EA 4110
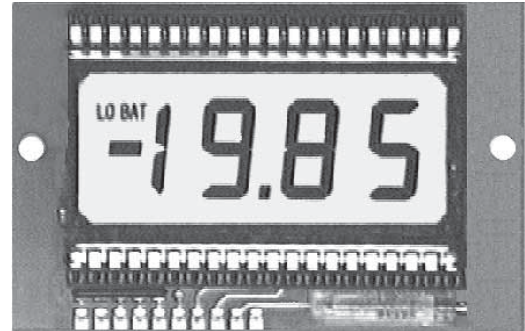
3½ DIGIT DVM, SINGLE +5V SUPPLY, COMMON GROUND

FEATURES

* HIGH CONTRAST 3½ DIGIT LCD
* 4 DIGIT HEIGHTS : 13,18,50 mm
* ACCURACY ±(0.1 % + 1 DIGIT)
* SUPPLY VOLTAGE FROM 3.7V TO 6.5V/2.5mA (L-TYPE ONLY 0.5mA)
* DIFFERENTIAL INPUT, TYPE A AND B: Ri > 100MΩ; TYPE C: Ri = 10MΩ
* 'COMMON GROUND' WITH MEASURING INPUT POSSIBLE
* AUTOZERO, AUTOPOLARITY, OVERFLOW INDICATOR
* DECIMAL POINT SELECTION, ALSO WITH SOLDER STRAPS SETTABLE
* OUTPUT VOLTAGE CA. -5V, LOADABLE WITH 10mA
* OPERATING TEMPERATURE 0 °C TO 55 °C (STORAGE TEMP.-20/+60 °C)
* 10 PIN SOLDERING CONNECTOR OR CONNECTOR PLUG
* VERSION S (WITH STORAGE) INCLUDES DATA HOLDING

OPTIONS

DISPLAY FOR EXTENDED TEMPERATURE RANGE -20 / +80 °C (OPTION -ET)
ELECTROLUMINESCENT BACKLIGHTING (OPTION -LF)[*)]

ORDERING INFORMATION

DVM, digit height 13 mm, incl. mounting bezel EA 03	**EA 4110-13??**
DVM, digit height 18 mm, incl. mounting bezel EA 08-N	**EA 4110-18??**
~~DVM, digit height 25 mm, incl. mounting bezel EA 011-N~~	**~~EA 4110-25??~~**
DVM, digit height 50 mm, incl. mounting bezel EA 050-N	**EA 4110-50??**

Wondering about question-marks? Here's how to specify your needs (??)

A/D converter, standard type (2.5mA), measuring range	± 200	mV	**NA**
	± 2	V	**NB**
	± 20	V	**NC**
A/D converter, low power type (0.5mA), measuring range	± 200	mV	**LA**
	± 2	V	**LB**
	± 20	V	**LC**
A/D converter, storage type (2.5mA), measuring range	± 200	mV	**SA**
	± 2	V	**SB**
	± 20	V	**SC**

*) additional EL inverter circuit needed (e.g. EA PSEL-1003)
Available display options : opt.-LF,-ET,-LFET

EA 4110

SPECIAL FEATURE

The modules of the **EA 4110** series are supplied with an internal DC/DC converter which converts the supply voltage (typ.+5V) into a negative voltage of nearly the same amount (typ.-4.9V). This enables one common ground (GND) between the measuring inputs and the supply voltage.

1. SUPPLY VOLTAGE (PIN 1,2) VDD,GND

Relating to GND, the supply voltage is +5V nominal (range from +3.7V to +6.5V).

2. NEGATIVE OUTPUT VOLTAGE (PIN 5) VSS

This voltage is of nearly the same amount as VDD (VDD-O.1V) and can be loaded externally with max. 10mA to supply e.g. a preamplifier. The internal output resistance is 70 Ω.

3. DIFFERENTIAL INPUTS (PIN 3,4) INH,INL

These inputs can accept differential voltages according to the measuring ranges of the modules (A = $\pm$ 200mV, B = $\pm$ 2V, C = $\pm$ 20V). Note that the reference potential of both inputs must lie within the following limits. These are VDD - 0.5V and VSS + 1V. Special note for type C : Because of the applied scaling resistor (1:10) only INH may lie at higher potential, the maximum is $\pm$ 20V.

4. DECIMAL POINT SELECTION (PIN 6,7,8) DP1,DP2,DP3

The decimal points can be selected by connection to VDD or by solder straps on the solder side of the board. If unrequired they are internally connected to LO via 1MΩ pull-downs and not visible.

5. TEST AND DIGITAL GROUND (PIN 9) TST

a) By connecting Tst with VDD you are able to test the display's segments as -1888 is shown for a short time. Note that prolonged connection may damage the display ('burn-in').
b) This pin represents also digital ground for decimal point selection and the hold input. DGND is held at about 5V below VDD (Zener diode stabilization), but independent from GND (0V) !

