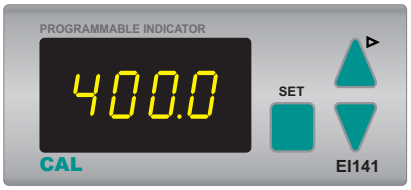
Please read this document carefully before using this product. The guarantee will be invalidated if the device is damaged by not following instructions detailed in the manual. CAL Controls shall not be responsible for any damage or losses however caused, which may be experienced as a result of the installation or use of this product.

CAL EI141 PROGRAMMABLE INDICATOR

Thank you for choosing the CAL EI141 indicator.



*** 34x77mm sized.**
*** 4 digits display.**
*** Easy to use by front panel keypad.**
*** Display scale can be adjusted between -1999 and 4000.**
*** Decimal point can be adjusted between 1 and 3 digits.**
*** Measurement unit can be displayed.**
*** Selectable four different standard input types (0-20mA, 4-20mA, 0-1V, 0-10V)**
*** User can calibrate the device according to his/her own specified input type.**
*** Sampling time can be adjusted in four steps.**
*** Maximum and minimum measurement values are registered.**
*** The maximum or the minimum values can be hold on the display.**
*** Current and voltage calibration can be made..**
*** Parameter access protection on 3 levels.**
*** Easy connection by removable screw terminal.**

Supply Voltage	Order Code
230V AC +10% -20%	EI141-230VAC
24V AC ± 10%	EI141-24VAC
12V AC ± 10%	EI141-12VAC
9-30V DC SMPS module	EI141-SM

TECHNICAL SPECIFICATIONS

ENVIRONMENTAL CONDITIONS	
Ambient/storage temperature	0 ... +50°C/-25 ... +70°C (with no icing)
Max. relative humidity	80% up to 31°C decreasing linearly 50% at 40°C.
Rated pollution degree	According to EN 60529 Front panel : IP60 Rear panel : IP20
Height	Max. 2000m
⚠ Do not use the device in locations subject to corrosive and flammable gases.	

ELECTRICAL CHARACTERISTICS	
Supply	230V AC +%10 -%20, 50/60Hz or 12/24V AC ±%10, 50/60Hz or optional 9-30V DC ±%10.
Power consumption	Max. 7VA
Wiring	2.5mm² screw-terminal connections
Date retention	EEPROM (Min. 10 years)
EMC	EN 61326-1: 1997, A1: 1998, A2: 2001 (Performance criterion B for the EMC standard)
Safety requirements	EN 61010-1: 2001 (pollution degree 2, overvoltage category II, measurement category I) ⚠ EI141 must not be used in location where measurement category is II, III or IV.

Input type	Measurement range		Measurement accuracy	Input empedance
	Min.	Max.		
0-1V DC voltage	0V	1.1V	±0,5% (of full scale)	Approx. 11kΩ (terminal voltage limits: min. = -2V, max. = 30V)
0-10V DC voltage	0V	14V	±0,5% (of full scale)	Approx. 11kΩ (terminal voltage limits: min. = -2V, max. = 30V)
0-20mA DC current	0mA	25mA	±0,5% (of full scale)	Approx. 5Ω (applicable terminal voltage is max. 50mA.)
4-20mA DC current	0mA	25mA	±0,5% (of full scale)	Approx. 5Ω (applicable terminal voltage is max. 50mA.)

⚠ In the current measurement mode input impedance is 5Ω. Therefore, in the current measurement mode, a voltage input should not be connected to the input terminals, otherwise, the device will be damaged. To change the input type from voltage to a current measurement mode, isolate the input before changing the operation mode.

HOUSING	
Housing type	Suitable for panel mounting according to DIN 43 700.
Dimensions	W77xH34xD70mm
Weight	Approx. 250g (after packing)
Enclosure material	Self extinguishing plastics
⚠ While cleaning the device, solvents (thinner, benzine, acid etc.) or corrosive materials must not be used.	

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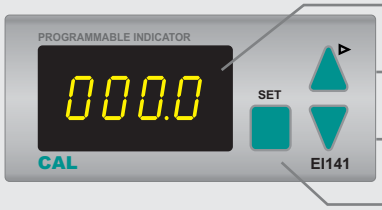
TERMS



1) Measurement value, measurement unit, the minimum or the maximum measured values are displayed in the run mode.
Parameter name, parameter value or a user defined unit is displayed in the programming mode.

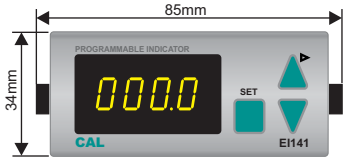
2) Increment or parameter selection key in the programming mode.
Used for displaying measurement unit or the max. measured value in the run mode.

