

EB Counter

Display Unit for Linear Gage System



**5-step tolerance/
7-channel limit
setting**

EB Counter

Display unit with multiple limits setting functions for Linear Gage system

542-092: EB-11P

for LGB, LGE, LGF and 100mm LG



542-094: EB-11Z

for LGF With scale reference point



542-093: EB-11D

for LGD and LGS



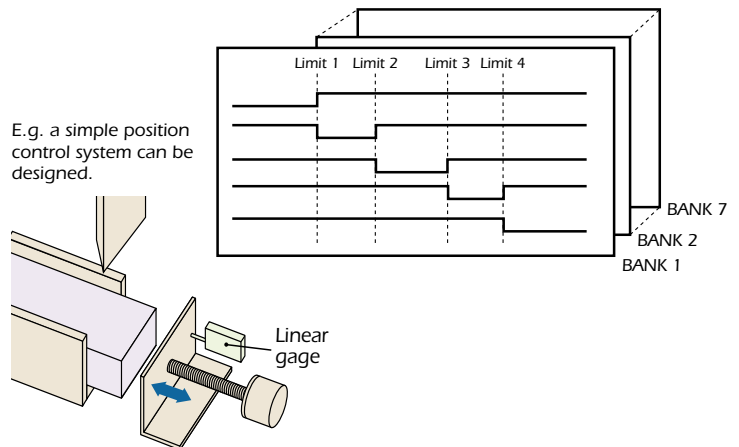
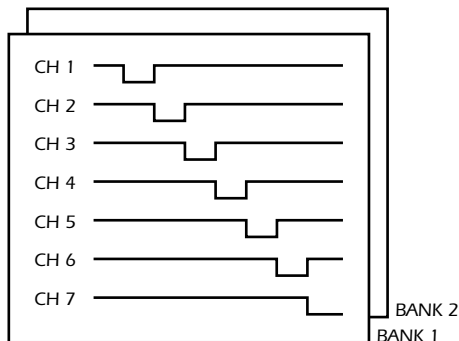
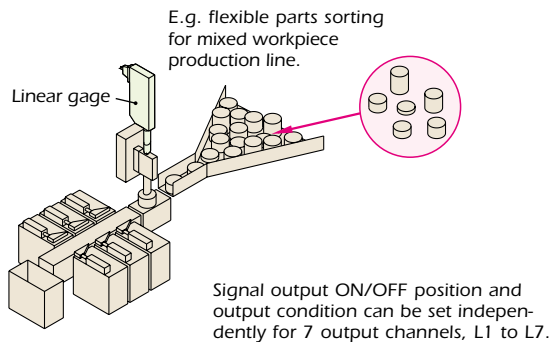
Features

- 3-/5-step x 7-bank tolerance judgement or 7-channel x 2-bank limit setting.
- Standard serial BCD signal output for simple wiring with a PC, programmable controller, etc..
- Simple analog signal output for a dynamic measurement.
- DIN compatible (96x48mm/3.86"x1.89") and Panel-mounting compact body design.
- Choice of three models for various gage inputs.

POWERFUL TOLERANCE JUDGEMENT FUNCTIONS

7-channel x 2-bank tolerance limit memory, switchable by the counter key operation or external signal input expands the application range of limit signal.

3-/5-step x 7-bank tolerance limit memory, switchable by the counter key operation or external signal input expands the application range of limit signal.



3-step tolerance setting

	GO/NG indicator	Output
$M < S1$	orange	L1
$S1 \leq M \leq S4$	green	L3
$S4 < M$	red	L5

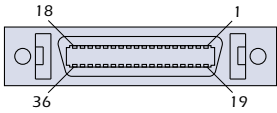
M: Measured value S: Limit value
●: LED lights * : LED flashes

5-step tolerance setting

	GO/NG indicator	Output
$M < S1$	orange	L1
$S1 \leq M < S2$	* orange	L2
$S2 \leq M \leq S3$	green	L3
$S3 < M \leq S4$	* red	L4
$S4 < M$	red	L5

Counter Output Specifications (I/O Output)

1 Pin assignments



Receptacle used
(10236-52A2 by 3M or equivalent)