6. DISPLAY HOLD (PIN 10) HO (S-VERSION ONLY)

By connecting to VDD the least measured value is held on the display, otherwise it is connected via a 70 kΩ pull-down to Tst and the actual value is displayed. On versions L and N this pin is connected additionally with VDD.

7. LOW BATTERY INDICATOR

The switching threshold of this indicator is set to about 3.7V (GND - VDD) is recommended to avoid errors which may occur when the total voltage is less than 7V (VSS - VDD).

8. OVERFLOW

If it happens to be there an overflow (value > $\pm$ 1999) only the figure '1' and (if negative) it's sign is displayed on the left side.

9. SOLDER STRAPS LB1,LB2 (REVERSE SIDE OF THE MODULE)

There are two possibilities supplying the measuring input INL with it's reference potential using solder straps :
a) Connect INL with COM (internal analogue ground = VDD - 2.8V).
b) Connect INL with GND (power supply common = 0V).
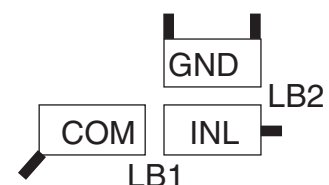
ELECTRONIC ASSEMBLY

APPLICATIONS CONCERNING THE DIFFERENTIAL INPUTS INH AND INL

Case A:

The object to be measured is free of potential.

The module is supplied from battery or an isolated neutral power supply unit. Connect the differential input INL with COM (analog ground) using solder strap LB1 **or** with GND (0V) using solder strap LB2. The latter can also be done externally. But attention: You must not use LB1 **and** LB2 at the same time ! Using LB1 will increase the common mode rejection ratio.
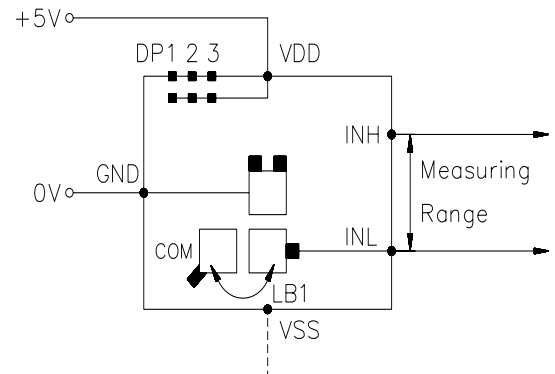
Case B:

Common ground.

If the ground (GND) of the module and the measuring object is equipotential (common), connect the differential input with GND either externally or using LB2.
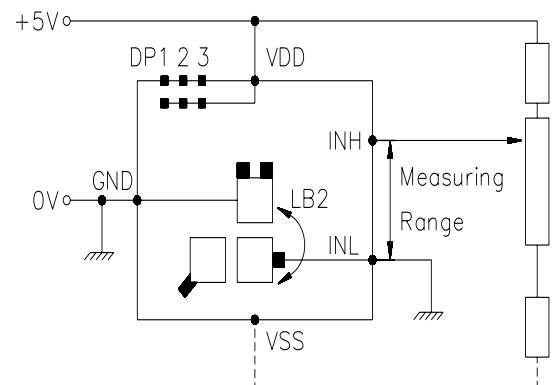
Case C:

True differential input.

Connect INL and INH with the measuring points, no other connections are necessary. Note that any input voltage must be no higher than VDD - 0.5V and no lower than VSS + 1.0V. A typical application would be e.g. a strain gauge measuring brigde.
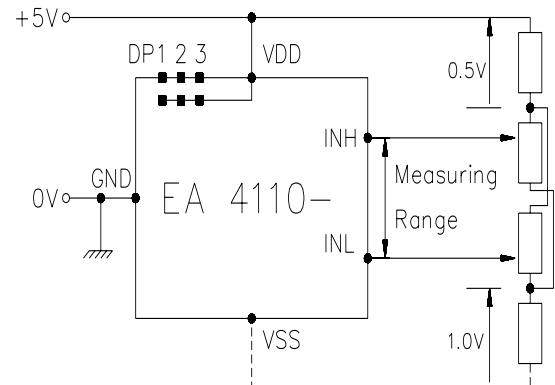
TECHNICAL DATA (CONTINUED FROM PAGE 1)