3) Decrement or parameter selection key in the programming mode.
Used for making the minimum and the maximum measured values equal in the run mode.

4) Used for selecting run and programming modes, adjusting parameters, displaying measurement unit or making the minimum and the maximum measured values equal.

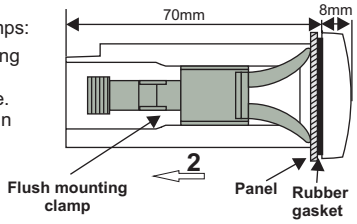
(1) Digital display	4 digits 7 segment yellow LED display
Character height	12mm
(2),(3),(4),(5) Keypad	Micro switch

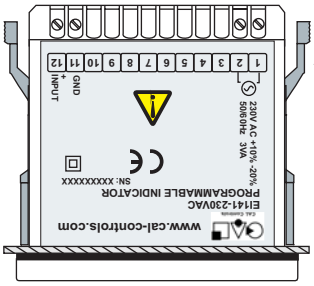
DIMENSIONS



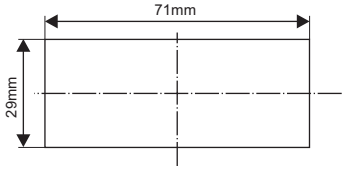
For removing mounting clamps:
- Push up the flush-mounting clamp in direction **1** as shown in the figure above.
- Then, pull out the clamp in direction **2.**

Depth





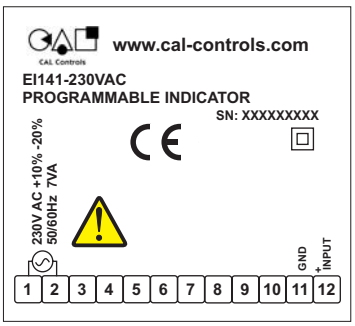
Panel cut-out

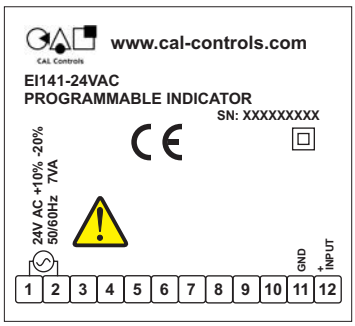


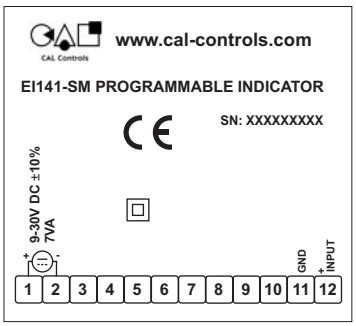
Note : 1) Panel thickness should be maximum 7 mm.
2) If there is no 60mm free space at the back side of the device, it would be difficult to remove it from the panel.

CONNECTION DIAGRAM

The CAL EI141 is intended for installation in control panels. Make sure that the device is used only for intended purpose. The shielding must be grounded on the instrument side. During an installation, all of the cables that are connected to the device must be free of electrical power. The device must be protected against inadmissible humidity, vibrations, severe soiling and make sure that the operation temperature is not exceeded. All input and output lines that are not connected to the supply network must be laid out as shielded and twisted cables. These cables should not be close to the power cables or components. The installation and electrical connections must be carried out by qualified staff and must be according to the relevant locally applicable regulations.

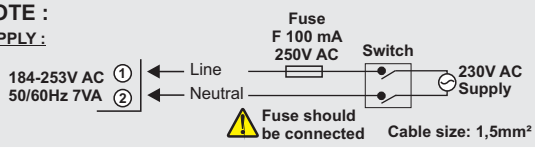






NOTE :

SUPPLY :

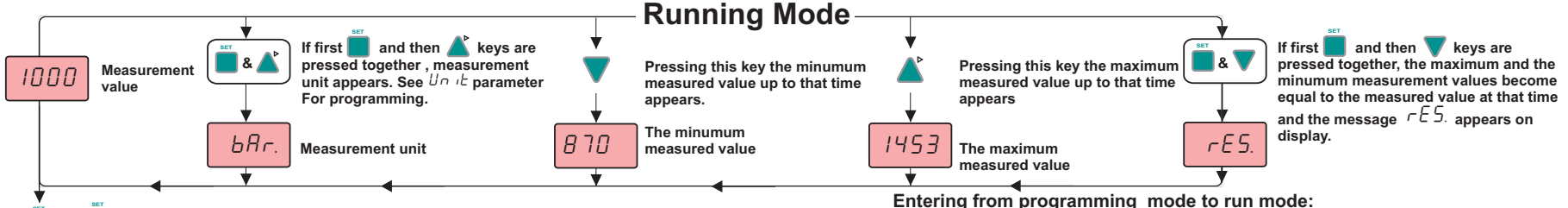


Holding screw 0.4-0.5Nm

Equipment is protected throughout by DOUBLE INSULATION.