Pin	I/O	Signal	Function
1, 2		COM	Internally connected to GND
3	O	L1	Tolerance output:
4	O	L2	The relevant output terminal becomes L.
5	O	L3	
6	O	L4	At error display:
7	O	L5	"L1=L5=L" (3/5-step tolerance limits)
8	O	L6	"L1 to L7=H" (independent settings)
9	O	L7	
10	O	NOM	Normal output, Output in the normal mode=L
21	O	BCD_CK	BCD output signal
22	O	BCD_ST	
23	O	BCD_DT	
24	O	ANALG	Analog output
25	O	ANGND	Analog GND
26		AREG	Analog range switching determination: Composite with SET
27	I	SET1	BANK, peak, analog range set
28	I	SET2	The set value is input beforehand by SET and determined by AREG, MODE, and BANK.
29	I	SET3	
30	I	MODE	Peak switching determination: Composite with SET
31		NC	(Not connected)
32	I	BANK	BANK switching determination: Composite with SET
33		NC	(Not connected)
34	I	HOLD	HOLD/error cancel input
35	I	P.SET	Normal measurement mode: Presetting Peak measurement mode: Peak clear
36		NC	(Not connected)

All input signal is a negative-ture logic.

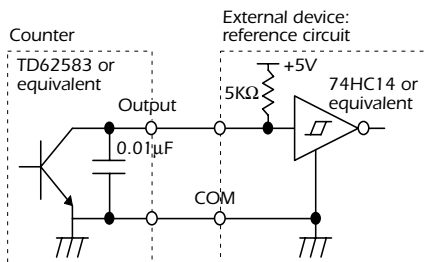
2 Applicable plugs/covers:

10136-3000VE (plug, 3M)
10336-52A0-008 (cover, 3M)
DX40M-36P (plug, HIROSE)
DX30M-36-CV (cover, HIROSE)

02ADB440 (plug with cover) is available as an optional accessory.

3 Output circuit

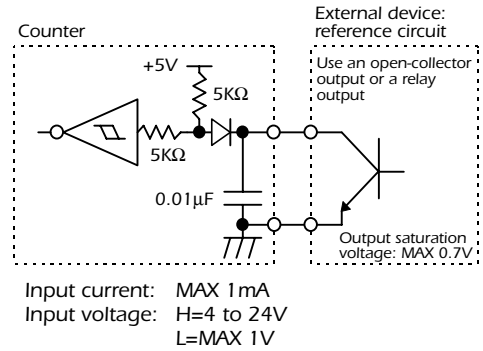
Operation: The transistor turns "ON" when an input is "L".
(Open corrector)



Output withstand voltage: MAX 24V
Output current: MAX 10mA
Output saturation voltage: MAX 0.7V

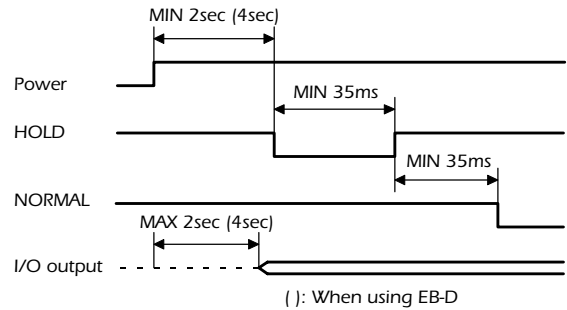
4 Input circuit

Operation: An input becomes valid when it is "L".