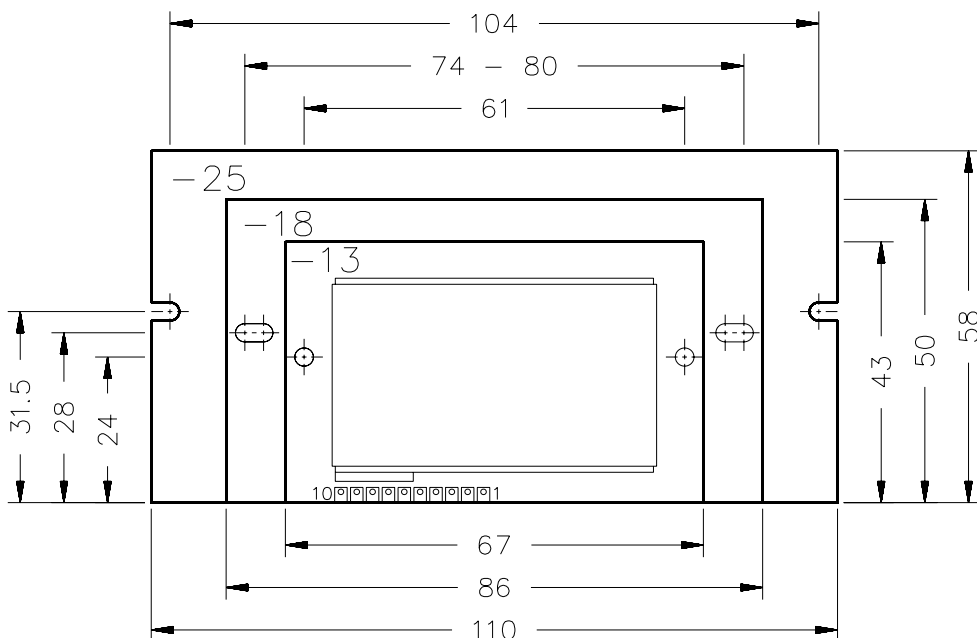|	
Storage temperature	- 20 °C to + 60 °C
Rollover error	± 1 digit
Linearity	± 1 digit
COM (analogue ground)	typ. VDD - 2.8V
Zero reading drift	typ. 1 mV / °C
Temp. coeff. of analogue common	typ. 80 ppm / °C
Ri decimal point input	typ. 1 MΩ
Ri hold input	typ. 70 kΩ
Sample rate	typ. 3 / sec
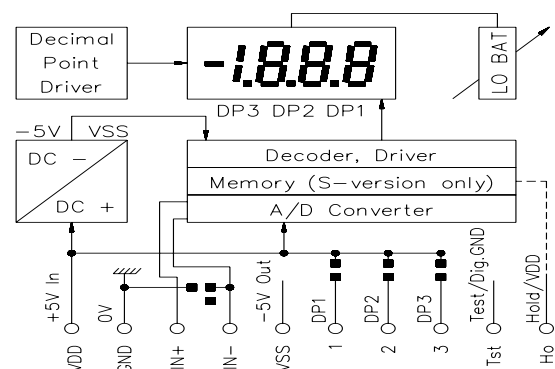
EA 4110

PIN DESCRIPTION

Pin	Symbol	Function
1	VDD	positive power supply + 5V (HI-Level)
2	GND	negative power supply OV (ground)
3	INH	pos. measuring input
4	INL	neg. measuring input
5	VSS	DC/DC converter output -5V
6	DP1	right decimal point, active HI-Level (L*)
7	DP2	middle decimal point, active HI-Level (L*)
8	DP3	left decimal point, active HI-Level (L*)
9	Tst	display test active HI-Level / dig. ground (L-Level)
10	Ho*	hold input, active HI-Level (L*)

(L*) : Internally connected via pull-down to Tst, digital GND.

(Ho*) : S-version only, otherwise connected to VDD

MODULE DIMENSIONS (in mm) EA 4110-13, -25. EA 4110-50:188x89x15mm

ATTENTION

handling precautions!

MOUNTING BEZELS (in mm) MOUNT. BEZEL EA 050-N WITH 4 SCREW PINS M2.5
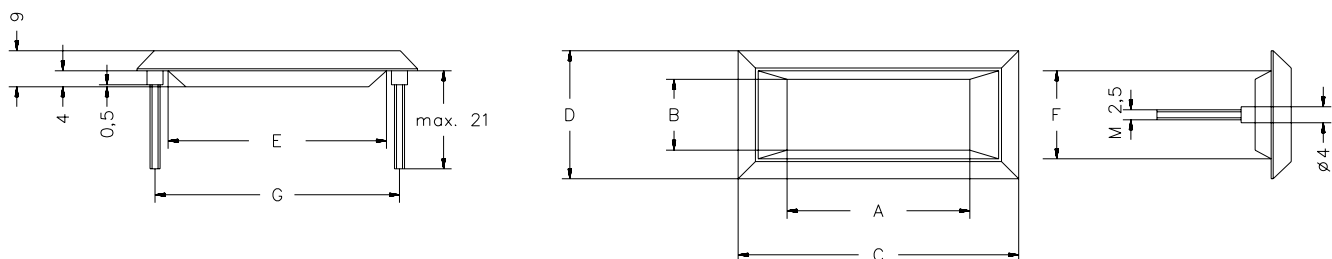
Type	Window A x B	Overall Dim. C x D	Panel Cutout E x F	Mounting Hole G / ∅	Suitable for Module
EA 03	45,7 x 17,7	70,0 x 32,0	54,5 x 22,0	61 / M2,5	EA 4110-13
EA 08-N	62,2 x 22,6	87,0 x 36,6	74,0 x 28,8	80 / M2,5	EA 4110-18
EA 050-N	160,0 x 56,0	189,0 x 73,0	173,2 x 63,0	180,3 x 61,0	EA 4110-50