Note : 1) Mains supply cords shall meet the requirements of IEC 60227 or IEC 60245.
2) In accordance with the safety regulations, the power supply switch shall bring the identification of the relevant instrument and it should be easily accessible by the operator.

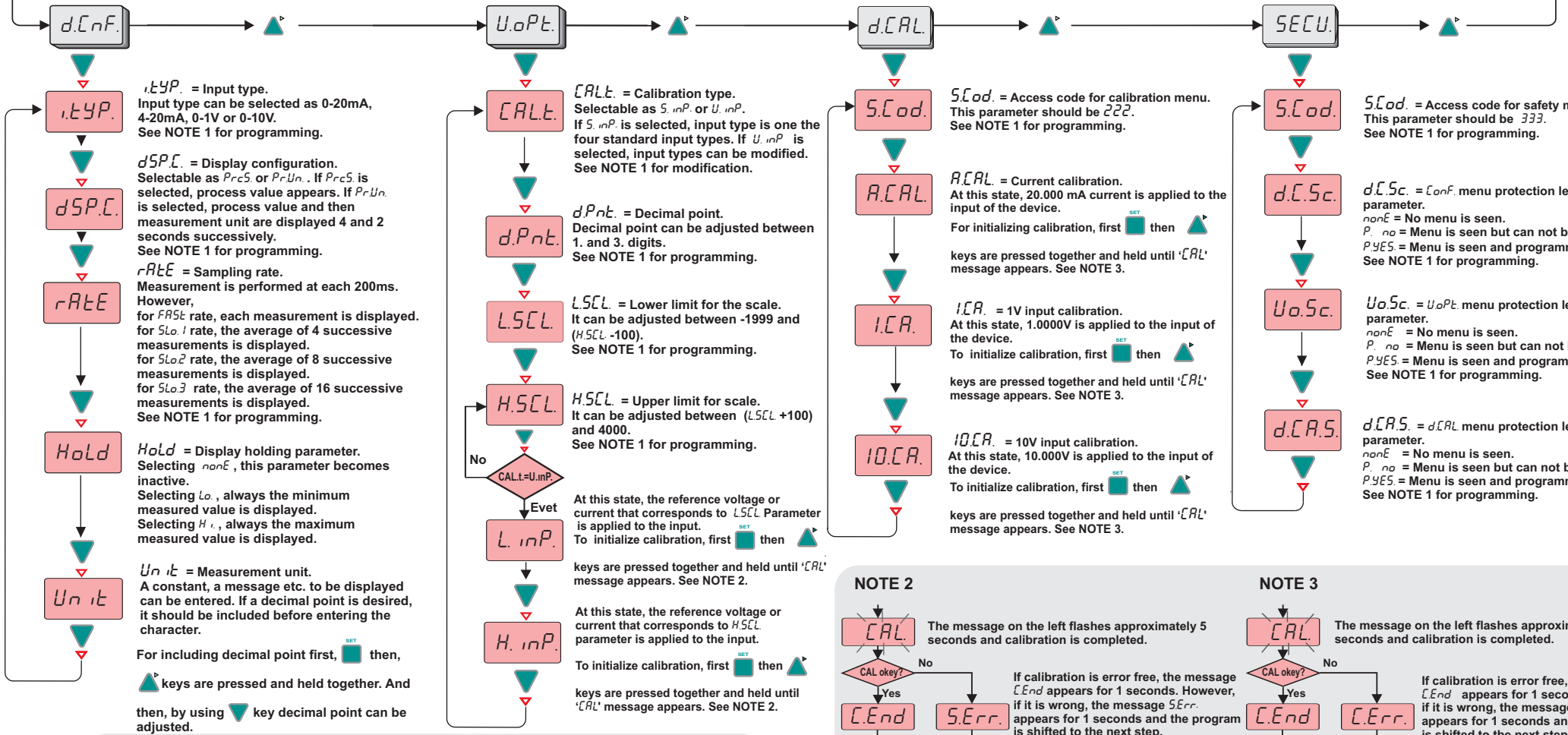
Running Mode



SET If SET key is pressed and held for 5 seconds programming mode is entered

Entering from programming mode to run mode:
If no key is pressed within 20 seconds during programming mode data is stored automatically and the run mode is entered. Alternatively the same function occurs by pressing SET key and holding for 5 seconds

Programming Mode



i.tYP. = Input type.
Input type can be selected as 0-20mA, 4-20mA, 0-1V or 0-10V.
See NOTE 1 for programming.

dSP.C. = Display configuration.
Selectable as PrcS. or PrUn. . If PrcS. is selected, process value appears. If PrUn. is selected, process value and then measurement unit are displayed 4 and 2 seconds successively.
See NOTE 1 for programming.

rAtE = Sampling rate.
Measurement is performed at each 200ms. However,
for FASt rate, each measurement is displayed.
for Slo.1 rate, the average of 4 successive measurements is displayed.
for Slo.2 rate, the average of 8 successive measurements is displayed.
for Slo.3 rate, the average of 16 successive measurements is displayed.
See NOTE 1 for programming.

