) and the maximum value (span amount)must not exceed ±3.3mV/V.
3). Calibration Method	Actual load calibration or quivalent input calibration

2－4. I/O section

1). Operation Switch : Pen touch 5 key : ITEM, NEXT (AZ), UP (AZ.R), ESC, ENTRY

2). Control Ouput :

- Open-collector negative logic output, 5 bits, 1 common
- Photocoupler isolation, NPN transistor
- Emitter-collector ON during signal output
- Rating : 30V DC, 30mA (resistive load)
- Emitter-collector saturation voltage : 1.2V or less (equivalent to Tohiba TLP127)

3). 4 ～ 20mA analog output (Option : OP-1)

①	Ouput signal	・D/A output linked to the displayed value (isolated output) 4～20mA/ 0 ～ FS (load resistance : 0 ～ 510Ω)
②	Ouput range	・3.2mA ～ 20.8 mA (Output Guaranteed Range)
③	Resolution	・Linked to display resokution
④	Nonlinearity	・±0.1% FS (of the displayed value)
⑤	Temperature Characteristic	・Zero point and sensitivity ±0.02 % FS/℃

4). 0 ～ 10V analog output (Option : OP-5)

①	Ouput signal	・Unipolar D/A output linked to the displayed value (isolated output) 0 ～10V / 0 ～ FS (load resistance : 5kΩ or greater)
②	Ouput range	・0.5V ～ 10.5V (Output Guaranteed Range)
③	Resolution	・Linked to display resolution
④	Nonlinearity	・±0.1% FS (of the displayed value)
⑤	Temperature Characteristic	・Zero point and sensitivity ±0.02 % FS/℃

5). Current loop serial output (Option : OP-4)

Interface standard :	Current loop serial (I/F dedicated to connecting to our external devices)
Connected devices :	CV-3010 (BCD converter), ED-3020, 3021 (large display), EP-3030 (printer)

As of 2009, January

2－5. Each function specification

1). Auto Zero Function (AZ) △2

Pressing the [AZ] key for one second resets the current weight reading to zero and displays the subsequent increase or decrease as the net weight value. The [AZ] LED lights up when this function is active.
Pressing the [AZ.R] key for one second deactivates the function.

2). Preset Tare (Fixed tare) Function

By keying in preset tare value, the displayed value will always be the tare value subtracted from the weighing value. The setting range is - 9999 ～ 9999.
(When zero point calibration and span calibration are performed, the tare value is cleared to 0)

3). Scale Division Function (S.DIV)

The minimum scale (display increments) for weighing values can be set using key operation. Can be set to 1, 2, 5, or 10 within the display resokution. (Default = 1)

4). Digital Filter Function (DF) △1

Reduces the impact of vibrations and other factors on weight values.
The strength of the changes depending on the DF setting.
There are 10 levels to choose from 1 (fast response but lacks stability) to 10 (slow response but stable.)
(Default : DF = 8)

5). Moving Average Function (AF) △1

Performs a moving average calculation of the weighing value for the AV setting number of times.
・Averaging settings : OFF, 2, 4, 6, 8, 16, 24, 32 times.
(Fctory settings / DF = 8, AV = 4 : Frequency characterestic / fc ≒ 1 Hz. Settling time ≒ 1 sec.)

6). Key Lock Function

Key operations can be locked to prevent settings from being changed accidentally.

If you press and hold the [ESC]key for 2 seconds while the unit is operating, the keys will be locked.

While the keys are locked, press and hold the [ESC] for 2 seconds to unlock the keys.

If any key is pressed while the keys are locked, LOC (short for LOCK) will be displayed for approximately 2 seconds, and key operation will be ignored. (Only the the [ESC] key can be unlocked by holding it down for 2 seconds)

7).CalLock (Span calibration lock) Function

To prevent accidental changes to sensitivity settings, you can disable changes to the sensitivity settings, the senstivity (span) setting only using key operations.
(Zeo point recalibration is possible even when locked.)

8).Comparator Function (SP1～5)

The comparator function comparates the displayed value and outputs five open collector signals.

・Quantitative setting values (SP1～SP 5)	- 9999 ～ 9999 (Key operation setting)
・Hysteresis Width Setting Value :	0～99：Default = 0 (Common set point 1～ 5)
・Comparison Data :	Displayed Value
・Comparison Mode :	Select from the following two modes of output ON (ON between O /C C～E) conditon.

① Upper limit operation Weighted value ≧ Quantitative setting value (Default value)

② Lowr limit operation Weighted value ≦ Quantitative setting value

Comparison operation : Performs every sampling (60ms)
Initial setting : SP1～SP5： + 9999 each.

9). Analog output scaling function (enabled when the analog option is selected)

Scaling settings : The display value corresponding to the analog output full scale FS (20mA or 10V) can be set by using key operations. They display value corresonding to the analog output zero point (4mA or 0V) can also be set.

10). Equivalent input calibration function

Calibration can be performed by key setting without applying actual load.

- Zero point settings : −2.8000～2.8000 [mV/V]
- Span amount settings : −3.0000～3.0000 [mV/V]
- Span weight settings : −9999～9999
- Calibration accuracy : ±0.2% FS (span 1mV/V and same cable length)

2－6. General

1) Power Outage Countermeasures (Memory backup)
- Each setting data is written to non-volatile memory (up to 1 million times)

2) Power Supply Voltage - DC 20～27V

3) Current Consumption - 0.5A type

4) Operating Temperature / Humidity Range - (-10～ + 40℃, 20 ～ 85%, No condensation)

5) Installation Method - Wall mount type (fixed using the main body 2-Φ4.5)

6) Unit weight - Approx. 1kg

§ 3. Model List, Accessories

3－1. Model

- Option installation is only possible at our factory (Factory installed option)

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Option
- Non : No option
- 1 : Current output (4 ～ 20mA)
- 4 : Current loop serial output
- 5 : Voltage output (0～10V unipolare output)

3－2. Accessories

1) Operation manual 1 set

2) Unit seal 1pc

§ 4 . Treminal Layout

1) Main unit terminal block

7.62mm pitch 2-tier terminal block

No.	Connenction signal	
1.	EXC+	Loade Cell Excited voltage (+)
2.	EXC−	Loade Cell Excited voltage (−)
3.	SIG+	Loade Cell Signal Input (+)
4.	SIG−	Loade Cell Signal Input (−)
5.	Shield	Loade Cell Shield
6.	E(F.G)	Ground
7.	DC24V	Power supply (+24V)
8.	0V	Power supply (0V)
9.	SP1	SP1 Collector output
10.	SP2	SP2 〃
11.	SP3	SP3 〃
12.	SP4	SP4 〃
13.	SP5	SP5 〃
14.	COM−E	Common Emitter
15.	OUT+	Option output (+)
16.	OUT−	Option output (−)

Standard crimp terminal : M3 crimp terminal up to 6mm wide.

In the case of OP-4
(current loop serial)
No. 15 ard No. 16 are non solar.

2) . Wiring precaution

① The shield of the optional output cable must be grounded to either this instrument or the connected measuring device.

② The cable wiring colors of load cells (transducers)vary depending on the manufacturer, so please check wiring colors on the test report that comes with the load cell.

§ 5 . External Dimensions