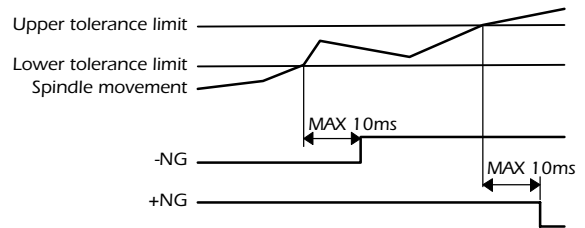


5 Timing chart

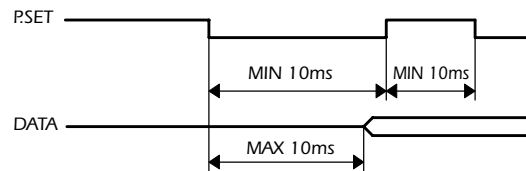
Power-on characteristic



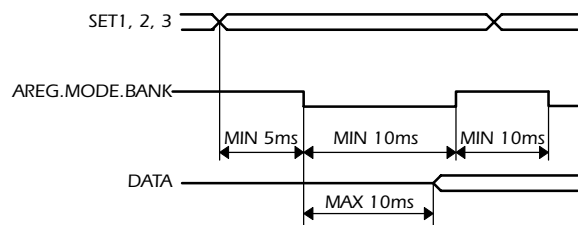
Tolerance output



External preset/peak clear

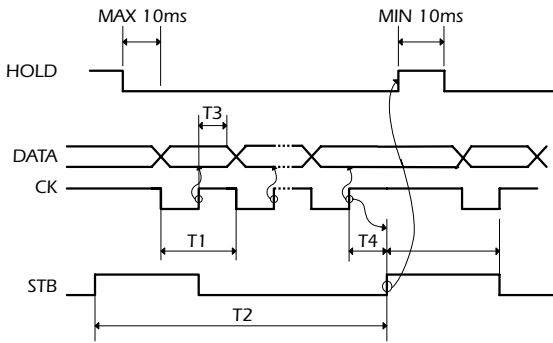


Peak mode/bank/analog range specifications



Counter Output Specifications (I/O Output)

6 Serial BCD output timing chart



$$38 \times T1 \leq T2 \leq 39 \times T1$$

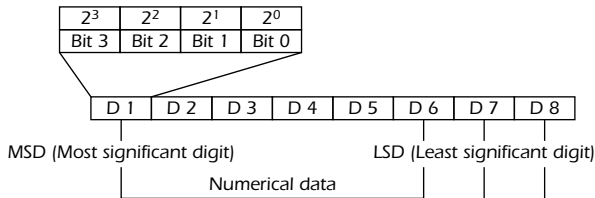
$$T3 \approx 0.5 \times T1$$

$$T4 \approx 0.5 \times T1$$

	T1	Total time
0	1.6ms*	62.4ms
1	3.2ms*	12.8ms
2	8ms	312ms
3	18ms	702ms
4	28ms	1092ms

*Requires a gage with less than 1ms

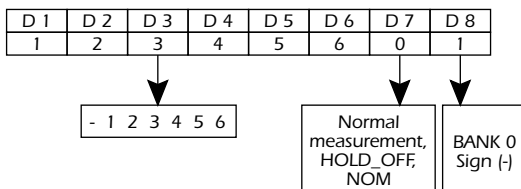
7 Serial BCD output data format



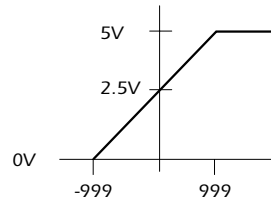
	Bit 2	Bit 1	Bit 0	Bit 0
	MODE 2	MODE 1	HOLD	ERR
Current value	0	0		
MAX	0	1		
MIN	1	0		
TIR	1	1		
			0: OFF 1: ON	
				0: NOM 1: ERR

	Bit 2	Bit 1	Bit 0	Bit 0
	BANK 3	BANK 2	BANK 1	Sign
BANK 0	0	0	0	
BANK 1	0	0	1	
BANK 2	0	1	0	
BANK 3	0	1	1	
BANK 4	1	0	0	
BANK 5	1	0	1	
BANK 6	1	1	0	
BANK 7	1	1	1	
				0: + 1: -