HoLd = Display holding parameter.
Selecting nonE , this parameter becomes inactive.
Selecting Lo. , always the minimum measured value is displayed.
Selecting Hi. , always the maximum measured value is displayed.

Un it = Measurement unit.
A constant, a message etc. to be displayed can be entered. If a decimal point is desired, it should be included before entering the character.

For including decimal point first, SET then, ▲ keys are pressed and held together. And then, by using ▼ key decimal point can be adjusted.

CAL.t = Calibration type.
Selectable as S. inP. or U. inP.
If S. inP. is selected, input type is one the four standard input types. If U. inP is selected, input types can be modified.
See NOTE 1 for modification.

d.Pnt. = Decimal point.
Decimal point can be adjusted between 1. and 3. digits.
See NOTE 1 for programming.

L.SCL. = Lower limit for the scale.
It can be adjusted between -1999 and (H.SCL. -100).
See NOTE 1 for programming.

H.SCL. = Upper limit for scale.
It can be adjusted between (L.SCL. +100) and 4000.
See NOTE 1 for programming.

At this state, the reference voltage or current that corresponds to L.SCL. Parameter is applied to the input.
To initialize calibration, first SET then ▲ keys are pressed together and held until 'CAL' message appears. See NOTE 2.

At this state, the reference voltage or current that corresponds to H.SCL. parameter is applied to the input.
To initialize calibration, first SET then ▲ keys are pressed together and held until 'CAL' message appears. See NOTE 2.

S.Cod. = Access code for calibration menu.
This parameter should be 222.
See NOTE 1 for programming.

A.CAL. = Current calibration.
At this state, 20.000 mA current is applied to the input of the device.
For initializing calibration, first SET then ▲ keys are pressed together and held until 'CAL' message appears. See NOTE 3.

1.CA. = 1V input calibration.
At this state, 1.0000V is applied to the input of the device.
To initialize calibration, first SET then ▲ keys are pressed together and held until 'CAL' message appears. See NOTE 3.

10.CA. = 10V input calibration.
At this state, 10.000V is applied to the input of the device.
To initialize calibration, first SET then ▲ keys are pressed together and held until 'CAL' message appears. See NOTE 3.

S.Cod. = Access code for safety menu.
This parameter should be 333.
See NOTE 1 for programming.

d.C.Sc. = ConF. menu protection level parameter.
nonE = No menu is seen.
P. no = Menu is seen but can not be programmed.
P.YES. = Menu is seen and programming is possible.
See NOTE 1 for programming.

Uo.Sc. = U.oPt. menu protection level parameter.
nonE = No menu is seen.
P. no = Menu is seen but can not be programmed.
P.YES. = Menu is seen and programming is possible.
See NOTE 1 for programming.

d.CA.S. = d.CAL menu protection level parameter.
nonE = No menu is seen.
P. no = Menu is seen but can not be programmed.
P.YES. = Menu is seen and programming is possible.
See NOTE 1 for programming.

Parameter adjustment method

NOTE 1

For adjusting a selected parameter first press and hold SET key. Then, by using ▼▲ keys adjustment can be made.
If increment key ▲ is pressed and held 0.6 seconds, the value of the selected parameter changes rapidly. If waited enough, the value increases 100 at each step. After 1 second following the release of the key, initial condition is returned. The same procedure is valid for the decrement key.

NOTE 2

The message on the left flashes approximately 5 seconds and calibration is completed.

If calibration is error free, the message C.End appears for 1 seconds. However, if it is wrong, the message S.Err. appears for 1 seconds and the program is shifted to the next step.

NOTE 3

The message on the left flashes approximately 5 seconds and calibration is completed.

If calibration is error free, the message C.End appears for 1 seconds. However, if it is wrong, the message C.Err. appears for 1 seconds and the program is shifted to the next step.

ERROR MESSAGES

S.Err. If the difference between the reference voltages or currents applied for the calibration of H. inP. and L. inP. is lower than one half of the full scale, this error message appears on the display.
For example: Assume that the selected input type is 0-1V. In this case, if the difference between the reference voltages applied for calibration of H. inP.and L. inP. is lower than 0.5V, this error message appears.

C.Err. If the reference voltage or current applied to the input for calibration is too high or too low, this error message appears.