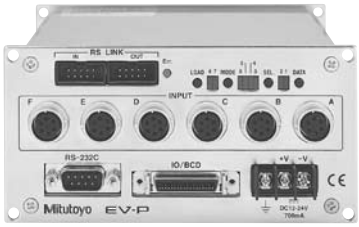
Display Units

EV Counter

DIN size (144 x 72mm) assembly-type unit for multi-gage systems

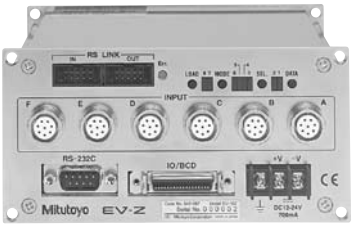
FEATURES

- Able to connect up to 10 EV counters to one personal computer using the RS link function to facilitate the configuration of a multi-point measurement system comprising a maximum of 60 gages.
- A range of output modes to choose from; I/O output for tolerance judgment and segment output, BCD data output and RS-232 output are available.



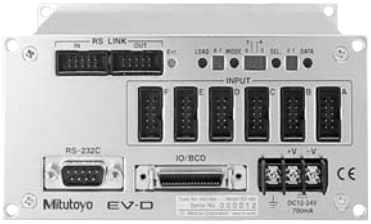
For differential square-wave output gage heads (6 axes)

542-063



For differential square-wave output gage heads with Origin Point Mark (6 axes)

542-067

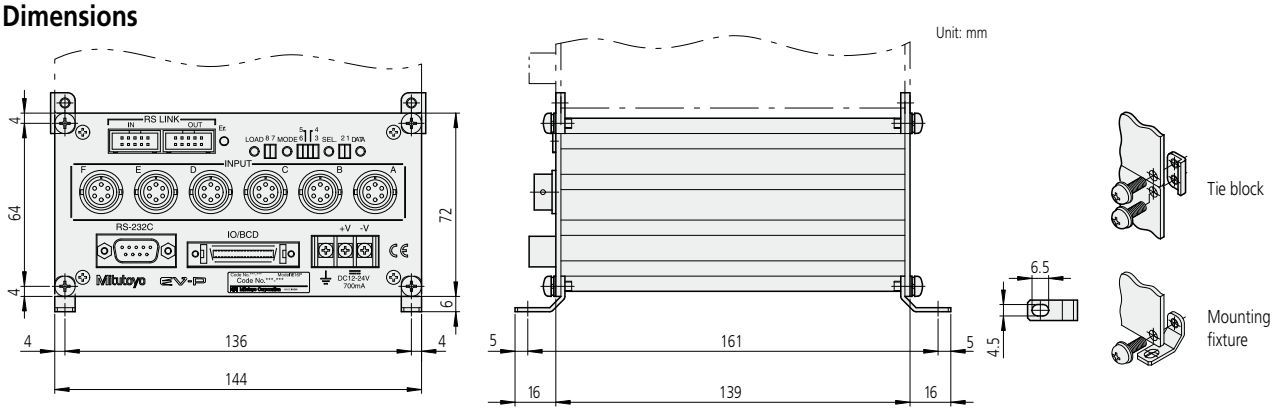


For Digimatic code output gage heads (6 axes)