Data output example



8 Analog signal output

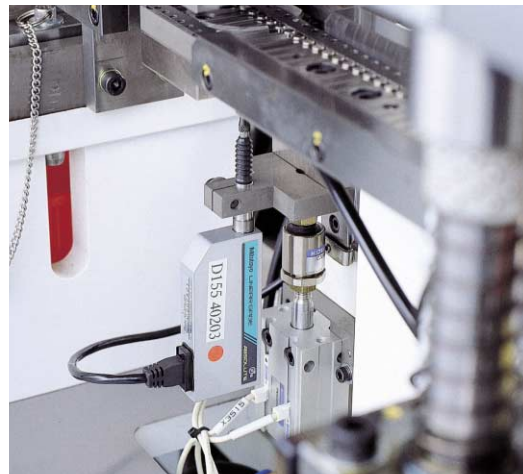
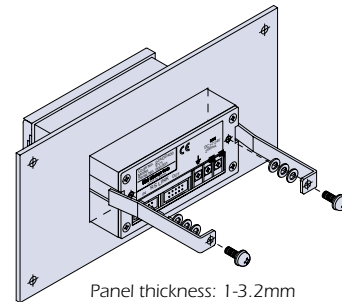


Output voltage:
 $2.5V + [\text{count value} \times \text{voltage resolution (25mV or 2.5mV)}]$
 *Full scale: 0V to 5V
 Response speed:
 10Hz (update time 5ms)
 Accuracy:
 $\pm 5\%$ (0V to 5V)
 $\pm 0.5\%$ ($2.5V \pm 200mV$, after offset adjustment)
 *The accuracy is indicated with respect to full scale 5V.
 Load resistance:
 300k Ω or more

SET1	SET2	SET3	Measuring range/Resolution (mm)		Voltage resolution
			10 μ m gage	5 μ m gage	
0	0	0	$\pm 0.99/0.01$	$\pm 0.095/0.005$	25mV
0	0	1	$\pm 9.99/0.01$	$\pm 0.995/0.005$	2.5mV
0	1	0	$\pm 99.90/0.1$	$\pm 9.950/0.05$	2.5mV
0	1	1	$\pm 999.00/1$	$\pm 99.500/0.5$	2.5mV
1	0	0	$\pm 9990.00/10$	$\pm 995.000/5$	2.5mV

SET1	SET2	SET3	Measuring range/Resolution (mm)		Voltage resolution
			1 μ m gage	0.5 μ m gage	
0	0	0	$\pm 0.099/0.001$	$\pm 0.0095/0.0005$	25mV
0	0	1	$\pm 0.999/0.001$	$\pm 0.0995/0.0005$	2.5mV
0	1	0	$\pm 9.990/0.01$	$\pm 0.9950/0.005$	2.5mV
0	1	1	$\pm 99.900/0.1$	$\pm 9.9500/0.05$	2.5mV
1	0	0	$\pm 999.000/1$	$\pm 99.5000/0.5$	2.5mV

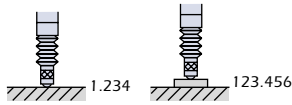
Panel Mounting



Available Functions

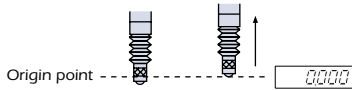
▪ Preset

Presets the displayed value at any value. Counting begins at the preset value.



▪ Scale reference point (EB-11Z only)

Sets the displayed value to 0 at scale reference point of the gage.

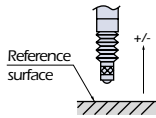


▪ Inch/mm switch

Selects mm or inch as the unit of display, and enables the automatic conversion of displayed values according to the selected unit.

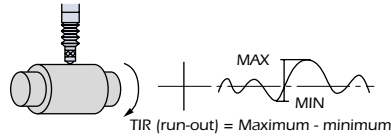
▪ Direction switch

Selects the counting direction of (+) or (-), whichever is convenient with a given direction of spindle movement.



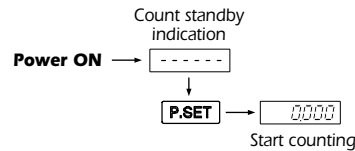
▪ Measurement mode switch

Allows switching to the measurement mode for maximum value, minimum value, and run out value (maximum - minimum), in addition to the normal measurement mode.



▪ Count standby display

Prevents a miss operation at momentary power interruption



▪ Key protect

Ignores the key operation of the EB counter and external 10-key unit to prevent an accidental key entry.

▪ Error message

If an error occurs on the gage, the EB counter shows an error message and outputs an error signal from the I/O terminals.

▪ External input of limit values

External 10-key unit (optional) can be connected to the counter. It allows you to input parameter No. and figures easy.