542-064

Dimensions

Unit: mm



SPECIFICATIONS

Order No.		542-063	542-067	542-064
Model No.		EV-16P	EV-16Z	EV-16D
Number of gage inputs		6		
Maximum input frequency		1.25MHz (differential square-wave): Max counting Speed: 5MHz		Depends on the gage head connected
Resolution		0.0005mm, 0.001mm, 0.005mm, 0.01mm		Depends on the gage head connected
LED indication		Parameter indication: 8, Error indication: 1		
Error indication		Overspeed, gage error		
Available external display		D-EV display unit (optional)		
No. of input switches		4		
Input switch functions		Measurement mode switching, parameter setting		
Interface	RS-232C	Measurement data and control signal, Conform to EIA RS-232C standard, Home position: DTE (Data Terminal Equipment), use a cross-type cable.		
	RS Link	Max. No. of connectable counters: 10 (6: EH counter is mixed.), Max. total length of RS link cable: 10m, Data transfer time: 1sec/60CH at 19200bps		
Input / output	Tolerance judgment	1 to 6-axis (L1, L2, L3), open-collector		
	BCD output	BCD parallel output (positive logic / negative logic), open-collector		
	Segment output	Turns ON the output terminal corresponding to the measurement value, open-collector		
	Control output	Normal operation signal (NORMAL), open-collector		
	Control input	Output channel designation (segment, BCD output modes), preset, peak value clear, range switching (segment output mode), data hold, open-collector or no-voltage contact signal (with/without contact point)		
Power supply		Terminal block (M3 screws), DC +12 to +24V, 700mA (max.)		
Power consumption		8.4W or less		
Operating temperature		0°C to 40°C (20%RH to 80%RH, without condensation)		
Dimensions		W144 x H72 x D156.7mm		
Standard accessories		Mounting fixture (4 pcs.), tie block (4 pcs.9, screw M4 x 12 (8 pcs.)		
Optional accessories		**02ADB440:** Output plug with cover, **02ADD400:** D-EV display unit, **02ADD950:** RS Link / SPC connecting cable (0.5m), **936937:** RS Link / SPC connecting cable (1m), **965014:** RS Link / SPC connecting cable (2m), **02ADD930:** Terminal connecting cable, **02ADN460:** AC adaptor, AC adaptor connecting cable		
Compatible gage head		LGK, LGB (ex. 0.0001mm resolution), LGF	LGF with origin point mark	LGD, LGS
Mass (main unit only)		910g		830g

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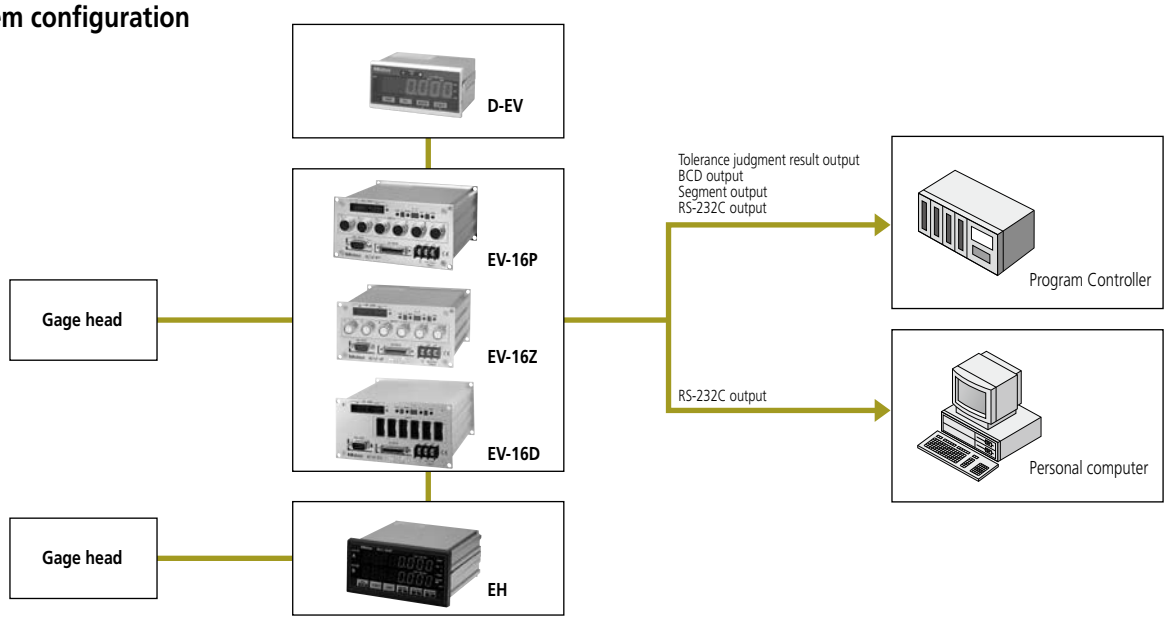
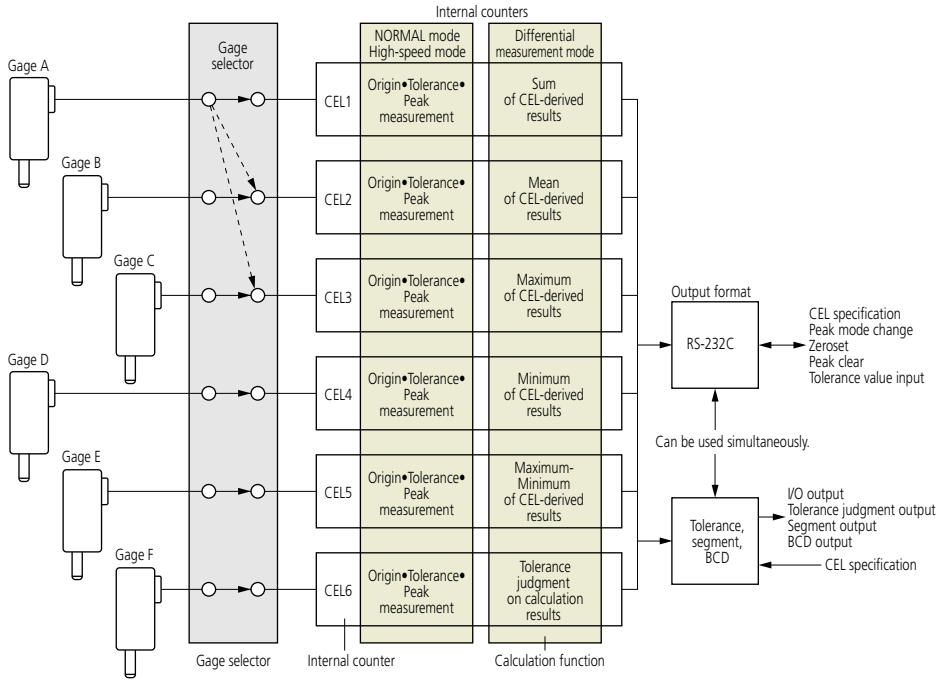
System configuration



Internal block diagram



Gage selector

It is possible to assign gage signals one-to-one or one-to-many to the internal counters through parameter settings. This allows the user to set more than one origin point and/or tolerance limit on one gage head.

Internal counters

Using the 6 internal counters (CEL1-CEL6) it is possible to perform origin setting, peak measurement, and tolerance limit setting.

Calculation function

Each of the internal counters is assigned a unique calculation function so that various kinds of calculation can be made between the internal counters specified with the parameters.

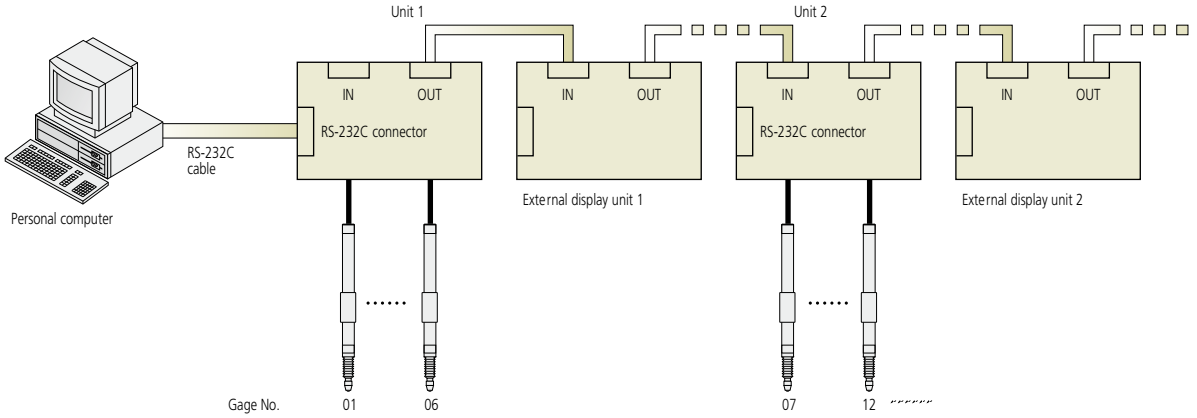
Output function

The output format can be selected from among RS-232C, BCD, tolerance judgment result and segment output. The objective CEL of the output can be selected with an appropriate RS-232C command or SET signal.

RS Link* function

It is possible to connect a maximum of 10 counter units together to carry a maximum of 60 channels of multi-point measurement at a time.
For this connection use the dedicated RS link cable; **02ADD950** (0.5m), **936937** (1m) or **965014** (2m) (The maximum total length of RS link cables permitted for the entire system is 10m.)