▪ External control

Preset and display hold can be controlled from the I/O terminals.

▪ Serial BCD output

The displayed value can be output as one of I/O signal to a sequence, etc.

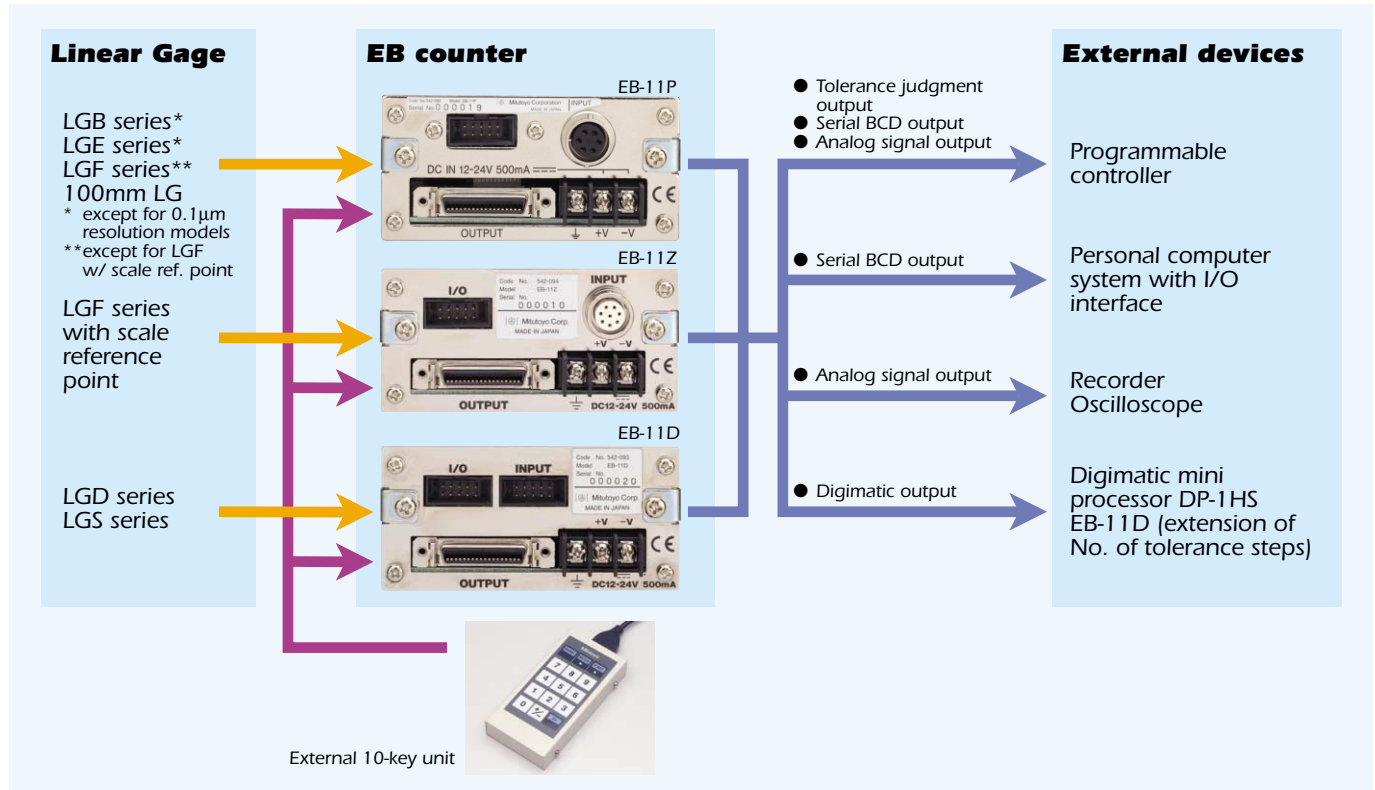
▪ Simplified analog output

The spindle displacement can be monitored with a pen recorder, oscilloscope, etc..

▪ Digimatic output

With Digimatic (SPC) output the data can be printed by Digimatic mini processor DP-1HS. The tolerance steps can be extended by connecting multiple EB-D counters with daisy chain.

System Configuration



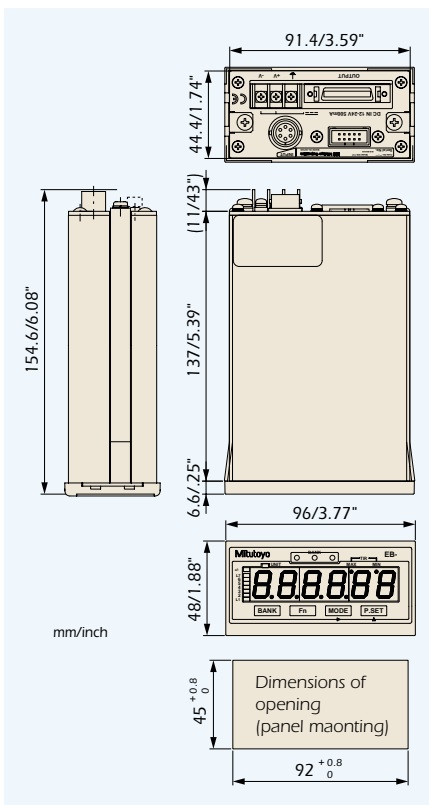
Specifications

Order No.	542-092	542-094	542-093
Model	EB-11P	EB-11Z	EB-11D
Applicable input	Differential square-wave	Differential square-wave	Digimatic code (SPC)
Applicable gage	LGB, LGE, LGF*, 100mm LG	LGF with scale reference point	LGD, LGS
Number of gage input	1	1	1
Resolution (count display range)	0.01mm (±999.99mm)/.0005" (±99.9995")		
	0.005mm (±999.995mm)/.00005" (±99.99995")		-----
	0.001mm (±999.999mm)/.00005" (±9.99995")		
	0.0005mm (±99.9995mm)/.000005" (±9.99995")		-----
	Selection with the parameter	Selection with the parameter	Auto-selection with gage connected
Display	6-digit and a negative (-) sign LED (green), Tolerance judgment indication LED (orange, green, red)		
Function	Presetting, 3/-5-step x 7-bank or 7-channel x 2-bank limit setting, GO/±NG judgement, GO/±NG signal output, MAX/MIN/TIR (runout) measurement, Counting direction switching, Scale reference point, mm/inch switching, Count standby display, Key protect		
Output	Tolerance judgment, Serial BCD output, Simplified analog output, Digimatic output		
External control	Preset, Data hold, Bank switching, Peak mode switching, Analog range selection		
Error display/output	Power-supply voltage error, overspeed error, overflow error, gage error, communication error, tolerance setting error		
Max. input frequency/count speed**	1.25MHz (2-phase square waveform)/5MHz		-----
Power supply/Power consumption	Via AC adapter (12V to 24V DC, 500mA (max.))/6VA		
Operating environment	0°C to 40°C (20%RH to 80%RH, without condensation)		
Mass	400g (.88lbs.)		
Standard accessory	Six washers for adjusting the mounting plate thickness		

* For LGF w/ scale reference point use 542-094

**Depending on the gage connected. The input frequency of the scale reference point signal (EB-11Z) is also restricted by the gage connected

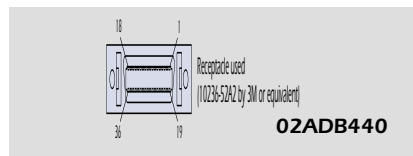
Dimensions



Optional Accessories

I/O output connector: 02ADB440

This receptacle fits the I/O output plug. Refer to the page for pin assignment.



AC adapter:

Connected to the power supply terminal. Use a 02ADD930 together with an AC adapter for the applicable line voltage.



Order No.	Description
02ADD930	Three-terminal section only
527428	for 100V AC
527428A	for 120V AC
527428CED	for 220V AC
527428CEE	for 240V AC

10-key unit: 02ADF180

Used to simplify the tolerance limit and preset value setting.



SPC cable:

Used to output the measured data from counter to various Digimatic mini processors DP-1 HS.



Order No.	Description
02ADD950	0.5m/20"
936937	1m/40"
965014	2m/80"

Specifications are subject to change without notice.

Mitutoyo

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