*Patent registered (Japan, U.S.),
Patent pending (E.U.)
When used with an EH counter, up to 6 counter units can be connected.



RS-232C Communication Functions

Makes it possible not only to log measured values but also make various remote settings including the zero-setting of a counter, etc.

Command format	Corresponding output	Function
GA**CRLF	G#**, +01234.567CRLF	Outputs the [Displayed value] through RS-232C.
CN**CRLF	CH**CRLF	Switches the display to the [Current value].
CX**CRLF	CH**CRLF	Switches the display to the [Maximum value].
CM**CRLF	CH**CRLF	Switches the display to the [Minimum value].
CW**CRLF	CH**CRLF	Switches the display to the [TIR (runout)].
CR**CRLF	CH**CRLF	Zeroset
CL**CRLF	CH**CRLF	Clears the peak value.
CP**, +01234567CRLF	CH**CRLF	Inputs the preset value and performs presetting.
CD**, +01234567CRLF	CH**CRLF	Inputs tolerance value.
CG**, +01234567CRLF	CH**CRLF	Inputs tolerance value.
CS**CRLF	CH**CRLF	Cancels the error.
CK**CRLF	CH**, $CRLF ($=0 or 1)	Confirms the HOLD state.
CT**CRLF	CH**,+01234.567CRLF	Outputs the [Displayed value] through RS-232C.

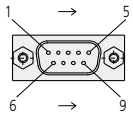
**: denotes a gage channel number between 01 and 99 ("00" means all channels).
#: denotes the type of data [N: Current value, X: Maximum value, M: Minimum value, W: TIR (runout).
CRLF: CR (carriage return), LF (line feed).
Note 1: For presetting and tolerance limit setting, enter each value consisting of a sign and 8 digits of numeric value without a decimal point.
Note 2: Perform the tolerance limit setting in the order of CD and CG for the case of 3-step tolerance judgment, and in the order of CD, CE, CF, and CG for the case of 5-step tolerance judgment.
Note 3: The RS communication function will be suspended during key operation (e.g. setting parameters, preset values, or tolerance limits). It automatically resumes the command and data output operation when the gage is recovered to such a condition that the counting is possible.
Note 4: For canceling the counting-standby state, use CS00CRLF (specification of all channels).

RS-232C specifications

1) Compatible plug:

D-sub 9-pin (female), inch thread specification

2) Pin assignment



Pin No.	Description	I/O	Contents (application)
2	RXD	IN	Receive data
3	TXD	OUT	Send data
4	DTR	OUT	Data terminal ready
5	GND	—	Ground
6	DSR	IN	Data set ready
7	RTS	OUT	Request to send
8	CTS	IN	Clear to send
1, 9	N.C.	—	Connection impossible

3) Communication specifications (conforming to EIA RS-232C)

Home position	DTE (Data Terminal Equipment) Use a cross-type cable.
Communication method	Half-duplex, teletype protocol
Data transfer rate	4800, 9600, 19200bps
Bit configuration	Start bit: 1 Data bits: (7, 8) ASCII, upper-case characters Number of parity bits: None, even, odd Number of stop bits: 2
Setting the communication conditions	Set via parameters.

EV Counter

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Input / output specifications

1) Compatible plug: 02ADB440 (with cover)

2) Pin assignment

Socket: 10236-52A2 (3M) equivalent

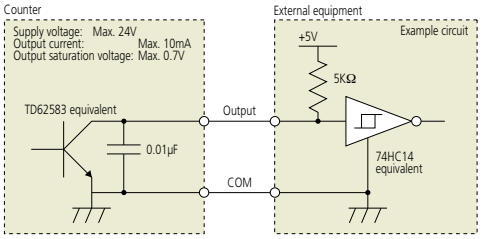
Output functions

Select either "Tolerance judgment result output", "Segment output", or "BCD output" depending on the application needs.

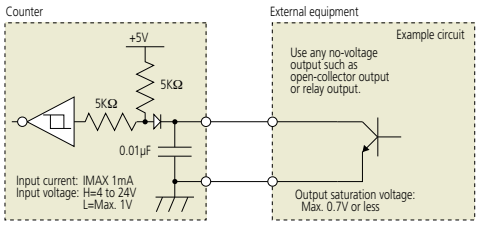
Tolerance judgment result output				Segment output			BCD output		
Pin No.	Description	Function	I/O	Description	Function	I/O	Description	Function	I/O
1	COM	Common terminal for I/O circuit (to be connected to the internal GND)	—	COM	Common terminal for I/O circuit (to be connected to the internal GND)	—	COM	Common terminal for I/O circuit (to be connected to the internal GND)	—
2	COM		—	COM		—	COM		—
3	CEL1_-NG	Tolerance judgment result output pin (1CH)	O	-OVER	- over-range	O	1X100	BCD output will be made through the specified channel.	O
4	CEL1_GO		O	-L10	With the specified channel ranges, make output from ±10 divisions.	O	2X100		O
5	CEL1_+NG		O	-L9		O	4X100		O
6	CEL1_NOM	Outputs "L" where counting is possible.	O	-L8		O	8X100		O
7	CEL2_-NG	Tolerance judgment result output pin (2CH)	O	-L7		O	1X101		O
8	CEL2_GO		O	-L6		O	2X101		O
9	CEL2_+NG		O	-L5		O	4X101		O
10	CEL2_-NOM	Outputs "L" where counting is possible.	O	-L4		O	8X101		O
11	CEL3_-NG	Tolerance judgment result output pin (3CH)	O	-L3		O	1X102		O
12	CEL3_-GO		O	-L2		O	2X102		O
13	CEL3_+NG		O	-L1		O	4X102		O
14	CEL3_NOM	Outputs "L" where counting is possible.	O	L0		O	8X102		O
15	CEL4_-NG	Tolerance judgment result output pin (4CH)	O	+L1		O	1X103		O
16	CEL4_GO		O	+L2		O	2X103		O
17	CEL4_+NG		O	+L3		O	4X103		O
18	CEL4_NOM	Outputs "L" where counting is possible.	O	+L4		O	8X103		O
19	CEL5_-NG	Tolerance judgment result output pin (5CH)	O	+L5		O	1X104		O
20	CEL5_GO		O	+L6		O	2X104		O
21	CEL5_+NG		O	+L7		O	4X104		O
22	CEL5_NOM	Outputs "L" where counting is possible.	O	+L8		O	8X104		O
23	CEL6_-NG	Tolerance judgment result output pin (6CH)	O	+L9		O	1X105		O
24	CEL6_GO		O	+L10		O	2X105		O
25	CEL6_+NG		O	+OVER	+ over-range	O	4X105		O
26	CEL6_NOM	Outputs "L" where counting is possible.	O	NOM (ANG)	Outputs "L" where counting is possible.	O	8X105		O
27	EXTEND	Output "L" while the RS command is processed.	O	EXTEND	Output "L" while the RS command is processed.	O	SIGN	Sign of the counting value (+="H", -="L")	O
28	READY	Data confirmation signal	O	READY	Data confirmation signal	O	READY	Data confirmation signal	O
29	START	First CEL identification signal	O	START	First CEL identification signal	O	START	First CEL identification signal	O
30	NORMAL	Normal signal	O	NORMAL	Normal signal	O	NORMAL	Normal signal	O
31	P.SET	Preset	I	P.SET	Preset	I	P.SET	Preset	I
32	OUTCEL	Set the objective CEL of output.	I	OUTCEL	Set the objective CEL of output.	I	OUTCEL	Set the objective CEL of output.	I
33	SET1	CEL specification data or segment range data	I	SET1	CEL specification data or segment range data	I	SET1	CEL specification data or segment range data	I
34	SET2	CEL specification data or segment range data	I	SET2	CEL specification data or segment range data	I	SET2	CEL specification data or segment range data	I
35	SET3	CEL specification data or segment range data	I	SET3	CEL specification data or segment range data	I	SET3	CEL specification data or segment range data	I
36	HOLD	Hold/Peak clear	I	HOLD	Hold/Peak clear	I	HOLD	Hold/Peak clear	I

3) I/O circuit

1. Output circuit:
   Tolerance judgment result output, NOM, segment output, etc.
   Transistor is "ON" to drive the line to "L" (open-collector output).

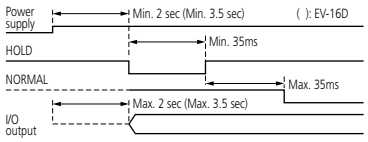


2. Input circuit :
   P.SET, HOLD, SET, etc. Input is valid when the line is "L".

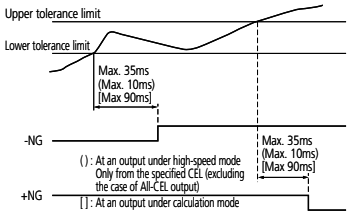


4) Timing chart

1. Power ON characteristics
   Where the RS link is established, the reference counter shall be the one that was powered last.



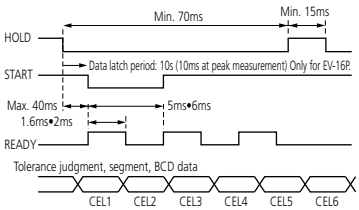
2. Tolerance judgment result output period
   All CELs will not output simultaneously.



Note: The output period in the case of ED-V counter depends on the gage unit being connected.

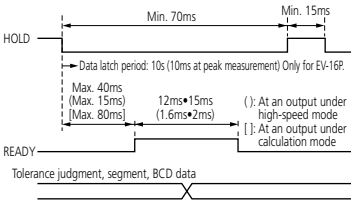
3. Data output
   There are two data output methods; Command mode and Interval mode. Either of them can be set via the I/O output mode parameters.

a. Command mode (All-CEL output)
   All-CEL data output (specified with SET1 through SET3) while the HOLD and READY lines are synchronously controlled.



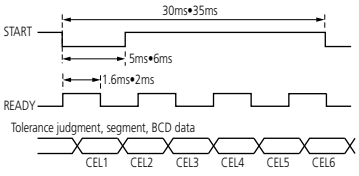
Note: During HOLD input the UNIT LED (D-EV) will be flashing.

b. Command mode (Individual CEL output)
   Individual CEL data output (specified with SET1 through SET3) can be performed while the HOLD and READY lines are synchronously controlled.



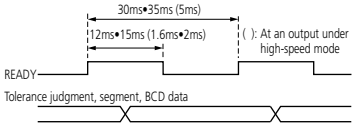
Note: When it is required to operate in the high-speed mode or All-CEL output mode, always use equipment whose input response time is 1ms or less.

c. Interval mode (All-CEL output)
   All-CEL data (specified with SET1 through SET3) will be sequentially output according to the counter's internal timing.



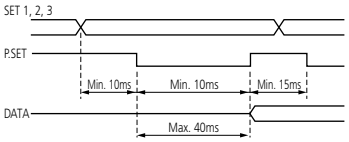
Note: When it is required to operate in the high-speed mode or All-CEL output mode, always use equipment whose input response time is 1ms or less.

d. Interval mode (Individual CEL output
   Individual CEL data (specified with SET1 through SET3) will be sequentially output according to the counter's internal timing.



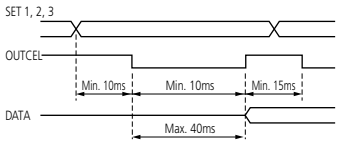
Note: The data update time in the case of **542-064** depends on the type of gage being connected. In addition, the same data may be output over multiple cycles.

4. External presetting
   Takes the current value of CEL (which has been specified with SET1 through SET3) as the preset value.



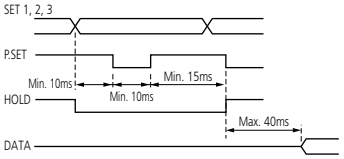
If presetting is executed, the peak value up until then will be cleared. (Max=Min=Current value, TIR=0)

5. Specification of objective CEL of output/ Specification of calculation method
   Assigns the CEL that has been specified with SET1 through SET3 to the data output CEL.



Input with SET3 through SET1 during segment output. This usually operates as the range specification data. (This acts as CEL specification when OUTCEL is input.)
- NORMAL, High-speed mode: Specification of the output CEL
- Differential calculation mode: Specification of the calculation method

6. Peak clear
   Clears the peak value.



Note: Peak clear takes effect only in the peak mode. (In the case of a current value, this has the same effect as a presetting operation.)